

**SOME HIGHLIGHTS ON THE EVALUATION OF MOBILE
MEDICAL TEAM SCHEME IN TAMIL NADU**

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ABSTRACT

The Mobile Medical Team (MMT) Scheme initiated by Tamil Nadu State Government in 1977 to provide comprehensive health care to the rural population was evaluated by the National Institute of Health and Family Welfare. The salient findings of this evaluation study are highlighted in this paper. By and large the scheme was found to be operationally feasible, effective in improving the coverage of population for selected components of health care and acceptable to the community.

Delivery of health care to all, particularly the rural population has been a challenge to health administrators all over the world and particularly in a developing country like India. For this purpose various strategies have been experimented in different parts of the country. The comprehensive rural health project at Jamkhed¹, Rehbar-i-Sehat in Jammu and Kashmir², Cooperative rural dispensaries in Kerala³, Mallur health cooperative in Karnataka⁴, the Indo-Dutch Project for child welfare in Andhra Pradesh⁵, are a few among them. The rural health scheme popularly known as the Village Health Guide Scheme (earlier known as the Community Health Workers [CHW] Scheme) initiated by the Government of India in 1977 is one such important strategy adopted at a national level in this line. Even though initially started in only few selected PHCs, this scheme was expected to be implemented all over the country in a phased manner. However, three States in India, viz. Tamil Nadu, Kerala, and Jammu and Kashmir were not in favour of accepting this scheme. Since, under the constitutional provision, matters related to delivery of health care fell within the purview of the States' own power, these States which already had their own alternative strategies for delivery of health care wanted to continue the same in their respective States. The Mobile Medical Team (MMT) was one of the experimental strategies tried out by the Tamil Nadu

State for extending comprehensive health care to the rural population. Since inception of the scheme in 1977, its implementation was undertaken with the States¹ own resources and no assistance was received by the State Government from the Central Government. It is when the Tamil Nadu Government requested the Government of India for financial assistance for expansion of the MMT scheme to cover the entire State then at that time the need was felt for a close look at the functioning of the scheme. In this context, the Planning Commission desired that the scheme be evaluated by the Ministry of Health and Family Welfare before any decision on financial assistance was arrived at. On behalf of the Ministry, the National Institute of Health and Family Welfare was requested to undertake this evaluation.

For the evaluation of any programme, its approach and methodology will depend to a great extent on the purpose of the evaluation. Thus, the approach of the evaluation of MMT was guided mainly by the basic purpose of examining the effectiveness and acceptance of the scheme as an alternative to the CHW scheme, as it was referred to at the time of study. Before the highlights of the evaluation study are presented it is desirable to give a brief description of the scheme.

Brief Description of MMT Scheme

The main consideration which persuaded the formulation of this scheme was the recognition among health authorities about the poor utilisation of existing facilities and expertise of the medical professionals which are mainly centred in the PHC headquarter. Through the mobile teams the service facilities and professional service could be brought nearer to the people, thereby increasing their accessibility to the services. The relatively better literacy of the population in the State, which according to the authorities would have caused refusal of services by functionaries with below professional qualifications on one side and the availability of surplus medical manpower in the State on the other side were two additional supportive factors responsible for the genesis of this scheme.

The objective of MMT Scheme as described by the State authorities was to deliver comprehensive health services including curative, preventive and promotive services to the

rural population in the villages as close to them as possible and free of cost by professional and para-professional workers through mobile teams.

The scope and range of services expected to be rendered by the mobile teams, included nearly all those services provided from the PHCs i.e. medical care, MCH care particularly immunisation, ante-natal care, and school health services and referral of cases according to the needs. In addition, these teams were expected to provide more opportunities for the PHC Medical Officers to execute their field supervisory responsibilities and to participate in health educational activities.

Organisational and Operational Aspects

Each PHC/Block area was divided into three sectors, each being under the charge of one of the three medical officers. Two mobile teams were functioning daily from this PHC. While one medical officer remained in the PHC for two days by turn to conduct the routine clinic work and other administrative responsibilities, the other two moved out with the pharmacists in the mobile van. The halting places for the team to conduct clinics, its starting time, arrival time at each halting place and departure time etc. were all incorporated in a fixed schedule about which prior information was given to the villagers. The villages covered by the team were those where no health care facility like panchayat dispensary, mini health centre etc. existed. At the rate of 6 to 8 villages in a day by each medical officer, it was intended to cover all major villages in the block once a week. In each halting place, village health committees (VHCs) consisting of formal and informal leaders of different sectors of population were organised by the PHC staff. The members of this committee were expected to perform certain functions like health education, first aid, mobilisation of local resources etc. and they had been trained for the same by the PHC staff. In order to keep up continuity of care, the team made arrangements for follow-up of cases through the local health staff and VHC members. The committee also maintained village based register in which the team had to make entries regarding their activities when they visited the halting places.

One of the important arrangements made under the scheme was the effort to set up referral services whereby patients

could be referred from the peripheral areas with special chits to higher hospitals. To make this more effective, step like making one Medical Officer in the big hospital responsible for care of referred patients, arrangements for intimation to the referring doctor in case of non-response from the patient etc. were also taken.

Objectives of the Evaluation Study

This study attempted to evaluate the MMT scheme in terms of three aspects viz. (a) operational aspects - which covered the range and volume of services and their coverage and quality, (b) the community aspects including community perception, acceptance and satisfaction regarding the services and community participation, and (c) providers' views on administrative and operational aspects of the scheme.

Methodology

The required data were collected by study of records and documents pertaining to the performance of MMT and the concerned PHCs, observation of functioning of MMTs and interview with concerned staff and members of community. Five PHCs were selected randomly from 24 PHCs where MMT was started initially in 1977 (hereafter referred as experimental PHCs). Equal number of control PHCs were also selected from out of the remaining PHCs. Eight villages were selected from the selected experimental PHCs representing villages/halting places covered by three medical officers during their visits and located at varying distances from the PHC headquarter. From each village, four VHC members, two teachers, and ten community members were selected for interview. All MOs and pharmacists of the ten MMTs in five experimental PHCs, all MOs incharge of experimental and control PHCs, four village leaders from each of selected, eight villages from control PHCs, all available district health officers and programme officers from the selected four districts were interviewed.

Observation was carried out in two different ways: (1) Research Staff observed all three medical officers of the five PHCs for three days each while they accompanied the MMTs, total number of MMTs observed being 45; and (2) Quality of patient care provided by MMT was observed by one medical officer by accompanying both MMTs from each experimental PHC

and medical officers' clinic at experimental and control PHC headquarter for one full day. Quality was assessed by using a scoring system during observation of a sample of cases seen i.e. every third general case and all ante-natal cases attended.

Findings

The important parameters considered for evaluation were coverage, quantum and quality of services, community perception, satisfaction and participation and administrative problems.

Coverage

This was studied in terms of actual items of services rendered by MMT as compared to those expected, coverage of various socio-economic sections of population for services, coverage of population according to distance of their residence from PHC headquarters and frequency and regularity of visits by the teams.

Range of Services Rendered

The range of services expected to be rendered by MMT according to State Government directives included diagnosis and treatment of both acute and chronic conditions, immunisation, ante-natal care and well baby care for referred cases, referral services, school health service, health education, arranging follow-up through auxiliary staff, home visits if needed, supervision of field staff etc. Information on services rendered collected through interview of staff of PHC revealed that all the above mentioned services were actually being rendered by the teams. However, in addition, services like environmental sanitation, birth and death verification, motivation for family planning etc. were also mentioned by the staff. Range of services as found during observation of MMTs in 216 halting places included medical care (in all 216 halting places), health talk (in 113), environmental sanitation (in 85), supervision of field staff (in 83), home visits (in 52) discussion with village health committee members (in 35), school visits (in 33) and verification of births and deaths (in 33). Personal preventive services like ante-natal care, family planning, immunisation etc. were not separately noted but were included under general medical care.

Coverage of Various Socio-economic Sections of Population

This could be ascertained from the members of village health committee and village members during interview. Regarding economic status 66.63 per cent of VHC members stated that both poor and rich equally used the services from MMT. Similarly, 88.12 per cent stated that both educated and uneducated people used the service*. According to 70 per cent of VHC members, all categories of people - male and female of all ages - were using services from MMT. Also 93.12 per cent opined that people of all castes used MMT services.

Coverage of Population by Distance from PHC Headquarter

The annual number of patients treated in 1977 and 1978 (i.e. before and after introduction of MMT) in experimental and control PHCs according to distance from PHC headquarters is shown in Table 1 (except one control PHC for which data was not available). In four experimental PHCs, the numbers of patients treated irrespective of the distance from PHC headquarter showed definite increase over one year period of operation of MMT. By and large similar pattern was seen in control PHCs also except in case of three which showed a decrease in number of patients from the nearby areas. However, the experimental PHCs showed significant increase in the number of patients treated, compared to the control PHCs particularly from areas more than five miles from PHC headquarters which definitely indicated a better coverage and better accessibility.

Regularity of Visits

Majority of the VHC members i.e. 82.5 per cent stated that the MMTs were visiting their villages regularly as per schedule.

Quantum of Services Provided

While studying the quantum of services, the services provided by the MMT were considered as supplementary to the already existing PHC system and therefore performance of the whole PHC was considered using different indicators. In

TABLE 1
ANNUAL NUMBER OF PATIENTS TREATED IN EXPERIMENTAL AND CONTROL
PHCs BY DISTANCE FROM PHC HEADQUARTERS - 1977 AND 1978

PHC	Year	Distance					
		< 2 miles		2-5 miles		> 5 miles	
		Experimental PHC	Control PHC	Experimental PHC	Control PHC	Experimental PHC	Control PHC
I	1977 1978	18672	28668	13566	31866	NA	5931
	Percentage	10710	30251	8029	34429	25539	5923
	difference*	-42.6%	+5.25%	-40.81%	+8.04%	-	-0.13%
II	1977 1978	12856	NA**	15307	NA	206 18316	NA
	Percentage	14957	NA	18577		+8791.2%	
	difference	+16.34%		+21.36%	NA		NA
III	1977 1978	10065	10134	4742	3411	875	571
	Percentage	11342	10031	8201	3482	19736	730
	difference	+12.68%	-1.01%	+72.94%	+2.08%	+2155.5%	+27.84%
IV	1977 1978	14214	3183 3720	9281	8406	6972	3351
	Percentage	22839	+16.87%	11766	9813	49905	3555 +6
	difference	+60.6%		+26.77%	+16.73%	+615.79%	.08%
v	1977 1978	17869	14459	17569	1968	2175	3481
	Percentage	17898	12623	19403	2366	29596	4076
	difference	+0.16%	-12.68%	+10.43%	+20.22%	+1260.7%	+17.09+

* Percentage calculated for the base year 1977.

** NA - Data not available

order to ascertain the contribution made by the MMT (a) performance under different health programmes for the experimental PHCs was compared for periods before and after the introduction of the scheme and (b) for the period after introduction of MMT, performance was compared between experimental and corresponding control PHCs. Since one of the criteria for selection of control PHC was nearly equal level of performance for important health programmes for the year before introduction of the scheme, the difference observed in any could be attributed to the MMT. The status of performance of the experimental PHCs in relation to these selected indicators is presented in Table 2.

Medical Care

For the four selected indicators of medical care all the five experimental PHCs showed better performance after the scheme was introduced. In comparison with the control PHC also wherever the data was compared, nearly all the experimental PHCs showed better performance except for one indicator i.e. average number of cases referred per 1000 cases seen. However, it is worthwhile to note that there was no referral of cases in four control PHCs. This very clearly showed the contribution made by MMT towards rendering medical care including referral service to the rural mass which according to the authority was the area requiring priority attention in the first stage of implementation of the scheme.

