Antenatal Care, Care-seeking and Morbidity in Rural Karnataka, India: Results of a Prospective Study

The potential for improved health promotion is immense

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"Pregnancy is special, let's keep it safe" was the theme for World Health Day in 1998. Even if agreement existed on the best way to ensure a safe pregnancy in a resource-poor setting, provision is only half the story; the level and nature of the demand for a "safe" pregnancy also needs evaluating.

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How women themselves perceive the dangers of pregnancy and how they react to those dangers are important questions to answer.

The objective of this prospective study was to identify the socio-economic determinants of antenatal care-seeking among rural women in a South Indian setting. The extent and nature of the antenatal mobidities suffered by these women are also described. The results give their responses to sequential questionnaires administered during pregnancy and beyond. All those who became pregnant in 11 South Indian villages within a 25-month period from August 1996 to September 1998 were followed as part of the study. Responses were collected during pregnancy itself, thereby reducing the recall error inherent in many cross-sectional studies. This article presents survey results for 282 women interviewed two or more times during pregnancy, with the second interview taking place during the latter part of the third trimester. Occasional supporting qualitative information is also given based on in-depth interviews with pregnant women and their families, as well as with health-care providers and other key informants.

Background to the study

The study took place in the state of Karnataka, which has a rural profile typical of South India. Early marriage and consanguineous marriages, especially between first cousins, are very common in this part of the country. Recent rapid fertility declines at all ages have brought the total fertility rate to 3.09 children per woman for rural residents, but short birth intervals still predominate - almost half are less than two years in duration. Literacy levels in the state are just a little higher than the national average of 52 per cent, with levels for men exceeding those for women by over 30 per cent (IIPS, 1993). This is a progressive rural setting for a developing country in South Asia; the fertility transition is well advanced in this part of India but maternal health is still very poor. Within India, which shows a considerable diversity of maternal health care provision, Karnataka falls between the extremes of good and poor health infrastructure. It is therefore a state with the potential for substantial improvement in maternal health.

Antenatal care

Antenatal care refers to pregnancy-related care provided by a health worker either in a medical facility or at home. In theory, antenatal care should address both the psychosocial and medical needs of the woman in the context of the health care delivery system and the surrounding culture (WHO, 1996). Rodhe (1995) states that antenatal care has two major functions. It can be used for early detection of some complications such as high blood pressure and

malpresentation. However, more critical in resource-poor settings is the opportunity that antenatal care providers have in transmitting information to pregnant women: it enables them to recognize problems when they occur, decide when to leave home to seek help; and identify where to go for the attention that they might need. It is important that this information is known not only by the pregnant woman, but also by her family. They must be able to look ahead, to be informed and motivated about complications and referral, and be prepared to arrange transport. Antenatal visits can play a critical role in preparing a woman and her family for birth by establishing confidence between the woman and the health-care provider, and by individualizing promotional health messages (WHO, 1996).

Scarce resources in some developing countries have led many commentators to suggest that unnecessary antenatal visits should be reduced in favour of fewer, more effective visits (Villar and Bergsjo, 1997; Khan-Neelofur and others, 1998). A recent antenatal care trial showed that four visits can produce maternal and child health outcomes that are just as favourable as more frequent antenatal contact regimes (Villar, 2000). This is the first evidence-based challenge to the British-inspired regular medical contact model developed in the 1930s and since thought of as a gold standard (London, 1992). It is a positive finding for resource-poor health service infrastructures, as the reduced four-visit scheme was shown to be 9-20 per cent cheaper than more frequent antenatal contact regimes in state-run developing country settings (Villar, 2000). However, the results of the trial are based on a controlled delivery of care elements spaced in an optimal way among the four visits. These elements included a haemoglobin test, gestational age estimation, blood pressure measurement, weight and height measurement, rapid syphilis test and treatment of symptomatic sexually transmitted diseases (STDs), urine test for protein, determination of blood type, tetanus toxoid immunization, iron and folate supplementation, recommendation for emergencies, advice for delivery, detection of foetal heart rate, recommendations for breastfeeding and contraception, accurate completion of antenatal card details, encouragement to retain and present the antenatal card, detection of breech presentations and, if necessary, referral. The inclusion of these elements was based on established associations between care procedures and maternal or perinatal outcome (Villar and others, 1998).

The recommended content of antenatal care thus has three main categories:

- Assessment (including history-taking, physical examination and laboratory tests to identify problems or risk factors)

- Health promotion (including advice on nutrition, planning the birth information about danger signs and contingency planning, subsequent contraception and breastfeeding)
- Care provision (including iron and folate supplements, tetanus toxoid immunizations, psychosocial support and record-keeping)

Commonly used risk factors in maternity care include height, weight, age, parity and previous history. All of these have some correlation with the risk of complications (Rolde, 1995). They identify populations of women who tend to have a higher proportion of complications, but not individual risk. Other risk factors commonly identified, such as antenatal bleeding, high blood pressure, STDs, malpresentation and severe anaemia, are in fact complications in themselves. All of the above have for a long time been used in antenatal care to identify women at high risk of complications in pregnancy and labour, and in need of referral to a hospital. This strategy, although necessary, has diverted crucial attention from the many "low-risk" women who go on to develop complications and comprise 50 per cent or more of all cases of maternal mortality.

To enable this complex of services in pregnancy to be delivered effectively, the study of the determinants of antenatal care-seeking is currently an established focus of investigation. In most health-care situations, services are static and patients must travel in order to use them. However, outreach setvices often exist, the function of which is to seek out pmgnant women. This is the case in both rural and urban areas of India, for municipal and state-run services, particularly in the antenatal period. Thus, if a maternal care contact is made, it has not necessarily been sought. Therefore, it is more appropriate to speak of "care contact" than "care-seeking". Another feature of maternal care-seeking is the length and transitional nature of the obstetric period. Even during the antenatal phase, the perceived importance and urgency of care-seeking change. Of course, women themselves are not necessarily ill during this period; childbearing is a healthy process that, for most women, is not problematic. However, the possibility that a complication may occur is potentially so serious that routine checks are highly desirable. A substantial minority of women, especially in poor, undernourished and anaemic populations, do suffer a huge range of problems during pregnancy. Care-seeking should occur for a mix of routine preventive, educational and problem-related reasons.

Maternal health care in India and in rural Karnataka

Health care service provision in India is very diverse, with rural services achieving considerably less coverage than their urban counterparts. In

Table 1. Rural maternal health care indicators from selected states of India

Indicators	Uttar Pradesh	Karna-taka	Kerala	India
No antenatal care (per cent)	60	17	2	42
Median number of antenatal visits	2.9	4.1	8.4	3.5
Median months pregnant at first visit	5.7	4.3	3.2	5.1
Institutional births (per cent)	6	26	85	16
Births attended by a doctor or nurse (per cent)	12	40	88	25
Births attended by a traditional birth attendant (per cent)	34	27	10	39

Source: International Institute for Population Sciences (IIPS), 1993.

rural Karnataka, maternal health care indicators compare favourably with those of rural India as a whole, but nevertheless, only 26 per cent of births are institutional and antenatal care is not universal. Table 1 gives estimates of indicators from rural Karnataka, rural Uttar Pradesh (a state with low provision of services) and rural Kerala (a state that is known for superior maternal care). These estimates are taken from the Indian National Family Health Survey carried out in 1992/93 (IIPS, 1993).

Indian maternal and child health and family planning services are integrated within the broad umbrella of the Family Welfare Programme (FWP). This Programme, currently in its fifth decade, was designed to provide integrated preventative, promotive and curative services for men and women (Measham and Heaver, 1996a). The more recent Child Survival and Safe Motherhood Progmmme was launched in India in August 1992. This FWP offshoot was specifically designed to improve the health status of women and children and to reduce maternal, infant and child mortality rates. The goals of the initiative were to monitor indicators such as the proportion of pregnant women receiving three antenatal visits, and the proportion of deliveries conducted by trained attendants (Measham and Heaver, 1996b). More recently, these initiatives have been succeeded by the Reproductive and Child Health Progrmne, although during the time of the study this programme had not yet been implemented.

As prart of the FWP in nual areas of India, maternal and child health services are delivered mainly by Government-run primary health centres and subcentres. Female health workers, who are auxiliary nurse midwives (ANMs), provide maternal and child health services in the villages. In practice, a subcentre is often an extension of the ANM's own residence. Registering

pregnant women and assessing their health throughout the pregnancy is the responsibility of the ANM either at their homes or at an antenatal clinic. If pregnant women encounter complications which are beyond the level of the health worker's competency or resources, the ANM must refer the woman to the primary health centre. However, those centres have only limited resources, including capacity for antenatal and postnatal care, so that complicated cases must be referred again.

The private health sector in India is very strong; charitable or mission institutions also play an important role. In terms of health care during the obstetric period, private antenatal care is often sought for problems and check-ups in pregnancy, but private delivery care is accessible only by higher socio-economic groups. With the recent profusion of practitioners of modem systems of medicine, some lacking recognized medical qualifications, it can be difficult for service-users to know whether the practitioner that they have contacted is properly qualified for providing maternal care (Bhatia and Cleland, 1996).

Study design and setting

The study was carried out in 11 villages surrounding a *taluk* (group of villages) headquartets town about 60 km from Bangalore. These villages cover a population of approximately 25,000 in about 6,000 households. The closest of the study villages to the *taluk* headquarters town is about 8 km away and the most distant is about 25 km away. The study villages had been randomly selected from the villages in the *taluk* for an earlier study; a larger village and a tribal village were later added in order to capture health-seeking behaviour in a wide range of rural settings.

The sample

All women in these villages who were already pregnant at the start of the study or who became pregnant during the study period were enrolled until the required total for the study was reached. Case identification was carried out by means of village health workers and the case load was crosschecked with local nursery school teacher (*anganwadi*) and ANM records to identify any missed cases. The survey was completed within 25 months of the start date. More than 300 women were enrolled in the study, but only 282 women were interviewed late enough in pregnancy (during the eighth month or later) for an almost complete exposure for reporting of morbidities and care contacts to be realized. By the time they had reached such a late stage of their pregnancies, most respondents had been interviewed two or three times.

The questionnaires

An initial questionnaire covering background characteristics, household data and pregnancy histories was administered, in most cases, during the first or early second trimester of pregnancy. Two more interviews were held during the pregnancy, mainly during the late second and the third trimesters. These covered morbidities, nutrition, health-seeking behaviour and intentions for delivery. In subsequent parts of the study (not covered in this article), delivery experiences and postpartum information were also collected from these women. Apart from some brief comments on the comparison between planned and actual delivety locations, this article focuses on the antenatal period.

The survey was carried out in women's homes; each of the sequential series of questionnaires took around 30-40 minutes to administer. Eight trained graduate interviewers were used for data collection and all were fluent in Kannada, the language spoken within the study area. Morbidity questions were treated with particular care, the women's perceptions of ill-health being elicited initially without prompts or pre-set categories, and only subsequently was recourse made to a more structured set of questions. Corroboration of morbidity status from health personnel was not sought, as a range of practitioners - often without mainstream medical training - was involved. The design of the questionnaire was carried out concurrently with medical anthropological studies on local morbidity taxonomies.

Characteristics of the study population

Almost three quarters of the sampled women in the study villages were between 18 and 24 years old at the start of their pregnancies; a small proportion was less than 18 years old. In terms of education, just over one half of the respondents had received at least some schooling. Despite the mismatch of literacy levels in some households, the general picture is of low female literacy within the study group, which is typical of this district as a whole (Census of India, 1992). All women were engaged in household work but only a few cited salaried work or trading as a primary occupation, and less than 10 per cent cited waged agricultural work as their primary occupation. Apart from household duties, the majority of the women had some secondary occupation. This was generally agricultural in natute, either work on the family's own land or caring for livestock. Most belonged to households with small landholdings; one quarter of the households were landless. Many of the women were married to relatives, usually a maternal uncle or a cousin, which is the norm in the area. More than a third of the women were pregnant for the first time, another third for the second. Fourth or subsequent pregnancies were reported

by less than 10 per cent of the women. The reason given for repeated pregnancies was the desire for a male child. The predominant caste in the villages is Gowde, from the "other backward caste" categoty. A substantial minority of scheduled castes and scheduled tribes (SC/ST) make up almost one third of the sample. Women from the Lambani tribe, located only in the "tribal" village, are part of this group, and they showed very different characteristics from the other women in the sample, both in terms of health-care-seeking behaviour, and morbidity. Although they are part of the SC/ST category, they are considered separately in this analysis.

A geographical categorization was created to locate the villages within areas that had access to the same ANM or subcentre. Group 1 consists of the four villages on the western side of the *taluk* that are served by one subcentre. Group 2 consists of a more disparate group of five villages that are served by a subcentre in the central village of the group. There remained a large village, situated in the southernmost part of the study area, that is well served by a number of health care providers. Lastly, the tribal village, consisting of Lambani tribespeople only, was considered as a separate category.

Results

Timing, frequency and type of antenatal contacts

At first glance, the situation with regard to antenatal care utilization is encouraging, with all but three of the studied women reporting some contact. In this context, "contacts" refers to visits to or from trained health personnel: government doctors, ANMs, private or mission hospital clinics or private providers. The qualitative interviews suggested that the women feel it is good to be checked early in pregnancy, as the doctor can thus predict that the rest of pregnancy and delivery will be problem-free.

A high number (56 per cent) of reported antenatal contacts occurred in the first trimester, which puts the median number of pregnancy months at first contact safely in the first trimester. This compares well with the equivalent median of 4.3 months for rural Karnataka (IIPS, 1993). A similarly favourable comparison can be made between the proportions who saw no health care provider at all during pregnancy: 1.1 per cent in this study compared with 17 per cent in rural Karnataka as a whole (IIPS, 1993).

The timing of the first antenatal contact is associated with various socio-demographic factors (table 2). The Lambani (tribal) group are much more prone to late first antenatal contact, as are those with less education, those on

Table 2. Factors associated with timing of first antenatal care contact in rural Karnataka

Factor	Percentage with antenatal care contact in the fast trimester	N
Caste[a]		
Gowda	57.2	138
Lingayat	61.1	18
Lambani	38.5	13
Scheduled caste/tribe	52.1	73
Other backward caste	62.5	40
Education[b]		
No schooling	51.5	130
Grade l-5	51.5	33
Grade 6-8	63.0	54
Grade 9+	61.5	65
Number of pregnancies[b]		
1st	67.3	107
2nd	51.0	104
3rd	37.2	43
4th or higher	60.7	28
Age (in years)[b]		
14-17	73.0	37
18-19	53.9	76
20-24	57.5	127
25+	40.5	42
Land and livestock		
No land and no livestock	57.1	35
Marginal land and no livestock	51.5	40
No/marginal land and some livestock	57.1	35
Some land and some livestock	57.1	112
Extensive land and much livestock	51.7	60
Value of possessions (rupees)[b]		
<l,000	52.2	134
l,00l-5,000	57.0	100
5,001-15,000	55.6	27
>15,000	76.2	21
Location[a]		
Large village	62.3	53
Tribal village	38.5	13
Village group 1	53.4	133
Village group 2	59.0	83
Previous problem[a]		
Any previous antenatal problem	62.9	35
No previous antenatal problem	45.7	140
Any previous intra/postnatal problem	60.0	25
No previous intra/postnatal problem	47.3	150
Any previous problem	60.8	51
No previous problem	44.4	124
Total	**56.0**	**282**

[a] Significant association at 1 per cent level (as tested by a Pearson's chi-squared statistic; adjustments were made for sparse cells).

[b] Significant association at 5 per cent level (test as above).

Table 3. Percentage distribution of women according to number of contacts with health care providers during pregnancy in rural Karnataka

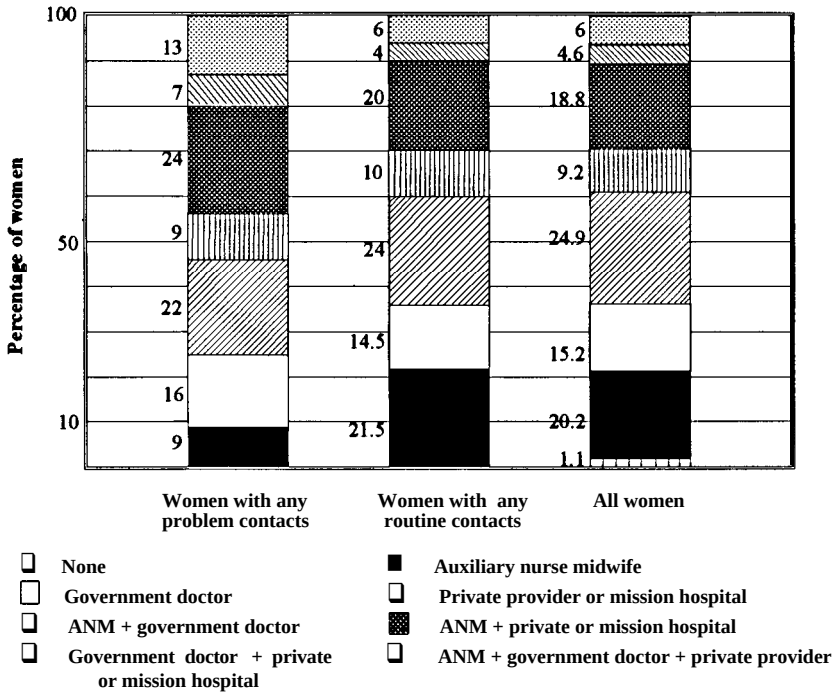
Number of contacts	Contacts that included routine care	All contacts
0	7	1
1	37	27
2	39	16
3	11	29
4	6	17
5	0	9
6	0	1
Total	**100**	**100**

their second or third pregnancy (although not those on their fourth pregnancy or more), older pregnant women and those with no previous obstetric problems. Wealth, as measured by the value of possessions, does not have a marked effect, except for the very wealthy, who have a much higher probability of contact during the first trimester.

Table 3 shows the frequency and reasons for antenatal care visits. For each visit, women were asked the reason for this visit, and multiple reasons could be recorded. From the left-hand column of the table it can be seen that a large proportion (93 per cent) of the women had health-care contacts that were either exclusively routine or included both routine and problem care. In fact, 63 per cent of the women had contacts which they stated were exclusively for routine care (this is not shown in table 3). However, of those with routine care as part of their contact, only 6 per cent went on to have four provider contacts, the great majority having only one or two contacts. Increased frequency of contact is more likely to be for problem care because, when problem care is included as a reason for contact, the median number of visits increases from just above one to over two visits. This compares unfavourably with the rural Karnataka median of 4.1 visits (IIPS, 1993).

Figure 1 shows that the type of health care provider chosen by those women whose contacts included routine visits is a little different from those who have problem care as part of their contact profile. Overall, 55 per cent of the women at some point in their pregnancy saw the ANM, either exclusively, or alongside contacts with government doctor, private or mission hospital clinics and private providers. However, women who needed problem care were less likely to rely on the ANM alone, and had usually also made contact with

Figure 1. Health care providers sought in pregnancy by contact type, in rural Karnataka



private practitioners. The impression gleaned from qualitative interviews is that care from private sources is considered far superior to that from government services.

Content of antenatal care

Table 4 shows a mixed picture of the content of antenatal care. Government health care personnel provide tetanus toxoid immunizations and iron and folate supplements, but carry out very few other recommended procedures. A surprisingly high proportion of the women who had been prescribed iron supplements (85 per cent) reported taking them "regularly". This finding differs from most other studies, and there is reason to question the high compliance rates cited here. The mistaken but widespread belief that iron pills cause the child to be dark-skinned often prompts women to discontinue the course, since a fair complexion is highly prized in India.

Table 4. Reported content of antenatal care during any visit during pregnancy in rural Karnataka

Services received	Percentage of those receiving any care (n = 279)
Assessment	
Blood pressure	57.3
Urine analysis	41.2
Blood taken	46.6
Weight taken	50.2
Abdomen palpated	81.7
Vaginal examination	23.7
Care provision	
Iron and folic acid prescribed	96.4
Tetanus toxoid administered	97.5
Health promotion	
Advice on diet	44.1
Advice on breastfeeding	3.9
Advice on danger signs	2.9
Advice on contraception	11.5
Told about postnatal checks	2.5

Note: **Three women had no antenatal care contact.**

Where women in this study had their weight recorded, haemoglobin estimated or urine checked, the procedure was done by private practitioners, a finding that helps to explain the preference for private care. Apart from perfunctory advice on diet (to eat more fruits and vegetables or "strengthening food", which was frequently impossible for the women in view of their limited financial circumstances), the advice and information aspect of antenatal care was neglected by almost all care providers (table 4). Less than half of the women had urine tests, and only just over half had blood pressure recorded or weight checked.

Prevalence of prenatal morbidities and care-seeking

The precise definition of obstetric morbidity is unclear (Fortney and Smith, 1999); further, there is no consensus on grading the severity of such mobidities, nor on how best to structure the enquiry in order to elicit information on self-reported morbidity, despite a great many suggested approaches including prompted lists, unprompted questions, different recall periods, different question wordings and so on. In some studies, the severity of morbidity is categorized into three groups: grades 1, 2 and 3 with diminishing severity. Bhatia and Cleland (1996) categorize swelling of the hands, hypertension, convulsions, vaginal bleeding and fever as grade 1

morbidity. Srinivasa and others (1997) add malaria, but exclude hypertension and fever. The definition of fever usually carries with it a number of days, or whether the fever is accompanied by "rigour", but there is no consistency between the studies. The definitions of morbidities in grades 2 and 3 vary widely, with the inclusion of problems in grade 3 being very varied indeed.

This study avoids categorization, and gives details of many individual morbidities so that comparisons can be made by cumulating the problems in any desired grouping (table 5). As a guideline, the morbidities listed at the start of the table printed in italics (fever, vaginal bleeding, hypertension, severe headaches and malaria) could be considered the most severe. Fever, vaginal bleeding, swelling of face or hands, and malaria were reported by 5.6 per cent, 0.4 per cent, 4.2 per cent and 0.7 per cent of the women respectively. Almost 10 per cent of the women reported one or more of these symptoms and the great majority of these women sought care, mostly from private practitioners, although the government doctor also had some (table 5). High blood pressure, a serious indication, was reported by only one woman, although as the testing is inadequate, it is unlikely to represent the true prevalence.

More than 60 per cent of the women reported some morbidity; 347 episodes in all were reported by 176 women. Most of this was what could be classified as non-severe, but was nevertheless of sufficient concern for 8-100 per cent of the women to seek care, depending on the problem. Gastro-intestinal problems such as inability to digest were reported by 41 women, and 31 reported nausea, resulting in reduced food intake by many. Abdominal pain and anaemia were the most frequently reported problems. Abdominal pain is thought by women to be a possible symptom of an impending miscarriage, and 78 per cent of women reporting this sought some medical care for it. Anaemia is usually diagnosed (though laboratory confirmation is rarely carried out) by the health care provider: thus, the true prevalence may be higher than the 22 per cent reported here. From qualitative reports, health-care-seeking depends largely on whether the symptoms are recognized as illness, or felt to be "normal" (frequently confused with "common") for pregnancy.

Self care

Unlike in neighbouring districts (Hutter, 1994), there is no overt practice in this region of reducing the diet to ensure easy delivery. However, the concept of a need for increased food intake during pregnancy does not exist either. Some food taboos were reported, but they did not involve common foods. A substantial minority reduced their intake, usually because of symptoms such as a feeling of heaviness, or burning sensation in the stomach

Table 5. Antenatal morbidity and care-seeking behaviour by problem type in rural Karnataka

Antenatal problem	Number of women reporting the problem (percentage of all women)	Number of women seeking professional care (percentage of all women reporting the problem)	Percentage of women seeking care with specified types of provider among all those who sought care				
			Auxiliary nurse midwives	Public health centrcs	Government doctor	Private doctor	Other
High fever/ fever with rigour/ fever for 3 or more days	16 (5.6)	15 (93.7)	13.3	6.6	20.0	40.0	20.0
Vaginal bleeding	1 (0.4)	1 (100.0)				100.0	
High blood pressure[b]	1 (0.4)	1 [a](NA)					
Severe headaches	8 (2.8)	5 (62.5)		40.0	20.0	40.0	
Malaria	2 (0.7)	2 (100.0)				100.0	
Anaemia[b]	62 (21.9)	62 (NA)					
Abdominal pain	60 (22.6)	47 (78.3)	12.7	10.6	27.6	46.8	2.1
Inability to digest	41 (14.5)	3 (6.7)	25.0		50.0		
Nausea	31 (10.9)	24 (77.4)	16.7	4.2	20.8	58.3	
Backache	19 (6.7)	12 (63.2)	16.7	8.3	8.3	58.3	8.3
Burning on urination	13 (4.6)	5 (38.5)			40.0	20.0	20.0
Urine incontinence	4 (1.4)	1 (25.0)			100.0		
Tiredness	13 (4.6)	5 (38.5)			20.0	60.0	20.0
Varicose veins	13 (4.6)	4 (30.8)			25.0	75.0	
Abnormal vaginal discharge	12 (4.2)	11 (91.6)	18.2			72.7	9.1
Giddiness	11 (3.9)	6 (54.5)			16.7	83.3	
Blurring of vision	10 (3.5)	2 (20.0)				100.0	
Heaviness/womb falls out	3 (1.0)	0					
Night blindness	3 (1.0)	0					
Beethi shanke[c]	2 (0.7)	2 (100.0)					10.0
Constipation	2 (0.7)	0					
Mouth of uterus open[b]	2 (0.7)	2 [a](NA)					
Other obstetric problems[d]	16 (5.6)	10 (62.5)	20.0		20.0	50.0	10.0
Shortness of breath	2 (0.7)	1 (50.0)				100.0	
Total[e]	176 (62.0)						

Note: Problems printed in italics at the top of the table correspond roughly to definitions of serious morbidity given by previous authors (see text). All problems were reported in the eighth or ninth months of pregnancy covering the whole of the previous antenatal period.

[a] Data not available on one case.

[b] Anaemia, mouth of uterus open and high blood pressure were diagnosed by a health care provider.

[c] A local, culturally defined syndrome associated with mental health problems.

[d] Other obstetric problems were: decrease in foetal movements, difficulty in passing urine, weight loss and swollen face/hands/feet.

[e] 347 episodes of morbidity were reported by 176 women out of the total sample of 282 women.

after a meal. Most women reported carrying out heavy activity until late into their pregnancy, the most common being fetching water, cleaning cattle sheds and carrying loads. If they stopped such activities, it is rarely because they saw a need for more rest in pregnancy. Most women, especially for their first pregnancy, went to their natal home during the seventh month of pregnancy, and their work load there was much reduced. Some community members recommend normal activity up to the end of pregnancy as this is believed to make the delivery easier. Most women take "green medicine", a herbal concoction derived from tree bark, to ensure a healthy baby and prevent inauspicious or spirit-related abnormalities in the newborn.

Planning for delivery

At least 75 per cent of maternal deaths are avoidable (WHO, 1996) and major obstetric complications can strike unpredictably. Planning for delivery is thus very important, but was not common in this study group. Although facilities for caesarean section and blood transfusion are some distance away in Bangalore, they are accessible. Therefore, it is feasible to advise people to make contingency plans and act on them if necessary. The qualitative reports reveal a belief that planning for emergencies is prophetic, and so adverse eventualities should not be contemplated. Interviews with women after delivery show that there was a significant level of switching from their original delivery intentions. The majority of the women (87 per cent) planned to deliver at home. Even women who visited private doctor for antenatal care generally planned home deliveries, largely because of high hospital costs or the absence of a woman doctor in the public health centre. In the event, more than 30 per cent of the women who planned to deliver at home went to the public health centre or hospital, often because of anticipated or actual complications. This "switching behaviour", due to unexpected events during labour, amounted to 36 per cent of women delivering at an institution or en route, a substantial increase on the 11 per cent who had originally planned institutional deliveries. Apart from switching towards institutional delivery in response to morbidity, the other major change between planned and actual outcomes concerned the switch from deliveries that were planned to take place with the ANM in attendance, to those that were eventually attended only by a relative, friend or *dai* (traditional birth attendant). In fact, nearly one third of the women who had planned to have an ANM assist at their deliveries finally had a *dai* or an experienced relative in attendance, since the ANM was either not available or unwilling to attend if women went into labour at night.

Delivery choices wem clearly made on the basis of perceptions of the likely quality of care, as well as cultural comfort. A striking finding was the propensity for women in village group 2 to plan deliveries with the ANM,

compared with relatively few from village group 1, despite their closer proximity to the subcentre. The ANM in village group 2 was clearly regarded very highly and was a desirable birth attendant. In contrast, women from the tribal village consistently planned home or public health centre births, and none envisaged assistance from the local ANM. In general, women prefer to deliver at home for reasons such as support, familiarity, tradition, as well as the feeling that birth is a normal phenomenon that does not need an institutional setting (for more details, see Matthews and others, 2000).

Summary and concluding discussion

The study shows early and widespread use of antenatal care, but it also reveals the content of that care to be far short of that recommended as a result of the recent WHO antenatal care trial (Villar, 2000). Initial contact is commendably early, even in comparison with surrounding areas, but only women with problems report an adequate frequency of contact. Morbidity in pregnancy is widespread, although it is difficult to make direct comparisons with other studies. Care-seeking for problems is also common, mostly from private practitioners, while deliveries are carried out mostly by the public sector, or *dais* and lay people. This mix of public and private uptake derives from both the outreach work carried out by the state system and the preference among community members for private providers. Both types of provider may learn lessons from these health-seeking tendencies and much scope for collaboration exists, at least with regard to widely acceptable and transferable record-keeping. A system of antenatal cards kept by women themselves is already in place. Clearer and mote detailed notes would enhance their utility; the system should be extended to include the notes of private practitioners. These changes combined with a community programme for transport in the case of emergencies could result in great strides being made in the improvement of maternal health in this community, where family members are clearly prepared to respond to morbidities.

The most thorough aspect of antenatal care is routine preventive provision, including tetanus toxoid immunization and the distribution of iron and folate supplements, though the level of compliance with iron supplementation among this highly anaemic population is in doubt. The assessment dimension of antenatal care is less well covered. The prevalence of history-taking is very low, although many providers, especially those in the private sector, do carry out physical examinations such as measuring weight and palpating the abdomen. The detection of risk factors and the level of effective record-keeping for referrals are unlikely to be optimal.

Considering that this population has the advantage of early and nearly universal antenatal coverage, the potential for improving health promotion is considerable. The current level of delivery planning is minimal and very little advice is given to pregnant women about aspects of pregnancy such as food intake, activity, danger signs in pregnancy, postnatal checks and breastfeeding. Whether women are able to act on such recommendations must also be carefully considered. If there were appropriate training programmes for health workers and effective community education, much useful information could be conveyed. Such education should reach the whole community, and take into account the provisions and duties required both of natal and conjugal families.

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Prevalence and Correlates of Morbidity in Pregnant Women in an Urban Slum of New Delhi

Women need more information about danger signs in pregnancy

By Supriya Mayank, Rajiv Bahl, Ashok Rattan and Nita Bhandari*

In most developing country settings, pregnancy and childbirth are accepted as normal events of life and it is not surprising that problems associated with pregnancy are also accepted without much ado. A new approach to measuring maternal mortality indicates that there are about 585,000 maternal deaths annually worldwide, 99 per cent of them in developing countries (AbouZhar and others, 1996). Over 20 million babies are born in India every year. The maternal mortality ratio ranges from 400 to 550 deaths

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per 100,000 live births, with wide variations between different states (Bhat and others, 1992). However, mortality represents just the tip of the iceberg. It has been estimated that for every maternal death, there are over 100 acute morbid episodes indicating an overall figure of 62 million morbidities annually (Koblinsky, 1993). Though these are crude estimates, they highlight the magnitude of the problem.

While estimates of maternal mortality have been made for most developing countries, information on gynaecological and obstetric morbidity is scanty. A few studies on gynaecological morbidity have been conducted in India (Bang and others, 1989; Bhatia and Cleland, 1995; Koenig and others, 1998), but community-based data on obstetric morbidity are rare. A study from South India showed that women suffering from obstetric complications during a previous childbirth were more likely to suffer subsequent gynaecological morbidity. This implies that pregnancy-related problems have far-reaching consequences on the overall reproductive health of women, in addition to their contribution to maternal mortality (Bhatia and Cleland, 1995).

In view of the scarcity of data on maternal morbidity, the World Health Organization's Technical Working Group recommended in its report on reproductive morbidity that the highest research priority be given to determining the magnitude of obstetric morbidity in developing countries (WHO, 1990). In the present study, overall reported obstetric morbidity was ascertained in pregnant women in an urban slum setting. A subsample of women was examined to corroborate reported symptoms of morbidity with medically diagnosed morbidity. The perceived severity of each morbidity suffered was recorded along with the woman's treatment-seeking. Socio-demographic, previous-pregnancy-related and behavioural predictor correlates of morbidity were also analysed.

Methods

Field site

Urban slums form nearly a quarter of the total population of New Delhi and of most major cities of India. Most slum-dwellers are people who have migrated to the city from rural areas in search of employment. Their perceptions about health and care-seeking reflect a blend of their traditional beliefs and the influence of the surrounding urban setting.

Dakshinpuri is one such slum on the outskirts of Delhi. It has a population of 125,594 living in 23,697 dwellings. Antenatal services in the area are provided by a private centre run by missionary nurses, two government

hospitals and 15-20 private practitioners. About 15 per cent of women utilize government hospitals for prenatal care. A little less than a third deliver in the missionary centre and a similar number in government hospitals; 10-15 per cent deliver in private clinics and nearly 40 per cent at home.

Study design

A door-to-door survey between April and December 1997 identified 1,704 pregnant women. All women identified at less than 28 weeks of gestation (n = 863) were encouraged to undergo clinical examination and laboratory tests at between 24 and 28 weeks of gestation. On the scheduled date, 600 women (69.5 per cent) could be examined. Of the remainder, 98 were not available, 41 could not be examined for a variety of medical reasons and 124 refused to be examined. The common reason for refusal was that they were registered elsewhere and were therefore already receiving care.

These women and an additional 841, identified at greater than 28 weeks of gestation, were visited at home at 37 weeks of gestation. Morbidities suffered during the antenatal period were recorded and socio-demographic details, past medical and obstetric history and current antenatal care were noted. In the case of unavailability at a scheduled visit, follow-up visits were made for three days, then weekly visits for a month, after which the case was considered lost to follow-up. Of the 1,704 women originally identified, 1,396 (81.9 per cent) could be interviewed at around 37 weeks. Of the remainder, 181 were not available, 19 had aborted, 8 had died, 96 had delivered before the visit of the research assistant and 4 refused an interview.

All women in the study were visited again at six weeks after delivery. At this visit, details of intranatal and postnatal morbidity were sought. It was possible to interview 1,361 women postnatally - a further three women had died in the meantime. The detailed data on examinations, intranatal and postnatal morbidity and maternal deaths are being reported elsewhere. This article focuses on antenatal morbidity.

Obstetric morbidity

The study focused on obstetric morbidities in accordance with the definition by WHO (1992), which includes causes related to or aggravated by the pregnancy (or its management) and excludes accidental or incidental causes. Clear definitions were used to minimize ambiguity and an interdisciplinary team of researchers, including an obstetrician, microbiologist and social scientist, comprised the study team.

The symptoms of morbidity reported by the women were grouped according to their potential medical severity into three groups. "Serious morbidity" included vaginal bleeding during pregnancy, high blood pressure (a sign of pre-eclampsia), fits (which imply eclampsia in pregnancy if other causes are ruled out) and vaginal leaking before eight months of gestation (a sign of premature rupture of membranes, leading to preterm labour or chorio-amnionitis).

The second group, "other important morbidity", included high fever (as reported by the woman or attendant), swelling of the legs, hands and abdominal wall (oedema), anaemia (indicated by observed pallor, or reported breathlessness or tiring easily), itching or burning sensation during urination, vomiting persisting after four months of gestation (excludes morning sickness) and vaginal discharge associated with a foul smell or itching. High fever can cause preterm labour; swelling and persistent vomiting can be symptoms of pre-eclampsia. Severe anaemia can cause growth retardation, and even foetal death, and can compromise maternal health at the time of delivery when there is blood loss. Urinary tract infections can cause renal disease during pregnancy and also high fever, while reproductive tract infections have potentially serious consequences for the mother and the newborn child.

The third group included "common problems" related to pregnancy that are disabling to the patient rather than having medical consequences. These include musculoskeletal complaints of backache and abdominal pain rash and gastritis. Our formative research showed that, from women's reported symptoms, it was extremely difficult to differentiate abdominal pain from the ominous preterm labour pains. Hence, preterm pains were not included separately. These "common problems" are not analysed in this article.

Perception of the severity of morbidity

A woman's perception of the severity of her symptoms was ascertained by asking her whether she felt that they could be dangerous to her own health or to the foetus. If the answer was yes, she was asked what type of risk they presented, for example, preterm labour, poor growth of foetus or any other danger. These perceptions were then compared with the medically accepted complications of that morbidity. If they reflected a correct appreciation of the symptoms' repercussions in pregnancy, the woman's perception of severity was classified as correct. For example, if she reported symptoms of anaemia, she was asked if they could endanger her pregnancy. If she said yes, she was asked how they could be dangerous. If she answered that they could result in her baby being small or that lack of blood could result in her becoming very weak and even dying in pregnancy, it was counted as being aware of the danger of

anaemia. If she could say only that the symptoms of anaemia were dangerous but not explain any complication, or if she said that the symptoms posed no danger, then her perception of the dangers of anaemia was classified as incorrect. In conditions that had multiple complications (for example, antepartum bleeding can imply an impending miscarriage, and threaten maternal as well as foetal life), if the woman could specify only one complication correctly, her perception of the severity of that condition was graded as correct.

Treatment-seeking

Treatment-seeking was evaluated using a semi-structured questionnaire for each morbidity. For all morbidities (except for musculoskeletal pain such as backache and abdominal pain and for gastritis), treatment-seeking was classified as appropriate if the woman had visited a doctor. If a woman had more than one morbidity, the appropriateness was ascertained for each separately.

Comparison between reported and medically diagnosed morbidity

We compared reported and medically diagnosed morbidity for the 600 women clinically examined. The degree of corroboration was ascertained for lower reproductive tract infections, anaemia, high blood pressure and urinary tract infection. For lower reproductive tract infections, vaginal discharge was considered a key symptom. A comparison was made between the gynaecologist's observation during the clinical examination and the woman's diagnosis of an "abnormal" discharge. The woman's and the gynaecologist's diagnosis were also compared with laboratory results. A woman's complaint of symptoms of anaemia (pallor, shortness of breath or tiring easily) was compared with the gynaecologist's observation of pallor and with the laboratory evaluation of haemoglobin levels. Detailed comparisons of self-reported symptoms, diagnoses by the gynaecologist and laboratory tests are not included in this article.

Data analysis

The prevalence of morbidity was described by frequency distributions, and cross-tabulated by the proportion of women who correctly recognized the potential severity of the morbidity suffered and by the proportion who sought appropriate care. The grouping for predictor variables for analyses was similar to that used by Bhatia and Cleland (1995) and included the socio-economic background of the women, demographic determinants and history of past stillbirths and abortions. Additionally, problems occurring during the antenatal,

intranatal and postnatal periods of the last pregnancy were also related to current morbidity. Past "antenatal problems" included bleeding, pregnancy-induced hypertension, preterm delivery or jaundice. "Complications during delivery" included prolonged or obstructed labour, or haemorrhage or tear. "Postnatal complications" included excessive bleeding, high-grade fever within a week of delivery, breast abscess or foul discharge during the postnatal period.

"Behavioural predictors" included exposure to health education during the current pregnancy, decision-making power and the number of antenatal visits. Exposure to health education was ascertained by asking the woman whether she had been counselled by any health care provider (physician, nurse or traditional birth attendant) about diet during pregnancy, danger signs during pregnancy, breastfeeding practices or advantages of a hospital delivery. If she had been counselled about any of the above, she was categorized as being exposed to health education. Decision-making power in the home was ascertained by asking questions about the woman's role in deciding to seek treatment for routine ailments, to attend an antenatal clinic and to obtain emergency health care, if required, and in choosing the place of delivery. If a woman had the freedom to make decisions about any of these issues, she was categorized as having high decision-making power. Antenatal visits were categorized as "no antenatal visits" versus "one or more visits to antenatal clinics for any reason".

A bivariate analysis was undertaken between the independent predictors and reported morbidity. This was followed by a logistic regression analysis in order to estimate the net effect of each factor on the likelihood of reporting symptoms. All variables were categorical in nature and for each variable one was selected as the reference category. Results are presented as odds ratios and p-values.

Results

Socio-demographic and economic profile

The study population comprised young women, mostly aged 20-29 years. Only 4.4 per cent were over 30 years of age and 8 per cent were less than 20 years old. Over a third of the women had never been to school, though their husbands were better educated, i.e. 79 per cent had received more than a primary level of schooling. Very few women (5 per cent) worked outside the home. Half the families were extended rather than nuclear and 88 per cent were Hindus. The median family income was 3,000 rupees (US$l = 46.7 rupees) per month.

The current pregnancy was the first for a third of the women; 7 per cent had a history of at least one stillbirth, 12 per cent had had at least one miscarriage and 8 per cent had had at least one therapeutic abortion. The majority (91 per cent) of women had attended an antenatal clinic at least once. About 40 per cent had been advised about appropriate diet during pregnancy and 28 per cent had some knowledge of the advantages of hospital delivery. Few (8 per cent) had been counselled about breastfeeding and nipple care or the danger signs during pregnancy. Three quarters had received both doses of tetanus toxoid, had had their blood pressure checked at least once, and had taken iron tablets (dose and duration not recorded). Height was measured in only 8 per cent of the women. Advice on contraception and postnatal care had been given to only 5 per cent.

Reported antenatal morbidity: prevalence, perceived severity and treatment-seeking behaviour

Ninety-six per cent of the women reported symptoms of at least one morbidity (including the less serious common problems) during their current pregnancy, and 20 per cent reported more than five. The mean number of morbidities per woman was 3.8.

The prevalence of "serious" morbidities reported during pregnancy was as follows: bleeding during the antenatal period (4.7 per cent), high blood pressure (5.2 per cent), fits (five women) and a history of leaking in 3 per cent (table 1). One third or more of the women recognized the serious nature of each of the morbidities suffered. Nearly two thirds or more sought appropriate care for bleeding, high blood pressure and fits. However, care-seeking for premature leaking was low (42 per cent).

Of the "other important" morbidities, symptoms of anaemia were reported frequently (44 per cent) followed by swelling of the face, hands or feet (28 per cent) and symptoms suggestive of urinary tract infection (26 per cent). Less than one fifth of the women repotted high fever, "abnormal" vaginal discharge or severe vomiting. Women's perception of the severity of these morbidities was poor. Only 16 per cent of women with high fever felt that it could endanger their pregnancy. The implications of swelling or symptoms of urinary tract infection were understood by less than a tenth of women and "abnormal" discharge was regarded as hazardous by less than a fifth. Appropriate care was sought most commonly for high fever (82 per cent) and anaemia (64 per cent). "Abnormal" vaginal discharge (17 per cent) and swelling (22 per cent) did not prompt the majority to seek care.

Table 1. Reported antenatal morbidity in pregnant women, perceived severity and care-seeking practices in a slum of New Delhi

Type of morbidity	Number of women (n = 1,396) and (%)	Percentage recognizing severity of symptoms[a]	Percentage seeking appropriate care[b]
Serious morbidities			
Vaginal bleeding	66 (4.7)	44	71
High blood pressure	72 (5.2)	33	75
Fits	5 (0.4)	40	60
Leaking per vagina	40 (2.9)	35	43
Women with any "serious morbidity"	169 (12.1)		
Other important morbidities			
High fever	262 (18.8)	16	82
Swelling (hands, face, feet)	394 (28.2)	9	22
Anaemia (pallor, tiring easily)	612 (43.8)	25	64
Frequent urination or burning sensation while passing urine	365 (26.1)	9	30
Severe vomiting	257 (18.4)	10	38
"Abnormal" vaginal discharge	235 (16.8)	19	17
Women with any "other important morbidity"	1,059 (75.8)		

[a] **Recognition of severity: women's perception of severity was checked against medically accepted consequences of the symptoms (see text for details).**

[b] **Appropriate care: defined as a visit to a doctor.**

Reported symptoms of antenatal morbidity compared with medically diagnosed morbidity

Table 2 shows the prevalence of morbidity in the subgroup of 600 women who were examined by a gynaecologist and underwent laboratory investigations. Nearly two thirds of women had some degree of anaemia (haemoglobin level <12g/dL) and 12 per cent were found to be severely anaemic (<9g/dL); 3 per cent were diagnosed as hypertensive and 6 per cent with urinary tract infection. Lower reproductive tract infections (RTIs) (trichomonas, candidiasis and bacterial vaginosis) were common (35 per cent), but cervicitis (gonorrhoea or chlamydia) was less prevalent. Active syphilis was diagnosed in 1.2 per cent of the cases.

