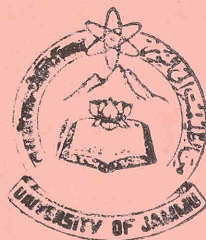
ESTIMATION OF FERTILITY PARAMETERS IN RURAL AREAS OF JAMMU

by
BASANT RAM

A THESIS SUBMITTED FOR THE
AWARD OF DEGREE OF
DOCTOR OF PHILOSOPHY
IN MATHEMATICS (STATISTICS)

UNDER THE SUPERVISION OF
DR. R. TIWARI



DEPARTMENT OF MATHEMATICS
UNIVERSITY OF JAMMU
JAMMU—180 004
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C E R T I F I C A T E

Mr. Basant Ram, who was registered for the Degree of Doctor of Philosophy in April, 1986 under my supervision has completed his work related to his thesis. The title of his thesis is "ESTIMATION OF FERTILITY PARAMETERS IN RURAL AREAS OF JAMMU".

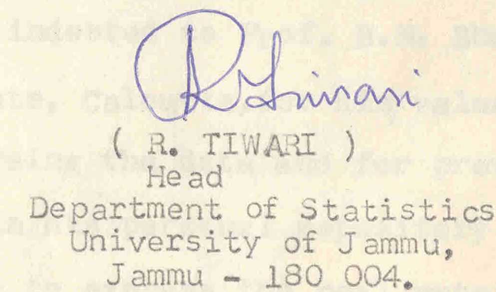
I certify that the work done by him is original and worthy of consideration for the award of Degree of Doctor of Philosophy in Mathematics (Statistics). I further certify that

(a) the thesis embodies the work of the candidate himself,

(b) the candidate worked under me for the period required under rules,

(c) the candidate has put in the required attendance in the Department of Mathematics, University of Jammu during that period, and

(d) the conduct of the scholar remained satisfactory during the period of the research.



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A C K N O W L E D G E M E N T

Although the author holds himself solely responsible for any weakness the study might be suffering from, a large number of persons and organizations were directly or indirectly involved in its conduct till the presentation of this report. The author, therefore, feels that he would be failing in his duty if he does not gratefully acknowledge the help these persons provided him at different stages from its inception to its successful completion. The limitation of space forbids him to acknowledge the assistance of each person by name as such an acknowledgement would make a huge volume in itself. However, those whose contribution has been outstanding and very fundamental must be mentioned here.

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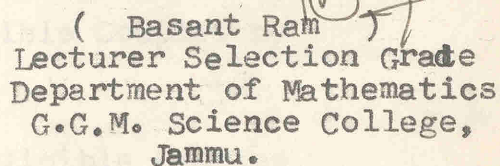

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Technical Abbreviations

ANM	Auxiliary Nurse Midwife
ANC	Antenatal Care
BCG	Bacillus Catomete Guison
CC	Conventional Contraceptive
DPT	Diptheria, Polio Triple Vaccination
FPS	Family Planning Services
IUD	Intra-utrine Device
LHV	Lady Health Visitor
MCH	Maternal and Child Health Care
MFWW	Male Family Welfare Worker
PHC	Primary Health Centre
PP	Post-Partum
SRSWOR	Simple Random Samplying Without Replacement
TT	Tetanus Toxoid
UPOI	Universal Programme of Immunization
WHO	World Health Organisation

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PREFACE

The research literature on fertility is available in abundance across the world. Even in India a large number of studies on various aspects of fertility, family welfare and family planning have been made and as such a huge volume of literature is available in the area in this country as well.

However, no significant systematic study was conducted in Jammu and Kashmir on the problems related to fertility. Hence a need to make such a study in this state was felt. Therefore, Dr. R. Tiwari, Reader in the Department of Mathematics, University of Jammu, designed a project on

> Utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu District (1986-87)''.

This research project was approved by the U.G.C. which provided the funds required for the successful completion of the study. This study is the first of its kind made in Jammu and Kashmir State.

The author of the present report was closely associated with study made by Dr. R. Tiwari and during the conduct of the study the author had very fruitful discussions with Dr. Tiwari whose insights motivated the present investigator to study the fertility parameters in Rural areas of the district, Jammu. Although the investigator wished to study the problem at the level of the state as a whole , but the constraints of time and financial resources

forced him to confine his study to Jammu district only. The primary data for the study was very kindly provided by Dr. R. Tiwari out of the body of data collected for the project referred to above.

The report of the study is presented in six chapters and each chapter is further divided into sections dealing with different aspects of the fertility parameters considered. Chapter I gives a description of the work done in the subsequent chapters. Descriptions about the survey and the district are also presented in this chapter. The attitude, to the knowledge of family planning methods of an individual and MCH services available are enquired into in the context of the demographic and socio-cultural characteristics of an individual as well as socio-cultural characteristics of the community to which the person belongs.

Chapter 2 presents the description of the characteristics of the households and the individuals who were eligible for the use of F.P. and MCH services.

A description of the model for the first live birth interval is the subject matter of chapter 3. In this model fecundability is taken to be time dependent on the early part of cohabitation, thus indirectly incorporating biological as well as behavioural factors. It also takes account of pregnancy wastages. The model is a specimen of the model proposed in the Bhattacharya et al (1989). The model is applied to birth for which the data was collected in the survey.

In chapter 4 a probability model is taken into account.

This model describes the length of interlive-birth interval. The model is a special case of the model proposed in Bhattacharya et al (1989). The model is applied to the real data taken from the survey, Utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu district (1986-87).

Chapter 5 analyzes the information regarding the family planning practices such as methods known without probe or with probe, source of knowledge, who provides the service, method, plans for use in future, and the intention of wives to use different family planning methods are analysed.

Chapter 6 discusses the various aspects of maternity and child health care services in Jammu district. The data based on the females who gave birth to children during the last three years from the date of survey, the information about the females who registered for antenatal check up during the pregnancy period, place of delivery, complication in post-natal period and immunization facilities available for newly born babies, are analysed in this chapter.

In the end a select bibliography on the subject is presented.

CHAPTER I

INTRODUCTION

The importance of family welfare programme in our socio-economic developmental plans is well recognised and needs no emphasis. The most crucial problem facing the nation today is the galloping population which has been increasing by about 15 million every year. The population of the country which was only 34.2 crores in 1947 grew to 68.5 crores in 1981. At the current rate of growth India's population will be one billion by the turn of the century. India presently has 15 percent of the world's total population and only 2.4 percent of the global land area.

Already, India is twice as densely populated as China. It will be the most populous country on earth in the next four decades. The rapid growth of population neutralizes the developmental efforts that thwarts all efforts to bring about improvement in the quality of life.

The National Family Planning Programme started in 1951. Though the country made great strides in family planning but it was not successful in achieving its targets. One of the important aspects of family welfare programme has been the promotion of health of mothers and children. This is also essential to accelerate the speed of family planning programme. Better MCH care creates a sense of security in the minds of parents that children will survive and lead a healthy life which inturn will contribute greatly to the acceptance of the small family norm as a way of life.

Since the inception of the programme in 1951 a vast infrastructure has been developed during the last 4 decades, to render the family planning, maternal and child care and other primary health care services, especially to the rural people at their doorstep. However, it is realised that the available infrastructure facilities are not properly utilized which is evident from the differential utilization patterns and target achievement as observed in studies conducted from time to time in different parts of the country as well as from the official figures. In order to examine the different dimensions of utilization of family planning and maternal and child health care services in rural areas a study entitled Utilization of Family Planning and MCH services in Jammu district (rural)'' was conducted by the Department of Mathematics, University of Jammu, during 1986-87 under the financial assistance from University Grants Commission.

In addition to the information on knowledge, attitude and utilization of family planning and MCH services, data on interval between marriage and first birth and between successive births were also collected for estimation of fertility parameters.

The objectives of the present study are:

(i) to propose probability models to explain and analyse data on birth intervals,

(ii) to study the attitude to and extent of knowledge and practice of family planning and to find out the socio-cultural factors that influence them,

(iii) to find out the extent of knowledge and utilization of maternal and child health services and perception of users and about the government-provided MCH services.

The thesis consists of six chapters. Chapter 1 gives a description of the work done in the subsequent chapters. Descriptions about the survey and the district Jammu are also presented in this chapter. The attitude, the knowledge, and family planning methods and MCH services of an individual are observed depending on the demographic and socio-cultural characteristics of individuals as well as socio-cultural characteristics of the community in which the individual lives.

Chapter 2 presents the description of the characteristics of the households and the individuals who were eligible for the use of family planning and MCH services.

Chapter 3 describes a model for the time of first live birth interval which takes fecundability to be time dependent during early part of cohabitation, it thus indirectly incorporates biological as well as behavioural factors. It also takes account of pregnancy wastages. The model is a specimen of the model proposed in Bhattacharya et al (1989). The model is applied to describe the data at the time of first birth collected in the survey.

Prevalence of taboos of varying severity on commencement and frequency of coitus during post partum (PP) period is common in

almost all the societies, especially in rural areas where prolonged breast feeding is the norm. Most often the practice of abstinence during the post partum period is directly and explicitly linked to breast-feeding (Leridon 1977, Corsini 1979, 197). The rationale for such a custom is probably that if the resumption of sexual intercourse or lack of precaution to avoid pregnancy during intercourse causes a new conception, that has a detrimental effect on the mother's health and milk production and in turn on the infant's health. Apart from this, congnisance of the fact that child birth is debilitating to mothers and there is a need for some period of recuperation which is another important consideration (Ohadike 1979, 285). These were probably the reasons for the development of the custom of sending the women to their parents mainly for the first and occasionally for the subsequent deliveries, and staying there till the child attains a certain age (United Nations 1982, 97). Thus, a model taking into account the sexual behaviour of the couple after child birth, may be suitable for analysing the birth interval data of traditional societies.

In chapter 4 a probability model to describe the length of interlive birth interval has been proposed. The model is a special case of the model proposed in Bhattacharya, et al (1989). The model is applied to the real data taken from the survey, "utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu district (1986-87)".

In chapter 5, the information regarding the family planning practices, such as methods known without probe or with probe, source of knowledge, who provides the service, methods used, methods in current use, reasons for changing to next method, plans for use in future and the intention of wives to use different family planning methods are analysed .

Chapter 6 deals with the various aspects of maternity and child health care services (MCH) in Jammu district. The data based on the females who gave birth to children during the last three years from the date of survey, the information about the females who registered for antenental check up and received tetanus-Toxoid and tablets of iron and folic acid during the pregnancy period, place of delivery, complication in post-natal period and immunization facilities available for newly born babies are discussed in this chapter.

1.1 Models for birth Intervals:

During the last three and half decades several stochastic models relating to fertility have been suggested and utilized to investigate the possible consequences of changes in the input of the process and to study the pattern of human reproduction. A critical review of the work upto 1972 is given in Sheps and Menken (1973). A review with more emphasis on the recent work is given in Leridon (1977) and Mode (1985). In these models, two categories of inter-related variables are usually studied- the distribution of the radom length of intervals between events,

such as births, conceptions, etc. and the number of events occurring in a specified period.

A variety of mathematical models based on interval data have been proposed. The early work on these models appears to have been started by Henry (1953) who utilized the concept of fecundability as described by Gini (1924). The distributions of time of first birth interval between two consecutive births and related functions were initially derived by Henry (1953) under the assumptions of no foetal wastage, constant fecundability and constant duration of non-susceptible period associated with a live birth. An extension of the above model included foetal losses and non-susceptible periods associated with pregnancy varying with the outcome of pregnancy (Henry, 1957). Later Henry (1961 a, 1961 b), Henripin (1954), Vincent (1961), Tietze (1959), Potter (1960) formulated models in detail and reported several results. Using the concept of Henry, Potter and Parker (1964) presented a model for the time of first conception assuming constant fecundability for a woman and a beta distribution for fecundability among women, first two moments of conception-months were used to estimate the parameters. Jain (1969) used Potter-Parker model to estimate the mean fecundability in a sample of Taiwanese women. Majumdar and Sheps (1970) gave a procedure to obtain the maximum likelihood (m l) estimates of the parameters of the model of Potter and Parker. Suchindran (1972) derived moment estimators, maximum likelihood

estimators and minimum Chi-Square estimators for four different situations - consored samples, truncated samples, grouped data and completed samples. Sheps (1964) also proposed a model for time of first birth conception with similar assumptions to that of Potter and Parker (1964), but instead of beta distribution she used an unspecified density function for fecundability.

Singh (1964) independently of Potter and Parker suggested an analogus model for time of first conception treating time to be continuous. He assumed that conditional instantaneous risk of conception is constant over time for a given woman and that the risk parameter varies among women according to a gamma density. He obtained the best asymptotically normal estimates of the parameters. Singh and Bhaduri (1972) derived the moment and the maximum likelihood estimators of the parameters of the model. Suchindran and Lachenbruch (1974) gave a procedure to obtain the maximum likelihood estimators of the parameters of the model suggested by George (1967).

The common assumption in the models discussed above is that all the females are in non-pregnant fecundable state at the time of marriage. In some situation, all the females may not be exposed to the risk after marriage. For example, the custom of early marriage, especially in some rural parts of India, is still prevalent. In such cases some females may be in the state of adolescent sterility at the time of marriage due to non-occurrence of menarche or higher incidence of inovulatory cycles. Further,

some of these females do not get a chance of cohabitation due to temporary separation caused by custom of frequent visits of females to their parents in the beginning of the married life. For such situations Chakraborty (1976), Pathak and Prassad (1977), Nair (1983 a, 1983 b), Mishra (1983) and Srivastava (1983) have proposed probability models for the time of first birth assuming that some females may not be exposed to the risk of conception just after marriage due to one or more reasons stated above.

Sheps and Perrin (1964) and Sheps (1967) derived some useful results from inter-live birth intervals considering the reproduction process as a Markov Renewal process. Srinivasan(1966a) extended the model of Perrin and Sheps (1964) which accounts for foetal losses between two successive live births and heterogeneity of fecundability. George (1967), George and Pillai (1969), George and Mathai (1975), D'Souza (1973, 1974) and others have formulated models for inter-live birth intervals under different sets of assumptions and illustrated their application to real data. Sheps and Menken (1972) and Menken and Sheps (1972) have studied the distribution of birth intervals under different definitions of the sampling frame in a birth cohort of women and in a cross-section of stable population. Their study was motivated by the fact that observed distribution of the lengths of intervals between the successive births are considerably affected by the choice of sampling frame, the composition of the population sampled and the effects of competing risks such as death, marriage

and marital dissolution. D'Souza (1974) tried to explain the variability in birth interval lengths by means of a multiple regression on such carriers as age of the mother at marriage, duration of marriage and survival status of the previous child, etc. Braun (1977, 1978) extended D-Souza's work to explain the histrocal birth interval pattern. More recently Braun and Hoem (1979) and Hobcraft and Rodriguez (1980) proposed distribution of waiting time among live births taking various parametric forms of the risk function.

An open birth interval for a specific parity is defined as the time elapsed since the birth to a fixed point in time. Srinivasan (1966 b) introduced the idea of open birth interval. Since then the interest in the interval seems to be increasing because of its possible use as a simple sensitive index useful in the measurement of short-run changes in fertility (see Srinivasan 1966 a, 1968, Leridon 1969, Venkatacharya, 1969 a, 1969 b, Pathak, 1971).

Henry (1961 a) introduced the concept of straddling and interior birth intervals which are defined as the closed birth interval that straddles the survey data, T and a closed interval beginning and ending between T and T + T (where T is predetermined). The work related to this interval is given in Sehgal (1971, 1973), Sheps and Menken (1972), Menken and Sheps (1972), Poole (1971). A systematic investigation of these types of interval may provide useful results.

1.2 Brief History of Family Planning Programme:

Although the development of intensified family planning programme in India is of a recent origin, the movement to control birth was advocated in 1925, long before the country became free. Prof. Roghunath Dhond Karve opend a birth control clinic in Bombay on June 11, 1930, the Mysore Government issued orders to open the first birth control clinic in the world in 1932. The Senate of Madras University, the Government of Madras and All India Women's Conference in Lucknow session supported birth control. In 1935 , the planning committee of the Indian National Congress of which Sh. J.L. Nehru was the Chairman expressed concern over growing population. In a report, which the committee submitted to the congress, it recommended that in the interest of social Economy, family happiness and national economy, family planning and limiting the number of children is essential and state should adopt a policy to encourage these.

On December 1, 1935 the society for the study and promotion of family Hygiene was formed. In 1939, Birth Control World Wide, opened clinic in U.P. and M.P. In 1940, Sh. P.N. Sapru successfuly moved a resolution in the Council of State for establishment of birth clinics. By 1940, the Society for the Study and Promotion of Family Hygiene became the Family Planning Society, the Health Survey and Development Committee appointed in 1945 by Government of India recommended provisions of birth control services.

In 1949, the Family Planning Association was formed under the Presidentship of Shrimati Dhanvantri Rama Rao . An important landmark in this interesting history was the first All India Conference on Family Planning organised by Family Planning Association of India in 1951 in Bombay.

Realising that the rapidly growing population posed a major challenge which greatly hindered the progress, the Government of India adopted family planning as an official programme in 1952. It was among the few governments in the world to adopt family planning as a national policy, as an integral part of the planning for social and economic development .

Under the first five year plan (1951-56), the programme was moderate and more or less exploratory in nature. Among the aims of the first plan was reduction of birth rate to a level which the national economy could sustain and allocation of 6.5 million rupees was made. The Family Planning Research and Programme Committee was appointed in 1953 which included distinguished doctors of medicine and public health experts, demographers and social scientists of the country. The committee made important recommendations on the scope of family planning, location of centres, staff and accomodation, training and field studies and research.

Thus in the early days of the programme, the methods recommended were the rhythm, diaphargm and Jelly and later the tablets. These were provided through family planning clinics, the

number of which rose from 50 in 1951 to 165 in 1956.

The Second Five Year plan (1956-61) was fairly a big step forward. At this stage the planning commission recommended the strengthening of the central organization for family planning. A central family planning Board was formed. Lt. Col. B.L. Raina was appointed as Director of family planning. The programme had now four clearly identifiable components viz. education, service, training and research.

By the end of second five year plan, there were 4135 clinics. Research became more meaningful and extensive. Medical Research, communication, action research, demographic research were made extensive. International agencies specially the Population Council and the Ford Foundation gave valuable support to research activities. In most states facilities for sterilization and other family planning services were introduced. Distribution of conventional contraceptives increased substantially almost all over country. By the end of the plan more than 150,000 sterilization operations had been performed.

The committee for the 3rd Five Year plan (1961-66) reviewed the experience that had been gathered in the preceding 10 years. On the basis of performance in the field and findings from research studies, the Director recommended two major shifts in the emphases of the programme. One of these was to make it a community Centre Programme rather than clinic centre programme

and the second was to involve to a greater extent the man in the process. The revised programme was named as 'Extended Family Planning Programme'.

In 1965 the ICMR cleared the IUCD for mass use after extensive trial in the preceding two years. Also, Government of India appointed a Family Planning Programme, planning and evaluation Committee the same year. During third plan period research was making study progress at 22 centres, 7 demographic centres, 7 communication action research centres and 8 centres conducting studies on bio-medical aspects.

At the end of 3rd plan, there were 2676 rural family welfare planning centres, 7081 rural subcentres and 1361 urban family welfare planning centres, providing supply services and advice on family planning all over the country. The number of sterilization operations had gone up considerably and 1.37 million operations were performed as compared to 0.15 million in the earlier plan period.

Many significant things happened during the fourth plan (1969-74) and three years preceding it which were not covered by any of the five year plan. A Department of Family Planning was established in April 1966 within the Ministry of Health and Family Planning. An abstract symbol, the inverted red triangle was adopted to carry the message of family planning to every home. There was greater emphasis on integration of health, family planning and Ministry and child health. Research and training attained a new dimension in Bio-medical research. In the field of human

reproduction, research to improve contraceptive technology involving the use of conventional methods, steroids, IUCD and sterilization, research to determine inter-relationship between demographic, social and economic fields were undertaken. There was no area left untouched. Mass Vasectomy Camps were organised throughout the country in 1971 and onwards to mobilise the family planning programme in every nook and corner of the country.

The fifth plan (1974-79) was construed as a landmark in the growth of family planning programme. It has, on the one hand found greater integration with the general health, nutrition and maternity and child health schemes and, on the other hand with the total process of socio-economic changes which India is going through, (particularly since the launching of National Population Policy in April 1974 as a vital part of National Development Programme). On the eve of the fifth plan, five central training institutions and 43 regional family planning training centres were functioning and were perparing 10,000 medical and 15,000 paramedical personnel required to implement the plan vigorously. There were 4326 rural family welfare planning centres, 22826 rural subcentres and 1797 urban family welfare planning centres in operation. There were some setbacks in 1973 but from 1974 onwards the programme started picking up and since then there has been no looking back.

In 1975-76 performance is the field of sterilization almost doubled from 1.35 million in 1974 to 2.63 million. In

April, 1976, Dr. Karan Singh the then Union Health Minister, outlined a national population policy for the next 25 years or so. A 12 point programme was presented by the Health Minister which included raising the minimum marriage age for girls from 15 to 18 years and from 18 to 21 years for boys. Compulsory sterilization was left to the states.

The Janta Government modified the preceding central Government's policy on the family planning by emphasizing that there will be no complusion of any kind in enforcing a population control policy. The policy announced on April 28, 1977 ruled out compulsion in family planning for all time to come.

The notable change in the government policy was that there was to be no legislation for compulsory sterilization either at the central level or by the states. The government, however will continue to impress upon the people the desirability of checking the population growth rate in the interest of the family and the nation. Secondly, it would be left to each family as to which method it would like to adopt to achieve the aim. Thirdly, monetary compensation and incentives will be provided and sterilization facilities will be available to all those who voluntarily seek them, also the department of family planning was renamed as Department of Family and Social Wefare.

With the Central Government's implementation of the various programmes to check the growth of population, the states

also followed suit. Apart from the central government's own programmes, they supported the programmes sponsored by the states by providing financial assistance as well as technical advice. Even the voluntary agencies received support from the centre as well as the states to help implement the Family Welfare Programmes.

1.3 A Note on the Present Survey:

A survey entitled utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu District was conducted in 1986-87 under the auspices of Department of Mathematics, University of Jammu, Jammu. One of the objectives of the survey was to collect reliable data on knowledge of the availability of the Health and Family Welfare services, especially provided by the government, attitude towards and the extent of use of these services among the rural people living in three categories of villages, namely, villages where PHC's are located, villages where subcentres are located and villages where neither a PHC nor a subcentre is located.

In Jammu district, there were 12 PHC's in 1986. Out of 12, four Primary Health Centres were selected by the method of Simple Radom Sampling without replacement (SRSWOR). Then from each selected PHC's two subcentres were selected by the method of SRSWOR . The survey included all the four villages where the selected PHC's were located and 8 villages where the selected subcentres were located. Further 16 villages where neither PHC nor subcentre was located were selected by selecting 2 villages

from the villages covered under each subcentre after excluding the subcentre villages by method of SRSWOR.

Since the main objective of the study was to collect information about utilization of family planning and MCH services, the households having one or more married female below 50 years of age were included in the sample.

In order to compare the utilization of health care Family planning facilities in the three categories of villages more or less equal number of households having at least one married female below 50 years were selected from each cetegory. Thus about 200 households were selected from category I villages, 100 households from each category II villages and 50 from each category III villages.

A household in a house was defined as a group of persons who normally stayed together and were taking food from a common kitchen. Married daughters and their children were treated as visitors. The information on household characteristics such as religion, caste, sources of income, total monthly income, number of living rooms etc, and household structure i.e. characteristics of the members of the household such as relation to the head of the household, age, sex, marital status, education and occupation were obtained from each selected household in the sample.

A couple was defined eligible if both the partners were alive on the date of investigation and the female was less than fifty years of age. From each eligible couple present in the

sample households, information relating to (i) order and age at marriage (ii) the interval between marriage and first birth and between consecutive births, sex and survival status of each child (iii) knowledge of health and family planning services and type of services provided by these centres (iv) Attitude towards services provided by these centres and their utilization was collected. For the two most recent births that occurred to eligible females in preceeding three years details of antenatal and post natal care, place of delivery, type of birth attendent, utilization of services of PHC/subcentre during antenatal, delivery and post natal periods and the reasons of non utilization of these services (if the services were not utilized) etc. were obtained.

The Interview Process:

The data were collected by personal interview method. The investigators engaged in the survey were the research fellows appointed under the research project and other research scholars of the Statistics Department working in the field of demography.

The author in the capacity of a teacher fellow under U.G.C's Faculty Improvement Programme, was involved in planning, conduct of survey, compilation and analysis of data.

All the investigators took active part in the discussions for the preparation of a number of questionaries used in the survey. However, the investigators were given formal training for filling in the schedules. The in estigators used to go to the villages as

a team. Initially the group leader used to prepare the list of households, by contacting responsible and influential persons of the village. In the meanwhile the other investigators used to explain the purpose of the survey to the peopld. This was helpful in getting their cooperation. After the preparation of the list of households, the investigators collected the desired information on the households. This process was adopted restrospectively at the time of the survey. When the respondents became familiar with the investigators, it was easier to collect information during the other rounds of prospective survey.

A Profileof Jammu District:

Jammu distridt derives its name from its headquarter, the city of Jammu. Historians are unanimous in the view that the city was orginally found by Raja Jamboo Lochan who lived in the fourteenth century B.C. It is said that one day he happened to witness a tiger and a goat drinking water from one and the same pond. So he decided to built a city so that the strong and weak could live together in peace and mutual tolerance [Nargis 1967]. Eventually, the city came to be known as Jamboo after his own name. With the passage of time and due to its frequent use, the name got slightly distorted and the city came to be known as 'Jammu' as it is called now.

This district is bounded in the North and North-East by the tehsils of Reasi and Udhampur district, in the East and south East partly by Tehsil Ramnagar of Udhampur district and partly by Tehsil Bhasoli of Kathua district, in South and South-

West by Gurdaspur district of Punjab and districts of Sialkot & Rawalpindi (Pakistan) and in North-West by Tehsil Nowshehra of district Poonch and parts of Tehsil Bimber now under the occupation of Pakistan.

The area of the district according to 1981 census is 3097 sq kms (2969.5 sq kms rural and 127.5 sq kms urban). The district has 5 tehsils - Samba, Ranbirsingh Pura, Jammu, Akhnoor and Bishnah. The largest in area is Akhnoor (969.5 km^2) and the smallest is Bishnah(138.3 km^2). Jammu tehsil has an area of 968.4 km^2, Samba has 841.4 km^2 and Ranbirsigh Pura has 264.3 km^2.

Population and its Density:

The population of the district at the time of the 1981 census was 9.4 lacks (4.9 lakh males and 4.5 lakhs females). The district occupies first position in Jammu and Kashmir state with regard to population size. The density of population in the district is 305 persons per square km. which is higher than the state average of 59 persons per sq. km. The population of urban and rural areas in 1981 were 2,79,644 and 6,63,751 respectively. In rural and urban areas of the district the density of population per sq. km. is about 224 and 2194 respectively.

Table 1.1 Tehsilwise distribution of population and number of villages (1981 census)

Tehsils	Number of village	Population (in lakhs) Total	Male	Female	Density per sq. km.
1	2	3	4	5	6
1. Samba	317	1.59	0.82	0.77	189
2. Ranbirsingh Pura	215	1.39	0.73	0.66	526
3. Jammu	342	4.30	2.26	2.04	444
4. Akhnoor	226	1.47	0.76	0.71	151
5. Bishnah	92	0.68	0.35	0.33	494
Total (district)	1192	9.43	4.92	4.51	305

Sex Ratio:

The variation in sex-ratio has not been uniform since 1921. The number of females per 1000 males in 1921 was 840, in 1931 it was 829, in 1941 it was 850, in 1951 it was 570, in 1961 it was 886, 1971 it was 920 and in 1981it was 918. The sex ratio was lowest (570) in 1951 and highest (920) in 1971. Sex ratio of district Jammu in 1981 was higher than any other district of the state. Urban sex ratio is only 887 and rural sex ratio is 931. The reason for the higher rural sex ratio is the fact that labour from rural areas migrate to cities for work leaving their families behind in their villages.

