

**PREVENTION OF FOOD ADULTERATION:
SOME THOUGHTS**

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ABSTRACT

The article highlights several issues of interest to health administrators. Adulterating food is regarded as a social evil, and is a reflection of the level of crime in society. Several methods are used for food adulteration, using techniques which range from simple to extremely complex procedures. Food adulteration takes place due to dishonesty, though it may also be due to ignorance. Both education of traders and consumers as well as legal measures have to be simultaneously undertaken to curb adulteration. Consumer movements in this direction have to be actively encouraged. Studies need to be undertaken to understand the types of adulteration and know the prevalence of the same.

Health care systems at Central, State, district or municipal levels have to implement various types of health programmes. But of these, the one which is most complicated, disappointing and frustrating is related to the prevention of food adulteration. For other types of health programmes, the manager has periods of satisfaction followed by periods of worry and concern; but, for those responsible for implementing prevention of food adulteration programme in a conscientious manner, it is nothing but continued agony. Any health care personnel responsible for administering this programme either at the administrative or at the operational level will have the same opinion.

What is food adulteration? It is undoubtedly a social evil which can be regarded as the outcome of an interaction between a number of social, economic, technical and human behavioural factors. It is a manifestation of a sick society and can be regarded as a crime similar to other crimes like theft, burglary or murder. Like any other crime, food adulteration is expected to continue in our society as long as the existing factors which generate crime will continue. The

question of eradication of food adulteration, is an impossible task. What is really necessary for consideration is the implementation of measures which can control this crime to a level which will not pose health hazard among the consumers.

Ugly Face of Food Adulteration

Food adulteration is common in almost all developing countries. But its ugly face is not the same everywhere. In a developing country which is at the lowest rung of the development ladder, food adulteration consists of relatively simple measures, the best examples of which are the addition of water to milk, mixing inferior quality of food to more expensive varieties and the use of non-permitted and harmful colours in the preparation of homemade processed foods for sale. On the other hand, in countries which have a developed food industry sector, food adulteration has a broad spectrum starting from simple procedures to most complicated technological procedures needing high level technical competence. It is obvious that in such food adulteration, technical expertise of very high order is utilised by the adulterator in performing such type of crime. India unfortunately comes in the latter category. Starting from the simple procedure of adding water to milk or selling diluted buffalo milk as cow's milk or using skimmed milk powder for making high quality milk, the adulteration process goes to the other extreme of utilising non-permitted food additives in making processed package foods or making perfect imitations of well known brands of food which can sometimes escape the most careful scrutiny of the food inspectorate.

Why Food Adulteration?

Let us be clear that food adulteration in India under the law includes both willful adulteration of food and "substandard" foods which do not conform to the prescribed food standards but are not done intentionally. Taking an overall view of all types of food adulteration, three major underlying causes could be identified:

- i. Inadequate availability of food to meet the demands of the consumer prompting the unscrupulous food traders to use any means to stretch the supply to earn more money.

- ii. The more important reason is the basic dishonesty of the food traders and an urge to make quick and easy money. In fact, this urge to make money in an unscrupulous manner is possibly the basic reason for the majority of crimes committed in the modern day society, be it theft, burglary, bank looting or murder. This dishonesty to earn easy and quick money is not only restricted to the food traders who commit crime of food adulteration but can also apply with equal force to the law enforcer who might make an alliance with the food trader with most disastrous results.
- iii. There are significant numbers of cases of food adulteration committed by small traders due to their ignorance about the standards they are expected to maintain. It is true that all food standards after they are developed are circulated by government notification for the knowledge of all traders; but it is equally true that there is an abysmal gap between the traders and the law enforcers, especially when they are small and medium traders e.g. the street corner food sellers.

All considerations for the prevention of food adulteration should, therefore, focus on these three major underlying causes and it is obvious to anyone that prevention is undoubtedly the most difficult task.

The legal enforcement is only one measure for the prevention of food adulteration and it will not have any appreciable impact unless and until there is adequate supply of food at a reasonable price which the average consumer can afford, awareness of the small traders about the food standards which they are expected to maintain, awareness of the common consumer regarding the dangers of adulterations and how to take advantage of the legal machinery to force the traders to get the proper food and lastly, a sense of honesty among the food traders, big and small, in the maintenance of the safety and quality of food.

How Prevalent is Food Adulteration?

This is a question which is being posed for the last few decades with no clear cut answer. The statement issued from

the government authorities on the basis of samples checked and the number prosecuted indicates that about 14 to 15 per cent of samples lifted are found to be adulterated. This is the most undependable and unrealistic estimate of the prevalence of this crime. Such data from the government reports can be regarded as the most distorted statistics since these are based on the samples lifted which is obviously a terribly biased sample based on the whims, likings, opportunities and the convenience of the food inspectorate. Anyone having a little knowledge of statistics would immediately come to the conclusion that this is the most undependable estimate of prevalence of food adulteration in the country. On the other extreme are the views of the consumer that almost all foods in the country are adulterated by the unscrupulous food traders. It is obvious that the real answer lies in-between the two extremes.

Need for a Realistic Study

It is felt that there is an urgent need for an impartial scientific study to determine the prevalence of food adulteration in the country. Such study should not be undertaken by an interested party, the consumers or the law enforcers, but should be undertaken by a research institution in a properly designed and controlled manner. The National Institute of Health and Family Welfare and the Indian Council of Medical Research are ideally suited to undertake such a study in various parts of India in order to find out the extent of food adulteration, the types of foods which are commonly adulterated, the types of adulteration adopted, the common adulterants used, the health hazards of such type of adulteration and lastly, to explore as far as possible the motives for such adulteration. In other words, such a study will generate for the first time data on the basis of which one can develop an "anatomy of food adulteration" and possibly, get an idea of the "profiles of the food adulterators" and the reasons for such adulteration. The results of such a study will be an eye opener for the consumers, law enforcers and also for those who are brooding for decades as to the reasons of food adulteration and how to prevent this menace.

How to Prevent Food Adulteration?

Can this menace be eradicated? Like any other crime, food adulteration would continue. However, everyone will

wish that this menace, like any other crime, be controlled significantly. In India, there are two extreme views which are in circulation. According to one view, we have to coexist with this crime for years to come but with suitable measures it could be brought down to a low level. The sense of co-existence with this crime has possibly emerged from a sense of frustration as over the decades we have witnessed the continuation of food adulteration without signs of abatement inspite of numerous measures taken by the government. The second view is that, with severe deterrent punishment and a strict enforcement of the legal measures, food adulteration could be eradicated almost to a stage of non-existence.

It is difficult to say which is the real answer. At the moment, one could identify three different views coming from three different angles - from the enforcers of the control measures, the consumers and the traders - the three partners in the prevention of food adulteration.

The enforcers which mean the government, municipal bodies and all others responsible directly or indirectly with the control of food adulteration will opine that the control of this menace needs a number of measures; only legal enforcement will not be enough. The basic requirements are providing adequate food supply at a reasonable price, setting up of realistic food standards which are enforceable and which can be attained by majority of the traders (not only the big food industries but the common agricultural producers, traders and the medium and petty food processor), the minimum basic honesty on the part of the traders and the law enforcers, a band of committed inspectorate staff and of course, a harsh deterrent punishment for those who commit this crime.

It has been mentioned for decades that if deterrent punishment is prescribed for food adulteration, this crime will disappear. A famous statement in the past was "Hang them on the nearest lamp post and adulteration will disappear" But this alone will not work. There is now a provision under the Prevention of Food Adulteration (PFA) Act and Rules that in extreme cases, life imprisonment could be awarded to those who commit food adulteration which is extremely injurious for health. Though this provision exists, so far not one person has been given this sentence. It is extremely difficult to interpret what is dangerous for the health of a man. The use

of a potential carcinogenic dye in the making of food, as is very commonly practised in the city of Delhi and in all other cities and towns, is sufficient enough to attract this punishment but why has not this punishment been awarded? It is true, that in those countries where severe punishments such as amputation of limbs are practised, the crime situation has greatly improved. In a democratic country like India, certainly such punishments are unthinkable nor is the pronouncement of life sentence possible for food adulteration. In all probability, making punishment more deterrent would lead to more of corruption. The traders fearing such punishment would do their best to corrupt the law enforcers with results which might be extremely alarming. Taking an overall view, one must admit that giving deterrent punishment alone is not the answer to the problem of food adulteration but one should take an overall view and simultaneously implement measures for its correction.

The consumers' view is certainly most important because the prevention of food adulteration machinery is designed for their benefit. The consumers feel by and large that an honest enforcement will certainly reduce the crime and along with that is the need to award harsh punishment, not only the provision of punishment under the law. In this connection, it is pointed out that the consumers who can play a very vital role in food adulteration are "dumb and gullible" in this country. The consumer movement has not taken roots at all excepting in a few instances in the big cities.

The view of the traders will obviously be one sided. They feel that the government is not making realistic standards and is imposing such standards which are only harming the trade. They also feel that whatever standards are made should be circulated to the traders not only through the government notifications but by some other mechanisms through which the traders, big and small, are made aware of these standards. Thirdly, standards, in order to be ideal, should not strangle the food industry.

Lessons Learnt

What lessons have we learnt in the implementation of a programme for food adulteration? India has the experience of running this programme for almost 30 years. Even now, we are not clear at all about the main facets of food adulteration.

For example, it is extremely important to get some information about the prosecutions being made in the States and the municipal bodies during the last five years in order to answer certain questions like -

- a. the percentage of prosecution launched against the big traders versus small and medium traders.
- b. percentage of prosecutions launched for dangerous adulterations versus innocuous adulteration.
- c. percentage of prosecutions launched for complex types of adulteration versus simple adulteration.
- d. percentage of prosecutions launched against institutional adulteration versus "unintentional adulteration".

This would throw considerable light on the motives of adulteration, the extent of adulteration, the gravity of adulteration, the mode of adulteration and the effectiveness of sampling adopted by the inspectorate.

The lifting of sample is an area which needs considerable improvement and every one responsible for the enforcement of food adulteration would agree on this point. At the present moment, this is entirely on the discretion of the food inspectors which certainly could be much more rationalised and made more realistic. It is suggested that the supervisory staff - the local health authority - who has been made more responsible should also be given more powers in decision making and as to the procedure of lifting samples to make them more realistic and rational.

Food Standards

Prevention of food adulteration goes very closely with the establishment of food standards. The Central Committee of Food Standards, a statutory body in the Directorate-General of Health Services, Government of India, is responsible for laying down realistic standards. However, one should realise that the standards should be such which are enforceable and which are realistic. For instance, laying down a standard like "carbide should not be used for ripening of fruits" is only a wishful thinking because the rules do not prescribe how the standard can

be enforced. A standard which is not enforceable is not a standard at all. Secondly, a standard must be realistic. The present standard that not a grain of Kesari Dal should be present in any other sample of cereals or grams is not realistic since it is not practicable in the present agricultural practices. Even if 3 per cent of Kesari Dal is present as "foreign body", which is permissible under the Rules, it is certainly not injurious to health. It does not mean pleading for the particular admixture of Kesari Dal with cereals. But it is being pointed out that the standard should consider the agriculture and other practices in the country and make those which are realistic.