MCH Programme

Ante-natal Care

A total of six specific indicators were examined in relation to ante-natal care. The average number of antenatal cases registered per month showed improvement in three PHCs after introduction of the scheme while in the other two it remained same. Compared to four control PHCs for which data was available, this indicator showed improvement in three experimental PHCs. Average monthly ante-natal clinic attendance increased in four experimental PHCs after introduction of the scheme. For the same indicator, when compared to available data for three control PHCs, two experimental PHCs showed better performance. Average number of TT immunisation given per month increased in four experimental PHCs after introduction of the scheme. However, in comparison with

TABLE 2
PROGRAMME PERFORMANCE INDICATORS AND PERFORMANCE STATUS OF
EXPERIMENTAL PHCS

COMPONENTS OF HEALTH PROGRAMME AND INDICATORS	No. OF EXPERIMENTAL PHCS SHOWING PERFORMANCE						
	AFTER INTRODUCTION OF MMT			IN COMPARISON WITH CONTROL			
	HIGHER	LOWER	NO CHANGE	HIGHER	LOWER	NO CHANGE	DATA NOT AVAILABLE
1	2	3	4	5	6	7	8
1. Medical Care							
a. AVERAGE NUMBER OF CASES SEEN PER MONTH	5	-	-	5	-	-	-
b. AVERAGE RATE OF C-CCC TREATED PER 1000 POPULATION	5	-	-	3	-	-	2
c. AVERAGE NUMBER OF CASES REFERRED PER MONTH	5	-	-	5	-	-	-
d. AVERAGE NUMBER OF CASES REFERRED PER 1000 CASES SEEN	5	-	-	4	1	-	-
2. MCH Services							
2.1 Ante-natal Care							
a. AVERAGE NUMBER OF REGISTERED ANTE-NATAL CASES PER MONTH	3	-	2	3	1	-	1
b. AVERAGE RATE FOR ANTE-NATAL REGISTRATION PER 1000 ELIGIBLE COUPLES	3	1	1	2	-	-	3

	1	2	3	4	5	6	7	8
c. Average monthly ante-natal clinic attendance		4	1	-	2	1	-	2
d. Average attendance in each AN clinic held per month		3	2	-	3	-	-	2
e. Average number of TT immunization given per month		5	-	-	2	-	2	1
f. Total number of TT benefici					2			
aries per 1000 registered ANC		4	1	-		2	-	1

2.2 Infant and Toddler Care

a. Average number of infants attended In a month		4	-	1	4	-	1	-
b. No. of infants attended per 1000 infant population		4	-	1	2	-	1	2
c. Average number of toddlers seen in a month		5	-	-	4	1	-	-
d. No. of toddlers attended per 1000 toddler population		5	-	-	2	1	-	2
e. Average number of 2nd dose DPT given in a month		5	-	-	5	-	-	-
f. DPT beneficiaries per 1000 (0-5 yrs.) population		4	-	1	1	-	2	2
g. , Average number of 2nd dose DT in a month		4	-	1	4	-	1	-

	1	2	3	4	5	6	7	8
2.3 Midwifery Care								
a. Average number of institutional deliveries in a month		2	2	1	3	-	-	2
b. No. of institutional deliveries per 1000 eligible couples		0	1	4	3	-	-	2
c. Average number of domiciliary deliveries in a month		2	3	—	1	2	1	1
d. Number of domiciliary deliveries per 1000 eligible couples		1	2	2	-	1	1	3
e. Average number of maternity and ante-natal cases referred per month		3	1	1*	3	2	-	-
f. Ante-natal and maternity cases referred per 1000 cases registered		2	2	1*	2	2	1	—
2.4 Distribution of Minerals and Vitamins								
a. Average number of mothers receiving F.S. Tab. in a month		4	1	-	3	2	-	-
b. Number of mothers receiving F.S. Tab. per 1000 eligible couples		1	1	3	1	2	-	2

*Nil performance in one experimental PHC

	1	2	3	4	5	6	7	8
c. Average number of Vit. A beneficiaries per month		2	3	-	3	1	-	1
d. No. of Vit. A beneficiaries per 1000 (1-5 yrs.) population		3	2	-	2	1	-	2
e. Average number of children receiving F.S. Tab. per month		5	-	-	3	2	-	-
f. No. of children receiving F.S. Tab. per 1000 (1-5 yrs.) population		4	-	1	-	2	-	2
3. National Malaria								
Eradication Programme								
a. Average number of slides taken per month under active surveillance		2	2	1	1	3	-	1
b. Slides collected under active surveillance per 1000 population		1	2	2	-	2	-	3
c. Average number of slides taken per month under passive surveillance		1	4	-	2	1	1	1
d. Slides collected under passive surveillance per 1000 cases seen		1	4	-	2	2	-	1
e. Average number of slides under active and passive surveillance per month		3	2	-	3	2	-	-

1	2	3	4	5	6	7	8
f. No. received R.T. (Radical Treatment) per 1000 slides taken	1	1	2**	3	1	1	-
g. Average number of patients receiving R.T. per month	-	2	2**	1	1	1	2
4. NATIONAL TUBERCULOSIS CONTROL PROGRAMME							
a. Average number of sputum examination done per month	2	1	2*	1	3	1***	-
b. Sputum examination done per 1000 cases seen	2	2	1*	-	4	1***	-
c. Average number of TB patients registered	4	1	-	4	1	-	-
d. Total TB patients registered per 1000 population	Practically negligible performance in all PHCs.						
5. ENVIRONMENTAL SANITATION							
a. Average number of soakage pits constructed per month	5	-	-	3	2	-	-
b. Average number of drinking water sources chlorinated as proportion of total sources	3****	-	-	1	2	-	2

**Data not available for 1 experimental PHC.
 *Nil performance in 1 experimental PHC,
 ***Nil performance in one control PHC.
 ****Data not available for 2 experimental PHCs.

1	2	3	4	5	6	7	8
6. Births and Deaths Registration							
a. Average number of births detected/verified	5	-	-	3	1	-	1
b. Average number of deaths verified/detected	4	1	-	2	2	-	1
7. Health Education and Community Involvement							
a. Activities for health education average per month	5	-	-	4	1	-	-
b. Average number of meetings with community per month	4	-	**	4	-	-	1

** Data not available for 1 experimental PHC.

available data from four control PHCs, only two experimental PHCs showed better performance. Total number of TT beneficiaries per 1000 registered cases increased after introduction of the scheme even though compared to control PHCs only two had better performance.

Maternity Services

With regard to maternity services, four specific indicators were examined. Average number of institutional deliveries improved in two out of five experimental PHCs after the scheme was introduced. Compared to the corresponding control PHCs, three experimental PHCs showed better performance in relation to this indicator. Average number of domiciliary deliveries showed improvement in two experimental PHCs but in other three there was a fall after the introduction of the scheme. Compared to control PHCs for which data was available, only one experimental PHC showed better performance for this indicator.

Infant and Child Care

Average number of infants and toddlers seen per month showed improvement in four and five experimental PHCs respectively. Comparison with control PHCs also indicated similar improvement. Average number of immunisation per month for both DPT and DT showed improvement since introduction of the scheme and also when compared with corresponding control PHCs.

With regard to distribution of Iron and Folic Acid tablets to women and children and Vitamin A solution for children, while the former registered improvement in most of the experimental PHCs after the scheme was introduced, the latter improved only in two experimental PHCs. However, comparison with control PHCs did not show such uniform improvement in performance of this service.

Malaria Eradication Programme

A total of seven indicators reflecting diagnostic and treatment services for malaria were examined. The average number of slides taken per month, and particularly those through active surveillance, showed improvement in three and two experimental PHCs respectively. With regard to other indicators not much improvement was seen.

Tuberculosis Control Programme

By and large performance under TB programme appeared to have been not much affected by MMT. The average number of TB patients registered showed improvement in four experimental PHCs. Even though average number of sputum examination done per month showed marginal improvement in the experimental PHCs after the scheme was introduced yet when compared to the control PHCs, similar improvement could not be observed.

Environmental Sanitation

The average number of soakage pits constructed showed definite improvement in all five experimental PHCs even though only three had performed better compared to control PHCs. Available data showed that proportion of drinking water sources chlorinated improved in three experimental PHCs but in two of them the performance was lower compared to their control PHCs.

Detection and Verification of Births and Deaths

With regard to births, this indicator showed improvement in all five experimental PHCs after the introduction of the scheme, and in three of them the performance was better than their corresponding control PHCs. Average number of deaths detected and verified also showed somewhat similar pattern.

Health Education and Community Contacts

Health education activities and meetings with community leaders improved in most of the experimental PHCs.

Quality of Services

Regarding the quality of services rendered by MMT, the following variables were examined.

Adequacy of Staff Members of the Team

The complete membership of the MMT included one medical officer, one pharmacist and one driver and all the 45 MMTs observed during the study were found to be with complete team members. In this regard, while interviewing the Village Health Committee members, only 16 (12.5.%) members reported

that they knew of some visits of the team without medical officers.

Average Time Spent per Patient by Medical Officer

From the observation data regarding the average number of patients seen by the team per day i.e. 223.6 and the average time spent for rendering patient care per day i.e. 207 minutes, the average time spent per patient by medical officer was worked out to 0.92 minutes.

Time Spent on Different Activities

The average time spent by MMT on different activities indicated that nearly 60.88 per cent of the available active time was spent on patient care services and the remaining 38.12 per cent was being spent on preventive and supervisory activities.

Extent of Referral

The observation data indicated that the average percentage referral of cases seen and treated by the team was 1.94 and average number of cases referred per MMT per day was 4.35.

Type of Equipment Carried and Used

As per directive from the State Directorate, in order to keep up the quality of patient care work, the MMTs were expected to carry with them necessary equipments like Blood Pressure Apparatus, thermometers, test-tubes and chemicals for urine examination etc. They were also specially instructed to adopt strict sterilisation precautions for injections. During observation it was found that all 45 teams had stethoscope, 32 had B.P. Apparatus, 28 had thermometer, 22 had tongue depressor and 21 had torch with them. All 45 teams had stove with kerosene and all had syringes and needles and their number varied between 1-5 and 5-7 respectively. Only two teams carried test-tubes and Benedict's¹ solution and only one team had blood smear slides.

Relative Emphasis on Medical Care and Other Services

Of the total 10,065 cases seen by the 45 teams observed.

87.1 per cent were given curative services and the rest were given various personal preventive services like ante-natal, immunisation and family planning services.

Quality of Components of Patient Care

Components of patient care assessed were history taking, clinical examination and instructions to patients after prescription. It may be noted from table 3 that, out of 649 patients observed for general medical care even though relatively low proportion of cases received poor quality care in terms of all three components of care, in case of examination, the proportion with score 'A' was the lowest and similarly the proportion with score 'C' was the highest. With regard to ante-natal cases also almost similar pattern was observed. A comparison of the quality of services in three different situations i.e. MMT, experimental, PHC and control PHC headquarters revealed that the quality of services rendered in the first two situations did not differ much though in most occasions this was better than the third situation i.e. Control PHC (HQ).

Precautions for Sterilisation

Out of the ten teams observed by the medical officer only one team was reported to have taken satisfactory precautions for sterilization of syringes and needles.

Community Perception, Satisfaction and Participation

Community Awareness

The high level of awareness about the scheme among the village population was very well indicated by the interview data. All but two among the 160 VHC members as well as 97.7 per cent of the 400 villagers were able to mention the correct day of the week for MMT visit in their villages. While patient care services rendered through MMT was well known among the VHC members and villagers, there were many who were not aware of services like follow-up facilities (nearly 56% VHC members and 11% villagers) referral services, (50% VHC members and 60% villagers) health education services (40% VHC members and 50% of villagers) etc.

TABLE 3
QUALITY OF PATIENT CARE RENDERED BY MMT

Type of Case	Score	Component of Care			
		History Taking	Examination	Instruction	
General Medical Care	A(good)	143 (22.06%)	50 (7.7%)	122	(18.85%)
	B(fair)	460 (70.98%)	516 (79.5%)	458	(70.78%)
	C(poor)	45 (6.94%)	83 (12.78%)	67	(10.35%)
	Total	648*	649	647**	
Ante-natal Care	A(good)	26 (36.62%)	5 (18.3%)	31	(43.12%)
	B(fair)	45 (63.38%)	57 (79.26%)	40	(55.5%)
	C(poor)	-	9 (12.5%)	1	(1.4%)
	Total	71*	72	72	

*Data not available in one case.

**Data not available in two cases.

Service utilization and satisfaction

About 60 per cent of VHC members and 62.5 per cent of villagers reported to have used the services from MMT. All the VHC

Service Utilization and Satisfaction

About 60 percent of VHC members and 62.5 percent of villagers reported to have used the services from MMT. All the VHC members and 209 out of 250 villagers who used the services were satisfied with them.

While 71.25 per cent of VHC members and 79.50 per cent of villagers had not expressed any complaints regarding the functioning of MMT, some had certain complaints like "no injections", "MMT visits only once a week", "halting time not sufficient", "no costly medicines given" etc.

Community Participation

Data obtained from interview of PHC staff and community members on the extent of participation by community in the activities of MMT indicated that no initiative for organising services was shown by the community. However, steps taken by the PHC staff for involvement of community was evident from the following: (a) in all the 216 halting places observed village health committees were formed; (b) 47.50 per cent of the VHC members reported that they were consulted and cooperation was sought by PHC staff in relation to the functioning of MMT; (c) 12 out of 15 MOs expressed that they had discussed with VHC members regarding operational aspects of MMT; (d) 51.25 per cent of VHC members reported to have attended meetings with PHC staff on MMT; (e) 57.5 per cent VHC members and 60 per cent of teachers interviewed reported to have rendered help to MMT staff during their visits; (f) during observation, in 51.38 per cent of halting places VHC members were found to be present and they were also found to be rendering assistance like provision of physical facilities, arranging cases etc.; and (g) 93.49 per cent of PHC field staff stated to have received help from VHC members in relation to MMT's functioning.