Table 1.2 Sex Ratio of the District, 1901 - 1981

Year	Sex ratio	
	Rural	Urban
1901	883	626
1911	814	846
1921	623	641
1931	866	822
1941	893	647
1951	905	741
1961	915	801
1971	940	865
1981	931	887

Population Growth:

Although the growth of the district population has been consistently positive since 1921 there have been oscillations in the growth rate during 1901-1981. Durring 1901-11 growth rate of po population was negative (-4.24 percent). The growth rate was highest during 1961-71 (40.52 percent). During the last decade 1971-81 it fell to (29.93 percent). In the decade 1961-71, the district experienced the higher growth rate than that of the earlier decades. The growth rate of the population of the district during 1901 to 1981 classified as 1901 to 1911 (-4.24 percent), 1911-21 2.26 percent), 1921-31 (10.96 percent), 1931-41 (15.03), 1941-51 (10.23 (10.23 percent), 1951-61 (9.28 percent), 1961-71 (40.52 percent) and 1971-81 (29.93 percent).

The two districts of Jammu and Kathua in the whole state of Jammu and Kashmir experienced a negative growth rate of its population in 1901-1911. Even between these two districts, the rate of negative growth was much sharper (-4.24 percent) in Jammu than Kathua (-1.56 percent). The main cause for negative growth in 1901-11 in the district was that plague remained active during this decade. There was a heavy loss of life specially in tehsils: Aihnoor, Ranbirsinghpura and Jammu. Malaria also occurred in the plain region of Jammu district. The out break of world war I affected the growth rate of population as a large number of people joined army and got killed in action and also as on their return, most of them were absorbed permamently in the British army.

The reasons for all time high growth rate of population during 1961-71 are not far to seek. Firstly, during this decade a war between India and Pakistan (1965) took place, as a result of which a large number people migrated from the border areas of the region to this district. Again, towards the end of 1970 hysteria preceding the 1971 war also caused this type of migration. Secondly, this decade was the decade of vigorous economic development of the district creating a lot of employment avenues which resulted in migration from other districts to district Jammu.

During 1971-81 the rate of growth of economic activity remained stagnant and thereby reducing employment opportunities as such preventing migration from other districts. During this period family planning programmes were vigorously persued by the state. These together caused the growth rate of population to fall from 40.52 percent in 1961-71 to 29.93 percent in 1971-81. In this district only 29.64 percent of the population lives in urban areas. The decadal percentage variation in its population during the decade 1971-81 was 46.15 percent whereas for the rural area it was only 24.42 percent . Average population per inhabited village was 895 in 1981 as against 686 in 1971.

The distribution of the rural population in the district among villages of different population sizes is given in Table 1.3.

Table:1.3 Villages by their size and population (1981 census)

Range of population	Number of villages	Percentage of villages in each range
Less than 500	604	57.31
500 - 1999	393	37.29
2000- 4999	52	4.93
5000 and above	5	0.47
Total	1054	100.00

Population of more than half (57,31 percent) of the villages is less than 500. The percentage of medium sized villages with population between 500 and 1999 is 37.29 percent and that of the large sized villages having population of 2000 and above 4.93 percent. As much as 71.45 percent of the rural population lives in medium sized villages (201-1999) and only 0.47 percent and 23.15 percent respectively in large (500 and above above) small sized villaves (less than 201). There are only five villages in the district having a population exceeding 5000.

Age Structure:

The population of the district is young as 40 percent of the population is below age 15. The percentage of old people, aged 60 and above, is a little over 6 percent. Thus over one half (54 percent) of the population is aged between 15 and 60. Distribution of the population of the district by age cohorts is given in Table 1.4.

Table: 1.4 Age-distribution of population by sex and residence, 1981.

Age group	Total			Rural		
	P	M	F	P	M	F
0 - 14	378,454	195,783	182,671	268,160	93,751	134,409
15 - 19	111,445	57,649	53,796	78,622	40,697	37,925
20 - 24	84,772	44,816	39,956	54,993	28,836	26,157
25 - 29	68,773	35,193	33,580	44,472	22,346	22,026
30 - 34	51,443	25, 858	25,587	33,153	16,071	17,082
35 - 39	48,883	24,660	24,223	31,962	15,798	16,164
40 - 44	31,953	2,006	19,947	27,857	14,103	13,754
45 - 49	38,907	20,203	18,704	26,865	13,675	13,190
50 - 54	33,833	18,512	15,321	24,448	13,200	11,248
55 - 59	20,676	11,849	8,827	14,870	8,509	6,361
60 and ab above	63,956	35,285	28,671	48,234	26,651	21,583
Total	943,395	491972	451423	663751	343,747	320,004

Marital Status:

According to the 1981 census, the percentages of never-marriaged, married and widowed including divorced and separated persons were 57.2, 38.5 and 4.3 respectively. The corresponding percentages for the rural areas were 57.6, 37.9 and 4.5. Data on marital status by age, sex and by type of residence in given Table 1.5.

Table: 1.5 Proportion per 1000 of ever married (1981)[x] and of widowed to ever married in Jammu (Rural)

Age group	Ever-married per 1000		Widowed to ever married per 1000	
	Male	Female	Male	Female
0 - 14	1.70	4.27	32.65	29.56
15 - 19	30.40	410.63	10.52	7.14
20 - 24	272.44	810.07	13.24	11.19
25 - 29	747.18	986.23	12.57	19.29
30 - 34	941.88	996.13	16.31	38.92
35 - 39	969.80	998.39	24.60	69.28
40 - 44	970.99	998.54	39.21	126.85
45 - 49	978.35	999.24	50.45	184.39
50 - 54	978.18	999.28	74.81	307.94
55 - 59	979.78	999.77	102.79	363.33
60 and above	975.70	998.14	240.23	815.67

x Ever married = married + Widowed + divorced + Separated

$$\text{Proportion of Ever married per 1000} = \frac{\text{Ever married}}{\text{Single + ever married}} \times 1000$$

$$\text{Proportion of widowed to ever married per thousand} = \frac{\text{Widow + divorced + separated}}{\text{Ever married}} \times 1000$$

The proportion of ever married in each age group is higher among females than males. The considerable proportions of married persons below the age of 15 indicates the prevalence of child marriage in the district. Roughly 2 per thousand males and 4 per thousand females are married before they attain the age of 15.

The proportion of widowed among females in the age groups 0 - 14 and 15 - 19 is lower compared to the corresponding proportion among males. This is because a number of young girls in this group die during child birth as they are not physiologically strong enough to bear children. In the case of all other age groups the proportion of widowed among females is higher than the corresponding proportion among males. There are several reasons for this situation. First, on an average the age at marriage is higher among males than among females and as such husbands die earlier than the wives. Secondly, a large number widowed/divorced and separated males remarry and as such are returned among ever-married and not widowed/divorced while among females an insignificant number prefer to remarry after their husband's death and are therefore returned as widowed/divorced.

Occupation:

Of the total population, 39.43 percent are workers and the rest non-workers. The percentage of workers in the rural population is 43.96. Among the workers 17.13 percent work as cultivators and agricultural labourers. Female participation is

significant as their percentage among workers is 32.06. Few of the females (1 percent) work as cultivators or agricultural labrurers.

The distribution of workers and their occupation by sex in the district and in rural areas according to 1981 census is given in Table 1.6.

Table : 1.6 Percentage of workers and occupation by sex in Jammu district and in rural areas 1981.

Occupation	Total			Rural		
	P	M	F	P	M	F
1. Total Main workers	26.66	48.48	2.86	26.34	48.85	0.22
(a) Cultivators	11.20	20.90	0.63	15.30	28.75	0.84
(b) Agricultural labourers	1.46	2.60	0.21	1.83	3.28	0.26
(c) Household Industrial workers manufacturing processing servicing and repair workers etc.	0.41	0.68	0.11	0.51	0.88	0.11
(d) Other workers	13.59	64.30	1.91	8.69	15.92	0.92
2. Marginal workers	12.77	4.16	22.16	17.31	5.60	29.89
Total workers	39.43	52.64	25.02	43.96	54.47	32.06

Household:

According to the 1981 census, mud is the predominant material used for house-walls in villages and burnt bricks in towns. Thatch with mud constitute the most important roofing material in the rural areas, although some houses have tiled roofs as well but in towns concrete is the most frequently used roofing material. Tiles are the next important roofing material used in the towns.

The average size of a household both in the rural and in the urban areas is about 5.7. Households occupying two rooms predominate accounting for 40 percent of the total houses followed by those living in three and five room tenements which respectively account for about 19 percent and 15 percent respectively of the total houses.

The average density per room is 2.6 persons in rural and 1.8 in the urban areas. Of the total houses in the rural areas of state only 77.08 percent are used for residential purposes while in the rural areas of the district Jammu only 69.41 percent of the houses are residential compared to 30.59 percent of those of the urban areas of the district.

Literacy:

The percentage of literacy in the district was found to be 42.9 in 1981 as against the state average of 26.7. Jammu is advanced in literacy. The district ranks 1 in literacy in the state. Literacy percentage among males in 1981 was found to be

52.6 and among females 32.2. It was found in the 1981 census, that among the literates 11 percent had no schooling, 11.4 percent had studied upto primary or Junior Basic Standard, 15.6 percent had studied upto High School Standard and only 4.7 had studied upto Higher Secondary and above including technical and non-technical diploma or certificate levels. The percentage of literacy in the rural population was found to be 35.7 percent. Among the rural males it was 46.6 percent and among females it was only 24.1 percent.

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Religion/Caste:

According to 1971 census[x], of the total population of the distfict 83.5 percent were Hindus, 7.95 percent Muslims and 7.6 percent Sikhs. The percentage of the Chiristians and Jains was insignificant. Among Hindus and Sikhs 73.5 percent each live in the rural areas of the district and among the Muslims over 82 percent are rural residents.

Scheduled castes constitute 28.36 percent of the total population of the district. Persons belonging to scheduled castes live mainly in villages. They form 34.06 percent of the rural and 14.83 percent of the urban population. Their total number in 1981 was a little below 2.7 lakhs, 1.4 lakhs males and 1.3 lakhs females. There were no scheduled tribes in Jammu and Kashmir state. However, while this thesis was in preparation the Government of India declared the community of Gujjars and Bakarwals as Scheduled Tribe.

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[x] Religius break up of the population in 1981 was not available.

But as the data presented in this report was collected much before this declaration, this community has not been treated as Scheduled Tribe.

CHAPTER 2

CHARACTERISTICS OF HOUSEHOLDS AND ELIGIBLE COUPLES

INTRODUCTION

Group relations provide an understanding of the social, cultural and demographic characteristics of the people. The most important human group that can be of concern in a population study is a household, i.e. a group of persons, closely knit together, cooperating in economic and social activities and though differentiated occupationally pool their earnings. They have strong feelings of mutual obligation during crisis and identify their personal interests with those of the household. The behaviour of an individual is greatly influenced by the ethnic, social and economic characteristics of the household. Thus the characteristics of the individual as well as that of the household in which he lives influence both the fertility behaviour as well as the attitude, knowledge and utilization of FP and MCH services.

This chapter presents a description of the characteristics of the surveyed households and the eligible couples enumerated in the sample households in three types of villages.

2.1 Population and the Sample:

The survey was conducted in 28 villages, classified in three categories, as: Category I - villages having a PHC, category II - villages having a subcentre, and category III - villages having neither a PHC nor a subcentre. Of the 28 villages, included in the survey, 4 were in category I, 8 in the category II and 16 were in the category III.

From these 28 villages a total of 2063 households having at least one eligible couple each were selected for the survey. The total number of the eligible couples so selected was 2337. The village-category-wise distribution of these couples is given in Table 2.1.

Table 2.1: Distribution of Sample Households and Eligible Couples according to Category of Villages.

Category of villages	No. of villages surveyed	No. of sample households	No. of Eligible couples	No. of couple per households
I: Villages having a PHC	4	663	799	1.2
II: Villages having only a subcentre	8	702	775	1.1
III: Villages having neither a PHC nor a subcentre	16	698	763	1.09
Total	28	2063	2337	1.13

2.2 <u>Religion and Caste Composition of the Households Surveyed:</u>

The households included in this survey were predominantly those of Hindus and a small proportion belonged to other religious communities (Muslims, Sikhs, Christians, etc). The Hindu households comprised of many Jatis' (Castes) in the Varna' system. Since many of these castes were not found in significant numbers and the number of castes was too large for comparison, castes were grouped on the basis of homogeneity in the pattern of living as well as their relative social status. Other religions formed different

groups. Thus, the households were classified into the following four groups on the basis of religion/caste:

1. Hindu upper caste : Brahman, Rajput, Khatri, Jat, Bhaniya, etc.
2. Hindu Middle caste : Nai, Sonar, Lohar, Kumhar, Lobana, etc.
3. Hindu scheduled caste: Barwala, Basith, Ramdesia, Batwal, Chura, Dhyar, Doom, Gardi Jolaha, Megh Ratal, Saryara and Watal.
4. Other Religions : Muslims, Sikhs, Christians, Jains, and Buddhists.

97.6 percent of the households and 96 percent of eligible couples were Hindus and the rest belonged to other religions.

The percentage of Hindu upper caste households was 42.8 with 42 percent of the eligible couples. The percentage of Hindu Middle caste households was 22.2 with 23.5 percent of the eligible couples. The rest of the households and the eligible couples therein (among the Hindus) were scheduled castes.

Table 2.2 gives the distribution of households and the eligible couples by category of villages and Religion/Caste . This table shows that the percentage of upper caste Hindus was relatively low in category I villages as compared to category II and category III where their percentage was about 45. Middle caste Hindus were mostly concentrated in category I villages and the proportion of Hindu scheduled castes was highest (41 percent) in category III villages and lowest (22 percent) in category I villages.

Table 2.2: Distribution of Households and Eligible Couples belonging to each category of villages according to Religion/Caste.

Religion/ Caste	Category of Villages							
	I		II		III		Total	
	Number of							
	House holds	Eligible couples	House holds	Eligible couples	House holds	Eligible couples	House holds	Eligible couples
Hindu								
Upper	246 (37.1)	285 (35.7)	319 (45.4)	353 (45.5)	319 (45.7)	343 45.0)	884 42.8)	981 42.0)
Middle	256 (38.6)	329 (4.1)	133 (18.9)	147 19.0)	68 (9.7)	73 (9.6)	457 (22.2)	547 (23.5)
Scheduled Caste	147 (22.2)	170 21.3)	199 (28.4)	222 (28.7)	286 41.0)	320 41.9)	632 30.6)	712 (30.5)
Other religions	14 (2.1)	15 (1.9)	51 (7.3)	53 (6.8)	25 (3.6)	27 (3.5)	90 (3.4)	95 4.0)
Total	663 (100.0)	799 (100.0)	702 (100.0)	775 (100.0)	698 (100.0)	763 (100.0)	2063 (100.0)	2337 (100.0)

X Figures in brackets represent the percent of households

2.3 Nature of Families:

The survey included only those households which had at least one eligible couple. Thus, the households were classified into two categeries: Households having wife (aged below 50 years) and husband without children or with unmarried children were termed as nuclear. The rest were classified as joint.

96 percent of the households were found to be nuclear. Of all the eligible couples 82.5 percent were in nuclear households.

The distribution of Households and eligible couples belonging to each category of villages by type of households is given in Table 2.3. More than 90 percent of the households in each category of villages were nuclear. 75 percent of the eligible couples in category I villages and a little more than 85 percent of the couples in categories II and III villages belonged to nuclear households.

One can notice from a perusal of Table 2.3 that the number of joint families was very small as compared to the number of nuclear families because of several reasons. Firstly, the literate youngmen migrate to towns in research of white-collar and skilled employment. Secondaly the growth of population and mechanization of agriculture has rendered youth unemployed in the rural economy. The impact of western culture on India also discourages joint family system. Thirdly, the land reforms in our state (Jammu and Kashmir) also became a factor in this regard because in order to retain the surplus land within the

Table 2.3 : Distribution of Households and eligible couples belonging to each category of villages according to type of household

Type of Family	Category of village							
	I		II		III		Total	
	Number of							
	House holds	Eligible couples	House holds	Eligible couples	House holds	Eligible couples	House holds	Eligible couples
Nuclear	601 (90.7)	604 75.6)	669 (95.3)	675 (87.1)	649 (93.0)	649 (85.1)	1919 (96.0)	1928 (82.5)
Joint	61 (9.2)	191 (23.9)	32 (4.6)	97 (12.5)	46 (6.6)	105 (13.8)	139 (6.7)	293 (16.8)
Not-known	1 (0.2)	4 (0.5)	1 (0.1)	3 (0.4)	3 (0.4)	9 (1.2)	5 (0.2)	16 (0.7)

family, the landlords distributed it among their sons and let them manage their affairs separately. Although such joint families actually have not broken but they appear to be so.

2.4 Education of Households:

Of all the households 36 percent were such wherein no member had education beyond middle standard, 42 percent were such wherein some member(s) had studied upto High School, but none beyond and only 21 percent were such wherein some members had an education of an intermediate or higher standard.

The distribution of the households belonging to each category of villages according to the highest level of education is given in table 2.4.

Table 2.4 : Distribution of households belonging to each category of villages according to highest level of education

Maximum Education	Category of villages I	II	III	Total
	Number of Households	Households	Households	Households
Primary and below	79 (12.0)	132 18.8)	174 (25.0)	385 (18.7)
Middle	69 (10.4)	146 (20.8)	150 (21.5)	365 (17.7)
High school	272 (40.0)	311 (44.3)	292 (41.8)	875 (42.4)
Intermediates and above	239 (36.0)	112 (16.0)	82 (11.8)	433 (21.0)
N.A.	4 (0.6)	4 (0.1)	0 (0.0)	5 (0.24)

The percentage of households with less than high school education increases and the percentage of households with above high school level education decreases as we proceed from category I villages to category III villages. The percentage was found almost the same (41 percent) in all types of village at the high school level of education.

2.5 Income of the Eligible Couples:

The monthly per capita income of one third of the households was below Rs. 150, for about 40 percent between Rs. 150 - 300 and 25 percent had a per capita income of Rs. 300 or above. Of all the eligible couples 33.3 percent had a per cepita income below Rs. 150, 31 percent between Rs. 150 - 300 and 36 percent had per capita income or Rs. 300 or above.

The distribution of households and eligible couples belonging to each category of villages by per capita monthly income is given in table 2.5.

In category I villages the largest proportion (43.6 percent) of the households had a percapita income between Rs. 150 - 300. However, among the eligible couples over 30 percent belonged to this per capita income group in all the three categories of villages.

The lowest proportion (26 percent) of the eligible couples with a per capita income of less than Rs. 150 was in category I villages.

Table 2.5: Distribution of households and eligible couples belonging to each category of villages according to per capita Income.

Per capita income (in rupees)	Category of village							
	I		II		III		Total	
	Number of							
	House holds	Eligible couples	House holds	Eligible couples	House holds	Eligible couples	House holds	Eligible couples
Below 150	179 (27.9)	208 (26.0)	256 (17.9)	278 (35.8)	265 (37.9)	294 (38.5)	700 (33.9)	780 (33.3)
150 - 300	289 (43.6)	255 (31.9)	276 (39.3)	236 30.0)	263 (37.6)	229 (30.0)	828 40.1)	720 30.8)
300 and above	194 (29.3)	335 (44.4)	170 (24.2)	261 (30.4)	170 (24.3)	240 (31.4)	535 (25.9)	836 35.7)
N.A	1 (0.1)	1 (0.1)	- (0.0	- (0.0)	- (0.0)	- (0.0)	+1 (0.0)	+1 (0.0)
Total:	663 (100.0)	799 (100.0)	702 (100.0)	775 (100.0)	698 (100.0)	763 (100.0)	2063 (100)	2337 (100)

2.6 The Age[x] Structure of Eligible Couples:

Of all the currently married women, belonging to the reproductive ages, in the sample, about 18 percent were aged below 25 years and about 42 and 40 percent belonged to each of the age groups 25 - 34 years and 35 - 49 years respectively. The percentages of women belonging to the three broad age groups, viz below 25 years, 25 - 34 years and 35 - 49 years for all categories of villages was more or less the same.

The distribution of eligible females according to age, separately for each category of villages is given in Table 2.6(a).

2.6 (a): Distribution of eligible couples according to age separately for each category of villages.

Age of wife (in years)	I		II		III		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Below 25	142	17.8	138	17.8	147	19.3	427	18.3
25 - 34	360	45.0	340	43.9	302	39.6	1002	42.8
35 - 49	297	37.2	297	38.3	314	41.1	908	38.9
Total	799	100.0	775	100.0	763	100.0	2337	100.0

Among the male partners of eligible couples only 3.5 percent were aged below 25 years and about 12 percent aged 50 years and above. The rest (85 percent) were between 25 - 49 years. The distribution of males was found to be similar in all the three categories of villages.

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[x] Age on the date of survey.

The distribution of male partners of eligible couples according to age separately for each category of villages is given in Table 2.6(b).

2.6 (b): Distribution of male partners of eligible females according to age at survey separately for each category of villages.

Age of husband (in years)	I		II		III		Total
	Number	Percentage	Number	Percentage	Number	Percentage	
Below 25	22	2.7	26	3.4	354	4.65	83
25 - 34	318	39.8	292	37.6	285	37.4	895
35 - 49	364	45.6	356	46.0	345	45.2	1065
50 and above	95	11.9	101	13.0	98	12.8	294
Total	799	100.0	775	100.0	763	100.0	2337

2.7 <u>Education of the eligible couples by type of village:</u>

About 50 percent of the female partners and 75 percent of male partners of eligible couples were literate. The percentage of female partners with educational level of primary or below, middle standar, high school, and intermediate and above, was 14.7, 12.9, 16.5 and 6.0 respectively. The corresponding percentages of male partners were 7.9, 16.0, 34.5 and 15.4.

Among both the male and female partners percent literate as well as the level of education of literates was highest in category I villages and was lowest in category III villages. This is because PHC villages had more opportunities, as two of these were tehsil headquarters with higher per capita income, etc.

The distribution of male and female partners of eligible couples according to level of education separately for each village category is detailed in Table 2.7 (a) and (2.7 (b) respectively.

2.7 (a) Distribution of male partners of eligible females according to level of education separately for each village category.

Education of husband (in years)	Category of village						Total
	I		II		III		
	Number	Percentage	Number	Percentage	Numberr	Percentage	
Illiterate	117	14.6	217	28.0	278	36.5	612
Primary and Below	52	5.3	73	9.5	71	9.3	186
Middle	93	11.6	146	18.8	136	17.8	375
High school	319	40.0	261	33.6	223	29.2	803
Intermediate and above	228	28.5	78	10.1	55	7.2	361
Total	799	100.0	775	100.0	763	100.0	2337

2.7 (b): Distribution of eligible females according to level of education separately for each category of villages.

Education of wife (in years)	Category of villages						Total
	I		II		III		
	Number	Percentage	Number	Percentage	Number	Percentage	
Illiterate	236	29.6	441	56.09	490	64.3	1167
Primary and below	111	13.9	120	15.5	113	14.8	344
Middle	121	15.1	99	12.8	81	10.6	301
High school	218	27.3	99	12.8	69	9.0	386
Intermediate and above	113	14.1	16	2.0	10	1.3	139
Total	799	100.0	775	100.0	763	100.0	2337

2.8 Education by age of Eligible Couples:

About 26 percent of male partners and 50 percent of female partners of eligible couples were illeterate. The percentage illeteracy increases with increase of age in both the cases.

In all the age groups, among the male partners, the largest population had an education of high school level with 42.5 percent in the age group 25 - 34 years, 35 percent in the case of below 25 years group and 31.8 percent in the case of 35 - 49 years group.

The same is true of the female partners, but among them the proportion of high school educated persons was found to be less than that of their male counterpart in each age group, the respective proportions being 22.3 percent in 25 - 34 years age group, 20.40 percent in below 25 years group and 8.2 percent in 35 - 49 years group.

So far as higher qualifications (intermediate and above) are doncerned, the male partners had a higher percentage than females in the age groups 25 - 34 years and 35 - 49 years. However the percentage in the age group below 25 years was more or less the same in both male and female partners.

The distribution of male and female partners among eligible couples according to the age and education is given in Table 2.8 (a) and 2.8 (b) respectively.

Table 2.8 (a) : Distribution of male partners of eligible females according to ate and education

Age of husband (in years)	Educational level					
	Illiterate	Primary and below	Middle	High school	Inter-mediate and above	Total
	Number of males					
Below 25	9 (10.8)	12 (14.4)	25 (30.2)	29 (35.6)	8 (9.6)	83 (100.0)
25 - 34	126 (14.1)	63 (7.0)	152 (17.0)	380 (42.5)	174 (19.4	895 (100.0)
35 - 49	316 (29.7)	81 (7.6)	165 (15.5)	339 (31.8)	164 (15.4)	1065 (100.0)
50 and above	164 (54.7)	30 (10.2)	35 (11.2)	55 (18.5)	15 (5.4)	294 (100.0)
Total	612 (26.3)	186 (7.9)	375 (16.0)	803 (34.4)	361 (15.4)	2337 (100.0)

Table 2.8 (b) : Distribution of eligible females according to age and education

Age of wife (in years)	Educational level					
	Illiterate	Primary and abelow	Middle	High school	Inter-mediate and above	Total
Below 25	139 (32.6)	79 (18.5)	79 (18.5)	87 (20.4)	43 (10.1)	427 (100.0)
25 - 34	420 (42.0)	144 (14.4)	143 (14.2)	224 (22.3)	71 (7.1)	1002 (100.0)
35 - 49	608 (67.0)	121 (.3.3)	79 (8.7)	75 (8.2)	25 (2.8)	908 (100.00)
Tdal :	1167 (50.0)	344 (14.7)	301 (12.9)	386 (16.5)	139 (5.9	2337 (100.0)

2.9 Residential Status of the Husband by the Type of Village:

The residential status of the husband in the surveyed households is classified into two types - 1 and 2

1 : The husband is a permanent member of the household, lives there, and present or absent at the time of investigation.

2 : The husband is a permanent member of the household who comes after a few days, a few months, or after a long interval of time and present or absent at the time of investigation.

Among all the eligible couples 80 percent came under the husbands residential status 1 and slightly more or less the same (80 percent) was found in each category of villages. The rest(20 percent) belonged to residential type 2 and the proportion was more or less the same in all the three categories of villages.

The distribution of eligible couples according to residential status of husband is given in Table 2.9.

Table 2.9: Distribution of Eligible Couples according to residential status of husband.

Residential status of husband	Category of village							
	I		II		III		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
1	656	82.1	605	78.1	601	78.8	1862	79.7
2	143	17.9	170	21.9	162	21.2	475	20.3
Total	799	100.0	775	100.0	763	100.0	2337	100.0

2.10 Number of children Alive by the Age of Wife:

The distribution of female partners of eligible couples by age and number of surviving children (at the time of survey), Table 2.10, shows that the proportion of women with no surviving children decreases with the increase in age. Thus, while 28.6 percent of women under 25 years had no surviving children, the proportion of women above 35 years of age having no surviving children was only 0.4 percent. This distribution also shows that number of surviving children increases with the increasing age and that the proportions of women having 5 or more surviving children increases with increase in age. Thus only 0.2 percent women under 25 years had 5 or more surviving children, the corresponding proportion was 36.0 percent among women above 35 years of age. As the distribution shows the largest proportion (36.3 percent) of women above 35 years age had 5 or more children, it can be concluded that women in general do not seem to be using methods of birth control although the knowledge of various methods of birth control is widespread. The most probable reasons seem to be the fear of non survival of children considering the facilities available for child health care in the rural areas, the other reason could be the idea that the larger the number of children, the larger number of persons available for work in the fields and consequently greater income. Lack of facilities of modern and more healthy means of entertainment in rural areas also seems to leave indulgence in sex as the only substitute for the poor rural population.

Table 2.10 : Distribution of eligible female partners according to age and number of surviving children.