Similarly, the PFA Act and Rules should be reviewed in-depth. At the present moment, the rules are designed to catch the criminal after the crime has been committed. More attention should be given to know how to prevent this crime. In other countries, such programme is known as food safety or food control, which is more realistic than the prevention of food adulteration.

Consumer Movement

Lastly it is to be pointed out that prevention of food adulteration in India should be spearheaded by a pressure group and that pressure group should be the consumers. In India, the consumer movement is almost absent excepting a few isolated cases in big cities. Millions of consumers are "dumb" and are not aware of food standards and the safety laws. In some cases, the Government might feel that consumer movement is an anti-Government activity. This attitude should be changed completely. The Government should come forward in supporting the development of consumer movement, guide them, make them aware through mass communication campaigns and only then, food adulteration control measures would be on the right track.

इस लेख में स्वास्थ्य प्रशासकों के रुचिकर अनेक मुद्दों पर प्रकाश डाला गया है। खाद्य पदार्थों में मिलावट करना एक सामाजिक बुराई समझी जाती है और यह समाज में अपराध के स्तर को दर्शाता है। खाद्य अवमिश्रण के लिए साधारण तकनीकों से लेकर अत्यन्त जटिल प्रक्रियाओं तक अनेकों विधियों का प्रयोग किया जाता है। हालांकि खाद्य

अवमिश्रण गैर-इमानदारी के कारण किया जाता है, यह अज्ञानतावश भी हो सकता है। अवमिश्रण को रोकने के लिए दुकानदारों व ग्राहकों की शिक्षा के साथ-साथ कानूनी उपाय भी करने होंगे। इस दिशा में उपभोक्ता आन्दोलनों की सक्रिय प्रोत्साहन देना होगा। खाद्य पदार्थों में मिलावट की किस्मों व इसके फैलाव को समझने के लिए अध्ययन किये जाने की आवश्यकता है।

LIVE BIRTHS TREND IN A SEMI-URBAN COMMUNITY OF PONDICHERRY

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ABSTRACT

In the field practice area of the Jawaharlal Institute Urban Health Centre (JIUHC), Kuruchikup-pam, Pondicherry, a nine year study of 1646 live births was carried out during the period 1973 to 1981. The percentage of male and female births were 51.6 per cent and 48.4 per cent respectively. The parity status ranged upto 15th para. The percentage of mothers who sought admission to hospitals for delivery were 73.14. Seasonal variation in births was also studied in this paper.

Child birth is a universal phenomenon of utmost importance. In developing countries high birth rates are posing many problems of far reaching consequences and hence the need was felt to study them. This study was therefore undertaken to analyse the trend of live births and some of the factors affecting it in a semi-urban community of Pondicherry.

The objectives of the study were (i) to know the trend of live births over a period of time; (ii) to study the seasonal variation in live births; and (iii) to study the utilisation of health services in relation to births.

Material and Methods

For this study, data on 1646 live births of hospital and home deliveries which occurred in the field practice area of Jawaharlal Institute of Postgraduate Medical Education and Research Urban Health Centre (JIUHC), Kuruchikuppam, Pondicherry, from January to December 1981 have been utilised. The population of the Urban Health Centre area increased from 6731 to 7629 during the period of study.

The health centre provides comprehensive, family centered health care to a low income population with a staff population ratio of one doctor, one public health nurse and one midwife for 3800 population. The system of maintenance of family folders and other MCH records and registration of vital

events has already been reported¹. Similarly, the type of service provided to antenatal mothers, infants and toddlers has been discussed in other study².

The information regarding sex, parity, month and place of delivery collected from the birth registers and annual reports of Jawaharlal Institute Urban Health Centre was compiled, analysed and tabulated³.

Observations

Of the 1646 live births, 850 (51.6 per cent) were males and the remaining 786 (48.4 per cent) were females as shown in Table 1. The male-female ratio for the country as a whole is 1000:936 (1981 census). Except in the year 1980, in all the other years from 1973 to 1981, male live births outnumbered female live births.

Parity

TABLE 1
YEAR-WISE DISTRIBUTION OF LIVE BIRTHS

YEAR	MALE	FEMALE	TOTAL
1973	116		212
1974	87	78	163
1975	104	88	192
1976	96	81	177
1977	96	88	184
1978	78	76	154
1979	101	100	201
1980	88	112	200
1981	84	77	161
TOTAL	850	796	1,646
PERCENTAGE	51.6	48.4	100

In table 2. The prity orders ranged from primipara to 15th para. It was found that primipara had more female (192) than male children (178). In all other parities, there were more male children than female children. A high percentage of births (27 per cent) was found to be of mothers with parity five and above.

Birth Rate

The Birth rate of JIUHC was much lower than the birth of Pondicherry and of the country as a whole as given in Table 3. As seen from figure I the birth rate fell from-

TABLE 2
DISTRIBUTION OF LIVE BIRTHS BY PARITY OF MOTHER
Insert to table

Parity	Male	Female	Total	Percentage
1	178	192	370	22.4
2	170	166	336	20.41
3	152	125	277	16.83
4	120	96	216	12.93
5th to 15th para	230	217	447	27.16
Total	850	796	1,646	100.00

TABLE 3
BIRTH RATE FROM 1973 TO 1981

	Midyear population of JIUHC	Live Birth Rate of		
		JIUHC Pondicherry		India
1973	6731	31.4	N.A.	54.6
1974	6996	23.3	N.A.	34.5
1975	6985	27.4	28.4	35.2
1976	6835	25.8	31.1	34.4
1977	6840	26.9	29.0	33.1
1978	6987	22.0	27.4	33.2
1979	7216	27.8	26.6	33.0
1980	7587	26.3	N.A.	N.A.
1981	7628	21.1	N.A.	N.A.

Source: Sample Registration Scheme and Deaths, Government of Registers of Births India.

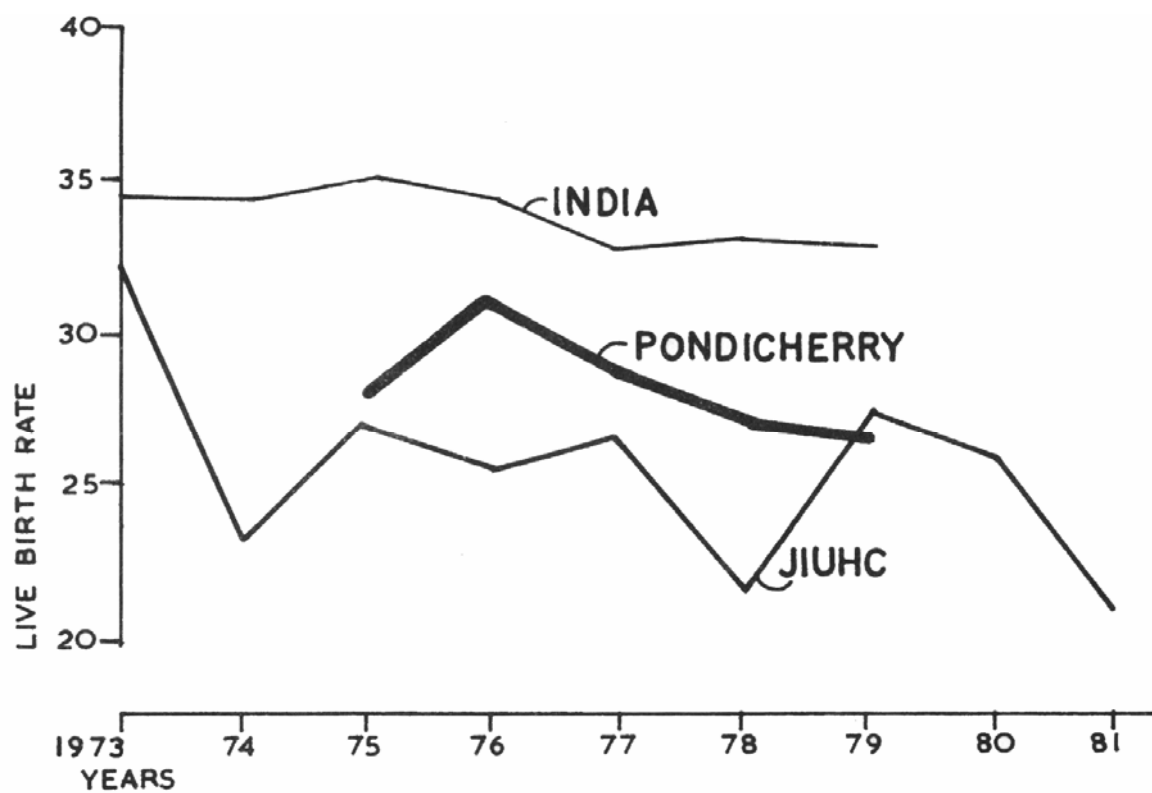


FIGURE 1: LIVE BIRTH TRENDS OF JIUHC, PONDICHERRY AND INDIA

31.4 per 1000 population in 1973 to 21.1 per 1000 population in 1981. During the interim years the birth rate fluctuated by about one point.

Place of Delivery

Of the total live births, 1204 (75.14 per cent) live births occurred in hospitals (Government and private) and only 442 (26.86 per cent) live births took place at home. Only 157 (9.54 per cent) live births were conducted by untrained persons (local barber women, relatives and neighbours).

Seasonal Variation

The monthwise occurrence of births was analysed to see if there was any seasonal variation in births as shown in Table 4. A time series technique was applied and the moving average plotted. The moving average clearly indicated a seasons variation in births; lowest births occurring in January, February and March and maximum occurring in May, June and July.

TABLE 4
MONTHWISE LIVE BIRTHS, JIUHC, 1973-81

Month	Year									
	73	74	75	76	77	78	79	80	81	Total
January	19	9	12	18	10	11	11	12	11	113
February	15	5	17	8	15	5	13	12	3	91
March	21	14	11	15	12	18	17	12	9	129
April	14	17	21	17	16	12	16	17	18	148
May	24	16	25	21	14	10	17	17	11	155
June	20	14	14	14	25	13	24	18	13	155
July	23	12	19	17	11	17	25	26	11	161
August	16	12	13	14	16	12	18	13	17	131
September	9	13	17	16	23	15	18	14	19	146
October	16	19	13	15	13	12	12	19	17	136
November	17	19	12	12	15	16	14	18	21	144
December	18	15	18	10	14	13	16	22	11	137
Total	212	165	192	177	184	154	201	200	161	1646

Discussion

The male-female ratio of live births during the year 1973 to 1981 was 1000:936. Except in the year 1980, in all the other years male live births were more than female. The all India male-female ratio is 1000:935 (1981 census). One of the commonest reasons given for the lower female population is the negligence of the female child⁵. The findings of this study showed that the female population is at a disadvantage right from birth.

