UNBOOKED MOTHERS

OUTCOME AND CONTRIBUTORY FACTORS

URSULA M BOTHA
MBChB FCOG (SA)

In partial fulfillment of the requirements for a Masters degree in Medicine (Obstetrics and Gynaecology) of the University of Cape Town.

Journal of Obstetrics and Gynaecology, October 2007; 27(7): 695–698

informa
healthcare

The unbooked patient: A lingering obstetric pathology in Jos, Nigeria

J. T. MUTIHIR & Y. A. NYIPUTEN

Department of Obstetrics and Gynaecology, Jos University Teaching Hospital, Jos, Plateau State, Nigeria

Summary
There were 297 unbooked patients constituting 2% of all deliveries in the Jos Teaching Hospital. Mean age and parity were 26.7 ± 6.8 years and 3.7 ± 3.0, respectively. Non-literate women accounted for 36.9%, secondary education 26.2% and tertiary education 3.8%. Housewives constituted 81.2% of the mothers. The majority (93%) were married, while 21 (7.1%) were unmarried. Maternal morbidity included pre-term labour (40.1%), intrauterine fetal death (9.1%), abruptio placenta (4.2%) and ante-partum eclampsia (2.8%). Vaginal delivery occurred in 246 (82.8%) and caesarean section in 45 (15.1%). There were five maternal deaths and all died undelivered. There were 78 perinatal deaths (260/1,000 births), and over 65% were due to low birth weight and prematurity. Mean birth weight was 2.5 ± 0.8 kg and 38.3% were of low birth weight. Unbooked patients remain significant obstetric pathologies in our maternity unit. Community health education is needed to reduce the number of unbooked patients and the associated pathologies.

Keywords
Antenatal care, unbooked, mortality

Introduction

Antenatal care from a trained provider (doctor or midwife) is important in monitoring pregnancy and helping to reduce the risks for the mother and baby during this period (NPC 2003). Such care has been asserted to be associated with marked reduction in maternal and perinatal morbidity and mortality, especially in developing countries. A woman is regarded as having had antenatal care if she booked for such care early, and afterwards made a minimum of two antenatal visits, the last one being no more than 2 weeks before delivery (Harrison 1985; Ekele and Audu 1998). Ryan et al. 1980 and Kluio and Kariwiga 1992 have demonstrated that antenatal care improved perinatal as well as maternal outcomes. The unbooked patient is thus deemed to have missed the purported benefits of antenatal care, and ends up with increased maternal and perinatal morbidity and mortality.

Unbooked patients have been found to be women who, for one reason or the other, failed to seek antenatal care services in a modern healthcare facility. They have been seen to develop many complications associated with their obstetric performance (Ryan et al. 1980; Hamilton et al. 1987; Dey and Hatai 1992). For example, the incidence of pre-eclampsia has been documented to be higher among unbooked patients (Mekbib and Ketsela 1991). Dey and Hatai 1992; Ozumba and Uchegbu 1991; Uzoigwe and John 2004 have found that unbooked patients are more prone to prolonged and complicated labour. Their babies have also been found to be smaller than their booked counterparts (Ekele and Audu 1998). The unbooked patient has generally been found in some studies as the older woman of low socioeconomic status (Hamilton et al. 1987; Onwudiegwu and Ezechi 2001) and of high parity (Dott and Fort 1975).

The objective of the study was to determine the incidence and the characteristics of the unbooked patient and the maternal and perinatal outcomes in our environment.

Materials and methods

This was a retrospective study of unbooked patients managed at the maternity unit of Jos University Teaching Hospital (JUTH), Jos, Nigeria. Over the period of 6 years (January 1999 to December 2004), the medical records of all mothers who had no form of antenatal care but delivered in the maternity unit of the JUTH were collated and evaluated.

The unbooked patient in this study refers to the woman who did not utilise the antenatal care services of the JUTH, or any other healthcare facility giving modern antenatal care services, but presented to the delivery room in labour or within 12 h of delivery. The patient was either referred from a healthcare facility, or was self referred to our maternity ward, and had no documented antenatal record of the index pregnancy. Any patient who had a booking clinic visit followed by one or two follow-up visits were excluded from this study.

The admission records were collected and the following information extracted: age, parity, educational status, ethnic group, occupation, marital status and gestational age at presentation. The obstetric outcomes of the pregnancies were also extracted. The total number of deliveries during the period of study was obtained from the delivery register. The data collected were collated and entered into the Epi-Info 2002® computer software and analysed.

Correspondence: J. T. Mutihir, Department of Obstetrics and Gynaecology, Jos University Teaching Hospital, Jos, Plateau State, Nigeria.
E-mail: jtmutihir01@yahoo.co.uk

ISSN 0144-3615 print/ISSN 1364-6893 online
DOI: 10.1080/01443610701612110

Results

A total of 14,565 deliveries were conducted in the facility and 297 (2% or 1 in 50 deliveries) were unbooked. The unbooked women had the findings observed below.

The age of the patients ranged from 15–45 years with a mean of 26.7 ± 6.8 years and the parity ranged from 1–13 with a mean of 3.7 ± 3.0. The non-literate women accounted for 36.9%, followed by those with secondary education (26.2%). Women with tertiary education accounted for only 3.8% of the unbooked mothers.

The Hausa ethnic group accounted for the majority (35.9%) of the mothers compared to other ethnic groups in the study. Housewives with no income of their own constituted 81.2% of the unbooked mothers. Majority (92.9%) of mothers were married, while 21 (7.1%) of them who were mainly secondary school students were unmarried. All the students were teenagers and were delivering for the first time (primiparae).

A total of 112 (38.2%) patients presented with no problems in pregnancy. Some 185 (61.8%) had problems either during labour, delivery or in the immediate puerperal or neonatal period.

Pre-term labour in the general population was in 2,619 (18%), while 11,458 (78.6%) were term, 270 (1.9%) were post-term and 218 (1.5%) were not documented. Pre-term labour and delivery was the most common morbidity in the unbooked women and occurred in 119 (40.1%), while 56.1% delivered at term. The mean gestational age was 35.9 ± 4.0 weeks in the unbooked women but 38.2 ± 2.7 weeks in the booked patients. Spontaneous vaginal delivery was the mode of delivery in 246 (82.8%), while caesarean section was performed in 43 (15.1%), Table I.

Fetal distress was the most common indication for caesarean section, occurring in 23 (54.8%) of the patients, followed by ante-partum eclampsia 8 (19.1%), Table II.

Intrauterine fetal death (IUFD) was recorded in 26 (9.1%) of the cases and were all macerated stillborn babies. Abruptio placenta occurred in 12 (4.2%), and were all fresh still born. Eight patients (2.7%) presented with ante-partum eclampsia (Table III).

There were five maternal deaths, all of whom died undelivered. There was no autopsy done to confirm the causes of maternal deaths.

The fetal outcome showed that there were 67 stillbirths, giving a stillbirth rate of 22.3%. Of the stillbirths, 27 were macerated, while 36 were fresh stillbirths. There were 11 immediate neonatal deaths, giving a total of 78 perinatal deaths (260/1,000 births). Fifty-one (65.4%) of the perinatal deaths were due to low birth weight and prematurity.

The mean birth weight was 2.5 ± 0.8 kg but 3.1 ± 0.8 in the booked patients. A total of 115 (38.3%) of the babies were of low birth weight (birth weight < 2.500 kg), Table IV.

Table I. Maternal characteristics ($n = 297$)

Characteristics	*n*	(%)
Age (years)		
15–19	40	13.5
20–24	82	27.6
25–29	73	24.6
30–34	51	17.2
35–39	32	10.8
40–44	16	5.3
≥45	3	1.0
(Mean age = 26.7 ± 6.8 years)		
Parity		
Para 1	119	40.0
Para 2–4	86	29.0
Para ≥ 5	92	31.0
(Mean parity = 3.7 ± 3.0)		
Educational status		
Non-literate	110	37.0
Primary education	73	24.6
Secondary education	78	26.2
Tertiary education	11	3.7
Not stated	25	8.4
Ethnic group		
Hausa	106	35.7
Berom	29	9.4
Igbo	19	6.4
Fulani	17	5.7
Yoruba	11	3.7
Idoma	8	2.7
Rukuba	6	2.0
Jarawa	6	2.0
Challa	6	2.0
Irigwe	5	1.7
Ngas	5	1.7
Mwaghavul	5	1.7
Others	74	24.9
Occupation of the patients		
House wife	241	81.2
Student	21	7.1
Civil servant	10	3.4
Trading	7	2.4
Tailor	6	2.0
Business	4	1.3
Others	4	1.3
Not stated	4	1.3
Gestational age at delivery (presentation to labour room)		
< 37 weeks	119	40.1
37–42 weeks	161	56.1
> 43 weeks	4	1.3
Not known	13	4.4
(Mean of gestational age = 35.9 ± 4.0 weeks)		
Mode of delivery		
Spontaneous vaginal delivery	238	80.1
Caesarean section	43	15.1
Assisted breech delivery	5	1.7
Vacuum delivery	2	0.7
Forceps delivery	2	0.7
Died undelivered	5	1.7

Discussion

A total of 2% of admitted women in the maternity unit were unbooked for antenatal care in Jos University Teaching Hospital. This is much lower that the 11% reported by English et al. 1995 in Saudi Arabia. The reason for this is not clear, but may be due to the fact that the Saudi women are predominantly Moslems, while our population is multi-religious. Healthcare service is also free for the Saudi woman, while this is not so here.

The sociodemographic characteristics of the patients in this study indicated that the 'unbooked patient' was a young housewife who was not likely to be working; or a student and single. The mean age of 26.7 years was lower than the 28.8 years in the same obstetric population and this was statistically significant ($p < 0.05$). About 40% of the study

Table II. Indications for caesarean section in the unbooked patients ($n = 45$)

Indications	*n*	(%)
Fetal distress	24	53.3
Eclampsia	8	17.8
Ante-partum haemorrhage	3	8.7
Transverse lie	2	4.4
Obstructed labour	2	4.4
Retained 2nd twin	2	4.4
2 previous caesarean sections	2	4.4
Footling breech	1	2.2
Acquired gynatresia (narrowed vagina)	1	2.2

Table III. Diagnosis at presentation to the hospital

Diagnosis	*n*	(%)
Normal labour	112	37.7
Pre-term labour	119	40.1
Intrauterine death	28	9.4
Abruptio placenta	12	4.0
Ante-partum eclampsia	8	2.7
Multiple pregnancy	8	2.7
Delivery before arrival	6	2.4
Prolonged labour	5	1.7
Retained placenta	4	1.4
Obstructed labour	4	1.4
Retained 2nd twin	2	0.7
HIV-positive in pregnancy	2	0.7
Others	5	1.7

Some patients had more than one clinical condition at presentation.

