

The Tobacco Epidemic in India

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By the time you would have finished reading this article, approximately 30 people would have died, a cause purely attributable to smoking. We all are aware of the health consequences of use of tobacco, yet there are reports which have confirmed the decline of the age of initiation in the use of tobacco in India. The Global Youth Survey (GYTS) 2006, reported that 14-15% of the children in the age group of 13-15 years are consuming tobacco in some form. As per the WHO Report 2005, 53% of deaths are due to non-communicable diseases in India and 50% of all cancer deaths are related to tobacco consumption (The Tobacco Control Report, 2004).

Health consequences of tobacco:

- Cardio-Vascular Diseases, Peripheral vascular disease
- Cancer: bladder, cervix, oesophagus, oral cavity, lungs, stomach, leukaemia, kidney etc.
- Respiratory diseases: Asthma, COPD
- Reproductive effects: Abortion, low birth weight etc.
- Osteoporosis, cataract, caries, early ageing etc.

This is despite the fact that India is among the few countries in the world which has signed and ratified the International Framework Convention on Tobacco Control, the first international treaty negotiated under the World Health Organization. India also has very meticulously drafted "Tobacco Control Act, 2003 applicable to all products containing tobacco in any form, that is cigarettes, cigars, cheroots, bidis, gutka, pan masala (containing tobacco) khaini, mawa, mishri, snuff etc. This enforcement under the Cigarette and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 is notified by the Ministry of Health and Family Welfare and the Act extends to whole of India. Some of the main provisions of the act are:

- Prohibition of smoking in public places (Section 4)
- Prohibition of advertisement, sponsorship and promotion of tobacco products (Section 5)
- Prohibition of sale of tobacco products to minors (Section 6a)
- Ban on sale of tobacco products within 100 yards of the educational institutions (Section 6 b)
- Specified Health Warnings in tobacco products (Section 7)

Given the burden of disease, it is very important to sensitize various stakeholders about the main provisions of the Act so that appropriate interventions can be carried out by the health personnel.

1. Prohibition of smoking in public places (Section 4)

Secondhand smoke exposure among children and non-smoking adults remains a major public health problem. Eliminating smoking in indoor spaces is the only way to fully protect non-smokers from secondhand smoke. As per the provisions contained in

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this act, “No Person Shall Smoke in Public Place.” Thus, smoking is prohibited at all places to which the public has access. A public place has been defined “as any place to which the public have access, whether as of right or not, and includes auditorium, hospital buildings, railway waiting rooms, amusement centers, restaurants, public offices, court buildings, educational institutions, libraries, public conveyances and like which are visited by general public but does not include any open space”. This is justified by the Surgeon General's Report, 2006 which states that there is no risk-free level of exposure to secondhand smoke. Smoke free policies improve the health and there are many research studies to substantiate that the workplace smoking restrictions lead to less smoking among employees, reduction in daily consumption of cigarettes and increase in cessation efforts among the employees. This law establishes the right of every individual to breathe clean air, hence enforcement and sensitization of hazards of secondhand smoke in its true spirit would help to provide clean air.

2. Prohibition of advertisement, sponsorship and promotion of tobacco products (Section 5)

Advertisements of tobacco products lead to increase consumption and also reduce the motivation to quit. In addition, they weaken the public health campaigns and initiatives undertaken by the governments. The advertisements are very specifically target-oriented, often misleading and deceptive in nature. Youth are especially affected as the advertisements and marketing **motivates** more young people to take up smoking. Research has demonstrated that the children who are aware of tobacco product brand advertisements are **more likely to begin** smoking. Further, the young people associate attractive advertisements with lifestyle and behaviour.

As per the provisions contained in this Act, ‘advertisement’ includes any visible representation by way of notice, circular, wrapper or other documents and also includes any announcement made orally or by any means of producing or transmitting light, sound, smoke or gas. Also, “No person, for any direct or indirect pecuniary benefit, shall:

- (a) Display, cause to display, or permit or authorize to display any advertisement or cigarettes or any other tobacco products; or
- (b) Sell or cause to sell, or permit or authorize to sell a film or video tape containing advertisement of cigarette or any other tobacco product;
- (c) Distribute, cause to distribute, or permit or authorize to distribute to any public any leaflet, hand bill or document which is or which contains as advertisement of cigarettes or any other tobacco products; or
- (d) Erect, exhibit, fix or retain upon or over any land, building, wall, hoarding, frame, post or structure or upon or in any vehicle or shall display in any manner what so ever in any place any advertisement or cigarettes or any other tobacco products”.

There are two forms of advertisements: direct and indirect. The direct form of advertisement include billboards; electronic media including TV, radio, films, internet; print media-newspapers, magazines, leaflets, direct mails and direct selling places. The indirect form of advertisement is an endeavour by the tobacco companies to shift their advertising expenditures to non-restricted media in response to complete or partial advertising bans. Any violation of the Act entails an imprisonment and/or a fine ranging from Rs. 1,000 to Rs. 10,000 and can be reported to the monitoring committee at State and district level. It further adds that wherever brand names or logos of tobacco products form a part of the pictures to be printed in any form of print or outdoor media or footage to be aired through any form of electronic media, it shall be mandatory for the media to crop or mask the same to ensure that the brand names and logos are not visible except in

case of live or deferred live telecast of sports, cultural and other events held in other countries being aired on television in India. With the increase in the information technology, how to restrict the cross border advertising remains one of the main challenges.

3. Prohibition of sale of tobacco products to minors (Section 6) and Prohibition of sale of tobacco products near educational institutions (Section 6 (b))

“Catch them young”, is the tactic that the tobacco industry plays. India with about 40% young population in the age group of 10-24 years is a promising client for promoting smoking and smokeless forms of tobacco such as pan masala, gutka etc. As per this Act, there is prohibition of sale of tobacco products to and by minors and ban on visible stacking of tobacco products at the point of sale to prevent easy access to minors. The survey conducted by CDC in 1995 reported that 78 per cent of youth had not been asked about the proof of their age on purchase of cigarettes in the last month. It is with spirit that the ban order clearly states that no tobacco products should be sold within a radius of 100 yards of any school or college. The key to public health action on the tobacco front seems to lie in combining strategies to discourage children from smoking and in producing a safer environment. The local regulatory authorities and civil societies can play a major role in preventing the youth from getting initiated into the practice of tobacco use.

Display of pictorial health warning on tobacco products packs (Section 7)

May 31st was yet another historic day when the Supreme Court set it as mandatory for all tobacco products to prominently display a pictorial warning of scorpion or cancerous lungs occupying 40% of the front panel/space of the tobacco product or gutka. It is expected that the pictorial warnings would sensitize people who indulge in smoking towards health hazards. As per Section 7 of the Act, each such packet shall contain in an Indian language as applicable, one of the following warnings:

- (i) Tobacco causes cancer, or
- (ii) Tobacco kills.

Further, the warning must be prominent, legible and in black colour with white background.

Current initiatives by the Government of India

The Government of India launched the Pilot Plan for National Tobacco Control Programme in India in two districts in twenty one states. National Tobacco Control Cells have been created in these states. Efforts of inter-sectoral coordination with various government departments including Panchayat, finance, railways, labour are being put in place. The State Governments working on the forefront have the responsibility to implement the law, sensitize the general public and stakeholders about the law and various provisions of the Act. Focus is on strengthening IEC, initiating school health programmes and establishing Tobacco Cessation Centres. Any violations of the law can be reported to a police officer not below the rank of sub-inspector or any officer of an equivalent rank authorized or notified by the Central or State Governance.

Summing up

The greatest burden facing the public health today is how to combat the current tobacco epidemic. India as a country has to deal with multiple causes and problems associated with diverse forms ranging from smokeless to smoking forms of tobacco. It is practiced and deeply reflected in the behaviour of approximately one-fourth of our adult population. Therefore, the tobacco control initiatives in India require a comprehensive strategy in a planned manner. The roles of social and behavioural sciences in providing an insight to such a behaviour coupled with efforts to educate the masses have to be persuaded with greater vigour.

Further, targeting the youth by way of promotional items during youth campaigns, festivals with T-shirts, caps, sports items by the tobacco companies have to deal with strictly not only with the provisions contained in the act; but by the society at large. The need of the hour is to advocate for increase tax legislation especially for bidi sector, complete ban on surrogate and direct advertising, smoke free workplaces, and reinforcing powerful graphic/pictorial warnings on cigarette packets. These have to be supported with no sales to and by minors and partnerships for sustainable tobacco control campaigns with NGOs/civil societies coupled with strengthening of anti-smuggling legislation and enforcement of laws. Concerted efforts need be made to help the smokers quit, and strengthen the cessation programmes. It would require tremendous efforts to help non-smokers remain smoke free and prevent them from the hazards of the secondhand smoke. No doubt, we have to work to build and encourage enforcement of the Act. Active involvement of NGOs and civil society's would strengthen the activities at all levels especially in the community. We need to work upon behaviour change strategies to address the social norms which have a direct bearing on the use of tobacco by organizing community-wide events. There is a need to change the perceptions among the youth related to the 'hero image' associated with the use of tobacco and smoking. This requires creating social acceptability and emphasis to completely abandon the use of tobacco in all forms.

MEDICAL ABORTION BY MIFEPRISTONE WITH SUBLINGUAL VS VAGINAL MISOPROSTOL: A RANDOMISED COMPARATIVE TRIAL

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ABSTRACT

To compare the success and side-effects between the sublingual and the vaginal administration of Misoprostol for induced abortion in women treated initially with Mifepristone. We administered 200 mg of Mifepristone to 117 women who requested termination of pregnancy of under-9 weeks. Forty-eight hours later they were randomised into two groups. Fifty-eight women received two doses of Misoprostol sublingually 3 hrs apart, while 59 women received Misoprostol 800 mcg vaginally. They were observed for 3 hrs and returned on 15th day for final assessment. Complete abortion occurred in 96.5% (95% CI: 91-100) of the women in the sublingual group and 96.6% (95% CI: 91-100) in the vaginal group. This regimen resulted in complete abortion in all women (100%) when it was administered before 7 weeks gestation. The median induction-to-abortion interval was shorter in women in the sublingual group compared to the vaginal group ($P < 0.001$). Women in the sublingual group experienced more diarrhoea ($P = 0.005$), chills ($P < 0.001$) and fever ($P = 0.001$). Two doses of sublingual Misoprostol administered after Mifepristone is an effective alternative route to the standard vaginal administration for medical abortion.

Key Words: Mifepristone; Misoprostol; Sublingual; Vaginal

The combination of 200 mg Mifepristone and oral administration of 400 mcg Misoprostol is the most commonly used medical method for termination of pregnancy up to 49 days of gestation.¹⁻³ However, between 7 and 9 weeks gestation, Misoprostol has to be administered vaginally to avoid a decrease in efficacy.⁴⁻⁷ The likely explanation for the higher efficacy of vaginal administration is the higher plasma levels which remain elevated for a longer period of time than following oral administration, resulting in long lasting stimulation of uterine contractility. A pharmacokinetic study

has shown that the systemic bioavailability of vaginally administered Misoprostol is three times higher than that of the orally administered Misoprostol when determined by the area under the curve (AUC).⁸ Although Misoprostol is more effective when given vaginally, most women prefer the oral route because this can avoid the uncomfortable vaginal examination. Given these concerns, sublingual administration has been investigated as an alternative. Tang et al.⁹ studied the pharmacokinetics of different routes of administration of a single dose of 400 mcg of Misoprostol in women

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undergoing termination of pregnancy at less than 12 weeks of gestation. The data in this study showed that sublingual and oral administration have the quickest onset of action when compared with vaginal administration. The systemic bioavailability as measured by the AUC, is also highest after sublingual administration of Misoprostol. This may be explained by the absence of a first-pass effect by the liver after sublingual administration. The good blood supply under the tongue and the relatively neutral pH in the buccal cavity may also be contributing factors. The time to peak concentration is the same as for oral administration, and thus significantly shorter than following vaginal administration. However the adverse-effect profile has shown that 800 mcg sublingual Misoprostol was associated with a higher incidence of side-effects. So Tang et al.^{10,11} have suggested that the side effects may be improved by decreasing the dosage to 600 mcg. Aronsson et al,¹² studied the effect of Misoprostol on uterine contractility following different routes of administration. They demonstrated that with vaginal administration uterine contractions appear to last up to 4 hrs. However, with sublingual administration, uterine contractility tended to decrease at the end of 3 hrs. So, we decided to repeat the second dose at the end of 3 hrs in sublingual group so that, uterine contractility is sustained.

The objective of this study is to compare the complete abortion rate and side-effects of two dose sublingual administration of Misoprostol in combination with Mifepristone with

single dose vaginal administration of Misoprostol in women undergoing medical abortion up to 63 days gestation.

MATERIALS AND METHOD

This prospective randomised trial was conducted in the Department of Obstetrics and Gynaecology at the Kasturba Hospital, Manipal. The protocol was approved by the local Research Ethics Committee of the hospital. The study subjects were recruited from outpatient clinic who requested termination of pregnancy under-9 weeks. All gave informed written consent after the study had been explained, including the right to withdraw from the trial at any time without prejudice to the further medical care. All women satisfied the following criteria: 1) a singleton live intrauterine pregnancy of ≤ 9 weeks as confirmed by vaginal ultrasound; 2) willing to comply with the schedule of visits; 3) willing to have a surgical abortion if indicated; and 4) access to a telephone.

Women with chronic systemic corticosteroid administration, adrenal failure, glaucoma, pregnancy with an intrauterine device or known coagulopathy were excluded from the sample selection.

At the initial clinic visit on day 1, counselling, history and physical examination, baseline haemoglobin, and blood group were performed. Transvaginal sonography was done to confirm intrauterine pregnancy and the gestational age. The women were given Mifepristone 200 mg orally and allowed

to go home. If a woman was Rh negative, she received Rh immune globulin (50 mcg) intramuscularly. On day 3, 48 hrs after the administration of Mifepristone, women were randomised into two groups based on random number table.¹³ Women randomised to the sublingual group were instructed to put three tablets of 200 mcg Misoprostol under the tongue and allowed them to dissolve. The Misoprostol took 10-15 minutes to dissolve and during this period the women were told not to swallow the tablets. After 3 hrs women received a repeat dose of 200 mcg Misoprostol sublingually. This regimen was based on the review of early medical abortion reported by Ashok et al.¹⁴ A resident doctor in the labour ward inserted four tablets (800 mcg) of Misoprostol into the posterior vaginal fornix for those subjects assigned to the vaginal group. Following the administration of prostaglandin, women were observed in the ward for 3 hrs (hourly recordings of pulse rate and blood pressure). Oral doxycycline was given prophylactically for 7 days in conjunction with Misoprostol. Prophylactic antibiotics were administered to all patients undergoing medical abortion based on the review by Stubblefield.¹⁵

All participants were given written instructions with a 24-hr phone number for emergencies. They were given a diary card to record the days and the amount of vaginal bleeding and side-effects. They were prescribed Paracetamol tablet once in 6 hrs for pain relief if required. The subjects returned for follow-up evaluation on 15th day after

taking Mifepristone. They underwent gynaecological examination, blood sampling for haemoglobin and transvaginal ultrasound to determine the status of the termination. Patients with ongoing pregnancy and incomplete abortion had suction evacuation. The procedure was considered successful if a complete abortion occurred without requiring a vacuum aspiration. All women were asked to use a barrier method for contraception up to the time of first menstruation.

The side-effects were used to calculate the sample size. From a previous study, by Tang et al.¹⁶ The complete abortion rate between the sublingual and vaginal group was found to be equivalent. However, sublingual Misoprostol was associated with a higher incidence of nausea, vomiting, diarrhoea, chills and fever. The mean of these side-effects in the two treatment groups were 39.8 and 14.4. Based on the above data, the total number of subjects required was calculated to be 94 to give a power of 80% at 5% significance level. Allowing for 5% dropouts, a total of 98 women were required. Differences in continuous variables were analysed with independent sample T test for normally distributed data and the Mann-Whitney U test for skewed data. Differences in discrete variables were analysed by Chi-square test and the Fisher Exact test as appropriate. Repeated measurements in haemoglobin levels were compared by paired T test. $P < 0.05$ was considered statistically significant.

RESULTS

Between August 2004 and September 2005, 123 patients were enrolled for the study. Four women were excluded because the gestational age exceeded 9 weeks since LMP. Two patients were diagnosed to have missed abortion after vaginal ultrasound. These 6 exclusions left a total of 117 women in the final sample. Both groups were similar in demographic characteristics (Table 1).

One of the patients had incomplete abortion, after the administration of Mifepristone but before the administration of Misoprostol. She was given Misoprostol sublingually to ensure complete evacuation of the products of conception. As displayed in Table 2, all the 74 women who were below 7 weeks gestation had a successful termination of pregnancy.

TABLE 1
CHARACTERISTICS OF PARTICIPANTS

Variables	Sublingual n=58	Vaginal n=59	P value
Age (years)†	27.7 (4.2)	28.1 (5.2)	0.65
Weight (kg) †	52.6 (7.7)	51.3 (7.7)	0.35
Height (cm) †	152.4 (4.7)	152.9 (5.1)	0.59
Gestational age (weeks) †	6.5 (1)	6.7 (0.9)	0.27
Number of women <7 weeks (%)	38 (65.5)	36 (61.1)	0.19
No. of women 7-9 weeks (%)	20 (34.5)	23 (38.9)	0.81
No. of primigravida (%)	6 (10.3)	7 (11.9)	0.79
No. of multigravida (%)	52 (89.7)	52 (88.1)	0.18
No. of women with prior elective abortion (%)	10 (17.2)	13 (22.1)	0.51
No. of women with prior caesarean delivery (%)	15 (25.9)	13 (22.1)	0.62

† Values are mean (SD)

TABLE 2
CHARACTERISTICS OF THE ABORTION PROCESS

	Sublingual n=58	Vaginal n=59	P value
Complete abortion	56 (96.5)	57 (96.6)	0.98
<7 weeks	38 (100)	36 (100)	
7-9 weeks	18 (90)	21 (91.3)	0.88
Incomplete abortion	2 (3.5)	2 (3.4)	0.98
<7 weeks	0	0	
7-9 weeks	2 (10)	2 (8.7)	0.88
Induction-to-abortion interval †			
Median (h)	3.45	4.3	<0.001
Range (h)	2.4-48	2.3-72	
Duration of vaginal bleeding (days)			
Mean	10.1±3.7	10.7±3.1	0.28
Range	4-19	5-20	
Mean haemoglobin concentration (g/dl)			
Day 1	11.6	11.3	
Day 15	11.5	11.3	

† 56 and 57 women reported the passage of products of conception in the sublingual and vaginal groups respectively.

TABLE 3
COMPARISON OF SIDE-EFFECTS OF SUBLINGUAL AND VAGINAL MISOPROSTOL

Side effects	Sublingual n=58(%)	Vaginal n=59 (%)	P value
Diarrhoea	22 (37.9)	9 (15.3)	0.005
Chills	30 (51.7)	6 (10.2)	<0.001
Fever †	21 (36.2)	6 (10.2)	0.001
Nausea	28 (48.3)	18 (30.5)	0.05
Vomiting	15 (25.9)	9 (15.3)	0.15

† Fever defined as temperature > 38°C.

A total of four women who were between 7 to 9 weeks gestation had incomplete abortion and underwent suction evacuation. None of the women had ongoing pregnancy on 15th day. The induction-to-abortion interval was noted as the time interval from administration of prostaglandin to the passage of products of conception. The induction-to-abortion interval was significantly shorter in the sublingual group when compared to that in the vaginal group ($P < 0.001$ by Mann-Whitney U test). Bleeding is an expected component of medical abortion. The duration of vaginal bleeding was similar in both groups. No significant change in the haemoglobin levels before and after abortion was found in both groups.

As can be seen in Table 3, the most common adverse effects reported by patients were nausea, diarrhoea, chills and fever. Most women who reported these symptoms did not experience them before taking prostaglandin. The incidence of diarrhoea, chills and fever in women who received Misoprostol sublingually was significantly more compared with women who received Misoprostol vaginally. Twenty-two women in sublingual group reported

that they developed palmar itching for about 30 minutes after administration. Oral analgesia was required for 12 women (20%) in the sublingual group and in 8 women (13%) in the vaginal group ($P = 0.32$). None of the women required intramuscular opiates.