Parity ranged upto the 15th para. Twenty seven per cent of births were of mothers 5th para and above. Intensive efforts have to be made to bring down this percentage.

Compared to the live births rate of Pondicherry⁴ and the country, the birth rate at the Centre was low. This proves that there is an effective impact of the family welfare programme. The population being small, a small number of births (7) can change the birth rate. This would explain the minor fluctuations in the trend of birth rate. The birth rate declined markedly in 1974, 1978 and 1981. Other factors could have influenced this marked decline. It is beyond the scope of this paper to investigate these factors. The birth-rate dropped from 31.4 per 1000 population in 1973 to 21.1 per 1000 population in 1981. Only 9.54 per cent of all live births were conducted by untrained persons (local barber women, relatives and neighbours). The hospitals being close to the area probably accounted for the fact that 75.14 per cent of births took place in hospitals. The fact that 17.32 per cent deliveries were conducted by trained personnel indicated that health knowledge and health awareness were well established in regard to Maternal and Child Health Programme in the area. Other reasons for hospital delivery were unfavourable housing conditions, 'nobody else to take care of the mother' and 'to get some rest'⁶. The existing traditions would explain the small percentage of deliveries conducted by untrained personnel.

It was seen that a seasonal variation occurred with maximum births occurring in the summer months of May, June and July and the least in the month of February, March and April. So it is logical to surmise that mating was least during the summer months of May, June and July and maximum during August, September and October when the rains set-in in this region.

Conclusion

In the field practice area of Jawaharlal Institute Urban Health Centre, Kuruchikuppan Pondicherry a nine year study of 1646 live births during 1973 to 1981 was carried out. The findings of the study were: (i) the male and female live births were 51.6 per cent and 48.4 per cent respectively and the male-female ratio 1000:936; (ii) the parity status ranged upto 15th para. Twenty seven per cent of live births occurred in mothers of 5th para and above; (iii) mothers who had sought admission to hospitals for delivery were 73.14 per cent; (iv) only 9.54 per cent of all deliveries were conducted by untrained persons; (v) the comparatively lower birth rate and the inclination of the people to have the delivery conducted by health personnel reveals the health awareness of the community and the impact of family welfare programme in the area over the years; and (vi) maximum live birth occurred in May, June and July and least in the months of February, March and April when analysed by the time series technique.

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जवाहरलाल संस्थान शहरी स्वास्थ्य केन्द्र (जे. आई.यू.एच.सी.), कुरुचिकुपक्कम, पांडिचेरी के फील्ड प्रेक्टिस क्षेत्र में सन् 1973 से 1981 के मध्य 1946 जीवित जन्मों का नौ वर्षीय अध्ययन किया गया था। पुरुष और महिला जन्म की प्रतिशत दर क्रमशः 51.6 प्रतिशत व 48.4 प्रतिशत पाई गई। समता स्तर पन्द्रहवें पैरे तक की सीमा में था। उन माताओं का प्रतिशत जिन्होंने डिलिवरी के लिए चिकित्सालयों में प्रवेश की इच्छा व्यक्त की थी, 73.14 प्रतिशत था। इस पेपर में जन्म के मौसमी परिवर्तनों का भी अध्ययन किया गया है।

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ANALYSIS OF FACTORS RELATED WITH BIRTH RATE

B.B.L.Sharma, P.K.Jain and D.C.Dubey

ABSTRACT

In this paper an attempt has been made to formally see that how socio-economic development has an operational relationship with fertility related factors. The analysis suggests that family planning programme efforts within a framework of responsive socio-economic environment would lead to quicker moderation in birth rate. A strong relationship between female age at marriage and birth rate and also higher longevity at birth and lower birth rates are the lead cases to link the programme efforts in these directions. This would require intersectoral management of the fertility moderation programme in future.

The association of factors like literacy levels, family planning performances, mortality rates (including infant mortality), age at marriage, etc. with likely birth rates* for 14 major States in India has been examined in this study. India is currently experiencing the phase of accelerating growth of population as revealed by recent census, 1981. This increase in the rate of growth of population in India has in the past been mainly due to the decline in mortality over the last few decades. It is clear, however, that the future growth of population will depend more on the trend in fertility rather than trend in mortality. Hence, the study of fertility and, the factors related to it, has been gaining increasing importance in the recent period. The efforts of the Government of India to reduce the birth rate as expeditiously as possible through the national family welfare programme has added further emphasis and importance to the study of fertility and factors influencing it.

This study presents the tentative trend analysis of some of the fertility related factors, as seem to be apparent-

A Note on the implications of the provisional results of the 1981 Census, Registrar General and Census Commissioner, India, New Delhi.

ly operating in Indian demographic situation. For more definite conclusions in this regard, further detailed analysis is suggested. Trend analysis of selected number of important variables has been dealt separately in this paper.

Family Planning Performance

The average percentage of couples effectively protected by accepting family planning methods during 1971-81 and the last three decadal birth rates for the 14 major States of India are given in Table 1. It is usually expected that in the States where the implementation of the programme is poor, birth rate should remain high i.e. above 40 and vice versa in case of States where implementation is relatively very effective or high, the birth rate should be low.

TABLE 1
PROGRAMME PERFORMANCE AND BIRTH RATES

STATE	Average Percentage of Couples Effec- tively Protected (1971-81)*	BIRTH RATES		
		1951-60	1961-70	1971-80
<u>I. HIGH (22 and above)</u>				
Maharashtra	28.51	41.2	41.0	29.2(L)
Haryana	27.07	-	44.5	37.3(M)
Kerala	24.03	38.9	37.5	28.7(L)
Gujarat	22.49	45.7	41.6	39.2(M)
Punjab	22.13	44.7	36.9	32.1(L)
<u>II. MODERATE(15-22)</u>				
Tamil Nadu	21.21	34.9	36.8	30.4(L)
Andhra Pradesh	21.14	39.7	39.2	35.9(M)
Orissa	19.71	40.2	41.3	34.6(L)
Madhya Pradesh	16.52	43.2	46.6	39.6(M)
Karnataka	16.12	41.6	39.9	37.8(M)
West Bengal	15.31	42.9	44.3	36.4(M)
<u>III. LOW (Below 15)</u>				
Bihar	9.82	43.4	41.9	41.1(H)
Uttar Pradesh	9.06	41.5	42.5	43.8(H)
Rajasthan	8.53	42.7	42.7	40.0(H)

Birth Rates; (H) - High - 40 and above (M) - Moderate (35-40)
(L) - Low - Below 35

*a brief note on Growth of Population during 1971-81 and related factors. Department of Family Welfare, Ministry of Health and Family Welfare, New Delhi, March, 1981.

For analysing the quality and quantity of effective implementation of the programme, it is measured in terms of percentage of couple effectively protected in 1971-81. The States have been divided into 3 groups: (i) high or better programme implementing States which have 22 per cent and above of the total couples protected. (ii) States which have below 15 per cent of couples protected are classified as low or below average programme implementing States, (iii) States which have 15 per cent to 22 per cent couples protected have been grouped as moderate or average programme implementing States. These three groups have been made keeping in view the all India average of 18 per cent couples effectively protected during 1971-81. Similarly, birth rate more than 40 has been termed as high, below 35 has been termed as low and these between 35 and 40 has been grouped as moderate.

The three States of Bihar, Uttar Pradesh and Rajasthan fall into low programme implementation States as measured by percentage of couple have been fully protected. As expected these States have also the birth rates above 40 which are classified as high birth rates in this study.

As against this, the group of States having high or better programme implementation should have low birth rates of 35 or below. It is clear from the Table 1 that there is qualified support to this expectation. Out of five States in this group, a majority of three have low birth rates (below 35) while two are in moderate group of 35-40 birth Rates. It is just possible that the deviation in case of Haryana and Gujarat from the expected trend of low birth rate may be because of non-programme factors such as all types of reporting lapses and lapses in the quality of couples protected under the programme. Social-structural and cultural factors could also be responsible for this. However, nothing definite can be said in this regard at this stage of analysis.

Similarly, in the third group of States included in moderate or average programme implementing stage has 15 per cent to 22 per cent couples effectively protected. It may be noticed that four States, out of a total of six, have moderate birth rates. Two States - Tamil Nadu and Orissa -have shown better results than expected as they have low birth rates of below 35. Here again, in case of these two States, one would expect non programme factors to be also responsible along with programme factors in pushing these States to low birth rate range.

In brief, we get a response of 'qualified yes' to our basic question raised initially in this section of analysis. 'Is the family planning programme as being implemented is having the desired impact of lowering birth rate?' It may be noted that in the year 1951-60, ten States were having high birth rates of 40 and above. Over a period of 20 years, only three States out of 14 States had high birth rates of 40 and above. This trend of reduction in number of States - no more showing high birth rates of 40 and above - is indicative of positive results of programme implementation. The increase correlation between couples protected and birth rate (1971-80) is found to be highly significant ($r = -0.744$).

Most urgent need have been felt to improve programme implementations in the States of Bihar, Uttar Pradesh and Rajasthan specially because they represent big chunk of the Indian population as shown in Table 1. Similarly, there seems to be a need to study more closely the four States of Haryana, Kerala, Tamil Nadu and Orissa to identify negative and positive non-programme factors operating in relation to birth rate trends in these States.

Per Capita Expenditure on Medical and Public Health

The overall picture, as revealed by Table 2, shows a relationship between per capita expenditure on medical and public health and birth rates. The inverse correlation between these two variables is found to be highly significant ($r = -0.675$). Three out of the four States having high per capita expenditure show a low birth rate. The case of Rajasthan is peculiar and needs a special investigation as it shows higher capita expenditure and high birth rate.

There are six States which have a moderate per capita expenditure (Rs.10 to Rs.14) and all of these with the exception of Maharashtra show a moderate birth rate. The case of Maharashtra is commendable as it has a low birth rate with moderate per capita expenditure.

The third group of four States having low per capita expenditure (below Rs.10) show correspondingly high birth rates with the exception of Orissa which has moderate birth rate and is therefore commendable.