Age of wife	Number of children alive							
	0	1	2	3	4	5	Total	NA
< 25	121 (28.6)	185 (43.8)	84 (19.8)	27 (6.4)	5 (1.2)	1 (0.2)	423 (100)	3
25 - 34	47 (4.7)	150 (15.1)	303 30.3)	298 29.8)	137 13.7)	64 (6.4)	999 (100)	0
35 and above	4 (0.4)	22 (2.4)	85 (9.9)	218 (24.39	246 (27.3)	327 (36.3)	902 (100)	6
Total	172 (7.4)	357 (15.4)	472 (20.3)	543 23.4)	388 (16.6)	392 (16.9)	2324 (100)	9

CHAPTER 3

A DISTRIBUTION FOR FIRST BIRTH AND ITS APPLICATION

INTRODUCTION

Interval from marriage to the first birth, to a female, in a population provides a good data for the study of fecundability. A variety of mathematical models to explain the nature of this interval have been proposed and are applied to real data to estimate unknown parameters (see, Sheps and Menken, 1973, Loridon, 1977, Mode, 1985). It is usually assumed in most widely used models that all the females are fecundable at marriage, fecundability is constant for a female till the occurrence of first live birth conception and fecundability may vary among women. However, those models often do not describe satisfactorily the data, (Singh, 1964, Singh and Singh, 1983, Bhattacharya, et al, 1989). Recently, Bhattacharya et al, (1986, 1989) have reviewed the modification in the existing models proposed by various authors to tackle such situations.

This chapter presents a model for the time of first live birth which takes fecundability to be time dependent during early part of marital life. It also takes into account foetal wastages preceding the first live birth conception, hence the model becomes more flexible and may be applied to data in societies where sexual relation starts at an early age. Thus model may be considered as a special case of the model proposed in Bhattadharya et. al, (1989).

3.1 The Model:

Let us consider a cohort of women of the same age at marriage, same duration of married life say, exactly T years, and have given at least one live birth. A probability distribution of the time between marriage and first live birth for such women is obtained under the following assumptions:

(i) The conditional instantaneous, risk of first conception during early part of cohabitation is a function of time elapsed since marriage and gradually reaches a normal level say, m_o. The conditional probability that the first conception to a female occurs during the interval $(t, t + \Delta t)$ is

$$\begin{cases} m(t)\,\Delta t + o\,\Delta t & (m(t) > 0 \text{ for } t > 0) \\ 0 & \text{otherwise} \end{cases} \qquad (3.1.1)$$

The assumed pattern of $m(t)$ reflects the sociocultural practices associated with early part of conjugal life, which govern the timing and frequency of intercourse.

(ii) A conception ends in either a live birth or a foetal loss. Let θ be the probability that a conception results in a foetal loss, $0 \leq \theta < 1$.

(iii) The length of non-susceptible period comprising the duration of pregnancy and post partum amenorrhoea associated with a foetal loss is an exponentially distributed radom variable with mean $1/c$, $c > 0$.

(iv) Given that the first pregnancy has resulted in a foetal loss, the instantaneous risk of conception thereafter is constant with a normal value m_o and remains the same untill

the occurrence of first live birth conception.

The interval between marriage and first live birth, say T_o, given that she has 'n' foetal wastages before the first live birth, is the sum of the following components:

(a) $X_o + X_1 + X_2 + \dots + X_n$, the total duration of stay in the fecundable state between marriage and the first live birth; where X_o : the time elapsed between marriage and first conception and X_j : the time spent in the fecundable state following j-th foetal loss till the next conception, $j \geq 1$.

(b) $Y_1 + Y_2 + \dots + Y_n$; where Y_j is the duration of non-susceptible period associated with the j-th foetal loss.

(c) g; the period of pregnancy associated with the first live birth. Thus

$$T_o/n = X_o + \sum_{i=1}^{n} (X_i + Y_i) + g \qquad \dots (3.1.2)$$

Under the assumptions (i) and (ii), the distribution of (X_o) is

$$F_o(t) = [1 - \exp(-\int_o^t m(x).dx)] \qquad \dots (3.1.3)$$

where $X_o, X_1, X_2 \dots X_n, Y_1, Y_2 \dots Y_n$ are satistically independent due to assumptions (i),(iii) and (iv). Moreover, for each $j \geq 1$, X_j and Y_j are exponentially distributed with parameters m_o and c respectively.

Let us denote the Laplace transformation of the distribution of X_o by $F_o(s)$. Following the procedure described in Suchindran and Lachenbruch (1974) in the derivation of Laplace transform of the time of first live birth, it can be shown

that the Laplace transform of the unconditional distribution function of T_o is

$$\phi(s) = \sum_{n=o}^{\infty} (1-\theta)\theta^n F_o(s)\left(\frac{m_o}{m_o+s}\right)^n\left(\frac{c}{c+s}\right)^n \exp(-sg) \quad \ldots (3.1.4)$$

which can be re-written as

$$\phi(s) = F_o(s)[A_o+A_1\left(\frac{V_1}{V_1+s}\right) + A_2\left(\frac{V_2}{V_2+s}\right)]\exp(-sg) \quad \ldots (3.1.5)$$

where

$$A_o = (1-\theta), \quad A_1 = \frac{m_o c\,\theta(1-\theta)}{V_1(V_2-V_1)}, \quad A_2 = \frac{m_o c\,\theta(1-\theta)}{V_2(V_1-V_2)}.$$

V_1 and V_2 are the additive inverses of the roots of the equation $s^2+(m_o+c)s+m_o c(1-\theta) = 0$ and V_1 and V_2 are non-negative and distinct. The inverse of $\phi(s)$, the complete distribution function of T_o is

$$K(t) = \sum_{j=o}^{2} A_j K_j(t) \quad \ldots (3.1.6)$$

where

$$K_o(t) = [1-\exp(-\int_o^{t-g} m(x)dx)], t>g \quad \ldots (3.1.7)$$

and

$$K_j(t) = \int_g^t K_o(y)V_j e^{-V_j(t-y)} dy, \quad t>g, j= 1,2 \quad \ldots (3.1.8)$$

Since the distribution is truncated at the T year, the truncated population is governed by the probability law

$$K^*(t) = \frac{\sum_{j=o}^{2} A_j K_j(t)}{K(T)}, \quad g \leq t \leq T \quad \ldots (3.1.9)$$

We specify the assumption (i) as follows:

(1) $m(t)$ is a polynomial of degree r in t for $0 < t < T_1$

and is of the form

$$m(t) = \sum_{j=o}^{r} q_j t^r \qquad \ldots (3.1.(10)$$

and for $t > T_1$

$$m(t) = \sum_{j=o}^{1} q_j T_1^j \qquad \ldots (3.1.11)$$

i.e. between time points $(0, T_1)$ the instantaneous risk of conception depends on distance between the start of cohabitation and of t and thereafter becomes constant and the expressions (3.1.7) and (3.1.8) reduce to

$$K_o(t) = [1-\exp\{-\int_o^{t-g} m(x)dx\}]$$

$$K_j(t) = [1-\exp\{-V_j(t-g)\} - V_j \int_g^t \exp\{-\int_g^{y-g} m(x)dz - V_j(t-y)dy\}]$$

where

$$\int_o^{a-g} m(x)dx = \sum_{j=o}^{r} q_j \frac{(a-g)^{j+1}}{(j+1)}, \; g < a < g+T_1$$

$$= \sum_{j=o}^{r} \frac{q_j \, T_1^{j+1}}{j+1} + m_o(a-g-T_1) \; a > g+T_1$$

3.2 Estimation:

A procedure to obtain maximum likehood estimates (MLE) of the parameter in the distribution (3.1.9) when $m(t)$ is of the form given in (3.1.10) and (3.1.11) and for $r = 1$, for known values of T_1, θ and c is outlined below for the grouped data. In this case, distribution involves two parameters q_o and q_1

Let range of first live birth interval be partitioned into k intervals with the end points of interval being t_j, $j = 0, 1,2,...k$, $t_o = 0$, $t_k = T$ and $t_1 > g$. Let P_j denote the expected proportion of women with their times of first birth in the jth interval (t_{j-1}, t_j) where

$$P_1 = \frac{K(t_1)}{K(T)} \text{ and } P_j = \frac{K(t_j) - K(t_{j-1})}{K(T)}, \ j = 2,3 \ldots k \ .$$

In a sample of N women $n_1, n_2 \ldots, n_k$ women are observed to deliver the first child duting intervals $i, 2, \ldots, k$ respectively and $\sum_{i=1}^{k} n_i = n$. It can be seen that the equations

$$\sum_{i=1}^{k} \frac{n_i \, \delta P_i}{P_i \, \delta q_j} = 0 \ (j = 0,1)$$

do not provide the explicit expressions of MLE. Hence MLE of the parameters may be computed by scoring method.

Using the scoring method (see Roa, 1952), the MLE of the parameters of $K^{*}(t)$ are solution to

$$I \delta \theta = S$$

where

$$I = \{I_{st}\} \quad s,t = 1,2$$

$$I_{st} = N \sum_{j=1}^{k} \frac{1}{P_j} \left(\frac{\partial}{\partial \theta_s} P_j\right)\left(\frac{\partial}{\partial \theta_t} P_j\right)$$

where $\theta_1 = q_o$ and $\theta_2 = q_1$

$$\delta\theta' = (\delta\theta_1 \, , \, \delta\theta_2), \quad S' = (s_1, s_2)$$

$$S_s = \sum_{j=1}^{k} \frac{n_j}{P_j} \left(\frac{\partial}{\partial \theta_s} P_j \right), \; (s = 1,2)$$

$$P_1 = \frac{K(t_1)}{K(T)}, \quad P_j = \frac{K(t_j) - K(t_{j-1})}{K(T)}, \quad j = 2,3,\ldots k$$

For $i = 0,1$

$$\frac{\partial}{\partial q_i} P_1 = \frac{1}{K(T)} \left[\frac{\partial}{\partial q_i} K(t_1) - P_1 \frac{\partial}{\partial q_i} K(T) \right]$$

$$\frac{\partial}{\partial q_i} P_j = \frac{1}{K(T)} \left[\frac{\partial}{\partial q_i} \{K(t_j) - K(t_{j-1})\} - P_j \frac{\partial}{\partial q_i} K(T) \right]$$

$$j = 2,3,\ldots, k.$$

From the expressions given in the previous section, it can be seen that; A_1 and A_2 are functions of V_1 and V_2; V_1 and V_2 respectively are functions of m_o; m_o and $\int_o^{t-g} m(x)dx$ respectively are functions of q_o and q_1. Thus the differentiation of $K(t)$, w.r.t. q_o and q_1 for different values of t can be obtained as under:

$$\frac{\partial}{\partial q_s} K(t) = \sum_{j=o}^{2} \left[K_j(t) \frac{\partial}{\partial q_s}(A_j) + A_j \frac{\partial}{\partial q_s}(K_j(t)) \right]; \quad s = 0,1$$

where

$$\frac{\partial}{\partial q_s} K_o(t) = \left[\exp\left(-\int_o^{t-g} m(x)dx\right) \right] \frac{\partial}{\partial q_s} \int^{t-g} m(x).dx \quad t > g$$

and for $j = 1,2$

$$\frac{\partial}{\partial q_s} K_j(t) = \left[(t-g)\, e^{-V_j(t-g)} \frac{\partial}{\partial q_s} V_j - \int_g^t \{\exp\left(-\int_o^{y-g} m(x)dx - V_j(t-y)\right)\} \right.$$

$$\left. \{(1-V_j(t-y)) \frac{\partial}{\partial q_s} V_j - V_j \frac{\partial}{\partial q_s} \int_o^{y-g} m(x)dx\} dy \right]$$

$$\frac{\partial}{\partial q_s} V_j = \frac{1}{2}[1+(-1)^{j-1} \frac{\{m_o - c(1-2\theta)\}}{\{(m_o - c)^2 + 4m_o + c\theta\}^{1/2}}] \frac{\partial}{\partial q_s} m_o$$

and

$$\frac{\partial}{\partial q_s} A_j = \sum_{\ell=1}^{2} \frac{\partial}{\partial V_\ell}(A_j) \frac{\partial}{\partial q_s}(V_\ell)$$

$$= (-1)^{j-1}[\frac{c\theta(1-\theta)(m_o - c)}{\{(m_o - c)^2 + 4m_o c\theta\}^{3/2}}] \frac{\partial}{\partial q_s} m_o \; ; \quad j = 1,2 \; .$$

The inverse of the matrix I is the variance co-variance matrix of the estimators.

A method of obtaining the pilot values of the unknown parameters which are required for scoring is given below.

When $m(t)$ is constant, the model involves only one parameter q_o. The pilot value of q_o can be obtained by equating $\bar{X}$ - the mean length of first birth interval of those giving birth in $(0, T)$, to its theoretical expression, where

$$\bar{X} = \frac{\sum_{j=1}^{2} \frac{B_j}{V_j}\{1-(\exp(-V_j(T-g)))\,(1+V_j T)\}}{[1 - \sum_{j=1}^{2} B_j e^{-V_j(T-g)}]}$$

where

$$B_j = A_j \frac{m_o}{m_o - V_j} \qquad j = 1,2 \; .$$

This equation may be solved by Newton-Raphson iteration procedure. Women of age below 15 years at the time of marriage are excluded from the analysis being few in number.

When $m(t)$ is a polynomial of degree one, there are two parameters viz. q_o and q_1. The MLE of q_o obtained by

taking $m(t)$ to be constant and zero can be taken as the pilot values of q_o and q_1 respectively.

3.3 Application:

For illustration of the model we use data from the survey described below. The data were compiled from the survey entitled, "Utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu District" conducted by the Department of Mathematics, Jammu University, Jammu in the year 1986-87. The survey included all the households numbering 2063 of 28 villages which were selected from rural areas of Jammu. The details of the survey are given in chapter 1 . Besides other information, marriage and birth histories of all the eligible couples (both husband and wife alive and wife below 50 years on the reference date of survey) were obtained. Table 3.1 provides age-at-marriage-wise distribution of women separately by length of interval between marriage and the first live birth. Data presented in the Table 3.1 to 3.3 refer to couples who did not practice any family planning method, both husband and wife were normal residents of the village, female partner was married only once, those whose date of marriage preceeds the reference date by atleast seven years, at least one child was born during the seven years of marriage and the age at marriage was 15 years or more. Assuming value of T_1 as 3.00 years, the probability of foetal loss, as 0.15 and the mean duration of non-susceptible period associated with a foetal loss, as 0.50

years, the distribution (3.1.9) taking risk of first conception to be constant and linear in t during the early part of cohabitation and constant thereafter is fitted to data presented in Table 3.1 to 3.3. The distribution seems more suitable with linear form of risk function than the distribution with constant form of risk function. Age-at-marriage-wise expected distributions of women according to time of first birth and estimates of parameters when $m(t)$ is a constant and is linear in t are presented in Tables 3.1 to 3.3. Variances of the estimates and correlation coefficients between estimators are also obtained.

Here $\hat{q}_o$ and $\hat{q}_1$ can be interpreted as the risk of first pregnancy just at the time of first exposure to stable sexual relationship i.e. marriage, and rate of increase in risk of first pregnancy during the period from start of marriage till further time T_1. From the Tables 3.1 to 3.3 it can be seen that the value of $\hat{q}_o$ is more or less the same for females with age at marriage 15-16 years and 20 years and above and having marriage durations between 7 - 14 years. The value of $\hat{q}_o$ is little higher for females with age at marriage between 17 - 19 years than those having age at marriage 16 years and below or 20 years and above. The values of $\hat{q}_o$'s are found to be smaller for females having marriage duration 15 years or more as compared to those having marriage duration between 7 -14 years. This may be because higher incidence of reporting longer intervals between marriage and first birth probably the time of birth of the eldest child

was reported as the time of first birth and children who were born and died before the eldest living child were ignored. $\hat{q}_1$ for females having ages at marriage 15 - 16 years is negative whereas it is positive for females with age at marriage 17 years and above. Reasons are obvious as most of the females enter cohabitation at mature ages and social factors hinder sexual relations also become weakerr at these ages. Desire to conceive the first child soon may be cause of higher $\hat{q}_1$ for women with age at marriage 17 years and above.

Here it is assumed that hazard of first pregnancy begins to increase and attains a plateau after time T_1. In fact that T_1 for a single woman may depend on age at marriage and also may vary among women of same age at marriage.

Table 3.1 : Distribution of females, for age at marriage 15 - 16 years giving birth in first seven years of marriage according to time of first live birth

Interval between marriage and first live birth (in years)	Interval between marriage and date of survey					
	7-15 years			morethan 15 years		
	Frequency					
	Observed	Expected when m(t) is		Observed	Expected when m(t) is	
		Constant	Linear		Constant	Linear
0 - 1.75	53	55.9	56.4	66	66.6	69.8
1.75 - 2.75	38	28.9	28.4	50	44.4	42.5
2.75 - 3.75	8	15.5	15.2	27	30.1	27.5
3.75 - 4.75	9	8.4	8.4	12	20.5	19.4
4.75 - 5.75	4 }	4.5 }	4.6 }	21	14.0	14.6
5.75 - 7.00	4 }	2.8 }	3.0 }	11	11.4	13.2
Total	116	116.0	116.0	187	187.0	187.0
Chi-square		7.22	7.29		8.12	7.55
Degree of freedom		3	2		4	3
Estimates						
$\hat{q}_o$		0.781	0.797		0.471	0.491
$\hat{q}_1$		-	-0.018		-	-0.048
$V(\hat{q}_o)$		0.0093	0.0209		0.0035	0.0054
$V(\hat{q}_1)$		-	0.0117		-	0.0029
$Cor(\hat{q}_o \hat{q}_1)$		-	-0.7349		-	-0.1662

Table 3.2 : Distribution of females, for age at marriage 17 - 19 years giving birth in first seven years of marriage according to time of first live birth.

Interval between marriage and first live birth (in years)	Interval between marriage and date of survey					
	7 - 15 years			more than 15 years		
	Frequency					
	Observed	Expected when m(t) is		Observed	Expected when m(t) is	
		Constant	Linear		Constant	Linear
0 - 1.75	144	135.0	143.7	142	142.8	147.2
1.75 - 2.75	65	66.1	66.1	82	72.8	68.9
2.75 2 3.75	33	33.9	31.5	31	38.6	35.9
3.75 - 4.75	14	17.5	14.9	16	20.7	20.4
4.75 - 5.75	7	9.1	7.0	11	11.1	12.1
5.75 - 7.00	4	5.4	3.8	11	7.0	8.5
Total	267	267.0	267.0	293	293.0	293.0
Chi-square		4.88	0.16		6.1	5.2
Degree of freedom		4	2		4	3
Estimates						
$\hat{q}_o$		0.845	0.929		0.795	0.856
$\hat{q}_1$		-	0.018		-	-0.066
$V(\hat{q}_o)$		0.0045	0.0135		0.0038	0.0085
$V(\hat{q}_1)$		-	0.0080		-	0.0045
$Cor(\hat{q}_o \hat{q}_1)$		-	-0.7791		-	-0.6966

Table 3.3 : Distribution of females, for age at on marriage 20 years and above giving birth in first seven years of marriage according to time of first live birth

Interval between marriage and first live birth (in years)	Interval between marriage and date of survey					
	7 - 15 year			more than 15 years		
	Frequency					
	Observed	Constant	Linear	Observed	Constant	Linear
0 - 1.75	111	114.7	113.2	69	79.5	70.1
1.75 - 2.75	68	59.4	60.8	67	58.5	63.5
2.75 - 3.75	24	32.0	33.0	47	43.5	51.1
3.75 - 4.75	24	17.4	17.4	36	32.5	35.4
4.75 - 5.75	5	9.5	9.1	25	24.2	22.7
5.75 - 7.0	7	6.0	5.5	16	21.8	17.2
Total	239	239.0	239.0	260	260.0	260.0
Chi-square		8.14	8.02		4.87	0.884
Degree of freedom		4	3		4	3
Estimates						
$\hat{q}_o$		0.775	0.748		0.355	0.295
$\hat{q}_1$		-	0.027		-	0.085
$V(\hat{q}_o)$		0.0045	0.0101		0.0022	0.0026
$V(\hat{q}_1)$		-	0.0059		-	0.0019
Cov $(\hat{q}_o \hat{q}_1)$		-	-0.7578		-	-0.6699

CHAPTER 4

A DISTRIBUTION FOR BIRTH INTERVALS AND ITS APPLICATIONS

INTRODUCTION

The study of fertility has been increasingly approached through the analysis of birth intervals during the past three decades. Various techniques for such analysis have been proposed (Mode 1985). Derivation and application of probability distribution relating to closed birth intervals is one of them.

The closed birth intervals are useful in studying the pattern of reproduction and estimation of certain parameters underlying the reproductive process of those women who continue to reproduce.

Under natural fertility conditions, usually a closed birth interval is decomposed into components; post-partum amenorrhea, menstruating interval, time added by foetal wastages and gestation period and the distribution of the sum of these components is derived using the theory of Semi-Markov processes with stationary transition densities. These distributions and their extensions, especially those accommodating variation in certain parameters among women, are extensively used to analyse and interpret real data, to estimate some unknown parameters of reproduction and to study the effects of use of family planning method on birth spacing.

An excellent survey and critical review of recent work can be found in Mode (1985). Braun (1977, 1978) extended

D'-Souza's (1973, 1974) work and developed models for inter-live birth intervals capturing some salient features of data for describing the whole reproduction process. Braun and Hoem (1979). Hickman and Singer (1982) proposed models incorporating co-variate information.

Some taboos on frequency of coitus after a child birth are prevalent in varying degree in different societies which affect the birth spacing through intermediate variables. Abstinence from coitus is a culturally patterned norm scrupulously observed for various reasons by most people in rural parts of India and in other traditional societies in different parts of the world (Mahadevan, 1979, Santow, 1978).

In this chapter, a probability model describing the length of interval between successive live births is proposed. It is a special case of the model proposed in Bhattacharya et al (1988 a : 57). The model is used to describe the observed distributions of closed birth intervals compiled from data collected in the survey entitled "Utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu District". A procedure to obtain maximum likelihood estimator of parameters involved in the model is also given.

4.1 <u>The Model</u>:

Let us consider a cohort of married women of parities $(i+1)$ and above, aged $a+T$ years, with ith birth at age a : $a+T < A$ where A is the age of natural sterlity $(i=1,2...)$. A probability distribution $X(T)$, the length of interval between

ith and (i+1)th birth for such women is obtained with the following assumptions:

4.2 <u>Assumptions:</u>

(i) The fecund females belong to two distinct groups with respect to duration of post-partum amenorrhoea (PPA), one with low value, say t_1, and the other with high value, say t_2; the proportions of females of low and high values of PPA are a_1 and a_2 respectively, such that $a_1+a_2 = 1$.

(ii) τ be the period of post-partum abstinence following occurrence of a birth. Thus, the duration of non-susceptible period associated with a birth to a woman of group ℓ, say z_ℓ, is $z_\ell = \max(t_\ell, \tau)$, $\ell = 1,2$.

(iii) Coition resumes after the period of abstinence. Its frequency at time t, depends on the duration of post-abstinence period and t, till a conception occurs or a normal level is attained, whichever is earlier.

Given that a woman did not conceive till time t following the birth, the conditional probability that the female has a coitus durint interval $(t, t+\delta t)$ is

$$m'(t)\,\delta t + O(\delta t) \quad \text{for} \quad t > \tau$$

where $\frac{O(\delta t)}{\delta t} \to 0 \quad \delta t \to 0.$

Let $m_o = \lim_{t} m'(t)$

The coitions are mutually independent and p, the probability that a coition to a fecund female of parity i, which

was attained at an age 'a', results in a conception is constant. Thus, after time t of the ith live birth, the conditional instantaneous risk of conception to a female of group ℓ is

$$m(t) = \begin{cases} p\, m'(t) & \text{for } t > z_\ell \\ 0 & \text{otherwise.} \end{cases}$$

Define $m_o = \lim_{t} m(t)$.

(iv) A conception ends either in a live birth or in a foetal loss. Let θ be the probability that a conception results in a foetal loss, $0 < \theta < 1$.

(v) The length of non-susceptible period comprising the duration of pregnancy and post-partum amenorrhoea associated with a foetal loss is an exponentially distributed random variable with mean $1/c$, $c > 0$.

(vi) Given that the pregnancy immediately following a live birth has resulted in a foetal loss the instantaneous risk of conception thereafter is constant with a normal value m_o and remains the same until the occurrence of the live birth conception.

4.3 Derivation:

The length of the interval between ith and (i+1) th live births for a woman who delivered the ith child at age 'a', could be decomposed as

$$T/n = \tau + \sum_{j=o}^{n} X_j + \sum_{j=1}^{n} Y_j + g \qquad \ldots (4.1.1)$$

given that there had been exactly n intervening foetal wastages, where

τ : as defined in assumption (ii).

X_j : The duration of stay in fecund state till conception following termination of the non-susceptible period of ith live birth or jth foetal loss in T_1 according to as j is 0 or $j \geq 1$

Y_j : the duration of non susdeptibility associated with the jth foetal loss.

g : the period of pregnancy associated with the (i+1)th live birth.

The probability that a female of parity i belonging to ℓth group ($\ell = 1,2$) will conceive during the interval $(0,t]$ is

$$F_o(t/z_\ell) = \begin{cases} 1-\exp\{-\int_{z_\ell}^{t} m(x)dx\} & \text{for } t > z_\ell \\ 0 & \text{for } t \leq z_\ell \end{cases} \quad \ldots (4.1.2)$$

Thus the distribution of the time of occurrence of conception following the ith birth is

$$F(t) = P[\tau + X_o \leq t].$$

Therefore,

$$F(t) = \begin{cases} 0 & \text{for } t < z_1 \\ a_1[1-\exp\{\int_{z}^{t} m(x)dx\}] & \text{for } z_1 < t \leq z_2 \\ a_1[1-\exp\{\int_{z_1}^{t} m(x)dx\}]+a_2[1-\exp\{-\int_{z_2}^{t} m(x)dx\}] & \text{for } t > z_2 \end{cases} \quad \ldots (4.1.3)$$

Under the assumptions of the model (X_o),

$X_1, X_2, \ldots, Y_1, Y_2, \ldots$ are statistically independent. Moreover for each $j \geq 1$ and X_j and Y_j are exponentially distributed with parameters m_o and c. It is easy to see that the Laplace transformation of the unconditional distribution function of length of the (j+1)th order completed interval T is

$$\phi(s) = \sum_{n=o}^{\infty} (1-\theta)\, \theta^n\, F^*(s) \left(\frac{m_o}{m_o+s}\right)^n \left(\frac{c}{c+s}\right)^n \exp(-sg) \qquad \ldots (4.1.4)$$

which can be written as

$$\phi(s) = F^*(s)\, [A_o + A_1 \left(\frac{V_1}{V_1+s}\right) + A_2 \left(\frac{V_2}{V_2+s}\right)] \exp(-sg) \qquad \ldots (4.1.5)$$

where $F^*(s)$ is the Laplace transformation of $F(t)$.

$$A_o = (1-\theta),\; A_1 = \frac{m_o c\,\theta(1-\theta)}{V_1(V_2 - V_1)},\; A_2 = \frac{m_o\, c\, \theta(1-\theta)}{V_2\,(V_1 - V_2)}$$

Where V_1 and V_2 are the additive inverses of the roots of the equation $s^2+(m_o+c)s+m_o c(1-\theta) = 0$ and V_1 and V_2 are non-negative and distinct.

The inverse of $\phi(s)$ - the completed distribution function of T is

$$K(t) = \sum_{j=o}^{2} A_j\, K_j\,(t) \qquad \ldots (4.1.6)$$

where

$$K_o(t) = \begin{cases} 0 & t \leq g \\ F(t-g) & t > g \end{cases} \qquad \ldots (4.1.7)$$

and

$$K_j(t) = \int_g^t K_o(Y) V_j\, e^{-V_j(t-y)}\, dy \quad \text{for } t > g \;, (j=1,2) \qquad \ldots (4.1.8)$$

Thus

$$K_o(t) = \sum_{i/u_i \leq t} a_i[1-\exp\{-\int_o^{t-u_1} m((x+u_i-g))dx\}] \quad \ldots (4.1.9)$$

and

$$K(t) = \sum_{i/u_i \leq t} a_i[(1-e^{-V_j(t-u_1)}) \quad \ldots (4.1.9)$$

$$- V_j \int_{u_i}^{t} \exp\{-(\int_o^{y-u_1} m((x+u_i-g)\, dx + V_j(t-y))\}dy] \quad \ldots (4.1.10)$$

where $h' = \tau + g$, and for $i = 1, 2,$

$h_i = t_i + g, \; u_i = \max(h_i, h')$

and when $h_i \leq h' + T_1$

$$\int_o^{t-u_i} m(x+u_i-g)dx = \sum_{j=o}^{2} \frac{q_j[(t-h')^{j+1} - (u_i-h')^{j+1}]}{j+1} \quad \text{for } u_i < t \leq h' + T_1$$

$$\sum_{j=o}^{2} \frac{q_j[T_1^{j+1} - (u_i-h')^{j+1}]}{j+1} + \sum_{j=o}^{2} q_j T_1^j (t-h'-T_1)$$

$$\text{for } t > h' + T_1$$

and when $h_i > h' + T_1$

$$\int_o^{t-u_i} m(x-u_i-g)dx = (\sum_{j=o}^{2} q_j T_1^j)(t-u_1) \quad \text{for } t > h' + T_1.$$

Thus the distribution of $X(T)$ is

$$K^*(t) = P[X(T) \leq t] = \frac{K(t)}{K(T)} \; : g < t \leq T \quad \ldots (4.1.11)$$

4.4 <u>Estimation:</u>

A procedure to obtain maximum likelihood estimates (MLE) of the parameters in the distribution (4.1.11) when $m(t)$ is of

the form given in (4.2.1) and (4.2.2) and for $r = 2$ for known values of τ, T_1, θ, c, a_1, t_1 and t_2 is outlined below for grouped data. In this case distribution involves three parameters q_o, q_1 and q_2.