DISCUSSION

There is considerable evidence that there is a learning curve after the introduction of medical abortion. In multicentre trials the rate of surgical intervention is lowest in those centres that have previous experience of the management of incomplete abortion.¹⁷ We had gained expertise by conducting a trial on 128 women requesting medical abortion in a hospital setting from 2002 till 2004.¹⁸ Following this study, we modified the route to sublingual in this clinical trial and compared this regimen with vaginal administration. The complete abortion rates in the two dose sublingual group were similar to those in the vaginal group.

The findings of this study suggest that sublingual route may provide an alternative route of administration for early medical abortion. It may provide

an additional choice to women undergoing abortion and avoid the vaginal route of administration. Another advantage of sublingual route is that the absorption of the drug will not be affected if the women start to bleed after taking Mifepristone. In this trial, the success of medical abortion decreased gradually with advancing gestational age.

The overall complete abortion rates in our study were comparable with those of the two previous studies by Tang et al.¹⁶ and Hamoda et al.¹⁹ In the present study, the success was 100% in both the groups for women with gestational age of < 7 weeks. Hence, in women seeking termination of pregnancy before 7 weeks, this regimen of medical abortion can be preferred over surgical abortion as it avoids the risk of instrumentation of the uterus and anaesthesia. All the study subjects returned for follow-up on day 15 after Mifepristone administration. Careful medical follow-up is essential to ensure that surgical termination is performed in cases of failed medical abortion as Misoprostol has been reported to be teratogenic.^{20,21} In this study, 15 women with previous Caesarean delivery who received Misoprostol sublingually did not develop any adverse events. So, sublingual Misoprostol, though a novel route was considered feasible and safe in women with scarred uterus.

The induction-to-abortion interval was significantly shorter with sublingual administration. This result was consistent with other studies such as Tang et al.¹⁶ and Hamoda et al.¹⁹ These findings suggest that sublingual

administration results in a more rapid effect on uterine contractility and may explain the observed shorter induction-to-abortion interval in this group. In the British study of Hamoda et al.,¹⁹ Mifepristone followed by Misoprostol 600 mcg $\pm$ 400 mcg after 3 hrs. sublingually in women up to 63 days gestation, resulted in vomiting, diarrhoea, and chills being reported by 57%, 63% and 85% of the women, respectively. In contrast, the women in our study reported these side-effects in 25%, 37% and 51% respectively. The lower incidence of side-effects are possibly because we used only 200 mcg sublingually as a repeat dose instead of 400 μ g. In this trial, sublingual Misoprostol was better tolerated when compared to Tang's study.¹⁶ This may be due to the lowering of initial dose from 800 mcg to 600 mcg. However, the prevalence of chills was not improved. We observed fever in 36% of the women, this rate is nearly identical to that reported by Tang et al.¹⁶ The pain experienced in medical abortion causes significant distress. We did not prescribe Ibuprofen for pain relief as it would prevent endogenous prostaglandin production and thus would increase the failure rate.^{22,23} In the trial reported by Hamoda et al,¹⁹ 63% of the women in sublingual group and 73% in the vaginal group received analgesic. In our study, only 13-20% of the women used analgesics. This may be because the women were less anxious about the abortion process as they were extensively counselled by the resident doctor.

One drawback of this method of pregnancy termination is the

inconvenience of the 3-hrs clinic stay after the administration of Misoprostol. In its favour is the fact that many adverse events, occurred during this period, and some women may prefer to be in the clinic during these events. In the study by Ashok et al⁵, only 0.35% required haemostatic uterine evacuation and 0.15% required blood transfusion for excessive bleeding associated with medical abortion. In contrast, we did not observe these adverse events in our study. However, there is a small risk of haemorrhage requiring oxytocics, surgical haemostasis or blood transfusion. So medical abortion should only be undertaken in settings where there is access to medical assistance for those few women requiring it.

In conclusion, Mifepristone in combination with two doses of sublingual Misoprostol is as effective as Mifepristone with single dose of vaginal Misoprostol for women seeking medical abortion of pregnancies up to 9 weeks duration. Sublingual Misoprostol is easier to administer when compared with vaginal administration and it has the potential to be developed as a self-administered regimen.

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SCHOOL IMMUNIZATION PROGRAMME IN TWO PRIMARY HEALTH CENTRES ATTACHED TO RURAL HEALTH TRAINING CENTRE, KENGERI

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ABSTRACT

School Immunization Programme (SIP) is an important component of school health services. The beneficiaries of the SIP are children studying in class-I, class-IV and class-X. These children are administered DT (class-I) and TT (class-IV and X) vaccines respectively. In this background this study was conducted with the following objectives: to explain the nature of immunization sessions practiced in schools, and to assess the vaccine coverage under the SIP.

A descriptive study of school children coming under two PHCs was conducted over a period of 6 months. A total of 410 school children were included in the study.

As much as 87.67% of the studied children were immunized in class-IV (TT vaccine) and 93.33% were immunized in class-X (TT vaccine), while 48 (11.70%) of the children missed the SIP. None of the children knew the vaccine administered to them and the adverse reaction related to the vaccine during SIP. Conclusion: As many as 88.29% of the studied children were immunized under the programme.

Key Words: School Immunization Programme, Adverse Reaction, Microplan, Cold Chain.

School health is an important branch of community health. School health services have developed in the last 70 years and is an economical and powerful means of raising community health.^{1,5} School health has never been a priority programme in the country.² The School Immunization Programme (SIP) is an important component of school health services. The beneficiaries of SIP are students of class-I, IV and X. These children are administered DT (class-I) and TT (class-IV and X) vaccines respectively. The present study was conducted to

explain the nature of immunization sessions practiced in schools, to assess the vaccine coverage in the SIP, to list the adverse reactions following immunization, and to assess the availability of equipment, vaccines and records for the programme.

MATERIALS AND METHOD

The study was conducted in 2005 involving schools in two PHC areas-- PHC-I and PHC-II. These PHCs are attached to the rural health training centre (RHTC), Kengeri, Department of

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Community Medicine, Kempegowda Institute of Medical Sciences (KIMS), Bangalore. The duration of the study was six months. A total of 90 schools were listed in the two PHC areas and the listing was done sub-centre-wise. One school was selected from each sub-centre by simple random sampling to ensure the coverage of the entire PHC area. Eleven (5-PHC-I and 6 PHC-II) schools representing about 10% (feasibility for conducting the study) of the schools in the two PHC areas were finally selected. A total of 410 school children studying in class-I, IV and X along with 24 school teachers and 8 PHC staff were the study subjects. The data on vaccine coverage, interviews of study subjects, adverse reactions was collected using a pretested questionnaire by personal interview of the subjects at the school. Duration of the immunization sessions was recorded by actual observation and check-list. Records and reports maintained at the PHCs and the schools were also used for analysis. The information regarding the vaccines, cold chain equipments etc. was collected by using the check-list (UIP Module) at the PHC by the interviewers. All government and private schools that participated in the SIP were included. Schools which did not participate in the SIP were excluded from the study.

RESULTS

DESCRIPTION OF THE SIP

The two PHCs together had 90 schools i.e. PHC-I = 43 and PHC-II =47. The SIP was conducted in 87 (96.66%)

schools, out of which 11 schools were visited.

DURATION

The duration of SIP was six months (July to December), factors determining the duration of SIP are availability of vaccines, records and school time table, etc. Ten (91.6%) schools had SIP annually, whereas only one (9.4%) school had SIP after three years. Out of the 410 beneficiaries, only 362 (88.29%) beneficiaries were immunized.

PLACE

Regarding the place of immunization, all 362 (100%) children were administered vaccine inside the classroom. Only 73 (20.16%) children were administered while lying on the floor of the classroom, 289 (79.83%) were administered vaccine while lying on the bench inside the classroom.

AWARENESS ABOUT SIP

None of the studied children (100%) in the school knew about the disease prevented by the vaccine, vaccine administered to them and adverse reactions related to the vaccine. Out of the 24 teachers interviewed, 14 (58.33%) knew about SIP, while all the 24 teachers were aware of the possibility of occurrence of adverse reactions to the vaccines.

NATURE OF VACCINATORS

The vaccinators involved in the SIP

were interns (KIMS), PHC staff- JHAF/M, SHAF/M, and medico-social workers (KIMS). As KIMS is attached to the two PHCs, vaccinators are available in adequate numbers for the SIP. The KIMS RHTC has been sponsoring disposable syringes (2ml) for SIP since the last few years. All syringes and needles were taken back by the PHC staff after immunization and disposed off according to guidelines.

DURATION OF IMMUNIZATION SESSION

The average duration of time taken to immunize one child is around one minute. The average number of children immunized per session is 36 (minimum = 10, maximum = 80). The average time taken for one session of immunization is 22 minutes (minimum=15 mins, maximum = 30 mins). The time duration available for the conducting the immunization session at the school was adequate.

IMMUNIZATION COVERAGE

Table 1 shows the immunization coverage of the beneficiaries in the different classes. All the 48 students who missed immunization continued to remain not immunized at the end of the SIP. Regarding vaccine administration, all the 104 children received DT vaccine intramuscularly on the antero lateral aspect of the thigh. Among the 258 children who were administered TT vaccine, 142 (55.03%) were administered in the deltoid, 111 (43.02%) gluteal region and 5 (01.95%) in the antero lateral aspect of thigh.

ADVERSE REACTIONS

Among the 104 children who took DT injection adverse reactions observed were mild such as pain 59 (56.7%), fever 36 (31.03%) and a singular case of myalgia (0.86%). Similarly, among the 258 children who took TT injection, adverse reactions observed were mild such as pain 100 (63.29%), fever 50 (31.6%) and myalgia 3 (1.89%). No life-

TABLE 1
DISTRIBUTION OF BENEFICIARIES OF SIP ACCORDING TO IMMUNIZATION COVERAGE

Beneficiaries	Class –I (N=119*)	Class-IV (N=137*)	Class-X (N=154*)
Immunized	104 (87.39)	116 (84.67)	142 (93.33)
Not Immunized	15 (12.61)	21 (15.33)	12 (06.77)
Total	119 (100.00)	137 (100.00)	154 (100.00)

*Figures in parentheses indicate percentage.

threatening reactions or incidents of hospitalization were reported with respect to DT and TT vaccines. Among the DT vaccine administered group 56.39% of children who had pain reported it in the first 30 minutes and as many as 89% of fever occurred within the first 24 hours. All reactions of myalgia occurred within the first 24 hours. Among the TT vaccine administered group, 29% reported pain in the first 30 minutes, while 88.88% developed fever within the first 24 hours and 67% got myalgia within the first 24 hours and 33% after 24 hours. Paracetamol tablets were given to teachers for management of the adverse events by the health workers.

VACCINE INDENTING

At the PHCs, indenting of vaccines for SIP is based on vaccine availability. No micro-plan is available for SIP. Records of SIP are maintained in the PHCs and respective schools. There was a shortage of cotton swabs and spirit for conducting the SIP.

COLD CHAIN

ILR and deep freezer was available and functioning in both PHC I and II. However, in PHC-II, ILR was not functioning for four months and DF for one month during the last one year based on PHCs records. Temperature records were entered on daily basis in both PHCs. DT and TT was stored in the ILR only in both PHCs. Adequate number of vaccine carriers and ice packs were available for conducting SIP.

DISCUSSION

None of the schools had provision of cot/bed for conducting the SIP. We had observed that 20% of the beneficiaries were immunized while lying on the floor. Similarly the environmental sanitation of the schools was fair. Availability of cot/bed, ensuring place of vaccination to be clean and tidy should be an important prerequisite for conducting the SIP. The coverage of immunization during the SIP was 88%. The PHC staff along with school teachers should have an action plan for follow-up of the missed immunization children during the SIP.

Antihistamines, Analgesics and Antipyretics should also be made available to teachers during SIP. We observed that though on paper a system of follow-up of adverse reactions after immunization exists in the PHCs, it needs to be strengthened.

School teachers are an integral part of the SIP. Awareness of the beneficiaries including teachers regarding the SIP is poor. It is the duty of the people involved in SIP to inform the beneficiaries about SIP by holding regular health education talks at the school for all the stakeholders. Ragahav Prasad³ had observed educating school children about immunization could play a vital part in increased compliance of SIP. Aras R. Y⁴ et al. had observed that establishment of a good functioning two way referral system, joint (health and education) training and joint visit by the supervisors of both department are needed. Sarkar A⁶ et al had concluded

that periodic reinforcement and training of teachers with provision for adequate practice under supervision are required to ensure attainment of skills.

The PHCs which do not have external support of vaccinators may have difficulty in covering all schools during SIP because of the magnitude of the beneficiaries to be covered.

Availability of disposable syringes for conducting SIP should be made mandatory as it was observed that the neighbouring PHCs did not use disposable syringes for SIP. The sterilization technique followed was not according to recommendations. This could lead to transmission of diseases. It is recommended that a policy decision at the highest level for providing disposable syringes during SIP along the lines of UIP is the need of the hour.

During immunization sessions it was observed that there were considerable variations in dosage of vaccine administered, site of vaccination among vaccinators. There is a need for regular, repeated, training and retraining for vaccinators and PHC staff in injection techniques and injection safety for SIP.

The district and PHCs need to have a micro-plan for SIP on the lines of UIP. This will reduce the duration of SIP, availability of vaccines, and ensure better coverage.

CONCLUSION

As many as 88.29% of the children were immunized during the SIP indicating

good coverage. There was no follow-up immunization of school children who missed SIP. None of the school children knew about the SIP. There was no micro-plan available for conducting the programme. Adequate cold chain equipments and records are available for SIP. Similar studies with a larger sample are needed so as to generalize the results.

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ARE GOVERNMENT HEALTH FACILITIES LOSING THEIR CHARM IN EXTENDING MATERNAL AND CHILD HEALTH CARE SERVICES? A CRITICAL REVIEW OF STUDIES FROM TAMIL NADU

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ABSTRACT

The author reviews the extent of utilisation of the maternal and child healthcare services from the government (public) and private health facilities by married women in the 15-44 age group in Tamil Nadu, besides examining the cost differentials, if any, for seeking such services. Published data and review of literature are used for this purpose. A large per cent of women from different districts of Tamil Nadu have received ANC services and delivery services, treatment for pregnancy complications and delivery and post-delivery complications from private health facilities as against public health facilities, whereas the reverse is true in the case of immunization services. Women perceive private healthcare facilities better in terms of quality and prefer to go to them if they can afford them. Costs of such services are considerably higher in the private sector than in the public sector healthcare facilities, even accounting for under-the-table payments in the latter. The paper also spells out major data/research gaps and recommendations for future research.

Key Words: Government Healthcare Facilities, Maternal and Child Healthcare Services, Quality of Services, Cost of Services.

Soon after the independence, the government had taken several concrete steps to provide maternal and child healthcare services such as ante-natal, natal and post-natal services, child immunization and also effective management of obstetric emergency at free of cost through its chain of healthcare facilities like sub-centres (SCs), primary health centres (PHCs) and hospitals. Since 1997, the safe motherhood and child healthcare services were incorporated into the Reproductive and Child Health (RCH) programme so as to provide these services more effectively to women and children especially those living in rural areas and in urban slums. But there are

arguments that women, by and large, are availing of such services to a large extent from private healthcare facilities rather than from public healthcare services outlets. With this background, in this paper an attempt is made to review to what extent women in Tamil Nadu are utilising these services from government-run centres as well as from private healthcare facilities. Attempts are also being made to examine the cost differentials, if any, for seeking such services from public and private healthcare facilities as well as the major reasons for non-utilisation of public healthcare facilities, including the reasons from their selected socio-economic characteristics.

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SOURCES OF DATA/LITERATURE

The major sources of data/literature for this paper are Round I of Rapid Household Surveys conducted in 23 districts (as of Census 1991) in Tamil Nadu (among 1,000 married women in the 15-44 age bracket) as part of the major Reproductive and Child Health Project during 1998 and 1999 carried out by the Government of India.¹⁻³ The data also include the similar type of Rapid Surveys conducted in seven districts (sub-projects that focussed on the assessment of quality and client satisfaction with family welfare services at the district levels) independently conducted by the Gandhigram Institute of Rural Health and Family Welfare Trust during 1996-1998.⁴⁻¹⁰ In addition to these sources, data from the all-India reports of the National Family Health Survey, 1992-93 (NFHS-1)¹¹ and 1998-99 (NFHS-2)¹², and Tamil Nadu Family Health Survey, 1995¹³ as well as the selected published reports¹⁴⁻²⁴ based on micro level studies have also been made use of for discussion.

MAJOR OBSERVATIONS AND DISCUSSION

Utilisation of Maternal and Child Healthcare Services from Public/Private Healthcare Services

It is common that women in the reproductive age generally make use of different healthcare facilities for various maternal care services like ante-natal, natal and post-natal care in addition to family welfare services and treatment for reproductive tract infections (RTIs).

Some studies in Tamil Nadu during the last decade tried to obtain data on utilization of various maternal and child healthcare services. On one side, these data would be useful to know the type of healthcare facility used by women, on the other it would be valuable for evaluating various health and family welfare programmes.

The National Council of Applied Economic Research's¹⁴ study highlighted that both in rural as well as urban Tamil Nadu, the intake of government healthcare facilities was comparatively lower (about 40% each) than the private healthcare facilities (58% and 52%, respectively). The NFHS-1 data¹¹ showed that among the deliveries taken place in institutions during the four years before the survey, the share of public healthcare institutions (such as government-operated district, taluk, town or municipal hospitals and PHCs) was higher than the private medical institutions. Curiously, in rural areas, the proportion of births taken place in public healthcare facilities was little higher than in private healthcare facilities, whereas in urban areas, the share of births occurred in public and private healthcare facilities was almost equal. The Tamil Nadu Family Healthy Survey (TNFHS) conducted in 1995¹³ (among 4,086 ever-married women aged 13-49 years) revealed that majority of women utilised private health facility as against government healthcare facility for ante-natal check-ups and delivery for the pregnancies/births during the four years preceding the survey. Such pattern

was more conspicuous among those who sought treatment for diarrhoea of the children. Further, in urban areas utilisation of private healthcare facilities for all the three services mentioned here was much higher than that of rural areas. The NFHS-2 data¹² for Tamil Nadu as a whole revealed that majority of the households (61%) normally used private healthcare facilities when a member of household got sick, whereas 38% used the public facilities. The proportion of births (during the three years preceding the survey) took place in healthcare facilities was equally divided between private and public institutions. However, the proportion of deliveries in private facilities as against in public facilities was higher in urban areas, the reverse was the case in rural areas. Among those women who reported reproductive health problem, majority obtained advice/treatment from someone in the private sector, mostly private doctors, while a sizeable proportion used government doctors.

The RCH-RHS district level data¹⁻³ for Tamil Nadu showed that in the case of maternal and child healthcare related aspects (Table 1), slightly more than 50% of women sought ANC from government facilities in districts like Chennai, Pudukottai, Sivaganga, Madurai, Salem, Dharmapuri and North Arcot. On the other hand, a large portion of women (around 60-80%) in about 17 out of 23 districts availed of ANC services from private facilities. Conspicuously, even for deliveries, majority used private healthcare facilities (in 17 out of 23) than government facilities. Private doctors

were the major source of treatment for pregnancy complications in almost all the districts, except Pudukottai (61% went to government doctors) as well as for delivery and post-delivery complications, except in Pudukottai, Chengalpattu and Thiruvannamalai (68, 61 and 59%, respectively went to government doctors).

Remarkably, government healthcare facilities served as the major sources for immunization uniformly among all districts (ranging from 51.4% in North Arcot to 91.6% in Pudukottai), except in North Arcot where almost half the clients used private facilities.

The Rapid Health Surveys by GIRH and FWT in selected districts⁴⁻¹⁰ (Table 2) revealed that the percentage of women who had deliveries in government facilities was comparatively higher in Madurai, Thanjavur and Nagapattinam, whereas in Kamarajar, Trichy and Erode majority used the private facilities. In Salem, this was equal when it came to delivery services. Availing of services for delivery-related problems from government facilities as against private facilities was higher in Madurai, Kamarajar, Thanjavur and Salem, whereas the reverse pattern was seen in the other three districts. The intake of government facilities for the treatment of reproductive health problems was almost uniformly higher in all the districts under consideration, except in Trichy, and it was more conspicuous in Madurai and Kamarajar.

