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SAMPLE REGISTRATION
KERALA—RURAL

DIRECTORATE OF ECONOMICS AND STATISTICS,
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PREFACE

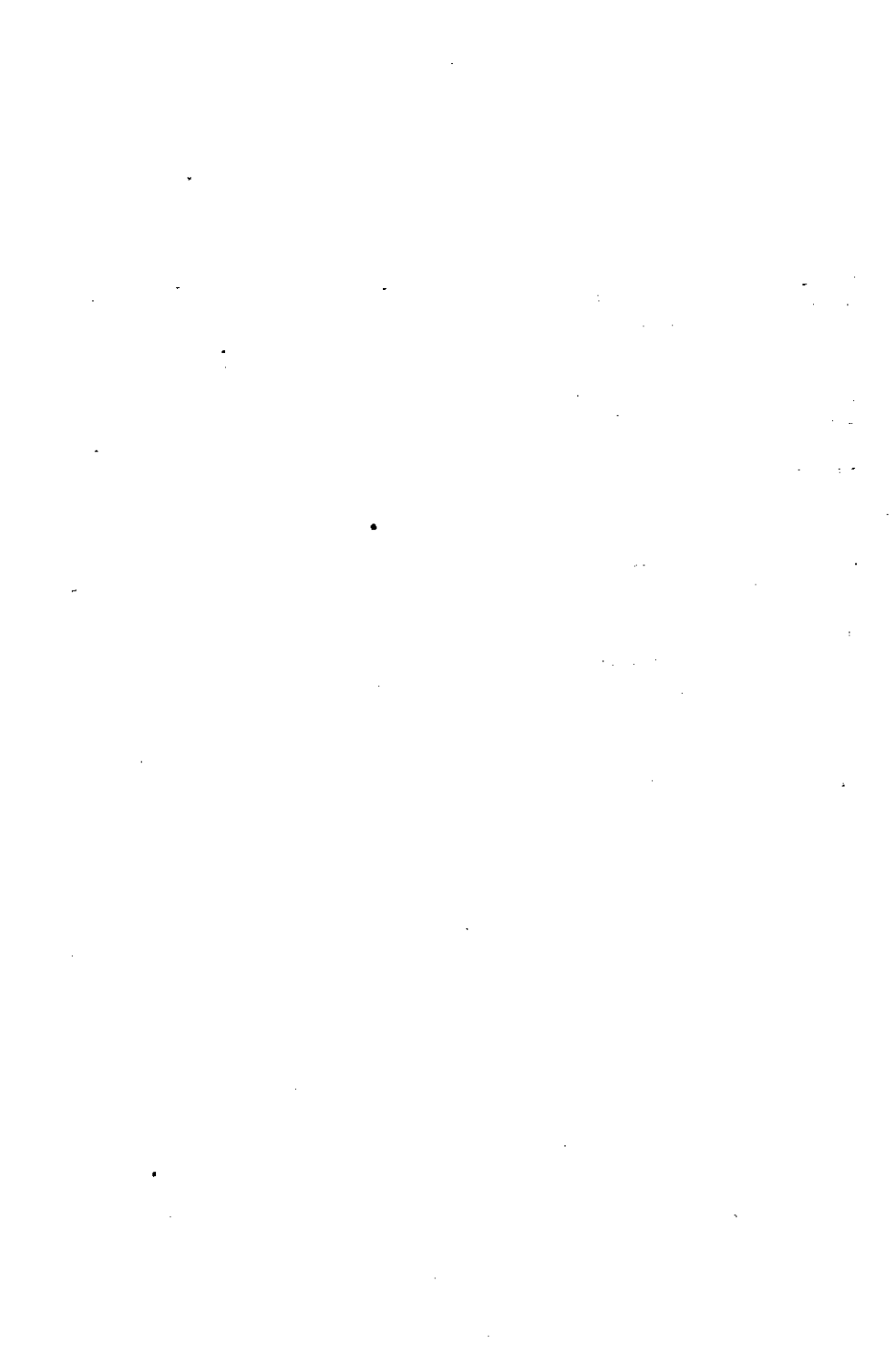
The Sample Registration Survey is conducted in all the States of India according to a Common Manual of Instructions issued by the Registrar General, Government of India. This survey is an approach to make available reliable estimates of birth and death rates and the growth rate of population.

In Kerala, the Directorate of Economics and Statistics is conducting the survey in the Rural Sector of the State. The survey in the urban sector of the State is conducted by the Census Department of the Government of India. This report presents the results of the survey conducted in the Rural Sector during the year 1977. Besides crude birth and death rates, a number of other results, derived from Sample Registration data have been included in this report. Special findings on vital rates for different religious groups, comparison of the rates for Malabar and Travancore-Cochin Regions of the State, are some of the unique features presented.

Shri S. Sthanukrishna Iyer, Deputy Director, Shri K. Ramanarayanan Nair, Regional Officer and Shri G. Aravindakshan Nair, Research Assistant were engaged in the preparation of this report.