TABLE 2
PER CAPITA EXPENDITURE ON MEDICAL AND PUBLIC HEALTH
DURING 1976-77 AND BIRTH RATES

State and Level of Per Capita Expenditure	Per Capita Expenditure on Medical and Public Health 1976-77*	BIRTH RATES			
		1951-60	1961-70	1971- 80	
I. <u>HIGH (14 and above)</u>					
Punjab	15.66	44.7	36.9	32.1 (L)	
Kerala	15.46	38.9	37.5	28.7 (L)	
Rajasthan	14.31	42.7	42.7	40.0 (H)	
Tamil Nadu	14.29	34.9	36.8	30.4 (L)	
II. <u>MODERATE (10-14)</u>					
West Bengal	13.38	42.9	44.3	36.4 (M)	
Maharashtra	12.86	41.2	41.0	29.2 (L)	
Gujarat	12.48	45.0	41.6	39.2 (M)	
Haryana	12.45	-	44.5	37.3 (M)	
Karnataka	11.61	41.6	39.9	37.8 (M)	
Andhra Pradesh	10.61	39.7	39.2	35.9 (M)	
III. <u>LOW Below.LP)</u>					
Madhya Pradesh	9.65	43.2	46.6	39.6 (M)	
Orissa	8.95	40.2	41.3	34.6 (L)	
Uttar Pradesh	5.64	41.5	42.5	43.8 (H)	
Bite*	4.57	43.4	41.9	41.1 (H)	
All India	11.60	41.7	41.2	37.1	
Birth Rates:	(H) -High- 40 and above (L) - Low - Below 35.	(M)	- Moderate-	(35-40)	

*Source: Central Bureau of Health Intelligence (D.G. H.S.), New Delhi.

Levels of Literacy

The relationship of literacy levels and birth rates are being examined in Table 3. The literacy rates and female literacy rates from the provisional population totals of 1981 census are being used as measures of educational development in 14 major States. Keeping in view the 1981 national literacy rate, the 14 States have been divided into the following three groups:

Group I High Literacy States (40 per cent and above for 'All', 30 per cent and above for 'Female'): 1. Kerala, 2. Maharashtra, 3. Tamil Nadu, 4. Gujarat, 5. West Bengal, 6. Punjab.

TABLE 3
LITERACY AND BIRTH RATES

State and Level of Literacy	Literacy Rate 1981*		BIRTH RATE		
	All	Female	1951-60	1961-70	1971-80
I. <u>HIGH</u>	(40%&above)	(30% & above)			
Kerala	69.2	64.5	38.9	37.5	28.7 (L)
Maharashtra	47.4	35.1	41.2	41.0	29.2 (L)
Tamil Nadu	45.8	34.1	34.9	36.8	30.4 (L)
Gujarat	43.8	32.3	45.7	41 .6	39.2 (M)
West Bengal	40.9	30.3	42.9	44.3	36.4 (M)
Punjab	40.7	34.1	44.7	36.9	32.1 (L)
II. <u>MODERATE</u>	(30- 40 %)	(20-30 %)			
Karnataka	38.4	27.8	41.6	39.9	37.8 (M)
Haryana	35.8	22.2	N.A.	44.5	37.3 (M)
Orissa	34. 1	21.1	40.2	41 .3	34.6 (L)
III. <u>LOW</u>	(Below 30 %)	(Below 20%)			
Andhra Pradesh	29.9	20.5	39.7	39.2	35.9 (M)
Madhya Pradesh	27.8	15.5	43.2	46.6	39.6 (M)
Uttar Pradesh	27.4	14.4	41.5	42.5	43.8 (H)
Bihar	26.0	13.6	43.4	41.9	41.1 (H)
Rajastkan	24.0	11.3	4^ .7	42.7	40.0 (H)

Birth Rate: (H) - High - 40 and above (M) - Moderate - (35-40)
(L) - Low - Below 35.

*Source: Registrar General and Census Commissioner for India.
Provisional Population Totals Of the 1981 census.

Group II: Moderate Literacy States (30 - 40 per cent for 'All', 20-30 per cent for 'Female'): 1. Karnataka, 2. Haryana, 3. Orissa.

Group III: Low Literacy States (Less than 30 per cent for 'All', less than 20 per cent for 'Female'): 1. Andhra Pradesh, 2. Madhya Pradesh, 3. Uttar Pradesh, 4. Bihar, 5. Rajasthan.

Andhra Pradesh falls in moderate female literacy group but it is kept in low literacy group due to marginal difference in our classification.

Further, this study examines the birth rates 1951-60, 1961-70, 1971-80 of these three groups of States. At this state a question can be asked, is there any marked difference in the birth rates of the three groups of States having high, moderate and low literacy levels? To answer the question, here again arbitrarily describe birth rates of 40 and above as high, birth rates between 35 to less than 40 as moderate and birth rates below 35 as low.

Considering the literacy rates of total population, the table indicates the following:

Analysis of Group I States

There are six States in this group where literacy is high (40 per cent and above for all and 30 per cent and above for females). In 1951-60, four of these States had high birth rates of 40 and above while one had moderate level of fertility (birth rate 35-40) and another one had low level of fertility (birth rate below 35). Subsequently, in the year 1971-80, that is within a period of 20 years. It is noticed that there is a substantial fall in birth rates of four States. These four States have crossed moderate birth rate level and now have entered low birth rate range (below 35). In the remaining two States although there is a declining trend in birth rate, they still have a moderate birth rate i.e. between 35-40. In 1971-80 no State showed high birth rate of 40 and above. Therefore, it can be said that most of the States with high literacy (40 per cent and above) show low birth rate of below 35.

Analysis of Group II States

Three States are placed in this group as they have moderate literacy 30 to 40 per cent for all and 20 to 30 per cent for females) in 1981 according to our classification.

In 1951-60, all these three States show high birth rates of 40 and above (birth rate for Haryana in 1951-60 is not readily available and therefore birth rate of 1961-70 has been considered in this case).

In 1971-80, after a lapse of 20 years, it has been observed that although there is a declining trend in birth rates, it is very gradual. The 1971-80, birth rates place two States in moderate fertility group and one State in low fertility level. Like the first group of high literacy States, no State in this group has high level of birth rate (40 and above). It is revealed that the States having moderate literacy are showing moderate birth rates also.

Analysis of Group III States

There are five States in this group having low literacy (30 per cent and below). It is noted that in 1951-60, practically all these States have high birth rates of 40 and above. Even after the lapse of 20 years birth rates in these States remained practically unchanged. It has been shown in the table that all States have high birth rates of 40 and above during 1971-80 with the exceptions of Andhra Pradesh and Madhya Pradesh which have entered the group of States showing moderate birth rates (35-40). In four of the five States, there is decline in birth rates, but it is marginal and in case of one, namely, Uttar Pradesh, it has been increased from 41.5 in 1951-60 to 42.5 in 1961-70 and to 43.8 in 1971-80. It is very much indicative that the States having low literacy have high birth rates.

The above analysis clearly shows important role of education in depressing birth rate within the present Indian demographic context. It is also of interest for further investigation to note that overall literacy and female literacy are similarly related to birth rates in the States of all the three groups.

The statements given already regarding the relationship between literacy and birth rate with respect to the three

groups of States seem to be collaborated by comparing the correlation of literacy and birth rate in all the three groups. As far as all the States are concerned, the literacy rate (1981) and birth rate (1971-80) are found to have a highly significant inverse correlation. Similarly, the female literacy rate (1981) also and birth rate (1971-80) have a strong significant inverse correlation.

Density of Population

Comparison of density of population (1981) and birth rates 1951-80 are shown in Table 4.

TABLE 4
DENSITY AND BIRTH RATES

State and Level of Density of Population	Density of Population per KM2 1981*	BIRTH RATES			
		1951-60	1961-70	1971-80	
I. HIGH (300 and above)					
Kerala	654	38.9	37.5	28.7	(L)
West Bengal	614	42.9	44.3	36.4	(M)
Bihar	402	43.4	41.9	41.1	(H)
Uttar Pradesh	377	41.5	42.5	43.8	(H)
Tamil Nadu	371	34.9	36.8	30.4	(L)
Punjab	331	44.7	36.9	32.1	(L)
II. MODERATE (150-300)					
Haryana	291	-	44.5	37.3	(M)
Maharashtra	204	41.2	41.0	29.2	(L)
Andhra Pradesh	194	39.7	39.2	35.9	(M)
Karnataka	193	41.6	39.9	37.8	(M)
Gujarat	173	45.7	41.6	39.2	(M)
Orissa	169	40.2	41.3	34.6	(L)
III. LOW (Below 150)					
Madhya Pradesh	118	43.2	46.6	39.6	(M)
Rajasthan	100	42.7	42.7	40.0	(H)
All India	221	41.7	41.2	37.1	

Birth Rates: (H)-High - 40 and above (M) - Moderate - (35-40)
(L) - Low - below 35.

*Source : Registrar General & Census Commissioner for India-Provisional Population Totals of 1981 census.

Here again a question comes up and that is 'In the changing demographic scene do density and birth rates show significant relationship?'¹ The answer to this question on the basis of the table is a definite 'no'. The overall correlation is found to be insignificant.

Further, on examination it was noted that in the group of States having high density, there are two States with high birth rates, three with low birth rates and one with moderate birth rate. In the group of moderate density of six States, there are two States which have low birth rates and the rest moderate birth rates. In the low density group of two States, the one State shows moderate birth rate and another one State shows high birth rate. The analysis of the density of population and birth rate does not indicate any relationship between them.

Proportion of Urban Population

The distribution of 14 major States according to three levels of high, moderate and low proportion of urban population[^] is given in Table 5. As of now there seems to be no significant relationship between urbanisation and birth rate. The overall correlation for proportion urban (1981) and birth rate (1971-80) is not significant.

If we look to the group of States classified as 'high' on urbanisation we note that two States have low birth rates while the third State has moderate (almost nearing high birth rate range) birth rate.

In the group of States classified as moderate in terms of proportion urban, we note one State has low birth rate, one has high and five have moderate birth rates.

Similarly, in group of States with low urbanisation, two have high and two have low birth rates.

This pattern of distribution of States is also indicative of the fact that as of now urbanisation is not significantly correlated with birth rate.

Per Capita Income

Among the 14 States, the correlation between per capita

TABLE 5

PERCENTAGE OF URBAN POPULATION TO TOTAL POPULATION AND BIRTH RATES

State and Level of Proportion Urban	Percentage of Urban to Total Population 1981*	Birth Rates		
		1951-60	1961-70	1971-80
I. HIGH (30% and above)				
Maharashtra	35.03	41.2	41.0	29.2(L)
Tamil Nadu	32.98	34.9	36.8	30.4(L)
Gujarat	31.08	45.7	41.6	39.2(M)
II. MODERATE (20-30%)				
Karnataka	28.91	41.6	39.9	37.8(M)
Punjab West	27.72	44.7	36.9	32.1(L)
Bengal	26.49	42.9	44.3	36.4(M)
Andhra Pradesh	23.25	39.7	39.2	35.9(M)
Haryana	21.96	-	44.5	37.3(M)
Rajasthan	20.93	42.7	42.7	40.0(H)
Madhya Pradesh	20.31	43.2	46.6	39.6(M)
III LOW (Below 20%)				
Kerala	18.78	38.9	37.5	28.7(L)
Uttar Pradesh	18.01	41.5	42.5	43.8(H)
Bihar	12.46	43.4	41.9	41.1(H)
Orissa	11.82	40.2	41.3	34.6(L)
All India	23.73	41.7	41.2	37.1

*Source: Registrar General & Census Commissioner for India - Provisional Population Totals.