Table IV. Fetal outcome compared with the general population

	Unbooked deliveries ($n = 300$)		Total deliveries ($n = 14{,}565$)	
Fetal characteristic	*n*	(%)	*n*	(%)
Levels of asphyxia in first minute				
Severe asphyxia (Apgar 1–3)	27	11.6	1,011	6.9
Moderate asphyxia (Apgar 4–5)	28	12.0	722	5.0
Mild asphyxia (Apgar 6–7)	60	25.8	3,124	21.4
No asphyxia (Apgar 8–10)	90	38.6	9,642	66.2
Not stated	28	12.0	66	0.5
(Mean Apgar score of the infants = 4.9 ± 3.3; there were 67 stillbirths)				
Birth weights in kg compared with the general population				
Very low birth weight (< 1.500)	42	14.0	218	1.5
Low birth weight (1.50–2.49)	73	24.3	1,474	10.1
Normal birth weight (2.50–3.99)	163	54.3	11,741	80.6
Macrosomia (≥4.00)	3	1.0	1066	7.3
Not stated	19	6.3	66	0.5
Mean birth weight	2.5 ± 0.8		3.1 ± 0.8	

group were below the age of 25 years. The large number of unbooked mothers in the younger age group may be because many were teenage students and unmarried, who would avoid antenatal care. They would normally hide the pregnancy as single parenthood is culturally unacceptable in this part of Nigeria. Another study in Zaria, Nigeria (Harrison 1985) reported that single marital status contributed significantly, in these patients, to preferring not to book for antenatal care. A total of 40% of the unbooked patients were pregnant for the first time (primigravidae), and had a mean age of 21.5 ± 4.2 years. Adelusi et al. 1999 also found this group of patients to be young, unskilled worker or student. The unbooked patient in other studies, however, has generally been found as an older woman of low socioeconomic status (Hamilton et al. 1987; Onwudiegwu and Ezechi 2001) and of high parity (Dott and Fort 1975). The mean parity of all the patients in the study was 3.7. This was higher than the 3.0 in the same obstetric population and this was found to be statistically significant ($p < 0.05$). This shows that the patients in this study were younger but of higher parity than the same obstetric population.

Over 60% of the unbooked patients had various complications of pregnancy, labour and delivery. Some of them had multiple pathologies requiring urgent management. Pre-term labour and delivery was the commonest maternal morbidity. The mean gestational age at presentation was 35.9 ± 4.0 weeks. The gestational age at booking both in Jos and Sokoto are similar as majority of them booked after 20 weeks' gestation (Ekele and Audu 1998; Mutihir et al. 2004). Some of the patients in this study were probably yet to book for antenatal care. Nigerian women tend to obtain antenatal care late in pregnancy, and for about one-third of these, the care was inadequate (Harrison 1985). Ekele and Audu (1998) had reported that 47% of the women started attending the antenatal clinic only in the third trimester. In addition, Kambarami et al. (1999) found that only 21.6% started antenatal clinic in the first trimester and 62% made five or fewer antenatal visits among rural Zimbabwe antenatal clinic attendees. Late and low utilisation of this needed care may be explained by high costs as one of the major barriers to utilisation of antenatal care. However, antenatal care service in Jos is affordable to the majority of the populace. Therefore, reasons for the non-utilisation or delay in seeking antenatal care will require further investigation.

Other problems at presentation included intrauterine fetal death (9.1%), abruptio placenta (4.2%) and ante-partum eclampsia (2.7%). Pre-eclampsia and other complications have been reported to be common in the unbooked mother (Kluio and Kariwiga 1992).

Spontaneous vaginal delivery was the most common (80.1%) mode of delivery among the patients in the study. Operative delivery (caesarean section) was performed in 15.1% of the cases, and this is similar to the caesarean section rate of 15.8% reported among the same obstetric population (Mutihir et al. 2005). This low caesarean section rate in the study could be explained by the fact that about 40% of the cases were premature labour; and all cases of intrauterine fetal deaths were allowed vaginal delivery, without resorting to caesarean delivery. Other workers have found an operative delivery rate of about three times higher among unbooked patients (Kambarami et al. 1999).

In this study, there were five maternal deaths (1,683/100,000) among the unbooked patients, all of whom died undelivered. All of them presented in moribund states, could not be successfully resuscitated and died within 1 h of admission. The maternal mortality ratio was lower than reported in other studies (English 1995). In Sagamu, Nigeria (Oladapo et al. 2006), 8.4% of the unbooked

patients died, and the authors predicted a deficiency in the provision of both basic and comprehensive obstetric care in the communities as the factor responsible. Other studies in Nigeria (Uzoigwe and John 2004; Onwudiegwu and Ezechi 2001) have demonstrated that the unbooked patient was 22 times more likely to die in hospital compared with her booked counterpart. The maternal mortality in the study was however higher than that of the general population, 740/100,000 total deliveries (Ujah et al. 2005) and between 800 and 1,000/100,000 live births with wide regional differences in Nigeria (UNFPA 2003). Antenatal care therefore appears to be associated with lower maternal mortality.

The fetal outcome showed increased perinatal morbidity and mortality. There was a stillbirth rate of 223/1,000 births, and a perinatal death of 260/1,000 births. Over 50% of the perinatal deaths were among babies of low birth weight and prematurity. Apart from the high stillbirth rate recorded, over one-third (38.3%) of the babies born alive suffered varying degrees of mild to severe asphyxia. This was significantly higher than the general obstetric population ($p < 0.05$). Antenatal care therefore has rightly been asserted to have positive effects on fetal outcome. Higher perinatal morbidity rates are associated with home deliveries (Kambarami et al. 1999) particularly in this environment.

Ekwempu 1988 has demonstrated that overall, educated booked patients experience reduced perinatal and maternal deaths compared with uneducated unbooked subjects. They are quick to point out however, that booking status has a greater positive influence than education on perinatal and maternal mortality.

Low birth weight rate was high (38.3%) among the unbooked patients. This was similar to figures reported in other studies (Ekele and Audu 1998; Onwudiegwu and Ezechi 2001). The average birth weight in the study was 2.5 kg compared with 3.2 kg in the obstetric population (Wright 1989). Maternal intrinsic factors such as nutrition and socioeconomic status have been suggested as the causative factors in the unbooked patients rather than the hospital booking per se (Ekele and Audu 1998).

In conclusion, the importance of proper antenatal care and hospital delivery towards the reduction of maternal and perinatal morbidity and mortality is not in doubt. However, women who prefer to avoid the utilisation of the service even when this is available, remain an obstetric problem in Jos, Nigeria. Unbooked patients are still seen in the maternity unit at the rate of about 1 in every 50 deliveries. The unbooked patient in our environment was found to be an obstetric high risk, requiring careful assessment followed by prompt management. She is likely to be that woman who is Hausa by ethnicity, non-literate, a housewife and presents with one or more obstetric problems. There is the need to make an effort to reach out to the ethnic groups concerned through the community leaders about the benefits of antenatal care, early booking for antenatal care and hospital delivery. Patients that are unable to afford the cost of antenatal care could be treated as indigent, and offered free services where necessary. A study will be required in this group of women to determine any physical, economic and cultural barriers to antenatal care, which this retrospective study was unable to determine. The identified barriers would lead to insights and potential planning strategies to reach out to women under-served by obstetric care.

References

Adelusi B, Al-Nuaim LA, Chowdhury N, Abotalib Z, Moghraby S, Kangave D. 1999. Socio-demographic characteristics of the 'unbooked mother'. West African Journal of Medicine 18:191–195.

Dey N, Hatai SK. 1992. A study of caesarean section cases with special reference to maternal and neonatal outcome. Journal of Indian Medical Association 90:149–151.

Dott AB, Fort AT. 1975. The effect of maternal demographic factors on infant mortality rates. American Journal of Obstetrics and Gynecology 123:847–853.

Ekele BA, Audu LR. 1998. Gestational age at first antenatal attendance in Sokoto, Northern Nigeria. Tropical Journal of Obstetrics and Gynaecology 15:39–40.

Ekwempu CC. 1988. The influence of antenatal care on pregnancy outcome. Tropical Journal of Obstetrics and Gynaecology 1:67–71.

English JD. 1995. Perinatal mortality at the North West Armed Forces Hospital, Tabuk, Saudi Arabia and the potential benefits of the biophysical profile score. Annals of Saudi Medicine 15:133–136.

Hamilton RA, Perlmann T, de Souza JJL. 1987. The unbooked patient. Outcome of pregnancy in unbooked coloured patients. South African Medical Journal 71:31–34.

Harrison KA. 1985. Child-bearing, health and social priorities: a survey of 22 774 consecutive hospital births in Zaria, Northern Nigeria. British Journal of Obstetrics and Gynaecology 92:S1–S119.

Kambarami RA, Chirenje MZ, Rusakaniko S. 1999. Antenatal care patterns and factors associated with perinatal outcome in two rural districts in Zimbabwe. Central African Journal of Medicine 45:294–299.

Kluio CA, Kariwiga G. 1992. A comparison of unbooked mothers delivering at Port Moresby General Hospital with mothers seen antenatally: socio-economic and reproductive characteristics. Papua New Guinea Medical Journal 35:3–9.

Mekbib T, Ketsela K. 1991. Pre-eclampsia-eclampsia in Yekatir 12 Hospital, Addis Ababa, Ethiopia 1987–1989. East African Medical Journal 68:893–899.

Mutihir JT, Maduka WE, Ujah IAO. 2004. Gestational age at booking of primigravidae in Jos, North Central Nigeria. Journal of Medicine in the Tropics 6:13–18.

Mutihir JT, Ujah IAO, Daru PH. 2005. Elective caesarean section in Jos University Teaching Hospital. Tropical Journal of Obstetrics and Gynaecology 22:39–41.

National Population Commission (NPC) and ORC Macro. 2004. Nigeria Demographic and Health Survey 2003. Maryland: NPC. pp 115–120.

Oladapo OT, Lamina MA, Fakoya TA. 2006. Maternal deaths in Sagamu in the new millennium: a facility-based retrospective analysis. Biomedical Central Pregnancy and Childbirth 6:6–16.