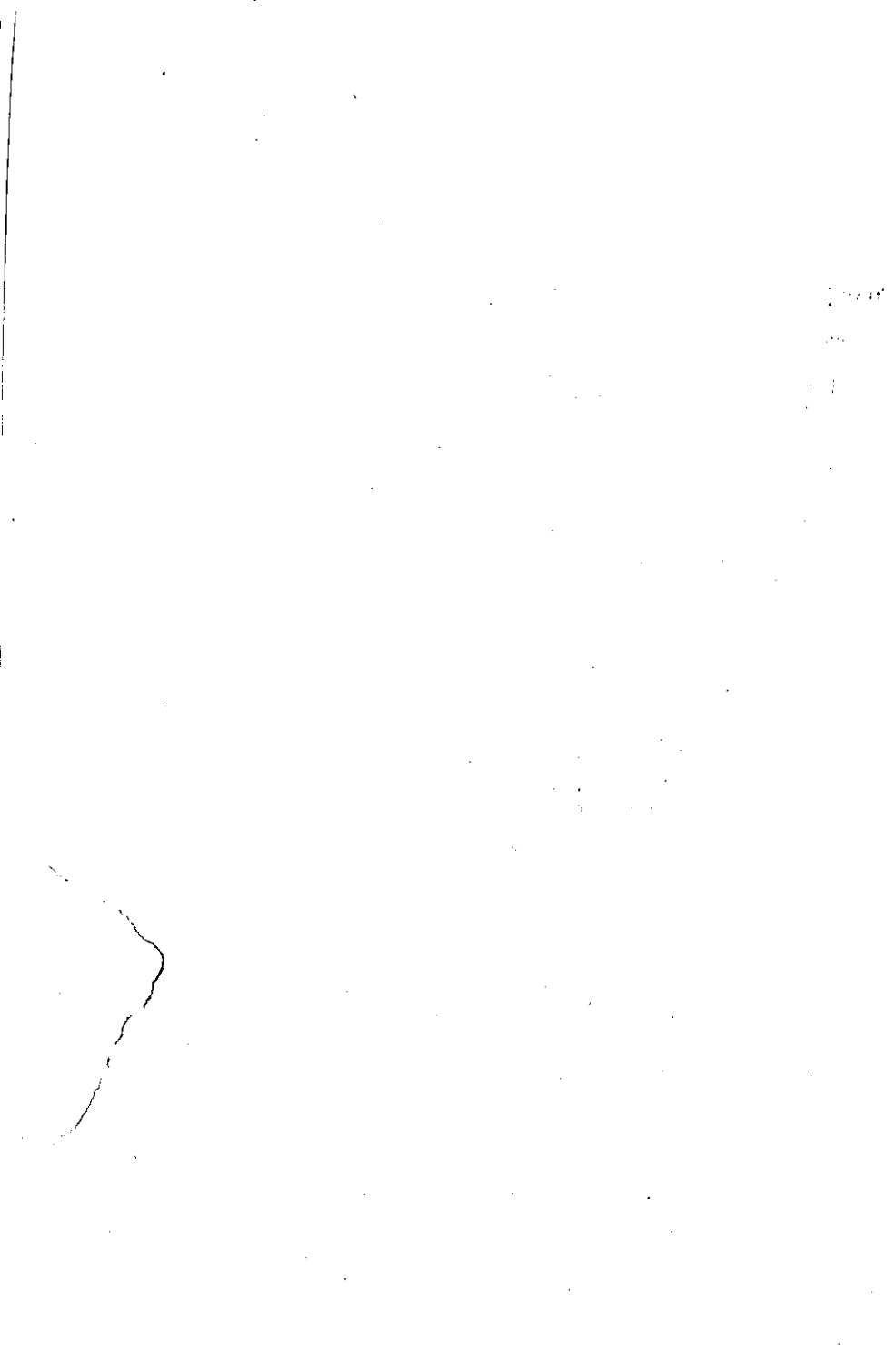
Trivandrum,
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DR. P. A. NAIR,
Director.



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CHAPTER I

SAMPLE REGISTRATION OF BIRTHS AND DEATHS IN KERALA—RURAL 1977

1. *Introduction*

This report presents the results of the operation of the scheme of Sample Registration in the rural areas of the State. The scheme continues on the same lines as in earlier years. In view of the continuing incompleteness in civil registration, the sample registration scheme is the only scheme for reliable birth and death rates.

As explained in earlier reports, the scheme was started in 1964-65 as a pilot project in 20 rural samples and 5 urban samples. The fullfledged scheme was introduced on 1-7-1965 in 150 samples in the rural areas on a regular basis. The Bureau of Economics and Statistics is responsible for the work in rural area. In urban areas, the work is done by the Director of Census Operations.

As in previous years the survey was conducted in the set of 150 rural samples where the work was done during the previous years. It may be noted that the samples were selected after stratifying the villages into four types according to the population such as below 500, 500-999, 1000-1999, 2000 and above under the three different regions of low-land, mid-land and high-land and allocating samples to different strata in proportion to the population of strata to the total population. It is therefore possible to have reliable stratum-wise estimates but not district-wise estimates. Details of allocation of sample units among strata are given in Table I appended.

1.1. *Staff*

The staff employed for the scheme previously continued this year also. 150 Enumerators were engaged in the field survey, 13 Computers in conducting half-yearly surveys and the Addl. District Statistical Officers in re-verification. The State Headquarters had the nucleus staff of Regional Officer, Research Assistant and Compilers under the Deputy Director (Population).

1.2. *Procedure of field work*

The Enumerators collected the details on a regular basis through the informants and by house visits. These were reported to the State Headquarters and the District Office. The computer conducted half-yearly survey to collect the details independent of the enumerator. The data collected by both the enumerator and computer were matched and reverification of unmatched events was done by the Additional District Statistical Officer.

1.3. *Overlapping Survey*

With every half-yearly survey, the details of the preceding half-year were also collected to bring out events missed by both the enumerator and computer. By this 138 births and 34 deaths have been detected during 1977.

1.4. *Intensive enquiry*

An intensive enquiry, in 51 selected samples was conducted in December, 1978 by the Senior Officers of this Directorate to detect missed events. 39 births and 6 deaths were detected through the intensive enquiry and these results were added to the results of the Calendar year 1977.

CHAPTER II

ESTIMATED POPULATION IN RURAL AREAS OF KERALA

2.1 *Population and its Growth*

The population in Kerala Rural estimated through SRS has increased from 18,890,056 on 1-1-1977 to 20,045,835 on 1-1-1978 recording a growth rate of 0.78 per cent as against 1.09 per cent during 1976. The actual growth rates during 1977 for lowland, midland and highland are 0.21 per cent, 0.91 per cent and 1.14 per cent respectively as against 0.74 per cent, 1.19 per cent and 1.20 per cent respectively during 1976.

2.2 *Percentage distribution of population by Age and Sex Ratio of each group*

Percentage distribution of population by Age for the years 1971, 1976 and 1977 is given in Table 2.2.

TABLE 2.2

Percentage distribution of population by Age and sex ratio In Rural Kerala for 1971, 1976 and 1977

Age Group	1971		1976		1977	
	Population Percentage	Sex ratio@	Population percentage	Sex ratio@	Population percentage	Sex ratio@
0-4	13.5	980	12.3	949	12.0	955
5-9	13.6	974	12.1	979	12.0	972
10-14	13.5	983	12.4	973	12.4	981
(0-14)	(40.6)	(978)	(36.8)	(965)	(36.4)	(970)
15-19	10.9	1078	11.7	1009	11.8	1014
20-24	9.2	1046	10.3	1109	10.2	1117
25-29	6.4	1103	8.0	1059	8.2	1041
30-34	5.6	1080	5.8	1091	5.8	1098
35-39	6.0	1080	5.3	1105	5.3	1091
40-44	4.6	1005	4.9	1130	4.9	1142
45-49	4.5	941	4.5	1060	4.5	1080
50-54	3.2	969	3.7	930	3.8	945
55-59	2.7	982	2.9	1026	2.9	994
60-64	2.3	1044	2.3	1009	2.3	1021
65-69	1.6	1086	1.6	1033	1.6	1058
70	2.4	1116	2.2	1122	2.3	1125
All ages	100.0	1020	100.0	1024	100.0	1027

@ No. of females per 1000 males.

During the year 1977, the percentage distribution of population in the age group 0-14 showed a decline when compared to that of 1971 and 1976. The percentage distribution of population in the age groups of 30-34, 35-39, 40-44, 45-49, 60-64 and 65-69 during the year 1977 maintained more or less the same level of 1976.

With regard to sex ratio during the year 1977, males outnumber females in the age group of 0-14 consisting of 0-4, 5-9 and 10-14. A reverse trend is seen in all other age groups except 50-54 and 55-59 age groups. The sex-ratio in total population showed a slight increase when compared to the sex-ratio for the years 1971 and 1976.