Medical examinations and laboratory tests were performed on only 600 women at about 26 weeks of gestation and therefore the results cannot be compared directly with the symptoms reported by the larger group of 1,396 women at 37 weeks gestation. Nevertheless, the two sets of results suggest that correspondence between reported symptoms and medically diagnosed conditions was low. While 44 per cent of women reported symptoms

Table 2. Prevalence of morbidity diagnosed by clinical examination and laboratory investigations in a slum of New Delhi

Morbidity	Investigation	Prevalence (percentage) (n = 600)
Anaemia	Cyanmethemoglobin	
<9g/dL haemoglobin		12
<12g/dL haemoglobin		65
Hypertension	Syphygmomanometer	3
Urinary tract infection	Culture sensitivity	6
Vaginitis or lower RTI		35
Trichomonas	Wet mount	9.8
Candida	Saboraud's culture	14
Bacterial vaginosis	Modified Amsel's criteria i.e. presence of clue cells and any of the two: potassium hydroxide (KOH) positive, homogeneous discharge	18
Cervicitis		4.5
Gonococcus	TM (Thayer-Martin) culture media	0.2
Chlamydia	ELISA (enzyme-linked immunosorbent assay) for antigen detection	4.3
Syphilis		
VDRL[a]	Flowmetry	11.0
TPHA[b]	Haemagglutination	1.2

[a] **Venereal Disease Research Laboratories.**

[b] **Treponema pallidum haemagglutination test.**

of anaemia (breathlessness or tiring easily), 77 per cent had haemoglobin levels below 12g/dL and in 12 per cent the levels were below 9g/dL. Symptoms of hypertension were reported slightly more often (5 per cent) than was confirmed on examination (3 per cent). Similarly, urine culture was positive in only 6 per cent of the cases, whereas 26 per cent reported urinary complaints. The reported prevalence of abnormal vaginal discharge was 17 per cent, while 35 per cent had laboratory evidence of vaginitis or lower RTI.

Maternal mortality

During the course of the study, 11 women died. Of these, three died in the antenatal period: one owing to excessive haemorrhage following a late second trimester induced abortion, one due to fulminant hepatitis at seven months of gestation and the third due to pulmonary tuberculosis at four months of gestation. Seven other deaths occurred during or within 24 hours of childbirth and one woman died a week after delivery. Of these, five deaths occurred due to haemorrhage, one due to puerperal sepsis, one in a severely anaemic woman who had excessive blood loss and one due to hepatitis.

Correlates of reported symptoms of antenatal morbidity

Socio-demographic factors

Women with a higher education reported "serious morbidity" more often than other women. Those with a higher per capita income, and hence a higher standard of living, reported morbidity more often, but this did not achieve statistical significance (table 3). In the multivariate analysis, when the influence of other factors was controlled, the same associations continued to be significant (table 5). No new associations emerged.

Older women, those at higher parity and those with a past history of stillbirths and abortions were more likely to report health problems, but none of these associations were statistically significant. Similarly, no significant association was found between age at marriage and reported symptoms. Multivariate analysis revealed that, after controlling for the intluence of other factors, women with parity l-4 reported lower morbidity compared with women pregnant for the first time (primigravida) and those having had five or more pregnancies (grand multiparous) which resulted in viable foetuses.

Factors related to last pregnancy

Women with health problems during the antenatal, intranatal or postnatal period during their last pregnancy reported morbidity in their current pregnancy more frequently than did other women (table 4). The occurrence of obstetric problems during or after a previous delivery proved to be a strong predictor for reporting antenatal morbidities during the current pregnancy with odds of 2.00 for "serious morbidities" and 2.48 for "other important morbidities" (table 5).

Behavioural factors

Exposure to health education increased the reporting of "serious morbidities" Women who had a role in household decision-making and those who used antenatal care consistently reported illnesses more often than their counterparts. In the logistic regression, the effects of these factors remained significant (tables 4 and 5).

Discussion

The present study had several strengths. It was prospective, as women were identified during their current pregnancy and followed up to capture all antenatal morbidity. The study was designed by a multi-disciplinary team of medical and social scientists to address social and demographic factors in addition to the medical aspects. Effort was invested in conducting in-depth formative research to identify the "emic" terms for morbidity as used by the

Table 3. Correlates of reported symptoms of antenatal morbidity in a slum of New Delhi: socio-demographic characteristics

Characteristics	Number of respondents (n = 1,396)	Serious morbidities (percentage)	Other important morbidities (percentage)
Socio-economic			
Years of schooling			
0	519	8.3	73.4
l-5	208	13.0	78.4
6+	669	14.8[a]	76.8
Income (rupees/year)			
Low (<6,000)	630	11.7	73.8
Mid (6,001-18,000)	696	11.9	77.2
High (>18,000)	70	17.1	80.0
Religion			
Hindu	1,225	12.2	75.5
Non-Hindu	171	11.1	77.8
Employment			
Not working	1,275	11.8	75.8
Working	121	14.9	76.0
Demographic			
Age (years)			
<20	106	7.5	73.6
20-30	1,229	12.4	75.7
31+	61	14.8	82.0
Parity			
Primigravida	432	12.5	76.9
1-4	904	11.6	74.8
5+	60	16.7	83.3
Age at marriage (in years)			
<19	851	10.7	74.9
19-25	529	14.0	77.5
26+	16	25.0	68.8
History of stillbirth			
No	1,303	12.0	75.9
Yes	93	14.0	74.2
History of abortion			
No	1,113	11.3	74.8
Yes	283	15.2	79.5

[a] p = <0.01.

Table 4. Correlates of reported symptoms of antenatal morbidity in a slum of New Delhi: characteristics related to the last pregnancy and behavioural factors

Characteristics	Number of respondents (n = 1,396)	Serious morbidities (percentage)	Other important morbidities (percentage)
Morbidities during previous pregnancy			
During antenatal period[a]			
No	747	9.9	72.8
Yes	217	18.9[b]	83.9[b]
During delivery[a]			
No	690	10.7	70.7
Yes	274	15.0	86.9[b]
During postnatal period[a]			
No	669	9.3	69.8
Yes	295	18.0[b]	87.8[b]
Behavioural			
Exposure to health education			
No	609	7.7	72.7
Yes	787	15.5[b]	78.1[c]
Decision-making power			
Low	1,161	11.5	74.4
High	235	15.3	82.6[d]
Had antenatal check-up			
No	123	4.9	60.2
Yes	1,273	12.8[d]	77.3[d]

[a] For these three groups, primigravidae have been excluded.
[b] $p < 0.001$.
[c] $p < 0.05$.
[d] $p < 0.01$.

women so as to be able to capture the different ways in which women understood and expressed their concerns regarding pregnancy-related morbidity. Clear definitions were used to decrease ambiguity, and intensive training was given to the interviewers to ensure internal validity of the data collected. All interviewers were women, fluent in the local language, who had excellent rapport within the community. Providing free immunization and a clinic for children within the community ensured high compliance. This is one of the few studies to examine women's perceptions of the danger of the morbidity suffered by them.

The prevalence of reported morbidity during pregnancy was very high with only 4 per cent of women being completely free of any complaint. Maternal mortality was also high, with 11 deaths out of the 1,704 women identified, giving a maternal mortality ratio of 645 deaths per 100,000 live births. In two studies from South India (Bhatia and Cleland, 1996; Srinivasa

Table 5. Multivariate analysis of reported symptoms of antenatal morbidity by socio-economic, demographic and behavioural characteristics in a slum of New Delhi

Characteristics	Reported symptoms of serious morbidities (odds ratios)	Reported symptoms of other important morbidities (odds ratios)
Socio-economic		
Years of schooling		
0	1.0	1.0
1-5	1.61	1.23
6+	1.81[a]	0.99
Income (rupees/year)		
Low (<6,000)	1.0	1.0
Mid (6,001-18,000)	0.84	1.11
High (>18,000)	1.09	1.29
Demographic		
Parity		
Primigravida	1.0	1.0
1-4	0.81	0.63[a]
5+	1.38	1.07
History of abortion		
No	1.0	1.0
Yes	1.25	1.07
Previous-pregnancy-related morbidities		
During antenatal period		
No	1.0	1.0
Yes	1.45	1.32
During delivery		
No	1.0	1.0
Yes	1.03	2.04[b]
During postnatal period		
No	1.0	1.0
Yes	2.00[a]	2.48[b]
Behavioural		
Exposure to health education		
No	1.0	1.0
Yes	1.97[b]	1.15
Decision-making power		
Low	1.0	1.0
High	1.30	1.48
Antenatal check-up in current pregnancy		
No	1.0	1.0
Yes	1.67	1.87[c]

[a] **p <0.01.**

[b] **p <0.001.**

[c] **p <0.05.**

and others, 1997) antenatal morbidity was reported by 22 per cent and 38 per cent respectively. Both studies had cross-sectional designs and used recall periods of up to five years and two years respectively, and this feature may account for lower morbidity estimates than were found in this study. However, in the study by Bhatia and Cleland (1996), 10 per cent of women reported potentially life-threatening antenatal morbidity, which is similar to the 12.2 per cent of women in this study who reported symptoms of serious morbidities.

Women in this population had a poor understanding of the potential dangers posed to their health and that of the foetus by symptoms of morbidity. Less than half correctly perceived the possible consequences of the serious morbidities and the corresponding figures for other important morbidities were much lower. At least part of the explanation can be attributed to failings of the antenatal care system. Although the vast majority of women had received antenatal care (which is free of charge), less than 10 per cent had been given any advice about "danger signs" during pregnancy.

Failure to appreciate the possible consequences if symptoms during pregnancy, of course, does not imply failure to seek medical help. For all but one symptom category, the proportions visiting a doctor for treatment exceeded the proportions with a correct perception of possible consequences. For serious morbidities, treatment-seeking ranges from 43 per cent (leaking through the vagina) to 75 per cent (symptoms of hypertension), and for other important morbidities from 17 per cent (abnormal vaginal discharge) to 82 per cent (high fever). Treatment-seeking for high-grade fever was high because it is well accepted by the elders of the community as a reason to visit a health centre. It also affects the working capacity of the woman, who may well run her entire household alone. Anaemia is often recognized by health care workers and treated. Nevertheless, an appropriate response to potentially serious symptoms could and should be much more common in a population which has such easy access to health services. A major educational effort is required to inform pregnant women about danger signs.

Analysis of predictors of antenatal morbidity revealed interesting associations. Women with a lower education reported morbidity less often than their educated counterparts. This is similar to the findings from the study in South India (Bhatia and Cleland, 1996). The most likely explanation for this is that higher education improves awareness and recognition of symptoms of ill health. This is supported by the data on maternal mortality. Though the number of deaths is too small to warrant firm conclusions, it is worth noting that seven of the eleven deaths occurred among women who had never been to school. Similarly, the risk of death was seven- to nine-fold higher in the groups not exposed to health education or with low decision-making power in the home.

Primigravida and grand multiparous women reported higher morbidity. This is expected, as these are high-risk groups from an obstetric viewpoint. Among previous-pregnancy-related factors, women who had a complicated childbirth or morbidity in their last postnatal period had higher morbidity in this pregnancy. These associations are important for recognizing women at higher risk during a current pregnancy.

In this study, women's reporting of symptoms of RTIs and anaemia was much less frequent than laboratory diagnosis of these conditions. A major problem was the low sensitivity of self-reporting (i.e. lack of reported symptoms among biomedically confirmed cases). For anaemia, this is readily understandable because several symptoms of this condition are considered a normal part of life. Similarly, with regard to RTIs, this discrepancy was observed during pilot explorations largely to be due to women perceiving several symptoms as normal, which inevitably leads to under-reporting. Such misperceptions are even higher among pregnant women as they believe that pregnancy causes excessive discharge. Another reason is that lower RTIs are often asymptomatic and cannot be diagnosed by reporting alone. An important observation was that the overwhelming majority of women (84 per cent) who complained of a discharge associated with a foul smell or itching did, in fact, have a lower RTI confirmed by laboratory diagnosis, so only a small proportion of women reporting those symptoms tested negative. A comparable study from Giza (Zurayk and others, 1995) has shown a high specificity of 88 per cent and a sensitivity of only 14 per cent when women were asked about the presence of a suspicious vaginal discharge.

In view of the high prevalence of lower RTIs and the much lower but still appreciable presence of cervicitis in this population, routine screening of pregnant women might be a justified and cost-effective modality. Most infections can be diagnosed at the primary health care level if appropriate reagents and a microscope are available.

These findings have other important policy implications. They address the usefulness of collecting women's reports of morbidity. Reported morbidity represents *perceived* rather than *medically diagnosed* morbidity. It has the potential to breach the information gap on women's health problems in the community, explore health-seeking behaviour and the impact of health problems on women's lives rather than giving accurate prevalence data and should be used accordingly. In conclusion, the magnitude of perceived ill-health during pregnancy in our sample of urban slum women was large, but the perception of serious or even life-threatening conditions was poor and care-seeking was often inadequate.

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Biomedical Facts and Social Constructs: The Relative Attention Paid to Prenatal and Postpartum Periods in Sri Lanka

The high level and quality of prenatal care is in stark contrast to the woeful inadequacy of postnatal care

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In Sri Lanka, a well-organized system of maternal and child health services provides care to mothers and children. However, the services provided before delivery differ markedly from those following delivery, when most of the care and attention is bestowed on the newborn and not on the

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mother. This difference may be seen with regard to both the formal health delivery system and the general attention given to the mother by the family. Although the pregnant mother receives attention from the maternal health services, it is not for the mother herself, but rather because she is carrying the baby. This is not surprising in a society where a woman's main role is child-bearing and child-rearing – a role that the mothers themselves accept. But because of such attitudes, mothers do not receive the necessary care during the postpartum period from the formal health delivery system, their families or even from themselves.

Most mothers in socially deprived sections of developing countries including Sri Lanka are unlikely to receive sufficient additional nutrition or emotional support from their families while they are breastfeeding. Breast-feeding is more prevalent among the poor, perhaps more out of economic necessity than for any other reason, so mothers in deprived communities are likely to suffer more during the lactation period than those from higher income groups.

In South Asia, most maternal deaths occur in the immediate puerperal period, but despite this few women are visited by health workers during this time (Jejeebhoy, 2000). A study conducted in rural Rajasthan, India, observed that morbidity more often occurs in the first trimester and the puerperium than in the second and third trimesters (Datta and others, 1980). As noted in many recent studies, maternal morbidity following delivery is extensive and under-recognized (Bhatia and Cleland, 1996; De Silva, 1997a; Glazener and Abdella, 1995).

Currently, Sri Lanka's Ministry of Health and Indigenous Medicine provides maternal health services which comprise a network of medical institutions and health units. The Family Health Bureau is the central organization responsible for planning, coordination, direction, monitoring and evaluation of maternal and child health (MCH) and family planning progmmmes. State-sponsored maternal health services, therefore, have a potentially crucial role to play in the promotion of safe motherhood in Sri Lanka. At the community level, the public health midwife (PHM) is the "front-line" health worker. She provides domiciliary health care, distributes contraceptives, follows up family planning users and assists at MCH clinics. One of her main duties is to register pregnant mothers in her area during home visits within the first four months of pregnancy. She is also tasked with providing care to pregnant and postpartum mothers and newborns in her PHM area through regular home visits.

As in other countries, the length of post-delivery stay in the hospital is decreasing in Sri Lanka owing to pressure on the availability of beds as well as maternal choice (Fortney, 1997; Koblinsky and others, 1993). And as in many developing countries, very few mothers with complications during the puerperium actually visit health facilities, which underlines the need to encourage mothers to make use of existing provisions (Nirupam and Yuster, 1995). At the same time, over two thirds of maternal deaths in Sri Lanka occur during the puerperium (Bandutilaka, 1996). All this indicates the necessity of strengthening services for mothers during this particularly important period of motherhood. The aim of the present study is to investigate the level of care mothers received from the maternal health services during their most recent pregnancy and postpartum period, and to identify those who received inadequate care.

Materials and methods

The 42 days following delivery is the generally accepted definition of the puerperium and is the definition used by the World Health Organization in defining maternal death (WHO, 1990). By contrast, the word postpartum, though heavily used in the literature, has no specific definition with regard to the health of mothers immediately following childbirth (Brady and Winikoff, 1992). A number of studies of maternal deaths, however, have extended the scope of the definition to include death occurring up to three months after delivery (Koenig and others, 1988) or even one year (Walker and others, 1986).

In order to investigate the levels and patterns of health care during the prenatal and postnatal periods, the study first started with a number of focus group discussions with mothers in the post-puerperium period and with health personnel in different locations of the study area. Second, structured interviews were conducted to obtain detailed information on prenatal, natal and puerperium experience from mothers who had just completed the puerperium. The present article draws only on the second data source.

The study took place in the Kalutara district about 50 km south of Colombo. Using structured interview schedules, data were collected from 600 mothers within one week following their puerperium (i.e. 43-50 days after delivery). Mothers were identified by the research team, which comprised the principal investigator, and a sociologist and medical scientist, who acted as co-investigators. Twenty-four specially trained female health volunteers of Kalutara district were selected as interviewers to assist the team. Mothers were identified by using the PHM registers in selected areas of Kalutara district and from other sources.

The respondents were selected from three Medical Officer of Health (MOH) areas in Kalutara district, namely, Kalutara, Beruwala and Matugama. The first two of these are supervised by the National Institute of Health Sciences of Sri Lanka. Kalutara can be categorized as urban, whereas Beruwala and Matugama are semi-urban and rural respectively. The three MOH areas together include 105 PHM areas.

Each interviewer was required to cover three to five PHM areas and make an initial visit to each mother identified by the PHM's register to check her availability for the interview. At least three visits were made to locate a mother. If she had moved, attempts were made to obtain her new address. Interviewers continued to identify mothers for the study using the eligibility criteria given to them until each interviewer had identified approximately 25 mothers from the allocated PHM areas who were willing to be interviewed. According to the eligibility criteria, the mother had to satisfy three conditions in order to be selected for the interview: she had to live in the study area, to have given a live birth about 43-50 days before the intended date of interview, and the child had to be alive at the time of the interview.

The selection, location and interviewing of mothers took place from May to September 1996. Fieldwork was not conducted simultaneously in all three MOH areas because of difficulties in supervision. Interviewers were given a maximum duration of two months to identify and complete the interviews with the eligible respondents. The interview schedules were detailed and lengthy; they included household, socio-economic, cultural and demographic information along with data on care received during the prenatal and postnatal periods related to the most recent fertile pregnancy.

Results

Prenatal care

The proportion of mothers who received maternal care and the timing of first contact with the PHMs are key indicators of the level of prenatal care. However, the utilization of prenatal domiciliary and clinic-based services may depend on the mother's attitude at the time of conceiving. In the study population, about 86 per cent of the mothers wanted to have a baby at that time, but another 8 per cent wanted to delay it. A small proportion of the mothers wanted no more children (3 per cent).

Fertility preferences were clearly related to their parity. Almost all women with no children wanted to have the pregnancy at that time but, among those who had four or more children, 30 per cent wanted no more children at

Table 1. Percentage distribution of women by timing of initial contact with prenatal care, according to fertility preferences, in Kalutara district, Sri Lanka

Number of months pregnant at the time of initial contact[a]	Wanted more children at that time	Wanted more children later	Wanted no more children at that time	Don't know/ uncertain	All women
1	4.3	4.3	5.9	4.3	4.4
2	45.3	34.8	29.4	26.1	43.5
3	38.4	43.5	35.3	47.8	39.1
4	8.0	8.7	11.8	4.4	8.1
5+	3.7	8.7	17.6	17.5	5.0
Total	100.0	100.0	100.0	100.0	100.0
N	510	46	17	23	596
Mean (months)[b]	2.5	2.7	3.2	2.9	2.6

[a] **Contact with doctor, nurse or public health midwife.**

[b] **p< .05.**

that time and another 24 per cent had not made up their minds (data not shown).

The mothers' fertility preferences and their utilization of prenatal care services were strongly associated. Mothers who had wanted a pregnancy at that time made their initial contact with health care services at a much earlier stage of pregnancy than those who wanted no more children or were undecided (table 1). About 88 per cent of the mothers who had wanted a pregnancy had their initial contact with prenatal health care personnel by the end of the first trimester, compared with about 70 per cent of the mothers who wanted no more children. Mothers who wanted no more children at that time had their initial contact with prenatal care services about six weeks later than did mothers who wanted the pregnancy.

Nearly three quarters (72 per cent) of the mothers received six or more home visits by the PHM during the prenatal period of their most recent fertile pregnancy, but 16 per cent received fewer than five visits and 3 per cent fewer than three visits; only a very small proportion of the mothers did not receive any domiciliary care at all (table 2). On average, women received a large number of PHM home visits in each trimester. During the second and third trimesters, the mean number of visits a mother received from a PHM was 2.6 and 3.1 respectively. Even during the first trimester, each mother received on average about one PHM visit.

Apart from the home visits by the PHM, mothers also received care through a variety of state-run prenatal clinics. About 90 per cent of the mothers

Table 2. Percentage distribution of mothers according to the number of home visits received from a public health midwife and their visits to maternal and child health clinics at three stages of pregnancy, in Kalutara district, Sri Lanka

Number of of visit	Prenatal home visits by public health midwife				Prenatal visits to maternal and child health clinic			
	First tri-mester	Second tri-mester	Third tri-mester	All tri-mesters	First tri-mester	Second tri-mester	Third tri-mester	All tri-mesters
0	30.9	4.5	4.7	1.5	37.0	3.0	2.3	0.8
1	50.2	8.1	6.0	1.5	49.3	6.4	2.7	1.5
2	15.8	27.2	14.8	2.3	1.7	18.3	10.9	1.0
3	2.7	51.8	41.6	4.5	2.5	64.9	29.7	1.8
4	0.2	4.5	17.6	5.7	0.3	5.4	25.2	5.4
5	0.1	2.0	9.1	11.7	0.1	0.7	12.1	6.0
6+	0.2	1.8	6.0	72.4	0.3	1.3	17.1	83.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mean visits[a]	0.9	2.6	3.1	6.6	0.8	2.7	3.8	7.3

[a] **Visits by public health midwife p <0.01 ; clinic visits p <0.01.**

reported five or more prenatal clinic visits during their most recent fertile pregnancy (table 2). Only 1 per cent of the mothers made no visit to a prenatal clinic. In the second and third trimesters, women made relatively more clinic visits than domiciliary contacts; during the third trimester, they received an average of only three home visits by the PHM, compared with making an average of about four visits to the prenatal clinic. The mothers in this study received an average of about 6.6 home visits by a PHM and they also made about 7.3 clinic visits, amounting to about 14 prenatal contacts in all.

Is the number of home visits based on need? To answer this question, the visits received by women who were hospitalized during the prenatal period (n = 70) were compared with those received by other women. The comparison was based on the assumption that women who are hospitalized suffer more serious maternal morbidities than those who are not hospitalized, and are, therefore, in greater need of attention from the MCH system. However, this proposition was found to be untrue at the community level in Sri Lanka. Those who were admitted to the hospital during the prenatal period and those who were not admitted received more or less the same number of home visits: 6.6 versus 6.7 visits. Where prenatal clinic visits are concerned, a mother who had been hospitalized made only about 0.4 more visits than those who had not (a non-significant difference), which suggests that neither the PHM nor MCH clinic staff paid special attention to mothers who needed more care and advice.

Content of prenatal care

Mothers who had seen a doctor, nurse or PHM for a prenatal check-up during their most recent fertile pregnancy were asked whether or not they received specified components of care during any of the visits. Almost all mothers (97-100 per cent) in the study population had prenatal examination/preventive services related to weighing, height, blood pressure, fundal height ("abdomen measured"), foetal heart auscultation ("listened to baby") and Leopold's manoeuvres ("checked baby's position"). Nearly 95 per cent of the mothers received tetanus toxoid injections (two doses).

At the prenatal check-ups, 93-98 per cent of the mothers received de-worming and iron tablets, and "Thriposha" (triple nutrient), which is a nutritious food supplement. Almost all were advised about diet, danger signs of pregnancy, breastfeeding, personal hygiene and family planning. Considering the number and content of prenatal check-ups, it could be said that whatever criteria are used to determine "adequate quality" of prenatal care, each and every mother would have received that without a doubt.

Perinatal care

Every delivery should be attended by adequately trained personnel, taking into consideration any risk factors, in order to offer appropriate monitoring of labour and delivery. In Sri Lanka, about 90 per cent of deliveries take place in an institution, where it is assumed that there are adequately trained personnel and the necessary resources for routine and emergency care, though this is not true in every case.

Of the total 596 deliveries, 78 (13 per cent) were by caesarean section, the balance being vaginal deliveries (87 per cent), including 13 cases of forceps delivery (table 3). In Sri Lanka, as in many parts of the world, all women having their first babies are required by hospital protocol to have an episiotomy (WHO, 1996). Only about 2 per cent of the total deliveries took place at home or on the way to the hospital, with the vast majority being in some health institution. Almost one third of the deliveries took place in a tertiary-level institution (teaching/general/base hospital), while only 12 per cent and 9 per cent took place in secondary- and primary-level institutions respectively. A small proportion of mothers used private hospitals for the delivery.

Clearly, most mothers tend to bypass primary- and even secondary-level institutions for their confinements. Most primary- and secondary-level institutions are very under-utilized for confinements for a variety of reasons. Consequently, tertiary-level institutions are overcrowded with mothers for confinements, and hospital stay is significantly shortened. A very large

Table 3. Percentage distribution of mothers according to place of delivery for most recent birth, by mode of delivery, in Kalutara district, Sri Lanka

Place of delivery for most recent birth	Mode of delivery for most recent birth		
	Vaginal[a]	Caesarian	Both
Teaching/general/base hospital	71.4	80.8	72.7
District hospital	13.3	5.1	12.2
Rural hospital/peripheral unit/maternity home	9.5	2.6	8.6
Private hospital	3.7	11.5	4.7
Home and other	2.1	-	1.8
Total	100.0	100.0	100.0
N	518	78	596
Mean number of nights spent in hospital	1.4	5.5	2.0

[a] **Includes 13 cases of forceps delivery.**

proportion of mothers in this study reported that they preferred not to stay longer in the delivery institution, primarily owing to family responsibilities, but also owing to the poor attention they received and the filthy environment of these places.

Over 70 per cent of the mothers who had had a vaginal delivery spent only one night in the health institution, while another 5 per cent did not stay even one night. On average, mothers who had a vaginal delivery stayed 1.4 nights and mothers who had a forceps delivery stayed about two nights after the delivery. In contrast, those who underwent caesarean section on average spent five nights in the health institution, before returning home (table 3).

Postnatal care

After a woman gives birth she faces the task of caring for a newborn – an especially challenging task for mothers with their first child – together with ensuring her own recovery from the ordeal of pregnancy and delivery. A number of childbirth-related problems experienced by mothers occur in the puerperium, the six weeks following delivery. Such problems can be identified and treated through proper follow-up visits for women during the puerperium.

According to guidelines laid down by the Department of Health, a mother who has delivered in a medical care institution should be seen by the PHM after coming home at least tluee times during the first 10 days and at least once during the remaining part of the puerperium. During those visits, the PHM should provide care for the mother and child and ensure that the baby is breastfed. Mothers should be counselled further and motivated to accept a suitable method of contraception.

Table 4. Percentage distribution of mothers according to number of home visits from a public health midwife and visits to maternal and child health clinics during two stages of the postnatal period, in Kalutara district, Sri Lanka

Number of visits	Postnatal home visits by a public health midwife			Postnatal visits to maternal and child health clinics		
	≤ 10 days	11-42 days	All	≤ 10 days	11-42 days	All
0	9.8	12.6	1.9	92.3	48.2	46.7
1	27.4	31.5	7.5	6.4	44.5	41.8
2	31.9	31.6	14.4	1.3	6.2	8.1
3	21.0	15.0	24.5	-	0.8	2.3
4	7.5	4.2	23.1	-	0.2	0.7
≥ 5	2.5	5.1	28.8	-	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mean visits[a]	1.8	1.7	3.3	0.1	0.6	0.7

[a] **Visits by the public health midwife are not significant; clinic visits p <0.01.**

Although the mothers received an excessive number of prenatal check-ups from the PHM and also had several clinic visits, they were given much less attention during the postnatal period. During the first 10 days post-partum, the mothers received an average of only 1.8 home visits from the PHM (table 4). About 10 per cent of the mothers received no PHM visits during this most critical part of the postpartum period. Almost 70 per cent of the mothers did not receive the recommended minimum of three PHM visits during this 10-day period. The average number of PHM visits a mother received during the second part of the puerperium (1l-42 days) was more or less the same as during the first part. In the second part of the puerperium, 13 per cent of the mothers had no domiciliary contact with the PHM. When the whole puer-perium is taken into account, mothers received 3.5 home visits on average from a PHM, with about half the mothers receiving four or more postnatal visits by a PHM.

Do the two different types of delivery and lengths of hospital stay influence the postnatal care given by the PHM? Although mothers delivered by caesarean section (CS) stayed longer in the hospital, the average number of PHM visits they received during the first 10 days after delivery was not significantly lower than that of vaginal-delivered mothers. During this period, 14 per cent of CS-delivered mothers and 9 per cent of vaginal-delivered mothers received no care from a PHM. However, during the 10-42 day period of the puerperium, a CS-delivered mother received a slightly higher average number of PHM visits than did vaginal-delivered mothers. By the end of the puerperium, no great difference was observed in relation to the average number of PHM visits per mother.

Mothers do not usually visit the MCH clinic during the puerperium since the clinic offers them no postpartum care. However, should a mother visit the MCH clinic and ask for postpartum assistance, whether she receives it or not will depend primarily on the attitude of the health care workers at the clinic. All MCH clinics are overburdened with the demands of prenatal care, so a postpartum mother will very rarely receive attention at these places. For this reason, very few women visit them. Only 8 per cent of the mothers in the study made a visit to a clinic during the first part of the puerperium (table 4). But during the latter part of the puerperium, just over half the mothers made at least one visit to the clinic. During the entire puerperium, mothers made an average of less than one visit to the MCH clinic.

Mothers who visited the MCH clinic during the puerperium did so to obtain the Thriposha food supplement, which clinics distribute free of charge to prenatal and postnatal mothers, or to have the newborn vaccinated with BCG (bacille Calmette-Guerin) for protection against tuberculosis. Apart from that, hardly any consultation or treatment occurred on such visits. It was concluded that the special attention given to pregnancy checks and delivery was aimed at the infant's well-being and not the mother's complete physical and nutritional recovery from a birth.

Content of postnatal care

Shorter post-delivery hospital stays have increased the need for better postnatal domiciliary care by the PHM and other primary health care workers in Sri Lanka. As the front-line community health worker, the PHM is increasingly expected to detect and monitor health problems among mothers in the puerperium and to take the necessary action. Mothers who received at least one postnatal home visit by a PHM were asked whether or not they received specified components of care during any of her visits. Body temperature was taken for only about half the mothers; abdominal and breast examinations were done on 70 per cent and 74 per cent of the mothers respectively.

Nearly 70 per cent of the mothers who received at least one PHM visit during the puerperium were examined to evaluate the status of the cut in the vagina (episiotomy) or assess the level of the fundus. The vast majority of mothers received advice regarding family planning, breastfeeding and baby care.

Relationship between prenatal and postnatal care

The link between prenatal and postnatal care is assessed in table 5. There appears to be a strong positive association between the number of prenatal visits and visits during the first 10 days of the puerperium. For instance, 91 per cent of mothers who had three or more postnatal PHM visits also had five or

Table 5. Relationship between prenatal and postnatal visits, and mean number of postnatal visits at different levels of prenatal visits, in Kalutara district, Sri Lanka

Number of postnatal home visits	Number of prenatal home visits			Total	N
	None	1-4	5+		
During 0-10 days[a]					
None	1.3	31.3	63.4	100.0	58
1	1.8	16.6	81.6	100.0	163
2	0.5	13.7	85.8	100.0	190
3+	1.1	8.1	90.8	100.0	185
Stages of postnatal period	**Mean number of postnatal home visits**				
0- 10 days[a]	1.2	1.6	2.1	1.8	
11-42 days[a]	1.0	1.4	1.9	1.7	
0-42 days[a]	2.2	3.0	4.0	3.5	

[a] $p < 0.001$

more prenatal PHM visits, compared with 63 per cent of mothers who received no postnatal visits.

The mean number of PHM visits received by a mother during the first 10 days of the postnatal period increased from 1.2 for those mothers who received no prenatal visits to 2.1 for those who received five or more visits. When the 42-day postnatal period is considered, mothers who had received five or more prenatal visits by a PHM received an average of four postnatal visits, compared with only three visits for mothers who had received l-4 prenatal visits.

Adequacy of postnatal care

Mothers who received fewer than three postnatal home visits by a PHM during the first 10 days of the puerperium, and not a single home visit by the PHM during the 11-42 days of the puerperium are categorized as having received inadequate postnatal care from the MCH system. The remaining women were categorized as having received adequate postnatal care. Almost 70 per cent of mothers in the study population received fewer than three PHM home visits during the first 10 days of the puerperium, while 13 per cent received none during the rest of the puerperium. When the two conditions are taken together, over 73 per cent of mothers in this study population did not receive adequate postnatal care by PHMs.

Which mothers are more likely to have received inadequate PHM postnatal care during the puerperium? This question was investigated using a number of demographic, maternal and socio-economic factors for the early (0-10 days) and late (1l-42 days) puerperium period and the puerperium as a whole (0-42 days).

Reflecting the fact that female age at marriage in Sri Lanka is about 26 years (De Silva, 1997b), the majority of the delivered mothers in the study population were aged 25-34. Although no significant difference by age was observed during the puerperium, older mothers (35+years) were more likely than younger mothers to have experienced inadequate postnatal care (table 6).

Sri Lanka is at, or even below, the replacement level of fertility (De Silva, 1994), and thus nearly half the delivered mothers in our study population were found to be first-time mothers. No significant association was found between the level of postnatal care and parity. However, during the first 10 days of the puerperium, inadequate prenatal care was received by a relatively higher proportion of mothers at parity four and above than of other mothers.

A strong statistical association was observed between fertility preference at the time of conceiving the most recent fertile pregnancy and the level of postnatal care received by individual mothers. Mothers who said that their most recent birth was unwanted were more likely to receive inadequate postnatal care than were mothers whose pregnancies were anticipated.

Compared with the others, mothers who delivered at the tertiary level (state) or private hospitals tended to miss out on PHM services during the puerperium. These mothers tended to obtain services from private consultants during the puerperium, rather than receiving the PHM domiciliary service. However, the mode of delivery did not make any significant difference to post-natal care.

As reported elsewhere, the prevalence of ill-health during the puerperium, particularly during the early part of it, was high in the study population (De Silva, 1997a). The overall health of about 31 per cent of the mothers during the puerperium was classified as unsatisfactory; for 49 per cent, it was less than satisfactory and for 20 per cent it was satisfactory. It might be expected that mothers whose health situation was unsatisfactory would have been visited by a PHM more frequently than mothers with satisfactory health. However, the data do not support this expectation.

Primary health care workers, including PHMs, face frequent public criticism about their work and accusations of being biased towards well-to-do people. In support of this view, the study found that mothers from low-income households were more likely to receive less frequent PHM postnatal domiciliary care than were mothers from high-income households. However, no relationship between the schooling of mothers and postnatal care was found.

Table 6. Percentage of mothers who had received inadequate postnatal domiciliary care from public health midwives, by selected characteristics, in Kalutara district, Sri Lanka

Characteristics	During 0-10 days of post-natal period (percentage)	During 11-42 days of post-natal period (percentage)	During 0-42 days of post-natal period (percentage)	N
Age (years)				
Less than 25	64.0	22.0	72.0	50
25-34	68.7	10.9	72.7	476
35+	74.3	14.3	78.6	70
Parity				
1	69.1	14.7	74.5	259
2-3	67.8	10.2	71.7	283
4+	74.1	11.1	75.9	54
Fertility preference				
Wanted	66.9[a]	11.0[a]	71.2[a]	510
Unwanted	81.4	19.8	86.0	86
Hospitalized during pregnancy				
Yes	71.4	14.3	75.7	70
No	68.5	12.0	73.0	526
Place of delivery				
Tertiary/private	70.5	13.2	75.3[a]	461
Secondary	58.9	9.6	60.3	73
Primary	68.4	8.1	74.2	62
Mode of delivery				
Vaginal	69.3	12.4	73.6	518
Caesarian	66.7	11.5	71.8	78
Health status during puerperium				
Satisfactory	70.3	14.4	74.6	118
Less satisfactory	67.8	11.5	72.9	295
Unsatisfactory	69.9	12.0	73.2	183
Education				
Primary (l-4 years)	69.3	6.8	70.5	88
Secondary (5-9 years)	67.8	10.7	70.5	149
Higher (10+ years)	69.4	14.2	75.2	359
Religion				
Buddhist	70.9	14.9[a]	75.8[a]	447
Muslim	65.7	4.0	65.7	99
Hindu/Roman Catholic	58.0	14.0	66.0	50
Residence (MOH)				
Urban (Kalutara)	67.7[a]	18.4[a]	75.6[a]	217
Semi-urban (Baruwala)	60.5	7.4	64.8	162
Rural (Matugama)	76.5	9.7	77.4	217
Household income				
High	57.1[a]	17.1	60.0[a]	35
Moderate	67.7	11.5	72.9	436
Low	77.4	13.7	79.0	124
All	69.0	12.2	73.3	596

[a] p 0.05.

Buddhists comprised the majority of respondents; Muslims accounted for 17 per cent of the sample and Hindus/Roman Catholics 8 per cent. Muslim mothers appeared to receive much better PHM postnatal services than the others during both parts of the puerperium. Cultural practices are part of the explanation. Muslim mothers are less likely than others to leave their homes for employment or other activities, and so are more easily contacted by the PHM than are other mothers. A Buddhist mother will often move to her parents' home before delivery and stay for a couple of weeks after delivery. For this reason, a significantly higher proportion of Buddhist mothers tend to receive inadequate postnatal care compared with both Muslim and Hindu/Catholic mothers.

The mother's place of residence had some influence on postnatal PHM domiciliary care. Mothers who lived in the Beruwala Medical Office of Health (MOH) area, which is semi-urban were more likely to receive the stipulated level of PHM postnatal care. However, this may be partly explained by the fact that the area also contained a large proportion of Muslim mothers. Mothers in the Matugama MOH area, a rural environment, received a much lower level of postnatal care than the guidelines stipulate. Mothers living in the Kalutara MOH area, an urban locality, tend to be missed by the PHM domiciliary care programme, but they may have better access to forms of postnatal care outside the government MCH system. Two of these MOH areas, Kalutara and Beruwela, come under the supervision of the National Institute of Health Sciences, but there appears to be no institutional effect on the level of postnatal domiciliary care service provided by PHMs.

Conclusions and policy implications

The overall impression given by many health personnel in Sri Lanka is that mothers are well looked after by the well-established island-wide network of MCH systems and that no change is therefore required. Moreover, the relatively low rates of maternal mortality (40 per 100,000 live births) and infant mortality (15 per 1,000 live births) are advanced as justification. However, the study suggests that, compared with prenatal care, the MCH system is not delivering enough in terms of quantity and quality of care during the postnatal period. This view is supported by the high prevalence of puerperal morbidity identified among the study population, findings which have been reported elsewhere (De Silva, 1997a). Although maternal mortality has declined over the last couple of decades, there has been no detailed investigation to document the prevalence of maternal morbidity, and this is particularly so in the case of the postpartum period.

Pregnant mothers are given special care by the health care system in Sri Lanka, but after delivery most of the care is diverted to the newborn. However, the process of normalization of the reproductive and other systems can expose new mothers to various morbid conditions following childbirth. The success of the normalization process depends mainly on the socio-economic status of the mother and the availability and utilization of health care facilities during the postnatal period. Consequently, care provided by PHMs and MCH clinic facilities, institutional care by hospitals and family support are immensely important.

This study investigated the level of support received by mothers during the pregnancy and postnatal period through MCH clinical and domiciliary services. The results indicate an excessively high level of prenatal care, but an inadequate level of postnatal care. An expectant mother in Sri Lanka can expect to receive on average almost seven prenatal home visits by a PHM, to make over seven visits to prenatal clinics and a couple of visits to a private specialist/consultant. The effectiveness of prenatal care in preventing maternal death and severe obstetric complications is uncertain because most of the complications that do occur during labour and delivery can be unpredictable and sudden in onset. Moreover, evidence exists to show that four antenatal visits can be sufficient for routine checking and educational purposes (Villar and Bergjo, 1997). In conclusion, the level of prenatal care provided and utilized in Sri Lanka appears to be excessively high.

Most mothers in Sri Lanka select tertiary-level institutions for their confinements, thus by-passing all the primary- and secondary-level institutions, which are quite capable of handling most confinements. The length of stay in the hospital is steadily declining in response to the pressure on beds as well as maternal choice. An average hospital stay of only two nights indicates the level of institutional care mothers receive in Sri Lanka before the responsibility of caring for the postpartum mothers is handed over to the MCH system for the remaining 40 days. On discharge, some hospital authorities advise mothers and their relatives to remind the respective area PHM to visit mothers on their return. However, this process is not effective, since there is no direct official communication to validate it.

The MCH postnatal care system has major deficiencies. Very few MCH clinics provide services for postpartum mothers, so they have to rely mainly on the PHM domiciliary service to obtain care. Although the prevalence of morbidity during this part of motherhood is extensive and unrecognized by many health personnel or even by the mother (De Silva, 1997a), no strong action has been taken to rectify this situation.

Most mothers see child-bearing as a natural biological phenomenon. Any subsequent inconveniences are also considered natural and largely ignored. Nor do PHC workers have any suitable monitoring/evaluating systems or correct indicators for quality of care assessment; thus, they do not make postpartum mothers aware of possible complications. However, the postpartum period is when an overwhelmingly large proportion of maternal deaths in Sri Lanka occurs. Consequently, there is a strong need to improve postnatal care at the community level, which currently is very poor in terms of quality and quantity.

Postpartum mothers received an average of 1.8 PHM domicilary visits during the first 10 days of the puerperium although the number of visits stipulated by health authorities is much higher. According to the Family Health Bureau, a PHM should make three visits within the first 10 days for an institutional delivery and five visits for a home delivery, plus at least one visit during the remainder of the puerperium. The study found that 73 per cent of the mothers did not receive the stipulated level of postpartum care by the PHM. Postpartum care is particularly inadequate during the first 10 days of the puerperium, when many postpartum mothers report illnesses (De Silva, 1997a).

Better care is needed for these postpartum mothers to reduce the burden of ill-health. Postpartum illness is costly in terms of delayed mother-infant interaction, lactation difficulties, readmission to the hospital, increased expenses and possible permanent injury or death. PHMs and public health nursing sisters are in a unique position to identify women at risk, recognize early warning signs and provide teaching and counselling for prevention and care (Clark 1995).

Mothers who received relatively few prenatal PHM home visits also tended to have inadequate postnatal care compared with mothers who received a large number of prenatal visits. This suggests a pattern of preference made by PHMs for domiciliary care service. Significantly fewer postnatal home visits by PHMs were observed among poor, rural and Buddhist mothers.

The Government has increased the coverage of primary health care by providing and expanding existing facilities and staff, but no similar programme exists to enhance the quality of care provided by health institutions. Mothers are increasingly expecting postnatal care in terms of quality and quantity, at both the domiciliary and the institutional level. The high level and quality of prenatal care is in stark contrast to the woeful inadequacy of postnatal care in this country. It appears that the special attention given to pregnancy checks and delivery is focused on the infant and not followed through in respect of the mother’s complete recovery from childbirth.

Home visiting provides a familiar environment for mothers to receive friendly care and advice from PHMs. An overwhelmingly large proportion of mothers were satisfied with their prenatal domiciliary care. Not surprisingly, mothers who received a relatively higher number of either prenatal or postnatal home visits were more satisfied than the mothers who received fewer visits. Mothers are delighted to receive care and advice in a homely environment, so it should not be difficult to provide adequate postnatal care through the same domiciliary services.

During the last few years, PHMs have taken on duties other than MCH activities. Health authorities in Sri Lanka need to investigate whether postnatal care is neglected as a result of PHMs being given inadequate time to perform all the duties assigned to them.

Under the present system of MCH care, no proper information system is available to evaluate the postnatal care. The mother's record card kept and maintained by PHMs has space for only limited information on postnatal care. Since the card is kept with the PHM, she can make entries any time as she wishes. If the same information were entered on the mother's appointment card, which is kept with the mother, supervising officers could more easily assess the quality and quantity of care by undertaking audits on postnatal PHM visits. There is also a potentially high demand for postnatal clinics in the field in addition to prenatal, family planning and child welfare clinics. They may be conducted alongside the well-woman clinics initiated recently, at the end of the first, second and sixth weeks of the postnatal period.

The frequency of PHM postnatal visits should be decided according to the health status of the mother and baby on discharge. It is also important to heighten awareness among the mothers and family members so that they know they should contact the PHM whenever necessary during the postnatal period. Postpartum contact with the husband particularly offers an opportunity to educate men about this important part of motherhood and the value of spacing subsequent births. The diminishing length of hospital stay and the emphasis on reducing health care costs create the need for innovative, low-cost postpartum follow-up programmes either at the domiciliary or the institutional level in Sri Lanka.

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Women's Perception of Their Reproductive Health Before and After Sterilization in Rural Maharashtra, India

Sterilization provides a unique opportunity for diagnosing and treating women as well as raising reproductive health awareness

By Arundhati Char*

Few community-based studies in India have investigated the determinants of women's self-reports of reproductive tract infections and other forms of gynaecological morbidity. One of the most striking findings to emerge from the

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few that have done so is the strong association between the use of female sterilization, or in some cases the intrauterine device (IUD), and reported or diagnosed gynaecological morbidity.