Onwudiegwu U, Ezechi OC. 2001. Emergency obstetric admissions: late referrals, misdiagnoses and consequences. Journal of Obstetrics and Gynaecology 21:570–575.

Ozumba BC, Uchegbu H. 1991. Incidence and management of obstructed labour in Eastern Nigeria. Australia New-Zealand Journal of Obstetrics and Gynaecology 31:213–216.

Ryan GM, Sweeny PJ, Solola AS. 1980. Prenatal care and Pregnancy outcome. American Journal of Obstetrics and Gynecology 137:876–881.

Ujah IA, Aisen OA, Mutihir JT, Vanderjagt DJ, Glew RH, Uguru VE. 2005. African J. Reproductive Health 9:27–40.

UNFPA. 2003. National Study on Essential Obstetric Care Facilities in Nigeria, Technical Report. Federal Ministry of Health, Nigeria.

Uzoigwe SA, John CT. 2004. Maternal mortality in the Lagos University Teaching Hospital: a ten-year review (1989–1998). Nigerian Journal of Medicine 13:32–35.

Wright EA. 1989. Birth weight of infants in Jos, Nigeria. West African Journal of Medicine 8:160–170.

INDEX

ACKNOWLEGEMENTS

I would like to thank Professor ZM van der Spuy, Head of the Department of Obstetrics and Gynaecology, Groote Schuur Hospital for sacrificing many hours supervising this study and for the personal guidance and support.

I also want to thank the women who so willingly cooperated and contributed to this study.

Lastly I would like to thank Dr Paul le Roux for helping with the statistical analysis.

This is to certify that this study is the sole and exclusive work of the candidate.

Signature: _____ Dated at Cape Town: 18/11/04

Signed by candidate

Supervisor: Professor ZM van der Spuy

INDEX OF TABLES

INTRODUCTION AND LITERATURE REVIEW

Healthcare workers in Obstetrics and Gynaecology emphasize the importance of antenatal care and most research in this field has demonstrated that favourable pregnancy outcome is related to adequate care.[1,2,3]

Antenatal care programs, as currently practised, originated from models developed in the early decades of the 20th century in Europe, especially the United Kingdom. Obstetrics and Midwifery were initially viewed as first aid services concerned with labour and its complications. During the 1920's a wider recognition of the maternal problems of pregnancy emerged. It was realized that events of labour had their precursors in pregnancy. In 1929, in the United Kingdom, Dame Janet Campbell started a national system of antenatal clinics with a uniform pattern of visits and procedures. The standard pattern of monthly visits until 28 to 30 weeks, fortnightly until 36 weeks then weekly until delivery was established. This was not based on a systematic analysis of risks and appropriate interventions but on the current practice of the doctors of those times. After the Second World War this standard protocol of care was more widely advocated and practised.[4]

The effectiveness of antenatal care was further emphasized when, as early as 1948, national surveys in the United Kingdom documented that women who received no antenatal

care at all experienced very high perinatal mortality. This was confirmed by surveys published between 1963 and 1978.[5,6,7,8]

In South Africa, in an audit of the period 1978-1983, van Coeverden de Groot reviewed maternal deaths in the Peninsula Maternal and Neonatal Service (PMNS). He stated that the unbooked state was an important factor associated with maternal death. Only 5 % of black patients were unbooked but this group accounted for 17% of the maternal deaths.[9] The perinatal mortality rate for the year 2000 in the PMNS was 33.1/1000. Inadequate antenatal care was identified in 18.1% of cases as an avoidable factor.[10] The maternal mortality rate in the Western Cape in 2000 was 58.7 per 100 000 deliveries and of the 50 women who died, 7 were recorded as unbooked and 7 as late bookers, factors which may have influenced the pregnancy outcome.[10]

The core package of care in the early models of antenatal management remains essentially unchanged in current programs except for the addition of a few new technologies such as ultrasonographic assessment of fetal well-being and genetic screening. Developing countries have mostly adhered to the antenatal programs of the industrialized countries with only minor adjustments. Components of antenatal care and the timing of visits have often been introduced without proper scientific evaluation. Typically health interventions are evaluated through randomized controlled trials (RCT), which are regarded as the best method of establishing efficacy but today it would be impossible and unethical to design a RCT to compare standard antenatal care versus no care. As a result most studies review the outcome of patients who do not access care with those who do. Too often new protocols

or technologies have been introduced without proper evaluation and it is often difficult to withdraw or assess these after the implementation.[11,12] Single interventions e.g. iron supplementation may still be reviewed in appropriately designed trials and it is obviously important that unproven management strategies in the future should receive adequate evaluation before being introduced into clinical practice. Evaluation of antenatal care programs should also consider patient satisfaction and cost-benefit analysis. Furthermore the needs of developing countries may differ from those of developed countries where the protocols were initiated and this should be addressed when designing obstetric programs.

Antenatal care is a perfect example of preventative medicine. The aim is to ensure the well being of mother and child. The basic components of antenatal care have been defined as early and continuous risk management, health promotion, psychosocial intervention and follow-up.[1] Initial studies assessed quality and effectiveness of antenatal care by the number of antenatal visits a woman had. More visits presumably meant a better outcome. The shortcoming of this approach is that the duration of pregnancy will alter the number of visits without necessarily compromising quality of care. Women who deliver prematurely have fewer visits and this was equated to poor outcome, the so-called "preterm bias". This problem has been addressed by the use of the Kessner index. The average time interval between visits is used as an index of the frequency of visits, independent of the gestation at booking and gestation at delivery. For example preterm delivery is the cause of the limited number of antenatal visits and poor outcome, not necessarily substandard care.[13]

How much antenatal care is necessary and is more really better?

Most healthcare workers agree that some antenatal care is better than none, early antenatal care is better than late and adequate care is better than inadequate care. At the Alan Guttmacher Institute in New York, USA, antenatal care is deemed "adequate" if the first antenatal visit occurs at or before thirteen weeks with nine or more subsequent antenatal visits. In contrast "inadequate" antenatal care is defined as starting antenatal care at or after twenty-eight weeks or having less than five visits . Anything in between is deemed as "intermediate".[14] Using this score, this institute reported in 1989 that sixteen percent of pregnant women (585,000 women) in North America received inadequate care.[14] This type of scoring has not been used in the United Kingdom. The London trial by Sikorski et al compared the traditional British antenatal schedule of visits to a reduced number of visits and concluded that fewer routine visits for low risk women do not put pregnancies at increased risk, but may lessen patient satisfaction.[15]

Blondel reviewed antenatal care in thirteen European countries with different structures of care and similar perinatal mortality rates and found that no single model for antenatal care was superior to another.[16] In 1989, in the USA, the National Institute of Health Expert Panel on Prenatal Care issued guidelines that recommended reducing the number of prenatal visits for low risk women.[17]

The concern in developing countries would be that patients need more education, nutritional advice and social support than those in industrialized societies where resources are often better. In a randomized clinical trial in Harare, Zimbabwe 15,994 women of middle and low

income communities were recruited over a 2-year period. They were randomized to a new program with fewer but more structured visits and fewer procedures per visit versus the standard program. They concluded that fewer visits with strict protocols can be introduced without adverse effects.[18]

The World Health Organization conducted a multicentre randomized controlled trial for the evaluation of a new model of antenatal care with more goal orientated visits and fewer clinic visits. Fifty three clinics in Argentina, Cuba, Saudi-Arabia, and Thailand participated in the study. They concluded that the new model did not adversely affect maternal and perinatal outcomes.[19] The World Health Organization further did a systematic review of 7 eligible randomized controlled trials and concluded that reduced numbers of visits presented no risk to low risk mothers and babies, but that dissatisfaction from the mothers, because of reduced contact, could be expected.[20]

Risks of unbooked status

There is some debate whether it is the unbooked status per se or the "type" of women who is unbooked that contributes to poor pregnancy outcome. Social circumstances, age, marital status, parity and financial support have all been shown to effect outcome.[1,21,22,23,24,25] Fink et al did a literature review to evaluate antenatal care programs and found that positive findings may have reflected the types of women who were likely to comply with care rather than the effects of program participation.[21] In South Africa and Zimbabwe factors

contributing to unbooked status were poor social circumstances, unemployment and poor financial and social support.[23,24,25] Psychosocial stress is one possible mechanism by which social disadvantage may give rise to poor pregnancy outcome.[26]

Adverse factors, which are often identified, include low income, inadequate access to and uptake of services and information, physical effort, isolation, poor diet and living conditions, ambivalence about the pregnancy and the lack of social support.[25] Antenatal care has been shown to improve neonatal and maternal morbidity and mortality.[3,24,,25,28] In the USA Vintzileos et al analyzed 14,071,757 births provided by the National Centre for Health Statistics and concluded that antenatal care is associated with fewer preterm births for both African-American and white women. They also determined the association between antenatal care and postnatal death and concluded that lack of antenatal care should be considered a high risk factor for postnatal death.[29] In Hungary, Orvos et al did a retrospective analysis of 5262 deliveries of which 1% had no antenatal care. The unbooked mothers had more preterm deliveries and low birth weight babies compared to the booked mothers.[30]

According to the World Health Organization there is a wide variation in the proportion of women who receive antenatal care, e.g. Africa 2 - 99 %, Asia 8 - 90 %. Several studies in developing countries have shown that the more care provided, the better the perinatal outcome.[31] Studies in industrialized and developing countries have demonstrated that antenatal care improves maternal and neonatal outcome. In the USA Ryan et al, reported increased prematurity (15.8% vs. 9.9%), increased stillbirth (3 times higher),

and perinatal mortality (3 times higher) in the group with less prenatal contact.[3] In Saudi Arabia, Abotalib and Adelushi found a significantly higher incidence of preterm deliveries, stillbirths and neonatal deaths in an unbooked group of mothers compared to the booked group.[25]

In South Africa a number of studies have investigated the effect of little or no antenatal care. In Durban, Larsen reported "unbooked" status associated with excessive perinatal mortality.[24]

In a Johannesburg study the neonatal mortality rate was 3 times higher in the unbooked mothers compared to booked mothers.[23] In an audit performed in 1987 at Tygerberg Hospital the perinatal mortality for babies weighing more than 1000 g among unbooked women was 128/1000 compared to 14.6/1000 in booked patients.[22]

Fiscella, however, searched the Medline database and concluded that current evidence does not satisfy the criteria necessary to establish that antenatal care definitely improves birth outcomes.[1] Confounding variables pose an enormous problem for studies of antenatal care because women at risk of receiving inadequate antenatal care are independently at risk for low birth weight babies (LBW). Low birth weight (< 2500 g) is the most commonly used outcome measure in studies of antenatal care evaluation because it is the single largest contributor to infant mortality, it is easily quantifiable and readily available on birth certificates.[1] Low birth weight arises as a consequence of

preterm onset of labour or restricted fetal growth and is more commonly found among socially disadvantaged women.[27]

In the USA increased use of antenatal care, particularly among black women, has not been associated with a corresponding decrease in LBW rates.[3] Buchman postulates that unbooked status should not necessarily be regarded as a high risk, poor prognostic category. In contrast to other studies, he found unbooked mothers at Baragwanath Hospital to be at lower risk, often presenting early because of preterm complications. He agrees that antenatal care is necessary for health education and detection of syphilis and hypertension but postulates that the true benefit of antenatal care is still unknown.[32] In an evaluation of antenatal care, which controlled for a number of social, demographic and medical factors, antenatal care was associated with a significant reduction in risk for LBW.[33] Most authors agreed that socially disadvantaged patients are at a higher risk and showed the most benefit of antenatal care.