CHAPTER III

FERTILITY MEASURES

3.1 Introduction

The most common measure of fertility is the crude birth rate. Other measures of fertility are the general fertility rate, age specific fertility rate, total fertility rate and gross reproduction rate. Estimates of these are presented here.

3.2 *Crude Birth rate = No. of live births in an year \times 1000 \div Population.*

The crude birth rate for the rural areas of Kerala for the year 1977 is estimated as 26.2 per 1000 population as against 28.5 for the year 1976. The births to visitors in the households are not included here. The birth rate for rural Kerala and for the Natural Regions for the years 1970 to 1977 are given in Table 3.2

TABLE 3.2

Crude birth rate in (1970-1977) Rural Kerala and All India Rural

Year	Natural Regions in Kerala			Kerala Rural	All India Rural
	Low land	Midland	Highland		
(1)	(2)	(3)	(4)	(5)	(6)
1970	30.4	32.5	34.4	32.3	38.9
1971	31.4	32.0	32.4	31.9	38.9
1972	30.5	32.4	33.4	32.1	38.4
1973	27.8	30.0	33.0	29.9	35.9
1974	25.6	27.0	29.3	27.0	35.9
1975	25.9	27.9	32.8	28.2	36.7
1976	26.4	28.7	30.8	28.5	35.8
1977	24.8	26.2	28.7	26.2	34.2

Compared to the year 1976, the birth rate in all the three regions shows a decreasing trend. A sequential increase in the birth rate from the lowest in lowland regions to next higher in the midland and the highest in the highland is also observed as in the case of the previous years.

3.3 Birth rates in Malabar and T. C. Areas of Kerala (Rural)

The State can be divided into two distinct regions, viz Malabar region and Travancore-Cochin region, based upon the historical development and socio-economic conditions. The Malabar region consists of 4 northern districts and the Travancore-Cochin region consists of the remaining seven districts. Out of 150 rural samples selected for Sample Registration System, 71 samples fall in Malabar region and the remaining 79 samples in Travancore Cochin region. Rural birth rates in the above two regions are given in Table 3.3

TABLE 3.3

Rural birth rates in Malabar and T.C. Regions

<i>Year</i>	<i>Malabar</i>	<i>T. C.</i>	<i>Kerala</i>
(1)	(2)	(3)	(4)
1974	30.09	24.01	26.96
1975	31.57	25.23	28.17
1976	31.87	25.31	28.50
1977	28.92	23.64	26.22

When comparing the birth rates for the years 1974 to 1977, it is seen that the birth rate is higher in Malabar region. This higher birth rate may be due to the concentration of Muslims in Malabar. The factors responsible for the higher birth rate among Muslims may be the lower age of females at marriages, and indifferent attitude towards family Welfare Programmes. The Muslims in the rural areas of Malabar form 33.54 percent of the total rural population of that region as against 13.25 per cent in rural T.C. region and 16.35 per cent in rural Kerala.

3.4 Birth rates by the religious groups

The birth rates for the major religious groups in the State for the year 1977 are given in table 3.4.

TABLE 3.4

Birth rate for Hindus, Muslims and Christians, 1977

<i>Region</i>	<i>Hindus</i>	<i>Muslims</i>	<i>Christians</i>
Lowland	22.38	35.99	20.12
Midland	23.96	36.31	18.83
Highland	28.27	35.64	21.78
STATE	24.30	36.17	19.39

The birth rate for Muslims in State level and all the three natural regions is the highest followed by Hindus. The birth rate is lowest among Christians.

3.5 *Distribution of Samples by birth rates*

The distribution of Samples by birth rate is given in Table 3.5

TABLE 3.5

Distribution (Numbers) of Samples under different rates of birth

		Birth Rate																			
		16		16-19.9		20-23.9		24-27.9		28-31.9		32-35.9		36-39.9		40-43.9		44+		All	
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
1977 Rural																					
Malabar	1	1.4	6	8.5	7	9.8	15	21.1	19	26.8	13	18.3	4	5.6	5	7.1	1	1.4	71	100.0	
1977 Rural																					
T.C. area	7	8.9	18	22.8	22	27.8	15	19.0	8	10.1	5	6.3	1	1.3	2	2.5	1	1.3	79	100.0	
1977 Rural																					
Kerala	8	5.4	24	16.0	29	19.3	30	20.0	27	18.0	18	12.0	5	3.3	7	4.7	2	1.3	150	100.0	
1976 Rural																					
Kerala	6	4.0	10	6.7	30	20.0	29	19.3	30	20.0	16	10.7	13	8.7	11	7.3	5	3.3	150	100.0	
1975 Rural																					
Kerala	5	3.3	18	12.0	17	11.3	36	24.0	30	20.0	17	11.3	16	10.7	10	6.7	1	0.7	150	100.0	
1974 Rural																					
Kerala	7	4.7	14	9.3	32	21.3	33	22.0	30	20.0	23	15.3	5	3.3	5	3.3	1	0.7	150	99.0	

Birth rate 28

1977 Malabar 19.3 % of the Samples (40.8% of sample in Malabar area)
 1977 T.C. 41.3 do. (78.5% " " T.C. area)
 1977 Kerala 60.7 do. (60.7% of total samples)

It is seen from the distribution of samples that 60.70% of samples have birth rate below 28 for the State as a whole during the year 1977 as against 50% of samples during 1976. 40.8 per cent of samples in Malabar area have birth rate below 28 as against 28.1 percent samples during 1976. In Travancore-Cochin area 78.5% of samples have birth rate below 28.

3.6 Age Specific Fertility Rate

Age Specific Fertility Rate is the number of live births in an year to 1000 women of specific age group. The age specific Fertility Rates for 1977 and for a few previous years are given in Table 3.6

TABLE 3.6
A.S.F.R. in Kerala Rural 1971-77

Age of mother	1971	1972	1973	1974	1975	1976	1977
15-19	49.1	50.6	48.8	44.5	41.6	42.7	44.2
20-24	213.9	212.6	206.5	179.3	188.5	193.4	186.2
25-29	226.6	238.5	221.8	190.2	194.8	202.3	171.9
30-34	175.8	174.9	153.6	134.3	134.0	137.1	113.1
35-39	118.4	119.3	99.9	86.3	94.1	80.7	75.9
40-44	43.6	45.7	39.6	25.7	29.8	25.3	24.3
45-49	7.0	6.3	6.0	6.9	5.4	6.1	5.6

Compared to the year 1971 and 1976 the A.S.F.R. in all the age groups except 15-19 have considerably decreased during the year 1977 as a result of the decline in the birth rate. The A.S.F.R. in the age group of 15-19 has shown slight increase when compared to the year 1976.

3.9 Gross Reproduction Rate

Gross Reproduction Rate is the average number of female children that would be born per woman among a group of women if they pass through their reproductive age of 15-49 experiencing the same schedule of A.S.F.R.

