

EPIDEMIOLOGICAL SURVEY - NORTH KANARA DISTRICT

A research project funded by Bhabha Atomic Research
Centre (BARC) , Mumbai, India

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"EPIDEMIOLOGICAL SURVEY- NORTH KANARA DISTRICT" is the outcome of the baseline epidemiological survey conducted among the population residing around 20 kilometers radius of Nuclear power plant at Kaiga . The survey was conducted by a team of Doctors and Medico Social Workers under our direct guidance and supervision.

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ACKNOWLEDGEMENTS

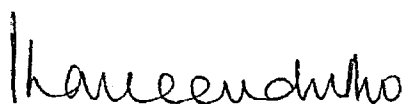
We would like to express our heartfelt gratitude to Professor Dr. M.S. Valiathan, former Vice Chancellor of Manipal Academy of Higher Education (MAHE), for his constant encouragement and guidance throughout the course of the research project.

We are grateful to Dr. P.L.N. Rao, Dean, Kasturba Medical College, Manipal for his continuous support and co-operation for the project.

We would like to express our sincere thanks to Prof. P.C. Kesavan, Director, Bioscience Group, BARC, Dr. R.S. Babu, Scientific Secretary, Board of Research in Nuclear Sciences, BARC, Dr. B.S. Chauhan, Member Secretary, BSC-II, Head, Cell Biology Division, BARC for their constant support and encouragement.

We would like to place on record our sincere appreciation to the officials of Nuclear Power Plant at Kaiga particularly Mr. V.K. Sharma, Project Director, Mr. Rajasabai, Station Superintendent, Mr. A.C.R. Subba Reddy, Maintenance Superintendent, Mr. Jugal Kishore and several others who have extended their fullest support and cooperation to complete this research project.

We gratefully acknowledge Bhabha Atomic Research Centre (BARC), Mumbai for the financial assistance.



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INTRODUCTION

The influence of natural background radiation on individuals health has aroused curiosity among many researchers in many parts of the World. High background Radiation (BHGR) and its association with cancer have been brought to focus in many of the epidemiological studies. These studies have failed to demonstrate a conclusive evidence of increased incidence of cancer among populations exposed to low doses of high background radiation. However, there has been an increase in the incidence of chromosome aberrations in peripheral blood cells¹. It is generally accepted that somatic mutations in peripheral blood are useful as biological dosimeter but not as a health indicator. Studies carried out in Chawara, Karunagappally Block, Quilon district of Kerala state have shown no significant increase in the incidence of Cancer, still births and congenital malformations².

Installation of Nuclear Power Station was envisaged by the Nuclear Power Corporation of India at Kaiga a few years ago. The village Kaiga is located about 50 kilometers east of Karwar - the district head quarter of North Kanara district- in Karnataka state. It is a remote place moffusil area surrounded by hills and jungle all around. The site is situated on the bank of the river Kali which would supply enough water that is needed for the plant. A dam is under construction at Kadra for this purpose.

Ministry of Environment and Forests while giving environmental clearance stipulated that a pre-operational epidemiological survey should be conducted among the population in and around the atomic power station.

The Department of Community Medicine, Kasturba Medical College, Manipal was undertaken the responsibility to conduct this epidemiological survey. (The purpose of the survey was to obtain baseline information regarding the health status of the population residing in 20 kilometers radius of Kaiga Nuclear Power Station. **The epidemiological survey focussed on the prevalence of i) different type of cancers viz., oral cancer, skin cancer, cancer of cervix, breast cancer, cancer of thyroid gland and leukaemia, ii) congenital malformations iii) still births and iv) cataract.**

This study was also intended to determine radiation induced genetic effects as well as immunological derangements if any in a well defined population supposed to be residing in a well defined geographical area.)

Thus the comprehensive research study has three essential components. Firstly an epidemiological survey to find out the health status and the cancer associated risk factors, secondly a cytogenetic and immunological study to find out radiation induced genetic effects and immunological disfunctions and thirdly monitoring radiation levels in the region to correlate the findings with radiation exposure.

AIMS AND OBJECTIVES

AIM

The overall aim of this study was to assess the impact of low dose radiation on health status of the population residing within 20 kilometers radius of Nuclear Power Plant at Kaiga village of North Kanara district.

SPECIFIC OBJECTIVES

- 1) To assess the morbidity status of the population with specific reference to cancer, congenital malformation, still birth and cataract.
- 2) To find out the chromosomal aberrations especially Down's syndrome in the population under study.
- 3) To find out the immunological derangements if any in the population under study.
- 4) To study the demographic, socio-economic and cultural profile and lifestyle practices relevant to morbidity with a view to find out the risk factors.
- 5) To correlate the findings stated in objectives 1, 2 & 3 with the existing radiation levels in the defined geographical area.
- 6) To periodically monitor the radiation levels over a 10 years period.

- 7) To find out if there is any change in morbidity pattern, cytogenic profile and immunological functions during the specified period of 10 years and to correlate the same with radiation levels.

However, this particular report exclusively deals with the details of the baseline epidemiological survey that was conducted with the following objectives.

1. To assess the morbidity status of the population with specific reference to cancer, congenital malformation , still birth and cataract.
2. To study the demographic, socio-economic and cultural profile and lifestyle practices relevant to morbidity with a view to find out the risk factors.

METHODOLOGY

STUDY AREA

2 [The present study was carried out in a population of approximately 32,000 people residing in 85 villages within 20 kilometers radius of Kaiga Nuclear Power Plant. The villages are scattered in 1280 square kilometer area and fall within the jurisdiction of 4 taluks viz., Yellapura, Supa, Ankola and Karwar of North Kanara district.] It is a hilly terrain and not all the villages have an access road. Some of the villages are accessible only by a Jeep and some others could be reached only on foot.

3 [Thirteen villages are located within 10 km radius while the remaining 72 villages are at a distance of 10-20 km radius of the Nuclear Power Plant.] The overall literacy rate is 37.4 percent. The female literacy is 33.5 percent while 41.2 percent of the males are literate. Nearly one third (34.4%) of the population is employed. While 54.2 percent of the men are unemployed, only 13.7 percent of women are working (Census, 1981)³.

STUDY POPULATION

The entire population of 32,000 people living in approximately 8000 households of 85 villages within 20 kilometers radius of the Nuclear Power Plant was considered for the epidemiological survey on the presumption that this population would probably be exposed to the risk of radiation if any.

STUDY DESIGN

It was essentially a prevalence study which would be repeated once in 3 years over a period of 10 years.

SURVEY PERIOD

The staff was recruited in the month of January 1997 and the actual survey started on 10th February 1997. The survey team could cover almost entire study area by the end of May 1998. Thus the epidemiological survey took one year and 5 months period. Few more visits were made to cover the non-responders.

PROFORMA DESIGN

To carry out the survey, an elaborate proforma was designed through extensive discussions at various sittings with members of faculty of the Department of Community Medicine, Consultant statistician, computer personnel and various officers of Kaiga project. Suggestions were also obtained from experts of BARC, Mumbai and epidemiology unit of Tata Memorial Centre (TMC), Mumbai. (Many components of TMC health survey proforma was also incorporated into it). Thus the final proforma was worked out (Annexure I).

The Proforma has two parts:

(a) Common schedule and (b) Individual schedule.

Common schedule consists of questions related to family identification particulars, demographic details, socio-economic status, housing and environmental sanitation, morbidity and mortality statistics and health seeking behaviour of the family. For each family one form was used.

The individual schedule consisted of various components viz **(I) Adults (≥ 15 years) personal habits assessment (II) Adults medical history, (III) Reproductive history of married women, (IV) Children (< 15 years) medical data (V) Birth defect (VI) Investigation report and final diagnosis.** For every member of the family a separate form was used. At the end there was a check list which had to be filled up by the medical officer and verified by the supervisor who invariably was a staff member from the Department of Community Medicine.

STAFF RECRUITMENT AND TRAINING

It was decided to have four survey teams to carryout the epidemiological survey. Each team consisted of one medical officer, a medico-social worker, a local representative from the village and a driver who was familiar with the terrain and the villages. The medical officers and medico-social workers were recruited in the month of January 1997. They were given one week training in the department of Community Medicine, Kasturba Medical College, Manipal.

PILOT SURVEY

A pilot survey was conducted by the survey team under the supervision of a senior member of the faculty of the Department of Community Medicine. This survey was conducted in the field practice area of Department of Community Medicine. The main

objective of this pilot study was to test the validity, reliability and practicability of the proforma and other survey instruments. The pilot study also helped the survey team to get familiarize with the proforma. The results and problems encountered in the pilot study were again discussed in the departmental meetings and required modifications were incorporated in the proforma.

EPIDEMIOLOGICAL SURVEY

4 [A house to house survey was carried out by the survey team. Information regarding the socio-demographic characteristics, lifestyle practices, morbidity conditions with specific reference to oral cancer, cancer of the cervix, breast cancer, skin cancer and cancer of thyroid gland, leukaemia, congenital anomalies, history of still births were documented by the survey team. The doctors examined the members of the household to identify the specific morbidity conditions. The information obtained was recorded on the duly pretested proforma.]

REFERRAL SERVICES

Suspected cases of cancer were referred to Kasturba Hospital, Manipal for confirmation of diagnosis and treatment. Similarly congenital malformations identified during the survey were also referred for appropriate management.

QUALITY CONTROL

The proformae which were filled up every day were scrutinized by the medical officers on a day to day basis. These proformae were further verified by the supervisor who was a senior member of faculty of the Department of Community Medicine. The

supervisor occasionally made random visits to the field with filled up proformae to cross check the validity of information collected. On monthly basis these completed proformae were transported to the Department of Community Medicine, Kasturba Medical College, Manipal, and the information was fed in to the computer.

DATA ENTRY AND ANALYSIS

The filled up proformae were received by the Computer Centre in the Department of Community Medicine every month. A database was created and the data was fed in to the computer by a trained data entry operator. Separate databases were maintained for each module of the proformae. To maintain the quality of data entry, every month random checking was performed on 10% of the records. At the end of the data entry, the data was verified for outliers of each variable which further improved the quality of data.

The data was analysed using the statistical package SPSSPC+ 6.0⁴ for windows and Epi-info⁵. The results were expressed appropriately in terms of percentages, prevalence, 95% confidence interval, mean and standard deviation. Graphs were plotted using the graphical package power point and Harvard Graphics.