In a pioneering study by Bang and others (1989), women who reported symptoms of morbidity attributed these symptoms to sterilization. Other more direct explorations in rural Karnataka and the slums of Mumbai report a strong association between the experience of sterilization and reported morbidity (Bhatia and Cleland 1995; Parikh and others, 1996; Koenig and others, 1998). In rura1 Karnataka, for example, sterilized women had a significantly higher level of laboratory-confirmed lower reproductive tract infections than other women (Bhatia and others, 1997). A study of pelvic inflammatory disease (PID) in Mumbai concludes that it is invasive procedures, such as IUD insertion, sterilization and abortion, rather than sexually transmitted diseases, that account for much of the PID in that city (Brabin and others, 1998; Gogate and others, 1998). Similar findings have been observed in studies conducted in Bangladesh and Egypt (Wasserheit and others, 1989; Younis and others, 1993). In view of the fact that female sterilization (tubal ligation) remains the leading method of fertility regulation in India, being used by 35 per cent of Indian couples and by as many as 49 per cent in the state of Maharashtra (IIPS, 2000), it is crucial that the factors underlying this association be better explored.

The studies cited above observed strong associations between the experience of sterilization and reporting of symptoms, but they did not go further in exploring causal mechanisms. At least two hypotheses can be advanced to explain the link between sterilization and reported or diagnosed gynaecological morbidity. First, poor conditions during sterilization may have resulted in iatrogenic infections (see, for example, Jejeebhoy and Koenig, forthcoming); the pressures on those conducting the procedure to achieve family planning targets (Khan and others, 1999) and the poor overall quality of care at sterilization (Koenig and others, 2000) make this a plausible hypothesis. Other possibilities are that the procedures exacerbate pre-existing conditions, or that the generally negative attitudes to sterilization lead women to attribute any post-sterilization gynaecological morbidity to the sterilization procedure itself. A long interval between the sterilization procedure and the reported morbidity clearly makes causation especially difficult to establish. A feature of the previous studies is that these intervals were not standardized. The time between sterilization and interview varied in each sample: some women may have been sterilized 10 or more years previously.

The objective of this study was to explore the links between reported morbidity at the time of sterilization and self-reported morbidity six months after sterilization among a sample of rural women in Maharashtra. Data come from a larger prospective study intended to explore the links between sterilization and gynaecological morbidity in depth. This larger study contained several phases: (a) a facility-based survey of women awaiting sterilization, inquiring about reported morbidity in the three months preceding the survey; (b) a pelvic examination of these women, clinical and laboratory diagnosis of morbidity, and treatment of those in need; (c) a one-week follow-up of women to assess immediate complications of the procedure; and (d) a six-month follow-up survey in which women reported morbidity experienced in the previous three months. Detailed analyses of findings from these other phases of the study are reported elsewhere (Char and Vaidya, 2000).

Methods

Study site and background

In Maharashtra, sterilizations are routinely performed in weekly "camps" held at primary health centres (PHCs). This study was undertaken at one such PHC, located in Palghar Block, a largely tribal area of Thane district, about 100 kilometres north of Mumbai. Palghar Block contains 10 PHCs and 59 subcentres. However, only one of these centres – the PHC located at the block headquarters – holds regular laparoscopy camps. This PHC was therefore selected for the study. It serves a largely rural area, where the main occupations are agriculture and fishing and, more recently, factory labour. Prevalent morbidities in the area include gastrointestinal diseases, malaria and various viral infections. Because the area is well served by rail and road, the PHC is accessible to the population and its services are well used.

The services provided by the PHC are typical of Indian PHCs in general. Sterilization camps are held each week. The PHC is staffed by two full-time male medical officers, along with nurses and auxiliary nurse midwives. Typically, between 20 and 100 women seek sterilization at each of these weekly camps, peaking during the period from September to March. Although government norms stipulate that women undergoing sterilization be examined and screened for contraindications, these norms are rarely observed. Medical officers are expected to deal with the regular patient flow at the outpatient department as well as the screening of women awaiting sterilization. Discussions with the medical officers and further observations revealed that they tended to overlook or conduct no more than a cursory screening of women, and clinical examinations of the women were almost entirely absent.

Study design

Before fieldwork was initiated, detailed pre-testing exercises were carried out to test and finalize data collection instruments. In-depth discussions were conducted with women who had undergone laparoscopic sterilization to elicit views about health problems encountered before and after sterilization, and to understand local terminology used to describe gynaecological symptoms. Instruments were then developed, pre-tested and revised, with particular care being given to the framing of questions about symptoms and their severity. The six investigators who conducted the survey were trained by the research team. Informed consent was obtained from all study participants after apprising them of the purpose of the study and the clinical tests that would be undertaken.

The main study was conducted in 1997/98. It was designed to minimize inconvenience to women who sought sterilization at PHC camps. The typical procedure at these camps was as follows. On camp days, women tended to arrive at the health centre from early morning. Routinely, blood and urine tests were conducted, blood pressure was taken, and anti-tetanus injections were given. Thereafter, the women waited for an average of three hours before the surgeon performed the sterilization. It was during this time that the first two main phases of the study — the survey and the clinical examination — were conducted.

The study sample comprised the first 20 women seeking sterilization at successive weekly camps, who consented to participate. The team elected to recruit no more than 20 on each occasion because of the difficulties involved in conducting a thorough physical examination of more than that number. A semi-structured questionnaire was administered to all the women, in which detailed information was elicited on current health status, and obstetric and contraceptive histories. The questionnaire focused on questions relating to the experience over the previous three months of such gynaecological problems as menstrual disorder, abnormal vaginal discharge, pain during intercourse, itching in the vaginal region and prolapse (probed as “something coming out from down below”).

Each woman was then given a counselling session in which she was provided with an opportunity to learn about various reproductive and child health issues, including safe sex information; for most women, this was the first time that such an opportunity had been given to them. Finally, women underwent a detailed clinical examination conducted by a gynaecologist; all those who were diagnosed clinically as requiring treatment or as anaemic were treated immediately and, if necessary, advised not to undergo sterilization that day. Swabs and mounted smears were sent to a laboratory and tested for chlamydia, trichomoniasis and gonorrhoea.

After their sterilization, women were visited at their homes one week after the procedure and again six months later. At this latter visit, women reported once again on morbidities experienced in the preceding three months.

A total of 511 women constituted the base-line sample; another 24 women who had initially agreed to participate in the study refused to undergo clinical examination, and were dropped from the sample. At the six-month follow-up, 40 (8 per cent) of the women could not be located, resulting in a sample of 471 women in this phase of study. A comparison of the socio-demographic and morbidity profiles of women lost to follow-up with those who were re-interviewed at six months post-sterilization revealed no significant differences in characteristics. The main reasons for loss to follow-up included household out-migration. The results presented here focus on the perceived gynaecological morbidity of these 471 women both before and six months after sterilization.

Results

Characteristics of women attending the PHC for sterilization

Table 1 presents the socio-demographic profile of the study participants. It is notable that at sterilization the large majority were aged 20-34 years, with a mean age of 26.6 years, and had an average of 3.4 children ever born and 3.1 surviving. A total of 4 per cent of the women had experienced a miscarriage, and an equal proportion had had a pregnancy terminated. More than half the women (51 per cent) had delivered their last child at home. Also notable is that only 8 per cent had used contraception, mainly IUDs and oral contraceptives.

Self-reported symptoms of gynaecological morbidity at sterilization

Table 2 outlines women's experiences of symptoms of gynaecological morbidity in the three months preceding sterilization, as reported at sterilization. As other studies have shown, the leading symptom reported by women was excessive discharge — limited here to those reporting a foul-smelling, greenish-yellow, thick and sticky discharge. Over half of all women reported the experience of such discharge. Aside from vaginal discharge, almost half of all women reported menstrual disturbances. These included passing of clots, inter-menstrual bleeding, scanty or prolonged bleeding, severe back or abdominal pain before or during a period that rendered women unable to perform normal tasks. In addition, almost one fifth reported lower back pain, and about one tenth reported vaginal itching or painful intercourse.

Table 1. Socio-demographic profile of the sample of women awaiting sterilization in rural Maharashtra

Socio-demographic characteristics	
Religion (percentage)	
Hindu	95
Education (percentage)	
With any education	66
Who had completed high school	15
Economic activity (percentage)	
Working for wages	15
Working in family farm or business	21
Living arrangements (percentage)	
Living in nuclear families	61
Income (rupees)	
Mean monthly family income	1,662
Age (years)	
Mean current age	26.6
Mean age at menarche	14.0
Mean age at first pregnancy	26.6
Pregnancies	
Mean number of pregnancies	3.4
Mean numher of live births	3.4
Mean number of living children	3.1
Mean family size	6.1
Number	471

A large proportion of the women (85 per cent) reported that they had been suffering from one or more disorders in the three months preceding the survey. Women who had experienced symptoms had typically experienced more than one symptom. Thirty-five per cent of the sample reported the experience of a single symptom, about half reported two or more symptoms, and 20 per cent reported three or more symptoms.

As indicated above, all 471 women underwent a gynaecological examination and women diagnosed on clinical examination or laboratory testing as having a morbidity were immediately treated for it. As reported elsewhere (Char and Vaidya, 2000) less than 10 per cent were diagnosed as having a sexually transmitted infection (2 per cent and 7 per cent with gonorrhoea and syphilis respectively) and 8 per cent were diagnosed as having one or more endogenous infections (bacteria1 vaginosis, pus cells, Gardnerella vaginalis, etc.). Among the most common conditions detected by clinical examination

Table 2. Reported morbidity at sterilization (number and type of symptoms reported), among women in rural Maharashtra

Morbidity	Percentage of women
Prevalence	
Women reporting one or more symptoms	84.7
Type of symptom (among those reporting a symptom)	
Menstrual problems	43.7
Vaginal discharge (foul-smelling, greenish-yellow colour, thick, sticky)	52.4
Lower back pain	19.1
Itching	11.9
Pain during intercourse	10.8
Frequent urination or burning on urination, along with fever and shivers	1.7
"Something coming out" (prolapse)	1.5
Number of symptoms reported (all women)	
1	34.5
2	29.9
3	10.6
4+	9.7
Mean (those reporting one or more symptoms)	2.0

were uterine prolapse (10 per cent), vaginal prolapse (22 per cent), vaginal infection (9 per cent) and pelvic infection (6 per cent). A total of 412 of the 471 women (87.5 per cent) received some form of treatment. All 412 received iron supplementation and three fifths wete also treated for specific reproductive tract infections according to national guidelines under the syndromic management approach for symptoms of vaginal infections.

Changes in reported morbidity six months after sterilization

Despite the fact that women diagnosed with these conditions were all treated, reported morbidity levels six months later suggest a profile of morbidity that is no different from that prior to sterilization (table 3). A large majority (90 per cent) of the 399 women reporting a morbidity before sterilization continued to report morbidity six months later, of the 72 women who did not report a morbidity in the pre-sterilization period, only 25 per cent continued to be symptom-free six months later. Only 41 (10 per cent) of the women who reported a symptom prior to sterilization were symptom-free six months later. Moreover, the average number of morbidities reported by symptomatic women remained unchanged, at about two.

Table 3. Prevalence of symptoms before and after sterilization among women in rural Maharashtra

Women reporting morbidity before sterilization	Number of women reporting morbidity after sterilization		
	No morbidity reported (percentage)	Morbidity reported (percentage)	Total (percentage)
No morbidity reported	18 (25)	34 (75)	72 (100)
Morbidity reported	41 (10)	358 (90)	399 (100)
Total	59 (13)	412 (87)	471 (100)

Data in table 4 also suggest little change in the nature of reported symptoms over the six-month period. There is some switching between categories but, by and large, reporting over the six-month period (except for increased reporting of lower back pain in the post-sterilization period) remained remarkably consistent. Among women who had initially reported vaginal discharge, virtually all continued to experience the condition six months later, moreover, another 8 per cent of the total sample, who had not experienced the condition in the pre-sterilization period, did so six months later. Even among the 245 women treated with antibiotics, no change in reporting of vaginal discharge occurred: 78 per cent at sterilization versus 80 per cent six months later.

Nor did reported severity of the morbidities significantly decline. Table 5 presents the distribution of women reporting various symptoms at sterilization, by their perception of a change in the severity of those symptoms six months

Table 4. Percentage distribution of women according to presence of symptoms prior to and six months after sterilization, by type of symptom, in rural Maharashtra

Type of symptoms	Presence of symptoms in 471 women				
	Absent at both times	Absent pre-sterilization, present 6 months later	Present pre-sterilization, absent 6 months later	Present at both times	Total
Menstrual problems	44.3	10.0	9.6	36.1	100
Vaginal discharge	39.3	8.3	0.8	51.6	100
Lower back pain	63.4	17.5	6.2	12.9	100
ltching	79.2	8.9	5.5	6.4	100
Pain during intercourse	83.5	5.7	2.3	8.5	100

Table 5. Among women in rural Maharashtra reporting specified morbidities at sterilization, percentage distribution according to changes in severity of reported condition six months after sterilization, by type of symptom

Type of symptom	Changes in severity of symptoms			
	More severe	No change	Less severe or eliminated	Number of women
Menstrual problems	15.8	57.5	26.7	215
Vaginal discharge	14.9	80.5	4.6	247
Lower back pain	46.1	19.4	34.6	90
Itching	12.6	34.5	52.9	56
Pain during intercourse	13.9	57.4	28.7	51

later. Among women reporting vaginal discharge at the time of sterilization, 81 per cent reported no change in severity six months later, 15 per cent reported an increase in severity, and only 5 per cent reported some improvement or elimination of the symptom. Larger proportions of women reporting other conditions at the time of sterilization did report reduced severity but, on balance, the improvement was minimaI.

Perceived change in health status six months after sterilization

Women were asked finally to assess their overall health status six months after sterilization. Over half (58 per cent) reported no change in their overall health. Almost one in five (18 per cent) reported an improvement, but almost one quarter (23.4 per cent) reported a deterioration. Of this latter group, two thirds attributed the deterioration in their health specifically to the sterilization experience and, secondarily, to overwork.

Conclusion

The study found that a large proportion of women undergoing sterilization experienced one or more gynaecological conditions at the time of sterilization. Significant proportions of these were diagnosed clinically or by laboratory testing as suffering from a morbidity. In resource-poor settings such as in India, where few women are likely to seek care for symptoms of gynaecological morbidity, sterilization may provide a unique opportunity to assess and provide treatment for women experiencing morbidity. Findings argue for the incorporation of gynaecological examination, treatment and reproductive health counselling into routine sterilization services.

Despite the provision of these services and the treatment of over half the sample for reproductive tract infections, perceived morbidity levels six months following sterilization had not declined, nor had the perceived severity of the reported conditions. We cautiously advance one possible interpretation. As indicated previously, the study design required that women were treated not only for morbidities detected clinically or by laboratory tests, but were also provided counselling and information. These procedures may have sensitized women at the time of sterilization to perceive such conditions as discharge, lower back pain and menstrual conditions as disorders and not as "a woman's lot to be endured in silence". Consequently, they may have been more likely to notice and report symptoms after sterilization than before it.

No link was found between treatment of reproductive tract infections at the time of sterilization and self-reported symptoms of discharge six months later. This result is consistent with the weak correspondence between self-reports and biomedical evidence of infection. It may also reflect rapid re-infection, since treatment of women for sexually transmitted infections is likely to be ineffective unless husbands are also treated.

The impact of treatment on biomedical (as opposed to self-reported symptoms) disorders six months later is impossible to assess in this study, since limited resources did not allow for repeating the full gynaecological examination and testing of women at six months post-sterilization. Subsequent research is needed to explore the links between pre- and post-sterilization morbidity as assessed by clinical diagnosis and laboratory testing.

Despite counselling and awareness-raising, women continued to link their symptoms with sterilization. Almost two thirds of the women in this study who reported a general deterioration in their health status attributed this deterioration to sterilization.

The findings tentatively suggest that sterilization provides a unique opportunity for diagnosing and treating women reporting and/or experiencing reproductive tract infections and other gynaecological disorders, as well as raising reproductive health awareness and providing counselling on symptoms and their possible aetiology. They also suggest that this is not enough: women may indeed become more sensitive to their bodies and experiences of symptoms of morbidity, but it does not follow that they ate sufficiently empowered to seek care for these in the post-sterilization period. It is equally important that health workers be charged with sensitive questioning, counselling, treating and referring of women reporting symptoms of gynaecological morbidity.

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Comparison of Self-reported Symptoms of Gynaecological Morbidity with Clinical and Laboratory Diagnosis in a New Delhi Slum

Improvements in diagnostic procedures are urgently needed

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In developing countries, reproductive morbidity commonly affects the quality of women's lives but, until recently, this form of ill health has been

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largely ignored both by health planners and researchers. The tools required to assess the nature and magnitude of the problem in different settings need to be developed if the rhetoric of the 1994 International Conference on Population and Development is to be translated into realistic action.

Three main methods exist for the diagnosis of gynaecological morbidity: self-reported symptoms, clinical examination and laboratory tests. A few studies have found a reasonable degree of consistency between self-reports and clinical or laboratory evidence of infection, provided that the diagnostic criteria are clear (e.g. Zurayak and others, 1993, but many more have found rather low levels of agreement between different diagnostic approaches (Filippi and others, 1997; Kaufman and others, 1999; Bhatia and Cleland, 2000). Several reasons account for this lack of correspondence. Infections may remain asymptomatic for long periods and clinical signs may be non-existent or subtle. Several studies have shown that many patients with reproductive tract infections (RTIs), including sexually transmitted infections (STIs), present without any symptoms (De Schryres and Mehens, 1990; Mabey, 1996). Conversely, some individuals who report symptoms have no biomedically detectable pathology (Abdool, 1994; Hawkes and others, 1999). Such discrepancies reflect the fact that women's perceptions of gynaecological illness are rooted in cultural beliefs. In India, for instance, it has been suggested that the reporting of abnormal vaginal discharge may be more an expression of underlying psychosocial distress than evidence of infection (Patel and Oomman, 1999).

The last decade has seen major advances in laboratory-based diagnostic tests for STIs, and such tests are generally regarded as the "gold standard". However, these tests are too expensive to be used as screening tools in resource-poor settings. In the foreseeable future, control and management of these infections will therefore continue to depend largely on self-reported symptoms and observable clinical signs. The sensitivity, specificity and predictive value of symptoms in the detection of underlying morbidity are not well known, but should be urgently established. The present article addresses this need.

The study on which this article is based is a part of broader study (Garg and others, 2000) and its objectives are twofold: to assess the prevalence of gynaecological morbidity among ever-married women aged 15-45 years in a slum community in New Delhi, and to assess the consistency of women's self-reports, clinical diagnosis and the results of laboratory tests.

Material and methods

The study area

The study was conducted between August 1996 and November 2000 in an urban slum in the vicinity of Maulana Azad Medical College (MAMC), New Delhi. A demographic census of the area was conducted between December 1997 and March 1998 by project staff. The slum colony comprised 826 hutments with a total population of 3,676, spread in four clusters around a peripheral health post. These clusters were uniform in socio-demographic features. The majority of residents had migrated from Uttar Pradesh and Bihar. The sex ratio was unbalanced: 2,248 males (61 per cent) and 1,428 females (39 per cent) were enumerated, a ratio of 635 females per 1,000 males. A total of 500 (14 per cent) men were identified who were single and living without their families. The population was also youthful: only 125 (3.4 per cent) individuals were above 45 years of age.

Health services were provided through a health post of the Department of Community Medicine, MAMC. The health post had existed for eight years prior to the study and provided comprehensive health care to the population under the supervision of doctors (senior residents and faculty members) with a postgraduate degree in community medicine. The site was selected because of its proximity to MAMC, and thus had the distinct advantage of being accessible to researchers from various disciplines, making the multidisciplinary strategy feasible in terms of sample collection, transport and processing.

Study population and recruitment procedure

The study population comprised all 446 ever-married women aged 15-45 years living in the slum community at the time of the demographic census. It was decided to include all women in the study rather than take a sample in order not to deny diagnosis and treatment to anyone. Unmarried women were excluded from the study because internal examination of such women is culturally unacceptable, but widowed and divorced women were included. Out of 446 females, 66 were pregnant and for these, following the ethical committee guidelines of the Indian Council for Medical Research, detailed general physical examinations and abdominal examinations were carried out, followed by collection of blood samples. Detailed general physical and internal examinations of non-pregnant women, along with collection of blood samples, were carried out.

Qualitative data collection

In-depth interviews and observation were carried out prior to the main phase of the study. This revealed high morbidity, poor health-care-seeking, and poor usage of contraceptive methods. Extramarital sex was an accepted norm in the community and men had access to nearby brothels. The results of this qualitative study were used for the development of a survey questionnaire but are not reported in this article.

Face-to-face interviews, referrals and examination

Face-to-face interviews were conducted with all 446 women by specially trained female field investigators at women's homes. The interview schedule covered socio-demographic characteristics, perceived symptoms of reproductive morbidity, hygiene, care-seeking behaviour, obstetric and contraceptive history, decision-making in the family and perceptions regarding HIV/AIDS. Generally two to three women a day were interviewed. At the end of the interview, each woman was given a referral slip which contained a unique identification number, name, husband's name, house number, cluster number and date of appointment at the clinic (health post) for clinical examination. A counterfoil of the referral slip was retained by the interviewer to ensure screening of every eligible woman interviewed.

Strategies were evolved to enhance participation and all women were encouraged to visit the peripheral health clinic shortly after the home interview. Before the date stipulated for the clinical examination, a team member paid a home visit which served as a reminder of the appointment. Women who failed to report for examination on the due date were followed up to ascertain the reason and were given another appointment.

Women were screened at the health post. Before screening for reproductive tract infections began, supplies to the health post were upgraded. A female health assistant was recruited to assist the gynaecologist in screening. The gynaecologist visited the health post twice a week for screening, examination and treatment of women.

At the clinic, the referral slip was matched with the counterfoil and a clinic data sheet was completed for every woman. This comprised questions about presenting gynaecological symptoms such as discharge, changes in menstrual pattern, pain in the lower abdomen, dyspareunia (painful intercourse), urinary complaints, low backache, prolapse, infertility and abortions. A detailed obstetric history was also obtained from every woman.

A physical examination was then performed. A detailed systemic examination of the cardiovascular system, respiratory system and abdominal examination was undertaken. This was followed by examination of the genital tract. The internal examination involved inspection of vagina and cervix using a speculum, under strict conditions of asepsis and privacy.

The criteria for clinical diagnosis were standardized beforehand (chart 1) and findings were recorded on pre-coded and pre-tested clinic data sheets. During the speculum examination, four vaginal and four cervical samples were taken for direct microscopy and culture for diagnosis of bacterial vaginosis, candidiasis, trichomonas vaginalis, gonorrhoea, chlamydia and for Pap smear screening. Routine microscopy and culture were also carried out for every respondent. A blood sample was taken from every respondent, i.e. 5 ml of venous blood was collected in a universal container. Blood was allowed to clot and serum separated before transportation to the laboratory. The specimens were transported to the microbiological laboratory on the same day by a technician.

The sample sites and criteria for laboratory diagnosis are shown in chart 2. For pathogens with multiple diagnostic tests, the infection was considered positive in the event of either of the laboratory tests being positive, in order to maximize sensitivity.

Treatment

Women with genital tract infections were managed in accordance with the National AIDS Control Organisation recommendations on syndromic management. After the laboratory reports, additional treatment, if required, was provided: for example, in cases of syphilis. The management of STIs included counselling, partner-notification and treatment. Those who required an expert opinion were referred to the Departments of Gynaecology or Skin and Venereology at Lok Nayak Hospital.

Ethical considerations

Ethical clearance was obtained from ethical committees of MAMC and associated hospitals. Face-to-face interviews were conducted in women's homes with due consideration for privacy. Confidentiality of information was not only assured but maintained. Diagnostic and treatment services were made available in a non-stigmatizing manner to all women who underwent examination. Symptomatic women who refused examination at the peripheral health facility were counselled and, if still unwilling, were advised to visit another health care facility; the research team provided no treatment

Chart 1. Criteria for clinical diagnosis	
Abnormal discharge	a) Presence of abnormal discharge during examination. The discharge was described in terms of amount, colour, consistency, smell, site and its association with itching. *or:* b) Microscopically[a] – Five pus cells per high-power field was also considered as abnormal discharge.
Genital ulcers	Presence of vesicles, papules, ulcers at labia, vulva, cervix.
Genital warts	Cauliflower lesions involving external genitals, perineum area; "flat" condylomata of cervix was diagnosed by cervical cytology.
Cervicitis	a) Presence of cervical erythema, inflammation or cervical bleeding on touch, with or without discharge. or: b) Microscopically[a] – Presence of cervical pus cells ≥ 10 per high-power field.
Cervical erosion	A bright red, clearly defined area on the vaginal aspect of the cervix where squamous epithelium is replaced by columnar epithelium.
Pelvic inflammatory disease	Presence of abdominal tenderness and uterine tenderness with or without adnexal tenderness.
Prolapse	Confirmed by direct examination and making the patient cough to determine anterior or posterior vaginal wall collapse. a) Rectocoele prolapse = descent of posterior vaginal wall below its normal position. b) Cystocoele prolapse = descent of anterior vaginal wall below its normal position. c) Uterine prolapse = descent of the uterus below its normal position.
Tuba-ovarian mass	Diagnosed by fullness in adnexa, presence of mass, if any.

Note: Major clinical entities were diagnosed according to standard criteria (W.E. Stamm, S.M. Kaetz, MB. Beirne and J.A. Ashman (1988). "The practitioner handbook for the management of STDs", Health Sciences Centre for Education Resources, University of Washington).

[a] Diagnosis was done on the results of the microscopy report.

without examination. Probing revealed that the opposition of the women's husband was a major cause of refusal. Accordingly, screening and management for men's reproductive and sexual health problems were initiated in the community in February 2000.

Data analysis

Each woman was identified by a unique number (given at the time of initial interview). Consistency checks were performed to avoid duplication of records. The data were analysed by the software packages, Foxbase and Epi

Chart 2. Sample sites and criteria for laboratory diagnosis of reproductive tract infections

RTI	Sample site	Laboratory methods	Diagnosis
Bacterial vaginosis	Vagina	1 a) Examination for characteristic vaginal discharge b) Vaginal pH measurement c) Amine test d) Direct microscopy for "clue cells" 2 Gram-stained vaginal smear examination and scoring	Amsel's criteria: (3 out of 4 clinical tests positive) Nugent's criteria: Score of ≥ 7
Trichomonas vaginalis	Vagina	a) Direct microscopy of saline wet mount b) Culture in Fineberg-Whittington medium	Positive by either or both methods
Candidiasis	Vagina	a) Direct microscopy of KOH (potassium hydroxide) mount and gram-stained smear b) Culture on Sabauraud's dextrose agar	Positive by either or both methods
Neisseria gonorrhoeae	Cervix	a) Direct microscopy of gram-stained smear b) Culture on modified Thayer-Martin medium c) ELISA (enzyme-linked immunosorbent assay) for detection of antigen	Positive by any one or more methods
Chlamydia trachomatis	Cervix	a) Direct fluorescent antibody test for detection of elementary bodies in cervical smear b) Polymerase chain reaction (PCR)	Positive by any one or both methods
Cervical inflammation dysplasia	Cervix	Pap smear	
Human papilloma virus (type 16 & type 18)	Cervix	PCR	Positive by PCR
Syphilis	Blood (serum)	a) VDRL test for screening b) Treponema Pallidum Haemagglutination Test (TPHA) for confirmation	Positive by both tests[a]
Hepatitis B virus	Blood (serum)	Detection of hepatitis B antigen by: a) Latex agglutination b) ELISA	Positive by both methods
Hepatitis C virus	Blood (serum)	Detection of anti-HCV (hepatitis C) IgM (immunoglobulin class M) antibodies by ELISA	Positive on repeat test also

[a] **VDRL (Venereal Disease Research Laboratories) and TPHA (treponema pallidum haemagglutination test) testing were used for diagnosis of syphilis. On VDRL screening, those who were found positive were tested by TPHA, thus ruling out false-positive cases.**

Info. Categorical data were compared using chi-square or Fisher's exact test, as applicable. Sensitivity, specificity and predictive values were calculated to compare women's reports, clinical and laboratory diagnoses. The calculation of predictive values of reported symptoms was considered important to assess the relative accuracy of positive and negative predictions of infection from the women's reports.

Results

Participation levels

Of the eligible women identified in the study area, 380 (85.2 per cent) reported to the health care facility. Clinic schedules were completed for all 380 women by the doctor at the health post. Of the 322 non-pregnant women, 79.2 per cent agreed to an internal examination, and samples (vaginal and cervical) were collected for laboratory tests. All 58 pregnant women underwent general physical and abdominal examinations, and blood samples were collected. Overall, blood samples for examination were collected from 332 (87.4 per cent) women. Socio-demographic characteristics of responders and non-responders were not significantly different in terms of age, religion, literacy, occupation and income.

Reported morbidity

Of the 380 women who attended the clinic, only 12.1 per cent reported no symptoms. The most common symptoms were low backache (63.9 per cent), vaginal discharge (56.8 per cent) and pain in the lower abdomen (42.1 per cent) (table 1). Together low backache and pain in the lower abdomen were reported by 76.0 per cent of women. These two symptoms were considered as a single entity for comparison with clinical and laboratory diagnosis.

Among 301 women who underwent internal examination, 91 per cent complained of one or the other symptom of reproductive morbidity. The highest reported morbidities were low backache (67.8 per cent), vaginal discharge (61.8 per cent) and pain in the lower abdomen (44.9 per cent) (table 1).

Observed gynaecological morbidity

On clinical examination, abnormal vaginal discharge was detected in the majority of women (94.6 per cent). Cervicitis was diagnosed in 36.2 per cent, cervical erosion in 43.9 per cent, pelvic inflammatory disease (PID) in 26.2 per cent and prolapse in 14.3 per cent of women. Overall gynaecological morbidity was detected by the gynaecologist in 74.1 per cent of women (table 2).

Table 1. Gynaecological morbidity reported at a clinic by women in a New Delhi slum

Reported morbidity	Percentage of alI women who attended the clinic (n = 380)	Percentage of women who underwent internal examination (n = 301)
Menstrual problems	25.8	24.6
Dysmenorrhoea	2.4	2.6
Menorrhagia	7.6	5.7
Oligomenorrhea	10.8	11.9
Dysfunctional uterine bleeding (DUB)/irregular	5.0	4.3
Vaginal discharge	56.8	61.8
Infertility	8.2	10.0
Primary	5.8	7.0
Secondary	2.4	3.0
Pain in lower abdomen	42.1	44.9
Lower backache	63.9	67.8
Prolapse	15.8	18.6
Urinary complaints	20.5	21.6
Genital ulcers	2.9	3.3
Dyspareunia	23.0	25.2
Any morbidity	88.0	91.0
Total morbidities	986	838
Mean morbidities per woman	2.6	2.8

Prevalence of reproductive tract infections

The results of the laboratory tests revealed that 41.5 per cent of the women had bacterial vaginosis, 18.6 per cent candidiasis and 4.3 per cent trichomonas vaginalis. Chlamydia was detected in 28.7 per cent of the cases. No case of gonorrhoea was detected, but tests for syphilis were found positive in 4.2 per cent, and 5.8 per cent of the cases were positive for hepatitis B antigens. Human papilloma virus (HPV) types 16 and 18 (the prime cause of cervical cancer) were found in 11.8 per cent and 3.3 per cent of the women respectively (table 3).

The combined prevalence of seven infections (bacterial vaginosis, candidiasis, trichomoniasis, chlamydia, gonorrhoea, syphilis and hepatitis B) was 72 per cent (188/261). When inflammatory smears were also included with these seven infections, 79.4 per cent of women were found to be infected.

Table 2. Prevalence of gynaecological morbidity by clinical examination among women in a New Delhi slum

Gynaecological condition	Number of women (n = 301)	Percentage
Abnormal vaginal discharge	285	94.6
Cervicitis[a]	109	36.2
Cervical erosion	132	43.9
Pelvic inflammatory disease (PID)	79	26.2
Prolapse	43	14.3
Anterior	40	13.3
Posterior	3	1.0
Tubo-ovarian mass	43	14.3
Suspected carcinoma of cervix	4	1.4
Any gynaecological morbidity	223	74.1

[a] **Comprising cervical inflammation or induced endo-cervical bleeding on touch.**

Comparison of self-reports, clinical diagnoses and laboratory tests

Women's reports of symptoms were compared with clinical diagnoses (table 4) and the laboratory diagnosis of reproductive tract infections (table 5). Table 6 compares clinical diagnoses with the results of laboratory tests. Measures of sensitivity, specificity and predictive power were used to summarize the results. The implicit assumptions underlying these comparisons are that clinical diagnoses are nearer the "truth" than self-reports and that laboratory test results are nearer the "truth" than clinical diagnoses. Thus, the validity of self-reports can be assessed against either of the other two types of measurement (the gold standards), and clinical diagnoses can be validated by laboratory tests (the ultimate gold standard). The four summary measures for assessing validity are defined as follows:

- *Sensitivity:* the percentage of individuals found positive (i.e. infected) by the gold standard test who were also found positive by the other test.
- *Specificity:* the percentage of negative cases (i.e. uninfected) by the gold standard test who were also found negative by the other test.
- *Positive predictive value (PPV):* the percentage of individuals found positive by the other test who were also found positive by the gold standard test. Departures from 100 per cent indicate the level of "false positives".
- *Negative predictive value (NPV):* the percentage of individuals found negative by the other test who were also found negative by the

Table 3. Prevalence of major reproductive tract infections detected by laboratory tests among women in a New Delhi slum

Infection	Number of women tested	Prevalence (percentage)
Bacterial vaginosis	301	41.5
Candidiasis	301	18.6
Trichomonas vaginalis	301	4.3
Chlamydia[a]	286	28.7
Gonorrhoea	301	0
Inflammatory/dysplastic smears[b]	273	37.4
Human papilloma virus type 16[c]	152	11.8
Human papilloma virus type 18[d]	152	3.3
Syphilis	332	4.2
Hepatitis B virus[d]	329	5.8
Hepatitis C virus[e]	166	1.8

[a] **15 samples were not tested because the smear were too thick.**

[b] **273 out of 301 smears were adequate for testing.**

[c] **Samples with DNA extracts were processed for HPV16 and HPV18.**

[d] **Three samples had insufficient quantity of blood.**

[e] **Testing was done on alternate samples.**

gold standard test. Departures from 100 per cent indicate the level of "false negatives".

Validation of self-reports by clinical diagnoses

Observation of vaginal discharge by the gynaecologist was much more common than self-reports of this condition, resulting in a very high PPV but extremely low NPV: 115 women reported no discharge but absence of discharge was confirmed by examination in only four cases. Conversely, self-reports of discharge were more common than diagnoses of cervicitis, leading to higher NPV but lower PPV.

The validation of self-reported pain in the lower abdomen or low backache against clinical diagnoses of celvicitis and PID reveals relatively high sensitivity values. Three quarters or more of the women diagnosed with these conditions also reported symptoms. Specificity, however, was low. Only about one quarter of the cases diagnosed as negative by the gynaecologist reported the absence of symptoms. The low PPVs imply that only about one third of the women complaining of pain in the lower abdomen or low backache were found to have clinical signs of cervicitis or of PID.

Table 4. Comparison of self-reported gynaecological symptoms with clinical diagnosis among women in a New Delhi slum (numbers of women)

Self-reported symptoms	Clinial diagnosis			
	Yes	No	Yes	No
	Abnormal discharge		Cervicitis	
Vaginal discharge				
Yes	174	12	70	116
No	111	4	39	76
	S 61.0, SP 25.0, PPV 93.5, NPV 3.5		*S 64.2, SP 39.5, PPV 37.6, NPV 66.0*	
	Cervicitis		Pelvic inflammatory disease	
Lower abdominal pain/lower backache				
Yes	81	148	64	165
No	28	44	15	57
	S 74.3, SP 22.9, PPV 35.3, NPV 61.1		*S 81.0, SP 25.7, PPV 27.9, NPV 79.2*	
	Cervicitis		Pelvic inflammatory disease	
Dyspareunia				
Yes	26	49	32	43
No	83	143	47	179
	S 23.8, SP 74.4, PPV 34.6, NPV 63.2		*S 40.5, SP 80.6, PPV 42.7, NPV 79.2*	

Note: **Abbreviations: S = sensitivity, SP = specificity, PPV = positive predictive value, NPV = negative predictive value. See text for definitions.**

Dyspareunia was less commonly reported by women than pain. Accordingly, this symptom has low sensitivity when compared with diagnoses of cervicitis or PID. PPVs were also low. The majority of women reporting dyspareunia were not diagnosed with cervicitis or PID.

Validation of self-reports by laboratory tests

The overall numbers of women reporting vaginal discharge and those diagnosed by laboratory tests as having a lower reproductive tract infection (bacterial vaginosis, candidiasis or trichomonas vaginalis) are similar: 186 compared with 168. However, this aggregate similarity conceals a poor consistency at the individual level, with low sensitivity and specificity values (table

Table 5. Comparison of self-reported symptoms with results of laboratory diagnosis among women in a New Delhi slum (numbers of women)

Self-reported symptoms	Laboratory diagnosis	
	Yes	**No**
	Any lower reproductive tract infection[a]	
Vaginal discharge		
Yes	95	91
No	73	42
	S 56.5, SP 31.6, PPV 51.1, NPV 36.5	
	Chlamydia	
Lower abdominal pain/ lower backache		
Yes	65	152
No	17	52
	S 79.3, SP 25.5, PPV 30.0, NPV 75.4	
	Syphilis (VDRL + TPHA)	
Genital ulcer		
Yes	2	8
No	8	262
	S 20.0, SP 97.0, PPV 20.0, NPV 97.0	

Note: **Abbreviations: S = sensitivity, SP = specificity, PPV = positive predictive value, NPV = negative predictive value, VDRL = Venereal Disease Research Laboratories, TPHA = treponema pallidum haemagglutination test. See text for definitions.**

[a] **Bacterial vaginosis, candidiasis, trichomonas vaginalis.**

5). About half of the women with reported discharge were found to be infected (PPV = 51); only about one third without this symptom were found to be uninfected (NPV = 36.5).

Pain in the lower abdomen or low backache has high sensitivity as a symptom of chlamydial infection but low specificity. Four fifths of women found by laboratory tests to be infected reported symptoms, but among uninfected women, only one quarter reported no pain. Low PPVs indicated that 30 per cent of the women reporting pain were infected with chlamydia.

Ten women reported genital ulcers and an identical number were diagnosed with syphilis. Such a low prevalence guarantees high specificity. However, sensitivity is low. Only two of the ten women infected with syphilis reported genital ulcers.

Table 6. Comparison of clinical diagnoses with laboratory-confirmed infections among women in a New Delhi slum

Clinical diagnoses	Laboratory results	
	Yes	No
	Any lower reproductive tract infection[a]	
Abnormal vaginal discharge		
Yes	164	121
No	4	12
	S 97.6, SP 9.0, PPV 57.5, NPV 75.0	
	Chlamydia	
Cervicitis		
Yes	31	73
No	51	131
	S 37.8, SP 64.2, PPV 29.8, NPV 71.9	
	Abnormal Pap smear	
Cervicitis		
Yes	51	48
No	51	123
	S 50.0, SP 71.9, PPV 51.5, NPV 70.6	
	Chlamydia	
Pelvic inflammatory disease	27	51
Yes	27	51
No	55	153
	S 32.9, SP 75.0, PPV 34.6, NPV 73.6	

Note: **Abbreviations: S = sensitivity, SP = specificity, PPV = positive predictive value, NPV = negative predictive value. See text for definitions.**

[a] **Bacterial vaginosis, candidiasis, trichomonas vaginalis.**

Validation of clinical diagnoses by laboratory tests

The gynaecologist observed abnormal discharge in a large majority of women (285). Laboratory tests showed that 168 women had some lower reproductive tract infection. Sensitivity is very high but specificity is very low (table 6). Nearly all infected cases were observed to have abnormal discharge, but only 9 per cent of uninfected cases were observed to have normal discharge. Of women observed to have abnormal discharge, a little over half were found to be infected (PPV = 57.5).

Clinical diagnosis of cervicitis or PID is weakly linked with laboratory evidence of chlamydial infection. Sensitivity is only 37 and 33, respectively. A higher sensitivity value (50) is found between cervicitis and abnormal Pap smears.

Discussion

Prevalence of reproductive morbidity

All three methods of measurement (self-reports, clinical diagnosis and laboratory tests) revealed a high prevalence of gynaecological morbidity in the urban slum community. The majority (88 per cent) of the women reported one or more symptoms of morbidity. The results of the clinical examination also revealed a high level of gynaecological morbidity in the study population. Three quarters (74.1 per cent) of the women had at least one clinically diagnosed gynaecological morbidity. These findings are broadly consistent with other community-based studies in India (e.g., Bhatia and others, 1997). A high prevalence of cervicitis (36.2 per cent) and cervical erosion (43.9 per cent) was observed. In a comprehensive review of six community-based studies in India, the prevalence of clinically diagnosed cervicitis ranged from 8 per cent to 48 per cent and cervical erosion from 2 per cent to 46 per cent (Koenig and others, 1998). Thus, the results of this study lie at the upper end of the range of estimates found elsewhere in India. However, in this population, the prevalence of chlamydia (29 per cent) is unusually high. As chlamydia is a major cause of PID and infertility, this result is of great public health significance.

Consistency of self-reports, clinical diagnoses and laboratory tests

In this study, 57 per cent of women who attended the clinic reported abnormal vaginal discharge, the complaint typically concerning the amount of discharge rather than its odour or colour. Abnormal vaginal discharge is regarded as one of the key symptoms of lower reproductive tract infections (RTIs). However, self-reported symptoms of discharge correlated poorly with laboratory evidence of lower RTIs, with a sensitivity of 56 and specificity of 32. Thus, nearly half of the infected cases reported no discharge and the majority of uninfected cases did report discharge. These values imply that treatment on the basis of reported symptoms alone would have missed half of the infected women, but would also have resulted in substantial treatment of uninfected cases.

Pain in the lower abdomen and lower backache are classic symptoms of cervicitis and/or PID. Over three quarters (76 per cent) reported such pain. Such a high prevalence ensures high sensitivity when compared with gynaecological diagnoses. However, specificity was very low; only about one quarter of those found not to have cervicitis or PID reported no pain. Management on the

basis of reported symptoms thus would have resulted in massive over-treatment of uninfected cases. Using the complaint of dyspareunia as a guide to treatment would also have been inadequate. Only a minority of diagnosed cases of cervicitis or PID reported dyspareunia.

One major cause of cervicitis and PID is chlamydia, but there are also many other possible causes. It is therefore not surprising that consistency between clinical diagnoses of these conditions and laboratory-confirmed chlamydial infection is low. Only about one third of cases with confirmed chlamydia were observed by the gynaecologist to have either cetvicitis or PID. The correspondence between observation by the gynaecologist of abnormal discharge and laboratory evidence of any lower reproductive tract infection was equally disappointing. Only 57 per cent of women observed to have abnormal discharge were found to be infected. This evidence is consistent with other recent studies that have pointed out the weaknesses of syndromic management (Hawkes and others, 1999; Sloan and others, 2000)

These results add to the growing body of evidence that treatment on the basis of reported symptoms is inadequate in the Indian setting. Women do not seek care for symptoms such as vaginal discharge because they do not perceive the implications of this symptom for health and, even if they do, the likelihood of misdiagnosis is high. There is an urgent need to create awareness in the population regarding symptoms, modes of acquisition and available treatment of RTIs by specially trained health care workers. Women who report to the health care facility should be examined by sensitive and trained health care providers, namely paramedical workers and medical officers available at the primary health care level. It is easier to sensitize and train these workers as they are already providing reproductive and child health services under the country's Reproductive and Child Health Programme. However, this approach will be effective only if concurrent efforts are made to improve the efficacy of diagnosis by developing better standardized diagnostic criteria and simple guidelines for training paramedical workers. Indications of what can be achieved come from a community-based study conducted by the Department of Community Medicine, MAMC, and the Institute of Cytology and Preventive Oncology of the Indian Council for Medical Research. The study assessed the feasibility of involving general health staff in the prevention and early detection of precancerous and cancerous lesions of the cervix. It demonstrated an agreement level of 83 per cent between the diagnoses of ANMs (auxiliary nurse midwives) and those of gynaecologists (Garg and others, 1993).

Policy implications

In developing countries, validation studies focusing on a range of gynaecological morbidities provide empirical evidence that self-reported and observed morbidity measure different aspects of reproductive health. Though self-reports of symptoms provide insights into the perceptions of ill health in the community, the results from this study show that symptoms alone may not be appropriate for the identification of specific gynaecological conditions. Symptoms and clinical signs together (i.e. syndromic management) may help in diagnosis and treatment of reproductive morbidity but, clearly, improvements in diagnostic procedures are urgently needed. While many laboratory tests for the confirmation of RTIs or STDs are expensive or not suitable for use in the field, a compromise solution should be to use simple cheap tests (which are available for certain conditions) until inexpensive laboratory tests become available. These simple tests include: pH testing for bacterial vaginosis, wet mount microscopy for trichomonas vaginalis, and microscopy for pus cells for cervicitis.