Results from some micro-level studies with regard to the extent of utilisation of

public and private medical/healthcare facilities are mixed. While private hospitals were found to be a source for seeking treatment among 320 mothers who had at least one child under two years of age from eight sub-centres of two PHCs in North Arcot Ambedkar district¹⁵, a large majority of women from the two slum areas of Coimbatore used MCH centres and government hospitals for deliveries as against private hospitals.¹⁶ Likewise, among pregnant women (1,273) in Dindigul slum areas¹⁷ 55% of deliveries took place in government facilities against 35% in private hospitals. However, 59% of all C-sections were done in private hospitals.

A study in 12 villages (one village in each of the 12 selected sub-centres) in Dharmapuri and Villupuram districts¹⁸ showed that the government was the predominant provider of ante-natal care. However, the proportion attending ante-natal clinics in the referral centres was very low in both these districts (3% and 10%, respectively). But, a large proportion went to local registered medical practitioners (RMPs) and private practitioners for post-natal and general healthcare. A study¹⁹ among 314 women in urban slums and 273 women from three rural settlements (all Scheduled Castes), in Coimbatore district revealed that women who suffered with ante-natal morbidity (for

TABLE 1
PERCENTAGE OF WOMEN WHO USED MATERNAL AND CHILD HEALTHCARE SERVICES ACROSS TAMIL NADU BY TYPE OF HEALTHCARE FACILITIES, RCH-RHS, 1998-99

DISTRICTS	Sources of ANC			Sources of Treatment for Pregnancy Complications		Institutional Delivery			Sources of Treatment for Delivery and Post Delivery Complications		Sources of Immunization	
	HW	GHF	PHF	Govt. doctor	Private doctor	Total	Govt.	Private	Govt.	Private	Govt.	Private
Chennai	35.4	59.6	58.5	48.0	63.5	99.2	55.4	43.9	52.6	50.8	65.2	34.5
Chengalpattu	39.8	43.8	53.5	47.7	63.1	83.3	42.6	40.7	60.7	39.2	66.5	33.2
North Arcot	43.0	50.9	48.1	56.1	63.7	65.5	34.1	31.4	51.4	51.5	51.4	50.5
South Arcot	53.3	43.9	48.2	55.5	61.3	55.3	30.6	24.7	46.1	56.2	85.6	24.0
Dharmapuri	65.5	47.1	59.4	54.6	57.8	62.6	24.8	37.7	44.5	66.2	81.2	18.5
Thiruvannamalai	47.7	40.5	49.8	47.6	62.1	57.4	32.9	24.5	59.1	38.8	83.1	16.5
Salem	45.5	58.6	64.1	45.2	66.0	76.4	30.5	45.9	34.2	70.2	80.0	19.7
Namakkal	63.0	40.3	67.2	42.8	57.1	87.0	32.4	54.6	23.4	76.4	77.3	22.4
Erode	42.1	47.4	56.8	49.1	62.2	82.6	29.0	53.7	45.2	58.4	74.5	25.3
The Nilgris	41.8	40.7	57.7	22.4	71.4	86.1	35.6	50.5	46.0	61.5	74.4	25.6
Coimbatore	30.2	27.5	72.0	26.9	73.9	92.9	31.3	61.5	34.0	70.1	63.2	36.4
Dindigul	47.1	36.6	59.5	34.0	71.4	74.9	28.2	46.7	38.6	64.8	83.0	16.8
Tiruchirappalli	44.7	31.2	68.8	26.9	78.8	77.2	23.3	54.0	27.6	75.8	72.8	26.8
Thanjavur	58.0	43.0	58.0	39.3	60.7	88.4	44.0	44.4	35.7	67.7	70.9	29.6
Pudukottai	64.1	62.9	52.1	64.5	44.1	87.7	57.8	29.9	67.8	41.9	91.6	8.4
Sivganga	51.6	58.3	67.1	39.3	67.5	85.9	32.5	53.4	44.6	61.6	90.5	9.5
Madurai	53.7	53.7	63.8	45.6	60.8	86.2	34.6	51.6	44.2	55.7	82.2	17.5
Theni	53.0	49.6	48.1	49.9	63.8	69.0	34.0	35.1	55.3	56.2	89.6	10.2
Virudhunagar	62.9	37.5	60.3	47.5	64.2	75.9	31.0	44.8	52.3	52.3	81.5	18.2
Ramanathapuram	52.9	34.8	72.0	29.2	79.5	86.1	30.9	55.2	28.0	73.6	76.8	22.8
Thoothukkudi	44.0	44.9	70.7	37.7	67.7	86.2	38.2	48.0	34.9	69.9	70.9	28.8
Tirunelveli	57.4	38.3	67.3	37.2	76.7	82.1	32.3	49.8	43.6	64.5	85.3	14.4
Kanyakumari	42.0	19.6	76.8	14.6	87.3	89.3	18.3	71.0	17.2	81.4	72.9	26.8

Note: Percentages would not add up 100 because the services were availed of from both GHFs and PHFs in some districts.

the last three episodes of illness) sought treatment equally from government and private facilities irrespective of their place of residence. More or less, similar pattern was also observed in the case of those women who sought treatment for post-natal morbidity in urban areas. Conspicuously, in rural areas, the percentage of women who got treatment from government facilities was much higher than private facilities.

Are Facilities and Services Provided at Private Health Centres Better?

A few studies in Tamil Nadu highlighted that the facilities and services provided by private clinics/hospitals were much better than government health facilities. The NFHS-2 data¹² for Tamil Nadu as a whole showed that among those women who visited a health facility in the 12 months preceding the survey, almost all the respondents, irrespective of public and private facilities, mentioned that they received the

services and the median waiting time to receive the services was about 30 minutes both at public and private facilities. However, the percentage of women who felt satisfaction with the amount of time the staff spent with the woman was generally high, but appeared to be much higher among those who visited private facilities (98%) than the public facilities (85%). Almost all women who received services from private facilities said that the staff talked to them nicely and also reported that the staff respected their need for privacy compared with about two-thirds of women who received services from public facilities. Likewise, as high as 91% of women who visited private facilities as against 56% who visited public facilities reported that the health facilities were very clean. These differentials were more conspicuous in urban areas than in rural areas.

Some micro-level studies also supported that the facilities were good

TABLE 2
PERCENTAGE DISTRIBUTION OF CURRENTLY MARRIED WOMEN (CMW) BY INTAKE OF SELECTED SERVICES AND ADVICE RECEIVED FROM VILLAGE HEALTH NURSES IN SELECTED DISTRICTS

Selected Facilities at Sub-centres	Madurai	Kamarajar	Thanjavur	Nagapattinam	Trichy	Erode	Salem
	% N	% N	% N	% N	% N	% N	% N
% of CMW by Place of Delivery	1000	1000	1000	1000	1000	1000	1000
Govt. Health Facility	30.9	22.1	49.2	48.2	22.6	40.8	36.3
Private Health Facility	26.2	40.9	39.2	35.0	55.0	47.2	36.4
% of CMW by Place of Treatment	267	274	404	114	359	348	426
for Delivery Problems	53.2	48.2	48.2	30.3	24.4	40.2	42.2
Govt. Health Facility	36.0	44.9	37.7	43.0	53.2	42.0	37.8
Private Health Facility							
% of CMW by Treatment for Health Problems	475	427	608	496	496	442	386
Govt. Health Facility	63.6	61.1	38.0	32.8	23.9	31.3	31.8
Private Health Facility	14.7	17.4	25.3	30.5	30.5	23.0	17.0

Note: CMW = Currently Married Women

in the private sector than in the public health facilities. For instance, while examining the maternity services in hospitals in urban Tamil Nadu (377 women from Chennai city and 92 women from Chidambaram/Cuddalore region). Muraleedharan²⁰ observed that some of the facilities like clean drinking water, toilet facilities, garbage bins etc. were found to be good in private facilities as against public, whereas a higher percentage of women reported that the consulting rooms were very clean in public hospitals than the private. All the private hospitals in Chennai city had power back-up, while none in the Chidambaram region had it. In case of public hospitals, none had power back-up. None of the private hospitals in Chidambaram had space for washing patients' clothes. It is important to note that none of the public hospitals answered this question. One-third of the users in private hospitals in Chennai said that often they waited for less than 15 minutes for regular ante-natal check-up, while only 9% of the users in Chidambaram region had such a low waiting time. On the other hand, only 7% in Chennai said that they had to wait for more than 30 minutes, while it was 33% in Chidambaram region. About 50% of those who visited private hospitals said that the staff were very helpful as against 20% only in public hospitals in Chidambaram/Cuddalore region. Overall, about 70% in private hospitals termed their general experience as 'good'. Users of public hospitals in Chennai showed a similar response, while it was only 6% in Chidambaram area.

A recent study in two selected villages²¹ highlighted that by and large, the villagers who availed of the services from government dispensary/hospitals were not happy with the quality of services, yet they went to them due to their poor economic conditions. However, most of the people from the low-fertility village, especially from socio-economically better-off community, preferred to visit private hospitals since the services and care were said to be comparatively better than government facilities. Interestingly, those who availed of the government facilities stated that the quality of services and care would also be relatively better there 'if they bribed the hospital staff irrespective of their cadre'. All these evidences clearly indicate that the quality of services is fairly better in the private sector than the public sector.

Do Private Hospitals Charge More than Public Facilities?

Across the country, medical and healthcare services through the government sector are free, whereas in private hospitals/clinics this is paid depending on the type of the doctor/hospital and type of illness. Of course, some NGOs are also providing free medical services, except for the cost of the medicines. One school of thought argues that since the services are of better quality in private facilities there is nothing wrong to charge for such services. Conversely, the other school of thought believes that the private sector charges exorbitantly even for providing basic medical assistance to simple diseases or illnesses, which can be cured with minimum expenditure. In

fact, today even government doctors prescribe medicines to be purchased from outside and there are complaints that even at government hospitals if one is able to pay some money, the services would be as equal as private hospitals/clinics. A few studies have looked into the medical expenses to be borne for the services received at private and public facilities.

The NCAER's¹⁴ study in Tamil Nadu showed that the average cost of treatment per episode of illness was found to be higher in private institutions (Rs 212 in urban areas and Rs 106 in rural areas) than in government hospitals (Rs 54 and Rs 71, respectively) and PHCs (Rs 174 and Rs 23, respectively). The average cost of treatment per episode of illness was noted to be much higher in urban areas (Rs 139) than their rural counterparts (Rs 92). On the other hand, the study by Muraleedharan²⁰ showed that a large majority of women paid 'speed money' to the providers in public hospitals (61% in Chennai city and 96% in Chidambaram/Cuddalore region). In case of private hospitals, 16% and 88%, respectively from Chennai and Chidambaram/Cuddalore region paid for such services that were not billed. On an average, Rs 12,965 was spent for a Caesarean section in private hospitals in Chennai city, while in Chidambaram/Cuddalore region the corresponding amount was Rs 6,985. Considerable variation in expenditure exists across private hospitals. For example, in Chennai city, it ranged from Rs 3,000 to Rs 30,000. A noteworthy point is that 75 out of 129 Caesarean cases surveyed in private hospitals in

Chennai city spent equal to or more than Rs 10,000.

In case of women belonging to slum areas of Dindigul town,¹⁷ the mean expenditure per delivery at home and the Municipal Maternity Hospital were Rs 295 and Rs 238, respectively. On the other hand, a woman spent Rs 1,895 for a normal delivery, compared to Rs 8,774 for a C-section in a private hospital, whereas in government hospitals, the corresponding figures worked out as Rs 485 and Rs 2,410, respectively. The difference is quite substantial. Interestingly, a large majority of slum population bears a considerable amount of financial burden for delivery. For example, out-of-pocket expenses per normal delivery at the Municipal Maternity Home varied from Rs 45 to Rs 2,000. Many poor women spent more than Rs 4,000 per C-section. A considerable number of women from high poverty risk groups chose private facilities for deliveries and spent as much as Rs 15,000 per C-section. A case study among home-based weavers²² showed that 70% of them largely depended on government hospitals because they were unable to afford the cost of private hospitals for each episode of illness. The study revealed that about 15-20% of their earnings spent on medical expenses, which included direct and indirect costs.

According to the TNFHS⁷, immunization services were also charged to a certain extent in government health facilities, whereas substantially in private clinics/hospitals. It was observed that for administering TT, BCG, Polio and

Measles, on an average, women paid Rs 31, 22, 24 and 30, respectively in private health facilities, whereas in government hospitals/PHCs the corresponding figures were Rs 15, 12, 22 and 20.

Reasons for Using/Not Using Government Facilities

Some of the studies in Tamil Nadu collected information about the reasons for using/not using government facilities. The findings from Phase-II of Round-I RCH-RHS² (11 districts) showed that about 30-60% of women did not visit any government facility as there was 'no need'. Curiously, about 23 to 45% (66% in Salem district) of women from 10 districts mentioned that they preferred private clinics/doctors instead of visiting public health facilities. Interestingly, the percentage of women who stated the reasons like 'centre's place/time is not convenient' and 'poor quality of services at the government facility' as the reasons for not visiting public healthcare facilities which was comparatively much lower in Salem district (0.3 and 0.7%, respectively), whereas, the corresponding figures were comparatively higher in the districts of Thoothukudi (10% in the case of former reason and Thirunelveli (12% in the case of latter reason) and the rest of the districts lie in between these extremes.

Differences in the reasons for not visiting health facilities were also noted to be conspicuous across women's socio-economic backgrounds (Table 3). The percentage of women who felt that

there was 'no need' for visiting a public facility was higher and conspicuous among SCs/STs, illiterates and those who from poor households uniformly among all the districts, except in Theni wherein such differences were marginal. Conversely, the percentage of women who preferred to visit private healthcare facility was found to be higher among the non-SCs/STs, completed 10+ years of schooling and belonged to high standard of living households, again uniformly in all the 11 districts under consideration, except in Theni. However, the percentage of women who mentioned the reasons like 'centre's place/time inconvenient' and 'poor quality of services at public health facilities' neither vary consistently across their socio-economic characteristics nor the district they belong to.

Individual district level studies highlighted that in Thanjavur⁴ (July-September, 1997, N=453) the major reasons for not visiting government facility was 'distance' followed by 'preferred private hospital', 'family status', 'inconvenient', and 'no knowledge about the PHC and in case of Erode⁶ (April-June 1998, N=463) the major reasons for not visiting government health facility mentioned were: 'far away', 'not customary', 'no proper care', 'not aware of health facility', 'no transport facility', 'inconvenient', and 'prefer private facility' in that order.

These findings clearly demonstrate that majority of the government healthcare facilities, especially the PHCs, are

located in places that are too distant for many, inconvenient timings and lack of transport facilities. Of course, some women openly came out that they preferred to visit private facilities only.

Some of the field-based micro-level studies have also brought out the reasons for visiting/not visiting government facilities. The study of women belonging to two slums (689 and 577 women) in Coimbatore city¹⁶ revealed that 'free treatment', 'MCH centre nearer', 'all the facilities are available' and 'good ANC and delivery care' as the major reasons for using natal care services, with minor variations across the two slums, whereas 'MCH centre distant' was reported to be major reason for not utilizing natal care services, followed by 'only normal deliveries used to be conducted', 'facilities are not available at MCH centres' and 'deliveries are not conducted by doctors'. Another micro-level study²² among women weavers in Karur district highlighted that they prefer private hospitals for treatment because of long waiting time in government hospitals, however, a large majority of them preferred to visit these hospitals only because of the inability to afford the cost of private healthcare. Yet another micro-level study²³ among 75 patients who visited two PHCs in Kanchipuram district, it was found that 'proximity to the PHC' seemed to be the over-reaching response for choosing the PHC for treatment, closely followed by the 'inexpensive services delivered at PHCs'. However, 4% said 'good treatment' and 8% stated other reasons to visit a PHC (regularly visit this centre,

lucky PHC, faith that will be cured, mother-in-law's advice). Based on three small community-based studies in rural areas of North Arcot district, Ravindran²⁴ concluded "although health facilities (public health facilities) are physically accessible in most instances, problems arise from inconvenient hours of operation and non-availability of personnel". A recent study²¹ in two selected villages reported that generally, the villagers would like to make use of the government facility because of their 'poor economic conditions'. However, among those who visited private facilities, 'poor quality of services' and 'lot of waiting time required to meet doctor' at government health facility were stated as the major reasons.

CONCLUSION AND IMPLICATIONS

A large majority of the women in Tamil Nadu, by and large, utilising the maternal and child healthcare services from government facilities as against private facilities. While this comparative picture is true, this does not mean that such pattern still prevails over a period of time and/or across the districts, rural-urban areas, as well as selected socio-economic groups. Studies conducted recently have shown that in districts that are developed wherein majority of the people are in better in their socio-economic conditions are slowly shifting towards private healthcare facilities as against government services. This pattern is true in the case of utilising ANC services, institutional deliveries and treatment for pregnancy, delivery and post-natal complications. Conspicuously, government facilities still

TABLE 3
PERCENTAGE OF CMW BY REASONS FOR NOT VISITING GOVERNMENT
HEALTHCARE CENTRES ACROSS SELECTED BACKGROUND AND
CHARACTERISTICS

Reasons/Districts	Percentage of CMW by Reasons for Not Visiting Govt. Health Centres						
	Total	Caste SCs/STs	Others	Education Illit. 10+ yrs.		Standard of Living Low High	
No Need							
Chennai	50.8	70.7	48.1	65.3	43.4	86.4	30.5
Dharmapuri	40.0	51.1	37.8	47.6	28.1	47.5	13.6
Salem	31.7	50.5	25.1	46.1	15.3	42.4	12.8
Namakkal	48.9	67.2	42.7	61.0	28.3	61.4	29.6
Pudukottai	49.1	47.5	49.5	54.7	29.5	50.6	31.5
Sivaganga	49.4	54.6	48.2	54.8	29.7	55.8	33.3
Madurai	39.5	49.4	38.0	59.3	18.3	61.3	9.4
Theni	60.7	61.7	60.3	69.8	47.1	66.3	60.6
Virudhunagar	47.0	50.9	46.4	51.8	41.8	55.2	33.3
Thoothukudi	39.3	54.2	36.1	54.6	22.7	52.9	22.0
Thirunelveli	47.4	56.8	44.6	54.9	38.5	55.9	37.7
Place/Time Convenient							
Chennai	7.7	3.6	8.3	6.4	8.8	2.7	8.6
Dharmapuri	5.1	6.1	4.9	4.6	4.9	5.3	6.8
Salem	0.3	1.1	0.0	0.3	0.0	0.6	0.0
Namakkal	4.9	3.2	5.4	2.5	7.4	2.3	8.6
Pudukottai	7.6	9.6	7.0	6.5	15.4	7.9	7.8
Sivaganga	2.5	0.0	3.0	3.1	2.7	2.4	2.2
Madurai	7.1	8.0	7.0	7.0	8.3	7.5	9.4
Theni	1.7	1.4	1.9	2.1	1.8	2.2	1.6
Virudhunagar	7.9	8.4	7.8	6.5	6.8	7.2	7.5
Thoothukudi	10.1	11.4	9.9	8.7	6.9	11.5	4.4
Thirunelveli	5.1	3.7	5.5	4.0	12.0	4.8	4.4
Poor Quality of Services							
Chennai	9.2	10.9	8.8	7.6	9.8	2.7	12.3
Dharmapuri	7.9	6.8	8.1	6.5	8.2	7.3	9.0
Salem	0.7	1.1	0.6	0.6	0.0	0.6	0.0
Namakkal	6.8	4.8	7.4	4.8	8.7	4.7	9.8
Pudukottai	9.8	11.0	9.5	10.9	8.4	9.7	7.8
Sivaganga	4.3	4.6	4.2	3.4	2.7	5.1	2.2
Madurai	3.5	4.6	3.4	3.3	3.3	3.1	4.2
Theni	9.5	10.2	9.2	7.2	11.3	9.6	11.4
Virudhunagar	4.6	6.6	4.3	5.6	4.2	5.4	1.5
Thoothukudi	6.9	5.7	7.2	7.1	11.8	6.4	10.2
Thirunelveli	12.0	12.8	11.8	16.6	4.8	13.5	8.8
Prefer Private Clinic/Doctor							
Chennai	22.8	9.7	24.6	12.8	26.9	22.7	23.2
Dharmapuri	44.9	32.8	47.3	39.0	58.6	37.4	70.4
Salem	65.5	44.7	72.8	51.1	83.7	54.7	84.1
Namakkal	37.6	20.9	43.2	28.4	54.7	28.1	50.6
Pudukottai	28.3	26.9	28.7	23.9	38.0	26.9	42.1
Sivaganga	40.7	38.8	41.1	35.9	62.1	33.6	57.7
Madurai	45.4	35.6	46.9	28.6	63.8	26.2	68.3
Theni	23.4	22.0	24.0	17.7	33.3	18.3	16.3
Virudhunagar	38.4	31.1	39.7	34.3	46.1	30.2	56.0
Thoothukudi	36.3	23.8	39.0	24.5	50.5	27.3	54.4
Thirunelveli	28.6	19.7	31.2	20.7	36.1	19.4	42.2

serve as a major source of immunization to children.

