

THE HEALTH INTERVIEW SURVEY AS A TOOL FOR ESTIMATION OF PREVALENCE OF CHRONIC DISEASE IN DEVELOPING COUNTRIES

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ABSTRACT

This study evaluates the health Interview survey as a tool for estimating the prevalence of chronic disease in a community. The problems of subject bias, recall bias, telescoping and others as reported from the current experience have been discussed. Validity checks such as clinical examination, record verification, and re Interviews have also been examined for their role in overcoming problems of bias. Special problems of developing communities, such as problems of validity checks, problems of perception, problems associated with the interviewer, proxy answers, and problems of the self-administered questionnaire In an Illiterate community have been considered and discussed., Though exact estimations of prevalence may not be possible with the health Interview survey in the developing countries, still It serves as an important tool for health planners to prioritize the felt needs.

This paper attempts to address two questions: (i) is the health interview survey (household survey of morbidity using questionnaires) an adequate tool to estimate the prevalence of chronic disease in the community?; and (ii) what are the special problems, or advantages, of this method in the developing countries?

It does not propose to examine the definition of chronic disease. The attempt is only to see if once having defined what any study is attempting to measure, whether it is effective in doing so. But it should be remembered that the definitional problem is an important one.

HEALTH INTERVIEW SURVEY AS A TOOL

The important questions to be addressed when attempting to assess any methodological tool to measure morbidity are: (i) reliability; and (ii) validity. Reliability in the context of surveys would refer to the random error, and whether one can quantify it. In other words, it is a question of whether the survey can be reproduced and come up with essentially the same estimates. The question of validity relates to the question of what is being measured, i.e., whether there is any bias.

Bias can Arise from Many Sources

1. Recall Bias: When illness events are selectively remembered because of their perceived severity, hospitalisation etc.

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2. **Subject Bias:** Some illnesses may not be discussed openly with a stranger. Some illnesses, of which the sufferer is hardly aware because it does not cause much distress or discomfort, tend to be underreported.

3. **Telescoping:** When a time period is specified within which the respondent is asked about illness episode, there is a tendency for including illnesses which occurred in the immediate past, prior to the specified period. This results in an overestimate of the true prevalence for the specified period.

4. **Interviewer Bias:** Interviewers may introduce bias in reporting because of their ethnic, cultural, sex or gender characteristics. Communities may be reluctant to discuss illness episodes with persons of certain characteristics.

There are many reasons why the health interview is prone to errors. Primarily, these have to do with recall. Illness events tend to fade from memory of the respondent rather fast, and two weeks is the reasonable time limit accepted by most of the experts as within bounds of recall. Perhaps, one can argue that with chronic diseases, recall may not be such a big problem. But there tends to be recall bias in terms of selective memory of events leading to disability, hospitalisation, etc. and a tendency to selectively forget morbidity events that are not severely delimiting and of long duration.

Many techniques have been developed to deal with the problem of bias in surveys. To validate the findings in a survey, one can attempt to do one or more of the following in a sub-sample.

1. **Clinical Examination:** This is by far accepted to be the most important validity check.

2. **Reinterviews:** These have been tried in many situations, but sometimes reinterviews tend to result in underestimation as both interviewer and respondent tend to be tired.

3. **Validity Checks from Records:** Have been tried in industrialized countries, from insurance records and such. Unless the record keeping is very good, this method is not advised. There is also a considerable difference between the pattern of illnesses for which people would voluntarily seek medical help and conditions which may show up in a survey.

4. **Check on the Probability of Occurrence of Specific Illness In Different Population Strata:** This would mean, for instance, that if diabetes and heart disease were not prevalent in the older population in the surveyed community, as we expect them to be, we would probably look upon the estimates as suspicious.

5. **Constructing a List of Tracer Conditions which Would be done through During the Interview:** This would increase the prevalence estimates for many diseases that would not come up. otherwise.

6. **Interviewer Selection, Training and Supervision:** This is an important area where possibilities for bias can be considerably reduced by efforts put into the preparation of interviewers.

In another study on the measurement of chronic disease by household interview, a researcher concludes that the lay interview is not now, or likely to become, a valuable tool for measuring the prevalence of diagnosable chronic disease. Further, no consistent bias between the conditions were found when compared with the prevalence assessed from interviews and prevalence assessed, from clinical examination of a sub-sample, only 22 per cent of chronic conditions diagnosed, clinically were found from the survey data.

While evaluating the use of health interview surveys for Chronic illness measurement another researcher makes the point that although surveys underestimate prevalence when compared to clinical examination, they nevertheless have their uses. Firstly, it may be the only realistic and feasible method of measuring morbidity in many communities. Also assigning correct diagnostic categories for various chronic conditions may be less important from the point of view of health planners than assessing the amount of disability and perceived illness in the community, which directly leads to health facility utilisation. If this view is accepted, then it has to be admitted that the clinical examination and the health interview survey are essentially measuring two different states, though related.

In medically diagnosed conditions, such as hypertension, diabetes, and so forth, the degree of underreporting tends to be high in prevalence surveys. On the other hand, one can also comment that the degree of bias is likely to be least in these conditions.

It has been pointed out that the clinical diagnosis itself is the only other instrument for estimating the true prevalence of chronic disease, and that physicians by their training are inclined to accept clinical diagnosis uncritically, whereas this is also prone to fluctuations depending upon the physician, the time in the course of the illness when the examination is made, and many other factors. Thus, the issues of reliability and validity of the clinical examination has been brought out⁴. But imperfect as it is, the clinical diagnosis is likely to be closer to reality than any other feasible method at present, and therefore morbidity surveys have to be assessed in comparison with clinical diagnoses. Further, other important reasons as to why interview surveys are valuable in assessing chronic disease have been mentioned, which include: (i) getting a better demographic profile of particular illnesses; (ii) getting a broader picture of community health, such as the amount of social disruption due to disease, social indicators which would help in case finding etc.; (iii) extension of our knowledge of the natural history of chronic diseases, which are likely to be unduly biased if based on clinical or hospital records; (iv) data about the utilisation of health services in relation to conditions, which give important clues to the planners that sometimes may be at odds with the priorities set by health professionals; (v) rosters of patients for detailed epidemiological studies in the future; and (vi) data on potential causative factors in disease.

More recent literature on the use of health interview surveys for assessing chronic morbidity discuss techniques to minimise the problems discussed above. In a recent review of National Health Interview Survey in the United States, formal techniques for evaluating components of response error have been discussed⁵.

These include interpenetrating samples, reinterviews, record checks, and analytical methods. Interpenetrating samples assess non-sampling variance due to interviewers. Reinterviews can be used to assess simple response variance or response bias, or both. Record checks can be very valuable if the record keeping system is good, for estimating the error from surveys. In the reverse technique of checking records, a sub-sample selected from existing records is interviewed using standard interview techniques, and the results compared with the records. Besides these, the informal techniques for quantitative evaluation include checking the survey records for completion rates, item non-response computer edit, and consistency checks of results etc. Qualitative methods would include field supervision of interviewers by more experienced staff, frequent discussion of problems etc.

NHIS experience in morbidity estimation has been reported as: (i) interviewer variance was an important contribution to total variance of estimation during the early years of NHIS; (ii) reinterviews have shown substantial underreporting of chronic conditions; (iii) record checks have shown evidence of under and over reporting; (iv) somewhat better results could be obtained in surveys which addressed a specific disease entity or group of diseases; (v) there has been a clear positive association between completeness of reporting and salience of the condition; and (vi) in general, it can be said that demographic and socio-economic factors do not seem to play a major role in causing bias.

THE HEALTH INTERVIEW SURVEY IN DEVELOPING COUNTRIES

It has been brought out that the methodological refinements in health survey research in recent years have not been taken into account while applying them to less developed countries⁷. Most problems of health interview research in developing countries pertain to cross cultural, communication. According to another researcher, the most important problem is the one of suspiciousness. People in less developed countries are suspicious of official data collection, and cannot understand the collective anonymity of survey research. Because of their experience of exploitation from various quarters they are not ready to give intensely personal details to the comparative strangers. Secondly, in peasant societies, reliable indicators of socio-economic status are difficult to establish. This calls for a considerable skill in constructing proxy indicators of socio-economic status based on detailed knowledge of local life. There are cultural problems: Visitors are not distinguished from permanent residents of the household, the counting of people may not be culturally acceptable, children may not be counted as people, and such. Validation of interview data by clinical records or examination may also not be feasible in the less developed countries. On a morbidity measurement survey in rural Nigeria it has been reported that the interviewers and respondents had low levels of education. Further, it was revealed that though the individual symptom reliability was not so high, but the category was found to be on higher side. Other authors have used a sophisticated randomised response technique evolved in the United States for Ethiopia, and found that it works well.

The special problems of morbidity surveys in developing countries can be summed up as follows:

1. Problems of Validity Checks: Reinterviews, and clinical examination of sub-samples, are time consuming and costly.
2. Problems of Perception: Correspondence between medical concepts of illness and lay concepts are likely to be much more divergent in developing countries.
3. Proxy Answers: In many developing societies, the head of the household takes decisions regarding the rest of the family, and this means that he may take on the role of the respondent on behalf of others, and consequently, the answers are likely to be biased.
4. The Self-Administered Questionnaire: With low levels of literacy, the self administered questionnaire is not a feasible option.
5. Definition of the Illness Role: Because of the demand for manpower in agriculture, the assumption of the illness role is almost prohibited at certain times of the year.

CONCLUSIONS

Scholarly opinion tends to the view that when precise estimates of chronic disease prevalence are needed the health interview survey may be a poor substitute for other refined methods. On the other hand, it has a role in assessing morbidity for planning purposes, and it certainly has a role in estimating chronic disease where no other type of data are available, as in many developing countries. More research is needed in the use of the health interview survey in developing countries to get around some of the special problems.

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प्रस्तुत लेख में स्वास्थ्य साक्षात्कार सर्वेक्षण का एक समुदाय में दीर्घकालिक रोग का आकलन करने के साधन के रूप में मूल्यांकन किया गया है। इस लेख में वर्तमान अनुभव से प्राप्त विषय-वस्तु-प्रभाव, प्रत्यावाहन-प्रभाव, दूरदर्शिता एवं अन्य समस्याओं पर भी विचार-विमर्श किया गया है। चिकित्सकीय परीक्षण, अभिलेख सत्यापन एवं पुनः साक्षात्कार जैसे वैधता परीक्षणों का प्रभावी समस्याओं को हल करने हेतु उनके योगदान का परीक्षण संबंधी समस्याएं, अनुभूति सम्बन्धी समस्याएं, साक्षात्कारकर्ता, से जुड़ी समस्याएं, एवजी उत्तर संबंधी समस्याएं तथा प्रशिक्षित समुदाय में स्वयं तैयार की गई प्रश्नावली संबंधी समस्याओं पर भी विचार किया गया है। यद्यपि विकासशील

देशों में स्वास्थ्य साक्षात्कार सर्वेक्षण द्वारा रोग की व्यापकता का अनुमान लगा पाना फिर संभव नहीं हो सकता है, किन्तु अभी भी स्वास्थ्य योजनाकारों द्वारा अनुभूत आवश्यकताओं की वरीयता सुनिश्चित करने के लिए इसे एक महत्वपूर्ण साधन माना गया है।

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COST OF IMMUNISATION SERVICES AT INSTITUTIONAL LEVEL

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ABSTRACT

In this paper an attempt has been made to examine variations in the costs incurred by various categories, of Government health institutions in the provision of immunisation services in rural and urban areas of two districts. The total as well as unit cost and incremental cost was estimated by analysing the data collected from the records of inputs maintained by the sampled institutions and interviewing the staff of the institutions. Large variation in total expenditure on immunisation was observed among urban institutions. The variation in average cost per immunisation within and between various categories of health institutions was comparatively less and the degree of variation in average incremental cost per immunisation was further reduced. The large variation in total cost indicated the level of efficiency of functioning of those institutions studied. The problem areas for cost containment have also been identified.

In India, primary health care services are provided through a network of health institutions in rural and urban areas. One of the important component of primary health care is maternal and child health services with special reference to immunisation of the infant and children below five years and pregnant Women. Intensified and enlarged efforts have been launched by the Government of India to control and prevent mortality due to communicable diseases among infants and children below five years and neonatal tetanus among new borns. One of the strategies adopted by the Government of India was to provide immunisation services to all eligible children and pregnant women by 1990 and thus in 1985 an universal immunisation programme was implemented in a "phased manner in the administrative areas of districts with the support from the international agencies such as WHO and UNICEF. In the programme various categories of health institution involved in immunisation services in rural and urban areas were strengthened with cold chain equipments and supplies and necessary support was provided by the Central and State Governments so as to reach cent per cent coverage and maintain in the quality of services.

In a district, the district headquarter and health institutions within a district were the implementors of the immunisation services. These institutions range from hospitals through health centres to health workers in rural areas and maternal child

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health centres in urban areas representing different degree of sophistication. This has led to the variations in cost of the services provided by these institutions.

An attempt has been made to estimate the operating cost of immunisation for each category of health institution for the year 1988-89 and to assess the management of the scarce resources and their utilisation for immunisation services at various levels and also to identify the levels at which high cost was incurred on immunisation. In addition, the variation in health institutions of same category was explored for cost profile and unit cost of services.

MATERIALS AND METHOD

The study was conducted as a part of the study 'Cost Analysis of UIP at District Level' in which two districts were selected using the following criteria: (a) to include districts in which UIP was implemented during 1985-66; and (b) choice to be made out of those districts which were included in the National Review of UIP. Thus, the two districts selected were Nanded in Maharashtra and West Nimar in Madhya Pradesh.

Sampling Design: There are various categories of health institutions providing immunisation services to the rural and urban population in a district. The number of such institutions is usually large. Hence, in the selected two districts the inventory of all Government institutions providing these services was prepared. These institutions, were stratified on the basis of their location - rural and urban at the first stage and then further classified on the basis of category or type of institution as per the facilities available for the delivery of services vary in each category. Then a sample, of institution was drawn from each classified group so as to include at least one of each group in both the districts. Thus, in total five urban and 2\ rural institutions in Nanded district of Maharashtra State and three urban and 16 rural institutions in West-Nimar district of Madhya Pradesh State were selected. While drawing a sample care was taken to include institutions having more or less similar staff and .facilities in the districts (Appendix 1).

Method of Data Collection: In order to understand the profile, status of implementation of UIP, facilities available, cost composition of immunisation services, detailed discussions were held with the officials at district headquarters and at institutional level. Further, it was followed by a retrospective study of records about quantum of equipments, instruments, supplies provided by the Government of India and UNICEF and their utilisation during the year 1988-89 for immunisation services. The data on output of services provided by the institution selected for study was collected from monthly reports submitted by them. The actual availability and working condition of the equipments, instruments was observed in the field and at the institutional level.

Delphi technique was used to.-estimate staff time allocation and also for estimating percentage time utilisation of capital equipments of common use for the activities related to immunisation.

Method of Cost Analysis: The use of over complex accounting methods to determine very accurate cost of services was considered not appropriate. Costing process becomes complex and cumbersome especially when expenditure originates from different sources and integrated services were provided without proper integrated accounts of all costs for a particular programme. Hence, to estimate the total cost of the programme at institutional level it was first defined as the monetary value of all resources utilized for the delivery of services. The data in regard to inputs such as manpower, cold chain' equipments, immunisation supplies and equipments etc. were converted into monetary values.

The items of inputs were either capital with one time expenditure or recurring with repeated expenditure giving rise to capital cost and recurring cost respectively. The capital cost was estimated by annualizing the value of the capital input utilizing: (i) the annualized factor using straight line depreciation for expected useful life of the equipment; (ii) general interest rate likely, to have been received for the amount invested in capital items; and (iii) the purchase price of the capital items provided by the Government of India or UNICEF. The recurring cost of the programme was estimated by adding up the value of all inputs consumed for provision of services and undertaking other activities related to UIP,

The health institutes providing different types of services to the community utilize some of the common facilities and inputs for more than one programme whereas certain inputs are exclusively used for a particular programme.

To estimate various costs the following definitions have been used in the present study:

Total Cost: The cost of all resources (common and specific to the programme) utilized for the delivery of immunisation services.

Obligatory Cost or Indirect Cost: A proportion of cost of common facilities and inputs available in the health institutions for different activities related to more than one programme and utilized for the delivery of immunisation services.

Incremental Cost or Direct Cost: Cost of inputs exclusively utilized for the delivery of immunisation services.

Unit Cost: It is the cost per immunisation provided by the institution and is estimated by dividing the total cost of services by the total number of immunisation of different antigens administered.

RESULTS

Socio-demographic Characteristics of Population in West Nimar and Nanded Districts: The district West Nimar in Madhya Pradesh is predominantly a tribal district having 14 tribal blocks out of 16 total blocks whereas the Nanded district is predominantly rural" having 14 blocks. The district headquarter of West Nimar is located at Barwani' and none of its part is connected by rail while the district headquarter of Nanded is well connected by road, rail and air.

The total population of West Nimar district is about 19,50,000 of which 84.5 per cent lives in rural areas. The density of population is 145 per sq. km. The sex ratio (1981) of the district is 954 females per 1000 males which is higher than the State ratio of 941. The literacy rate of the district is 22.81 per cent with 33.15 per cent for males and 12.18 per cent for females. On the other hand, the total population of district Nanded is 19,36,000 of which nearly 81 per cent is rural. The density of population is 167 per sq. km. The sex ratio (1981) of 960 females per 1000 males is higher than the State average of 937. The overall literacy rate of the district is 29.7 per cent.

The district West Nimar had a birth rate (BR) of 36 births per 1000 population and infant mortality rate (IMR) of 116 per 1,000 live births as compared to Nanded district's BR of 30.7 and IMR of 90 per 1000 live births respectively.

West Nimar being tribal district had more number of health institution. Yet the new pattern of one PHC per 30,000 population was not fully implemented in all the blocks.

Total Cost at Institutional Level: Hospitals selected in the urban areas were functioning independently whereas other peripheral units like primary health centres, sub-centres and civil dispensaries were dependent on the higher authorities for resources and in performing their functions. These peripheral units have very limited financial control though they have considerable control over the utilisation of resources. This affects the expenditure pattern in those health units. Thus, detailed analysis and comparison of the operating costs of immunisation programme (1988-89) indicated that the average expenditure on programme related activities varied to a large extent between two districts for each category of health unit.

In urban area, the average expenditure for immunisation services was estimated to be Rs.2,08,370 for the three hospitals and ICDS facilities available in Nanded district and it was much higher than the estimated average expenditure of Rs.47,017 for two hospitals in West Nimar during 1988-89 (Table 1). This variation was of the magnitude of around three times. The factors contributing to the variation were availability and utilisation of infrastructure, equipment and manpower facilities at institutional level; salary structure difference in two districts; and also the output of services provided (Appendix 2).

in rural areas, the average cost incurred for provision of immunisation services at CHC level for 1,00,000 population and PHC level for 30,000 population was Rs.1,92,937 and Rs.1,49,784 respectively in West Nimar and it was Rs.1,96,172 for PHCs for 30,000 population in Nanded. The mini PHCs and civil dispensaries functioning in West Nimar spent approximately same amount of Rs.28,198 and Rs.26,595 respectively, for immunisation services whereas in district Nanded the average expenditure incurred by civil dispensaries was Rs.74,515 - nearly three times that in West Nimar. At the lowest peripheral level, namely sub-centre, the average expenditure on immunisation was Rs.10,375 in West Nimar and Rs.23,872 in Nanded. It was found that the range of total expenditure was narrower for all

TABLE 1
AVERAGE TOTAL COST OF IMMUNISATION SERVICES PROVIDED BY
HEALTH UNITS AT DIFFERENT LEVELS IN WEST NIMAR DISTRICT,
MADHYA PRADESH AND NANDED DISTRICT,
MAHARASHTRA (1988-89)

Category of Institution	Average Total Cost (in Rs.)	Average Percentage of Direct Cost/Incremental Cost
1. Hospitals		
i. West Nimar	47,017 (24693-69411)	31.8 (16.9-37.0)
ii. Nanded	2,06,370 (100000-386437)	11.1 (4.4-21.6)
2. CHCs		
i. West Nimar	1,92,937	25.0
3. PHCs		
i. West Nimar	1,49,784 (140458-159109)	29.5 (18.0-40.0)
ii. Nanded	1,96,172 (122357-294391)	9.4 (854-12.6)
4. Mini PHCs		
i. West Nimar	28,198 (18884-37153)	9.7 (9.1-10.8)
5. Dispensaries		
i. West Nimar	26,595 (22776-30419)	7.9 (3.7-13.6)
ii. Nanded	74,515 (59600-82524)	13.6 (102-16.2)
6. Sub-centres		
i. West Nimar	10,375 (4645-15978)	11.0 (4.0-25.0)
ii. Nanded	23812 (21329-286160)	6.2 (5.2-a6)
Total District		
i. West Nimar	54,38,248	18.2
ii. Nanded	126,74,069	9.2

Note: Figures in the parentheses indicate the range of variations in the estimate.

categories of health units studied in West Nimar district compared to those studied in Nanded district.