Why do women not want to utilize our services?

In Hamilton's Johannesburg study the main reason given for not attending antenatal clinics was the expense of traveling and social and cultural restraints.[34] In the USA reasons for not attending antenatal clinics include lack of medical insurance, long clinic waiting times, long distances to clinics, lack of childcare, language incompatibility, fear that they would be pressurized to alter certain behaviours, unwanted pregnancies and fear of medical procedures.[14] In 1980 Reid and McIlwaine from Glasgow reported the

establishment of a peripheral clinic to reduce traveling and waiting time for mothers.[35] This is similar to the service established in Cape Town in 1980 with the formation of the Peninsula Maternal and Neonatal Service which offers perinatal care to mothers and their infants within the community and, as far as is possible, minimizes the number of visits to the supporting hospitals. Medical personnel attend the clinics regularly to assess clinical problems identified by the midwife.[36]

Most studies of unbooked mothers in South Africa have been done prior to1994.[22,23,24] Since 1994 free antenatal care has been available and peripheral clinics have been established in many areas. The PMNS compromises a tertiary level maternity service at Groote Schuur Hospital, two secondary level hospitals - Mowbray Maternity Hospital and New Somerset Hospital - and eight midwife obstetric units (MOU's) - False Bay, Guguletu, Khayelitsha, Hanover Park, Heideveld, Mitchells Plain, Retreat and Vangaurd Drive.

In spite of these facilities we still have a high incidence of unbooked mothers in our services. Unbooked mothers have comprised five to seven percent of the Peninsula Maternal and Neonatal Service (PMNS) for many years.[9] In the PMNS about twenty-eight thousand women deliver each year and the 5-7% unbooked women account for one third of maternal deaths and one quarter of the perinatal mortality.[37]

This study was undertaken to compare maternal and neonatal outcomes in booked and unbooked mothers in our service and to assess the factors that at present influence a woman's decision to book for care in her pregnancy, given the availability of free maternity services since 1994.

PATIENTS AND METHODS

This study was undertaken in secondary and tertiary hospitals in the Peninsula Maternal and Neonatal Services (PMNS). Unbooked women presenting to the hospitals were interviewed by one of two interviewers using a structured questionnaire (see appendix 1) from March 2000 to September 2000. An effort was made to recruit as many of the unbooked women in the hospitals as possible. Women were not recruited from the MOU's, unless referred to the hospital, because it was not feasible for a single researcher to cover an additional six sites. Therefore the study was deliberately limited to hospital admissions. All these patients presented to the labour ward, although they may not have delivered at the time of admission and their subsequent antenatal course and delivery was recorded in this study. Women are only admitted to the labour ward at 20 weeks, depending on the complication. Women at an earlier gestation are treated in the gynaecological service unless they have a problem eg. hypertension which will impact on their entire pregnancy. The control group comprised the two booked patients admitted to the labour ward after the unbooked admission.

The questionnaire included demographic details (including age, ethnic group, marital status, employment, education, accommodation and financial support), previous medical history, previous obstetric history (parity, previous obstetric complications), maternal outcome and pregnancy outcome (estimated gestational age at presentation in hospital, complications during labour and delivery, mode of delivery, birth weight and neonatal outcome). We also

asked the reasons for either booking or for declining antenatal care. For the purpose of this study an unbooked patient was defined as one who had no contact with maternity care. Patients who booked elsewhere and therefore had received antenatal care, albeit in another system, were excluded. All the booked patients had a minimum of two visits for antenatal care – ie their initial assessment and a follow up visit to discuss their results of antenatal tests.

Signed informed consent was obtained from all the participants. Reassurance was given that declining to participate in this study would not affect their treatment. Permission to perform this study was obtained form the Ethics and Research Committee of the Faculty of Medicine at the University of Cape Town (see appendix 2).

Data was computerized using Microsoft Excel. Odds ratios and the corresponding confidence intervals were used to assess the statistical significance of association between the various factors. Student t-test was used for numerical variables. Statistical significance was accepted at $p < 0,05$.

POWER CALCULATION

The statistics available for the Peninsula Maternity and Neonatal Services demonstrated that 25% of the perinatal mortality is in unbooked patients.

The total perinatal mortality rate is 30/1000 deliveries. The average number of deliveries per annum is 28000 and the number of unbooked patients is1500. Therefore the total perinatal loss is 840. If one quarter is in the unbooked group it equals 210 perinatal deaths.

If the percentage perinatal mortality in the unbooked group equals 15% and the percentage perinatal mortality in the booked group equals 3% with the confidence limits set at 95%, the power at 80%, the minimum sample sizes needed for a ratio of 2:1 is 144 in the Booked group and 72 in the Unbooked group.

RESULTS

Two hundred booked patients and 100 unbooked patients were recruited from Groote Schuur, Mowbray Maternity and New Somerset Hospitals. None of the women approached to participate in this study, declined to do so. The women were recruited as they presented during the study period and therefore do not reflect the number of deliveries in each unit.

Demographic Characteristics

Age

There was no significant difference in the age of the women in the 2 groups. The mean age was 26.06 years for the booked patients (range 15 - 42) and 25.56 years for the unbooked patients (range 14 -41).

Ethnic group

The booked group consisted of 62 black, 95 coloured, 41 Asian and 2 white women. In the unbooked group there were 45 black, 50 coloured, 5 Asian and no white women. According to Census 1996 our population in the Western Cape consists of 20.9% black, 54.2% coloured, 1% Asian, 20.8% white and 3.1% "other" ethnic groups. The booked group therefore reflected the pattern of women accessing our services rather than the demographics of the Western Cape.

TABLE 1 Ethnic groups

	BOOKED n(%)	UNBOOKED n(%)	ODDS RATIO (CI)
Black	62(31%)	45(45%)	0.55(0.32-0.93)
Coloured	94(47%)	50(50%)	0.89(0.53-1.47)
Asian	40(20%)	5(5%)	4.75(1.72-14.21)
White	2(1%)	0	

The only statistically significant difference was in the black and Asian groups, with more Asian women who booked and more unbooked black women.

Parity

The parity distribution is set out in Table 2. There were no significant differences in the 2 groups. There were 43% nulliparous women in the booked group vs. 34% in the unbooked group. Only four patients had a parity of greater than five.

TABLE 2 Parity

	BOOKED n (%)	UNBOOKED n (%)	ODDS RATIO (CI)
Nulliparous	86 (43 %)	35 (35 %)	1.46 (0.86 – 2.49)
Parity 1 - 4	111 (55,5 %)	64 (64 %)	0.73 (0.43 – 1.23)
Parity > 5	3 (1.5 %)	1 (1 %)	0.51 (0.14 – 38.1)

Parity did not effect the booking status.

Education and Employment

The level of education and employment is summarized in Table 3. The unbooked mothers had a lower scholastic attainment compared to their booked counterparts and 54% vs. 35.5% had nil or only primary education (OR 0.52 CI 0.31-0.88). Nearly half the unbooked women had secondary or tertiary level education (46 %). The booked women were more likely to be employed (39.5 % vs. 26 %). Of the women who had partners, there was no difference in the employment of the partners.

TABLE 3 Education and Employment

	BOOKED n (%)	**UNBOOKED n (%)**	**ODDS RATIO (CI)**
Nil or only primary education	71 (35.5 %)	54 (54 %)	0.53 (0.31 - 0.88)
Secondary or tertiary education	129 (64.5 %)	46 (46 %)	2.13 (1.27 - 3.56)
Employment self	79 (39.5 %)	26 (26 %)	1.86 (1.06 - 3.27)
Employment partner	177 (88.5 %)	72 (72 %)	2.55 (1.35 - 4.82)

Booked status was associated with higher level of education and a greater likelihood of employment, but with no difference in employment of partners.

Income

Financial support included self employment, partner employment or assistance from family and friends. Table 4 demonstrates that only 35.5 % of the unbooked mothers had an income of more than R1000 per month, 22 % had an income of less than R 250 per month compared to 5.5 % among their booked counterparts. Only 87 % of unbooked mothers had financial support, however minimal, versus 98,5 % in the booked group.

TABLE 4 Income

	BOOKED n (%)	UNBOOKED n (%)	ODDS RATIO (CI)
> R 1000 per month	119 (59.5 %)	35 (35.5 %)	2.73 (1.61 - 4.64)
< R 250 per month	11 (5.5 %)	22 (22 %)	0.21 (0.09 - 0.47)
Financial support	197 (98.5 %)	87 (87 %)	9.81 (2.53 - 44.56)

All the findings were found to be statistically significant and demonstrated that unbooked status was associated with greater financial need and deprivation.

Social support and Accommodation

Social support and accommodation is set out in Table 5. In terms of social support, which included family, friends or neighbours, the unbooked mothers were statistically more disadvantaged with only 80 % having support compared to 95.5 % in booked

mothers. Only 37% of the unbooked mothers were involved in a stable relationship with the father of the baby compared to 67 % in the booked group. Of the booked women 84.5% lived in formal accommodation compared to 63% of unbooked women. Thirty-five percent of the unbooked women lived in informal accommodation and 2 unbooked women had no accommodation at all.

TABLE 5 Social support and Accommodation

	BOOKED n (%)	UNBOOKED n (%)	ODDS RATIO (CI)
Stable relationship	134 (67 %)	37 (37 %)	3.46 (2.03 - 5.90)
Social support	191 (95.5 %)	80 (80 %)	5.31 (2.18 - 13.22)
Formal accommodation	169 (84.5 %)	63 (63 %)	2.04 (1.19 – 3.48)
Informal accommodation	31 (15.5 %)	35 (35 %)	0.34 (0.19 – 0.62)
Nil accommodation	0 (0 %)	2 (2 %)	

Unbooked women were less likely to be in a stable relationship, and frequently had no social support and were living in informal accommodation.

Previous pregnancy outcome

Table 6 is a summary of the previous pregnancy outcome in the 114 booked and 65 unbooked multigravid women. In the booked group there were 248 previous

pregnancies and 152 in the unbooked group. Thirty eight percent of the women in the booked group were primigravid and 31% in the unbooked group and therefore had no previous obstetric history. In the booked group 14.5% and in the unbooked group 12.5% had had a previous caesarean section. There was no significant difference between the two groups regarding previous stillbirth (1.6% vs. 3.9%), neonatal death (2.4% vs. 0.66%) and infant death (1.6% vs. 0%). Significantly more of the women who booked had a previous history of ectopic or miscarriage (18.1% vs. 5.9%) and the unbooked mothers had a significantly higher number of previously uncomplicated deliveries (77% vs. 61.7%).

TABLE 6 Previous pregnancy outcomes

Note: These numbers reflect pregnancies and not women. One patient might have more than one outcome eg caesarean section + neonatal death + ectopic.

	BOOKED n(%)	UNBOOKED n(%)	ODDS RATIO (CI)
Number of pregnancies	n=248	n=152	
Previous caesarian section	36(14.5 %)	19(12.5 %)	1.19 (0.63 – 2.25)
Stillbirth	4(1.6 %)	6(3.9 %)	0.4 (0.09 - 1.63)
Neonatal death	6(2.4 %)	1(0.66 %)	3.74 (0.44 – 83.32)
Infant death	4(1.6 %)	0(0 %)	P = 0.3
Miscarriage/ ectopic	45(18.1 %)	9(5.9 %)	3.52 (1.6 –8.0)
Normal vertex delivery with live baby	153(61.7 %)	117(77 %)	0.48 (0.3 - 0.7)

Unbooked multiparous mothers were more likely to have had a previous normal vaginal delivery. There was no significant difference in previous caesarean section, stillbirth or neonatal death between the 2 groups.

Admission complications

Admission complications are set out in Table 7. Most of the booked women presented to the labour ward in normal uncomplicated labour. Eighteen percent of unbooked women and 4,5% of the booked women presented in preterm labour. Antepartum

haemorrhage was less common in the booked group (3% vs.15 %). There was no difference in the number of women who presented with hypertension (17.5% vs. 20%). The "other" group included intra-uterine growth restriction, post dates, extra-uterine pregnancy, diabetic complications and cardiac complications.

TABLE 7 Admission complications

	BOOKED n (%)	UNBOOKED n (%)	ODDS RATIO (CI)
Normal labour	116 (58 %)	35 (35%)	2.56 (1.51 - 4.36)
Preterm labour	9 (4.5 %)	18 (18%)	0.21 (0.09 - 0.53)
Antepartum haemorrhage	6 (3 %)	15 (15%)	0.18 (0.06 - 0.5)
Hypertension	35 (17.5 %)	20 (20%)	0.85 (0.44 - 16.4)
Other	34 (17 %)	12 (12%)	

The booked women were therefore more likely to present in normal labour, while complications such as preterm labour, antepartum haemorrhage were more likely to occur in the unbooked group. There was no difference in the number of women who presented with hypertension.

Maternal outcome in index pregnancy

The maternal outcome in the index pregnancy is summarized in Table 8. Most of the mothers had an uncomplicated delivery. There was no statistically significant difference in

major maternal complications between the two groups (PPH, sepsis, GPH-related complications). One death occurred in the booked group secondary to complications of severe pre-eclampsia. In both groups one patient had a cardiac complication and one unbooked patient survived a dissecting aortic aneurysm.

TABLE 8 Maternal outcome in index pregnancy

	BOOKED n(%)	UNBOOKED n(%)	ODDS RATIO (CI)
No complications	165(82.5 %)	78(78 %)	1.33 (0.7 - 2.52)
Post partum haemorrhage	6(3 %)	6(6 %)	0.48 (0.13 – 1.75)
Sepsis	0(0 %)	2(2 %)	
Death	1(0.5 %)	0(0 %)	
GPH related	27(13.5 %)	12(12 %)	1.14 (0.53 - 2.53)
Other	1(0.5 %)	2(2 %)	

Index pregnancy outcome

In Table 9 the outcome of the index pregnancy is summarized. The unbooked group had a significantly higher percentage of stillbirths (17 % versus 2.5 %), neonatal deaths (8 % versus 0.5 %), preterm delivery (54 % vs.12.5 %) and low birth weight infants (64% vs. 21%). Of the unbooked women 12 had an stillbirth at first admission. Ninety-five percent of the booked mothers had a live birth while only 75 % of unbooked mothers delivered a live infant.

TABLE 9 Index pregnancy outcome

	BOOKED n(%)	**UNBOOKED n(%)**	**ODDS RATIO (CI)**
Live birth	194(97%)	75(75 %)	9.19 (3.59 - 24.48)
Stillbirth	5(2.5 %)	17(17 %)	0.4 (0.18 - 0.8)
Neonatal death	1(0.5 %)	8(8 %)	0.06 (0.0 –0.46)
Mean gestational age	37 weeks	33 weeks	P < 0.0001
Preterm delivery	25(12.5 %)	54(54 %)	0.12 (0.07 – 0.22)
Birth weight	2976 g	2147 g	P < 0.05
Low birth weight (< 2500)	42(21 %)	64(64 %)	0.15 (0.08 - 6.26)

Method of Delivery

The method of delivery is summarized in Table 10. There were more breech deliveries in the unbooked group (9%) compared to the booked group (1%). More caesarean section deliveries were performed on the booked group compared to the unbooked group (42 % versus 22 %). There was no difference in the number of vacuum deliveries in the two groups.

TABLE 10 Method of delivery

	BOOKED n(%)	**UNBOOKED n(%)**	**ODDS RATIO (CI)**
Normal vertex delivery	104(52%)	66(66%)	0.56 (0.33 - 0.95)
Breech	2(1%)	9(9%)	0.1 (0.01 - 0.52)
Caesarian section	84(42%)	22(22%)	2.57 (1.43 - 4.63)
Vacuum	8(4%)	3(3%)	1.35 (0.32 - 6.56)

Reasons for booking

The women were asked in an open ended question what motivated their decision to book for antenatal care, one hundred and twenty-three of the 200 booked patients said this was for the health of the baby and their own health. Seven booked to secure a place for delivery. Six women booked due to concern over an existing medical condition. Three women had vaginal bleeding in the first trimester, which prompted them to seek medical advice. Two

women attended the services because they wanted a caesarian section delivery. These reasons are summarized below.

TABLE 11 Reasons for booking

REASON	NUMBER
For the health of baby and self	123
Advised to book	27
Previous pregnancy related problems	23
To confirm pregnancy	9
Needed a place for delivery	7
Medical problems	6
Vaginal bleeding	3
Requested a caesarean section	2
TOTAL	200

Reasons for not booking

Reasons given for not booking often reflected a lack of information (Table 12).

Fifteen women said they did not know it is important to book, 19 said they were not aware they were pregnant and 5 women did not know where to find a clinic. Other reasons reflected poor social circumstances with 10 women saying they had not booked due to financial constraints, 8 women had no transport and 10 women had moved to Cape Town in the previous week. Nine women preferred to book with a private doctor even though the doctor had no facilities for labour or delivery. Three women rejected the resources offered and 4 women wanted a home delivery. Some reasons reflected lack of acceptance of the pregnancy. Nine women did not want the pregnancy and tried to

conceal it, 2 wanted to give the baby up for adoption and 1 woman was raped. One woman wanted to book but could not get time off work and 4 wanted to book later but delivered before they could make arrangements.

In our community relocation during pregnancy and just prior to delivery is quite common as women often move to access health care. Therefore we enquired if patients had relocated in the last 6 months or even in the last week. Of the booked mothers 14(7%) relocated to Cape Town in the previous 6 months compared to 35(35%) unbooked mothers. Ten of the 35 relocated in the week prior to delivery.

TABLE 12 Reasons for not booking

REASON FOR NOT BOOKING	NUMBER
Unaware of importance	15
Did not know they were pregnant	19
Moved to Cape Town in the last week	10
No money	10
No transport	8
Concealed pregnancy	9
Private doctor	9
Unaware of resources	5
Rejection of resources	3
Wanted a home delivery	4
Planned to book later	4
Adoption	2
Rape	1
Unable to get time off work	1
TOTAL	100

DISCUSSION

Socio Demographic Factors

The unbooked mother accessing care in our service was more likely to have a low scholastic attainment, was likely to be unemployed, single and with limited social and financial support.

In a retrospective study of one hundred live births O'Brien and her co-workers in London, U.K, reported that young unskilled working class women and those of high parity are at high risk of being unbooked.[38] In our study there was no significant difference in the ages of the booked and unbooked mothers. Black women were more likely to be unbooked but this is probably a reflection of their recent arrival in Cape Town- often to access medical care.

Other studies have found the unbooked mother to be at the extremes of age[2] and of low parity.[3] In the USA Ryan et al (1980) found teenage girls and women over the age of forty-five were the least likely of all ages to start antenatal care in the first trimester. They looked at the relationship between prenatal care and perinatal outcome in a racially and socio-economically homogenous population at E.H Crump Women's' Hospital, Tennessee. The group with inadequate prenatal care had significantly higher fetal and antenatal mortality rates. They found that women in their first pregnancy are less likely to receive antenatal care than women in their second pregnancy. A consistent finding was that of less prenatal

care for Black mothers due to low income and poor education. Unmarried mothers received late or no antenatal care.[3]

A retrospective study in Hungary by Orvos et al examined the social conditions of women who never attended prenatal care and evaluated the perinatal outcome. They concluded that mothers who never attended prenatal care are at higher risk to deliver a pathological newborn compared to a control group of mothers of similar age, educational level, parity and marital status.[30]

At a tertiary hospital in Saudi Arabia, Abotalib et al (1999) investigated the characteristics of the unbooked mother by looking retrospectively at the files of 467 patients who presented for delivery with no antenatal care. The unbooked mother tended to be young (<24yrs.) and an unskilled worker or student.[25]

In the USA risk factors for low birth weight include African-American ethnicity, low income, unemployment, less education, informal housing, single parent, smoking and substance and alchohol abuse.[2] In most studies the unbooked women are either very young or more mature, unmarried, unemployed, of higher parity, with poor financial and social support and poor access to peripheral services. In the USA Ryan et al found women in first pregnancies are less likely to receive early antenatal care than multiparous women.[3] In contrast, Pattinson et al in a study in the Western Cape, reported that 19 of 21 multiparous unbooked women had previously delivered in their service and then subsequently declined antenatal care.[22] Hall reported that women in

Scotland who attend antenatal clinics earlier were on average healthier, taller, better educated, more likely to be married or supported, more likely to be in a favoured socio-economic group and more likely to value medical advice.[39] It therefore appears that the woman who is already more advantaged is more likely to utilize health care facilities maximally.

Similar to our study, studies in several different centres in South Africa found no difference in age and parity between booked and unbooked mothers. At a tertiary hospital in the Western Cape, Pattinson et al (1987) did a prospective study of 30 unbooked mothers. Their "typical" unbooked mother was young, unemployed, with a low income and had no permanent relationship with the father.[22] Hamilton et al (1987) reviewed 200 unbooked women at a tertiary hospital in Johannesburg and found the women to be of lower socio-economic status and living in poorer areas compared to their booked counterparts.[23] Larsen et al (1982) reported no difference in age or parity in 51 unbooked women compared with booked women who attended the Kind Edward VIII Hospital in Durban. However these patients were more likely to be unmarried and have less financial support.[24]

In an attempt to improve maternal and neonatal outcome by improving social support and educating women, Heins et al (1990) studied 1458 women at risk of low birth weight babies.[40] A randomized controlled trial (RCT) was carried out by this group at five regional centres in South Carolina, USA. Women who attended state-funded antenatal clinics were identified as at risk for low birth weight (LBW) babies by using risk factors

as described by Papiernick-Berkhauer.[41] They were randomized to receive either antenatal interventions provided by nurse-midwives or the standard antenatal care provided by obstetricians. Interventions included patient education, stress reduction by education, social support and nutrition counselling. The results do not suggest any advantage of the nurse-midwifery intervention over standard obstetric care. The incidence of LBW in the intervention group was slightly lower (19%) than that in the control group (20.5%), but was not of statistical significance.[40] This either suggests that other factors impact on perinatal outcome or that the chosen interventions were not appropriate for that group.

In Manchester in the U.K. Spencer et al (1989) recruited 1288 women who were at above average risk of giving birth to a LBW baby, to assess if social support in the form of a family worker would improve outcome. After recruitment the women were randomly divided into control (633 women) and experimental (655 women) groups. No significant differences were observed between experimental and control groups where social support was provided to the experimental group and routine care to the control group.[27]

Outcome

We found that in our study even if women had a previous obstetric complication (caesarean section, stillbirth, neonatal death) it did not influence their decision to book in their next pregnancy. The only event that seemed to encourage more patients to book was if they had previously had an ectopic pregnancy or miscarriage. Larsen in Durban also reported that a mothers' experience of an operative delivery in a previous pregnancy does not seem to

affect her booking status.[24] Adelushi found that mothers with either a previous history of preterm delivery, low birth weight baby or neonatal death were not more likely to book than mothers without this history. In contrast he found mothers with a previous big baby (>4000 g) or intra-uterine death were more inclined to book. No reason for this apparent discrepancy was reflected in his study.[25]

In our study the only maternal death occurred in the booked group due to complications of severe pre-eclampsia. There was no statistical significant difference in other major maternal complications between the two groups. The two groups had similar gestational proteinuric hypertension-related complications (13.5 % booked vs. 12 % unbooked), probably a reflection of the referral pattern in the Peninsula Maternal and Neonatal Service for obstetric complications.

In contrast there was a marked difference in perinatal outcome. Our results are in agreement with numerous previous studies that have documented that unbooked women are at greater risk of pregnancy loss. In fact the perinatal mortality rate in the unbooked women (25%) exceeded that anticipated in the power calculation. This was in the PMNS figures and therefore reflects primary secondary and tertiary patients which this study represented. When we calculated the perinatal mortality rate it was to ensure adequate sample size.

Ryan et al (USA) showed increased prematurity (15.8% vs. 9.9%), increased still birth rate (3 times higher) and increased perinatal mortality (3 times higher) in the group with less

prenatal contact.[3] Abotalib (Saudi Arabia) reported a significantly higher incidence of preterm deliveries (17.8% vs. 5.6%) and LBW (10.6% vs. 4.9%), while the difference in the incidence of stillbirth (SB) and neonatal death (NND) was not statistically significant.[42] In the 1987 Johannesburg study by Hamilton et al the unbooked group had a 3 times higher neonatal mortality.[23] At Tygerberg Hospital, de Jong et al (1988) in a series of 12,587 deliveries of patients of low socioeconomic class found that 4.7% of patients were unbooked, but they accounted for 42.2% of all stillbirths.[43]

In contrast to most studies on antenatal care and the subsequent perinatal outcome, Buchman et al (1998) postulated that unbooked mothers are at lower risk and only present unbooked because of preterm complications and probably would have booked, albeit late in pregnancy, had their pregnancies advanced uneventfully. They feel that low birthweight or prematurity, and not booking status, is the cause of the higher perinatal mortality. Their booked group had more mothers with poor obstetric histories and therefore were at higher risk. This study reviewed 91 unbooked mothers from a local community clinic in Soweto and at Baragwanath hospital. They acknowledge that a limitation of their study is the small number of patients .[32]

Tyson and co-workers did an observational study on 28,838 deliveries at Parkland Memorial Hospital, Texas and avoided the preterm delivery bias by comparing women who reached a specific gestation and compared their antenatal care status (zero vs one or more visits). Antenatal care was associated with improved pregnancy outcomes in the 34- 38- and

42week cohorts. Their findings suggest substantial benefit from antenatal care after 30 weeks gestation, but not from early care.[44]

Most of the unbooked patients in our study had normal vaginal deliveries (59 % booked vs. 74 % unbooked). The booked group had a high incidence of caesarean section (42 % vs. 22 %) presumably because our hospitals are referral centres for patients with complications in labour and our protocols ensure that all patients with previous caesarean section should deliver at a secondary or tertiary hospital. The overall caesarean section rate in the PMNS is 37.3%, but obviously no caesarean sections are performed at the clinics – all referred to hospitals. Preterm labour occurred more frequently in the unbooked women.

Reasons for unbooked status

In our study reasons given by women for their unbooked status reflected a lack of information or knowledge, poor social circumstances, rejection of resources and reasons associated with an unwanted pregnancy. Reviewing their reasons for not booking for antenatal care presents a picture of social deprivation and poor support and suggests that education and improvement of social circumstances might lead to more acceptance of antenatal care. The availability of antenatal care is essential, but it does not guarantee adequacy or acceptability of care.

In a study in Michigan(USA) financial incentives were used to try increasing the participation in prenatal care. Two hundred and twenty low-income women were asked for reasons why they failed to attend antenatal clinics. These were most frequently given as

lack of transportation, poor weather and illness. Financial incentives, however, failed to increase participation in antenatal care which suggests that other additional factors also impacted on uptake of care.[45] Lack of medical insurance seems to be a major barrier in the USA resulting in women not accessing maternity services.

In South Africa, it was hoped that the introduction of free antenatal care would reduce the unbooked rate. In our service this has not occurred, but only 10 of the women in this study cite inadequate finance as a reason for not booking. Many of the reasons given could probably be addressed by public health education. It could be argued that those women who had recently relocated to Cape Town, often in difficult circumstances, had shown particular enterprise in trying to seek medical care during their pregnancies (10 in previous week, 35 in previous 6 months). The social isolation of the 9 women who concealed their pregnancies needs investigation. The 19 women who said they did not realize they were pregnant were perhaps deliberately avoiding discussing important underlying personal problems.

In the U.K. important factors in rejection of antenatal care were long distances to clinics, absence of good public transport, no childcare and negative feelings towards pregnancy. Clinic waiting time has the greatest effect on patient compliance.[11] In developing countries social and cultural constraints may be an obstacle but the major reason for non- attendance is the lack of resources.[46] In rural areas the distance from home to the health care centre also plays a part.

In the UK, in an attempt to improve antenatal care attendance, alternative prenatal care has been reviewed with a resultant reduction in the number of visits for low risk women. Jewell et al (2000) did a randomized control trial at 11 primary care centres (609 women) to assess changes in satisfaction associated with a flexible approach to antenatal care schedules for women at low obstetric risk. They reported a "strong desire" among women to receive a "traditional" (more frequent) pattern of care.[47,48]

Despite a well-established and free antenatal care system that operates in Hungary, Ovros et al found poor social conditions, undesired pregnancy and the intention of hiding the pregnancy were the most common causes for neglecting antenatal care.[30]These are remarkably similar reasons to those cited by many of our patients.

Expanded antenatal care programs that include psychosocial support and educational activities have been assessed by randomised controlled trials.These trials provided little evidence for the effectiveness of social support interventions in the prevention of preterm birth in women with poor obstetric histories.[49] Villar et al (1992) did a RCT at four centres in Latin America that included 2,235 women at higher-than-average risk for delivering a low birth weight infant. They showed that psychosocial support and education were unlikely to improve maternal health or to reduce the incidence of low birth weight among infants.[50] Oakley et al (1990) looked at 509 socially disadvantaged women in the UK and found that support during pregnancy improved the mothers' satisfaction with medical care received during their pregnancy, but did not improve outcomes in terms of mean birth weight, low birth weight and preterm delivery.[51]

In developing countries where services already suffer from considerable financial constraints it is probably not feasible to offer financial incentives. Healthcare could, however, be made more acceptable to a wider community, by, for example, providing food parcels as incentives to attend for antenatal care or to provide a meal for women during long waiting times. Antenatal care should be made more user-friendly by offering services at more accessible hours and by supplying crèche facilities. Perhaps we have to consider evening clinics which would also encourage the attendance of partners. Advice and education should be offered during long waiting times. Employers need to be educated to allow women to attend for antenatal care. Because unwanted pregnancies are a common reason given for not booking, the prevention of unwanted pregnancies should receive more emphasis in all health education programs.

CONCLUSION

Most health care workers agree that some antenatal care is better than none and early antenatal care is better than late care. In our study the unbooked mother was usually socially disadvantaged with less education, less resources and limited support. Her pregnancy outcome was poorer than that of booked mothers and more likely to be complicated by fetal problems.