Cost of maternal and child healthcare services observed to be exorbitant at private facilities than in the public sector, even accounting for 'under-the-table' payments in the latter. In spite of this, women prefer to use such facilities because of the perceived quality of services, convenient timings, easy access and emergency/quick treatment. But in the process, the worst hit people are those who are at the low-economic and socially disadvantaged groups. These groups have a choice between a rock and a hard place--either to go for healthcare or incur catastrophic debts in order to seek healthcare from private facilities.

Based on the broad findings of this review of studies, some of the policy implications are put forth for making the government healthcare facilities to win over the hearts of the people so as to utilise the services provided at their end. Firstly, there is an urgent need to ensure that government healthcare facilities have better infrastructure, service personnel and they provide quality of healthcare services to the needy, especially at the rural and slum areas. For this, budgetary allocation could be hiked for differential funding pattern based on the need. Efforts also have to be made to enhance the capabilities of doctors, village nurses and other paramedics through pre-service and in-service training programmes based on the new paradigm of RCH programme so as to equip them to extend various reproductive health services

meticulously at the clients' doorsteps.

On the research front, there is a need to conduct large-scale surveys exclusively on utilisation of public and private healthcare services in a holistic manner with sufficient sample size giving representation to geographic locations (districts) and rural-urban areas as well as to socio-economic groups and/or major communities.

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BACTERIOLOGICAL QUALITY OF DRINKING WATER IN ALIGARH

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ABSTRACT

In developing countries, most of the ill-health conditions are attributed to environmental insanitation, especially the non-availability of safe drinking water. It has been observed that nearly 80% of all diseases in the world are associated with unsafe water. The present community-based cross-sectional study was carried out for 6 months (May to October, 2008) to analyse the bacteriological quality of drinking water in urban and peri-urban areas of Aligarh. The study shows that 68.4% samples were contaminated with coliform organisms. Mostly contamination was seen in running water samples (78.9%) supplied by the Municipality followed by shallow hand-pumps (64.%). 62.1% of the running water samples were highly contaminated (MPN > 10/100 ml of water) followed by shallow hand-pumps (34.9%). In highly contaminated samples from all sources, average number of coliform organisms/100 ml of water was 58.9. During monsoon, level of contamination (MPN > 3/100 ml) increased in shallow hand-pump samples from 29.7% to 50%. Adequate treatment of water supply and subsequent monitoring is needed and if possible water from shallow hand-pumps may be avoided.

Key Words: Bacteriological Quality, Coliform Organisms, Escherichia Coli (E. Coli), Most Probable Number (MPN), Presumptive Coliform Test.

In developing countries, most of the ill-health conditions are attributed to environmental insanitation, especially the non-availability of safe drinking water. In South East Asian countries, people do not have access to environmental sanitation services. There is scarcity of facilities for safe disposal of excreta and waste leading to contamination of groundwater with pathogenic organisms and toxic chemical substances. According to the World Health Report (2002), approximately 3.1% of deaths (1 million) and 3.7% of DALYS (disability adjusted life years) worldwide are attributed to unsafe drinking water, sanitation and hygiene. It has been observed that

nearly 80% of all diseases in the world are associated with unsafe drinking water¹.

In India, the lack of availability of safe drinking water and sanitation is a serious public health problem throughout the country. Water contamination has been identified in many parts of the country. Urbanisation, industrialisation and population explosion are leading to increased water pollution. People from rural background and small cities migrate to big cities to earn better livelihood. This breeds urban slums where housing conditions are very bad. They do not have access to safe water and basic

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amenities. Groundwater is highly contaminated. Sometimes safe water may be contaminated during supply and storage due to corrosion in the pipes, leaking joints, suction of content of sewerline in the water supply line, touching the water with unclean hands and storing it in unclean containers². People carry a heavy burden of water related diseases, the heaviest being the diarrhoeal diseases caused by number of viral, bacterial, protozoal and helminthic agents.

For assessment of bacteriological quality of drinking water, coliform group of organisms are recommended as indicator. It includes all aerobic and facultative anaerobic organisms. This group also includes both coliform organisms of faecal (*E. coli*) and non-faecal (*K. aerogens*) organisms. For all practical purposes, it is assumed that all coliform organisms are of faecal origin unless proved otherwise. Coliform organisms have been taken as indicator of faecal contamination, as they are present in large numbers in intestines. However, *E. coli* is undoubtedly the predominant bacterial indicator of faecal contamination³.

The following table shows the recommended guidelines for assessing water quality.

S.No.	Faecal Coliform/100 ml of Water	Interpretation	Recommendation
1.	0-10	Reasonable quality	Accepted
2.	10-100	Polluted	Better protection, simple treatment
3.	100-1,000	Very polluted	Treatable but look for alternative sources
4.	Over 1,000	Grossly polluted	Source to be avoided

Source: UNHCR

In 1980, UN General Assembly launched the International Drinking Water Supply and Sanitation Decade (1981-1990) – with the aim of providing adequate supply of safe drinking water and sanitation to people by 1990⁴.

In India, the National Water Supply and Sanitation Programme was started in 1954 to provide adequate drinking water supply and sanitation facilities across the country. Provision has also been made in subsequent Five Year Plans to improve the water supply.⁵

Keeping in mind the above facts, the present study has been carried out to analyse the bacteriological quality of drinking water in urban and peri-urban areas of Aligarh.

MATERIALS AND METHOD

Aligarh is one of the advanced, prosperous, agriculturally and industrially developed districts of western Uttar Pradesh. It covers an area of 34.98 sq km with a population of around 8.30 lakh with an estimated population growth of 6%. Out of this 6% population, 4% are immigrant population which needs additional food, water and other amenities.

The present study was carried out in

urban and peri-urban areas of Aligarh city. Two areas of Bhamola and Jamalpur in the city and two registered peri-urban areas under Urban Health Training Centre (UHTC) of the Department of Community Medicine, namely Firdous Nagar and Patwari Ka Nagla on the GT Road Bypass were randomly selected. Out of 250 samples collected during the six months of the study, half of them (125) were taken from urban and the rest from peri-urban areas of Aligarh. In peri-urban areas, drinking water is not supplied by the Municipality and people depend on hand-pumps. In urban areas, timing of the water supply is strictly followed because water is supplied in the morning till 10.00 am. On a few occasions, the study team could not reach on time or water supply was stopped before 10.00 a.m.

The present study was conducted for six months covering summer, rainy season and early winter from May to October 2008. Five samples were collected from different sources per visit. The samples were collected twice weekly by trained laboratory staff and medical interns. Clean sterilized bottles, made of neutral glass with wide mouth, were used to collect the water samples from different sources.

First, spirit swab was placed on the tap or opening of source of water. Swab was burnt to kill the micro-organisms present on the exposed part of the water source. The tap was opened fully and the water ran to waste at least for two minutes and to discharge the stagnant water in the pipeline.

The bottles were held near the base

with one hand and the stopper and paper cover over it, removed together and held in the fingers. The same procedure of water sample collection was applied in the case of hand-pumps and other sources. A quantity of 250 ml of water was collected in the bottles.

Certain particulars regarding time and date of collection, source of water supply and area were noted down on bottles. Samples were analysed on the same day within two hours or as early as possible as recommended⁶. Sometimes, analysis was not possible on the same day due to late collection or transportation of samples into the laboratory, hence they were kept in the refrigerator and analysed the next day. However, it is recommended that water quality testing may be performed within 6 hrs of sampling and if samples are kept in refrigerators, it should be done within 48 hrs of collection.

Presumptive coliform or most probable number (MPN) test is used extensively for drinking water quality analysis. It can be used as indicator both for treatment efficiency and of the integrity of distribution system⁷.

Five test-tubes of 1 ml and 10 ml each and one 50 ml test-tube were used for inoculation of water samples. McConkey's lactose bile salt broth was used as medium with 1% neutral red solution as indicator⁸. The tubes were incubated at 37°C for up to 48 hrs. Acid and gas production was confirmed by identifying the bubbles in Durham's tubes put in all tubes. MPN was calculated by using McCrady's table⁹.

S.No.	MPN/100 ml	Water Quality
1.	0	Excellent
2.	1-3	Satisfactory
3.	4-10	Suspicious
4.	>10	Unsatisfactory

Water samples were classified into four categories as given above¹⁰.

However, the US Environmental Protection Agency's limit for acceptable total coliforms and E. coli is < 1 organism per 100 ml water^{11,12}.

Collected data were tabulated and analysed. For statistical significance, 'Z' test for proportions was applied wherever necessary. A 'p' value of <0.05 was taken as significant.

FINDINGS

Out of the 250 water samples tested for bacteriological quality, 171 (68.4%) were found to be contaminated. As many as 78.9% of the samples collected from running water supplied by the Municipality were contaminated followed by samples from shallow hand-pumps (64.1%). Samples from deep

hand-pumps, jet pumps and submersible pumps were comparatively less contaminated (Table 1).

As many as 62.1% of water samples collected from running water supply were highly contaminated (MPN >10/100 ml of water) followed by samples from shallow hand-pumps (34.9%) and deep hand-pumps (33.3%). Water samples from jet pumps and submersible pumps were highly contaminated in only 16.7% and 20% of the samples, respectively. Excellent quality of water (MPN 0/100 ml of water) was seen mostly in submersible, jet and deep hand-pumps. A sizeable number of samples drawn from shallow hand-pumps and running water were also of excellent quality. The overall excellent quality of water was seen only in 31.6% of samples and highly contaminated quality was seen in close to half of the overall samples (46.8%) (Table 2).

Table 1
DISTRIBUTION OF SOURCES OF WATER ACCORDING TO COLIFORM PRESENCE

S. No.	Sources of Water	Coliform Contamination				Total	
		Present		Absent			
		No.	%	No.	%	No.	%
1.	Running water	94	79.0	25	21.0	119	47.6
2.	Hand-pumps (Shallow)	66	64.1	37	35.9	103	41.2
3.	Hand-pumps (Deep)	06	50.0	06	50.0	12	4.8
4.	Jet pumps	02	33.3	04	66.7	06	2.4
5.	Submersible pumps	03	30.0	07	70.0	10	4.0
Total		171	68.4	79	31.6	250	100.0

Table 2
DISTRIBUTION OF WATER SOURCES ACCORDING TO MPN/100ML

S. No.	Sources of Water	MPN=0		MPN=1 to 3		MPN= 4 to 10		MPN > 10		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1.	Running water	25	21.0	15	12.6	05	4.2	74	62.1	119	47.6
2.	Hand-pumps (Shallow)	37	35.9	22	21.4	08	7.8	36	34.9	103	41.2
3.	Hand-pumps (Deep)	06	50.0	02	16.7	00	0.0	04	33.3	12	4.8
4.	Jet pumps	04	66.7	01	16.7	00	0.0	01	16.7	6	2.4
5.	Submersible pump	07	70.0	01	10.0	00	0.0	02	20.0	10	4.0
Total		79	31.6	41	16.4	13	5.2	117	46.8	250	100.0

The average number of coliform organisms in 100 ml of water samples from all sources was 58.9. In unsatisfactory or highly contaminated category, the average number of coliform organism was 124.4/100 ml of water (Table 3).

Samples were collected in the pre-monsoon, monsoon and just post-monsoon seasons. In the pre-monsoon season (Table 4), 53.4% samples were having contamination level of $MPN \leq 3$ and $MPN > 3/100$ ml contamination was found in 46.6% of water samples. Running water samples in pre-monsoon season were contaminated as well ($MPN > 3$) maximally (64.3%)

followed by shallow hand-pumps (29.7%). The contamination level was comparatively low in deep hand-pumps, jet pumps and submersible pumps in the pre-monsoon season.

During the monsoon and just post-monsoon seasons, water samples were contaminated more (46.6%) as compared to pre-monsoon season (54.9%). In case of running water samples, there was no significant difference as far as the level of contamination ($MPN > 3$) was concerned ($Z=0.4$, $p > 0.05$). However, shallow hand-pump samples were more contaminated (50%) in monsoon or post-monsoon season as compared

Table 3
QUALITY OF WATER SAMPLES ACCORDING TO AVERAGE NUMBER OF COLIFORM ORGANISMS

S.No.	Quality of Water	Average no. of Coliform Organism/100 ml
1.	Excellent (n=79)	0.0
2.	Satisfactory (n=41)	1.9
3.	Suspicious (n=13)	6.3
4.	Unsatisfactory (n=117)	124.4
Total (n=250)		58.9

Table 4
DISTRIBUTION OF SOURCES OF WATER ACCORDING TO SEASON AND MPN/100ML

S. No.	Sources of water	Pre monsoon			Monsoon & just post monsoon			Total		'Z' Test	p value
		MPN $\leq$ 3	MPN>3	Total	MPN $\leq$ 3	MPN>3	Total	No.	%		
1.	Running water	15 (35.7)	27 (64.3)	42 (35.3)	25 (32.5)	52 (67.5)	77 (64.7)	119	47.6	0.4	> 0.05
2.	Hand pumps (Shallow)	26 (70.3)	11 (29.7)	37 (35.9)	33 (50.0)	33 (50.0)	66 (64.1)	103	41.2	2.5	< 0.05
3.	Hand pumps (Deep)	02 (50.0)	02 (50.0)	04 (33.3)	06 (75.0)	02 (25.0)	08 (66.7)	12	4.8	1.7	> 0.05
4.	Jet pumps	03 (75.0)	01 (25.0)	04 (66.7)	02 (100.0)	00 (0.0)	02 (33.3)	06	2.4	1.3	> 0.05
5.	Submersible pumps	01 (100.0)	00 (0.0)	01 (10.0)	07 (77.8)	02 (22.2)	09 (90.0)	10	4.0	No Comparison	-
Total		47 (53.4)	41 (46.6)	88 (35.2)	73 (45.1)	89 (54.9)	162 (64.8)	250	100.0	-	-

to pre-monsoon season (29.7%). In case of shallow hand-pumps, the difference between water contamination levels in pre-monsoon, monsoon and just post-monsoon seasons was found significant ($Z=2.5$, $p < 0.05$). There was no significant difference in the level of contamination in deep hand-pump, jet pump and submersible pump samples.

DISCUSSION

The source of drinking water in Aligarh city is mainly the groundwater. The present work reveals the quantification of the extent of microbial contamination of drinking water in urban and peri-urban areas of Aligarh.

The presence of total coliform from all sources tested was demonstrated. Microbiological potability stands for drinking water in most developing countries, depends on the detection of total coliforms and *E. coli* as markers for human pathogens. The heterogeneous coliform group, which is present in human and animal faeces as well as in

soil and decomposing plant matter, is the most universal non-specific faecal pollution or inadequate disinfection or post-treatment contamination of drinking water supply.

Maximum numbers of households were using running water supplied by the Municipality and hand-pumps. Significantly, water samples from all sources were contaminated. Majority of samples from public water supplies and shallow hand-pumps were highly contaminated (MPN > 10/100ml of water). However, the level of contamination was low in deep hand-pumps. Similar observations were also made by Sharma et al in a study conducted in urban areas of Nepal where 70 to 100% of water samples were found to be contaminated with coliform organism. A very high incidence of contamination as compared to the present study can be attributed to the fact that in Nepal, mostly water samples were collected from rivers.¹³ However, in Chandigarh, the comparatively lower incidence of contamination (35.9%) was observed.¹⁴

This may be attributed to the fact that the study was carried out in rural areas. In another study conducted in the rural areas of BG Nagar in Mandya district, all the samples collected from public water supply taps were negative from *E. coli* and *Streptococcus faecalis*.¹⁵ In rural areas, the level of contamination is generally less as compared to the urban areas because many rural water systems may be protected from hazards of faecal contamination¹⁶

The average number of coliform organisms per 100 ml of water samples was very high. The level of coliform organisms present in drinking water far exceeded the maximum permissible limit of less than one cell per 100 ml of water.^{11, 12}

In pre-monsoon season, the contamination level was low in comparison to monsoon or just post-monsoon seasons. Potability would be expected to deteriorate during heavy rains since bacterial contamination generally increase after heavy rains.^{17, 18} However, in the study conducted in Chandigarh, the overall incidence of bacteriological contamination was higher in pre-monsoon season for hand-pumps and post-monsoon season for water samples from taps¹⁵. This difference from the present study could be explained on the basis of the area of the study and also in Aligarh city, the drainage system does not exist at all as a result, there is accumulation of waste water in the open space within the localities.

Water quality has been recognised as the foundation for any health improvement strategy accompanied by programmes for increased water quantity and sanitation. However, in the absence of changes in personal behaviour and hygiene practices, the incidence of water related diseases, especially diarrhoeal diseases, is likely to remain high in contaminated environment where faeco-oral route is a major source of disease transmission¹⁶. Supply of safe drinking water is one of the most cost-effective measures to improve the health status of the people.

Thus, it can be concluded that drinking water from public water supply and shallow hand-pumps is highly contaminated and not safe for drinking at all. This calls for the needs to have adequate treatment plants and periodical bacteriological analysis of water samples from all sources so as to avoid potential hazards of water-borne diseases of faecal origin.

Simultaneously, other sanitary activities should be carried out like hand washing with soap after using toilets and before taking meals and sanitary disposal of excreta. There is a need to improve awareness in the community regarding health hazards of unsafe water. A safe and reliable water supply is of prime importance for community health. But this is a difficult but not an impossible task. Information, education and communication (IEC) activities should be carried out through media to sensitise the community and political system. A comprehensive and sustained development programme will

have a positive impact on the community with the impression that health of a nation lies in homes not in the hospitals. If we are able to provide safe drinking water to people, they will enjoy a more stimulating environment and healthy life.

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STRESS AMONG DOCTORS – A REVIEW

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ABSTRACT

Stress has become a public health menace of the day. It cannot be eliminated from life and it's absolutely essential that we learn to manage it. Stress management is of special relevance to doctors who encounter extreme challenges in their professional and personal life. Diagnosing the type of stressors that they come across and experience assumes greater significance. It will pave the way for working out appropriate coping strategies and interventions. This paper presents a review of existing empirical studies and literature on the nature and types of environmental demands and pressures that doctors have to face globally. These studies have focused on the impairment that stress causes among hospital doctors and general practitioners (GPs) with respect to workload, demands and challenges; problems in interpersonal communication, professional aspirations, proneness to various addictions, environmental hazards, security issues, media phobia, legal threats, suicidal tendencies and family life. Some coping mechanisms as how to 'heal the healers' and interventions from organisational as well as from the individual points of view to choose a proactive life, focusing on 'positive internalisations' have been suggested at the end.

Key Words: Stress, General Practitioners

Stress management has become a big deal today. It is like a demon at our doorstep. We never heard of it so much a few years back. But now everyone is talking about it. Today stress has become a condition of living -- a condition that cannot be eliminated from life. It's high time each one of us learn to manage it. Stress is not always bad. In fact, a minimum level of stress is required to lead a productive and a creative life. But if it surpasses the required and manageable level, the consequences can be highly counter-productive and even fatal. Capacity for stress tolerance varies from individual to individual. No absolute standard exists for that.

Stress identification and management has a special relevance for doctors who face multiple environmental challenges and demands, tremendous professional accountability, intense work pressure and patient overload, medical ethics; legal issues on one hand and concern for people and morality on the other, exposing them consistently to stress-prone situations. Combined with these is the challenge that they have to deal with managing the family and their own personal lives.