Such tests are also already available for syphilis, and routine screening for this disease among antenatal clinic attenders is a priority. In terms of policy implications, it is necessary to train peripheral workers and provide microscopes to all peripheral health facilities. This provision is already envisaged under the Reproductive and Child Health Programme, but full implementation is urgently required.

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Determinants of Unmet Need for Family Planning in Squatter Settlements in Karachi, Pakistan

IEC components of family planning programmes should include among target audiences older women, who may be obstacles to the adoption of contraception by their daughters-in-law.

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The concept of "unmet need" for family planning refers to a discrepancy between the fertility goals expressed by women and their actual contraceptive

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practices (Concepcion, 1980). The most fundamental discrepancy is non-use of contraception despite an expressed preference for limiting births. High levels of unmet need are a principal rationale for the existence of family planning programmes.

Women with an unmet need for family planning constitute a significant fraction of all married women of reproductive age in developing countries. Data from the Demographic and Health Surveys in 27 countries show that unmet need is particularly prevalent in sub-Saharan Africa. In Asia, high levels of unmet need persist in a smaller number of countries, including Pakistan (32 per cent), Nepal (28 per cent) and the Philippines (26 per cent) (Westoff and Bankole, 1995). The fact that a substantial proportion of women have an unmet need for family planning has important demographic implications. If the unmet need were eliminated, fertility would decline substantially (Casterline, 1995; Westoff and Bankole, 1995; Sinding and others, 1994). Despite its importance in meeting national goals for a decline in fertility, little is known about the determinants of unmet need (Dixon-Mueller and Germaine, 1990).

In recent years, fertility has begun to decline in Pakistan from a total fertility rate of 6.3 children per woman in 1975 to about 5.0 in the mid-1990s. This is a consequence of an increase in age at marriage and a rise in contraceptive use, from 5 per cent in 1975 to 24 per cent in 1996/97 (Hakim and others, 1998). However, at 2.4 per cent annually the rate of population growth remains one of the highest in Asia (ESCAP, 2001). Despite the documented existence of a demand for family planning services expressed by Pakistani women (Hakim and others, 1998; Population Council, 1998) lack of consistent government commitment and socio-cultural constraints have reduced the effectiveness of the family planning programme. The failure of these efforts also reflects an ignorance of those factors that cause a discrepancy between expressed fertility goals and contraceptive behaviour among Pakistani women. Identifying the factors that contribute to umnet need can be an important step in improving family planning services and towards widespread acceptance of contraception.

This study aims to identify the barriers that contribute to unmet need for family planning in the urban squatter settlements of Karachi, in order to frame recommendations for strategies that will help family planning programmes to address unmet need.

Methods

Study site

The study was conducted in selected urban squatter settlements in Karachi, Pakistan's largest city and its major port. Approximately 40 per cent of Karachi's estimated 10 million people live in 400 squatter settlements, which are characterized by poverty, lack of education, poor sanitary conditions, political instability, ethnic violence and drug abuse. From 1986 to 1995, the Aga Khan University's Department of Community Health Sciences implemented primary health care (PHC) projects in six such settlements with an estimated total population of 45,500 persons. The PHC projects provide all modern family planning methods except for tubal ligation, for which women are referred elsewhere. Female community health workers also dispense contraceptive supplies to women in their homes on their monthly home visits. The communities were selected as likely to represent Karachi's squatter settlements in terms of socio-economic, health status and ethnicity factors. A typical family income is US$ 40-80 per month and a median family size is six persons. Sixty per cent of the houses in these communities could be considered fairly well constructed for a squatter settlement, i.e. the walls are made of brick with a roof of corrugated concrete-asbestos sheeting. Forty per cent of the males and 65 per cent of the females are illiterate. Ethnically, most are Mohajirs (descendants of migrants from India at the time of Partition in 1947), Sindhis or Punjabis.

Study population

As part of a larger project designed to determine the differences between users and non-users of modern methods of contraception, 717 married women aged 15-30 years who had at least two children and whose mother-in-law and husband were living in Karachi were identified. Only women who had never used a modern method of contraception (non-users) and women who had been using a modern method for at least 12 months (users) were included in the study. In each household, the woman, her husband and her mother-in-law were interviewed. If possible, all interviews were conducted separately and concurrently. This article focuses on data from women who expressed a desire to have no more children, i.e. they said that they did not want any additional sons or daughters (n = 387). This group of women was then divided into two groups on the basis of their reported consistent use of a modern contraceptive method, i.e. 129 non-users and 258 users. Among the 387 women in the study, 234 had their mother-in-law living with them in the same house and 153 had a mother-in-law who lived in Karachi but not in the same house.

Study instrument

The study team administered a detailed questionnaire to the 387 women, which included items regarding demographic factors, fertility preferences, inter-spousal communication, female autonomy and modernity issues. The questionnaire was developed following an initial qualitative assessment consisting of a series of in-depth interviews about the main themes identified earlier (Khan and others, 1995). Complementary questionnaires were administered to the husband and mother-in-law of these women.

The socio-demographic factors studied included the age of the woman, number of surviving sons and daughter, whether she had received a formal education and the economic conditions of her family, characterized by ownership of a bicycle, motorcycle or car. In order to assess the importance of the husband's and/or mother-in-law's contribution to unmet need, each woman was asked about the fertility preferences of her husband and mother-in-law, and whether she had ever discussed fertility goals with either her husband or mother-in-law. If she responded in the affirmative, she was asked whether her husband or mother-in-law concurred with her fertility goals of having no more sons and no more daughters. It was therefore possible to differentiate between women who knew that their spouse or mother-in-law agreed with their preferences to have no more children and those who either did not know or knew that they disagreed with her.

Inter-spousal communication was assessed by whether or not the woman reported discussion with her husband about their sexual life. Women's autonomy was characterized by such items as paid employment status, whether she would be allowed to work for money if the need arose, her ability to travel by herself outside the home and make decisions to seek health care for herself.

Modernity is another factor that potentially affects the existence of unmet need. This was assessed by asking the woman questions about who should choose a spouse for the boys or girls in her family, and whether she had had a choice in the selection of her husband. To elicit attitudes towards contraception, women were asked whether they found it acceptable to have family planning information provided on broadcast media and whether Islam allowed the use of family planning. They were also asked about their knowledge of both modern and traditional contraceptive methods, and whether they had heard of contraception from a health care provider or on television advertisements.

Data analysis

The study used the SAS system for data analysis using the principles of case-control studies (SAS Institute, 1994). All predictor variables (except current age) were dichotomized. The bivariate results (table 1) are summarized in terms of the percentage of non-users and users who possess specific attributes (e.g. any schooling, allowed to go to market by herself). A multiple logistic regression model was designed, including those variables that distinguished non-users from users at the 95 per cent confidence level in the bivariate analysis (table 2). Results are presented as odds ratios with 95 per cent confidence intervals. Finally, each woman's perceptions about the fertility preferences of her husband and mother-in-law were compared with the preferences reported by the husband and mother-in-law themselves. We looked at the association between these responses using chi-square (tables 3 and 4).

Results

There was no difference in age between users and non-users: both had a mean age of 27 years. Non-users had significantly fewer sons and daughters than users, though the difference between the two groups is more pronounced for sons than for daughters. Non-users were as likely to have received formal education as users, but were slightly less likely to have been related to their spouses prior to marriage ($p = 0.08$). A non-significant difference in socio-economic status was observed between the two groups, with non-users being less likely to own a bicycle, motorcycle or car than users ($p = 0.095$).

With regard to fertility preferences, 62 per cent of non-users perceived that their spouse also wanted no mote children compared with 69 per cent of users, but this difference is not statistically significant. Only 24 per cent of non-users believed that their mother-in-law concurred with their fertility goals compared with 43 per cent of users, a highly significant difference ($p < 0.01$). With regard to inter-spousal communication, 79 per cent of non-users discussed their sexual life with their spouse, significantly fewer than among users (88 per cent; $p = 0.02$). Women's economic independence was also significantly associated with unmet need for family planning. Among non-users, only 15.5 per cent of the women worked for pay or perceived that they would be allowed to work if the need arose, compared with 26 per cent of users ($p = 0.02$). There was no difference between the two groups in their mobility outside the home:

Table 1. Comparison of non-users and users of contraception in terms of specified factors in squatter settlements of Karachi, Pakistan

Factors	Non-users (percentage)	Users (percentage)	p-values (percentage)
Socio-demographic			
Mean age	27.0 years	27.1 years	0.74
Has at least four live children	52	72	<0.01
Has at least two live sons	61	82	<0.01
Has at least two live daughters	50	64	0.01
Has some formal education	44	48	0.47
Related to spouse prior to marriage	59	68	0.08
Family owns bicycle, motorcycle or car	36	45	0.095
Perceived preferences			
Perceives that her husband concurs with her fertility preferences	62	69	0.17
Perceives that her mother-in-law concurs with her fertility preferences	24	43	<0.01
Inter-spousd communication			
Has discussed their sexual relationship with her spouse	79	88	0.02
Autonomy			
Works or perceives that she will be allowed to work if the need arose	16	25	0.05
Allowed to go to the market by herself	27	27	0.94
Allowed to travel on a bus by herself	28	21	0.16
Modernity			
Able to make a decision to seek health care for herself	33	33	0.22
Had a say in the choice of her spouse	5	5	0.16
Thinks that boys should choose their spouses	27	31	0.43
Thinks that girls should choose their spouses	24	24	1.00
Family planning exposure and attitudes			
Has heard about family planning from a health care provider	73	90	<0.01
Has seen family planning ads on television	94	98	0.05
Finds the provision of family planning information on broadcast media acceptable	65	80	<0.01
Thinks that Islam allows the use of family planning	23	34	0.03
Knows of more than six modern contraceptive methods	30	57	<0.01
Number	129	258	

Table 2. The multiple logistic regression model of factors related to unmet need for family planning in squatter settlements of Karachi, Pakistan

Variables	Odds ratio[a]	Confidence intervals	p-values
Perceives that her mother-in-law concurs with her fertility preferences	0.38	0.23-0.64	<0.01
Has at least two live sons	0.30	0.18-0.50	<0.01
Has at least two live daughters	0.51	0.32-0.82	<0.01
Discusses their sexual relationship with her spouse	0.42	0.22-0.79	<0.01
Works or perceives that she will be allowed to work if the need arose	0.47	0.26-0.87	0.02

[a] The odds ratio represents how likely a woman with an unmet need for family planning is to give a positive response to a question when compared to a woman who is a consistent user of a modern contraceptive method. For example, a woman with an unmet need for family planning is only 0.3 times as likely as a consistent user of a family planning method to have at least two live sons.

73 per cent of both groups were not allowed to go to the market by themselves. Similarly, 73 per cent of non-users and 79 per cent of users were not allowed to travel on a bus by themselves. When comparing the women's ability to decide to seek health care for themselves, 22 per cent of non-users and 28 per cent of users perceived that they could make the decision themselves, a further non-significant result. None of the modernity indicators showed significant differences between non-users and users.

Seventy per cent of non-users think it acceptable for information about family planning to be shown on television, compared with 83 per cent of users (<p <0.0l), and 22.5 per cent of non-users think that Islam allows family planning compared with 34 per cent of users (p = 0.03). Non-users were less likely to have heard of family planning from a health care provider (73 per cent) than users (90 per cent; p <0.01). They were also likely to know fewer methods of family planning overall (mean = 7.1/12) than women who were consistent contraceptive users (mean = 8.4/12; p <0.00l) and they were less likely to know about modern contraceptive methods (mean = 5.6/9) than were users (mean = 6.6/9; p <0.00l).

On the basis of these bivariate results, a multivariate model was built to include factors with significant differences at the 95 per cent confidence level.

Table 3. Actual fertility preferences of mother-in-law, by women's perception of mother-in-law's preference, in squatter settlements of Karachi, Pakistan

Woman's perception of mother-in-law's fertility preferences	Mother-in law's actual fertility preferences			
	Wants woman to have no more children (percentage)	Wants woman to have more children (percentage)	Unsure or says it is God's will (percentage)	Total (percentage)
Non-users (unmet need)				
Mother-in-law wants her to have no more children	10 (32)	4 (13)	17 (55)	31 (100)
Never discussed with mother-in-law	13 (22)	3 (5)	42 (72)	58 (100)
Mother-in-law unsure how many or says it is God's will	3 (12)	1 (4)	21 (84)	25 (100)
Mother-in-law wants her to have more children	2 (15)	2 (15)	9 (69)	3 (100)
Total	**28 (22)**	**10 (8)**	**89 (70)**	**127[a] (100)**
Chi-square = 7.58, p = 0.27				
Users of contraception				
Mother-in-law wants her to have no more children	74 (66)	7 (6)	31 (28)	112 (100)
Never discussed with mother-in-law	33 (36)	2 (2)	57 (62)	92 (100)
Mother-in-law unsure or says it is God's will	9 (24)	5 (14)	23 (62)	37 (100)
Mother-in-law wants her to have more children	2 (12)	9 (53)	6 (35)	17 (100)
Total	**118 (46)**	**23 (9)**	**117 (45)**	**259 (100)**
Chi-square = 79.5, p <0.001				

[a] Out of a total of 129 mother-in-law responses, two had missing data.

Results are presented in terms of odds ratios (ORs) and 95 per cent confidence intervals. However, as it was clearly redundant to include the number of living children in addition to sons and daughters, this variable was dropped. Indicators of attitude to and knowledge of contraception were also omitted because of ambiguity about causal direction (the adoption of contraceptive use, for instance, may precede the development of positive attitudes, and the decision to adopt a method may stimulate information-gathering).

The final multiple logistic regression model shows that users were more than twice as likely as non-users to perceive that their mothers-in-law agree

Table 4. Actual fertility preferences of husbands, by women's perception of their preferences, in squatter settlements of Karachi, Pakistan

Woman's perception of husband's fertility preferences	Husband's actual fertility preferences			
	Wants no more children (percentage)	Wants more children (percentage)	Unsure or says it is God's will (percentage)	Total (percentage)
Non-users (unmet need)				
Husband wants no more children	22 (28)	6 (8)	52 (65)	80 (100)
Never discussed with husband	7 (37)	2 (11)	10 (53)	19 (100)
Husband unsure or says it is God's will	2 (15)	0 (0)	11 (85)	13 (100)
Husband wants more children	3 (21)	4 (29)	7 (40)	14 (100)
Total	**34 (27)**	**12 (10)**	**80 (63)**	**126[a] (100)**
Chi-square = 10.13, p = 0.119				
Users of contraception				
Husband wants no more children	107 (60)	4 (2)	67 (38)	178 (100)
Never discussed with husband	19 (63)	2 (7)	9 (30)	30 (100)
Husband unsure or says it is God's will	6 (26)	1 (4)	16 (70)	23 (100)
Husband wants more children	11 (46)	3 (13)	10 (42)	24 (100)
Total	**143 (56)**	**10 (4)**	**102 (40)**	**255[b] (100)**
Chi-square = 17.34, p = 0.008				

[a] Out of a total of 129 husbands' responses, three had missing data.

[b] Out of a total of 258 husbands' responses, three had missing data.

with their fertility preferences after all other factors have been controlled for (OR = 0.38; p <0.01). The users were also three times as likely as the non-users to have at least two living sons (OR = 0.30; p <0.01). Furthermore, women using contraception consistently were twice as likely as non-users to work, or to perceive that they would be able to work if the need arose (OR = 0.47; p = 0.01). They were also slightly less than twice as likely as non-users to have at least two living daughters (OR = 0.51; p <0.01) and to discuss their sexual relationship with their husband (OR = 0.42; p <0.01).

In order to assess whether the woman's perceptions about the fertility preferences of her mother-in-law and husband were correct, the responses of her mother-in-law and husband themselves concerning how many additional children they wanted the woman to have were analysed (tables 3 and 4). Twenty-two per cent of the mothers-in-law of non-users wanted their

daughters-in-law to have no more children compared with 46 per cent of the mothers-in-law of users. Similarly, the non-users' husband was less likely to want no more children (27 per cent) than the users' husband (56 per cent).

The consistency of responses to questions about fertility preferences by women, their husband and their mother-in-law was examined. This analysis was stratified on the unmet need status of the women. Among non-users who believed that their mothers-in-law wanted them to have no more children, 32 per cent of their mothers-in-law actually did not want them to have any more children (table 3). Among users, this number rose to 66 per cent. Interestingly, there is no statistically significant association between the responses of non-user women and those of their mothers-in-law ($p = 0.27$); however, the responses of users are strongly associated with the responses of their mothers-in-law ($p < 0.001$).

Similarly, there is no statistically significant correlation between the responses of non-users and those of their husband ($p = 0.12$); however, the responses of users are significantly correlated with the responses of their husband ($p = 0.008$). Furthermore, among non-users, only 28 per cent correctly perceived that their husband did not want any more children, though among users this rose to 60 per cent (table 4).

In summary, the results show that the factors influencing the existence of unmet need for family planning among women of the urban squatter settlements of Karachi include the woman's perception that her mother-in-law's goals for her fertility differ from her own, a lack of female autonomy indicated by her perception that she cannot be economically independent, and a lack of communication with her spouse on sexual matters. The number of surviving sons and, to a lesser extent, daughters also influenced contraceptive use among women who wanted no more children. Furthermore, the mother-in-law and husband of users were much less likely to want more children than those of non-users.

Discussion

Factors identified as determinants of unmet need have included access and quality of available health care services, health concerns about contraceptive use, social and familial opposition, especially from husbands, and a low perceived risk of pregnancy (Bhushan, 1996; Bongaarts and Bruce, 1995; Schuler and others, 1994). In the Philippines, the main factors found to be associated with unmet need were the strength of women's reproductive

preferences, the fertility preferences of the husband and the perceived detrimental health side-effects of contraceptive methods (Casterline and others, 1996).

The reasons for unmet need identified in this study differ in a number of aspects from those identified in other surveys on this subject. This difference stems in part from the specific nature of the Karachi study population. Difficulty in accessing distant family planning services, which has been identified as an important risk factor, can pose a significant problem for women in rural settings. However, in this study area, a strong programme for provision of family planning services exists, making this factor less relevant. Considering barriers to access other than distance, both users and non-users were equally likely to perceive that someone other than themselves makes the decision for them to seek health care.

Perhaps most interestingly, this study identifies the mother-in-law as the key figure whose perceived opposition is likely to deter women who profess to want no more children from adopting contraceptive methods. Previous studies have had mixed results. Some have shown the mother-in-law to influence contraceptive use; for example, the presence of the mother-in-law in the home tends to be correlated with low contraceptive usage in South Asia (Caldwell and others, 1982; Poffenberger and Poffenberger, 1965). On the other hand, in-depth interviews in Punjab Province of Pakistan have shown that family elders have less influence than before, leaving fertility decision-making to the couple themselves (Casterline and others, forthcoming). This study may be the first to show a direct relationship between unmet need for family planning and the women's perception that their mothers-in-law do not agree with their desire to cease childbearing. In our model, this perception on the woman's part is the strongest predictor of use (apart from number of sons) among the wide range of factors that were assessed. Furthermore, mothers-in-law of women with unmet need are more likely to corroborate the perceptions of their daughters-in-law that they want them to have additional children, highlighting the important role that mothers-in-law play in unmet need for family planning.

Further evidence regarding effective communication between users and their mothers-in-law is demonstrated by the highly significant association between these women's perception of their mothers-in-law's fertility preferences and the mothers-in-law's actual preferences (table 3). The strong evidence from the perspectives of both women and mothers-in-law underlines the decision-making role and power that mothers-in-law continue to have within Pakistani families. Appreciation of the role of the mother-in-law in the

complex process by which women who want no more children but fail to use a modern contraceptive method can imply important changes in the selection of the target audience for education and information campaigns in family planning programmes aimed at reducing unmet need. Spousal influence on women's contraceptive practices is well accepted; however, this study highlights the hitherto-unrecognized contributions of the mother-in-law.

The study found little difference between those women with an unmet need for family planning and those consistently using a modern family planning method in terms of their perception of their husband's fertility goals, with substantially more than half the women in both groups believing that their husband also wants no more children However, the husband of a non-user is less likely to express a desire to stop childbearing (27 per cent) than the husband of a user (56 per cent) (table 4). Further analysis shows that there is a statistically significant association between the husband's expressed fertility preferences and the woman's perceptions of her husband's fertility preferences among users but not among non-users (table 4). The low consistency between the responses of women and their husband in the non-users group signifies poor communication on the subject of fertility preferences within this group. In other areas of Pakistan unmet need for family planning is strongly linked with women's perception of spousal opposition (Casterline and others, forthcoming). These results regarding women's perceptions of their husband's fertility goals do not reflect this; it may be explained by the stronger role that is played by the perceived opposition of the mother-in-law. Other possible explanations may be differences in the populations studied, this one being exclusively urban compared with the mixed but predominantly rural population studied by Casterline and others. The role of spousal opposition may be different in the two studies, but both demonstmte that the husband's opposition, either real or perceived, contributes to unmet need. Family planning programmes should therefore continue to target the husband, as an important decision-maker, in the process of addressing unmet need for family planning.

Women were also asked whether they and their husband ever discussed their sexual relationship. This was used as a measure of the most intimate kind of communication in a society where discussions about sex are taboo. The data show that women who had such discussions were less likely to have unmet need than those who did not. This association supports previous studies that show that inter-spousal communication is correlated with contraceptive use. Previously, it was unclear whether discussion with the spouse about family planning led to contraceptive use or vice versa (Robey and others, 1996). The

relationship found in this study between poor spousal communication about sex and unmet need for family planning suggests that communication about topics that are generally regarded as taboo is a determinant of consistent use of a modern contraceptive method among women who profess not to want any more children.

Another important factor identified in this study is the presence of two living sons and two living daughters. Women who have an unmet need for family planning are less likely to have at least this number of living children than women practising consistent contraception. The greater effect of having two living sons may be reflective of the male gender preference that exists among the population of Karachi's squatter settlements. The relationship between having fewer than four children and unmet need also points to another previously identified determinant of unmet need, i.e. how strongly the woman holds the fertility goals she espouses (Westoff and Bankole, 1995; Casterline and others, forthcoming). If the study population regard a family of four children with at least two sons as ideal, then, although women with fewer children may profess to want no more children, they may not hold those fertility goals as strongly as women who have achieved the "ideal" family size. Alternatively, they may be under external pressure to have more children. The family planning programme, therefore, may be most efficient in concentrating on couples who have completed their desired family size, and in making efforts to change perceptions about what constitutes an ideal family size. The latter of these two options is probably the more difficult, at least in the short term. The preference for sons is perhaps the most difficult factor to address effectively as the perception of a son as an asset and a daughter as a burden is deeply ingrained in this society. Ultimately, interventions that help to overcome gender bias may prove to be the most effective in reducing fertility in Pakistan.

The importance of female autonomy in contraceptive use has been identified in the past (Sathar, 1996). This study shows that women who believe that they will not be allowed to work are twice as likely to have an unmet need for family planning as women who are either working for income or those who believe that they would be allowed to work if necessary. However, none of the other items that were used to measure female autonomy, including mobility outside the home and the woman's ability to decide to seek health care for herself were found to be related to the existence of unmet need for family planning. This implies that a woman's perception that she can be economically self-sufficient, to a degree, independently protects her against unmet need for family planning, even in the absence of other forms of autonomy. Consequently, one of the most important interventions for addressing

contraceptive needs may actually be to empower women economically, as has also been mentioned by Sathar (1996). Further investigation into the autonomy paradigm and its influence on contraception is needed.

Similarly, the analysis shows that there is no difference in terms of the items measuring modernity between those who have unmet need and those who do not, with one exception. Non-users were consistently more likely to disapprove of the provision of family planning information on broadcast media than women who use contraceptive methods. This presents an analytical dilemma, as the direction of the causal relationship is ambiguous. Similarly, though lack of knowledge of family planning and discussions with health care providers are clearly related to unmet need, it is unclear what the causal direction of this relationship is. However, it may suggest that health care providers can play an important role in addressing unmet need and perhaps should be trained to counsel each woman of childbearing age, whenever the opportunity arises, about family planning methods, their advantages, disadvantages and availability.

A potential bias that may have affected the study could have arisen if mothers-in-law were aware of the study's relationship to the Primary Health Care Programme, which actively promotes contraception in their community, and consequently downplayed their opposition to family planning or smaller families. However, such bias would be unlikely to overstate the relationship between their perceived or real opposition and unmet need for family planning. On the contrary, if a bias in that direction had occurred it would have rather tended to underestimate the effect of the mother-in-law's influence in discouraging her daughter-in-law from using contraception.

Recommendations for reducing unmet need in the squatter settlements of Karachi, based on this study, include improvements in the family planning programme. In particular, the educational and informational components of family planning progmmmes should widen their focus to include among target audiences older women, many of whom are currently acting as obstacles to the adoption of contraception by their daughters-in-law. Social changes outside the domain of the family planning programme, such as policies to enhance female economic autonomy, may be equally important in the longer term. Specifically, in order to address the role of son preference, two major societal changes are needed: first, the educational and economic empowerment of women and, second the provision of a social security net which prevents parents from being solely dependent on their male offspring in advanced age.

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Sex-Selective Abortion: Evidence from a Community-based Study in Western India

Only far-reaching social changes that aim at increasing female autonomy, female economic power and the value of the girl child are likely to make a significant impact on the demand for sex-selective abortion

By Bela Ganatra, Siddhi Hirve and V. N. Rao*

Selective abortion of female foetuses has been documented in India as early as the late 1970s when amniocentesis for genetic screening became available (Ramanama and Bambawale, 1980), but it was only with the

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increasing availability of ultrasound technology in the mid-1980s that the practice became widespread. Most of the existing evidence on sex-selective abortion comes from micro-studies in northern India. These have demonstrated a widespread acceptance of the practice, and several researchers have documented indirect evidence in the form of increasing sex ratios at birth in hospitals or within communities (Booth and others, 1994; Gu and Roy, 1995; Khanna, 1997; Sachar and others, 1990 and 1993; Sahi and Sarin, 1996). While abortion (also called medical termination of pregnancy, or MTP) on broad social and medical grounds has been legal since 1972, sex selection is not. The state of Maharashtra, where the present study was conducted banned prenatal sex selection in 1988; the Prenatal Diagnostic Techniques Bill made sex detection tests illegal throughout India in 1994.

This article examines the circumstances surrounding the abortion decision as well as the actual abortion experience of 252 rural women in the state of Maharashtra in western India who underwent a sex-selective abortion. It also compares the profile and abortion experience of these women with those of 1,085 women from the same community who had undergone an induced abortion for reasons other than sex selection. Such evidence is a crucial first step in evaluating potential approaches aimed at reducing the high prevalence of sex-selective abortion.

Methods

The present article focuses on a part of the data from a rural, community-based study of induced abortions that was carried out by the KEM Hospital Research Centre in 139 villages (population 324,431) in three districts of western Maharashtra during the period 1996-1998. Public sector abortion services in the area include the district hospitals, teaching hospitals in nearby cities, and some primary health centres and rural hospitals. As elsewhere in western Maharashtra, in addition to public sector services, a number of small private hospitals offering varying levels of abortion services are present throughout the study area. Parts of the study area are also serviced by non-governmental organizations (NGOs). Fifteen per cent of the villages were within 5 km of a functioning government facility providing abortion services, while one third of the villages (33.1 per cent) were within a 5-km radius of a private practitioner offering abortion services.

An elaborate community network (health and other workers, community men and women, women's groups) and providers of abortion services were used to identify and enrol women who underwent an induced abortion during

an l8-month reference period in 1996-1998. Both types of information sources served as an initial link between the researchers and the abortion-seekers both in seeking permission from the women concerned and in setting up interview logistics. Information from providers was used only if both the client and the provider agreed.

Married women who were known to have had an abortion were approached by field workers with a structured questionnaire on general pregnancy and health issues. Women were never confronted with the prior knowledge of their abortion and, if this fact was got spontaneously acknowledged by the women during the interviews, the matter was not pursued. Diffuser (dummy) interviews using the same questionnaire were held with other married women from the same village who were not known to have had an induced abortion in the study period. This helped to prevent women who had undergone an induced abortion from becoming a focus of undue attention from the community.

Interviews were conducted in clinics, homes or elsewhere depending on circumstances. The interview questions were framed within a broader context of questions on past pregnancy outcomes and health complications. However, if, during the course of a detailed pregnancy history, the woman acknowledged her induced abortion, further questions about the entire episode were canvassed using a combination of a structured questionnaire, open-ended probes and a qualitative timeline of sequence of events. Women were free to discontinue the interview at any point. Back-up medical services were made available, where required, to all participants through the outreach programme and tertiary care facilities of the KEM Hospital as well as through other referral and teaching hospitals providing services in the study area.

Additionally, 178 providers known to offer abortion services in and around the study area and nearby towns were interviewed for their perspective on induced abortions.

Results

A total of 1,717 married women from the study area were found to have undergone an induced abortion during the reference period. Of these, 19 (1.1 per cent) refused to be interviewed and a further 177 (10.3 per cent) could not be interviewed as they subsequently migrated out of the study area, or were deliberately not interviewed because the research team perceived them to be at social risk. A further 112 women (6.5 per cent) agreed to be interviewed, but

Table 1. Reasons for induced abortion among 1,409 women who acknowledged their abortion in Maharashtra study area

Reason for abortion	Number of abortions	Percentage
Sex selection		
Because foetus was thought to be female	263	17.6
Because foetus was thought to be male	2	0.1
Unrelated to sex selection		
Birth spacing	472	31.6
Desired family size reached	599	40.1
Failure of contraception	41	2.7
Other	40	2.5
Subtotal	**1,152**	
For medical reasons such as serious maternal illness	75	5.2
Total	**1,492**	**100**

labelled their abortion episode as spontaneous or denied having had an abortion.

A final total of 1,409 women who acknowledged an induced abortion during the reference period were interviewed. Of these, 252 women reported that the main reason for the abortion was to avert the birth of a girl child (n = 263 abortions), accounting for 17.6 per cent of all identified abortions among married women. Two women had a sex-selective abortion to abort a male foetus. Non-sex-selective reasons, including spacing, limiting family size and contraceptive failure, were cited by 1,085 women (n = 1,152 abortions) (table 1).

Further analysis examines the characteristics of the 252 women who had an abortion to avert the birth of a daughter, and compares this group with the 1,085 women who had abortions for other reasons. Second and third abortions that occurred during the reference period in the same women were excluded in the comparative analysis, as were the abortions that occurred for medical reasons (n = 75), and two cases where the foetus was aborted because it was male.

General profile

The mean age of women undergoing a sex-selective abortion was 24.8 years, which is similar to that of other abortion-seekers. Their mean level of education was 5.7 years, which was marginally but not significantly lower than that of other abortion-seekers (mean education = 6.3 years). The husbands of

Table 2. Socio-economic profile of women who underwent a sex-selective abortion in Maharashtra study area compared with women who underwent abortions for other reasons

Socio-economic factors	Odds ratio (unadjusted)	95 per cent C.I.
Family characteristics		
Living in a joint family	1.84	1.36-2.49
Cohabiting mother-in-law	1.86	1.41-2.47
Farming is primary occupation	1.89	1.42-2.51
Own a house with separate kitchen	1.53	1.03-2.28
Own irrigated land	1.74	1.06-2.89
Role in decision-making		
Buying groceries	0.63	0.44-0.9
Making household purchases	0.51	0.34-0.76
Seeking care for child illness	0.69	0.5-0.95
Autonomy		
Independent income source	0.67	0.46-0.9
Family permission needed to go to the market	1.44	1.01-2.13
Spousal communication		
Ever discuss contraception/family size with husband	0.47	0.33-0.68

the women undergoing a sex-selective abortion were as well educated as the husbands of other abortion-seekers (9.2 years compared with 9.4 years). The proportion of Muslim women was significantly lower among the sex-selective abortion seekers (3.4 per cent) than among non-sex-selective abortion-seekers (9.3 per cent).

Sex-selective abortion-seekers were significantly more likely to come from joint families and were better off economically (as measured by owning a house with a separate kitchen and irrigated land) than women who had an abortion for other reasons (table 2). However, they had less autonomy and mobility, and were less likely to play a major mle in family decision-making. They were also less likely to have an independent source of personal income and even when they did earn money, a significantly lower proportion of these women were able to keep or spend their earned income (12.5 versus 38.4 per cent).

Family size and sex composition of living children

None of these 263 sex-selective abortions took place during the woman's first pregnancy and only one woman had no living children; however, nearly

Table 3. Sex composition of living children belonging to women who underwent sex-selective abortions in Maharashtra study area

Number of living children	Number of women	Percentage
No living children	1	0.4
1 living child	49	19.8
1 son	3	1.2
No son	46	18.6
2 living children	81	32.7
1+ sons	13	5.2
No sons	68	27.5
3 living children	75	30.4
1+ sons	34	13.8
No sons	41	16.6
4+ living children	41	16.6
1+ sons	13	5.3
No sons	28	11.3
Total	**247**	**100**
1+ sons	63	25.5
No sons	184	74.5

one fifth (19.9 per cent) took place among women who had only one living child, usually a daughter (table 3). While the majority of these women did not have living sons, over a quarter (25.5 per cent) already had one or more living sons at the time they had a sex-selective abortion. The youngest living child at the time of the sex-selective abortion was usually a daughter (86 per cent).

Previous abortions

The index abortion was not necessarily the respondent's first abortion. Thirty-nine (15.5 per cent) of the 252 women who underwent a sex-selective abortion, and 201 (18.5 per cent) of the 1,085 women who had an abortion for other reasons had a history of an induced abortion before the study period. Among women whose current abortion was sex-selective, nearly all past abortions (97.4 per cent) were also for sex selection. Among other abortion-seekers, only 1.5 per cent cited sex selection as the reason for previous abortions.

Pathways to decision-making

The majority of women in both groups reported that they, together with their husband, were the primary decision makers in deciding to terminate the pregnancy. Other family members were significantly more likely to know of

and be involved in the decision in the case of a sex-selective abortion. Among women living in joint families, mothers-in-law were more likely to know of the woman's intention to undergo a sex determination test or sex-selective abortion (96 per cent) than they were to know of an abortion for another reason (77 per cent). The same was true of fathers-in-law (94 versus 68 per cent) and sisters-in-law (91 versus 72 per cent).

In-depth interviews with 12 of the women who underwent a sex-selective abortion revealed the complex nature of the decision-making process with two prominent patterns emerging. In the first pattern although no overt demand to undergo a sex determination test was made by the family, women "decided" on the sex-selective abortion as a response to the intense pressure to produce male heirs, at times through implicit threats of the husband's remarriage. These women did not want to suffer the burden of frequent and repeated childbirths in order to fulfil their obligation of producing the required number of sons:

> "You know how it is. Once you have decided that you don't want to increase your family size, then there is no alternative other than going for it (sex determination test and abortion)". **(20-year-old woman with two daughters, educated to ninth standard)**

> "My mother-in-law used to say: 'I won't say anything, but tomorrow if my son starts feeling that he should have a son and if he thinks about remarrying, then don't blame me at that time. You manage with that'. After all such things, I am having fear in my mind, so I thought let's try and go for checking (the sex)". **(21-year-old woman with two daughters, educated to third standard)**

In the second pattern, the demand for a sex determination test came directly from family elders, often against the wishes of the woman herself. The husband usually agreed with the elders or remained indifferent:

> "This time my mother-in-law wanted a boy. So she decided we should check it (the sex of the foetus). My husband did not say anything. What can I say? I do whatever elderly people in the family say". **(21-year-old housewife, who had had two sex-selective abortions)**

Twenty women (7.9 per cent) who ultimately underwent a sex-selective abortion reported that the pregnancy was unwanted for additional reasons (spacing or limiting family size), but family and other community members

opposed their wish to go for an early abortion and influenced them to wait for a sex determination test before making a decision to abort. Eighteen sex-selective aborters (7.1 per cent) reported that they initially went to a doctor seeking an early pregnancy termination, but were advised by the medical practitioner to defer the abortion until they had confirmed the sex of the baby through sonography:

> "We have two daughters. We had already decided to do curetting and have an operation. I had gone to the hospital. The doctor there said: 'You check it (the sex) first. Why should you go for it (the abortion) if it is a boy!'" **(20-year-old housewife with two daughters)**

Eleven women (4.4 per cent) said they had intended to abort in early pregnancy but circumstances (farming season, family illness) delayed their ability to act on the decision. Since they were already advanced in pregnancy, they decided to wait for a sex determination test before making a final decision. All of these women said they would have continued with the pregnancy if the sonography had indicated a male foetus.

While the decision to abort was taken within the marital family, women undergoing sex-selective abortion were more likely to be sent to their natal homes for the actual abortion than were other abortion-seekers (13.9 versus 4.9 per cent), mainly because of the high expenses involved in the procedure.

Provider choice

Sex-selective abortions were preceded by a sex determination test. Nearly all of these (97.2 per cent) took place in the private sector, and most (95 per cent) were done by sonography. Amniocentesis was used in only six cases and seven women diagnosed the sex of the foetus as female based on ethno-diagnostic methods (such as advice from a faith healer and excessive nausea in early pregnancy).

In-depth interviews indicated that providers did not supply their diagnoses in writing because this could have been used as proof of their involvement in sex-selection practices.

The insistence of the medical provider or the fear of a misdiagnosis of the sex of the foetus led 50 (19.8 per cent) women to have a second, and sometimes third ultrasound sex determination prior to the abortion. The following remark was typical:

Table 4. Providers used for second-trimester abortions in Maharashtra study area[a]

Providers	Sex-selective abortions	Other abortions	P vaues
Abortion	**(n = 235)**	**(n = 127)**	
Traditional	1.2	1.6	0.81
Private sector	85.1	51.2	<0.0l
Non-allopathic	14.9	10.2	0.25
Bachelor of Medicine and Bachelor of Surgery	16.2	10.2	0.06
Diploma/degree io obstetrics and gynaecology	49.8	22.0	<0.01
Specialists in other areas	4.3	8.7	0.08
Public sector	13.6	47.2	<0.01
Median distance travelled to abortion provider	15 km (range =l-70 km)	9 km (range =l-80 km)	<0.0l

[a] Only second trimester abortions are considered in order to control for gestational age.

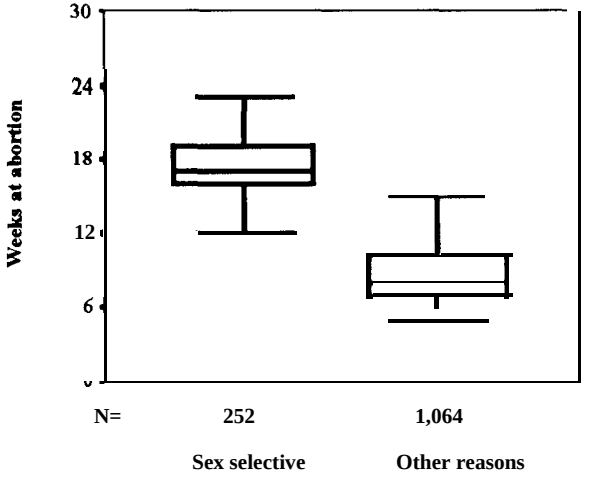
> "We checked twice. To confirm it, we went to (the provider). It (the foetus) was far (in a late stage of development) and we had to spend a little more, but my husband said: 'That is not the problem, but whatever is to be done should be done properly"'. **(22-year-old mother of three daughters)**

The subsequent sex-selective abortions were also significantly more likely to take place in the private sector than were abortions for other reasons. The comparison in table 4 is restricted to second trimester abortions to eliminate the confounding effect of gestational age on the choice of a provider. A higher proportion of these women went to more qualified providers and travelled significantly farther to obtain services. Several women (13.6 per cent) had a sex determination test in the private sector and the subsequent abortion in a public hospital, primarily for financial reasons. Even though the public sector does not provide sex-selective abortions, these women were able to obtain pregnancy terminations easily by not revealing the sex determination test and citing reasons other than sex selection for seeking an abortion. Interestingly, even when both the sex determination test and the abortion were done in the private sector, the majority of women (84 per cent) used different providers for the two events. This was true even when facilities for both were available at the same place.

Timing

The determination of foetal sex on sonographic examination is usually not done before 13-14 weeks of pregnancy. Consequently, both the decision to

Figure 1. Comparison of the timing of actual abortion between sex-selective abortions and abortions for other reasons in Maharashtra study area*



* *Note:* The figure compares the distribution of gestational age at abortion (graphically presented as box and whisker plots) of women with sex-selective abortions and women with abortions for other reasons. The lower and upper borders of the box represent the 25th and 75th percentile of the gestational age values, and thus the depth of the box represents the interquartile range, within which 50 per cent of the values fall. The horizontal line inside the box represents the median (50th percentile) gestation age at abortion. The whiskers are lines that extend from the lower and upper end of the box to the lowest and highest values respectively, excluding the outliers. They represent the distribution from the 25th or 75th percentile to the lowest or highest value, which falls within 1.5 times the interquartile range. These are the tails of the distribution. As shown above, the distributions are slightly skewed towards the upper or higher end.

abort as well as the actual sex-selective abortion took place significantly later than did other abortions (mean gestation 17.2 versus 9.2 weeks) (figure 1). The mean lag between the decision to abort and the actual abortion was, however, significantly lower among women seeking abortion for sex-selective reasons than it was among women seeking abortion for other reasons (1.2 versus 2.4 weeks). Sex-selective abonions accounted for over two thirds (68 per cent) of all second trimester abortions among married women in the study. Fifty-one (12 per cent) of the sex selective abortions were performed after the legally permissible limit of 20 weeks gestation.

Table 5. Comparison of abortion experience among women who underwent sex-selective abortion with those who had abortions for other reasons in Maharashtra study area

Experience	Percentage of sex-selective abortion-seekers (n = 252)	Percentage of other abortion-seekers (n = 1,085)	P value
Husband's signature/consent required	26.5	20.6	0.03
Abortion procedure explained to woman	58.0	27.2	<0.01
Post-abortion contraceptive counselling given	35.7	62.8	<0.01
Post-abortion contraceptive adopted	32.6	61.5	<0.01
Mean cost of second trimester abortion[a]	Rs.1,594	Rs.967	<0.01
Self-reported post-abortion morbidity	74.5	65.0	<0.01

[a] US$l = 46.7 Indian rupees (Rs.).

The experience of sex determination and abortion

The lateness of sex-selective abortions as well as their illegality contributed to the mean cost for abortion being higher for these abortion-seekers than for other women undergoing second trimester abortions. Providers were also more likely to insist on written consent from the husband (not a legal requirement under Indian abortion law) for women seeking abortion for sex-selective reasons (table 5). Most women were satisfied and spoke well of the providers but several recounted exploitative situations:

> "He checked the sex on a TV; we cannot see it. He saw it and then sat on his chair. We asked him, 'Tell us, what is it?' He said: 'First you give me my money and then I will tell.' We got angry. It is not that we did not have money, my husband never says 'no' for money; but we did not like the way the doctor talked to us. I said to him 'Did you feel that we will not pay your fees if it is a girl child?'" **(21-year-old housewife, who had had two induced abortions)**

Women undergoing a sex-selective abortion were less likely to be counselled on post-abortion contraceptive use and were also less likely to adopt post-abortion contraception. They were also more likely to be shown the aborted foetus than other women having second trimester abortions and to be given the foetal remains for disposal. Of the 185 women who were shown the aborted foetuses, five said the aborted foetns was male and not female as

expected. In-depth interviews revealed the mixed feelings that ranged from relief that the aborted foetus was female, to intense guilt coupled with attempts to rationalize their actions:

> "I got admitted. The medicine was put inside and I started worrying. I felt that if that was a son, everyone in the family will blame me. I was praying to God that it should be a girl. When I actually saw a girl, I felt relieved". **(27-year-old second wife and mother of two daughters)**

> "Yes, I saw it. She was like a small doll (showing with her hands). How will I feel? Of course I felt bad. After all it is infanticide; five months were over. I cried a lot, but what to do! Now I have decided; I will not do it again". **(21-year-old housewife, who had had two sex-selective abortions)**

> "The hope for a son was so much that I didn't have any other feeling. I felt sad, but what to do? One has to burn one's mind. There are two daughters, what to do with a third daughter? Nothing else, a son is wanted. Only that is in my mind." **(23-year-old with two daughters, after having a second sex-selective abortion)**

Overall, about 7 per cent of the women who had undergone sex-selective abortion complained of sleep disturbances while about 12 per cent of the women experienced mood changes (persistent sadness, crying episodes) that persisted for at least a month following the abortion. While the trauma of the experience made some decide not to repeat it, 63 per cent of the women who had had a sex-selective abortion said that they would consider sex determination tests and abortion in future pregnancies:

> "If now this time, I get pregnant, will I do the same again? How can we say whether at that time we will have the money in hand or not! Last time we could manage to spend, so we did it. Now let's see if we have the money". **(Mother of two daughters)**

Post-abortion morbidity

Post-abortion morbidity among women who underwent a sex-selective abortion was high. Three quarters of the women reported one or more problems that they felt were severe enough to have disrupted their daily work routine. About 45 per cent of the women complained of prolonged and severe bleeding, 13 per cent had persistent menstrual irregularities and 64 per cent attributed

weakness to the abortion event. While all these morbidities were significantly higher than among other abortion-seekers, the differences between the two groups did not persist after controlling for the trimester in which the abortion took place.