The total expenditure on immunisation described above includes the obligatory expenditure expended by district and State Governments which they would have with or without immunisation programme. Thus, the incremental/direct cost related to the programme, which forms the basis for the State and Central Government to allocate the funds to the health institutions, was examined. It is seen from Table 1 that percentage of incremental cost to the total cost of the programme was comparatively more in higher level health institutions in West Nimar. The annualized capital cost of the cold chain equipments and vehicle provided at these levels contributed to the higher incremental cost. But this was not true for Nanded district as total cost for immunisation services was high due to higher salary structure which has brought down the percentage incremental cost in all categories of health units in this district. This is evident from the total cost of the programme for the two districts which was nearly two and a half times more in Nanded district compared to West Nimar district but the percentage of direct or incremental cost of the programme was half in Nanded (9.2%) compared to West Nimar (18.2%).

Cost Composition: The institutional level classification of the programme cost permitted to look, at the relative proportion of different cost components. The breakup of the total expenditure into capital and recurring costs showed that the expenditure on recurring items mainly the manpower salary accounted for larger percentage of spending in all the categories of health institutions in both districts (Table 2).

The average contribution of manpower salary in urban units varied from 63 to 81 per cent and 86 per cent to 89 per cent in West Nimar and Nanded respectively. The high proportion in Nanded was due to higher salary structure. In rural areas this component accounted for nearly same percentage range of total cost upto CHC and PHC level in West Nimar but declined to 83 per cent in Nanded district. At the lower level, the average percentage of this component increased to more than 85 per cent in both the districts.

Conversely, the vaccine and immunisation supplies for lower level health units represented a smaller proportion of about 5 to 9 per cent of total cost compared to urban health units, CHCs and PHCs where it was more than 20 per cent for district West Nimar and about 4 to 8 per cent for district Nanded. The 'other category in recurring cost included costs relating to repair and maintenance of cold chain equipments undertaken out of contingency funds, POL for operating vehicles for the programme and contingency expenditure incurred. The contribution of this component was less than 8 per cent of total cost in health institutions at PHC level and above and was found to be negligible for peripheral units. Similar situation was observed for capital cost estimated as annualized fixed cost for equipment utilized for immunisation services. Thus, cost composition showed that the institutions

*In Maharashtra, the Fourth Pay Commission's recommendations were implemented for the payment of salary to the staff whereas in Madhya Pradesh, it was not implemented till the time of this study.

TABLE 2
AVERAGE PERCENTAGE COMPOSITION OF TOTAL COST OF
IMMUNISATION SERVICES AT VARIOUS INSTITUTIONAL LEVELS IN
WEST NIMAR AND NANDED (1988-89)

Category of Institution	Percentage Composition of Total Cost in				Others
	Capital	Salary	Vaccine Immunisation	Supply	
1. District Hospital					
West Nimar	5.1	62.9	19.1	5.7	7.2
Nanded	1.3	86.5	7.0	1.5	3.6
2. Sub-Divisional Hospital					
West Nimar	3.2	81.4	13.0	0.6	1.6
Nanded	3.0	88.9	3.6	0.7	3.8
3. CMC					
West Nimar	2.4	73.8	18.6	2.0	3.2
Nanded	-	-	-	-	-
4. PHC					
West Nimar	5.0	65.1	22.0	2.4	5.7
Nanded	5.6	83.5	4.2	1.9	4.8
5. Mini PHC					
West Nimar	0.5	90.1	7.5	0.7	1.2
Nanded	-	-	-	-	-
6. Civil Dispensary					
West Nimar	-	91.6	6.9	1.0	0.3
Nanded	4.0	85.6	4.4	2.5	3.3
7. Sub centre					
West Nimar	-	88.9	8.6	0.5	2.0
Nanded	-	93.8	5.2	-	1.0
Total District - West Nimar	2.7	81.1	10.1	3.5	2.6
Nanded	2.9	89.7	4.0	0.9	2.5

providing efficient immunisation services had lower contribution towards manpower salary but higher contribution to vaccines and immunisation supplies. Higher cost of vaccines and immunisation supplies led to more number of immunisation with the available staff and brought down unit cost of services in these health institutions. Further, it may be pointed out that no systematic difference in the cost composition was observed in these health units. The percentage distribution of total expenditure in various components of the programme in these Institutions was representative of the distribution of the total cost of the programme at the district level.

Unit Cost of Services: To explore the variation in efficiency with the level of health units, the unit cost estimates were compared among different categories of health units within two districts as well as between the two districts.

The average cost per immunisation services provided by hospitals, CHC and PHC was observed to be around Rs.5 in West Nimar district with a range of Rs.3.4 to Rs.8.0. This cost increased to Rs.10 for lower level health units with wide variation from Rs.5.6 to Rs.28.5 between health units of same category in that district. On the other hand in district Nanded, the average unit cost of immunisation services did not show any consistency but variation was large having more or less same range in all categories of health units except civil dispensaries where variation was comparatively less. The average cost per immunisation in that district (Nanded) was about Rs.24 in all type of institutions with range of Rs.12 to Rs.38 except for sub-centres where average cost was Rs.18.1 per immunisation. This unit cost is comparable with the unit cost at the district level which was Rs.11 for West Nimar and Rs.26.47 for Nanded. This cost included the obligatory cost expended by the State and district organisations for immunisation services (Table 3).

The contribution of incremental cost in the average cost per immunisation services was observed to be much less. The average incremental cost per immunisation was about Rs.2 in all the institutions of West Nimar district with range of Re.1.0 to Rs.2.3. On the other hand, in district Nanded average incremental cost per immunisation was around Rs.4 in urban units, PHCs and dispensaries with range of Rs.1.5 to Rs.5.0 except for sub-centres where average cost was Rs.1.1 with range of Re.1.0 to Rs.1.5.

The average cost per fully immunised child estimated on the basis of WHO norm of 90 per cent of measles immunisation (Appendix 2) indicated the same pattern of variation between different categories of institutions but the range of variation between institutions within same category was more due to poor performance in vaccination against measles in some of the units. The average incremental cost for fully immunised child in urban units of West Nimar district was Rs.20 with range of Rs.10.2 to Rs.23.8 and it declined to about Rs.13 in all other institutions with range of Rs.7.6 to Rs.24.1 while for Nanded district the average incremental cost per fully immunised child was Rs.26.7 in urban units with range of Rs.15.8 to Rs.90.8. For PHCs it was Rs.22.8 and increased to Rs.51.2 for civil dispensaries with range of Rs.18.9 to Rs.66.2. However, for sub-centres level the incremental cost per fully immunised child for this district was Rs.11.5 with range of Rs.7.7 to Rs.16.2.

TABLE 3
AVERAGE COST OF IMMUNISATION SERVICES PROVIDED BY HEALTH
UNITS AT DIFFERENT LEVELS IN WEST NIMAR AND NANDED (1968-89)

Category of Institution	Average Cost per Immunisation Average Cost per Fully Immunised Child		Average Cost per Fully Immunised Child	
	Total (in Rs.)	Incremental (in Rs.)	Total (in Rs.)	Incremental (in Rs.)
1. Hospitals				
West Nimar	6.04 (5.8-6.1)	1.9 (1.0-23)	59.15 (53.7-61.2)	20.0 (10.2-23.8)
Nanded	24.35 (15.2-33.0)	3.7 (1.5-5.0)	244.0 (142.0-410.1)	26.7 (15.8-90.8)
2. CHCs				
West Nimar	5.14	1.3	47.0	13.1
Nanded	-	-	-	-
3. PHCs				
West Nimar	4.65 (3.4-8.0)	1.4 (1.36-1.42)	41.8 (31.1-71.8)	13.2 (12.9-13.9)
Nanded	22.8 (12.6-38.2)	2.6 (1.8-3.4)	227.8 (127.6-394.8)	22.8 (18.9-36.1)
4. Mini PHCs				
West Nimar	13.3 (12.4-15.5)	1.3 (1.1-1.7)	125.2 (114.8-1530)	13.9 (12.3-18.3)
Nanded	-	-	-	-
5. Dispensaries				
West Nimar	12.9 (7.5-28.5)	1.0 (1.0-1.1)	120.2 (76.2-235.6)	10.8 (10.1-11.1)
Nanded	125.4 (21.9-292)	4.4 (2.2-4.7)	362.6 (341.7-404.1)	51.2 (37.4-662)
6. Sub-centres				
West Nimar	10.2 (5.6-25.1)	1.1 (0.9-13)	102.0 (28.2-353.7)	12.4 (7.6-24.1)
Nanded	18.1 (12.2-26.1)	1.1 (10-1.4)	166.4 (127.8-289.3)	11.5 (7.7-162)
Total District - West Nimar	10.95	1.99	96.97	18.78
Nanded	26.42	2.42	270.25	25.66

Note: Figures in parentheses indicate range of variations in the estimates.

These variations in unit costs, were due to a number of factors such as: (i) population and its rural/urban distribution; (ii) the delivery strategies used; (iii) size of population to be immunised; and (iv) availability of infrastructure facilities and inputs, etc. In spite of the variation in average unit cost per immunisation within and between various categories of health units, the degree of variation in the average unit incremental cost was much less. This could be attributed to factors such as: (i) only few inputs contributing to incremental cost; (ii) quantum of base inputs utilized varying with output of services; and (iii) lack of objectivity in measuring inputs in the estimation of indirect costs.

Thus, the estimate of unit costs suggests that service outputs which are being provided more efficiently in health institutions at a higher level in district health organisations. But the variations in unit costs within district between different categories of health institutions as well as within same category of institutions reflect differences in efficiency and potential for increase in resource productivity through better management of resources in majority of institutions studied. In such a situation transfer of resources from low productivity or high cost area/institutions to a high productivity or low cost area/institutions could allow greater output for no additional cost.

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प्रस्तुत लेख में विभिन्न श्रेणी के सरकारी स्वास्थ्य योजनाओं संस्थानों द्वारा दो जिलों के ग्रामीण एवं शहरी क्षेत्रों में प्रतिरक्षण सेवाएं उपलब्ध कराने संबंधी व्यवस्था पर आने वाली लागत में विभिन्नताओं का परीक्षण करने का प्रयास किया गया है। सैम्पल के रूप में चुने गए संस्थानों द्वारा व्यवस्थित आदानों के रिकार्डों से एकत्र आंकड़ों का विश्लेषण करके तथा उनके कर्मचारियों से साक्षात्कार लेकर कुल लागत के साथ-साथ इकाई की लागत में होने वाली वृद्धि का अनुमान लगाया गया है। शहरी संस्थानों द्वारा प्रतिरक्षण पर किए गए कुल व्यय में भारी विभिन्नता पाई गई थी। विभिन्न श्रेणियों के स्वास्थ्य संस्थानों के भीतर और परस्पर प्रतिरक्षण हेतु औसत लागत में वृद्धि तथा गिरावट पाई गई थी। कुल लागत में आई भारी विभिन्नता से अध्ययन हेतु चुने गए संस्थानों की कार्यकुशलता के स्तर का पता चलता

APPENDIX 1

NUMBER OF GOVERNMENT HEALTH INFRASTRUCTURE FACILITIES INVOLVED IN IMMUNISATION ACTIVITIES IN TWO DISTRICTS AND SAMPLE OF FACILITIES SELECTED FOR STUDY (1988-89)

Area	Type of Institution	Number of Institutions			
		Total	Nanded Sampled	West Nimar Total	West Nimar Sampled
Urban	Medical College and Hospital (Ayurvedic)	1	1	-	-
	Municipal Hospital	1	-	-	-
	District/Civil Hospital	1	1	5	2
	Post-Partum Centres*	1	1	4	1
	FP/MCH Centres	1***	1	2	-
	Civil Dispensaries	11	-	23	-
	Municipal Dispensaries	5	-	-	-
	ICDS Projects	3	1	6	-
Rural	Rural Hospitals	10		4	1
	Community Health Centres				
	Primary Health Centres (30,000 population)	52	6	37**	2
	Additional Primary Health Centres	-	-	8	-
	Mini PHCs/Primary Health Units	7	-	12	2
	Rural Post-partum Centres	1	-	-	-
	Sub-centres	331	12	357	9
	Rural Dispensaries	39****	3	23	2
	FP/MCH Centres	-	-	16	-

* PPCs are the part of civil hospital.

** Includes 12 PHCs with 1,00,000 population.

*** Includes 30 Zila Parishad, 5 Ayurvedic and 4 Unani dispensaries.

**** MCH centre is within Municipal Hospital and is a part of hospital.

Source: State FW Bureau, Maharashtra, Pune. Reports of National Review of Immunisation Programme.

APPENDIX 2(a)

**PERFORMANCE OF UIP IN DIFFERENT HEALTH UNITS, DISTRICT WEST
NIMAR, MADHYA PRADESH -1988-69**

Type of Health Unit	BCG	DPT	OPV	Measles	TT
A. District Level Health Unit					
1. District Hospital (Inclusive) Post-Partum Centre)	1267	3455	3395	1053	2157
2. Civil Hospital	387	1239	1239	403	963
B. Community Health Centre					
CHC-1	4255	10807	10807	3719	7945
C. Rural Dispensary					
Rural Dispensary -1	276	1032	1063	294	374
Rural Dispensary - II	90	316	316	112	235
D. Mini PHC					
Mini PHC -1	302	675	875	288	679
Mini PHC - II	131	349	349	107	282
Primary Health Centre					
Primary Health Centre -1	5139	15901	15569	5170	5462
Primary Health Centre - II	1709	5733	5776	1834	2579
E. Sub-centre					
Sub-centre - 6	22-187	138-457	143-457	39-160	27-243

APPENDIX 2(b)

**PERFORMANCE OF UIP IN DIFFERENT HEALTH UNITS. DISTRICT
NANDED, MAHARASHTRA -1988-89**

Type of Health Unit	BOG	DPT	OPV	Measles	TT
A. District Level Health Unit					
1. Medical College and Hospital (Ayurvedic)	479	1181	1112	761	364
2. Municipal Hospital	1303	4123	3968	1077	1220
3. District Civil Hospital	1687	3023	2850	1,023	1714
4. ICDS Project	1134	2628	2292	402	1884
B. Rural Dispensary					
1. Civil Dispensary -1	359	964	699	209	530
2. Civil Dispensary - II	201	704	608	132	399
3. Civil Dispensary –III	371	1334	1078	216	764
C. Primary Health Centre					
Primary Health Centres - 6	544-912	2581-4275	1928-2848	653-956	973-2046
Sub-centre					
Sub-centres -12	85-162	.312-713	271,597	83-172	79-404

**IMPACT OF FEMALE AGE AT MARRIAGE, AGE AT FIRST
TERMINATION, PARENTAL EDUCATION AND OCCUPATIONAL
STATUS ON FERTILITY IN LUCKNOW CITY**

J.N. Srivastava*

ABSTRACT

Using the data collected from a sample of 916 mothers of Lucknow in course of a follow-up of hospital delivery cases of the city's largest maternity hospital, an attempt has been made to study the Impact of Important policy manipulate factors on fertility through analysis of fertility differentials.

The findings revealed that a rise in age at marriage of mother and her age at first termination have been associated with the marked decline in fertility. Educational level of both parents has a negative influence on fertility but the negative influence of mother's educational level has been far larger than that of the father. Occupational status of father has also been inversely related with fertility of the couple. Lastly, mother's participation in economic activities particularly in white collar and technical occupations has a sharp negative influence on her fertility. Thus, measures to raise female age at marriage, education and promotion of female participation in white collar and technical occupations were expected to reduce fertility significantly.

Numerous studies have attempted search for factors influencing fertility of a population through analysis of its patterns and differentials by selected demographic and socio-economic characteristics. Such studies assume importance for identifying important intervention measures for reducing high fertility in India. With this objective, the present paper seeks to analyse child-bearing pattern of Lucknow City females with respect to some selected factors, which can be manipulated by policy measures. Section 1 deals with sources of data and method. The analysis has been presented in section 2 and policy implications of the findings have been discussed in section 3.

MATERIALS AND METHOD

During 1978-79, the Population Research Centre of Lucknow University completed a study of perinatal mortality based on hospital deliveries¹. For the purpose, at the Dufferin Hospital, the largest in the City of Lucknow case cards of all mothers, totalling 5,506, who had given birth in the period September 1976 to August 1977, were copied. Thereafter all women, who had given their complete local address at the time of their admission to the hospital, numbering about 1,500, were

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listed separately and identified as prospective cohort to be followed-up in a survey of infant mortality in Lucknow City during December 1978 to March 1979. Due to limitations like incorrect address, change in address within the city of movement out of the city, only 916 women could be contacted and interviewed with the help of a pre-structured interview schedule. Since, the selection of Lucknow City cases at each stage was at random and not deliberate, it is likely that the sample of the cases interviewed is representative but the possibility of some bias cannot be excluded. In regard to age distribution, Table 1(a) shows that while there is a general correspondence of the followed-up sample with the total admissions, the former tend to include fewer younger and more older women. The difference in the median ages of 1.8 years is almost the time difference (1.9 years) between the mid-point of the delivery period 1 st March, 1977 and the following survey period 1 st February, 1979.

During interviews, data were collected in respect of child-bearing and survival pattern of children, family size motivations and family planning practices of the couples and this only helped an understanding of the Impact of child mortality on family formation patterns, socio-economic and demographic correlates of infant and child mortality, family size motivations and fertility patterns in Lucknow City. The present study has been based on the follow-up data.

The analysis has been conducted in two stages. In the first stage, the percentage distribution of couples with 1,2,3,4 and 5 or more children born by the characteristics studied and mean number of children born in different categories have been computed. Since, fertility is significantly influenced by age of mother, for controlling the influence of age, mean children born in different categories by current age of mother has been computed in the second stage. To get an overall comparable picture of fertility differentials, age standardised means have also been computed for different groups, which give estimated fertility level, on the assumption that age composition of mothers in different categories is the same as in the total sample.

ANALYSIS

Age at Marriage of Mother: Mother's age at marriage is expected to exert a negative influence on her fertility by reducing her reproductive span⁶. Several past investigations have brought out this finding^{7, 8, 9}. An attempt has been made in this paper to understand the influence of mother's age at marriage on number of children born to the sample mothers. The cross-classification of the sample mothers by age at marriage and the number of children born to them have been given in Table 1(b).

As compared to 29.3 per cent of the sample mothers having four or more children born to them, this percentage was found to be as high as 62.1 in case of mothers married below 15 years. It went on declining consistently with increase in age at marriage to 8.8 per cent in case of mothers married at ages 23 and above. This negative influence of marriage age on fertility is brought out further from a steady decline in mean number of children born to the sample mothers from 4.40 in case of mothers married below age 15 to 1.90 in case of those married at ages 23 or above.

TABLE 1(a)
COMPARISON BY AGE OF TOTAL HOSPITAL ADMISSIONS AND FOLLOW-UP
SAMPLES

Age (Years)	Hospital Admissions		Follow-up Survey	
	Number (5506)	Percentage	Number (916)	Percentage
< 20	479	8.7	26	2.9
20-24	2123	38.6	288	31.7
25-29	1662	30.2	312	34.4
30	1238	22.5	282	31.0
Total	5502*	100.00	908*	100.0
Median age;		25.45		27.24

*Excluding cases for which age was not available.

Note: Number of total hospital admissions and the follow-up survey cases have been given in parentheses.

TABLE 1(b)
PERCENTAGE DISTRIBUTION OF NUMBER OF CHILDREN; BORN BY AGE AT
MARRIAGE OF ' MOTHER

Number of Children Born	Below 15 (111).	Age at Marriage in Years				Total (916)
		15-17 (296)	18-20 (212)	20-22 (195)	23 and above (102)	
1	7.2	20.9	21.2	26.2	38.2	22.4
2.	14.4	24.0	30.7	43.6	43.1	30.7
3	16.2	17.2	24.1	16.4	9.8	17.7
4	14.4	16.2	9.9	7.2	7.8	11.7
5 and more	47.7	21.6	14.2	6.7	1.0	17.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mean Children	4.40	3.19	2.79	2.32	1.90	2.91

Note: The figures in parentheses in this and subsequent tables give number of cases.

For studying the influence of mother's marriage age on her fertility after controlling the influence of her current age, mean number of children born in different marriage age categories has been computed for the four current age groups of mothers. The analysis has been presented in Table 2. A consistent decline in number of children born with the rise in age at marriage of mother in all her current age groups. This finding was found to be more relevant for current ages 30 and above, in which all marriage age groups have received adequate exposure to child bearing. For the total sample/rise in age at marriage, for example, from 15-17 years to 18-19 years, 20-22 and 23 years and above appears to reduce fertility (as represented by age standardised mean children) by 10.1 per cent, 25.9 per cent and 43.8 per cent respectively, the finding clearly brings out negative influence of mother's age at marriage on her fertility. Further, findings also suggested that this negative influence is more when marriage age is raised to 20 years and above.