It has been recognised long back that stress could prove very dangerous for doctors. Doctors are reported to have higher level of stress than among the

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general population. Doctors have significant psychological vulnerabilities and are more likely to suffer from one or more of the three Ds- drugs, drinks and depression and even suicide than average persons. Doctors who are in general practice seem to be even worse victims of stress. It has been found that about half suffer moderate to severe stress. What makes the situation worse is their reluctance to seek help from professionals in case of any psychological problem. Reluctance to seek help is a major problem.

In Australia, those doctors who neglect the early symptoms of stress and indulge in self-medication have to present themselves before the Medical Practitioners Board. Stress among general practitioners in Britain also is a regular feature. In addition to personal distress, stress among GPs in England is a great concern because of the problems with recruitment and retention of people required to complete the National Health Scheme led primary healthcare targets. A recent survey on GPs' retirement revealed that a quarter of professionals decided to retire before reaching 60 due to 'health, including stress' which contributed to 36% of these decisions. In 2001, another study showed that 33% of doctors retired due to psychiatric illness.

Systematic review of papers reporting suicides in European or North American doctors describes the relative risks of suicides among doctors compared with general population as lying between 1.1 to 3.4 times for male doctors. Reports from the British Medical Association and

other researches reveal that 23% of GPs have increased their drinking in response to stress. The consequences of stress on practice has been reported as: prescribing, increased staff turnover, limited teamworking, increased number of patients' complaints, poor time-keeping and sickness absence, resistance to change or adoption of new technology or systems, disruption in the practice organisation, practice partnership split, disloyalty, less motivated or effective staff, little energy and capacity for listening and empathy with patients, problems in relationship with the family, weak communication with patients, withdrawal and isolation. The rate for female doctors is even higher at 2.27 times in relation to the general public.

British researches have also reported doctor's tendency to compulsivity and perfectionism. This is coupled with a type of personality that is highly self-critical. One important manifestation of this perfectionism is the need to portray a healthy image to both patients as well as colleagues due to the perception that good health and doctors are linked with professional medical competence. This is both stressful and a barrier to appropriate self-care. It has been found that the worries about confidentiality and image lead to high levels of self-prescriptions and medication among GPs' high levels of working when sick, and, a low use of formal medical services.

The British Medical Association (health policy and economic research unit) passed a resolution in 1998 asking for a

report to be prepared on stress among doctors. The aim of the report was to review the research on work-related stress among consultants and GPs. Peer reviews and published studies were located using Medline and by following up relevant citations from retrieved papers. 'Grey literature' such as research reports by relevant organisations were also sought. The British Medical Association has in the past addressed the subjects of stress in the medical profession and the morbidity and mortality of doctors (1993).

This report indicated that there is a large body of evidence that many senior doctors suffer high levels of stress as a result of their work and that this impairs their health and compromises their ability to provide high quality care to their patients. The main source of work-related stress for consultants and GPs is the workload, especially the effect this has on personal life. Other sources of stress are organisational changes, poor management and insufficient resources to do the job, dealing with the patient, sufferings, mistakes, complaints and litigations.

Observations point out that stress has become endemic in general practice too. Screening Australian doctors for anxiety and depression using the general health questionnaires has revealed a high level of stress among GPs. Similarly, in New Zealand severe stress symptoms are much higher among GPs than amongst the general population. The troubled doctors group is at risk of becoming 'impaired' in due course.

Studies in England have revealed that wives of GPs are four times more likely to commit suicide than other women. Also, it has been observed that main stressors for GPs' spouses are the GPs detachment from family, communication problems and concern about workload.

Stress and suicide among doctors have been even more a matter of grave concern at the global level. Suicide mortality in doctors is reported to be significantly higher in relation to other professionals and general population in many industrialised countries including the US. American doctors kill themselves at a rate of 41% higher comparatively to other places.

The case in India is no better. Four incidents of suicides by doctors in the recent past have sent out the signals of alarm among the fraternity and common public. In January, 2003-2004 one doctor from the National Institute of Health and Family Welfare (NIHFW) doing diploma in public health committed suicide by hanging herself. On January 24, 2002, one doctor at the Safdarjung Hospital allegedly committed suicide. He was doing a diploma in Anaesthesia, and was a second year student. He injected some poisonous substance to kill himself. Another doctor doing some super-specialty course from the AIIMS committed suicide on July 13, 2004. In February 2005, a senior resident doctor attempted suicide inside his room at the AIIMS. Though these cases have been alarming definitely not surprising. Newspapers frequently report such incidents.

No systematic studies on doctors' stress are available in the country though plenty of work has been done outside.

Review of Research Studies

Cooper et. al (1989) in their study found four most important predictors of job stress of GPs work-home interface, demands of the job and patients expectations and practice administration. For women doctors, the most important predictor is the interference of job with the family and for men it is the joint stressors of practice administration and job demands. Most stress come from night calls, emergencies during surgeries and interruption of family life. Stressors for females are identified too. Female doctors experience more stress than their male counterparts from visiting during adverse weather conditions, and fear of being assault on night visits among others. Finding a locum, the working conflict between their work and personal lives, self-medication and less likely to seek formal medical help. Cooper and others have also identified the stressors like high expectations of others, adverse publicity by the media, the working environment, dealing with problem patients, worrying about complaints and arranging hospital admissions and dealing with terminal illness.

A study was conducted in Britain by Appleton et. al (1998) on GPs' psychological distress. General health questionnaire-12 (GHQ-12) was used. GHQ-12 was used as a self-report

questionnaire to measure psychological symptoms in GPs. Results reported that 52% of respondents scored above the cut-off usually used to diagnose the vulnerable cases of psychiatric morbidity in general population surveys. The results indicated roughly two times more problems among GPs in comparison to the general population. Earlier, a similar study was taken up in England by Edwards et. al in 2002. General health questionnaire 28 was administered. Approximately 50% of GPs scored 'as being stressed' which was also twice in comparison to the general public. The scores of GPs, however, were comparable with hospital consultants and hospital managers.

Howie et. al (1992) carried out studies on occupational stress in GPs, specially in connection with respective timing of consultations and doctors working styles. Many of the main stressors for GPs seemed to be created by their own policies over booking patients, starting surgeries late, accepting commitment too soon after surgeries are due to finish, making insufficient allowances for extra emergency patients and allowing inappropriate telephone calls or other interruptions. Howie and others (1992) in another survey reported that a changing trend in England was the rise of 'inappropriate patient demands' along with 'increasing expectations of what doctors can provide' as a cause of stress, rather than simply an increase in the numbers of patient demands.

Pullen et al (1995) conducted a postal survey of 2,564 doctors. The results

revealed that 19% had marital disturbance, 18% emotional disorders, 3% alcohol problems and 1% drug abuse. As many as 26% doctors suffered from one or other medical condition warranting medical consultation but felt inhibited about consulting a doctor; upto 25% would treat them or not seek treatment for such conditions as alcohol and drug abuse or excessive tiredness and 45% for insomnia and sexual difficulty. Also 76% had self-prescribed antibiotics, 45% non-narcotic analgesics, 35% NSAIDs and 2% had narcotics.

Cozens (1997) conducted a study named 'New research on stress in doctors' to find out individual and organisational predictors of stress, depression, alcoholism and early retirement to relate this to performance/error and also to look into individual and organisational interventions. It was a longitudinal study including 318, 4th year students from 1983. They were followed up in 1985, 1993 and 1999. The purpose was to explore long-term predictors of stress, depression, alcoholism and specialty. The study also involved longitudinal study of 126 pre-registration house officers with different types of rotations; study of all general practitioners over 45 in Northeast England, exploring predictors of early retirement; study of all senior registrars in Northeast England exploring training, stress and gender/specialty differences. Stress and depression levels were measured by GHQ and SCL respectively.

It was a series of studies with three-fold objectives: 1) To identify individual and

organisational predictors of stress, depression, alcoholism and early retirement; 2) To find out its relation to performance/error, to explore individual and organisational interventions. Results of the study indicated that i) stress, depression and indulgence in alcohol are high in doctors; ii) they retire early due to stress and dissatisfaction; iii) all these factors act as hurdles in effective patient care in terms of tiredness, pressured by overwork and depression or anxiety; iv) effects of alcohol; v) decision-making and concentration gets affected by more than half the working day performance during depression; vi) stress and depression lead to more performance related errors; vii) highly stressed are more self-critical; viii) consistency is high, from the first postgraduate year; ix) individual causes include gender, family, career choice, coping and personality; x) gender: women are more depressed than men mainly after graduation, but they are less stressed than men. Female doctors have an increased risk of suicide compared to general population; xi) family in the proportions scoring higher than the threshold on the GHQ for males/females with and without children, fathers and mothers scored higher than others; xii) career choice: surgeons have low stress, depression and high job satisfaction. Psychiatrists and laboratory personnel have high depression. Psychiatrists also have high stress and job dissatisfaction. All these affective states were present as students also; and xiii) among the work/organisational factors of senior doctors dealing with complaints against

self, fear of making mistakes and litigation, threat of violence, overwork, conflicts between career and personal life and poor team membership.

Interventions have been suggested at individual and organisational level towards creating cost- effective approach to better patient care through healthier staff.

Manus et. al (1997-2000) conducted a study on 'Emotional exhaustion and stress in doctors' with the objective of diagnosing the relationship between stress and burnout. A stratified sample of 800 doctors were selected at random from the British medical directory, which has the list of all registered doctors in Britain. Their stress levels were monitored for three years. The sample constituted men and women; and hospital doctors and family practitioners who had qualified between 1950-59 and 1990-94. One among five doctors in each age, sex and practice had qualified outside Britain. The stress level was measured by a 12 item version of GHQ and burn out with Maslach Burn Out Inventory including sub-scales on emotional exhaustion, de-personalisation (cynicism) and personal accomplishment (professional efficiency). As many as 551 doctors who filled the questionnaire in 1997 were asked to do again three years later in 2000; and 382 (69%) responded.

The study findings reveal a reciprocal causation between emotional exhaustion and stress. The largest causal effects in the model showed a causal cycle in which high levels of

stress caused emotional exhaustion ($b=0.175$). Increased levels of personal accomplishment increased stress levels ($b=0.080$) whereas de-personalisation-perceiving patients more as objects than humans lowered stress levels ($b=0.105$)

Schattner et. al (1998) conducted a study on the 'Stress of metropolitan general practice' by a postal survey of the metropolitan doctors from all states in Victoria. As many as 464 GPs were surveyed with a 64% response rate (296 participants). Results showed that 13% of GPs had scores suggestive of severe psychiatric disturbance and 30% had mild psychiatric symptoms. Major stressors in descending order were workload, economic factors, medico-political factors, clinical factors, effects of work on outside life, physical working environment. As many as 53% considered leaving general practice because of work stress.

Burbeck et. al (2002) conducted a study on 'Occupational stress in consultants in accident and emergency medicine: a national survey of levels of stress at work'. The objective was to assess levels of occupational stress amongst the British accident and emergency consultants. The method used was postal survey. The results indicated that 154 respondents had GHQ-12 scores over the threshold for distress. Levels of depression as measured by the SCL-D was 18%, slightly higher than other groups. About 34 (10%) reported suicidal ideation. Women had significantly higher SCL-D scores than men. Respondents were highly

satisfied with A&E as a specialty. Protective factors found in other occupational groups did not apply. Only one demographic or work-related factor, number of time posts significantly correlated with either stress outcome measure. Logistic regression modelling revealed 'being overstretched', 'effect of hours and stress on family life', and 'lack of recognition' were significant predictors of GHQ identified cases, while 'the effect of stress on family life', low prestige of specialty, and 'dealing with management' predicted SCL-D scores.

A British Medical Audit Advisory Group conducted a survey in 1993 on the 'Causes of Stress in GPs'. The causes identified were rank ordered as emergency calls during surgery hours, night calls, time pressure, working after a sleepless night, dealing with problem patients, worrying about patient complaints, interruption of family life, 24-hour responsibility for patients lives and unrealistically high expectations by others of the doctors role and partner on a holiday.

Vanagas and Alxelsson (2004) conducted a cross-sectional study on 'Interaction among GPs age and patient load, prediction of job strain, decision latitude and perception demands - a cross-sectional study'. It was a study done through a mailed survey of random national sample. Computerised sampling was performed from the registry of the Lithuanian physicians. Total number of GPs in Lithuania at that time was 1,007. Out of this, 300 Lithuanian GPs were chosen.

Psychosocial stress was investigated with the questionnaire based on the Reeder scale. Job demands were investigated on the Karasek scale. The analysis included descriptive statistics: logistic regression Beta coefficients to find out the predictors and interactions between characteristics and predictors. Work characteristics were measured by the Karasek' Job Content Questionnaire. This has two scales that measure stressful job character -- job decision latitude and psychosocial workload demands. This model is also known as the 'job strain' model. Psychological workload demands were defined by questions such as 'working very fast, very hard', 'doing so many things'. Job decisions latitude was measured with questions as: 'always must learn for new, and working a lot'. A four-point Likert-like scale was used with the coding from 4-1 for series. Results revealed that Lithuanian GPs have high patient load and are at risk of stress, they have high job demands and decision latitude. Job strain development and higher job demands can be influenced in duration of general practice. However, older GPs perceived less strain.

Sharma (2005) conducted a study on 'Role stress among doctors'. Role stress was measured by Pareek's Psychological Instrument. Ten (10) role stresses included in the study were: i) inter-role distance (IRD): focuses on conflicts between organisational and non-organisational roles; ii) role stagnation (RS): focuses on feeling of getting stuck in one role; iii) role expectation conflict (REC): focuses on

conflicting expectations of various important people in the office like supervisors, subordinates and peer group; iv) role erosion (RE): focuses on the feeling that role occupant's functions are being performed by someone else; v) role overload (RO): focuses on the feeling that expectations from the role occupant are many; vi) role isolation (RI): focuses on the psychological distance between one's role and role of others in the same role set; vii) personal inadequacy (PI): focuses on the feelings of incompetence on part of the role occupant; viii) self-role distance (SRD): focuses on the feeling that demands of one's role are in conflict with one's self-concept; ix) role ambiguity (RA): focuses on lack of clarity about role expectation; and x) resource inadequacy (RIIn): focuses on the feelings of the role occupant that he has not been given adequate resources.

Spurgeon et. al (2005) in a study on stress among GPs found that older practitioners were more stressed by the new contract demands in comparison to younger doctors, but younger doctors were more stressed by unrealistic patient demands. Those GPs who considered the job stress responsible for causing them psychological symptoms of ill health were those who reported being particularly stressed about the effects of work on their homes and social lives. Worrying about patients' complaints was an important stressor as was a feeling that the media was becoming more hostile and creating a blame culture.

Heal the Healers

The impact of doctors' unmanageable stress has a deeper impact throughout the community. The consequences can leave big social and economic costs. 'Healing the healers' is a priority.

There is no exclusive training or other interventions available for the target group. It is amazing for many that stress management has not been formally included in the medical course because of an overwhelming and overloaded environment. There is a strong view that doctors' stress right from their student days assumes serious dimensions gradually. Though it is a global phenomenon for India, the amount of misery, poverty and suffering seen in the wards is sickening. Apart from that, study medium from 'Flester books' and applying that knowledge into the Indian context offers challenges. That is why courses like 'beat stress' designed for doctors and it also being relevant for medical students, which has become the need of the day.

Since doctors mental health is of utmost importance to the society, it seems to be attracting international attention. Divisions of general practice in Australia have taken up various well being programmes covering areas such as stress management techniques, improving skills in the business aspects of running a medical practice and providing opportunities for social support through peer networking. The challenge has also been taken by several Australian universities, which have developed personal and

professional development programmes to deal with self-care for health professionals. An innovative way of promoting psychological health has been introduced at the Monash University, where first year medical students undertake a single semester subject that teaches 'mindfulness' based stress management techniques that they can practice on themselves. Similar courses are also being offered at PG level too.

Consequently, based on their stress pattern, the necessary interventions in terms of building 'life skills' could be introduced as a self-management programme to deal with their stress. The WHO has strongly emphasised on the 'development of life skills' to manage the stress in life and has been strongly suggesting the idea of building such skills in school children. The focus is on preventive approach, rescuing the 'troubled doctor' significantly affected by stress, likely to be converted into 'impaired doctors', gradually landing up in mental illness or substance abuse.

It becomes absolutely important for doctors to understand that the sources of stress do not come from overt world but rather from overt paradigms. Joy comes from within. Happiness does not have an external source. Nobody can give you happiness, nor can anyone snatch it. Saying so will mean acting irresponsibly. Peace is intrinsic. It does not depend on circumstances. One chooses to be happy or unhappy. We live by perceptions and not facts. There is a saying that two people looked out of a window, one saw the stars and other

saw the mud. If a string is hanging out of a balcony, one person sees a rope in it, the other may see a snake in it. Life is a game of perceptions and responses. In one of his discourses on Budha, Osho quoted an anecdote. Two people residing in a multi-storeyed building would usually use the lift together while coming back from the office in the evening. Amazingly the one who would get down on 7th floor would always abuse the man living on the 10th floor. The lift man always feel bad and would rather be amazed at non-reactive behaviour of the man living on the 10th floor. One day he gathered the strength to ask him, 'Sahib woh uper walae sahib tow apko roz gali dethete hai aur aap kuch nahi kahtay'. The 7th floor man replied, "mainay gali lii hi kab". Life is about making choices. Whatever you internalise is the reality, the rest is all absurd.

Situations, events and people do not cause stress

Perceptions, attitudes, beliefs and values lead to stress

One creates the stress. One filters information with subjectivity. Only individual is the architect for designing a structure for himself in which there is no way out. Take a minute. Introspect. Refer yourself to yourself. Eighty per cent of stress is invited by you yourself-- too many material cravings, extreme ambitions, comparisons, jealousy, strong ego, partial faith in god, indulging in the 'you are ok, I am not ok dynamics', unrelenting anger, extreme resistance to apologise even if you are at fault,

expecting people to follow your thought and work patterns, learned helplessness syndrome, aggression-passive modes, winning in an argument, too many expectations from others, the why should it happen to me syndrome, living in the past-future modes, ignoring here and now, not getting out of routine, non-aesthetic attitudes, always indulging in the process of changing others rather than changing yourself, should's and must's and many others. Twenty per cent of stress could be genuine like suffering from an incurable diseases or pain, disasters, death in the family, traumas, accidents, rape, non-gratification of libido and other such issues over which you have no direct control. However, in such cases also, stress management mechanisms can lead to at least neutralising their impact.

Indirect interventions in addressing the high levels of stress experienced by senior doctors, is to reduce excessive workloads and enable individuals more time away from work. Improvement could also be achieved by addressing the organisational environment in which doctors work, specifically promoting supportive management and ensuring that doctors have adequate resources to do their job. Much can also be done to improve doctors' ability to cope with stress. Training in management skills would equip them for new managerial and administrative roles, whilst communication skills would improve doctor-patient interaction and equip doctors for dealing with difficult clinical situations. Stress management skills would improve the way doctors

perceive sources of stress and enhance their coping repertoire.

It becomes absolutely essential for doctors and GPs to look into their stressors, learn and internalise the coping mechanism of dealing with stress and seek professional training in stress management. They have to make the stress combating mechanisms as a part of their daily lifestyle, otherwise non-stop stress can act as a killer in terms of their performance be it professional or personal.

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MORBIDITY PROFILE OF 'PARAJA TRIBE' RESIDING IN AN 'UN-REACHED AREA' OF MALKANGIRI DISTRICT, ORISSA

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ABSTRACT

This study was conducted in the tribal dominated district of Malkangiri in Orissa during 1st January to 28th February 2005. The objectives of the study were to assess the health status of the tribal people in these unreached areas; identify and treat their health problems; and identify the TB cases and put them under DOTS.

The study revealed that one-fifth of the target population was suffering from URTI, with the highest incidence rate being among the children between 1 and 5 years age, followed by the infants. Thirty-nine cases had cough for more than three weeks, suggesting pulmonary tuberculosis among which two cases were tested positive for acid fast bacilli, who were referred to the nearest PHI for further treatment under DOTS. More than two-thirds of the children under 15 were suffering from under-nutrition with no significant difference being found in different age groups but none of them had severe wasting.