The G.R.R. for Kerala—Rural for the year 1972 to 1977 are given below:—

Year	1972	1973	1974	1975	1976	1977
G. R. R.	2.1	1.9	1.6	1.7	1.7	1.5

3.7 Total Fertility Rate

Total Fertility Rate (T.F.R.) is the average number of children that would be born to a woman if she experiences the same schedule of A.S.F.R. while passing through the reproductive age group of 15-49. The T.F.R. for Keral Rural for 1977 and for a few previous years are given below:—

Year	1971	1972	1973	1974	1975	1976	1977
T.F.R.	4.1	4.2	3.9	3.3	3.4	3.4	3.1

The T.F.R. for lowland, midland and highland during the year 1977 is estimated at 2.8, 3.4, and 3.5 respectively.

3.8 General Fertility Rate

General Fertility Rate (G.F.R.) is the number of live births in an year to 1000 women in the reproductive age group of 15-49. The G.F.Rs for Kerala. Rural for the years 1971 to 1977 are given below:—

Year	1971	1972	1973	1974	1975	1976	1977
G.F.R.	126.7	127.9	118.4	104.0	108.0	109.0	99.4

3.10 Order of birth

The observed number of births by age of mother and order of birth of child during the year 1977 are given in table 3.10.

Age of mother and order of birth of child—1977

Age group	Order of birth									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10) Total
15-19	574	61	8	..	..	..	..	..	..	643
20-24	1182	880	333	48	9	1	1	..	..	2454
25-29	256	406	247	397	125	45	11	1	..	1758
30-34	33	107	159	191	162	102	53	19	7	41
35-39	8	29	38	74	84	96	81	60	27	516
40-44	..	..	1	6	24	28	30	18	19	146
45-49	..	..	..	3	5	6	7	3	5	32
Total	2058	1543	1036	629	409	278	183	101	53	45 6390

It can be seen from the above table that 73.34 per cent of total births comes under the first three orders and the remaining 26.66 per cent of births falls under orders above 3. The percentages of births under orders above 3 during 1974, 1975 and 1976 are 32.6, 31.6 and 28.8 respectively. Out of 6390 live births observed during the year 1977, 32.20% comes under the first order of birth in the age groups 15-39.

3.11 Medical attendance at birth

The percentage of births under different types of medical attendance is given in Table 3.11.

TABLE 3.11
Medical Attendance at Birth (Percentage)

<i>Year</i>	<i>Institutional</i>	<i>Trained Professional</i>	<i>Untrained Professional</i>	<i>Non Professional</i>	<i>Not stated</i>
1972	25.1	19.3	38.9	16.5	0.2
1973	26.0	20.4	36.2	17.4	0.0
1974	28.1	20.8	37.5	13.2	0.4
1975	28.8	21.8	34.8	14.3	0.3
1976	32.1	19.8	32.6	14.8	0.7
1977	35.6	17.6	31.8	13.9	1.1

It is seen from the above table that the percentage of births under the institutional attendance has been increasing year by year which reveals that people are becoming more and more aware of the facilities and benefits of institutional attendance. In highland region, the percentage of medical attendance of birth is low when compared to lowland and midland regions. The low percentage of medical attendance of birth in this region may be due to the lower level of socio-economic conditions of this region in respect of education, health, transport, etc.

3.12 Still birth rate (S.B.R.)

The still birth rates for the year 1977 and for a few previous years are given below:

<i>Year</i>	1972	1973	1974	1975	1976	1977
S.B.R.	27.25	25.01	18.28	19.44	26.18	19.30

The still birth rate for the year 1977 Kerala rural has been estimated as 19.30 for 1000 live births as against 26.18 during 1976. Among the natural regions the still birth rate is highest for midland (20.36) followed by lowland (18.22) and highland (16.46).

3.13 Sex-ratio at birth

The sex-ratio at birth (number of males for 100 females) for the year 1977 and for the last six years are given below:

<i>Year</i>	<i>Sex ratio at birth</i>
1971	107.9
1972	105.7
1973	110.2
1974	103.2
1975	108.0
1976	100.5
1977	103.6

The sex-wise classifications of the live born children of the rural samples of Kerala during 1977 show that more males are born alive than females. The sex-ratio at birth during the year 1977 is 103.6, which is greater than that of the year 1976.

3.14 Child Woman Ratio

Child woman ratio may be defined as the number of children in the age group 0-4 years per 1000 women in the reproductive age group of 15-49. The child woman ratio for the areas of Kerala Rural for the year 1977 is estimated as 457. This ratio is considerably low when compared to the ratios for the years 1971 to 1976. The child woman ratio for the years 1971 to 1977 is given below—

<i>Year</i>	1971	1972	1973	1974	1975	1976	1977
<i>C.W.R.</i>	519	520	511	479	463	470	457

CHAPTER IV

MORTALITY MEASURES

4.1 Crude death rate

The crude death rate for Kerala Rural for the year 1977 is estimated as 7.5 as against 8.3 for the year 1976. The rate relates to the usual resident population. The deaths to visitors are not taken into account for estimating the death rates. The death rates for Kerala Rural and for all India Rural are given in Table 4.1.

TABLE 4.1

Crude death rate (1970-77) in Kerala Rural and All India Rural

Year	Natural regions in Kerala			Kerala Rural	All India Rural
	Lowland	Midland	Highland		
1970	8.7	9.1	10.6	9.2	17.3
1971	8.5	9.2	10.4	9.2	16.4
1972	8.2	9.5	11.0	9.4	18.9
1973	8.8	8.5	9.3	8.7	17.0
1974	8.1	7.7	9.6	8.0	15.9
1975	8.5	8.4	9.1	8.5	17.5
1976	8.6	7.7	10.4	8.3	16.3
1977	7.4	7.3	8.4	7.5	16.0

The death rates for Kerala Rural since 1970 have shown a declining trend. Among the natural regions of Kerala the death rate is highest in highland as in the case of birth rate. Since 1970 the death rates for Kerala Rural are very low when compared to the death rates of all India Rural.

4.2 Death rate in Malabar and Travancore-Cochin region

The death rates in Malabar and Travancore-Cochin regions since 1974 are given in Table 4.2.

TABLE 4.2

Rural death rate in Malabar and Travancore-Cochin regions

<i>Year</i>	<i>Malabar</i>	<i>Travancore-Cochin</i>	<i>Kerala Rural</i>
1974	8.89	7.15	8.0
1975	9.18	7.93	8.5
1976	8.91	7.71	8.3
1977	8.39	6.64	7.5

It is seen from the above table that the Malabar region recorded a higher death rate than Travancore-Cochin regions in all the years. The difference in death rate between these two regions may be due to the differences in socio-economic conditions of these regions.

4.3 Death rates for religious groups

The death rates for the major three religious groups for the year 1977 are given in Table 4.3.