Birth Rates: (H) - High - 40 and above) (M) - Moderate - (35-40)

(L) - Low - Below 35.

Income⁷ at current prices during 1974-75 and the birth rate during 1971-80 is not found to be significant. The Table 6 presents per capita income and birth rates in the 14 major States of India.

Examining the three groups of States classified into 'high¹, 'moderate' and 'low' per capita income, it is noted that in the group of high, two States, Punjab and Maharashtra have low birth rates while the third State, Haryana has moderate birth rate.

In the group of States classified as 'moderate' in terms of per capita income, all the three States in this group (West Bengal, Gujarat and Andhra Pradesh) having the moderate per capita income are found to have the moderate birth rates also.

TABLE 6
PER CAPITA INCOME AND BIRTH RATES

State and Level of Per Capita Income	Per Capita Income at Current Prices 1974-75* (Rs.)	Birth Rates		
		1951-60	1961-70	1971-80
I. HIGH (1100 and above)				
Punjab	1482	44.7	36.9	32.1 (L)
Maharashtra	1270	41.2	41.0	29.2 (L)
Haryana	1217	-	44.5	37.3 (M)
II MODERATE (900-1100)				
West Bengal	1041	42.9	44.3	36.4 (M)
Gujarat	1038	45.7	41.6	39.2 (M)
Andhra Pradesh	1003	39.7	39.2	35.9 (M)
II, LOW (Below 900)				
Kerala	861	38.9	37.5	28.7 (L)
Madhya Pradesh	830	43.2	46.6	39.6 (M)
Rajasthan	819	42.7	42.7	40.0 (H)
Uttar Pradesh	817	41.5	42.5	43.8 (H)
Tamil Nadu	814	34.9	36.8	30.4 (L)
Karnataka	784	41.5	39.9	37.8 (M)
Bihar	718	43.4	41.9	41.1 (H)
Orissa	707	40.2	41.3	34.6 (L)
All India	989	41.7	41.2	37.1

*Source: Estimates of State Income of Delhi 1960-61 to 1975-76, Bureau of Statistics and Economics, Orissa.

Birth Rates: (H) - High - 40 and above (M) - Moderate - (35-40)

(L) - Low - Below 35

In the third group of eight States of low per capita income, three States have low birth rates, two States have moderate birth rates and three States have high birth rates. This shows absence of any definite relationship of per capita income and birth rate. This distribution in third group along with deviation of Haryana makes it to conclude that though it appears that there is some inverse correlation between per capita income and birth rates, it is not found to be statistically significant.

Female Age At Marriage

Average female age at marriage and birth rates are compared for the 14 States in Table 7. However, the mean female age at marriage for the State of Haryana is not available and so it is dropped in this analysis.

TABLE 7
MEAN AGE AT MARRIAGE AND BIRTH RATES

State and Level of Female Mean Age at Marriage	Female Mean Age at Marriag 1971*	Birth Rates		
		1951-60	1961-70	1971- 80
I. HIGH (18 and above)				
Kerala	20.9	28.9	37.5	28.7 (D)
Tamil Nadu	19.6	34.9	36.8	30.4 (L)
Punjab	18.8	44.7	36.9	32.1 (L)
Gujarat	18.3	45.7	41.6	39.2 (M)
II. MODERATE (16-18)				
Karnataka	17.9	41.6	39.9	37.8 (M)
West Bengal	17.8	42.9	44.3	36.4 (M)
Maharashtra	17.5	41.2	41.0	29.2 (L)
Orissa	17.2	40.2	41.3	34.6 (L)
Andhra Pradesh	16.4	39.7	39.2	35.9 (M)
III. LOW (Below 16)				
Uttar Pradesh	15.6	41.5	42.5	43.8 (H)
Bihar	15.5	43.4	41.9	41.1 (H)
Rajasthan	15.4	42.7	42.7	40.0 (H)

*Source: Demographic Research Centre, Delhi.

Birth Rates: (H)- High - 40 and above (M) - Moderate - (35-40)
(L) - Low - Below 35.

The overall view emerging from the Table 7 shows a strong relationship between female age at marriage and birth rates. It is widely held that high age at marriage correlates with low birth rate. Similarly, low age of marriage goes with high birth rates. The table broadly supports this view strongly in case of female age at marriage (1971)8 and birth rate (1971-80).

Out of the four States, classified as having high female age at marriage three show low birth rates while one falls in the region of moderate birth rate. It may be noted that no State in this group shows high birth rate.

In the second group of States where female age at marriage is considered to be moderate, it is noted that three States show moderate birth rates and two show low birth rates. In this group also, none of the States show a high birth rate.

There are four States which show low female age at marriage. Out of these four States, three States show high birth rates and one has moderate birth rate. It may be noted that none of these States have low birth rate.

Crude Death Rate

A mortality profile⁹, vis-a-vis fertility rates of 14 major Indian States during past decades is shown in Table 8. The States have been grouped in the three groups according to their levels of death rates in respect to the all India level (high death rate - 17 and above, moderate-between 13-17 and low-below 13 per thousand population in 1971-80).

Accordingly, the States of Uttar Pradesh, Bihar and Madhya Pradesh belong to the first group of high mortality level. The second groups of States having experienced moderate mortality level consist of Orissa, West Bengal, Rajasthan, Andhra Pradesh, Gujarat, Tamil Nadu and Karnataka. The States of Haryana, Maharashtra, Punjab and Kerala having the low mortality level belong to the third group of States. Here, an attempt has been made to analyse the prevailing fertility levels amongst the States falling in these three levels of mortality groups.

The first group contain three highly populous states

TABLE 8 CRUDE DEATH RATES AND CRUDE

BIRTH RATES

State and Level of Death Rate	Death Rate 1971-80*	Birth Rate			
		1951-60	1961-70	1971-80	
I. <u>HIGH</u> (17 and above)					
Uttar Pradesh	20.9	41.5	42.5	43.8	(H)
Bihar	19.5	43.4	41.9	41.1	(H)
Madhya Pradesh	17.0	43.2	46.6	39.6	(M)
II. <u>MODERATE</u> (13-17)					
Orissa	16.5	40.2	41.3	34.6	(L)
West Bengal	16.3	42.9	44.3	36.4	(M)
Rajasthan	15.4	42.7	42.7	40.0	(H)
Andhra Pradesh	15.2	39.7	39.2	35.9	(M)
Gujarat	14.9	45.7	41.6	39.2	(M)
Tamil Nadu	14.3	34.9	36.8	30.4	(L)
Karnataka	14.1	41.6	39.9	37.8	(M)
£11. <u>LOW</u> (Below 13)					
Haryana	12.4	-	44.5	37.3	(M)
Maharashtra	12.0	41.2	41 .0	29.2	(L)
Punjab	11.2	44.7	36.9	32.1	(L)
Kerala	8.9	38.9	37.5	28.7	(L)
All India	14.8	41 .7	41 .2	37.1	

Birth Rate: (H) - High - 40 and above (M) - Moderate - (35-40)
(L) - Low - Below 35

*Source: Registrar General and Census Commissioner, India, New Delhi.

having death rates as high as 17 and above. In these high mortality group of three States, the fertility level continued to be high in two States in the past three decades. However, one State showed from high birth rate to moderate level during 1971-80 Uttar Pradesh where death rate is highest of all the three States, the birth rate showed a continuous upward increase since 1951-60. Thus, this group reveals that the States of high mortality have high birth rates also.

Seven States fall in the second group as they have a moderate medium level of mortality having 13 to less than 17 deaths per 1000 population. The table shows that in this moderate mortality group of seven States, four show moderate birth rates, two States (Orissa and Tamil Nadu) low birth rates and one State (Rajasthan) high birth rate in 1971-80. Thus, most of the States in the group of moderate death rates are associated with moderate birth rates.

All the four States in the third group show mortality level of below 13 deaths per 1000 population. Amongst these States Kerala had the lowest death rate of 8.9. In the decade 1971-80, a clear cut fall in the birth rates of these four States has been observed. It has also been noticed that these low death rate states accordingly have moved from their high and medium rate in current decade* of 1971-80. Three States i.e. Maharashtra, Punjab and Kerala have touched the points of low birth rates and the fourth State of Haryana came down to moderate level of birth rate in 1971-80 from its very high birth rates in the previous decade according to our classification. It may be noted that in this group none of these States show high birth rate.

When data on birth rate is examined according to the three groupings of low, medium and high mortality of States, the analysis indicates that in general mortality decline worked as a prospect towards fertility decline in India. The overall relationship between death rate and birth rate during 1971-80 has shown a positive strong correlation.

Infant Mortality Rate

An overview of the Table 9 strongly supports the view that infant mortality is related to birth rate. It is said that high infant mortality and high birth rate go together. The reverse of this is also said to be true. There is a significant positive correlation between infant mortality rate (1976)¹⁰ and birth rate (1971-80).

When examined closely the three groups of States having high, moderate and low infant mortality the following seems to emerge. In case of Bihar and West Bengal, the infant mortality rates were not readily available and therefore, these two States are not considered.

The first group of high infant mortality States reveals the expected picture. It is noted that out of three States in high infant mortality group, two show high birth rates and one shows moderate birth rate which is also very close to high birth rate range. This reveals that high infant mortality is correlated with high birth rate.

In the second group of three States with moderate infant mortality, two States have moderate birth rates while the

TABLE 9
INFANT MORTALITY AND BIRTH RATES

Status & Level of Infant Mortality	Infant Mortality Rate(1976)*	1951-60	1961-70	1971- 80
I. <u>HIGH</u> (140 and above)				
Uttar Pradesh	178	41.5	42.5	43.8 (H)
Gujarat	146	45.7	41.6	39.2 (M)
Rajasthan	142	42.7	42.7	40.0 (H)
II. <u>MODERATE</u> (120-140)				
Madhya Pradesh	138	43.2	46.6	39.6 (M)
Orissa	127	40.2	41.3	34.6 (L)
Andhra Pradesh	122	39.7	39.2	35.9 (M)
III. <u>LOW</u> (Below 120)				
Haryana	112	N.A.	44.5	37.3 (M)
Tamil Nadu	110	34.9	36.8	30.4 (L)
Punjab	108	44.7	36.9	32.1 (L)
Karnataka	89	41.6	39.9	37.8 (M)
Maharashtra	83	41.2	41.0	29.2 (L)
Kerala	56	38.9	37.5	28.7 (L)
All India	129	41 .7	41.2	37.1

Birth Rates

*Source: Office of the Registrar General of India, New Delhi.