Perceptions of legality

The fact that sex-selective abortions are illegal was widely known by the women in the study. However, nearly all those who had undergone a sex-selective abortion (99.5 per cent) and the majority of other abortion-seekers (97.7 per cent) approved of abortion for sex selection:

> "No, it should not be banned. What will people like us (who do not have sons) do? Already females are more than males in the population". **(Mother of five daughters, who had a sex-selective abortion)**

> "Yes, it should be considered legal. After all . ..what to do? A male child is a must in the family. Otherwise where will people like us go?" **(Mother of two daughters)**

Of the 178 abortion-providers interviewed, 73.3 per cent said that sex selection was unjustified. While they were not directly asked whether they provided services, at least 28 of the providers were known to be performing sex determination tests. Of these, 18 were among those who said that sex-selective abortions were unjustified. However, most providers agreed that the proportion of sex-selective abortions was on the increase as a result of increased awareness about ultrasound screening. Those who talked openly about their own involvement justified their actions by saying that they were only meeting a felt need for such services from the community. One provider went as far as to say: "I use my ultrasound more than my stethoscope"

Discussion

This analysis of sex-selective abortions is a subset of a larger study of induced abortions. Given the multiple sources of information used to identify cases, acceptance of the practice as normative and the willingness of women to talk about the issue, it is unlikely that a significant number of sex-selective abortions that occurred in the study area in the reference period were missed. A limitation of this study design, however, is that the data are restricted to women who underwent a sex-selective abortion; and no information is available on women who had sex determination tests but not subsequent abortions.

Despite the fact that prenatal sex determination and sex-selective abortion are banned and the knowledge of their illegality is widespread, sex selection was a common reason for pregnancy termination among married women in this study. Equally noteworthy is the fact that the study area was in Maharashtra, which is relatively less patriarchal than the northern states, where the practice is assumed to be the most widespread.

Most countries in the South and South-East Asian region, with the possible exceptions of Thailand, Indonesia, the Philippines and Sri Lanka, exhibit a strong son preference (Wongboonsin and Prachuabmoh, 1995). In high fertility settings, this modifies contraceptive use and becomes manifest as increased family size. But as increasing economic pressures and family planning programme successes move families towards a two-child norm, sex-selective abortion becomes a means to meet the conflicting demands of a small family and the desire for sons. In this study, the majority of the sex-selective abortions took place where there were only one or two living children.

Women who seek abortions for sex-selective reasons appear to be distinct from other abortion-seekers: they have less autonomy and weaker decision-making powers within the house and are more likely to be living in larger joint families and therefore more vulnerable to the pressure to produce male heirs. As the decision-making pathways suggest, overt and covert pressures from family, community and even medical practitioners strongly underlie the decision to abort a female child. These women are also at higher medical risk for post-abortion complications because of the lateness of their abortions.

Service providers appear to share the community perception that sex-selective abortion is justified or, at least, to accept it as a pragmatic response to a felt need. Commercial considerations also seem to play an important role: most sex determination tests in this study were done in the private sector, as were the majority of subsequent abortions. A self-protective mechanism seemed to be operating, in that both families and providers encouraged women to use a different provider for the sex determination test and the abortion, making it difficult to link the two events. This also made it possible for some women to have a sex-selective abortion in the public sector, which othetwise does not provide these services.

Interventions which focus on increasing contraceptive acceptance will have little effect in reducing these abortions since it is not the pregnancy but the child that is unwanted. Only far-reaching social changes that aim at increasing female autonomy, female economic power and the value of the girl

child are likely to make a significant impact on the demand for sex-selective abortion. Legal sanctions are also difficult to enforce as a result of the widespread acceptance of sex selection as normative, despite awareness of its illegality, and the difficulty in establishing a direct link between an ultrasound examination and sex determination, or in linking the test to the subsequent abortion. The fact that most providers work in the ever-growing but largely unregulated private sector presents a further obstacle in the path of enforcing the law. Nevertheless, efforts by the medical community to self-regulate its own members and to comply with existing laws banning prenatal sex selection should also receive high priority.

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The Risks of Pregnancy and the Consequences among Young Unmarried Women Working in a Free Trade Zone in Sri Lanka

Programmes are needed to lessen the dangers of free trade zones for young women

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The primary health care system in Sri Lanka has an international reputation for its contributions to reducing the rates of infant and maternal morbidity and mortality. These results have been achieved in part through a

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comprehensive system of early identification of expectant mothers, careful follow-up and monitoring, almost universal hospital deliveries, postpartum follow-up for three months after delivery, an effective immunization programme, nutrition supplements and the reporting of infectious diseases. A key to this system is the "public health midwife" (PHM) who identifies pregnant mothers, ensures their regular attendance at maternal and child health (MCH) clinics, makes monthly home visits, advises pregnant mothers on nutrition and health, facilitates hospital admission for delivery and responds to emergencies. They also provide postnatal follow-up of mother and child (Ministry of Health and Indigenous Medicine, 1998).

In a typical rural community, a PHM is responsible for an average of 3,000 families and addresses the needs of 25-30 expectant mothers a year. This article explores the dynamics of a situation in which the demands on the PHM have expanded tenfold, resulting in significant risks to pregnant women and infants. This situation has arisen following the formation of a "free trade zone" (FTZ) associated with the international airport north of Colombo. That FTZ has dramatically increased the population of the adjoining residential communities from about 9,000 to a current population of 70,000. In addition, the transition has changed the sex ratio from an approximately even balance of females to males to a proportion of nine females for every male. Almost all of these women are unmarried and are mostly aged between 18 and 24. The article aims to identify the factors that contribute to a high rate of premarital pregnancies among FTZ workers and the implications of those pregnancies for the effective delivery of services through the MCH system.

Background

Sri Lanka became involved in export processing in 1978 with the establishment of the FTZ in Katunayake, a northern suburb of Colombo. It is now estimated that there are 60,000 workers in that FTZ, of whom approximately 52,000 are women; the overwhelming majority of these are young women between 18 and 30 years of age. The Katunayake FTZ has become a complex ecological niche comprising factories behind high-security walls and fences; dormitories, small buildings and family homes housing women workers; shops and markets which, while providing basic food and supplies, emphasize jewellery, cloth and dresses geared for young women with disposable income; and streets in which large numbers of young and older men loiter, some of whom derive their financial support by "living off" the earnings of young women.

Into this environment have come young women drawn almost exclusively from the poorest sectors of rural villages. They arrive in communities which were traditionally focused on paddy culture and coconut plantations. With the development of the airport and the FTZ, however, the communities are now characterized by industrial effluent, noise and air pollution, a saturated and polluted water table, overcrowding and other unhealthy environmental conditions. The women work in factories that are crowded, poorly ventilated and have limited resources for supporting workers. They live in crowded dormitories with poor living and cooking facilities. They must cope with the continual advances of men who congregate outside the factories and dormitories in bars, dark places and wooded areas to lure, coerce, take advantage of or prey on young women.

This article is based on a two-year study of behaviour among FTZ women and seeks to determine the level of sexually risky behaviour in this population, to identity the social processes that can lead to such behaviour, and to use the results as a basis for the development of effective risk reduction progmmmes. The results of this research show that a small but significant subset of young women in the FTZ are involved in risky sexual behaviour and therefore are in danger of unwanted pregnancy. The article is aimed at examining the consequences of such pregnancies in the FTZ communities in terms of the social implications for the mother, the health of mother and child, and the impact on the health care system.

Methodology

Data collection for the research was carried out using qualitative and quantitative methods. The first, exploratory stage involved key informants, group discussions and observation. Key informants were visited in the field and interviewed. They were drawn from all categories of people relevant to the subjects under investigation and included factory managers, boarding house landlords, shopkeepers, transport providers, health service providers (belonging to both allopathic and traditional medicine disciplines), public sector officers from national and local administrations, local police, religious organizations, representatives of non-governmental organizations (NGOs) in the area and the male partners of working women. Group discussions were held with PHMs, village officers (*grama niladhari*), three-wheel taxi drivers, female workers and female schoolteachers. Subsequently, systematic observations were carried out in the boarding houses, streets and bazaars, in which both the physical aspects of these environments and people's behaviour were observed and carefully recorded. PHMs were enlisted as interviewers and data collectors and were

given three days of training on qualitative interviewing. Since they had direct and official access to boarding houses, they were asked to meet landlords and residents and collect information on their behaviour. They were also instructed to collect specific cases of women workers whose situations in the communities were difficult. Over a four-month period, case histories of 40 working women with problem situations were collected.

The information collected in the exploratory stage became the basis for the development of a self-administered questionnaire for the second phase of the research. For sample selection, the research area was divided into three geographical units depending on the number of working women living in those areas. These three units were categorized as the heavy concentration area (adjacent to the factory complex), medium concentration area (0.5 to 1.5 km from the factory complex) and low concentration area (1.5 to 3 km from the factory complex). The boarding houses were enumerated and 30 were selected using stratified random sampling. The stratification was on the basis of the size of the boarding house (small, medium and large) and sex of the residents (mixed versus female only). Once the boarding houses were selected, all residents present at the time of the research team's visit were considered part of the sample. A total of 1,162 women responded to the questionnaire, generating 775 complete questionnaires. Analysis of the demographic characteristics of the questionnaires that were only partially completed indicated no significant socio-demographic differences between those women who had and those who had not fully completed the questionnaire.

The third stage of data collection involved the maternal and child health records of the PHMs for their respective divisions. Nine PHM divisions are incorporated into the service delivery area of the District Director of Health Services for the communities associated with the FTZ. Of these, five divisions overlap with the three *grama niladhari* divisions (the smallest administrative division in the country) in which data collection for the sample of female workers was carried out. PHMs are required to maintain a system of mothers' cards, which monitor the pregnancy and care of expectant mothers. The research team collected all mothers' cards maintained for the five divisions, amounting to 1,205 pregnancies registered for one calendar year from 1 July 1995 to 30 June 1996. The cards were collected at the end of 1997 so that all pregnancies during the research period would have been fully resolved. Of these pregnancy records, 270 were randomly selected for analysis. The information collected from the cards included: mother's age, mother's age at time of sexual union, mother's occupation at the time of the pregnancy, parity, the number of visits to the MCH clinic, number of times the PHM met the mother in her field visits, and the outcome of the pregnancy.

A member of the research team visited the two MCH clinics in the study area held every other week and identified expectant mothers coming in for services who were willing to discuss their situation. The researchers conducted an in-depth interview to collect information on the woman's origins, her experiences on arrival at the FTZ, how she met her partner, problems in the relationship with the partner, the nature of the pregnancy and other aspects of the woman's story. A total of 30 women were interviewed by this method.

Results

Premarital sexuality in the FTZ communities

The great majority of women in the FTZ work long hours, walk home quickly and in groups for protection, cook a meal in their tiny rooms and go to bed, repeating the same schedule day in and day out. Some young women thrive in the relative freedom of the FTZ communities, avoiding the constraints and dictatorial demands of parents, and may develop lasting relationships. A subset of women, however, seek and maintain active relationships with their female and male peers, which involves shopping, entertainment and activities outside the factory and residence. From the questionnaire sample, 29.5 per cent of the women report having female friends who often have been in the FTZ longer, and are involved in risky behaviour (alcohol use, living with a man, having sexual relationships). These friendships provide the young women with the knowledge, motivation and initial feeling of security they need in order to begin involving themselves in the FTZ communities outside their residence.

Among the women in the questionnaire sample, 25 per cent reported having a "boyfriend". The boyfriend concept is not a feature of traditional Sri Lankan culture. It implies that young, unmarried women choose a man independently of parental approval and are alone with him without supervision. While a few middle and upper class young women may espouse the idea, such a relationship is virtually unheard of among poor young women in rural Sri Lanka. In the qualitative interviews, many women believe these men to be their fiances whom they will eventually marry.

The men with whom the women become involved are for the most part not permanent residents of the FTZ communities. They include male workers in the factories, members of the armed forces stationed at Katunayake to guard the airport, men who have moved to the zone with other women to avoid problems in their home communities, and tradesmen and taxi drivers who serve

the FTZ communities but live with their wives and families a long way from the zone. The men may be married (and often hide that fact) or unmarried. The case histories collected by the research team indicate that most men profess love and long-term commitment in return for a sexual relationship. The familial, social and cultural constraints that would be present in the villages are absent in the FTZ communities, so these men are free to conduct a sexual relationship, then move on to other women or disappear entirely. A woman who has been loved and left must deal with the disappointment of a lost relationship, made even more extreme if she has taken the man home to her family and announced an engagement. There will also be concern over her loss of virginity and the consequent reduction in her marriageability.

In Sri Lanka, as in many parts of South Asia, it is not easy to collect valid survey data on the sexual relationships of young unmarried women. In this study, risky sexual activities were measured by a number of questions in the questionnaire, including ones which asked about involvement in the following: a sexual relationship (12.8 per cent), oral sex (0.9 per cent), getting pregnant (2.7 per cent), having an abortion (1.4 per cent), having a relationship with a married man (2.6 per cent), and having penetrative sex (2.6 per cent). A positive response to any of these questions was classified as involvement in risky sexual behaviour. Of the 775 respondents, 16 per cent were involved in at least one of these activities.

There is considerable motivation for young unmarried women to under-report sexual activity; therefore, it might be supposed that the actual figure could be somewhat higher. However, as the interrelationships of sexual behaviour are examined in association with other variables, consistent patterns are established which suggest that the group having and the group not having sexual relationships have been reasonably accurately defined. The questionnaire data confirm that there is a significant relationship between having women friends involved in risky behaviour and for the respondent to have a boyfriend ($p < 0.00l$). As one indicator of involvement in the world outside the dormitory and the workplace, 29.8 per cent of women reported attending musical evenings (music and dancing with large numbers of young men and women attending). Having women friends involved in risky behaviour ($p < 0.00l$) and having a boyfriend ($p < 0.001$) are both significantly related to attending musical evenings.

Pregnancy and lost relationships

Men frequently promise long-term commitment and marriage, and as a result some young women get involved in unprotected sexual activity.

However, serious problems start when they tell their partner that they are pregnant. Although the women want to get married and settle down, the men often abandon them and disappear or sometimes force them to seek abortions. The relationship may continue with the same man after the abortion, or he may abandon her a while later. If she is abandoned, the need for a male relationship leads her to repeat the process, namely, getting friendly with another man and perhaps getting pregnant again. However, after the first experience, a woman may feel she is smarter and can pick a man who will stay with her. The qualitative data provide a perspective on how becoming pregnant affects the relationships between young women workers in the FTZ and their boyfriends (all names are pseudonyms):

Ramani, aged 21 years, came to work in the FTZ and began to meet the same man each day on her way to work. He proposed that she become his girlfriend and she accepted. They went out for musical evenings with other women who also had boyfriends and very soon moved into a rented room. Within three months she conceived. When she told him she was pregnant, he moved out and found another woman who moved in with him.

Chandani, aged 28 years, being the eldest, decided to work in the zone to support her family. At first she travelled to work from home about 20 km from the FTZ, but later she moved to a boarding house. There she met a young man and developed a relationship. After some time she conceived and she went to Colombo to get an abortion The man went with her to the abortion clinic. After the abortion, he started avoiding her. She learned that he is a married man.

Rangika, aged 26 years, was brought to the FTZ by a relative of her stepfather. She was left in the room of another relative. He promised to marry her and they began to have sex. She conceived after eight months and had an abortion. After the abortion, he began spending less time with her. She learned that he was having a relationship with another young woman.

Kanchana, aged 25 years, came to the zone when she was 21. A young man in the FTZ started pursuing her. In the beginning she didn't like him but she finally agreed to have him as her boyfriend because she started to be pestered by another man. She introduced him to her patents as her fiance. After this they regularly visited her home and had sex. They moved into a rented room and within three months she had conceived. When she told the man he said not to

worry because they would be marrying soon. A week later, he went to work as usual but never returned. She does not know his home address. She told her mother, who said she should continue to work as long as possible and come home for the delivery.

Sunitha, aged 29, comes from Kandy. Her mother died early and her father, who was an alcoholic, remarried, and she was looked after by her grandmother and aunt. She was educated only up to grade 6. In order not to be a burden to her relations, she came to work in the zone. For four years she had no problem; then she met a young man from the armed services. She told her aunt; she took him to her house as her fiance. They had a sexual relationship, but did not use contraception. They discussed their future marriage and decided she should work abroad to earn money for a house. Soon after arriving in Kuwait she found she was pregnant and her employers sent her back. She was scared to see her aunt and immediately went to the boarding house in the FTZ community where she had lived before going abroad. Her fiance was gone. She was told that he was transferred to the eastern part of the country. After further enquiries, she learned that he is married and has two children. She contacted the PHM and through her, a religious organization that arranges adoptions.

Estimated pregnancies in the FTZ communities

There are an estimated 52,000 unmarried women in the FTZ communities between the ages of 18 and 30. From the questionnaire sample, 16 per cent of the women reported that they were involved in risky sexual behaviour. Extrapolating this figure to the broader population gives an estimate of 8,320 women in the FTZ communities who were having risky sex. While this figure still represents a minority, it is well above the rates identified by Silva and others (1997) for a comparable urban poor community in Kandy.

An NGO in the area conducts menstrual regulation for an average of 2,250 FTZ women workers annually. Analysis of the PHM records shows that the communities in the FTZ study area recorded 2,410 pregnancies, of which 2,179 were those of FTZ workers. Because little overlap is expected between menstrual regulations and the frequencies recorded by the PHMs, the two figures can be summed to give an estimated 4,429 pregnancies in total. The NGO has also indicated that a significant number of women seek abortions through private practitioners. Therefore, it can safely be estimated that there are at least 5,000 pregnancies annually. This annual pregnancy rate is consistent with the estimated number of FTZ workers at risk of conception.

Coping with pregnancy in the FTZ communities

The cases quoted above indicate that one of the major contributing factors to a lost relationship is breaking the news to the boyfriend that the woman is pregnant. Since few of the women knew about family planning and there was little report of the use of contraceptive methods, premarital pregnancy is clearly likely among the sexually active. For a young pregnant FTZ worker, the options are clear. She can marry her partner, return to her home village, seek an abortion, give the child up for adoption, rear the child as a single mother in the zone, or abandon the child. But for some women, even these options are not all available. A young unmarried woman with a child in Sri Lanka faces social ostracism, economic difficulties and problems in finding housing and a supportive environment. She is frequently barred from working in factories, is cast out of the dormitory and is unable to return to her parents' household or her village. In these circumstances, her efforts, whether to bring the pregnancy to term or seek an abortion, are fraught with social, economic and emotional difficulties.

Abortion

The qualitative data provide insights from the perspective of women who chose to seek an abortion:

> **Nilanti** did not have her period for two months. She had a pregnancy test and it was positive. She was unmarried so she and her boyfriend sought an abortion. Her boyfriend's friend told them about a clinic in a town about 50 km from the FTZ. The fee was Rs. 200 (US$l = 85.5 Sri Lankan rupees) because she had the abortion after the second month. The doctor gave her an injection and asked her to wait outside until she had pains in the abdomen. When she told the doctor she had pains, she was taken inside and asked to lie on a bed. He inserted some drug to dissolve the foetus. Then he opened up her womb and her period started. The whole procedure took 10 minutes. After this she was given medicine for fever, abdominal pain and excessive bleeding. She was told to go home as quickly as possible. When she returned to the boarding house, she started bleeding heavily. The following day she went to the factory but found it difficult to work. She then took leave for two days and went back to work afterwards.
>
> **Pavitra** missed her period and she told the landlord, with whom she had had a sexual relationship. He gave her a soft drink with eight

analgesic tablets mixed in it (a commonly available analgesic is sometimes used as a crude abortifacient). She drank the mixture and that resumed her periods.

Sunita went to a private clinic and the doctor put some drug inside her womb. Then she was taken into the operating theatre and something else was inserted and she began bleeding. Then the doctor asked her to go home soon and advised her that, if she bled too much, she should get admitted to the nearest hospital and not tell where she had the abortion. She was given a prescription to buy some vitamins. After three or four days, her bleeding subsided and she went to her home village and then later to the boarding house. She did not tell anybody about the abortion.

Premarital pregnancies and the MCH system

There are seven PHMs for the nine divisions in the FTZ study area. Taking into account the figures given for total pregnancies, it can be assumed that each PHM on the average will have 712 FTZ women workers becoming pregnant in their service areas. The figures from the NGO referred to above and the data from the PHMs indicate that approximately 56 per cent of the women have an abortion, with 44 per cent bringing their pregnancies to term. Therefore, each PHM will have the responsibility for 309 expectant mothers and their infants. This number is in sharp contrast with the 25-30 pregnancies that a PHM would handle in a typical rural area. Faced with these overwhelming numbers, the PHMs report the following:

- PHMs have difficulty knowing the identities of the women in their service area because of the constant in- and out-migration of the FTZ population.
- The social stigma of pregnancy for unmarried women means that many are reluctant to identify themselves to health officials.
- FTZ women workers are unaware of their pregnancies and of the services needed and available for their pregnancies because of a lack of education and awareness.
- PHMs are overwhelmed and unable to carry out case-finding activities because of the large number of pregnancies in addition to their other activities.
- PHMs depend on hearsay from other workers or from landlords and then track down the pregnant women.

- Many women who bring their pregnancies to term have considered abortion as an option in the first half of their pregnancy and do not seek prenatal services until they finally commit to having the child.
- Women who leave the area to return to their village or another location are lost to the FTZ PHMs, resulting in a further delay in connecting with the MCH system.

Characteristics of pregnant women in the FTZ

The mothers' cards maintained by the PHMs represent the only hard data available on women who have been monitored during their pregnancies. Of the 243 pregnant women obtained from a random sample of mothers' cards maintained by the PHMs of the area from 1 July 1995 to 30 June 1996, 42.3 per cent were below the age of 24. This figure may be compared with the national figure (Department of Census and Statistics, 1994) which indicates that the average age of women at first pregnancy to be at least 27 years, or one year after the average age of women at marriage. Of the total sample, 139 (60 per cent) of the FTZ women gave up employment at the time of pregnancy, presumably hoping to resume work after delivery. Only those women who have children and are pregnant for the second or third time and those who have really given up employment, at least for a substantial period of time, are considered as not employed.

The great majority of women in the FTZ communities are unmarried. The relatively small number of married women are from indigenous families or are workers who subsequently married and remained in the communities. However, because 61.5 per cent of the women who received MCH services reported that they were married, it is likely that these women wanted to avoid admitting that they were pregnant outside marriage, or that their marriage occurred after conception.

Pregnancy outcomes

The options for women carrying their pregnancy to term include staying in the FTZ communities or leaving the area. The mothers' cards indicated that, of the 243 pregnant women, 105 (44.5 per cent) of them were lost to the PHMs because the women had left the area or could not be located (table 1). They left, generally, between the fourth and eighth month of their pregnancy. Of the 138 women whose pregnancy outcome was known, over 85 per cent had a live birth, 6.5 per cent had a stillbirth and 9 per cent reported a spontaneous abortion. The national figure for stillbirths is 1.92 per cent, and the

Table 1. Location of pregnancy outcomes in Katunayake Free Trade Zone

Location of outcome	Frequency	Percentage
Stayed in the FTZ community	138	56.5
Left the area	105	44.5
Visiting parents	17	
Leaving the area permanently	54	
Missing	34	
Total	**243**	**100**

district in which the FTZ communities are located reported a stillbirth rate of 1.3 per cent. Consequently, the FTZ workers show a stillbirth rate almost five times higher than that of the general population in the district. The rate of spontaneous abortion in this population is over four times higher than the national rate of less than 2 per cent (Ministry of Health and Indigenous Medicine, 1998). An explanation for this heightened rate of spontaneous abortion may be the poor living, working and nutritional conditions experienced by women in the FTZ.

MCH utilization

The mothers' cards pmvided information on the utilization of MCH services once a pregnancy was identified by the PHM. Generally, a pregnant woman is required to visit a prenatal clinic at least six times in order to get a normal admission for delivery in a government hospital. Failure to have at least six prenatal visits would preclude getting admission except as an emergency case. Table 2 shows that these women made an average of only 2.6 visits to the prenatal clinic, which is extremely low by national and district standards. It

Table 2. Number of visits by pregnant women to the MCH clinic in Katunayake Free Trade Zone

Number of visits	Frequency	Percentage
1	23	9.5
2	108	44.4
3	60	24.0
4	38	15.6
5	14	5.7
Total	**243**	**100**

was extremely rare for one of these women to visit the clinic on her own initiative. The PHM, after receiving the information about a pregnancy either from a boarding housemaster or mistress or from some other source, had to track down these women and force them to register at the clinic. Once registered, most women visited the clinic on the appointed day, although in many cases, they had to be reminded with a visit to the home or in the field or by someone else. However, the great majority of women did not follow up with subsequent visits and the PHMs were mostly unable to follow up with a residential visit.

The average number of times the PHM met the woman in the field or at her home, at 0.23 visits, is much lower than called for in the PHM guidelines, which stipulate at least one visit a month after conception has been confirmed. The great majority of women (82 per cent) received no visits at all, and only just over 5 per cent received two visits. No woman was visited more than twice. Frequently, the PHM visited and the women were not at home. A standard comment, as recorded on the mothers' cards, is that the woman had gone to the factory to work.

Conclusion and implications

This article has described the factors and processes that can result in risky sex for young women workers in the Katunayake FTZ and the consequences of unwanted pregnancy. The limited knowledge of poor rural women coming into the FTZ combined with their desire for increased opportunities in life expose them to manipulation by men who turn the women's income and sexuality to their advantage (Hettiarachchy, 1992, 1994, 1998). The result for these sexually active women is frequently negative in terms of the loss of the relationship and/or unwanted pregnancy. Consequently, many of them are cast adrift from the cultural mainstream of Sri Lankan rural society and endure cultural, economic and social rejection. To make matters worse, the health care system, despite its favourable MCH reputation, is completely unprepared to deal with the magnitude and complexity of the needs of these young women workers.

FTZs will continue to be part of Sri Lankan social and economic life; young, unmarried women from poor rural villages will continue to migrate to FTZs seeking a better life. As a result, the negative consequences of risky sex, lost relationships, unwanted pregnancies, hazardous abortions and single parenthood will increase, thus overwhelming an inadequate and unprepared reproductive health and MCH system. The results in this article point to the need to formulate and implement programmes to lessen the dangers of FTZs

for Sri Lanka's young women. These progmmmes should include: newcomer orientation, health and education campaigns, expansion of existing primary health care and reproductive health care services and the organization of women workers' associations with support from NGOs. The elements of this action plan include the following:

Outreach to dormitories: The dormitory strategy for collecting questionnaire data showed that the best method of engaging women is to conduct meetings and activities at the dormitory residences. The first step would be to select a cluster of large dormitories close to the factory complex to pilot initial programmes.

Public health midwives: PHMs played a key role in the implementation of the research project and could be a vital means of entry, information and identification of problems and participants. They could be trained to upgrade their roles and thereafter provided with an income supplement.

Identifying change agents: While it would be ideal to recruit women into voluntary roles as programme implementers, the lack of time among working women makes such an approach difficult. Instead, the project would seek to hire young women between the ages of 25 and 30 who have had at least four years' experience of living and working in the FTZ. They would be hired at a salary comparable to what they would earn in the FTZ. They would be trained in their new role as change agents.

Cooperative action in the dormitories: Women in the dormitories were observed to carry out their everyday chores on an individualistic basis. The organization of a cooperative effort could address, for example, the problem of nutrition through joint food acquisition, food preparation and cleaning activities on a rotating basis. Other possibilities for cooperation could include alternatives for disposable income in terms of savings and investment, and recreational activities. However, each dormitory group would select its 'own priorities. Using the change agents, the project would conduct education sessions in the selected dormitories concerning the advantages for the residents of organizing cooperative action. Change agents would be trained in cooperative action by a Sri Lankan government training facility.

Organization of cooperative committees: The success of cooperative action could lead to the organization of specialized committees to address issues on an ongoing basis. Committees of dormitory residents could be organized for newcomer orientation to the FTZ, handling such areas as nutrition, recreation and the alternative uses for disposable income.

Legal and political advocacy: University faculty and advanced students could provide training on workers' and residents' rights. One aspect of this effort could involve registering women to vote in the FTZ communities rather than their home district, so that their voting power could influence the behaviour of politicians and government representatives in the area.

Development of dormitory-based mobile health clinics: A shift in service policy could enable the PHMs to visit dormitories on a monthly basis to examine women with health problems and refer them to regular health delivery systems. The change agents and the health cooperative committee could support the PHMs in their work.

Reproductive health programme: Many of the women workers have poor knowledge of reproductive health and most have never had a gynaecological examination. The programme would utilize the PHMs, the change agents and family planning agencies to provide education and discussion, and referral for reproductive health problems.

Contraceptives: A contraceptive awareness programme could be conducted by family planning programmes and other NGOs to educate women on the alternatives available for contraception. The first step in the training would be to provide information on condoms and their use, accompanied by the distribution of condoms.

Counselling: For many young women, the absence of appropriate advice spells disaster and causes dysfunctional behaviour. The presence of elders and kin who could help to guide young women is very much needed. It may be possible to implement a system of "fictive kin" in which a senior woman, such as a landlady, creates a "surrogate relationship" linked to a small group of young women. Regular visits and group activities could create such a relationship and provide the opportunity to discuss problems and decisions. Professionals in a variety of fields need to be identified as educators and counsellors.

Support systems for pregnant women: When an unmarried woman becomes pregnant her world can collapse, with both the man in her life and her family withdrawing support. Any intervention needs to address a series of issues in terms of assisting the women in their decisions to give birth or to have an abortion, to work or go on leave, to pursue the man or not, to change residence, and many other concerns. The project needs to work with public, non-governmental, and private religious and non-religious organizations to develop a system of support for pregnant women.

In today's global economy, FTZs are a major phenomenon in the process of globalization (Schensul and others, 1994). Their basic structures and functions show great similarities across national systems and regions. Systematic research on the effects of FTZs on women is still inadequate, as are models for effective health promotion and education progmmmes. However, the commonalities among FTZs suggest that generation of knowledge and mechanisms for intervention can have a positive effect not only locally but also for FTZs elsewhere in the world. It is known that the development of these industries makes a significant contribution to the national economy. However, all efforts must be made to ensure that that economic contribution does not come at the cost of the health and well-being of young women workers.

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Childless Couples in the Slums of Mumbai: An Interdisciplinary Study

Gynaecologists rush too quickly into expensive diagnostic and therapeutic procedures and fail to impart basic knowledge that might assist couples to conceive

By Veena B. Mulgaonkar*

For most couples, procreation is a natural biological urge and an integral part of a stable marital relationship. Motherhood is an important social position actively sought by many women. Although motherhood is seen as an essential stage in women's lives (Phoenix and others, 1991), it is frequently romanticized and idealized as a woman's supreme achievement (Ussher, 1990).

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It is also symbolically important because it shapes the cultural and social identities of women. It demonstrates their physical and psychological adequacy and, as producers of the next generation, gives them identifiable social functions (Busfield, 1987; Rapoport and others, 1977). This is especially true in India, as in the rest of Asia, where childbearing is traditionally essential to a woman's social and cultural identity.

Although perceptions are changing, especially among the middle and upper classes, Indian tradition still demands that all marriages result in children and preferably male ones. The patrilineal system produces a strong desire for sons to continue the family line (Reddy, 1992). Children are also regarded as sources of income and security in old age. Childless women are socially stigmatized and regardless of the medical causes of their childlessness, they tend to be the ones blamed for infertility problems and can face grave personal and social consequences, including economic deprivation, violence and marital disruption.

These consequences, together with feelings of guilt, worthlessness and low self-esteem, compel women to attempt to produce children at any cost to themselves, resulting in prolonged use of drugs and a succession of experimental procedures, sometimes including expensive high-technology options.

In India as in many developing countries, gender disparities and religious and socio-cultural diversities influence fertility-seeking practices (Reddy, 1992). Occasional references to fertility-seeking behaviour occur in studies on family, gender and reproductive health (Das, 1976; Madan, 1981; Reddy, 1992; Patel, 1994) but there are very few studies on fertility-seeking practices in relation to infertility and childlessness in India (Unisa, 1999; Singh and others, 1997). Furthermore, although infertility is evidently an issue for couples and men are at least partly responsible for the infertility in around 50 per cent of the cases, male infertility remains a relatively neglected issue, and little is known about men's involvement and participation in fertility-seeking practices.

To ameliorate this imbalance, the present study has four main aims: (a) to explore the socio-cultural context of treatment-seeking behaviour of childless couples, (b) to outline the range of remedial practices from traditional to modern that childless couples follow to address their childlessness, (c) to carry out simple cost-effective interventions for childless couples and assess their outcome and (d) to use these data to create awareness and help to develop health education strategies and programmes for local communities.

Research setting, study population and methodology

A community-based study of childless couples was undertaken by the Sujeevan Trust – a non-governmental organization catering to the reproductive health needs of nearly 50,000 slum-dwellers of municipal "K" ward of the city of Mumbai. The study was conducted between June 1997 and September 2000 under the sponsorship of the Ford Foundation.

Fieldwork was conducted in two slums in the eastern part of Andheri and Jogeshwari in the western suburbs of Mumbai. These slums were selected because they are located within 3 km of the office of the Sujeevan Trust. They consist primarily of *chawls* (single room tenements) dispersed over a large area. Each *chawl* is a single or double-storeyed concrete structure with about 20 single-room tenements on either side of a corridor. Many tenements have their own water facilities. Lavatories are communal. About 15-20 people share one latrine.

The study area also included unauthorized shanty settlements called *zopadis* (huts), which consisted of a motley assortment of dwellings constructed out of almost anything that is available. Narrow pathways thread throughout the *zopadis*, with open drains on either side. Because of the slums' unauthorized status, the municipal authorities have not provided them with basic facilities such as water supply, electricity, toilets, garbage clearance, roads or street lights. Depending on their purchasing capacity, residents of the unauthorized areas buy these essential services from slum lords and other local leaders. They live with the constant threat of eviction.

The service areas of the slums have schools, innumerable small-scale industries, godowns (warehouses) and shops. Some men work in the local industrial establishments, but most work in the service sector. Many are casual workers with irregular employment. Most of the women are household workers and very few are employed on a regular basis. The population is predominantly Hindu (80 per cent) and Marathi-speaking, but also includes people who speak Telugu, Konkani, Gujarati and Hindi. The slums come under the jurisdiction of the health departments of the Brihan Mumbai Municipal Corporation and receive basic family welfare services. Numerous private dispensaries and nursing homes are located in the study area, and private practitioners of various disciplines play a major role in delivering reproductive health services to the people in the community.

After initial qualitative investigations, a household survey was conducted in the two slums by specially trained female interviewers using a carefully

piloted and pre-tested questionnaire. In addition to recording dwelling characteristics, household composition and income, obstetric histories were taken for all ever-married women aged 18 years and above, and the survival status of all live births was ascertained. The household survey covered 9,016 households and 9,102 couples; 10,278 ever-married women and 5,636 currently married women between 18 and 44 years of age were identified.

The main purpose of the household survey was to identify childless women for detailed investigation. The definition of childlessness encompassed two main categories: (a) "primary infertility": any woman who has never conceived despite cohabitation and exposure to pregnancy in the absence of contraception for a duration of three or more years and (b) "pregnancy wastage or child loss followed by secondary infertility": any woman who has experienced pregnancy wastage or whose child or children have died within one year of birth and who has been unable to have a subsequent live birth despite cohabitation without contraception for three or more years.

Based on these definitions, 346 childless women were identified from the household survey, of whom 256 were currently married women aged 18-44 years. The prevalence of childlessness among currently married women in the study population was 4.54 per cent.

By the time the next phase of data collection started 25 childless couples had migrated and six couples refused to give any information on their treatment-seeking behaviour. Consequently, informed consent to participate in this phase was obtained from 225 childless couples of childbearing age. Background information along with details of treatment-seeking behaviour was obtained by using semi-structured face-to-face interviews. This information was supported by examination of medical records depending upon their availability and the couples' willingness to share the records.

Most childless couples (151) were interviewed at clinics, either at the Sujeevan Trust office or in the community, and the remaining 74 couples were interviewed in their homes. After initial informal and semi-structured interviews, sufficient information on relevant aspects of treatment-seeking behaviour was obtained on subsequent visits to the childless couples either at clinics or at their homes. Husbands and wives were interviewed separately. To gain additional insights, a subsample of 30 women and 30 men was selected for repeated in-depth interviews. Most of these interviews were tape-recorded and transcribed.

In the final phase of the study, all couples were invited for clinical examination, counselling and treatment. A total of 151 couples agreed to participate. The remainder (74) refused, mainly because they were satisfied with their existing treatment or because they had given up hope of conceiving. Pregnancy rates of all 225 couples were carefully monitored for a duration of two to three years.

Results

Profile of childless couples

Of the 225 childless women, 103 were from Andheri and 122 from Jogeshwari. About half were below 30 years of age, 21 per cent were aged 30-34 years, and 30 per cent 35-44 years. Hindus accounted for 87 per cent of the sample, the remainder being mainly Muslims and Christians. Nearly 70 per cent spoke Marathi. Just over one tenth (12 per cent) of the women had received no schooling, 82 per cent had school education up to twelfth grade, and graduates and postgraduates comprised 6 per cent. The majority of the childless women (75 per cent) were housewives. The remainder were employed as domestic workers or involved in either administrative or professional work. About 40 per cent of the husbands were daily labourers or manual workers in regular jobs. Among 225 childless men, 20.5 per cent were below 29 years, 24.5 per cent were aged 30-34 years, and the remaining 55 per cent were above 35 years of age. Their religion and mother tongue were similar to those of their wives; 42.7 per cent had informal to middle-level education, 44 per cent secondary education and 1.3 per cent higher level education. The remaining 12 per cent were illiterate. One third were self-employed and one quarter were in administrative or managerial jobs. Half of the couples lived in nuclear families and 72 per cent were owner-occupiers.

Of the childless women, 74 per cent had never been pregnant. The remaining 26 per cent had had one or more pregnancies that had resulted in spontaneous abortion, premature death, stillbirth or ectopic pregnancy, or had experienced infant deaths, and had been unable to bear any more children. One third had been childless for three to four years, 36 per cent for 5-12 years and 30 per cent for 13 or more years.

Perceived and biomedical causes of infertility

In the course of semi-structured interviews, both wives and husbands were questioned about their perceptions and beliefs regarding the cause of infertility. Most gave multiple reasons, summarized in table 1. Evidently,

Table 1. Perceived reasons for childlessness among childless couples in the slums of Mumbai

Reasons	Number of mentions by women	Percentage	Number of mentions by men	Percentage
Physical ailments, congenital abnormalities of the genital tract in females	85	37.8	76	37.8
Physical ailments, congenital abnormalities of the genital tract in males	63	28.0	96	42.7
Swellings of genital tract in females	69	30.7	43	19.1
Swellings of genital tract in males	12	5.3	8	3.6
Menstrual disorders	81	36.0	32	14.2
Anovulation	38	16.9	18	8.0
Sexual problems	22	9.8	67	29.8
Evil spirits including ill-omen and supernatural or evil mechanisms of people	89	39.6	80	35.6
God's will	72	32.0	86	38.2
Personal destiny and ill luck	63	28.0	49	21.8
Miscellaneous (socio-economic, cultural and behavioural causes)	103	45.8	73	32.4
Medical causes (anaemia, tuberculosis, mumps, malaria, leprosy, typhoid)	30	13.3	5	2.2

attribution of infertility to biomedical causes, no doubt imparted largely by medical doctors, coexists with reasons that stem from traditional and religious beliefs.

The explanations given by men and women did not differ radically. Physical and congenital abnormalities, in addition to dysfunction of the reproductive organs, constituted a common group of causes. In terms of women's problems, respondents often mentioned the presence of a small uterus, tilted uterus, small or wide opening of the uterus or a uterus of abnormal shape. Lumps in the uterus were believed to block the fallopian tubes. They were also felt to cause much bleeding or severe pain during coitus and to compel sexual abstinence. In the case of men, a small penis, small testes or abnormal position of the testes were commonly mentioned in addition to physical problems such as hernia or collection of fluid in the scrotal region (hydrocoel).

Swellings of the genital tracts were also identified as another causative group. Many respondents indirectly referred to sexually transmitted diseases and genital tract infections while describing these symptoms. The swellings were also believed to block the fallopian tubes, resulting in childlessness; and the infections were said to produce excessive heat in the body and in the genitals, leading to dilution of semen and poor quality sperm. The consumption of spicy and pungent items of food, such as chillies and spices as well as chicken, mutton, sea fish and eggs, was thought to aggravate the problem.

Some respondents felt that consumption of "cold" items of food such as milk, curd and plantain by men would have an adverse effect on the viscosity of semen. Very watery semen and thick semen were perceived to cause infertility. They believed that thick semen did not liquefy fast enough and sperm became immobilized.

Menstrual disorders such as scanty, irregular, excessive, painful or no menses were perceived to cause childlessness. Black menstruation and passing blood clots during menstruation were specifically mentioned as a cause of childlessness by North Indian women. They and their husbands believed that black menses were due to an accumulation of dirt in the uterus and insisted that menstrual fluid must be purified to achieve a cure.

Sexual problems were perceived as another group of causes. The various causes mentioned in the case of men were difficulty or weakness in erection or in penetration, and premature ejaculation. Painful and difficult coitus, and a shallow and dry vagina, were the causes mentioned in the case of women. Spillage of semen from the vagina was perceived to be a common reason, which they believed, reflected the narrow passage of the vagina, and/or the small opening of the uterus preventing the sperm from travelling upwards.

Supernatural causes were commonly mentioned by both men and women. Some women were accused of being witches and were therefore held responsible for their childlessness by their in-laws' family. Jealousy of relatives and neighbours, curses of ancestors, breach of cultural traditions were also perceived to be the causes of infertility.

Many couples attributed their childlessness to "God's will" or to their destiny. One of the interesting observations in the study was that many of the women who knew that their husbands had physical problems causing their childlessness did not blame their husbands, but felt that it was in their own destiny and that nothing could be achieved against God's will.

Table 2. Percentage distribution of perceived responsibility for childlessness among childless couples in the slums of Mumbai

Person responsible for childlessness	Responses of women	Responses of men
Self	18.2	11.6
Spouse	12.0	16.9
Both	8.5	8.9
Neither	61.3	62.6

Couples were asked whom they held responsible for their childlessness. Responses of husbands and wives are remarkably similar (table 2). Women were more likely to blame themselves than men, but this difference is not pronounced. The majority of both sexes felt that neither they nor their spouses should be held responsible.

These perceived causes of infertility were compared with biomedical evidence from the medical records and investigations performed on the 151 couples who participated in the intervention phase of the study. For 57 couples (37.7 per cent), no biological cause could be found. In 32 cases (21.2 per cent), only the husband exhibited a biological cause, while in a similar number (31), only the wife exhibited a biomedically detectable cause of infertility. In the remaining couples (3l), problems were identified in both spouses. The most common problems in women were infections of the reproductive tract, (for example, pelvic inflammatory disease (PID), blocked fallopian tubes (especially infected tubes and tuberculous salpingitis), uterine problems such as endometriosis and fibroids, and anovulation due to polycystic ovaries. Problems in men were mainly oligospermia and azospermia, stemming from a variety of causes. Impotence was rare.

Treatment-seeking

Response to childlessness was swift in this population. By the end of the first year of marriage, 109 childless couples had sought treatment for infertility, and a further 81 couples sought treatment in the second year, leaving only 35 couples who delayed treatment-seeking for over two years.

Couples were asked their reasons for seeking treatment. The majority (201 out of 225) said it was their own decision to initiate treatment. However, equal numbers cited family pressures and the anxiety of family members, and

Table 3. Sequence of treatments for childlessness among childless couples in the slums of Mumbai

Order of treatment	Allopa-thic	Reli-gious	Ayur-vedic	Homeo-pathic	Tradi-tional	Home remedies	Chemist
1st	207	13	2	3	0	0	0
2nd	16	203	4	2	0	0	0
3rd	2	6	9	1	12	4	2
4th	0	3	0	0	1	5	0
5th	0	0	0	0	0	1	1

attitudes relating to feelings of disassociation when friends or others in the same age group conceived.

The childless women were asked, with and without probing, about the types and sequence of all treatments that they had sought. All 225 childless women sought allopathic or religious treatments at one point or another. As shown in table 3, 207 childless couples chose allopathic treatment as their first choice, while for 13 couples their first choice was religious treatment. Although they began with allopathic or religious treatment, couples soon sought another form of treatment, and both these treatments were typically followed simultaneously.

Only two childless couples initiated their treatment with ayurvedic methods, and three couples, with homeopathy. These five couples did not prefer allopathic treatment initially because they felt that allopathic treatment produced heat in the body and affected ovulation and strength of the sperms. But very soon, after insistence by in-laws, these childless women switched over to allopathic and religious treatments. Rather than following definite sequences of treatment, the majority of couples followed allopathic and religious treatments simultaneously. Some later added other forms of treatments and practised all such remedies simultaneously.