One-fifth of the population was suffering from fever. Nearly 20% of the slides were found positive for malaria. A quarter of the studied populations was having splenomegaly suggesting that they were either suffering from malaria in the past or continuing to have chronic malaria. The prevalence of splenomegaly was significantly higher among children under 14. Splenomegaly was significantly higher among the people with anaemia, or those with confirmed cases of malaria, among males and those living in cut-off areas.

Other morbidities seen in the studied population were musculoskeletal disorders, goitre, ophthalmic problems, dental problems, skin disorders, ear problems, vitamin-A deficiency and GI problems.

Keywords: Tribals, Common Health Problems, Malnutrition, Malaria

The tribal population comprises 8% of the total population and there are 533 tribes living in 15% of the country.⁽¹⁾ The population of tribes in the world is more than 150 million, while in India their population is around 90 million which is around 60% of the total global tribal population.⁽²⁾ According to the Census 2001, the total population of Scheduled Tribes in the country was 8.43 crore (8.2% of total population.⁽³⁾) Poverty,

malnutrition, poor sanitation and scarcity of safe drinking water are the main contributors for the poor health status of the tribals. Lack of infrastructures, inaccessibility to healthcare institutions and poor affordability are also responsible for this condition.⁽⁴⁾

Orissa has a varied geographic territory with rural plains, coastal belts and tribal

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pockets. So, the socio-cultural as well as demographic characters vary from place to place. There are over 62 tribes in Orissa constituting 22% of the state's population. Southern Orissa has a major proportion of its population residing in tribal pockets of the erstwhile *Dandakaranya* area. The Southern-most district of Malkangiri is one such district where over 50% of the population reside in far-away, inaccessible, forest-covered villages and hamlets. It is one of the least developed districts in the country. With 80% of the households being under below poverty line (BPL) and having only 30.5% literacy rate (below 10% in some areas and even less among women), the district ranks below the national averages in most human development indices.

The population density in the district is only 83 persons per sq km. Low population density and general geographical inaccessibility results in large numbers of people remaining out of the ambit of state-sponsored services like education and health. Commonest tribal community belongs to the Paraja tribe, followed by the Bondas, the Koyas, the Bhumias etc.

The situation further deteriorated due to construction of the Balimela reservoir and Machhkund hydro-electric projects resulting in displacement of many tribal communities (2,000 tribal households were displaced due to the construction of the Balimela project). For the affected people, the impact of these development projects goes beyond the loss of land and livelihood as they

disrupt their entire way of life. Destruction of vegetations adversely affected the age-old life sustaining activities like hunting, food-gathering and collecting fuel and medicinal plants. Physical dispersal of villages also led to dilution of social and kinship bonds that has united the people for ages.

The Balimela dam submerged large areas of the Kudumulgumma block, the third largest block of Malkangiri with 252 inhabited villages and 9,162 households. Officially, the area of this block separated by the Balimela dam is called the 'Cut-off area'. The cut-off villages are made 'far-reach' due to unavailable or poorly available communication.

Geographical inaccessibility coupled with poor transport facilities has isolated this part of the block from most of the government-sponsored development activities. Many of the villages do not have roads, electricity, tube-wells, Anganwadi centres and other infrastructural facilities to support the basic standards of living. The cut-off area has no functional schools and a skeletal health system which indicate that resources have not been invested commensurate with needs of the people. Two mobile units comprising a pharmacist, an ayurvedic doctor and a female health worker try to cover the entire area. Though some people are rehabilitated in resettlement colonies, still many villages remain on the other side of the reservoir within dense forests, thus aptly termed as *Unreached Areas*.

In addition to being an area endemic with malaria, other diseases prevalent in the district include gastrointestinal infections such as diarrhoea, dysentery, pneumonia, yaws and respiratory disease including tuberculosis.

MATERIALS AND METHOD

With this background, this health survey was conducted in nine difficult-to-access villages of Kudumulgumma and Korukonda blocks of Malkangiri district after further stratifying the villages as hilly or difficult (latter being located in the cut-off area) by the Department of Community Medicine, MKCG Medical College, Berhampur. The study aimed at (i) assessing the health status of the tribal people in the unreached areas; (ii) identifying and treating their health problems; and (iii) identifying the tuberculosis cases and put them under DOTS.

This cross-sectional study was conducted in Malkangiri, a tribal dominated district of southern Orissa during 1st January to 28th February 2005. Considering the nature of the study, two blocks--Kudumulgumma and Korukonda-- having hilly and cut-off areas, were selected randomly. The Kudumulgumma block PHC had three sectors-- Kudumulgumma, Janbai (hilly area) and Panasput (cut-off area). Four villages from the cut-off area (Panasput) and three villages from other hilly areas (Janbai) were selected. The Korukonda block PHC had six sectors. Two villages from the Chitrakonda sector near the Balimela reservoir were selected. Thus, a total of

nine villages were selected for study. All the nine sample villages are located in dense forests around the Balimela reservoir, which can only be accessed by crossing the reservoir.

The population is fairly homogeneous with similar socio-cultural characteristics. People have little access to the health system as the nearest PHC is about 70 km from these villages. There are two PHCs (new) at Jodamba and Janbai. Although health centres do exist in the area, people are not able to avail of the services due to the presence of the reservoir. Dense forests and steep hills add to their geographical isolation. None of the selected villages has any health sub-centre.

All the households in the selected nine villages were included and all the available persons in those households at the time of visit of the survey team were examined. The list of blocks, sectors, villages and population covered is given in Table 1.

The survey team was divided into two groups, each consisting of two faculty members, two PG trainers and one lab technician. With the assistance of local volunteers, each team conducted a house-to-house survey in the selected villages. During house visits, socio-demographic data were gathered using a structured schedule. Persons suspected to be suffering from anaemia on the basis of clinical examination were given a haemoglobin test. Blood smear examination for malaria was routinely done for all cases of fever.

**TABLE 1
HOUSEHOLD AND POPULATION**

Name of Block	Name of Sector	Name of Village	Total House-holds	Total Popula-tion	Households enumerated	Population enumerated	Population examined
Kudu-mulag-umma	Janbai	Khajurigumma	43	202	39	188	150
		Karlamal	44	183	42	170	142
		Janturai	44	192	41	180	150
		Darlabeda	55	224	52	203	181
	Panasput	RSC-17	77	333	74	312	271
		Banguru	36	161	34	148	111
		Lambasing	35	156	33	145	141
Korku-nda	Chitrakunda	RSC-2	29	137	28	131	121
		RSC-4A	55	220	51	195	165
Total			418	1,808	394	1,672	1,432

Following this protocol, each team could examine between 70 and 80 persons or cover 15 to 18 households in a day. Persons having identified as suffering from some disease or other were also given treatment and advised on the spot. Data were analysed using SPSS in the Department of Community Medicine, MKCG Medical College.

FINDINGS

During the survey, 394 (94%) of the total number of households were contacted and 1,672 (92%) of the total population were enumerated. Among the enumerated population, 1,432 (86%) individuals were examined and data on their health status collected and recorded in individual examination schedules.

The survey revealed that 53.6% of the population examined were females with the rest being males. The age-wise population distribution with the highest concentration in the reproductive age group of 15-45 years was in keeping with the general demographic trends in the country.

Predominant tribal groups in the sample were the 'Paraja' (72.4%), followed by the Kondha (15.2%). Others include groups like the Nabasutra, the Bindhani, the Raita and Scheduled Caste Harijans. Most of the inhabitants were associated with cultivation (43.7%) followed by wage labourers (13.1%). A full 33% were dependants including children, students and elderly persons. Despite a sex ratio more favourable to females, access to

**TABLE 2
POPULATION EXAMINED DURING FIELD SURVEY**

Age (in years)	Male	Female	Total (%)
<1	17	29	46 (3.2)
1-5	100	90	190 (13.3)
6-14	134	163	297 (20.7)
15-45	296	335	632 (44.1)
46-60	87	105	192 (13.4)
>60	30	46	76 (5.3)
Total	664 (46.4%)	768 (53.6%)	1432

TABLE 3
AGE DISTRIBUTION OF RESPIRATORY DISORDERS

Respiratory Diseases	Age Group (in Years)						Total (n = 1432)
	<1 (n = 46)	1 – 5 (n = 190)	6 – 14 (n = 297)	15 – 45 (n = 631)	46 – 60 (n = 192)	>60 (n = 76)	
URTI	18	104	59	70	23	14	288 (20.1%)
LRTI	3	3	2	9	0	1	18 (1.2%)
Asthma	0	0	0	1	4	1	6 (0.5%)
Total	21 (45.6%)	107 (56.3%)	61 (20.5%)	80 (12.6%)	27 (14%)	16 (21%)	312 (21.8%)

$\chi^2 = 225.09$, d.f. = 15, $p < 0.001$

services like education was not better as three-quarters of the students were males.

A little over one-fifth (20.1%) of the people were suffering from URTI (ARI), with highest incidence rate being noted among the children under 5 (56.3%), followed by infants (45.6%).

Thirty-nine cases (20 males and 19 females) had cough for more than three weeks for which sputum examination was done to diagnose pulmonary tuberculosis (PTB). Most of them (51.3%) were in the reproductive age group of 15–45 years with one

suspected case of childhood tuberculosis. Most of those cases had other associated TB symptoms, most common being low-grade fever/night sweat (71.8%) followed by chest pain (66.7%), weight loss (46.1%) and hemoptysis (25.6%). Two cases out of the 39 suspected cases were found positive for AFB were referred to the nearest PHI for further treatment.

The exact age of the children could not be assessed due to ignorance of parents and non-availability of records, therefore the nutritional status was assessed by considering the weight for height reference put forward by the

TABLE 4
CASES WITH FEATURES OF TB (n = 39)

Features of TB Symptoms	Number (%)
Hemoptysis	10 (25.6)
Chest Pain	26 (66.7)
Weight Loss	18 (46.1)
Low Grade Fever/Night Sweat	28 (71.8)

TABLE 5
AGE DISTRIBUTION OF MALNUTRITION

Age Group (Year)	Severe Wasting	Under-nourished	Normal	Obese
< 1 (n = 46)	0	5 (10.8%)	41 (89.2%)	0
1–5 (n = 190)	0	28 (14.7%)	158 (83.2%)	4 (2.1%)
6–14 (n = 297)	0	36 (12.1%)	256 (86.2%)	5 (1.7%)
Total (n = 533)	0	69 (12.9%)	455 (85.4%)	9 (1.7%)

TABLE 6
SEVERITY OF ANAEMIA IN DIFFERENT AGE GROUPS

Age Group (Years)	Anaemia			
	Severe (%)	Moderate (%)	Mild (%)	Total (%)
<1 (n = 31)	0.0	6.5	12.9	19.4
1–5 (n = 142)	2.1	16.9	32.4	51.4
6–14 (n = 246)	2.8	28.0	41.9	72.7
15–45 (n = 564)	2.3	25.9	35.3	63.5
46–60 (n = 173)	2.9	22.0	34.7	59.6
>60 (n = 61)	0.0	27.9	27.9	55.8
All (n = 1217)	28 (2.3)	295 (24.3)	430 (35.3)	753 (61.9)

WHO. Nutritional status assessment of children under <15 revealed that 69 (12.9%) were undernourished with no significant difference in different age groups and 455 (85.4%) had a normal weight for height curve. Only nine (1.7%) children were obese and none were having severe wasting.

Out of the 1,217 cases of which haemoglobin was assessed, anaemia was found to be the commonest (61.8%) micronutrient deficiency disorder. As many as 725 (59.6%) persons had mild to moderate anaemia (HB between 6-10 gm%) while, 28 (2.3%) had severe anaemia (Hb below 6 gm%). Majority were (72.7%) in the age group of 6–14 followed by reproductive age group of 15–45 years (63.5%).

Prevalence of anaemia was significantly higher among females in comparison to males ($p < 0.001$). The study also revealed that 68.7% of the target people in the cut-off areas were anaemic while it was 56.8% among people in the hilly areas and the difference was also statistically significant ($p < 0.001$).

During the survey it was observed that 21% were suffering from fever. As Malkangiri district is an endemic area for malaria, majority of the fever cases may be due to malaria. More than one-fourth (26.1%) of the children under 15 were suffering from fever posing a serious health concern. Out of 301 cases, slide examination for malaria was done for 241 (80.0%) of which 18.2% were found positive. Though the rest had negative slide report, the

TABLE 7
AREA AND SEX-WISE DISTRIBUTION OF ANAEMIA

Area and Sex		Anaemia Present	χ^2	d.f.	P
Area	Cut-off area (n= 518)	356 (68.7%)	17.95	1	<0.001
	Hilly area (n=699)	397 (56.8%)			
Sex	Female (n = 687)	492 (71.6%)	57.47	1	<0.001
	Male (n = 530)	261 (49.2%)			

TABLE 8
AGE DISTRIBUTION OF FEVER CASES AND SLIDE POSITIVITY FOR MALARIA

Age Group in Years	Fever Cases (%)	Total Slides Examined (n = 241)	
		Malaria Parasite Positive	Malaria Parasite Negative
<1 (n = 46)	13 (28.3)	44 (18.2)	197 (81.7)
1–5 (n = 190)	56 (29.5)		
6–14 (n = 297)	61 (20.5)		
15–45 (n = 631)	127 (20.1)		
46–60 (n = 192)	30 (15.6)		
>60 (n = 76)	14 (18.4)		
Total (n = 1432)	301 (21.0)		

clinical findings was suggestive of malaria. Although more number of females were suffering from malaria in each age cohort than males, there was no significant difference ($p > 0.05$) between sex ($\chi^2 = 3.012$, d.f. = 2), and age groups. There is no significant difference ($p > 0.05$) in the occurrence of fever cases in the hilly and difficult area villages.

Overall, 24.9% of the studied populations were having splenomegaly. The prevalence of splenomegaly was 46.8% among children between 1 and

14 years. Prevalence of splenomegaly declines significantly ($p < 0.001$) after 14 years. The age distribution of persons with enlarged spleen was found to be statically highly significant.

Prevalence of splenomegaly was higher among males (13.8%) in comparison to females (11.1%) and it was statistically significant ($p < 0.001$). The prevalence of splenomegaly was also found to be significantly higher ($p < 0.005$) among people living in the cut-off areas (28.5%) in comparison to the hilly areas (22%).

TABLE 9
AGE DISTRIBUTION OF SPLENOMEGALY

Splenomegaly	Age Group (Years)						Total (n=1432)
	<1 (n=46)	1–5 (n=190)	6–14 (n = 297)	15–45 (n=631)	46–60 (n=192)	>60 (n=76)	
Present	8 (17.4%)	96 (50.5%)	131 (43.1%)	98 (15.5%)	16 (8.3%)	7 (9.0%)	356 (24.9%)

$\chi^2 = 194.72$, d.f. = 5, $p < 0.001$

TABLE 10
AREA AND SEX-WISE DISTRIBUTION OF SPLENOMEGALY

Area and Sex		Splenomegaly Present	χ^2	d.f.	P
Area	Cut-off area (n = 623)	178 (28.5%)	8.13	1	< 0.005
	Hilly area (n = 809)	178 (22.0%)			
Sex	Male (n = 664)	197 (13.8%)	15.32	1	< 0.001
	Female (n=768)	159 (11.1%)			

TABLE 11
SPLENOMEGALY AMONG ANAEMIC AND MALARIA CASES

Anaemia and Malaria		Splenomegaly Present Number (%)	χ^2	d.f.	P
Haemoglobin Level estimated (n = 1217)	Anaemia Present (n = 753)	229 (30.4)	29.12	1	<0.001
	Anaemia Absent (n = 464)	77 (16.6)			
Malaria Status Estimated (n = 1432)	Confirmed (n = 44)	23 (52.3)	39.23	2	<0.001
	Suspected (n = 197)	73 (37.0)			
	No Malaria (n = 1191)	250 (21.0)			

Splenomegaly and anaemia usually co-exist in malaria endemic areas. Analysis of data showed that splenomegaly was significantly higher ($p < 0.001$) among people with anaemia (29.12%) in comparison to normal population (16.6%). Similarly, the prevalence of splenomegaly decline significantly ($p < 0.001$) from people having confirmed malaria to people having suspected and no malaria. There was a significant difference ($p < 0.001$) in the prevalence of splenomegaly among suspected, confirmed and non-malarial cases.

It was also observed that 19.6% of the people were suffering from musculoskeletal disorders commonest being low backache (80.1%), while 197 (13.8%) were having features of goitre of which four cases had Grade-II thyroid enlargement. A full 11% people had ophthalmic problems, commonest being cataract (69.6%). Dental problems were seen among 10% cases, commonest being missing tooth (50.3%) followed by caries tooth (32.1%). Scabies (56.3%) was the commonest skin disorder seen among

the study population. While 5.5% persons had ear problems, 4.2% were suffering from vitamin-A deficiency, and 36 (2.5%) had GI problem, commonest being simple diarrhoea (86.1%) followed by dysentery (11.1%).

DISCUSSION

The study area mainly constitutes the scheduled tribes of which three-fourths belong to the Paraja tribe followed by the Kondha.

One-fifth of the study population was suffering from URTI, with highest incidence rate seen among children under-5, followed by infants. Rapid household survey of Bastar district indicated that 16.9% of the tribal children were suffering from breathing problems⁽⁵⁾. Similarly in another study by S.K. Ray et al in Nimpith of West Bengal found ARI (58.17%) to be the common morbidities among children <5 years⁽⁶⁾.

Thirty-nine cases had cough for more than three weeks indicating pulmonary

TABLE 12
INCIDENCE OF DIFFERENT OTHER MORBIDITIES

Morbidity			Number (%)
Musculoskeletal diseases	Low backache	225 (80.1%)	281 (19.6)
	Arthritis	33 (11.7%)	
	Both	15 (5.3%)	
	Others	8 (2.9%)	
Goitre	Grade-I	193 (97.9%)	197 (13.8)
	Grade-II	4 (2.1%)	
Eye diseases	Cataract	110 (69.6%)	158 (11)
	Impaired vision	42 (26.6%)	
	Others	6 (3.8%)	
Dental problem	Missing teeth	72 (50.3%)	143 (10)
	Caries teeth	46 (32.1%)	
	Missing and caries	21 (14.6%)	
	Gum problem	4 (2.8%)	
Skin diseases	Scabies	80 (56.3%)	142 (9.9)
	Dermatitis	17 (11.9%)	
	Eczema	7 (4.9%)	
	Ulcer/Boils	4 (2.8%)	
	Candidiasis	14 (9.9%)	
	Tinea	10 (7.0%)	
	Multiple disease	6 (4.2%)	
	Others	4 (2.8%)	
Ear diseases			79 (5.5)
Vitamin –A deficiency			60 (4.2)
Gastro-intestinal disorders	Simple diarrhoea	31 (86.1%)	36 (2.5)
	Severe diarrhoea	1 (2.7%)	
	Dysentery	4 (11.1%)	
Other ailments			20 (1.4)

tuberculosis among which two cases were tested positive for acid fast bacilli, which were referred to the nearest PHI for further treatment under DOTS. Half of them were in reproductive age group of 15-45 years with one suspected case of childhood tuberculosis. Commonest associated TB symptom was low-grade fever/night sweat seen in three-quarter of the suspected cases followed by chest pain, weight loss. A quarter of cases had haemoptysis.

More than two-thirds of the children below 15 years were suffering from under-nutrition with no significant

difference in different age groups. None were having severe wasting. The National Nutrition Monitoring Bureau revealed in a survey during 2001-02 that 6% of the pre-school children were suffering from severe under-nutrition, while a majority (75%) of pre-school children had mild to moderate under-nutrition and was relatively higher among low socio-economic households belonging to SCs and STs.⁽⁷⁾ In a study by Anitha C and K. Begum in Mysore district among ICDS beneficiaries, found that percentage of children in normal grades which ranged from 6.4-31.8 among males and 14-36 among

females and the remaining children were found to fall in various grades of under-nutrition⁽⁸⁾. In states like Punjab, 60% of pre-school children were stunted and 38% were severely stunted and in Kerala the percentage of pre-school children who were severely under weight (-3SD) was found to be 6.3% and those belonging to underweight (-2SD) was found to be 22.6%.^(9, 10)

More than 60% (n = 1217) were suffering from nutritional anaemia mostly being mild to moderate in nature with the majority (72.7%) of these people were in the age group of 6-4, followed by reproductive age group of 15-45 years. Following the normal epidemiological pattern of an excess of anaemia among females in the country, 71.6% of the studied females were found to be suffering from anaemia. Prevalence of anaemia was significantly higher among females in comparison to males (p < 0.001). Significantly, a higher number of people residing in the cut-off areas were suffering from anaemia in comparison to people living in the hilly areas (p < 0.001). More than half (52.7%) of the sample in the hilly area and 47.3% in difficult area were anaemic. Since anaemia is an iron deficiency condition more dependant on diet than access to the health system, it was not surprising that the prevalence rates were higher in the more accessible villages situated in hilly areas than in the cut off area villages.

T. Sahu et. al. reported that 94% of under-five children were anaemic and

almost all children of the 5-14 age group were anaemic and 8.8% of < 5 years children and 5.4% of 5-14 years children were severely anaemic in the tribal area of Mohana block.⁽¹¹⁾ Similarly, Elizabeth A.M. in her study in Kerala reported the mean $\pm$ SD of haemoglobin level to be 10.1 $\pm$ 3.7 g/dl and around 88% of the pre-school children were anaemic, of these 74% were mild anaemic and around 14% were moderately anaemic.⁽¹⁰⁾ Another study conducted among 27,000 tribals and rural pre-school children under the ICDS Scheme reported anaemia in 20%.⁽¹²⁾ According to the NIN study in Bastar district, 23% of children (5-14 years age group) suffered from severe anaemia.⁽⁵⁾ Prevalence of anaemia in mild, moderate and severe conditions was 21, 37 and 23% respectively among beneficiaries of ICDS in Mysore district⁽⁸⁾.

One-fifth of the population covered suffered from fever which might be due to malaria as the area was endemic for malaria. Nearly 20% of the slides were found positive for malaria. A quarter of the studied populations were having splenomegaly suggesting that they either suffered from malaria in the past or are still having chronic malaria. Malaria is a major health problem in the tribal districts of Orissa, Jharkhand, Madhya Pradesh and Chhattisgarh.⁽¹³⁾ The National Anti-Malaria Programme of the Central Government estimated that Orissa contributes nearly 40% of falciparum cases in the country and 50% of the deaths. It was observed by Sharma et. al. (2001) that malaria is one of the major diseases affecting the

tribals to a great extent.⁽¹⁴⁾ In a study by Das, et. al. (1989) in Koraput district of Orissa among the tribal areas, it was found that malaria is a major cause of morbidity followed by helminthiasis and malnutrition.⁽¹⁵⁾ In a study by T. Mathiyazhagan, et. al. (2007) it was found that 53.95% of tribals in Mandla district of MP had correct knowledge about causes of malaria.⁽¹⁶⁾ In another study by Kusum Chopra et. al. (2004) it was observed that 72.5% of the tribals of Bastar district of Chhattisgarh had fever during the time of the survey and 41.6% of them experienced fever in last three months.⁽⁴⁾

During the present study, it was also observed that low backache was the commonest musculoskeletal disorder which might be due to the heavy physical activities. While 13.8% were having features of goitre, four of them had Grade-II thyroid enlargement. Other morbidities were ophthalmic problems (11%), dental problems (10%), scabies (56.3%), ear problems (5.5%) and vitamin-A deficiency (4.2%), and 2.5% had GI problem. However, the commonest ailment was simple diarrhoea (86.1%) followed by dysentery (11.1%).

Kusum Chopra et. al. (2004) found that the common health problems encountered by the tribal community in Bastar district of Chhattisgarh during the survey in last three months and as reported by health professionals are fever, cough and cold, skin problems, diarrhoea, anaemia, malaria and malnutrition.⁽⁴⁾ Similarly T. Mathiyazhagan et. al. (2007) reported

that the tribals in Mandla district of MP had poor knowledge on diseases like malaria, anaemia, TB, leprosy and worm infestation though they are suffering from these diseases.⁽¹⁶⁾ Anitha. C et. al. (2008) reported that in Mysore district children were suffering from various grades of malnutrition and scabies was a common problem and 1.4% and 4.4% in male and female respectively had night blindness⁽⁸⁾.

CONCLUSION

Improvement in basic health infrastructure would considerably improve the overall health status of the population in such areas. Since most of the prevailing morbidities can be managed through simple medication and preventive health education a two-pronged approach of extending a package of integrated health services to the far-flung areas and training a corps of local volunteers in basic health would help in improving the health status of tribal communities, whose access to the services is blocked by a combination of geographical, economic, social and cultural barriers.

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WHY MOTHERS DIE? A SURVEY OF MATERNAL MORTALITY IN A DISTRICT HOSPITAL IN BIHAR

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ABSTRACT

The still appalling maternal mortality rate has goaded the author to delineate the causes of maternal mortality in a district hospital in an EAG state Bihar. The article analyses why some causes are more common and suggests some low-cost obstetric and administrative interventions to help reduce high maternal mortality rate speedily. The paper analyses 52 instances of maternal deaths over a one-year period in a district hospital in Bihar. Traditionally-recognized major causes of maternal mortality - toxæmia, infection, haemorrhage and anaemia-- are still rampant among the rural population of the state. The paper concluded that maternal death figures can be drastically and rapidly reduced by simple pharmacological and administrative interventions that do not require sophisticated expensive ultramodern technology.

Key Words: Maternal Mortality Rate (MMR), Safe Motherhood, Essential Obstetric Care, Emergency Obstetric Care.

Safe motherhood remains an elusive basic human right for a shockingly high percentage of women in developing countries. Government policies (MCH schemes, CSSM, RCH programmes) and catchy slogans like 'Pregnancy is special, let us make it safe' have failed to make significant reductions in maternal mortality in many regions where RCH care is most needed but is still largely inaccessible.

Maternal mortality is not uniform across the country¹ and is disproportionately higher in the Empowered Action Group (EAG) states. The MMR varies greatly in different states and regions-- from 250 to 750 per 1,00,000². According to the Sample Registration System Survey, 2006, the MMR varies between 517 and 110 among different states (average 301/1,00,000 live-births in 2001-2003). From 1997-1998 to 2001-

2003, the rate declined from about 398-301- a relative decline of about 24%. However, the rates remain disturbingly high in states like Bihar.

This paper aims at looking into the causes of maternal deaths in a population served by a district hospital and formulate interventions, obstetric and administrative, to rapidly reduce MMR in the region.

MATERIALS AND METHOD

The study was conducted in the maternity unit of a district hospital situated in a predominantly rural area of Bihar with high levels of poverty, illiteracy and sub-optimal healthcare service infrastructure. The case notes of all deaths occurring in the maternity unit from 1st October 2004 to 30th September 2005 were analysed for the

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following data-age, parity/gravida, religion, place of residence, quality of ante-natal care received, tetanus immunization status, history of outside intervention by unskilled birth attendants (i.m, i.v injections/oxytocin drips, internal vaginal manipulations) and the documented cause of death based on clinical findings and any investigations if done.

RESULTS

The district hospital concerned is a busy unit with an estimated average annual delivery rate of 2,500-2,800. There were 52 maternal deaths during the above-mentioned one-year period. This figure could have been higher had it not

been for a slump in admissions due to strike by government paramedics and nurses for 52 days during December 2004/January 2005.

When analysed for age, the maximum number of deaths occurred during the years of maximum fertility (41 were below 30 years) (Table 1), 24 occurred in primigravidae, 19 among gravida 2-4, and 9 among grand multigravidas (Table 2). There were no significant differences among the religious communities (Muslims 24 and Hindus 28). The place of residence was extremely significant--48 deaths occurred in women who resided in rural areas compared to only four living in urban areas.

TABLE 1
AGE DISTRIBUTION OF MATERNAL DEATHS

Age Group	Number of Cases(n)	Percentage of Cases
Below 20 years	5	9.6
20-29 years	36	69.2
30 and above	11	21.1

TABLE 2
PARITY DISTRIBUTION OF MATERNAL DEATHS (N=52)

Parity/Gravida	Number of Cases (n)	Percentage of Cases
Primigravida	24	46
G2-G4	19	36.5
G5 and above (Grand multipara)	9	17.3

Quality of ante-natal care was assessed by the number of ante-natal check-ups each patient received (good ANC=3/more check-ups) and whether she had full tetanus immunization in that pregnancy.

A disquieting feature noted was the incomplete documentation of such care since the entries were often made by nurses when the obstetrician was not available. Tables 3 and 4 reflect the poor antenatal coverage of the women who died and the large gaps in the relevant information required for each patient. Only three patients got good care during pregnancy while the remaining had scanty, none or doubtful ante-natal care. Even tetanus immunization during pregnancy was not universal since a small but significant number were not immunized and in a large number the immunization status remained uncertain (either attendants gave vague history or the information was not asked for by the hospital staff).

Table 5 shows the causes of these maternal deaths. Eclampsia emerged as the single most important cause (n=14 or 16.92%) followed by infective causes (septic abortion n=3 or 5.77%; septicaemia due to prolonged labour n=1 or 1.9%); post-operative infection after caesarean section-- 2 or 3.8%; total n=6 or 1.54%) and rupture uterus (n=5 or 9.61%). Severe anaemia was another important cause (n= 4 or 7.69%). Accidental haemorrhage was the cause in one case (1.29%) and postpartum haemorrhage in two cases (3.84%). Among the miscellaneous causes were congestive heart failure in one case, acute renal failure due to severe diarrhoea and vomiting soon after delivery in one case, hepatic coma in three cases and Koch's chest in another case.

What is very disturbing is the observation that in 14 cases (26.9%) the cause of death could not be determined because the patient reached hospital in the terminal stage

TABLE 3
QUALITY OF ANTE-NATAL CARE RECEIVED BY CASES (N=52)

Standard of Ante-natal Care	Number of Cases (n)	Percentage of Cases
Nil/scanty	31	57.6
Adequate	3	5.7
Not documented	18	34.6

TABLE 4
TETANUS IMMUNIZATION STATUS OF CASES (N=52)

Complete Immunization	Number of Cases	Percentage of Cases
Yes	30	57.7
No	3	5.7
Not documented	19	36.5

TABLE 5
CAUSES FOR MATERNAL DEATHS

Documented Cause	Number of Cases	Percentage of Cases
Eclampsia	14	26.92
Rupture uterus	5	9.61
Septic abortion	3	5.769
Septicaemia due to prolonged labour	1	1.923
Accidental haemorrhage	1	1.293
Postpartum haemorrhage	2	3.846
Severe anaemia	4	7.692
Miscellaneous causes		
≤ Congestive cardiac failure	1	1.923
≤ Acute renal failure due to diarrhoea and vomiting	1	1.923
≤ Hepatic coma	3	5.769
≤ Koch's chest	1	1.923
≤ Post-operative infection	2	3.841
Undetermined cause	14 (probably due to meningitis)	26.92

and/or during late night when she was not examined by an obstetrician so that a definitive diagnosis could not be made.

Definite history of prior intervention by unqualified persons was documented in 15 case notes (Table 6). Such unskilled intervention contributed significantly to the causes of death like rupture uterus and infective morbidity.

DISCUSSION

Maternal mortality is often due to the compounding effects of adverse socio-

economic and cultural factors and sub-optimal community health services on the primary medical/obstetric cause. The predominant causes again emerge as toxemia, haemorrhage, infection and anaemia. Similar findings were reported by Joshi and Sapre³, and Pal et al⁴.

Eclampsia was the single biggest killer in our series. The following factors contribute: 1) Pregnant women often do not have blood pressure check-ups done since ANMs either do not know how to check it or the instrument is either not available or out of order. 2)

TABLE 6
MATERNAL DEATHS WITH HISTORY OF UNSKILLED INTERFERENCE OUTSIDE (N=15)

Cause of Death	Number of Cases
Rupture uterus	3
Septic abortion	3
Septicaemia due to prolonged labour	1
Post-operative infection after CS	2
Severe anaemia following spontaneous miscarriage and internal handling at home	1
Undetermined cause	5

Inadequate obstetric and nursing care on admission to FRU or district hospital where patients seek emergency care. In this hospital there was only one obstetrician and only two nurses per 8 hours shift to look after female surgical and medical patients in addition the busy maternity unit and labour ward. They were proficient in delivery skills but not trained in checking blood pressure. 3) Several patients died due to severe pulmonary edema but there was no suction machine to deal with this complication. 4) Magnesium sulphate regime could not be followed because the local chemists did not stock it and it was provided by the hospital.

The following low-cost interventions are urgently needed to cut down mortality due to eclampsia: 1) ANMs should be trained to recognise the danger signs of impending eclampsia like severe/persistent headache in late pregnancy, recurrent vomiting in late pregnancy, visual disturbances, epigastric pain not responding quickly

to antacids and excessive/rapid weight or generalised body swelling in late pregnancy. 2) ANMs should be given a simple protocol for emergency management of eclampsia before they rush them to referral units. Magnesium sulphate treatment packs could be incorporated in their delivery kits so that they could give it to their patients as and when needed, and to document the dose and time of administration in their emergency referral slip. The regimens used in the Collaborative Eclampsia Trial do not require cumbersome serum monitoring of magnesium sulphate levels⁵. 3) Posting of more lady doctors in FRUs and district hospitals rather than in remote PHCs where their skills can be better utilised in the government health services. The remote PHCs and sub-centres could be run by well-trained ANMs and staff nurses whose midwifery skills could be regularly upgraded by the obstetricians working at the referral and district hospitals. 4) Ensuring that all obstetric units have a functioning suction apparatus, two

oxygen cylinders and magnesium sulphate ampoules available always. 5) Increasing the staff strength of maternity units as regards A-grade nurses, ANMs and grade-IV employees. 6) During ante-natal visits the patient and her family should be educated to recognise the early clinical features of severe fulminant pre-eclampsia and impending eclampsia. Public awareness can be further heightened with inputs from the print and electronic media.

Infective morbidity and mortality can be reduced by training birth attendants in clean delivery practices and providing them with the necessary kits, implementing strict legislation against criminal abortion, training doctors at PHCs to perform MTPs upto 10-12 weeks gestation/uterine size below symphysis pubis using manual vacuum syringes. Increasing institutional delivery and ultimately phasing out home deliveries can reduce infective morbidity and mortality drastically. All staff attending the woman in labour should be tutored in universal infection control practices as far as possible. A strict adherence to aseptic labour ward protocol should be enforced among the ANMs and nursing staff in all hospitals. Sterilisers, sterile instruments and linen sterile gloves cotton and gauze should be freely available in all labour wards. Hygienic biomedical waste disposal norms should be taught to all personnel there.

Deaths due to uterus rupture. Ante-partum and post-partum haemorrhages and anaemia were considerably less in

proportion to eclampsia. Though the hospital blood bank was almost non-functional then, there was an efficient blood bank run by the Red Cross closeby. The nursing staffs are familiar with transfusion procedures and the initial management of bleeding emergencies while the obstetrician was summoned. Consequently most such cases had good outcome if the patient reached hospital before irreversible shock. Deaths due to such cases can be further reduced by the following low-cost interventions: 1) Vigorously implementing the current government contraceptive policies to promote small family norms since anaemia, ante-partum, post-partum haemorrhage and uterine rupture are all commoner in higher parity women. 2) Syntocinon to be made prescription- only drug. 3) Early referral by ANMs if labour likely to be prolonged and/or difficult.

The cases documented as undetermined causes expose a very serious lacunae in the community healthcare service. These are largely due to non-availability of obstetricians to provide round-the-clock coverage in the unit due to understaffing in the entire district.

CONCLUSION

The greatest tragedy about maternal deaths is that almost all are avoidable. It is even sadder that the dying women are often young, otherwise healthy and their untimely death leaves behind motherless children with its attendant problems.

What could have been perhaps merely some degree of morbidity culminates in deaths due to the 3Ds--delay in seeking care, delay in transport to EmOC unit, and delay in diagnosis and definitive treatment. It is ironical that these appalling death figures can be reduced drastically by simple interventions which do not require sophisticated modern technology.

The causes of maternal mortality are an indictment of the failing community health services⁶. Iron-folic acid tablets, a working blood pressure instrument and suction apparatus available to properly trained birth attendants (doctors, nurses and ANMs,) an efficient blood bank, simple drugs like inexpensive antibiotics, magnesium sulphate and oxytocics, an enthusiastic IEC programme to motivate the masses to accept the small family norm, accessibility of safe MTP services to all women when they need them, policies to reduce the unmet need for contraception, an anaesthetist and an operation theatre with basic equipment to perform laparotomy and caesarean section does not require huge financial resources but chiefly administrative will and vision to meet the targets of the RCH programme^{6,7}.

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EVALUATION OF CONDOM PROMOTION PROGRAMME - A STUDY CONDUCTED IN ANDHRA PRADESH

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ABSTRACT

To promote condom use among men to prevent HIV/AIDS, the Condom Promotion Project of Hindustan Latex Family Planning Promotion Trust (HLFPPT) has implemented an IEC campaign titled 'Do you have it?' in select towns of Andhra Pradesh, using different techniques and communication methods. The campaign included five major activities-- street plays, kiosks, bars, cinema halls and push-carts. Concurrent evaluation of these activities was carried out to assess the utility and effectiveness of the campaign.

The present report is the outcome of the above mentioned evaluation study. The specific objectives of the evaluation are: (1) to assess the quality of content delivery; (2) to check the process of implementation; and (3) to collect quick feedback on the utility of these activities. A mix of qualitative and quantitative techniques was used to elicit the opinions of the public attending the campaign. Observation checklist for the activity, spot interviews with customers/audience, observations and discussions in the field were the tools used for data collection. Out of 230 total performance locations, the study covered 30 places in the urban areas of Hyderabad, Vijayawada and Visakhapatnam. Evaluation of the campaign recorded highly satisfactory rating. Majority of the people watching the performances responded and rated the campaign to be very good. Message was given more importance than the entertainment aspects. Respondents have understood the importance of condom in preventing HIV/AIDS.

Key Words: Kiosks, Bars, Cinemas

The use of condoms has brought down the prevalence rate of HIV across various communities across the globe. The correct and consistent use of condoms has proved to be the life-saviour particularly among high risk populations. Andhra Pradesh has the highest prevalence of HIV/AIDS in the country. Among the many programmes under implementation to contain the epidemic in the state, the Condom Promotion Programme (CPP) is one of the projects initiated by HLFPPT in 2004. The project is funded by the Department for International Development (DFID) of the British government.

The goal of the CPP is to reduce HIV incidence by increasing the adoption level of condom usage among the high risk groups in particular and the general public in general. The following are the objectives of the CPP:

- To increase the availability and accessibility of condoms;
- To increase consistent and correct use of condoms with special focus on high risk groups;
- To create an enabling environment for increasing condom usage among general population; and
- To build competent programme partners (NGOs, social marketing

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organisations and retailers) in promoting condom usage.

Various surveys conducted in Andhra Pradesh reveal very low availability of condoms in the high risk areas and to the high risk groups.² The CPP follows a unique approach in making condoms available, affordable and acceptable to the high risk and general populations. The programme sensitises retailers of non-traditional outlets such as *pan* shops, *kirana* shops, wine shops, PCO booths and other outlets through Retailer Training Programme. The training programme motivates retailers to stock, display and sell condoms thereby increasing its intake level among the high risk groups as well as the general population. Awareness generation among the target population and general public is another major activity under the project.

As a part of the awareness generation activities, the CPP implemented many IEC (information, education and communication) activities in February 2007, with a view to promote the use of condoms in select towns of Andhra Pradesh using different communication methods. The promotion campaign was designed to touch people at points of contact where there was a psychological link with sexual activity or in public places or manner, which projected condom and its use as something normal and socially acceptable. This led to the selection of bars, cinemas screening adult movies in the former category and public places (major traffic junctions) and condom push-carts in the latter category. The

activities were carried on simultaneously with messages and content remaining the same across the activities to produce a campaign effect. Concurrent evaluation of these activities was also carried out to assess the utility of the campaign. The present report is the outcome of the above mentioned evaluation study.

Methodology

Objectives

1. To assess the quality of content delivery during the campaign;
2. To check the process of implementation; and
3. To collect quick feedback on the utility of the activities.