Birth Rates: (H) - High - 40 and above (M) - Moderate - (35-40)
(L) - Low - Below 35

third has low birth rate which is also being very close to moderate birth rate. It is significant to note that no State shows high birth rate in this group.

The third group of low infant mortality rates consists of six States. Out of six States, four States show low birth rates and two moderate birth rates.

The above analysis clearly establishes that the infant mortality rates are positively correlated with birth rates.

Expectation of Life at Birth

Significant negative correlation between expectation of life at birth during (1961-70)¹¹ and birth rate during 1971-80 has been revealed in Table 10. This relationship is in the same direction as envisaged and so high expectation of life at birth correlates with low birth rate. Similarly, low expectation of life at birth goes with high birth rates.

Out of the five States, classified as having the highest expectation of life at birth in comparison to the other States, namely, Kerala, Punjab and Maharashtra have the lowest birth rates while one falls in the region of moderate birth rate and another in the region of high birth rate.

TABLE 10
EXPECTATION OF LIFE AT BIRTH RATES

State and Level of Expectation of Life	Expectation of Life at Birth 1961-70*	Birth Rates		
		1951-60	1961-70	1971-80
I. <u>HIGH</u> (48 and above)				
Kerala	60.2	38.9	37.5	28.7 (L)
Rajasthan	50.2	42.7	42.7	40.0 (H)
Punjab	49.4	44.7	36.9	32.1 (L)
Maharashtra	49.0	41.2	41.0	29.2 (L)
Gujarat	48.7	45.7	41.6	39.2 (M)
II. <u>MODERATE</u> (43-48)				
West Bengal	47.1	42.9	44.3	36.4 (M)
Haryana	47.0	-	44.5	37.3 (M)
Karnataka	46.5	41.6	39.9	37.8 (M)
Madhya Pradesh	45.9	43.2	46.6	39.6 (M)
Orissa	44.8	40.2	41.3	34.6 (L)
Andhra Pradesh	44.1	39.7	39.2	35.9 (M)
Tamil Nadu	43.4	34.9	36.8	30.4 (L)
III. <u>LOW</u> (Below 43)				
Bihar	40.4	43.4	41.9	41.1 (H)
Uttar Pradesh	39.3	41.5	42.5	43.8 (H)
All India	45.6	41.7	41.2	37.1

*Source: Department of Family Welfare, Government of India, New Delhi.
Birth Rates: (H) - High - 40 and above (M) - Moderate - (35-40)
(L) - Low - below 35

In the second group of States, where expectation of life at birth is considered to be moderate, it is noted that five States show moderate birth rates and two States show low birth rates.

The third group of low expectation of life at birth has only two States, Bihar and Uttar Pradesh. As expected both these States of lowest expectation of life at birth have the highest birth rates. One can conclude that both these variables show inverse correlation.

Correlation between Birth Rate and Selected Variables

With the increasing confidence in the inter-relationship between birth rates and socio-economic development variables, one becomes to examine further their levels of relationships. The following analysis will show as to how far the socioeconomic structure of the 14 major States of India changes with the birth rates.

From the data gathered for the latest year, it is correlated State-wise birth rate (1971-80) with the following variables classified into various groups:

A. Programme Variables

- i. Average percentage of couples effectively protected during 1971-81; and
- ii. Per capita expenditure on medical and public health in 1976-77.

B. Social Variables

- i. Literacy rates, 1981 - female and overall;
- ii. Mean female age at marriage, 1971;
- iii. Density of population(Km²), 1981; and
- iv. Percentage of urban population to total population, 1981.

C. Economic Variables

- i. Per capita income at current prices 1974-75.

D. *Health Variables*

- i. Crude death rate, 1971-80 (provisional);
- ii. Infant mortality rate, 1976; and
- iii. Expectation of life at birth, 1961-70.

The correlation coefficients between birth rate (1971-80) and the groups of variables classified are given in Table 11.

The table reveals that the programme variables (namely, family planning performance in terms of average percentage of couples effectively protected during 1971-81 and the per capita expenditure on medical and public health in 1976-77), are inversely correlated with the birth rate and the values of the correlation co-efficients were found to be statistically highly significant. It is, therefore, observed that the increase programme input leads in bringing down the level of birth rate in the States.

Amongst the social variables considered, literacy and female age at marriage are more responsive to lowering the birth rate than to density of population, urbanisation and per capita income at current prices.

The correlations between health indicators and birth rate among the States are led to suggest that the decrease in death rate and infant mortality rate are correlated with the decrease in birth rate. Similarly, the lowering of birth rate leads to the upward trend of longevity of life at birth.

Summary and Findings

It is generally seen that population growth and socioeconomic development are interrelated. Population variables influence development variables and are themselves influenced by them. It has, therefore, been attempted to visualise this interrelationship to see how far population growth trends in terms of birth rates are affected by socio-economic development in the 14 major States of India in relation to the Provisional Population Results of the 1981 Census.

Out of the various socio-economic indicators, ten indicators have been selected to cover the broad specturum of the

TABLE 11
CORRELATION BETWEEN BIRTH RATE AND SELECTED VARIABLES
IN 14 MAJOR STATES OF INDIA

Variables	Correlation co-efficient with Birth Rate 1971-80 (r)	Levels of significance
I. Programme		
i. Family Planning Performance, 1971-81 (Average % couples effectively protected)	-0.744	Significant at 1%
ii. Per capita expenditure on Medical and Public Health in 1976-77	-0.675	Significant at 1%
II. Social		
i. Literacy Rate, 1981:		
Female	-0.783	Significant at 1%
Male & Female	-0.786	Significant at 1%
ii. Mean Female At at Marriage, 1971	-0.783	Significant at 1%
iii. Density of Population (Km ²), 1981	-0.297	Not significant
iv. Percentage of urban population to total population, 1981	-0.429	Not significant
III. Economic		
i. Per capita income at current prices, 1974-75	-0.384	Not significant
IV. Health		
i. Crude Death Rate, 1971-80	-0.804 +0.834	Significant at 1% Significant at 1%
ii. Infant Mortality Rate, 1976		
iii. Expectation of life at Birth, 1961-70	-0.576	Significant at 5%
N.B.: Levels of significance of correlation co-efficients (r)		
i. Significant at 1% - Strong correlation (Positive/Negative)		
ii. Significant at 5% - Moderate correlation (Positive/Negative)		
iii. Not significant - Low correlation/Uncorrelated		

programme, social, economic and health indicators which has been defined each into three levels - (1) High, (2) Moderate, and (3) Low. On the assumption that the selected variables would be indicative of the general status of the socio-economic developments influencing human behaviour and action, and tried to ascertain their relationship with crude birth rate.

The analysis of these socio-economic variables suggests the following directive for policy makers:

1. Family planning efforts within a responsive socioeconomic environment as indicated by the variables considered would lead to quicker reduction in birth rate.
2. The States of Bihar, Uttar Pradesh and Rajasthan belong to the group of the lowest family planning performance and the highest birth rate in comparison to other States. Therefore, there is a most urgent need to improve programme implementations in the State of Bihar Uttar Pradesh and Rajasthan.
3. Education has significant correlation with birth rate. The States with high literacy (40 per cent and above) show low birth rate (below 35 per 1000 population). Similarly, States which have moderate literacy have moderate birth rate (35-40) and States having low literacy have high birth rates. Therefore, education of male and female has played an important role in depressing birth rate within the present Indian demographic context.
4. A strong relationship between female age at marriage and birth rate is observed. Thus, it conforms that the high age at marriage leads to low birth rate.
5. The indicators of health studies in this analysis reveal that the States of low death rates or low infant mortality rates have low birth rates also and similarly the States of high death rates or high infant mortality rates have high birth rates. The States having high longevity at birth have lower birth rates.

6. The socio-economic variables like density of population, urbanisation and per capita income are not significantly correlated with birth rates.
7. The analysis highlights some unique features in few States which currently either having low birth rates or having high birth rates. Examining the States of Kerala, Maharashtra and Tamil Nadu in the low birth rates group and Rajasthan, Bihar and Uttar Pradesh in the high birth rates group, following are the observations :
 - a. Rajasthan is in the high birth rate group. It is worth noting that Rajasthan ranked third on the higher side of per capita expenditure on medical and public health during 1976-77 among the 14 major States of India but, however, it is still having high birth rate unlike the other two States, Bihar and Uttar Pradesh in this group.
 - b. Again, Rajasthan having high birth rate has brought down its death rate and is entered in the moderate group which seems to be a prospective.
 - c. Maharashtra State is an example of low birth rate group which has the per capita expenditure on medicine and public health moderate unlike others, namely, Kerala and Tamil Nadu in this group where per capita expenditure is high. With moderate per capita expenditure, this State has shown other encouraging observations of low death rate and high expectation of life at birth.
 - d. Tamil Nadu though in the low birth rate category is not found to have high performance of family planning (1971-81). It is still in the moderate group of performance. Not only this, Tamil Nadu is moderate on the health indicators also i.e. expectation of life at birth.
 - e. Kerala, Bihar and Uttar Pradesh have indicated consistency in the expected levels of each variable considered in the analysis.

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इस पेपर में औपचारिक रूप से यह देखने का प्रयत्न किया गया है कि सामाजिक-आर्थिक विकास का जन्म सम्बन्धता सम्बन्धी कारकों से किस प्रकार का व्यवहारिक सम्बन्ध है। विश्लेषण से यह सुझाव मिलता है कि एक प्रत्युत्तरदायी सामाजिक-आर्थिक पर्यावरण के भीतर किये गये परिवार नियोजन प्रयासों से शीघ्र ही जन्म दर को संयमित किया जा सकता है। विवाह के समय महिलाओं की आयु और जन्म दर तथा समय उच्च जीवन आयु व कम जन्म दर के मुख्य कारण हैं जिनका कार्यक्रम सम्बन्धी प्रयासों की दिशा में सशक्त नाता बैठता है। उसके लिए भविष्य में किये जा रहे प्रजननता संयमन कार्यक्रम के अन्तर्क्षेत्रीय प्रबंध की आवश्यकता है।

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**A STUDY OF HEALTH CARE DELIVERY SYSTEM IN
TAMIL NADU WITHSPECIAL REFERENCE TO
PRIMARY HEALTH CARE**

S. Srinivasan

ABSTRACT

An attempt has been made in this paper to study the extent of utilisation of health care services by a sample of 125 respondents in selected primary health centres in Tamil Nadu. This study revealed that 65.6 per cent of the respondents utilised the medical care facilities rendered by the selected health centres. It further revealed that the effectiveness of the health centres was adversely influenced due to large population to be covered. This investigation highlighted that the frequency of visits by the staff of health centres to their respective field areas was very low and far from satisfactory. The present study suggests that periodical inspection of field work of para-medical workers attached to the health centres by the Medical Officers alone will improve the efficiency of staff and will go a long way in enhancing the image and optimal utilisation of services of the health centres.