Allopathic treatment

Allopathic sources included treatments in government hospitals as well as by private doctors and nursing homes. The duration of treatments and number of visits made by these childless couples were directly proportionate to the duration of childlessness. As the duration of childlessness increased, the number of visits to the allopathic doctors and duration of treatment increased, but recall problems made it difficult to gather information about the exact

Table 4. Sequence of allopathic treatments for childlessness among childless couples in the slums of Mumbai

Choice of doctor	General practitioner	Gynae-cologist	General surgeon	Medical consultant	Psychiatrist
1st	167	57	1	0	0
2nd	21	199	2	3	0
3rd	26	141	0	2	0
4th	15	51	1	2	0
5th	7	25	0	2	0
6th	6	14	1	1	2
7th	2	13	0	0	0
8th	0	5	0	0	2

number of visits and courses of treatment. Owing to their anxiety for success and easy access to health care facilities, many childless women visited allopathic doctors frequently during their initial period of childlessness.

All childless women consulted their husbands before deciding on the line of treatment. The majority of husbands (89 per cent) were initially cooperative and attended the clinic simultaneously with their wives on the first or subsequent visits. However, a minority of 11 per cent had to be convinced by their wives or relatives, or had to be forced by the doctors to visit the clinics. Government hospitals were preferred by 131 childless couples, compared with 94 who chose private clinics. The choice of place of initial treatment was made by the wife or husband in 123 cases, while in others this choice was made by the childless women's in-laws, parents, relatives or neighbours.

The major reasons given for attending government hospitals were that the treatment was less expensive, the doctors of various specialities were found at the same place, and there were known people working in the place who helped them to avoid delay in the treatments. Others preferred private doctors initially because they felt that there was immediate and personal attention given to them, that private doctors were more cooperative, and the same doctor was available throughout the period of their treatment. Suitable timings and convenience in terms of distance were additional reasons for paying extra money to visit private doctors.

When seeking treatment, the majority of the childless couples in the present study initially preferred general practitioners to gynaecologists. As shown in table 4, 167 childless women consulted genera1 practitioners compared with 57 childless women who went to gynaecologists when initiating treatment. Women who visited general practitioners initially were soon referred

Table 5. Percentage of women undergoing specified numbers of investigative procedures among childless couples in the slums of Mumbai

Number of procedures	Dilatation and curettage	Laparoscopy
None	28.4	55.5
One	45.4	38.3
Two	19.5	4.4
Three	5.8	0.9
Four or more	0.9	0.9

to gynaecologists and these couples followed the advice of gynaecologists judiciously for a considerable period in the hope of having a child. Only one woman went to a surgeon initially for treatment of a tuberculous abscess, and three women went to a medical consultant as their second choice of allopathic doctor for treatment of tuberculosis. Some visited general surgeons or physicians as their subsequent choices for medical problems associated with tuberculosis or for psychosomatic problems.

Few doctors imparted to patients basic knowledge of reproductive anatomy, physiology, manner of occurrence of conception and timing of coitus or advice on behavioural practices. Only 11 per cent of the childless couples were given such information. Very few doctors allowed enough time for nutritional advice, or advice on coping strategies such as adoption and living with infertility in a positive manner. Women dissatisfied with the failure of their current treatment changed doctors very frequently; 22 women had consulted seven or more allopathic doctors (mostly gynaecologists) during their period of childlessness. Two women in the present study were referred to psychiatrists for mental depression and abnormal behaviour.

A considerable number of women experienced repeated investigative procedures, including Rubin's tests (which involves putting air into the fallopian tubes to identify patency), ovulation studies, dilatation and curettage, laparoscopies, hysterosalpingographies (x-ray of the uterus and uterine tubes after injection of opaque material) and at times hysteroscopies (endoscopic direct visual examinations of the canal of the uterine cervix and the cavity of the uterus). Because they did not preserve their previous reports or because some of the doctors did not trust their previous reports, a change to a new doctor often resulted in repeated investigations, with consequent additional unnecessary expenditure of money and time. Table 5 shows the number of the two most common operative procedures (dilatation and curettage and laparoscopies) undergone by the childless women in the study.

Table 6. Percentage of women undergoing specified numbers of drug courses among childless couples in the slums of Mumbai

Number of courses	Oestrogen/progesterone	Gonadotrophins	Both
None	50.6	41.3	85.3
1-3	5.6	7.6	5.4
4-10	28.9	38.2	9.3
11 or more	14.9	12.9	0

The most common treatment for addressing irregular menstrual cycles was a combination of hormones such as oestrogen and progesterone. For the problem of anovulation, ovulation-induction agents either in the form of oral drugs (i.e. clomiphene citrate, bromocryptine) or injectable drugs such as gonadotropins or gonadotropin-releasing hormones were used. Table 6 shows the number of courses of hormonal treatments undergone by childless women. Overuse of these drugs produced side effects such as pelvic discomfort, pain in the abdomen, nausea, vomiting and breast pain. Two childless women experienced blurred vision while taking a course of ovulation-inducing drugs. Failure of induction tempted the doctors to increase the dosage of these hormones, which produce a variety of other side effects such as headache, fatigue, nasal congestion and psychological symptoms including mental depression and negative impacts on self-confidence, self-esteem and health. The impact was intensified when the treatment process was prolonged and the couples experienced anxiety, frustrations and doubts about the success of treatment.

Religious treatments

Many couples cited "God's will" as the reason for their childlessness. Appropriate religious practices were the treatment of first choice for 18 couples, and 207 couples who initially sought help from allopathic sources resorted to religious practices after six months to one year. Ultimately, all couples practised both allopathic and religious remedies simultaneously. Surrendering the outcome to the will of God was among the most common solutions sought by childless couples, and one that relieved them of anxiety and guilt.

Prayers, fasts, circumambulations, making offerings, worshipping, following gurus and making pilgrimages were the practices most frequently observed by childless couples. In general, women were more meticulous in their performance of these rituals than were men. Often, by keeping them occupied, the rituals were helpful coping strategies for living with infertility.

To the extent that their domestic chores allowed, women performed regular prayers and chanted passages from holy books either at home or at places of worship. They undertook fasts in honour of specific gods, eating or avoiding certain foods on specific days. On Fridays, for example, they might honour the goddess Santoshi Mata by eating only once and avoiding sour items in their food. Some women practised arduous rituals such as circumambulation (i.e. walking round the inner part of the temple) — in three cases, over 1,000 times in wet clothes once a week for two years.

Making or promising offerings to the gods was a common practice observed by childless couples. Some Hindu women gave flowers, fabrics, coconut, rice, turmeric or red powder, others offered cooked food or sweet-meats. Sometimes a childless woman would offer gifts to a woman who had given birth on a particular day; to fail to honour such women was seen as unpropitious. Two South Indian couples promised their hair to the god at the Tirupati temple; and subsequently the men did not shave their beards to enable them to fulfil the promise. Christian women offered flowers in their churches and lit candles in honour of Jesus and the Madonna.

Interestingly, the study showed that if their worship failed to produce the required results, women would simultaneously approach the gods and goddesses of other religions in the hope of success:

> "I worship Lord Ganesha and Goddess Santoshi Mata and Mahalaxmi regularly... I visit Mount Mary Church every Wednesday, light candles and pray to Mary earnestly. I also visit Haji Ali (a Muslim tomb in Mumbai) often... I am confident that all these gods will eventually fulfil my desire". **(A Hindu childless woman)**

> "I visit Haji Ali and the *dargah* (shrine) at Ulhasnagar (tomb of a Muslim saint) often; I also regularly visit the Ganesha temple and offer flowers, sweets and coconut to him. I have extreme faith in Lord Ganesha. I have promised to offer an idol of Lord Ganesha made of gold after getting a child". **(A Muslim childless woman)**

Some couples became regular followers of particular gurus or saints, and practised their instructions, which were sometimes helpful, as in the case of a childless couple who visited the living saint Narendra Maharaj:

> "We started visiting Narendra Maharaj and followed his advice religiously. He asked us to stop all the treatment and have patience.

He told me to drink milk and eat bananas every day and soon after I followed his advice, my menstrual cycles became very regular. I am happy that by virtue of his spiritual power my husband has discontinued all his vices of consuming *gutka* (an intoxicant), tobacco and alcohol. We now undertake pilgrimages to Kolhapur and meet him regularly".

The sacrifice of animals such as sheep, goats or chickens is known to be a practice followed by childless couples in rural India. In this study, however, only a few of the childless couples repotted such practices. Three Muslim women reported that they had promised to sacrifice a goat at a *durgah*, and one Muslim woman actually sacrificed a goat on a religious day (Eid Al-Adha, or feast of sacrifice, which is popularly known as Bakri (goat) Id in India) in the hope of having a child. Two Hindu women said that they had promised to sacrifice hens in honour of their goddess and one North Indian Hindu woman actually sacrificed a hen to her village deity. All of the Hindu women said that they had performed the rituals on the advice of local faith healers and elders.

Often, even though couples knew there were irreversible biomedical causes for their childlessness, they continued their devotions in the hope of a miracle, or to help them decide whether or not to adopt a child. Aside from their religious significance, such rituals performed an important function in providing psychological relief, reducing anxiety and promoting a degree of acceptance, and thus prevented marital disharmony or disruption.

Traditional treatment

The role of traditional healers was affirmed by the 1978 Alma Ata conference on primary health care (WHO, 1978). The Indian traditional system includes traditional healers, herbal therapists, traditional midwives, self-proclaimed therapists and spiritual healers. Many studies of the behaviour of childless couples in India show the widespread use of such traditional therapies alongside conventional medicine (Singh and others, 1997; Jejeebhoy, 1998; Unisa, 1999). Generally, traditional practices are adopted when the infertility is thought to be caused by the malevolent actions of other people, evil spirits or witches. In this study, although evil spirits and witchcraft were cited as causes of childlessness, most couples relied on their religious observances to combat such influences, and did not resort to traditional therapies.

Only 13 couples mentioned using traditional therapists. They believed that persons jealous of their prosperity had used *tantrik* (black magic)

practices against them. Three Hindu women in the study reported using other black magicians to counter these malevolent influences. Others visited faith healers, quacks or traditional healers and, on their advice, consumed herbal powders, holy water or ash mixed with water. Some also visited astrologers.

Home remedies

Only 10 women reported using home remedies. They included eating *ghee* (clarified butter), herbal powders, leaves of *tulsi* (basil) or *bel* (leaf used in the worship of Lord Shiva). Three couples mentioned visiting pharmacies directly and buying tonics or medicines, including ovulation-inducing drugs or drugs to improve the strength of sperm.

In contrast to reports from elsewhere in the world (Gerrits and others, 1999; Sundby and others, 1998) none of the couples in this study reported non-medical strategies such as having sex with different partners, or during specific phases of the moon, or adopting different positions during or after sex.

Expenditure on treatment

On average, couples had spent Rs. 25,566 (US$l = 46.7 rupees) on treatment for infertility. Most of this sum was expended on medical (Rs. 19,790) rather than religious treatments. Median expenditures on medical and religious treatments were approximately Rs. 10,000 and 5,000 respectively. A few couples had spent very large sums: for instance 14 had incurred medical costs in excess of Rs. 50,000 and one couple had spent a similar amount on religious treatments.

Results of the intervention

As mentioned above, 151 couples agreed to participate in the intervention and 74 refused to do so for a variety of reasons. All participating couples were physically examined and their medical records scrutinized. Detailed medical and sexual histories were taken, and all couples were educated about the timing of ovulation in the menstrual cycle and advised against douching, withdrawal of the penis or getting up immediately after intercourse. These couples were provided with information about reproductive anatomy and physiology, the manner in which conception occurred and the timing of coitus. Infections were treated and dietary supplements recommended as appropriate. Routine diagnostic procedures (e.g. semen analysis, Rubin's test, ultrasonography for the study of ovulation) were applied in cases where such tests had not been performed previously, and appropriate therapeutic action was taken.

The diagnostic evidence suggested that the 151 couples could be classified into four broad groups: no biological cause found (57) easily treatable (32), advanced procedures required (36), and difficult or impossible to treat without huge expense (26).

Participating couples were asked to return to the clinic every three months for further advice and treatment. On average, couples were followed up for 30 months after initial enrolment in the intervention phase. Similarly, the 74 non-participating couples were visited at home every three months for a similar period of time. Among the participants, five became pregnant before the start of treatment and a further 69 after the start. Thus, 49 per cent of the intervention group conceived and all of these, apart from six cases of spontaneous abortion, either delivered a live child or were currently pregnant at the end of the observation period in September 2000. In the non-participating group, 19 women (27.5 per cent) conceived over the same period.

Further analysis of the 69 participating couples who conceived after the start of treatment shows a very high success rate among the 57 couples for whom no biological cause of infertility could be found. A total of 45 pregnancies (equivalent to 79 per cent) occurred in this group. Among the 93 couples in which a biological cause was detected in the husband, wife or both, 24 (25.5 per cent) conceived. Most (19) of these 24 "successes" were relatively easily treatable with antibiotics, anti-inflammatory drugs, stimulation of the ovaries with clomiphene citrate, correction of anaemia, reduction of obesity and other straightforward procedures.

In the non-participating group, 19 women (27.5 per cent) conceived over the same time period. In 27 of the 74 non-participating couples, no biological cause was evident from their medical notes; the cumulative conception rate in this subgroup was 55.5 per cent. The cumulative rate for the others was 8.5 per cent.

Discussion and conclusions

The level of childlessness found in this study population of slum-dwellers in Mumbai was broadly in line with expectations and similar to that found in rural Andhra Pradesh (Unisa, 1999). Of the 151 couples that were examined as part of the study, no biomedical cause could be detected in 57 cases. Where biomedical causes were detected, they were equally shared by husbands and wives. While in-laws and relatives typically blamed the wife for

infertility and thereby caused much misery, the views of childless couples themselves were found to be reasonably balanced. The majority of husbands and wives felt that neither person was responsible. Husbands were more likely to hold their partner responsible than were the wives, but this difference was not marked. Most husbands (89 per cent) cooperated in treatment-seeking and willingly accompanied their wives on the first or subsequent medical consultations. No doubt this experience influenced views on who was to blame.

Among childless couples, biomedical beliefs about causes of infertility coexist with traditional beliefs about the influence of evil spells and spirits. "God's will" was one of the most commonly mentioned causes. This blending of beliefs is reflected in fertility-seeking behaviour. The study showed that the majority of childless couples sought treatment in the first year of marriage (or in the first year following the death of an infant) and the majority opted for allopathic treatment. A very few followed homeopathic, ayurvedic, traditional or home remedies. However, most couples sought a religious solution soon after the start of allopathic treatment and both approaches to the problem of childlessness were followed simultaneously.

During the course of the study, a large body of information was collected both by interviews and consultation of medical records about the nature of allopathic treatments. It is difficult to evaluate these treatments because, of course, successfully treated couples did not fall into the sample. Nevertheless, two general patterns emerged that have implications for future improvements in the management of infertility.

First, very few of the gynaecologists consulted offered any basic information that might have aided conception without recourse to expensive technical diagnosis and therapies. Such information should include the timing of ovulation in the menstrual cycle, the need to avoid standing up immediately after coitus and to refrain from douching after coitus. Similarly, very few gynaecologists paid any attention to counselling or rehabilitation of childless couples, for instance, by suggesting the possibility of adopting a child.

A second striking pattern was the frequency with which couples switched from one medical expert to another in their search for a remedy. The most damaging consequence of this behaviour was the excessive replication of tests and related escalation of expenditure. Perhaps some gynaecologists had genuine reason to doubt the accuracy of tests performed elsewhere, but financial motives no doubt also played a part.

The preliminary results from the intervention phase of the study indicate that about half of infertile couples can be helped to conceive if they are given skilled counselling, diagnosis and treatment. Moreover, resort to advanced (and expensive) treatment was found necessary in only a minority of cases. The most striking result was the cumulative pregnancy rate of 79 per cent among couples in whom no biological cause of infertility could be detected. Comparison with the couples who did not participate in the intervention must be cautious because participation was voluntary and the two groups differed in their characteristics. For instance, non-participants tended to be older and had longer durations of infertility. Nevertheless, the cumulative pregnancy rate among non-participant couples for whom no biological cause of infertility had been detected was much lower (55.5 per cent) than the equivalent participant group. This difference suggests, but does not prove, that the simple straightforward advice offered by the Sujeevan Trust about sexual practices may have been effective, thus reinforcing the point that gynaecologists rush too quickly into expensive diagnostic and therapeutic procedures and fail to impart basic knowledge that might assist couples to conceive.

Policy and programme implications

Four main lessons for future policy and programmes may be derived from this study:

- Community education is needed to dispel harmful beliefs and myths about the causes of infertility. The particular focus should be on overcoming beliefs about evil spirits or the influence of malevolent individuals. At the same time, it should be recognized that religion can offer much solace to childless couples, and an acceptance of "God's will" for untreatable cases offers a pathway to recovery and rehabilitation.

- Preventive services should be strengthened. In this study 36 women out of the 151 couples examined were found to have pelvic inflammatory disease. This result suggests that untreated infections account for about 25 per cent of cases of infertility. Reproductive tract infections, including sexually transmitted diseases, constitute the major component of the causes of such infections. Careful analysis and planning is required to devise ways in which diagnosis and treatment of these infections can best be integrated into general services for women. The programmatic remedy is to improve the quality of services with particular emphasis on maintaining aseptic conditions.

- The organization of infertility services needs to be reviewed. Currently services are dominated by the private sector, which imposes a severe financial burden on low-income couples. The public sector, together with non-governmental organizations, could and should play a greater part in meeting the needs of low-income childless couples. A greater involvement of these sectors would require sound referral systems, good coordination and publicity.

- Even if infertility treatment in Mumbai is improved, it is certain that some couples will remain childless. They will need support strategies, including strengthening of adoption and foster care services, educational efforts to reduce stigma, the creation of self-help groups and effective counselling.

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Sequence of Fertility Treatments among Childless Couples in Ranga Reddy District, Andhra Pradesh, India

In the new Reproductive and Child Health Programme, there is no mention of strengthening existing infertility services or increasing them

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Despite its well-established links to other aspects of reproductive ill-health, such as sexually transmitted infections (STIs) and unsafe abortion (Berer, 1999), infertility is the most neglected component in the reproductive health programmes of many developing countries.

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In the case of India also, no special government interventions or programmes exist to treat infertile couples, and Indian researchers have generally neglected the subject of infertility. Studies on the type of treatment sought by infertile women are sporadic. Evidence of a mainly anecdotal nature suggests that couples go to traditional healers or religious places for treatment (Kakar, 1983; Jejeebhoy, 1994; Sundby and Sonkos, 1998). In recent years, however, substantial developments in reproductive technologies have occurred. The number of private hospital specialists in these techniques has increased tremendously and these specialists have popularized their services by extensive advertising. Under these new circumstances, infertile couples may be going for allopathic treatment as their first choice, rather than to traditional or religious healers as in the past. However, there is a dearth of information about the role of modern private health services in fertility treatments and about the costs of treatment.

The aim of this article is to document the treatment-seeking behaviour and associated expenditures of childless couples in one district of Andhra Pradesh, and thereby identify major problems and possible remedies. Andhra Pradesh is an appropriate locale for this study because the reported rates of childlessness in this state are among the highest in the country and thus insights into the problem are particularly relevant for programmes (Pathak and Unisa, 1993).

Material and methods

The data analysed come from a four-year community-based research project in the Ranga Reddy district of Andhra Pradesh. To obtain a sample of childless women, villages were first selected by stratified random sampling: all villages in the district were grouped into three strata, in ascending order of women's literacy, and 10 villages were selected randomly from each stratum. A total of 8,713 households belonging to the 30 villages were screened and 9,298 ever-married women of reproductive age were briefly interviewed. Of those 9,298 women, 12 per cent were found to be childless. This study focused on a subset of childless women with the following characteristics: they were aged 20-49 years, currently married for at least three years and had never had a live birth. A total of 339 women with these characteristics were identified.

Types of treatment available were identified from key informants by free listing in the first phase of data collection. A list of 13 of the types of fertility treatment methods most frequently used by childless couples was extracted from the free listing. All primary health centres and sub-centres in and around

the selected villages were visited and the best-known private doctors and hospitals mentioned by key informants were also visited. Doctors and auxiliary nurse-midwives were also interviewed during this phase of data collection.

The second phase of data collection involved face-to-face interviews with childless women, using specially trained female interviewers. Only one woman and two households refused to be interviewed and another four women were partially interviewed, giving a final sample size of 332. Detailed information was elicited by interviewers on household characteristics, marriage and pregnancy history, treatment-seeking behaviour, the consequences of childlessness, social participation, decision-making about treatment, and general and mental heath.

Clinical examination was performed on all 332 women and 101 husbands by a female gynaecologist for the women and a male doctor for the men. The causes of infertility were recorded from pathological and clinical reports for those couples who had complete case history records. After data collection, the doctors gave the respondents information about the reproductive system, the fertile period and common reasons for infertility. Help was offered to these couples to try to overcome any minor reproductive health problems that might affect fertility. They were also referred to hospitals where fertility treatment was available.

The third and final phase of data collection involved qualitative methods: 60 detailed case studies of childless women from 10 villages were obtained. Cases selected from the survey included examples of women who had adopted a child, those whose husband had taken a second wife, those who had not sought any fertility treatment, those who had gone to many holy places, or those who had received many allopathic treatments. These in-depth interviews were conducted to gather explanatory information on all relevant aspects of the present study.

Results

Profile of childless women

Table 1 compares the samples from Ranga Reddy district with the 1992 National Family Health Survey (NFHS, 1993) for rural Andhra Pradesh, in terms of demographic characteristics. The distributions by current age and age at marriage are similar in both surveys for all married women aged 20-49 years. However, the Ranga Reddy sample contains a higher proportion of women who married in the last five years than does the state sample.

Table 1. Demographic characteristics of all currently married women and of childless women aged 20-49 years in rural Andhra Pradesh and Ranga Reddy district

Characteristics	Childless women in Ranga Reddy (percentage)	Childless women in Andhra Pradesh[a] (percentage)	All women in Ranga Reddy (percentage)	All women in Andhra Pradesh[a] (percentage)
Age (in years)				
20-24	41.3	57.1	19.0	26.2
25-29	33.4	16.6	23.3	23.3
30-34	12.7	3.7	17.9	17.0
35+	12.7	22.7	39.8	33.4
Age at marriage (in years)				
Below 15	51.8	38.7	41.0	49.4
15-19	42.8	55.2	50.4	46.7
20-24	5.1	4.5	7.4	3.4
25+	0.6	1.2	1.2	0.1
Duration of marriage (in years)				
Below 5	25.0	30.1	10.1	6.2
5-9	35.2	34.4	17.6	20.1
10-14	19.9	7.4	19.7	22.9
15+	19.9	28.2	52.6	50.8
Number	**332**	**163**	**8,285**	**2,404**

[a] According to data from the 1992/93 National Family Health Survey.

The demographic characteristics of the sample of the 332 childless women are broadly similar to those of childless women in the NFHS sample. Interestingly, about 75 per cent of the childless women in both samples were aged less than 30 years, and about 60 per cent had been married for less than 10 years. Several factors may have contributed to this unexpectedly youthful profile: successful treatment of infertility leading to low levels of infertility among women aged 30 or more; a greater probability of divorce, separation or desertion among infertile than fertile women; and adoption of children by older infertile women who are then declared as "own children". All these factors are likely to have contributed to the relatively small number of older infertile women in the Ranga Reddy screening survey.

Of these 332 childless women, 10 per cent had adopted a child by the time of the study. In 39 cases, representing 11.7 per cent of the sample, the husband had already taken a second wife. The majority of childless women (70 per cent) had never been pregnant; the remainder had experienced miscarriages or stillbirths.

Table 2. Comparison of socio-economic characteristics of currently married childless women aged 20-49 years in the Ranga Reddy district with those of currently married women in rural Andhra Pradesh

Characteristics	Ranga Reddy (percentage)	Rural Andhra Pradesh[a] (percentage)
Caste		
Scheduled caste/tribe	36.1	23.3
Others	63.9	76.7
Religion		
Hindu	93.1	92.0
Muslim/Christian	6.9	8
Type of family		
Nuclear	66.0	N.A.
Joint	34.0	N.A.
Literacy		
Illiterate	68.4	79.3
Literate	31.6	20.7
Standard of living		
Low	64.2	25.4
Medium	19.9	39.0
High	16.0	35.6
Occupation		
Agricultural labourer/cultivator	48.5	48.8
Business/home-based work	17.8	10.6
Service	0.9	5.2
Housewife	32.8	35.1
Married previously		
Once	98.2	97.5
More than once	1.8	2.5
Husband related before marriage		
Yes	35.8	38.4
No	64.2	61.6
Number	**332**	**2,404**

Note: N.A. = not available.

[a] According to data from the 1992/93 National Family Health Survey.

Are childless women different in terms of socio-economic characteristics from other women? The Ranga Reddy screening survey did not collect such data. However, when childless women in Ranga Reddy are compared with currently married rural women from the Andhra Pradesh segment of the 1992 NFHS (table 2) no appreciable differences are apparent in religion, woman's occupation and number of marriages or consanguinity. However, childless women are more likely than other women to be from a scheduled caste/tribe, to be illiterate and to have low economic status. Economic status is based on household infrastructure and ownership, with appropriate weighting for value (Sulabha and others, 1999).

Regarding the institution of marriage, in this sample single marriages were the norm, with few of the women reporting more than one marriage. Cross-cousin marriages and marriages between other close blood relatives are common in the south of India. In the present sample, as well as the NFHS data, a substantial number of women were married to their close relatives (36 per cent and 38 per cent respectively).

Probability of treatment-seeking

Seventy-three per cent of childless couples had sought treatment or advice outside the home regarding their infertility problem. Age and marital duration have a positive relationship with seeking at least one treatment. Whereas only 59 per cent of the women who had been married for three to five years had sought treatment, 76 per cent of the women married more than 10 years had done so. Education and standard of living have a positive effect on treatment-seeking. Only 69 per cent of illiterate women compared with 82 per cent of literate women had sought treatment, and as standards of living rose so did the propensity to seek treatment for their infertility, from 65 per cent among women with a low standard of living, to 84 per cent among those with the highest standard of living (table 3). Treatment-seeking among scheduled caste and tribal women was low compared with other groups. An important reason cited for not seeking treatment was its high cost. Another prominent reason was lack of nearby health services and of information about the diagnostic and treatment procedures offered for infertility. Other women gave the following reasons for not seeking treatment:

> "It is God's will; whenever He gives me, we will have children". **(Illiterate woman, aged 23 years)**

> "I feel everybody will laugh at me if I consult a doctor for my childlessness". **(28-year-old high-school-educated husband of a childless woman)**

> "I feel that I am not able to conceive because of Devta (God) on me. I will become pregnant only when He goes off'. (*Note:* In the villages, when a woman suffers an attack of hysteria people say that the God or Goddess visited her.) **(Illiterate woman, aged 25 years)**

> "My husband told me that everybody is getting babies without going for any treatment. Why do I only need treatment?" **(Literate woman, aged 21 years)**

Table 3. Percentage of persons in Ranga Reddy district seeking any treatment and type of initial treatment, by socio-demographic characteristics

Socio-demographic characteristies	Allopathic	Religious	Any method[a]
Religion[b]			
Hindu	53.4	17.8	73.5
Muslim/Christian	56.5	4.3	65.2
Caste[c]			
Scheduled caste/tribe	43.3	22.5	66.7
Others	59.4	13.6	76.4
Literacy[c]			
Literate	70.6	8.8	82.3
Illiterate	46.1	20.4	68.7
Standard of living[c]			
Low	40.1	21.2	65.2
Medium	57.6	16.6	75.0
High	72.1	8.8	83.8
Number of pregnancies			
0	50.6	16.3	69.9
1	60.0	14.5	76.4
2+	63.0	23.1	86.8
All	**53.6**	**16.9**	**72.9**

[a] Total includes ayurvedic, homeopathy and *unani* and traditional methods.

[b] Chi-square is not calculated, as cell frequencies are less than 5.

[c] Differences in choice of initial treatment are statistically significant at the 95 per cent confidence level.

Choice of initial treatment

Despite the spread of allopathic medicine in India, indigenous systems of medicine remain popular. These indigenous forms of treatment, called the Indian System of Medicine, include ayurvedic, homeopathy and *unani* (collectively known as AHU). In the ayurvedic system, treatment is based on drugs, diet, exercise and general life-style. In homeopathic treatment, the primary emphasis is on increasing the strength of the body's defence mechanisms through a holistic and individualized approach. In the *unani* system of medicine, treatment is carried out mainly with drugs made from herbs and animal and mineral sources, which are supposed to have specific characteristics (hot, cold moist, dry, etc.) to different degrees. These systems of medicine are formally taught at university level, parallel to a bachelor's degree in allopathic medicine. However, many untrained persons also practise them.

Traditional healers who use methods developed by their forefathers also offer remedies. They are untrained persons, sometime relatives of childless couples, or *dais* (midwives), or roadside sellers of a variety of a medicines and herbs. Finally, religious or spiritual treatments are often undertaken by childless couples in India. They consist mostly of *puja* (prayers), sacrifice of animals, bathing in temple wells, visiting temples regularly for three to four months, and hanging a cradle at the temple.

Women were asked, first without probing and then with probing, the number, styles and chronological order of the treatments they had taken. Later, the methods they described were grouped into four categories: (a) allopathic, (b) AHU, (c) traditional and (d) religious. Allopathic treatment included treatment sought from the public sector as well as the private sector. Contrary to the belief that people opt for AHU or traditional methods for their infertility problems, the majority (73 per cent) of the 242 women who went for any treatment opted for allopathic treatment as their first choice. The vast majority (90 per cent) of women going for allopathic treatment chose a private practitioner or private hospital. Religious methods were the first choice of 56 women, and seven women underwent traditional methods of treatment. Only one woman reported AHU as her first choice of treatment.

The data were analysed to detect links between socio-demographic characteristics of childless women and choice of initial treatment (table 3). Caste and type of treatment were found to be significantly associated. Scheduled caste or tribal women were more likely to opt for religious treatment than were other women. Literacy and standard of living also had marked effects on choice of treatment. Literate women were much more likely than illiterates to opt for allopathic treatment as the first choice. With increasing standard of living, the proportion of women opting initially for allopathic treatment also rose. This may be explained by the ability of the women with higher standards of living to spend more on treatment, compared with women from poor households.

Pregnancy history and type of treatment sought show no significant interrelationship. A question on post-abortion care was asked of women who had had spontaneous abortions. Some women had gone to a hospital for "cleaning" after the miscarriage. Others had gone to a local healer, and many women had not consulted any doctor after their miscarriage, which without care and treatment may have led to infertility among such women (Okonofua, 1994).

The first choice of treatment is affected by prevailing belief systems as indicated by the following quotations:

> "When I did not have baby after three years of my marriage, my parents-in-law started behaving badly. My brother who is working in the military suggested I consult an allopathic doctor immediately as there is no other treatment which can cure the infertility". **(Primary school-educated woman, aged 22 years)**

> "I went to temple of Goddess Mahakali (Hindu goddess) at Bontapally because some people have conceived after going to this temple". **(Illiterate woman, aged 25 years)**

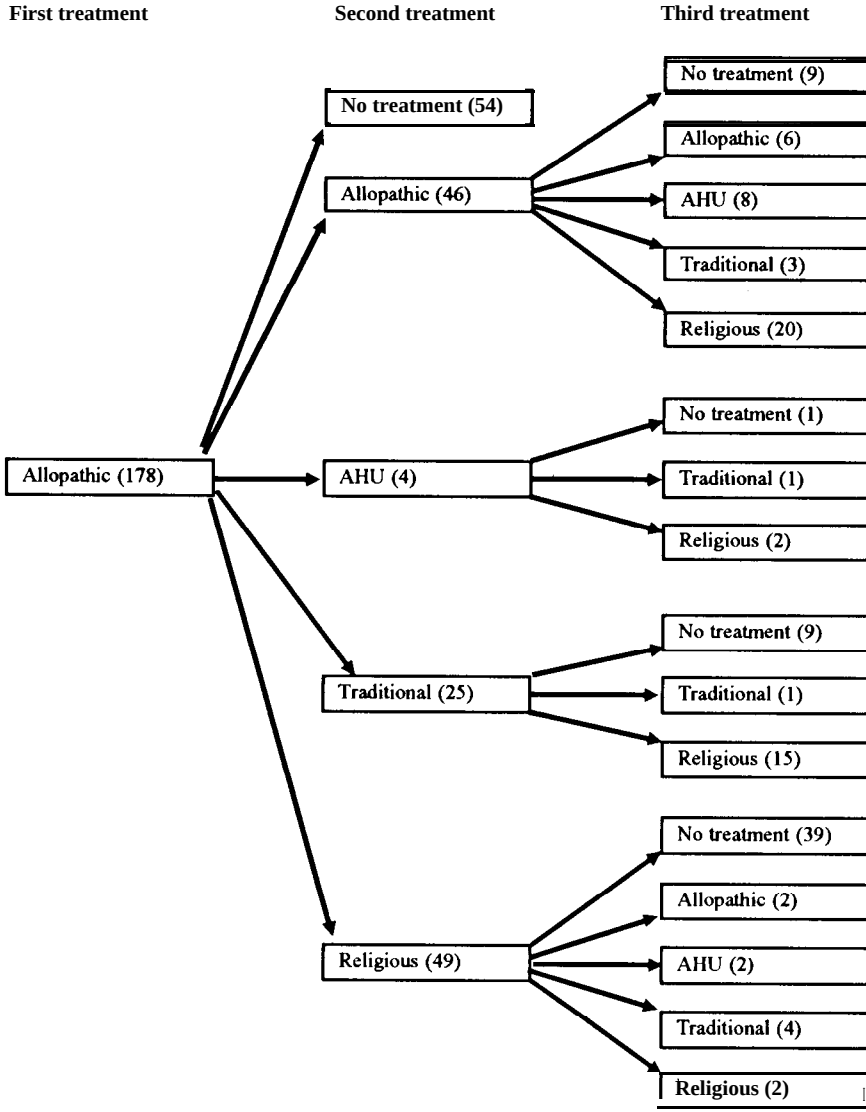
Sequence of treatment among women who initially sought allopathic treatment

The sequence of fertility-seeking methods adopted by the 178 women who had opted for allopathic treatment as their first choice is shown in figure 1. Among these couples, nearly one third had gone to see a specialist in the city of Hyderabad, travelling a distance of 20-120 km in some cases. After the first treatment, 30 per cent of these women did not go for any subsequent treatment. The main reason for stopping after the first treatment was the prohibitive cost and number of visits needed for treatment (Unisa, 1999). In addition, some couples who had received a thorough diagnosis had been informed about the actual cause of their infertility. If it was the wife's problem, some husbands were planning to take a second wife. If it was the husband's problem, wives were nevertheless disinclined to consider divorce or separation (Unisa, 2000).

For second treatments, there was a shift in choice, from allopathic to religious, although a significant number of women opted for traditional methods as their second choice. Most couples who preferred religious and traditional methods could not afford the high cost of allopathic treatment for a second time, and did not feel they were getting the desired results from their expenditure. Couples who chose allopathic treatment for a second time mainly comprised those who had not received complete or satisfactory diagnostic reports from the first course of treatment, as the following case illustrates:

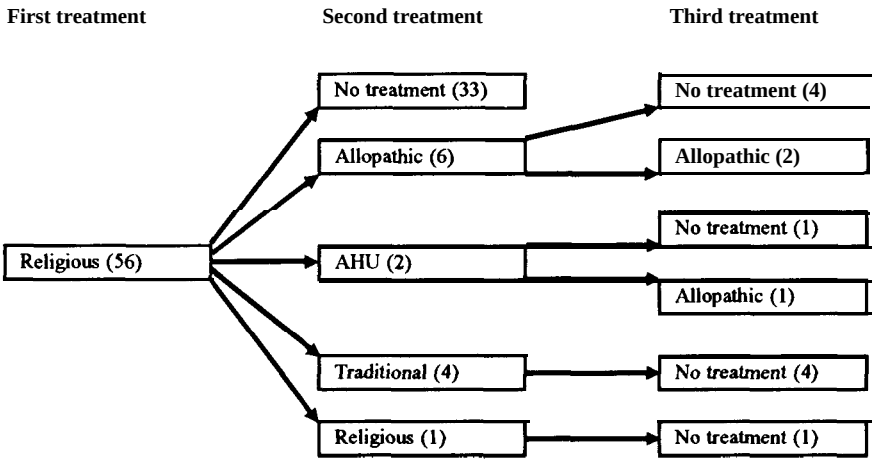
> "First I went to the nearby hospital, there the doctor told me to go to Gandhi Hospital. When I went to Gandhi Hospital, they told me to come back the next day for D&C (dilatation and curettage)". **(Illiterate woman aged 21 years)**

Figure 1. Sequence of treatments and number of women in Ranga Reddy district who made allopathic treatment their first choice



Note: AHU = ayurvedic, homeopathy and *unani*

Figure 2. Sequence of treatments and number of women in Ranga Reddy district who made religious treatment their first choice



Note: AHU = ayurvedic, homeopathy and *unani*

A small proportion of couples had gone for a second allopathic consultation to get a second opinion. Among the 46 women who had opted for an allopathic consultation as their second treatment, only a few women opted again for allopathy as their third choice (13 per cent). The largest group (43 per cent) chose religious methods for the third treatment, and some chose AHU (17 per cent).

The majority of the 49 women who had adopted religious methods as their second recourse after an initial allopathic consultation did not attempt any further treatment. Of the 25 women who had opted for a traditional method for the second course of treatment, the majority (60 per cent) opted again for religious methods for the third treatment, 4 per cent tried traditional methods, and about 36 per cent discontinued any further treatment.

Sequence of treatment among women who initially sought religious treatment

Fifty-six women first tried religious or spiritual remedies for the problem (figure 2). Two thirds did not go for any further treatment; these women

Table 4. Probability of persons in Ranga Reddy district seeking treatment, by type and sequence

Treatment name and sequence	Probabiliy
One treatment	
Allopathic	0.536
Religious	0.159
Traditional	0.021
AHU	0.003
Two treatments	
Allopathic-religious	0.147
Allopathic-allopathic	0.138
Allopathic-traditional	0.075
Allopathic-AHU	0.012
Religious-allopathic	0.018
Religious-traditional	0.012
All other sequences[a]	0.032
Three treatments	
Allopathic-allopathic-religious	0.060
Allopathic-traditional-religious	0.045
Allopathic-allopathic-AHU	0.024
All other sequences[a]	0.076

Note: AHU = ayurvedic, homeopathy and *unani*

[a] Sum of the cumulative probabilities of all other sequences is presented.

tended to be poor and illiterate. A significant proportion of couples realized that religious treatments had not proven to be effective. After initially trying religious methods, a small number shifted to allopathic treatment as a second approach. Of the women who had opted for allopathic treatment for their second treatment, only 33 per cent tried the same treatment again; the rest sought no further treatment.

Preferred sequences of treatment

To examine the sequence of treatments adopted by childless women, further analysis of the flow charts was done (table 4). Only two flow charts were considered, i.e. those starting with allopathic and religious treatments. Cumulative probabilities were calculated using the numbers in figures 1 and 2. As a first choice of treatment, allopathic methods are preferred by the majority of the women in the sample followed by religious and traditional methods. Among the two-treatment sequences (based on both flow charts), the most preferred sequence is allopathic to religious. The second preferred sequence is allopathic to allopathic.

Table 5. Total mean cost of treatments and mean number of treatments, by initial treatment, of persons in Ranga Reddy district

First treatment	Total for:		Total
	Allopathic treatments	Religious treatments	
Allopathic (private)			
Mean cost (rupees)	6,002	1,355	7,357
Median cost (rupees)	2,000	80	3,024
Mean treatments (N)	2.1	1.8	2.9
Number of women			153
Allopathic (government)			
Mean cost (rupees)	9,777	2,768	12,545
Median cost (rupees)	2,000	500	2,500
Mean treatments (N)	2.2	1.9	4.2
Number of women			25
Religious			
Mean cost (rupees)	442	2,053	2,495
Median cost (rupees)	14	1,175	1,350
Mean treatments (N)	0.2	2	2.2
Number of women			56
Women who had at least one treatment			
Mean cost (rupees)	4,956	1,715	6,671
Median cost (rupees)	412	0	1,440
Mean treatments (N)	1.6	1.4	3.0
Number of women			242
All women			
Mean cost (rupees)	3,613	1,250	4,862
Median cost (rupees)	300	0	1,050
Mean treatments (N)	1.2	1	2.2
Number of women			332

The analysis based on three treatments showed the preferred sequence as allopathic-allopathic-religious, followed by allopathic-traditional-religious. While few couples started treatment with a religious method, many more used it as a final resort, perhaps out of desperation.

Cost of treatment

In table 5, the mean and median cost of all treatments and average number of treatments that women underwent are presented. These costs include doctors' fees, cost of medicines and travel costs. The bottom panel summarizes expenditure for all couples, regardless of whether or not they sought treatment. On average, childless couples spent around Rs. 5,000 (US$1 = 46.7 Indian rupees) and had more than two treatments. The median cost was about

Rs.l,000. Among those who went for at least one treatment, the average cost was nearly Rs.7,000.

The upper three panels classify costs by type and source of initial therapy. The majority of those who opted for allopathic treatment used a private hospital or clinic for treatment. The average cost of allopathic treatment and average number of treatments is lower among these couples than among couples who initially used government services. In government hospitals, there are no fees for consultations but many hospitals do not have the necessary pathological and diagnostic equipment. In many instances, women had to make several visits for these services at government hospitals. Ultimately, people shifted to private services for higher quality diagnoses and treatment. The net result was that they spent more on their treatments and experienced a greater number of treatments than those opting for the private sector from the start.

Couples whose initial treatment was religious in nature tended to spend less than other couples and they underwent a smaller number of treatments. From this analysis it is very clear that allopathic treatment is not affordable by low-income couples; as an alternative, they are going for other forms of treatments. The following quotation is typical:

> "I had a D&C done, this cost us Rs5,000. After that, every time we went to the doctor, he would charge us Rs.200 as a fee. He told us that I could have a child if I continued the treatment for one year more. Since we did not have that much money, we had to discontinue the treatment". **(Literate woman aged 27 years)**

Conclusions and recommendations

This study is one of the most thorough non-medical investigations of infertility in India, but it has limitations. Most importantly, it does not throw light on the success rate of fettility-enhancing treatments as the sample of childless couples studied, by definition, comprised those who had so far not been treated effectively.

The high prevalence of childlessness in the state of Andhra Pradesh needs immediate attention to investigate the causes of infertility. A thorough examination of the reports of all couples who have undergone treatment is required, as well as investigations of the environmental (food, water, air) and occupational hazards they face. Some cases of infertility are preventable by

simple information on the timing of ovulation, the need to refrain from douching after intercourse and so on. The programme in Andhra Pradesh should emphasize such informational efforts to prevent infertility. In particular, specific interventions are required in areas where infertility is high in order to educate people about the causes of infertility and provide information on diagnosis and treatment. A good referral system is needed to help these couples, starting from the village level to "high-tech" hospitals. Infertility conditions that require sophisticated and expensive facilities may be better handled by the private sector for those people who can afford it.

In the present study, it was found that one quarter of childless couples had not sought any treatment for their infertility. The majority of them were illiterate and had a low standard of living. Many of them lack knowledge about the opportunities for diagnosis and treatment of infertility. A great need exists for more effective information and educational campaigns about infertility that reaches to the grass-roots level.

Unfortunately, couples who opt for allopathic treatment are spending a great deal of money on private practitioners without getting the desired result and without counselling to satisfy their questions regarding infertility. Couples adopt multiple pathways for treatment and sometimes this leads to exploitation, false hope and inhuman behaviour.

Infertility diagnosis and treatment services are very scarce in Andhra Pradesh and more or less similar situations prevail in other states of India (mapping of government services was done in the first phase of data collection). In the new Reproductive and Child Health Progmmme of the Government of India, there is no mention of strengthening existing infertility services or increasing them. A government programme for managing infertility is one way to demonstrate a public commitment to helping people with family building.

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Experiences and Perceptions of Marital Sexual Relationships among Rural Women in Gujarat, India

Multipronged, carefully formulated and timely interventions are needed to educate young girls about sexual matters

By Archana Joshi, Mrinalika Dhapola, Elizabeth Kurian and Pertti J. Pelto*

Sexual behaviour is one of the most central, yet mysterious aspects of human life. For many people, it is virtually taboo to discuss such matters in traditional Indian settings, where attitudes remain, by and large, conservative (Bang and others, 1989). Research into sexual behaviour in India has been

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almost entirely confined to urban populations, particularly among groups of people thought to be at high risk of HIV infection (Pachauri, 1992; National AIDS Control Organization, 1994). Little is known about the sexual behaviour of people in rural areas, who comprise nearly 70 per cent of the country's population. An understanding of sexuality and gender-based power relations is important to issues of reproductive health because they underlie many relevant behaviours and conditions. Family planning policies and programmes should address a broader spectrum of sexual behaviour and consider questions of sexual enjoyment and risks, and confront ideologies of male entitlement that threaten women's sexual and reproductive rights and health (Dixon-Muller, 1993).

Traditionally, the dominant value system in India implies strong disapproval of premarital sexual relationships among both men and women (Nag, 1996). Female sexuality is seen as a powerful, unruly and dangerous trait, which should be channelled into marriage at an early age (George and Jaswal, 1995). Many people, including some policy makers, believe that there is universal marital fidelity, premarital chastity and a near total absence of homosexuality in India (Nag, 1996). Whether or not this characterization was ever valid, social taboos and sanctions against sex outside marriage have weakened under the influence of mass media, increased mobility and later age at marriage (Nag 1996; Khan and Patel, 1996; Savara and Shridhar, 1996).