Method

A mix of qualitative and quantitative techniques was used. Feedback was obtained from a pre-determined number of randomly selected respondents from among the audience for each activity/show/performance. Interviews were held with the randomly selected respondents on the spot immediately after watching the shows/activities. During the performance of the activity, the audience were informed that at the end of the show that they would be asked some questions relating to the performance/message etc.

Tools

Observation check-list for the activity, spot interviews with the target persons

and observations and discussions in the field. The tools used for all the five activities were common. The interview questions were split into two parts. The questions in the first part were common across all the activities, while the questions in the second part were specific to the particular activity/performance that the respondent witnessed or took part in.

Area and Sample Size

Towns: Three- Hyderabad, Vijayawada and Visakhapatnam.

Locations	30
Hyderabad	18
Vijayawada	6
Visakhapatnam	6
Activities	5 types
Performance Locations	230
Kiosks	30
Street-plays	90
Bars	40
Cinemas	40
Push-carts	30

Observation Schedule

Type	Total		Hyderabad		Vijayawada		Visakhapatnam	
	Performances	Sample	Total	Sample	Total	Sample	Total	Sample
Kiosks	30	8	18	4	6	2	6	2
Street shows	90	16	54	8	18	4	18	4
Bars	40	8	20	4	10	2	10	2
Cinemas	40	8	20	4	10	2	10	2
Push-carts	30	8	18	4	6	2	6	2
Total	230	48	130	24	50	12	50	12

Total shows to be observed as sample = 48 (24+12+12)

Interview Schedules

Performance	Total	Hyderabad		Vijayawada		Visakhapatnam	
	Sample		Sample		Sample		Sample
Kiosks	80	4 x 10	40	2 x 10	20	2 x 10	20
Street shows	160	8 X 10	80	4 x 10	40	4 x 10	40
Bars	80	4 x 10	40	2 x 10	20	2 x 10	20
Cinemas	80	4 x 10	40	2 x 10	20	2 x 10	20
Push-carts	80	4 x 10	40	2 x 10	20	2 x 10	20
Total	480	24X10	240	12x10	120	12X10	120

(No. shows* No. of samples interviewed)

Total observation schedules

Interviews

	48
	<u>480</u>
Total	<u>528</u>

In total, 48 observation schedules (kiosks 8, street shows 16, bars 8, theaters 8 and push-carts 8) and 480 interview schedules (kiosks 80, street shows 160, bars 80, theaters 80, and push carts 80) were administered for the study.

Field Work

Trained investigators collected data under supervision and guidance. The chief coordinator visited the sites and recorded observations. In addition to observation check-list and interview schedule, field observations were also documented.

Analysis of Results

The results are presented activity-wise. Respondents' profile and general opinion about the campaign are discussed for all the respondents. This is followed by activity-wise analysis for the respective samples. Observation checklist is discussed first and interview responses later. This order is followed for all the items.

A. Respondents' Profile

A large majority (97%) of the respondents were males. The campaign activities were conducted in public places like cross-roads, which are usually over-crowded and therefore attract more people to participate in the programmes. There was not much scope for women to participate. Participation of women was further constrained since the activities were about the use of condoms. Though the

subjects - HIV/AIDS and use of condom - are very much concerned with women, the study could not get enough women audience for the reasons stated above. Though women were noticed among moviegoers they felt shy to attend the programmes/shows. Situation at bars and push-carts (in motion on main roads) needs no explanation.

About 31% of the respondents were in the 31-35 age group. A near equal number (30%) were drawn from the 26-30 age group, followed by 20% who were under-25 and 14% were in the 36-45 age bracket. Sample of 46 years and above was also significant at 5%. The education status of the respondents did not move beyond the intermediate level. Participants with intermediate consisted of 26%. A correlation is observed between higher levels of education and higher propensity to participate in the programmes i.e. high school (23%), middle school (17%) and primary school (10%). People with technical background were also in considerable quantum (16%) while only 9% were illiterates.

A majority (68%) of the respondents were employees followed by students (14%) and businessmen (7%), with the remaining were drawn from housewives, unemployed and 'no response' categories.

Since condoms are also useful for spacing births, information regarding marital status and the number of children was also obtained. A large segment of the respondents were married (68%). However, the number of

unmarried men was also significant at 31% and one respondent was a divorcee. Three out of 10 audience had two children (30%), followed by three children (18%) and one child (12%). While a sizable number (24%) had no children and 8% had more than three, an equal number did not reveal information related to children.

B. General Opinion about the Campaign

As mentioned earlier, the campaign included five different activities. Hence, exclusive observation check-list and interviews were designed for all five activities. However, a few questions were framed to assess the broad opinion of all the respondents about the usefulness of the campaign and were common in nature to all respondents. The present discussion is focused on these aspects.

Opinion about the Campaign

Exactly half (50%) of the respondents rated the campaign to be 'very good' and a considerable number (44%) felt it to be 'good'. 'Average' score was given by a little above 6%.

Items Liked Most

The alternatives provided for this question were not the specific items covered in each activity but were general aspects, which were common to all the five activities. A high percentage (68%) liked the 'message' part, with the remaining items also enjoying good score (performance

12%, entertainment 11% and songs 8%).

C. Response to Different Activities

C.1 Street Play

Street plays were chosen as an important medium because of its popularity with the local population. The songs, music and drama associated with street plays invariably attracted crowds in public places. High level satisfaction was reported about the street plays. Adequacy of content, coordination among the artists and their performance, effectiveness of songs, public mobilization and the tagline (*Undo mee daggara* – Do you have it?) received full scores. The other factors-- location, convenience, conduct of quiz programme at the end, distribution of gifts, though observed to be conducted well had some scope for improvement.

Recall of Message

Thirty-eight per cent of the respondents recalled that the message was about condoms followed by 'importance of using condom' at 27%. Other responses listed were 'awareness on HIV/AIDS' (22%) and 'awareness on condom' (13%).

Topics of the Playlets

The street play in total included four playlets, which were focused mainly on prevention of HIV/AIDS. The individual topics covered were use of condom, injection safety, sexually transmitted infections (STIs) and types of condoms.

Some overlapping among the topics could not be ruled out.

Nearly the majority (41%) of the respondents were successful in recalling *Mass-Malles* (the stereotype macho man) playlet on uses of condom. Another 26% without indicating any particular playlet said, 'all items were good'. While 21% appreciated the benefits of using condom, 6% recalled the playlet on STI. Injection safety was remembered by only 4% though it was covered under the *Mass-Malles* playlet, which received relatively high score at 41%.

Reasons for Men not Using Condoms

A full one-third (33%) of the respondents felt uncomfortable using a condom stating that it decreased pleasure. While 31% did not have proper knowledge, 21% were lazy about carrying the contraceptive with them. People who were unaware of places where condom was available formed 6% and another 7% felt shy to buying a pack of condom.

Prevention of HIV/AIDS

An attempt was made to assess how far the respondents have understood that use of condom prevents contracting HIV infection. A large majority (64%) exhibited adequate knowledge about the need to use condoms to prevent infection. People who suggested, 'avoid extra-marital sexual relations' and need to create awareness on HIV/AIDS constituted 16% each. The other

reasons cited were 'prevents the risk of infection' and 'facilitates safer sex' (2% each).

Precautions for Injection Safety

A large majority (65%) were aware that contaminated syringes and used needles should not be reused. A good number (22%) preferred disposable syringes. Only 7% did not make any opinion, while a still lower (1%) were lacking in the knowledge.

Meaning of Tag-line 'Unda mee daggara'

The campaign used a tagline '*Unda mee daggara*' (Do you have it?), asking the audience whether they were carrying a condom with them. The tagline was used in all the activities during the campaign. Information was sought to know whether the respondents understood the concept and recalled the tagline. A highly satisfactory response was seen in this aspect. An overwhelming number of respondents (87%) referred to the tagline as condom. Seven per cent mentioned Nirodh since condoms are mostly identified with the generic 'Nirodh' brand in the country and people who related it to HIV/AIDS were also significant with 6% responding so.

C. 2 Kiosks

There is a bit of a child in everyone and games are an effective way of infotainment. The kiosks were set-up with this in mind and had popular games played commonly at fairs/*melas*, but

with an element of condom and its use in them. To have more authentic feel and bring in an element of commitment, the participants were charged Rs 3 or Rs 5 for various games. Convenience of the location, position of team members, availability of materials, visitors in stalls, communication skills of the team, curiosity of the visitors, coordination among team members, performing team in costumes, distribution of gifts, tagline promotion were noticed to be extremely satisfactory. Visitors playing game, display of price list of the items was observed to be less prominent in one of the kiosks. Banner was not displayed at one kiosk.

Participation in the Game

A majority (62%) of the respondents did not participate in the games. However, a significant number (28%) interestingly involved in the game. Dispensing with the entry fees (Rs 3/5) perhaps could have attracted more people to participate in the game. About 10% expressed no interest in playing the game.

Winning Prize

Only one per cent of the turnout was successful in winning the prizes. This can be well understood because as mentioned above the number of people who played the game was considerably less.

Advantages/Uses of Condom

A high degree of awareness and knowledge was observed among the

participants. Eighty per cent understood that condom protected from HIV/AIDS and STI. While 13% knew that it helped in preventing undesired pregnancies, 7% preferred not to respond.

Types of Condoms

A question was put to gauge the knowledge of the respondents on the varieties of condoms available in the market. A little over one-fourths (27%) referred to Deluxe Nirodh, closely followed by Moods (23%), Ustad (16%) and Rakshak (15%). However, 19% did not identify any brands.

Previous Exposure to Campaign on Condom

When asked about their experience of watching such programmes in the past, a very large segment (96%) reported in the negative.

C.3 Bars

Many reports in the past, as well as focus group discussions with high risk population revealed that a high proportion of sexual activity was preceded by drinking. Thus, local bars (mass bars, as they are called in Andhra Pradesh) were targeted. These are bars with usually no TVs, music or other forms of entertainment. Thus, mimicry and magic shows were a welcome novelty appreciated by the clients.

Observation Checklist

Convenience of the location, performance of magic show and

mimicry, scheduling, distribution of gifts and tagline promotion were given high ranking. Show arrangements, size of audience, effectiveness of show, artists' clarity in expression, content delivery, audience participation and display of banners were observed to be not up-to the mark in case of some performances.

INTERVIEWS

Recall of Mimicry Items

Need for the use of condom was mentioned by a majority (58%) of the respondents. While 22% recalled that the mimicry was 'all about condom', 19% identified it to be about 'awareness creation on condom'.

Recall of Magic Show Items

Similar trend was noticed in the response to magic show also. While as many as 57% understood the advantages in the use of condom, 24% stated that the show was about condom. 'Awareness about condom' was recalled by relatively fewer number (14%) as compared to mimicry. Only 5% listed different flavours of condom as a result of watching the magic show.

Tagline 'Unda mee daggara'

A high percentage (87%) identified the tagline connection correctly. While 8% mentioned Nirodh, 5% went ahead saying that it was about the need to use condom for preventing HIV/AIDS.

Advantages of Using Condom

'Prevents HIV/AIDS/STI' was the reaction of six out of ten persons (61%). A little over one-fifths (22%) believed that condoms averted undesirable pregnancies. Remaining responses were general in nature.

C. 4 Cinemas

Cinema halls that screen adult movies are an important touch point where the messaging on importance of condom use can be specifically focused on a group consisting exclusively of the target population. Street plays were the activity enacted at the cinemas, as such the tools used to collect information for both observation checklist as well as for interview schedule were common in respect of street plays, kiosks and cinemas.

Observation Checklist

Adequacy of contents, artists' performance, coordination among artists, effectiveness of songs, number of audiences, quiz programme, audience participation, distribution of gifts, tagline promotion were all given high scores. Though convenience of location, encouraging audience to pose questions, clarifying queries, size of the audience for the shows, mobilization of public and arrangement of banners received good rating, made clear the need for improvement.

INTERVIEWS

Recall of Messages

Majority (62%) of the respondents referred to 'use of condoms' as the key message in the play. Another 21% mentioned about the use of condom to prevent HIV/AIDS as the message of the plays and 6% remarked that people should avoid extra marital sexual relations.

Knowledge about HIV/AIDS

An attempt was made to know the knowledge level of the respondents on HIV/AIDS. As many as 37% believed it to be a dangerous disease. A slightly higher number (38%) knew that pre and extra marital affairs risked of contracting HIV infection, while 10% gave general responses, and 15% claimed ignorance.

Mode of HIV Transmission

While a majority (52%) saw unprotected sex as the major route for HIV transmission, 16% said it spread only through blood. About 22% referred to needles and blood as the routes through which this infection spread, while 9% did not provide any answers to the mode of transmission.

Prevention of HIV/AIDS

More than half (53%) of the respondents preferred condom for prevention of HIV/AIDS. For 22% 'avoiding extra marital sex' was the method of curtailing the spread of the

infection. Other replies given were 'awareness on HIV/AIDS' (15%), and 'safe sex' (9%). One per cent did not know how to prevent infection.

Prevention of HIV/AIDS through Condom

It is surprising to note that a major segment did not respond to the question (28%). While 42% claimed no knowledge on the subject, for 14% it was a tool to stop transmission thereby preventing the spread of HIV from person to person. It protected one against sexual diseases, prevented assimilation of fluid/semen were other responses (8% each).

C. 5 Push-carts

Push-carts vending vegetables, fruits and other items are a common sight in our all cities and towns. The idea behind running condom push-carts was to tell people that condoms were also a daily use item that did not warrant any embarrassment. The cart displayed and sold condoms and played catchy numbers to attract people's attention. As cited earlier, the push-cart activity did not take place as per schedule. Thus the study could not collect responses in Vijayawada and Visakhapatnam and the present sample was from Hyderabad city alone. From response point of view also the activity received little attention compared to others.

Observation Checklist

Display of variety of condoms and tag-line *Unda mee daggara* promotion were

rated high. This was followed by play back of audiocassettes, presence of promoters and supervisors, distribution of leaflets (80% each). Roaming of push-cart in different areas and exhibition of banners received around 60% score. Items rated very low (10% each) by the respondents were; sale of condoms, display in DICs and NGOs explaining about NGO kit, sale, display and informing people about special schemes, taking orders for condom purchase from the visitors and distribution of gifts to winners.

INTERVIEWS

Purchase of Condoms

Only 17% purchased condoms, the large majority of 83% didn't show any interest in buying the item.

Meaning of STI

Audiocassettes included messages about HIV/AIDS, STI and condom. For a question as to the meaning of STI a majority said they had no idea (59%) and 16% responded appropriately and 25% referred to as sexual disease, which is quite satisfactory.

Collection of Leaflets

Sixty-eight per cent of the respondents collected the leaflets.

Tagline – Unda mee daggara

Seventy-five per cent of the sample identified the tagline with condom in general and 3% referred to it as Nirodh.

A significant 20% even related it to prevention of HIV/AIDS.

Mode of HIV Transmission

A considerable number (29%) expressed ignorance and a good percentage (37%) gave generic responses. Needles and blood were mentioned by 27% and blood transfusion was the response of 7%.

Major Observations – Discussion

Evaluation of the process (conduct) of the campaign revealed highly satisfactory rating. However scope for improvement was also noticed particularly in case of push-carts. The campaign was extremely successful in addressing of young men. Women participation was observed to be low. Though education did not cross intermediate level a gradual increase in number is noticed from illiterates to intermediate level revealing relationship between educational status and willingness to respond without inhibitions. As the education increased the number of respondents increased.

General Opinion about the Campaign

Majority of the respondents rated the campaign to be very good. This may not be surprising as any effort made in the interest of public usually receives appreciation. The effects will be much more significant when special care is taken to make the campaign attractive and entertaining. Majority liked the message. This response shows the

effective reach of the message, which is very important to create awareness about the use of condoms for prevention of HIV/AIDS. This also reveals the judicious mix of education and entertainment in the campaign. However use of condom is given considerable weighting. Importance of using condom and awareness on HIV/AIDS have also received satisfactory response.

On the whole it can be concluded that respondents have understood the importance of condom in preventing HIV/AIDS.

Response to Different Activities

Among the activities, street plays focused on the discussion of the concepts of HIV/AIDS, STI and condoms, while kiosks and push cart activities concentrated on the sales of condoms. Mimicry and magic shows at bars stressed on the need to use condoms. The focus of the campaign was the use of condoms for preventing HIV/AIDS. Hence topics like, what is condom, types, how to use it etc were discussed extensively in addition to the issues relating to HIV /AIDS.

Street Plays

Relatively more number of respondents recalled uses of condom. People who felt all items useful were also good in number. As many as 21% who mentioned the benefits of condom fell under the category 'awareness about HIV/AIDS'. Still many continue to feel condom reduces sexual pleasure. This aspect needs to be given importance in

future campaigns. Lack of knowledge was also quite high with 21% mentioning laziness. Laziness could be in procurement of condoms or in their usage. Condom as a device to prevent HIV/AIDS is quite well understood. There is a need to talk more about avoiding pre and extra marital sex. Knowledge about used syringes causing HIV/AIDS was satisfactory. Campaign about tagline was understood by a large majority.

Kiosks

A large majority of 80% said condoms helped protect oneself from contracting HIV/AIDS, for 13% it helped prevent pregnancies. There seems to be a shift towards understanding the use of condom more as a preventive measure to HIV/AIDS than as a contraceptive tool.

There is a need to familiarize people with different brands of condoms irrespective of cost factor, as a significant 19% did not express any interest in identifying the brands. Almost all the respondents mentioned that they did see this kind of campaign earlier, reinforcing the utility of the campaign. Many people did not participate in the games at the kiosks. If entry fees (Rs. 3/5) were not charged perhaps more people would have volunteered to participate. Only 10% expressed lack of interest in playing the game.

Bars

Need for the use of the condom received high response in mimicry

which can be interpreted as awareness about prevention of HIV/AIDS. Similar trend was observed during magic shows also. High percentage of the respondents identifying the tagline further strengthens this observation. Once again the shift from use of condoms as a family planning device to an HIV/AIDS prevention tool was observed.

Cinemas

The questions asked here were more on the knowledge about the disease. Use of condoms was mentioned as the key message by a majority of the people. Regarding knowledge about the disease, a significant 15% expressed no knowledge, which is a matter of concern. Half of the respondents knew heterosexual mode as a major route of transmission of HIV/AIDS. The remaining half was split between untested blood transfusion and unsafe needles. Knowledge about prevention of HIV/AIDS by using condom was quite satisfactory. Avoiding pre and extra marital sex also recorded responses. Interestingly, how condom prevents HIV/AIDS did not receive many responses. Many claimed ignorance when asked to explain how condom prevents HIV/AIDS.

Push-carts

Collection of leaflets was satisfactory. Tagline promotion was satisfactory. Knowledge about the mode of transmission, though satisfactory needs improvement. As in case of kiosks, purchase of condoms was not

much. Understanding of STI was also low.

As per the results available, the campaign received good response. The activities were well planned and promptly executed. Cooperation of the managements of cinemas and bars shows the excellent coordination and rapport of the CPP team. Campaign materials (posters, banners, pamphlets, booklets and other handouts), games, audio material, street theatre and other equipment were very impressive in terms of content, design and production. Field observations revealed good response to the activities. Street plays pulled in good crowds and the messages were communicated very effectively. The campaign was successful in realising the objectives by increasing availability and accessibility of condoms and creating an enabling environment for increasing consistent and correct use of condom among general population.

Critical Observations

Attendance of females at the spots was very low. Out of five activities pushcarts received relatively low response mostly due to implementation constraints

The activities were conducted in public places as a strategy. It revealed both advantages and disadvantages. While the number of audience was more, noise prevented effective listening of the contents, particularly in case of street play. Public places also had limited female participation.

Suggestions for Consideration

The campaign could have included one or two activities exclusively addressing women, which perhaps could have facilitated women to join, participate without hesitation.

Five different activities at a time demanded exhaustive planning and arrangements in terms of men and materials. Limiting the campaign to two or three types would have provided more time and energy to look in to details and concentrate on individual items. Future campaigns should include activities which facilitate women also participate. Entry fee for playing the game at kiosk perhaps influenced the participation of audience in the game. It can be dispensed with, at least during the campaigns. Campaigns are occasional activities and usually create good impact. There is a need to periodically reinforce the messages.