RESULTS AND DISCUSSION

The results of the epidemiological survey is classified under 9 categories as follows:

- A. General information of the survey area.**
- B. Socio-demographic details of the survey population.**
- C. Housing and Environmental conditions of the survey population.**
- D. Educational and Occupational status of the survey population.**
- E. Health seeking behaviour, illness and mortality experience in the study population.**
- F. Adults - personal habit assessment.**
- G. Health status of adults.**
- H. Reproductive history of married women.**
- I. Health status of Children.**

A. GENERAL INFORMATION OF THE SURVEY AREA

The details of number of houses and villages surveyed were given in the following table

TABLE 1. INFORMATION ABOUT SURVEY COVERAGE

NUMBER OF TALUKS COVERED	:	4
NUMBER OF VILLAGES COVERED	:	85
TOTAL NUMBER OF HOUSES VISITED	:	8008
NUMBER OF SECTORS COVERED	:	15
NUMBER OF HOUSES FOUND TO BE DOOR LOCKED	:	701 (8.75%)
NUMBER OF HOUSES FROM WHICH INFORMATION OBTAINED :		7307 (91.25%)

The total survey area was divided into 15 sectors (Annexure II). There were 8008 houses in this area. These houses were spread out in 85 villages of 4 taluks of North Kanara district. All these houses were visited by the survey teams. During the house to house visit, 701(8.75%) houses were found to be door locked. Thus epidemiological information was obtained from 7307 (91.25%) households which form the basis of this report.

Table 2 explains the sector-wise distribution of houses covered. Sectors were numbered from A to P. Majority of the houses (Number of houses=3569, 44.6%) were in sector 'N' followed by sector 'M' (Number of houses=1229, 15.3%). Sectors A, J and L had only few houses. Remaining houses were more or less evenly distributed among other sectors.

TABLE 2. SECTORWISE DISTRIBUTION OF THE NUMBER OF HOUSES VISITED

SECTOR	NUMBER OF HOUSES VISITED
A	20
B	239
C	158
D	512
E	510
F	424
G	369
H	365
I	112
J	31
K	206
L	58
M	1229
N	3569
P	206
TOTAL	8008

Taluk wise distribution of houses surveyed is given in table 3. Nearly two-thirds of the houses were in Karwar taluk. Both Ankola and Yellapur taluks had nearly 15% each and the remaining 8% of the houses were in Joida taluk.

TABLE 3. TALUKWISE DISTRIBUTION OF THE NUMBER OF HOUSES SURVEYED

TALUK	NUMBER OF VILLAGES COVERED	NUMBER OF HOUSES SURVEYED	%
ANKOLA	21	1057	14.5
KARWAR	19	4536	62.1
SUPA (JOIDA)	25	609	8.3
YELLAPUR	20	1105	15.1
TOTAL	85	7307	100.0

The distribution of the houses surveyed according to villages in each taluk is shown in table 4-8.

**TABLE 4. VILLAGEWISE DISTRIBUTION OF HOUSES SURVEYED :
TALUK - ANKOLA.**

VILLAGE NAME	VILLAGE CODE	NO. OF HOUSES
Agsur	17	22
Dongri	14	76
Gule	72	16
Halvalli	15	75
Hebbul	7	41
Heggar	12	53
Heggarmakkigadde	4	43
Heggarnikotebavi	78	3
Kalleshwar	13	27
Kattinhakkal	8	62
Kavalalli	6	20
Kodlagadde	10	152
Kondige	74	3
Lakkeguli	73	1
Mallani	76	2
Marugadde	5	19
Sakalben	70	205
Shevakar	11	55
Shikliturli	75	1
Sunksal	9	170
Vasarkudrige	32	11
Total		1057

TABLE 5. VILLAGEWISE DISTRIBUTION OF HOUSES SURVEYED:
TALUK : KARWAR

VILLAGE NAME	VILLAGE CODE	NO. OF HOUSES
Baad	7	1
Balemane	33	2
Bhaire	27	85
Devalmakki	46	460
Gotegali	31	288
Haroor		4
Hartuga	36	34
Kadra	32	997
Kaiga	35	311
Katar	42	83
Kerwadi	40	427
Kuchegar	37	17
Kumargaon	29	1
Lande	30	1
Madhewada	9	1
Mallapur	39	1692
Shirve	47	8
Ulga	26	2
Virje	38	122
TOTAL		4536

TABLE 6. VILLAGEWISE DISTRIBUTION OF HOUSES SURVEYED -
TALUK : SUPA (JOIDA)

VILLAGE NAME	VILLAGE CODE	NO. OF HOUSES
Ambolli	96	57
Anshi	95	102
Badpoli	98	2
Bidoli	94	21
Birkhol	92	58
Chafer	84	12
Chandrali		6
Dungali		2
Hebbal	88	10
Henkola		4
Kalsai	99	6
Kamshathnadi		4
Kariyadi	81	6
Kodathalli	91	24
Malachandral		3
Neturge	89	9
Nigundi	97	59
Patmi		2
Phansoli	35	1
Sangawe	33	4
Shivapur	87	24
Talsgeri	93	24
Ulvi	90	101
Vadkal	86	1
Yermukh	83	67
TOTAL		609

**TABLE 7. VILLAGEWISE DISTRIBUTION OF HOUSES SURVEYED -
TALUK : YELLAPUR**

VILLAGE NAME	VILLAGE CODE	NO. OF HOUSES
Ambagaon	16	10
Arbail	10	89
Baginkatte	28	23
Barballi	30	26
Bare	22	109
Bigar	26	33
Chimnalli	27	95
Dabguli	11	2
Dehalli	37	3
Gullapur	14	139
Haroor		9
Honagadde	18	46
Kalche	24	182
Kodsalli	29	49
Kodlagadde	15	55
Mavinamane	19	63
Sathodi		6
Targar	25	22
Telangeri	8	25
Vajralli	9	119
TOTAL		1105

TABLE 8: TALUKWISE DISTRIBUTION OF FAMILIES

TALUK	NO. OF FAMILIES	PERCENT
ANKOLA	1057	14.5
KARWAR	4536	62.1
SUPA (JOIDA)	609	8.1
YELLAPUR	1105	15.1
TOTAL	7307	100.0

B. SOCIO-DEMOGRAPHIC DETAILS OF THE SURVEY POPULATION

Basic social and demographic structure of the population is depicted in table 9 to table 14. Among the 31784 people in the survey population, 16353 (51.5%) were males and 15431 (48.5%) were females. This gives a sex ratio of 944 females/1000 males which is comparable with Karnataka's sex ratio of 960 females per 1000 males. These facts are shown in table 9.

TABLE 9: SEX DISTRIBUTION OF THE SURVEY POPULATION

SEX	NUMBER	PERCENT
MALE	16353	51.5
FEMALE	15431	48.5
TOTAL	31784	100.0

SEX RATIO: 944

Among the total study population, 51.2% were in the age group of 15-44 years. There were nearly 30% in the age group of less than 15 years and 6.5% were elderly (60 years and above). The age and sex composition of the study population is shown in table 10.

TABLE 10: AGE AND SEX DISTRIBUTION OF THE SURVEY POPULATION

AGE GROUP (Year)	SEX				TOTAL	
	MALES		FEMALES		NUMBER	%
	NUMBER	%	NUMBER	%		
<1	415	2.5	382	2.5	797	2.5
1-5	1355	8.3	1268	8.2	2623	8.3
6-14	3017	18.4	3056	19.8	6073	19.1
15-44	8330	50.9	7936	51.4	16266	51.2
45-59	2114	12.9	1848	12.0	3962	12.4
60 & ABOVE	1122	6.9	941	6.1	2063	6.5
TOTAL	16353	100.0	15431	100.0	31784	100.0

Majority of the families (77.8%) in the study area were nuclear in type and 60% of the families had 4 or less members. However, five percent of the families had 9 or more members. These details are given in table 11 and 12.

TABLE 11: DISTRIBUTION OF FAMILIES ACCORDING TO TYPE OF FAMILY

TYPE OF FAMILY	FAMILIES	
	NO.	%
NUCLEAR	5681	77.8
3 GENERATION	617	8.4
JOINT	1009	13.8
TOTAL	7307	100.0

TABLE 12: DISTRIBUTION OF FAMILIES ACCORDING TO NO. OF MEMBERS IN THE FAMILY

NO. OF MEMBERS IN THE FAMILY	FAMILIES	
	NO.	%
<=2	1516	20.8
3-4	2830	38.7
5-6	1988	27.2
7-8	612	8.4
9-10	204	2.8
>10	160	2.2
TOTAL	7307	100.0

Distribution of families according to religion and caste is given in table 13 and 14 respectively. Hindus constituted 90%, where as Christians and Muslims were 4 percent each. 8.9% of families belonged to SC/ST.

TABLE 13: RELIGION-WISE DISTRIBUTION OF THE FAMILIES

RELIGION	FAMILIES	
	NO.	%
HINDU	6654	91.10
CHRISTIAN	309	4.20
MUSLIMS	325	4.40
JAINS	3	0.04
OTHERS	16	0.20
TOTAL	7307	100.00

TABLE 14: DISTRIBUTION OF FAMILIES ACCORDING TO CASTE

CASTE	FAMILIES	
	NO.	%
SC	154	2.1
ST	495	6.8
OTHERS	6658	91.1
TOTAL	7307	100.0

Regular dietary pattern of the population is analysed in table 15. As far as food habit is concerned, majority of the people in this area eat mixed diet. Nearly 21% of the villagers are vegetarians.

TABLE 15: DIETARY PATTERN OF THE STUDY POPULATION

	VEGETERIAN		MIXED	
	NO.	%	NO.	%
MALES	3481	21.3	12872	78.7
FEMALES	3245	21.0	12186	79.0
TOTAL	6725	21.2	25058	78.8

In the study population, 45% of the people were married and 4.4% were widowed. The proportion of widow (7.7%) were more than that of widower (1.3%). These details are given in table 16.

TABLE 16: MARITAL STATUS OF THE STUDY POPULATION

SEX	SINGLE		MARRIED		WIDOWED		SEPARATED		DIVORCED	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
MALES	8933	54.6	7175	43.9	214	1.3	26	0.2	5	0.03
FEMALES	7112	46.1	7046	45.7	1192	7.7	78	0.5	3	0.02
TOTAL	16045	50.5	14221	44.7	1406	4.4	104	0.3	8	0.03

C. HOUSING AND ENVIRONMENTAL CONDITIONS OF THE STUDY POPULATION

Table 17-20 explain the housing condition of the study population. Nearly 51% of the families have Pucca houses and another 33% live in mixed houses. Sixty percent families live in their own houses and 72% have electricity connection. Biomass is the common cooking fuel (61.7%) followed by LPG (25.3%). The existence of these facilities clearly shows that these families are having a better living standard.