Age at First Pregnancy Termination: The actual start of child-bearing indicated by mother's age at first pregnancy termination realises the potential negative influence of age at marriage on fertility. In order to understand the impact of this factor, cross-classification of the sample mothers by their age at first pregnancy termination and number of children born to them have been presented in Table 3.

The percentage of mothers bearing four or more children exhibits a steady decline from 55.8 per cent in case of mothers having terminated their first pregnancy before 18 years of age to only 13.9 per cent in first termination age group 25 years and above. This negative influence of first termination age on fertility is also brought out by a consistent decline in mean number of children born from 4.05 in the lowest termination group of less than 18 years to 2.17 in the highest termination age group of 25 years and above.

In order to study the above impact after taking into account current age of mother, an analysis of mean number of children born in different first termination and current age groups of sample mothers has been shown in Table 4.

TABLE 2
MEAN NUMBER OF CHILDREN BORN BY AGE AT MARRIAGE OF
MOTHER AND HER CURRENT AGE

Current Age of Mother (in years)	Age of Mother at Marriage					Total
	Below 15	15-17	18-19	20-22	23 and above	
Below 25	2.28 (29)	1.74 (135)	1.72 (93)	1.47 (57)	-	1.74 (314)
25-29	4.31 (36)	3.60 (68)	2.86 (71)	2.05 (95)	1.42 (45)	2.74 (315)
30-34	5.61 (31)	4.28 (50)	4.19 (26)	3.67 (30)	2.08 (40)	3.90 (172)
35 and above	6.85 (13)	5.93 (42)	5.47 (21)	4.92 (131)	3.00 (15)	5.40 (104)
Arithmetic Mean	4.40	3.19	2.79	2.32	1.90	291
Age Weighted Mean	4.15	3.36	3.02	2.49	1.89	-

TABLE 3
PERCENTAGE DISTRIBUTION OF NUMBER OF CHILDREN BORN BY
MOTHER'S AGE AT FIRST
PREGNANCY
TERMINATION

Number of Children Born	Mother's Age at First Termination (in years)					Total
	Below 18 (156)	18-19 (229)	20-21 (223)	22-24 (207)	25 and above (101)	
1	13.5	18.3	23.3	29.5	28.7	22.4
2	17.9	27.1	30.9	38.2	42.6	30.7
3	12.8	20.5	19.7	17.4	14.9	17.7
4	17.3	12.2	11.7	7.2	10.9	11.7
5 and more	38.5	21.8	14.3	7.7	3.0	17.6
Total	100.0	100.0	100.0	100.0	100.0	1000
Mean Children	4.05	3.16	2.75	2.34	2.17	2.91

TABLE 4
MEAN NUMBER OF CHILDREN BORN BY, MOTHER'S AGE AT FIRST
PREGNANCY TERMINATION
AND HER CURRENT AGE

Current Age of Mother (years)	Mother's Age at First Termination					Total
	Below 18	18-19	20-21	22-24	25 and more	
Below 25	2.06 (63)	1.82 (110)	1.58 (105)	1.31 (36)	-	1.74 (314)
25-29	4.64 (42)	3.37 (60)	2.94 (68)	1.91 (116)	1.48 (29)	2.74 (315)
30-34	5.44 (34)	4.81 (31)	4.43 (30)	3.37 (35)	2.23 (47)	3.90 (177)
35 and above	7.31 (16)	6.26 (27)	6.79 (19)	5.94 (17)	2.84 (25)	5.40 (104)
Arithmetic Mean	4.05	3.16	2.75	2.34	2.17	2.91
Weighted Mean	4.22	3.45	3.09	2.44	1.94	-

The analysis brings out a sharp negative influence of first termination age on fertility of the sample mothers. Except in one cell, where the number of observations were relatively much smaller, it means that the number of children born was declining consistently and marked with rise in first termination age in all age groups of sample mothers. The findings were particularly noteworthy for the current age group of 30-34 in which sufficient exposure to child-bearing has been received by all first termination age groups and the number of observations in each cell were also larger. It may be noticed that number of live births were reduced to about 41 per cent from the lowest (5.44) to the highest (2.23) first termination age groups. For the total sample, rise in first termination age from less than 18 years to 18-19, 20-21, 22-24 and 25 years and above, reduces fertility by 18.2 per cent, 26.8 per cent, 42.2 per cent and 54.0 per cent respectively. The analysis also demonstrates that negative influence of rise in first pregnancy termination age on fertility becomes more marked when this age is raised to 20 years and above,

Father's Education: Education is hypothesized to modernise attitude and raise aspirations for higher living standards, which reduces demand for children vis-a-vis other material goods and exerts a negative influence on fertility¹⁰. The earlier investigations had revealed a significant negative influence of educational attainments of both father and mother on fertility. In order to investigate the influence of father's education on fertility of the couples. The distribution of number of children born by education level of husband have been presented in Table 5. The table shows that the percentage of couples with four or more children declines consistently with increase in father's education from 51.6 per cent in case of illiterate fathers to 17.8 per cent in case of fathers with graduate level of education and above. The mean number of children is also seen to decline markedly, in general, with increase in father's level of education.

To eliminate the influence of age from the analysis, Table 6 depicts mean number of children by age group of mother's and father's education.

The negative influence of father's education on fertility has been clearly brought out from age weighted mean number of children which exhibit a consistent decline with increase in level of education. As compared to illiterate fathers, weighted mean fertility was 2.5 per cent lower among fathers educated upto junior high school, 22.6 percent lower among fathers with high school and intermediate education, and 29.8 per cent lower among the fathers with graduate level of education and above. This negative influence above high school level of education have been found sufficiently marked.

Mother's Education: Mother's education is expected to exercise a negative influence on fertility for the same reasons as father's education does besides their increasing disinclination to bear a large number of children with increase in their education and the fact that it interferes with their participation in social and economic activities outside home. Thus, female education is also expected to exercise a larger negative influence on fertility than male education does and has been found so in several investigations. To investigate these influences and the

TABLE 5

PERCENTAGE DISTRIBUTION OF NUMBER OF CHILDREN BORN BY FATHER'S EDUCATION

Number of Children	Illiterate	Education Level			Total
		Upto Junior High School	High School and Inter	Graduate and above	
	(31)	(231)	(326)	(327)	(916)
1	22.6	16.9	22.7	26.0	22.4
2	12.9	24.2	29.1	38.5	30.7
3	12.9	11.7	22.4	17.7	17.7
4	9.7	13.9	12.6	9.5	11.7
5 and more	41.9	33.3	13.2	83	17.6
Total	100.0	100.0	100.0	100.0	100.0
Mean Children	3.64	3.71	2.74	2.42	2.91

TABLE 6

MEAN NUMBER OF CHILDREN BORN BY FATHER'S EDUCATION AND CURRENT AGE OF MOTHER

Current Age of Mother	Illiterate	Father's Educational Level			Total
		Upto Junior High School	High School and Inter	Graduate and above	
Below 25	1.70 (10)	1.81 (79)	1.64 (110)	1.79 (115)	1.74 (314)
25-29	4.00 (7)	3.68 (59)	2.67 (125)	2.28 (124)	2.74 (315)
30-34	5.57 (7)	4.69 (45)	3.69 (57)	3.07 (68)	3.90 (177)
35 and above	5.00 (7)	6.02 (45)	4.94 (3D)	4.80 (20)	5.40 (104)
All Ages					
Arithmetic Mean	3.84	3.71	2.74	2.42	2.91
Weighted Mean	3.63	3.54	2.81	2.55	2.91

number of children born to mothers by their own educational attainment has been given in Table 7.

The table brings out that the percentage of the sample couples having four or more live births declines consistently with increase in educational attainments of mother from 56.1 per cent among illiterate mothers to only 5.2 per cent among graduate and postgraduate mothers. The mean number of children also declines sharply and consistently with increase in level of mother's education.

The analysis regarding influence of mother's education on fertility is presented in Table 8 after controlling for the influence of mother's age. The age standardised mean number of children declines consistently with increase in mother's education from 3.72 among illiterate mothers to 2.14 among graduate and postgraduate mothers. As compared to illiterate mothers, weighted mean children are 11.8 per cent lower among mothers educated upto junior high school, 30.1 per cent lower among high school and intermediate mothers, and 42.5 per cent lower among graduate and postgraduate mothers. A relatively larger negative influence of mothers education than of father's education on fertility of the couples is brought out by the fact that there is a larger decline (42.5%) in weighted mean children from the lowest to the highest level of mother's education than the corresponding decline (29.7%) in case of father's education.

Father's Occupation: Father's occupation is expected to influence his fertility behaviour by influencing his desires, motivations and aspirations in life, and perceived cost and benefits from a large number of children and has been found to exert a significant influence on fertility⁷. In order to examine this influence, the distribution of number of children by occupational status of the father has been shown in Table 9.

The table brings out that the percentage of couples with four or more children at 16.7 per cent is the lowest for the highest occupational group of father and it goes on increasing consistently with decline in occupational status to 22.8 per cent for 'business and clerical' group. 33.3 per cent for 'farmers and sales workers' group and to 48.1 per cent for 'farming and other manual workers' group. The mean children born also increase consistently with decline in occupational status from 2.42 for the highest occupational status to 3.74 for the lowest occupational status.

For eliminating the influence of mother's age on fertility, the mean number of children born by father's occupational status and mother's current age has been presented in Table 10.

The table shows that as compared to the 'professional' and 'technical' group, the age standardised mean number of children is seen to be about 14.8 per cent larger in 'business and clerical' group, and around 45 per cent larger in 'farmer and sales workers' and 'farming and other manual workers' groups. It brings out a negative relationship between occupational status of father and fertility of the couple.

Mother's Occupation: Mainly by increasing opportunity cost of children, female participation in economic activities outside home in non-agricultural sectors

TABLE 7
PERCENTAGE DISTRIBUTION OF NUMBER OF CHILDREN BORN BY
MOTHER'S EDUCATIONAL
LEVEL

Number of Children	Illiterate (166)	Mother's Educational Level Upto Junior High School (312)	High School and Inter (244)	Graduate and above (094)	Total (916)
1	16.1	18.9	242	32.0	22.4
2	15.1	23.1	384	46.9	30.7
3	13.9	17.6	21.7	16.0	17.7
4	12.7	17.6	10.7	2.6	11.7
5 and more	43.4	22.6	5.3	2.6	17.6
Total	100.0	100.0	100.0	100.0	100.0
Mean Children	4.19	3.22	2.39	159	2.91

TABLE 8
MEAN NUMBER OF CHILDREN BORN BY MOTHER'S EDUCATION AND
THEIR CURRENT AGE

Current Age of Mother	Illiterate	Mother's Education Level Upto Junior High School	High School and inter	Graduate and above	Total
Below 25	1.80 (44)	2.02 (96)	1.77 (111)	1.50 (50)	1.74 (314)
25-29	3.90 (39)	3.27 (96)	2.47 (84)	1.57 (96)	2.74 (315)
30-34	5.44 (39)	4.26 (66)	3.23 (31)	2.36 (41)	3.90 (177)
35 and above	6.09 (41)	5.41 (39)	4.39 (11)	4.17 (6)	5.40 (104)
-					
All Ages					
Arithmetic Mean	4.19	3.22	2.39	1.99	2.91
Weighted Mean	3.72	3.28	2.60	2.14	2.91

TABLE 9
PERCENTAGE DISTRIBUTION OF NUMBER OF CHILDREN BORN BY
FATHER'S OCCUPATIONAL STATUS

Number of Children	Occupational Status				Total
	Professional Technical, Administrative (108)	Business and Clerical (461)	Farmers and Sales Workers (114)	Farming Manual Workers and Others (210)	
1	25.0	24.7	24.6	15.7	22.4
2	41.7	22.8	25.4	22.9	30.7
3	16.7	19.7	16.7	13.3	17.7
4	7.4	11.1	15.8	13.8	11.7
5 and more	9.3	11.7	17.5	34.3	17.6
Total	100.0	100.0	100.0	100.0	100.0
Mean children	2.42	2.62	2.99	3.74	2.91

TABLE 10
MEAN NUMBER OF CHILDREN BORN BY FATHER'S OCCUPATIONAL
STATUS AND MOTHER'S CURRENT AGE

Current Age of Mother	Father's Occupational Status				Total
	Professional, Technical, Administrative and Executive	Business and Clerical	Farmers and Sales Workers	Farming and Other Manual workers	
Below 25	1.65 (23)	1.67 (162)	1.84 (55)	1.78 (59)	1.74 (314)
25-29	2.04 (46)	2.51 (172)	3.31 (36)	3.57 (60)	2.74 (315)
30-34	2.81 (27)	3.62 (86)	4.73 (15)	4.76 (46)	3.90 (177)
35 and above	4.73 (11)	4.92 (39)	6.43 (7)	5.67 (43)	5.40 (104)
All Ages					
Arithmetic Mean	2.42	2.62	2.99	3.74	2.91
Weighted Mean	2.36	2.71	3.44	3.42	2.91

is expected to reduce fertility. Their participation in white collar and technical occupations in particular, is likely to exert a strong negative influence on fertility and has been found to have done so according to the findings of some investigations. In order to analyse this influence, the distribution of number of live births by mother's, occupational status has been presented in Table 11. In view of low level of female participation in economic activities, the sample mothers are classified in three categories, white collar workers', 'total workers' and 'non-workers'. White collar workers have been defined to include mothers working in 'professional, technical administrative and executive' and 'business and clerical' occupational categories.

The table displays that the percentage of sample mothers with four or more children was 26.2 percent among total working mothers as compared to only 8.4 per cent among white collar workers and 29.6 per cent among non-workers. The mean number of children born among total working mothers (2.80) is far above that among white collar workers (1.98).

The relationship between mother's occupational status and fertility has been analysed in Table 12 by current age group of mother. The analysis demonstrates that as compared to total working mothers, non-working mothers have about 32.4 per cent higher fertility. Among working mothers, fertility of white collar workers is markedly lower than that of the total group, implying for higher fertility among manual workers. Within the limitation of small number of observations, the analysis brings out a negative influence of mothers' participation in economic activities on her fertility and among working mothers a negative influence on fertility of her occupational status. Moreover, the analysis suggests a higher negative influence of mother's occupational status on her fertility than that of father's occupational status.

POLICY IMPLICATIONS

Ages at marriage and at first termination are seen to be the two important demographic factors having a negative influence on fertility. A marked decline in fertility is seen to occur when these ages were raised to 20 years or above. The obvious policy implication is that an attempt should be made to raise female marriage age not only to 18 years, the legal minimum age prescribed in 1978 but at least to 20-21 years. The studies have shown that it could be done by promoting socio-economic development, the most important and effective components of which being female education and female participation in economic activities in white collar and technical jobs. The process may be expedited by raising legal minimum marriageable age for females and creation of social consciousness about its advantages through mass media and alternative avenues of population education. Another content of the message could be that females married earlier may postpone their first pregnancy at least to early twenties.

It has been observed that education of father and mothers also exercise a strong negative influence on fertility. Further, at each level of education, negative influence of female education has been more marked than that of male education. Thus, negative influence of male education has been noticed to be larger above high school level and that of females above junior high school level. These findings

TABLE 11
PERCENTAGE DISTRIBUTION OF NUMBER OF CHILDREN BORN BY
MOTHER'S OCCUPATIONAL
STATUS

Number of Children Born	Mothers' Occupational Status			Total
	White Collar Working Mothers (48)	Total Working Mothers (66)	Non-working Mothers (848)	
1	33.3	33.3	22.3	224
2	47.9	41.5	29.8	30.7
3	10.4	10.4	18.3	17.7
4	4.2	6.2	12.1	11.7
5 and above	4.2	20.0	17.5	17.6
Total	100.0	100.0	100.0	100.0
Mean Children	1.98	2.80	2.93	2.91

TABLE 12
MEAN NUMBER OF CHILDREN BORN BY MOTHER'S OCCUPATIONAL
STATUS AND HER CURRENTAGE

Current Age of Mother (in years)	White Collar Mothers	Mother's Occupational Status		Total
		Working Mothers	Non-Working Working Mothers	
Below 25	137 (8)	1.44 (9)	1.74 (305)	1.74 (314)
25-29	136 (22)	1.87 (23)	2.81 (290)	2.74 (315)
30-34	2.38 (13)	232 (17)	4.01 (160)	3.90 (177)
35 and above	2.40 (5)	438 (16)	5.50 (88)	5.40 (104)
All Ages Arithmetic Mean	1.98	230	2.93	2.91
Weighted Mean	1.85	2.25	2.98	2.91

suggest that emphasis should not only be on horizontal expansion of education but on its vertical expansion also. In view of relatively lower level of female education and its larger influence, expansion of female education be particularly emphasized.

Occupational status of both parents, especially that of females, has a negative influence on fertility. Besides, female participation in economic activities as such has a marked negative influence on fertility. This influence has been found to be far larger, when they were engaged in white collar and technical jobs. Female participation in economic activities may be promoted by encouraging females to participate in these activities through creation of appropriate social climate and by ending sex discrimination in employment against females. Moreover, additional employment opportunities require to be created particularly in areas better suited to females, in some of which females superiority has been proven over the male workers as well. Fast increasing potentiality of electronic industry under recent policy pronouncements of the Government may be a case in point. It would also require setting up of appropriate training facilities for females. Raising female education, both general and technical, would also promote their employment in white collar and technical jobs.

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प्रस्तुत लेख में, लखनऊ शहर के सबसे बड़े प्रसूति अस्पताल में प्रसव हेतु आने वाले मामलों की पुनरीक्षण प्रक्रिया के अंतर्गत 916 माताओं के एक सैम्पल के अध्ययन से प्राप्त आंकड़ों को ध्यान रखते हुए प्रजनन-क्षमता विभेदकों की विवेचना द्वारा प्रजनन-क्षमता नीति में हेर-फेर करने वाले महत्वपूर्ण कारकों के प्रभाव के अध्ययन का प्रयास किया गया है।

प्राप्त निष्कर्षों से पता चलता है कि स्त्रियों की विवाह योग्य आयु और प्रथम पर्यवसान की आयु में बढ़ोतरी का प्रजनन-क्षमता में गिरावट से बहुत गहरा संबंध है। माता-पिता, दोनों की शिक्षा के स्तर का प्रजनन-क्षमता पर विपरीत प्रभाव पड़ता है, किन्तु माता की शिक्षा के स्तर का विपरीत प्रभाव पिता की शिक्षा के स्तर की अपेक्षा कहीं अधिक है। पिता के व्यवसायिक स्तर से भी दम्पति की प्रजनन-क्षमता अप्रत्यक्ष रूप से प्रभावित होती है। अंततः, सफेदपोश नौकरीपेशों और तकनीकी व्यवसायों में आर्थिक क्रियाकलापों में माता की भागीदारी उसकी प्रजनन-क्षमता पर विपरीत प्रभाव डालती हैं। इस प्रकार स्त्रियों की विवाह योग्य आयु बढ़ाने के शिक्षा स्तर में सुधार और सफेदपोश नौकरीपेशा तथा तकनीकी व्यवसायों में आर्थिक क्रियाकलापों में माता की भागीदारी उसकी प्रजनन क्षमता पर विपरीत प्रभाव डालती है। इस प्रकार स्त्रियों की विवाह योग्य आयु बढ़ाने के शिक्षा स्तर में सुधार और सफेदपोश नौकरीपेशा तथा तकनीकी व्यवसायों में स्त्रियों की भागीदारी को प्रोत्साहित करने वाले उपायों के फलस्वरूप प्रजनन-क्षमता में उल्लेखनीय गिरावट अपेक्षित है।

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ASSESSMENT OF PROFICIENCY OF COMMUNITY HEALTH GUIDES IN THREE COMMUNITY DEVELOPMENT BLOCKS OF ALLAHABAD

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ABSTRACT

The study was conducted on the Community Health Guides of three Primary Health Centres (PHCs) of District Allahabad in India during the year 1988. Out of the 120 CHGs studied, over two-third of them had skills and knowledge about disinfection of wefts, male contraceptives, presumptive treatment of malaria, preparation of blood smears, Immunisation services, female contraceptives, Identification of common illnesses, sanitary latrines and treatment of minor ailments. But actual performance of the majority of the activities, were carried out by less than 60 per cent of CHGs especially for sterilization. Health education on weaning and first aid treatment got the least priority. Remedial measures suggested were refresher courses, monitoring, improved logistics and a career structure.