TABLE 4.3

Death rates for religious groups (1977)

<i>Region</i>	<i>Religious</i>		
	<i>Hindus</i>	<i>Muslims</i>	<i>Christians</i>
Lowland	7.54	7.66	6.25
Midland	7.60	8.76	4.32
Highland	8.78	8.82	7.10
State	7.79	8.54	4.98

Among the three major religious groups Christians have a low death rate in all the three natural regions. Muslims in all regions of the State have highest death rate followed by Hindus.

4.4 Distribution of samples by death rates

The distribution of samples by death rate is given in Table 4.4.

TABLE 4.4

Distribution of number of samples under different rates of death

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	Total
		< 3	3-4.9	5-6.9	7-8.9	9-10.9	11-12.9	13-14.9	15-16.9	17+	
1977 Rural	No.	5	6	11	21	10	12	3	3	..	71
Malabar	%	7.0	8.5	15.5	29.6	14.0	17.0	4.2	4.2	..	100.00
1977 T. C.	No.	4	21	25	14	8	3	2	2	..	79
area	%	5.0	26.6	31.6	17.7	10.1	3.8	2.6	2.6	..	100.0
1977 Kerala	No.	9	27	36	35	18	15	5	5	..	150
Rural	%	6.0	18.0	24.0	23.4	12.0	10.0	3.3	3.3	..	100.0
1976 Kerala Rural	No.	8	16	27	38	28	22	6	3	2	150
	%	5.3	10.7	18.0	25.3	18.7	14.7	4.0	2.0	1.3	100.00
1975 Kerala Rural	No.	3	18	30	40	33	10	7	5	4	150
	%	2.0	12.0	20.0	26.7	22.0	6.7	4.7	3.3	2.7	100.1
1974 Kerala Rural	No.	5	22	42	32	24	13	7	1	4	150
	%	3.3	14.7	28.0	21.3	16.0	8.7	4.7	0.7	2.7	100.1

It can be seen from the above table that 71.4% of samples have death rate below 9 as against 59.3 during 1976 and the remaining 28.6% of samples have death rates between 9 and 16.9 during the year 1977 as against 39.4 in 1976. In Travancore-Cochin area 80.9% samples have death rate below 9 while in Malabr area 60.6% samples have death rates below 9.

4.5 Age specific death rate:

Age specific death rate (ASDR) is the number of deaths in a specified age group in an year to thousand persons of that age group. The age specific death rates for males and females for the year 1977 are given in Table XI appended. Age group 70 and above has the higher death rate followed by the age group 65-69 and 0.1. The death rate is lowest in the age group of 10-14 both for males and females.

4.6 Infant mortality rate.

Infant mortality rate (IMR) is the number of deaths of infants (below 1 year) in an year out of 1000 live births. The IMRS for Kerala Rural for the years 1972 to 1977 are given below:

Region	1972	1973	1974	1975	1976	1977
Lowland	55.3	46.6	30.7	45.8	57.3	44.9
Midland	61.2	46.8	55.4	58.1	50.8	46.6
Highland	101.7	78.1	95.2	68.5	77.4	71.4
State	66.0	51.7	55.9	57.3	56.3	50.1

As in the case of previous years, the infant mortality rate is highest for the highland region. The IMRS, for all the three regions have decreased during the year 1977.

4.7 Medical attendance at death

The percentage of deaths under different types of medical attendance for the year 1972 to 1977 is given in Table 4.7.

TABLE 4.7

Medical attendance at death (Percentage)

<i>Year</i>	<i>Institutional</i>	<i>Recognised practitioner</i>	<i>Unrecognised practitioner</i>	<i>None</i>
1972	19	34	17	30
1973	17	33	22	28
1974	18	36	19	27
1975	20	36	16	28
1976	24	31	19	26
1977	22	33	19	26

The above table shows that 26 per cent of deaths for the year 1977 has not received any medical attendance. The percentage of deaths attendance by unrecognised practitioners for the year 1977 is 19 which maintained the same position of the previous year. Institutional deaths for the year 1977 have slightly decreased while the percentage of deaths attended by recognised medical practitioner has increased when compared to the previous year.

4.8 *Expectation of life.*

Life tables have been constructed using the average values of age specific death rates for the years 1975, 1976 and 1977 and are presented in Tables XIX, XX and XXI appended to this report. The expectation of life at birth is 62.53 years for males and 65.17 years for females. The expectation of life for the population as a whole is worked out as 63.78. Females have higher expectation of life at all ages than males.

APPENDIX

List of Tables

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TABLE I

Number of units and 1961 population in the universe and in the samples

Stratum	Universe			Sample				
	No. of units (1961 census)		No. of units selected (n)	Population 1961	% of units selected (n/N)	% of sample population (n/n)	Raising factor for stratum estimates(N/n)	
	Segments (N)	Census villages						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
I A	85	85	27545	1	494	1.18	1.79	85.00000
B	164	164	126496	1	632	0.61	0.50	164.00000
C	349	349	512766	5	7659	1.43	1.49	69.80000
D	1718	609	2731775	29	43473	1.69	1.59	59.24138
Lowland	2316	1207	3398582	36	52258	1.55	1.54	..
II A	498	498	151292	1	341	0.20	0.23	498.00000
B	791	791	596342	6	5241	0.76	0.88	131.83333
C	1178	1178	1722319	18	27057	1.53	1.57	65.44444
D	4066	1566	6213177	66	101026	1.62	1.63	61.60606
Midland	6533	4033	8683130	91	133665	1.39	1.54	..
III A	77	77	20310	..	976	1.45	1.89	69.00000
B	69	69	51719	1	4950	2.07	2.29	48.33333
C	145	145	215801	3	30145	1.64	1.59	61.10326
D	1161	356	1897998	19	36071	1.58	1.65	..
Highland	1452	647	2185828	23	221994	1.46	1.56	..
STATE	10301	5887	14267540	150	..	..	..	..

TABLE II

Observed population in the samples and estimated population for strata

Region/Stratum	Observed population in samples in each stratum (Retained area)				Estimated population for each stratum		
	1-1-1977	1-7-1977	1-1-1978	(4)	(5)	(6)	(7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)
I A	666	668	671	56610	56780	57035	57035
B	1121	1136	1080	183844	186304	177120	177120
C	7956	7932	7984	701713	699599	704183	704183
D	47814	47956	47991	3548866	3559405	3562004	3562004
Lowland	57557	57692	57726	4491033	4502088	4500342	4500342
II A	428	433	430	213144	215634	214140	214140
B	6779	6741	6715	893698	888688	885261	885261
C	30465	30726	30735	2404022	2424616	2425328	2425328
D	111162	112230	112395	9035174	9121920	9135391	9135391
Midland	148834	150130	150275	12546038	12650918	12660120	12660120
III B	1203	1220	1218	83007	84180	84042	84042
C	5001	4999	5080	241715	241617	245533	245533
D	29566	29651	29888	2528263	2535534	2555798	2555798
Highland	35770	35870	36186	2852985	2861331	2885373	2885373
STATE	242161	243692	244187	19890056	20014337	20045835	20045835

AMPLE REGISTRATION (RURAL SAMPLES)—KERALA 1977

TABLE IV

Mid year population (observed in retained portion and estimated population) according to age and sex

Age	Observed population		Total	Estimated population		Total
	Male	Female	(4)	Male	Female	(7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0—1	3103	3110	6213	254034	254710	508744
1—4	11856	11177	23033	970813	913682	1884495
5—9	14855	14440	29295	1215332	1189388	2404720
10—14	15279	14989	30268	1255746	1228038	2483784
15—19	14304	14504	28808	1177555	1193705	2371260
20—24	11723	13096	24819	961729	1072257	2033986
25—29	9788	10189	19977	803351	837524	1640875
30—34	6733	7391	14124	552455	609060	1161515
35—39	6169	6729	12898	508912	553712	1062624
40—44	5562	6349	11911	456205	521037	977242
45—49	5279	5703	10982	433112	469294	902406
50—54	4727	4468	9195	387125	366206	753331
55—59	3528	3505	7033	290881	288216	579097
60—64	2804	2864	5668	231644	237081	468725
65—69	1930	2042	3972	159227	169315	328542
70+	2587	2909	5496	213293	239698	452991
Total	120227	123465	243692	9871414	10142923	20014337

TABLE V

Live births observed in retained portion and estimated for stratum for the year 1977

Stratum/Natural Division/ State	Observed in retained portion			Estimated births		
	Male	Female	Total	Male	Female	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I A	7	12	19	595	1020	1615
B	11	14	25	1804	2296	4100
C	100	81	181	8820	7144	15964
D	622	584	1206	46166	43346	89512
Lowland	740	691	1431	57385	53806	111191
II A	7	4	11	3486	1992	5478
B	75	77	152	9887	10151	20038
C	392	383	775	30933	30222	61155
D	1542	1449	2991	125332	117774	243106
Midland	2016	1913	3929	169638	160139	329777
III B	13	18	31	897	1242	2139
C	74	84	158	3576	4060	7636
D	408	433	841	34889	37027	71916
Highland	495	535	1030	39362	42329	81691
STATE	3251	3139	6390	266385	256274	522659

SAMPLE REGISTRATION SCHEME (RURAL SAMPLES)—KERALA 1977

TABLE VII

Live Births observed in samples classified by month of occurrence 1977

Stratum/Natural Division/State	Number of live births reported from samples													
	Total	January	February	March	April	May	June	July	August	September	October	November	December	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
I A	19	2	2	2	2	4	1	1	1	2	1	..	1	
B	25	..	4	2	5	6	1	2	1	2	..	1	1	
C	181	16	19	15	17	14	18	18	14	9	15	14	12	
D	1206	121	98	105	103	102	104	96	96	82	111	85	103	
Low land	1431	139	123	124	127	126	124	117	112	95	127	100	117	
II A	11	1	1	2	..	..	1	..	..	1	3	..	2
B	152	13	12	19	14	9	16	14	15	6	15	11	8	
C	775	58	72	83	80	72	65	57	55	52	64	62	55	
D	2991	187	277	282	246	346	257	273	219	226	252	213	213	
Mid land	3929	259	362	386	340	427	339	344	289	285	334	286	278	
III B	31	7	2	3	2	3	3	1	2	3	..	3	2	
C	158	19	14	13	14	8	10	14	16	18	..	9	12	
D	841	72	80	79	93	67	75	60	62	53	64	62	75	
High land	1030	98	96	95	109	78	87	75	80	74	75	74	89	
STATE	6390	496	581	605	576	631	550	536	481	454	536	460	484	

SAMPLE REGISTRATION SCHEME (RURAL SAMPLES)—KERALA 1977

TABLE VIII

Live births by type of attention at delivery

Stratum	Type of attention				Total
	Institutional	Trained professional	Untrained professional	Non-professional	
I					
A	10	2	7	..	19
B	9	2	10	4	25
C	100	21	58	2	181
D	525	332	326	18	1206
Low land	644	357	401	24	1431
II					
A	9	1	1	..	11
B	83	23	44	2	152
C	302	162	256	55	775
D	1048	474	998	449	2991
Mid land	1442	660	1299	506	3929
III					
B	3	..	12	16	31
C	11	4	..	105	158
D	175	105	319	235	841
High land	189	109	331	356	1030
STATE	2275	1126	2031	886	6390

TABLE IX

Observed deaths, deaths in sample area and estimated deaths by sex

Stratum	Observed deaths			Deaths in sample area			Estimated deaths		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
I A	..	2	2	..	2	2	..	170	170
B	5	5	10	5	5	10	820	820	1640
C	32	25	57	40	32	72	2822	2205	5027
D	174	183	357	218	229	447	12915	13582	26497
Low land	211	215	426	263	268	531	16557	16777	33334
II A	2	2	4	2	2	4	996	996	1992
B	30	17	47	30	17	47	3955	2241	6196
C	128	95	223	154	115	269	10101	7496	17597
D	421	396	817	555	522	1077	34219	32186	66405
Mid land	581	510	1091	741	656	1397	49271	42919	92190
III B	6	7	13	6	7	13	414	483	897
C	19	36	55	19	36	55	918	1740	2658
D	128	112	240	179	157	336	10946	9577	20523
High land	153	155	308	204	200	404	12278	11800	24078
STATE	945	880	1825	1208	1124	2332	78106	71496	149602

TABLE X

Number of deaths by age and sex—1977

Region	Sex	Age in years																	
		All ages	Below one	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
Low land	All	426	62	25	13	5	6	11	7	3	7	10	11	12	29	46	38	141	
Mid land	All	1091	176	111	37	18	15	23	15	15	22	32	39	46	60	89	89	302	
High land	All	308	75	32	15	6	9	13	10	6	2	7	9	10	19	21	13	61	
STATE	Male	945	166	81	28	15	13	23	13	13	16	26	37	42	64	81	89	238	
	Female	880	14	87	37	14	17	26	19	11	15	23	22	26	44	75	51	266	
	All	1825	313	168	65	29	30	49	32	24	31	49	59	68	108	156	140	504	

SAMPLE REGISTRATION (RURAL SAMPLES)—KERALA 1977

TABLE XI

Age specific death rate (based on estimated values)