TABLE 17: DISTRIBUTION OF FAMILIES ACCORDING TO TYPE OF HOUSE

TYPE OF HOUSE	NO. OF FAMILIES	PERCENT
PUCCA	3712	50.8
KUTCHA	1213	16.6
MIXED	2382	32.6
TOTAL	7307	100.0

TABLE 18: DISTRIBUTION OF FAMILIES ACCORDING TO OWNERSHIP OF THE HOUSE

OWNERSHIP STATUS	NO. OF FAMILIES	PERCENT
OWN	4381	60.0
RENTED	740	10.1
FREE	758	10.4
TEMPORARY	1428	19.5
TOTAL	7307	100.0

Drinking water facility and sanitary conditions of the population under study is detailed in table 21 to 23. Main source of drinking water is open well (44.9%). A considerable proportion of the population (34.6%) is having tap water facility also. However, absence of sanitary latrine and drainage facility were observed in majority of the families which is a pointer towards the lack of awareness of sanitation and personal hygiene.

TABLE 21: SOURCE OF DRINKING WATER FACILITY

SOURCES OF DRINKING WATER	NO. OF FAMILIES	PERCENT
TAP	2529	34.6
BOREWELL	283	3.9
WELL	3284	44.9
POND	363	5.0
RIVER	175	2.4
OTHERS	673	9.2
TOTAL	7307	100.0

TABLE 22: PRESENCE OF SANITARY LATRINE

LATERINE	NO.OF FAMILIES	PERCENT
PRESENT	2632	36.0
ABSENT	4675	64.0
TOTAL	7307	100.0

TABLE 23: PRESENCE OF DRAINAGE FACILITY

DRAINAGE FACILITY	NO. OF FAMILIES	PERCENT
PRESENT	1869	25.6
ABSENT	5438	74.4
TOTAL	7307	100.0

D. EDUCATIONAL AND OCCUPATIONAL STATUS OF THE STUDY POPULATION

Literacy status of the population is detailed in table 24-26. Even though this area is geographically very interior and rural, the literacy rate is comparatively very high. Female literacy observed to be 65% where as 78.6% of males were literate. Overall literacy rate was 72% and adult literacy rate was 75.2%. However, only 12.5% had more than 10 years of schooling .

TABLE 24: LITERACY STATUS OF THE STUDY POPULATION

LITERACY STATUS	MALES		FEMALES		TOTAL	
	NO.	%	NO.	%	NO.	%
ILLITERATE	3494	21.4	5401	35.0	8895	28.0
JUST LITERATE	484	3.0	436	2.8	920	2.9
1-4 YRS. SCHOOLING	3772	23.1	3462	22.4	7234	22.8
5-7 YRS.SCHOOLING	2782	17.0	2403	15.6	5185	16.3
8-10 YRS.	3253	19.9	2319	15.0	5572	17.5
11-12 YRS.	847	5.2	567	3.7	1414	4.4
MORE THAN 12 YRS.	1721	10.5	843	5.5	2564	8.1
TOTAL	16353	100.0	15431	100.0	31784	100.0

TABLE 25: SEXWISE LITERACY RATE AMONG THE STUDY POPULATION

SEX	LITERACY RATE (%)
MALE	78.6
FEMALE	65.0
TOTAL	72.0

**TABLE 26: SEXWISE ADULT LITERACY RATE AMONG THE STUDY POPULATION
(≥15 years)**

SEX	LITERACY RATE (%)
MALE	84.2
FEMALE	65.5
TOTAL	75.2

As far as occupation is concerned, the study area resembles a typical rural Indian village. Majority of the adult male population is engaged in agriculture related activities and females are confined to the household chores. Among males, the main occupation was farming (27.0%) followed by unskilled work (18.0%). Majority of females (58.5%) were housewives. Detailed description of occupational status is explained in table 27.

TABLE 27: DISTRIBUTION OF POPULATION ACCORDING TO OCCUPATION

OCCUPATION	MALES		FEMALES		TOTAL	
	NUMBER	%	NUMBER	%	NUMBER	%
WHITE COLLAR	1991	14.1	246	1.9	2237	8.2
SKILLED	1197	8.5	95	0.7	1292	4.7
FARMERS	3816	27.0	311	2.4	4127	15.1
PETTY BUSINESS	342	2.4	36	0.3	378	1.5
UNSKILLED	2550	18.0	975	7.5	3525	12.9
HOUSE WIVES	0	0.0	7657	58.5	7657	28.1
UNEMPLOYED	348	2.4	324	2.4	672	2.5
STUDENTS	3900	27.6	3439	26.3	7339	27.0
TOTAL	14144	100.0	13083	100.0	27227	100.0

E. HEALTH SEEKING BEHAVIOUR, ILLNESS & MORTALITY IN THE STUDY POPULATION

The information regarding utilization of health facilities is summarised in table 28. The primary health centre is the main health facility that the study population utilises in case of minor illness. A considerable proportion (16.2%) uses Kaiga project hospital also. As far as major illness is concerned, the people are mainly depending on private hospitals or Nursing homes.

TABLE 28: HEALTH SEEKING BEHAVIOUR DURING MINOR AND MAJOR ILLNESSES

HEALTH FACILITY	MINOR ILLNESS		MAJOR ILLNESS	
	NO. OF FAMILIES	PERCENT	NO. OF FAMILIES	PERCENT
PRIVATE PRACTITIONER	604	8.3	709	9.7
KAIGA PROJECT HOSPITAL	1186	16.2	586	8.0
PRIVATE HOSPITAL/ NURSING HOME	584	8.0	3953	54.1
P.H.C	4271	58.5	1064	14.6
INDIGENOUS	80	1.1	50	0.7
TRADITIONAL	8	0.1	3	0.1
VILLAGE HEALTH	4	0.1	0	0.0
ANGANWADI WORKER	0	0.0	0	0.0
HOME REMEDIES	8	0.1	8	0.1
OTHERS	562	7.7	934	12.8
TOTAL	7307	100.0	7307	100.0

During the study period, the study team came across 872 (2.7%) people who were suffering from prolonged illness. Information regarding people suffering from illness and its duration is given in table 29.

TABLE 29: INFORMATION ABOUT PEOPLE SUFFERING FROM PROLONGED ILLNESS

SEX	N	AGE (YEARS) (MEAN±SD)	DURATION OF ILLNESS(YEARS) (MEAN±SD)
MALE	426	49.9±18.1	7.2±8.5
FEMALE	445	45.7±17.2	7.1±7.8
TOTAL	872	47.7±17.9	7.19±8.1

There were 131 deaths during the last one year which gives a death rate of 4.12/1000 population. Sex wise death rate is given in table 30.

TABLE 30: INFORMATION ABOUT DEATH IN THE STUDY POPULATION

SEX	N	AGE (YEARS) (MEAN±SD)	DEATH RATE (/1000 POPULATION)
MALE	92	55.4±22.9	5.6
FEMALE	39	55.1±26.4	2.5
TOTAL	131	55.5±23.8	4.1

E. ADULTS : PERSONAL HABITS ASSESSMENT

One of the important objective of the present study was to assess the prevalence of high risk personal habits in the community which are considered as probable determinants of terminal illness like cancer, birth defect and pregnancy wastage. The habits assessed in the present study were smoking, chewing tobacco snuff use and alcohol consumption.

Among the 22291 adults in the survey population, we could interview 13806 (61.9%) for their personal habits. 41.7% of them were males and 58.3% females.

TABLE 31: DETAILS OF ADULTS INTERVIEWED FOR PERSONAL HABITS ASSESSMENT

SEX	NUMBER	%
MALES	5760	41.7
FEMALES	8046	58.3
TOTAL	13806	100.0

Details of prevalence of various personal habits among males and females are given separately in table 32 to table 35.

The main personal habit prevalent in the female population was chewing (25.6%). Among the female chewers, 89% used pan-supari-tobacco (PST) which is the hard form of chewing. Even though very rare, smoking among females was also reported in this community. Nearly one percent of the women folk admitted that they smoke beedies. 12 out of 8046 women interviewed agreed that they drink alcohol, mainly country liquor.

**TABLE 32: PREVALENCE OF CERTAIN PERSONAL HABITS AMONG FEMALES
(N=8046)**

HABITS	NUMBER	PREVALENCE (%)
CHEWING	2063	25.6
SMOKING	57	0.71
SNUFF	3	0.04
ALCOHOL	12	0.15

TABLE 33: DETAILS OF CERTAIN PERSONAL HABITS AMONG FEMALES
(N=8046)

HABITS	PREVALENCE	
	NO.	%
<u>CHEWING</u>		
PST	1815	22.56
T	101	1.26
OTHERS	239	2.97
<u>SMOKING</u>		
CIGARETTE	0	0.00
BEEDI	56	0.70
OTHERS	1	0.01
<u>SNUFF USER</u>		
SOLID SNUFF BALLS	0	0.00
POWDERED SNUFF	3	0.04
OTHERS	0	0.00
<u>ALCOHOL</u>		
COUNTRY LIQOUR	12	0.15
IMFL	1	0.01
BEER	0	0.00
TODDY	0	0.00
OTHERS	0	0.00

Among males also, chewing was the main personal habit (31%) prevalent followed by smoking (25.1%). Among the male chewers 89.1% used PST and among smokers, beedi was very popular and constituted 85.1%. Nearly 6% of the adult males were habituated to alcohol consumption. Country liquor was the preferred brand of drink. Beer, toddy and Indian manufactured foreign liquor(IMFL) were used but rarely. Surprisingly snuff use was prevalent in this community.