However, general members of the community did not seem to have been motivated to participate in the MMT other than for using services, since only 11.25 per cent reported to have provided some help for MMT's work.

Perception Regarding Usefulness of MMT

From the very fact that all the VHC members and villagers

expressed their desire for continuation of the scheme, it was clear that they had found the scheme to be useful. The various reasons mentioned by them for the continuation were availability of services under different programmes to the villagers in the interior and remote places, without expense and waste of time; more opportunity to consult doctors; improvement observed in the village sanitation etc.

Problems of Programme Implementation

Only two out of 15 MOs had expressed problems in relation to the functioning of MMT which were mainly related to the lack of adequate participation from people and inadequacy of time at halting places during their visits. With regard to vehicles, which were most important for the scheme to function effectively, four out of five experimental PHCs had experienced some problems particularly due to their breakdown, or non-availability of driver. However, according to them, the work could progress without interruption because of timely alternative arrangements. Requests from PHCs for diversion of staff (MO, Driver) and transport used to be very common according to the district officers and they were required to make necessary arrangements in short time. Ten out of 15 MOs stated to have experienced shortage of certain drugs during their visits for short periods but the district officers did not indicate this as a problem and further, stated that arrangements for local purchase and diversion of drugs from other PHCs were always made.

With regard to the field workers, six out of 123 interviewed, expressed to have faced some problem related to increase in workload, interruption in their routine work due to their involvement in MMT work etc. and 16 had difficulty in contacting the VHC members particularly as a group in one place.

Discussion

This attempt for evaluation of the MMT Scheme concentrated mainly on its effectiveness in terms of quantitative achievements and coverage of population for different components of health care, and the community's acceptance and satisfaction with the scheme. Quality of care provided and the administrative or operational difficulties faced by the staff at different levels of health administration during implementation of the scheme also were considered in this study.

The main aim of this new strategy was to make health services available and accessible to the hitherto uncovered or inadequately covered population in interior villages. With regard to medical care (patient care) services, the study findings very clearly indicated the effectiveness of this scheme whereby there was manifold increase in the number of patients from farthest villages seen and treated in those PHCs through MMTs as given in table 1. Regarding the delivery of different type of services - curative, preventive and promotive - expected to be delivered by the team, the available findings indicated that they were achieved to a great extent, even though this was more evident in the case of curative services. In this connection, the State authorities' statement regarding the priority and emphasis at different stages of implementation of the scheme, i.e. curative services in the initial phase, referral in the intermediate and preventive and promotive care towards the final phase, should be kept in mind. Moreover, the scheme was just one year old at the time of the evaluation and it was too early to draw any conclusions regarding emphasis given on different components of services, considering the initial time lag in catching up with the activities.

In the area of personal preventive services like antenatal care, immunisation, infant and toddler care, the new strategy contributed sizeably to improve the overall performance of the concerned PHCs, in terms of quantum of performance and coverage of the target population as shown in table 2. While the improvement in the performance of experimental PHCs since the implementation of the scheme was quite clearly seen, due to paucity of data from the corresponding control PHCs for all respective indicators, definite conclusions were difficult. However, wherever available, such data had been mostly in favour of the contributions made by the scheme.

In the area of midwifery services it was difficult to draw any definite conclusion pertaining to benefits from the new strategy. From the description of the functioning of the scheme, one can reasonably make out that apart from better supervision of field staff and better health educational efforts, direct service that could be expected from the mobile team towards this component of care was in detecting high-risk maternity cases and their referral to suitable institutions for better care. This should have made an impact

on the number of institutional deliveries from these PHCs. The observed change in this indicator was marginal as shown in table 2. Further, indicators related to referral of maternity cases also showed a marginal improvement in the experimental PHCs. Effect of better supervision and health education efforts should have improved domiciliary deliveries in terms of use of midwifery services from trained staff including trained dais. However, in this study information regarding this was not collected.

National health programmes of Malaria and Tuberculosis did not seem to have benefited much by the introduction of the scheme. As mentioned earlier, even though the priority was given to medical care in the initial phase of implementation of the scheme, the teams while rendering medical care to patients, were expected to detect cases of Malaria through blood slide examination as passive surveillance agencies and to refer or supply drugs for cases of tuberculosis. With the wider coverage of population in remote areas, performance under these programmes should have also shown improvement, but the indicators in table 2 did not suggest the same. The observation findings also revealed that most of the MMTs observed, did not even carry the blood slides and this could, to some extent, explain the poor performance, under these programmes. The improved performance under environmental sanitation and health education also supports the conclusions that community based preventive services were also being rendered along with curative services by the MMT. This could be the result of improved supervision by medical officers which was expected to be strengthened under the new strategy.

Without clearly laid down standards of quality it was difficult to make any judgement regarding quality of the services. However, this evaluation showed that the patient care services under MMT and those in the PHC headquarter clinics did not differ much in quality as services were being rendered by the same professionals. However, the inadequacy of facilities for clinical examination of patients in the MMT, the need for ensuring more strict precautions for sterilisation of instruments, the need for carrying with the team all essential materials particularly blood slides for malaria etc. are some important findings brought out in this regard. The time spent by doctors for patient care particularly with each patient can give some indication about the quality of service rendered. In the absence of an appropriate standard

for this under these specific situations and lack of comparative data even from the PHC headquarter clinics run by Medical Officers, again no judgments could be made in this regard. However, the medical officer who observed the quality of components of patient care found them to be either 'good' or 'fair' in these situations.

Since the introduction of MMT, referral services seemed to have improved to a great extent in quantitative terms. In the light of the special arrangements made for referral of cases under the scheme, it would have been worthwhile if the effectiveness of the functioning of referral system could be studied. Further, timely referral of deserving cases to the right source of care, patients' compliance with such referrals, type of attention received by referred patients at the referral institution etc. would have also indicated the quality of patient care rendered. However, such details regarding referral services could not be obtained during this evaluation.

Quality of services rendered by the MMT could be judged to some extent by the satisfaction with the services among the beneficiaries. In this connection, the high degree of satisfaction with MMT services expressed by the VHC members and the villagers is worth noticing.

Active and sustained community involvement is very eccentric for the success of any such schemes. In relation to MMT, even though no evidence of initiative from the community's side for MMTs functioning was obtained, the effort on the part of the health authorities to involve them was evident from the findings of the study. The fact that in all halting places, the VHCs were formed, who were involved at various stages of the MMT's functioning by way of consultation and seeking other assistance and that they were given the responsibility of maintaining village based register for recording the teams' activities could definitely be considered positive steps towards involving the villagers. Since, the community had accepted the scheme as a useful mode of delivery of health care to them and wanted this to continue further, it could only be expected that in the long run from this one-sided approach it will change into a more mutually cooperative involvement, with more active initiative from the villagers. Despite these efforts to involve the community through VHC members, the basic philosophy of primary health care i.e. peoples' health in peoples' hands, remained outside the purview of the scheme.

It remained a totally government initiated scheme with efforts to 'involve' the community but with little resource inputs, planning efforts or implementation initiatives from the people.

The doctors and staff of PHC who actually rendered service through the MMT and the health administrators seemed to be satisfied with the operational aspects of the scheme and there appeared to be no serious hurdles in its implementation. Even for the occasional problems faced by them like that of transport, staff and drugs, the authorities could make alternative arrangements in short time without interruption to the teams' work. This indicated the operational feasibility of the scheme, under the support and sustained interest of the authorities. There is no doubt that the success of the scheme heavily depended on the availability of adequate number of vehicles, facilities for their timely repair and adequate provision for POL which would involve a heavy expenditure for the State health authorities. Moreover, considering this as a suitable strategy for delivery of primary health care to the people, it should meet the criteria of *economic feasibility* and the State authorities should be able to expand the scheme to cover the entire State. In this evaluation, however, no attempt was made to consider the economic aspect of the scheme through cost analysis.

Continuity of care by making services available to the people always is another important requirement for a successful strategy for primary health care. By selecting a volunteer from the community and equipping him/her for rendering health services as in the case of community health workers scheme is one strategy to meet this requirement. Under the MMT scheme this is expected to be met by the follow-up arrangements made by the team, for cases in need, through the VHC members (who have undergone a short training). However, findings from the study did not indicate success in this regard because of the high proportion of the VHC members and the villagers being not aware of this component of service *i.e.* follow-up arrangement for needed cases.

The findings of this evaluation study by and large indicated that the new strategy of delivery of health care to the rural mass through mobile medical teams was effective in improving the coverage of population for different components of health care particularly curative medical care.

maternal and child health care and some community based preventive services. However, there was no evidence to suggest improvement in services related to national health programmes of Malaria and Tuberculosis. The services rendered through teams were also found to be acceptable to part of the village population. Even though based on short duration of experience (one year) the scheme was found to be operationally feasible too.

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Lkkjk'k

तमिलनाडू राज्य सरकार द्वारा 1977 में ग्रामीण जनता को वृहद स्वास्थ्य रक्षा प्रदान करने के लिए चलाई गई चलती-फिरती चिकित्सा टीम(एम.एम.टी) योजना का राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान द्वारा मूल्यांकन किया गया था। इस मूल्यांकन अध्ययन के मुख्य निष्कर्षों को इस पेपर में दर्शाया गया है। मोटे तौर पर यह योजना कार्यान्वयन के उपयुक्त तथा स्वास्थ्य रक्षा के चुनौतीपूर्ण घटकों का जनता के लिए कार्यक्षेत्र बढ़ाने में कारगर और समुदाय को स्वीकार्य सिद्ध हुई है।

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**A STUDY ON THE REORGANISATIONAL NEEDS OF THE
KAMLA NEHRU MEMORIAL HOSPITAL, ALLAHABAD**

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ABSTRACT

Kamla Nehru Memorial Hospital, Allahabad is run by Jawaharlal Nehru Memorial Trust and Kamla Nehru Memorial Trust jointly. Since its establishment in 1941, many rapid changes have taken place specially in regard to its expansion. What adversely affected the organisation most was the transfer of the administration and control of the hospital to the State Government on two occasions. This took place mainly because of the resource constraints with the Hospital Trust. These changes in the management from Trust to State Government and vice-versa, coupled with the pressing problems of lack of space, physical facilities and proper utilisation of hospital services etc. necessitated an indepth study. The authors on request from the Trust spent seven days to study thoroughly the organisation and its problems and submitted their report, on (a) restructuring the existing organisation, and (b) future development of the hospital. The methodology and process of analysing the aforesaid aspects with relation to a hospital have been described in this paper.

Never before have our hospitals been subjected to public scrutiny as in recent years. Primarily, this public concern is due to three factors: (i) the greatly increased structure and function of hospitals in the care of the sick and in the provision of allied health services, (ii) the rapid increase in the cost of hospital care which consumes large proportion of our national as well as too often the individual income, and (iii) the growing criticism and public dissatisfaction. In fact these are the main maladies facing our hospitals in general.

It is the infirm, injured and acutely ill patients who visit the hospitals to seek help, relief and care. While in

the hospital, they are under great physical, psychological and other stress, and if the hospital is not geared to look after them courteously and promptly a lot of damage is caused to the human relationships. All those concerned with hospitals must sit together and ponder over the issues and problems facing their hospital and take immediate steps not only to mend but improve the situation. In fact, we go to the extent of saying that the nose diving public image of hospitals can be salvaged by nothing less than a revolutionary effort.

To meet this great challenge adequately, hospitals must be developed on certain basic principles - a philosophy such that through functional planning, out facilities can keep pace with the dynamic changes in medical practices and hospital operation¹.

Some of these principles are:

- *Form Follows Functions*-. The building and its facilities must express the functions to take place within it. Architectural or other considerations must be secondary to the primary functions.
- Maximum flexibility and expansibility are paramount
- External and internal traffic patterns must be simple.
- Physical and functional¹ separation must be achieved in traffic flow of people and things both horizontally and vertically.
- Labour saving devices must be utilised.
- In building any new facility, the old must adjust to the new; functional operation of the new facilities must not be compromised by existing building.

This study titled "Reorganisation of Kamla Nehru Memorial Hospital, Allahabad" is based on these technical and humane considerations. The study has attempted at widening the scope and the resultant advantages of the hospital service utilisation.