Let range of interlive birth intervals be partitioned into k intervals with the end points of intervals being t_j, $j = 0,1,2,\ldots, k$, $t = 0$, $t_k = T$ and $t_1 > h_1$. Let P_j dente the expected proportion of women falling in the jth interval (t_{j-1}, t_j) where

$$P_1 = \frac{K(t_1)}{K(T)} \text{ and } P_j = \frac{K(t_j) - K(t_{j-1})}{K(T)}, \; j = 2,3, \ldots k$$

In the sampe of n women $n_1, n_2, n_3, \ldots, n_k$ women are observed to deliver the first child during the intervals $1,2,\ldots,k$ respectively and

$$\sum_{i=1}^{k} n_i = n .$$

It can be seen that the equations

$$\sum_{i=1}^{k} \frac{n_i \partial P_i}{P_i \partial q_j} = 0 \quad (j = 0,1,2)$$

do not provide the explicit expressions of MLE. Hence MLE of the parameters may be computed by scoring method. A method of obtaining the pilot values of the unknown parameters which are required for scoring is given below.

When $m(t)$ is constant the model involves only one parameters q_o. The pilot value of q_o can be obtained by equating $\bar{X}$, being the mean of the length of the interval between ith and (i+1)th birth of remales giving (i+1)th in $(0, T)$ to

its theoretical expression $E(X(T))$ respectively, where

$$E(X(T)) = \frac{\sum_{i/u_i<T} a_i[u_i + \sum_{j=1}^{2} \frac{B_j}{V_j}\{1-(\exp(-V_j(T-u_i)))(1+V_jT)\}]}{K(T)}$$

$$= \sum_{i/u_i<T} a_i[u_i^2 + \frac{2u_i(c+q_o\theta)}{q_oc(1-\theta)} + \frac{2(c^2+\theta q_o^2+2q_oc\theta)}{(q_oc(1-\theta))^2}]$$

where,

$$B_j = A_j \frac{q_o}{q_o-V_j} \quad j = 1,2$$

and

$$K(T) = \sum_{i/u_i<T} a_i[1-\sum_{j=1}^{2} B_j\exp(-V_j(T-u_i))]$$

V_1 and V_2 are defined in Derivation.

This equation may be solved by the Newton-Raphson interation procedure.

When $m(t)$ is a polynomial of degree one there are two parameters viz. q_o, q_1. The MLE of q_o obtained by taking $m(t)$ to be constant and zero for q_1 can be taken as pilot value of q_o and q_1 respectively. Similarly the MLE of q_o and q_1 obtained and zero may serve as the pilot value of q_o, q_1 and q_2 respectively, when $m(t)$ is quadratic.

4.5 Applications:

In this section an attempt is made to provide an illustration of the model with the birth interval data compiled from the survey entitled "utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu District" which was conducted in 1986-87 by Department of Mathematics,

University of Jammu, Jammu. In accordande with objectives of the survey, a sample of 28 villages was taken from the Jammu District. The survey included all the households, numbering 2063 of these villages.

A couple was defined eligible if both the partners were alive and the wife was less than 50 years old on the reference date. Data relating to age at consummation of marriage, interval between consummation of marriage and first birth and between consecutive births, age of female at different orders of births, use of family planning methods, etc, were collected from each eligible female in the surveyed households. In the present study only those eligible couples are considered who did not adopt any terminal method of family planning and both husband and wife were normal residents of the village.

In the present survey data were collected on a sample of eligible women with ages spanning the child bearing year, resulting in information on maternity histories for different birth cohorts. Analysis of data has shown that the period age patterns of child bearing for different birth cohorts differ relatively little. Thus, assuming changes in traditional fertility values and behaviour pattern over time are not appreciable, interval data for women of different age limits attaining same parity at same age are combined.

In the analysis of interval between ith and (i+1)th births (i = 1,2,...), eligible women of parity (i+1) and above, whose date

of birth of ith child precedes the reference date by at least seven years and (i+1)th order interval was less than seven years, are included. Table 4.1 to 4.7 present the distribution of such females according to observed length of the closed intervals of order 2 to 5 and age of women at the start of interval.

The analysis of amenorrhea data from the rural regions of India and Bangladesh, where long breast feeding was the practice of most of women, reveals the bimodal nature of its distribution function with a mode within a few months after birth and another mode many months later. Since the present survey was conducted in rural areas it is assumed that PPA takes two values t_1 and t_2 with probabilities a_1 and a_2 respectively, $0 < a_1 \leq 1, a_1+a_2 = 1$.

In the area under study breast feeding in customary and some tabeos on time of commencement and frequency of coitus after child birth are also prevalent. However, the data on this are not available. Thus the following simplifying assumptions are made: (a) The duration of post-partum abstinence is the same for all women and it is of length τ , (b) Coital frequency, $m'(t)$, is a polynomial of degree r in t for $\tau < t \leq \tau + T_1$ and is of the form

$$m'(t) = \sum_{j=o}^{r} q'_j (t-\tau)^j \qquad \ldots (4.2.1)$$

and

$$m'(t) = m'(\tau+T_1)$$

$$= \sum_{j=o}^{r} q'_j T^j \qquad \text{for } t > \tau + T1 \qquad \ldots (4.2.2)$$

Thus for a female with duration of PPA t_i, the conditional instantaneous risk of conception is

$$m(t) = \begin{cases} 0 & \text{for } t \leq \max(t_i, \tau) \\ \sum_{j=0}^{r} q_j (t-\tau)^j & \text{for } \max(t_i, \tau) < t \leq \tau + T_1 \\ & t_i > \max(t_i, \tau + T_1) \\ \sum_{j=0}^{r} q_j T_1^j & \text{for } t > \max(t_i, \tau + T_1) \end{cases}$$

where $q_j = Pq_j'$, $j = 0, 1, 2, \ldots, r$ ... (4.2.3)

Assuming t_1 to be 0.25 year, t_2 to be one year, probability of a foetal loss, θ, equal to 0.15, the mean duration of non-susceptibility, proportion of the women with smaller value of PPA (a_1) to be 0.45, associated with foetal loss equal to 0.50 year, τ equal to 0.25 and T_1 equal to two years, the maximum likelihood estimates of the parameters involved in m(t) has been obtained by using the model to data presented in Tables (4.1 to 4.7), taking m(t) separately to be constant, linear and quadratic in t as considered in equation (4.2.3).

Constant and linear form of hazard rate of conception. The distribution worked well with quadratic form of risk function as compared to the expected distribution of women according to length of birth intervals and estimates of parameters for quadratic form of the risk function are presented in Table (4.1 to 4.7). The variance of estimators and correlation coefficient between estimators for different orders are also given in Tables (4.1 to 4.7).

Coital frequency $m'(t)$, during the interval $(\tau, \tau + T_1)$ is taken to be proportional to $q_o + q_1(t-\tau) + q_2(t-\tau)^2$. It appears reasonable to think that $m'(t)$ increases steadily during the interval. Contrary to expectation the negative value of $\hat{q}_1$ obtained for most of the data sets, indicates that $m'(t)$ decreases during the interval $(\tau, \tau - q_1/2q_2)$ and increases thereafter more rapidly till $\tau + T_1$. However the width of the interval $(\tau, \tau - q_1/2q_2)$ is small and found to range between 0 and 4 months for different data sets. Also the rate of decrease in $m'(t)$ is slow. One of the reasons for the deviation from the preconceived pattern of $m'(t)$ may perhaps be the simplifying assumptions made about the various components. Recently, the emphasis laid on the studies on determinants of fertility by international agencies giving more importance to socio-cultural determinants is likely to produce more quantitative information on these determinants, which would enable the studying of the role of the behavioural and cultural factors in regulating birth intervals and the study of the impact of changes in these factors on fertility.

The distribution with suitable modification can be applied to birth interval data collected under different sampling frames. Parity and age of women at previous parity apart, the period of abstinence, time beyond abstinence during which coital frequency increases may depend, among other things, on the sex and survival of

the previous child. The other factors and risk of conception may vary among women also. Further, many other forms other than polynomial may be more feasible and appropriate. Readers interested in extensions of the model incorporating some of the above mentioned factors may consult Bhattacharya et al., (1988 b :91), Mode (1985), Heckman and Singer (1982 : 567).

Table 4.1 : Distribution of married females according to length of interval between first and 2nd births provided they have exposure of at least seven years after first birth

Interval (in years)	Mother's age at first birth is below 20 years: Frequency			
	Observed	Expected when $m(t)$ is		
		Constant	Linear	Quadratic
0-1.25	26	31.7	25.5	25.6
1.25-1.75	37	51.0	46.4	40.8
1.75-2.50	131	112.0	114.5	125.1
2.50-3.25	77	74.7	83.9	80.2
3.25-4.00	50	50.6	54.6	52.1
4.00-4.75	36	34.5	34.7	34.1
4.75-5.50	24	23.5	22.2	22.5
5.50-6.25	16	16.1	14.2	14.8
6.25-7.00	8	10.9	9.0	9.8
Total	405	405	405	405
Chi-square		9.05	5.81	1.5
d.f.		7	6	5
Estimates				
q_0		0.638	0.496	0.683
q_1		-	0.130	0.024
q_2		-	-	-0.006
$V(q_0)$		0.0024	0.0064	0.0215
$V(q_1)$		-	0.0043	0.0416
$V(q_2)$		-	-	0.0039
$Cor(q_0 q_1)$		-	-0.8246	-0.9070
$Cor(q_0 q_2)$		-	-	0.8102
$Cor(q_1 q_2)$		-	-	-0.9609

Table 4.2 : Distribution of married females according to length of interval between first and 2nd births provided they have exposure of at least seven years after first birth

Interval (in years)	Mother's age at first birth is between 20 - 24 years			
	Frequency			
	Observed	Expected when m(t) is		
		Constant	Linear	Quadratic
0 - 1.25	40	37.2	38.6	40.6
1.25-1.75	48	58.1	58.9	50.6
1.75 - 2.50	140	125.7	125.2	134.8
2.50 - 3.25	71	79.5	77.7	74.4
3.25 - 4.00	49	51.3	50.5	49.5
4.00 - 4.75	35	33.3	33.2	33.9
4.75 - 5.50	26	21.6	21.9	22.2
5.50 - 6.25	10	14.1	14.5	14.5
6.25 - 7.00	11	9.2	9.5	9.5
Total	430	430	430	430
Chi-Square		7.12	6.93	2.8
d.f.		7	6	5
Estimates				
q_0		0.725	0.754	1.128
q_1		-	-0.026	-0.417
q_2		-	-	0.093
$V(q_0)$		0.0026	0.0090	0.0364
$V(q_1)$		-	0.0051	0.0621
$V(q_2)$		-	-	0.0054
$Cor(q_0, q_1)$		-	-0.8347	-0.9272
$Cor(q_0, q_2)$		-	-	0.8444
$Cor(q_1, q_2)$		-	-	-0.9697

Table 4.3 : Distribution of married females according to length of interval between first and 2nd births provided they have exposure of at least seven years after first birth.

Interval (in years)	Mother's age at first birth is between 25 - 49			
	Frequency			
	Observed	Expected when m(t) is		
		Constant	Linear	Quadratic
0 - 1.25	13	12.2	9.3	12.3
1.25-1.75	12	18.6	16.8	14.4
1.75- 2.50	39	39.8	41.3	37.9
2.50- 3.25	29	24.1	27.9	26.7
3.25- 4.00	14	15.0	16.3	20.9
4.00- 4.75	17	9.4	9.3	11.1
4.75- 5.50	7	5.9	5.3	4.7
5.50- 6.25	0	3.7	3.1	2.1
6.25- 7.00	0	2.3	1.7	0.9
Total	131	131	131	131
Chi-Square		15.84	15.15	10.12
d.f.		6	4	3
Estimates				
q_o		0.792	0.571	1.203
q_1		-	0.196	-0.803
q_2		-	-	0.306
$V(q_o)$		0.0096	0.0267	0.1226
$V(q_1)$		-	0.0186	0.2511
$V(q_2)$		-	-	0.0258
$Cor(q_o,q_1)$		-	-0.8367	-0.9199
$Cor(q_o,q_2)$		-	-	0.7988
$Cor(q_1,q_2)$		-	-	-0.9597

Table 4.4 : Distribution of married females according to length of interval between second and 3rd births provided they have exposure of at least seven year after second birth.

Interval (in years)	Mother's age at second birth is below 25 years			
	Frequency			
	Observed	Expected when m(t) is		
		Constant	Linear	Quadratic
0 - 1.25	39	38.8	35.6	39.3
1.25 - 1.75	49	61.9	39.7	52.1
1.75 - 2.50	147	135.6	136.8	142.4
2.50 - 3.25	89	89.4	93.9	88.6
3.25 - 4.00	55	59.9	61.9	63.9
4.00 - 4.75	47	40.4	40.5	43.5
4.75 - 5.50	36	27.2	26.6	26.9
5.50 - 6.25	15	18.4	17.5	16.8
6.25 - 7.00	7	12.4	11.5	10.5
Total	484	484.0	484.0	484.0
Chi-square		10.97	10.50	6.2
d.f.		7	6	5
Estimates				
q_0		0.657	0.596	0.956
q_1		-	0.056	-0.353
q_2		-	-	0.101
$V(q_0)$		0.0021	0.0062	0.0251
$V(q_1)$		-	0.0038	0.0456
$V(q_2)$		-	-	0.0041
$Cor(q_0, q_1)$		-	-0.8266	-0.9238
$Cor(q_0, q_2)$		-	-	0.8300
$Cor(q_1, q_2)$		-	--	-0.9665

Table 4.5 : Distribution of married femalesaaccording to length of interval between 2nd and 3rd births provided they have exposure of at least seven years after 2nd birth.

Interval (in years)	Mother's age at 2nd birth isbetween 25 - 49 years			
	Frequency			
	Observed	Expected when m(t) is		
		Constant	Linear	Quadratic
0 - 1.25	18	21.4	16.4	20.3
1.25 - 1.75	26	33.5	30.2	26.4
1.75 - 2.50	79	72.6	74.9	72.7
2.50 - 3.25	45	46.2	53.0	49.7
3.25 - 4.00	32	30.0	32.7	37.6
4.00 - 4.75	32	19.6	19.6	22.7
4.75 - 5.50	11	12.8	11.8	11.6
5.50 - 6.25	6	8.4	7.1	5.9
6.25 - 7.00	1	5.5	4.3	3.1
Total	250	250·0	250·0	250·0
Chi-square		15.40	12.84	7.36
d.f.		7	5	4
Estimates				
q_0		0.713	0.524	0.995
q_1		-	0.170	-0.481
q_2		-	-	0.180
$V(q_0)$		0.0045	0.0120	0.0509
$V(q_1)$		-	0.0082	0.1020
$V(q_2)$		-	-	0.0100
$Cor(q_0, q_1)$		-	-0.8321	-0.9169
$Cor(q_0, q_2)$		-	-	0.8033
$Cor(q_1, q_2)$		-	-	-0.9621

Table 4.6 : Distribution of married females according to length of interval between third and 4th births provided they have exposure of at least seven years after third birth.

Interval (in years)	Mother's age at third birth is below 25 years			
	Frequency			
		Expected when m(t) is		
	Observed	Constant	Linear	Quadratic
0 - 1.25	17	14.9	16.4	20.5
1.25 - 1.75	20	23.6	24.7	21.4
1.75 - 2.50	58	51.6	51.1	50.0
2.50 - 3.25	24	33.8	31.7	27.7
3.25 - 4.00	19	22.5	21.5	24.0
4.00 - 4.75	25	15.1	15.0	18.1
4.75 - 5.50	13	10.1	10.4	10.9
5.50 - 6.25	4	6.8 }	7.2	6.5 }
6.25 - 7.00	3	4.6 }	5.0	3.9 }
Total	183	183.0	183.0	183.0
Chi-square		14.06	13.66	7.8
d.f.		6	6	4
Estimates				
q_0		0.668	0.741	1.449
q_1		-	-0.068	-1.011
q_2		-	-	0.271
$V(q_0)$		0.0057	0.0189	0.1045
$V(q_1)$		-	0.0103	0.1579
$V(q_2)$		-	-	0.0140
$Cor(q_0, q_1)$		-	-0.8160	-0.9456
$Cor(q_0, q_2)$		-	-	0.8669
$Cor(q_1, q_2)$		-	-	-0.9737

Table 4.7 : Distribution of married females according to length of interval between third and 4th births provided they have exposure of at least seven years after third birth.

Interval (in years)	Mother's age at third birth is between 25 - 49 years			
	Frequency			
	Observed	Expected when m(t) is		
		Constant	Linear	Quadratic
0 - 1.25	21	21.0	20.4	21.0
1.25 - 1.75	26	33.9	33.5	29.3
1.75 - 2.50	86	74.7	74.9	81.2
2.50 - 3.25	49	50.5	51.3	49.2
3.25 - 4.00	27	34.6	35.0	33.7
4.00 - 4.75	29	23.8	23.9	23.8
4.75 - 5.50	17	16.4	16.3	16.5
5.50 - 6.25	14	11.3	11.1	11.4
6.25 - 7.00	5	7.8	7.6	7.9
Total	274	274.0	274.0	274.0
Chi-square		8.04	8.02	4.8
d.f.		7	6	5
Estimates				
q_o		0.618	0.599	0.864
q_1		-	0.018	-0.229
q_2		-	-	0.049
$V(q_o)$		0.0035	0.0102	0.0395
$V(q_1)$		-	0.0061	0.0662
$V(q_2)$		-	-	-0.0192
$Cor(q_o, q_1)$		-	-0.8150	-0.9251
$Cor(q_o, q_2)$		-	-	0.8486
$Cor(q_1, q_2)$		-	--	-0.9674

Table 4.8 : Distribution of married females according to lengths of interval between fourth and 5th births provided they have exposure of at least seven years after fourth birth

Interval (in years)	Mother's age at fourth birth is 25 years and above			
	Frequency			
	Observed	Expected when m(t) is		
		Constant	Linear	Quadratic
0 - 1.25	15	17.7	11.4	12.8
1.25 - 1.75	15	27.4	23.2	20.4
1.75 - 2.50	67	59.0	62.4	64.5
2.50 - 3.25	45	36.8	45.3	43.1
3.25 - 4.00	25	23.4	26.3	27.7
4.00 - 4.75	13	14.9	14.7	15.7
4.75 - 5.50	15	9.6	8.3	8.2
5.50 - 6.25	4 }	6.2 }	4.7 }	4.3 }
6.25 - 7.00	0 }	4.0 }	2.7 }	2.3 }
Total	199	199	199	199
Chi-square		17.07	12.83	10.7
d.f.		6	5	4
Estimates				
q_o		0.750	0.442	0.725
q_1		-	0.276	-0.011
q_2		-	-	0.049
$V(q_o)$		0.0059	0.0141	0.0496
$V(q_1)$		-	0.0107	0.1134
$V(q_2)$		-	-	0.0119
$Cor(q_o,q_1)$		-	-0.8259	-0.8922
$Cor(q_o,q_2)$		-	-	0.7654
$Cor(q_1,q_2)$		-	-	-0.9571

CHAPTER 5

KNOWLEDGE AND PRACTICE OF FAMILY PLANNING METHODS

INTRODUCTION

Since the inception of the national family planning programme of the government of India around 1952, various schemes had been adopted, modified and changed from time to time for better efficacy of the programme. For example, the target oriented programme proved to be a failure in the sense that the targets set for the different states of India had never been achieved within the stipulated time period. In fact, the targets were used to be set for all India and then allocatted to the states on the basis of mere population sizes without paying attention to people's perceptions about small family norms, their sex preferences and socio-economic development, etc. (Pathak and Prasad, 1977). Eventually government of India perceived family planning as an integral part of a comprehensive policy covering education, health, maternity and child care, family welfare, women's rights and nutrition, etc. Since the ultimate objective is to reduce fertility to a specified level within a given period of time, millions of couples in the reproductive age groups will have to accept some kind of family planning methods, though according to their own choice. Hence it is a Prima-facie aspect of research to know - who are the acceptors of different methods, who are non-acceptors, the reasons for non-acceptance and many such other items. From a statistical point of view, it is an important subject matter to study the knowledge of various family

planning methods , their sources of information, place of availability of services etc. as well as practices and non-practices of the methods by the couples of various socio -economic and demographic groups usually belonging to different states, districts or even blocks and villages of India. It should be very useful for policy markers to know the actual situation of family planning activities amont different sections of population and for programme implementation, at a later stage, to be made at par with the different socio-economic and demographic levels of the population in different geographical areas. A small attempt was made on a district level data to cope with the present nature of analysis on family planning. Since there were no such significant studies made in the district of Jammu so far, this district was selected for the present study to find out the people's knowledge and practices of family planning methods and other related aspects among various socio-economic, demographic groups of population in the rural areas of the district. The primary data for the present analysis were based on a study , "utilization of maternal and child health care and family planning services in rural areas of Jammu district" , conducted in 1986-87 under the auspices of Department of Mathematics, University of Jammu, Jammu. Details of this survey were given chapter I, unite 1.3.

The information regarding knowledge and practice of family planning methods was collected from currently married women below 50 years of age. The information as to their knowledge about different family planning method, their sources of information,

practice of different methods, attitude towards and willingness to practice family planning methods in future were gathered.

5.1 Knowledge of Family Planning Methods:

As in other spheres, knowledge is power, the public is powerless to regulate fertility until it possesses the requisite knowledge about contraceptive methods-what they are, how they work, and where one goes to obtain the service (CLEADE and CFSE, 1972). In order to investigate the knowledge concerning family planning the interviewer asked the respondents to name any methods of delaying or preventing pregnency that they knew about. If a method was not spontaneously mentioned by the respondent, the interviewer read its name and asked if the women had ever heard of it. Combining the two answers, spontaneous and proposed, resulted in levels of contraceptive knowledge of the respondents in the study area.

Table 5.1 depicts the percentage distribution of females knowing different family planning methods in three categories of villages. Almost all in each category of villages knew about terminal methods, - Vasectomy and Tubectomy, knowledge of IUD, condom and oral pills was higher in category I village (IUD-52 percent, condom = 80 percent and Oralpills = 62 percent). The other two categories of villages showed almost similar but much lower figures, knowledge regarding natural methods such as, Rhythm, withdrawal and Abstinence was lower in category I villages as compared to the figures shown by each selected category II village and category III village.

The most plausible explanation for the females being better informed in the category I villages about IUD, condom and oral pill is that the category I villages, in general are situated near a city, developed in terms of communications, education of people and many other things including more contacts with the health workers, visits to private clinics and government hospitals, etc. Respondents from remote villages, on the other hand, were less informed about scientific methods possibly because of lesser number of visits by the Health workers to their houses, backwardness and superstitions in their mind, thoughts and beleifes, etc. However, they were found knowledgeable more about natural methods which perhaps culminated from the traditional knowledge and beleifs of elderly persons who might have practised them in old times and advised them to follow the same.

5.2 Social and Demographic Variables and Knowledge about conventional Contraceptive Methods:

This section deals with an exploratory analysis into possible relationships between selected social and demographic variables and knowledge about contraceptive methods excluding terminal methods which they knew mostly (almost cent percent). Tables 5.2 to 5.4 give the percentage distribution of females according to their various age groups and the knowledge of the family planning methods including IUD (Table 5.2), condom (Table 5.3) and oral pill (Table 5.4). These tables clearly show an age-selective knowledge of family planning methods. As for example, the middle and the most effective age group 25-34 years in respect of family planning aspect contains the

higher percentage (57.8 percent) about the knowledge of IUD than other remaining age groups, (Table 5.2), in category I villages. The same pattern was observed in category II villages (42.1 percent). and category III villages (35.4 percent). From the figures in Table 5.3 one finds that condom was mostly popular and known to females of all the age groups except the eldest females of age group (35 and above years) in category III-villages (48.7 percent). Notwithstanding, the wider extent of knowledge of this method among the females of all the age groups, the most vulnerable age group 25-35 years showed the highest percentage figure in category I villages (83.3 percent) on the contrary, the youngest females (less than 25 years) possessed the highest figures in respect of selected category II villages (72.5 percent) and category III villages (69.4 percent).

Knowledge about oral pill was found among females of all the age groups with an average pattern i.e. neither very high, nor very low (Table 5.4). Among them category I villages showed the higher perception rate of 64.2 percent in the age group 25-34 years. The category II villages possessed the highest figure of 62.3 percent in less than 25 years of age. While the category III villages showed the highest figure around 50 percent in the age group less than 35 years. Although females of different age groups possessed knowledge regarding IUD, condom and oral pill, it was observed that females of same age groups in category I villages were more knowledgeable than category II and III villages and vice-

versa.

The explanation for this differential knowledge could be varied. As for example, the excess of knowledge in the age group 25-34 years in category I villages might possibly be due to actual practice of some spacing methods by some of the couples in the area where health workers can visit the families more frequently, to motivate them in delaying freqnency when they already possessed a child. This kind of motivational approach might possibly be absent in remote villages. As a result, the category II and III villages possessed less number of females using any spacing methods in the same age group. And the young females of age less than 25 years by dint of their agility, curiosity and more education became more knowledgeable about those methods which perhaps they did practise so far.

Education, an important socio-economic variable, was found associated with the knowledge of family planning methods in the area under study. The three tables given above showed that higher the education of each spouse the higher was the percentage of knowledge of family planning methods including IUD, condom and oral pill. It was further found that a sizeable proportion of females (64 percent) in category I villages were knowledgeable about condom when they were illiterate. In all other cases of IUD and oral pill either in category I villages or category II and III villages, the illiterate females were usually less knowledgeable about those methods (Tables 5.2, 5.3 and 5.4). Another encouraging point that emerged from table 5.3 was that when females from category I villages were educated upto high school and above, they mostly knew about condom (93 percent). But this was not found in any other cases.

The juxtaposition of figures for knowledge in the different methods for similar levels of education of each of the spouses gave an indication of the effects of husband's education on the knowledge of his spouse, when in particular, the level of education of each of the spouses started declining to the level of illiteracy. For example, the figures for knowledge about IUD for illiterate wives and illiterate husbands were 35.2 and 21.4 percent respectively in category I villages. Afterwards, as the standards of education increased, independently for each of them, the percentages for knowledge also increased as in normal cases. But the gap between the figures tended to a minimum which might show that wives were quite knowledgeable about the methods by virtue of their own education. Any further enhancement of knowledge of them could not be possible by the influence of education of their spouses when they were themselves highly educated. Since in our society, husband's education in general is higher than his wife, lower value of 21.4 percent in respect of knowledge of females when it was known that husband was illiterate, could almost be impossible to increase further by the education of wife who would always be illiterate. The reason behind higher figure of 35.2 percent in respect of illiterate wife was the standard of education of husband, in this case could either be illiterate or higher. And the excess of knowledge of illiterate females might possibly be due to the influence of some of their educated spouses. Similar observations were obtained in all other cases whether in category I villages or category II villages or category III villages.

The data were further classified into two broader categories

of occupation of wife - household work and engagement in some kind of services. Some distinct associations of knowledge of family planning with those types of occupations were presented in the said three tables. In general, in all cases, service holders were more knowledgeable as compared to housewives with some sampling fluctuations due to which a reverse result was found probably in case of condom.