**TABLE 34: PREVALENCE OF CERTAIN PERSONAL HABITS AMONG MALES
(N=5760)**

HABITS	NUMBER	PREVALENCE (%)
CHEWING	1787	31.02
SMOKING	1447	25.12
SNUFF	6	0.10
ALCOHOL	344	5.97

TABLE 35: DETAILS OF CERTAIN PERSONAL HABITS AMONG MALES
(N=5760)

HABITS	PREVALENCE	
	NO.	%
<u>CHEWING</u>		
PST	1593	27.66
T	171	2.97
OTHERS	126	2.19
<u>SMOKING</u>		
CIGARETTE	236	4.10
BEEDI	1232	21.39
OTHERS	10	0.17
<u>SNUFF USER</u>		
SOLID SNUFF BALL	2	0.04
POWDERED SNUFF	4	0.07
OTHERS	0	0.00
<u>ALCOHOL</u>		
COUNTRY LIQOUR	291	5.05
IMFL	38	0.66
BEER	32	0.56
TODDY	24	0.42
OTHERS	10	0.17

G. HEALTH STATUS OF ADULTS

After assessing personal habits of adults, the adult members present at home at the time of interview were subjected to a brief medical examination. The summary findings of medical examination is given in tables 36 to 46.

Among the 22291 adults in the survey population, 13762 (61.7%) were subjected to medical examination. During medical examination, medical officers besides routine checkup, specifically looked for cancer cases, suspected cancer cases, danger signals of cancer, abnormalities for various organs and cataract. Among the total subjects examined, 4% had family history of cancer and 9.4% had history of concomitant illness. A summary of the findings is given table 36.

TABLE 36: PREVALENCE OF CANCER AND CATARACT AMONG ADULTS

TOTAL NUMBER OF ADULTS IN THE SURVEY	:	22291
MEDICAL DATA AVAILABLE	:	13762 (61.7%)
CANCER :		
FAMILY HISTORY OF CANCER	:	550 (4.0%)
NUMBER OF CONFIRMED CANCER CASES	:	10
CANCER PREVALENCE/100,000 POPULATION	:	31.5
NUMBER OF SUSPECTED CANCER CASES	:	57
CATARACT:		
NUMBER OF CATARACT CASES	:	233
PREVALENCE OF BLINDNESS DUE TO CATARACT	:	0.73%

Among the various danger signals of cancer, the most common one was "a swelling or sore that does not get better" with a prevalence rate of 19.62/10000 examined; followed by unexplained loss of weight with a prevalence rate of 18.17/10000 examined. These details are given in the following table.

TABLE 37: PRESENCE OF DANGER SIGNALS OF CANCER
(N=13762)

DANGER SIGNALS	NUMBER OF SUBJECTS HAVING	RATE (/10000 EXAMINED)
1. A LUMP OR HARD AREA IN THE BREAST	12	8.72
2. A CHANGE IN WART OR MOLE	4	2.91
3. A PERSISTENT CHANGE IN DIGESTIVE OR BOWEL HABITS	20	14.5
4. A PERSISTENT COUGH OR HOARSENESS	14	10.17
5. MENORRHAGIA, INTERMENSTRUAL BLEEDING	11	7.99
6. BLOOD LOSS FROM ANY NATURAL ORIFICE	16	11.63
7. A SWELLING OR SORE THAT DOESNOT GET BETTER	27	19.62
8. UNEXPLAINED LOSS OF WEIGHT	25	18.17

PREVALENCE OF CANCER

There were 10 confirmed cases of cancer in the study population. This gives a prevalence of 31.5/100,000 population. Among these 4 were males and 6 females. Cancer of the oral cavity was the most common observed cancer (60%) followed by breast cancer (30%). Sex-wise distribution and various types of cancer cases are given in table 38 and 39 respectively.

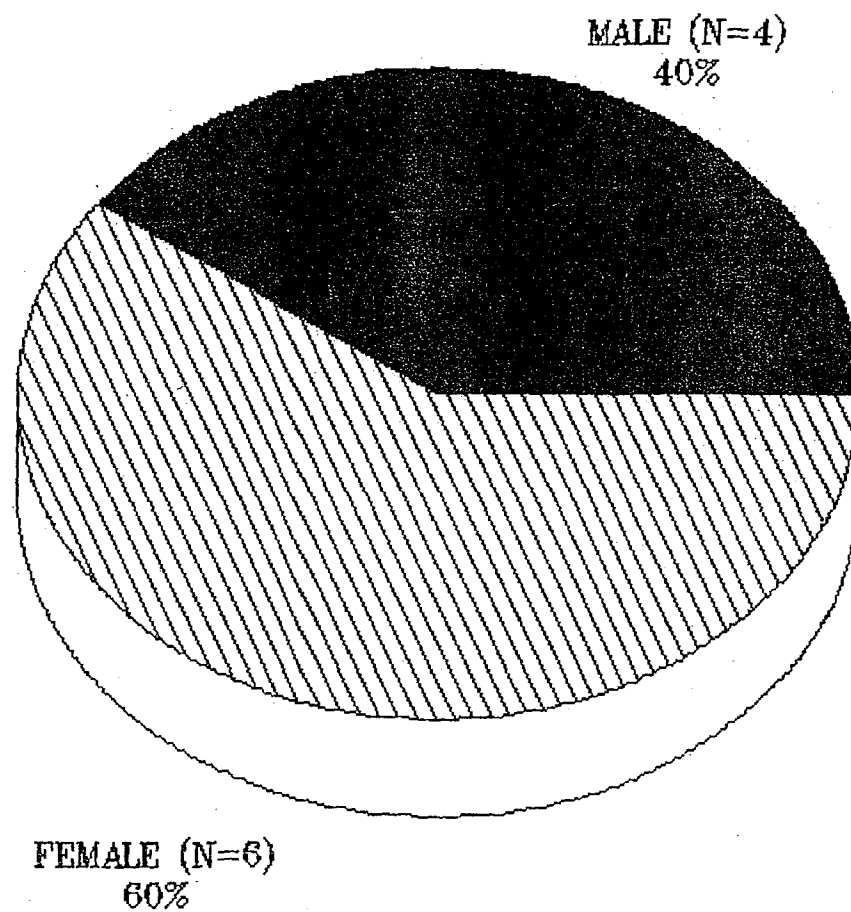
TABLE 38. SEXWISE DISTRIBUTION OF CONFIRMED CANCER CASES

SEX	NUMBER	%
MALE	4	40
FEMALE	6	60
TOTAL	10	100

TABLE 39. TYPES OF CONFIRMED CANCER CASES

SITE OF CANCER	NO	%
ORAL CAVITY	6	60
BREAST	3	30
THROAT	1	10
TOTAL	10	100

SEXWISE DISTRIBUTION OF CONFIRMED CANCER CASES



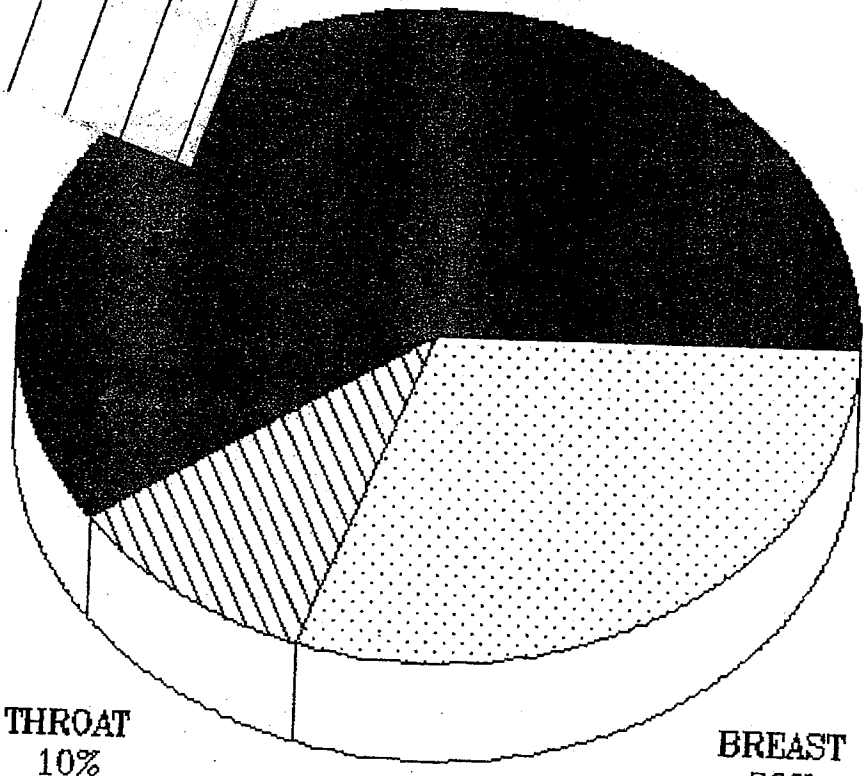
CONFIRMED ER CASES

MR-70

DOCTOR'S CODE

DEPT.

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Complete case by case details of all the confirmed cancer cases is given below in table 40.

TABLE 40. DETAILS OF CONFIRMED CANCER CASES

IDNO	AGE	SEX	DURATION	DIAGNOSIS	TREATMENT
D0234	52	M	3 YRS	SQUAMOUS CELL CARCINOMA SOFT PALATE	SURGERY CHEMOTHERAPY
D0236	50	M	2 YRS	CANCER CHEEK	SURGERY RADIOTHERAPY, CHEMOTHERAPY
D0378	80	F	-	THROAT CANCER	NO TREATMENT
G0125	56	M	1 YR	ORAL CAVITY	RADIOTHERAPY
N0375	60	F	1 YR	CANCER CHEEK	RADIOTHERAPY FOR ONE MONTH IN GOA
N0382	36	F	5 YRS	BREAST CANCER	SURGERY CHEMOTHERAPY
N1382	67	F	1 YR	CANCER CHEEK	CHEMOTHERAPY
N1836	45	F	3 YRS	BREAST CANCER	SURGERY
N2160	45	F	8 YRS	BREAST CANCER WITH SECONDARIES	SURGERY
M0836	65	M	7 MTHS	SQUAMOUS CELL CARCINOMA BASE OF TONGUE STAGE II	RADIOTHERAPY CHEMOTHERAPY

There were a total 57 cases of suspected cancer. Among them 54.4% were females and 45.6% were males. Oral cancer was the most common followed by cancer of the thyroid. The third most common cancer suspected in the study population during medical examination was the breast cancer. These details are given in tables 41 and 42.