Material

It will be pertinent to give some background of the hospital. The Kamla Nehru Memorial Hospital made a very modest

beginning with 40 maternity beds. Today, with a compliment of 181 beds it is not only giving useful services to the community but is a training centre for post-graduate medical students in Obstetrics and Gynaecology of the Moti Lai Nehru Medical College, Allahabad. In addition, the hospital is also a recognised training centre for Auxiliary Nurse Midwives. The Administrator and the Medical Superintendent are responsible for hospital administration, while the Administrator is responsible for the general hospital administration, the Medical Superintendent look after technical services.

Objectives of the Study

The increased demand on this hospital due to its growing popularity resulted in overcrowding and affected the functioning of the hospital services. Following are the objectives of the study:

1. to study the layout and physical facilities of the different services;
2. to study the organisation and staffing pattern of the different services;
3. to study the working of the various services of the hospital; and
4. to suggest remedial measures in the study areas.

Methodology

The threefold methodology *i.e.* the record-study, interview and observation technique was adopted in conducting the study. The study was carried out in October, 1982.

Record Study: The records available in the study area, and to a limited extent the records available with the Hospital Administrator and Medical Superintendent were studied.

Interview: Informal discussion with hospital authorities and interview of the staff of the hospital were carried out during the study period.

Observation: The general layout, physical facilities available and working of the study area were observed.

Findings and Discussion on Existing Situation

Out-patient Department

Physical facilities: The out-patient service is conducted in a portion of the adjoining building of the Begum Abdul Kalam Azad Memorial Cancer Block (which is non-functioning) on the ground floor, due to paucity of space in the main hospital building. The out-patient department consists of mainly registration counter and Doctor's room. The registration counter is located in a corridor. The doctors' room is a common one for four doctors. The doctors room has two examination cubicles. Three benches are provided within this room for the patients to sit as there is no separate waiting area.

In addition, to the regular out-patient clinics, the special clinics, like sterility clinic, post-natal clinic and well-baby clinics are conducted. The sterility and post-natal clinics are conducted in an adjacent room to the doctor's room. The well-baby clinic is conducted in another corridor which is parallel to the registration corridor. A toilet room is located at the left side of the out-patient clinic.

The out-patient clinic is conducted every day by a team of four doctors, one consultant, one resident and two house-surgeons. One staff nurse is responsible for the registration work.

The out-patient attendance ranged from 100 to 148 cases with an average of 126 cases per day, of which 85 per cent and 15 per cent are obstetric and gynecological cases respectively.

Emergency Services

Physical facilities: The emergency services are provided in the Admission Room in the main hospital building. This small room is divided into two portions by means of curtains. The front portion of the room is utilised as working place for doctor and sister. The rear portion is used as an examination and treatment area. The admission room is inadequate in space (16'x10'=160 sq.ft.) and provides no privacy to the patients. In the year 1981, the total admission were 11,220 out of which 2,097 (19 per cent) are emergency admissions.

There is no suction apparatus and oxygen cylinder in the Admission-cum-Emergency room. There are no observation beds. There is no delivery room nearby. (Delivery suit is situated in the first floor.) The admission room has a attached bath room.

There is no separate staff for the emergency services. The duty doctor and sister of the day manage the admission room.

The emergency cases are examined and admitted to various wards from the Admission-cum-Emergency room. The admission fee is collected by the sister. The emergency deliveries are conducted in the admission room as there is no delivery room nearby. The baby bath is given in the adjoining bath room, which lacks the necessary facilities for it.

X-Ray Department

Physical facilities: The x-ray department is situated on the ground floor of the Cancer Block. The Radiologist office, sister's duty room, two x-ray plant rooms and a dark room were adequately furnished and equipped. The Radiologist office is provided with view-boxes to examine the x-ray films. The sister's duty room is also used as store room for instruments and equipment. There is no separate dress changing room. X-ray plant room is used for dress changing purpose. The department is manned by a Radiologist, two technicians and a sister.

In-patient Facilities

Layout and physical facilities: There are four wards. Ward I and Ward II are situated in the ground floor. The Ward III and Ward IV are in the first floor. The delivery suits are in the first floor. One elevator is available near ward II and is out of order for more than 3 months. There is no ramp leading to the ward in the first floor. The wards are rectangular in shape with single or double corridors. The ward design permits the nurses to have ample visibility of patients at all times. The space between the rows of beds is utilised to provide floor beds.

The maximum size of the ward (beds inpatient housing area only) is that for 20 beds. The distribution of beds in the various in-patient areas is presented in Table 1.

TABLE 1
DISTRIBUTION OF BEDS IN THE HOSPITAL

Ward	Patient housing area	Full paying	Part paying	Verandah	Floor	Total
Ward I						
Post-operative	14	3	5	8	12	42
Isolation	-	-	-	-	-	14
Ward II						
Post-operative	14	3	5	7	8	37
Ward III						
Wing I	13	5	4	11	-	33
Wing II (Big Ward)	20	-	-	-	-	20
Ward IV						
	18	3	10	8	3	42
Total	93	14	24	34	23	189

The hospital has a few full-paying single bed rooms, a few part-paying (2to5bed rooms)and free general wards. The existing and suggested floor area requirements per hospital bed are given in Table 2.

In single bed rooms the area per bed is more than the suggested norm. All the wards except the isolation and wing I of the ward III are overcrowded. The post-operative wards are the most overcrowded ones.

TABLE 2 EXISTING AND SUGGESTED FLOOR AREA PER BED				
Type of Accommodation	Patient housing area in sq. ft.	Suggested area per bed (sq. ft.)	Number of beds that can be placed	Actual*
Single Room	157 (12.4 x 13.4)	125	1	1
General Wards				
Ward I				
Post Operative	1150 (23 x 50)	80-90	14	26
Isolation	1158 (39.8 x 29.10)	80	14	15
Ward II				
Post Operative	1150	80-90	14	22
Ward III				
Wing I	1150	70	16	14
Wing II	1158	70	16	20
Ward IV	1150	70	16	21

*Floor beds included as on 20th October, 1982

The isolation and one of the post-natal wards (big ward) as written on the door have no separate nursing stations. The existing nursing stations in other wards also have no proper storage space for stationery, records and medicines. The nurses have no separate dress changing and toilet facilities.

Treatment Rooms

There is no separate treatment room in the wards. One end of the corridor near to the pantry room) is used as a treatment room. The area has no proper lighting, handwashing facilities and has no dressing trolleys or other necessary arrangements. The pantry rooms are mainly utilised for giving baby bath, as there is no facilities for baby bath.

There is no store room either. In ward I, the toilet room is used as a store room. In ward II the store is kept in electric switch board room.

Sanitary Areas

One bath room for 8 patients and one toilet for 5 patients is considered optimum. The paying patients are provided with bath room and toilet as per the norms. The general ward patients have one bath room for 25 to 30 patients and one toilet for 10-12 patients. The available bath room is also utilised as dirty utility room, as there is no separate dirty utility room. The general wards have no wash basins. The pantry room or toilet room is utilised for handwashing purpose.

Power Supply

There is no proper alternative arrangement in the event of electricity failure. In the wards, and delivery suits the work is carried out with the help of candles with great difficulty.

Organisation of Nursing Services

The present Matron, who is a senior most ward-sister officiating as a Matron since 1977, is not possessing the desired qualification and training. She is not well-versed with her job responsibilities.

Staffing Pattern

The staffing position of the nursing service is rather inadequate. The inadequacy of the nursing staff is highlighted in Table 3.

The sanctioned strength of staff nursing is well below (42 per cent) the staffing pattern suggested for 200 bedded hospitals. Even the sanctioned strength of ward sisters and staff nurses are not available.

The post-operative ward I and ward II, where critical patients are kept, are large and managed by most inadequate staff. The ward sisters, who works 7.00 a.m. to 11.00 a.m. and 12.00 noon to 4.00 p.m., the shift in which most of the activities of the ward take place, has hardly any time to supervise the activities of the Auxiliary Nurse-Midwife.

In the absence of adequate strength of ward sisters and staff nurses, the auxiliary nurse midwives have become the main stay for the patient care. This obviously will not have a favourable effect on the quality of nursing care.

TABLE 3
THE EXISTING AND SUGGESTED STAFFING PATTERN OF NURSES

Designation	Sanctioned strength	Existing strength	Vacant posts	Suggested staffing pattern for 200 beds hospital
Matron	1	1	-	1
Ward Sister	16	10	6 (37.5%)	12
Staff Nurse	20	8	12 (60%)	48
Auxiliary Nurse Midwives	16	18	-	-

Supplies to the Wards

The shortage of the following equipment and material is observed:

1. Syringes
2. Stands for I.V. fluids administration
3. Dressing materials, and
4. Cradles

The syringes are sterilised by boiling. In the absence of adequate number of syringes, the duration of boiling of syringes is likely to be inadequate.

Operation Theatre

The operation theatre complex consists of two aseptic operation theatres for major operations, one septic and one minor operation theatres. There is no dress changing room for doctors and nurses. There is neither pre-operative nor postoperative recovery room. There is no clear demarcation of protected, clean, sterile and disposal zones. There are only two sets of instruments for each type of operations. The operations are sometimes held up due to shortage of instruments. Theatre is not air-conditioned. There is no central pipeline for oxygen, nitrons oxide and suction. In case of electricity failure, there is no adequate and safe arrangements for lighting. At present, torch lights and petromax lights are provided to meet such an emergency.

There is no separate central sterile supply department (CSSD) in the hospital. The sterilisation room is attached to operation theatre complex. The sterilisation room caters to the requirements of the operation theatre complex and requirements of the dressing material to the entire hospital. The main sterilizer is out of order for over a year. Only one small sterilizer is functioning.

The staffing pattern of. the operation theatre is as follows:

Sister-incharge	- 1
Staff Nurse O.T.	- 2
Attendant	- 2

The table shows that on an average each aseptic operation theatre conducts two major operations per day.

Routine investigations like blood, urine and stool examination and special investigations like histopathological examination are carried out by the laboratory. There is no separate central sample collection room. The samples of both out patients and inpatients are collected inside the laboratory creating much inconvenience to staff and patients.

Pathologist	1	
House-Surgeon	1	
Lab. Technician	4	) Qualified - 1
		) Trained - 3
Ward Boys/Attendant	3	
Sweeper	1	

There are two types of stores. General and Medical Store. The general store is located in a room on the ground floor adjacent to the research laboratory. The medical store is located in a room at the basement. Linen, laboratory equipment and reagents are transferred immediately after receipt to Matron and Pathologist respectively and they maintain their stores. The general store room is very congested. Most of the space is occupied by the items to be condemned. The medical store is quite spacious and medicines are well arranged. However, there is shortage of drugs.

TABLE 4

TOTAL MAJOR AND MINOR OPERATIONS WITH DAILY AVERAGES DURING ONE YEAR

Type of Operation	Obst. Cases	Gynae cases	Others	Total	Average per day		
					Per aseptic O.T.	Per septic/minor OT	Total
Major	690	904	12	1606	2.2	-	4.4
Minor	3013	2148	27	4288	-	5.8	11.7
Total	3703	3052	39	5894*	2.2	5.8	16.1

* Note: Does not include episiotomies, suturing of the perineal tears and blood transfusions.

Medical Record Department

The Medical Record Section is in its infancy state. The medical record section is located in the ground floor of the cancer block. One pharmacist is in-charge of the section. He is under direct supervision of the Medical Superintendent. Patient admission number is given in the Admission Room and not in the medical record section. Registers on admission, discharges and deliveries are maintained in medical record section. Filing and indexing system is not in existence. Case-sheets of deaths are not sent to medical record section as they are under the custody of Registrar. Case-sheets of all paying and CGHS patients are deposited in the main office after making necessary entries in medical record section.

Mobile Dispensary

The hospital is operating a mobile dispensary twice a week (Tuesday and Friday) to two different villages situated 40-45 kms. from Allahabad. There is one vehicle for the visit.

The staffing pattern of the Mobile dispensary is as follows:

Doctor	1
Compounder	1
Driver	1
Cleaner	1

The main function carried out by the mobile dispensary is treatment of minor ailments and screening of the patients for further referrals. The attendance of the patients of the mobile dispensary ranged from 28 to 45 patients with an average of 35 patients per day.

Based on this study and the foregoing discussion the study group made following recommendations.

General Recommendations

1. Administration

To avoid the administrative dichotomy the Administrator

of the hospital should be made; responsible for total administration of the hospital. The Medical Superintendent should work only in the area of medical administration. It is important to *identify one officer of the hospital to be chief*, responsible for planning as well as implementation of all the objectives of the hospital.

2. *Medical College Staff*

Medical college teaching staff is deputed to the hospital for the purpose of patients care which comprises of almost half of the hospital staff. There is complete segregation of the wards etc. which are being looked after by the medical college staff and by the hospital employed medical staff. Such an organisation is not conducive for unified functioning of the hospital. We got the impression that the medical college staff has no involvement or commitment to achieve the objectives of the hospital. They are only concerned with the training activities. Such an organisations leads to malfunctioning of the patient care.