Health problems of the developing countries stem largely from unfavourable living conditions, malnutrition, infections and parasitic infestations. In the Alma Ata Declaration of WHO in 1978 on Health for All by 2000 AD is to be achieved through primary health care. The Primary Health Care was to be delivered through the; community health guides (CHGs)². The CHG is a local person and is expected to perform a wide variety of health related tasks and to encourage awareness in his community. The success of the CHG in this endeavour largely depended on the process of his selection, intensity of initial and refresher training, relationship with the community and the formal health system and reward-cunvpunishment mechanisms.

The community health guide scheme has been operative in India for the last one decade. A number of studies have been conducted to assess the scheme but only a few have made objective evaluation of the performance of CHGs. The present study seeks to answer four key questions namely: (i) What is the level of knowledge and competence of the CHGs? (ii) What are the functions performed by them? (iii) How does the community feel about them? and (iv) What are the pitfalls and the constraints?

MATERIALS AND METHOD

The study was conducted on the CHGs of three, Primary Health .Centres

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(PHCs), namely; Chaka, Jasra and Shankergarh of Allahabad District in India, situated 12 kms., 25 kms. and 38 kms. respectively from Allahabad city. Out of a total of 262 CHGs, in these PHCs, 131 were selected randomly for the study, equally representing the three PHCs. The total information was collected by interview of the CHGs and by the analysis of the task performed by them from January 1988 to December 1988. The villages of the selected CHGs were visited by the investigating team members with three proformae: (I) A CHV schedule to test his knowledge and skills. It included 15 variables, viz. preparation of blood smears, disinfection of wells, treatment of minor ailments, first aid in injury, snake bite management, presumptive treatment of malaria, sanitary latrines, waste water disposal, solid waste disposal, male and female contraceptives, immunisation services, identification of common ailments, organisation of meetings for health education and weaning of infants. It also included a questionnaire on pitfalls and constraints of their functionings; (ii) Performance schedule - It included fifteen activities. Monthly performance of each activity was recorded from the register available with the CHGs; and (iii) Community opinion poll schedule - Three community members or community leaders were interviewed from each CHV area. The questionnaires were designed to elicit their response regarding their awareness of CHGs, CHGs acceptance and involvement in health care, perception of their roles and types of services provided by them. The knowledge and skills of the CHGs was assessed on the basis of the guidelines of CHG manuals of the Government of India.

RESULTS

The three Primary Health Centres - Chaka, Jasra and Shankergarh of district Allahabad are attached with MLN Medical College, Allahabad for training and field demonstration of medical undergraduates and interns in rural health. The community health guide scheme was started in the three PHC areas in the year 1977. After recruitment of the CHGs, they were trained as per manual prescribed by the Government of India at the PHC for three months. Thereafter, each health guide was entrusted a population of about one thousand in their own village. They were supplied with a medicine kit which was replenished on quarterly basis at the rate of Rs.600 per year. They were also paid a remuneration of Rs.50 per month. Of the total, 131 CHGs selected for the study only 120 could be covered. The rest did not cooperate.

Profile of the CHGs: All the health guides were males local residents, between 21 -35 years of age, with the mean age of 25.8 years (Sd $\pm$ 3.4). Occupation wise 101 (84.2%) were in agribusiness. 19 (15.8%) were engaged in teaching, shop keeping and cottage industry. Of the total, 45 (37.5%) were educated upto intermediate level, 35 (29.2%) high school standard and the remaining 40 (41.3%) were middle pass. As many as 66 (55.0%) belonged to scheduled caste and backward caste and the rest 54 (45.0%) were drawn from upper caste strata. Analysis of the data according to their socio-economic gradient revealed that 26 (21.7%) were of socio-economic class III with per capita monthly income between Rs.70.0-149.0 and rest 94 (78.3%) belonged to class IV with per capita monthly

income ranging between Rs.30 to Rs.60. Majority of the CHGs 49 (40.8%) had opted for this job because of unemployment, followed by a desire, for social work 50 (41.7%), to become medical practitioners 15 (12.5%) and for additional mercenary gains in 6 (5.5%)³.

Levels of Knowledge: The levels of knowledge and skills evaluated have been presented in Table 1. Of the total CHGs interviewed and observed, 74 (66.7%) were proficient In blood smears, 71.7 per cent had correct knowledge of presumptive treatment of malaria and 60 per cent about disinfection of wells by bleaching powder. The awareness about sanitary latrines, method of waste water and solid waste disposal ranged from 65 to 71 per cent. Majority of the CHGs had knowledge about male contraceptives (88.3%) than female contraceptives (73.3%). About three-fourth (71.7%) of them were acquainted with the immunisation services.

TABLE 1
EVALUATION OF KNOWLEDGE AND SKILLS OF COMMUNITY HEALTH GUIDES
(CHGs)

(Multiple Response)

Knowledge and Sk8ls Evaluated	No. Proficient	Percentage
1. Preparation of blood smears	74	66.7
2. Disinfection of wells	96	80.0
3. Therapeutics of minor sicknesses	64	70.0
4. First Aid In Injury	54	45.0
5. Snake bite management	46	38.3
6. Presumptive Treatment of Malaria	86	71.7
7. Sanitary Latrine	81	67.5
6. Waste Water Disposal	78	65.0
9. Solid Waste Disposal	85	70.8
10. Male Contraceptives	106	88.3
11. Female Contraceptives	88	73.3
12. Immunisations	92	76.7
13. Recognition of Common Sicknesses	86	71.7
14. Group meeting organizations	79	65.8
15. Weaning	66	55.0

Total No. of Health Guides Evaluated= 120

Seventy per cent had knowledge of therapeutics for minor sickness and 71.7 per cent knew about the identification of common ailments. The items in which they were not fully aware were management of snake bite, first aid in an injury, weaning of infants and organisation of group meeting for health education.

Job Performance: On the whole, 120 health guides provided 19,956 services to 14,781 persons, amounting to an annual average of 166.3 services per CHGs. The total included 18,611 (93.3%) personal services and 1,345 (6.7%) community services in the form of disinfection of wells and nutrition education. Treatment of minor-ailments-was done by all CHGs, 6,248 cases were treated during the study period, with an average of 52.6 cases per CHG. The other activities performed were assistance in immunisation by (76.7%), condom distribution by (61.7%) to an average of 27 persons per CHG, iron folic acid to pregnant women were supplied by 60 per cent of them Fever case detection and presumptive treatment were carried out by 56.7 per cent of the CHGs but blood smear were prepared by only 48.3 per cent of the CHGs. The average number of cases treated by each CHG and number of blood smears prepared were 58 and 51 respectively. More than half of them (54.2%) carried out disinfection of wells and distribution of ORS packets was done by (59.2%). The number of wells disinfected of each CHG were 18 and 4 ORS packets were distributed by each of them. The least priority activities were, motivation of couples for sterilization, nutrition education and first aid treatment as has been shown in Table 2. None of the CHGs had motivated the people for installation of sanitary latrine, soakage pit and compost pit.

Since treatment of minor ailments was done by all health guides, this task was further analysed according to their socio-economic profilers has been given in Table 3. Average number of cases treated by teachers employed as health guides were 81.4 per cent cases per annum per CHG The upper caste CHG treated more cases (70.8%)/head Education had an inverse relationship with the treatment of minor ailments, intermediate pass CHGs had an average of 48.6 per cent cases/head as against 51.6 for high school pass and 56.4 for middle school pass. Those who had opted for health guide job because of unemployment had treated 53.8 cases on an average and 49.0 cases/head were treated by those who chose the job to render social service. Those who joined this job with the aim of becoming private practitioners or for purely mercenary gains had an average of 57.4 and 48.2 cases/head respectively. CHGs drawn from socio-economic class III treated 54.5 cases as against 51.4 cases by class IV.

Community Opinion Poll: A set of questions were asked from 386 persons amongst the community leaders (both formal and non-formal) and the replies were collected on the community poll schedule. A majority of them (82.1 %) were aware of the services provided by the health guides. As many as 216 (67.7%) had actually availed of one or the other kind of service during the past one year and about one-fourth (26.4%) had never received any type of the benefits. The commonly acknowledged services were treatment of minor ailments, presumptive treatment of malaria, assistance in immunization, health education and distribution of condom etc. as has been depicted in

TABLE 2
PERFORMANCE OF COMMUNITY HEALTH GUIDES
(Multiple Response)

Services Extended	Average Performance Per CHG per annum	N = 120 Executors Percentage
1. Presumptive treatment of malaria	58	56.7
2. Fever case detection	62	56.7
3. Blood smear preparation	51	43.3
4. Disinfection of wells	18	54.2
5. Assistance in Immunisation	36	76.7
6. Nirodh distribution	27	61.7
7. Sterilization Motivation	4	43.3
8. Nutrition Education sessions	5	29.2
9. Iron-Folic Acid tablets distribution	32	60.0
10. Treatment of minor ailments	52	100.0
11. Compost pits	-	-
12. ORS distribution	4	59.2
13. Installation of Latrines	-	-
14. Construction of soakage pits	-	-
15. First-Aid in Injury	8	30.8

TABLE 3
MINOR AILMENTS TREATED BY CHGs
(Multiple Response)

Nature of Ailments	No. of Treating CHGs	Episodes Treated	Episodes Treated - per CHG/year
1. Cough and cold	67	952	142
2. Pyrexia	72	986	13.7
3. Diarrhoeal diseases	68	776	11.4
4. Abscess	46	414	9.0
5. Conjunctivitis	63	492	7.8
6- Pain-Abdomen	68	510	7.5
7. Arthritis	43	241	5.6
8. First-aid	48	269	5.6
9. Scabies	74	814	11.0
10. Ear discharge	32	161	5.0
11. Anaemia	48	242	5.0
12. Constipation	75	391	52
Total		6248	52.6

Table 4
COMMUNITY OPINION-POLL ON SERVICES RENDERED BY COMMUNITY HEALTH GUIDES

(Multiple Response)

Type of Enquiry	No. of Person	Percentage
1. Aware about CHG service	317	82.1
2. Availed treatment of minor ailment	216	67.7
3. Blood-smear made	159	41.2
4. Presumptive Malaria Treatment	258	66.8
5. Witnessed well Disinfection	196	50.8
6. Contacted for Immunisation	65	16.8
7. Nirodh received	33	8.5
8. Contracted for Immunisation	84	21.8
9. Referrals made	9	2.9
10. Health Education Sessions	176	45.6
11. ORS received	69	17.9
12. Never availed any service	102	26.4
N = Base (Total number of persons interviewed) = 886		

Constraints and Pitfalls: The health guides were interviewed for the problems and difficulties they had to face in carrying out their work. Majority (92.5%) of them stated that the supply of medicines was irregular and incomplete and they had to work with the exhausted medicine kit for a number of days or even months. This shattered the confidence of the local people. Similar statement was made about the supply of stationery items, by 90.5 per cent of CHGs. As many as 70.8 per cent felt that the honorarium paid to them was meagre and that they should be absorbed in regular service cadre. More than half (60.3%) of them desired that there should be incentives and disincentives for good and bad workers on the basis of their performance. Poor communication with the PHC staff, lack of supervision and training and no supply of health education material, were the other problems faced by the CHGs as has been given in Table 5.

DISCUSSION

Community Health Guide Scheme is an innovative strategy to use the tool of primary health care for achieving Health For All by 2000 AD. It means active

TABLE 5
PROBLEMS AND DIFFICULTIES ENCOUNTERED BY COMMUNITY HEALTH GUIDES

Nature of Problem of Difficulty	Number of Respondents	(Multiple Response)
		Percentage
1.Irregular supply of medicine	111	92.5
2.No Supply of stationery	109	90.8
3.Priority not accorded to referrals	101	84.2
4.Lack of community cooperation	97	80.8
5.People not interested in CHG services	95	79.2
6.Honorarium too meager	85	70.8
7.No incentive and rewards	76	63.3
8.Poor communication with PHC staff	79	65.8
9.Irregular visits by supervisory staff	67	55.8
10.No supply of Health Education Material	57	47.5
11.Inadequate training	31	25.8
12.No problem	19	15.8
Base (Total interviewed) = 120		

involvement of people in solving their own health problems, rather than being passive recipient of the care from above.

All the Community Health Guides were local residents, males in the age bracket of 21 - 35 years with an average of 25.8 years. The age structure of CHGs is in line with the guidelines laid down by the Ministry of Health and Family Welfare, Government of India, New Delhi.

Nearly three-fourth of the health guides were drawn from agribusiness. However, teachers constituting 15 per cent of the total, had a better performance record. Educational status and socio-economic class gradient of the health guides had an inverse relationship with their performance levels. Middle pass health guides of low economic status, had greater interest in retaining their jobs and had endeavoured hard in performing their duties. Half of the health guides (55%) were drawn from scheduled caste and backward classes. The caste structure had an important bearing on the utilization of the services. The upper caste population of the rural areas were reluctant to obtain services from lower caste health guides. Of the total upper caste beneficiaries only 16.1 per cent had sought services from lower caste health guides. However, majority of the lower caste beneficiaries 54.1 per cent preferred to avail services from upper caste health guides. Similar observation have been reported in other studies.

Nearly 20-30 per cent health guides did not know about the preparation of blood smears, disinfection of wells and treatment of minor ailments. More than half of them were ignorant of first aid in injury and management of snake bite. This brought out the necessity of in-service continuing education of the CHGs. Analysis of the performance record of health guides revealed that 51.7 per cent to 69.2 per cent did not give first aid in injury, education on weaning, motivation of couples for sterilization and preparation of blood smear for malaria parasite (Table 2). The other activities in which 40 per cent to 46 per cent defaulted were in fever case detection, malaria treatment, disinfection of wells and distribution of ORS and iron folic acid tablets. This high default rate was a logical sequence, since there was no monitoring of their performance. None of the CHGs had motivated the people to dig compost pits, construct sanitary latrines and soakage pits. Similar observation were made by another researcher⁷. There was no protocol for submitting monthly work reports. Erratic supply of medicines was another common lacuna noted in this study as well as in other studies. District and Primary Health Centre level functionaries should have been equipped with managerial know-how, which would have helped in efficient operation of the scheme". Sanyal and Kataria, in their study in various States of India recorded activities in order of preference by the CHG as: (i) Nirodh distribution; (ii) Presumptive treatment of fever cases; (iii) Preparation of blood slides; and (iv) Getting children vaccinated. They observed wide variations amongst the States.

A majority of community opinion leaders were aware about the services provided by the CHGs and 67.7 per cent had actually availed of one or the other type of services from CHGs. The most common services availed by them were treatment of minor ailments (67.7%) and presumptive treatment of malaria (66.8%). Similar

observations were made in studies by other authors on awareness and performance of CHGs.

If the primary health care strategy is to succeed, there must be a means of diffusing health awareness throughout the community and right into every one's home. Family health care can be effective only if promoted by health workers who are in intimate contact with the community and the health system takes the responsibility to encourage it. Appropriate skills and level of knowledge of health guides should be improved continuously by regular reorientation courses. The job requirements should be limited and well defined as pointed out by the WHO, which in turn can make the CHGs accountable for their functioning to the community, and to the Medical Officer at the PHC¹². Regular supply of drugs should be ensured by the Government by cutting down expenditure at the Centre in favour of the periphery. Performance based honorarium and a career structure may be needed to avoid frustration and attrition in the CHVs.

Lkkjk'k

एक अध्ययन, इलाहाबाद जिले के तीन प्राथमिक स्वास्थ्य केन्द्रों के सामुदायिक हैल्थ गाइडों पर 1988 के दौरान किया गया था। कुओं को कीटाणु-रहित रखने, पुरुषों व स्त्रियों के लिए गर्भनिरोधकों, मलेरिया का संभावित इलाज, रक्त जांच हेतु स्लाइड तैयार करना, प्रतिरक्षण सेवाओं, आम बीमारियों की पहचान, स्वच्छ शौचालयों और छोटी-मोटी बीमारियों के इलाज के बारे में अध्ययन हेतु चुने गए 120 सामुदायिक हैल्थ गाइडों में से दो-तिहाई से ऊपर गाइडों में क्षमता तथा जानकारी थी। लेकिन उनमें से अधिकांश द्वारा किए गए कार्य, विशेषकर नसबन्दी के लिए किए जाने वाले कार्य 60 प्रतिशत से भी कम सामुदायिक हैल्थ गाइडों द्वारा किए गए। स्वास्थ्य शिक्षा के अंतर्गत स्तनपान कराने और छुड़ाने तथा प्राथमिक उपचार को बहुत कम वरीयता दी गई थी। प्रबोधन पाठ्यक्रम, निदेशन, उन्नत संभारतन्त्र और एक वाहन प्रणाली जैसे कुछ उपचारी प्रयास सुझाए गए थे।

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STUDY ON WATER QUALITY: BACTERIOLOGICAL ASPECT

Manju Mehta* and Asha V. Dass**

ABSTRACT

Water is basic necessity of all living beings. There are many uses of water and one of the important use is for drinking purpose. The study was undertaken to determine the bacteriological quality of drinking water stored in the stainless steel, brass, plastic, earthenware and copper vessels. Multiple fermentation tube technique was used for the experiment. Sewage was deliberately added in the drinking water in order to ensure bacterial population in drinking water. The most probable number (MPN) of coli form organisms was calculated. Water was stored in these vessels till the MPN was negligible upto ten days. It was found that rate of decay of micro-organism was faster in copper and slowest in plastic. Decay of micro-organism in descending order was copper, brass, earthenware, stainless steel and plastic. Hence, copper is best material for storing drinking water.

Water is very important for living beings, it is impossible to think of life without water. One of the most important uses of water is for drinking purpose. Drinking water should be clean and pure; as impure water will give rise to various water borne diseases like cholera, typhoid etc. which can even lead to death. Keeping this fact in mind present study was undertaken with specific objective, "to assess by experiment the bacteriological quality of drinking water stored in the vessels of different materials i.e. plastic, earthenware, copper, brass and stainless steel".

METHODOLOGY

The study was carried out to investigate the effect of vessels of different materials normally used in Indian homes, on the bacteriological quality of drinking water in terms of destroying of microbes. The study was conducted in Environmental Engineering Laboratory, Department of Civil Engineering, IIT, Kanpur.

Multiple tube fermentation technique was used. Most probable number (MPN) was used for determining the number of micro-organism present in the water. The drinking water of IIT, Kanpur was used as the test water. The keeping quality (bacteriological quality) of water with respect to metal/material of vessel used in Indian homes for storing drinking water was studied.

Various Steps Involved: All the vessels (copper, brass, stainless steel, plastic, earthenware) were thoroughly cleaned, for the maximum effective contacting

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surface with water. One litre of drinking water was stored in these vessels. Sewage was added to it so as to provide bacterial population *I.e.* coliform organisms, the indicator of pollution. At different time intervals water samples were withdrawn from all these vessels to determine the bacterial population (MPN of coliform organisms). First day the withdrawal of sample was done after every six hours, second day after every 12 hours and afterward 24 hourly. After withdrawal of sample from vessel, the sample were immediately inoculated in lactose fermentation tubes.

The water was stored until no organism could be detected from the sample, on two consecutive tests.

Multiple Tube Fermentation Technique: This test is based on estimating the most probable number (MPN) of coliform organism in 100 ml of water. The test was carried out by inoculating measured sample of water in lactose broth.

Ten ml of lactose broth was taken in the test tubes, and an inverted Darhami tube (small glass tube) was inserted in each test tube containing lactose broth. Mouth of these test tubes was covered by cotton plug. These test tubes (fermentation tubes, were sterilized at 15 Paig pressure at 121 °C for 15 min.

For the sample of 10 ml double strength media was used, whereas for sample of 1 ml and 0.1 ml, single strength media was used as recommended by standard method (1976).

With the help of sterilized pipette, water sample of 10 ml was inoculated aseptically in double strength fermentation tube and water sample of 1. ml and 0.1 ml was inoculated in single strength fermentation tube, three fermentation tubes were used for each of these 3 volumes of water sample from one vessel. Number of each fermentation tube was noted against each amount of sample in record book. These inoculated fermentation tubes were kept in incubator at 35°C for 48 hours. The manifestation of gas collection in Oarham's tube indicated the gas production by microbes and hence was a positive indication of presence of coliform organisms in water sample.

Counting and Recording of MPN: The number of positive findings of coliform group organism resulting from multiple portion decimal dilution planting was computed and was recorded in terms of MPN,

The MPN for a variety of planting series and result was computed from statistical table.
$$\text{MPN/100 ml} = \text{No. of positive tube} \times h$$

ml of sample in a negative tube $\times$ ml sample in all tube

The MPN for combination not given in the table was estimated by Thomas simple formula.

Addition of Sewage: Water was contaminated with sewage diluted 10 times (100 ml of sewage in 1 litre of water), MPN of coliforms per 100 ml of water contaminated with high concentration of sewage produced different results.