TABLE 41. SEXWISE DISTRIBUTION OF SUSPECTED CANCER CASES

SEX	NUMBER	%
MALE	26	45.6
FEMALE	31	54.4
TOTAL	57	100.0

SEXWISE DISTRIBUTION OF SUSPECTED CANCER CASES

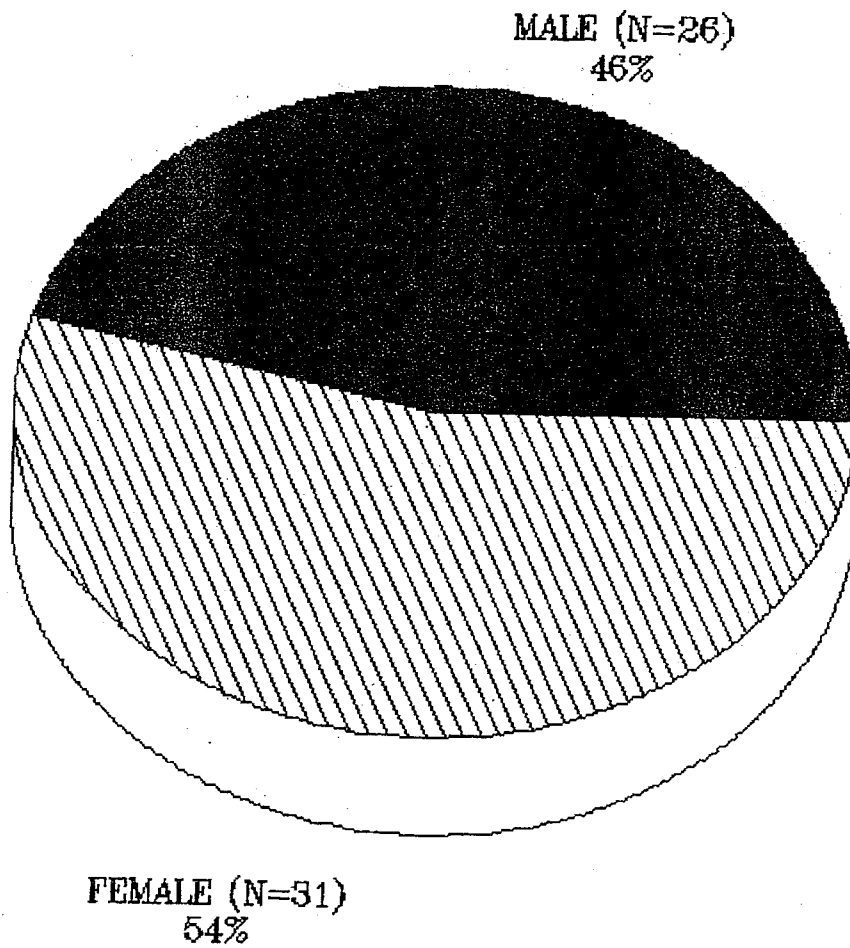
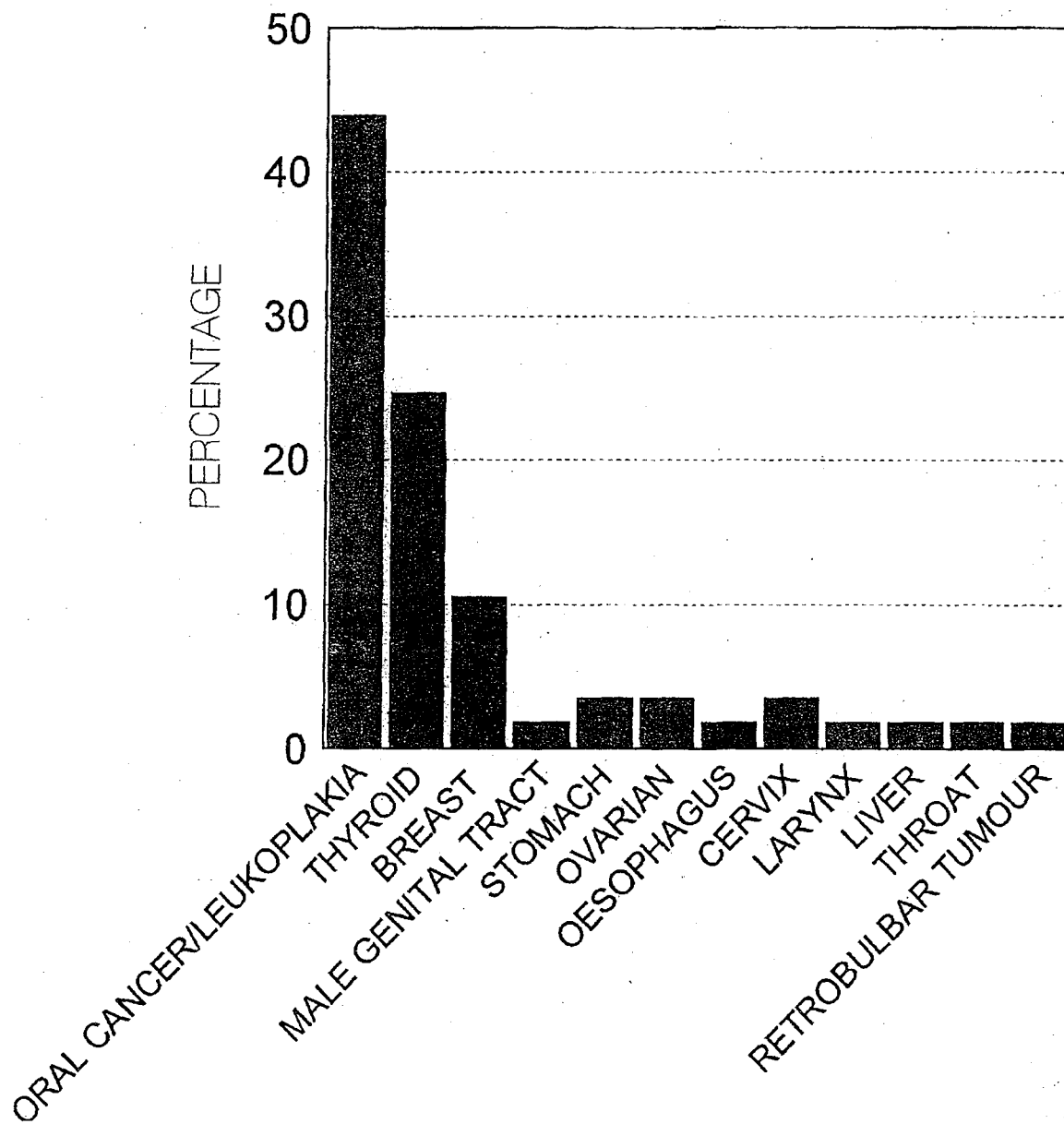


TABLE 42. SITES OF SUSPECTED CASES OF CANCER

SITES	NUMBER	%
THYROID	14	24.6
LEUKOPLAKIA/ORAL CANCER	25	43.9
BREAST	6	10.5
GENITAL TRACT	1	1.8
STOMACH	2	3.5
OVARIAN	2	3.5
OESOPHAGUS	1	1.8
CERVIX	2	3.5
LARYNX	1	1.8
LIVER	1	1.8
THROAT	1	1.8
RETROBULBAR TUMOUR	1	1.8
TOTAL	57	100.0

SITES OF SUSPECTED CASES OF CANCER



Case by case details of these suspected cancer cases are given in table 43.

TABLE 43. DETAILS OF SUSPECTED CANCER CASES

(N=57)

IDNO	NAME	SEX	AGE (in yrs)	SITE OF CANCER	FAMILY HISTORY OF CANCER
B0038	BHAGIRATHI	F	35	CA OF OESOPHAGUS	NO
B0102	NARAYAN	M	65	ORAL CANCER	NO
B0179	SEETHA	F	33	CA CERVIX	NO
B0212	MAHABALESHWARA M		69	LEUKOPLAKIA	NO
C0043	KULSUMBI	F	50	THYROID	NO
C0058	SHIVANNA	M	45	LEUKOPLAKIA	NO
C0067	YASHODA	F	47	CA CERVIX	NO
C0096	DEVAMMA	F	34	THYROID	NO
C0113	GAYATHRI	F	65	THYROID	NO
C0117	SRIKANTH	M	55	LEUKOPLAKIA	NO
C0120	LAXMI	F	57	THYROID	YES
C0120	SEETHA	F	26	THYROID	YES
C0147	SUKRI	F	50	THYROID	NO
D0194	PARVATHI	F	34	THYROID	NO
D0347	GIRIJA	F	50	THYROID	NO
D0501	RAMA	M	55	ORAL SUBMUCUS FIBROSIS	NO
E0115	SARA B	F	55	THYROID	NO
E0136	MANJUNATH	M	38	THYROID	NO
E0351	JAYALAXMI	F	46	THYROID	NO
E0442	ANASUYA	F	30	ORAL SUBMUCUS FIBROSIS	NO

TABLE 43 (Continued). DETAILS OF SUSPECTED CANCER CASES

IDNO	NAME	SEX	AGE (in yrs)	SITE OF CANCER	FAMILY HISTORY OF CANCER
E0448	SURESH	M	34	ORAL SUBMUCUS FIBROSIS	NO
E0452	SARASWATHI	F	66	OVARIAN TUMOUR	NO
F0131	KRISHNA	M	28	ORAL CANCER	NO
F0182	UMESH	M	45	LEUKOPLAKIA	NO
F0300	GANAPATHI	M	45	ORAL CANCER	NO
F0367	BETHAYA	M	73	ORAL SUBMUCUS FIBROSIS	NO
G0025	MUKAMBIKA	F	44	THYROID	NO
G0071	THIMMAYYA	M	50	LEUKOPLAKIA	NO
G0110	SALO ANDU	M	65	CA OF GENITAL TRACT	NO
G0167	DODDATHAMMA	M	65	CA INTESTINE	NO
G0349	DATHA	M	35	ORAL SUBMUCUS FIBROSIS	NO
H0035	THIPPAVVA	F	50	LEUKOPLAKIA	NO
H0072	GALIAMMA	F	60	LEUKOPLAKIA	NO
I0009	DURGI	F	50	RETROBULBAR TUMOUR	NO
J0008	SOMI	F	50	LEUKOPLAKIA	NO
J0030	NEMU	M	30	ORAL SUBMUCUS FIBROSIS	NO
M0056	VASANTHI	F	60	ORAL CANCER	NO
M0313	SAVITHRI	F	55	CA LARYNX	NO
N0016	VINAYAK	M	23	LIVER CANCER	NO
N0046	MAHADEV	M	70	LEUKOPLAKIA	NO
N0682	BINDIYA	F	21	BREAST CANCER	NO
N0794	LAXMI	F	60	THYROID	NO

TABLE 43 (continued). DETAILS OF SUSPECTED CANCER CASES

IDNO	NAME	SEX	AGE (in yrs)	SITE OF CANCER	FAMILY HISTORY OF CANCER
N0841	SUBRAYA	M	62	LEUKOPLAKIA	NO
N1292	SUMA	F	25	OVERIAN TUMOR	YES
N1322	SADIKA BANU	F	33	BREAST CANCER	NO
N1340	ACHUTHAN	M	60	ORAL CANCER	NO
N1355	RANGAPPA	M	50	CA STOMACH	NO
N1396	NAZMA	F	30	BREAST CANCER	NO
N1551	JAYAMMA	F	30	BREAST CANCER	NO
N1823	ARCHANA	F	47	THYROID	NO
N2158	KAMALA	F	38	BREAST CANCER	NO
N2158	VIDYA	F	18	BREAST	NO
N2196	PERU	M	55	LEUKOPLAKIA	NO
N2255	PRABHAKAR	M	48	LEUKOPLAKIA	NO
N2990	MANJANNA TV	M	37	LEUKOPLAKIA	NO
N3131	GAJANAN	M	55	THROAT	NO
P0039	DAULO NARASIMHA	M	75	LEUKOPLAKIA	NO

Another important health problem assessed was cataract. There were 233 cataract cases in the survey population which gives a prevalence of 0.73%. The prevalence among males were slightly higher than (0.78%) females (0.68%). These details are depicted in table 44 and 45.