It was further observed that even the resident staff i.e. Registrars, House Surgeons etc. are employed by the medical college for use in the hospital. None of the above mentioned staff is answerable to the hospital administration and this result in complete dichotomy within the functioning of the hospital. Such a situation is counter-productive and early steps should be taken to ractify the same.

To begin with all the house staff should be recruited by the hospital and be under the direct administrative control of the hospital administration. Later on the teaching staff should also be brought under the administrative control of the hospital administration so long as they are working in the hospital. This reorganisation is of great importance and should be given serious consideration by the authorities.

3. *Incinerator*

In a maternity hospital lot of dead tissues material is generated which needs safe disposal and incinerator is absolutely essential. The hospital can have a brick incinerator for this purpose to start with and later on endeavors should be made to install an oil fire regular

incinerator. In the main report essential recommendations have also been made with reference to blood bank, staff quarters, transport, telephone/intercom, firefighting, parking and Dharamshala.

4. *Strengthening of Medical Staff*

In some of the crucial areas the medical staff is inadequate. Anaesthesia, laboratory services and radiology services need a relatively senior professional in each department to work with the Head of the Departments. Early steps should be taken to recruit the above said staff.

Three or four General Duty Medical Officers may also be inducted in the medical staff organisation which will enable the administration to provide medical cover to all the areas of the hospital round the clock.

Short-Term Recommendations

1. *OPD Complex*

There should be a Central Registration fee collection counter in the existing OPD complex. The Central Hall and the adjoining corridor, right side of the cancer block, may be utilised as a waiting hall for the patients.

A laboratory technician should be in the OPD to conduct the routine investigations of the ante-natal cases. He may be located in the left corridor near the bathroom.

2. *Emergency Services*

The existing admission room should exclusively be used as examination-cum-observation room for the emergency admissions. The existing matron room may be converted as a working room for doctors and nurses. Matron's office may be shifted to the vacant room near to Assistant Medical Superintendent on the ground floor. The admission-cum-emergency room should be equipped with suction apparatus, oxygen cylinder and other equipment necessary for resuscitative measures.

3. *Medical Records Department*

As a short-term measure at least two qualified medical

record technicians should be appointed, or someone from the hospital may be sent for training in medical records science in one of the recognised training centre's.

4. *Wards*

(a) Reorganisation

The bed complement of the hospital, may be increased from 181 to 200. The delivery suits should be located near to Admission/Emergency Room in the ground floor rather than in the first floor to overcome the hurdles like Elevator going out of order and lack of ramp. The existing four wards, Ante-natal, Post-natal and Post-operative wards should be reorganised to segregate the Aseptic and Septic, post-operative and post-natal and gynae cases. The reorganisation will lead to the following wards:

1. Ante-natal ward
2. Gynae ward
3. Aseptic post-natal ward
4. Aseptic post-operative ward (obstetrics)
5. Aseptic post-operative ward (Gynae)
6. Septic post-natal/post-operative ward (obstetrics)

A flow-chart of patients and the lay-out of the above wards was also suggested.

(b) Facilities in the Ward

Each ward should have will equipped treatment room, nursing station, store-room and the equipment.

Treatment Room

The treatment room should have the following equipment:

<i>Equipment</i>	<i>Quantity</i>
Cough examination	1
Trolley, dressing	1

There should be at least one Nurses' lavatory and cloakroom in each floor. As an immediate measure one lavatory and cloakroom may be provided in the ground floor.

The toilet which is now being used as ward I store on the ground floor on the left end of the main corridor should be vacated for using as patients' toilet.

(c) *Supplies*

The shortage of dressing materials and syringes should be avoided as it affect the quality of care.

(d) *Staff*

The present Matron, 'who is a senior most# ward sister officiating as a Matron, does not possess the desired qualification and training. A well qualified Nursing Suerinten-dent may be appointed to manage the Nursing Services. The sanctioned posts of Nursing Staff should be revised. The shortage of ward sisters (37.5%) and staff nurse (60%) should be filled at an early date.

At present. Matron, controls all group 'D' employees. This should be instead managed by the sanitary inspector. He will look after the routine administration of all categories of group 'D' employees. Therefore, a post of Sanitary Inspector may be created to look after the general cleanliness of the hospital.

Operation Theatre

(a) *Physical Facilities Reorganisation*

A post-operative observation room and a changing room for doctors and nurses has to the provided, as these facilities are non-existence. The special examination room may be utilised, as a dress changing room for doctors and nurses. Office on the ground floor may be utilized as a post-operative observation room. Medical Superintendent's chamber and office may be shifted to the Research Laboratory rooms as these areas are not in use except as a store for research laboratory equipment is going to be shifted from this area shortly. The changing room and Anesthetist room will be in clean zone, minor OT, washing room, major OT and sterilization room will be in sterile zone. To introduce zoning system a few modifications were also suggested.

The number of sets of instruments for major operations

should be increased to at least five. All the available sterilization machines should be in working condition. Central gas pipeline for oxygen suction and nitrous oxide should be installed. There should be safe and adequate alternative arrangements like emergency light to meet the emergencies due to power failure. The use of petromax should be stopped immediately as it is most unsafe to use in Operation Theatre.

Dispensary

At present no medicines are issued to the patients attending the OPD. It is suggested, that basic medicines must be issued from the dispensary to OPD patients.

Laboratory Services

One separate room should be made available for sample collection. A vacant room adjoining the laboratory may be utilized for this purpose. One lower division clerk must be appointed to look after the clerical work of the laboratory. A provision should be made to appoint two medical officers/junior pathologists, on regular basis. The present system of deputing one house-surgeon from wards on rotation should be stopped. Money receipt book should be certified by Account Section prior to their supply to pathology department.

No investigations, other than those not done in the hospital, should be ordered from outside. It was noted that the medical college staff orders investigation on their patients from outside.

Medical Store

The following measures are recommended to relieve the congestion in the stores:

- a. The printed records and registers should be directed to Medical Records Section.
- b. The stationery for office use should be diverted to Hospital's office.
- c. The items to be condemned should be condemned at an early date and disposed off suitably.

A qualified pharmacist must be appointed as medical store-keeper (msk) to look after the medical store. One more pharmacist should be posted to help him. The indent and supply should be made once in a fortnight. Different dates should be fixed for each ward and operation theatre.

The hospital should construct the following blocks:

1. Administrative block;
2. Opd complex and emergency block; and
3. Service department complex.

1. *Administrative block*

The separate administrative complex will minimise the traffic in the main hospital and increase the bed strength in the main hospital. It should be a two-storeyed building.

Ground floor

The ground floor should house the following facilities:

1. General store;
2. Workshop; and
3. Garrages.

First floor

The first floor should house the following facilities:

1. Administrative offices;
2. Medical record department;
3. Conference room;
4. Seminar room; and
5. Library.

2. *Opd and emergency complex*

The opd complex should be a two-storeyed building. *Ground floor*

1. Out-patient service
2. Emergency services.

First floor

1. Laboratory
2. Miscellaneous services

The following areas should be provided on the ground floor:

1. Reception, Central Registration-cum-collection counter.
2. Consultation-cum-examination rooms.
3. A Dispensary.
4. One room for clinical pathology for routine laboratory investigations.
5. Casualty department with one examination-cum-observation hall. The examination-cum-observation hall should have two examination tables and six observation beds and a nursing station.
6. The Doctor's Duty Room.
7. One operation theatre to perform emergency operations.
8. Common waiting place for patients.

The site between the cancer block and the post-partum ward and operation theatre complex of the main hospital building should be utilized for construction of OPD complex.

3. *Service Block*

The service block may be a separate one or it may be combined with OPD complex. The service block should have Laundry and CSSD.

4. It is also proposed that an amenity centre should be opened near the existing sheds, meant for the relatives of indoor patients. It should include a drug shop, fruit shop and Tea and snack shop.

Lkkjk'k

कमला नेहरू स्मारक अस्पताल, इलाहाबाद जवाहर लाल नेहरू स्मारक न्यास व कमला नेहरू स्मारक न्यास द्वारा संयुक्त रूप से संचालित किया जाता है। सन् 1941 में इसकी स्थापना के बाद से इसमें विशेषतः इसके

विस्तार के सम्बन्ध में अनेकों तीव्र परिवर्तन हो चुके हैं। इस संख्या पर जिस बात का प्रतिकूल असर पड़ा वह दो अवसरों पर अस्पताल के प्रशासन व नियन्त्रण का राज्य सरकार को स्थानांतरित किया जाना है। ऐसा मुख्य रूप से अस्पताल न्यास के पास स्रोतों के अवरोध के कारण हुआ। न्यास से सरकार और इसके विपरीत प्रबन्धकीय परिवर्तनों के साथ-साथ जगह तथा सामान की कमी और अस्पताल की सेवाओं के उचित उपयोग न होने की बढ़ती समस्याओं का गहन अध्ययन करने किये जाने की आवश्यकता उत्पन्न हो गई थी। न्यास के अनुरोध पर लेखकों ने संस्था व उसकी समस्याओं का गहन अध्ययन करने के लिए सात दिन वहां बिताये और अ- वर्तमान संगठन का पुर्नगठन करने और ब- अस्पताल के भविष्य के विकास के लिए अपनी रिपोर्ट प्रस्तुत की। उक्त पहलुओं का एक अस्पताल के सम्बन्ध में अध्ययन करने में अपनाई कार्यविधि तथा विश्लेषण की प्रक्रिया को इस पेपर में व्याख्या की गई है।

REFERENCE

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ON A PROBABILITY MODEL FOR INTERIOR BIRTH INTERVAL

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ABSTRACT

Under simplified assumptions a model is derived for an interior birth interval: a closed birth lying entirely within a given segment of marriage duration. It may be also used to describe closed birth interval lying between two survey dates. Method to find out moment estimates of the parameters are outlined. The application of the model is illustrated through three observed sets of data taken from a survey entitled "Rural Development and Population Growth - A Sample Survey 1978".

The study of birth intervals is increasingly attracting the attention of researchers on account of their possible use as sensitive indices to detect changes in the level of fertility which may be due to natural or unnatural causes, e.g., sterility, use of contraception, etc. Several authors^{1,2,3, 4,5,6} have proposed probability models for closed birth intervals and have examined their suitability to describe data obtained mainly from retrospective enquiries. Since information on certain duration variables, especially, when they relate to long past, suffer from recall lapse, prospective studies, have been adopted for analysing such data. A number of probability models dealing with straddling, forward and interior birth intervals have been suggested for which data are collected under prospective or follow-up surveys^{7,8, 9,10}.

In this paper, a model has been presented to describe the data on birth intervals which lie entirely within a given segment of marriage duration. It may also lie between two survey dates. Such intervals are called interior birth intervals. Their distributions are different from those of usual closed birth intervals. The model is derived in section 2. A procedure to find out the estimates of the parameters by the method of moments has been outlined in Section 3. For

illustration, the proposed model has been applied to three observed sets of data taken from a survey entitled "Rural Development and Population Growth - A Sample Survey 1978" in Section 4.

Model

Let $T_0, T_0+T_1, T_0+T_1+T_2, \dots$ be the time of recording of successive births to a married female since a given time t_1 , where T_1 is the time of first recording since t_1 and is the time between the i^{th} and $(i+1)^{\text{th}}$ recording. Now suppose a female of a given marital duration is observed between time points t_1 and t_2 ($t_1 < t_2$) and the time of occurrences, of successive live births are recorded. The interval between i^{th} and $(i+1)^{\text{th}}$ recording ($i \in \mathbb{N}$) occurring in a time period (t_1, t_2) , say $x^2(t_1, t_2)$ is defined here as interior birth interval of order i .

The human reproduction system has been considered as a Markovian renewal process and have shown that it attains the equilibrium after four to five years from marriage¹¹. Thus if t_1 is distant point since marriage and if we assume that the parameters of reproduction are constant in recent past prior to t_1 , the process may be assumed to be in equilibrium process at time t_1 . Further, let us assume that the parameters do not change after t_1 .

Now under the assumptions (i) a constant risk of conception, m (ii) one to one correspondence between a conception and a live birth and (iii) a constant period of non-susceptibility denoted by h associated with each delivery; T_i ($i \geq 1$) has a common density function (p.d.f.) $f(t/h)$:

$$f(t/h) = me^{-m(t-h)}, \quad t > h \quad (2.1)$$

and the p.d.f. of T_0 , $f_0(t/h)$:

$$f_0(t/h) = \frac{1-F(t/h)}{\mu} = \begin{cases} \frac{1}{1-mh} & 0 < t < h \\ \frac{m}{1+mh} e^{-m(t-h)} & t > h \end{cases} \quad (2.2)$$

where μ is instantaneous birth rate which is the mean of T_i ($i \geq 1$) and $F(t/h)$, the distribution function corresponding to the density function $f(t/h)$.

The distribution function of the random variable $X_1(t_1, t_2)$, say $H_1(t/h)$, is

$$H_1(t/h) = \frac{P\left\{T_i \leq t \cap (T_0 + T_1 + \dots + T_i \leq T)\right\}}{P\{T_0 + T_1 + \dots + T_i \leq T\}} \\ = \frac{\int_0^t P\{T_0 + T_1 + \dots + T_{i-1} \leq T-u/T_i = u\} f(u) du}{P\{T_0 + T_1 + \dots + T_i \leq T\}} \quad (2.3)$$

and the corresponding density function, say $g_1(t/h)$, is

$$g_1(t/h) = \frac{P\{T_0 + T_1 + \dots + T_{i-1} \leq T-t\} f(t/h)}{P\{T_0 + T_1 + \dots + T_i \leq T\}} \quad (2.4)$$

Since $T_0, T_1, \dots, T_i$ are mutually independent, the p.d.f. of $T_0 + T_1 + \dots + T_i$, say $f_{i+1}^*(t/h)$, is

$$f_{i+1}^*(t/h) = \left\{ m/(1+mh) \right\} A(i, m(t-ih)), \quad ih < t < (i+1)h \\ = \left\{ m/(1+mh) \right\} \left\{ A(i, m(t-ih)) - A(i+1, m(t-i+1)h) \right\} \\ (i+1)h < t < \infty \quad (2.5)$$

where

$$A(n, c) = 1 - e^{-c} \sum_{j=0}^{n-1} \frac{c^j}{j!}$$

and thus the corresponding distribution function, say

$$F_{i+1}^*(t/h) = P_0\{T_0 + T_1 + \dots + T_i \leq t\},$$

is given by

$$F_{i+1}^*(t/h) = \left\{ i/(1+mh) \right\} \left\{ m(t-ih) - \sum_{s=0}^{i-1} A(s+1, m(t-ih)) \right\} \\ ih < t < (i+1)h \\ \left\{ 1/(1+mh) \right\} \left\{ mh + \sum_{s=0}^i A(s+1, m(t-i+1)h) \right. \\ \left. - \sum_{s=0}^{i-1} A(s+1, m(t-ih)) \right\} \quad t > (i+1)h \quad (2.6)$$

Therefore, $g_i(t/h)$, the p.d.f. of the random variable $X_i(t_1, t_2)$ for $i = 1$, becomes

$$g_1(t/h) = \left[me^{-m(t-h)} - \left\{ me^{-m(T-2h)} / (1+mh) \right\} \right] / F_2^*(t/h), h < t < T-h$$

$$= \left\{ m^2 e^{-m(t-h)} (T-t) / (1+mh) \right\} / F_2^*(T/h), T-h < t < T \quad (2.7)$$

Again for $i > 1$

$$g_i(t/h) = me^{-m(t-h)} \left\{ mh + \sum_{s=0}^{i-1} A(s+1, m(T-t-ih)) \right.$$

$$\left. - \sum_{s=0}^{i-2} A(s+1, m(T-t-i-1h)) \right\} / \left\{ F_{i+1}^*(T/h) (1+mh) \right\}$$

$$h < t < T-ih$$

$$= \left\{ me^{-m(t-h)} \left\{ m(T-t-i-1h) - \sum_{s=0}^{i-2} A(s+1, m(T-t-i-1h)) \right\} \right.$$

$$\left. / \left\{ F_{i+1}^*(T/h) (1+mh) \right\} \right\}, T-ih < t < T-(i-1)h \quad (2.8)$$

Estimation

If the female consists of q distinct groups with respect to the period of non-susceptibility, h , and p_i is their proportion in i^{th} group with $h = h_i$ ($i=1, 2, \dots, q$), $0 < p_i < 1$ and

$\sum_{i=1}^q p_i = 1$, then the expected proportion of females with at least i births in (t_1, t_2) is $\sum_{i=1}^q p_i F_{i+1}^*(T/h_i)$, of which

$$\sum_{i=1}^q p_i F_{i+1}^*(T/h_i) g_i(t/h_i) dt \quad (3.1)$$

is expected to have the length of the i^{th} order interior interval in $(t, t+dt)$. Thus, the p.d.f. of $X_i(t_1, t_2)$ is

$$g_i(t) = \frac{\sum_{i=1}^q p_i F_{i+1}^*(T/h_i) g_i(t/h_i)}{\sum_{i=1}^q p_i F_{i+1}^*(T/h_i)} \quad (3.2)$$

Moments

When 'h' is same for all females, the r^{th} order moment ($r \geq 1$) of the random variable $X_i(t_1, t_2)$ about zero for $i = 1$ is given by

$$\begin{aligned}
 E(X_1^r(t_1, t_2)/h) &= \frac{1}{F_2^*(T/h)} \frac{r!}{m^r} \left[\sum_{u=0}^r \frac{(mh)^u}{u!} - \frac{e^{-m(T-2h)}}{1+mh} - \right. \\
 &\quad \left. \left\{ (r+2) \sum_{u=0}^r \frac{\{m(T-h)\}^u}{u} - \sum_{u=1}^r \frac{m(T-h)\}^u}{(u-1)!} \right\} \right. \\
 &\quad \left. + \frac{e^{-m(T-h)}}{1+mh} \left\{ (r+1) \sum_{u=0}^r \frac{(mT)^u}{u} - \sum_{u=1}^r \frac{(mT)^u}{(u-1)!} \right\} \right. \\
 &\quad \left. - \frac{1}{1+mh} e^{-m(T-2h)} \left\{ \frac{(m(T-h))^{r+1}}{(r+1)!} - \frac{(mh)^{r+1}}{(r+1)!} \right\} \right] \quad (3.3)
 \end{aligned}$$

Also for $i > 1$

$$\begin{aligned}
 E(X_i^r(t_1, t_2)/h) &= \frac{1}{F_{i+1}^*(T/h)} \frac{r!}{m^r} \left[\sum_{u=0}^r \frac{(mh)^u}{u!} - \frac{e^{-m(T-i+1)h}}{1+mh} \right. \\
 &\quad \left. \left\{ (r+i+1) \sum_{u=0}^r \frac{\{m(T-ih)\}^u}{u!} - \sum_{u=1}^r \frac{\{m(T-ih)\}^u}{(u-1)!} \right\} \right. \\
 &\quad \left. + \frac{e^{-m(T-ih)}}{1+mh} \left\{ (r+i) \sum_{u=0}^r \frac{\{m(T-i-1)h\}^u}{u!} - \sum_{u=1}^r \frac{\{m(T-i-1)h\}^u}{(u-1)!} \right\} \right. \\
 &\quad \left. + \frac{e^{-m(T-ih)}}{1+mh} \sum_{s=0}^{i-2} \sum_{k=0}^s \sum_{u=0}^r \frac{(mh)^{r-u} (m(T-i-h))^{k+u+1}}{(k+u+1)! (r-u)!} \right. \\
 &\quad \left. - \frac{1}{1+mh} e^{-m(T-i+1)h} \sum_{s=0}^{i-1} \sum_{k=0}^s \sum_{u=0}^r \frac{(mh)^{r-u} \{m(T-i+1)h\}^{k+u+1}}{(k+u+1)! (r-u)!} \right] \quad (3.4)
 \end{aligned}$$

The distribution (3.2) involves $2q$ parameters $h_1, h_2, \dots, h_q, p_1, p_2, \dots, p_{q-1}$ and m . Assuming that h takes only two values h_1 and h_2 with respective probabilities p_1 and p_2 , $0 < h_1 < h_2$, $0 < p_1 < 1$, $p_1 + p_2 = 1$, the p.d.f. of $X_i(t_1, t_2)$ given by expressions (2.7) and (2.8) reduces to

$$g_i^*(t) = \frac{\sum_{l=1}^2 p_l F_{i+1}^*(T/h_l) g_i(t/h_l)}{\sum_{l=1}^2 p_l F_{i+1}^*(T/h_l)} \quad (3.5)$$

which involves four parameters h_1, h_2, p_1 and m . A procedure has been outlined to obtain moment estimates of the parameters m and p_1 and their asymptotic variance covariance matrices, for known values of h_1 and h_2 . The method can be extended on similar lines when h takes more than two values.

For consideration a random sample n from $g_i^*(t)$ given by equation (3.5). It may be denoted by $m'_{i,1}$ and $m'_{i,2}$ respectively sample mean and second sample moment about zero. For known values of h_1 and h_2 the moment estimates of m and p_1 , say $\tilde{m}$ and $\tilde{p}_1$ respectively, can be obtained by equating these two sample moments with corresponding theoretical expressions. The asymptotic variance - covariance matrix of the estimators $\tilde{m}$ and $\tilde{p}_1$, say W , is given by

$$W = J V J'$$

where

$$J = \begin{bmatrix} \frac{\partial u'_{i,1}}{\partial m} & \frac{\partial u'_{i,1}}{\partial p_1} \\ \frac{\partial u'_{i,2}}{\partial m} & \frac{\partial u'_{i,2}}{\partial p_2} \end{bmatrix}^{-1}$$

$\begin{matrix} m=m \\ p_1=\tilde{p}_1 \end{matrix}$

$$V = \begin{bmatrix} \text{var.}(m'_{i,1}) & \text{cov.}(m'_{i,1}, m'_{i,2}) \\ \text{cov.}(m'_{i,1}, m'_{i,2}) & \text{var.}(m'_{i,2}) \end{bmatrix}$$

and

$$\text{Var. } (m'_{i,r}) = \frac{1}{n} \{ \mu'_{i,2r} - (\mu'_{i,r})^2 \}$$

$$\text{Cov. } (m'_{i,r}, m'_{i,s}) = \frac{1}{n} \{ \mu'_{i,r+s} - \mu'_{i,r} \mu'_{i,s} \}; r, s \geq 1,$$

where $\mu'_{i,r}$ ($i, r \leq 1$) is the r^{th} row moment of $X_i(t_1, t_2)$.

When a sample is drawn from a population homogeneous with respect to non-susceptible period which is of duration h , the distribution of $X_1(t_1, t_2)$ involves only one parameter for known h . The moment estimate m is the solution of equation $m'_{i,1} = \mu'_{i,1}$ and the variance is $\frac{(\mu'_{i,2} - (\mu'_{i,1})^2)}{m}$.

Application

For illustration, the model has been applied to three sets of observed data on interior birth intervals taken from a survey entitled "Rural Development and Population Growth A Sample Survey 1978" conducted by Demographic Research Centre, Banaras Hindu University. It is, worthwhile to mention here that the investigation consists of a baseline survey conducted in 1978 and 6 rounds of prospective survey conducted during period from April, 1978 to March, 1981. The reference date of the baseline survey was March 25, 1978. It is important to note that the study of interior birth intervals lying in three years starting from the reference date of baseline survey and final round of prospective survey may not be appropriate due to small number of females with atleast one such interval. To have an adequate number of females with such intervals, a longer duration of observational period is required. Consequently, we have taken the interval lying in April, 1975 and March, 1981. The married females enumerated in baseline survey and remaining in the unbroken marital status till the reference date of the final round of the prospective survey are considered. The distributions of the length of interior birth interval of different orders' occurring between 1975-81 to these females are analysed in this section. Because of the assumption in the model that the start of observational period is a distant point since marriage, the females with five or more years of marital duration in April 1975 have been considered. In this case $T = 6$ years.

Now, the probability distribution derived in section 2 can be used for analysing the data of the in order interior interval ($i > 1$) of females having at least ($i+1$) births in between 1975-81. In the present survey, 1,022 and 293 females respectively have experienced two or more and three or more births during April 1975 and March, 1981. For homogeneity in fertility characteristics, these females are classified into four groups on the basis of their marital duration as in 1975. The groups I, II, III and IV relate to females with marital duration 5-10, 10-15 and 15-20 and 20 and more respectively. The females with marital duration 20 or more years (Group IV) in the present analysis are not taken into account due to paucity of adequate number of observations. Further, to have considerable number of observations in each of the first three groups, the data on distribution of the length of first order interior birth intervals of females with two or more births have been considered and are given in Table 1.

In the "Demographic Survey of Varanasi (Rural) 1969" conducted by Demographic Research Centre, Banaras Hindu University, the duration of post-partum amenorrhoea (PPA) associated with a live birth was found to be 9 months (0.75 years). Further, analysis of data revealed that the distribution of this duration is perhaps bimodal with peaks occurring between 0-4 and 10-14 months. This indicates that the population, perhaps, consists of two groups with respect of PPA; one with low average duration of PPA and the other with high average duration of PPA. Therefore, the distribution of non-susceptible period, h , is taken as $h_1=1.00$ year and $h_2=1.75$ years with respective probabilities p_2 and $1-p_1$.