Knowledge about Rhythm was more prominant among younger females particularly in category II and III villages. Females in category I villages were found reluctant about this method and almost uniform distributions (percent) were found in the various age categories. The effects of education of wife and spouses and occupation on the knowledge were found to have a similar pattern as obtained in case of IUD condom and oral pill (see Table 5.5)

5.3 Sources of Information About the Knowledge :

As regards the sources of information about the knowledge of family planning methods Table 5.6 it could be divided into three sections. Section I, represents the analysis regarding Vasectomy and Tubectomy. Next section is based on IUD, oral pill and condom, Finally Rythm, withdrawal and abstinence are analysed in the last section.

The information about the knowledge of Vasectomy and Tubectomy came to about one third from doctors among all other sourcees given in the list. Next, females came to know about these methods from friends/relatives/househodds with almost about the same

proportion as in case of doctors. Health workers were also found to contribute to some extent (around 2.3 percent) towards the enhancement of knowledge about the terminal methods. A few have learnt about these methods from mass media like TV/Radio (around 13 percent).

Doctors were found again contributing mostly (32 percent) as a source of the knowledge of IUD. Knowledge about oral pill and condom, on the otherhand, mostly came from friends/relatives/ households (around 50 percent). The second largest source of information was TV/Radio in respect of oral pill and condom. Around one fourth of the females knew about IUD from TV/Radio. Around 15 percent knew about oral pill and condom from doctors. Health workers communicated the knowledge about IUD, condom and oral pill within the domain of females around 7 to 10 percent. Knowledge regarding Rhythm, withdrawal and abstinence was mostly concentrated around a single source of information like friends/relatives/households (around 89 to 91 percent.

5.4 Place of Availability of Methods/Services:

This section deals with an analysis of the data on the knowledge about the places of availability of methods/services. To know about the place of services is as important as to know about the method itself.

Table 5.7 showed that higher proportion of females (48 percent) were of the opinion that Vasectomy could be done at PHC/subcentive. Around 34 percent reported that this operation could

be done at hospital or PHC. Some of them (18 percent) reported about private clinics. Similar observations were found in respect of Tubectomy. More females (about 62 percent) reported about PHC/ subcentre where Tubectomy could be done. Hospital was the major source for IUD insertion as reported by 50 percent of females. This insertion could also be done at PHC subcentre as observed by around 39 percent [around 10 percent reported private clinics as the place for IUD insertions] But 5 percent of women did not know even the place where IUD could be inserted. Most of the females (54 percent) were of the opinion that condom and oral pill were obtained from shops. Some of them reported that condom could be available from PHC/subcentre (23 percent) and hospital (17 percent). They had similar perception about the place of availability of oral pill (PHC/subcentre = 14 percent, hospital = 12 percent). A few reported that condom could be available from private clinics (5 percent). Other sources were very insignificant for oral pill and condom.

5.5 Current Practice of Family Planning Methods:

In this unit, attempt is made to analyse the extent to which the knowledge of different family planning methods has been used in terms of percentage of currently practising the different methods. Table 5.8 represents the percentage distribution of acceptors of family planning methods in three categories of villages. In Table 5.8, the percentage distribution of users of different methods of contraception have been computed in three categories of villages and presented below:

Percentage distribution of users of different contraceptive methods

Category of villages	Vasectomy	Tubectomy	IUD	Condom	Oral pill	Total acceptors
I	13	45	11	27	2	318
II	13	78	1	7	-	310
III	17	65	2	11	5	305

These percentages show that in the category I villages 45 percent accepted Tubectomy and 13 percent Vasectomy. In the category II villages 78 percent accepted Tubectomy and only 13 percent Vasectomy. Lastly, category III villages showed a similar picture (Tubectomy = 65 percent, Vasectomy = 17 percent). From the above figures, it is clear that Tubectomy was more popular among females of all the village categories, whereas Vasectomy was not so popular owing to some specific reasons. People usually thought that after Vasectomy operation a person could not do his normal job. One interesting feature of acceptance of conventional contraceptive such as condom, oral pill and IUD insertion is obvious. When these three methods constituted around 40 percent in category I villages, category II and category III villages possessed comparatively smaller figures around 8 percent for the former and 18 percent for the latter. It simply shows that motivation towards birth spacing was not so effective particularly in category II and III villages. In fact, health workers probably used to motivate more for terminal methods so as to bring more cases to the camps. They perhaps did not

visit the households regularly and remained much reluctant about the birth spacing methods which was important particularly for young couples. As a result of which larger proportions were using terminal methods whereas smaller sections practised conventional contraceptions. Although some researchers observed that sterilization, because of its popularity and long continuation, has built up sufficient users world wide to give protection against pregnancy to more couples than other methods (Ross et al. 1988). In India more emphasis should be given to increase the C.C. users among young couples, in particular.

Having discussed the use of contraceptions among eligible females of three different village categories, it is eventually legilimate to know whether the family planning programme is reaching to the kind of people it should reach? Is the programme attracting young persons? What is the family size of the couples at the time of adoption? Is the programme equallypopular among all religious groups? Do the less priviledged sections of society come forward to accept family planning? Answers to these questions have obvious implication for the achievement of the programme (Rao, 1976). More or less similar investigations are quite possible in this sections by incorporating different socio-economic and demographic characteristics of the acceptors.

The extent of acceptance of family planning methods among different caste groups was found to be different (Table 5.8). Among the three broad caste groups of Hindu couples, Middle caste group constituted 48.3 percent of current users, upper caste and scheduled

caste couples 41.4 and 36.1 percent respectively. Although 44.3 percent of current users were found among other religious groups but the number of couples in this group was only 95. The similar figures for upper caste, middle caste and scheduled caste groups were respectively 979 , 548 and 710. Among the scheduled caste group, couples adopted mostly terminal methods (22 percent) when over-all users in this group was 36 percent. But among upper caste and middle gcaste groups currently using some methods figuring 41.4 percent and 48.3 percent respectively, adopted terminal methods figuring only 23 percent and 27 percent respectively. These two groups used temporary methods and IUD insertions together constituting roughly 7 percent and 15 percent respectively. The figures for scheduled caste group was only about 5 percent. Nothing could be said about other religious groups as the figure for total users was very low. They contributed as high as 35 percent and 7 percent respectively to terminal and temporary methods. The use of natural methods was confined mainly to upper caste group (10.4 percent) and around 7 percent and 8 percent respectively to middle caste and scheduled caste groups. From the analysis so far made in respect of caste/religious groups , it was pointed out that use of temporary methods was not so popular among couples particularly belonging to scheduled caste group. The extent to which the remaining groups used these methods was also not very encouraging. Hence more and more motivation was necessary among them for spacing methods. For this, more health workers should be engaged in order to fulfil the need.

So far as per capita income is concerned it was found that the users of some kind of methods among couples were much higher (around 46 percent) among families with lower per capita income, below rupees 300. Around 30 percent of the acceptors had per capita income of Rupees 300 and above . Among different per capita income groups, the highest acceptance of permanent methods (around 32 percent) was found among families with income less than Rs. 150. A fewof them adopted temporary methods (around 5 percent). Around 27 percent accepted permanent methods in the per capita income group of Rs. 150 to 299 out of a total of acceptors of 46 percent. Among them about 9 percent accepted temporary methods. Couples from highest per capita income of Rs. 300 and above returned about 12 percent and 8 percent respectively of permanent and temporary methods. A slightly higher acceptance of natural methods was found among couples from higher per capita income group as in contrast to other groups [see Table 5.8].

5.6 <u>Education and Practice of Methods:</u>

Considering the educational background of either husband or wife the percentage distribution of acceptors of any kind of family planning method did not show any significant variation among couples with different educational background (Table 5.9). The figures varied from 37.5 percent to 46.0 percent and from 34.9 percent to 47.2 percent respectively for education of wife and for education of husband. The low figure of 34.9 percent among females whose husband's education being primary and below might not be so valid as in other cases since the number of couples in this

group was as low as 186 compared to other groups possessing higher sample sizes. The only significant changes which were observed among couples with different educational background were the use of temporary and permanent methods, barring natural methods where the figures did not vary much. In both the cases of education of either wife or husband, the illiterate always adopted permanent methods (around 31 percent) ignoring temporary methods (around 2.5 percent). The figures, therefore, showed higher the educational standard, the higher was the use of temporary methods (around 21 percent in intermediate and above group) and lower was the use of permanent methods (around 8 percent). From the above analysis it can be said that illiterate relied more on permanent methods than the temporary ones which they perhaps did not know how to use, etc. or could not maintain the regularity of the use of those methods. Greater motivation required particularly for illiterate and less educated couples in order to popularize the methods which only could be done by the health and other related workers.

Occupation of husband did not show any significant changes of the number of acceptors of any kind of methods (Table 5.9). The figures varied from a minimum of around 36 percent to a maximum of 48 percent. The sample couples for the last figure showed a minimum of 235 whereas maximum sample figure of 959 was seen in (Table 5.9). Cultivators (around 29 percent) and labourers (around 26 percent) families were found to rely more on permanent methods than on temporary ones, (around 2 and 1 percent respectively for own

agriculture and labourer). The use of IUD , condom and oral pill altogether constituted around 16 percent, 11 percent and 8 percent among females whose husband's occupations were respectively business, government/ semi-government services and others. In three cases the figures were around 22 percent, 22 percent and 27 percent respectively for permanent methods.

Motivation towards spacing methods needed to be more concentrated on agriculture and labourer families.

5.7 Age and Number of Surviving Children:

Age is important in the measurement of contra-ceptions' demographic impact because it serves as the prime determinant of and a proxy for births averted. It is well known that female fertility characteristically increases from zero at age of menarche to a maximum sometime in the early or mid-twenties, then declines progressively with increasing age to virtually zero by age 50(Coale and Trussel, 1974). Thus, after the age of peak fecundity, biology dictates that the older the contraceptive user, the lower is her potential fertility , and the fewer the births she will avert, even if she is presumed intially to be fecund. As such from the age at acceptance of females, one could judge how effective is the programme of family limitation. As the general opinion dictates, most Indian females from their lower age at Cohabitation experience the entire child-bearing period right from the very young age to the end, this kind of analysis is very worthwhile. Instead of age at acceptance , present ages of the acceptors, who have currently been practising any

kind of family planning methods have been analysed which might give an idea about comulative effect (Table 5.10). The analysis shows that among three broader age groups, less than 25, 25-34 and 35-49 years, the last one possessed maximum number (55.6%) of acceptors. The earliest one contained 17.8 percent and 25-34 years had 38.9 percent acceptors. The highest number found in 35-49 years might indicate the highest contribution of acceptors of terminal methods (41 percent) as compared to 19 percent in 25-34 years and 3.3 percent in less than 25 years of age. The figures moreover showed that Tubectomy was preferred to Vasectomy in all age categories. The use of IUD, condom and oral pill was always preferred more either in 25-34 years or in less than 25 years than the oldest age group 35-49 years possibly because of more thrust on child spacing in earlier ages. Whereas the figures for users of natural methods including Rhythm, withdrawal and abstinence might possibly indicate that they belong to traditional families as they use these methods both for delaying and preventing pregnencies, rather than any other kind of scientific methods.

The distribution of acceptors according to number of surviving children they have, might indicate a gloomy picture of how the programme could be of little usefulness, when 62.4 percent acceptors have 5 and more number of children, only 25.8 percent of acceptors were with 1 to 2 surviving children. The only bright point was that the total number of sample couples who have 5 or more children was 383 as compared to 829 couples with 1 to 2 children and 930 couples with 3 to 4 surviving children. A sizeable contribution might be found among acceptors

who have 3 to 4 surviving children. Although maximum number of sample couples (930) was in this group, but among them 53.8 percent accepted some family planning methods . If the replacement level required only 2 children the previous analysis might indicate that the rural population of Jammu remained much over replacement level which is responsible for much higher population growth. The figures for IUD, condom and oral pill showed that as the acceptors have fewer number of children, the use of these methods was more than among couples with larger number of children. This might indicate a possible shifting of temporary methods to permanent ones as and when the couples got larger number of surviving children. But interestingly, it was found that such tendencies were not found among the couples who once accepted natural methods. That is when they accepted these methods with fewer number of children they accepted them also for larger number of children.

5.8 <u>Sex-Preference and Acceptance:</u>

In this unit an attempt has been made to see how couples preferred sons to daughters. Table 5.11 focuses on the distribution of acceptors of different methods with different number of male and female children, independently, they possessed. From the table it can be seen that they did not adopt any terminal methods at all when they possessed no male children, but possessed one, two or three and more female children. But they were found to use some kind of temporary methods. For instance, about 15 percent used condom when they possessed one female child, 7.5 percent when they had two female

children, while about 6 percent used IUD when they had two female children and another 6 percent used this method when they possessed 3 or more female children. The pattern was found entirely different when couples possessed male children. It was seen that nearly 50 percent of the couples who had 3 to 8 male children accepted terminal methods. Around 37 percent accepted these methods when they possessed two male children. About 15 percent accepted terminal methods even when they possessed only one male child. The above analysis shows a strong son preference of couples of rural Jammu.

5.9 Motivators, Source of Supply and Ratings of Family Planning Methods:

An important aspect of research is to know how couples accepted family planning methods, from where the methods and/or services were received and how good are the methods they adopted. In the first instance, resort was made to know how the different methods were accepted i.e. who were the motivators. Interestingly, it was found from the figures in Table 5.12 that respondents (eligible females) themselves or their spouses played most significant part in motivating themselves or their spouses for the acceptance of all the methods excepting IUD where friends played that role. Neverthless, self/spouse contributed very highly (around 39 percent), almost close to friends (around 41 percent). It was further observed that doctor played the next important role in motivating the couples for the acceptance of terminal methods (Vasectomy = 36.4 percent, Tubectomy = 33.1 percent). The third source for motivating

couples to accept terminal methods was the Family planning field workers (Vasectomy = 9 percent, Tubectomy 20.2 percent). A few of them were motivated by friends.

Doctor also remained as a third source in motivating couples to accept IUD (11.4 percent). Around 5 percent also were motivated by family planning field workers . In using the condom doctors were also found to play active role to some extent (9 percent) as motivators. Family planning workers motivated around 5 percent of the cases.

Family planning workers ranked third in respect of motivation towards the use of oral pills (15 percent) . Doctor also played some role in motivating couples to accept oral pill (10 percent).

Table 5.13 shows that almost all the couples had undergone sterlization operation from Health/family welfare/centre as a source of services available to them. A few obtained these services from other sources (Vasectomy = 8.2 percent, Tubectomy = 6 percent). Out of a total 44 sample cases of IUD insertion around 98 percent of them got this done at the Health/Family Welfare/Centre. Couples were found to receive condom mostly from other sources (90 percent). Around 10 percent also received them from Health/Family Welfare/ centre . Out of a total of 20 cases of oral pill users, three fourths of them received the material from other sources. One fourth of the couples also obtained the same material from Health/Family Welfare/ Centre.

Finally, the opinion of the respondents about the methods they adopted was presented in Table 5.14. The data shows that almost all the methods were considered good by the respondents. A few acceptors rated condom (9.4 percent) and IUD (around 7 percent) poor as methods of family planning. A few rated other methods such as Vasectomy, and Tubectomy and oral pill as poor but the proportion was insignificant.

5.10 Reasons for Non-acceptance of Family Planning Methods:

In the last section, it was found that the couples currently using some of the family planning methods like Vasectomy, Tubectomy IUD, condom etc. mostly had a favourable opinion about those methods. Present section is devoted to find out the nonusers of family planning methods at the time of the survey and the reasons they had for not using these methods currently. The distribution of these nonusers according to the different characteristics is presented in Table 5.15. It is found from this table thatthe maximum number of nonusers belonged either to category II villages or to category III villages. The reason for lesser number of non-users from category I villages was primarily the greater motivation from the PHC staff to the eligible couples in these areas. In general, the reason for non-acceptance by the couples from the three categories of villages indicated that the couples from category II villages (61 percent) and category III villages (55 percent) was that they felt a strong need for having children. The couples from category I villages also showed the same reason for non-acceptance but the percentage was

lower (47 percent). About 3 percent couples from category III villages did not adopt because of superstition. Around 9 percent of the respondents from the villages other than category II or category I villages did not adopt family planning methods because of ignorance.

One could find from the Table 5.15 that the respondents from cagegory I villages ranked (46 percent) first in terms of maturation as mentioned in the table compared to category II villages (31 percent) and category III villages (33 percent). Maturation included various queries in the schedule at the time of survey - such that those who had used any method exclusively in the past, those who could not use any method because of their ill health and over-age, etc. It was quite understandable that the maximum number of couples from category I villages were not using any methods currently because of their higher ages. Majority of them must have practised earlier and because of ill-health, a few of them could not practise currently. On the other hand, in the remote villages (category II and III villages), majority of the couples might not be practising any method because of their ill health. A few of them might have practised earlier but do not do so currently because of higher ages.

In considering different caste/religious groups, other religious group possessed maximum percentages (74 percent) as having a desire for children as the reason for not using any method upper caste, other caste and scheduled caste Hindu females showed more or less same figures in this category within 50 to 60 percent of cases. The influence of superstition about family planning was found among

upper caste and scheduled caste to the same extent. Other caste Hindus and other religious groups had a few cases of ignorance about family planning methods. Similar observations were found among couples with higher percapita income of husband. Among couples with percapita income of less than Rs. 150/- got maximum (2 percent) cases due to the superstition and other two groups got the same (0.7 percent), because of superstition. The maximum cases (74 percent) were found for need of child among the couples with percapita income of Rs. 300/- and above.

Table 5.16 gives the distribution of the nonusers according to their sociocultural characteristics. Considering the educational standards of husband and wife, it was observed that among illiterate the non-acceptance of family planning methods due to superstitution, was higher as compared to higher educated couples. Among highly educated couples, it was found that only because of nonfulfilment of their desire for required number of children they did not use any family planning methods.

The analysis of Table 5.17 clearly shows that the maximum number (around 71 percent) of couples of younger ages did not adopt any family planning methods because of the desire for children. In the case of older females the figures for desire for children (as the reason for non-acceptance) was much lower about (32 percent) as compared to other age groups. The older females aged 35 or more indicated that the maximum proportion (12 percent) did not use family planning methods because of ignorance.

It was also found that the couples with only female children showed lesser number of non-acceptors of family planning because of their desire for more children. On the other hand, the corresponding proportion was much higher when they possessed at least one or more male children. It obviously shows strong sex bias in favour of male child. Moreover, when couples had larger number of surviving children, the number of couples with reason for non-acceptance due to desired number of children was low

5.11 Plan for Furure use of Family Planning Methods Among nonusers:

Among the couples from the three categories of villages it was found (Table 5.18) that category I villages and category III villages showed almost 81 percent of non-users having plans for future use of family planning methods. On the other hand, non-users from category II villages, 28 percent reported that they planned to practise family planning method after one birth. Around 69 percent couples did not have any plans for future use of family planningmethods. In terms of caste and religion, the scheduled castes showed highest figures (79.8 percent) for no future planning. On the other hand, upper caste Hindus and other religious groups showed higher percentage figures for future use particularly after one birth which it was found that as per capita income increased the percentage of non-users of family planning methods in future also increased. And 25 percent of the couples with minimum per capita income had plans for future use after one birth.

While considering the educational standards of husband and

wife (Table 5.19), it was found that in both the cases that as the standard of education decreased the figures for no plan for future family planning decreased. Conversely, it showed that they planned to use family planning after one birth particularly when the standard of education increased.

Table 5.20 reveals that 24 percent of the couples in the age group 25-34 years did not have any plan for future use of family planning method after one birth. An interesting result was obtained when the total number of births/serviving children of the couples were considered . They got more or less same percentages for future non-use of family planning methods. Moreover, they planned for future use after one birth when they already possessed 5 or more children.

The proportion of couples who plan to use family planning methods after two births is smaller than that of those who plan to use such methods after only one birth. Same is the case with those who have been late in producing children.

5.12 Opinion of non-users Regarding Visits of Health Workers.

Analysis is made in this section, to know about the visits of health workers to non-acceptors of family planning methods for giving information about these methods. It is seen from Table 5.21 that couples from category II and category III villages reported that they were informed by health workers about family planning methods in considerable proportions (48 and 43 pereents respectively). On the other hands proportion of respondents from category I villages was lower (14 percent). 86 percent of them reported that they were not

guided by any health worker. Regarding visits as observed in case of different caste/religious groups no significant differences were found . The percentages ranking 60 to 69 percent of respondents reported that they were informed by the health workers.

When percapita income of the family was considered, it was found that couples with minimum income in large proportions (69 percent) reported that they were not informed by health workers. The corresponding figures for highest income group was 59 percent. When education of husband and wife were considered (Table 5.22), it was found that the proportion of highly educated couples reporting that they were not informed by health workers was larger than those among the illiterate, or in other words, illiterate reported that they were visited by the health workers.

Table 5.23 gives detailed information about the females with surviving children in regard to the visits of health workers. The table shows that the proportions of younger couples reporting [illegible] that health workers did not inform them, was higher (72 percent) compared to older couples doing so. There was no difference among such figures for couples with different number of total births . On the other hand, there was difference in figures when surviving children to non-users were considered. As the number of children increased the proportion of those reporting that health workers did not visit them decreased from a high of 72 percent to a low of 57 percent. However the pattern did not show a uniform trend.

5.13 <u>Preference for future use of family planning methods by various characteristics:</u>

When the nonuser respondents were asked which of the methods they would prefer to accept in future, it was found from over all figures (Table 5.24, Table 5.25, and Table 5.26) that in all cases, they would mostly prefer tubectomy.

The reasons for the most preferable family planning methods as mentioned above could be given as follows:

1. People liked mostly terminal methods without bothering about conventional contra-captives which generally required the waste materials to be disposed of after use. In some other cases, couples ought to maintain regularity, which they did not like.
2. In terminal methods, Vasectomy was not recommended because they got some prior conception that physical workers, in particular labour class, cultivators etc. would be unable to their job properly or with full strength after the operation. It seems that females from all socio-economic, socio-cultural and demographic situations had similar ideas as mentioned above.

Table 5.1 Percent of couples having knowledge of various Family Planning Methods

Methods	Category of villages I	II	III
	Percent having knowledge of the methods		
Vasectomy	98.9	100.0	98.6
Tubectomy	97.5	99.7	97.9
IUD	52.0	37.2	30.7
Condom	80.4	63.4	57.6
Oral Pills	62.4	52.6	46.2
Rhythm	27.7	63.3	49.2
Withdrawal	20.9	43.2	37.7
Abstinence	29.7	69.4	66.3
Total no. of eligible couples from whom information was available	790	774	762
No. of couples from whom information are not available	9	1	1

5.2 Distribution of eligible females having knowledge of IUD by the age, education, occupation and by education of husband for different categories of village

	Categories of village					
	I		II		III	
	Total no. of women	Percentage having knowledge	Total no. of women	Percentage having knowledge	Total no. of women	Percentage having knowledge
Age of wife						
Less than 25 years	142	43.7	138	30.4	147	32.6
25-34 years	360	57.8	340	42.1	302	35.4
35 and above	297	47.4	297	35.0	314	25.4
Education of husband						
Illiterate	117	21.4	217	27.2	278	17.6
Literate but primary or below	42	28.6	73	32.9	71	24.0
Attended upto middle class	83	51.8	146	35.0	136	34.6
High School	319	53.6	261	43.3	223	41.7
Intermediate and above	228	70.2	68	61.8	55	52.7
Education of wife						
Illiterate	236	35.2	441	35.1	490	23.7
Literate but primary or below	111	35.1	120	35.8	113	34.5
Attended upto middle class	121	53.7	99	43.4	81	44.4
Upto high school and above	331	67.7	115	41.7	79	55.7
Occupation of wife						
Household work	749	51.0	750	36.8	755	50.3
Employed	50	58.0	25	52.0	8	75.0

Table 5.3 Distribution of eligible females having knowledge of condom by the age, education occupation and by education of husband for different categories of villages

	category of village					
	I		II		III	
	Total no. of women	Percentage having knowledge	Total no. of women	Percentage having knowledge	Total no. of women	Percentage having knowledge
Age of wife						
Less than 25 years	142	75.4	138	72.5	147	69.4
25-34 years	360	83.3	340	64.4	302	61.2
35 and above	297	76.8	297	58.0	314	48.7
Education of husband						
Illiterate	117	51.3	217	54.0	278	41.4
Literate but primary and below	42	69.0	73	54.8	71	56.3
Attended upto middle class	93	74.2	146	61.6	136	58.8
High School	319	85.0	261	69.7	193	83.0
Intermediate and above	228	90.4	78	79.5	55	81.8
Education of wife						
Illiterate	236	64.0	441	45.6	490	50.6
Literate but primary and below	111	74.8	120	66.7	113	62.8
Attended upto middle class	121	77.7	99	68.7	81	69.1
Upto High school and above	331	92.7	115	71.3	79	82.3
Education of wife						
Household work	749	79.7	750	62.7	755	57.4
Employed	50	76.0	25	84.0	8	87.5

Table 5.4 Distribution of eligible females having knowledge of oral pills by the age, education, occupation and by education of husband for different of villages

	Total		Category of villages			
	I		II		III	
	Total no. of women	Percentage having knowledge	Total no. of women	Percentage having knowledge	Total No. of women	Percentage having knowledge
Age of wife						
Less than 25 years	142	55.6	138	62.3	147	51.7
25 - 34 years	360	64.2	340	54.1	302	50.0
35 and above	297	61.6	297	46.1	314	40.1
Education of Husband						
Illiterate	117	29.1	217	38.2	278	28.8
Literate but primary and below	42	40.4	73	32.9	71	49.3
Attended upto middle class	93	56.0	146	55.5	136	47.1
High school	319	66.8	261	61.3	323	57.8
Intermediate and above	228	77.6	78	75.6	55	81.8
Education of wife						
Illiterate	236	44.1	441	45.6	490	37.0
Literate but primary or below	111	50.4	120	54.2	113	51.3
Attended upto middle class	121	67.8	99	61.6	81	64.2
Upto high school and above	331	75.8	115	69.6	79	78.5
Occupation of wife						
Household work	749	61.5	750	52.0	755	45.8
Employed	50	64.0	25	68.0	8	76.5

Table 5.5 Distribution of religible females having knowledge of Rhthm by the age, education, occupation and by education of husband for different categories of villages

	Categories of village					
	I		II		III	
	Total no. of women	Percentage having knowledge	Total no. of women	Percentage having knowledge	Total no. of women	Percentage having knowledge
Age of wife						
Less than 25 years	142	24.6	138	70.3	147	54.4
25 - 34 years	360	29.2	340	60.3	303	47.0
35 and above	297	26.6	297	66.0	314	49.0
Education of Husband						
Illiterate	117	12.8	217	54.8	278	45.0
Literate but primary or below	42	21.4	73	61.6	71	43.7
Attended upto Middle class	83	28.9	146	62.3	136	51.5
High school	319	23.2	261	69.3	223	48.3
Intermediate and above	228	42.5	68	91.2	55	72.7
Education of wife						
Illiterate	236	20.0	441	50.8	490	51.4
Literate but primary or below	111	24.3	120	75.0	113	46.0
Attended upto middle class	121	16.5	99	73.7	81	51.8
Upto high school and above	331	37.8	115	80.0	79	64.6
Occupation of wife						
Household work	149	27.2	750	64.0	755	49.1
Employed	50	30.0	25	72.0	8	62.5

Table 5.6 D Percentage distribution of couples having knowledge of the methods by the sources of information.

Source of knowledge	Vasectomy	Tubectomy	IUD	Oral pills	Condom	Rhythm	Withdrawal	Abstinence
	Percent having knowledge of the method							
Doctor	30.1	31.2	32.1	14.2	15.8	4.8	2.8	2.0
Health worker	23.1	23.1	10.5	6.9	8.8	2.6	8.1	1.9
Friends/relatives/ neighbourers	29.0	27.6	27.6	49.4	42.3	88.8	91.0	91.3
TV/Radio	12.5	12.6	24.7	26.4	30.0	4.0	1.14	0.4
News paper/Book/ Wall Poster/Cinema	3.6	3.6	2.2	2.0	2.0	1.6	0.8	1.4
Not reported	1.7	2.0	2.7	1.3	1.8	1.1	1.3	2.3
Number having knowledge of the method	2307	2288	934	1252	1565	1092	786	1277

Table 5.7 Percentage distribution of couples having knowledge of the methods by the place of availability of the facility.