TABLE 44. SEXWISE PREVALENCE OF CATARACT CASES

SEX	POPULATION	PREVALENCE	
		NUMBER	%
MALE	16353	128	0.78
FEMALE	15431	105	0.68
TOTAL	31784	233	0.73

TABLE 45. SEXWISE DISTRIBUTION OF CATARACT CASES

SEX	CATARACT CASES	
	NUMBER	%
MALE	128	54.94
FEMALE	105	45.06
TOTAL	233	100.00

H. FEMALES : REPRODUCTIVE HISTORY

Another component of the health information collected was the reproductive history of married women. There were 10725 females in the age group of 15 years and above and 8319 among them were married. These married women were interviewed and examined. The survey team could gather information from 7772 (93.4%) married women. The information is depicted in tables 46 to 53.

TABLE 46: FEMALES REPRODUCTIVE HISTORY DATA

NUMBER OF FEMALES OF AGE 15 YEARS AND ABOVE IN THE SURVEY POPULATION :	10725
NUMBER OF EVER MARRIED WOMEN :	8319
NUMBER OF MARRIED WOMEN WITH REPRODUCTIVE HISTORY DATA AVAILABLE :	7772

The consanguineous marriage rate was considerably high (13.1%) in the study population and the most common type of consanguineous marriage in the community was marriage with first cousin (46.8%). Uncle-niece marriage was also common (27.9%). These details are given in table 47 and 48.

TABLE 47: HISTORY OF CONSANGUINITY

CONSAGUINITY	NUMBER	%
YES	1018	13.1
NO	6754	86.9
TOTAL	7772	100.0

TABLE 48: NATURE OF CONSANGUINOUS RELATIONSHIP

RELATION	NUMBER	%
UNCLE NIECE	284	27.9
1 st COUSIN	476	46.8
2 nd COUSIN	11	1.1
DISTANT RELATIVE	247	24.2
TOTAL	1018	100.0

Overall infertility rate was 4.3% in which 2.5% was primary infertility and 1.7% secondary infertility. This information is given in the following table.

TABLE 49: PREVALENCE OF INFERTILITY AMONG FEMALES

INFERTILITY	NUMBER	%
PRIMARY	197	2.5
SECONDARY	134	1.7
NO INFERTILITY	7441	95.8
TOTAL	7772	100.0

TOTAL INFERTILITY RATE : $331/7772=4.3\%$

Demographic details of married women are described in tables 50 to 52. The median age of women who were interviewed was 36 years. Median age at menarche, marriage and menopause were 14, 18 and 46 years respectively. 43.7% of the married women were practicing one or the other form of contraception. The most common choice of contraceptive method in this population is tubectomy (37.2%). Other methods are rarely practiced.

TABLE 50: DEMOGRAPHIC DETAILS OF MARRIED WOMEN

PARAMETER	MEAN± S.D	MEDIAN
PRESENT AGE (YRS)	39.3 ± 13.8	36.0
AGE AT MENARCHE (YRS)	13.7 ± 0.8	14.0
AGE AT MARRIAGE (YRS)	19.0 ± 3.4	18.0
AGE AT MENOPAUSE (YRS)	46.1 ± 3.7	46.0

TABLE 51: PROPORTION OF MARRIED WOMEN ATTAINED MENOPAUSE

MENOPAUSE ATTAINED	NUMBER	%
YES	2204	28.4
NO	5568	71.6
TOTAL	7772	100.0

TABLE 52: ACCEPTANCE OF FAMILY PLANNING METHODS AMONG MARRIED WOMEN

FAMILY PLANNING METHODS ADOPTED	NUMBER	%
TUBECTOMY	2888	37.2
IUCD	172	2.2
O.C	42	0.5
VASECTOMY (HUSBAND)	113	1.5
OTHERS	176	2.3
NIL	4381	56.3
TOTAL	7772	100.0

PROPORTION OF MARRIED WOMEN PRACTICING CONTRACEPTION = 43.7%

Another important information gathered from these married women was about the details of pregnancy outcome for the last 10 years. These details have been explained in table 53. The overall still birth rate was 24.6/1000 births which widely varied between 13.6 to 33.6 during the 10 year period. Similarly spontaneous abortion rate was 36.6/1000 pregnancies which varied from 18.7 to 56.6 per 1000 pregnancies in the last 10 years. The overall pregnancy wastage was 7.1 percent with a range between 5.8% and 11.1% during the last 10 years.

TABLE 53: PREGNANCY WASTAGE DURING THE LAST 10 YEARS (1987 TO 1996)

YEAR	NO. OF PREGNANCIES	NO. OF LIVE BIRTHS	%	NO. OF S. B	SB RATE (/1000 BIRTH)	NO. OF S. A	SA RATE (/1000 PREGNANCIES)	PREGNANCY WASTAGE (SB+SA+IA)	%
1987	695	653	94.0	21	31.2	13	18.7	42	6.0
1988	568	528	93.0	12	22.2	22	38.7	40	7.0
1989	641	603	94.1	15	24.3	16	25.0	38	5.9
1990	581	538	92.6	16	28.9	23	39.6	43	7.4
1991	684	644	94.2	18	27.2	21	30.7	40	5.8
1992	650	602	92.6	17	27.5	23	35.4	48	7.4
1993	619	575	92.9	9	15.4	27	43.6	44	7.1
1994	622	582	93.6	8	13.6	25	40.2	40	6.4
1995	583	518	88.9	18	33.6	33	56.6	61	10.5
1996	557	516	92.6	11	20.9	24	43.1	41	7.4
TOTAL	6200	5759	92.9	145	24.6	227	36.6	441	7.1

SB = STILL BIRTH, SA = SPONTANEOUS ABORTION, IA = INDUCED ABORTION,

I. HEALTH STATUS OF CHILDREN

The general health status of the children was examined separately. There were 9493 children below the age of 15 years in the survey population. Among them, 5830 (61.4%) were available for medical examination, of which, 2947 (50.5%) were males and 2883 (49.5%) were females.

TABLE 54: DETAILS OF CHILDREN IN THE STUDY POPULATION

TOTAL NUMBER OF CHILDREN IN THE SURVEY POPULATION	:	9493
NUMBER OF CHILDREN EXAMINED	:	5830 (61.4%)
MALES	:	2947 (50.5%)
FEMALES	:	2883 (49.5%)

The overall health status of children were found to be good. The prevalence of common disorders were dental problems (22.8/1000 children examined), skin diseases (18.4/1000 children) and lymphadenopathy (11.7/1000 children). Few children also presented with other problems such as goitre, deranged mental status etc.

A few children had some danger signals of cancer. There were 20 children (0.34%) with swelling which did not subside. There were 6 cases of abnormal gait, 3 cases of unexplained fever not responding to treatment and 2 cases of mass abdomen and gradual deteriorating vision. Details of these are given in table 55.

TABLE 55: DANGER SIGNALS OF CANCER AMONG CHILDREN
(N=5830)

SYMPTOMATOLOGY	NUMBER	%
SWELLING THAT DOES NOT SUBSIDE	20	0.34
FEVER, UNEXPLAINED, NOT RESPONDING TO TREATMENT	3	0.05
VISION, THAT GRADUALLY DETERIORATES	2	0.03
GAIT THAT IS ABNORMAL	6	0.10
MASS ABDOMEN	2	0.03

CONGENITAL ANOMALIES

Finally the interview team made an inquiry and examined the individuals to find out on the congenital anomalies prevalent in the study population. A total of 111 cases of birth were defect reported. This gives an overall prevalence of 3.49/1000 population. Table 56 deals with age-wise distribution of birth defects. There were 8 infants and 21 children under 5 years of age with birth defect. There were 56 children below 15 years of age with birth defects which gives a prevalence of 5.89/1000 children in this age group.

TABLE 56. AGE WISE DISTRIBUTION OF BIRTH DEFECTS

AGE IN YRS	NUMBER	%
<1	8	7.2
1-4	13	11.7
5-14	35	31.5
15-59	52	46.9
>=60	3	2.7
TOTAL	111	100.0

The prevalence of birth defect for males and females was 3.85/1000 and 3.11/1000 respectively. Table 57 and 58 explains sex-wise distribution and prevalence of birth defects.

TABLE 57. SEXWISE DISTRIBUTION OF BIRTH DEFECTS

SEX	NUMBER	%
MALE	63	56.8
FEMALE	48	43.2
TOTAL	111	100.0

TABLE 58. SEXWISE PREVALENCE OF BIRTH DEFECTS

SEX	POPULATION	PREVALENCE	
		NUMBER	RATE/1000 POPULATION
MALE	16353	63	3.85
FEMALE	15431	48	3.11
TOTAL	31784	111	3.49

The details of children with birth defects are listed in table 59.