The values of first two sample moments (in years) of the first order interior birth interval for the three groups are

	Group		
	I	II	III
$M'_{1, 1}$	2.51	2.65	2.69
$M'_{1, 2}$	7.08	7.88	8.09

The distributions and $X_1(t_1, t_2)$, derived on the assumption that sampling is done from the population (i) homogeneous

TABLE 1

OBSERVED AND EXPECTED DISTRIBUTIONS OF THE FIRST ORDER INTERIOR BIRTH INTERVAL 15 AND 15-
FOR FEMALES WITH EFFECTIVE MARRIAGE DURATIONS 5-10, 20 YEARS

Time in years	Observed freguen- cies of Group I	Expected Variable h	frequencies Constant h	Observed freguen- cies of Group II	Expected Variable h	frequencies Constant h	Observed freguen- cies of Group III	Expected Variable h	frequen- cies Constant h
Less than or equal to									
1.5	51	45.43	153.58	31	23.34	84.96)	16	11.47	41.35)
1.5 - 2.0	96	105.91		57	63.45		28	31.82	
2.0 - 2.5	132	134.43	112.97	79	84.96	68.20	47	46.39	34.89
2.5 - 3.0	87	0A £1	91.66	58	59.96	57.47	30	31.50	29.19
3.0 - 3.5	67	54.59	57.52	46	40.84	43.31	21	21.16	22.77
3.5 - 4.0	26	32.07	38.91	30	26.23	31.32	15	14.44	18.32
4.0 - 4.5	17	18.27	24.56	18	16.78	23.71	9	8.69	13.54
greather than 4.5	15	13.69	21.80	10	13.44	20.03	6	6.53	11.95
Total	491	491.00	491.00	329	329.00	329.00	172	172.00	172.00
χ^2		5.84	14.13		5.81	8.44		2.40	9.62
d.f.		5	5		5	5		5	5
M		0.7812	0.7213		0.6155	0.5447		0.5877	0.5201
Pi		0.2271			0.1608			0.1241	
Var.(m)x10 ⁻³		0.83	5.42		1.34	6.43		2.53	9.43
Var.(P1)x10 ⁻³		7.34			9.24			10.25	
Cov.(m , P1)x10 ⁻³		- 0.13			- 0.25			-0.32	

with respect to h ($h = 1.5$ years), (ii) heterogeneous with respect to h (population is a mixture of two distinct homogeneous sub-groups in proportions p_1 and $1-p_1$ with values of h being 1.00 and 1.75 respectively) , are fitted to the three sets of data by the method of moments. The distribution for each set is given in Table 1. The estimates of parameters and their estimated variances and co-variances is also given in Table 1.

The distribution which assumes h , to be same for all females fails to explain the observed frequency in first cell.

The computed values of chi-square statistic under the model with variable h , are insignificant for all the three sets of data. It should be noted that the computed values of chi-square statistic for constant h are consistently larger than that from variable h . This is also in agreement with the observation on PPA that female population are in two groups: one with low average value of PPA of about 0.25 years and the other one with high average value of PPA of about 1.00 year. The estimates of the percentage of females with high value of PPA ($X-p^{\wedge}$) are 0.78, 0.84 and 0.88 for the Groups I, II and III respectively. This finding is also in agreement with the reports of several studies indicating that duration of PPA increases with the age of mother.

The estimate of m , the live birth conception rate, is found to decrease with increase in marriage duration. The moment estimates of m , obtained using distribution (3.2) are 0.7812, 0.6155 and 0.5877 during 5-10, 10-15 and 15-20 years of marriage duration respectively.

In the present survey the average age of females at return marriage was found to be 15 years. Thus, the estimated values of m for the Groups I, II and III relate to the age intervals 20-25, 25-30 and 30-35 respectively.

It is important to mention that the length of birth interval computed from data relating to long past generally suffers from recall lapse, under reporting of children ever-born, etc., hence the estimates based on such data may not be reliable. The intervals dealt in the present paper relate to the births occurring between a short segment and are very near to survey date, and hence are expected to be almost free from these biases.

The model is derived on the assumption that the parameters of reproduction were same over time for a considerable period before the start of the observation and also during the period of observation (t_1 , t_2). This may not be true at the latter part of the reproductive period. Recently, the formula has been modified for the distribution of the time of recording of the i^{th} birth in an equilibrium birth process, when the fertility parameters before the start of observational period are different from those during the period of observation¹². Consequently, distribution of the interior birth intervals for the latter segment of the marriage duration can be modified. However, it is observed that if the relative changes in the parameters are small then the theoretical results presented in this paper can reasonably be applied to observed data as a first approximation.

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सामान्य अवधारणा के अन्तर्गत आंतरिक जन्म अंतराल: एक बंद जन्म जो विवाह की अवधि के दिये हुए भाग के अन्दर आता है, एक प्रतिरूप की कल्पना की गई है। इसका उपयोग दो सर्वेक्षण तिथियों के मध्य बंद जन्म अंतराल की व्याख्या करने के लिए भी किया जा सकता है। मापकों के चलन का अनुमान लगाने की विधि को बताया गया है। प्रतिरूप की उपयुक्तता "ग्रामीण जनसंख्या एवं जनसंख्या वृद्धि—एक नमूना सर्वेक्षण 1978" शीर्षक सर्वेक्षण के तीन आब्जर्व सेट के आंकड़ों से दर्शाया गया है।

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**FINANCING THROUGH HEALTH INSURANCE
AND COOPERATIVES T.R. Anand**

ABSTRACT

The development of social security schemes with reference to health insurance in India have been presented in this paper. An in-depth analysis of the financial aspects of Central Government Health Scheme and the Employees State Insurance Scheme has also been studied and presented. The development of health insurance schemes in the private and voluntary sector has also been discussed.

Development of medical care services all over the world has an intimate relationship with the development of health insurance schemes. Health insurance, in turn, has always developed in almost all the countries of the world as a part of the various social insurance schemes. It was in the earlier parts of this century that most of the social insurance schemes were initiated and consolidated in Scandinavian and European countries. In England also in the early part of this century health insurance as a part of social security was initiated. Similar developments took place in United States of America with the difference that most of the health insurance schemes came into existence not as a result of the social security schemes but more because of the voluntary community action. The health insurance as well as social security is intimately related with the development of industries in a country. Thus, the countries which have developed more rapidly on the industrial front have a better infrastructure of social security as well as health insurance schemes.

In India, the social security schemes are in the rudimentary stage with the result that health insurance as a part of these schemes is also in its formative stages as yet. The two, most important experiments that have been implemented in India are - Central Government Health Scheme and Employees State Insurance Scheme. Both these schemes follow the classical characteristics of a social insurance scheme. These are: (1) common funds from contribution from the workers as well as employers; (2) there is no co-relation between payments and the extent of benefits available.

Payments are normally graded but the benefits are uniform; (3) under such schemes there is more emphasis on meeting the basic medical needs. Therefore, the level of benefits provided are moderate;(4) the schemes are compulsory in nature and there is no option for the covered workers;(5) the benefits are claimed as a matter of legal and personal rights without any means test; and (6) the State takes active part in the administration of such social insurance schemes.

Let us have a look at the financial aspects of these two premier schemes in the country.

Central Government Health Scheme

The Central Government Health Scheme (CGHS) was started in 1954 as Contributory Health Services Scheme with the primary objective of providing comprehensive medical care facilities to the Central Government employees and their families. With a modest start in Delhi, the scheme which was experimental in nature was put on firm and permanent basis in 1957. The scheme was extended to Bombay in 1963 and thereafter it was extended to large number cities which have a sizeable number of Central Government employees population. Today, the scheme is in operation in Delhi, Bombay, Allahabad, Meerut, Kanpur, Calcutta, Nagpur, Madras, Hyderabad, Bangalore, Patna, Pune, Jaipur, Ahmedabad and Lucknow. Nearly six lakhs families are covered by the scheme and the number of beneficiaries which are enjoying the benefits is about 26 lakhs.

The scheme is financed by contributions from the government servants and grants by the Central Government. The average per family contribution is about Rs.36 per year while the average per family expenditure is Rs.326 per year. The income per year per beneficiary is a little over Rs.8 while the expenditure per year per beneficiary is almost Rs.75. The expenditure per family shows wide variations from city to city and is governed by a large number of factors which are of local in nature. The city-wise expenditure per family and per person during the last year is as under:

City	Per Family	Per Person
	Rs	Rs.
Ahmedabad	845	200
Lucknow.	705	140

Meerut	454	93
Pune	448	127
Patna	427	67
Jaipur	384	74
Nagpur	370	76
Delhi	363	82
Calcutta	266	66
Hyderabad	265	71
Bombay	255	66
Kanpur	248	50
Madras	243	60
Bangalore	188	45
Allahabad	173	33

It may be noted that while it costs Rs.200 per annum to look after one person at Ahmadabad, in Allahabad this expenditure is only Rs.33. In other cities also the variation is far too much to arrive at any positive conclusions. The expenditure at Bombay and Delhi where services are well developed and the number of beneficiaries covered is fairly large are more accurate indicators of the financial status of such a venture. In Delhi, the cost of giving services per beneficiary per annum is Rs.82 while in Bombay it is Rs.66. The break-up of this expenditure is as follows:

Name of the item	Percentage Expenditure
1. Salaries	38
2. Materials	48
3. Professional service Charges	10
4. Office expenses	2
5. Rent etc.	1
6. Equipment etc.	1
Total	100

Employees State Insurance Scheme

The ESI Scheme is one of the major health insurance schemes under the social security system in our country. The number of workers and their families covered is really very

large. Seventy-two lakh families constituting a little over two crore beneficiaries take the advantage of the medical care system under ESI Scheme. The cost of providing medical care per family per year is as under. It would be seen that the cost varies from Rs.283 per family in the State of Karnataka to Rs.109 per family in the State of Bihar. The wide variation in the cost of providing medical care is explained by the variations in the benefits offered but more so because of the variations in the organisation of services. The services being provided in the city of Delhi where the Corporation itself takes the responsibility of organising medical care services is perhaps better indicator of the possible costs that would have to be incurred under this scheme to provide reasonably good medical care services. In Delhi it costs Rs.185 to look after one family during one year. Seventy per cent of this expenditure is consumed to provide ambulatory care (dispensary service) and about 30 per cent of the expenditure is related with the activities of hospitalization. It may be noted that even with moderate benefits of medical care, the expenditure incurred under the scheme is rather heavy. The expansion of this scheme to other workers or to general public would put more financial strains on the Government.

S.No.	State	Per I.P. Unit Exp. 1983-84 in Rs.
1.	Andhra Pradesh	172
2.	Assam	133
3.	Bihar	109
4.	Chandigarh Admn.	175
5.	Delhi	185
6.	Goa	114
7.	Gujarat	253
8.	Haryana	149
9.	Himachal Pradesh	126
10.	Karnataka	283
11.	Kerala	183
12.	Madhya Pradesh	186
13.	Maharashtra	193
14.	Orissa	125
15.	Pondicherry	275
16.	Panjab	155
17.	Rajasthan	179
18.	Tamil Nadu	186
19.	Uttar Pradesh	148
20.	West Bengal	162

Other Experiments

In the non-governmental sector limited numbers of experiments have been carried out in the area of health insurance. The Milk Cooperatives of Gujarat and Maharashtra are fairing rather well in providing medical care services. The secret of success of the milk cooperatives is that these schemes are tied up with economic development schemes. The health cooperatives of Kerala are well known. These have been organised by the medical professionals themselves to generate more employment. The experience of Kerala cooperatives is not very happy in so far as the finances are concerned. Most of the cooperatives in Kerala are facing financial problems because they find it difficult to raise funds from the community for health services. The voluntary health care programme in Tamil Nadu has had a limited success. The voluntary hospitals lying under the Christian Mission sector, off late have been extending their work in communities adjoining the hospitals. The Community Health Projects of voluntary mission hospitals are gradually being converted into family health insurance programmes wherein the community getting the services is being asked to contribute. These projects are started on experimental basis with grants from the hospitals or other social agencies and over a period of time when people realise the value of such services, more and more finances are raised from the communities.