RESULTS AND DISCUSSION

Contamination of water with high concentration of sewage produced decrease in MPN of coliform of drinking water stored in different vessels as has been given in Table 1. The graph was also obtained between the mean value of coliform organism per 100 ml and time (Graph 1). Vessel wise decrease observed in the MPN of coliform is as follows:

Copper. Till 12 hours of storage there was no decrease and after 18 hours there was tremendous decrease in MPN of coliform organisms and after 144 hours MPN of coliform was negligible. This indicates that with the storage of water for more than 12 hours in copper vessel, the MPN of coliform decreased and water became safer for use after 144 hours.

Brass: During storage of water in brass vessel there was no decrease in MPN of coliform till 12 hours, but after 18 hours there was a high reduction in MPN of coliform. After 168 hours (7 days) there was hardly any coliform present in water. Similar to copper the MPN of water stored in brass also decreased with the increase in period of storage and it became pure after seven days of storage.

Stainless Steel: In stainless steel vessel there was no decrease in MPN of the coliform till 168 (7 days) of storage of water. There was some decrease after 142 hours (8 days) which remained constant till 216 hours and 240 hours (9 and 10 days). The maximum storage period was upto 240 hours (10 days), as drinking water is not stored for more than ten days. The long term storage in stainless steel was less .safer than copper and brass, as it took 10 days for MPN to reduce to considerable number in stainless steel.

Earthenware: In earthenware there was no decrease in the MPN of coliform till the 12 hours of storage. Reduction started after the 18 hours of storage. After 24 hours of storage there was some decrease and after 240 hours (10 days) the MPN of coliform organism was negligible.

Plastic: In plastic vessel there was no decrease in the MPN of coliform even after the 240 hours (10 days) of storage. Thus plastic is not safe for storing drinking water as there is no reduction in coliform bacteria with storage period.

Log Value of Coliform Organisms Reducing Per Hour

A semilog plot was made between the $\log \frac{N}{N_0}$ and time as per the following formula:

$$\log_e \frac{N}{N_0} = -Kt$$

or

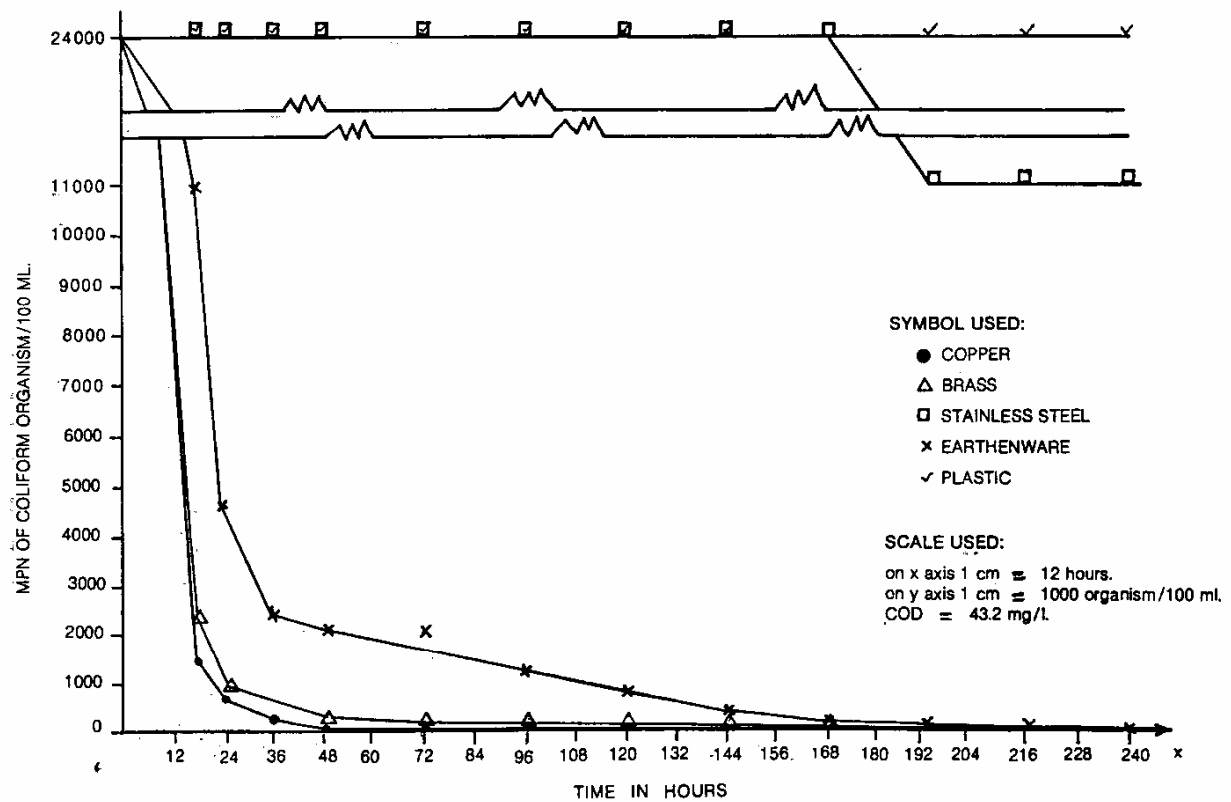
$$\log_e \frac{N_0}{N} = Kt$$

TABLE 1
MPN OF COLIFORM PER 100 ML OF WATER COOTAMINATED WITH
HIGH CONCENTRATION
OF SEWAGE

Material/	Copper Time		Brass		Stainless Steel		Earthenware		Plastic	
	a	b	a	b	a	b	a	b	a	b
0 hrs	3-3-3	24000	3-3-3	24000	3-3-3	24000	3-3-3	24000	3-3-3	24000
6 hrs	3-3-3	24000	3-3-3	24000	3-3-3	24000	3-3-3	24000	3-3-3	24000
12 hrs	3-3-3	24000	3-3-3	24000	3-3-3	24000	3-3-3	24000	3-3-3	24000
18 hrs	3-2-1	1500	3-3-0	2400	3-3-3	24000	3-3-2	11000	3-3-3	24000
24 hrs	3-1-1	750	3-2-0	930	3-3-3	24000	3-3-1	4600	3-3-3	24000
36 hrs	2-2-1	280	3-0-2	640	3-3-3	24000	3-3-0	2400	3-3-3	24000
48 hrs	2-0-0	90	3-0-0	230	3-3-3	24000	3-2-2	2100	3-3-3	24000
72 hrs	1-0-1	70	2-1-0	150	3-3-3	24000	3-2-2	2100	3-3-3	24000
96 hrs	1-6-0	40	1-2-0	110	3-3-3	24000	3-1-2	1200	3-3-3	24000
120 hrs	0-1-0	30	1-0-0	40	3-3-3	24000	3-1-1	750	3-3-3	24000
144 hrs	0-0-0	£-30	0-0-1	30	3-3-3	24000	3-1-0	430	3-3-3	24000
168 hrs			0-0-0	<30	3-3-3	24000	2-2-0	210	3-3-3	24000
192 hrs					3-3-2	11000	1-2-0	110	3-3-3	24000
216 hrs					3-3-2	11000	1-0-1	70	3-3-3	24000
240 hrs					3-3-2	11000	0-0-0	<30	3-3-3	24000

a- Combination of positive tubes

b - MPN index/100 ml



GRAPH NO. 1
MPN OF COLIFORM ORGANISM/100 ML. PER HOUR IN HIGH
CONCENTRATION OF SEWAGE (10 TIMES)

where N and N_0 are the coliform organisms surviving at any time 't' and initial number of coliform organisms in the vessels, respectively.

K is decay rate constant (time^{-1})

t is time of contact

Log value of coliform organisms reduced per hour was calculated by plotting the semilog plot, *i.e.* by plotting $\log N/N_0$ (-y axis) against the time {x axis}, this indicated that for each vessel the initial number of organisms was constant whereas number of coliform changed (reduced) every hour in each type of vessel (Graph 2).

The value of $\log N/N_0$ was calculated for various storage times has been shown in Table 2.

Value of K was calculated as per Graph 2. K value calculated as per Graph 2 for copper, brass, stainless steel, earthenware and plastic were 0.042/hour, 0.033/hour, 0.003/hour, 0.029/hour and 0.00/hour, respectively.

Higher the value of K faster is the decay of coliform organism. Value of K was highest in copper and lowest in plastic. Value of K for brass, earthenware and stainless steel were in-between copper and plastic.

As the contact time increased there was a considerable reduction in MPN of coliform especially in copper, brass and earthenware. These materials can disinfect the water to a higher degree and eliminate the use of disinfecting chemicals. Stainless steel can disinfect the water to a lesser degree. In plastic there was no reduction in the MPN of coliform, so it can't disinfect the water.

CONCLUSION

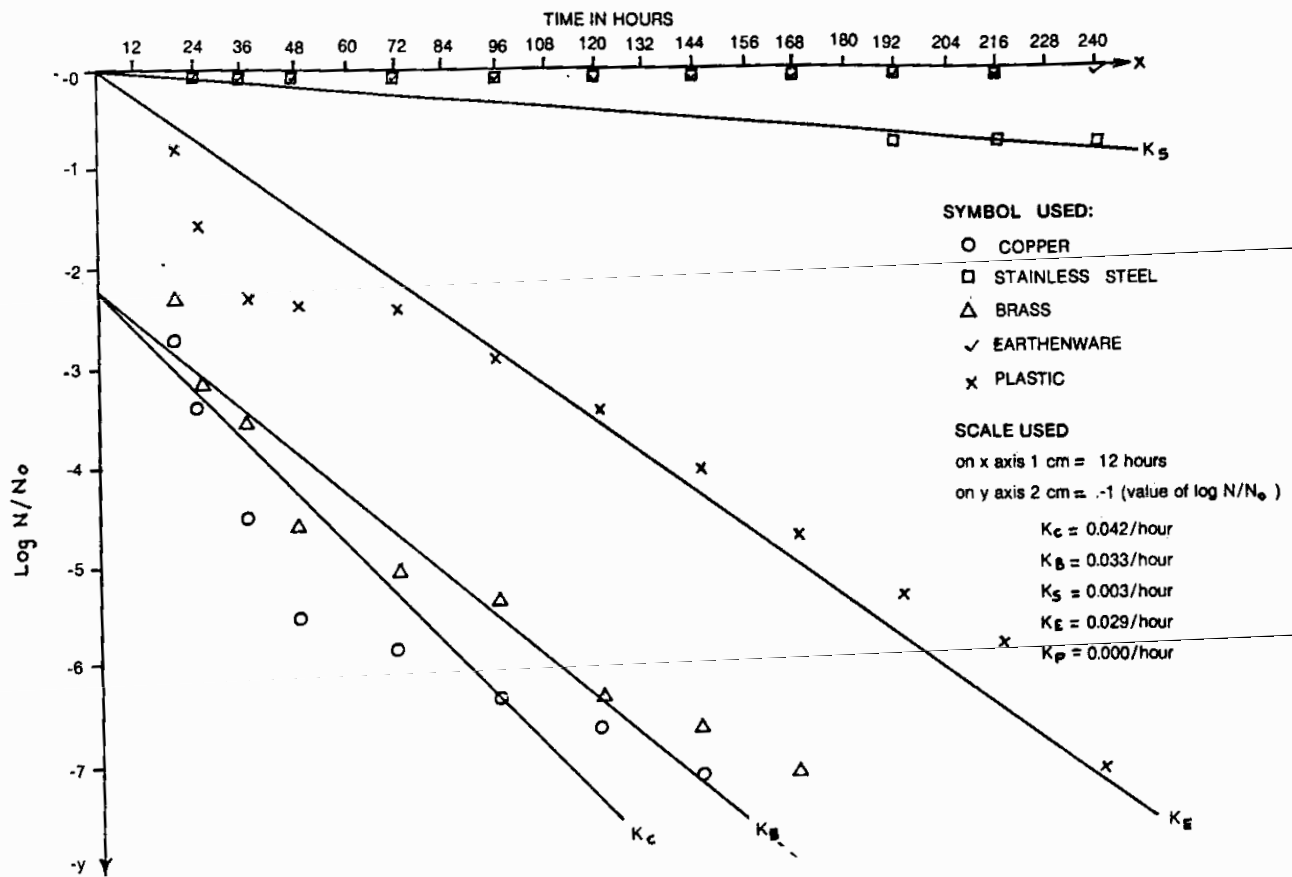
Water can also be purified without the use of chemicals which some time have some side-effects. Some of the materials also act as disinfectant and kill the microorganisms present in the water. Copper, brass and earthenware act as the disinfectant for water. Copper had highest disinfecting quality, followed by brass and then earthenware. Stainless steel had negligible disinfecting quality and plastic doesn't have any disinfecting quality.

संक्षेप

जीवन के लिए जल एक मूलभूत आवश्यकता है। जल कई प्रकार से उपयोग में आता है तथा पीने के उद्देश्य से जल का उपयोग उनमें से एक महत्वपूर्ण उपयोग है। यह अध्ययन स्टेनलैसस्टील, पीतल, प्लास्टिक, मिट्टी और तांबे के बर्तनों में भर कर रखे गए पानी में जीवाणु संबंधी दोषों का पता लगाने के लिए किया गया है। इस दोष को प्रायोगिक रूप से सिद्ध करने के लिए बहु उच्चतापीय नली तकनीक अपनाई गई है। गन्दा पानी पीने वालों को जीवाणुओं के प्रति आश्वस्त करने के लिए जानबूझ कर

TABLE 2
LOG N/N_c VALUE FOR HIGH CONCENTRATION OF
SEWAGE

Material/	Copper		Brass		Stainless Steel		Earthenware		Plastic	
Time	N	Log N/N₀	N	Log N/N₀	N	Log N/N_c	Log N/NN₀	Log N/N₀	N	Log N/N₀
0 hrs	24000	0	24000	0	24000	0	24000	0	24000	0
6 hrs	24000	0	24000	0	24000	0	24000	0	24000	0
12 hrs	24000	0	24000	0	24000	0	24000	0	24000	0
18 hrs	1500	-2.7725	2400	-2.302	24000	0	11000	0.7801	24000	0
24 hrs	750	-3.4657	930	-1.2502	24000	0	4600	-1.6519	24000	0
36 hrs	280	-4.510	640	-1.6243	24000	0	2400	-2.3025	24000	0
48 hrs	90	-5.5859	230	-4.6470	24000	0	2100	-2.4361	24000	0
72 hrs	70	-5.8373	150	-5.0751	24000	0	2100	-2.4361	24000	0
96 hrs	40	-6.3969	110	-5.3853	24000	0	1200	-2.9957	24000	0
120hrs	30	-6.6846	40	-8.3969	24000	0	750	-3.4657	24000	0
144hrs	<30	-7.0900	30	-6.6846	24000	0	430	-4.0220	24000	0
168hrs			£30	-7.0900	24000	0	210	-4.7387	24000	0
192hrs					11000	-0.7801	110	-5.2853	24000	0
216hrs					11000	-0.7801	70	-5.8373	24000	0
240hrs					11000	-0.7801	<30	-7.0900	24000	0



GRAPH NO. 2
RATE OF DECAY OF COLIFORM ORGANISM PER HOUR IN HIGH
CONCENTRATION OF SEWAGE (10 TIMES)

पीने के पानी में गन्दा पानी मिलाया गया। छलनी/फिल्टर की सहायता से पानी को छानकर जीवाणुओं को अत्याधिक संभावित संख्या का हिसाब लगाया गया। दस दिन तक अत्याधिक संभावित संख्या अत्यन्त होने तक इन बर्तनों में पानी भर कर रखा गया। यह पाया गया कि तांबे के बर्तन में रखे गए पानी में सूक्ष्म जीवाणुओं में कमी की दर तेज थी जबकि प्लास्टिक के बर्तन वाले पानी में यह दर बहुत धीमी थी। तांबे, पीतल, मिट्टी, स्टेनलेसस्टील और प्लास्टिक के बर्तनों में रखे गए पानी में सूक्ष्म जीवाणुओं की संख्या क्रमशः कम होती पाई गई थी। अतः पीने के लिए पानी भर कर रखने के लिए तांबे को सबसे अच्छी धातु माना गया है।

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EARLY IDENTIFICATION - A BOON FOR DISABLED CHILDREN

S. Agarwal* and T. Verma**

ABSTRACT

Five villages of Hissar District of Haryana State were selected, through simple random sampling technique, to identify the children having different types of physical disabilities. House to house survey approach was adopted. The study confirms the high prevalence rate of disability among children. The higher percentage of children was with orthopaedic disability when compared to visual, speech and hearing disability. Their disability occurred when they were below six years of age, caused by after polio effects and other serious illnesses, which made them to suffer moderately to severely.

The disability projection in India is approximately 5.4 million orthopaedic/locomoter, 3.4 million blind, 3.0 million deaf and 1.7 million speech disabled (National Sample Survey, 1981). The prevalence rate was observed higher in rural as compared to urban areas. Further, a constant increasing trend was found with age, irrespective of the nature of disabilities. This implies the need for an early detection of impairments for reducing the disability incidences. The estimation of five per cent cure of disabilities lies in timely intervention. This study was planned with specific objective to identify the disabilities among rural children and also for right type of arrangement for their early detection.

METHODOLOGY

The study was carried out in Hissar district of Haryana State. Five villages of Hissar district were selected through simple random sampling technique. A survey schedule was developed for the identification of orthopaedic, visual, hearing and speech disabilities among children. House to house survey approach was adopted to identify the children suffering from disabilities. In order to confirm the appropriateness of diagnosis of the identified cases, PHC doctors' examination were subsequently followed.

RESULTS AND DISCUSSION

The cases of different disabilities identified have been presented in Table 1. It has been observed from Table 1 that there were 127 children having orthopaedic/locomoter disability. Forty two children were found with visual disability and there were 31 children with hearing and speech impairments. Thus, in all there were 200 children who were having one or the other kind of physical disability. The

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TABLE 1
DISTRIBUTION OF CHILDREN IDENTIFIED AS PHYSICALLY
DISABLED

S. No.	Nature of disability	No. of children identified	No. of children not tallied with Medical Examination	No. of children identified as disabled
1.	Orthopaedic	127	0	127 (63.50)
2.	Visual	44	2	42 (21.00)
3.	Hearing and Speech	34	3	31(05.50)
	Total	205	5	200

higher percentage of children was with orthopaedic disability compared to visual and speech and hearing disability. Further, attempts were made to find out the prevalence rate of disabled children.

Prevalence Rate: Number of disabled children and their proportion to one thousand population of children by type of disability have been incorporated in Table 2. It is revealed from the Table that there were 193 physically disabled children among one thousand population of children.(0-14 years). The prevalence rate for different types of. disabilities was 123 for orthopaedic disability .followed by visual disability (40) and hearing and speech disability. (30). Thus, the rate of prevalence was observed higher in case of orthopaedic disability compared to visual, speech and hearing disability. This made it imperative to find out the causes of disability among children.

TABLE 2
NUMBER OF DISABLED CHILDREN AND THEIR PROPORTION TO ONE
THOUSAND POPULATION OF CHILDREN BY TYPE OF DISABILITY

S. No. of children.	Total number	Number of disabled type of disability	children identified by	Prevalence rate Number of disabled children per 1000 , children
1.	1029	Orthopaedic	127	123
		Visual	42	40
		Speech and Hearing	31	30
		Total number of disabled	200	193

Causes of Disability: The various causes of disability among children has been shown in Table 3. In most of the cases (42 per cent) the cause of disability was post-polio paralysis, whereas other illness occupied the second place (35 per cent). However, 10.5 per cent cases were reported due to congenital disorders and in 10 per cent cases due to accidents. Very meagre percentage cases (2.5 per cent) were reported due to malnutrition.

When seen specifically in accordance with their nature disability, the orthopaedic disability among children was mainly due to post-polio paralysis (63.79 per cent) followed by congenital disorders (14.95 per cent) and other illnesses (14.17 per cent). In cases of visual impairments, the major causes were serious illnesses (59.54 per cent). In 23.60 per cent cases the accident was the cause of blindness. The cause of deafness in majority of cases was serious illness (87.09 per cent).

It may, therefore, be inferred that orthopaedic disability occurred due to polio after effects. However, blindness and deafness among children were mainly due to serious illness.

Further, efforts were made to ascertain the age at which the disability occurred among children.

Age at Onset of Disability. The distribution of children in Table 4 as per their age at the time of occurrence of disability reveals that majority of children were affected during their first six years of life followed by 6-9 years of age. In very meagre percentage of children disability took place after nine years of age.

Since, the children suffered from disabilities in their early life, it was thought relevant to assess the acuteness or degree of their disability.

Degree of Disability: The degree of disability among children was determined through the assistance of medical doctor and the children were placed under three categories as has been shown in Table 5.

It is evident from Table 5 that irrespective of nature of disability, majority of children (57.50 per cent) were moderately disabled followed by severely disabled (27.50 per cent). When mothers' opinion about their children's disability was explored, the results indicated that majority (75.00 per cent) of mothers had expressed moderate degree of disability of their children. However, very meagre percentage (9.50 per cent) of mothers felt that their children were severely disabled in comparison to the percentage of children found severely disabled through medical examinations. This revealed that the mothers had not rightly viewed the seriousness of the disability of their children.