TABLE 59. DETAILS OF BIRTH DEFECTS AMONG CHILDREN (<15 YEARS)
(N = 56)

IDNO	NAME	AGE	SEX	DEFORMITY
B0010	JANAGANNATH	1	M	CAPILLARY HEMANGIOMA
B0012	SULABHA	1	F	PROPTOSIS
B0120	JEYANA	2	F	CLUB FOOT
C0050	GAJANANA	9	M	EAR DEFORMITY
C0153	SATHISH	1	M	CLEFT LIP
D0110	ADITHYA	1	M	NO LEFT EYEBALL
D0294	MONIKA	3	F	VSD
E0049	SHYAMA	11	M	BILAT.SYNDACTYLY
E0077	ASHWINI	8	F	MENTAL RETARDATION
E0259	VIDYA	12	F	CEREBRAL PALSY
E0271	MAHABALESHWAR	2	M	CLUB FOOT
E0452	PAVANRAJ	4	M	PHYSICAL,MENTAL RETARDATION
E0480	BHAGYALAXMI	5	F	CEREBRAL PALSY
F0016	SHRIDHAR	10	M	SQUINT
F0112	CHIDANAND	12	M	POLYDACTYLY
F0190	NAGARATHNA	7	F	MICROCORNEA
F0362	SACHIDANAND	1	M	VSD
G0014	PRADEEP	1	M	MENTAL RETARDATION
G0039	NAGVENI	2	F	TALIPES EQUINO VARUS (CLUB FOOT)
G0209	GOPAL	10	M	DEAF MUTISM
G0277	CHANDRAKANTH	11	M	UNDESCENDED TESTIS
G0311	KESHAVA	13	M	CTEV
G0320	JEEVAN	6	M	CTEV
H0035	MANJANNA	4	M	VSD
H0039	MANJU	8	M	CLEFT LIP
K0017	GOPESH	5	M	CLEFT LIP
K0104	PADMA	12	F	VSD
L0029	REVATHI	3	F	TONGUE SHORT FRENULUM
M0019	VANITHA	4	F	DEAF AND DUMB
M0131	SURAJ	6	M	MENTAL RETARDATION
M0274	TANNY	14	F	MENTAL RETARDATION
M0363	VEENA	8	F	BLINDNES
M0522	SANDHYA	14	F	DEAF & DUMB
M0522	NITHIN	11	M	DEAF & DUMB
M0879	NAGARAJ	4	M	POLYDACTYLI
M0926	SUCHITRA	7	F	MENTAL RETARDATION
M0926	SWETHA	5	F	MENTAL RETARDATION

TABLE 59 (Continued). DETAILS OF BIRTH DEFECTS AMONG CHILDREN (<15 YEARS)
(N = 56)

IDNO	NAME	AGE	SEX	DEFORMITY
M1016	MALASHREE	9	F	MENTAL RETARDATION
M1203	DEEPAK	5	M	MENTAL RETARDATION
M1227	PAVITHRA	3	F	DOWN'S SYNDROME
N0256	PRAVEENA	14	F	MENTAL RETARDATION
N0595	AKSHATHA	2	F	MENTAL RETARDATION
N0698	ROOPA	7	F	CLUB FOOT
N0818	SUNNA	3	F	MENTAL RETARDATION
N0922	VIVEK	4	M	CONGENATAL HEART DISEASE
N1687	SANDESH	10	M	CEREBRAL PALSY
N1834	SONAL	8	F	MENTAL RETARDATION
N1969	DAYANAND	9	M	MENTAL RETARDATION
N2031	SACHIN	10	M	GROWTH RETARDATION
N2163	VINAY	5	M	CEREBRAL PALSY
N2432	NISARGA	1	F	CONGENATAL HEART DISEASE
N2834	SUSHMA	5	F	CEREBRAL PALSY
N2850	VISHAD	6	M	CEREBRAL PALSY
N2861	VASANTHI	14	F	CLEFT PALATE
N3070	VINEETH	1	M	CLEFT PALATE
P0107	RAJENDRA	7	M	PTOSIS

SUMMARY AND CONCLUSIONS

Study area: (This study was carried out among people residing in 85 villages within 20 kilometers radius of Kaiga Nuclear Power Plant.)

Study population: The entire population residing in the stipulated area was included in the study.

Study design: This was a prevalence study - a baseline epidemiological survey.

Study period: (January 1997 to May 1998.)
5L The survey was completed in 1 1/2 yrs. for

SUMMARY OF FINDINGS

Number of villages covered	:	85
Number of houses in the study area	:	8008
Number of houses from which information was obtained	:	7307 (91.25%)
Population covered :		
Males	:	16353
Females	:	15431
Total	:	31784

Prominent family type in the study population was nuclear (77.8%) and majority of the families were Hindus (91.1%). Most of the families own land and live in pucca or mixed type of houses (83.4%). 72% of houses are electrified. Well water and tap water are the main sources of drinking water.

Lack of sanitary latrines (64.0%) and absence of proper drainage facilities (74.4%) were observed. Among the total population, 78.6% of males and 65.0% of females were literate. Agriculture and unskilled work were the major occupation of males whereas majority of females were housewives.

As far as minor illness is concerned, majority of population sought help from Primary Health Centre (PHC) or Kaiga Project Hospital and for any major illness they reported to private hospital or Nursing home.

During the survey time nearly 2.7% of the population were suffering from prolonged illness. The death rate was 4.12/1000 population during the preceding year of the survey.

A total of 5760 males and 8046 females were interviewed for assessing their personal habits. Among females the most prevalent personal habit was chewing (25.6%). In males, 31.02% were chewers and 25.12% were smokers. Nearly 6.0% males were consuming alcohol, mainly country liquor.

A total of 13762 adults were available for medical examination. 4% of them had some family history of cancer. There were 10 confirmed cancer cases which gives a prevalence of 31.5/100,000 population. Oral cancer was the most common (6 cases) followed by breast cancer (3 cases). There were 233 cataract cases which gives a prevalence of 0.73%.

There were 7772 married women in the age group of 15-45 years who were interviewed and examined for gathering information about their reproductive history.

The data reveals that 13% of the marriages were consanguinous marriages in which marrying the first cousin was the most prevalent custom (46.8%) followed by marriage between uncle and niece (27.9%). Overall infertility rate was 4.3%. Median age at marriage was 18 years. The survey reveals that, nearly 43% of the eligible couples were practicing contraception; tubectomy being the most popular one.

7 | A probe into pregnancy outcome for the last 10 years, among the married women, shows that **the overall still birth rate was 24.6/1000 births and spontaneous abortion rate was 36.6/1000 pregnancies.** The overall pregnancy wastage was 7.1%.

Finally the children who were present at during home visits were examined for assessing their general health status. Common health problems observed were related to dental health and skin disorders. No cancer case was detected among children.

The last aspect examined in the epidemiological survey was estimation of prevalence of congenital abnormalities.

8 | There were 111 cases of birth defects reported in the total population, which gives a prevalence of 3.49/1000 population.] Among these 7.2% were infants and 11.7% were in the age group of 1-5 years. A total of 56 children below 15 years of age with birth defect were in during the survey population.

RECOMMENDATIONS

1. Study should be continued to fulfill the remaining objectives viz.
 - i) To find out the chromosomal aberrations especially Down's syndrome in the population under study.
 - ii) To find out the immunological derangements if any in the population under study.
 - iii) To find out if there is any change in morbidity pattern, cytogenic profile and immunological functions during the specified period of 10 years and to correlate the same with radiation levels.

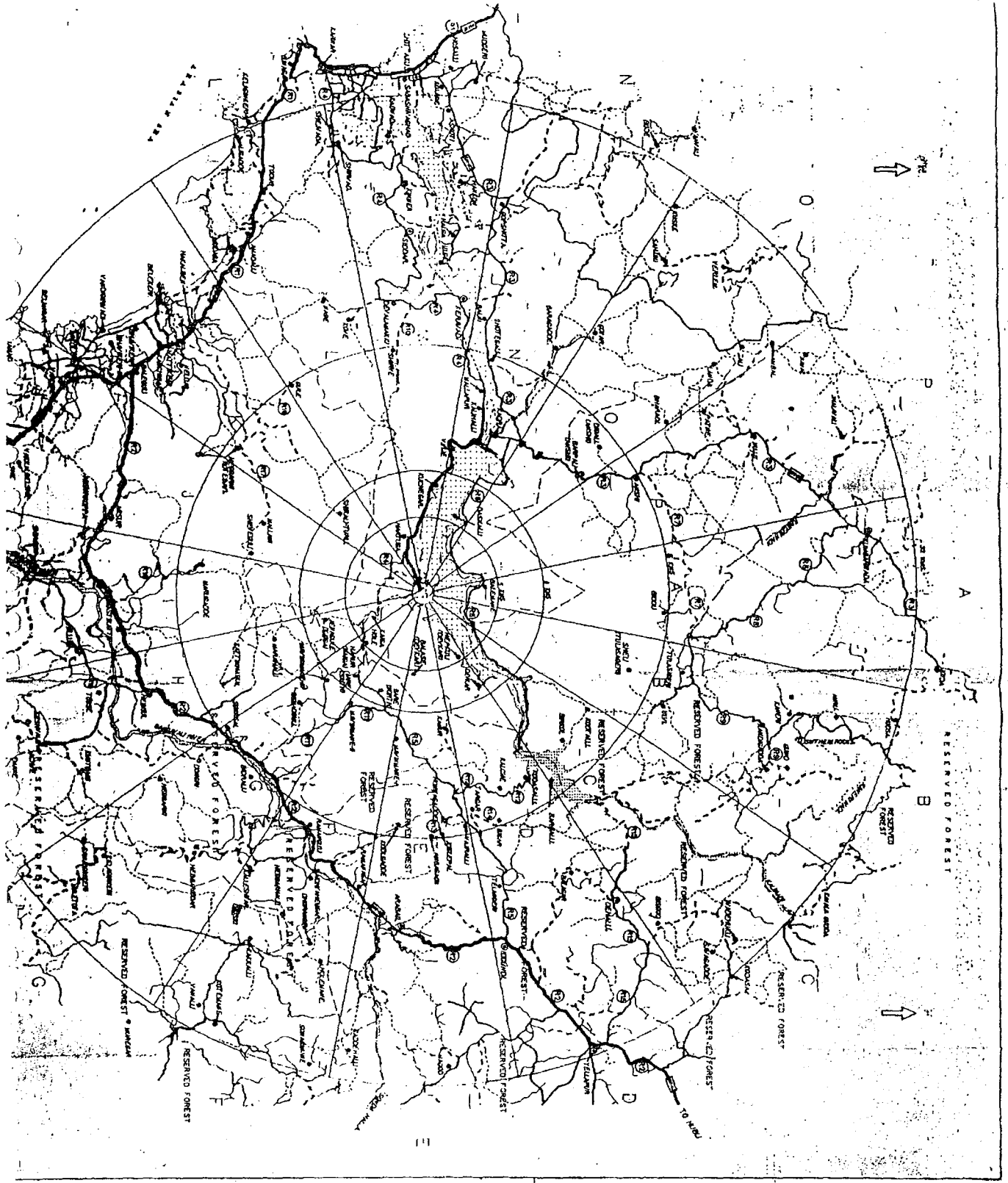
2. After the plant becomes operational, similar epidemiological surveys must be conducted periodically preferably at an interval of 3 years and the results could be compared with the baseline data in order to find out differences if any in the pattern of morbidity and mortality.