The health care system is intended to deliver the health care services. In other words, it constitutes the management sector and involves organisational matters. The health care system may be defined as the industry which provides health services (health activities) so as to meet the health needs and demands of individuals, the family and the community*. There are three components in health care delivery system, namely: i) consumers of health care; (ii) providers of health care; and (iii) the delivery system. Detailed descriptions of each one of them have already been discussed elsewhere².

The health care system of a society can also be defined as a set of ideas, practices and organisations which have been developed to deal with problems of health and illness in the society³. Numerous studies by Medical Anthropologists

and Sociologists in the past several decades have shown that the content of health care system tends to vary from one society to another, depending upon socio-historical and ecological circumstances. Broadly speaking, three different health care systems have been in practice at three different cultural levels, namely, the primitive, folk-culture and traditional and modern societies .

In every contemporary society, developed or developing, there has emerged more than a single medical tradition within the overall system of health care. It has been normal phenomenon that several medical traditions - each with its distinct system of concepts, skills and organisation of personnel exist side by side in one territory. These various medical traditions do not blend into a unified system of health care, despite the fact that they claim to perform similar functions i.e. dealing with health and illness.

More recent studies have shown that the dual system can and does exist side by side in India. Studies by anthropologists indicate that traditional medicines do persist even though the health consumer has access to Western Medicines which are deemed more scientific⁵. Leslie has shown ample evidence of integration of indigenous systems of medicine, namely. Ayurvedic and Unani with Western (Allopathic) medicine. In India, both modern and traditional systems of medicine such as Ayurveda, Unani and Siddha, coexist.

The health care system operates in the context of the socio-economic and political system of the country. In India, the delivery system of health care is mainly through the complex of state owned primary health centres, dispensaries and hospitals in rural areas.

Primary health care as defined by WHO (1978) is essential health care for all citizens easily accessible and at a cost that the citizens and the community can afford. It embraces promotive, preventive, curative and rehabilitative services.

The organisation of primary health care takes care of family welfare, nutrition, communicable diseases and many other problems in a continuous manner. The delivery of primary health care is the foundation of the rural health care system. The primary health centres (PHCs) are the focal points for delivery of health and medical care services in

rural areas. Their operational responsibility is to offer medical care, maternal and child-health services, family welfare, nutrition, control of communicable diseases, protected water - supply and environmental sanitation. The primary health centre in a community development block is the base from which the primary health care services radiate into the homes of the villagers.

There is no systematic and holistic study so far carried out in understanding the health care delivery system that exists in the state of Tamil Nadu with special reference to primary health care. The present attempt may go a long way in bridging the gap between the philosophy of health care system in Tamil Nadu and the reality of the situation. The main objective of the present paper is to examine the health care delivery systems that exist in the State of Tamil Nadu, with special reference to primary health care.

Specific Objectives

The specific objectives of the present investigation are: (i) to study the extent of utilisation of health care services by the respondents in selected health centres and other health delivery systems in Tamil Nadu; (ii) to evaluate the functioning of selected primary health centres in terms of their cover age, quality of service, adequacy of staff, equipment and medicines and other infrastructure; and (iii) to examine the role of health organisation in Tamil Nadu from the point of view of delivery of health care services to rural populations.

Methodology

Anthropological field methods such as observation and interview technique were employed for collection of data. One primary health centre in Kanchipuram block of Chingleput district at Thiruppukuzhi and another primary health centre in Alangayam block of North - Arcot district at Alangayam were selected for the present study. Seventy-five villages were selected randomly from each of the five PHCs. A pretested interview schedule was administered to the head of the household to collect data pertaining to knowledge, perception and utilisation of health care services. A quota sampling of 25 respondents from each of the five sample villages in the selected primary health centres, was drawn at random. Totally, 125 respondents selected at random, were interviewed

in the sample villages. Data were collected from the Medical Officers, incharge of the selected primary health centres by administering them interview schedules. The interview schedule was intended to collect basic information on staffing pattern and other infrastructure and functioning of the selected health centres. Data were also collected through secondary sources in the offices of Directorate of Medical Services and Family Welfare; the Directorate of Public Health and Preventive Medicine and the Directorate of Primary Health Centres, Government of Tamil Nadu, Madras. The data thus collected were analysed, both quantitatively and qualitatively.

Observations and Results

i. Utilisation of Medical Care Services: This study revealed that 82 (65.6 per cent) out of 125 respondents had utilised medical care services rendered by the selected health centres. The main reason given for visiting the health centre was the treatment available to them free of cost. They also said that they got good medical attention from the doctors and other paramedical staff in the health centres. It was found that 35 (28.0 per cent) respondents had utilised the medical care services of the Government Headquarters Hospital at Kanchipuram and Government Hospital at Vaniyambadi. It was also found that 81 (64.8 per cent) respondents had utilised the services of registered medical practitioners. Some respondents had also utilised both the PHC services and R.M.Ps. Services for their medical needs. All the respondents preferred to have injections as treatment for the diseases since they believed that they got quick relief from illness. They voluntarily asked the doctors to give injections instead of tablets and mixtures for all types of illnesses. They also attached greater curative value to the injections as compared to tablets and mixtures in their preference scale. This can at best be regarded as the acceptance of medical technology by the rural populations, since its efficacy is well demonstrated. Findings further revealed that they have implicit faith in allopathy system of medicine.

i. Utilisation of Maternal and Child Health Services: A Maternal and child health service is one of the major programmes envisaged in the package system of health care delivery! The primary health centres are the main nuclei from which maternal and child health services cater to the mother and children in rural areas through the network of their subcentres.

In the health centres, there were six beds in each centre, of which four were exclusively utilised for maternity cases for conducting normal delivery. The maternal and child health services included antenatal, intra-natal and post-natal services for mothers and health and nutritional services for infants and children under five years of age. Routine antenatal supervision was provided by the health centres for pregnant women. It was observed that a good number of pregnant women attended the antenatal clinic in the health centres regularly on every friday. The pregnant women were immunised for tetanus toxoid in the health centres. They were also given 30 iron tablets per head per month for three months for iron deficiency during pregnancy under this programme.

This study revealed that there were 97 births in the families of the respondents interviewed in the last five years. The respondents were aware of maternity services available at the health centres and their sub-centres. Out of 97 deliveries, 34 of them (35.1 per cent) were conducted at the selected health centres and sub-centres. Ten deliveries were conducted at the Government hospitals at Kanchi-puram and Vaniyambadi. Thirty-seven deliveries were conducted by the traditional birth attendants (T.B.A.), otherwise called "local dais". It was very significant to note that in Alangayam, out of 20 deliveries, 14 of them were conducted by the local dais, who were trained in the health centres, and were very popular among the villagers. However, it was revealed that the PHC at Thiruppukuzhi, was very popular among the villagers and they had utilised the maternity services to the maximum extent possible. The study further revealed that 45 respondents preferred home as the place of delivery. This clearly showed that the people still preferred the traditional practice of conducting delivery at home.

All the respondents believed that immunisation prevented certain diseases like smallpox, diphtheria, tetanus, whooping cough and polio. They were aware of immunization programme being implemented in the selected health centres very satisfactorily. Eighty-one respondents had immunised their children against smallpox and DPT. This study clearly indicated that immunisation has almost become part of their routine, they not only believe in it but also willingly give immunisation to their children.

iii. Family Welfare: All the respondents in the sample

Villages were aware of family welfare programme and its methods. Thirty-eight respondents were in favour of family welfare programme. This study indicated that majority of them (69.6 per cent) were not in favour of family welfare programme. The main reason for their lack of willingness to adopt family welfare methods is that they like to have more children to engage themselves in agricultural pursuits to eke out their livelihood.

iv. Evaluation of Selected Primary Health Centres under Investigation: It was found that the primary health care services were provided by a total of 383 primary health centres run by the Government of Tamil Nadu to cover an estimated rural population of about 38 million.

A brief assessment of the selected primary health centres has been taken into account while conducting the study. The Government Primary Health Centre of Kanchipuram block of Chingleput district is located at Thiruppukuzhi village. Thiruppukuzhi village is situated at a distance of 13 kms. from Kanchipuram town, the district headquarters of Chingleput, on Madras - Bangalore national highway. It falls under the jurisdiction of Kanchipuram Panchayat Union. This village is connected to Kanchipuram town and Madras city by road transport. This health centre covers an area of 271.75 sq. kms. with a population of 72,416 (as per the 1971 census) spreading over 44 village panchayats under the jurisdiction of Kanchipuram community development block.

The Government Primary Health Centre of Alangayam block of North-Arcot district is located at Alangayam. Alangayam is situated about 18 kms. from Vaniyambadi on Vaniyambadi -Alangayam road transport. It is connected to Vaniyambadi and Vellore, the district headquarters of North - Arcot, by road transport. It falls under the jurisdiction of Alangayam Panchayat Union. This health centre covers an area of 80.39 sq.kms. with a population coverage of 69,812 spreading over 29 village panchayats under the jurisdiction of Alangayam community development block. Both the health centres were functioning in government buildings. The primary health centre at Thiruppukuzhi had sufficient accommodation to house various wings. It was found that both the health centres had public health facilities like flush-latrines, piped water and electricity. But flush latrines were not working in Alangayam health centre for the past six months.

The residential accommodation had been provided for most of the staff in both the health centres.

Primary health centre complex in Thiruppukuzhi as well as in Alangayam, is composed of three wings, namely, (i) public health unit; (ii) rural family welfare centre; and (iii) mobile health team. A Siddha wing was introduced under public health unit in the Government primary health centre, Alangayam, in the year 1982. One of the senior doctors is designated as the medical officer, incharge of the PHC, the other is called the medical officer (family welfare) and the medical officer (mobile health service scheme).

The planned staff-pattern for a primary health centre was implemented in both the health centres under investigation. The posts of Block Extension Educator (BEE) and Computer under family welfare side and pharmacist and driver under mobile health services were vacant in the Government PHC, Thiruppukuzhi. The post of Block Extension Educator, two Pharmacist (one for general and the other for Siddha wing), one Health Inspector (HI), one Basic Health Worker (BHW), one Vaccinator, one male-nursing assistant were vacant, in the Government Primary Health Centre, Alangayam. The delay in filling up of these posts was not known. The delay was attributed to non-availability of trained personnel. These selected health centres were not centrally located in the blocks. It was observed that the villagers living very close to the health centres had utilised the services to a much larger extent than the villagers living away from it. It was also revealed from this study that only those villagers who resided within 5 kms. radius from the respective health centres visited frequently to the health centres for medical care.

The supply of medicines was not sufficient enough to cope with heavy attendance in O.P.D. Due to the paucity of resources, the supply of medicines was very much limited to the health centres. Besides, there was no regular supply of medicines per month to the health centres. The stock of medicines was not always adequate. The health centres were provided with a laboratory under National Malaria Eradication Programme for examination of malaria cases. But this laboratory was not equipped to handle cases for investigation of general diseases. Blood tests, sputum tests, stool examination were not carried out for clinical examination in this laboratory.

The disease control programmes, school health and nutrition programmes, family welfare and mobile health service scheme in the health centres were implemented satisfactorily. Regular DPT immunisation for children and tetanus toxoid immunisation for pregnant women were carried out in the health centres.

The frequency of visits by the PHC staff to their respective field areas was very low. It was observed that the field work of the PHC staff was far from satisfactory as per the time schedule prescribed for each staff in the PHC. However, it was strongly felt that significant improvement in the utilisation of health services can be effected only by improving the field work in the homes. In the present set-up, inspection of field work of the PHC staff was very much limited due to lack of time and coverage of large population. The medical officer himself admitted that he faced a lot of difficulties in supervising a large number of field staff. A periodical meeting of field staff with their immediate superiors as well as the medical officer in getting guidance was not always possible. But this is a 'must'. Unless, there is a periodical check in the work-spot by the supervisors over their subordinates in carrying out their assigned work, it is very difficult to improve the efficiency of the field staff.

v. Organisational set-up of Health Services in Tamil Nadu: A schematic presentation of organisational structure of health care services in Tamil Nadu is shown in Figure I. It is found that the health organisation in Tamil Nadu is divided into 5 broad categories, namely, the Directorate of Medical Services and Family Welfare (D.M.S. & F.W.), The Directorate of Medical Education (D.M.E.), The Directorate of Public Health and Preventive Medicine (D.P.H. & P.M.) , The Directorate of Primary Health Centres (D.P.H.C.) and the Directorate of Indigenous Systems of Medicine (D.I.S.M.).

Health services in Tamil Nadu revealed the following salient features:

- a. A three-tier system of health care delivery, namely, primary, secondary and tertiary, exists in Tamil Nadu.
- b. The Director of Medical Services and Family Welfare is the state-level administrator of all hospitals,

Organisational Structure of Health Services in Tamil Nadu

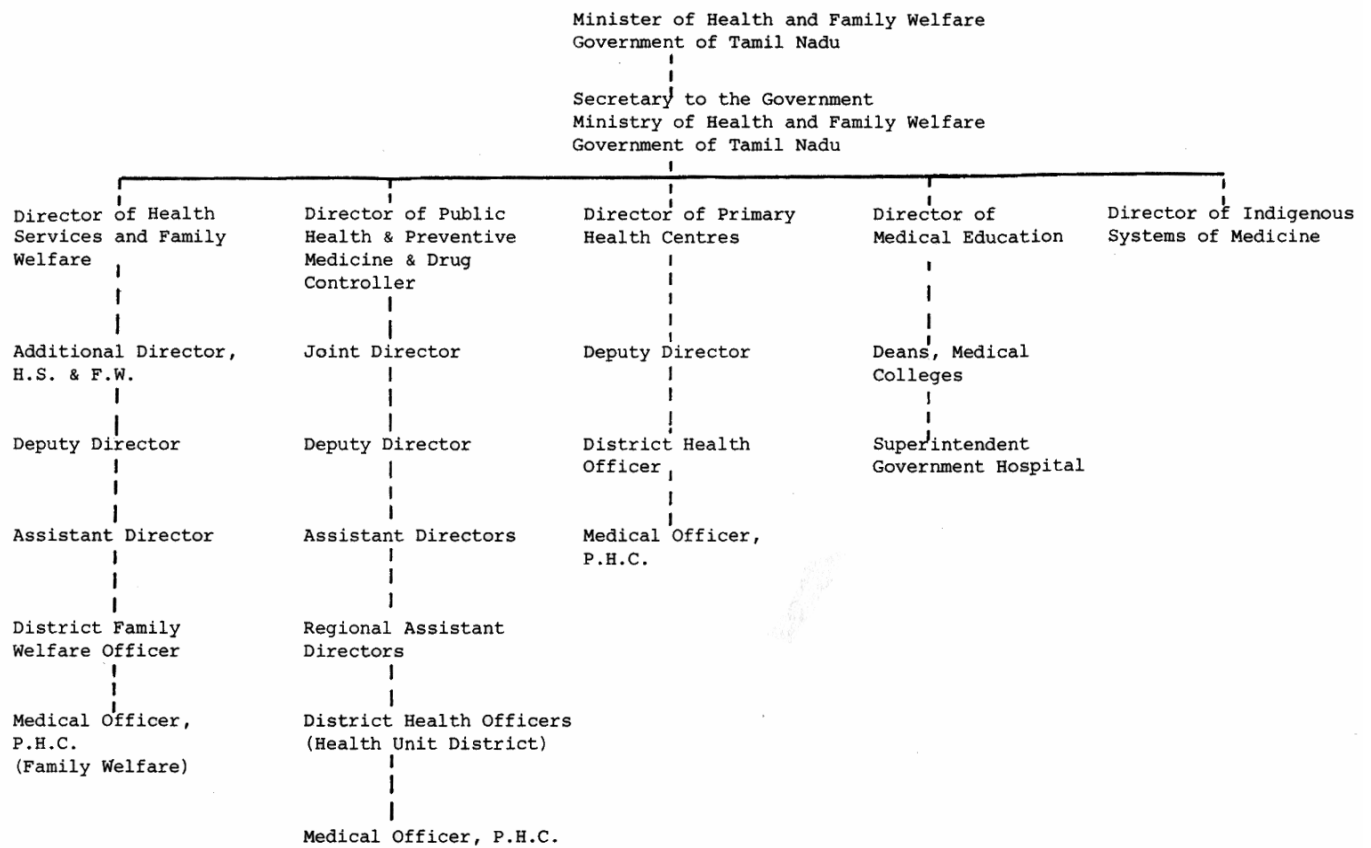


FIGURE: I

dispensaries and family welfare centres run by the government. He is assisted by a team of deputy-directors and assistant directors to carry out his departmental work.

- c. The Public Health Department consists of several technical units for primary health centres, maternal and child-welfare, malaria, smallpox and filaria control units, nutrition, health and vital statistics, etc. A couple of years back, the public health department was reorganised and at present, there are 7 regions, in the state each headed by a Regional Assistant Director, with the jurisdiction of 2 or 3 revenue districts. There are 29 health unit districts in Tamil Nadu and each health unit is under the control of a District Health Officer with jurisdiction of a maximum of 15 PHCs. The Regional Assistant Director Coordinates the work of different health unit districts and guides and supervises the effective implementation of various health programmes. He also supervises the functioning of primary health centres under his administrative control.
- d. The Government of Tamil Nadu had created a separate Directorate for Primary Health Centres with a full-time independent director, so as to improve the package of services available at the PHC level and also to strengthen the curative services offered at the PHCs. It is observed that Siddha medical wings are functioning in 250 Primary Health Centres in the entire State.

Summary and Conclusions

Some of the major findings on health care behaviour of respondents were as follows:

1. It was found that 65.6 per cent of the respondents had utilised the medical care services rendered by the selected health centres; 28.0 per cent of them had utilised the services of the government hospitals at Kanchipuram and Vaniyambadi, and 64.8 per cent of them had utilised the services of Registered Medical Practitioners for their medical care.

2. Thirty-four out of 97 deliveries were conducted at the health centres. Thirty seven deliveries were conducted by the local dais. The people still preferred the traditional practice of conducting delivery at home.
3. All the respondents believed that immunisation prevented certain diseases - diphtheria, tetanus, whooping cough and polio. Majority of them had immunised their children against smallpox and DPT.
4. All of them were aware of family welfare programme and its methods. It was found that 69.6 per cent of them were not in favour of family welfare programme.

Based on the assessment of the functioning of the selected health centres, the following conclusions were drawn:

1. The planned staff-pattern for a primary health centre had been implemented in the selected health centres.
2. The health centres were not centrally located in the blocks. It was observed that the people living very close to the PHCs had utilised the services to the maximum extent possible than the people living away from it.
3. The supply of medicines was not sufficient enough to cope up with heavy attendance in out-patient department daily. Moreover, there was no regular supply of medicines to the health centres.
4. The frequency of visits by the staff of health centres to their respective field areas was very low. The leadership of the medical officer, incharge of the PHC was only nominal and restricted to treatment in OPD, inpatient ward and attending to mobile health camps. It is suggested that three medical officers in the primary health centre in rotation have to inspect the field work of the para-medical workers periodically so as to improve the efficiency of staff which will go a long way in enhancing the image and services of the health centres.
5. Health care services in Tamil Nadu revealed that a three-tier system of health care delivery exists in the State. It was found that the public health department was

reorganised for effective implementation of various health programmes of the State. The Government of Tamil Nadu had created a separate directorate for primary health centres for improving the package of health services in the rural areas and also to strengthen the curative services at the health centre level. Siddha wings were added in the health centres to boost the image of the Indian systems of medicine in rural areas of Tamil Nadu.

इस पेपर में तमिलनाडू के चयनित प्राथमिक स्वास्थ्य केन्द्रों के 125 उत्तरदाताओं के नमूने से स्वास्थ्य रक्षा सेवाओं के उपयोग की पहुंच का अध्ययन करने का अध्ययन किया गया है। इस अध्ययन से पता चलता है कि उत्तरदाताओं में से 65.6 प्रतिशत लोगों ने चयनित प्राथमिक स्वास्थ्य केन्द्रों द्वारा प्रदत्त चिकित्सा रक्षा सुविधाओं का लाभ उठाया। इस अध्ययन से यह भी पता चलता है कि प्राथमिक स्वास्थ्य केन्द्रों के दायरे में बड़ी जनसंख्या होने के कारण केन्द्रों की कार्यकुशलता पर विपरीत प्रभाव पड़ता है। इस जांच से यह बात उभरी है कि स्वास्थ्य केन्द्रों के क्षेत्र कार्यकर्ताओं द्वारा अपने क्षेत्रों में किये गये भ्रमण बहुत कम और असन्तोषजनक है। यह अध्ययन दर्शाता है कि स्वास्थ्य केन्द्रों से जुड़े पैरामेडिकल कार्यकर्ताओं का अनेक चिकित्सा अधिकारी द्वारा उनके कार्य का समय-बद्ध निरीक्षण करने से ही उनकी कार्यक्षमता बढ़ेगी जिससे स्वास्थ्य केन्द्रों की सेवाओं का उपयुक्त उपयोग हो सकेगा और उनकी प्रतिष्ठा बढ़ सकेगी।

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