Thus, the majority of children were orthopaedically disabled and their disability occurred when they were below six years of age caused by after polio effects and other serious illnesses, which made them to suffer moderately to severely.

The present study brought to light that the rate of prevalence of disability among children was quite high. Among-the identified physically disabled children the

TABLE 3
DISTRIBUTION OF CHILDREN ACCORDING TO THEIR CAUSES OF
DISABILITY

S No.	Causes of disability	Nature of disability			Total
		Orthopaedic	Visual	Hearing and Speech	
1.	Congenital	19 (14.96)	2 (4.76)		21 (10.50)
2.	Accident	9 (7.08)	10 (23.80)	1 (322)	20 (10.00)
3.	Post-Polio Paralysis	81 (63.79)	0	3 (9.69)	84 (42.00)
4.	Other illness	18 (14.17)	25 (59.54)	27 (87.09)	70 (35.00)
5.	Malnutrition	0	5 (11.90)	0	5 (2.50)
6.	Other causes	0	0	0	0
	Total	127	42	31	200

TABLE 4
DISTRIBUTION OF CHILDREN ACCORDING TO THEIR AGE OF ONSET
OF DISABILITY

S. No.	Age of onset of disability	Nature of disability			Total
		Orthopaedic	Visual	Hearing and Speech	
1.	At birth	19 (14.96)	2 (4.76)	—	21 (10.50)
2.	Below- 3 years	81 (6178)	4 (9.52)	2 (6.45)	87 (43.50)
3.	3-6 years	18 (14.18)	22 (52.38)	19 (6129)	59 (29.50)
4.	6-9 years	6 (4.72)	10 (23.82)	10 (3225)	26 (13.00)
5.	9-12 years	1 (0.78)	3 (7.14)	0	4 (2.00)
6.	12-15 years	2 (158)	1 (2.38)	0	3 (1.50)
	Total	127	42	31	200

TABLE 5
DISTRIBUTION OF CHILDREN ACCORDING TO THEIR NATURE
AND DEGREE OF DISABILITY

Sr. No.,	Nature of disability-	Nature of disability							
		Severe		Moderate		Mild		Total	
		M ₁	M ₂	M ₁	M ₂	M ₁	M ₂	M ₁	M ₂
1.	Orthopaedic (n=127)	32 (25.19)	12 (9.46)	72 (56.69)	97 (76.37)	23 (18.12)	18 (14.17)	127	127
2.	Visual(n=42)	13 (30.95)	5 (11.90)	25 (59.53)	33	4 (9.52)	4 (953)	42	42
3.	Hearing and Speech (n=31)	10 (32.25)	2 (6.45)	16 (58.06)	20 (64.52)	3 (9.67)	9 (29.03)	31	31
Total		55 (27.50)	19 (9.50)	115 (57.50)	150 (75.0)	30 (15.0)	31 (15.50)	200	200

M = Through medical examination

M = As felt by mothers

number of orthopaedically disabled children was higher as compared to other types of disabled children. The data of the study confirms the higher rate of prevalence of orthopaedic disability as compared to other types of disability. The main cause for their disabilities was the serious illness. These findings of the study were also supported by the results of studies conducted by other researchers. This might be due to the fact that during the early years of life, children were found to be more susceptible to diseases and during this period proper treatment against diseases was required and slight negligence in this may have lead to disability among children. The study has highlighted that majority of these children had disability when they were below six years of age. This also found support because of similar results of studies conducted by other scholars. Further, if the mothers do not perceive properly, the disability of their children deteriorates with time from mild to severe degree of disability.

Lkkjk'k

विभिन्न प्रकार की विकलांगताओं से प्रभावित बच्चों का पता लगाने के उद्देश्य से हरियाणा राज्य के हिसार जिले में रैन्डम सैम्पलिंग प्रक्रिया के आधार पर पांच गावों का चयन किया गया था। इसके लिए घर-घर जाकर सर्वेक्षण किया गया था। इस अध्ययन से इस बात की पुष्टि होती है कि बच्चों में विकलांगता की व्याप्ति दर बहुत उच्च है। दृष्टि, वाणी तथा श्रवण विकलांगताओं की तुलना में विकृतांग-विकलांगता से

प्रभावित हुए बच्चों की प्रतिशतता काफी उच्च पाई गई थी। जब वह बच्चे छह वर्ष से कम आयु के थे, तब पोलियोग्रस्त होने के कारण उनमें विकलांगता आई थी, जिसके परिणामस्वरूप बच्चों का स्वास्थ्य विकलांगता की स्थिति से लेकर गंभीर विकलांगता की स्थिति का सामना करना पड़ रहा है।

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**A PROFILE AND ONE YEAR FOLLOW-UP OF IUCD TCU 200
ACCEPTORS IN A RURAL AREA OF DELHI**

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ABSTRACT

Ninety three women belonging to two villages Prahladpur and Barwala of Delhi were fitted with Tcu 200 device (IUCD) and followed-up for a period of one year thereafter. Majority of the acceptors were young and educated with mean parity of three. In 58 per cent of acceptors, IUCD was inserted in the post-menstrual phase which is the ideal time. Commonest misconception in the minds of acceptors was that IUCD would be pushed up into the thorax, and the commonest medical problem was menorrhagia. Removals accounted for 12.9 per 100 users and commonest reason for removal was non-medical particularly family pressure. Failure rate observed was 1.06 and expulsions were 2.15 per 100 users.

India is committed to the goal of achieving Eligible Couple Protection Rate (ECPR) of 60 per cent by 2000 AD to stabilize the population. Intensive efforts have to be made to make people voluntarily accept family planning and a two child norm. In this context stress has to be placed on spacing methods. This study is an attempt to find out in a rural area of Delhi, the characteristics of acceptors of IUCD and the efficacy, effectiveness of IUCD which have been studied in depth by a one year follow-up of the IUCD acceptors.

MATERIALS AND METHOD

This study was carried out in two sub-centres villages (Prahladpur and Barwala) of rural field practice area of Maulana Azad Medical College having a total population of 9,400. IUCD (Tcu 200) insertion was done by the doctors from Department of Preventive and Social Medicine and from post-partum unit of LNJP Hospital. IUCD insertion was carried out at both the above mentioned sub-centres. During the period of study of one year, between January 1987 to December 1987, IUCD insertions were done in 102 women. These acceptors were followed-up for a period of one year but at the end of the study only 93 remained as nine had migrated, to other areas. Follow-up was done keeping the objectives of follow-up in mind, at the following intervals: one month, three months, six months and 12 months after insertion. All women were examined after the first menstrual period also. A structured, pretested proforma was used to record the observations. The acceptors were given adequate, treatment in case of complaints like menorrhagia, pain abdomen etc.

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OBSERVATIONS

Age and Literacy: The profile of the 93 acceptors that emerged from the study was that 45 (48.3%) were 20-25 years of age and none were above 35 years. Forty-four (47.3%) were educated upto secondary school. However, 32 (34.4%) were illiterate as has been presented in Table 1.

Number of Living Issues: Majority of the acceptors 56 (60.2%) had more than two living issues (Table 2), 10.7% acceptors who had more than four and had not adopted any other contraceptive method earlier. The number of acceptors with one or two living issues was only 37 (39.6%) as has been given in Table 2.

Phase of Insertion: Maximum, *i.e.* 54 (58%) IUCD insertions were done in the post-menstrual phase and post-partial insertions 37 (39.7%) were next in order as has been shown in Table 3.

Knowledge of Side-Effects and Reasons for Accepting: Awareness regarding side-effects was elicited in order to rule out fears and misconceptions associated with IUCD. It was observed that only 14 (15.05%) acceptors did not fear any side-effects but the rest gave multiple responses. Fifty-eight (62.3%) acceptors feared that IUCD can be pushed up into thorax, 42 (45.1 %) feared excessive vaginal discharge while 20[^](21.5%) and 19 (20.4%) feared local irritation and menstrual cycle disorders, respectively. Only 3 (3.2%) feared pain abdomen (Table 3).

Maximum acceptors, 90 (96.7%) reported that they sought IUCD insertion because it was reasonably "safe and sure to prevent pregnancy while being reversible: This knowledge they claimed had been given to them by para-medical workers 63 (67-6%), mass media in 48 (51.6%) and anganwadi workers in 46 (49.5%). However, multiple responses were given by most. Two (0.02%) claimed to have accepted because of the incentive money provided while one woman despite repeated questioning did not respond as to why she had accepted.

TABLE 1
AGE GROUP AND EDUCATIONAL STATUS

Age Group	Educational Status				Total	
	Illiterate	Upto Primary	Upto Secondary	More than Secondary	No.	Percentage
20-25	17	3	23	2	45	48.3
-30	13	9	12	0	34	36.5
-35	2	1	9	2	14	15.0
Total	32 (34.4)	13 (13.9)	44 (47.3)	4 (4.3)	93	100

TABLE 2
NUMBER OF LIVING ISSUES AND PHASE OF INSERTION

Number of Living Issues	Post Menstrual	Post Abortal	Phase of Insertion Post Partum	Total	
				Number	Percentage
1	6	Nil	7	13	13.9
2	15	Nil	9	24	25.8
3	14	1	11	26	27.9
4	12	1	7	20	21.5
>4	7	Nil	3	10	10.7
	54 (58.06)	2 (2.1)	37(39.7)	93	100

TABLE 3
SIDE-EFFECTS KNOWN TO ACCEPTORS

S. No.	Side-effect Known	Acceptors (n=93)	
		Number	Percentage
1.	No side-effect	14	15.05*
2.	IUCD can be pushed up	58	62.30
3.	Perforation of uterus	14	15.05
4.	Local irritation	20	21.5
5.	Excessive discharge per vaginum	42	45.16
6.	Menstrual cycle disorders	19	20.43
7.	Pain abdomen	3	3.22

*Many acceptors gave multiple responses.

Duration of Effectiveness of IUCD: Was known accurately to majority of the acceptors, 86 (92.47%) who stated that it had to be changed every three years. Seven (7.52%) were, however, not aware of its exact effective duration and thought it ranged between two to four years.

FOLLOW-UP OF IUCD ACCEPTORS

Summary of Findings: The commonest complaint of the acceptors was increased menstrual blood loss, menorrhagia, as seen in Table 4. After first menstrual period 13 (13.9%) acceptors had complained of menorrhagia which was severe enough to warrant removal in only one case. After receiving adequate treatment the number of acceptors complaining of menorrhagia declined at each visit with only one remaining at end of one year. At the end of three months, 12 acceptors complained of menorrhagia. This included some acceptors in post-partal and post-abortal phases who had their first period after the first visit.

Other complaints seen were pain abdomen accompanied with menorrhagia which was present in 9 (9.6%) after first period. The numbers declined herealsodue to adequate treatment. Backache and leucorrhoea was next in order with 4 (4.3%) complaining of it in the first visit.

Expulsions: There were only two expulsions observed after the acceptors' first menstrual period at the first visit. Both acceptors were muciparous and IUCD had been inserted in the post-menstrua I phase. One was a partial expulsion and IUCD was reinserted immediately on detection. The other was a complete expulsion and IUCD was reinserted after repeated motivation after 12 months.

Removals: In all 12 (12.9%) IUCD's were removed. Maximum removals were due to non-medical reasons (7 out of 12), family pressure being the commonest accounting for 6 LB. 50 per cent of removals. One removal was done due to acceptor wanting another child at end of one year since she had lost the first child.

Pregnancy with device in situ occurred in only one case detected at six weeks of gestation, six months after IUCD insertion.

The net cumulative continuation and termination rates for 100 users at the end of 12 months are shown in Table 5.

DISCUSSION

In this study important features observed were that majority of the acceptors though literate and of a younger age group had mean parity of three implying that target group of young and low parity couples had not accepted this spacing method. However, in 54 (58%) cases the device was inserted in the post-menstrual phase which is the most propitious time as reported by Grey and Hawkins *et al.* The commonest fear in the mind of more than half of the acceptors was that the IUCD would be pushed up into the thorax which was allayed by a suitable health education programme. At the end of 12 months all closers amounted to 13.9/100 users. The leading cause was removal of the device in 12.9/100 users. Menorrhagia as a

TABLE 4
ONE YEAR FOLLOW-UP OF IUCD ACCEPTORS

Follow-up After	Total	Nil	Complaints		Pain	Removal	Failure	Expulsion
			Menorrhagia only	Backache +Leucorrhoea	Abdomen+ Menorrhagia			
1st menstrual period	93	67	13	4	9	2	Nil	2 (Reinserted)
3 months	91	72	12	4	3	2	Nil	0
6 months	89	80	6	1	1	5	1	0
One year	84	82	1	0	1	3	0	0

*One IUCD removed after first period was reinserted now.

TABLE 5
NET CUMULATIVE CONTINUATION AND TERMINATION RATES
FOR 100 ACCEPTORS BY THE
END OF 12 MONTHS

S. No.	Type of Termination	Rates per 100 users
1.	Pregnancy	1.06
2.	Expulsion	2.15
3.	Removal	12.9
4.	All Closers	13.9
5.	Active at the end of one year	86.01

leading medical cause for removal accounted for 3.2 per 100 users. Similar finding reported by Gupta *et al* and Tejuja *et al*. The menorrhagia leading to removal was 14.1 and 9.5 per 100 users respectively in the two studies. Sivin also cites menorrhagia as the leading cause for removal of IUCD in Iranian women.

Pain leading to removal accounted for 2.12/100 users. This was the second commonest medical cause for removal. Similar finding reported by Gupta *et al.* and a WHO report^{3, 8}.

Majority of the removal *i.e.* seven out of 12 were, however, done on patient's persistent demand. This finding of non-medical reasons as the leading cause of discontinuation also reported by Gupta *et al.* and Tejuja *et al.*

Expulsion of the device was 2.1 per cent which is half as compared to that reported by Gupta *et al* and Engineer *et al*^{3, 7}. This could be because sample size was smaller and all the insertions were done by trained medical personnel after careful screening and usually in the post-menstrual phase.

Failure rate of the device was found to be 1.06/100 users in one year. An even lesser rate of 0.9 per cent reported by Tejuja *et al.* A high failure rate of 9.8 per cent however, was reported by Engineer *et al*, whereas Gupta *et al.* report a failure rate of 1.7 which is similar to our finding.

RECOMMENDATIONS

1. Major stress, should be placed on imparting constant health education to allay anxiety and fear associated with IUCD in the general public.
1. The acceptors during follow-up visits should be attended properly to remove common psychological problems.
3. Majority of problems including menorrhagia and pain can be treated if followed-up diligently and removal should not be hastened.

Lkkjk'k

दिल्ली के प्रलादपुर तथा बरवाला नामक दो गावों की 93 महिलाओं को टीसीयू 200 (अन्तर्गर्भाशीय गर्भनिरोधक) लगाए गए थे तथा उसके पश्चात एक वर्ष की अवधि तक उनका फालो-अप किया गया था। इनमें से अधिकांश महिलाएं, युवा व शिक्षित थीं। तथा उनके बच्चों की औसतन संख्या 3 पाई गई थी। अट्ठावन प्रतिशत महिलाओं को आईयूसीडी मासिकधर्म होने के पश्चात लगाया गया था, जो इसके लिए बहुत उपयुक्त समय समझा जाता है। इन महिलाओं में आमतौर पर यह भ्रांति व्याप्त पाई गई थी कि आईयूसीडी लगाये जाने के पश्चात यह छाती की ओर खिसक जाता है। इसी प्रकार इन महिलाओं में अत्याधिक रक्तस्राव होने की शिकायत भी आम पाई गई थी। यह पाया गया था कि 12.9 प्रतिशत केसों में आईयूसीडी निकलवा दिया जाता था तथा इसे निकलवाने का प्रमुख कारण, चिकित्सकीय कारण न होकर पारिवारिक दबाव होना पाया गया था। इस गर्भनिरोधक की असफलता दर 1.06 प्रतिशत तथा स्वतः बाहर निकल जाने की दर 2.15 प्रतिशत पाई गई थी।

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FERTILITY DIFFERENTIALS AMONG WHITE COLLAR WORKERS

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ABSTRACT

Utilising data collected from a sample of 1210 white collar workers working in the Uttar Pradesh State Government Secretariat, Lucknow City, this paper attempts to investigate fertility differentials among white collar workers.

The findings revealed that age at marriage of wife, her education, and her participation in white collar occupations exercise strong negative influence on fertility of the workers. Per capita income and family status have also been observed to exercise negative influence on fertility. Fertility differentials by origin of the couples, by religion and caste status have also been considered, which suggest the strength of cultural factors in influencing fertility even among educated and decently employed sections of the Indian population.

A study of fertility differentials of an educated and decently employed section of population like white collar workers has methodological importance also besides having substantive value. Recent researches have brought to fore important influence exercised by female education and female work participation particularly in white collar and technical occupations, on reproductive behaviour of the couples. But neither the use of data collected in general population surveys nor of real statistics has been able to provide a conclusive evidence about these influences. It is because few females with education and white collar employment are available without their husbands having similar characteristics and the limitations of available methodologies limit the separation of the influence of wife's characteristics from that of their husbands. Therefore, the influence of female education and work participation, as brought out by the studies, has generally been contaminated with the influence of corresponding characteristics of the husbands. In case of white collar workers, all the husbands have been educated and employed in white collar occupations. It is only the education and economic activity of females, which become differentiating factors and, therefore, fertility differentials were attributable to these factors only. The present study seeks to understand the influence of salient demographic and socio-economic factors on the fertility of white collar workers in India.

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*The use of multivariate techniques like multiple regression, multiple classification analysis etc. has been no solution of the problem as the results obtained are biased by the problem of multicollinearity in between the controlling characteristics.

MATERIALS AND METHOD

The study is based on the data collected during June-November 1982 from a sample of 1210 currently married white collar workers, working in the Uttar Pradesh Government Secretariat, Lucknow City, the capital town of the State. The Secretariat is divided into 344 sections, A fifty per cent sample of these sections was taken by selecting every alternate section from the listing of these sections available in Secretariat telephone directory. The study covered all the" currently married white collar workers working in the selected sections. A pre-structured interview schedule was used to collect information from the sample workers through personal interviews.

In terms of education, the study workers constituted highly educated category. Over three-fourths (76%) were educated upto graduate level and above.17 per cent had received intermediate level of education and only remaining 7 per cent were bare high school.

For studying fertility differentials, the mean number of children ever born by age of wife were computed from different categories and age standardised means were derived for studying the differentials among these categories.

RESULTS

Demographic and Socio-Economic Differentials Wife's Age at Marriage: Higher age of marriage of wife reduces fertility by reducing exposure to child bearing as well as through lower fecundity during that exposure. The analysis of fertility differentials among the white collar workers by age at marriage of wife has been presented in Table 1.

TABLE 1

MEAN CHILDREN BORN BY AGE AT MARRIAGE OF WIFE AND HER CURRENT AGE

Current Age of Wife in Years	Age at Marriage of Wife in Years					Total number of cases
	Below 15	15-17	18-20	21-22	23 and above	
Below 25	2.27	1.37	0.80	0.55	0.17	169
25-29	2.66	2.67	1.97	1.63	0.75	292
30-34	3.93	3.50	3.02	2.00	1.56	161
35-39	4.65	4.15	3.60	2.79	2.33	139
40-44	4.83	4.16	3.87	3.27	2.33	182
45 and above	5.83	5.03	4.69	3.58	2.17	266
Total cases all ages	131	383	363	158	174	1210*
Arithmetic	3.95	3.60	2.96	2.32	1.48	2.98
Age weighted	4.03	3.51	3.02	2.34	1.51	

*Including one non-response case on wife's age at marriage.

The analysis brings out a clear negative influence of age at marriage of wife on her fertility as indicated by a consistent decline in mean number of children born with rise in age at marriage in each current age group of wife. For the total group, rise in age at marriage from 15-17 years to 18-20 years, 21-22 years and 23 years and above has been observed to reduce age-weighted mean fertility by 14.0 per cent, 33.3 per cent and 57.0 per cent respectively. Thus, a marked decline in fertility has been observed to occur when marriage age rises to 21 years and above.

Origin of Couple: Rural or urban area, where a person is born and brought up, is expected to influence his/her fertility behaviour through attitudes and values towards procreation imbibed in early years of life. To study the influence of this factor on fertility of the sample white collar workers, the mean number of children born according to current age of wife has been analysed in three categories of origin of the worker couples as has been shown in Table 2.

In all age groups of wife, mean children born decline with increase in urban influence in early age of the couples. As compared to 'both rural' couples, the age weighted mean fertility is 14.9 per cent lower among couples with one partner urban and 27.1 per cent lower among 'both urban' couples.

Religion and Caste: Religion prescribes a code of life, refers to a system of

TABLE 2
MEAN CHILDREN BORN BY ORIGIN AND CURRENT AGE OF WIFE

Current Age of Wife (Years)	Both Partners Rural	Origin One Partner Rural.	Both Partners Urban	Total Cases
Below 25	1.12	0.89	0.94	169
25-29	2.38	1.63	1.56	292
30-34	3.27	2.70	2.14	162
35-39	4.08	3.79	3.02	139
40-44	4.67	3.81	3.10	182
45 and over	4.94	4.72	4.09	263
Total cases all ages	528	227	452	1210
Arithmetic	3.16	3.06	2.70	2.98
Age-weighted	3.43	2.92	2.50	

*Including three non-response cases on origin.

beliefs, attitudes and practices, which individuals share in groups and this orientation towards life and death is supposed to affect one's fertility behaviour. The influence of religion on fertility has been particularly important in traditional societies. Among the Hindus, the main religion of India, different caste status categories were associated with varying cultural practices, and these practices, influence their fertility. In order to examine these influences among the white collar workers relevant analysis has been given in Table 3.

From the analysis, Hindu-Muslim differences in mean fertility were observed in all age groups. The age-weighted fertility has been seen to be 25.3 per cent higher among the Muslims as compared to the Hindus. Among the Hindus, mean fertility has been observed to vary inversely with caste status. As compared to 'high' caste Hindus, age-weighted mean fertility has been observed to be 18.8 per cent higher among middle caste Hindus and 38.3 per cent higher among low caste Hindus.

Education of Wife: Education affects fertility in many complex ways by affecting proximate fertility determinants. Education of wife has been considered to be a more important factor in this respect and has been found to be so in several investigations. Such influence, if found among the sample mothers, most of whom were highly educated, could be considered to be independent influence of wife's

TABLE 3
MEAN CHILDREN BORN BY RELIGION AND CASTE AND CURRENT
AGE OF WIFE

Current Age of Wife (Years)	Hindu High	Hindu Middle	Hindu Low	Total Hindus	Muslims	Total cases
Below 25	0.82	1.17	1.41	1.00	1.38	169
25-29	1.75	2.17	2.52	1.97	2.18	290
30-34	2.64	2.84	3.56	2.77	3.17	158
35-39	3.41	3.50	4.67	3.60	4.06	137
40-44	3.54	5.45	5.11	3.75	5.38	176
45 and over	4.36	4.60	5.67	4.39	5.67	264
Total Cases All	636	134	119	1089	107	1210
Ages						
Arithmetic	2.97	2.53	3.01	2.92	3.66	2.98
Age weighted	2.77	3.29	3.83	2.92	3.66	

*Including 2 non-response cases on religion and 12 cases belonging to other religious groups.

education. The analysis of fertility differentials by education of wife has been presented in Table 4.

The table displays more or less a consistent decline in mean fertility level with increase in wife's education in all age groups. The age weighted mean fertility level has been observed to decline consistently with increase in wife's education. As compared to 'illiterate and below primary' group, mean fertility is 4.4 per cent lower in 'primary and junior high school' category, 24.5 per cent lower in 'high school and intermediate' category and 45.1 per cent lower in 'graduate and above' category. Thus, the analysis demonstrates a marked negative influence of wife's educational attainments on fertility, particularly from high school level onwards.

Wife's Participation in Economic Activities: Mainly by increasing opportunity cost of children, female participation in non-agricultural economic activities outside homes helped to reduce fertility: Their participation in white collar and technical occupations, in particular, is likely to exert a strong negative influence on fertility and further, it has been found to have done so according to the findings of some investigations. However, as noted above, the findings of general population surveys were contaminated by the husbands' varying occupations. In the present survey, the

TABLE 4
MEAN CHILDREN BORN BY WIFE'S EDUCATION AND HER
CURRENT AGE

Current Age of Wife (Years)	Illiterate and below Primary	Primary and Junior High School	High School and Intermediate	Graduate and above	Total
Below 25	1.50	1.29	0.82	0.74	169
25-29	2.53	2.55	2.05	1.31	292
30-34	3.55	3.60	2.65	1.73	161
35-39	4.33	4.05	3.50	2.63	139
40-44	4.82	4.12	3.73	2.41	182
45 and over	5.31	5.28	3.90	3.21	2.65
Total Cases	242	296	366	304	1210*
All ages					
Arithmetic	3.65	3.74	2.91	1.76	2.98
Age-weighted	3.68	3.52	2.78	2.02	

*Including two non-response cases on wife's education.

sample consisted of 1130 male workers and 80 female workers. The husbands of all females (excepting two non-response cases) were engaged in white collar profession (67) or in business (11). Thus, with almost all husbands working in white collar occupation, the only differentiating characteristic in the analysis is the working status of wife. Besides, 80 working wives included in the white collar sample, all the wives of 99 sample male workers were working in white collar professions including business. In all, 179 wives in case of the sample couples were working (all in white collar professions). In order to examine the effect of wife's participation in economic activities involving white collar work, on their fertility has been shown in Table 5.

The analysis revealed that wives working in white collar professions have 34.9 per cent lower fertility than non-working wives. This strong negative effect on fertility appears to be wholly due to female participation in white collar economic activities.

Per Capita Family Income: Beyond the threshold level, income level of a couple has been observed to have negative influence on its fertility behaviour. Per capita family income was an important indicator of income level. In order to examine the influence of income on fertility, the analysis of differentials in mean fertility level of sample workers by per capita family income has been presented in Table 6.

The analysis reveals a consistent decline in mean fertility level with increase in per capita family income in all age groups of wife. Age weighted mean fertility level has also been noticed to decline sharply with increase in per capita family income. As compared to the lowest per capita income group of 'Rs.200 and below', the age weighted mean fertility has been observed to be 21.3 per cent lower in per capita income group of 'Rs.201 -300'. 44.3 per cent lower in per capita income group of Rs.300-400 and 58.4 per cent lower in per capita income group of 'Rs.401 and above'.

Family Status: Family status of white collar workers was determined by their possession of certain durable household assets. At higher level of income, preference for alternative material assets increases over preference for children, and, therefore, family status, thus defined, has been found to have negative influence on fertility⁷. In order to examine influence of family status on fertility, relevant analysis has been given in Table 7.

The analysis displays more or less a consistent decline in mean fertility with rise in family status in all age groups of wife. After standardising for age, mean fertility has been observed to decline sharply with increase in family status. As compared to low status group the weighted mean fertility is 18.5 per cent lower in middle status and 32.9 per cent in high status group'.

Conclusion and Implications: Even among white collar workers, marked religious and caste differences in fertility have been observed astound in general population of India, both in rural and urban areas, showing importance of cultural factors in determination of fertility. The same factors operate through origin of the couples. Income and family status have been found to have depressing influence on

TABLE 5
MEAN CHILDREN BORN BY WIFE'S WORKING STATUS AND
HER CURRENT AGE

Current Age of Wife (Years)	Wife Working in White Collar Professions	Non-working Wife	Total Cases
Below 25	0.82	1.0 6	169
25-29	1.42	2.1 2	292
30-34	1.45	3.0 6	162
35-39	2.75	3.7 8	139
40-44	2.73	4.0 8	182
45 and over	3.06	4.6 9	266
Total Cases All Ages	179	1031	1210
Arithmetic	1.96	3.16	2.98
Age-weighted	2.05	3.15	

TABLE 6
MEAN CHILDREN BORN BY PER CAPITA FAMILY INCOME AND
CURRENT AGE OF WIFE

Current Age of Wife (Years)	Per Capita Family Income Rs.				Total Cases
	200 and below	201 -300	301 -400	400 and above	
Below 25	1.39	0.90	0.58	0.41	169
25-29	2.57	2.03	1.09	0.93	290
30-34	3.69	2.52	1.95	0.94	162
35-39	4.89	3.18	2.47	1.67	139
40-44	5.78	4.11	3.08	2.00	161
45 and over	5.95	5.66	4.10	3.56	266
Total Cases All Ages	376	410	201	220	1210
Arithmetic	3.39	3.13	2.67	2.30	2.98
Age-weighted	4.04	3.18	2.25	1.68	

*Including three non-response cases on family income.

TABLE 7
MEAN NUMBER OF CHILDREN BORN BY FAMILY STATUS AND
CURRENT AGE OF WIFE

Current Age of Wife (Years)	Low	Family Status Middle	High	Total
Below 25	1.05	0.94	1.12	169
25-29	2.22	1.74	1.32	292
30-34	3.19	2.35	1.89	162
35-39	4.04	3.59	2.76	139
40-44	4.90	3.67	2.78	182
45 and over	5.23	4.52	3.92	266
Total Cases	569	429	212	1210
Arithmetic	2.87	3.18	2.84	2.98
Age-weighted	3.46	2.82	2.32	

fertility of the workers. The most important findings having policy implications for curbing baby boom in the country relate to age at marriage of wife, her education and work participation in white collar occupations. A marked decline in fertility has been noticed to occur, when wife's age at marriage rises to 21 years and above suggesting desirability of raising female marriage age to at least 21 years. Likewise female education and work participation in white collar occupations were seen to have marked negative influence on fertility. The suggested policy measures were vertical and horizontal expansion of female education and promotion of their participation in white collar and technical occupations by creating adequate job opportunities for them in these sectors and providing them necessary technical education and training for these jobs.

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प्रस्तुत लेख में उत्तर-प्रदेश राजकीय सचिवालय तथा लखनऊ शहर में कार्यरत 1210 बाबू वर्ग के लोगों के एक सैम्पल के बारे में एकत्र किए गए आंकड़ों का प्रयोग करके उनमें प्रजननशीलता संबंधी विभेदकों का अन्वेषण करने का प्रयास किया गया है।

अध्ययन से प्राप्त निष्कर्षों से पता चलता है कि विवाह के समय पत्नी की आयु, उसका शिक्षा स्तर तथा बाबू व्यवसाय में उसकी सहभागिता का इन कर्मचारियों

की प्रजननशीलता पर बहुत नकारात्मक प्रभाव पड़ा था। उनकी प्रजननक्षमता पर होने वाले नकारात्मक प्रभाव का आंकलन करने के लिए उस वर्ग में प्रति व्यक्ति आय तथा पारिवारिक स्तर का भी प्रेक्षण किया गया था। प्रजननशीलता संबंधी विभिन्न विभेदकों जैसे दम्पतियों के मूल वंश, धर्म, तथा जातिगत स्थिति आदि पर विचार किया गया था, जिससे यह निष्कर्ष सामने आया है कि समाज के दृढ़ सांस्कृतिक पक्ष भारतीय समाज के शिक्षित तथा समुचित रूप से रोजगार प्राप्त वर्गों के लोगों के प्रजनन व्यवहार को भी प्रभावित करते हैं।

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HEALTH STATUS OF TRIBAL PEOPLE IN ORISSA: PROBLEMS AND PERSPECTIVES

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ABSTRACT

A study on health and morbidity status of the tribal population with special reference to S. T.D. was carried out under the auspices of Indian Council of Medical Research. The district Phulbani, having highest concentration of Kondha population, which is numerically the largest tribal population of the State, was selected for the study. The paucity of data on health and nutritional status were unacceptably meagre. Basing on the study recommendations have been offered which include to undertake a fact finding study to be aware of the actual situation, to take steps to improve agricultural produce through better tools, introducing foodgrain storage facilities, to improve nutritional status, to introduce income generating programmes, taking steps for the protection of forest, utilisation of traditional healers, improving the health care delivery services, protection of dormitory life, improvement of communication facilities, and most important the education of the consumers and the providers.

Tribal people, all over the world, are the most deprived section of the community, and understandably, every Government is concerned regarding their health and development. Their number and proportion to the general population varies in different countries. In the Indian sub-continent, leaving aside the State of* Madhya Pradesh. Orissa has the highest concentration of tribal population. There are 62 tribes consisting of roughly 60 lakhs of population which account for more than 22 per cent of the entire population of the State. As against the State's overall growth rate of 20.16 in 1971-81, the growth rate of the tribal population has been somewhere 16.44 which has been the cause of concern of both the Central and State Governments.

Data on tribal health and nutritional status is woefully inadequate. During several Five Year Plans, crores of rupees have been spent for the development and welfare of the tribal people without yielding any tangible results. This issue might be accusatory in some but it needs an indepth study and more of introspection on the part of the planners. No reliable information is available, since no serious studies have been undertaken in these areas, though some reports are available from anthropological studies, which may be extremely important and useful. For obvious reasons, however, they are grossly inadequate. Most of them are also single point

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studies. The Tribal and Harijan Research-cum-Training Institute in Orissa has undertaken some work, but it does not permit generalisation.

The purpose of this paper is (a) to give an overview of the health status of the tribal population of the State; and, (b) to suggest measures for improving the situation.

By and large, the health status of any population would depend on: the food production and consumption; socio-economic factors including poverty, ignorance, illiteracy, etc.; cultural factors leading to food habits, food fads, cooking practices, religion, child rearing practices, etc.; individuals' life style: influence of diseases; availability of health care facilities and its utilisation: opportunities to utilise natural resources; and intercourse with outside agency.

The health status of the tribal people can be analysed on the basis of above determinants. Although accurate documentation is lacking, overall findings indicate that the health and nutritional status of the tribal population is poor. Most of the preschool children suffer from Protein-Energy Malnutrition (PEM). Nutritional anaemia is common in women in child-bearing period. Diet has been found to be grossly inadequate, both in quality and quantity. In some cases, individuals were either under-fed or not-fed at all for days together and when food became available, they ate voraciously, as if to compensate for their past dietary inadequacy thus leading to nutritional imbalance.

The relationship of food, nutrition and health are too obvious to comment upon. But for the tribals, the meaning is much more than what is implied for the non-tribals. Food plays such a key role in the life of the people that they are divided in the following four categories depending on the availability of food.

- i. Those living purely on nature, forest produce, animals and birds of forest are very primitive,
- ii. Those living on shifting cultivation, use primitive and extremely poor agricultural technology.
- iii. Those living on stable cultivation, at times grow each crops, but still living below subsistence level;
- iv. A combination .of any or all of the above.

The above categorisation has special significance since majority of the tribals depend on the forest and the forest products for their livelihood. Forest is so much a part of their life that the tribals would face extinction without it. In fact, the recent shrinkage of forest area has adversely affected the entire tribal life. Forest products, leaves, roots and tubers, animals and birds, fruits and flowers constitute not only the main items of their diet, but also of their habitat and livelihood. This holds good even where nature has not been kind and the environment extremely hostile. But even when nature has been bountiful, the lack of storage facilities and accommodation in addition to outside exploitation prevent them from storing the foodgrains against a rainy day.

The low level of literacy, ignorance, simplicity and abject poverty have only aggravated the situation for the tribal people who always are struggling for a morsel of food which has never been perennially sufficient.

But their cultural practices relating to food habit, and child rearing practices have been found to be best judged by any standard. They breast feed their babies as long as they can, and their method of carrying children gives best sense of security to the child. They cook in most unsophisticated manner which helps in retaining the nutritional value of food material, eat fresh raw fruits, roots and tubers, honey etc. available in the forest which have helped them to survive inspite of heavy odds and deficiencies.

The needs of the tribal people are extremely limited and therefore they are very easily satisfied with what is bestowed on them by the Almighty with whom they have a relationship of fear and reverence. To them, it is he, who is responsible for everything what they have got and hence they should not do anything which would incur His wrath, and should try to appease Him by whatever means they can. This total reliance on the "unknown" helps them to lead rather a free life, at times adversely affecting their initiative, though helping them simultaneously to be happy.

They suffer from almost all the communicable diseases which are common to this part of the country.

From a recent study, undertaken by the author among the Kondhs of Phulbani (refer to table 1), It was found that among the Desias dental and gum diseases ranked highest being 59 per cent. Deficiency diseases followed by Eye and Ear troubles were found in 40 per cent and 33 per cent of cases respectively. Skin and genito-urinary conditions were detected in 14 per cent and 7 per cent of cases.

Among Kutia Kondhs, dental diseases were prevalent in 63 per cent eye and ear conditions in 32 per cent, deficiency diseases in 28 per cent, gastrointestinal problems in 21 per cent, fever in 16 per cent and genito-urinary diseases in 10 per cent of cases.

Respiratory and circulatory diseases were found to be on the lower side in both the groups. A breakdown of deficiency diseases indicated that deficiency of Vit A and B and Iron were higher among Desla Kondhs.

Most of the above diseases are due to unhealthy environment, undernutrition, lack of potable water supply and unhygienic personal habits.

The tribal people have a very strong belief in their own magico-religious system and the entire village community at times, offers animal sacrifices to appease the supernatural being. They do have their own traditional medicine man who provides various herbs and roots some of which are said to have been extremely useful, specially in the field of limiting children. But the veracity of this fact remains to be tested.

They live in inaccessible areas, very thinly populated and villages are widely spread over. The present norm of the Primary Health Centre and sub-centre for the

SEX-WISE DISTRIBUTION OF MORBIDITY OF STUDY POPULATION

Diseases	DESIA KONDHA						KUTIA KONDHA					
	Male n =1021		Female n= 944		Total n = 1965		Male n = 382		Female n= 416		Total n= 798	
Deficiency	379	37.12	408	43.22	787	40.05	122	31.93	99	23.80	221	27.70
Skin	164	16.06	106	11.22	270	13.74	66	17.80	37	6.90	105	13.15
Genito-Urinary	76	7.44	69	7.30	145	7.38	46	12.56	33	7.93	81	10.15
ENT & Eye	342	33.50	312	33.05	654	33.28	133	34.81	125	30.04	258	32.33
Respiratory	24	2.35	20	2.11	44	2.24	24	6.28	18	4.32	42	5.26
Circulatory	7	0.66	6	0.63	13	0.66	10	2.61	2	0.48	12	1.50
Genito-Intestinal	48	4.70	42	4.45	90	4.58	96	26.13	75	18.02	171	21.42
Teeth	541	52.00	611	64.72	1152	58.62	257	67.28	245	58.89	502	62.90
Glands	42	5.10	29	3.07	71	3.61	37	9.68	41	9.85	78	9.77
Fever	29	2.84	20	2.11	49	2.50	73	19.10	57	13.70	130	16.30
Others	18	1.76	11	1.16	29	1.47	60	15.70	66	20.67	146	18.30
	1670		1634		3304		928		818		1746	

tribal areas It totally inadequate to meet their requirements. Further, the hospital setting, impersonal behaviour of health staff and inspiring equipments and instruments, rigid hospital schedule all discourage them to utilise the service facilities.

The opportunities to utilise the natural resurces are gradually dwindling due to various restrictions imposed on the forest products which are main sources of their income. To further aggravate this problem, the food reserve is being gradually depleted due to migration of outsiders, thereby increasing the population pressure and outside influence leading to drainage of local raw materials.

The development of roads has adversely affected the local economy, as this has enhanced the exploitation, by easy transport of forest produce. The result has been that the tribal community labours hard to enrich his affluent neighbour, remaining hungry at the same time.

With such a gloomy picture as this what could be done to improve the situation?

SUGGESTIONS FOR IMPROVEMENT

The first and foremost step would be to collect the basic data which would help in the planning of the development programme. There are large number of Government schemes for the benefit of the tribal people. If only the plans could be executed properly it would go a long way in helping the developmental activities. Health cannot be dealt with in isolation. It needs an integrated and multisectoral approach.

Activities leading to socio-economic development, specific planning for improvement of environmental sanitation, water supply, nutrition, education, MCH care, etc., are essential. Programmes should be based on locally available culturally acceptable, and inexpensive methods and materials. They should address to specifically vulnerable groups. Further, specific protective measures like immunisation, supply of nutrients, supplementary feeding programme, etc. need to be geared up.

Though continuous doling of food is undesirable, at the initial stage this is a necessity for their survival. Unless the mothers' nutrition during antenatal period and that of the pre-school and school-going child is adequately improved, it would adversely affect the overall brain development of the child. The quality of human material would steadily erode due to malnutrition.

Facilities be provided for early diagnosis and prompt treatment of diseases. The Government planning of one sub-centre for 2-3 thousand population has not materialised as yet. Wherever they exist, the staff are generally not found to be in position. With difficult terrain, lack of conveyance and widely spread out population, it is rather unworkable proposition. It is further complicated due to the extreme mobility of the population, shifting their residence as the natural resources dwindle. In a situation like this, a modest mobile health unit can be attached to every tribe as has been done elsewhere in the world. The health personnel be selected from the

tribal people who would live and move with them, offering care at the time of need. Only the basic medical care is to be provided but referral services have to be streamlined.

The tribal people have great faith on their traditional healers. Special mention needs to be made regarding TBAs (Traditional Birth Attendants). Their number is too huge to be ignored. It would be desirable to recruit and train them so that their services could be utilised both as healers and educators. It is also to be noted that the traditional system of cure does not come into conflict with the modern system of medicine - a finding which would be appropriately used.