LIMITATIONS

1. Many suspected cases of cancer could not be followed up and investigated further. It would have probably contributed to an increase in number of cancer cases.
2. There may be an under estimate in reporting congenital malformations due to the fact that the survey was conducted by medical officers and not specialists. As such only overt and obvious congenital malformations could be detected in the survey.
3. In spite of repeated attempts information could not be collected from nearly 9% of houses due to very difficult terrain and weather conditions. However, this proportion of non-response is within the acceptable limits.

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ID NO. **EPIDEMIOLOGICAL SURVEY IN NORTH KANARA DISTRICT (Karnataka)**

Department of Community Medicine, KMC MANIPAL

Date of Interview: M [] D [] YEAR []. **I. IDENTIFICATION**

1. Sl. No. [] 2. Sector Code [] 3. Team Code []
4. Head of the household:
5. Village Name: 6. Village Code:
7. House No. 8. Locality:
9. Land mark: 10. Taluk:

II. FAMILY PARTICULARS

1. Total family members: [] 2. Type of family: Nuclear 1
3 generation 2
Joint 3
3. Religion: Hindu 1
Christian 2
Muslim 3
Jain 4
Others 5
4. Caste: SC 1
ST 2
Others 3
5. Mother tongue: 6. Home Town:
7. Duration of stay (in years):

III. SOCIO-ECONOMIC STATUS

1. Type of house: Pucca 1
Kutchha 2
Mixed 3
2. Ownership: Own 1
Rented 2
Free 3
Temporary 4
3. Land holding: Cents Acres
4. Possession of Vehicles: [Y/N]
- Bicycle []
 Scooter/Motor Bike []
 Car []
 Tractor []
 Auto Rickshaw []
 Heavy Vehicles []
 Others (specify) []
5. Household belongings: [Y/N]
- Radio []
 TV (B/W) []
 TV (Col) []
 Fridge []
 VCR []
6. Live Stock: [Y/N]
- Cows []
 Buffalo []
 Goat []
 Others []
7. Getting Newspaper: [Y/N]
- Daily []
 Weekly []

3. Family details (attach additional sheets if more members are present)

Sl. No.	Name (Begin with head)	Sex	Date of birth (Age)	Relationship (with the head)	Marital status S/M/W/ D/SP	Occupation	Income	Literacy Status*	Veg/ Nonveg.	Remarks
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.										
14.										
15.										
16.										

1) Nil, 2) Can read and write 3) 1-4 years 4) 5-7 years 5) 8-10 years 6) 11-12 years 7) Drp 8) Grad 9) P. Gra. 10) Prof.

3. Total family income (monthly in Rs.):

IV. ENVIRONMENTAL SANITATION

<p>1. Separate kitchen : Yes No</p> <p>3. Cattle shed : Nil 1 In the house 2 Separate 3</p> <p>5. Electricity : Yes No</p> <p>7. Latrine : Yes No</p> <p>8. Drainage facility : Yes No</p>	<p>2. Smoke outlet : Yes No</p> <p>4. Fuel used : Biomas 1 Biogas 2 Kerosene 3 LPG 4</p> <p>6. Source of drinking water : Tap 1 Borewell 2 Well 3 Pond 4 River 5 Others 6</p>
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V. AVAILABILITY, RANGE AND UTILIZATION OF HEALTH FACILITIES

- a) Where would you get medical aid if somebody in your family fell sick? [] Minor illness
[] Major illness
1. Private practitioner (Allopathic)
 2. Kalga Project Hospital
 3. Private hospital/nursing home
 4. PHC/PHU/Subcentre/Mobile unit
 5. Indigenous Medical Practitioners (Ayurvedic/Homeopathic/Others)
 6. Traditional Healer
 7. Village Health Guide
 8. Anganwadi Worker
 9. Home remedies
 10. Others (specify)
- b) Distance of the nearest medical facility available in kms: []

VI. INFORMATION ABOUT PROLONGED ILLNESS

Is any person suffering from prolonged illness?

Yes

No

If Yes, details

Name	Age	Sex	Duration of Illness	Complaints	Diagnosis	Treatment	Place * of treatment

VII. MORTALITY HISTORY (SINCE JANUARY 1996)

Did any death occur in the family since Jan. 1996?

Yes

No

If Yes, details

Name	Age	Sex	Date of death	Place of death	Cause of death	Place of treatment

* Write corresponding number for place of treatment

1. Private practitioner (Allopathic)
2. Kaiga Project Hospital
3. Private hospital/nursing home
4. PHC/PHU/Subcentre/Mobile unit
5. Indigenous Medical Practitioners
(Ayurvedic/Homeopathic/Others)
6. Traditional Healer
7. Village Health Guide
8. Anganwadi Worker
9. Home remedies
10. Others (specify)

**PERSONAL HABITS ASSESSMENT AND MEDICAL DATA ON ADULTS
(15 YEARS AND ABOVE)**

(Fill up a separate form for each adult member of the family)

1. Sector Code: [] 2. Team Code: [] 3. Village Code: []
 4. Name: 5. Age: 6. Sex: M/F.....

I. PERSONAL HABITS ASSESSMENT FOR ADULTS

A. CHEWING HABIT

1. Non-chewer: Never 1
 Occasional (<1 per day) 2

2. Present chewer:

Type of chewing	Yes/No	Age started	Duration (in yrs.)	Frequency (per day)
PST				
T				
Others				

3. Ex-chewer:

Type of chewing	Yes/No	Age started	Age stopped	Duration (in yrs.)	Frequency (per day)
PST					
T					
Others					

PST = Pan Supari Tobacco T = Tobacco with or without other ingredients

B. SMOKING HABIT

1. Non-smoker: Never 1
 Occasional (<1 per day) 2

2. Present smoker:

Type of smoking	Yes/No	Age started	Duration (in yrs.)	Frequency (per day)
Cigarette				
Beedi				
Others				

3. Ex-smoker:

Type of smoking	Yes/No	Age started	Age stopped	Duration (in yrs.)	Frequency (per day)
Cigarette					
Beedi					
Others					

Medical Examination (Only if suspected of cancer/cataract)

A. General

Pulse rate: BP: Hi: Wt:

B. Specific

Site	Condition (N = Normal, A = Abnormal)	Details (if abnormal)
Head & Neck		
Eyes		
Oral cavity		
Throat		
Thyroid		
Lymphnode		
Breast		
Thorax		
CVS		
RS		
Abdomen		
Liver		
Spleen		
External genitalia		
Extremities		
Any other (specify)		

CATARACT (To be included after examination of eyes for all individuals above 50 years)

V.A. F.C < 6 mts Yes/No F.C < 3 mts Yes/No CATARACT Yes/No

C. Any other disease (specify):

D. Investigations done:

i) Pap smear taken: Yes N.A. 3
No Unknown 4

if Yes, details:

ii) X ray taken: Yes/No

if Yes, details:

iii) Blood test: Yes/No

if Yes, details:

iv) Any other investigations

PROVISIONAL DIAGNOSIS

1. Provisional diagnosis; Normal 1 Cancer 3
Suspected cancer 2 Other disease 4

2. Recommendations:

REPRODUCTIVE HISTORY (ONLY FOR MARRIED WOMAN)

(Fill up a separate form for each married woman)

1. Sector Code: []	2. Team Code: []	3. Village Code: []
4. Name:	5. Age:	
6. Age at menarche:	7. Age at marriage:	
8. History of consanguinity:	Yes	
	No	
If Yes, specify the relation:	Uncle-niece	1
	1st cousin	2
	1st cousin once removed	3
	2nd cousin	4
	Distant relative	5
9. Conceived:	Yes	
	No	
10. Regarding infertility (if applicable):	No	1
	Primary	2
	Secondary	3
11. Number of Pregnancies:		
12. Number of abortions/still births:		
13. i) Has menstruation stopped:	Yes	
	No	
ii) If Yes, whether:	Naturally	1
	Artificially	2
14. Age at Menopause:	Yrs.	
15. i) Family planning:	Yes	
	No	
ii) If Yes, type of contraception:	Tubectomy	1
	IUCD	2
	O.C.	3
	Vasectomy (Husband)	4
	Others	5
	None	6

16. HISTORY OF PREGNANCIES

Pregnancy No.	1	2	3	4	5	6	7	8
Month & Year of delivery								
Age of Mother								
Gestational Age (in months)								
Outcome*								
Sex of the child**								
Vital Status 1 = Alive, 2 = Dead, 3 = N.A.								
If dead, state cause of Death								
Age at Death (child)								
Birth Defect if any (1 = Yes, 2 = No, 3 = N.A.)***								

LB = Live Birth, SB = Still Birth, SA = Spontaneous Abortion
 IA = Induced Abortion, P = Pregnant
 * M = Male, F = Female, MM = Male Male, MF = Male Female, FF = Female Female
 N.A. = Not Applicable
 *** For every Birth Defect reported fill up Birth Defect form for each child

17. Any other details:

PROVISIONAL DIAGNOSIS

1. Provisional diagnosis: Normal 1 Cancer 3
 Suspected cancer 2⁹ Other disease 4

2. Recommendations:

ID.NO.

BIRTH DEFECT FORM
(To be filled up only when a birth defect is noted)

1. Sector Code: [] 2. Team Code: [] 3. Village Code: []

4. Name of the child: 5. Age: 6. Sex:

7. Vital status of child: Alive 1
 Dead 2

8. Head Circumference (in cms):

9. Mental Retardation: Yes
 No

Details if any:

10. Growth Retardation: Yes
 No

Details if any:

11. Abnormalities:

	[Y/N]	If Yes, specify.
Head	[]
Extremities	[]
Heart	[]
CNS	[]
Genitalia	[]
Skeletal	[]
Spine	[]
Any other	[]

Provisional diagnosis:

Recommendations:

