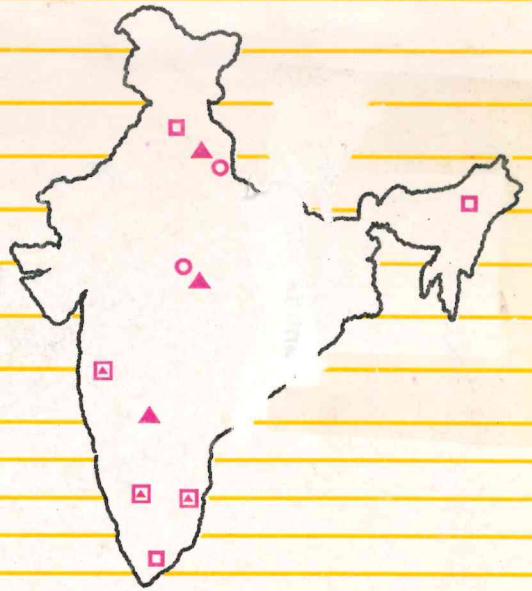
CANCER REGISTRY ABSTRACT



NEWSLETTER OF THE NATIONAL CANCER REGISTRY PROJECT OF INDIA

Vol. IX OCTOBER 2002 No.1

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CANCER REGISTRY ABSTRACT

NEWS LETTER OF THE NATIONAL CANCER REGISTRY PROGRAMME-ICMR VOL.IX NO.1 OCTOBER 2002.

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Development of An Atlas of Cancer in India

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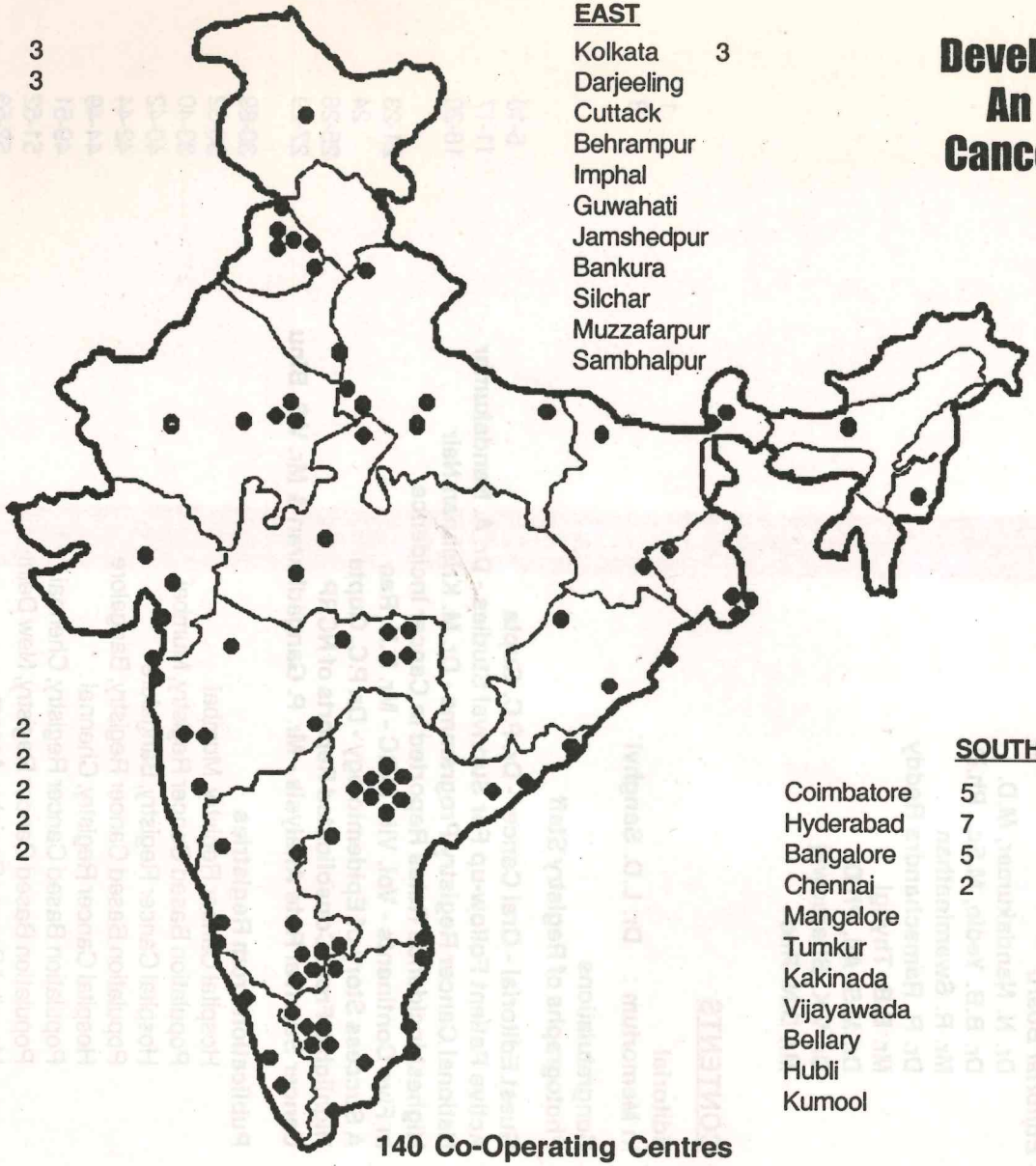

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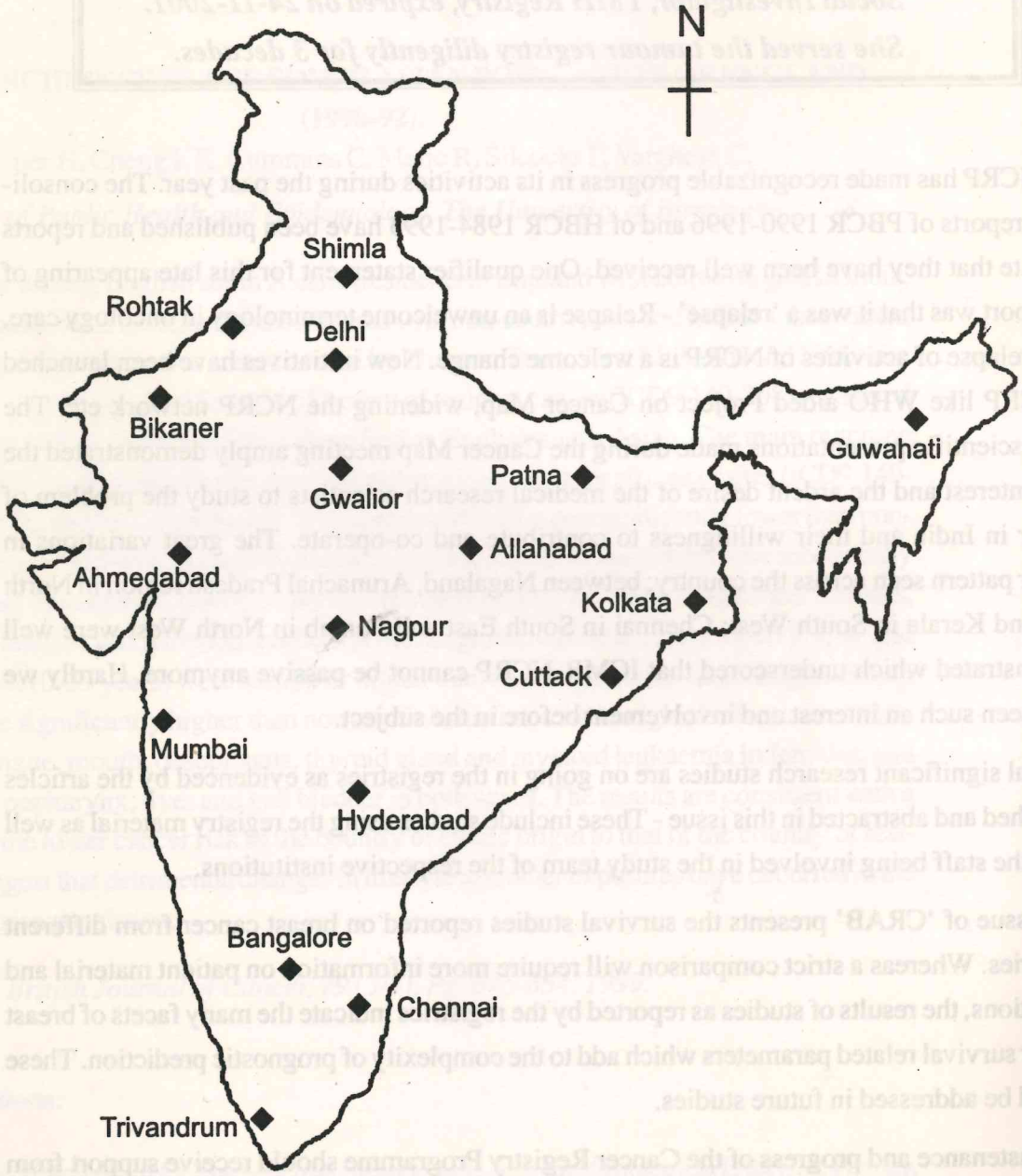
Hubli		Nalgonda
Kumool		Karaikal

140 Co-Operating Centres

REGIONAL CANCER CENTRES IN INDIA



IN MEMORY

Dr. L.D. SANGHVI
(1921-2001)

Dr. Labhshankar Dalichand Sanghvi, Lalit Sanghvi to the scientific community, passed away on 12th September 2001 after a brief illness. Dr. Sanghvi was a scientist of eminence with varied scientific interests. In his early years he worked with Dr. V.R. Khanolkar and was head of the Human Variation Unit (HVU) of the Indian cancer Research Centre set up by Dr. Khanolkar at the Tata Memorial Hospital in Mumbai. The unit had several achievements to its credit like identification of the first Sickle Cell anaemia case in India. Various genetic studies on Cooley's anaemia, Rhesus factor etc were undertaken. These studies encouraged ICMR to set up the Blood Group Reference Centre by recruiting some of the excellent staff from HVU. The other studies undertaken were, Inbreeding in India and its biological effects, Genetic variation and Genetic distance analysis in castes and tribes of India. Dr. Sanghvi was founder President of the Indian Society of Human Genetics. He was a member of the World Health Organisation's Panel of Experts in Human Genetics. He had several prestigious assignments abroad in the field of Human Genetics and Anthropology. When the HVU became the Division of Cancer Epidemiology Dr. Sanghvi headed the division. Several need based studies in cancer epidemiology were undertaken. He was deeply interested in the study of tobacco hazards. Way back in 1955, he was the lead author of the first publication on association of bidi smoking with oropharyngeal cancers. The publication was editorially commented upon in the British Medical Journal where it was published. He was instrumental in initiating studies on chemical analysis of bidi smoke. He was the Founder President of an active group called Action Council against Tobacco. After superannuation, he was invited by ICMR to set up a network of Cancer Registries in the country. Dr. Luthra and he developed 12 cancer Registries in different parts of India. These registries brought to light some interesting regional differences in cancer incidence and pattern besides helping in formulating Cancer Control Programmes. Dr. Sanghvi's research contribution include more than 75 publications on Human Genetics and Cancer Epidemiology in national and international journals. He was the recipient of the Sandoz award for cancer research in 1972. He is survived by his wife Mrs. Veena Sanghvi about whose support he used to fondly mention and his beloved daughter Darshana.

- Kasturi Jayant, Bangalore.

Dr. L.D. Sanghvi was the first professional in India to devote 100% of his time to cancer epidemiology. He made numerous original and substantive contributions to the subject through planned epidemiologic studies and insightful observations from the existing data. His most important contribution to cancer epidemiology interestingly, happened after his superannuation as a main scientific advisor and architect of the National Cancer Registry Project in the form of a network of hospital and population based cancer registries in India. This would be a difficult project at any place, any time and more so during

early eighties in India. It is a tribute to his scientific insight and skills that the project has become so successful.

My association with Dr. Sanghvi started when I joined an epidemiological research project on oral cancer and oral precancerous lesions in Tata Institute of Fundamental Research in 1966. I had little knowledge about epidemiologic studies at that time but Dr. Sanghvi was the Consulting Statistician to this research project. I had frequent periodic discussions and consultations with him on the project and I benefited greatly from this interaction during early years. Later on we collaborated in other activities such as a symposium on tobacco and health that he organized during 1987 and another international symposium on control of tobacco related cancers I organized in 1990. I also interacted with him as consultant and steering committee member of the NCRP and I always found his comments very perceptive and insightful.

- Dr. P. C. Gupta, Mumbai.

Dr. L.D. Sanghvi - an eminent Epidemiologist, outstanding Cancer research scientist was a great stalwart in paving way for the formation of Cancer Registries in India. He was an excellent human being ready to help every one, every time; he was a tough taskmaster, with vision for future things. I have known to Dr. Sanghvi for last 20 years, while working in the Steering Committee of the National Cancer Registry Project. Despite his international recognition and repute he was a monumental figure of modesty, and always passing the credit of achievements to his colleagues. Indeed his sad demise has brought a great void in Cancer Research in India and his friends are going to miss his ever-smiling face all the time. May god give courage to his family to bear this loss, and may his soul rest in place.

- Dr. N. C. Mishra, Lucknow.

I had the privilege of working with Dr. L.D. Sanghvi for several years. At the time I joined the Tata Memorial Hospital in 1957, the work I did was under the supervision of Dr. Sanghvi. He had by then established himself as an eminent Cancer Epidemiologist of India. Along with Ms. K.C.M. Rao (Mrs. Jayant) and Dr. Khanolkar, he produced the landmark paper in 1955 on various forms of tobacco use in causing oral and pharyngeal cancer. From then on he was the only cancer epidemiologist from India known abroad. He also was the first to study the carcinogenic potential of Bidi Smoke. Through meticulous and hard work, several cancer epidemiologic studies were conducted. His scientific temperament was a guiding force to all of us then working in Tata Memorial Centre. He also was the Dean of Cancer Research Institute. Along with Ms. Jayant, his work in Alibag, Colaba District in Maharashtra was the first effort in this country to study the cancer problem in Rural India. Heading the National Cancer Registry Project from 1982, he steered the NCRP to attain international acceptance. His was a life dedicated to the study of cancer as it affects the human beings. His kind acceptance of us, the juniors, and the leadership provided leave pleasant memories.

- P. Gangadharan, Karunagappally.

Congratulations

We are happy to inform that **Dr. Ketayun A. Dinshaw, DMRT (Lond.), FRCR (Lond.)**, Director, Tata Memorial Centre, received *'Padmasree'* Award from the **President of India Sri. K.R. Narayanan** in January, 2001. Dr. Dinshaw is the Principal Investigator of Hospital Cancer Registry, TMH and the Rural Population Cancer Registry Barshi.

Padmasree Dr. V. Shanta (1986), Chairman, Cancer Institute (WIA), Chennai, Principal Investigator, Madras Metropolitan Population Cancer Registry & Principal Investigator Hospital Cancer Registry, Adyar, Chennai was conferred Honoris Causa, ***Doctor of Science*** by the Tamil Nadu Dr. MGR Medical University on 03-05-2002.

We are happy to inform that **Dr. B.B. Yeole**, Deputy Director, Bombay Cancer Registry, has been awarded *'Rastriya Gaurav Award'* by 'India International Friendship Society', New Delhi. He received the award from **Sri. Bhim Narayan Singh former Governor of Tamil Nadu** on 26th October 2002.