Income generating programmes be instituted, emphasising on small scale cottage industries. Tribals have a rich cultural heritage and should be taught to develop their own cottage industries. Instead of teaching them new skills, emphasis should be placed, at least in the initial stage, to develop their own traditional cottage industries, providing them with market facilities for the finished products. The purchasing power needs to be increased to cope with the general population of the State. The various tribal development agencies have not been very effective and need to be improved.

It is suggested that the forest plantation programme should lay emphasis on development of orchards of mango, jack fruit and such other variety of fruits to serve the need of the forest-dwellers so that they would become the guardians rather than destroyers of forest.

Tribal farming is based on primitive and poor agricultural technology. This needs to be improved and as far as possible, better tools and techniques be made available to them. The outsiders have infiltrated tribal areas and have been a source of exploitation. While the outside influx cannot be prevented, stringent legal measures to be taken to stop the exploitation of the tribal people.

The needs of the tribal people are extremely limited and education is not considered a necessity, rather it is an encroachment on their free life style. Sending child to the school means loss of the family income since the child also is a bread-earner. It needs special effort to make them realise the value of education and start special types of schools suitable to their needs and time.

A very fascinating socio-cultural pattern of tribal society is the institution of dormitory life which is fast disappearing adversely affecting their traditional charm and utility. These institutions not only helped in socialisation and educational process but were also a source of maintenance of their dance and songs and helpful in releasing the tensions. Special efforts should be undertaken to preserve these institutions.

An area which very often is not taken care of is the education of educators and planners. Great emphasis should be placed on the social responsibility of the planners and they should be properly oriented, educated and trained to understand the problems of the tribal community including methods to solve them which would be area as well as cultural specific.

It would not be out of place to plead for the establishment of a special unit/wing only to cater to the needs of the tribal people in the health sector. The approach should be holistic and not a crisis management service system. Regular monitoring and evaluation activities should form an important component of these cells.

Finally, since health, food, nutrition and development are closely linked with each other, this has to be viewed in its proper perspective specially discussing the tribal health.

The author is fully conscious of the fact that this is just an overview and a very simplistic approach to the more complicated health problems of the tribals. But this attempt was undertaken to bring out some of the salient features and that there is an utter lack of the very basic information which needs to be collected for proper planning, if the quality of life of this vast deprived segment of human population really need be improved.

Lkkjk'k

भारतीय आयुर्विज्ञान अनुसंधान परिषद् के तत्वाधान में आदिवासी लोगों के स्वास्थ्य तथा रूग्णता दर संबंधी स्थिति पर विशेष रूप से यौन संवर्धित रोग के संदर्भ में एक अध्ययन संचालित किया गया था। इस अध्ययन के लिए फूलबनी जिले का चयन किया गया था, जहां कॉड जाति के आदिवासियों के घनी आबादी है तथा यह राज्य के आदिवासी जनसंख्या वाले क्षेत्रों में सख्या के आधार कुछेक सिफारिशें की गई हैं, जिनमें: वास्तविक स्थिति की जानकारी रखने वाले तथ्य अन्वेषक अध्ययन का संचालन करना, बेहतर उपकरणों के माध्यम से कृषि उत्पाद के सुधार लाने के उपाय करना, खाद्यान्नों के भण्डारण की व्यवस्था लागू करना, उनके पोषण स्तर में सुधार लाना, आय अर्जक कार्यक्रमों को लागू करना, स्वास्थ्य परिचर्या वितरण सेवाओं में सुधार लाना, देहाती जीवन के संरक्षण के उपाय करना, संचार सुविधाओं में सुधार लाना आदि सुझाव सम्मिलित हैं। इनमें सबसे महत्वपूर्ण सिफारिश यह की गई है कि उपभोक्ताओं तथा सेवा प्रदाताओं को शिक्षित किया जाए।

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EFFECT ON FERTILITY OF HUSBAND-WIFE SEPARATION DUE TO MIGRATION

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ABSTRACT

This paper attempts to study the fertility differentials between two types of couples, designated as 'migrants' and 'non-migrants' by taking into consideration the characteristics such as caste, educational and economic status of household, education of males and females etc. The present study is based on the data collected from about 3500 households from rural area near Varanasi. The study revealed that the fertility in all the age-groups of 'migrants' was lower in comparison to 'non-migrants' and fertility differentials between 'migrants' and 'non-migrants' were also not uniform in different socio-economic groups of the rural society.

In the process of rural-urban migration, the fertility of migrants lies between the fertility of urban natives and rural non-migrants! One explanation for a lower fertility among migrants than that of non-migrants has been that migrants constitute a literate and more enterprising class of the population. According to population reports, the main reason for the relatively low fertility of migrants compared to non-migrants are:

Selectivity. Migrants may be a self-selected group that would have had lower fertility than their rural neighbours even if they had not migrated. This should be because willingness to migrate and desire for a small family, both reflect a tendency towards more modern, less traditional attitude.

Adaption: After they move, migrants may quickly adapt to the new surroundings, attitudes and behaviour including lower fertility, like those of other urbanites to suit city life.

Disruption: Moving itself may lower fertility by delaying marriages, separation of spouses, reducing the desire for an immediate pregnancy, and creating streams that perhaps disrupt the functioning of the reproductive system.

In India, one of the important characteristics of migrants from rural areas is that they mostly migrate singly leaving their wives and children in the villages. This separation of households from their wives have been found to be one of the important factors causing migrant and non-migrant fertility differentials in rural areas of India. Analysing data of a fertility survey conducted in certain rural areas of Uttar Pradesh in 1956, further, it has been reported that the fertility of couple

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that had the husbands who worked in non-local areas (*i.e.* working in the cities of Banaras, Calcutta and Bombay) was lower than that of couples working locally". He mentioned that the lower fertility of such couples can be explained by the non-residence of the husband in the village, another study based on data from 23 villages in the two districts of Gujarat and Maharashtra, also reported lower fertility for women whose husbands were absent for more than six months than for those with the husband present.

Although, the Indian studies cited above strongly suggest that husband-wife separation affects the fertility of migrants, but these studies do not throw any light on whether the difference in fertility of migrants and non-migrants is the same in different socio-economic groups of the rural society or differ in various groups of the society.

The objective of the present study is to find out the fertility differentials between 'migrants' and 'non-migrants' by taking into consideration the characteristics like caste, economic and educational status of the households and the education of the males (husbands) and the females (wives). Here the two types of couples are: (i) husband migrated leaving behind his wife in the village and visits the village occasionally; and (ii) husband and wife both living together in the village. These two types of couples have been termed as 'migrants' and 'non-migrants' respectively. The data has been taken from a survey entitled, "Rural Development and Population Growth (RDPG) - A Sample Survey 1978" conducted under the auspices of the Centre of Population Studies, Banaras Hindu University.

THE DATA

The data for this study are taken from a survey entitled 'RDPG-A Sample Survey 1978' conducted during March-October, 1978 in the rural areas of Eastern Uttar Pradesh, India. The main objective of the survey was to study the existing levels of fertility, mortality and migration in the three types of villages representing different levels of social and economic development.

The data from the selected households were collected by the personal interview method. The information on household structure, household facilities, migration, commutation, fertility, mortality and morbidity was obtained from each household. The information on migration could successfully be included by adopting a 'modified definition' of a household. A household was defined as a group of people who usually stay together and take food from a common kitchen, inclusive of the people who usually live outside the village but claim the household to be their own. Such people are generally migrants who go away to earn their livelihood but maintain contact with the household by visiting at regular intervals. The details about the survey have been given in another study.

RESULTS AND DISCUSSION

In the survey about 83 per cent of male migrants were found to be married, and, out of them about 75 per cent had migrated leaving their wives in the village. This

shows a more or less similar percentage of husband-wife separation as reported in other parts of the India. It is to be noted that here the couples have been classified as 'migrants' and 'non-migrants' on the basis of their present residential status. Thus, a couple, where male partner was a migrant earlier, might have returned now to his village currently comes under the category of non-migrant. A study of fertility of the couples where both partners (husband and wife) were migrated is not attempted here due to lack of detailed information about them. Here, the comparative study of fertility between 'migrants' and 'non-migrants' in different socio-economic groups has been done mainly on the basis of number of children ever born to females of different age-groups in those various socio-economic groups. However, in many of the age-groups, the number of observations become quite small, and hence the comparison has been based on the number of children ever born for all females (irrespective of age). This figure, too, has a major limitation that apart from depending upon number of children born to females of different age-groups, it also depends upon the age structure of the female population of the specific group. Consequently, a 'standardised average' number of children ever born to all females has also been computed for females of different socio-economic groups, taking the weights based on the age distribution of the total female population in the reproductive age-group. Thus, for example, if $\bar{i}_G$ represents the average number of children ever born to females of age x of specific group 'G' then the standardised average number of children ever born to all females of this group is computed as:

$$\sum \bar{i}_G \cdot W_x$$

where W_x is the proportion of females of age x in the total population of females belonging to the reproductive age-group.

The average number of children ever born to females of different age-groups in case of migrants as well as non-migrants have been shown in Table t. The average number of children ever born as well as standardised averages for different socioeconomic groups have also been presented in the same table. Various groups have been formed by taking into consideration the caste, economic and educational status of household, and the education of male and female. The details of these classifications have been given in Appendix 1.

Table 1 indicates that the average number of children ever born to migrants was consistently lower than that for non-migrants for all age-groups. However, some studies dealing with the rural-urban migration in India have reported that migrants have a relatively higher fertility than non-migrants upto 25-29 years age-group after which it has a declining tendency for each later age-group. These studies have reported a pattern of 'crossover' in the age-group 25-29 years which has been reverse of 'crossover' noticed in urban areas where rural migrants have a lower level of fertility at younger ages but fertility becoming progressively higher with age than that of urban non-migrants, surpassing from ages 25 to 30 years. However, present findings do not reveal any type of 'crossover' and migrants exhibit lower fertility for all the age-groups. This may be mainly due to the prolonged separation between wife and husband in the case of migrants. Further, it has been noticed that the

percentage difference between the fertility of the migrant and the non-migrant was' not uniform for the four age-group, viz., below 20 years, 20-29 years, 30-39 years and 40-49 years. Intact, these percentages are 18.2 per cent, 25.6 per cent, 22.3 per cent, 21.7 per cent respectively. The smaller gap between the fertility of the migrants and the non-migrants for the age-group below 20 years may be attributed to the fact that in most of the cases the husband might have migrated very recently, causing lower fertility differentials between the migrants and the non-migrants. Further, the declining trend in differences between fertility of the migrants and the non-migrants beyond age 20 years may be perhaps due to the fact that at older ages, the coital frequencies of the non-migrants may decline substantially due to various socio-cultural factor whereas it may be very nominal in case of the migrants, where the' husband does not observe any 'abstinence' when he visits the Village after a prolonged separation.

FERTILITY AND CASTE

In India, caste is an important determinant of socio-economic and cultural status of a person and effects fertility to a large extent.

It is evident from Table 1 that the average number of children ever born to the migrants was consistently lower than that for the non-migrants for all the caste groups in almost all the age-groups. Further, the fertility among upper caste was lowest while it was maximum for the scheduled castes.. Intact, people of upper castes have an average higher social, economic, cultural and educational status in the society while the scheduled caste-group occupies the lowest position in the rural society. However, we compared the difference between the standardised averages of number of children ever born for all the caste groups to which migrants and non-migrants belonged, then a reverse picture was observed. Though the fertility, among upper caste was found to be the least, the percentage difference between the fertility of the migrants and the non-migrants was the maximum. However, this difference was least in the case of the scheduled caste who have the higher fertility. Infact, the percentage for upper caste was 41.9 per cent while for scheduled caste, it was only 9.3 per cent. This shows that though the separation is a dominant factor for fertility differentials between migrants and non-migrants, the role of selectivity and adaption may be more for the migrants of upper castes than those belonging to the other caste-groups.

FERTILITY AND ECONOMIC STATUS OF HOUSEHOLD

Much discussion have been done about the relationship between income and fertility in both developed and developing countries. Studies with-minor differences, have shown an inverse relationship between fertility and economic status of the couples. An inverse relationship between fertility and economic status was also observed among both migrant and non-migrant couples. A sample study made in the same region but from different villages has also reported a similar pattern. Further, the average number of children ever born to the females of different age-groups has been lower in the case of migrants in comparison to non-

migrants in all the economic groups. However, the percentage difference in standardised averages of migrants and non-migrants fertility was about 16 and 20 respectively in the middle and higher economic status, while in case of lower economic group, it was found to be 14 per cent. Thus, it has been observed that effect of the migration in reducing fertility was more among the couples of higher economic status group than in lower economic status group of the society.

EDUCATION AND FERTILITY

Migrant and non-migrant fertility differentials have been examined according to both the educational level of household (defined in Appendix) and the education of females (wives) and males (husbands). It may be noted from Table 1 that the average number of children ever born to a 'migrant' couple was lesser in comparison to the average for a 'non-migrant' couple in all the educational groups of household except for the females of age-group less than 20 years, where the number was, of course, very small. The standardised averages of the number of children ever born were 3.71, 2.59 and 2.61 for migrants which was rather smaller than 3.78, 3.73 and 3.38 noted for non-migrants respectively for low, middle and high educational status of the households. It should, however, be noted that the percentage difference in migrants and non-migrants fertility was about 25 and 30 for middle and high educational group of households whereas it was much less (about 2%) for low educational group of the households. This, further confirms the earlier finding that in upper strata of the society, migration has played a greater role in reducing fertility than in lower group of society.

When the fertility differentials were examined between migrant and non-migrant according to the education of the wife and the husband, a more or less similar picture was observed as in the case of educational status of household. However, here the percentage difference in the fertility of migrants and non-migrants was more apparent when one moves from lower to higher educational groups. For example, these percentage differences were 6, 14 and 40 for the case of illiterate, primary and middle and high school and above educated husbands. This difference was even more pronounced for the case of education of wife, it being 17 and 61 per cent for illiterate and literate wives respectively.

CONCLUSIONS

The findings of the study revealed that husband-wife separation due to migration reduces migrant's fertility to a considerable extent. However, the gap between completed fertility of migrants and non-migrants was not as much as the extent of separation between husband and wife. This may be mainly due to very high coital frequency of migrated husbands when they visit the household after prolonged separation. An interesting finding of this study also revealed that effect of migration on reducing fertility was not uniform in different socio-economic groups and infact the difference between fertility of migrants and non-migrants was higher in the upper strata of rural society where they have the least fertility.

TABLE 1
AVERAGE NUMBER OF CHILDREN EVER BORN ACCORDING TO AGE OF
FEMALE AND RESIDENTIAL STATUS OF HUSBANDS BY VARIOUS
CHARACTERISTICS

Characteristics	Age of Female									
	Below 20 year		20-29		30-39		40-49		All (Standardized Mean)	
	M	NM	M	NM	M	NM	M	NM	M	NM
1. Caste										
Upper Case	0.17	0.45	1.56	2.19	3.79	4.00	3.83	6.27	2.31	3.28
Middle Caste	0.31	0.28	2.19	2.45	4.24	5.41	5.82	6.82	3.03	3.51
Business Caste	0.00	0.37	2.17	2.51	4.25	5.43	7.50	6.13	3.24	3.55
Functional Caste	0.45	0.47	2.00	2.57	5.04	5.48	5.73	6.96	3.19	3.77
Scheduled Caste	0.50	0.43	2.46	2.79	5.08	5.41	6.11	6.77	3.44	3.76
Muslims	0.00	0.35	1.07	2.77	4.71	5.37	7.80	7.28	2.33	3.81
All	0.30	0.39	2.03	2.55	4.48	5.48	5.53	6.73	2.96	3.58
2. Economic Status										
Low	0.50	0.56	3.00	3.08	4.89	5.96	6.00	7.04	3.59	4.09
Middle	0.33	0.38	1.99	2.61	4.79	5.49	5.71	6.86	3.09	3.72
High	0.30	0.33	1.39	2.19	4.15	5.02	5.38	6.38	2.89	3.34
3. Educational Status										
Low	1.50	0.46	3.00	2.80	4.91	5.45	5.67	6.76	3.71	3.78
Middle	0.38	0.38	1.87	2.53	4.32	5.61	5.28	6.38	2.39	3.73
High	0.00	0.32	1.77	2.20	3.65	5.12	5.60	6.40	2.61	3.38
1. Education of Female (Wife)										
Illiterate	038	0.40	2.14	253	4.72	552	6.00	6.77	3.18	3.73
Literate	0.17	036	1.43	2.06	3.32	480	230	605	1.97	3.18
Education of Male (Husband)										
illiterate	0.71	0.41	2.86	2.76	5.03	5.63	6.05	6.92	3.62	3.83
Primary and Middle	0.37	0.44	1.34	2.55	5.21	5.64	6.00	6.76	3.20	3.73
High school and above	0.21	0.34	1.76	2.29	2.90	4.96	4.58	5.69	2.32	3.26

M: Migrant; NM: NON-migrant *Less than five observation.

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प्रस्तुत लेख में दो प्रकार के दम्पतियों, जिन्हें “प्रवासी तथा गैर-प्रवासी” कहा गया है, के बीच प्रजननशीलता संबंधी विभेदकों के बारे में यह अध्ययन करने का प्रयास किया गया है। इस अध्ययन के लिए उनकी जातिगत विशिष्टताओं, परिवार के शैक्षिक व आर्थिक स्तर, पुरुषों व महिलाओं के शिक्षा स्तर आदि पक्षों पर ध्यान केन्द्रित किया गया था। यह अध्ययन वाराणसी के समीप एक ग्रामीण क्षेत्र के 3500 परिवारों से एकत्र किए गए आंकड़ों पर आधारित है। इस अध्ययन से यह निष्कर्ष प्राप्त होता है कि “गैर-प्रवासियों” की तुलना में सभी आयुवर्ग के प्रवासियों का प्रजननशीलता स्तर कम था तथा ग्रामीण समाज के विभिन्न सामाजिक-आर्थिक समूहों के प्रवासियों व गैर-प्रवासियों के बीच प्रजननशीलता विभेदक भी समाज नहीं पाए गए थे।

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APPENDIX 1

CASTE FACTOR OF HOUSEHOLD IN VILLAGES

In rural areas, caste is an important determinant of occupation, education and social status, and may therefore, be one of the important factors responsible for migration. In the particular area under study, about 95 per cent of households were Hindu belonging to about 35 castes. Keeping in view the total number of households, these castes were grouped into five categories on the basis of homogeneity in the pattern of living and the relative importance of the caste in the area. Although, a type of caste system also prevails in the Muslim community, all Muslims have been, treated as 'Single group' as their number was not sufficiently large for any further grouping. The caste groups are given as:

- | | |
|-----------------------|--|
| I. Upper Castes | Kshatriya, Bhumihar, Brahmin, Kayastha, Gosain, Brahmbhatta, Mahabrahmin |
| II. Middle Castes | Kurmi, Koiri, Ahir, Gareria |
| III. Business Castes | Bania, Teli, Thathera, Sonar, Kalwar, Halwai, Barai |
| IV. Functional Castes | Kohar, Kahar, Lohar, Nai, Mali, Mallah, Bind, Nonia, Rajbhar |
| V. Scheduled Castes | Chamar, Khatik, Dharkar, Dhobi, Nat, Pasi, Bhangi, Musahar |
| VI. Muslims | |

ECONOMIC STATUS OF HOUSEHOLD

In most studies the economic status of a household has been measured with the help of per capita income. It is a well known fact, however, that income data, is not particularly reliable, especially that obtained from the rural areas. Keeping in view this fact, it was decided to define the economic status of a household by taking into account a number of other factors in addition to per capita income, which were highly correlated with the economic condition of the household, in the present survey, the economic status of a household was computed taking into consideration the following five factors:

- i. Per capita income,
- ii. Type of house,
- iii. Possession of prestigious goods in the household,
- iv. Consumption of milk, and
- v. Consumption of vegetables

Appropriate scores were given to the above factors and the total score represented the economic status of the households. The scores assigned to the above five factors varied as 0-60, 0-15, 0-15, 0-5 and 0-5 respectively. Thus, the total score

could theoretically vary from 0 to 100. On the basis of these scores the households were classified into three major groups as below:

<i>Economic Status Group</i>	<i>Scores</i>
1. Low	24 and less
2. Middle	25-44
3. High	45 and More

EDUCATIONAL STATUS OF HOUSEHOLDS

The educational status of a household was determined by taking into consideration the average educational level of the members of the household as well as the maximum education of any one in the household. For computing the educational status, only males of fifteen years and above were included. In this context, appropriate scores were given to the education of each member included and the average of these scores represented the average educational level of the household. A similar score was also given to the educational level obtained by any one in the household and the total of the two scores represented the educational status of the household. The scores were given in such a way that they ranged from 0 to 10. On the basis of these scores the households were classified into educational status groups as below:

<i>Educational Status Group</i>	<i>Scores</i>
1. Low	0-0.99
2. Middle	1-4.99
3. High	5 and above