Region	Sex	All ages	Age group																
			0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
Low land	All	7.40	45.75	5.14	1.84	0.70	0.85	1.72	1.40	0.87	2.33	3.39	4.66	5.35	17.26	31.15	36.59	101.12	
Mid land	All	7.29	47.27	7.65	1.96	0.95	0.74	1.68	1.23	1.65	2.69	4.21	5.55	8.20	13.86	26.83	35.80	88.82	
High land	All	8.42	77.96	9.23	3.62	1.14	1.89	3.28	3.46	3.03	1.10	3.74	5.15	7.10	17.79	28.07	24.30	85.08	
STATE	Male	7.91	56.25	6.88	1.83	0.94	0.82	2.01	1.25	1.89	2.66	4.58	7.09	8.87	18.21	28.72	45.97	91.80	
	Female	7.05	46.70	7.85	2.49	0.91	1.12	1.84	1.92	1.48	2.13	3.41	3.64	5.69	12.20	27.35	25.61	90.87	
	All	7.48	51.47	7.35	2.16	0.92	0.97	1.92	1.59	1.68	2.38	3.96	5.30	7.32	15.22	28.02	34.44	91.31	

Deaths observed in (retained portion) samples classified by month of occurrence

Stratum	Total deaths	Months											
		January	February	March	April	May	June	July	August	September	October	November	December
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
I A	2	..	..	..	..	1	..	..	..	1	..	..	..
B	10	..	2	1	..	3	1	1	..	..	1	..	1
C	57	5	6	5	2	3	3	3	7	5	7	4	7
D	357	31	30	30	22	21	24	43	41	34	28	26	27
Low land	426	36	38	36	24	28	28	47	48	40	36	30	35
II A	4	..	..	..	..	..	..	2	..	1	..	1	..
B	47	5	..	3	4	3	2	4	8	4	3	7	4
C	223	21	14	22	27	20	20	17	12	19	18	12	21
D	817	63	51	50	53	70	75	88	96	86	64	63	58
Mid land	1091	89	65	75	84	93	97	111	116	110	85	83	83
III B	13	2	1	1	1	2	..	1	..	2	3	..	..
C	55	2	3	6	5	2	6	5	8	4	6	2	6
D	240	20	18	17	20	16	24	16	26	16	26	15	26
High land	308	24	22	24	26	20	30	22	34	22	35	17	32
STATE	1825	149	125	135	134	141	155	180	198	172	156	130	150

TABLE XII

TABLE XIII

Deaths classified by type of Medical Attention

Stratum	Total Deaths		Type of Medical attention		
	(1)	(2)	Institutional	Recognised practitioner	Unrecognised practitioner
(1)	(2)	(3)	(4)	(5)	(6)
I A	..	2	..	1	..
B	..	10	..	..	7
C	..	57	21	20	8
D	..	357	79	154	73
Low land	..	426	100	175	88
II A	..	4	2	1	1
B	..	47	15	10	16
C	..	223	49	76	37
D	..	817	175	275	195
Mid land	..	1091	241	362	249
III B	..	13	..	7	6
C	..	55	14	..	39
D	..	240	49	53	93
High land	..	308	63	60	138
STATE	..	1825	404	597	475

TABLE XIV

Estimated infant deaths by sex and infant death rate for Stratum 1977

Stratum	Number of infant deaths observed in retained portion				Whole sample area				Estimated for stratum				Estimated live births	Infant death rate
	Male		Female		Male		Female		Male		Female			
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)			
(1)														
I														
A	..	1	1	..	1	1	..	85	85	1615	52.63			
B	1	2	3	1	2	3	164	328	492	4100	120.00			
C	4	3	7	5	4	9	349	279	628	15964	39.34			
D	31	20	51	39	25	64	2310	1481	3791	89512	42.35			
Lowland	36	26	62	45	32	77	2823	2173	4996	111191	44.93			
II														
A	2	..	2	2	..	2	996	..	996	5478	181.82			
B	4	2	6	4	2	6	527	264	791	20038	39.47			
C	18	16	34	22	19	41	1440	1243	2683	61155	43.87			
D	66	68	134	87	90	177	5360	5545	10905	243106	44.86			
Midland	90	86	176	115	111	226	8323	7052	15375	329777	46.62			
III														
B	2	1	3	2	1	3	138	69	207	2139	96.77			
C	6	8	14	6	8	14	290	387	677	7636	88.66			
D	32	26	58	45	36	81	2750	2200	4950	71916	68.83			
High land	40	35	75	53	45	98	3178	2656	5834	81691	71.42			
State	166	147	313	213	188	401	14324	11881	26205	522659	50.14			

SAMPLE REGISTRATION SCHEME (RURAL SAMPLES)—KERALA 1977

TABLE XV

Population and Vital events observed in retained portion and calculated for whole sample area

Stratum	Observed in retained portion				Calculated for whole sample area					
	Population 1-7-1977	Births	Deaths	Still Births	Infant Deaths	Population 1-7-1977	Births	Deaths	Still births	Infant deaths
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
I	668	19	2	..	1	668	19	2	..	1
A	1136	25	10	1	3	1136	25	10	1	3
B	7932	181	57	5	7	10023	229	72	6	9
C	47956	1206	357	20	51	60083	1511	447	25	64
D	57692	1431	426	26	62	71910	1784	531	32	77
Lowland	433	11	4	..	2	433	11	4	..	2
II	6741	152	47	1	6	6741	152	47	1	6
A	30726	775	223	15	34	37048	934	269	18	41
B	112230	2991	817	68	134	148069	3946	1078	90	177
C	150130	3929	1091	84	176	192291	5043	1398	109	226
D	1220	31	13	..	3	1220	31	13	..	3
Midland	4999	158	55	3	14	9999	158	55	3	14
III	29651	841	240	14	58	41494	1177	336	20	81
B	35870	1030	308	17	75	47713	1366	404	23	98
C	243692	6390	1825	127	313	311914	8193	2333	164	401
D										
Highland										
State										

TABLE XVI

Estimated population, births, deaths and vital rates 1977

Stratum	Estimated population, births and deaths				Vital rates				
	Population 1-7-1977	Births 1977	Deaths 1977	Still Births 1977	Infant death 1977	Birth rate	Death rate	Still birth rate	Infant death rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
I A	56780	1615	170	..	85	28.44	2.99	..	52.63
B	186304	4100	1640	164	492	22.01	8.80	38.46	120.00
C	699599	15964	5027	419	628	22.82	7.19	25.58	39.34
D	3559405	89512	26497	1481	3791	25.15	7.44	16.28	42.35
Lowland	4502088	111191	33334	2064	4996	24.70	7.40	18.22	44.93
II A	215634	5478	1992	..	996	25.40	9.24	..	181.82
B	888688	20038	6196	132	791	22.55	6.97	6.54	39.47
C	2424616	61155	17597	1178	2683	25.22	7.26	18.90	43.87
D	9121980	243106	66405	5545	10905	26.65	7.28	22.30	44.86
Midland	12650918	329777	92190	6855	15375	26.07	7.29	20.36	46.62
III B	84180	2139	897	..	207	25.41	10.66	..	96.77
C	241617	7636	2658	145	677	31.60	11.00	18.64	88.66
D	2535534	71916	20523	1222	4950	28.36	8.09	16.71	68.83
Highland	2861331	81691	24078	1367	5834	28.55	8.42	16.46	71.42
STATE	20014337	522659	149602	10286	26205	26.11	7.48	19.30	50.14

SAMPLE REGISTRATION SCHEME (RURAL SAMPLES)—KERALA 1977

TABLE XVII

Births and deaths recorded by Enumerators and Supervisors and detected through overlapping Survey

Stratum	Births 1977						Deaths 1977											
	Enumerator alone			Supervisor alone			Enumerator alone			Supervisor alone								
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Lowland	1379	1186	1231	89.3	1334	96.7	41	11	1431	413	359	379	91.8	393	95.2	12	1	426
Midland	3828	3280	3427	89.5	3681	96.2	75	26	3929	1071	926	965	90.1	1032	96.4	17	3	1091
Highland	1006	870	908	90.3	968	96.2	22	2	1030	301	261	277	92.0	285	94.7	5	2	308
STATE	6213	5336	5566	89.6	5983	96.3	138	39	6390	1785	1546	1621	90.8	1710	95.8	34	6	1825

TABLE XVIII

Extra events detected through overlapping and intensive survey classified according to place and kind

Stratum/Natural/ Division/State	Births					Deaths				
	Total	Place		Kind		Place		Kind		
		In	Out	Live birth	Still births	In	Out	Infant deaths	Other deaths	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
I A	1	..	1	1	..	1	..	1	..	1
B	1	1	..	1	..	1	..	..	1	1
C	5	4	1	5	..	1	..	..	1	1
D	45	29	16	44	1	8	2	1	9	10
Lowland	52	34	18	51	1	11	2	2	11	13
II A	..	..	..	..	..	..	..	..	..	..
B	3	..	3	3	..	..	..	..	..	..
C	20	16	4	18	2	1	1	1	1	2
D	78	43	35	78	..	13	5	4	14	18
Midland	101	59	42	99	2	14	6	5	15	20
III B	..	..	..	..	..	..	..	..	..	..
C	7	5	2	7	..	1	..	1	..	1
D	17	7	10	17	..	4	2	1	5	6
Highland	24	12	12	24	..	5	2	2	5	7
STATE	177	105	72	174	3	30	10	9	31	40

TABLE XIX

Abridged life table based on mean age specific death rates for 1975, 1976 and 1977

$$q_0 = \frac{16}{3439} + \frac{150}{3251} = .05079 \quad (\text{Males})$$

Age x to $x+n$	Central age specific death Rates m_x	Probability of a person aged x dying before age $x+n$ q_x	Number surviving to age x out of 100000 born alive l_x	Years of life lived		Complete Expectation of life in years	
				Between age x and $x+n$ L_x	At age x and over T_x	At age x and over Ex	Beginning age x
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<1	.06254	.05079	100000	95462	6253647	62.53	0
1-4	.00759	.02991	94921	374006	6158185	64.87	1
5-9	.00197	.00980	92082	438152	5784179	62.81	5
10-14	.00096	.00479	91179	454802	5326027	58.41	10
15-19	.00091	.00454	90742	452680	4871225	53.68	15
20-24	.00196	.00975	90330	449447	4418545	48.91	20
25-29	.00241	.01198	89449	444545	3969098	44.37	25
30-34	.00268	.01331	88377	438945	3524533	39.88	30
35-39	.00331	.01641	87201	432427	3085588	35.38	35
40-44	.00532	.02625	85770	423220	2653161	30.93	40
45-49	.00797	.03907	83518	409432	2229941	26.70	45
50-54	.01165	.05660	80255	389917	1820509	22.68	50
55-59	.02092	.09940	75712	359745	1430592	18.89	55
60-64	.02698	.12638	68186	319387	1070847	15.70	60
65-69	.04298	.19405	59569	268947	751460	12.61	65
70 +	.09950	1.00000	48010	482513	482513	10.05	70

TABLE XX

Abridged life tables based on mean age specific death rates for 1975, 1976, 1977

$$q_0 = \frac{16}{3423} + \frac{131}{3139} = .04641 \quad (\text{Females})$$

Age x to $x+n$	Central age specific death rates m_{ax}	Probability of a person aged x dying before age $x+n$ q_x	Number surviving to exact age x out of 100000 born alive l_x	Years of life lived		Complete expectation of life in years E_x	Beginning age x
				Between age x and $x+n$ L_x	At age x and over T_x		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<1	.05544	.04641	100000	95925	6517064	65.17	0
1-4	.00959	.03764	95359	374256	6421139	67.33	1
5-9	.00209	.01040	91769	456457	6046883	65.89	5
10-14	.00105	.00524	90814	452880	5590426	61.56	10
15-19	.00129	.00643	90338	450237	5137546	56.87	15
20-24	.00166	.00827	89757	446930	4687309	52.22	20
25-29	.00231	.01148	89015	442520	4240379	47.63	25
30-34	.00173	.00861	87993	438070	3797859	43.16	30
35-39	.00220	.01094	87235	433790	3359789	38.51	35
40-44	.00340	.01686	86281	427767	2925999	33.91	40
45-49	.00459	.02269	84826	419317	2498232	29.45	45
50-54	.00744	.03652	82901	406935	2078915	25.07	50
55-59	.01217	.05905	79873	387572	1671980	20.93	55
60-64	.02160	.10247	75156	356527	1284408	17.09	60
65-69	.03125	.14493	67455	312835	927881	13.75	65
70+	.09378	1.00000	57679	615046	615046	10.66	70

TABLE XXI

Abridged life table based on mean age specific death rates for 1975, 1976 and 1977

$$q_{10} = \frac{32}{6362} + \frac{281}{6390} = 0.94863$$

All (Males and Females)

Age x to $x+h$	Central age specific death rates m_x	Probability of a person aged x dying before age $x+n$ q_x	Number surviving to exact age x out of 100000 born alive l_x	Years of life lived		Complete expectation of life in years E_x	Beginning of
				Between age x and age $x+n$ L_x	At age x and over T_x		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<1	.05903	.04863	100000	95634	6378560	63.78	0
1—4	.00856	.03366	95137	374144	6282926	66.04	1
5—9	.00203	.01010	91935	457122	5908782	64.27	5
10—14	.00100	.00499	90914	453435	5451660	59.96	10
15—19	.00105	.00524	90460	451115	4998225	55.25	15
20—24	.00180	.00896	89986	447915	4547110	50.53	20
25—29	.00236	.01173	89180	443285	4099195	45.96	25
30—34	.00219	.01089	88134	438270	3655910	41.48	30
35—39	.00273	.01356	87174	432915	3217640	36.91	35
40—44	.00430	.02127	85992	425387	2784725	32.38	40
45—49	.00625	.03077	84163	414340	2359338	28.03	45
50—54	.00960	.04688	81573	398305	1944998	23.84	50
55—59	.01653	.07937	77749	373317	1546693	19.89	55
60—64	.02428	.11445	71578	337410	1173376	16.39	60
65—69	.03696	.16917	63886	290122	835966	13.18	65
70 and above	.09648	1.00000	52663	545844	545844	10.36	70