Dr.K.A. Dinshaw

Dr.Kusum Verma

Dr.V. Shanta

Dr.M.R. Kamat

Dr.P.S. Prabhakaran

Dr.M.Krishnan Nair

Dr.V.K. Bharadwaj

Dr.B.M. Nene

Dr.K.U. Ahamed, Dibrugarh - Photo Not Available

Mrs. K. Jayant
P.B.C.R. Barshi

Dr. A. NANDAKUMAR
Officer in Charge,
NCRP

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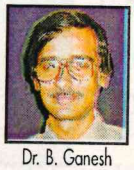
D.N. Rao



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Snehal Sant

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M. Sivakumar

Lakshmi Sarathy

R. Mahalakshmi

Dr. V. Gajalakshmi**

*Deceased on 24.11.2001

** Left Service on April 2002

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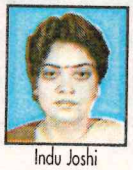
K.A. Puranik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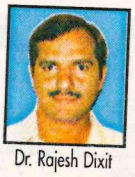
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Padmakumari


Anitha Nayar


V. Jalajakumari


N.M. Asha

Dr. L.D. Sanghvi and Dr. Usha K. Luthra - ARM Meeting

Photographs of some Registry Staff were not available in time Omissions are not deliberate. However it is regretted.

Guest Editorial:

ORAL CANCER

Prakash C. Gupta
Senior Research Scientist, Tata Institute of Fundamental Research,
Homi Bhbha Road, Mumbai - 400 005.

Nomenclature.

Oral cancers in ICD 9 (International Statistical Classification of Diseases and Related Health Problems) comprise 140, 141 and 143-5. The emphasis here would be on intra-oral cancers. Although site 140 (lips) does include some extra oral cancers, their etiopathogenesis may be quite different. For the same reason, site142 (salivary gland) is not included in oral cancer. In many reports, sites 146, 148 and 149 are often combined with oral cancers and this group is termed as oropharyngeal cancers. Although pharyngeal cancers have somewhat similar epidemiology and etiopathogenesis as oral cancers, they cannot be visualized unaided like oral cancers.

Descriptive Epidemiology.

Oral cancer incidence shows great variation in different parts of the world. The incidence is almost always much higher among men compared to women. Among men, incidence rates are high in parts of France, Brazil, Puerto Rico and in some population groups of Europe, Americas and Australia (annual incidence>10 per 100,000). The incidence is particularly high in South Asia, specifically India, where oral cancer forms a substantial proportion of all cancers. Among women, oral cancer incidence is reported to be very high in India[1,2]. There are no very clear-cut trends on incidence and mortality. In some countries in Europe, the incidence seems to be increasing[3,4]. In India, there are no significant trends although very recently oral cancer is reported to be increasing among younger males[5]. The intra oral site distribution of cancer can be very different in different populations. Among populations with low levels of skin pigment, extra oral cancers (site 140) may be the most common resulting in an overall high incidence rate of oral cancer. In western populations, cancer of the floor of the mouth is quite common whereas in India, cancer of the buccal mucosa is generally the most common cancer. In some parts of India, cancer of the palate is the most common form of oral cancer.

Risk Factors.

Smoking - The most common mode of smoking all over the world is cigarette smoking. There are numerous case-control as well as large cohort studies that demonstrate high and significant relative risk for relationship between cigarette smoking and oral cancer. For example, Cancer Prevention Study II (CPS II) after a 4-year follow-up of a cohort of 1.2 million Americans demonstrated a relative risk for oral cancer (ICD 140-149) among men as 27.48 for current smokers and 8.80 for former smokers[6].

Bidi smoking is the commonest form of smoking in India, and it is also prevalent in some other countries. Numerous case-control studies demonstrate a strong and dose-dependent relationship between bidi smoking and oral cancer.

Pipe smoking has been shown to be causally related to oral and lip cancers with high relative risk for a long time[7]. In recent years, there has been an upsurge in cigar smoking and therefore a renewed interest in its health consequences. In a recent review report, it was reiterated that cigar smoking results in high relative risk for oral cancer[8].

Country made cheroots are commonly smoked in eastern part of India, often with the glowing end inside the mouth (reverse smoking). This form of smoking causes cancer of the palate, otherwise an uncommon location. Thus palatal cancer is the most common oral cancer among the regions where reverse smoking is prevalent[9].

Smokeless tobacco use - Tobacco is used in a smokeless manner in a wide variety of ways[9]. The most common are the use of tobacco as an ingredient in betel quid popular in South Asia and the use of oral snuff popular in parts of USA, Scandinavian countries and several countries in Asia and Africa. Scientific evidence is sufficient and conclusive that both these forms of smokeless tobacco use cause oral cancer[10]. In India, tobacco is often used in smokeless manner without betel quid (e.g. only with lime as khaini) and such use has also been found to be related to oral cancer. Within last couple of decades a new industrially manufactured smokeless tobacco product called gutka or pan masala has been introduced and widely promoted in India. This has resulted in a near epidemic of oral submucous fibrosis, a precancerous condition[11] and an increased incidence of oral cancer among younger individuals[5].

Alcohol - High exposure to alcohol is thought to be a main reason for high incidence of oral cancer in some countries of Europe and Americas. The relationship between alcohol drinking and oral cancer has been examined in a multitude of cross-sectional and cohort studies in different parts of the world. The overall evaluation is that 'There is sufficient evidence for carcinogenecity of alcoholic beverages in humans. The occurrence of malignant tumors of the oral cavity, pharynx, larynx, oesophagus and liver is causally related to consumption of alcoholic beverages'[12].

Areca nut - Areca nut is generally an essential ingredient of betel quid. In India most betel quid chewers incorporate tobacco as one of the ingredient. Independent epidemiologic assessment of carcinogenecity of areca nut therefore has been difficult although there is a lot of anecdotal evidence. In an earlier comparison of carcinogenecity of betel quid with and without tobacco, the evidence for carcinogenecity of betel quid without tobacco was considered inadequate[10]. In recent years however, there has been new and compelling evidence. In South Africa, incidence of oral cancer among women of Indian origin is reported to be high and they chew betel quid quite commonly. They however, do not generally include tobacco in their quid, do not smoke, or drink alcohol, so this relationship is unconfounded with other risk factors. There is strong evidence from Taiwan since the habit of chewing betel quid without tobacco is common over there. A recent case-control study from Pakistan has reported high and significant relative risk of oral cancer among chewers of betel quid without tobacco[13]. Carcinogenecity of areca nut is an important issue as the areca nut is the fourth most commonly used psychoactive substance globally (after caffeine, alcohol and nicotine).

Virus - Human papilloma virus has often been reported among oral cancer patients. Among HIV positive patients, there is a high occurrence of oral lesions and oral malignancies.

Bacteria - In the past, tertiary syphibilies was said to be an important factor for oral cancer. This is of no public health significance now.

Oral factors - Sharp tooth surfaces and poor oral hygiene have often been postulated in the literature as related to oral cancer, mostly on the basis of anecdotal evidence. The observed relationships however, are likely to be due to confounding with known risk factors.

Protective factors.

Many case-control studies point out towards intake of vitamin A and its precursors in regular diets especially in fresh fruits and vegetables as protective factors. In short term clinical trials, remission of precancerous lesions with supplementation has been demonstrated. There are no studies however, to demonstrate a long-term benefit and protection from oral cancer.

Primary Prevention.

The most important etiologic factor for oral cancer, especially in South Asia, is the use of tobacco in any from of chewing or smoking. In a WHO meeting, it was estimated that 90% oral cancers among men in South Asia could be attributed to the chewing or smoking of tobacco[14]. Thus intervention of tobacco use is the most important strategy for primary prevention of oral cancer.

A primary prevention trial of oral cancer and tobacco use has been reported from India. This trial had several shortcomings: it was not randomized; the end point was oral precancer rather than oral cancer; and, control cohort was not concurrent with intervention cohort. Despite these shortcomings, the overall results were quite compelling. In this trial, two large cohorts were examined for the presence of oral cancer and precancerous lesions in house-to-house surveys and were followed-up annually. One cohort was exposed to an intense program of educational intervention for stopping their tobacco use. Evaluation showed that just after one year, spontaneous regression of oral precancerous lesions was significantly higher in the intervention cohort. By the end of 5 years, in two out of three districts, the incidence of oral precancerous lesion was significantly and substantially lower in the intervention cohort compared to control cohort[15]. After 10 years of follow-up, these results were further strengthened and the risk of oral precancerous lesion was substantially reduced to near zero among individuals who had stopped their tobacco habits[16].

Secondary prevention.

Oral cancer can be treated with good prognosis if it is detected at an early stage. Most deaths from oral cancer occur because it is detected at a rather late stage. Oral cancer can be easily visualized in a careful routine, clinical examination. It is therefore unfortunate that it is often detected at late stage resulting in high mortality. Any health professional can easily detect oral cancer. Oral health care professionals and otolaryngologists are in a special position to detect oral cancer at an early stage.

In the context of developing countries where oral cancer is common, a question arises whether para medical personnel can detect oral cancer at an early stage? This question was addressed by studies conducted in India and Sri-Lanka. Indian study provided special training to basic health workers for identifying high risk individuals; a proper examination of the mouth; and, categorising their assessment of oral mucosa into normal, non-referable and referable. It was reported that these workers were able to refer suspected oral cancer with acceptable sensitivity and specificity[17]. Although Sri-Lankan study differed slightly in methods, the results were nearly identical. Evaluation of a national programme

of oral cancer screening has been reported from only one country (Cuba) and the results were equivocal.

Oral Precancer.

Oral cancer is often preceded by specific changes in the oral mucosa that are termed as oral precancer. The changes can be localized; these are termed as lesions (e.g. leukoplakia, erythroplakia) or generalised, termed as condition (e.g. oral submucous fibrosis). Oral precancer shows a very similar epidemiology and risk factor profile as oral cancer[18]. The relative risk of malignant transformation of oral precancer can be quite large, up to 3243.2 for nodular type of leukoplakias[19]. Sometimes on histopathological examination, cancer is diagnosed in a lesion that was classified only as a leukoplakia. Thus a proper diagnosis and management of oral precancer either may prevent the occurrence of oral cancer (primary prevention) or its detection at an early stage (secondary prevention).

Recommendations:

Oral cancer has proved to be an interesting and educative model for studying primary prevention, secondary prevention and carcinogenesis[20]. The knowledge gained so far, however, has not been fully applied, especially in developing countries.

Primary prevention of oral cancer is eminently feasible and the feasibility has been clearly demonstrated. Since tobacco use is the major etiological factor, the primary prevention efforts should be coordinated with primary prevention of other tobacco related cancers with one caveat - the contribution of smokeless tobacco needs to emphasized. Smokeless tobacco use sometimes tends to get forgotten while concentrating on smoking and as a matter of fact, there have been suggestions to promote smokeless tobacco use as a safer alternative to smoking. Any such suggestion needs to be strongly resisted.

There is a great scope for secondary prevention of oral cancer through opportunistic screening by health professionals. Health professionals need to be educated about risk factors for oral cancer, proper technique of oral mucosal examination and clinical appearance of the oral cancer and precancer.

Organised screening through the use of para medical personnel can be cost effective, especially if enough attention is paid to the level of training in terms of identification of high-risk individuals and clinical appearance of suspicious lesions. The effect of such a program on mortality due to oral cancer, which would be the final criterion, still needs to be investigated.

Mouth self examination has been proposed as a possible strategy for early detection of oral cancer. Its feasibility and effectiveness however, have not yet been investigated.

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AMERICAN CANCER SOCIETY GUIDELINES ON DIET, NUTRITION AND CANCER PREVENTION

★★ CHOOSE MOST OF THE FOODS YOU EAT FROM PLANT SOURCES.

- Eat five or more servings of fruits and vegetables each day.
- Eat other foods from plant sources, such as breads, cereals, grain products, rice, pasta, or beans several times each day.

★★ LIMIT YOUR INTAKE OF HIGH FAT FOODS, PARTICULARLY FROM ANIMAL SOURCES.

- Choose foods low in fat.
- Limit consumption of meats, especially high-fat meats.

★★ BE PHYSICALLY ACTIVE - ACHIVE AND MAINTAIN A HEALTHY WEIGHT.

- Be at least moderately active for 30 minutes or more on most days of the week.
- Stay within your healthy weight range.

★★ LIMIT ALCOHOLIC BEVERAGES, IF YOU DRINK AT ALL.

Source: *CA Cancer J Clin; 51:153-187, 2001.*

ACTIVE PATIENT FOLLOW-UP FOR SURVIVAL STUDIES

Dr. A. Nandakumar
Officer-in-Charge, NCRP, Bangalore - 560 094.

This note highlights the various factors and methodology involved in conducting active follow-up by cancer registries. The difficulties and constraints are outlined with possible solutions.

In cancer centres as well as in other institutions where cancer patients are treated, poor patient follow-up appears to be one of the most important and crucial issues that confront the treating physician and researchers alike. The poor system of registration of death and incomplete or incorrect certification of cause of death compound the problem. the short comings not withstanding , there is little doubt of the need to have information on survival and mortality of at least important and selected sites of cancer where cancer control measures are being undertaken.

A. MATCHED DEATHS.

These are usually for population registries and are normaly excluded from active follow-up, specially if the information required for the study is nothing more than vital status. However, where the exact cause of death or treatment details are needed then active follow-up may be required for these cases also. Therefore, depending on the purpose of the study, matched deaths are either included or excluded. When included the procedure is as for the registered incident cases.

B. REGISTERED INCIDENT CASES.

Before commencing the exercise of active follow-up, it is assumed that duplicate registrations have been checked and all information updated. Then the following steps are suggested in order to conduct active follow-up with a high degree of efficiency.

I. Scruitiny of medical records, etc.

1. The Medical Records of patients would indeed be the first source to be checked. If patients are alive and on follow-up, the required information will be obtained from this source.
2. If the records are computerised a list of hospital registration numbers & names of patients who attended for follow-up could be obtained. This list should be sought, since may times in some centres new case records with the old/original numbers, could be prepared since the old file is immediately not traceable.
3. The next item to be scrutinised are replies to follow-up letters. If information through these are available and are recent, at least the vital status would be known.

The exercise of active follow-up is needed because in a high proportion of patients for whom information that is available through the above three steps would need supple-

mentation. Even if they are reasonable, a high degree (at least 85 percent) of follow-up would be required for reporting valid results on survival. Hence these additional efforts.

II. Preparation for house visits.

A proforma has been developed for this purpose and is shown in Appendix 1.

1. The recording of address or addresses from the case record or core proforma is the first step. If a Telephone number or office address is available then these sources should be tapped first.
2. Classifying the completed forms according to area of residence is the next logical step.
3. The chances of tracing the residence are distinctly better and relatively simpler if the social investigator is able to go to the respective post office of the locality, early in the morning and gets in touch with the concerned postman, before he leaves for field delivery.
4. Once the address is traced and the family members are available the introduction, approach and the interview to elicit answers should not only be systematic but skillful, as the social investigator is unaware whether the patient has died or is alive (the social investigator should be equipped with an ID Card with his/her photograph). Recollection of events that led to the death of a family member is certainly not a pleasing experience and the social investigator should be sensitive to such feelings. If the patient is alive the performance status and disease condition may determine the response of the patient and their family members.

III. Confidentiality.

Confidentiality during home visits, particularly when the patient is alive is important from two angles.

a. The first is with reference to knowledge of patient and / or family of the nature of disease and probable prognosis. The patient and sometimes the family may not be completely aware about these aspects and the social investigator should be conscious of these facts when discussing or gathering more information during the couse of the house visit.

b. The second instance when confidentiality could play a role during house visits is with reference to the treating physician. It is important for the treating doctor to be aware of his/her patient being contacted by a social investigator through house visit. The rapport developed by the registry with the medical community involved in diagnosing/treating cancer patients becomes important. If the follow-up is of the hospital cancer registry cases then there is less cause for concern. However, in following cases of the population registry which have never been registered at the base hospital, follow-up of cancer patients through house visits should have the concurrence of the physician who is currently treating the patient. If the information to be gathered is restricted to vital status, then absence of concurrence of the treating physician is unlikely to pose serious problems. But, whenever details of treatment

are being sought, particularly when the treating physician is not in the base hospital where the registry is located, knowledge and consent of the concerned physician is mandatory.