Method	Place of availaibility of services					Number of women in sample having knowledge of the method
	Private clinic	PHC/ subcentre	Hospital	Shops	Not known	
Vasectomy	18.05	47.7	31.2	0.0	0.8	2307
Tubectomy	13.9	62.2	37.7	0.0	1.6	2288
IUD	9.8	39.4	50.3	0.0	5.1	934
Condom	5.2	22.6	16.8	54.2	2.7	1565
Oral pills	3.6	14.1	11.7	61.5	2.3	1252

Table 5.8 Proportion (per 1,000 eligible couples) of current users of different family planning methods by socio-economic characteristics of household.

Socio economic characteristics	Methods								
	Vasectomy	Tubectomy	IUD	Condom	Oral pills	Rhythm/ withdrawal abstinence	Other methods	Total No.of acceptance	No.of eligible couples on the sample
Category of village									
I	58	192	46	112	10	63	4	485	796
II	37	225	4	19	1	84	3	373	774
III	46	181	5	31	14	108	0	386	762
Religion/caste									
Hindu									
Upper caste	43	190	19	50	6	104	2	78	979
Middle caste	49	217	35	100	9	69	4	710	548
Schèduled caste	51	186	6	27	13	77	1	710	710
Other religion	53	295	21	53	0	21	0	0	95
Maximum education									
Illiterate primary and below	35	176	7	20	2	77	2	320	403
Attended upto middle	44	214	16	13	5	90	0	382	387
High school	49	224	16	61	8	84	4	446	1001
Intermediate and above	56	160	35	100	17	87	0	455	538
N.A.	0	333	0	0	0	0	0	333	3
Percepita income of household									
Less than Rs.150/-	54	266	10	30	6	85	4	456	777
Rs. 150 - Rs.299	51	219	30	63	1	87	1	460	942
Rs.300 andabove	33	83	13	74	1	80	2	295	611
Not available	0	500	0	500	0	0	0	1000	2

Table 5.9 Proportion (per 1,000 eligible couples) of current users of different family planning methods by socio-cultural characteristics of the couples.

Socio-cultural characteristics	Methods								
	Vasectomy	Tubectomy	IUD	Condom	Oral pills	Rhythm withdrawal abstinence	Other methods	Total No. of acceptors (per 1000 couples	No. of couples in the sample
Educational standard of wife									
Illiterate	63	243	5	16	3	90	2	422	1163
Literate but primary or below	41	192	26	35	12	81	3	390	344
Attended upto middle class	30	176	17	63	13	73	3	375	301
High school	31	140	44	148	21	73	3	460	385
Intermediate and above	14	65	50	151	7	101	0	388	139
Educational standard of husband									
Illiterate	64	249	5	8	3	105	2	436	610
Literate but primary or below	27	210	5	27	5	75	0	349	186
Attended upto middle class	51	209	16	32	3	91	3	404	374
High School	37	181	20	75	19	69	4	395	802
Intermediate and above	47	142	50	128	22	83	0	472	360
Occupation of husband									
Own agriculture	54	236	6	9	2	113	0	420	538
Business	18	205	49	115	3	79	8	476	391
Labourer	55	196	0	9	0	94	4	357	235
Govt./SemiGovt. services	56	169	20	66	18	70	1	399	959
Others	33	239	14	62	5	77	0	431	209

Table 5.10 Proportion (per 1,000 eligible couples) of current users of different family planning methods by age of wife andby the number of surviving children.

Demographic characteristics	Method								
	Vasectomy	Tubectomy	IUD	Condom	Oral pills	Rhythm/ withdrawal abstinence	Other methods	Total No. of acceptors (per 1000 couples)	No. of couples in the sample
Age of wife (years)									
0 - 24	7	26	7	66	16	54	2	178	426
25 - 34	25	165	36	81	9	73	0	389	1000
35 - 49	91	319	6	21	4	111	4	556	906
No. of surviving children									
0	12	6	6	23	0	29	0	75	173
1 - 2	11	33	25	93	18	77	1	258	829
3 - 4	63	299	25	47	4	97	2	538	930
5 and above	102	402	5	8	3	99	5	624	383
Not available	0	333	0	0	0	0	0	333	9

Table 5.11 Proportion (per 1,000 eligible couples) of current users of different family planning methods by the number of surviving children

No.of surviving children	Methods							Total no. of acceptors (per 1000 couples)	No.of couples in the sample
	Vasec-tomy	Tubec-tomy	IUD	Condom	Oral pills	Rhythm/ withdrawal/ abstinence	Other methods		
0	12	6	6	23	0	29	0	75	173
1	6	11	11	148	17	74	0	267	176
2	0	0	56	75	9	28	0	168	107
3	0	20	59	59	0	59	0	196	51
4	32	115	21	67	15	93	1	346	712
5	65	303	22	46	6	104	1	547	676
6 and above	92	399	5	18	2	85	7	608	437

Key:

0 , No. srviving child, 1. only one surving daughter, 2, only two surviving daughters.

3, three or more surviving daughters only, 4, one surviving son, 5, two surviving sons,

6, three or more surviving sons.

Table 5.12 Percentage distribution of current users of each family planning method by the types of motivators.

Method	Percent of acceptors motivated by					Total	Number of eligible in the sample currently using the method
	Self/ spouse	Doctor	Family planning field workers	Friends	Could not tell		
Vasectomy	48.2	36.4	9.1	3.6	2.7	100.0	110
Tubectomy	40.2	33.1	20.2	5.8	0.7	100.0	465
IUD	38.6	11.4	4.6	40.9	4.5	100.0	44
Condom	47.7	8.6	4.7	34.4	4.6	100.0	128
Oral pills	35.0	10.0	15.0	30.0	10.0	100.0	30

Table 5.13 Percentage distribution of current users of each family planning method by the sources of supply.

Method	Percent of acceptors received service			Number of eligible couples in sample currently using the method
	Health/Family welfare centre	Others	Total	
Vascetomy	91.8	8.2	100.0	110
Tubectomy	94.0	6.0	100.00	465
IUD	97.7	2.3	100.0	44
Condom	10.2	89.8	100.0	128
Oral pills	25.0	75.0	100.0	20

Table 5.14 Percentage distribution of current users of each family planning method by levels of satisfaction.

Methods	Percentage of current users rated the methods as				Number of eligible couples currently using the method
	Good	Poor	Could not tell	Total	
Vasectomy	94.6	3.6	1.8	100.0	110
Tubectomy	94.8	3.9	1.3	100.0	465
IUD	93.2	6.8	0	100.0	44
Condom	89.1	9.4	1.5	100.0	128
Oral pills	90.0	5.0	5.0	100.0	20

Table 5.15 Percent distribution of couples who never used any family planning method according to reason of non-use by socio-economic characteristics

Socio economic	Percent of eligible couples who never used any family planning method stated reason for not using as					Total No.of women in the sample	
	Ignorance	Superstitious	Need of child	Naturation	Total	Reported	Not reported
Category of villages							
I	6.3	0.0	47.3	46.4	100.0	317	73
II	7.3	0.2	61.4	31.1	100.0	440	32
III	8.9	2.7	54.9	33.5	100.0	439	22
Religion/caste							
Hindu							
Upper	8.2	1.4	59.7	20.1	100.0	487	69
Others	4.1	0.0	50.8	45.1	100.0	244	26
Scheduled caste	8.6	1.4	50.6	39.4	100.0	419	26
Other religion	4.3	0.0	73.9	21.8	100.0	46	6
Percapita income							
Less then Rs.150	14.9	2.0	35.5	47.6	100.0	349	62
Rs.150 - 299	7.4	0.7	54.3	37.6	100.0	444	50
Rs.300 and above	1.5	0.7	73.5	24.3	100.0	403	15

Table 5.16 Percent distribution of couples who never used any family planning method according to reason of non-use by socio-culture characteristics

Socio-cultural	Percent eligible couples who never used any family planning method stated reason using as					Total number of women in sample	
	Ignorance	Superstitious factors	Need of child	Naturation	Total	Reported	Not reported
Education of wife							
Illiterate	10.6	1.7	47.8	39.9	100.0	594	61
Literate but primary or below	6.4	0.5	51.8	40.3	100.0	191	15
Attended upto middle class	3.6	0.7	58.3	37.4	100.0	163	23
High School	4.0	0.6	69.7	95.7	100.0	175	22
Intermediate and above	1.3	0.0	83.6	15.1	100.0	73	6
Education of husband							
Illiterate	15.6	2.2	41.4	40.7	100.0	302	34
Literate but primary or below	10.8	0.8	15.8	36.6	100.0	112	8
Attended upto middle class	3.9	0.9	60.8	34.4	100.0	201	16
High School	5.0	0.8	58.1	36.1	100.0	420	53
Intermediate and above	1.8	0.0	69.6	28.6	100.0	161	16

Table 5.17 Percent distribution of couples who never used any family planning method according to reason of non-use by demographic characteristics

Eemographic characteristics	Percent of eligible couples never used any family planning method stated reason using as					Total number of women in sample	
	Ignorance	Superstitious factor	Need of child	Naturation	Total	Report	Not reported
Age of wife (in year)							
0 - 24	5.4	0.3	70.9	23.4	100.0	337	10
25 - 34	5.8	0.4	60.7	33.1	100.0	519	67
35 - 49	12.7	2.9	31.5	52.9	100.0	240	50
Type of birth							
1 - 2	1.8	0.2	67.5	30.5	100.0	619	43
3 - 4	12.8	1.6	44.2	42.4	100.0	410	64
≥ 5	18.6	3.0	37.1	41.3	100.0	167	23
Number of surviving children							
≤ 2	2.2	0.3	67.2	30.3	100.0	714	46
3 - 4	12.4	1.5	39.6	46.5	100.0	351	62
5 - 8	7.3	4.0	31.1	41.6	100.0	125	19
Not available	34.0	0.0	50.0	17.0	100.0	6	0

Continued

Demographic characteristics	Reason for not using any family planning method					Total No.of women in sample	
	Ignorance	Superstitions factor	Need of child	Naturation	Total	Reported	Not reported
No.of surviving children[x]							
1	2.5	0.0	75.5	22.0	100.0	278	8
2	3.7	1.3	63.7	31.3	100.0	80	6
3	2.7	0.0	70.2	27.0	100.0	37	3
4	5.9	0.8	58.0	35.3	100.0	405	49
5	12.6	2.0	37.2	48.2	100.0	253	37
6	16.9	2.8	31.0	49.3	100.0	142	24
Not available	0.0	0.0	100.0	0.0	100.0	1	0

Code X :

1. One child alive
2. Two children alive
3. Three children alive
4. Four children alive
5. Five children alive
6. Six children alive

Table 5.18 Percent distribution of couples who never used any family planning method by their plan for future use of the methods by socio-economic characteristics of the couples.

Socio-economic	Plans for use any family planning method in future					No. of women never used family planning methods	
	No plans	Use after one birth	Use after two birth	Will use for want of late child	Total	Reported	Not reported
Category of villages							
I	81.4	14.5	3.2	0.9	100.0	220	170
II	69.2	28.4	1.0	1.4	100.0	419	53
III	80.5	11.4	3.2	4.6	100.0	411	50
Religion and caste							
Hindu							
Upper	72.8	21.4	2.2	3.6	100.0	448	108
Other	77.9	17.2	2.5	2.4	100.0	204	66
Scheduled caste	79.8	16.0	2.5	1.7	100.0	356	89
Other religion	73.8	26.2	0.0	0.0	100.0	42	10
Per capita income							
Less than Rs. 150	69.6	24.4	2.5	3.4	100.0	326	85
Rs.150-299	78.0	17.5	2.4	2.1	100.0	377	117
Rs.300 and above	80.4	15.3	2.0	2.3	100.0	347	71

Table 5.19 Percent distribution of couples who never used any family planning methods according to their plan for future use of family planning method by socio-culture characteristics of the couples.

Socio-culture	Plans for use any family planning method in future					No. of women never used family planning methods	
	No. plane	Use after one birth	Use after two birth	Will use for want of late child	Total	Reported	Not reported
Education of wife							
Illiterate	75.8	19.0	2.6	2.6	100.0	537	118
Literate but primary or below	78.6	16.4	2.0	3.0	100.0	164	42
Attended upto middle class	79.7	17.6	1.4	1.3	100.0	148	38
High School	74.5	22.7	0.7	2.1	100.0	145	52
Intermediate and above	69.6	19.6	5.4	5.4	100.0	56	23
Education of husband							
Illiterate	78.3	8.0	0.8	2.9	100.0	272	64
Literate but primary or below	79.8	16.2	3.0	1.0	100.0	99	21
Attended upto middle class	73.1	20.6	4.6	1.7	100.0	175	42
High School	74.0	20.4	2.1	3.5	100.0	373	100
Intermediate and above	79.4	16.8	2.3	1.5	100.0	181	46

Table 5.20 Percent distribution of couples who never used any family planning methods by their plan for future use of the methods by demographic characteristics of the couples

DEMOGRAPHIC CHARACTERISTICS	Plans for use any family planning method in future					No. of women never used family planning	
	No. plans	Use after one birth	Use after two birth	Will use for want of late child	Total	Reported	Not reported
Age of wife (Years)							
0 - 24 (years)	76.0	18.0	2.8	3.2	100.0	278	69
25 - 34	70.7	23.6	2.7	3.0	100.0	482	104
35 - 49	85.5	12.1	1.0	1.4	100.0	290	100
Total number of births							
1 - 2	76.5	18.6	3.4	1.5	100.0	526	136
3 - 4	74.6	19.6	1.3	4.5	100.0	382	89
≥ 5	77.9	17.9	2.8	1.4	100.0	145	48
Number of surviving children							
≤ 2	76.8	17.9	3.3	2.0	100.0	604	156
3 - 4	74.3	20.8	0.8	4.1	100.0	339	74
5 - 8	78.2	19.8	1.0	1.0	100.0	101	43
Not available	83.3	16.7	0.0	0.0	100.0	6	0

Continued

Demographic characteristics	Plans for use any family planning method in future					No.of women never used family planning	
	No.plans	Use after one birth	Use after two birth	Will use for want of late child	Total	Reported	Not reported
No.of surviving children[x]							
1	82.9	11.4	1.8	3.9	100.0	229	57
2	73.8	16.4	8.2	1.6	100.0	61	25
3	65.8	26.3	2.6	5.3	100.0	38	2
4	70.2	23.7	3.6	2.5	100.0	363	91
5	74.5	22.9	0.4	2.2	100.0	231	59
6	88.2	11.0	0.0	0.8	100.0	127	39
7	100.0	0.0	0.0	0.0	100.0	1	0

X 1. One child alive, 2. Two children alive, 3. Three children alive
4. Four children alive, 5. Five children alive, 6. Six children alive
7. Seven children alive.

Table 5.21 Percent distribution of couples who never used any family planning method according to ever visit by family planning workers for giving information about family planning by socio-economic characteristics of couples

Socio-economics	Visit of Health worker for giving information about family planning				
	Yes	No.	Total	No.of women in the sample	
				Reported about workers visits	Not reported about workers visits
Category of village					
I	14.0	86.0	100.0	386	4
II	47.6	52.4	100.0	464	8
III	43.1	56.9	100.0	453	8
Religion/caste					
Hindu					
Upper	39.6	60.4	100.0	548	8
Others	37.8	62.2	100.0	267	3
Scheduled caste	30.5	69.5	100.0	436	9
Other religion	36.5	63.5	100.0	52	0
Per capita income					
Less than Rs. 150	31.5	68.5	100.0	403	8
Rs.150 - 299	35.4	64.6	100.0	486	8
Rs.300 and above	41.3	58.7	100.0	414	4

Table 5.22 Percent distribution of couples who never used any family planning method according to ever visit by family planning workers for giving information about family planning by socio-cultural characteristics of couples.

Socio-cultural	Visit of health worker for giving information about family planning				
	Yes	No	Total	No. of women in the sample	
				Reported about workers visits	Not reported about workers visits
Education of wife					
Illiterate	40.6	59.4	100.0	641	14
Literate but primary or below	34.6	65.4	100.0	205	1
Attended upto middle class	33.3	66.7	100.0	183	3
High School	31.6	68.4	100.0	196	1
Intermediate and above	20.5	79.5	100.0	78	1
Education of Husband					
Illiterate	39.3	60.7	100.0	331	5
Literate but primary or below	34.5	65.5	100.0	119	1
Attended upto middle class	38.9	61.1	100.0	216	1
High School	35.0	65.0	100.0	463	9
Intermediate and above	30.5	69.5	100.0	174	3

Table 5.23 Percent distribution of couples who never used any family planning method according to ever visit by family planning worker for giving information about family planning by demographic characteristics of couples.

Demographic characteristics	Visit of HW for giving information about family planning			No.of women on the sample	
	Yes	No.	Total	Reported about workers visits	Reported about workers visits
Age of wife(years)					
0 - 24	28.3	71.7	100.0	343	4
25 - 34	39.4	60.6	100.0	574	12
35 - 49	38.1	61.9	100.0	386	4
Total No.of births					
1 - 2	33.5	66.5	100.0	653	9
3 - 4	38.9	61.1	100.0	463	8
≥ 5	38.0	62.0	100.0	187	3
No.of surviving children					
≤ 2	32.2	67.8	100.0	751	9
3 - 4	40.7	59.3	100.0	405	8
5 - 8	43.3	56.7	100.0	141	3
Not available	33.3	66.7	100.0	6	0
No.of surviving children					
1	27.6	72.4	100.0	283	3
2	42.2	57.8	100.0	83	3
3	40.0	60.0	100.0	40	0
4	37.3	62.7	100.0	448	6
5	37.7	52.3	100.0	284	7
6	40.8	59.2	100.0	164	2
Not available	0.0	100.0	100.0	1	0

Table 5.24 The percent distribution of eligible couples who never used any family planning method according to their intentions of use of methods in future by socio-economic characteristic of couple.

Socio-economic characteristics	The method intends to use in future							No. of women in the sample	
	Vasectomy	Tubectomy	IUD	Condom	Oral pills	Others	Total	Reported	Not reported
Category of village									
I	17.1	57.1	5.2	10.2	2.8	7.6	100.0	210	180
II	8.7	63.2	0.7	5.7	8.3	13.4	100.0	299	173
III	10.1	61.1	0.8	5.9	14.2	7.9	100.0	267	194
Religion and caste									
Hindu									
Upper	9.6	67.5	0.3	5.9	9.5	7.2	100.0	323	233
Others	11.0	52.9	4.7	9.3	9.9	12.2	100.0	172	98
Scheduled caste caste	14.3	58.2	2.0	7.9	6.4	11.2	100.0	251	194
Other religion	10.0	56.7	3.3	13.3	16.7	10.0	100.0	50	22
Per capita income									
Less than 150	12.3	67.1	1.7	3.0	3.9	12.0	100.0	234	177
Rs.150-299	12.7	61.8	2.3	7.5	7.5	8.2	100.0	291	203
300 and above	9.1	53.8	2.8	10.8	15.1	8.4	100.0	251	167

Table 5.25 The percent distribution of eligible couples who never used any family planning method according to their intentions of use of methods in future by socio-cultural characteristic of couple.

Socio-cultural character-istics	The method intends to use in future							No.of women in the sample	
	Vasectomy	Tubectomy	IUD	Condom	Oral pills	Others	Total	Reported	Not reported
Education of wife									
Illiterate	10.3	65.1	0.8	5.9	7.8	10.1	100.0	358	297
Literate but primary or below	18.5	56.3	0.0	5.9	10.9	8.4	100.0	119	87
Attended upto middle class	13.1	61.7	3.7	6.6	6.5	8.4	100.0	107	79
High school	6.6	57.7	2.2	6.6	13.1	13.8	100.0	137	60
Intermediate and above	12.7	49.1	9.1	21.8	5.5	1.8	100.0	55	24
Education of Husband									
Illiterate	8.7	59.9	0.6	7.6	8.7	14.5	100.0	172	164
Literate but primary or below	17.6	52.9	1.7	14.4	13.2	10.2	100.00	68	52
Attended upto middle class	7.8	67.9	2.4	4.7	11.7	5.5	100.0	128	89
High school	12.9	62.8	1.4	7.9	5.5	9.5	100.0	293	180
Intermediate and above	22.1	54.9	5.2	9.5	12.1	6.2	100.0	115	62

Table 5.26 The percent distribution of eligible couples who never used any family planning method according to their intensions of use of methods in future by demographic characteristics of couple.

Demographic characteristics	Vasectomy	Tubectomy	IUD	Condom	Oral pills	Others	Total	No. of women in the sample Reported	Not reported
	The method intends to use in future								
Age of wife (year)									
0 - 24	13.5	55.6	0.0	11.6	12.1	7.2	100.0	207	140
25 - 34	10.5	64.3	3.3	5.6	8.4	7.9	100.0	392	194
35 - 49	11.3	59.3	1.1	5.7	6.2	16.4	100.0	177	213
Total number of births									
1 - 2	12.8	57.4	2.4	8.9	10.9	7.6	100.0	383	279
3 - 4	11.2	65.4	2.0	5.8	6.8	8.8	100.0	295	176
≥ 5	7.1	60.2	0.0	5.1	7.2	20.4	100.0	98	92
No. of surviving children									
1 - 2	12.4	56.5	2.1	9.9	10.3	8.8	100.0	435	325
3 - 4	11.2	68.4	2.3	3.8	6.4	7.9	100.0	266	147
5 and above	6.8	58.9	0.0	4.1	9.6	20.6	100.0	73	71
N.A.	0.0	50.0	0.0	0.1	0.0	50.0	100.00	2	4
Category of surviving children									
1	14.0	46.0	0.6	14.7	12.0	12.7	100.0	150	136
2	8.2	57.1	6.1	8.2	16.4	4.0	100.0	49	37
3	3.8	74.0	7.4	7.4	7.4	0.0	100.0	27	13
4	13.5	62.4	1.4	5.9	8.9	7.9	100.0	290	164
5	11.2	68.8	3.0	4.7	4.7	7.6	100.0	170	120
6	5.6	63.3	0.0	3.3	7.8	20.0	100.0	90	76
7	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0	0

CHAPTER 6

ON UTILIZATION OF MATERNITY AND CHILD HEALTH SERVICES IN RURAL JAMMU

INTRODUCTION

India is moving ahead to reach the goal of Health for All by 2000 A.D. through Primary Health Care, having had adopted the Alma Ata Declavation in 1978 (WHO 1978). However, the ideology of Primary Health Care is not new to India. As early as 1952, Health care services were organised as a component of community development programme based on concept of comprehensive health care for the improvement of socio-economic status of people and improving their quality of life. It emphasised the provision of basic health care with the main focus on preventive, promotive and curative health care to all. Since thirty-eight years of its inception, the concept and contents of health care have undergone a significant change and the health services have greatly expanded in terms of coverage, manpower, types of services and financial outlays (Kanitkar 1979).

In India, women of child bearing ages constitute around 22 percent and children under five years are around 15 percent of the total population. Mortality has been reduced less than half, indidence rate of major communicable diseases has been drastically brought down, the life expectancy has increased by more than one and half times. But inspite of all these developments in health, the maternal mortality rate, prenatal mortality rate, infant mortality rate and child mortality rate are unacceptably high. Therefore,

the task of achieving the goal of health for All by 2000 A.D. for India is not an easy one and the 9th joint conference of the central council of health and central family planning council at New Delhi in 1983 rightly recommended:

"The Family Welfare Programmes including Maternal and Child Health and Primary Health Care on which the future well-being of the country and the people are dependent should be accorded top most priority among all programmes" (MOHFW 1983).

In this context the National Health Policy Document, 1983, identified some specific goals in health indicators to be achieved by the year 2000 A.D. such as infant mortality rate below 60 per thousand live births, a prenantal mortality rate around 30 per thousand live births, a mortality rate of 10 for every thousand pre-school children i.e. between ages one and four years and a mortality rate below 2 per thousand deliveries (MOHFW 1984).

Approximately 110 per thousand women die every year in India due to causes related to pregnancy and child birth (Majumdar 1988). High rate of maternal mortality and morbidity are due to, (i) medical causes such as malnutrition, anaemia, maternal infection, toxaemias of pregnancy, haemorrhage, sepsis, vascular accidents and (ii) social causes such as young maternal age at child birth, small interpregnancy intervals, large family size, illeteracy, ignorance and prejudices, lack of maternity services and unskilled assistance at labour.

Every year in India, about 2.5 million children are expected to die (Majumdar 1988). Low birth weight, prematurity, birth injury, congenital abnormalities, antenatal tetanus, acute respiratory tract infection, maternal malnutrition, maternal anaemia, lack of antenatal care, lack of immunization, deliveries attended by untrained persons, are some of the causes of infant and childhood mortality.

Several studies in India confirmed that the people, in general, do not see the need for antenatal care during pregnancy and prefer to deliver at home with a dai (untrained mid-wife) as an attendant (Ahluwalia 1963, Ghosh 1968, Charles 1971, Mathews 1979 and Bhatnagar et al. 1988). In a south Indian village, about 22 percent had it due to lack of antenatal care while another 10 percent had it because of some problems dring pregnancy (Matthews 1979). In urban slums of Delhi about 21 percent registered for antenatal care while 16 percent reported receipt of iron and folic acide tablets and about 12 percent reported to have had tetanus toxoid during antenatal care (Bhatnagar et al. 1988).

Matthews (1979) reported around 70 percent home deliveries in a south Indian village in early 1970 and the deliveries were mainly attended by untrained dais. Bhatnagar et al (1988) also reported that about 72 percent deliveries took place at home in urban slums of Delhi and 76 percent of these home deliveries were attended to by untrained dais. Sample registration system of India also provide statistics of home deliveries and attended at those

deliveries e.g. in 1986, about 80 percent deliveries in India were conducted at home and 61 percent of the total deliveries were attended to by untrained persons. Similarly, in rural areas of Jammu and Kashmir about 95 percent were domiciliary deliveries and 79 percent deliveries took place under the assistance of of untrained dais.

The diet is severely restricted during and after delivery to the mother and the child which leads to severe malnutrition and anaemia to the mother (Matthews 1979).

Knowledge regarding immunization was practically nil and the people have imaginary fears about immunization and in case of illness , people prefer traditional treatment as observed by Matthews (1979) in a south Indian village, Bhatnagar et al (1988) also reported poor status of immunization by kind of immunization in urban slums of Delhi. In these areas about 62 percent children registered for BCG, 28 percent for polio while about 19 percent for DPT injection with 3 doses.

Therefore, there is a need to assess the status of utilisation of maternity and child health services in India, especially in rural areas. With this in mind, an attempt is made, in this chapter, to define the current utilization of maternity and child health services in rural areas of Jammu after about a decade of Alma Ata Declaration. This study will be unique in the sense that no other reference is available from this area.

6.1 Knowledge regarding Place for Maternity and Child Health Services

A question was asked to the respondents regarding their

known places for maternity and child health services and their response is depicted in table 6.1. Over all 84 percent respondents reported Primary Health Centre as a place for MCH services followed by district hospital (70 percent), subcentre (35 percent), government dispensary (31 percent) and private clinic (5 percent). However, respondents differed in terms of knowledge regarding places for MCH service by type of village they live in. Respondents in the PHC villages behave a little differently from the respondents either from the subcentre villages or from other villages in terms of place for availability of MCH services. Approximately 88 percent respondents from PHC villages reported primary health centre for MCH services in comparison with 82 percent either from subcentre villages or from other villages. Thus more respondents from PHC villages referred primary health centre as the place for MCH services than those from subcentre villages (Z = 3.30 > 2.58 at P = 0.01) and other villages Z = 3.24 > 2.55 at P = 0 01). Respondents in the PHC villages were more aware of availability of MCH services at the primary health centre because they are more exposed to the activities of a PHC as it is situation in their own village.

Approximately 5 percent respondents from PHC villages reported subcentre as a place for MCH services as against 49 percent from subcentre villages and 51 percent from other villages. Therefore, in comparison with either to subcentre villages (Z = 19.69 > 2.58 at P = 0.01) or to other villages (Z = 20.25 > 2.58 at P = 0.01) respondents in PHC villages were less aware of MCH services at the subcentre. No significant difference (Z = 0.74 < 1.96 at P = 0.05)

is observed between subcentre villages and other villages in terms of subcentre as a place for availability of MCH services. Probably respondents from PHC villages had little knowledge about the existence of a subcentre and this has been reflected in in their response.

Government dispensary as a place for availability of MCH services as reported by approximately 36 percent respondents from PHC villages, 28 percent from subcentre villages and 30 percent from other villages. Comparatively more respondents from PHC villages were aware of MCH services at the government dispensary as against respondents either from subcentre villages ($Z = 3.65 > 2.58$ at $P = 0.01$) or from other villages ($Z = 2.59 > 2.58$ at $P = 0.01$) whereas statistically no significant difference ($Z = 1.04 < 1.96$ at $P = 0.05$) is found between respondents of subcentre villages and other villages in reporting government dispensary as a place for MCH services.

District hospital for MCH services was stated by more than 70percent respondents; 73 percent from PHC villages, 64 percent from subcentre villages and 74 percent from other villages. More respondents from PHC villages were aware of district hospital as a place for MCH services in comparison with subcentre villages ($Z = 14.27 > 2.58$ at $P = 0.01$) and other villages ($Z=10.54 > 2.58$ at $P = 0.01$). Similarly more respondents from other villages were aware of MCH services at the district hospital in comparison with subcentre villages ($Z = 4.09 > 2.58$ at $P = 0.01$).

Private clinic for MCH services was mentioned by a little over 5 percent respondents either from PHC villages or from subcentre villages whereas a little less than 4 percent reported it from other villages. No statistically significant difference was found in reporting private clinic for MCH services either by respondents from PHC villages and subcentre villages ($Z = 1.77 < 1.96$ at $P = 0.05$) or by respondents from PHC villages and other villages ($Z = 1.33 < 1.96$ at $P = 0.05$) or by respondents from subcentre villages and other villages ($Z = 1.50 < 1.96$ at $P = 0.05$).

6.2 Knowledge regarding Services Provided at the Maternity and Child Health Centres:

Respondents who had knowledge of places for MCH services were asked about type of services provided at such places. Little over 75 percent respondents reported medical care followed by facilities for preventive measures (such as control of epidemics and immunization services) (75 percent), family planning (68 percent), and maternal as well as child health (such as antenatal, intra-natal and post-natal) (62 percent). Apart from these, a few respondents referred to prevention of malaria, improvement in health and sanitation. It appears from Table 6.2 that there are differences in knowledge regarding type of services provided at MCH centres by type of residence of the respondents.

Availability of medical care at MCH centre was reported by approximately 78 percent respondents from PHC villages, 72 percent from subcentre villages, and 77 percent from other villages. Thus knowledge regarding availability of medical care at MCH centre differs significently between respondents from PHC villages and

subcentre villages ($Z = 2.59 > 2.58$ at $P = 0.01$) and subcentre villages and other villages ($Z = 2.43 > 1.96$ at $P = 0.05$) but no such significant difference is observed between PHC villages and other villages ($Z = 0.14 < 1.96$ at $P = 0.05$).

Preventive measures at MCH centre was mentioned by 84 percent from PHC villages, 75 percent from subcentre villages and 66 percent from other villages. Knowledge regarding availaibilty of preventive measures varies directly with the location of the primary health centre. More respondents from PHC villages had knowledge of preventive measures at MCH centre in comparison with respondents either from subcentre villages ($Z = 4.29 > 2.58$ at $P = 0.01$) or from other villages ($Z = 8.05 > 2.58$ at $P = 0.01$). Respondents from subcentre villages were more aware of availability of preventive measures at MCH centre in comparison with respondents from other villages ($Z = 3.82 > 2.58$ at $P = 0.01$). Type of residence (such as nearer to PHC or away from PHC) plays a positive role in terms of knowledge for providing preventive measures at MCH centre.

About 8 in every 10 respondents from PHC villages had reported knowledge of maternal and child health care at the government health care centre in comparison with about 6 from the subcentre villages and 5 from other villages. Hence, knowledge regarding availability of maternal and child health care varies inversely with the type of residence (PHC villages to other villages) since the observations are statistically highly significant for each pair of villages such as PHC and subcentre ($Z = 6.98 > 2.58$ at $P = 0.01$), subcentre and other ($Z = 3.66 > 2.58$ at $P = 0.01$) and

PHC and other ($Z = 10.53 > 2.58$ at $P = 0.01$) villages.

Regarding the availability of family planning advice and services, only 26 percent from PHC villages had knowledge in comparison with about 59 percent from subcentre villages and 68 percent from other villages and these observations by villages are statistically highly significant because of high Z-values for each pair of villages the respondents live in i.e. between PHC and subcentre villages ($Z = 13.24 > 2.58$ at $P = 0.01$), subcentre and other villages ($Z = 3.70 > 2.58$ at $P = 0.01$), and PHC and other villages ($Z = 16.61 > 2.58$ at $P = 0.01$). Thus the residence is nearer the location of health centre , the lesser is the knowledge regarding availability of family planning advice and services from the governmental health centre.

6.3 <u>Knowledge Regarding Services Provided by Health Workers from the Health Centre at the door step:</u>

Health workers from the health centres are supposed to visit homes for advice and guidance for health as well as maternal and child health Care. In order to assess this, respondents were asked about their knowledge of the provision of services at the village by the health workers from the health centre and the responses are reflected in Table 6.3. Approximately 48 percent of the respondents had knowledge that health workers from the health centre are supposed to provide services at the village but this knowledge differes significantly among respondents by type of residence ($\chi^2_2 = 240.70 > 9.21$ at $P = 0.01$). It is interesting to note that

only 22 percent from PHC villages were aware of services provided by health workers at villages as against 64 percent from subcentre villages or 60 percent from other villages. As the health centre is situated at the villages respondents from PHC villages probably visit the health centre more often and therefore health workers may pay little attention to visit homes in PHC villages. So knowledge regarding health workers providing services at the doorstep is low among respondents in PHC villages.

6.4 Knowledge Regarding Type of Health Workers Providing Services at the door step:

Respondents who were aware of health workers from the health centre visiting home to provide services were asked about the type (i.e. designation/rank) of such workers and their responses are presented in Table 6.4.

About half of the eligible respondents reported lady health visitor (LHV) providing services at the villages from the health centre followed by auxiliary nurse-cum-midwife (ANM) (46 percent), physician/doctor (32 percent), malaria worker (24 percent), male family welfare workers (7 percent), and immunization workers (2 percent). Apart from these less than one percent respondents mentioned sanitary inspectors and extension educators.

About 34 percent respondents from the subcentre villages mentioned physicians/doctors visiting villages from health centre to provide services followed by 31 percent from PHC villages and 30 percent from other villages. No statistically significant

differences were observed in terms of knowledge regarding physician/doctor visiting home to provide services by residence of the respondents because of very low Z-values in all three pairs of observations i.e. , PHC villages and subcentre villages ($Z = 0.68 < 1.96$ at $P = 0.05$), PHC villages and other villages ($Z = 1.75 < 1.96$ at $P = 0.05$) and subcentre villages and other villages ($Z = 1.13 < 1.96$ at $P = 0.05$).

The rank of auxiliary nurse-cum-mid-wife was reported by 40 percent respondents from PHC villages , 43 percent from subcentre villages and 51 percent from other villages. More respondents from other villages had knowledge regarding services provided by auxiliary nurse-cum-mid-wife (ANM) at the door step than that of respondents either from PHC villages ($Z = 2.51 > 1.96$ at $P = 0.05$) or from subcentre villages ($Z = 2.53 > 1.96$ at $P = 0.05$) but no such difference is observed between respondents of PHC villages and subcentre villages ($Z = 0.72 < 1.96$ at $P = 0.05$).

Lady health visitors' (LHV) visits to home for advice and guidance was reported approximately by 53 percent from PHC villages, 55 percent from subcentre villages and 44 percent from other villages. No significant difference in reporting LHV providing services at the door step is observed between respondents of PHC villages and subcentre villages ($Z = 0.31 < 1.96$ at $P = 0.05$) but significant differences are observed betweem PHC villages and other villagds ($Z = 2.10 > 1.96$ at $P = 0.05$) and between subcentre villages other villages ($Z = 3.35 > 2.58$ at $P = 0.01$).

Malaria worker working in the village was mentioned by 17 percent from PHC villages, 20 percent from subcentre villages and 30 percent from other villages. Thus knowledge about maliaria worker working in the village is significantly higher among respondents in other villages in comparison with respondents either from PHC villages ($Z = 3.20 > 2.58$ at $P = 0.01$) or from subcentre villages ($Z = 3.32 > 2.58$ at $P = 0.01$) but no significant difference is observed between responsentds of PHC villages and subcentre villages ($Z = 0.96 < 1.96$ at $P = 0.05$).

For every 100 respondents only 14 percent from PHC villages reported male family welfare workers (MFWW) working at the village in comparison with only 8 from subcentre villages and 3 from other villages. Respondents differ significantly in terms of reporting MFWW working in the villages by type of residence such as between PHC villages and subcentre villages ($Z = 2.17 > 1.96$ at $P = 0.05$), between PHC villages and other villages ($Z = 4.85 > 2.58$ at $P = 0.01$), and between subcentre villages and other villages ($Z = 3.17 > 2.58$ at $P = 0.01$).

Apart, from the above workers , name of immunization workers , extension educators and sanitary inspectors were mentioned by a few respondents either from subcentre villages or from other villages but by none from PHC villages.

Thus status of knowledge regarding the rank of health working in the village was very low especially among those living in PHC villages.

6.5 Status of Registration for Antenatal Care:

Antenatal care means care for pregnant women thus improving the foetal and maternal outcome of each pregnancy. In this part, therefore, an assessment will be made regarding the status of antenatal care in the survey area.

Respondents having had atleast one live birth during the last three years prior to survey reference date were asked about their status of registration for antenatal care during pregnancy. Table 6.5, reveals that 72 percent respondents (i.e. those having given births during the last three years prior to survey date) registered for antenatal care while 24 percent did not register for such care and no information was available from 4 percent respondents because of their non response to antenatal care items.

For every 10 respondents (eligible for antenatal care), eight registered for antenatal care from PHC villages, 7 from subcentre villages and 6 from other villages. Thus the respondents differ significantly by type of residence and by registration status for antenatal care (X_4^2 = 67.62 > 13.28 at P = 0.01).

The respondents who were eligible for antenatal care were further examined for their registration status for antenatal care by various demographic and socio-economic characteristics excluding respondents whose status of registration for antenatal care was unknown.

It appears from table 6.6 that three respondents registered for antenatal care for every four eligible respondents during pregnancy. Around 76 percent of eligible respondents below

age 35 years registered for ANC in comparison with only 64 percent at age 35 years and above. It appears from the table that respondents in the middle age group were more likely to register for antenatal care than respondents of the younger age group. This may be due to more autonomy enjoyed within the household by respondents in middle aged cohort than the younger aged cohort. The status of registration for antenatal care by age of the respondents at birth differs significantly ($X_2^2 = 16.82 > 6.64$ at $P = 0.01$).

Live birth orders of the respondents were inversely related with registration status for antenatal care ($X^2 = 51.54 > 9.21$ at $P = 0.01$). About 81 percent respondents registered for antenatal care among those having 1 to 2 live birth order in comparison with 73 percent having 3 to 4 live birth order and 56 percent having live birth order 5 or more. Registration for antenatal care appeared to be popular among the respondent with early live birth order.

Other religions group were more likely to register for antenatal care than Hindus ($Z = 2.54 > 1.96$ at $P = 0.05$) but it is not possible to make anylegitimate conclusion because of small sample size of other religious group. Among Hindus approximately 86 percent from other castes registered for ANC followed by 76 percent from upper castes and 63 percent from scheduled castes. It appears that the prevalent rate of registration for ANC was low among scheduled castes in comparison with other castes as well as other religion group. There appears to be a significant difference by castes (including other religion as a separate group) and

status of registration for ANC (X_3^2 = 60.83 > 11.34 at P = 0.01).

Education of the respondents played a positive role in registration for antenatal care (X_4^2 = 198.63 > 13.38 at P = 0.01). Approximately 57 percent illiterate respondents registered for antenantal care while 81 percent with education upto primary level and 37 percent with education at least upto high school registered for ANC.

Registration of respondents for antenatal care varies directly with education of spouse of the respondents (X_4^2 = 162.00 > 13.33 at P = 0.01). Approximately 51 percent respondents with illiterate spouse registered for ANC and the tempo of registration increases gradually with increase in education of the spouse. About 61 percent respondents registered for antenatal care with literate spouse but education upto primary level. 74 percent having spouse with education above primary but below middle and 93 percent having spouse with education above high school level registered for ANC.

About 62 percent respondents registered for antenatal care with percapita income of the family upto Rs. 149/- in comparison with 79 percent with per capita income of the family between Rs.150/- and Rs. 299/- and 86 percent with percapita family income above 299/- Registration for antenatal care increases with increase in percapita income in the family (X_2^2 = 73.34 > 9.21 at P = 0.01).

Location of health centre played a positive role in registering for antenatal care (X_2^2 = 66.85 > 9.21 at P = 0.01). More respondents from PHC villages registered for antenatal care (86 percent) in comparison with 73 percent from subcentre villages and

63 percent from other villages.

6.6 Type of Health Institution Sedected for Registration And Type of Services Received:

Respondents who have registered for antenatal care were asked about the type of health institution where registered for antenatal care and the type of serrvices received during antenatal period, such as tetanus toxoid (TT) and prophyloxis (tablets of iron and folic acid).

Table 6.7, reveals that 20 percent respondents registered at hospitals for antenatal care but the bulk of the respondents, approximately 72 percent , registered at the primary health centre for suchhcare. Apart from these a little over 4 percent registered at private clinics/nursing homes, another 3 percent or so at the subcentre for antenatal care. Most of the respondents (80 percent) from subcentre villagesregistered at primary health centre followed by respondentsfrom PHC villages (73 percent) and other villages (62 percent). Thus respondents from PHC villages are more likely to register at primary health centre in comparison with respondents either from subcentre villages ($Z = 2.17 > 1.96$ at $P = 0.05$) or from other villages ($Z = 9.51 > 2.58$ at $P = 0.01$). Similarly more respondents from subcentre villages prefer to register at primary health centre than the respondents from other villages ($Z = 8.00 > 2.58$ at $P = 0.01$) for antenatal care. About 26 percent from other villages registered at hospitalsfor antenatal care followed by 23 percent from PHC villages and 11 percent from subcentre villages.

There was no difference in terms of hospital as place of registration for antenatal care among respondents from PHC villages and other villages ($Z = 0.98 > 1.96$ at $P = 0.05$). But there were some significant differences in terms of selection of hospital as a place for registration for antenatal care between respondents of PHC villages and subcentre villages ($Z = 4.42 > 2.58$ at $P = 0.01$) as well as of subcentre villages and other villages ($Z = 4.97 > 2.58$ at $P = 0.01$). A few persons from subcentre villages registered at the subcentre for antenatal care while a negligible number of respondents either from PHC villages or from other villages registered at the subcentre for such care.

Surprisingly, more respondents from other villages registered at private clinics/other places for antenatal care followed by PHC villages and subcentre villages even though the number registered at such centre were negligible.

Almost all respondents registered for antenatal care reported to have received tetanus toxiod (TT) from the same health centre where they registered for antenatal care. However, a little smaller number of respondents reported to have received prophylaxis (i.e. tablets of iron and folic acid) in comparison with tetanus toxiod (TT).

6.7 Prevalence of Home Visits by Health Workers to Respondents Eligible for Antenatal Care but not Registered for such Care:

Enquiries were made from those respondents who were eligible for antenatal care, but were not registered for such care, regarding their receiving advice at home for antenatal care

(ANC) from lady health visitor (LHV) and auxiliary nurse-cum-midwife (ANM) from the nearest health centre. The extent of home visit by health workers for antenatal advice and guidance to those not registered for antenatal care is depicted in Table 6.8. Only 7 percent respondents reported that female health workers (ANM/LHV) from the health centres visited their homes during their antenatal period for advice. Approximately 10 percent from other villages, 5 percent from subcentre villages and about 4 percent from PHC villages were reported to receive antenatal advice at home by female health workers (ANM/LHV). No significant difference was observed by residence of the respondents and by home visit of female health workers for antenatal advice and guidance (X^2_2 = 13.43 > 9.21 at P = 0.30). In the survey area, it appears that there is hardly any home visit by female health workers for antenatal care. But it is also necessary to note that probably some of the respondents might have been registered at the health institutions after receiving advise at home by the female health workers.and they were excluded here. This may have an impact for the low estimates of home visits by female health workers for antenatal advice and care.

6.8 Intra-Natal Care:

Intra-natal care is important for the survival of mother and the child. In India, most of the deliveries take place at home and one fifth of these deliveries were attended to by trained persons. Utilization of untrained persons at delivery and prevailing unhygienic and non-sterile conditions at home may be

responsible for a large number of babies and mothers infected with several disease germs which lead to high infant and maternal mortality. Non-availability of trained health personnel and poverty are to some extent responsible for the high incidence of home deliveries apart from some social and ritual taboos. Majumdar 1989). Therefore, an attempt is made here to understand the prevalence of intra-natal care by examining: (1) type of place where the babies are delivered, (2) type of attendents who helped in delivering the child, and (3) reasons behind home deliveries.

Type of place for Deliveries:

The type of place of delivery by various demographic and socio-economic characteristics of respondents is given in Table 6.9. In this sample, about 85 percent respondents delivered at home, about 5 percent either at PHC or at subcentre and about 10 percent at the government hospital.

Even though for every four deliveries three deliveries were conducted at home but still the proportion of deliveries at home varies directly with age of the respondents. Only 9 percent respondents with age below 25 years delivered at PHC/subcentre while only 3 percent respondents with age 25 years or above did so. About 12 percent respondents between age (25 and 34 years) delivered at government hospital in comparison with a little over 9 percent below age 25 years and 3 percent at ages 35 and above. Thus delivery at government hospital follows an inverted J-shaped curve by age of the respondents. Overall it appears that respondents differ

significantly by age and by places at delivery (X_4^2 = 28.80 > 13.28 at P = 0.01).

Live birth order is inversely associated with deliveries at home and similar relationship is also observed with deliveries at government hospital. About 9 in every 10 deliveries occured at home to respondents with live birth order three or more in comparison with 8 to respondents having live birth order up to two children. Thus place of delivery differs significantly by live birth order of the respondents (X_4^2 = 63.43 > 13.28 at P = 0.01).. Hindu respondents delivered more either at home or at PHC/subcentre in comparison with other religious group respondents (X_2^2 = 7.08 > 5.99 at P = 0.05).

Deliveries either at home or at PHC/subcentre varies inversely with caste but no such pattern is observed with deliveries at government hospital. Thus the places where the babies are d delivered differ significantly by caste (X_4^2 = 44.70 > 13.28 at P=0.01).

Inspite of bulk deliveries, that have occured at home, education plays a positive role in selecting the place for delivery. Home deliveries vary almost inversely with education of the respondents whereas deliveries at government hospital vary directly with education. Thus education of the respondents plays a positive role in selecting the medically safe place for delivery (X_8^2 = 120.23 > 20.09 at P = 0.01).

Similar relationship is observed by education of spouse of

the respondents and by places where the respondents delivered the child (X^2_8 = 105.12 > 20.07 at P = 0.01).

Per capita income of the family is negatively associated with home deliveries where as deliveries at PHC/subcentre or at government hospital are positively associated with percapita family income. Thus places for child birth differ significantly by percapita family income of the respondents (X^2_4 = 88.6 > 13.28 at P = 0.01).

For every twenty deliveries 18 deliveries took place at home from those who live in subcentre villages, 17 from those who live in other villages and 16 from those who live in PHC villages. No significant difference is found from those who delivered only at PHC/subcentre by type of residence the respondents live in. Approximately 14 percent respondents from PHC villages delivered at government hospital followed by 9 percent from other villages and 6 percent from subcentre villages. Over all it appears that respondents differ significantly by type of residence in selecting the place for deliveries (X^2_4 = 18.32 > 13.28 at P = 0.01).

Type of Attendents Assisting at Deliveries:

Type of person attending home deliveries by demographic and socio-economic characteristics of the respondents are depicited in Table 6.10. Most of the deliveries at home were attended to by untrained persons such as untrained dai 55 percent and members of the household, friends and relatives (7 percent). About 38 percent home deliveries were attended to by trained persons such as trained dai

(13 percent), ANM (12 percent), LHV (11 percent) and doctor/physians, (2 percent).

Home deliveries attended to by untrained persons were more among respondents with age 35 years and above than those with age below 35 years. There appears to be a changing trend among younger respondents to take assistance from trained persons at delivery (X^2_{10} = 18.78 > 18.31 at P = 0.05).

More home deliveries were attended to by untrained persons to respondents having birth order 5 or more in comparison with their counterparts with birth order less than 5. Respondents differ significantly by live birth order and by type of persons attending home deliveries (X^2_8 = 23.63 > 20.09 at P = 0.01).

Trained persons attended home deliveries more to respondents belonging to other religious groups in comparison with Hindus and vice versa. But no statistically significant difference is found beyond 10 percent level by religion and by type of persons attending home deliveries (X^2_3 = 7.36 > 6.25 at P = 0.01).

Among Hindus trained persons attended more deliveries to other castes followed by upper castes and scheduled castes. It is true that type of persons attending home deliveries differ significantly by castes (X^2_{10} = 100.76 > 23.21 at P = 0.01).

An inverse relationship is observed between education of the respondents and untrained persons attending home deliveries. Home deliveries attended by trained persons increases with increase

in education. Respondents differ significantly by education in terms of selecting birth attendent at home deliveries (X^2_{12} = 101.23 > 26.22 at P = 0.01).

Comparatively, untrained persons attend deliveries more of respondents whose spouses are literate but education may be upto primary level than those whose spouses have no education. Apart from this, education of spouse plays a negative role with untrained persons as attendent at home deliveries . Respondents differ significantly by education of their spouse in selecting type of person as an attendent for deliveries conducted at home (X^2_{12} = 73.25 > 26.22 at P = 0.01).

No significant difference is found by type of attendents for deliveries at home and by percapita family income (X^2_{10} = 17.28 > 15.99 at P = 0.01).

More respondents from other villages called untrained persons for assistance at deliveries conducted at home in comparison with those living in subcentre villages followed by those living in PHC villages. More respondents from PHC villages were assisted by trained persons in their deliveries at home followed by respondents from subcentre villages and other villages. Even though the extent is small but still it is interesting to note that doctor/physician assisted more in delivery at home to respondents from other villages than the respondents either from PHC villages or from subcentre villages. Respondents in this sample area do differ significantly in terms of selecting birth attendent at home deliveries by type of

residence (X^2_{10} = 38.64, > 23.21 at P = 0.01).

<u>Reasons behind home deliveries:</u>

Respondents who delivered at home were asked their reason behind home deliveries and the responses were depicted in Table 6.11. Approximately 85 percent respondents who delivered at home did not find any problem behind home deliveries where as distance of hospital/ Institution from home was reported by about 14 percent respondents and only one percent indicated availability of trained persons for home deliveries.

No consistent relation was observed by reasons behind home deliveries and by age of the respondents. Respondents who delivered at home did not differ significantly by age and by reasons behind home deliveries (X^2_4 = 6.52 > 6.25 at P = 0.10).

About 21 percent respondents with birth order five or more mentioned distance (i.e., governmental institution for delivery is for away from home) in comparison with 13 percent respondents with birth order four or less. About 86 percent respondents with birth order upto four did not foresee any problem associated with home deliveries and about 78 percent respondents with birth order 5 or more felt the same way. Respondents by live birth order differ significantly in reasons behind home deliveries (X^2 = 14.95 > 13.28 at P = 0.01).

Hindus do not foresee any problem for delivering child at more than any other religious group. Distance (place of government institution for delivery is far away from home) was mentioned by

about 15 percent respondents belonging to Hindu religion closely followed by about 14 percent from other religious group. About 5 percent from other religious group stated availability of trained persons at home for home delivery where as only one percent hindu respondents reported the same. It appears that there is a significant difference between hindus and other religions in reason behing home deliveries ($X_2^2 = 6.72 > 5.99$ at $P = 0.05$).

Approximately 18 percent upper caste hindus and 17 percent scheduled caste hindus delivered at home because of distance of government institutions from home where as only 4 percent did so among other caste hindus. About 96 percent respondents from other caste hindus did not foresee any problem associated with home deliveries as against a little over 81 percent either from upper caste hindus or from scheduled caste hindus. Respondents differ significantly in reasons behind home deliveries by caste among hindus ($X_4^2 = 33.13 > 13.28$ at $P = 0.01$).

Reason, like do not foresee any problem with home delivery, is positively associated with education of the respondents. Distance of government institution from home as a factor for home delivery is inversely associated with education of the respondent. Overall, it seems that the respondents differ significantly for reasons behind home deliveries by education ($X_8^2 = 37.89 > 20.09$ at $P = 0.01$).

Education of spouse follows the similar pattern in reasons behind home deliveries as education of the respondents did. Respondents differed significantly by education of their spouse and

by reasons behind home delivery (X_8^2 = 43.98 > 20.09 at P = 0.01).

No clear cut relationship is noticed between percapita family income and reasons behind home delivery. However, it appears that respondents did differ significantly by reasons behind home deliveries and by percapita income in the family (X_4^2 = 12.94 > 9.49 at P = 0.05).

Among those who delivered the child at home, 99 percent from PHC villages did not foresee any problem associated with home delivery in comparison with about 84 percent from subcentre villages and 69 percent from other villages. More than 30 percent respondents from other villages stated distance as a reason behind home deliveries compared to about 14 percent from subcentre villages and 1 percent from PHC villages. Respondents in this sample do differ significantly in reasons behind home deliveries (X_4^2 = 131.54 > 13.28 at P = 0.01).

6.9 Prevalence of Immunization among Infants (aged 0 - 3 years):

Children especially infants are more susceptible to diseases such as tetanus , diptheria, whooping cough, Polio, tuberculosis etc. But through immunization, mortality and morbidity of infants and children due to above diseases can be prevented.

The scheme of immunization of infants and pre-school children against whooping cough, diptheria and tetanus were included in the Fourth Five Year Plan of India, 1969-74 (GOI 1968). However, the progress in the field of immunization was slow because of many problems associated with implementation of immunization programme.

In this section an attempt is made to assess the current status of immunization among children who were born in the last three years prior to survey reference date. Prevalent pattern of immunization of children is shown in Table 6.12. The respondents who reported having had births during the last three years prior to survey reference date were asked about immunization status of that child. Approximately 85 percent respondents reported that their child was immunized with B.C.G. and Polio vaccines and 87 percent reported that their child was immunized with DPT injections.

Prevalence rate of immunization was highest to the children of the respondents between age 25 and 34 years. But no consistent relation was observed by age of the respondents and by various type of immunization to their children. However, respondents differed significantly by age and by various type of immunization to their children ($X_4^2 = 23.54 > 13.28$ at $P = 0.01$).

Immunization of children by various kinds of immunization varies inversely with live birth order. Approximately 3 of the every four children at live birth order 5 or more were immunized either by B.C.G. or polio or DPT but about 9 of the every ten children were immunized at live birth order 4 or less. Thus the prevalence of immunization by kind of immunizations to the children differed significantly by live birth order ($X_4^2 = 28.91 > 13.28$ at $P = 0.01$).

Hindu children were likely to be immunized more in comparison with children from other religions ($X_2^2 = 17.27 > 9.21$ at $P = 0.01$).

Among hindus, children of other caste hindus were more likely be immunized by various kinds of immunizations in comparison with upper caste hindus. Lowest immunization rate was found among children of scheduled castes. The prevalence of immunization by kind of immunizations of children varies significantly by caste among Hindus ($X_4^2 = 20.14 > 13.28$ at $P = 0.01$).

In general, there is a positive association between prevalence of immunization to the children and by education of the respondents. Respondents differ significantly by education and by prevalence of various kinds of immunization of the children ($X_8^2 = 25.93 > 20.07$ at $P = 0.01$).

The prevalence rate of children by various kinds of immunization increases with increase in education of spouse of the respondents and is statistically highly significant ($X_8^2 = 50.52 > 20.9$ at $P = 0.01$).

Children of labourers (i.e. agriculture and other) participated in the immunization programme less frequently than the children of fathers in other trades. It appears that the prevalence rate of immunization of children varies directly with the occupational status of the spouse of the respondents. Children, in this sample areas differ significantly in terms of prevalence of immunization rate by kind of immunization and by occupational status of the spouse of the respondent ($X_8^2 = 64.64 > 20.09$ at $P = 0.01$).

An increase in percapita income of the family increases

the prevalence of kind of immunization of the children and is highly significant ($X_4^2 = 21.53 > 13.28$ at $P = 0.01$).

Respondents whose spouses normally are in the village (i.e. works within village boundary) were less likely to immunize their children than those whose spouses worked normally outside the village. Respondents differ in terms of immunization of their children by kind of immunization and by type of residential status of spouse ($X_2^2 = 10.16 > 9.21$ at $P = 0.01$).

Respondents from PHC villages were more likely to immunize their children by various kinds of immunization than those from the subcentive villages. Similarly respondents of subcentre villages were more likely to accept various types of immunization to their children than those from other villages. Respondents differ significantly in terms of prevalence of various kinds of immunization by type of residence ($X_4^2 = 25.33 > 13.28$ at $P = 0.01$).

Age Specific Prevalence Rate of Immunization of Children Aged (0 - 3) years:

An explanation will be attempted here to assess the current coverage of immunization of children who are below three years of age by various kinds of immunization. The prevalence rate of various kinds of immunization by age of children (in months) is provided in Table 6.13.

The prevalence rate for DPT is highest followed by BCG and Polio. The prevalence rates for various kinds of immunization (i.e. , BCG, Polio and DPT) were highest among those who live in

PHC villages followed by those in subcentre villages and other villages. Accessibility of PHC/subcentre increases the prevalence rates of immunization. It appears that prevalence rates by various kind of immunization of children were more, in general, to those who are below one year of age in comparison to those who are at age one or above. Therefore it seems that prevalence rate of immunization by various kinds are increases with age.

6.10 Conclusions:

Respondents from PHC villages , probably, think that the district hospital is better equipped and so most of them consider it as number one government health infrastructure . On the other hand , they pay little attention to the subcentre because most of them may not be aware of the existence of such health infrastructure at that level. Thus most known government institutions in health care in order of popularity among PHC respondents are district hospital, primary health centre, government dispensary and a few about subcentre and there are significant differences between respondents from subcentre villages and other villages. Primary health centre is the most known governmental institution for health care followed by district hospital , subcentre and government dispansery , among respondents from subcentre villages and other villages.

Respondents were mainly aware of availability of curative services in case of illness and preventive services at the government health institution. Comparatively, respondents were less

aware of services and advice of maternity dare and family planning provided by the government health institutions. This suggests that there is a great need to educate people regarding the kind of services available at each type of government health infrastructure from grass roots level to district hospital level.

Knowledge regarding health workers providing medical advice and services at the village level by visiting homes is very poor especially at PHC villages. Less number of people at PHC villages were aware of services provided by health workers at the village because it is likely that residents from PHC villages visit primary health centre more frequently in case of need and they may place little confidence in health workers other than the doctors/ physicians.

Respondents were more aware of ANM/LHV visiting homes for advice and guidance than male health workers such as family welfare workers, malaria workers etc. In general, there is little interaction between female in the household with male from outside and this might have an influence in understanding home visit by male health workers.

The prevalence rate of registration for antenatal care is very high and those registered for antenatal care also reported to have received tatanus toxiod (TT) and prophylaxis during antenatal period. However, there is a small gap between registrationfor antenatal care and the receipt of prophylaxis during antenatal period and research is needed to find out reasons behind this gap.

The paradox of this study is that inspite of high level of registration forantenatal care, most of the deliveries were domiciliar and were assisted by untrained persons. This is not unique in India and other studies confirm this observation (Ahluwalia 1963, Ghosh 1968, Charles 1971, Mathews 1979, Bhatnagar et al 1988). It seems that some social taboos are associated with home deliveries in India (Majumdar 1988). For this reason most of the respondents do not foresee any problems with home deliveries. More detailed and elaborate investigations are needed to find out the reasons behind home deliveries including the role of culture, prejudice and rumour.

Prevalence rates for various kinds of immunizations to children aged (0 - 3) years are only a few points behind the full score. This shows a very effective implementation of universal programme of immunisation (UPOI)

Education and percapita income play a positive role in terms of knowledge, type of services available and the extent of utilization of maternity and child health services. On the other hand, age religion/caste, do not provide any definite conclusion in terms of knowledge, availability of type of services and the extent of utilisation of such services.

Level of knowledge and utilisation of maternity and child health services may increase by keeping the live birth order stable at a very low level i.e. upto two children.

Location of health centre also plays a positive role in terms of knowledge, awareness and utilisation of maternity and child health services.

By improving the educational status, percapita income and keeping the live birth order stable at low level, it may be possible to increase the extent of knowledge, availability and utilisation of maternity and child care services and to do away with superstitions and prejudices associated with maternity and child birth.

Poverty and nonavailability of trained persons in India are to some extent responsible for high incidence of domiciliar deliveries as well as high attendance at deliveries by untrained persons and domiciliar deliveries very directly with infant mortality as well as percents of female deaths due to maternal causes (Majumdar 1989). Therefore, this study suggests that factors associated with home deliveries are to be investigated into first and proper action, such as a strong programme on information, education and communication is to be launched to remove prejudice, ignorance and myth associated with home deliveries. This will help to reduce infant and maternal mortality further by some points.

There is also a need to study the situation that prevails in various governmental health centres and whether that has any influence on the reluctance to deliver the child at these places.

Table 6.1 Percentage distribution of respondents by reported places for maternity and child health services and by type of residence

(Multiple responses)

Reported place for MCH Services	Respondent lives in			
	PHC villages	Subcentre villages	Other villages	Total
Primary health centre	88.2	82.3	82.4	84.1
Subcentre	5.0	48.9	50.8	34.5
Government dispensary	36.3	27.7	30.1	31.4
District hospital	93.4	64.0	73.7	70.4
Private clinics	5.2	5.4	3.8	4.8
Reported number of respondents	796	773	760	2329
(Non-reported number of respondents)	(3)	(2)	(3)	(8)

Table 6.2 Percentage distribution of respondents by knowledge regarding type of services available at the health centre and by residence. (Multiple responses)

Type of services at the health centre	Type of residence			
	PHC villages	Subcentre villages	Other villages	Total
Medical care	77.7	72.0	77.4	75.7
Preventive measures (control of epidemics/ immunisation services)	83.8	75.0	66.1	75.0
Maternal and child health care (Antenatal, intra-natal and postnatal)	75.9	59.3	50.0	61.9
Family planning	26.2	59.3	68.4	51.1
Malaria	0.3	0.3	0.4	0.3
Health and sanitation	0.1	0.4	0.1	0.2
Reported number of respondents	780	772	760	2312
(Non-reported number of respondents)	(16)	(1)	(-)	(17)

Table 6.3 Percentage distribution of respondents by knowledge of health workers from health centres providing service at the door step by type of residence

Health workers providing services at the door step	Type of residence			
	PHC village	Subcentre villages	Other villages	Total
Yes	21.7	63.8	60.1	48.2
No	78.3	36.2	39.9	51.8
Total (percentage)	100.0	100.0	100.0	100.0
Reported number of respondents	794	774	761	2329
(Non-reported number of respondents)	(5)	(1)	(2)	(8)

Table 6.5 Percentage distribution of respondents having at least one birth during the last three years prior to reference date of the survey by status of registration for antenatal care and by residence

Status of antenatal care (ANC)	Type of residence			
	PHC villages	Subcentre villages	Other villages	All villages
Registered	82.9	70.9	60.3	72.0
Not registered	13.4	25.8	34.9	24.1
No response	3.7	3.3	4.8	3.9
Total	100.0	100.0	100.0	100.0
Number of eligible respondents	538	477	461	1476

Table 6.6 Percentage distribution of eligible respondents eligible for antenatal care by demographic and socio-economic characteristics and by registration status for antenatal care

Demographic and socio-economic characteristics	Registered for antenatal care				
	Yes	No	Total	Reported number of respondents	Non-reported number of respondents
All eligible respondents-	74.9	25.1	100.0	1418	58
Age of respondents (in years)					
15 - 24	74.4	25.6	100.0	360	12
25 - 34	77.7	22.3	100.0	853	31
35 - 49	63.9	36.1	100.0	205	15
Live birth urder:					
1 - 2	81.2	18.8	100.0	717	23
3 - 4	73.3	26.7	100.0	518	23
5 or more	55.7	44.3	100.0	183	12
Religion/caste:					
Hindu					
Upper caste	74.3	25.7	100.0	1362	55
Other caste	76.4	23.6	100.0	538	25
Scheduled caste	86.4	13.6	100.0	345	11
Scheduled gtribes	63.3	36.7	100.0	479	19
Other religion	89.3	10.7	100.0	56	3
Education:					
Illiterate	56.5	43.5	100.0	593	26
Primary or below	81.0	19.0	100.0	210	11
Upto middle but above primary	84.5	15.5	100.0	226	11
Upto high school but above middle	93.3	6.7	100.0	297	8
High school and above	96.7	3.3	100.0	92	2
Educationoof sponse					
Illiterate	51.0	49.0	100.0	298	13
Primary or below	60.8	39.2	100.0	102	4
Upto middle but above primary	74.2	25.8	100.0	225	10
Upto high school but above middle	82.7	17.3	100.0	556	23
High school and above	93.2	6.8	100.0	237	8

Contd.

Demographic and socio-economic characteristics	Registered for antenatal care				
	Yes	No	Total	Reported number of respondents	Non-reported number of respondents
Percapita family income:					
Less than Rs. 150	61.5	38.5	100.0	478	26
Rs. 150 - 299	79.4	20.6	100.0	603	20
Rs. 300 and above	85.8	14.2	100.0	337	12
Type of villges respondents live in:					
PHC Villages	86.1	13.9	100.0	518	20
Subcentre villages	73.3	26.7	100.0	461	16
Other villages	63.3	36.7	100.0	439	22

Table 6.7 Percentage distribution of respondents eligible for antenatal care by type of residence and by place of registration for ANC by type of services availed and by place of surviving such services

Subject	Type of residence			
	PHC villages	Subcentre villages	Other villages	All villages
Number of eligible respondents	446	338	278	1062
Total	100.0	100.0	100.0	100.0
A. place of registration for ANC				
Primary health centre	72.9	79.6	61.9	72.1
Subcentre	0.4	8.3	2.1	3.4
Hospital	23.1	10.9	26.3	20.1
Private clinics and other	3.6	1.2	9.7	4.4
B. Tetanus toxoid:				
i) Received during pregnancy	98.7	99.7	100.0	99.3
ii) Place receiving T.T.				
Primary Health centre	72.6	79.6	61.9	72.0
Sub centre	0.5	8.3	2.1	3.4
Hospital	22.2	10.6	26.3	19.6
Private clinics and other places	3.4	1.2	9.7	4.3
C. Prophylaxis:				
i) Received during Pregnancy	95.5	98.2	99.3	97.4
ii) Place for receiving prophylaxis:				
Primary health centre	71.3	78.7	61.5	71.1
Sub centre	0.2	7.7	1.8	3.0
Hospital	20.6	10.6	26.3	18.9
Private clinics and other places	3.4	1.2	9.7	4.4

Table 6.8 Percentage distribution of non registered eligible respondents for antenatal care by home visit of female health workers from health centres and by residence

Type of residence	Female health workers(ANM/LHV) visited home for antenatal care			
	Yes	No	Total	Number of elig.respondents
PHC villages	3.6	96.4	100.0	56
Subcentre villages	5.2	94.8	100.0	96
Other villages	9.8	90.2	100.0	122
All villages	6.9	93.1	100.0	274

Table 6.9 Percentage distribution of respondents by demographic and socio-economic characteristics and by place of delivery

Demographic and socio-economic characteristics	Place of delivery				Number of respondents	
	Home	Primary health centre/ sub centre	Government hospital	Total	Reported	Not reported
All respondents	85.4	4.7	9.9	100.0	1409	67
Age group: (in year)						
15 - 24	82.0	8.6	9.4	100.0	361	11
25 - 34	85.1	3.3	11.6	100.0	845	39
35 - 49	93.1	3.4	3.4	99.9	203	17
Live birth order:						
1 - 2	78.1	7.0	14.9	100.0	712	28
3 - 4	92.6	2.1	5.2	99.9	516	25
5 or more	94.0	2.8	3.3	100.1	181	14
Religion/caste						
Hindu (Non S/C)	85.7	4.8	9.5	100.0	1353	64
Upper	81.4	8.0	10.6	100.0	539	24
Other	82.0	3.8	14.2	100.0	338	18
Scheduled caste	93.3	2.0	4.8	100.1	476	22
Other religion	78.6	1.8	19.6	100.0	56	3
Education:						
Illiterate	94.6	1.5	4.0	100.1	589	30
Literate but upto primary	86.2	5.2	8.6	100.0	210	11
Above primary but upto middle	84.4	3.6	12.0	100.0	225	12
Above middle but upto high school	76.5	8.5	15.0	100.0	294	11
Intermediate and above	56.0	14.3	29.7	100.0	91	3
Education of spouse						
Illiterate	96.0	1.3	2.7	100.0	295	16
Literate but upto primary	91.2	1.0	7.8	100.0	102	4
Above primary but upto middle	88.4	2.7	9.0	100.1	224	11
Above middle but below Intermediate	84.4	4.5	11.1	100.0	551	28
Intermediate and above	69.6	12.7	17.7	100.0	237	8

Contd...

Demographic and socio-economic characteristics	Place of delivery				Number of respondents	
	Home	Primary health centre/ sub centre	Government hospital	Total	Reported	Not reported
Percapita family income						
Less than Rs. 150	95.6	1.5	3.0	100.1	476	28
Rs. 150-299	93.8	3.7	12.5	100.0	600	23
Rs. 300 and more	73.8	11.1	15.0	99.9	333	16
Type of residents :						
PHC villages	81.5	4.5	14.0	100.0	513	25
Subcentre villages	89.3	4.6	6.1	100.0	458	19
Other villages	86.1	5.0	9.0	100.1	438	23

Table 6.10 Percentage distribution of home deliveries by demographic and socio-economic characteristics of the respondents and by type of attendant at delivery

Demographic and socio-economic characteristics	Type of attendant at delivery							Number of respondents	
	Household members	Untrained dai	Trained dai	ANV	LHV	Doctor	Total	Reported	Not reported
All respondents	7.0	55.4	12.7	11.8	10.8	2.3	100.0	1201	3
Age group(years)									
15 - 24	6.8	55.6	12.2	9.8	11.9	3.7	100.0	295	1
25 - 34	6.3	53.4	13.7	13.2	11.2	2.2	100.0	717	2
35 - 49	10.1	62.4	10.1	9.5	7.4	0.5	100.0	189	-
Live birth order:									
1 - 2	7.0	54.6	12.1	11.0	11.5	3.8	100.0	555	1
3 - 4	4.8	54.6	14.5	13.9	11.0	1.3	100.0	476	2
5 or more	13.0	60.0	10.0	8.8	7.6	0.5	99.9	170	-
Religion/caste									
Hindu	7.2	55.6	12.3	12.0	10.5	2.4	100.0	1157	3
Non-scheduled caste									
Upper	8.4	48.0	11.4	14.8	16.0	1.4	100.0	438	1
Other	4.0	45.0	18.1	18.1	11.6	3.3	100.1	276	1
Scheduled caste	8.0	69.8	9.5	5.4	4.5	2.9	100.1	443	1
Scheduled tribe									
Other religion	2.3	50.0	25.0	6.8	16.0	-	100.1	44	-
Education:									
Illiterate	11.3	62.7	9.5	7.9	6.8	1.8	100.0	557	-
Literate but upto primary	5.6	59.4	15.6	7.2	7.8	4.4	100.0	180	1
Above primary but upto middle	1.6	56.1	13.2	13.8	14.3	1.1	100.1	189	1
Above middle but below intermediate	2.2	39.7	17.0	20.5	17.9	2.7	100.0	224	1
Intermediate and above	5.9	27.4	17.6	25.5	19.6	4.0	100.0	51	-

Contd....

Demographic and socio-economic characteristics	Type of attendant at delivery							Number of respondents	
	Household members	Untrained dai	Trained dai	ANV	LHV	Doctor	Total	Reported	Not reported
Education of spouse:									
Illiterate	10.6	59.4	11.3	10.6	7.4	0.7	100.0	283	-
Literate upto primary	8.6	67.7	9.7	8.6	1.1	4.3	100.0	93	-
Above primary but upto middle	8.6	69.0	10.7	5.6	3.7	2.5	100.1	197	1
Above middle but below intermediate	5.6	55.1	14.5	11.5	10.8	2.5	100.0	463	2
Intermediate and above	1.8	38.2	14.5	24.2	18.2	3.0	99.9	165	-
Percapita family Income									
Less than Rs.150	9.9	54.0	13.0	11.4	10.4	1.3	100.0	454	1
Rs.150 - 299	5.0	56.4	12.4	12.5	11.6	2.2	100.1	502	1
300 and above	5.7	56.0	13.1	11.0	9.8	4.5	100.1	245	1
Type of residence:									
PHC villages	2.2	34.8	16.8	30.0	13.9	2.4	100.1	417	1
Subcentre villages	2.4	66.3	10.3	3.4	16.8	0.7	99.9	409	0
Other villages	17.3	66.4	11.0	0.8	0.5	4.0	100.0	375	2

Table 6.11 Percentage distribution of respondents with home deliveries by demographic and socio-economic characteristics and by reasons behind home delivery

Demographic and socio-economic characteristics	Reasons for home delivery					
	do not foresee any problem	Availability of trained persons	due to distance	Total	Number of respondents	
					Reported	Not reported
All respondents	84.7	0.9	14.4	100.0	1145	59
Age group(years)						
15 - 24	81.4	1.1	17.5	100.0	280	16
25-34	86.8	0.9	12.3	100.0	690	29
35 - 49	81.7	0.5	17.7	99.9	175	14
Live birth order:						
1 - 2	85.4	0.7	13.8	99.9	529	27
3 - 4	86.3	0.8	12.8	99.9	460	18
5 and above	77.6	1.3	21.2	100.1	156	14
Religion/caste:						
Hindu	84.8	0.7	14.5	100.0	1101	59
Non scheduled caste						
Upper	81.1	0.4	18.4	99.9	408	31
Others	95.5	0.3	4.1	99.9	268	9
Scheduled caste	81.6	1.2	17.2	100.0	425	19
Other religion	81.8	4.5	13.6	99.9	44	-
Education:						
Illiterate	79.7	1.3	19.0	100.0	528	29
Literate but upto primary	80.3	1.2	18.5	100.0	173	8
Above primary upto middle	89.6	-	10.4	100.0	183	7
Above middle but below intermediate	93.8	-	6.2	100.0	211	14
intermediate and above	96.0	2.0	2.0	100.0	50	1

Contd...

Demographic and socio-economic characteristics	Reasons for home delivery					
	do not foresee any problem	Availability of trained persons	due to distance	Total	Number of respondents	
					Reported	Not reported
Education of spouse:						
Illiterate	78.3	0.3	21.3	99.9	272	11
Literate but upto primary	73.3	2.2	24.4	99.9	90	3
Above primary but upto middle	82.4	2.1	15.4	99.9	188	10
Above middle but below intermediate	87.9	0.6	11.4	99.9	437	28
Intermediate and above	96.2	-	3.8	100.0	158	7
Percapita family Income						
Less than Rs.150	83.1	1.1	15.7	99.9	439	16
Rs.150 - Rs.299	86.2	0.6	13.1	99.9	472	31
Rs.300 and more	84.6	0.8	14.5	99.9	234	12
Type of residence:						
PHC villages	99.0	0	1.0	100.0	399	19
Subcentre villages	84.5	1.8	14.0	100.3	400	9
Other villages	68.8	0.8	30.3	99.9	346	31

Table 6.12 Prevalence rate per thousand children (0-3)years of age by various kind of immunization and by demographic and socio-economc characteristics of the respondents

Demographic and socio-economic characteristics	Prevalence rate per 1000 children age (0-3) years for			Number of respondent
	BCG	Polio	DPT	
All respondents	850	852	867	1476
Age group(years):				
15 - 24	821	818	852	372
25 - 34	874	874	884	884
35 - 49	798	821	826	220
Live birth order:				
1 - 2	884	874	895	740
3 - 4	835	854	859	541
5nor more	759	759	779	195
Religion/caste:				
Hindu	853	853	869	1417
Non scheduled caste				
Upper caste	892	879	896	563
Other caste	922	889	901	356
Scheduled caste	757	795	813	498
Other religion	769	820	837	59
Education:				
Illiterate	746	765	782	619
Literate upto primary	856	868	874	221
Above primary but upto middle	910	917	950	237
Above middle but below intermediate	962	917	931	305
Intermediate and above	955	952	944	94

Contd....

Demographic and socio-economic characteristics	Prevalence rate per 1000 children age (0-3) years for			Number of respondent
	BCG	Polio	DPT	
Education of spouse:				
Illiterate	658	664	687	311
Literate but upto primary	806	846	879	106
Above primary but upto middle	837	848	852	235
Above middle but below intermediate	910	906	914	579
Intermediate and above	966	942	970	245
Occupation of spouse:				
Labourer(Agriculture and other)	657	674	692	
Agriculture worker(own)	700	728	756	
Other workers private services, construction, family trade, students, etc.	873	855	867	
Business	805	873	891	
Govt./semi-governmental services	921	919	936	
Percapita family income:				
Less than Rs.150	766	776	795	504
Rs.150 - 299	879	891	899	623
Rs.300 and above	907	881	906	349
Place of work of spouse:				
(with reference to residence)				
Work within the village the resident	830	840	853	
Work elsewhere than the place of residence	914	894	917	
Type of residence:				
PHC villages	912	910	918	538
Subcentre villages	890	901	910	477
Other villages	733	731	761	461

Table 6.13 Age specific prevalence rate of immunizations per thousand children below three years of age by kind of immunizations and by type of residence

Current age/ age at death of children (in months)	Prevalence rate of immunization per 1000 children aged (0 - 3 years)											
	Type of residence											
	PHC villages			Subcentre villages			Other villages			All villages		
	BCG	Polio	DPT	BCG	Polio	DPT	BCG	Polio	DPT	BCG	Polio	DPT
0 - 2	632	636	618	758	531	594	500	452	452	626	542	557
3 - 5	843	778	860	893	800	846	429	381	429	748	692	763
6 - 8	957	909	891	870	905	909	800	706	865	881	838	886
9 - 11	1000	963	966	926	923	923	700	750	875	924	918	937
12 - 35	952	960	964	915	960	956	786	790	803	886	904	909
Total	913	907	914	894	895	904	724	719	753	848	845	862

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APPENDIX

CONFIDENTIAL

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Utilization of Maternal and Child Health Care and Family Planning Services in Rural Areas of Jammu Province (1986-87)

1. PHC..............................Sub-centre..........................Village...............................S. No...........Type of Village.....................
2. Distance from city....................................Distance from PHC............................Distance from Sub-centre..............................
3. Name of Head of Household..Religion...............................Caste..........................
4. Name of respondent...Description of respondent..
5. Household Structure :

S. No.	Couple No.	Name	Relationship	Sex	Date of Birth		Age	Correct age	Education	Marital Status	Residential Status	Main Occupation	Subsidiary Occupation	Monthly Income
					Month	Year								

6. Household Facilities :

(1) S. No. of houses	(2) New/Old	(3) Type of house	(4) Type of use	(5) No. of rooms	(6) No. of rooms for residential use	(7) Ownership

1. How many household(s) live in your residential house ?

....

2. Does your house-hold own

(i) Ox.............. (ii) Buffalo.............. (iii) Cow...........

(iv) Goat........... (v) Horse.............. (vi) Cycle...........

(vii) Well.................... (viii) Handpump.......................

(ix) Pumping Set.................... (x) Thrasher.....................

(xi) Cane Crusher............ (xii) Radio/Tape recorder...........

(xiii) T.V........................ (xiv) Fan.......................

(xv) Others.........................

7. Area under, (i) cultivation..(ii) garden..
8. Trade and commerce : Nature of business...
9. Average daily sale/profit Rs...
10. Use of milk/vegetables in your household : regularly/when produced/during ceremony/never.
11. From where do you get milk/vegetables ? Your own product/purchase/both.
12. Type of clothes generally used by the members of the Household : Superfine/fine/average/coarse.
13. What additional clothes you use in winter ? ....
14. Do your family members use foot-wear ? Yes/No
    If yes, type of foot-wear used :
    (i) Company made : Shoes/Chappals/Sleepers (ii) Hand made : Shoes/Chappals/Sleepers
    Do they use daily/frequently/only in ceremonies or other social functions.
15. Sources of Income : (i)..(ii)...(iii)..
    If possiple, yearly Income from each source : (i) Rs......................... (ii) Rs......................... (iii) Rs.........................

Marriage Record :

1 Couple No.	2 Name		3 Order of marriage		4 Age of husband at		5 Age of wife at			6 Date of return marriage		Inter... marr... return...
	Husband	Wife	Hus-band	Wife	Marri-age	Present/Death	Marri-age	Return marri-age	Present/death	Month	Year	

Birth Record For Eligible Couple only :

1 Parity	2 Name of Child	3 Sex	4 Survival status of child	5 Type of Birth	6 Time of Birth		7 Birth interval in months	8 Age of Child at present/death		m...
					Month	Year		Month	Year	

For Recent Births which occured within Last Three Years :

	Last child	Last but one ch...
NAME		
16. Whether the female was registered for antenental check up		
17. If No, go to 18		
If yes, (a) Where did she go for registration ?		
(b) Did she have tetanustoxoid ?		
(c) Did she receive tablets of 'ron and Folic acid ?		
Go to 19		
18. Whether any health worker ANM/LHV visited your home during pregnancy ?		
(a) If yes, did she/he advised for utilization of the health ser.ices ?		
(b) If No, reasons for not registering		
19. Where the child was delivered ?		
20. Who delivered ?		
21. If the child delivered at home why ?		
22. Did she has a.y complications in post-natal period ?		
23. If yes, who helped her ?		

24. Immunization Record :

	Last child		Last but one child	
	Ist year	2nd year	Ist year	2nd year
B. C. G..	Yes/No	—	Yes/No	—
D. P. T..	I / II / III		I / II / III	
Polio..	I / II / III	I / II / III	I / II / III	I / II / III

25. Place of Immunization ... ...
26. Do you know the government institutions where maternal and child health services are available ?
(i) ... ... (ii) ... ... (i i) ... ...
27. What services are available there ?
(i) ... ... (ii) ... ... (iii) ... ...
28. Do you know that health workers from these health centres are supposed to provide services at your village ?
29. If yes, who are those workers... ... ...
30. Have any of the workers from these service units (sub-centre/PHC) visited you/your home in last one year ? ... ...
31. If yes, who visited ... ...
32. What services do they especially emphasize ? ... ...
33. Did you ever avail of the services of Govenment Institutions ? Yes/No
34. If yes, to which services did you generally use ? ... ...
35. What problems did you have when you wished to use them ? ... ...
36. Family Planning Practices :

Methods	Known		Source of knowledge	Who provides the service
	Without probe	With Probe		
(i) Male Sterilization				
(ii) Tubectomy				
(iii) IUD				
(iv) Condom				
(v) Oral Pills				
(vi) Other female suen				
(vii) Rythem				
(viii) Withdrawl				
(ix) Abstain				
(x) Others (specify)				

37. Have you or your wife ever used ony method ? Yes/No
If No, Go to 39

	Methods used I	Methods used II	Methods currently using
38 (a) If yes name the methods ever used in order of use			
(b) After which live birth...			
(c) Duration of use...			
(d) Who motivated...			
(e) How would you rate the after care facilities as offered by the government ?...			
(f) How for you are satisfied with that method ?			
(g) How regularly was the method used ?...			
(h) Source of supply			
(i) Reasons for changing to next method...			

39. Why have you not used any method so far ?... ... ...
40. Did any family planning/health worker ever contact you for giving you information on family planning ? ... ...
41. What are your plans for use in future ? ... ...
42. If you or your wife intend to use what method you will like to use ? ... ...
43. Some women do something or have something done either by a mid wife or by a doctor or some other way to end the pregnancy that they do not want and have an abortion. Do you approve this ? Yes/No
44. Are you aware that in our country the induced abortion has been legalised and that women can have induced abortion free of cost in government hospitals ? Yes/No

INVESTIGATOR'S REPORT

Name of Investigator : ... ... Date... ... ...