Much of the available literature on marital sexual relationships in India and other developing countries has emphasized men's sexual dominance (Nayar and Chawla, 1996; Knodel and others, 1996), lack of communication between spouses (George and Jaswal, 1995), and domestic violence linked to sexual relations (Khan and others, 1992; Sharma and others, 1998). There is little doubt that, in many sections of Indian society (as in other cultures), some men assert their dominance in family life through insistence on their right to sexual intercourse "on demand", regardless of the attitude and responsiveness of their wives. Some studies imply that the overwhelming majority of women are therefore unwilling participants in sexual intercourse, and have little negotiating power over its timing or situation, or over matters such as the use of condoms (Elias and Heise, 1993). Such interpretations, which portray a negative image of women's sexual lives, should be viewed with caution because many are based on single-contact interviews, which may tend to project a stereotypical picture of women being reluctantly coerced into sex or, at best, being passive participants.

A few studies have countered these stereotypes and have hinted at ways in which women express their desire for sex. One such study describes how rural Egyptian women associate sex with love and tenderness. They enjoy their sexual life and are happy and proud of the love expressed by sex with their husbands (Khattab, 1996). In rural Rajasthan, older women and women of higher social status have reported positive sexual experiences with their husband (Oomman, 1996). In rural Maharashtra, even young wives were able to communicate their desire for sex to their husband (Apte, 1997).

One of the few studies on marital sex in a low-income country to have used repeated interviews, conducted in Nairobi, Kenya, revealed the ways in which coitus is initiated and negotiated by couples in stable marital relationships (Balmer and others, 1995). Women in this study believed coitus to be a male prerogative and therefore submitted to their husband's demands. They felt unable to verbalize their need for sex or suggest a particular position during sexual intercourse. This reluctance reflected the local belief that women who talked about their sexual needs had gained their knowledge through extramarital affairs. However, subsequent repeated in-depth interviews revealed that couples used various non-verbal strategies to initiate coitus. Those adopted by women included cooking a favourite meal, putting the children to bed early, kissing, caressing, hugging and so on.

Similar in-depth studies on inter-spousal communication and sexual interaction are almost entirely absent in India. Suitable methods to elicit valid data on sexual behaviour in India's conservative rural communities are yet to be established. This article represents a step in that direction. It explores Indian rural women's attitudes towards sex; their ability to initiate and communicate their desire for sex; and aspects of their premarital, marital and extramarital sexual experiences. It also addresses the methodological approaches necessary to elicit such sensitive information about the sexual conduct of rural women.

Methods

The setting

The study was conducted in two *taluka* (subdistricts), namely Padra and Vadodara, in the Vadodara district of rural Gujarat. Eight small villages about 20-25 km from Baroda were selected. The researchers' familiarity with the community and lack of urban influence were two major criteria for selecting these villages. The average village population is around 1,000; the majority of the villagers are Hindu (87 per cent), with approximately two fifths of them

being upper caste Hindus. A wide socio-economic disparity exists between the various caste groups, and strongly held religious beliefs have occasionally led to communal violence.

Agriculture is the principal occupation, although just over half of the households are landless. Most men and women work as agricultural or casual labourers. Television and regular work-seeking migration of the inhabitants to the United Kingdom of Great Britain and Northern Ireland and United States of America as well as countries in the Persian Gulf area provide exposure to Western mass media and lifestyles.

The villages have electricity, public transportation and other basic amenities, but most of the houses are *kutcha* (mud and thatch) or of mixed construction (brick walls and tin or tiled roofs). Government and private health facilities are available within each village or at close proximity. For certain conditions, such as measles, jaundice and infertility, villagers prefer traditional remedies provided by faith healers to modern allopathic medicines.

The sample

Initially, houses were listed in eight villages and married women reporting reproductive illnesses were identified. The researchers used a check-list that included local terms for related problems such as white discharge, menstrual problems, problems with pregnancy and childbirth, lower abdominal aches and pains, and other symptoms occurring in the urine-genital area. Out of 1,067 married women contacted during house-listing, 262 (25 per cent) reported a current reproductive health problem. Many women (58 per cent) reported multiple problems. The problems were broadly grouped into five categories: vaginal discharge (53 per cent), urine-genital problems (48 per cent), menstrual problems (24 per cent), infertility (4 per cent) and uterine prolapse (2 per cent).

Women with reproductive health problems were purposely selected in order to explore their perception of symptoms of sexually transmitted diseases and the relationship of these to their sexual behaviour. This approach also provided a strong rationale for probing into their sexual experiences. A non-participation level of about 30-40 per cent was originally anticipated, so 120 women reporting a current reproductive health problem were initially selected for the interviews. The sample was proportionately distributed across the five categories of reproductive health problems. Subsequently, with the help of 11 key informants, for example, school-teachers and *panchayat* (village council)

members, social maps were prepared to identify socio-economic clusters in the villages. The sample was selected from different clusters (called *falia*) based on community-mapping to ensure broad socio-economic representation. The final sample of 69 women comprised those with whom rapport was well established, who agreed to participate in the study and who could be contacted during repeated visits. Because of the selective nature of the sample, the findings cannot be generalized as representative of all rural Gujarati women. However, the socio-economic profiles of the women and households in this study are broadly similar to many of the agricultural communities in the state.

Training

A group of five researchers and five field assistants received a month-long training course in order to desensitize them on topics related to sexual behaviour. They were also trained to conduct in-depth interviews using appropriate vocabulary and subtle approaches. This was followed by trial interviews in a village 15 km from Baroda.

Interviews

An average of five in-depth interviews were conducted with each woman. During the pilot study, it was observed that the women were relatively uninhibited in discussing their reproductive health problems and treatment. It was, therefore, decided to initiate the discussions on these topics. Gradually, as rapport was established during the second and third interviews, women started talking about their sexual experiences with their husband. Women had no hesitation in talking about their "wedding night", on which occasion various customary practices and games were followed in different communities. It was only at the third interview that discussions about their first experience of sex were broached. Topics in the discussion guidelines also included negative issues such as sexual coercion and violence prompted by reproductive health problems (particularly in relation to menstruation, when rural women observe isolation and avoid sexual contact) and alcohol consumption, as well as premarital and extramarital relationships.

The interviews were conducted in Gujarati and were usually held in private to ensure confidentiality. However, some interviews were conducted with women in the presence of their husband (11 women) or friends (6 women). Paired interviews were allowed in order to dispel any doubt or apprehension among the respondents, and to help them to feel comfortable about the research topics, but they were limited to an initial two or three visits,

until the woman felt comfortable and her husband or friend no longer wished to attend subsequent interviews. During the study period of more than four months (April-July 1996), about 350 in-depth interviews were conducted with the 69 women. Extensive notes were taken during each interview and these were expanded as soon as possible after the completion of the interview.

Focus group discussions

The in-depth interviews were followed by focus group discussions with other married women in the community. Information was obtained on their attitudes and beliefs regarding knowledge and awareness of women's reproductive health problems, treatment-seeking behaviour, contraceptive use and their understanding of factors causing reproductive and sexual health problems. Women for these discussions were selected from various socio-economic clusters in the villages, excluding those who were selected for in-depth interviews. In each village, at least two groups were conducted, one each among high- and low-income groups. All focus group discussions were tape-recorded, transcribed and then translated into English.

Analysis

Textual information from interviews and focus group discussions was systematically analysed using the dtSearch software and was also manually scanned as part of the content analysis.

Results

Respondents' profile

Most of the women selected for the interviews were aged in their 20s and 30s, with only a few aged 40 or more (table 1). The majority were Hindus and lived in nuclear families. Only 11 women were educated to middle grade or above, and more than two fifths had no formal education. Most of them were employed outside the home, mainly as agricultural or casual labourers.

Half of the women had begun menstruating by 14 years of age, but nearly half (29) married before attaining puberty, although consummation was postponed until puberty. Age at first conception was 18 years old or younger for most women (48). Forty-two women out of the 69 had undergone sterilization, and only six respondents said they were currently using birth-spacing methods.

Table 1. Socio-demographic profile of rural women interviewed in depth in Gujarat

Characteristics	Number of women (n = 89)
Age (years)	
20-29	28
30-39	31
40+	10
Marital status	
Married	68
Separated	1
Number of children	
None	7
1-2	22
>2	40
Type of family	
Nuclear	45
Joint	24
Religion	
Hindu	56
Muslim	13
Occupation	
Agricultural/casual labourer	29
Housewife	24
Cultivator	9
Other (small business etc.)	7
Education	
No formal schooling	31
Primary level	27
Middle grade and above	11

Views on early marriage

Most respondents felt that girls should marry as soon as they attain puberty. Fear of premarital relationships that could jeopardize the family reputation, avoidance of love marriages (outside the caste) and the need to start a family were some of the reasons cited by women for their preference for early marriage. The following quotes from the in-depth interviews illustrate the views expressed by the respondents.

> "In villages, when a girl is 10-11 years old, the parents are on the look-out for a suitable match for her. Once she attains puberty, it is very risky. Nowadays, we hear so many cases of abortion. Once the daughter gets *badnam* (defamed) then she will remain single forever".

> "If my daughter elopes with someone, ultimately I will be blamed. People would say: 'her mother is like that' (meaning of loose character)".

Awareness of sex and sexuality

Illiteracy, dropping out of school early (especially after the onset of menstruation), restricted exposure to mass media, the burden of domestic chores, and limited ability to communicate on issues related to sex and sexuality are some of the well-documented reasons for ignorance about sex among adolescents in India (Jejeebhoy, 1998). In this study, more than half of the women had no knowledge of menstruation before menarche. The immediate reaction to their first period was usually described negatively in words such as "shocking" and "puzzling". Most of them approached sisters, sisters-in-law, or friends for advice.

Similarly, before their marriage, rural women had little information on the nature of the sex act and sexual relations in marriage. The majority of the women (43 out of 69) said that they had been totally unaware of sex prior to marriage. Others had only the vaguest idea. They cited various reasons for their ignorance such as restricted mobility, early marriage and lack of exposure to media or other potential sources of information.

> "I married at the tender age of 12. What would a girl know about it at that age? I had no brains at that time. I used to think that after marriage a boy and a girl stay together and the girl has to cook — nothing beyond that".

> "I used to think that even if a girl's foot touches a man's foot she would get pregnant. I had no idea about all this (intercourse)".

Only 10 women reported that they knew about the nature of the sexual relationships between men and women. They were aware of the meaning of the term "intercourse" (locally termed as *dhando*, *sambandh* or *sansar kare*) and that it was necessary for procreation.

Finding out about sex

The main sources of information were older female relatives such as sisters-in-law and sisters (21), friends (17) and neighbours (15). Most of the women (43) were told about sex in the time between marriage and *gauna*, which is a ceremony held when a married girl is sent to her husband's house. It

takes place only after she attains puberty or is considered by the parents to have matured enough to share conjugal life with her husband. Some women spoke of writing letters to their husband (2), going to the cinema with him (3) and getting the opportunity to talk to him or get physically close to him (4) during the period between marriage and *gauna.* This was also considered an appropriate time to tell newly married girls about sexual relationships. The task was usually performed by female relatives and friends, but it generally involved circumlocutions and metaphors instead of direct explanations about the sex act. They were advised to yield or submit to their husband and to adjust well to other family members in the house.

> "The day before my wedding, my sister-in-law explained everything to me. She said: 'Never deny anything to your husband. Listen to whatever he says. Satisfy all his demands. If he will not get satisfaction (from sex), he will seek it elsewhere ' ".

Sexual debut

Just four respondents learned about sex as a result of physical intimacy with their husband between the time of engagement and marriage. Most women understood what sexual intercourse actually was only when their marriages were consummated. Around one quarter (19) said that they found their first sexual experience pleasant (though painful), and that their husband was patient, considerate and gentle on their wedding night. However, the majority of the women (37 out of 69) were either scared and shocked (24), or resisted and avoided (13) the sexual advances made by their husband.

> "When it happened for the first time, I started bleeding as though I was menstruating. I felt as though something had hurt me. After that I had problems while urinating; it used to burn a lot. Yet my husband insisted on doing it every day. I did not enjoy it at all. I used to pray that the night would not come. I developed a fear of sex...I would cry and tell him that it was painful...still he would continue. This continued until I had to consult a doctor for bleeding. The bleeding did not stop for 15 days. After this, I developed a fear of sex".

These young women had very inadequate information about sex before they married, and as a result the first sexual encounter for most of them was a negative experience. However, as discussed below, marital sex improved for many women.

Sexual interaction and communication

It is generally believed that in conservative Indian society sexual interaction is always initiated by the husband and that women remain passive partners during sexual intercourse. This study indicates that several strategies were used by rural women to communicate their desire for sex to their husband. Many of them (28 women) used physical signals to convey such messages. These were described as playful hits or winks, or they would fondle, caress him, hug or kiss him and so on. Some women (15) were able to verbalize their desire for sex using circuitous terms such as "I want to do it (*mane karvanu che*)", or "I am in the mood", or simply by using the word "Come (*chal*)". Other non-verbal initiating signals (13 women) were described in various ways: "It clicks through eye contact (*aakh madi jai*)", or "I go and sleep very close to him and he understands (*pase jai ne sui jau*)".

Seven women refrained from answering the question directly by saying that the issue did not arise as their husband wanted sex all the time, or said that they were shy and felt hesitant about expressing their desire for sex, for example, "I never indicate my desire. But I never refuse him. After all he is a man. Where will he go?"

Two women felt awkward discussing the subject at all, and four women said that they did not express their desire for sex because they "did not like sex" or felt it was "dirty".

Current attitudes towards sex

During repeated in-depth interviews, it was observed that initially women tended to give passive or non-committal replies concerning their sexual desires and experiences. With subsequent probing, and as rapport increased, a different picture emerged. It appears that sexual contacts were perceived by many women as positive and pleasurable, rather than a negative and unpleasant task forced upon them by their husband. In order to quantify this impression, a content analysis of the in-depth interviews was performed. The informants were sorted into three categories according to whether their views on sex were broadly positive, negative or neutral.

Analysis of the in-depth interviews revealed that sex with their husband was experienced by many women (29) as positive and pleasurable, and they willingly participated in sexual intercourse. Typical of their attitudes is the following:

> "Both of us enjoy sex. What's wrong in it? I do not consider it to be dirty (*gandu nathi manti*). Also, children are born because of intercourse. Then how can we say it's dirty?"

Another large group of women (24) felt that sex was an important and necessary part of their relationship with their husband. This group tended to emphasize their duty to fulfil their husband's sexual desire rather than their own pleasure. Even so, they expressed no sense of endurance or tolerance that might indicate negative attitudes towards sex, e.g. "It brings us close; we can share all our joys and sorrows. It also increases the understanding between a couple".

Sixteen of the women interviewed in depth did express negative attitudes towards sex. They reported varying degrees of forceful and coercive sexual interactions with the husband who, according to wives, became angry, threatened them, subjected them to verbal abuse and forced them to have sex, even though they did not want to. In such situations, the women tried to accommodate their husband's sexual needs in order to prevent the man from seeking alternative outlets that could threaten the security of their marital lives. Some of them expressed their feelings as follows:

> "To keep him at home, I allow him to have sex whenever he desires, otherwise he will go to a prostitute *(randi)*. He loses his temper. Now I have less desire for sex, but my husband forces me to have sex. I am helpless".

> "Whenever we have intercourse, it pains me a lot in the abdomen and all the sides of my stomach. When my husband puts pressure on me, I cannot bear it. He knows that it hurts me, but he does not leave me alone. I try to make him understand, but he does not listen. I cannot say no to him. He forces me and fights with me whenever I say no".

The interviews suggest that several, complex interrelated causes may account for women's negative attitudes towards sex. One of the main reasons was the fear that sex would aggravate current reproductive health problems due to heat *(garmi)*, pain and white discharge. Eleven women attributed their current reproductive health problems to sex with their husband because of the transfer of man's heat *(garmi)* or because of his extramarital relationships. Of these, eight women said that they did not willingly participate in sex with their

husbands. They developed negative attitudes towards sex when they were forced by their husband to have sexual intercourse despite their physical discomfort.

In some instances other factors were responsible. For seven women, what were felt to be excessive sexual demands from their husband ("he wants to have sex daily") and the fear of losing their husband to other women if they refused to have sex marred their interest and participation in sexual intercourse. Two women attributed their negative attitudes to the fact that they were forced to marry their husband against their wishes (as they were in love with some other person). Two others simply disliked sex without giving any particular reason for their dislike. Another two were sexually dissatisfied with their husband.

Most of the 16 women who had negative attitudes towards sex were concerned about marital stability. Yet in Gujarat, unlike some other states, widows and divorcees are not ostracized. They do have the opportunity to marry again. In this sample, nine of the interviewees had been divorced and had remarried. Reasons for the earlier divorce were given variously as alcohol abuse, violence and sexual coercion by the husband (4), husband's mental impairment (1), sexual dissatisfaction (1), infertility (1), incompatibility with a husband who was old (1) and for other unspecified reason (1). The fact that such women could marry again indicates that under certain circumstances there are options available for rural women who are unhappy in their marital lives.

The women in this study were able to some extent to articulate their likes and dislikes for sex and were quite verbose if they did not like sex. They did not necessarily project a blissful picture of their married lives, but few reported physical abuse and violence despite being asked specific questions on these subjects.

Premarital and extramarital relationships

Only four women interviewees reported premarital sexual relationships. On the contrary, focus group discussions and the 11 key-informant interviews revealed that inter- and intra-household premarital and extramarital relationships were not uncommon in these villages. A plausible reason for under-reporting of premarital relationships by married women was reported by a key informant:

> "No woman who is happily married would reveal to an outsider about her past (premarital sexual experience) for fear of jeopardizing her current married life. Such relationships are very common in the villages".

Similarly, although 45 women interviewed in depth said that extramarital relationships were quite common in their communities, only four out of the 69 women interviewed admitted to having such relationships. Of these, three had had premarital relationships with men with whom they were in love, which continued even after their marriages. ln one case, it had resulted in marital breakdown; in another case, the woman had a relationship with her ex-husband, who had been compelled by his family to divorce her because she was infertile. Although she remarried, she remains physically and emotionally attached to her ex-husband and has sex with him whenever they meet.

Some women suggested that the extent of extramarital relationships in these rural communities may well be higher than was admitted by the respondents:

> "These activities (extramarital relationships) are rampant (*dham dhokar*) in our village". **(From a low-income focus group discussion)**

> "Sexual relationships among relatives within joint families are quite common in our village — like a married man having a relationship with a sister-in-law and women with a younger brother-in-law". **(From a high-income focus group discussion)**

Determinants of positive sexual experiences

The main object of this study has been to present a qualitative, descriptive picture of rural women's sexual experiences in marriage. The information was also analysed to see which, if any, background variables were linked to the range of differences among the women's responses. We compared women reporting more positive sexual experiences with those whose responses were neutral and negative, using the chi-squared statistic. The analysis revealed that age at marriage, education, religion or caste were significantly associated with positive sexual experiences (table 2).

Family characteristics, on the other hand, showed strong relationships to the women's reports of positive sexual experiences. Both family size and type

Table 2. Statistical association between background characteristics and whether marital sexual experiences were positive or not in rural women from Gujarat

Characteristics	Chi squared	Probability
Age at marriage	1.22	.54
Education	7.1	.31
Caste	3.66	.72
Religion (Hindu/Muslim)	.06	.97
Family size (df = 3)	13.78	<.01
Type of family (df = 3)	18.90	<.001

of family (nuclear versus joint or extended family) were significantly associated with the women's marital sexual experiences. Women in nuclear families reported more positive sexual relationships with their husband than did women living in extended/joint families. Similarly, women in small families felt more positively about the sexual side of their marriage than did women in larger families.

Discussion and conclusions

This study portrays a range of information about the sexuality of rural women, in contrast to most other recent reports, which delineate a uniformly negative view of Indian women's sexual relationships with their husband. These women appear to be more articulate and communicative about sex than the women observed, for example, in rural Uttar Pradesh and urban Mumbai and Delhi (George and Jaswal, 1995; Nayar and Chawla, 1996; Savara and Shridhar, 1996). Despite the fact that the large majority of these women experienced unpleasant, coercive sex initially in marriage, many of them reported their current sexual relationships with their husband to be positive. The fact that a number of the women spoke of strategies for initiating sexual activity with their husband adds to the credibility of these findings.

The negative stereotypes of Indian women's sex lives may derive in part from the research methodologies usually employed in such studies, namely, one-shot interviews or group discussions. This study, on the other hand, adopted the method of repeated conversational sessions with the women in the sample. The experience suggests that there is a stereotyped "expected norm", or ideal cultural pattern of female sexual experience, in which Indian women

are expected to be uninterested in or negative towards sex. They are not therefore likely to admit that they might sometimes initiate sexual contacts with their husband. During the first and second interviews many of the women in this study produced just such stereotypical, somewhat negative responses. Getting closer to the underlying reality is akin to peeling away the layers of initial reserve. At first only the outer "expected" picture presents itself. The second and third sessions reveal more detail, and some of the women admitted that they had given a somewhat misleading picture in their first interviews. Women revealed the positive side of their sexual experiences only after greater rapport had been built up with them through repeated visits.

Of course, it is impossible to know how far these results can be generalized. The respondents were drawn from one district in Gujarat. In view of the huge size of the country and its cultural diversity, it would be unjustified to claim that similar findings would apply elsewhere. Moreover, the women were selected based on the criterion that they reported a current health problem. This method of selection also raises questions about the representivity of results even for the study district. However, this feature of the study design strengthens rather than undermines the central conclusions. Some evidence exists in India that reporting of symptoms of reproductive ill-health may be more an expression of underlying depression and psychosocial distress rather than any biomedical infection (Patel and Oomman, 1999; Trollope-Kumar, 1999). To the extent that this is true, it is likely that the sex lives and marital relationships of the 69 subjects are "worse" than those of other women. In other words, a more positive impression might have been gained by a representative sample of all married women.

The results also suggest that focus group discussions, as a methodology to elicit information on sexual behaviour, may produce a generalized and, at times, exaggerated view. For example, the focus group discussions in this study depict extensive premarital and extramarital relationships in these rural communities, whereas only four out of the total sample of 69 women acknowledged their involvement in such relationships during repeated in-depth interviews. Perhaps the truth lies somewhere between the two extremes. However, data obtained through repeated in-depth interviews provide information on actual experiences and knowledge and, therefore, may be more reliable than the generalized views obtained through focus group discussions. Similariy, a study of sexual behaviour of African women reported that "in-depth, one-on-one intelviews were necessary for eliciting good data on actual knowledge and experience" (Helitzer-Allen and others, 1994).

One of the intriguing results from this study suggests that women's sexual experiences may be conditioned by family size and type of family. This link may reflect the ways in which the traditional large extended families submerge and obstruct communications between wives and husbands of the younger generation. In traditional families, any intimacy between wife and husband must be covert, and the husband is usually expected to be aloof and distant from his wife in the presence of the older generation. However, the study does not provide extensive documentation in support of these findings. More research is needed to explore the implications of the data, but the apparent effects of these family factors suggest that intervention strategies with regard to reproductive and sexual health issues in families should pay heed to the special dynamics of extended/joint families as compared with nuclear family structures.

One striking result from the study is the lack of preparedness for marriage and the ensuing trauma of sexual debut. Preparing young girls for marriage, especially those who are not in school, is difficult. Even if they attend school, introducing topics related to reproductive and sexual health into the school curriculum is not enough. Often these topics are skipped as teachers are not specially trained and are unskilled in dealing with them. The responsibility to educate young girls in these matters should be shared by health-providers, teachers, parents and community gate-keepers. To do such would require multi-pronged, carefully formulated and timely interventions.

In conclusion, the study found that, contrary to the belief that sex is virtually a taboo subject for research in Indian communities, these women respondents were quite candid about their sexual interaction and communication with their husbands.

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Sexual Behaviour and Risk Perceptions among Young Men in Border Towns of Nepal

Migrant men are probably more at risk of STD/HIV infection than residents

By Anand Tamang, Binod Nepal, Mahesh Puri and Devendra Shrestha*

The incidence of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) has increased significantly in Nepal in recent years. As of 31 May 2000, there were 1,541 identified HIV-positive cases in the country, of which 69.9 per cent were adolescents and young adults aged

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between 14 and 29 years (Ministry of Health, 2000). The major transmission route in this country is through heterosexual relations with non-regular sex partners and commercial sex workers (Karki, 1998). In view of the hidden nature of the problem, the actual size of the infected population is likely to be considerably larger.

Although there are no "red light" areas and brothels in Nepal, commercial sex work is prevalent in many towns, and particularly so along the country's open border with India. In addition, it is estimated that several thousand girls and women from Nepal are serving in the sex industries in major Indian cities (National Planning Commission/Government of Nepal and UNICEF, 1996). Once they are diagnosed with HIV/AIDS, they are forced to return to Nepal, where they have no other choice but to continue their trade. In the process, they transmit the virus to their new clients.

The nature and extent of sexual contacts between individuals and their non-regular partners have important bearings on HIV transmission. In the absence of a cure or effective vaccine, the only way of preventing the spread of the disease is to try to change the sexual behaviour of sexually active persons by disseminating information about HIV/AIDS and by encouraging the use of condoms. Given their circumstances, it is difficult for many people to learn about or adopt safe sexual behaviour, or to insist on it from their partner (UNAIDS, 1996). Knowledge of safe sexual practices is a prerequisite for behavioural change, although, of course, it is not sufficient. Unless sexual behaviour changes and, in particular, condom use in relationships of risk increases, the incidence of HIV infection will continue to grow in Nepal.

This article aims to examine the extent to which young men aged 18-24 years who live in the border towns, as well as those who frequently visit these towns, engage in casual sexual relations and use condoms. It also explores whether these men consider themselves to be at increased risk of contracting sexually transmitted diseases, including HIV/AIDS, as a result of their activities.

Data sources and methodology

The data for the present article are derived from a larger research study entitled "Sexual risk behaviour and knowledge and attitude to condom use and HIV/AIDS transmission among men in live border towns of Nepal" conducted by the authors during the period 1997-1998 with funding support from the World Health Organization (WHO). The article presents data gathered from

242 resident and 84 non-resident young men between 18 and 24 years old. The term "resident men" was defined to include those men who were resident in the town under study and had been so for the six months or more preceding the survey. The term "non-resident men" was defined as including those men who visited the town for business, project/official work or for religious matters, but who were not resident there. Most of the non-resident young men were short-term visitors (six days at most). A few (13 per cent) of them were citizens of India. Half of the non-resident young men stayed in a hotel or lodge, and nearly a third stayed at the home of relatives or friends.

Case studies of young men who showed high-risk sexual behaviour (14 from the resident and 8 from non-resident respondents) were also carried out to supplement the survey findings.

The site of the study

The study was conducted in five border towns, namely, Kakarbhitta, Birgunj, Bhairawa, Nepalgunj and Dhangadi. These towns were purposely selected because of the higher concentrations of commercial sex workers in these locations, and also because of the free flow of a large number of transient people from both Nepal and India. Border towns such as Birgunj and Bhairawa were for a long time the principal trade routes between India and Nepal until, more recently, Kakarbhitta was opened as the eastern corridor for cross-border traffic of passengers and goods. The remaining towns (Nepalgunj and Dhangadi) function primarily as transit points for agricultural products.

The sample

Data collection was accomplished in two phases: April-June 1997 for resident men and July-September 1997 for non-resident men. The sample of residents was chosen randomly from the core residential areas of the study sites. A cluster sampling approach was used in the selection of settlement clusters and sample households.

The sample of non-residents was obtained through purposive sampling to represent different occupational categories. The occupational categories considered for the study were drivers, conductors/assistants on public and private vehicles, rickshaw-pullers, businessmen, students and people engaged either in construction activities or the execution of development projects requiring frequent visits to the towns. These respondents were approached at meeting places such as bus parks, public places, places of work, restaurants and lodges. The respondents' consent to participate in the study was obtained and they were interviewed in private.

The questionnaire

The questionnaire for the individual interviews was designed on the basis of the Global Programme on AIDS questionnaire for men, developed by WHO (1990), with modifications to suit the Nepalese context. The questionnaire for both resident and non-resident respondents was the same. Multivariate logistic regression analysis has been performed to identify the factors associated with the likelihood of involvement in casual sexual relations among sexually active males.

To identify men involved in non-regular sex, the respondents were asked whether they had had sex with anyone apart from their wife (in the case of married men) or regular partner (in the case of unmarried men) in the past 12 months. Among the sexually active unmarried young men, 52 per cent had a regular sexual partner, though no attempt was made to identify what type of sexual partner that person might be.

Results

Background characteristics

The demographic characteristics of 242 resident and 84 non-resident young men aged 18-24 years are presented in table 1. Note that the samples differ in several respects. For example, in the non-resident sample, there are larger proportions of men with schooling above the secondary level; similarly, there are large proportions of those employed in the transport industry as drivers, conductors or assistants, than in the resident sample. Unmarried men (74-80 per cent) and those from ethnic communities in the hill areas (73-75 per cent) are well represented in both groups.

Sexual experience among unmarried young men

Among the unmarried men, over half (54 per cent) of the residents and 40 per cent of the non-residents had had some sexual experience (figure 1). Of these, nearly a third of the residents and over half the non-residents said that they had a regular partner (data not shown). In terms of education, the better educated among the single residents seemed to be more sexually experienced: over half of those educated to the middle school level (58 per cent) and to the secondary level or above (51 per cent) were sexually experienced compared with only 43 per cent of those with primary education or less (figure 1). Among non-resident single men, however, 50 per cent of those with middle-grade education levels were sexually experienced compared with 43 per cent of

Table 1. Percentage distribution of resident and non-resident young men, by their background characteristics, in Nepalese border towns

Characteristics	Residents (percentage) (n = 242)	Non-residents (percentage) (n=84)
Age (years)		
18-19	40	18
20-24	60	82
Marital status		
Unmarried	80	74
Married	20	26
Ethnicity		
Hill origin	73	75
Terai origin	27	25
Education		
Primary (grade 5) or less	12	12
Middle (grade 6-10)	41	24
Secondary or above (grade 1l+)	47	64
Occupation		
Student	53	42
Businessman	21	14
Service	14	14
Driver/conductor/helper	3	19
Others[a]	9	11
Total	**100**	**100**

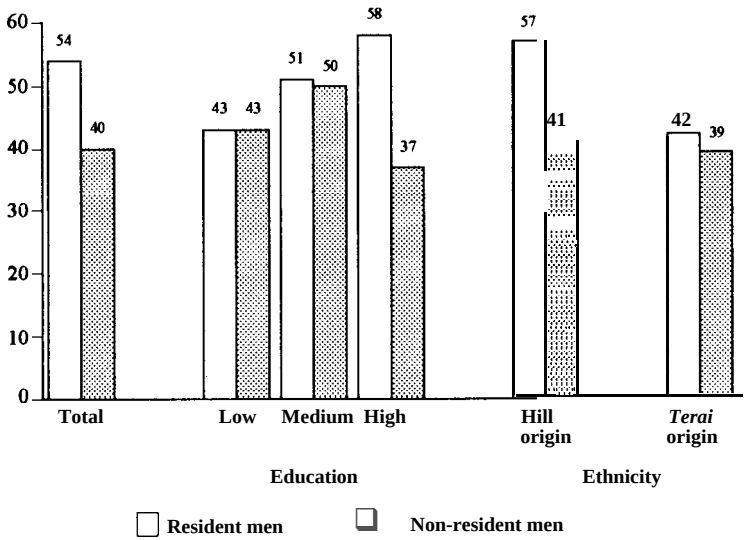
[a] Others include daily wage labourer, farmer, mechanic, social worker (volunteer), photographer and laundryman.

those with primary schooling or less, and only 37 per cent of the best-educated group. Ethnicity made a difference for residents but not for non-residents. Among single residents belonging to hill ethnic groups, 57 per cent were sexually active compared with only 42 per cent of those from *terai* (plains) ethnic groups, but non-residents of both ethnic groupings showed little divergence in terms of sexual experience.

Age at first sexual experience

Among young men aged 20-24 years, 30 per cent of the residents and 35 per cent of the non-residents had become sexually experienced before they were 18 years old (table 2). Twenty-four per cent of the residents and 35 per cent of the non-residents had never had sex, and 15 per cent of the residents and 12 per cent of the non-residents were over 20 years old before their first

Figure 1. Percentage of unmarried young men aged 18-24 years who are sexually active, by their background characteristics, in Nepalese border towns



sexual experience. The median age at first intercourse was 18 years for residents and 17 years for non-residents. The in-depth interviews indicated that it was peer group influence that steered young men towards sexual experimentation. The following case study is such an example:

> "I first had sex when I was 15 years old. I had little knowledge on this subject but was inspired by my village friend. One day he asked me to accompany him if I wanted to have contact with a *bhaloo* (commercial sex worker). Then, I accompanied my friend to a village near Taranagar where my friend used to have contact with a goldsmith's daughter for a long time. After arrangements and fixing the deal, we had sex with her in the nearby forest. The cost of Rs. 200 (US$ 1 = Nepalese Rupees 74.5) was borne by my friend. After getting and liking the taste of sex, I have been habituated to it and have had sexual relations with seven to eight women since then". **(20-year-old single student resident)**

Table 2. Percentage distribution of residents and non-residents aged 20-24 years, by age at first sexual intercourse, in Nepalese border towns

Age at first interecourse (years)	Residents (percentage) (n = 153)	Non-residents (percentage) (n = 47)
<l5	6	7
15	3	3
16	13	12
17	8	13
18	19	13
19	12	6
20+	15	12
No sexual experience	24	35
Total	**100**	**100**
Median age at first intercourse	18	17

Sex with non-regular partners

One in four residents (27 per cent) and non-residents (25 per cent) said that they had had sex with a non-regular partner in the 12 months preceding the survey (table 3). A substantially higher percentage of married (46 per cent) than single non-residents (18 per cent) appears to have been engaged in non-regular sex and a slightly higher proportion of men with schooling up to middle grade or higher, wherever they lived, had had sex with non-regular partners than had those educated to the primary level or less. The ethnic background of the respondents had no marked effect on their involvement in non-regular sex.

Respondents were asked about whether their last non-regular sexual partner (NRSP) was a commercial sex worker, a friend or another person. The last NRSP of the large majority of single (82 per cent) and half of the married non-residents (50 per cent) was a sex worker (figure 2). In contrast, the last NRSP for the majority of both single (62 per cent) and married (69 per cent) residents was a friend (either in school/college or in the community). Even so, for about one third of the residents (31-33 per cent), their last NRSP was a commercial sex worker.

Use of condoms

Information on the use of condoms during sex with NRSPs is shown in table 4. The proportion of men who had ever used a condom during sex with

Table 3. Percentage of men aged 18-24 years who have had at least one non-regular sexual partner in the 12 months preceding the survey, by their background characteristics, in Nepalese border towns

Characteristics	Residents	Non-residents
Age (years)		
18-19	20	7
20-24	31	29
Marital status		
Unmarried	27	18
Married	27	46
Education		
Primary or less	25	20
Middle grade	28	30
Secondary or higher	26	24
Ethnicity		
Hill origin	27	25
Terai origin	26	24
All	**27**	**25**

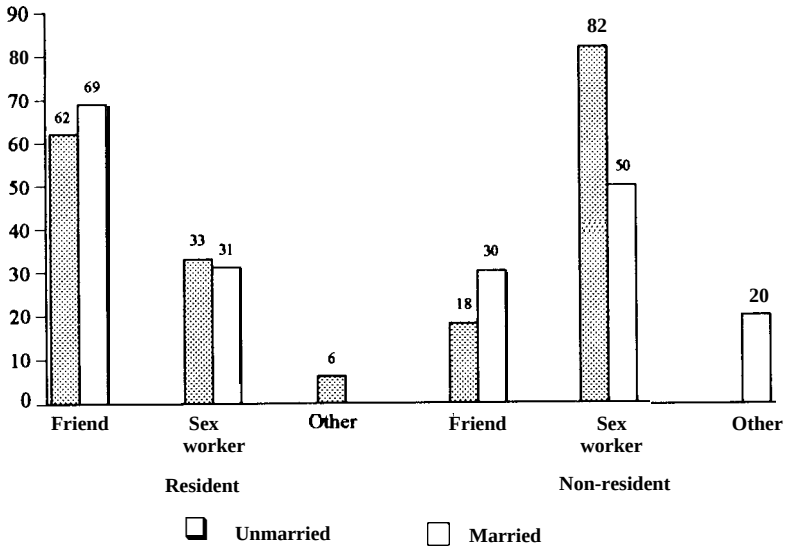
Note: Denominator includes virgins.

an NRSP is much higher among unmarried than married young men, whether resident or not. However, a rather smaller proportion (42-43 per cent) used a condom every time. But regular use of condoms by married men during non-regular sex was even lower: only 31 per cent among residents and 20 per cent among non-residents; and only 40 per cent of non-resident and 31 per cent of resident married men had used a condom during their last encounter with an NRSP. This is in marked contrast to the much higher percentage (52-82 per cent) of condom-users among unmarried men, whether resident or not, when they last had sex with an NRSP.

The case studies confirm that young men did not always use condoms with NRSPs, even if those partners were commercial sex workers. They were sure that they would not be the ones at risk of a sexually transmitted disease (STD) including HIV. Some did not use condoms in order to optimize "enjoyment"; others "did not have time to get condoms" or "could not buy a condom because of embarassment". The responses of these young men reflect the attitudes of a large number of men regarding condom use:

> "As I have sex with clean or disease-free women, there is no need to use condoms... As this disease [AIDS] has spread everywhere, it is natural to fear it, but I take precautions by being selective about my partners". **(22-year-old single student resident)**

Figure 2. Among young men who had non-regular sex, the percentage reporting specified types of most recent partner, in Nepalese border towns



"I have had sex with many girls and among them some may have had relations with others; also I never used a condom as the brain does not work while enjoying but so far I have no symptoms of AIDS". **(18-year-old student, unmarried resident)**

"Sometimes due to excitement, my partners themselves take off the condom.. . . They say 'unless your semen comes out, we do not enjoy' ". **(23-year-old truck driver of Indian origin)**

"I had sex not only with women of my community but also with three other women in the past one year. Two of them were sex workers. I did not use condoms on any of the occasions. I did not have time to buy them and it is embarrassing for bachelors to buy condoms in our locality. However, I am sure that I do not have any diseases". **(22-year-old farmer, unmarried non-resident)**

Table 4. Percentage of men aged 18-24 years by extent of condom use during sex with non-regular sex partners in Nepalese border towns

Condom use	Residents			Non-residents		
	Total	Unmarried	Married	Total	Unmarried	Married
Ever used a condom during sex with NRSP	60	65	38	76	91	60
Used a condom during last sex with NRSP	48	52	31	62	82	40
Used a condom every time during sex with a NRSP	41	44	31	43	64	20
Number	**65**	**52**	**13**	**21**	**11**	**10**

Note: NRSP = non-regular sex partner.

Risk perceptions among men involved in non-regular sex

The vast majority of resident (89 per cent) and non-resident (76 per cent) young men who have had sex with non-regular partners felt they were not at risk of contracting any form of an STD or HIV (table 5). Their reasons for this belief differ marginally between residents and non-residents. The majority of men (50-52 per cent) in both groups believed their partners to be uninfected with any disease. However, more than half the non-resident men (56 per cent) were also confident about themselves not being at risk, saying tbat they had been using condoms during sex.

The case studies showed that, generally, men indulging in risky sexual behaviour were unconcerned about transmission and continued to expose themselves as well as their partners (regular or non-regular) to disease. Only when they began to experience signs or symptoms of STDs did they become worried about their exposure to HIV.

> "Once I had bought a condom but did not use it as I thought it would not give sexual satisfaction, but since I have come to know about AIDS, I have thought of using it despite its minimal enjoyment". **(19-year-old trader, non-resident, unmarried)**

> "I did not always use condoms. I had suffered from syphilis last year. After that, I started wearing condoms. Whenever I recall those days when I was suffering from syphilis, I become frightened". **(23-year-old transportation worker from Bihar, India, married)**

Table 5. Perceived risk of contracting sexually transmitted diseases including HIV among residents and non-residents aged 18-24 years who had had sex with a non-regular sex partner, and reasons for belief that they are not at risk, in Nepalese border towns

	Resident (percentage)	Non-resident (percentage)
Perceived risk of STD/AIDS to himself		
Yes	9	19
No	89	76
Don't know	2	5
Total per cent	**100**	**100**
Number	**65**	**21**
If not, reasons		
My partner is not infected	52	50
I use condoms all the time	38	56
My partners have sex only with me	9	–
I avoid sex with girls having multiple partners	7	–
No symptoms of venereal disease have yet developed on me	3	–
1 use condoms most of the time while having sex with commercial sex workers	2	–
No risk of contracting because blood test should be HIV-positive	2	–
AIDS had not originated when I had many partners	2	–
I have not had sex with many girls	2	–
I wash my penis with urine immediately after sex	2	–
Number	**58**	**16**

Note: Percentage total exceeds 100 due to multiple responses.

Predictors of non-regular sex

Multivariate analysis was carried out to identify the factors associated with the likelihood of involvement in non-regular sexual contacts. The dependent variable in the multivariate analysis was whether the young man was involved in non-regular sex in the previous 12 months (i.e. sexual intercourse with anyone apart from his wife or a regular partner). The analysis was based on 242 resident and 84 non-resident young men aged 18-24 years. Residents and non-residents were analysed separately.

It appeared, on the basis of initial exploration of the data, that non-regular sex among non-residents was associated with factors such as frequency

of visits to the border town, duration of stay, place of stay and the habit of drinking alcohol. Thus, these variables along with socio-demographic variables were included in the multivariate model. A logistic regression technique was employed to estimate the likelihood of involvement in non-regular sex, as the dependent variable was dichotomous (Hosmer and Lameshow, 1989).

The results of the multivariate analysis are presented in table 6. They indicate the habit of drinking alcohol to be the only significant predictor of risky sexual activity for resident men. Of the total of 242 resident men, 55 per cent drank alcohol; of those, 74 per cent reported at least one non-regular sexual contact. Resident men who drink were almost four times more likely to be involved in non-regular sexual behaviour than those who do not drink. However, this variable was dropped in the non-resident model owing to its inexplicably high coefficient, perhaps a reflection of the small sample size.

Marital status turned out to be a significant predictor of involvement in non-regular sex, but the effect was not the same for both groups. Among non-residents, married men were much more likely to be involved in risky sexual behaviour than single men, whereas among residents, the difference was small and not significant. Married non-residents were 87 per cent more likely to be involved in non-regular sex than single non-residents.

Neither education nor occupation showed significant association with non-regular sex. However, exposure to mass media emerged as a significant predictor, but not in the direction that might have been expected. Although one might suppose that increased exposure to television would be associated with lower involvement in non-regular sex because educational messages about safer sex practice in the context of HIV/AIDS appear quite frequently on television, the results in table 6 contradict this expectation. They indicate that residents who watch television regularly were 51 per cent more likely to engage in risky sexual behaviour than residents who rarely watch. This result is of borderline significance at the 95 per cent confidence level. Similarly, among non-residents, men who watch television regularly were 89 per cent more likely to engage in risky sexual behaviour than those who rarely watch. This difference is statistically significant.

For non-resident men, three extra variables were included: frequency of visits to the town, duration stayed and place stayed during the visit. Non-resident men who visited the town more frequently were nearly three times more likely to be engaged in non-regular sex than those who visited the town less frequently. Similarly, non-resident men who stayed in a hotel, lodge

Table 6. Estimated odds ratios (and 95 per cent confidence intervals) of having had non-regular sex, among residents and non-residents aged 18-24 years, by selected predictors, in Nepalese border towns

Variabes	Residents		Non-residents	
	Odds ratio	95 per cent CI[a]	Odds ratio	95 per cent CI[a]
Education				
Primary or less	1.00	–	1.00	–
Middle (grades 6-10)	1.30	(0.44, 3.90)	0.60	(0.07, 4.99)
Secondary or higher (grade 11+)	1.23	(0.39, 3.89)	0.33	(0.03, 3.41)
Occupation				
Professional	1.00	–	1.00	–
Non-professional	1.06	(0.42, 2.70)	0.75	(0.08,7.24)
Student	0.78	(0.30, 2.02)	0.89	(0.13, 6.19)
Marital status				
Married (reference)	1.00	–	1.00	–
Unmarried	1.19	(0.51, 2.75)	0.13	(0.63, 0.60)
Ethnicity				
Hill origin	1.00	–	1.00	–
Terai origin	1.00	(0.48, 2.06)	0.40	(0.09, 1.83)
Exposure to television				
Almost every day	1.00	–	1.00	–
Rarely	0.49	(0.20, 1.18)	0.11	(0.02, 0.61)
Frequency of visit to the town				
Once in two months or less	–	–	1.00	–
Once a month or more	–	–	2.74	(0.57, 13.29)
Duration stayed				
Short (1-3 days)	–	–	1.00	–
Long (4 + days)	–	–	0.52	(0.08, 3.51)
Place stayed				
Friend/relatives	–	–	1.00	–
Hotel/lodge/vehicle	–	–	2.53	(0.66, 9.62)
Drinking habit				
No (reference)	1.00	–	–	–
Yes	3.94	(2.01, 7.74)	–	–
Model chi-square	25.08		21.32	
DF	**8**		**10**	
Number	**242**		**84**	

[a] Cl = Confidence interval.

or guest house during their visits to the towns were two and half times more likely to have non-regular sex than those who stayed with friends or relatives (table 6). However, these effects do not attain statistical significance.

Conclusions and discussions

This is an exploratory study that attempts, for the first time, to understand the extent and nature of sexual risk behaviour of young men living in or visiting Nepalese border towns. It is also intended to contribute to narrowing existing information gaps pertaining to high-risk sexual behaviour among the adult male population at large.

About 50 per cent of single men aged 18-24 years living in border towns and visiting these towns are sexually experienced. Most of them had their first sexual encounter during adolescence, with the median age at sexual debut being around 18 years. As age at marriage for men in Nepal is about 22 years, this result implies that men in border towns typically experience several years of sexual exposure before marriage.

The design of the study was based on the assumption that migrant men would be more likely to engage in extramarital sex than resident men. Many studies in low-income countries have shown such a relationship (for example, Jochelson and others, 1991). In this study, however, little difference was observed between residents and migrants in the probability of non-regular sexual contacts. In each group, about one quarter reported at least one non-regular partner in the preceding 12 months. The striking contrast between the residents and migrants lies in the nature of the sexual partners. The latter appear much more likely to have sex with prostitutes. This distinction is readily explained by the likelihood that temporary visitors to border towns do not have the opportunity to establish relationships with women who are not involved in commercial sex. Because of this factor, migrant men (particularly those making frequent short visits to border towns) are probably more at risk of STD/HIV infection than residents, and this should be a matter of serious concern to health policy makers.

In many countries, single men are more likely to engage in non-regular sex than married men (Carael and others, 1995). In our study, no such pattern was found. Among residents, there was no difference between married and single men and, among migrants, married men were significantly more likely to report at least one non-regular partner than single men. Moreover, married men were less likely to use condoms during non-regular sexual encounters, which enhances the risk of infection.

Overall, only about 40 per cent of the men reported regular use of condoms during non-regular sexual encounters. The reasons for non-use parallel those found in 'many other studies: fear of losing sexual pleasure, embarrassment over buying condoms and a belief that careful selection of partners offers sufficient protection. It is of great concern to note that the large majority of young men who engage in non-regular sex perceive little or no risk of STD/HIV infection to themselves.

Analysis indicated that men who watch television often are more likely to engage in non-regular sexual behaviour than those who rarely watch television. The survey did not collect information on respondents' income, but it is likely that those who watch television belong to higher-income brackets and are therefore able to pay for commercial sex workers. Nevertheless, this apparent link needs further exploration. Among residents, drinking habits emerged as the only significant predictor of non-regular sex. This link is consistent with results from many other studies (for example, Kiraju and Zabin, 1993).

The findings have important policy implications. They show that mobile young men are more vulnerable to contact with sex workers and may therefore be responsible for the transmission of STDs and HIV/AIDS to their partners. Programmes aimed at the promotion of safer sexual practice should be targeted at such groups. Similarly, drinking habits have emerged as a strong predictor of sexual risk behaviour. Therefore, it is also important to develop suitable educational messages linking STD and HIV/AIDS infections to increased risk in casual sexual relations resulting from alcohol consumption. The existing messages on safer sexual practice and condom use also need strengthening to produce a more effective impact on the target audience. Further research is needed to examine the link between mass media, such as television and radio, and risky sexual behaviour and condom use.

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Male Sexual Debut in Orissa, India: Context, Partners and Differentials

Young men still need to be reached with information on unsafe sex and condom promotion

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First sexual intercourse is a significant event in a man's life, whether or not it happens within the context of marriage. In the wake of the HIV pandemic, sexual initiation before marriage has become a focus of attention. From an intervention point of view, the proportion of young people who are sexually active, especially before they form stable partnerships, is an important area of concern. Early age at sexual debut and the number of pre-marital partners have been shown to be correlated with risk behaviour later in life

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(White and others, 2000). Contextual data on sexual partners and circumstances are needed to understand and assess the risk associated with early sexual experiences, and thereby design appropriate policies and programmes.

Systematic information on sexuality and sexual behaviour in India is scarce. Despite a rapid increase in intervention research on sexual behaviour and health in the second half of the 1990s, most studies covered groups with high risk behaviour, and little is known about what happens in the general population (Nag 1995; Pelto, 1999). An exception is a study of married men in the state of Uttar Pradesh, in which 14.5 per cent of the men were reported to have had sexual intercourse before marriage (Singh and others, 1998). Only a few studies of Indian young people report on their sexual behaviour (Jejeebhoy, 1998).

Drawing on in-depth sexual case histories, this article provides information on the context of young men's first sexual encounters, describing the range of sexual partners. These qualitative findings are supplemented by data from a general population sample giving numerical estimates of premarital sex and age at sexual debut, which allow for comparison.

Methods and data

Of all Indian states, Orissa has the second highest concentration of tribal people: its 62 different scheduled tribes make up 22 per cent of its population. The study area for the research on sexual health and behaviour was limited to the four coastal districts of Orissa with low concentrations of tribal people: Puri, Cuttack, Balasore and Ganjam districts. The distinctly different cultures of the scheduled tribes in Orissa suggest the need for a separate in-depth study in tribal areas.

The strategy adopted for the qualitative data collection broadly followed the guidelines for conducting focused ethnographic studies (Pelto, 1994; Pelto and Pelto, 1997). Data-gathering focused on the need to answer programmatic questions on sexual health and condom promotion interventions. The field-workers were trained in in-depth interviewing, social mapping and various structured interviewing techniques.

In total, 17 *sahi* (localities: colonies, neighbourhoods or hamlets) were studied in depth by a team of four male and two or three female researchers. The average number of days spent in one location varied from seven to ten days, depending on the availability of the informants, and time taken initially to build rapport. Each *sahi* was treated as a separate case and a

detailed study of the various role players in each location was carried out. Data-gathering and analysis took about four months to complete from May to September 1997.

In-depth individual interviews were done with both key informants and case study informants. Key informants were selected for their extensive knowledge of local cultural beliefs and practices, and the conversation focused on local perceptions and behaviours. They were selected during participatory social mapping exercises and other informal group discussions, and guided the interviewers towards men who had experienced sexual ill-health and others who engaged in risky sexual behaviour. This article draws heavily on interviews with these case study informants (42 cases), who were visited several times in order to build up rapport and permit probing into sensitive issues. The conversation focused on their personal lives, to elicit illness episodes and sexual histories.

Fieldworkers took notes during the group and in-depth interviews, which were expanded and written out immediately afterwards. Transcripts of all interviews were coded and analysed with the software package Ethnograph. All names in the quotations presented in this article have been replaced by the fictional name Kanhu.

Following the qualitative fieldwork, a structured survey was undertaken to estimate the extent of sexual risk behaviour and the need for condoms in the general male population. The findings from the qualitative study were used in the design and refinement of the survey instrument, mainly to employ the correct local vocabulary and define coding categories. This survey covered a large population-based random sample of 2,087 single and married men in urban and rural areas of the four coastal districts in Orissa. The ages of the respondents were limited to 18-35 years since international studies of sexual behaviour show that risk behaviour tends to peak before age 30 (Cleland and Ferry, 1995), a finding confirmed in the study area by the qualitative research preceding the survey. Respondents were selected using multi-stage random sampling. In each selected cluster, all houses were mapped and numbered, and 33 selected at random. All men aged 15 or older in the selected households were listed and de facto resident men aged 18-35 were ranked by age. Male field-workers selected the youngest, second youngest, third youngest, and so on, of the eligible males in strict rotation in consecutive households. The selected respondent was asked to consent and invited to a central location outside his home for a private interview. The questionnaire pre-test indicated that a half-hour rapport-building chat was needed before discussing sensitive issues of sexual behaviour. The refusal and non-contact rate was lower than 1 per cent.

Men not living in households may have a different pattern of sexual risk behaviour and had no chance of being sampled by these methods. During completion of the household schedule, interviewers therefore asked about family members currently staying away from home. Of men aged 18 to 35, 6.9 per cent were away from home as students or migrant labourers. As there was no sampling frame, an opportunistic sample of eight college hostels and four migrant-worker camps was selected: 159 single students and 150 migrant labourers (85 married and 65 single) were subsequently interviewed. The article presents some comparative statistics on sexual debut from these separate samples.

The statistical analysis of survey data was done using SPSS software. The data file was weighted according to urban/rural residence and the size of the district, to make it truly representative of the four coastal districts. Since marriage is virtually universal in India, sexual activity among single men is referred to as "premarital sex".

Results

The socio-demographic characteristics of the single and married men in the sample are presented in table 1. It gives the actual distribution of respondents, and was calculated from the unweighted data. In the weighted sample, 1,033 men (49 per cent) were married and 86 per cent lived in rural areas. Equal-sized samples were selected in urban and rural areas of the four coastal districts and only one man regardless of marital status, was selected randomly in each household. The different distribution of single and married men according to residence and district is thus a result of differences in age at marriage. Urban men and men living in Cuttack marry later, resulting in a higher proportion of single men in these strata. Less educated men marry at younger ages and nearly 20 per cent of married men had received no education compared with 4 per cent of single men. More than half of the single respondents had studied beyond the secondary level. The caste distribution for single and married men was also slightly influenced by age at marriage, which is later among the higher caste. By sampling coastal districts only, very few men from the tribal populations were included, and all men in the "no caste" category are Muslim.

Sexual experience before marriage

In the survey sample, only 8 per cent of men under the age of 25 were married, and among the 30-35-year-olds 7 per cent were single. The median

Table 1. Percentage distribution by marital status, according to selected background characteristics, among men in Orissa

Background characteristics	Married men	Single men	Total
Residence			
Urban	40.7	57.9	50.0
Rural	59.3	42.1	50.0
District			
Puri	25.6	24.2	24.8
Ganjam	29.3	21.1	24.9
Balasore	25.7	24.6	25.1
Cuttack	19.4	30.1	25.2
Education			
None	19.9	3.8	11.2
Primary/non-formal	26.9	9.2	17.3
Secondary	36.1	33.5	34.7
Higher	17.0	53.5	36.8
Caste			
Upper caste	21.8	28.9	25.6
Other backward caste	48.5	50.4	49.5
Scheduled caste	26.2	18.3	21.9
Scheduled tribe	1.9	1.1	1.4
None (Muslim)	1.6	1.3	1.4
Age (years)			
18-19	0.1	22.9	12.4
20-24	7.2	49.5	30.1
25-29	31.3	22.5	26.5
30- 35	61.4	5.1	31.0
Number	**958**	**1,129**	**2,087**

age at marriage was 26, but was higher in urban areas (27.8) than in rural areas (25.1). Despite this late age at marriage, the survey data showed that only about a quarter of the men in Orissa had had premarital heterosexual intercourse. Twenty-two per cent of the single men reported at least one sexual partner and 27 per cent of the married man had had sex before marriage. The difference in these levels for married and single men can be attributed to censoring; more of these single men will have sex before they marry. Life table analysis of loss of virginity enables the comparison of age patterns of sexual initiation as shown in table 2. The probabilities of surviving in the virgin state by each age axe very similar for both single men and married men who reported premarital sex, thus supporting the assertion that the difference in the proportion reporting premarital sex was because of censoring and not under-reporting of sexual activity by single men.

Table 2. Indications of age at sexual debut among single and married men in Orissa who reported premarital sex

Indications	Median age at sexual debut	Proportion of men still virgins at exact age (years)				Number
		18	20	25	30	
Sexually active single men	18.6	60	35	6	1	240
Married men reporting premarital sex	18.7	62	38	7	1	291

Since urban men many later, 36.1 per cent had had sex before marriage compared with 26.3 per cent of the rural men; 17 per cent of the student sample reported premarital sexual intercourse.

First partner and circumstances of first intercourse

The young men's first sexual experiences took place with three main categories of partner: married women, single women and sex workers. Among married men who reported premarital sex, 6 per cent reported that their first sexual intercourse was with the girlfriend who later became their wife (8.3 per cent in urban areas and 5.6 per cent in rural areas). Nearly three quarters of the men who had sex before marriage reported girlfriends or acquaintances as their first partner, and 16 per cent reported relatives. A small proportion of men (4 per cent) reported sexual initiation with a so-called *bhauja*; this is the Oriya term for sister-in-law. Indian culture sanctions close interaction between young men and their *bhaujas*. This may sometimes include sexually explicit conversation and sexual relations are often mentioned. The qualitative study had shown that probing about sexual relations with the wife of "own" brothers was too sensitive for the survey setting and the coding category was broadened to "*bhaujas* in the neighbourhood". This broader term thus included the wives of older men in the community. Initiation with these *bhaujas* was more frequent for urban men (8 per cent) than rural men (3 per cent).

Among the 42 case study interviews, several instances of sex with married women in the neighbourhood were reported. For example, a man from a slum in Cuttack had had sex with five married women. He described how he became familiar with the women and other family members by shopping for them and doing various little jobs in their houses, enabling him to gain access to their homes without suspicion. The following extract relates how another man from Cuttack was taken along by his friend to the house of a married woman:

> "... One day Kanhu was sitting in front of his house when one of his friends came to him and told him that there is a woman with whom he had sex and if he is willing they can go to her since her husband is not at home. Around 4 p.m., both of them went to that woman's house where she was alone.... Then his friend told her about the purpose of their visit. Initially she was not willing because there were two. But his friend convinced her and she agreed. After that they went to her bedroom and they had sex. It was his first sexual experience.... after that he had sex with the same woman three times...."

First sexual intercourse in the company of another man was not unusual. First sex with sex workers often happened on the invitation or encouragement of a friend or a group of friends. Though the qualitative data include several instances of first sex with a sex worker, the survey shows that relatively few men in the general population (7 per cent of those who had sex before marriage, and thus less than 2 per cent of all men) shared that experience. It was higher for urban men, and married men reported more sex workers as first partners than single men (9 per cent compared with 5 per cent). It is possible that perceptions of who gets labelled as a sex worker may change, though the difference may also be explained by the fact that men who start their sex life late are more likely to have sex workers as first partners. Five per cent of the men who had sex before the age of 20 reported a sex worker as their first partner, compared with 10 and 12 per cent among those who had their first sexual encounter at ages 20-24 years and over 25 years respectively.

In all, 4 per cent of the married men reported that they were with a friend when they first had sex and 3 per cent of them reported the company of a group of friends. However, among those whose first partner was a sex worker (n = 25), nearly half were accompanied by one or more friends when it happened. Less than 10 per cent of the men were under the influence of alcohol during their first sexual experience, although this indicator was as high as 40 per cent for first encounters with sex workers.

First sex most frequently took place with girlfriends or other single young women, and young people do seem to get chances to meet. The interviews reflected different degrees of courting and emotional involvement with the woman. A man in Puri town recounted the gradual development of his affection for a girlfriend, which culminated in the young people having sex in her house:

> "... Four to five years back I had sex for the first time. There was a girl who is the sister of my friend (she is married now). I used to go to my friend's house frequently. We started liking each other and gradually a relationship developed between us. I went approximately 20 to 30 times to her house. Then we started going out together to the beach. In the evenings we would sit on the beach and kiss each other. One day when nobody was there in the house, her sister had gone for tuition, her father had gone to work and her grandmother was also not present, she called me to her house. I asked her for sex and she agreed. I went to her at least 22 to 23 times to have sex after that day...."

This man further explained that he had used a condom on this occasion as "... I was prepared, since I had expected to have sex with her, I had taken a condom in my trousers....". In this case, both partners seemed to have had the same intention. Not all instances depict this mutuality (nor the advance planning), and some young men resorted to emotional blackmail to get to the sexual act.

The sexual case histories suggest that women and girls play a surprisingly active role in initiating sexual contact. Some girls were known to have several sexual partners, and are referred to as bad girls or *kharap jhea*. But it is not only these "bad" girls who appear to be pursuing the men; ordinary girls are not all averse to loosing their virginity with their boyfriends, as was depicted by one of the cases described above. The active role women play was confirmed by the survey data. Excluding first encounters with sex workers, 29 per cent of married men who reported sex before marriage said that they had been approached by the woman. In 38 per cent of the encounters, it had been a mutual initiative and in 33 per cent of the cases it was the man himself who had clearly taken the initiative. For those with the so-called *bhaujas* as first partners, more than half of the encounters (8 out of 14 respondents) were reported to have been initiated by the women.

From the case histories it is clear that these first sexual encounters were usually unplanned and happened on the spur of the moment. Although young people do find chances to meet, the windows of opportunity are often short which makes first intercourse very mechanical and quick. The lack of privacy and the fear of being found out are pressing considerations. Only 5 per cent of first encounters took place in hotels, lodges or brothels; about 44 per cent happened in a public place or open area, and half took place in the home of either partner. Usually this was in the absence of the other family members, although several instances were reported of other family members being present, mostly at night when everyone was asleep.

Table 3. Differentials in timing of sexual debut: life-table median ages and proportions still virgin at specified ages, among men in Orissa

Characteristics	Median age at sexual debut	Proportion of men still virgins by exact age (years)				Number
		18	20	25	30	
Sample						
Main sample	24.5	89	80	47	17	2,087
Student sample	–	88	83	71	–	159
Migrant sample	20.3	75	52	26	6	150
Residence						
Urban	25.7	90	81	56	23	296
Rural	23.6	89	78	39	12	1,791
Education						
Less than secondary	21.6	84	69	23	3	679
Secondary	24.4	88	78	45	15	723
Higher	28.3	95	91	74	37	685
Current age						
18-24	–	89	81	60	–	887
25-29	24.6	91	82	47	18	554
30-35	23.8	88	76	42	14	646

Differentials in age at sexual debut

Table 3 shows differences in the timing of sexual debut, presenting data on life table median ages at sexual initiation, and on the probability of remaining in the virgin state by different ages. Overall, half of the men in coastal Orissa have sex before the age of 24.5 years, but only 11 per cent have sex before the age of 18. Migrant labourers showed earlier sexual debut, but the students sampled at college hostels did not. The median age for the student sample could not be calculated since only 17 per cent reported premarital sex. Life-table estimates show that less than 30 per cent of students have had sex before the age of 25, which is consistent with the 26 per cent of men in the main sample who had higher education and had lost their virginity by the age of 25.

Sexual debut among urban men takes place about two years later than among rural men. There is a strong association between age at first intercourse and educational level, with men studying beyond secondary level starting nearly seven years later than those with no schooling beyond primary level. The differential across cohorts can be interpreted as a change in timing of

sexual debut, which is towards a later rather than an earlier start. This is explained mainly by the trend towards a later age at marriage: in the youngest cohort, life-table probabilities of getting married before the age of 25 are one in three, while the median age at marriage for the 25-29 cohort is 24.6 and 23.8 for the oldest cohort.

A comparison of the median ages in table 3 with those among the subgroups of men who had had premarital sex, as presented in table 2, illustrates how estimates of sexual debut can be biased when they are based only on the sexually active. About three quarters of single men were still virgins, and so are excluded from the estimates in table 2, as are married men who did not report premarital sex. For those married men who reported premarital sex, the average interval between the first sexual experience and marriage was 4.5 years, varying little across different strata. However, for urban men and for those with an education above secondary level, the gap was 5.1 years. Despite this long period between first sex and regular sex within marriage, 56 per cent of the married men who had engaged in premarital sex said they had done so with only one partner, 13 per cent of them reported more than five partners (which is less than 4 per cent of all men).

Discussion

In the coastal districts of Orissa, men start sex late and nearly three quarters of them have their first sexual experience within marriage. A comparison of the data from the qualitative and survey components reveals both agreement and contrast between the two data sources.

Under-reporting of sexual activity before marriage in surveys cannot be ruled out owing to the strong social norms which inhibit the free discussion of sexuality and sexual behaviour in India. However, it is important to note that interviewers were very well trained: all had been involved in the qualitative field work preceding the survey, were de-sensitized and felt relaxed talking about sexual practices, and had put a great deal of effort into building rapport with the respondents before starting the interviews. Even so, some men may have chosen not to reveal that they had partners before marriage. However, in the only other comparable Indian study, among married men in Uttar Pradesh (Singh and others, 1998), only 14.5 per cent reported sexual intercourse before marriage, about half the level found in this study in Orissa. The consistency of age patterns of sexual debut from reports by both married and unmarried respondents (as shown in table 2) reinforces the validity of the findings.

The household sampling did exclude men who do not live in households and those who were away from home for travel. Away from the family context, men have more opportunity to engage in activities outside social norms, including risky sexual behaviour. Indeed the migrant labourers showed an earlier age at sexual debut. College students start sex later than the general population, though slightly earlier than men with higher education in the main sample. In a study of men in different occupational groups in Maharashtra (Savara and Sridhar, 1994), 19 per cent of the students had experienced sexual intercourse, compared with levels of 26-35 per cent among white and blue collar workers, and migrant workers. The data gathered in this study on the general population are in sharp contrast to observations among groups with high-risk behaviour such as truck drivers (AIMS-Chennai, 1997; Rao and others, 1994).

The relatively low level of sexual activity reported in the survey is not inconsistent with the findings of the qualitative study. The case study informants were purposely selected because they engaged in high-risk behaviour and even though they report multi-partner sex, the encounters they describe were of an unplanned and occasional nature.

The men's first sexual partners can be classified mostly as low risk, consisting mainly of young unmarried women and also married women. Sex workers play a much lesser role in sexual initiation than is commonly believed. It is often assumed that men resort to sex workers for their first sexual encounter, but less than 2 per cent of the men in the study had done so, and less than 4 per cent had had any sexual encounter with sex workers before marriage. However, the higher the educational level and the later the age at debut (and marriage), the more likely it was that first sex was with a commercial sex worker. This finding is consistent with the study in Maharashtra where white collar workers were two to three times more likely to have had first sex with sex workers than were the lower occupational groups (Savara and Sridhar, 1994). Men in all communities were able to identify places where commercial sex could be obtained (not necessarily within their own neighbourhood), although there are only a few towns in Orissa where prostitution is organized (in contrast to the big Indian cities). Apart from the few "red light" areas, pimps and female agents contact sex workers who live in the slums, and these women are usually taken to the client's home, or some public place. Some hostels and lodges also have the reputation for being able to contact and supply sex workers. Key informants often told of women who solicit for sex near bus stands, cinema halls and railway stations.

Seventeen per cent of the students had been initiated into heterosexual sex, but that does not necessarily mean they had been recently sexually "active". In fact, less than 6 per cent reported having had sex in the previous year, compared with 9 per cent of the single men in the main sample. Collumbien and others (2000) give more detail on the most recent encounter, showing that sex among single men is infrequent (on average once a month among the 9 per cent who reported having had sex in the previous year), with 19 per cent of the most recent encounters being protected by condom use. Men whose last partner was a sex worker, reported 40 per cent condom use. Even though the low frequency of sex is encouraging in the context of the prevention of HIV transmission, the fact that most encounters were unplanned events poses challenges for the promotion of consistent condom use. In the main sample, 2 per cent of single men reported anal intercourse with other men, with both the survey and qualitative study pointing to large variations in the prevalence of male-to-male sex, which was higher in Puri district.

The relatively high levels of proactive sexual participation by women contrasts with varying degrees of coercion and force used by men in order to obtain sex (Collumbien and others, 2000). The late start of sexual intercourse for most Oriya men, with 47 per cent not having had sex before the age of 25, suggests a widespread tension caused by suppressed sexuality, which may be expressed in sexual coercion. The late sexual debut may equally explain the high levels of anxiety expressed in concerns about nocturnal emissions and involuntary semen loss in this population (Collumbien and others, forthcoming; Collumbien and Hawkes, 2000).

These data from the coastal districts in Orissa cannot be indiscriminately generalized to other states in India (or even to other districts within Orissa). Substantial variations in sexual behaviour patterns are clearly suggested by recent statistics on HIV infection. Whereas some states detected their first HIV infection only in the last few years, 2 per cent of pregnant women tested HIV-positive at antenatal clinics in urban populations of West and South India (UNAIDS/WHO, 1998). The findings of this study in Orissa should therefore not be used to distract attention from campaigns encouraging safer sex. They can be used to inform the design of programmes for the prevention of sexually transmitted infections so that they run with maximum effectiveness. In low HIV settings such as Orissa, this means that control efforts should be directed to the core group of high transmitters (Shelton, 1999). Efforts in Orissa should be concentrated on sex workers and their clients, and areas where male-to-male sex is more prevalent. Young men still need to be reached with information on

unsafe sex and condom promotion, but this should be done in the broader context of addressing all their perceived sexual health concerns rather than being focused on the threat of HIV transmission.

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Puberty Rituals, Reproductive Knowledge and Health of Adolescent Schoolgirls in South India

Public celebration of girls' coming of age would seem to offer a vehicle for broadened transmission of information about reproductive health issues

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In India, programmes and research concerned with women's health until very recently have focused mainly on the reproductive functions of married

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women. The recent paradigm shift in the Government's primary health programme was intended to increase the attention given to gynaecological problems and other aspects of women's health. Nonetheless, the attention given to the health problems of adolescent girls is still meagre, even though adolescence is a time when looking after health and nutrition can help to build a buffer against the heavy physical demands of the reproductive years. High rates of gynaecological morbidity have been reported in rural populations, adolescents included (Bang and others, 1989; Koenig and others, 1998). However, the health knowledge and problems of adolescents have so far received only minimal attention (Koblinsky and others, 1993).

Vaginal discharge is frequently the most common gynaecological symptom reported by both rural and urban Indian women (Bang and Bang, 1994; Patel, 1994; Narayan and Srinivasan, 1994; Koenig and others, 1998), but very few studies have explored the determinants of these complaints. Koenig and others (1998) compared results from seven studies in different parts of India, and found wide variations in all types of gynaecological problems, ranging from 33 to 65 per cent for menstrual disorders and 13 to 57 per cent for excessive discharge. The same study noted strong evidence to suggest that frequencies of conditions such as "excessive discharge" are subject to serious under-reporting in one-shot interviews, citing supporting data from Haryana and Karnataka.

Adolescent girls who are fortunate enough to be given relevant textbooks and health education materials by their teachers gain some information about reproductive functioning and reproductive health problems from school sources. But a great deal of their scant knowledge is dependent on informal communications with peers and family members. Some studies of Indian women have found that young girls are generally told nothing about menstruation until their first personal experience of it (for example, George, 1994). A study of women in Mumbai noted: "The silence surrounding menstruation burdens young girls by keeping them ignorant of this biological function" (George, 1994:179). The events and experiences surrounding menarche can be a significant influence on young girls' view of themselves, as well as on their understanding of reproductive health issues, and on appropriate behaviour for hygienic management of menstruation.

Materials and methods

This study of the social dimensions of menarche and menstruation was carried out in the urban and rural field-practice areas of the Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) in Pondicherry,

which is located in the northern part of Tamil Nadu State. JIPMER is a medical school for undergraduate and postgraduate medical education, with a strong mandate for community-based training and research. The urban practice area is in the centre of Pondicherry town, contiguous to the Bay of Bengal. It is a low-income residential area that is currently in the process of development. Multi-storeyed new apartment buildings are intermingled with numerous individual huts and other semi-permanent and permanent habitations. The population has a wide range of occupations, including fishing, construction labour, small-scale business and others.

The rural practice area is about 13 km from Pondicherry, in a cluster of villages comprising approximately 8,000 inhabitants. Most of the people in the villages are employed in agriculture.

The first phase of this study consisted of in-depth interviews, collection of free lists, and other qualitative data from adolescent girls as well as older women. Information was collected about first menstruation, celebrations during menarche, issues about hygiene and other topics. Attempts at using "body-mapping" to assess adolescent girls' knowledge of female anatomy were not encouraging. Therefore, the second phase of the study (the quantitative survey) used a diagram of the female torso showing the different body organs; the girls were then asked to identify the organ from which menstrual blood flows. From those responses, it was possible to rate the girls' different levels of knowledge of female anatomy.

The questionnaire was developed from the detailed information gained during qualitative interviewing. It included questions about first menstruation, celebrations of the onset of menarche, issues and problems (if any) related to genital hygiene, storage and washing of the menstrual cloth, traditional beliefs and practices related to menstruation, and health problems such as dysmenorrhoea, white discharge and irregular periods. Open-ended questions were used to generate information about food preferences and avoidance, opinions about marriage, perceptions and attitudes about menstruation, and other topics.

Sample size and selection

A sample size of about 800 was chosen for the survey. All schools in the two areas were selected. The sample was stratified across the 12-17 age group to capture the changes in knowledge with age. Equal numbers of rural and urban girls were interviewed. The number of girls in classes 7-12 in each school was noted. In the rural area, there was a shortfall in the number of girls

in the schools, especially in the higher classes. Consequently, a school in the adjoining area of Katerikuppam was also sampled to give the desired numbers. The schools in the rural study reached only class 10, so the eleventh and twelfth standards in a school at Villianur, where the girls from the sample area studied, were also sampled.

Data collection

The questionnaire was self-administered in schools in both rural and urban areas, by a total of 823 girls, of whom 619 had attained menarche. The statistical analyses are based on the 619 respondents. An interviewer was present with the girls to clarify questions and minimize missing data. No girl refused to participate. However, no effort was made to interview girls who were absent on the day of data collection.

About 60 in-depth interviews were conducted with mothers, elderly women, and astrologers to understand the significance of the rituals associated with menarche. The place of washing and storing the menstrual cloth were observed in a subsample. A focus group discussion was held with school girls to probe their perceptions on menstrual morbidity with an emphasis on white discharge.

Data analysis

The quantitative data were analysed using the SPSS statistical software package. After computing frequencies and cross-tabulations of some main variables, factor analysis was used to identify clusters of items for developing indices of "traditional beliefs", "menstrual hygiene" and "material style of life" (for measuring socio-economic status). Logistic regression was used to establish the associations among major variables, including the composite indices.

Results

Celebration of first menstruation

In the first part of the study, qualitative data were gathered through in-depth interviews with both young girls and older women, in order to gain an understanding of the patterns of ritual observance of first menstruation among contemporary rural and urban people in the study area. The interview data, plus our own experiences in this cultural system, indicate that detailed beliefs and practices vary between different castes and communities, but the overall patterns are broadly similar throughout the area.

Table 1. Age at menarche among adolescent schoolgirls in Pondicherry, South India

Age	Number	Per cent
11	13	2.1
12	82	13.2
13	195	31.5
14	213	34.4
15	98	15.8
16+	18	3.0
Total	**619**	**100.0**

First menstruation is often a traumatic and very negative experience for young girls in most parts of India (George, 1994) although among almost all communities in Tamil Nadu the event is marked with a festive celebration Bhattacharyya (1980; 1996) described the menstrual rites widely prevalent in ancient India. Evidently, in ancient times such puberty celebrations for young girls pervaded all parts of India (and many other parts of the world), but this extensive public celebration of the onset of menarche has all but disappeared from much of central and northern India, although it is still observed among Tamilians and some other groups in South India. It is celebrated as *manjal neer-attu vizha* (turmeric bathing ceremony), during which relatives and friends of the girl are invited to a grand feast, and the girl receives expensive gifts of clothing and jewellery. The traditions surrounding the *manjal neer-attu vizha* require strict rules of seclusion (in a separate "hut" referred to as a *kudisai*, inside or outside the house), ritual bathing, practices and proscriptions concerning washing and management of the menstrual cloths or pads, as well as newly invoked restrictions on mobility and contacts with males.

South Indian female puberty rites can be divided into three main segments of ritual action. The ritual series begins when the girl "comes of age" *(vaisuku varuvathu)*, at the age of 13,14 or thereabouts (see table 1). This is a period of ritual seclusion. The girl sits separately on a wooden plank in a corner. Neighbourhood women gather for a ceremonial meal that is served on plantain leaves, after which they paint the girl's feet with a mixture of red ochre, turmeric and limestone. This *nalangu* ceremony is enacted in the same manner for first menstruation, as part of wedding festivities, and the celebration of a woman's pregnancy.

For ritual seclusion, a *kudisai* (hut) is made of fresh leaves, for example, those of coconut, neem and mango, among others. This hut may be either inside or outside the house. The *kudisai* is furnished with all the things needed by the girl, including toiletries, clothing and vessels. Food is brought to her, and she takes complete rest. She is helped by other women while bathing. Daily bathing alternates between "head-bath" and "ordinary bath". When she goes to the toilet, she must carry neem leaves and something made of iron, to ward off evil spirits. Special foods are prescribed for this seclusion, which is continued for 9, 11 or 13 days (it must be an odd number of days).

During the seclusion, the girl is instructed not to look at birds on an empty stomach, not to go out alone, and especially not to go into the *pooja* (prayer) room. She is warned not to leave leftover food where dogs could get it, because she would get a stomach ache if a dog ate the leftovers. Further restrictions symbolize her ritually dangerous status: she should not touch flowering plants (they might wilt), and she should not touch stored food items such as tamarind, rice or salt, which might be spoiled by her contact. The girl is relieved of the seclusion only after a purification ritual called *puniya-thanam*, which is the second step in the ritual process.

The third and final step in the series is the *manjal-neeru*, or *satangu*. The ritual is often performed in the third month after the *puniya-thanam*, but can be any time before the girl marries. The *manjal-neeru* is celebrated with pomp and splendour. Even poor families borrow money, or pledge their jewellery in order to make this event a grand occasion. This major celebration has many of the same elements as a wedding — large numbers of relatives and friends are invited; a priest officiates at a *pooja* (prayer ritual), a wide assortment of food with many sweets is served, and the girl receives gifts of jewellery and clothing.

In view of the number of rituals, restrictions and all the associated beliefs and symbolisms, it is surprising that young girls are not prepared for it with information about menstruation, about the social meanings (including social readiness for marriage), and other knowledge. One would expect that, somehow, during the early phases of this elaborate enactment, useful information about menses, reproduction and hygiene could be imparted. But from this study, it appears that adolescent girls were not prepared in any way for their first menstruation. Two thirds of the girls described the onset of menarche as a shocking or fearful event, which often came as a distinct surprise to them. Many of them cried when they first saw the menstrual blood. According to their testimony, the little information they were given was about

"keeping the cloth", and much of the "new information" they gleaned during the rituals came in the form of restrictions and cautions about behaviour towards males. To some extent, the evidence suggests that families rely increasingly on schools for imparting the information.

The attention paid to a girl's first menstruation would appear to provide an opportunity for important health education, including genital hygiene. Certainly there is evidence that young women do have a great need for information about the management of menstruation. The levels of information about menstruation, genital hygiene and related reprodnctive health issues are gradually increasing, but it appears to be a very slow process.

Knowledge and practices

The results from the quantitative survey showed that adolescent girls' knowledge of anatomy (particularly their knowledge of the source of menstrual blood) is very weak. Only one third of the girls identified the uterus correctly. Nearly as many girls (28 per cent) mistakenly identified the urinary bladder as the source of menstrual blood. Older girls had somewhat better anatomical knowledge, as would be expected, and the urban girls scored better than the rural girls.

Beliefs and restrictions related to menstruation

The qualitative interviews revealed a large number of traditional beliefs and restrictions surrounding menstruation. Most of the restrictions are based on concepts of pollution surrounding the condition of menstruation, which translate into prohibitions of acts that may be dangerous to others, as well as behaviours or situations in which the girl herself may be vulnerable to harm. In the questionnaire, the girls were asked whether they had been told about these beliefs.

Table 2 lists the 16 items included in the questionnaire, and the frequencies of the "yes" responses. The frequencies vary considerably, with generally high numbers associated with the prohibitions regarding religious places (*pooja* room and temple), which are deeply ingrained in Hindu practice. Also, some seemingly "irrelevant" or trivial beliefs received a large percentage of affirmatives, including "should not sit on the threshold", and "dog should not eat her leftover food".

A factor analysis of those 16 items was conducted in order to identity those that are statistically interrelated, and hence could be used to construct an

Table 2. Percentage of adolescent schoolgirls believing in specified taboos at menarche and menstruation in Pondicherry, South India

Type of taboo	Per cent
Shouldn't see birds	11.0
Shouldn't sit on the threshold	70.0
Dog shouldn't eat leftover food	72.7
Shouldn't touch stored foods	39.6
Shouldn't see men before bathing	31.5
Mother shouldn't be first to see menarche girl	48.8
Widow shouldn't be first to see menarche girl	12.8
Lizard shouldn't eat blood tissues	35.7
Shouldn't touch *pooja* things	63.8
Shouldn't touch plants	69.3
Shouldn't keep flowers	58.8
Shouldn't touch infants	38.6
Shouldn't go to temple	85.8
Take neem twig while going out	58.2
Shouldn't go out at noon	54.6
Take neem and piece of iron while going to school	34.1

index of "traditionality". This made it necessary to eliminate items 1, 10 and 12, as they did not fit the overall model. The remaining items were then used to derive individual scores. Those raw scores were collapsed into five groups to form the "traditionality index". Higher scores are associated with greater familiarity with and adherence to the traditional practices. Traditionality was found to be higher among rural girls, and the correlation coefficient with socio-economic status is -0.2 which is significant at the 95 per cent confidence level.

Hygiene practices

Questions focused on the types of menstrual pads used, and the washing and storage of the pads. It seems possible that these items may be related to the likelihood of infections of the genital area, either directly from contact with infection sources, or indirectly through association with bathing and other aspects of personal hygiene. Of the 10 items in the questionnaire, five indicators were statistically interrelated, and could therefore be combined in a hygiene index. Those items are as follows: type of pad used, where the pad is washed, structure of the washing place, where the pad is dried, and where it is stored (table 3). For example, a small number of girls (6.5 per cent) used only their undergarments during menstruation, and an even smaller number (5.2 per

Table 3. Percentage distribution of menstrual hygiene characteristics among adolescent schoolgirls in Pondicherry, South India

	Area		Total (n = 619) (percentage)
	Rural (n = 327) (percentage)	Urban (n = 292) (percentage)	
Type of pad used			
Only undergarments	11.0	2.4	6.5
Old cloth	82.5	72.2	77.1
Old cloth and napkins	4.8	17.1	11.3
Commercially available disposable napkins	1.7	8.3	5.2
Number of times pad is washed			
1	19.9	10.4	14.9
2	46.6	37.9	42.0
3	22.3	32.7	27.8
4	9.6	10.7	10.2
Use disposable napkins	1.7	8.3	5.2
Place where pad is dried			
Hidden under other clothes	4.1	3.1	3.6
Hidden elsewhere	30.1	32.1	31.2
In shade	22.3	14.4	18.1
In sun	41.8	42.2	42.0
Use disposable napkins	1.7	8.3	5.2
Place where pad is stored			
Cowshed, tree-hole etc.	49.0	29.7	38.8
Bathroom	40.8	49.8	45.6
With other clothes	8.6	12.2	10.5
Use disposable napkins	1.7	8.3	5.2

cent) used “modern” commercially available sanitary napkins. The rural girls tended to report the “less modern”, and probably less hygienic materials, but the vast majority of both rural and urban girts used “old cloth”.

Differences between rural and urban girls are also evident in other items in the hygiene index. The places where the cloth was stored were observed and found in many cases to be the most unhygienic places. The structure where the cloths were washed was also examined. The majority of the urban girls had a permanent structure for a bathroom or wash area. However, in the rural areas, the bathroom was genetally an enclosure made from palm leaves with no flooring, and a stone for washing the cloths. Hence, the girls faced difficulty while bathing and while washing the menstrual cloths.

Table 4. The reporting of white discharge, by selected characteristics, among adolescent schoolgirls in Pondicherry, South India

	Percentage reporting white discharge	N = 619
Hygiene score		
Low	34.1	290
Medium	22.3	233
High	12.5	96
Socio-economic score		
Very low	35.1	131
Low	26.5	162
High	29.5	200
Very high	11.9	126
Residence		
Rural	32.2	292
Urban	21.1	327
Index of traditionality		
Very traditional	36.0	75
Traditional	29.7	202
Modern	24.7	215
Very modern	18.1	127

The Pearson correlation coefficient between the "traditionality scale" and the hygiene index was -.244 ($p<.0l$), indicating that girls who are higher in "traditionality" have poorer hygienic practices with regard to type of menstrual pads, as well as their washing and maintenance of these items.

Reported health problems

The girls were asked about health problems associated with menstruation such as dysmenorrhoea, white discharge, diarrhoea and vomiting. Menstrual pain and/or discomfort was reported by 87 per cent of the girls, a quarter had white discharge and 4 per cent had some urinary problems. The reporting of a white discharge was significantly higher among rural girls and those with lower socio-economic status and was negatively associated with the hygiene score (table 4).

Since the prevalence of white discharge was significantly related to the hygiene score, a logistic regression was performed to test whether the relationship between reported white discharge and the hygiene score might be an artefact of rural/urban differences, or perhaps confounded by socio-economic status. The girls using commercially manufactured napkins were

Table 5. Logistic regression analysis of the link between hygiene and reporting of white discharge, among adolescent schoolgirls in Pondicherry, South India

	Unadjusted odds ratios	Adjusted odds ratios[a]	95 per cent confidence intervals
Hygiene index			
High	1.0	1.0	–
Medium	2.0	1.8	0.8-4.0
Low	3.6	2.1	1.2-6.3

[a] Adjusted for socio-economic score and rural-urban residence and age.

removed from this analysis. Table 5 shows the results, which indicate that white discharge is significantly related to the level of hygiene as measured by the index of hygiene. Odds of reporting white discharge were 2.7 times higher when the index was poor than when it was high.

Discussion and conclusions

The study shows that the ceremonial attention to the onset of menarche in the *manjal neer-attu vizha* rituals, accompanied by seclusion and other restrictions on the girls' behaviour, continue to be maintained in the Tamilian culture. But despite the prominence of this ceremonial attention to "coming of age", very little attention is paid to informing adolescent girls about the "facts of life" of menstruation; most girls in the Pondicherry area are unprepared for the trauma of their first menses. A restriction appears to have been imposed on the extent to which mothers confide in their daughters about menstruation. This restriction in communication is symbolized in the "rule" that the mother should not be the one to see and "verify" her daughter's first menstrual bleeding. Aunts, neighbours, older sisters and grandmothers have been the traditional sources of information about the management of menstruation, but the amount of information transmitted has generally been extremely sparse.

Even after the attainment of menarche, very little information is given to young girls about the physiological processes involved and the hygienic practices to be followed. Data from Mumbai show that this reticence about giving relevant information to adolescent girls is indeed widespread (George, 1994). Some information is given to girls in science classes in school, but even there the information is very inadequate, because at least half the girls in our sample could not identify the reproductive organs.

Much of the "information" about menstruation imparted to a young girl is in the form of restrictions on her movements and behaviour, along with "superstitions" about the possible harmful effects of her "polluting touch" and the equally polluting potential of the menstrual cloth.

The restrictions and other traditional features affecting adolescent girls are stronger in rural areas. In the urban sector, the girls from poorer families also report both poorer hygiene practices and more traditional restrictions and beliefs.

The reports of white discharge among adolescent girls in the study suggest the presence of gynaecological morbidity, but these data should be interpreted cautiously. As pointed out by Koenig and others (1998), as well as researchers in other countries (Bulut and others, 1995), the correspondence between women's self-reported white discharge and detectable infections is rather low. Clearly, some of the reported white discharge reflects reproductive tract infections (RTIs). On the other hand, some of the reported complaints may be excessive worry about "normal" vaginal secretions. Patel and Oomman (1999) have suggested a psychological dimension related to the reports of white discharge, which remains to be investigated. Despite the lack of strong correspondence between women's reports of white discharge and the presence of detectable RTIs, these manifestations are experienced by women as problematic illness. More research is needed, in India and elsewhere, concerning the physical and psychological concomitants of vaginal discharge. Our data suggest that at least some of the occurrences can be related to unhygienic management of menstruation. Although the primary cause of cervical cancer is the human papilloma virus, which is sexually transmitted (Bishop and others, 1993, the possibility of contributing factors related to poor genital hygiene has also been suggested.

Patterns of menstrual hygiene that are developed in adolescence are likely to persist into adult life. Our data suggest that young girls should be taught more effective procedures of washing their menstrual cloths, as well as careful, more sanitary, storage of the pads, or preferably using new cloths for each monthly cycle. Some simple procedures are likely to be available to most young girls, even in relatively poor families. Some of the traditional beliefs and practices could be linked to new forms of dissemination of hygiene information.

The teaching of hygienic practices related to menstruation should be linked to an expanded health education in which young girls can learn about

reproductive physiology and functioning, as well as practical information about reproductive tract infections, sexually transmitted infections, and other useful knowledge. Some of this knowledge is spreading in the adolescent population, but the dissemination is slow and uncertain. Sanitary napkins for menstruation are now advertised in television commercials, and the use of commercially available pads has increased. In view of the fact that issues surrounding puberty and menstrual hygiene are extremely sensitive and conventional sources of health information such as popular media or brochures do not generally include them, more informal means of dissemination may be needed. Community groups, peer groups, school curriculums, and other such channels are likely to be more effective means of transmitting important health messages and advice to young women entering puberty.

The visible, expressive public celebration of girls' coming of age in Tamil Nadu would seem to offer a vehicle for broadened transmission of information about reproductive health issues, including specific information about menstrual hygiene. Although people increasingly look to the school system to impart this knowledge, some of this transmission could take place in the informal sector, provided health educators and providers develop new strategies of dissemination. More effective education about hygienic menstrual practices could be a major contribution to improving women's reproductive health, including reduction of reproductive tract infections.

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