IV. Conduct of House Visits.

All the information on the items listed below should be collected to the extent possible. On verifying the name and address of the patient, the most important information is:

1. **Vital Status :** This may or may not be the very first question posed to the family, nonetheless, is the most important one. It the patient is alive the sequence of questions would be silightly different than if the patient was dead. Certain details of death will have to be obtained in the latter cases. Otherwise, all other questions would be common, regardless of vital status.

<u>If Patient has expired.</u>

a) **Date of Death:** Though the fact that the patient is died is known many times the exact date of death is not remembered by the family. Most family members are able to recall the year as only "so many years back". Many times recall of exact month of death could be difficult. In such circumstances addtional effort may be required by way of contact of other family members (who were not present at the time of visit of the social investigators). This contact may be either through telephone or re-visits or visiting the concerned family member who knows the details but resides at some other local address. If, after considerable efforts it appears impossible to obtain the exact month then these cases should be identified and the mid year date could be taken as date of death.

b) **Place of death:** The place of death whether at home or hospital or elsewhere should be recorded.

c) If copy of death information paper or certificate of death is available details of corporation unit, number etc should be noted.

d) The details of disease at time of death should be obtained to the extent possible. Because, only this will give some indication of-

e) **Cause of Death:** Whether due to disease- cancer or otherwise. If one has to get the corrected survival rate this has to be clearly determined. The circumstances that led to death and whether the patient was on any treatment should also be noted.

<u>The following information is required whether patient is Alive or Dead:</u>

2. **Current Address:** It is important to record the most recent address of the patient with a contact address, preferably of the office of the patient or closest relative. Telephone numbers of both residence and office would also be extremely helpful. Such updation of address makes it easier for further follow-up of patients who are alive.

3. **Age:** Many times the age of the patient is not accurately available. In the family setting the response to this question may be more exact. Therefore, it would be good practice to verify this. The age to be recorded is that at the time of first diagnosis of the disease.

4. **Duration of Stay:** This is important because in many instances the patient has not been interviewed at the time of initial registration and therefore the exact duration of stay in the registry area is not known, though the person is known to be a resident of the area.

5. **Date of First Diagnosis:** Since patients attend various clinics, hospitals and nursing homes, the exact date when the patient consulted a doctor for the first time for the stated ailment may not be able, particularly in patients who have not been interviewed earlier. In calculation of survival this becomes important and therefore the first date of diagnosis need to be confirmed.

6. **Method of Diagnosis:** The method of diagnosis would generally not require further confirmation if the most valid basis of diagnosis is through primay histology. The only additional information that could be sought is for sites of cancer where there is a possibility of surgical resection being done and a detailed histopathology review is being planned.

   If the basis of diagnosis is microscopy, but other than primary histology (that is through histology of metastasis, cytology or peripheral blood) further details of diagnosis should be obtained. If the basis is histology of metastasis, questions should be asked of a possible biopsy/resection of the primary. Further details of diagnosis should also be got in instances where the method of diagnosis has been only cytology or only peripheral blood. In case of cytology diagnosis, additional information on the possibility of a histopathology diagnosis should be sought and in the latter instance of diagnoses based only on a peripheral blood smear, information on a bone marrow smear/biopsy should be obtained.

   Where the method of diagnosis recorded is other than through microscopy, then clarification should be obtained whether any procedures were employed to arrive at a diagnosis through microscopy. This is specially important in cases where cancer directed treatment has been given.

7. **Details of Treatment:** If one of the purposes of the follow-up is to have stage and treatment details, especially for a hospital cancer registry, it is assumed that these have already been obtained from individual case records. Any additional or left over details of stage/treatment and place where treatment is being taken or last taken should be recorded.

8. Details of Disease: Details of current disease status if patient is alive or disease status at time of death if patient has died, should be recorded as far as possible.

9. Performance status: Similarly, the performance status of the patient may be assessed (to the extent possible) and recorded at the time of follow-up (house visit) for the patient who is alive and at the time of death for the deceased patient.

V. Other Critical Issues.

Apart from the above a critical assessment/evaluation of certain case situation is necessary:

a) Patient in whom the diagnosis was not based on microscopy (i.e., clinical/radiological or other method of diagnosis) and are alive and well with or without treatment. If, after the additional exercise indicated above there is evidence to suggest that these patients have really had a microscopic diagnosis which was not known or available at the time of registration then there is little cause for concern. However, if no evidence for a microscopic proof of cancer is available and the patient is alive and well, especially without treatment, then there is every reason to doubt the diagnosis and the whole case should be critically evaluated to determine whether the case is indeed a proved cancer or not and therefore to include or exclude from the registry.

b) Patients who have had a microscopic diagnosis of cancer and who have received no treatment whatsoever, but are alive and well at the time of active follow-up (which, at the minimum time interval would be at least two years since diagnosis). Though in some patients the disease process itself may be slow to progress, it is unlikely that in any substantial number the disease would have regressed or disappeared without specific treatment. Such cases may require re-evaluation including pathology slide review.

VI. Problems in Tracing Houses/Patients.

The foregoing discussion on conduct of house visits would be applicable if the patient or family could be contacted, from the address(es) available. However, in the urban set up it is often observed that many a time the exact address is not available or, even if available, it cannot be located. Repeated attempts by a different social investigator helps many times. There are other possiblities. the address may be correct but the patient/ family would not be available. In most instances these persons have shifted-migrated. Sometimes the forwarding address may be obtained from the current resident of the premises. To get follow-up information of those patients in whom the forwarding address is not available is extremely difficult. The best bet in such cases is to get the medical records and complete whatever follow-up information that is available. In rare instances patients do not give the correct address of their residence even at the time of registration. On occasions, the vital status of the patient may be reasonably reliably learnt from the neighbours, friends or others in the surrounding area but little else would be known. In such a circumstances the information on vital status and whatever else is possible should be recorded.

In view of the possible circumstances stated above and to have insight into the quality of data collected it seems important to record two additional items of information. These would be (Items 10 & 11 of the proforma) as to who was the Respondent and the Results of the house visit.

C. DEATH CERTIFICATES ONLY.

The method pursued for this category of cases is slightly different from the usual incident cases. Wherever the name of the Hospital/Nursing Home which the patient died or last attended is available, the records/registers in the respective hospitals/nursing homes should be first scrutinized for date of first diagnosis and other details that may be required. Generally the corporation death certificates do not contain the site of cancer or histological diagnosis (and therefore the basis of diagnosis). Therefore, this, as well as the exact cause of death with or without any other associated disease conditions should be noted. No further visit to the residence of the deceased is generally required. However, when the above details are not available or are incomplete house visit will be required. Another reason for house visit is to know the duration of residence of the deceased in the area.

Appendix 1

PROFORMA FOR ACTIVE FOLLOW-UP THROUGH HOUSE VISITS

Cancer Registry Number :
Name of Patient :
Sex :
Address I : Address II :

Source of Registration :
Name of Hospital/Lab/NH: Code :
Number of Hosp./Lab/NH :

1. Vital Status.
   (1) Alive (2) Dead (9) Unknown.
   If alive
   Date of Last follow-up
   (Date of House visit)
   Information on Death (for deceased patients)
   a) If Dead,
   Date of Death :
   b) Place of Death.
   (1) Hospital (2) Nursing Home
   (3) Residence (4) Others (Specify) .....
   (9) Unknown
   If (1) or (2)
   Name of Hospital/Lab/NH: Code :
   Number of Hosp./Lab/NH :
   c) Certification of Death - Death certified by :
   (0) Not certified; (1) Allopathic Practitioner
   (2) Non-allopathic Practitioner (3) Coroner;
   (4) Medical Autopsy; (5) Others (Specify) .....
   (9) Unknown
   d) Cancer Status at Death:
   (0) No evidence of cancer; (1) Advancing cancer;
   (2) Others (Specify) ..... (9) Unknown.
   e) Cause of Death.
   (1) Cancer
   (2) Other (specify) .....

Items of Information (for deceased & alive patients)

2. Current Address
   Address III
   (Current or last residence, if deceased)
   Tel.No.
   Address IV
   (Office)
   Tel.No.

3. Age of the Patient : (at diagnosis)

Recorded Age:

Verified Age:

4. Duration of Stay (in years):

Recorded Duration :
Verified Duration :

5. Date of First Diagnosis:

Recorded Date:
Verified Date:

6. Method of Diagnosis (most valid final basis):
(01) Clinical only; (02) X-Ray; (03) Isotopes;
(04) Endoscopy; (05) Angiography;
(06) Exploratory surgery or autopsy without histology;
(07) Biochemical &/or Immunological tests; (08) Cytology;
(09) Blood film; (10) Bone Marrow;
(11) Histology of Primary; (12) Histology of Metastasis;
(13) Autopsy with histology; (14) Death Certificate only;
(15) Others (Specify) .....

Recorded Diagnosis:
Verified Diagnosis:

7. Details of Treatment Received (at RI & Elsewhere):
(00) No cancer directed treatment;
(01) Surgery(S) only; (02) Radiotherapy(R) only;
(03) Chemotherapy(C) only; (04) S+R; (5) S+C;
(06) R+C; (07) S+R+C; (08) Hormone Therapy(H) only;
(09) S+H; (10) R+H; (11) C+H; (12) S+R+H; (13) S+C+H;
(14) R+C+H; (15) S+R+C+H; (16) Others (Specify).....
(99) Unknown

8. Disease Status (of first primary cancer only):
(1) No Evidence of Disease-cancer (NED).
(2) Cancer in regression / residual disease.
(3) Cancer in progression/recurrence (primary disease & or metastasis)
(4) Too advanced/Cachexia

Any other disease condition:
(0) Absent;
(1) Non-malignant disease present;
(2) Second Primary present;
If (2) complete separate form.

9. Performance status:
(0) All normal activity without restriction;
(1) Restricted in physically strenuous activity, but ambulatory and able to carry out light work;
(2) Ambulatory & capable of self-care; confined to bed or chair > 50% of waking hours;
(4) Completely disabled, cannot carry on any self-care totally confined to bed or chair.

10. Respondent:
(1) Patient; (2) Family of patient
(3) Neighbour; (4) Others (specify).....

11. Result of House Visit:
(0) House visit not done; required information obtained through other sources;
(1) Address traced and all required information obtained.
(2) Address traced; patient/family shifted; information obtained through neighbours/other sources;
(3) Address traced; patient/family shifted; no information obtained through other sources;
(4) Address not traced.

NATIONAL CANCER REGISTRY PROGRAMME
Past, Present and Future

Dr. M. Krishnan Nair, Principal Investigator, HCR - Trivandrum.

Progress, achievements

When one reviews the NCRP performance of the past two decades; the following becomes apparent.

- ★ The programme has evolved a sustainable methodology for Cancer Registration in Indian conditions.
- ★ There is authentic data now available on cancer from selected urban centres but only from one rural area in the NCRP data.
- ★ Variations in the site pattern of cancer (i.e. risk of developing cancer) in different population groups like stomach cancer in Chennai and Bangalore, Gall bladder cancer in Delhi and Bhopal etc have been identified.
- ★ Epidemiologic studies have been conducted and Survival rates for selected cancer types are known from some centers.
- ★ The burden of cancer in India is approximately estimated as between 7 & 8 lakhs new cases annually.
- ★ There is a very high percentage of clinically spread disease (75-80%) when 1st attending for treatment, which makes poor survival rates and emphasises the need for organizing Professional Updates, Public Education, Early Detection and Prevention, Palliative Care and Pain Relief Clinics.
- ★ Incidence rates of some cancers, like cervix and oral cancer may be decreasing whereas cancers of lung, breast, prostate, ovary show increases.
- ★ Human Resource Development has been attempted and considerable progress achieved.
- ★ The co-operation and co-ordination between the registries of the project have been well established and linking of data and information has become possible.
- ★ Registry data from India have appeared in Global Compilation of Cancer Occurrence.

The lacunae observed are

- ★ The programme has not spread to encompass several population groups especially in rural areas where 70% of population lives. Except Barshi, studies of cancer occurrence in rural areas are not available in ICMR - NCRP.
- ★ The registries do not have enough information on patient care, this is a severe lacunae. Patient care practices should be evaluated through the registry data and ways and means to standardize documentation of therapeutic and palliative care should receive focus.
- ★ Studies on Epidemiology of cancers require more efforts and encouragement.
- ★ The rural areas in the country may have lower cancer incidence rate than urban areas but reasons have not been adequately explored.
- ★ Leads for cancer control available from the existing registries are only partially utilized. Study of these will offer enormous opportunities for planning control programmes.

★ Medical professionals are not adequately informed about cancer registries, findings, uses of registries in cancer control and cancer education.

Suggestions for improvement of Registries.

1. Consolidated Biennial reporting of both HCR & PBCR together.
2. Include therapeutic details (type of surgery, Radiotherapy details, Chemotherapeutic regimes, Palliative care and Pain relief methods) in HCR forms and present analysis of these.
3. Request Indian Medical Council to highlight Cancer Registration and Cancer Epidemiologic Study Methods under chronic diseases curriculum.
4. All the 17 RCC's in India should have standard NCRP model Hospital Cancer Registries in 3 years from now.
5. All medical college hospitals (Government and NGO) with facilities for Radiation Oncology should have HCR in 5 years from now.
6. The existing PBCR and HCR along with NCRP should focus on training personnel for cancer registration and for conducting studies in Cancer Epidemiology. Such persons will be Medical Graduates, Social Workers, Statisticians and Medical record personnel.
7. NCRP should develop strong scientific, academic links with other national institutions like National Institute of Virology, Institute for Preventive Oncology, Institute for Research in Medical statistics etc and plan new studies jointly.
8. The NCRP should develop capacity for organizing and training in Cancer Registration in developing countries. This may be done through its various collaborating registries and IARC.
9. Each HCR and PBCR should help and guide to organize other HCR's or PBCR's in their neighbourhood areas and develop close links in Data sharing.
10. Rural Cancer registration should be given priority along with forming registries in newer and unrepresented areas. A task force group may be entrusted to form guidelines and for selecting areas for cancer registries particularly in rural areas.
11. The role of NCRP in National Cancer Control Programme should be exploited more - in planning, execution and evaluation. Meaningful parameters or surrogates should be identified and provided to NCCP for these activities.
12. Dissemination of cancer epidemiology information through Publications and Medical Conferences should be encouraged and financial support for travel and presentation of a paper in Conferences in India should be programmed annually and abroad biannually for NCRP staff.
13. There are a number of cancer registries now functioning outside the NCRP network and a number of hospitals with good medical records system which are anxious to join the ICMR registry network. Some of these registries are contributing data to the WHO - IARC Publication - Cancer Incidence in Five Continents. It should be possible for NCRP to receive all the reliable Indian Data through its network. Ways and means to attract cancer related data from these registries by NCRP should be developed. Indian data sets should receive more acceptance in India.

14. NCRP started using IT developments since its inception two decades back. However, further progress in this area is not visible. The Cancer Atlas project has planned data linking, transfer, scrutiny, analysis, reporting and retrieval in a highly systematic manner using IT technology. A task force be formed to attain similar progress in this area by NCRP. The Cancer Atlas project is a welcome project and marks progress in the right direction using IT technology. Sharing and using of available cancer data would be enhanced by this.

15. A major objective of Hospital Registries is to evaluate Patient Care and Survival rate assessment. But these are not yet achieved. This is a serious drawback. From all registries, the Principal Investigator, the Medical Officer, the Statistician and the Social Investigators have to put maximum effort to remedy this short coming. This should be discussed. The HCR's should not function only as epidemiologic registries. Patient care evaluation should receive priority. Necessary one day updates should be conducted by all HCR's. Scientifically strong HCR's in an area is a basic need to have good PBCR data.

16. There are a class of cancer registries which address a special issue - these are Special Purpose Registries. These may relate to population in general or to some specific cancer type. These registries can be very productive. The registry in Bhopal is such a Special Purpose Registry and we have one registry set up by RCC for evaluating the effect of exposure to Natural Radiation. There must be a programme for NCRP to organize such selected Special Purpose Population Registries. These will provide the 'fast track' for eteologic studies.

17. There is a rightful concern among staff of some registries regarding their job status. The initial understanding was that the registry staff will be absorbed as host institute staff after 5 years. The ICMR had allotted funding in response to such agreements. The ICMR should look into lapses in this regard and take urgent steps to revitalize the staff morale and help to regain their confidence and active support to the system and commitment to the objectives of cancer registries.

Over all, the NCRP has undertaken a tedious exercise and progress achieved is substantial, but some major issues like patient care evaluation, dissemination of information especially among the academic forums, study of cancer pattern in Rural India, information utilization, increased use of information technology etc remains to be addressed more vigorously.

Palliative care is the active total care of patients whose disease is not responsive to curative treatment - WHO
(CA July-Aug 2001. V51/4 Page 232).

HIGHEST INCIDENCE RATES REPORTED IN CANCER INCIDENCE IN FIVE CONTINENTS - Vol. VII - IARC

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The cancer Incidence in Five Continents, Vol.VII was published by the International Agency for Research on Cancer (1997). This provides cancer incidence and two most important measures namely Age Standardized Incidence Rates per 100,000 (ASR) using world standard population and cumulative rate (CR 0-74 yrs) expressed in percentage. Table 1 shows the population with highest ASR's reported as per this publication for individual sites and all sites together for the data collected during the period 1988-'92. This volume contains data from 50 countries covering 150 cancer registries and about 183 population groups. The regions include Africa, America Central & South, America North, Asia, Europe and Oceania. Table II shows the highest cumulative rate (0-74 yrs) reported for each individual site and for all sites together. The reporting of skin cancer is not mandatory in Canada and Australia and hence not reported by the registries in these countries.

It is interesting to note that Indian registries have reported highest ASR rates for some sites namely, cancer of the penis in males and tongue (ICD9-141), mouth (ICD-143-5) and hypopharynx (ICD-148) in females. The country/population having the highest ASR for some cancer did not seem to have highest cumulative rate.

Yukon registry in Canada where highest rates reported for rectum (ICD-154), hodgkin's (ICD9-201), lymphoid leukaemia (ICD9-204), monocytic leukaemia (ICD9-206) among males and oropharynx (ICD-146), pharynx NOS (ICD9-149), rectum (ICD9-154), ovary (ICD9-183). Hodgkin's (ICD9-201) and lymphoid leukaemia (ICD9-204) among females has a census population of about 26,000 people; the lowest reported in the volume and it registered only 325 cancers in males and 273 female cancers for 1983-1992.

The range of the ASR's in males varied from 0.8 for the other leukaemia (ICD-207) in Latvia to 535.4 for skin cancer in Harare registry in Zimbabwe for the European population and for females it varied from 0.6 to 343.0.

These measures provide leads to identify the high risk groups in the world for specific cancer sites and for total cancer.

Reference:

D.M. Parkin, S.L. Whelan, J. Ferlay, L. Raymond and J. Young. Cancer Incidence in Five Contients Vol.VII. IARC Scientific Publication No. 143, Lyon, France, 1997.

Table I

Highest Incidence Rates (ASR per 100,000) reported in the world site and all sites
(Cancer Incidence in Five Continents, Vol. VII, 1997)

Site ICD-9	Males Country/Population	ASR	ASR	Females Country/Population
140	South Australia	13.5	3.2	South Australia
141	France Bas-Rhin	8.0	3.7	India Karunagappally*
142	Canada N.W. Territories	4.2	2.0	Canada N.W. Teritories
143-5	France Bas-Rhin	12.4	8.9	India Bangalore*
146	France Somme	13.3	2.0	Canada Yukon
147	Hong Kong	24.3	9.5	Hong Kong
148	France Calvados	15.0	2.4	India Madras
148	France Somme	3.5	1.3	Canada Yukon
150	Zimbabwe Harare African*	30.4	8.7	Uganda Kyadondo*
151	Japan Yamagata	95.5	40.1	Japan Yamagata
152	U.S. Detroit Black	2.5	1.5	U.S. Connecticut Black & U.S. Hawai Hawaiian
153	U.S Detroit Black	35.0	29.6	New Zealand Non Maori
154	Canada Yukon	33.7	14.4	Canada Yukon
153-4	U.S Hawai Japaneese	53.5	40.8	New Zealand Non Maori
155	Thailand Khon Kaen*	97.5	39.0	Thailand Khon Kaen*
156	Japan Miyagi	7.9	12.5	U.S. New Mexico American Indian
157	U.S Central Louisiana Black	20.8	11.0	U.S. San Francisco Black
160	Zimbabwe Harare European*	3.1	1.5	U.S. New Mexico American Indian
161	Spain Basque country	18.2	2.9	U.S. Detroit Black
162	U.S New Orieans Black	110.8	72.9	New Zealand Maori
163-4	Italy Trieste	3.3	2.9	Argentina Concordia*
Kaposi Sar	Uganda Kyadondo*	43.5	18.0	Uganda Kayadondo*
Mesothelioma	Italy Trieste	6.4	0.9	Argentina Concordia*
170	Brazil Porto Alegre*	3.6	2.2	Switzerland Graubunden
171	Zimbabwe Harare European*	6.9	3.2	Switzerland Vaalais
172	Australia New South Wales	33.1	29.8	New Zealand Non-Maori
173@	Zimbabwe Harare European*	535.4+	343.0+	Zimbabwe Harare European*
174-5	French Polynesia*	1.6	127.7	Zimbabwe Harare European*
179			9.0	Brazil Porto Alegre
180			67.2	Zimbabwe Harare African*
181			1.8	Vietnam Hanoi*
182			20.6	U.S. Hawai Hawaiian
183			19.9	Canada Yukon
184			4.4	French Polynesia*
185	U.S. Atlanta Back	142.3		
186	Switzerland Granbunden	10.3		
187	India Barshi Paranda & Bhum*	3.9		
188	Italy Trieste	38.7	12.5	Zimbabwe Harare African*
189	Czech Republic	16.9	8.5	Czech Republic
190	Zimbabwe Harare European*	4.1	1.8	Uganda Kyadondo*
191-2	Zimbabwe Harare European*	14.8	11.4	Zimbabwe Harare European*
193	Iceland	6.1	25.5	U.S Hawaii Filipino
194	Italy Trieste	2.3	3.1	Italy Trieste
200&202	U.S. San Francisco Non Hisp White	25.0	11.5	Italy Ferrara
201	Canada Yukon	7.9	4.1	Canada Yukon
203	U.S. Los Angeles Black	9.5	6.4	U.S San Francisco Black
	U.S. San Francisco Black			U.S Detroit Black
204	Canada Yukon	9.6	11.1	Canada Yukon
205	New Zealand Maori	6.7	4.5	New Zealand Maori
	U.S. Los Angeles Black	6.7		
206	Canada Yukon	1.1	0.7	Canada N.W. Territories
				U.S. Hawaii Chinese
207	Latvia* }	0.8	0.6	Sweden
	Switzerland Valais }			
208	French Polynesia*	3.9	1.9	French Polynesia*
				Phillipines Manila*
204-208	Italy Trieste	15.0	11.7	Canada Yukon
140-208	Zimbabwe Harare European*	825.4	640.2	Zimbabwe Harare European*
140-208#	U.S. San Francisco Black	465.4	339.7	New Zealand Maori

@ North America (Canada 13 populations and Australia 6 populations not reported skin cancer);
* Data from this registry needs to be interpreted with caution as per the Editors of this publication; # exclude skin

Table II

Highest Cumulatives Rates (CR 0-74 yrs in %) reported in the world for individual site and all sites

ICD-9	Males			Females
	Country/Population	CR(0-74yrs)	CR(0-74yrs)	Country/Population
140	Canada Newfoundland	1.53	0.32	South Australia
141	France Haut-Rhin	1.00	0.47	India Karunagappally*
142	Canada N.W. Territories	0.40	0.27	U.S. San Fancisco Japanese
143-5	France Bas-Rhin	1.41	1.03	India Bangalore*
146	France Somme	1.55	0.19	Canada Yukon
147	Hong Kong	2.57	0.99	Hong Kong
148	France Calvados*	1.86	0.26	India Madras
147	Canada Yukon	0.72	0.12	Philliphines Manila
150	France Calvados*	2.78	1.04	India Bangalore*
151	Japan Yamagata	11.52	4.6	Japan Yamagata
152	New Zealand Maori	0.33	0.23	U.S. Hawaii Haawaiian
153	U.S. Hawaii Japanese	4.26	3.55	Canada Newfoundland
154	Canada Yukon	4.15	1.52	Israel Jews born in America or Europe
153-4	U.S. Hawaii Japanese	6.61	4.76	Canada Newfoundland
155	Thailand Khon Kaen*	12.27	5.03	Thailand Khon Kaen*
156	Japan Miyagi	0.94	1.47	U.S. New Mexico American Indian
157	U.S. Central Louisiana Black	12.42	1.33	U.S San Francisco Black
160	Phillipines Manila* } Kuwait Non Kuwaitis* }	0.19	0.18	Singapore Malay
161	Spain Basque Country	2.26	0.36	U.S. Detroit Black and New Orleans White
162	U.S. Central Louisiana Black	14.29	8.92	New Zealand Maori
163-4	Poland Lower Silesia*	0.3	0.34	Argentina Concordia
Kaposi Sar	U.S. San Francisco Non-Hisp.White	2.83	0.11	Israel Jews born in Africa or Asia
Mesothelioma	Italy Trieste	0.75	0.13	Argentina Concordia*
170	French Polynesia* Brazil Porto Alegre*	0.33	0.25	Thailand Khon Kaen*
171	U.S. Central Louisiana Black	0.40	0.39	U.S Central Louisiana Black
172	Australia New South Wales	3.67	3.02	New Zealand Non-Maori
173+	Swizerland Geneva	12.69	0.04	Switzerland Geneva
174-5	U.S. Atlanta Black	0.24	12.12	Los Angeles Non-Hisp White
179			1.07	French Polynesia*
180			6.90	Brazil Belem*
181			0.11	Canada Northwest Territories
182			2.67	Canada Yukon
183			2.78	Canada Yukon
184			0.42	French Polynesia* and Argtentina Concordia*
185	U.S Detroit Black	18.21		
186	Switzerland St.Gaull-Appenzell	0.81		
187	India Barchi Paranda & Bhum*	0.49		
188	Italy Genoa	4.77	1.01	Italy Trieste
189	Czech Republic	2.09	1.01	Czech Republic
190	Canada Saskatchawan	0.19	0.15	Peru Trugillo
191-2	Canada Yukon	1.00	0.76	Italy Trieste
193	Iceland	0.63	2.59	U.S Hawaii Fillipino
194	Italy Trieste	0.21	0.31	Italy Trieste
200&202	U.S. San Fancisco Non-Hisp. White	2.57	1.28	Israel Jews born in Israel
201	Italy Macerata	0.40	0.28	Italy Macerata & Veneto
203	U.S. San Francisco Black	1.15	0.81	U.S. San Francisco Black
204	Canada Yukon	1.10	0.88	Canada Yukon
205	U.S. Los Angeles Filipino } U.S. Hawaii Filipino }	0.62	0.46	U.S. San Francisco Hisp. White
206	Canada Yukon	0.09	0.08	U.S Hawaii Chinese
207	Latvia*	0.08	0.07	Latvia
208	French Polynesia*	0.39	0.26	French Polynesia*
204-208	Italy Triwarw	1.49	0.93	Canada Yukon
Other & US	Argentina Concordia*	3.56	2.51	New Zealand Maori
All Sites	U.S. Detroit Black	57.06	38.03	New Zealand Maori
All Sites#	U.S. Detroit Black	56.97	38.03	New Zealand Maori

@ North America (Canada 13 populations and Australia 6 populations not reported skin cancer);

* Data from this registry needs to be interpreted with caution as per the Editors of this publication; # exclude skin

A SUCCESS STORY OF EPIDEMIOLOGY

Dr. P. C. Gupta

ALL INDIA.

To protect the non-smokers, through an executive order in 1990, the government prohibited smoking in all health care establishments, government offices, educational institutions, air-conditioned railway cars, chair cars, buses, suburban trains etc.

Smoking is banned on all domestic flights in the country.

The Railway Ministry has banned sale of tobacco products on the railway platform as well as inside the train.

The Supreme Court of India has declared smoking in Public Places, a punishable offence in Nov, 2001.

EXISTING LEGISLATIONS IN STATES

In India several states have legislations to control tobacco use and protect the rights of non-smokers.

The **Goa** 'Prohibition of Smoking & spitting Act' 1997, prohibits smoking or spitting in places of public work or use as well as in public service vehicles in the State of Goa. It also prohibits tobacco advertising, sale of tobacco products to minors, and sale or distribution of tobacco products within 100 meters of a place of worship and educational institutions. In addition this act makes it mandatory for a 'No Smoking/Spitting' board to be prominently displayed at all places of public work.

In the National Capital Region of **Delhi**, A similar legislation was brought in 1996, prohibiting smoking in places of Public work or in Public service vehicles. It also prohibits sale of tobacco products to minors.

In the state of **Kerala**, a High Court order (2000) prohibits smoking in public areas.

Public smoking is banned in the states of **Himachal Pradesh, Tamil Nadu, Meghalay, Jammu and Kashmir, Assam, Rajasthan** and **Sikkim** by legislation.

The Govts. of **Tamil Nadu, Andhra Pradesh** and **Maharashtra** have recently banned sale of Gutka in their state.

Rajasthan, Bihar and **Goa** have also shown an intention of banning sale of Gutka.

The High Court in **Uttar Pradesh** and **Madhya Pradesh** had also banned Gutka but the same has been stayed.

HIGHLIGHTS FROM CONSOLIDATED REPORTS OF NCRP

Reports of PBCR - 1990-1996.

- The cancer registry is central to any rational and national programme on cancer control.
- For all anatomical sites the rates (AAR) vary from 97.8 in Bangalore to 121.9 in Delhi in urban males. In urban females the rates vary from 92.2 in Bhopal to 135.3 in Delhi. Incidence rates in the rural registry of Barshi are lower 46.2 and 57.7 per 100,000 in males and females respectively. The urban incident rates are similar to that seen in Indians in Singapore 105.5 and 122.7 per 100,000 in males and females respectively, but lower than the rates observed in the registries of the developed countries in the west and Oceania or Japan. The crude incidence rates in urban areas varies from 56.9 per 100,000 in Bhopal to 78.6 in Chennai among males, and 55.6 in Bhopal to 91.4 in Chennai among females.
- **Estimated number of new cancers diagnosed in India every year: 700,000 - 900,000.**
- On an average about **one in about 15 men and one in about 12 women** in urban centres could develop cancer in their lifetime.
- **Among males**, cancers of sites associated with use of tobacco are the most frequent. **Cancer of the lung** is numerically the **number one cancer**.
- The age adjusted incidence rate of **oesophageal cancer** in women in **Bangalore** is one of the highest (8.3 per 100,000) in the world.
- Based on currently available data, in registries in all continents, males in **Bhopal** have the highest age adjusted incidence rate (8.8 per 100,000) of **cancer of the tongue**.
- **Cancer of the stomach** in **males** continues to be the leading site of cancer in the southern registries of **Chennai and Bangalore**.
- In **women**, cancers of the **cervix and breast**, together account for over **40%** of cancers in **ubran women** and over **65%** of cancers in the **rural registry in Barshi**.
- The age adjusted incidence rate (8.9 per 100,000) of **cancer of the gall bladder in Delhi women** is one of the **highest in the world**.

Report of HBCR - 1984-1993.

- Hospital Based Cancer Registries (HBCRs) provide an idea of the **magnitude and patterns of patient care**. They help in **planning the facilities** required in the hospital and help in **evaluation of outcome of treatment**.
- **A very high percentage of clinically advanced disease** (75-80%) is seen when the patients first attend for treatment leading to poor survival rates. This empha-

sizes the importance and need of early detection and organising pain-palliative care facilities.

Population Based Survival Studies:

- For the first time, in the context of a developing country, population based survival studies on selected sites of cancer have been published.
- The reported five year relative survival for cancers of the female breast and cervix are as follows:

Registry	Breast	Cervix
Bangalore	46.8%	40.4%
Chennai	49.5%	60.0%
Mumbai	55.1%	50.7%

- The registries provide an opportunity to embark on studies that could combine in-depth laboratory components with epidemiologic design.
- Over the years, the data from NCRP network have helped in bringing out numerous research publication in indexed national and international journals.
- Registries are also involved in the conduct of District Cancer Control Programmes in their respective regions.
- The NCRP network has some of the best scientifically trained personnel in the field.

Ongoing Project:

NCRP (ICMR) - WHO Project on 'Development of an Atlas of Cancer in India' with data collection through website: *canceratlasindia.org*

Cancer prevention and control must no longer be regarded as merely an economic, social/ethnic or medical problem. We have to reframe the issue as one that is fundamental to social justice - Dileep G. Bal : Cancer Statistics 2001.
Quo Vadis : CA 2001, 51:11-14.

CANCER SURVIVAL RATE ANALYSIS

FACETS OF BREAST CANCER SURVIVAL STUDIES

Compliled by Mr. P. Gangadharan & V.S. Binu

The ultimate objective of studies on cancer survival estimation is to reduce mortality from cancer. This can be achieved when the parameters (Biologic) influencing the survival and the appropriate treatment are correctly identified. Survival estimation and analysis can be attempted by analysis of overall survival rates, disease free survival, observed survival, relative survival, composite stage groups and by using individual parameters identified.

Clinical trials are intended to yield methods to improve survival experience over the existing ones. Information about the existing survival experience is thus a prime need. Multicentric clinical trials have also to recognise the existing differences in survival experiences when data are pooled for analysis. Concurrent case-control approach overcomes most of these problems.

The different facets of Breast Cancer Survival studies reported from population based and hospital based survival studies from India are shown in the following tables.

POPULATION BASED SURVIVAL STUDIES:

Population Based 5 Year Observed & Relative Survival Rates of Breast Cancer

	OSR	RSR
Bangalore	41.7%	45.1%
Mumbai	51.1%	55.1%
Chennai	45.9%	49.5%

OSR-Overall Survival Rate RSR-Relative Surival Rate

Population Based 5 Year Survival Rates by Extent of Disease

	Localised Disease		Regional Spread		Distant Mets		Unknown	
	OSR	RSR	OSR	RSR	OSR	RSR	OSR	RSR
Bangalore	56.9	61.3	37.6	40.7	13.0	14.3	37.6	40.4
Mumbai	74.4	79.9	43.0	46.1	9.5	10.4	59.5	65.8
Chennai	53.5	58.2	50.3	54.4	21.2	22.9	44.1	47.0

Population Based 5 Year Survival Rates (RSR) by Age Group

	0-34	35-44	45-54	55-64	65-74	75-99
Bangalore	49.5	50.1	44.3	44.1	36.3	25.6
Mumbai	59.5	56.1	53.7	53.7	55.8	49.6
Chennai	63.6	55.4	50.5	40.1	42.7	19.3

References:

Bangalore: A. Nandakumar, N. Anantha, T.C. Venugopal, Population-based Survival from Breast & Cervical and Lymphoreticular malignancies in Bangalore, India.

Mumbai : B.B. Yeole, D.J. Jussawala, S.D. Sabnis, Lizzy Sunny, Survival from Breast & Cervical Cancer in Mumbai, India.

Chennai : V. Shanta, C.K. Gajalekshmi, R. Swaminathan, Cancer Survival in Chennai, India.

In Eds. R. Sankara Narayanan, R.J. Black & D.M. Parkin, IARC Scientific Publication No, 145, 1998.

HOSPITAL BASED 5 YEAR SURVIVAL RATES:

5 Year Observed & Relative Survival Rates of Surgically Treated* Breast Cancer. Tata Memorial Hospital, Mumbai

Total Number of Cases Studied - 1701.
Disease Type : Non Metastatic - Non Inflammatory Breast Carcinoma.
Treatment - Surgery alone or in combination with other modalities as initial treatment.
Excluded : M1, M2 & Sarcoma.
5YR OVERALL SURVIVAL - 61%
5YR DISEASE FREE SURVIVAL - 56%

Stage	S	S+R	S+C	S+R+C	S+H	S+R+H	S+C+H	S+R+ C+H	R.S.R.
I	95.8 (52)	87.1 (16)	75.0 (6)	100.0 (2)	90.4 (21)	33.3 (3)	0 (0)	0 (0)	97.3 (100)
II	77.5 (190)	86.9 (29)	61.8 (176)	52.4 (72)	74.8 (87)	74.0 (15)	70.7 (30)	45.8 (12)	73.1 (611)
IIIa	56.2 (27)	50.0 (6)	59.1 (36)	23.4 (29)	67.2 (18)	51.9 (51.9)	31.7 (9)	48.6 (9)	51.9 (143)
IIIb	43.6 (24)	53.1 (17)	31.9 (50)	41.8 (64)	62.1 (17)	55.3 (21)	38.5 (21)	37.4 (19)	44.8 (233)
IV	0 (3)	0 (1)	0 (3)	0 (1)	0 (0)	0 (1)	30.0 (5)	50.0 (2)	37.6 (16)
Nos.	38.1 (9)	40.0 (5)	0 (0)	0 (1)	66.7 (3)	100.0 (1)	0 (0)	0 (0)	47.2 (19)

S - Surgery R - Radiotherapy C - Chemotherapy
H - Hormone RSR - Relative Survival Rate

Reference:

Tata Memorial Hospital: Breast Cancer Incidence, risk factors and Survival rates by Mr. D.N. Rao & Dr. K.A. Dinshaw, HCR Tata Memorial Hospital, 1999.

BREAST CANCER 5 YEAR SURVIVAL RATES - RCC, TRIVANDRUM:

1. **Survival Percent according to Tumour Status.**

	Tumour Size.				
	T1	T2	T3	T4	NK
Overall Survival	75%	69%	50%	38%	52%
Disease Free Survival	63%	61%	49%	42%	48%

2. **Survival Percent according to Node Status.**

	Node Status.	
	N_0	N+
Overall Survival	80%	46%
Disease Free Survival	70%	45%

3. **Survival Percent according to Number of Nodes +ve.**

	No. of Nodes +ve.			
	0	1	2	>2
Overall Survival	80%	62%	56%	39%
Disease Free Survival	70%	57%	56%	37%

Reference:

Aleyamma Mathew[1] PhD, Manoj Pandey[2] MS, B Rajan[3] MD., Ten-year survival of 1701 women with non-inflammatory non-metastatic breast carcinoma, Regional Cancer Centre, Trivandrum - Under Publication.

1 Division of Epidemiology & Clinical Research,

2 Division of Surgical Oncology,

3 Division of Radiation Oncology.

Regional Cancer Centre, Trivandrum, Kerala, 695 011.

HOSPITAL CANCER REGISTRY, MUMBAI

TATA MEMORIAL HOSPITAL, PAREL, MUMBAI - 400 012.

Principal Investigator: Dr. K.A. Dinshaw, Director

Officer-in-Charge: Mr. D. Nagaraj Rao

Cancer Registry, TMH.

The Cancer Registry collects, collates, analyses and reports cancer related information such as site of disease, histological classification, clinical extent of disease, primary treatment and end results analysis since 1941. Only around 1,000 patients were diagnosed as cancer cases in 1941, since then there has been remarkable increase in patient attendance and at present over 25,000 new patients get registered and over 15,000 patients are diagnosed as suffering from cancer annually. The ICMR-NCRP was formed in 1982.

The cancer registry operations were computerized in 1985 using Norsk Data 550 computer, installed in the hospital. In 1997, new computer AS400 IBM Server was installed in the hospital and the entire HCR data were subsequently transferred to this Server. A special software which makes use of Visual Basic as a GUI based front-end and DB2/400 on AS/400 as the bank end data base. As cancer is not a notifiable disease, information about patient's health status is obtained through active follow-up of patient, mostly by postal inquiry.

The TMH Cancer Registry brings out comprehensive annual reports on cancer statistics covering various aspects of cancer management and care. Monographs:- End Results Reports on Head and Neck cancer and Breast cancer are published periodically. Epidemiological studies and case-control studies were carried out to identify high risk and associated factors for common cancers like head and neck, oesophagus and breast cancers and the results have been published in Indian and International Journals.

Staff from other hospital cancer registries are given training in cancer registry techniques and over 20 personnel have been given training so far. Cancer registry staff also attend various workshops on cancer registry operations and are trained well in various aspects of cancer registration.

The Population Based Cancer Registry (PBCR) for Greater Bombay was started in 1964 by the Indian Cancer Society and TMH Cancer Registry has been the major source for providing information on resident cancer cases. As TMH is a well-recognized institution, patients from other states of India and abroad attend the hospital for expert medical care and opinion. Thus, this cancer registry has become an important source to identify resident cancer cases of PBCRs from Bhopal, Delhi, Madras and Barshi which are in the NCRP network.

Barshi Rural Registry.

The TMH initiated the Barshi Rural Cancer Registry in collaboration with Ashwini Rural Cancer Research and Relief Society's, Tata Memorial Centre Rural Cancer Project, Nargis Dutt Memorial Cancer Hospital, Barshi, Solapur. The registry staff continued to help and guide in the methodology of the working of this registry and the cancer registry is the major source for identifying cancer patients attending from Barshi area.

Training/Education.

During the year Mr. Sanjay D. Talole attended the short course in Biostatistics conducted by Christrian Medical College, Vellore from July 1 to July 15, 2002.

Conference/Workshop.

Mrs. S.A. Sant, Mrs. P.V. Mangalvedhe and Mrs. S. H. Kothare attended the workshop on Cancer Registry organised by NCRP (ICMR) at Bhopal, April 11-12, 2001.

Mr. D.N. Rao - Attended the Western Regional Workshop on Development of An Atlas of Cancer in India held at TIFR, Mumbai, June 8-9, 2001.

Mr. D.N. Rao - Attended one day meeting on National Cancer Registry Programme - World Health Organisation Project on Development of An Atlas of Cancer in India held at Bangalore on 2.8.2001.

Mr. D.N. Rao - Attended the XVI IEA World Congress of Epidemiology, Montreal, Canada from August 18-22, 2002 and presented a Poster Presentation on 'A case-control study of stomach cancer in Mumbai, India.

Mr. D.N. Rao - Attended the WHO Project - Cancer Atlas Workshop held at Bangalore from July 31st to August 2nd, 2002.

Mr. D.N. Rao - Visited Barshi Cancer Registry, Solapur on 19th October 2002 to review the work of the Barshi Cancer Registry.

International Visitors.

Prof. (Dr.) Matti Hakama, University of Tampere, Finland visited our Dept. and gave a Lecture on 'Cancer Control - Current and Future Directions' on 8th December 1999.

Dr. D.M. Parkin, Chief of Epidemiology Division, IARC, Lyon, France visited the registry in the last week of July 2002 and we discussed the epidemiological research presently being carried out by the Department.

Dr. Murari Man Shrestha, Head, Cancer Prevention Control and Research Dept., B.P. Koirala Memorial Cancer Hospital, Nepal visited our Dept., in March 2002 for training in Cancer Registry operation.

National Visitors.

Mrs. Sandhya Mahakal, Prince Aly Khan Hospital, Mumbai - 2 weeks training programme on Cancer Registry from 1.6.1999.

Doctors from Armed Forces Medical College (AFMC), Pune, visited during the year to get first hand information about medical records management and other functions of the Department.

Publication:

A CASE-CONTROL STUDY OF STOMACH CANCER IN MUMBAI, INDIA

D. Nagaraja RAO[1]*, Balasubrahmaniam GANESH[1], Ketayan. A. DINSHAW[2] and K.Mallath MOHANDAS[3].

1. Division of Epidemiology and Biostatistics. 2. Director, TMH & 3. Head, Division of Digestive Diseases, TMH.

Stomach Cancer Incidence rates are much lower in India than elsewhere, but the stomach remains one of the 10 leading sites of cancer in both sexes in most of the metropolitan registries. This is an un-matched case-control study of stomach cancer carried out at the Tata Memorial Hospital (TMH), Mumbai. Our purpose was to identify the association of tobacco and alcohol use, occupational hazards, diet, consumption of beverages like tea and coffee, the living environment, cooking media and literacy with stomach cancer. Our study included 170 stomach cancer cases and 2,184 hospital controls interviewed during the period 1988-1992. Tobacco chewing, bidi or cigarette smoking and alcohol drinking did not emerge as high risk factors for stomach cancer. Consumption of dry fish at least once a week compared to never or once a every 2 weeks showed a 12-fold excess risk (OR=12.4, 95% CI 7.0-22.1, $p< 0.0001$) for stomach cancer among the nonvegetarian food items considered. A protective effect of tea consumption (OR=0.4, 95% CI 0.2-0.9, $p<0.03$), showing 59% reduction in risk, was identified, which could be of use for possible control and prevention of this cancer.

Key words: alcohol; tobacco; diet; dry fish; stomach cancer; India.

Published in:- *International Journal of Cancer. Vol. 99/5, June 2002.*

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Dr. K.A. Dinshaw	Director, Principal Investigator
2.	Mr. D.N. Rao	Officer-in-Charge
3.	B. Ganesh	
4.	Rajani Vachchrajani (Deceased on 24-11-2001)	
5.	Snehl Sant	
6.	Josephine Jose	
7.	Pushpa Mangalvedhe	
8.	Vidya Lanke	
9.	Shubha Kothare	
10.	Shanthakumari	
11.	Gopu Natarajan	
12.	Elizabeth George	
13.	Hilda Sequeira	
14.	Sanjay D. Talole	

POPULATION BASED CANCER REGISTRY, MUMBAI

INDIAN CANCER SOCIETY, PAREL, MUMBAI - 400 012.

Principal Investigator: ***Dr. M.R. Kamat***

Deputy Director & Co-Investigator: ***Dr. B.B. Yeole***

Publications:

AN ASSESSMENT OF IMPROVEMENT IN RELIABILITY AND COMPLETENESS OF MUMBAI CANCER REGISTRY FROM 1964-'97

Yeole B.B.

Background: Mumbai Cancer Registry was established in 1964. In this registry files more than 2,00,000 cancer cases were registered and above 1,00,000 cancer deaths were recorded. So far on this registry's data 100 epidemiological research articles and 35 monographs (reports) have been published. It was essential to asses whether there has been any improvement in reliability and completeness in this registry's data over the past 3-decades.

Material and Methods: For studying improvement in reliability and completeness of Mumbai Cancer Registry's data, the data published in consecutive 7 volumes (volume II-VIII) of 'Cancer Incidence in 5 Continents' published by International Agency for Research on Cancer have been used. For studying completeness of data the indicators 'Proportion of deaths in period', 'Proportion of death certificate alone' and 'Stability of age incidence rates' are used. For reliability of data the indicators: proportions of cases registered after histological verification, proportion of cases where age is not known, the flattening of age incidence curves and proportion of other and unspecified neoplasm's have been used.

Results: Proportion of deaths in period for all cancer together and for most prominent sites in both the sexes over a period 1964 to 1997 remained almost constant. For all sites together it was around 54% for males and for females it was around 51%. The percentage of cases diagnosed through death certificate alone for all sites decreased from 15% in 1964-1966 to 7% in 1993-1997 in males; while in females it decreased from 18% in 1964-66 to 6% in 1993-1997. The crude incidence rates did not show any significant difference over time (1964-66 to 1993-97) in both sexes. The crude rates for males were around 70 per 100,000 population and 73 per 100,000 populations for females. As far as total cancer cases there is substantial improvement in the percentages of histological verification in each successive 5-year period. In males it has improved from 58% in 1964-66 to 77% in 1993-97; while in female it has increased from 57% to 80% during same period. The percentages of cases where the age is not known, never exceeded more than 0.1% in any 5-year period in either sex. The proportion of other and unspecified sites is around 7% and it remained almost same in all the periods in both the sexes. When the age curves for all sites are drawn for each period it indicates that they have same pattern, and steep rise at older ages indicates that registration efficiency is maintained in the older age groups also.

Conclusions: This study clearly indicates that the data collected by Mumbai Cancer Registry is complete and reliable; and quality of data has improved considerably over time.

Published in:- *'Asian Pacific Journals of Cancer Prevention, vol.2, pg 225-232, 2001'.*

POPULATION-BASED SURVIVAL FROM COLORECTAL CANCER IN MUMBAI

Yeole B.B.[1], Sankarnarayanan R[2], Lizzy Sunny[1], Swaminathan R[3] and Parkin D.M.[3]

1. Indian Cancer Society, Mumbai. 2. IARC, France. 3. Cancer Institute, Chennai.

Background: Survival estimates of patients registered by population-based cancer registries reflect the average prognosis from a given cancer in a given health service setting as they include mostly unselected group of cancer patients with a wide range of natural histories and treatment patterns. Report of such a data are few from developing countries.

Material and Methods: Follow-up information on 1,642 colorectal cancer patients registered by the PBCR during 1987-'91 was obtained by matching with death certificates from the Mumbai vital statistics registration system, postal/ telephone enquiries, home visits and scrutiny of medical records. The survival for each case was determined as the duration between the date of incidence and date of death or date of lost to follow-up or the closing date of the study (31st December 1996). Cumulative observed and relative survivals were calculated by the Hakulinen's method. For comparisons of results the other populations, age standardized relative survival was calculated by directly standardizing age specific relative survival to the specific age distributions of the estimated global incidence of major cancers in 1985. The log rank test was used in univariate analysis to identify the potentially important prognostic variables. The variables showing statistical significance in univariate analysis were introduced stepwise into a Cox regression model to identify the independent predictors of survival.

Results: The 5-year observed survival was 31.2% for colon cancer and 36.3% for rectal cancers, the relative survival were 36.6% and 42.2% respectively. The age standardized relative survival for those aged 0-74 years was 33.3% for colon and 40.7% for rectal cancers. Age and clinical stage of disease emerged as independent predictors of survivals. Age-specific 5-year relative survival showed declining trend with advancing age for both colon and rectal cancers. Survival at 5 years was 53.5% for localized colon cancers, 27.8% for regional and 7.5% for distant mets disease. These were 57.3%, 22.2% and 3.7% respectively for rectum.

Conclusions: Comparison with other populations revealed significant regional variations, which may be related to differences in detection and treatment. The survival in Mumbai was similar to most populations in less developed countries but lower than those of US, Europe, The prognosis from colorectal cancers in Mumbai in particular, developing countries in general, may further be improved by early detection linked with treatment.

Published in:- *'European Journal of Cancer, Vol.37, pg.1402-08, 2001'.*

EPIDEMIOLOGICAL FEATURES OF CHILDHOOD CANCERS IN GREATER MUMBAI

Yeole B.B., Advani S.H., Lizzy Sunny.

Reliable data on childhood cancers in incidence and mortality are available from a few areas in the developing countries. In general, the most common adult cancers hardly ever occurred in children. It is likely that genetic predisposition has a greater role in the etiology of childhood tumors than those of adults, and thus comparisons between different ethnic groups living in the same area or between similar ethnic groups in different environments may be relevant.

The Mumbai Cancer Registry data for the five years, 1993 to 1997 has been analysed for this study. Analysis was carried out on childhood cancers for incidence and mortality by age, sex, site, histology etc. The ICD-9 classification was used for primary site and for histology. Analysis has been done by examining the crude, age specific and age adjusted rates.

In Mumbai, childhood cancers formed 3.3% of the total cancer load. Of the 1330 childhood cancers 814 were boys and 516 were girls; a sex ratio of 1.58:1. The total crude incidence rates were 10.0 for males and 6.8 for females. The crude rates and AAR(WP) for both the sexes for total childhood cancers did not show any difference. Leukaemias showed the highest incidence rate followed by CNS tumors in both the sexes. A total 557 cancer deaths were noted in the resident population of Mumbai under the age of 15, during the period under review. More or less same pattern by sex, age and residence was observed in incidence.

Childhood cancers tend to have short latent periods, but are generally more responsive to chemotherapy than tumors typically occurring in adults. Thus although specific types of childhood cancers are uncommon, collectively they represent an important public health problem.

Published in:- *'Indian Pediatrics, Vol.38, pg.1358-64, 2001'.*

SURVIVAL FROM HEAD AND NECK CANCER IN MUMBAI (BOMBAY)

Yeole B.B.[1], Sankarnarayanan R[2], Lizzy Sunny[1], Swaminathan R[3] and Parkin D.M.[2]

1. Indian Cancer Society, Mumbai. 2. IARC, France. 3. Cancer Institute, Chennai.

Background: Head and Neck Cancers, among the 10 most frequent cancers in the world are common in regions with a high prevalence of tobacco and alcohol habits. They account for one-fourth of male and one-tenth of female cancers in India. The authors report and discuss the survival rates from these cancers in Mumbai (Bombay), India.

Methods: Follow-up information on 6,311 head and neck cancer patients registered by PBCR Mumbai for the period 1987-1991 was obtained by a variety of methods, including matching with death certificates from the Mumbai vital statistics registration system, postal/telephone enquiries, home-visits and scrutiny of medical records. The survival for each case was determined as the duration between date of incidence and the date of death or date of lost to follow-up or closing date of the study (December 31st 1996). Cumulative observed and relative survivals were calculated by the Hakulinen's method. For comparisons of results with other populations, age standardized relative survival was calculated by directly standardizing age specific relative survival to the specific age distributions of the estimated global incidence of major cancers in 1985. The log rank test was used in univariate analysis to identify the potentially the important prognostic variables. The variables showing statistical significance in univariate analysis were introduced stepwise into a Cox Regression Model to identify the independent predictors of survival.

Results: The 5-year relative survival rates were 74.5% for the lip, 42.7% for the anterior tongue, 25.5% for the posterior tongue, 45.1% for the mouth, 29.7 % for the oro-pharynx, 38.7% for the nasopharynx, 29.1% for the hypo-pharynx, 41.2% for the larynx. Age, marital-status, religion, site and clinical extent of disease emerged as independent predictors of survival. Age specific 5-year relative survival declined with advancing age. Single patients had a 20% excess risk of death compared with married patients. Those with cancer of the lip, mouth, nasopharynx, and larynx had a better prognosis than those with cancer of other sites. Those with regional spread of disease experienced

a three-fold increased risk of death and those with distant metastasis experienced a six-fold excess risk. Less than one-fourth of cancers were localized in the organ of the origins at diagnosis; 5-year survival for localized cancers ranged from 52.9% to 80.2% depending on the sub site.

Conclusions: Significant variations in survival from cancer at individual sites within the head and neck region were noted. Comparison with other populations revealed variations that seemed to be related to differences in detection and treatment. Tobacco and alcohol control, early detection and treatment are essential to reduce mortality from head and neck cancers.

Published in:- *'CANCER', Vol. 89, Number 2, pg. 437-444, 2000.*

TRENDS IN CANCER INCIDENCE IN GREATER BOMBAY

Yeole B.B.

The information behind cancer incidence trends forms the scientific basis for planning and organization of prevention, detection and treatment of cancer in the community. A trend, however, always represents a summary curve of changes that have occurred within different groups of people living under different conditions. In this paper, the trend analysis is carried out for 30 major cancer sites for both the sexes using age-incidence data of Greater Mumbai for the period 1968-1992. For studying time trends the polynomial models are fitted as generalized linear models with Poisson distributed errors and logarithmic link using the statistical package, GLIM. While evaluating the significance of period, cohort or drift, a model was considered significantly better than another model if the reduction in deviance was significant at 5% level on the basis of chi-squared distribution. Present trend analysis showed that cancers of the tongue, mouth, oropharynx, oesophagus, stomach and larynx in both the sexes and cervix for females have registered a decline in incidence over the period of observation, while, during the same period, cancers of the liver, pancreas, bladder, brain and thyroid in both sexes and breast, endometrium and ovary in females; testis in males showed increasing trends in incidence. Cancers of hypopharynx, lung, bone, connective tissue and lymphomas in both the sexes did not show any significant change in incidence. The trends observed in cancers of the tongue, oropharynx, hypopharynx, oesophagus, larynx and lung are consistent with the observed patterns in prevalence of tobacco habits in the population. The increase in breast cancer is related to a gradual decrease in the proportion of women having a first child before 20 years of age. A declining trend in cervical cancer incidence could be a cohort effect.

Published in:- *'Cancer Strategy, Vol.2, pg 7-12, 2000'.*

TRENDS AND PREDICTION OF CANCER INCIDENCE CASES BY SITE AND SEX FOR MUMBAI

Yeole B.B.

In order to estimate the resources needed for diagnosis, treatment, follow-up and rehabilitation services, it is important to know the magnitude of common cancers at present and in future. For this, an attempt has been made to predict cancer incidence cases for most common cancers for Greater Bombay up to the year 2002.

The trend analysis is carried out for 30 cancer sites using age incidence data of Greater Bombay for the period 1968 to 1987. The age-period-cohort model was fitted to the data to study trends. Prediction was based on the assumption that the characteristic features of the model estimated from the observed rates would continue to hold during the prediction periods.

Trend analysis showed that cancers of the tongue, mouth, oropharynx, oesophagus, stomach and larynx in both sexes and cervix for females have registered a decline in incidence over the period of observation. During the same period, cancers of liver, pancreas, bladder, brain and thyroid in both the sexes, breast, endometrium and ovary in females and testis in males showed increasing trends in incidence, while cancers of hypopharynx, lung, bone, connective tissue and lymphomas in both the sexes did not show any significant change in incidence.

In males during 1968-1972, cancer of the oesophagus was the leading cancer, followed by lung, larynx, tongue and stomach, while in 1988-2002 cancer of the lung will be most predominant cancer, followed by hypopharynx, oesophagus, prostate and tongue.

It is believed that the results of the present study will provide a sound basis for planning cancer control, prevention, diagnostics, treatment and rehabilitation in Mumbai.

Published in:- *'Indian Journal of Cancer, Vol.36, pg 163-178, 1999'.*

BLADDER CANCER IN MUMBAI, INDIA

Yeole B.B.

For studying the descriptive epidemiology of cancers of the Urinary bladder, the data reported by Mumbai Cancer Registry for the most recent five-year cancers have been utilized. For studying time trends in these cancers, data of the past 30 years have been used. In Mumbai, bladder cancer is very uncommon in the first three decades of life; but after the age of thirty; the incidence rates increase with age, in both the sexes. When the incidence of these cancers was compared community wise, the highest incidence was noted in the Parsis and the lowest in the Hindus, in both the sexes. The incidence of urinary bladder cancers is found to be associated with the marital status in both sexes. No association was observed between the incidence and educational level obtained by the patients having urinary bladder cancers.

Published in:- *'Ostomy International, Vol.21 No-1, pg 26-27, 1999'.*

DESCRIPTIVE EPIDEMIOLOGY OF LEUKAEMIAS IN GREATER MUMBAI

Yeole B.B., Jussawalla D.J., Advani S.H.

Background: There is little data available on the occurrence of leukaemias in India. This is despite a large number of patients being diagnosed and treated at various cancer centers all over the country. We therefore analyzed the available data of the Bombay Cancer Registry to ascertain the epidemiological characteristics of leukaemias in India.

Methods: The incidence and mortality rates of leukaemias by cell type and sex were obtained for the most recent 5 years (1989-93). The data of the past 30years were used to study the time trends using a linear regression model based on the logarithms of the incidence rates.

Results: Leukaemias constituted 3.9% of all registered cancer cases and 5.4% of all registered deaths in Greater Mumbai. Males were affected more frequently than females. Myeloid leukaemias were the commonest. A bimodal age incidence was observed with the first peak in childhood, a trough between 15 to 19 years of age and a slow rise thereafter. Among the various religious groups Hindus had the highest rate. An increasing trend in the incidence of all types of leukaemias was also observed.

Conclusion: The incidence of leukaemias in Greater Mumbai is comparable to World rates. There is a male preponderance in all cell types and an increase in incidence was seen over the past 30 years. The higher incidence of myeloid leukaemias observed might be related to under reporting of chronic lymphatic leukaemias.

Published in:- *'The National Medical Journal of India, Vol.11, No-3, pg 116-199, 1998'.*

LONG-TERM SURVIVAL FROM CERVICAL CANCER IN MUMBAI

Yeole B.B.

This brief report concerns long term cervical cancer survival in Mumbai. 375 cases of cervical cancers were registered in Mumbai for the year 1977. 331 cases were eligible for study as 47 cases were registered on the basis of death certificates only.

The cut off date for follow-up was 31st December 1993. Both active and passive methods were used to obtain information on the vital status of cases. Cumulative observed survival rates were calculated by the Kaplan & Meier methods. Cumulative relative survival rates were calculated as a ratio of observed and expected survival rates.

The overall 5, 10 and 15 years observed survival rates were 51%, 36% and 30% respectively. The corresponding relative survival rates were 55%, 43% and 41% respectively.

There was a clear downward gradient in survival with advancing clinical stage of the disease.

Published in:- *'International Journal of Cancer, Vol.78, pg 394-95, 1998'.*

SURVIVAL FROM BREAST AND CERVICAL CANCER IN MUMBAI

Yeole B.B., Jussawalla D.J., Sabnis S.D., Lizzy Sunny

In this paper an attempt has been made to study the survival experience of breast and cervical cancer patients registered during 1982-86 in Bombay Cancer Registry. 2973 breast cancer and 2426 cervical cancer cases were registered during the period. The cases, which were registered through DCO's, were excluded from the analysis.

31st December 1993 was the closing date for follow-up. Follow-up information was collected through Death Certificates, Telephone and Postal enquiry and house visits. Cumulative observed and relative survival probabilities were calculated using Hakulinen's method.

The five-year relative survival was 55% for cervical cancer. There was decreasing trend in relative survival with age in cervical cancer, no such effect was seen for breast cancer.

On univariate analysis age, marital status and extent of disease emerged as significant factors affecting survival in breast and cervical cancer. On multivariate analysis all of these emerged as independent predictors of cervical and breast cancer. For cervical cancers age group and clinical extent of disease were independent predictors of survival with both the factors showing an inverse relationship.

Published in:- *'Cancer Survival in Developing countries, IARC Scientific Publication No.145 pg79-87, 1998'.*

Scientific Conferences

1. Dr.B.B.Yeole attended and presented a paper 'Cancer Mortality in Greater Mumbai' on International Symposium on Strengthening of death certificate system in India held at Mumbai, Tata Institute of Fundamental Research, February 22-24, 1999 .
2. Dr.B.B. Yeole attended and presented a paper 'Trends in Cancer Incidence in Greater Bombay' on 21st International Association for Cancer Registries held at Lisbon, Portugal, Sept.28-3rd October, 1999.
3. Dr.B.B. Yeole attended and presented a paper 'Prostate Cancer Survival in Mumbai' on XI Asia Pacific Conference held at Chennai, December 12-15,1999.
4. Dr.B.B. Yeole attended and presented a paper 'Epidemiology of breast cancer in India' on Second ICON conference - 'Breast cancer in the new millennium' held at Nagpur, February 18-28, 2000.
5. Dr.B.B. Yeole attended and presented a paper 'Population Based Survival estimates for Prostate Cancer in Mumbai' on the 22nd Annual Scientific meeting of the International Association of Cancer Registries held at Khonkaen, Thailand, November 8-12, 2000.
6. Dr.B.B. Yeole attended and presented a paper 'An Assessment of cancer incidence patterns in Parsi and Non-Parsi population in Greater Bombay' in IXth Biennial Conference of Indian Society of Oncology held at Hyderabad, November 10-12, 2000.
7. Mrs. Lizzy Sunny, Programmer, attended and presented a paper 'An epidemiologic features of Childhood cancer in Greater Bombay' in IXth Biennial Conference of Indian Society of Oncology held at Hyderabad, November 10-12, 2000.
8. International conference on 'Environmental and Occupational respiratory diseases' was held at Lucknow, India, during 29th October-2nd November 2000. As per invitation by organizing committee, Dr.B.B.Yeole attended this conference as a faculty member and gave a talk on 'An epidemiological assessment of lung cancer in India'.
9. Update in Thoracic Oncology and first national lung cancer conference was held in Tata Memorial Hospital, Mumbai during 15th to 17th March 2001. Dr. B.B.Yeole was invited as a panelist in discussion of 'Lung Cancer-Pretreatment-Epidemiology Session'.
10. Tata Memorial Hospital celebrated its foundation day on 20th February 2001. Dr. B.B. Yeole was invited as a panel member of epidemiology session at this scientific meeting.
11. Dr. B.B. Yeole was invited as a faculty member at a National Conference on Pulmonary Diseases, held at Hotel Taj Mahal, Mumbai, during 7th-11th Nov. 2001. Dr. Yeole gave a talk on 'Epidemiology of Lung Cancer in India' at this conference.

Training Programme

1. Mrs. Lizzy Sunny, Programmer has been awarded an International Cancer Technology Transfer Fellowship (ICRETT) by the International Union Against Cancer (UICC). The host institute was International Agency for Research on Cancer, Lyon, France. The fellowship training was at Lyon from 25th April to 9th June 2000. During this period she has participated in the IARC Summer School on Cancer Registration and application in epidemiology and later she received training in survival analysis. She worked under the supervision of Dr.Sankarnarayanan, Scientist, Descriptive Epidemiology Unit of IARC.

2. Mrs. Lizzy Sunny, Programmer has been selected for the doctoral training programme in Epidemiology by the Dept. of Public Health, Tampere University, Finland, for the academic year 2001-'02.

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Dr. M.R. Kamat	Principal Investigator
2.	Dr. B.B. Yeole	Deputy Director
3.	Lizzy Sunny	
4.	R.A. Sarkar	
5.	Indu Joshi	
6.	S.S. Hirve	
7.	K.A. Puranik	
8.	M.P. Pagare	
9.	Ramamurthy	
10.	N.G. Shasthri	
11.	Ajitha Virkar	
12.	S.S. Wad	
13.	M.V. Bangera	
14.	P.P. Bandekar	
15.	Kavita C. Jadav	
16.	Gita S. Palav	
17.	Lalitha Rajan	
18.	H.R. Bhagat	
19.	Meena J. Rawal	
20.	K.S. Shirsat	
21.	Sunitha R. Shahani	

HOSPITAL CANCER REGISTRY, BANGALORE

KIDWAI MEMORIAL INSTITUTE OF ONCOLOGY, BANGALORE-29.

Principal Investigator: ***Dr. P.S. Prabhakaran, Director, KMIO***

Officer-in-Charge: ***Prof. K. Ramachandra Reddy***

The Department of Biostatistics and Cancer Registry has two components namely Biostatistics & Epidemiology and Cancer Registration. The faculty of Biostatistics component is involved in teaching of Bio-statistics and Cancer Epidemiology to the students of superspeciality courses, Post-graduate and Under-graduate students of different disciplines in addition to providing consultation in statistical methods and Epidemiology to many research projects of the Institute.

The Registry component of the department collects information on sociodemographic items in the pre-devised questionnaire at presentation / registration of a patient. It also extract information on diagnosis, clinical extent of the disease, stage, treatment, prognosis of the disease etc., as recorded

in the case records by the clinicians. The data so abstracted is coded and entered into the computer and necessary consistency checks using the special validation software programmes and analysis of the data is done by site and for different parameters according to the international classification of the diseases and publishes annual scientific report(s). The information so generated serves not only for the administrative purpose but also as a scientific base for the researchers in planning the prevention and control of cancer.

RESEARCH ACTIVITIES / PROJECTS:

1. Case Control Study of Breast Cancer:

The incidence of Breast Cancer is increasing in almost all the Urban Centres of the country including Bangalore. In Bombay and Delhi, Breast Cancer ranks No.1 among all female cancers and in Bangalore urban females though it is No.2 but the difference between breast and cervical cancer incidence (which is No.1) is very marginal. The proportion of these cancers even in the patients attending KMIO (HCR) is also increasing. The study was undertaken to identify the risk factors for Breast Cancer and the data analysis is in progress.

2. Case Control Study of Ovarian Cancer:

The data from HCR at KMIO indicates that among the gynecological malignancies cancer of the Ovary is the second commonest cancer. Yearly about 130-140 cases (ovarian cancer) are registered at KMIO.

Case control studies conducted in the developed Countries have shown many etiological factors associated with ovarian cancer. Some of the established risk factors are reproductive factors such as late menopause, prolonged ovulatory age, increased number of spontaneous abortions, severe premenstrual symptoms in addition to dietary, genetic and other environmental factors. The KMIO study is in progress.

Publications:

(Dr. C. Ramesh - As Co-Author)

1. The Myths in Medicine about Cancer (Accepted for Publication in Indian Journal of Public Health).
2. Factors influencing the evaluation of an article in Cancer literature. Indian Journal of Cancer, 36(2): 69-79, 1999.
3. The role of free radical detoxifying system in the cellular response to Radiotherapy in Carcinoma of the Uterine Cervix. In recent aspects of Cellular and applied radiobiology (Des). F.H.A Schneeweiss & R.N. Sharan, International Co-operation Bilateral Seminars, Forschungszentrum Julich Germany, 30: 162-164, 1999.
4. Role of Electron Beam Treatment in Postoperative Management of Carcinoma of the Breast. Indian Journal of Cancer, 35:1-9, 1998.
5. Effects of overall treatment time on overall and Disease free survival in the post-operative Radiotherapy of Carcinoma of the breast. Journal of Medical Physics, 22:77-78, 1997.
6. Role of Bio effect models in the Post-Operative Radiotherapy of Carcinoma of the

Breast. Journal of Clinical Radiotherapy and Oncology, 12(1-2): 91-95, 1997.

7. Primary CNS lymphoma - A report of Nine cases Indian Journal of Cancer, 33-2:103-107, 1996.

8. Spinal Cord compression by primary NHL. Indian Journal of Cancer, 32-2:81-84, 1995.

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Dr. P.S. Prabhakaran, Director, KMIO	Principal Investigator
2.	Prof. K. Ramachandra Reddy	Prof. & Head
3.	Dr. C. Ramesh	Associate Prof.
4.	K. Mani	
5.	D.J. Jayaram	
6.	V. Bhadraiah	
7.	A.V. Srinivasa Gowda	
8.	R. Lingaraju	
9.	M.K.M. Gowda	
10.	B.J. Kumudini	
11.	Balakrishnoji Rao	
12.	A. Subramani	
13.	A.K. Jyothi	
14.	V.M. Mahadevappa	

POPULATION BASED CANCER REGISTRY, BANGALORE

KIDWAI MEMORIAL INSTITUTE OF ONCOLOGY, BANGALORE-29.

Principal Investigator: ***Dr. P.S. Prabhakaran, Director, KMIO***

Officer-in-Charge: ***Dr. Arnua E. Prasad***

KMIO was established on 26th June 1973 with a bed strength of 50. It became autonomous on 8th January 1980. The Government of India has accorded the status of a Regional Caner Centre on 1st November 1980 to this institute and thus became one of the 11 RCC's in the country in 1980. The Indian Council of Medical Research has recognized this referral institution as research institution. Thus from a small non descript cancer hospital, it has progressed to became a major and model comprehensive regional center for cancer research and treatment offering sophisticated diagnostic and treatment services to patients afflicted with cancer from Karnataka and adjoining areas of AndhraPradesh, Tamil Nadu, Kerala and Maharashtra. WHO has recognized it as an Institute of Excellence in 2000.

The institute has now a bed strength of 450. In addition to this, there are 2 Dharmashalas, a unique project of its kind in the country, which provide accommodation for ambulatory cancer patients and 500 of their attendants. The inmates (the patients and attendants) receive 3 meals a day free of cost through a perpetual free feeding endowement donation.

TREATMENT FACILITIES.

The KMIO has well equipped departments of Surgical oncology, Radiation oncology, Medical

oncology, Nuclear medicine, Radiological and Imaging division, Blood transfusion and Immuno hematology services, Blood component therapy, clinical and tissue Pathology, Cytology, Biochemistry, Microbiology and a division of alternative Indian Medicines.

It has established special Palliative care & Rehabilitation clinics, Department of Community oncology and Anti tobacco cell in the institute.

Peripheral Cancer Centres:

There are two well-equipped peripheral cancer centers with facilities for diagnostic and radiation therapy in the districts of Gulbarga and Mandya to facilitate treatment for patients who cannot reach the Regional Caner center. These centers are being upgraded to become self-sufficient satellite cancer centers with facilities for surgery and chemotherapy as well.

Postgraduate Teaching:

The center offers postgraduate course on Radiotherapy from year 1987. Superspeciality courses are MCH (Surgical Oncology) and DM (Medical Oncology) Postgraduate Diploma in Nuclear Medicine. DNM and DRP (Diploma in Radiation Physics) Bsc Medical Technology (Lab/ Radiotherapy/Radio Diagnosis) have also started from 1st September 1989. The se courses are affiliated to RajiveGandhi University of Health Sciences and are recognized by Medical Council of India.

WHO fellowships are awarded for most of the faculties of the institute.

Cancer Registry:

The Bangalore Population Based Cancer Registry was established at KMIO in August 1981 as a joint project with Indian Council of Medical Research as part of National Cancer Registry Programme. It covers 365.7 sq.km. The Population covered by the registry is 51,42,775 (as on 1.7.1977) based on 1991 census. The population based cancer registry of Bangalore uses active case finding from various sources of data. The number of sources for data collection covered by the registry is about 400. The Regional Cancer Centre accounts for 60% of the cancer cases. The information on death is obtained from corporation death registration units as well as city Municipal Corporation and death registration offices.

The registry was involved in tobacco and caner survey, case control study of prostate cancers, survival studies in Cervical and Breast Cancer and Tobacco related cancers etc,.

Summary:

During 1997, a total of 3007 new cancer cases were registered. The average annual Crude Incidence Rate (CR), Age Adjusted Rate (AAR) and Truncated Incidence Rates (35-64) of all sites (ICD-9 140-208) taken together were 51.4,78.04 and 123.6 among males and 66.3, 100.8 and 205.4 among females.

The common cancers among males were stomach (AAR:7.9), esophagus (AAR:6.7) and Lung (AAR:6.2). Among females the common sites of cancers were Cervix (AAR:20.1), Breast (AAR:19.8) and Oral Cavity (AAR: 7.9). Cervix and Breast were the commonest leading cancers even when cancers in both sexes were combined.

Most of the top ten cancers show an increasing trend except for cervix cancerwhich shows a decreasing trend. Tobacco related cancers accounted for 38% of all cancers in males and 16.8% of all cancers in females. Among the childhood cancers, Leukaemias contribute to 36.2% of all child

hood cancers; 36.2% of all childhood cancers in males and 30% in females. The next in frequency are the lymphomas in male, and CNS tumors in females. The mortality to incidence ratio is 27.4 for the year 1997.

Publications:

1. Cancer incidence in five continents Vol.VII, IARC Scientific publications No.143, International Agency for Research on Cancer, Lyon, France, pp 338-341. 1997.
2. Survival in cancer of the Cervix: A report presenting Results on outcome of treatment in the setting of a Population Based Cancer Registry in a Developing Country (Bangalore, India). Cancer Causes and Control Vol.9. 117- 121, January, 1998.

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Dr. P.S. Prabhakaran, Director, KMIO	Principal Investigator
2.	Dr. Aruna E. Prasad	Officer-in-Charge
3.	K. Puttuswamy	
4.	K.V. Krishna Reddy	
5.	B.R. Gopalakrishnappa	
6.	N.M. Sreerama Reddy	
7.	Rajanna	
8.	T.C. Venugopal	
9.	A.T. Vinutha	
10.	Srinivasa	
11.	P. Savithramma	

HOSPITAL CANCER REGISTRY, CHENNAI

CANCER INSTITUTE (WIA), CHENNAI-20.

Principal Investigator: ***Dr. V. Shanta***

Co-Investigator: ***Mr. R. Swaminathan***

The Cancer Institute (WIA), in Chennai, is the first comprehensive cancer care centre to be established in South India and the second in India. It is recognized as a Regional Cancer Centre by the Ministry of Health & Family Welfare of Government of India, with state of art facilities for cancer diagnosis, treatment and research. It is an autonomous non-profit institution with a bed strength of 423; more than 50% of the patients are boarded, lodged and treated at free of cost. The institute is primarily research oriented and is recognized by the University of Madras, Anna University and The Tamil Nadu Dr. M.G.R. Medical University for doctoral and super speciality degrees. The proportion (%) of patients attending the Institute from southern states of India is as follows: Tamil Nadu-63%, Andhra Pradesh-27% and Kerala-3%. Over 240 patients (new patients and follow-up cases) are seen at the Institute per day and these figures are increasing over the years. The three leading sites of cancer among males are oral cavity (UICC), oropharynx (UICC) and oesophagus. In females, the order is cervix, breast and oral cavity (UICC). In paediatric age group, leukaemia and lymphoma are the predominant cancers.

The Hospital Based Cancer Registry has been functioning since the inception of the Institute in 1955. Data collection on the lines of ICMR started on 1st January 1984. All new cases attending the

Institute are interviewed during registration and the required data are abstracted from the records using a standard proforma. The coded profomae are then scrutinized by the Medial Officer and Statistician. Data are then computerized. The validity and consistency checks for unlikely combinations of age, sex, site and morphology and other factors are carried out using in-house computer programs. In addition to these the IARC quality control programs are also used to validate the data. The cleaned data are then sent to the ICMR coordinating unit. Exercises on re-abstraction and coding on a random sample of cases are done regularly and presented in national level registry meetings.