In our system the number of unbooked mothers is significant and these women should be regarded as a high-risk group both medically and socially. Despite the availability of free antenatal care, for some women there are still many barriers to accessing the maternity services. Education of patients, family members and their employers should help. And those women who are employed, should not lose income when attending clinics. Dealing with the socially isolated women, who conceal or deny their pregnancies is a particular problem that demands an infrastructure and support system not presently in place.

Resources must be accessible and acceptable and we must remain sensitive to failures in our system and attempt to redress these, ideally with the participation of community structures and NGO's.

REFERENCES

1. Fiscella K. Does prenatal care improve Birth outcomes ? a critical review. Obstet Gynecol 1995; 85: 468-79.
2. Greenberg RS. The impact of prenatal care in different social groups. Am J Obstet Gynecol 1983; 145: 797-803.
3. Ryan GM, Sweeney PJ, Solola AS. Prenatal care and pregnancy outcome. Am J Obstet Gynecol 1980; 137: 876-881.
4. Oakley A. The origins and development of antenatal care. In:Enkin M, Chalmers I (eds) Effectiveness and satisfaction in antenatal care. (1982) Spastics International Medical Publications/Heinemann, London
5. Douglas JWB 1948 Maternity services in Great Britain. Oxford University Press, Oxford.
6. Butler NR, Bonham DG. 1963 Perinatal mortality. The first report of the British perinatal mortality survey. Livingstone, Edinburgh.
7. Butler NR, Alberman ED. 1969 Perinatal Problems. The second report of the British perinatal mortality survey. Livingstone, Edinburgh.
8. Chamberlain R, Chamberlain G, Howlett B, Claireax A 1975 British Births 1970, vol 1. Heinemann Medical, London.
9. Van Coeverden de Groot H A. Maternal Mortality in Cape Town 1978-1983. S Afr Med J 1986; 69: 797-802.
10. Fawcus S, Western Cape Province maternal mortality assessors report in the Third Interim Report on Confidential Enquiries into Maternal Deaths and Saving Babies Report(PIPP) (April 2000)

11. Villar J, Bergsjo P. Scientific Basis for content of Routine antenatal care 1. Philosophy, recent studies and power to eliminate or alleviate adverse maternal outcomes. Acta Obstet Gynecol Scand 1997; 76: 1 - 14.

12. Lindmark G, Cnattingius S. The scientific basis of antenatal care. Acta Obstet Gynecol Scand 1991; 70: 105-109.

13. Kessner DM, Singer J, Kalk CE, Schlesinger ER. Infant death : An analysis by maternal risk and health care. Washington D.C.: National Academy of Sciences, 1973

14. Yoong A, Chard T. The effectiveness of current antenatal care. In: Studd JJ, ed. Progress in Obstetrics and Gynaecology: Edinburgh: Churchill Livingstone, 1996: 12: 3-18

15. Sikorski J, Wilson J, Clement S, Das S, Smeeton N. A Randomised control trial comparing two schedules of antenatal visits : the antenatal care project project. Br Med J 1996; 312: 546 - 53

16. Blondel B, Pusch D, Schmidt E. Some characteristics of antenatal care in 13 European countries. Br J Obstet Gynaeol 1985;92:565-568.

17. Binstock M, Wolde-Tsadik G. Alternative prenatal care, impact of reduced visit frequency, focused visits and continuity of care. J Reprod Med. 1995; 40:507-12.

18. Munjanja S, Lindmark G, Nystrom L. Randomized control trial of a reduced visits program of antenatal care in Harare, Zimbabwe. Lancet. 1996; 348: 364-369.

19. Villar J, Baáqeel H, Piaggio G, Lumbiganon P, Belizán JM, et al , for the WHO Antenatal Care Trial Research Group. WHO Antenatal care randomised trial for the evaluation of a new model of routine antenatal care. Lancet 2001; 357: 1551-1564.

20. Carroli G, Villar J, Piaggio G, Khan-Neelofur D, Gulmezoglu M, Mugford M et al, for the WHO Antenatal Care Trial Research Group. WHO systematic review of randomized controlled trials of routine antenatal care. Lancet 2001; 357: 1565-1570.

21. Fink A, Yano E, Goya D. Prenatal programs: what the literature reveals. Obstet Gynecol 1992;80:867-72.

22. Pattinson R C, Rossouw L. The Unbooked Mother at Tygerberg Hospital. S Afr Med J 1987;71:559-560.

23. Hamilton R A, Perlmann T and De Souza J J L. The Unbooked patient 2: Outcome of pregnancy in unbooked coloured patients. S Afr Med J 1987;71:31-34.

24. Larsen J V, van Middelkoop A. The Unbooked Mother at King Edward VIII Hospital, Durban. S Afr Med J 1982;62:483-486.

25. Adelushi A, Abotalib B et al. Socio-demographic characteristics of the "unbooked" mother. West Afr J Med 1999;18:3 191-195.

26. Blondel B, Marshall B. Poor antenatal care in 20 French districts:risk factors and pregnancy outcome. J Epidemiol Community Health 1998;52:501-506.

27. Spencer B, Thomas H, Morris J. A Randomised control trial of the provision of a social support service during pregnancy: the South Manchester Family Worker Project. Br J Obstet Gynaecol 1989;96:281-8.

28. Gcaba R, Brookes H B. The Unbooked Maternity Patient in an Academic Hospital in Durban. Curationis 1992;15:3 43-47.

29. Vintzileos A, Ananth C, Smulian J, Scorza W, Knuppel R. The impact of prenatal care in the United States on preterm births in the presence and absence of antenatal high-risk conditions. Am J Obstet Gynecol 2002;187:1254-7.

30. Orvos H, Hoffmann I, Frank I, Katona M, Pal A, Kovacs L. The perinatal outcome of pregnancy without prenatal care. A retrospective study in Szeged, Hungary. Eur J Obstet and Gynecol and Reprod Biol 2002;100:171-173

31. World Health Organization. Coverage of Maternity Care. A Tabulation of Available Information. Third Edition. Geneva: WHO/FHE/MSM 93.7,1989.

32. Buchman E J, Ndiweni Q. Unbooked mothers and their babies-what causes the poor outcome? S Afr Med J 1998;88:192-199

33. Gortmaker S L. The effects of prenatal care upon the health of the newborn. Am J Public Health 1979;69:653-660.

34. Hamilton RA, Perlmann T, De Souza JJL. The unbooked patient Part 1. Reasons for failure to attend antenatal clinics. S Afr Med J 1987;71:28-30.

35. Reid M E, Mc Ilwaine G M 1980 Consumer opinion of a hospital antenatal clinic. Soci Sci Med 14A:363-368.

36. Van Coeverden de Groot H A, Davey D A, Howland R C. The Peninsula Maternity and Neonatal Service - an urban community perinatal program. SAMJ 1982; 61:35-36.

37. Van Coeverden de Groot H A. Provision of a community perinatal service in a developing country. Aust NZ J Obstet Gynaecol 1993; 33:3:225-229.

38. O'Brien M, Smith C. Woman's views and experiences of antenatal care. The Practioner, (1981) 225 : 123 - 125.

39. Hall MH, Chng PK, MacGillivray I. Is routine antenatal care worthwhile? Lancet 1980; ii : 78 – 80.

40. Heins H C, Nance N W, Mc Carthy B J, Enfird C M. A Randomised trial of nurse midwifery prenatal care to reduce low birthweight. Obstet Gynecol 1990;75:341-5.

41. Papiernik-Berkhauer E. Prediction of the preterm baby. Clin Obstet Gynecol 1980; 11: 315-9

42.Abotalib B, Adelushi A. Obstetric Outcome in the Unbooked Mother. East Afr Med J 1998;75:2 102-107.

43. De Jong G, Pattinson RC, Odendaal HJ. Influence of perinatal care on stillbirths in patients of low socio-economic class. S Afr Med J 1988; 74:53-54.

44. Tyson J, Guzick D, Rosenfeld CR, Lasky R, Gant N, Jiminez J, Heartwell S. Prenatal care evaluation and cohort analyses. Pediatrics 1990; 85:195-204.

45. Laken M P, Ager J. Using incentives to increase participation in antenatal care. Obstet Gynecol 1995;85:3:326-328.

46. Sundari T K. The Untold Story: how the health care systems in developing countries contribute to maternal mortality. Int J Health Serv 1992;22:513-8.

47. Jewell D, Sharp D, Sanders J, Peters TJ. A randomized control trial of flexibility in routine antenatal care. Br J Obstet Gynaecol 2000 ; 107 : 1241 - 1247.

48. Jewell D, Sanders J, Sharp D. The views and anticipated needs of women in early pregnancy. Br J Obstet Gynaecol 2000 ; 107 : 1237 - 1240.

49. Bryce R L, Stanley F J, Garner J B. Randomised control trial of antenatal social support to prevent preterm delivery. Br J Obstet Gynaecol 1991;98:1001-8.

50. Villar J, Farnot U, Barros F et al. A Randomised trial of psychosocial support during high risk pregnancies. N Eng J Med 1992; 327:1266-71.

51. Oakley A, Rajan L, Grant A. Social support and pregnancy outcome. Br J Obstet Gynaecol 1990; 97: 155-62.

APPENDIX 1

FACTORS CONTRIBUTING TO UNBOOKED STATUS OF OBSTETRIC PATIENTS

CASE NO: .....

NAME: .....

FOLDER NO: .....

DATE: .....

HOSPITAL: .....

Case No: ☐☐☐

Race: African=1 Coloured=2 Asian=3 White=4 ☐

Age: ☐☐

Gravidity: ☐☐

Parity: ☐☐

Abortions and Ectopics: ☐☐

Past Medical History:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

Past Surgical History:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

Medication:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

Past Obstetric History:

NVD=1 C/S=2 SB=3 NND=4 Infant Death=5
Abortion/Ectopic=6 Not Applicable=7

1. 2. ☐☐

2. 4. ☐☐

5. 6. ☐☐

7. 8. ☐☐

9. 10. ☐☐

Previous APH:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

THIS PREGNANCY:

Date of Booking: ☐☐☐☐☐☐☐☐

Admission category:

In labour=1 Antenatal=2 BBA=3 Postpartum=4 ☐

Complications:
APH=1 HT=2 PPH=3 F/D=4 Febrile Illness=5
Other=6 Nil=7 ☐

Specify: (If other) .....