The extend and scope of such projects is limited by its very nature. There are a few *ad hoc* plans here and there for limited coverage. One such plan has been organised at the Salt Lake City, Calcutta with the help of New India Assurance Company in collaboration with a professional group known as SEBA. The scheme is called medical assistance plan. Any person can become member of the scheme by holding a specified number of shares. The cover offered to a family is for diagnostic and hospitalisation facilities against payment of an annual fee. Emergency care at night is also the part of the package offered. Such schemes are in infancy. Their financial viability is doubtful. So long as free medical services are available in the government owned hospitals, voluntary

health insurance will not find deep roots in our country. The political elite and other influential people of the society have an easy access to the free government service. The demand for medical services is then limited to the poorer segments of the society who have to subsist on governmental or free voluntary care. The richer section of economic elite do not feel the necessity of having a health insurance cover as they can buy the best of the services as and when required.

Under the present circumstances, therefore, the future of health or medical care insurance in our country is uncertain.

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भारत में स्वास्थ्य बीमा के सन्दर्भ में सामाजिक सुरक्षा योजनाओं के विकास को इस पेपर में प्रस्तुत किया गया है। केन्द्रीय सरकार स्वास्थ्य योजना और कर्मचारी राज्य बीमा योजना के वित्तीय पहलुओं का भी गहन विश्लेषण व अध्ययन किया गया है। वैयक्तिक और स्वैच्छिक क्षेत्रों में स्वास्थ्य बीमा योजनाओं के विकास की भी चर्चा की गई है।

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URBAN-SLUM PEOPLES CONCEPT OF ILLNESS

S.C. Gupta

ABSTRACT

In this paper concept of illness of urban-slum people has been studied. More than three-fourths of respondents define illness on purely somatic basis like physical discomfort, feeling unhealthy or inability to continue with one's normal activity. Taking into account age as a factor for determining one's definition of illness, it is evident that age does not seem to have any significant relation with one's definition of illness. People belonging to upper class are more likely to define illness as a state of feeling unhealthy, whereas those belonging to the middle and lower classes associate illness with one's inability to continue with work. Around one-third of the respondents seek medical care immediately after having illness. On the other hand a large numbers of people avail medical care facilities when illness has a definite effect upon their daily routine by impairing them from the normal activities. Social class does not have any significant effect upon the time of seeking medical care.

Ever since existence of mankind, man has sought help and relief from illness. Although, illness refers primarily to a person's subjective experience of ill health and is a biological phenomenon, yet its definition varies from person to person and society to society, depending upon various social, economic and cultural factors¹. It affects not only the physical state of health but also influences several other roles of the individual. There are copious evidence that morbidity and mortality rates are markedly higher among the people belonging to an urban slum areas as compared with those belonging to non-urban slum areas. In this study, therefore, efforts have been made to analyse the concept of illness as defined by the people residing in urban slum areas of Ludhiana city.

The study was undertaken with the following objectives: (i) to determine the urban slum people's perception of illness,

(ii) to study the correlation of age, occupation and social class etc. with the peoples' concept of illness, and (iii) to ascertain the state at which treatment is sought by the people.

Methodology

Three urban slum areas of Ludhiana city were selected through simple random sampling method. Sample of 100 subjects (head of families) from each area was drawn by systematic random sampling method, thus the total sample of 300 respondents was constituted. Data was collected through an interview schedule consisting structured as well as unstructured questions. For studying the impact of social class of respondents on the health behavior a socio-economic scale was prepared on the basis of respondents education, occupation and economic level.

Analysis of Data

An attempt has been made to analyse the concept of illness as defined by our respondents. About one-fifth of our respondents define illness as a state of feeling unhealthy i.e. any deviance from the normal state of health as shown in table 1. While all other i.e. about 78 per cent define ill-

TABLE 1
DISTRIBUTION OF RESPONDENTS ACCORDING TO
THEIR PERCEPTION OF ILLNESS

Definition of Illness	Total number of respondents and percentage
1. A state of feeling unhealthy	55 18.3 per cent
2. Physical discomfort or pain	101 33.7 per cent
3. Cannot do household work	59 19.7 per cent
4. Restricted to bed	80 26.7 per cent
5. Loss of appetite/Lack of interest in work/irritable behaviour	5 1.7 per cent
Total	300 100.00 per cent

ness on purely somatic basis like physical pain or discomfort or inability to continue with one's normal activity. Only two per cent of respondents give some behavioural changes being embodied in the definition of illness.

Thus it is evident that most of the population locates illness more in the physical activities of a man rather than locating it in the psychological make-up of the individual.

Taking into account age as a factor for determining one's definition of illness, it is evident that age does not seem to have any significant relation with one's definition of illness.

An attempt has been made to analyse as to whether one's socio-economic background exercises some influence in shaping one's perception of illness.

Findings revealed that the upper class people are more likely to define illness as a state of feeling unhealthy, whereas those belonging to the middle and lower classes associate illness with one's inability to continue with work as given in table 3. Therefore, it can be argued that lower and middle class people have a somatic approach towards illness whereas upper class persons define it on the basis of psychological state of feeling unhealthy or healthy.

Coming to the relationship between occupation and definition of illness it can be noted that semi-skilled and unskilled workers define illness only in physical terms whereas artisans define illness as a state of feeling unhealthy. However, the category of artisans is too small to arrive at any conclusions. Artisans are followed by owner cultivators, white-collar workers and skilled workers in that order as shown in table 4. Therefore, it can be maintained that occupation does not have any significant effect on the definition of illness and that one's definition of illness is affected more by one's socioeconomic status than by other factors.

It has already been noted that the definition of illness is affected by one's socio-economic status. But it is not only the definition of illness which is important for studying the illness behaviour. More important is the stage of illness at which an individual seeks treatment. This will give an insight into the actual behaviour of individual rather than just theoretical and superficial ideas. Though seeking medical

TABLE 2
RELATIONSHIP BETWEEN AGE AND DEFINITION OF ILLNESS

Age	Definition					Percentage and total numbers
	A State of feeling unhealthy	Physical discomfort or pain	Cannot do household work	Restricted to bed	Lack of interest in work/ loss of appetite/irritable behavior	
Upto 30 years	(13.04)	(30.43)	(23.91)	(30.43)	(2.17)	(28.05) 811
31-40 years	(16.67)	(38.10)	(14.29)	(30.95)	-	(25.7) 77
41-50 years	(18.75)	(34.38)	(25.00)	(18.74)	(3.13)	(19.3) 58
51-60 years	(14.29)	(35.71)	(14.29)	(28.58)	(7.14)	(8.7) 26
61 and above	(30.00)	(30.00)	(16.67)	(23.33)		(18.3) 55
Total	(18.29)	(33.54)	(18.90)	(26.83)	(1.83%)	(100%)300

TABLE 3
RELATIONSHIP BETWEEN SOCIAL CLASS AND DEFINITION OF ILLNESS

Social Class	Definition					Each No. of cases = 100% Total and percentage
	A State of feeling unhealthy	Physical discomfort or pain	Cannot do household work	Restricted to bed	Lack of interest in work/ Loss of appetite/irritable behaviour	
Upper	(33.33)	(27.77)	(16.66)	(22.22)	-	66 (22.0)
Middle	(14.68)	(32.98)	(21.28)	(27.66)	(3.75)	172 (57.3)
Lower	(11.76)	(44.12)	(14.76)	(29.41)	-	62 (20.7)
Total	(18.29)	(33.54)	(18.90)	(26.83)	(1.83%)	300 (100%)

TABLE 4
RELATIONSHIP BETWEEN OCCUPATION AND RESPONDENT'S DEFINITION OF ILLNESS

Occupation	A State of feeling unhealthy	Physical discomfort or pain	Cannot do household work	Restricted to bed	Lack of interest in work/ Loss of appetite/Irritable behaviour	Each total No. of cases = 100%
1. Owner Cultivators	(23.53)	(17.65)	(29.41)	(23.53)	(5.88)	31 (10.3)
2. White-collar workers	(22.73)	(29.55)	(20.45)	(25.00)	(2.27)	81 (27.0)
3. Small Business	(12.50)	(31.25)	(25.00)	(28.13)	(3.13)	59 (19.7)
4. Lowest administrative and related workers	(17.86)	(25.00)	(14.29)	(42.86)	-	51 (17.0)
5. Skilled workers	(19.05)	(42.86)	(14.29)	(23.81)	-	38 (12.7)
6. Artisans	(60.0)	(20.00)	-	(20.00)	-	9 (3.0)
7. Semi-skilled and unskilled workers	-	(70.59)	(17.65)	(11.76)		31 (10.3)
Total	(18.29)	(33.54)	(18.90)	(26.83)	(1.83)	300 (100%)

care depends upon many factors like availability of health facilities, nature of illness and to a much larger extent on the economic conditions of an individual, it will certainly give an idea as to at what stage of illness an individual defines it as severe enough to demand proper medical attention. In many cases the stage at which medical help is supposed to be required is seen as being the proper definition of illness. The condition at which treatment is usually sought by respondents is shown in table 5.

The findings revealed that more than one-third of the respondents seek medical care immediately after being ill. However, in many cases illness itself is being defined as inability to continue with one's normal activity. Another 36 per cent respondents wait and see the severity of illness before seeking any medical treatment. More than one-fourth of the respondents seek medical care only when illness has a definite effect upon their daily routine by impairing them from the normal activities.

TABLE 5

STAGE OF ILLNESS AT WHICH RESPONDENTS GO IN FOR TREATMENT

Stage		Total number of respondents and percentage		
1.	Immediately	105		
		35.0	Per	Cent
2.	Halt and see the severity of. Illness	109		
		36.3	Per	Cent
3.	When it starts interfering in day-to-day work	39		
		13.0	Per	Cent
4.	When it incapacitates one	43		
		14.3	Per	Cent
5.	Sudden illness	2		
		.7	Per	Cent
6.	No need	2		
		.7	Per	Cent
Total		300		
		(100%)		

If data are combined with the Table 2 giving definition of illness it can be observed that illness in most cases is defined as one's inability to cope with the normal activities, which is in conformity with the Sweater's study where interference with the usual activities was found to be the most important condition associated in layman's mind with illness.

The stage at which an individual seeks medical care is determined by a host of factors like general economic conditions, availability of time and medical facilities and one's working conditions.

A very clear idea about the relationship between one's socio-economic status and the stage at which a person seeks treatment is given in table 6.

The table reveals that social class does have an effect upon the time of seeking medical help. However, the effect is not as strong as was expected. The reason for such a state of affairs may be that lower class persons who define illness mainly as one's inability to continue with work are likely to seek treatment at an early stage i.e. when it impairs their economic activity. Whereas upper class people who define illness as a state of feeling unhealthy or slight discomfort may postpone medical treatment for some time probably thinking that it might cure by itself.

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इस पेपर में शहरी-स्लम निवासियों की बीमारी सम्बन्धी धारणा का अध्ययन किया गया है। तीन-चौथाई से अधिक उत्तरदाताओं ने बीमारी को विशुद्ध रूप से शारीरिक विकास जैसे शारीरिक बैचेनी, अस्वस्थ महसूस होना और अपनी सामान्य गतिविधियों के निर्वाह होने में असफल होना माना है। आयु को व्यक्ति की बीमारी सम्बन्धी परिभाषा के लिए

TABLE 6

RELATIONSHIP BETWEEN SOCIAL CLASS AND THE STAGE AT WHICH
TREATMENT IS SOUGHT

Class	Stage at which treatment is sought						Total No. of cases and percentage
	Immediately	Wait and see the severity of illness	When it starts interfering in day-today work	When it incapacitates one	Sudden illness	No need	
Upper	(35.29)	(41.1b)	(11.76)	(11.76)	-	-	66 (22.0)
Middle	(35.63)	(35.63)	(12.64)	(13.79)	(1.15)	(1.15)	170 (56.7)
Lower	(33.33)	(33.33)	(15.15)	(18.18)	-	-	64 (21.3)
Total	(35.05)	(36.36)	(12.99)	(24.29)	(0.65)	(0.65)	300 (100%)

एक कारक मानने से यह स्पष्ट हो जाता है कि आयु का व्यक्ति की बीमारी सम्बन्धी परिभाषा से कोई महत्वपूर्ण सम्बन्ध नहीं है। उच्च वर्ग के लोग बीमारी को अवस्थता की दशा के रूप में परिभाषित करते हैं जबकि मध्यम और निम्न वर्ग के लोग बीमारी का सम्बन्ध व्यक्ति की कार्य न कर सकने की सामर्थ्य से जोड़ते हैं। लगभग एक तिहाई उत्तरकर्ता बीमार होते ही चिकित्सकीय सेवाओं का उपयोग करते हैं। दूसरी ओर बड़ी संख्या में लोग चिकित्सकीय रक्षा सुविधाओं का तभी लाभ उठाते हैं जब अस्वस्थता का उनकी सामान्य गतिविधियों व दैनिक जीवन दिनचर्या पर निश्चित प्रभाव पड़ता है। चिकित्सकीय सेवाएं लेने में सामाजिक वर्ग का कोई महत्व—पूर्ण प्रभाव नहीं होता।

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