Gestational Age (In completed weeks) -

LMP: ☐☐☐☐☐☐☐☐☐ EDD: ☐☐☐☐☐☐☐☐

LMP Certain? Yes=1 No=2 Don't Know=3 ☐

G.A.:

By palpation: ☐☐ By U/S: ☐☐

By dates: ☐☐ Final G.A.: ☐☐

VDRL: -VE=1 +VE=2 ☐

Rh: -VE=1 +VE=2 ☐

HIV: -VE=1 +VE=2 D/K=3 ☐

If multiparous, has patient booked in previous pregnancies? Yes=1 No=2 ☐

No. of unbooked pregnancies: ☐☐

Reason for unbooked status:

No transport	=1
Unaware of importance of booking	=2
Unaware of resources	=3
Rejection of resources	=4
Did not know pregnant	=5
Wanting to conceal the pregnancy	=6
Wanting a home delivery	=7
No money	=8
Incest/Rape	=9
Private Midwife	=10
Private doctor	=11
Other reasons	=12 ☐☐

Specify: .....

.....

SOCIAL: Yes=1 No=2 Don't Know=3

Married or stable co-habitation ☐

Employment: Self: ..... ☐

Partner: ..... ☐

Specify type of employment:

Self: .....

Partner: .....

Social class by occupation:

Self: ..... ☐

Partner: ..... ☐

Recent move to Cape Town (When.....) ☐

(From where.....)

Educational standard:

None =1 Up to Std 1=2 Up to Std 5 =3 Up to Std 8=4

Up to Std 10=5 Tertiary=6 ☐

Language:
English=1 Afrikaans=2

Xhosa=3 Other=4 ☐

Smoking (no./day) ☐

Ethanol abuse: ☐

ACCOMMODATION:

Rented=1 Own=2 Nil=3

Informal with services=4 Informal without services=5 Other=6 ☐

If other, Specify: .....

Support system (next of kin, friend etc) Yes=1 No=2 ☐

If yes, specify: .....

Financial support: Yes=1 No=2 ☐

Specify: .....

Income (available): >1000/month=1 501-1000=2 ☐
250-500=3 <250=4

Contraceptive use: Ever=1 Never=2 ☐

Would you book in your next pregnancy?

Yes=1 No=2 Don't Know=3 N/A=4 ☐

If yes – When?

As soon as pregnancy known=1 <20 weeks=2 ☐
>20 weeks=3 Don't know=4

If >20 weeks, Why?

Specify: .....

If no, why not?

Specify: .....

If you book, do you think the outcome is -

Better=1 The same=2 Worse=3 ☐

On discharge: Preferred method of contraception:

T/L=1 IUCD=2 Pill=3 Injectable=4 Barrier=5

Non-Acceptor=6 ☐

CARE OF BABY:

Self only=1 Self+Family=2 Family out of C.T.=3

Paid Help=4 Adoption=5 ☐

PREGNANCY:

Pregnancy outcome: Live=1 SB=2 NND=3 ☐☐

Maternal outcome: Hospital stay (days) ☐☐

PPH=1 Sepsis=2 Evac=3 Death=4 Hyst=5 Other=6 ☐

Specify: .....

Preterm Labour: Yes=1 No=2 ☐

Preterm Delivery: Yes=1 No=2 ☐

MODE OF DELIVERY:

NVD=1 Breech=2 C/S=3 ☐

Vaccuum=4 Forceps=5 Other=6

Specify: .....

Birth weight (grams): ☐☐☐☐

Placental weight (grams): ☐☐☐☐

FACTORS CONTRIBUTING TO UNBOOKED STATUS OF OBSTETRIC PATIENTS

BOOKED CONTROLS

CONTROL NO: .....

NAME: .....

FOLDER NO: .....

DATE: .....

HOSPITAL: .....

Case No: ☐☐☐

Race: African=1 Coloured=2 Asian=3 White=4 ☐

Age: ☐☐

Gravidity: ☐☐

Parity: ☐☐

Abortions and Ectopics: ☐☐

Past Medical History:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

Past Surgical History:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

Medication:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

Past Obstetric History:

NVD=1 C/S=2 SB=3 NND=4 Infant Death=5
Abortion/Ectopic=6 Not Applicable=7

1. ☐☐ 2. ☐☐

3. ☐☐ 4. ☐☐

5. ☐☐ 6. ☐☐

7. ☐☐ 8. ☐☐

9. ☐☐ 10. ☐☐

Previous APH:

Yes=1 No=2 Don't Know=3 ☐

Specify: .....

THIS PREGNANCY:

Date of Booking: ☐☐☐☐☐☐☐☐

Gestational Age (In completed weeks) -

LMP: ☐☐☐☐☐☐☐☐ EDD: ☐☐☐☐☐☐☐☐

LMP Certain? Yes=1 No=2 Don't Know=3 ☐

G.A.:

By palpation: ☐☐ By U/S: ☐☐

By dates: ☐☐ Final G.A.: ☐☐

VDRL: -VE=1 +VE=2 ☐

Rh: -VE=1 +VE=2 ☐

HIV: -VE=1 +VE=2 D/K=3 ☐

If multiparous, has patient booked in previous pregnancies? Yes=1 No=2 ☐

No. of unbooked pregnancies: ☐☐

Reason for booked status:

Specify: .....

SOCIAL: Yes=1 No=2 Don't Know=3

Married or stable co-habitation: ☐

Employment: **Self:** ..... ☐

Partner: ..... ☐

Specify type of employment:

Self: .....

Partner: .....

Social class by occupation:

Self: ..... ☐

Partner: ..... ☐

Recent move to Cape Town (When.....) ☐

(From where.....)

Educational standard:

None=1 **Up to Std 1=2** **Up to Std 5=3** **Up to Std 8=4**

Up to Std 10=5 **Tertiary=6** ☐

Smoking (no./day) ☐☐

Ethanol abuse: ☐

ACCOMMODATION:

Rented=1 **Own=2** **Nil=3**

Informal with services=4 **Informal without services=5** **Other=6** ☐

If other, Specify: .....

Support system (next of kin, friend etc) **Yes=1** **No=2** ☐

If yes, specify .....

Financial support: **Yes=1** **No=2** ☐

Specify: .....

Income (available): >1000/month=1 501-1000=2 ☐

250-500=3 <250=4

Contraceptive use: Ever=1 Never=2 ☐

Would you book in your next pregnancy?

Yes=1 No=2 Don't Know=3 N/A=4 ☐

If yes – When?

As soon as pregnancy known=1 <20 weeks=2 ☐
>20 weeks=3 Don't know=4

If >20 weeks, Why?

Specify; .....

If no, why not?

Specify: .....

If you book, do you think the outcome is -

Better=1 The same=2 Worse=3 ☐

On discharge: Preferred method of contraception:

T/L=1 IUCD=2 Pill=3 Injectable=4 Barrier=5
Non-Acceptor=6 ☐

CARE OF BABY:

Self only=1 Self+Family=2 Family out of C.T.=3
Paid Help=4 Adoption=5 ☐

PREGNANCY:

Pregnancy outcome: Live=1 SB=2 NND=3 ☐☐

Maternal outcome: Hospital stay (days) ☐☐

PPH=1 **Sepsis=2** **Evac=3** **Death=4** **Hyst=5** **Other=6** ☐

Specify: .....

Preterm Labour: Yes=1 No=2

Preterm Delivery: Yes=1 No=2

MODE OF DELIVERY:

NVD=1 **Breech=2** **C/S=3** ☐

Vaccuum=4 **Forceps=5** **Other=6**

Specify: .....

Birth weight (grams): ☐☐☐☐

Placental weight: ☐☐☐☐

APPENDIX 2

UNIVERSITY OF CAPE TOWN

Department of Obstetrics and Gynaecology

Medical School, Anzio Road, Observatory, South Africa 7925
HEAD of DEPARTMENT Professor Zephne M van der Spuy PhD, FRCOG
Telephone: (021) Personal Secretary 406-6112/404-4484
Fax: (021) 448-6921
Cell phone: 082-6583779
E-mail: zvdspuy@uctgsh1.uct.ac.za
Secretary: jartlett@uctgsh1.uct.ac.za

11 February 2000

Professor D Dent
Acting Chairman – Ethics Committee
UCT Medical School

Dear Professor Dent

SURVEY OF UNBOOKED MATERNITY PATIENTS PRESENTING IN THE PENINSULA MATERNAL AND NEONATAL SERVICE

I originally submitted an application to the Ethics Committee for permission to perform this study in 1989. There were no ethical conditions and we went ahead with the initial study.

Since then the legislation has changed and we now wish to repeat this study given that women may now access free antenatal care should they so wish. We are using the same format, have the same motivation and will be using the same clerking sheets with very minor modifications.

I enclose a copy of the original Ethics Committee consent and, because the Ethics Committee records of our original submission are not available, also a very brief outline of the study.

May we proceed using the original Ethics Committee consent? There is some urgency as this study will be undertaken by one of the registrars – it is unfunded – and she needs to complete it in the next few months. If it is to be reassessed by the Ethics Committee, I should appreciate it if this could be done as soon as possible.

Many thanks for your assistance.

Yours sincerely

Zephne van der Spuy

ZEPHNE M VAN DER SPUY

Department of Obstetrics and Gynaecology

Medical School, Anzio Road, Observatory, South Africa 7925
HEAD of DEPARTMENT Professor Zephne M van der Spuy PhD, FRCOG
Telephone (021) Personal Secretary 406-6112/404-4484
Fax: (021) 448-6921
Cell phone: 082-6583779
E-mail zvdspuy@uctgsh1 uct.ac.za
Secretary.jartlett@uctgsh1.uct.ac.za

CONSENT FORM

SURVEY OF UNBOOKED MATERNITY PATIENTS PRESENTING IN THE PENINSULA MATERNAL AND NEONATAL SERVICE

I ....., hospital number .....

have had this study explained to me and I consent to participate in it.

I understand that I shall be interviewed about my pregnancy.

I have been informed that I have the right to refuse to participate in this study should I so wish.

I understand that the purpose of this study is to identify shortcomings or problems within the Maternity services in the hopes of improving the care which is given to pregnant women.

Signed: .....

Date: .....

Investigator

APPENDIX 3

LIST OF ABBREVIATIONS

CI - Confidence interval

GPH – Gestational proteinuric hypertension

LBW – Low birth weight

NGO – Non-Governmental Organization

PMNS – Peninsula Maternal and Neonatal Services

PPH – Post partum haemorrhage

RCT – Randomized control trial

UK – United Kingdom

USA – United States of America

WHO – World Health Organization