Lifetime follow up of the cancer cases is generally felt difficult in India. With great efforts, we have evolved methods to overcome the problems in the follow up of cases treated at the Institute. An address form consisting of a minimum of seven addresses of patients and their relatives/friends/ referring physician is maintained to help in follow up. Reply paid cards are sent to all patients who do not report for check up on the due date. Home visits/telephone enquiries are made by the field investigators to find out the vital status of the treated patients who had given a contact address in Chennai. If there is no response from any of the addresses given by the patients from outside Chennai, letters are written to the Village Headman, referring doctors, President/Secretary of local service organizations like the Lion, Rotary etc. for tracing the patient. The help of the cured patients from the area, who are currently on regular follow up is also sought for this purpose. We also provide concession for travel by bus, rail and air to the patients coming for treatment/follow up and an accompanying person. The follow up rate is more than 80%.

Reports on the activities of hospital cancer registry are published regularly on an annual or biennial basis. We have been organizing workshops on 'Techniques for early detection of cancer' for the medical officers in Tamil Nadu. Epidemiological investigations of different types to determine the risk factors and survival studies to elicit the prognostic factors are being carried out. The results of these studies have been published in reputed national and international journals. Case-control studies on cancers of the oral cavity, cervix, colon, rectum, lung and larynx in collaboration with the International Agency for Research on Cancer, France and on cancers of the female breast and stomach with the Nagoya City University Medical School, Japan have been completed. Clinical trials were done on cancers of the cervix and oral cavity to assess the role of chemotherapy in advanced cancers. The tobacco cessation clinic and the hereditary cancer clinic are also functioning at the Cancer Institute (WIA).

Publications:

PAUCITY OF HEMATOLOGICAL NEOPLASIA AFTER TREATMENT OF HODGKIN DISEASE: OBSERVATION AFTER LONG-TERM FOLLOW-UP AT CANCER INSTITUTE, CHENNAI, SOUTH INDIA

Sagar T.G., Chandra A., Raman S.G., Swaminathan R.

The purpose of the study was to evaluate the incidence of second malignancies in childhood Hodgkin disease treated with COPP and COPP/ABV (replacing mechlorethamine by cyclophosphamide) chemotherapy. In 212 children with Hodgkin disease who were under 14 years of age and treated at Cancer Institute during the 25-year period of 1970-1994, the occurrence of second malignant neoplasms was analyzed as on 31 December 1999. Eighty-two percent attained complete response. The 5- and 10-year overall survival rate was 91 and 83%, respectively. In this interm report 5 cases

of second malignancies were documented. All 5 were solid tumors: one each of soft tissue sarcoma, dermatofibrosarcoma, micropapillary carcinoma of thyroid, malignant phylloides tumor of breast, and chondrosarcoma of ilium. All patients had received combination chemotherapy and radiotherapy. Interestingly, all were splenectomized. All these patients had advanced stage of cancer and were 7-14 years of age at the time of diagnosis of first primary Hodgkin disease. It is significant that there were no secondary hematological malignancies. COPP and COPP/ABV are effective therapeutic regimens. The paucity of secondary hematological malignancies is unique in this series and may be attributed to the substitution of nitrogen mustard with cyclophosphamide in the chemotherapy combination. This is an initial observation, and further follow-up is needed for a firm conclusion.

Published in:- *'Pediatr Hematol Oncol, 19(3): 197-203, 2002'.*

ORAL CANCER IN SOUTHERN INDIA: THE INFLUENCE OF SMOKING, DRINKING, PAN-CHEWING AND ORAL HYGIENE

Balaram P., Sridhar H., Rajkumar T., Vaccarella S., Herrero R., Nandakumar A., Ravichandran K., Ramdas K., Sankaranarayanan R., Gajalakshmi V., Munoz N., Franceschi

Between 1996 and 1999 we carried out a case-control study in 3 areas in Southern India (Bangalore, Madras and Trivandrum) including 591 incident cases of cancer of the oral cavity (282 women) and 582 hospital controls (290 women), frequency-matched with cases by age and gender. Odds ratios (ORs) and 95% confidence intervals (CIs) were obtained from unconditional multiple logistic regressions and adjusted for age, gender, center, education, chewing habit and (men only) smoking and drinking habits. Low educational attainment, occupation as a farmer or manual worker and various indicators of poor oral hygiene were associated with significantly increased risk. An OR of 2.5 (95% CI 1.4-4.4) was found in men for smoking > or = 20 bidi or equivalents versus 0/day. The OR for alcohol drinking was 2.2 (95% CI 1.4-3.3). The OR for paan chewing was more elevated among women (OR 42; 95% CI 24-76) than among men (OR 5.1; 95% CI 3.4-7.8). A similar OR was found among chewers of paan with (OR 6.1 in men and 46 in women) and without tobacco (OR 4.2 in men and 16.4 in women). Among men, 35% of oral cancer is attributable to the combination of smoking and alcohol drinking and 49% to pan-tobacco chewing. Among women, chewing and poor oral hygiene explained 95% of oral cancer.

Published in:- *'Int J Cancer, 98(3): 440-445, 2002'.*

SURVIVAL FROM CONTRALATERAL BREAST CANCER

Gajalakshmi C.K., Shanta V., Hakama M.

First primary, or unilateral, breast cancer (UBC) cases diagnosed in 1960-89 at the Cancer Institute (WIA), Chennai, India were followed-up until December 31, 1994. Patients with UBC (n = 3163) and those who developed second cancer in the contralateral breast (CBC) after the initial breast cancer (n = 67 or 2.1% of UBC) were analysed. Compared to UBC patients, those who developed CBC were younger at the time of diagnosis of initial breast cancer and had higher frequency of breast cancer among the family members. The relative survival rate takes into account competing causes of death and was estimated as the ratio of observed survival rate to the expected survival rate. The cumulative relative survival from UBC at 5 and 10 years were 51% and 41%, respectively, and the corresponding rates for CBC were 47% and 30%; the survival difference seen between UBC and CBC patients was not statistically significant. The survival rates among younger,

middle-aged and older women were significantly different from each other in UBC but not in CBC patients. Both UBC and CBC with early stage disease had a better survival compared to late stage disease. Survival advantage was also seen among both UBC and CBC patients with family history of breast cancer compared to those without. The multivariate analysis by the life table proportional hazards model showed that the age at diagnosis is an independent prognostic factor for breast cancer. The study results should be interpreted in the light of small sample size of second cancers.

Published in:- *'Breast Cancer Res Treat, 58(2): 115-22, 1999'.*

A STUDY ON SERUM CAROTENOID LEVELS IN BREAST CANCER PATIENTS OF INDIAN WOMEN IN CHENNAI (MADRAS), INDIA

Ito Y., Gajalakshmi K.C., Sasaki R., Suzuki K., Shanta V.

Two-hundred and six breast cancer cases were histologically confirmed breast cancer diagnoses at the Cancer Institute in Chennai (Madras), India. One-hundred and fifty hospital controls were patients who had cancer at any site other than breast and gynecological organs, and 61 healthy controls were persons accompanying patients in the Cancer Institute. Serum levels of carotenoids such as beta-carotene, lycopene, cryptoxanthin, and zeaxanthin & lutein were determined by HPLC. Serum levels of total carotenes and total carotenoids including beta-carotene, which reflects food intake of colored vegetables and fruits and has a protective role for certain sites of cancer, were significantly lower among breast cancer cases and hospital controls compared to healthy controls, especially in post-menopausal women. Serum carotenoid levels appeared to change with menopausal status. Serum beta-carotene levels tended to be lower among breast cancer cases than among hospital controls in premenopausal women. Serum xanthophyll levels were significantly lower among breast cancer cases than among healthy controls in post-menopausal women, but not in premenopausal women. Serum levels of retinol and alpha-tocopherol among breast cancer cases were not significantly different from those in post-menopausal healthy controls, but were higher than those in hospital controls. Serum estrone levels were significantly higher among breast cancer cases than among healthy controls, but serum levels of estradiol and estriol were not. In conclusion, Indian women with cancer of breast or of other sites might have low intake of green-yellow vegetables rich in fiber and carotenoids such as beta-carotene and zeaxanthin & lutein.

Published in:- *'J Epidemiol, 9(5): 306-14, 1999'.*

A SURVIVAL STUDY OF CERVICAL CANCER IN CHENNAI, INDIA

Gajalakshmi V., Rajaraman S., Shanta V.

A total of 4304 cervical cancer cases registered during 1982-89 in Chennai registry, India, were analyzed. Relative survival at 1, 3 and 5 years were 90%, 72% and 60% respectively. Age at diagnosis and extent of disease emerged as statistically significant prognostic factors ($p<0.001$). Five-fold higher risk of death was seen among those above 64 years vs. <45 years and those with distant metastasis vs. localized disease at diagnosis. Cancer control programs focusing on health education would motivate women to attend hospital at an early stage of disease for better survival.

Published in:- *'Indian J Cancer,37(4): 158-64, 2000'.*

EPIDEMIOLOGY OF CANCER OF THE CERVIX: GLOBAL AND NATIONAL PERSPECTIVE

Shanta V, Krishnamurthi S, Gajalakshmi CK, Swaminathan R, Ravichandran K.

Cancer of the uterine cervix is one of the leading causes of cancer death among women worldwide. The estimated new cancer cervix cases per year is 500,000 of which 79% occur in the developing countries. Cancer cervix occupies either the top rank or second among cancers in women in the developing countries, whereas in the affluent countries cancer cervix does not even find a place in the top 5 leading cancers in women. The truncated rate (TR) in the age group 35-64 years in Chennai, India, is even higher (99.1/100,000; 1982-95) than rate reported from Cali, Colombia (77.4/100,000, 1987-91). The cervical cancer burden in India alone is estimated as 100,000 in 2001 AD. The differential pattern of cervical cancer and the wide variation in incidence are possibly related to environmental differences. Aetiologic association and possible risk factors for cervical carcinoma have been extensively studied. The factors are: Sexual and reproductive factors, socio-economic factors (education and income), viruses e.g., herpes simplex virus (HSV), human papillomavirus (HPV), human immunodeficiency virus (HIV) in cervical carcinogenesis and other factors like smoking, diet, oral contraceptives, hormones, etc. The accumulated evidence suggests that cervical cancer is preventable and is highly suitable for primary prevention. Sexual hygiene, use of barrier contraceptives and ritual circumcision can undoubtedly reduce cervical cancer incidence. Education, cervical cancer screening of high risk groups and improvement in socio-economic status can reduce cervical cancer morbidity and mortality significantly.

Published in:- *'J.Indian Med Assoc, 98(2): 49-52, 2000'.*

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Prognostic factors and survival in intermediate and high grade non Hodgkin's lymphoma, Cancer Institute (WIA), Chennai, India. Ravichandran K, Sagar TG, Ramanan SG and Devarajan S. Asian Pacific J Cancer Prev (APCC Suppl), 1: 213-216, 2000.

Tracking the epidemic: Tobacco control activities in Tamil Nadu. Gajalakshmi CK. Lifeline 3:2000.

Global patterns of smoking and smoking attributable mortality.Gajalakshmi CK, Prabhat J, Ranson K and Nguyen S. In: World Bank Report on Tobacco Control in Developing countries, 2000.

Diet and cancers of the stomach, breast and lung. Gajalakshmi V. Asian Pacific J Cancer Prev.1 (Suppl): 44-46, 2002.

Survival from cancer in Chennai, India. Gajalakshmi V and Shanta V. Asian Pacific J Cancer Prev., 1 (Suppl): 199-201, 2002.

Cancer registration in India. Gajalakshmi V, Shanta V and Swaminathan R. Asian Pacific J Cancer Prev., 2 (IACR Suppl): 13-20, 2001.

An independent survey to assess completeness of registration: Population based cancer registry, Chennai, India. Gajalakshmi V, Swaminathan R and Shanta V. Asian Pacific J Cancer Prev., 2: 179-183, 2001.

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Dr. V. Shanta	Principal Investigator
2.	Mr. R. Swaminathan	Co-Investigator
3.	R. Rama	
4.	R. Selvakumaran	
5.	P. Rajakumari	

POPULATION BASED CANCER REGISTRY, CHENNAI

CANCER INSTITUTE (WIA) - CHENNAI-20.

Principal Investigator: Dr. V. Shanta

The Population Based Cancer Registry (PBCR), Chennai, is one of the oldest in the National Cancer Registry Network Programme (NCRP) of Indian Council of Medical Research (ICMR). It was established in 1981 at the Cancer Institute (WIA) and has completed 20 years of existence. It caters to an entirely urban population of 4.2 million within the metropolitan limits of Chennai city and is the only one of its kind in the state of Tamil Nadu. The data generated by the registry on patterns and trends of cancer incidence and mortality have formed the basis for a variety of cancer control activities in the state. Besides a principal investigator and a co-principal investigator, the staff of the registry encompasses a medical officer, two statisticians, one computer programmer, eight social investigators, three field investigators and one typist. Majority of the staff members have completed more than ten years of service and their commitment has resulted in the improvement of the quality of data. Registration of cases continue to be done by the active method. About 215 health care facilities in and around the city are visited by the social investigators of the registry, to collect data on incident cancer cases. The vital statistics division of Corporation of Chennai is the source for collecting data on mortality.

The average annual crude incidence rate (CIR), age standardized rate (ASR) and truncated (35-64 years) rate (TR) in Chennai during 1994-98 were 84.1, 109.2 and 192.6 per 100,000 among males and 96.7, 119.9 and 255.5 per 100,000 among females. The lifetime (0-74 years) cumulative risk of getting cancer was one in nine among males and one in eight among females. The leading site of cancer among males was stomach followed by lung, esophagus and oral cavity. An increase in CIR was observed in cancers of the lung, esophagus, oropharynx, leukaemia and rectum since 1984-'88 with minor fluctuations while there was not much of a change in the incidence of other common cancers. Among females, the rank order was cancer of the cervix followed by breast, oral cavity and stomach. An increase in the CIR of breast cancer and decrease in CIR of cervical cancer

were noted during 1984-'88. There was a slight increase in CIR of malignant lymphoma and leukaemia, a slight decrease in CIR of cancer of the hypopharynx and not much of a change in CIR of other cancers.

Over the years, the registry had organized two national level workshops on 'Cancer registration' for registry personnel in 1989 and 1998. It had hosted two Annual Review meetings of NCRP in 1985 and 1994. Besides these, several state level training programmes on 'Cancer Registration' have been conducted regularly by the registry (i) for medical records personnel from government hospitals all over the state and private hospitals in and around the city of Chennai and (ii) for birth and death registrars of the vital statistics division of Corporation of Chennai. The staff of the registry are well trained in their respective fields by exposure to many training programmes in epidemiology and cancer registration conducted in India and abroad. They have taken active part in many national and international cancer conferences and presented papers arising from registry data.

Some of the landmark activities carried out by the registry are the following: (i) it was the first to start the trace back of cancer cases registered on the basis of Death Certificate Notifications (DCN) since 1984: this has resulted in the steep decline in the proportion of cases registered on the basis of Death Certificates Only (DCO) (ii) it was the first to start active follow up of selected cancer sites for collection of information on their vital status in 1985: This paved way for the publication of survival rates for top ten cancers in Chennai, (iii) it is the only registry in the network of NCRP to collect data on all deaths occurring in the city irrespective of the stated cause of death in death certificate from 1992: This resulted in a two fold increase in the availability of death information of registered cancer cases, (iv) an independent survey of general population to assess the completeness of coverage of the registry, as part of a multicentric study under NCRP during 1997- 98: This study revealed that the completeness of coverage in PBCR, Chennai is 96% *(Asian Pacific J Cancer Prevention, 2: 179-183, 2001).*

A SPECIAL NOTE ON PERSONS WHO HAVE COMPLETED 20 YEARS OF SERVICE IN THE REGISTRY

1. Mrs. Lakshmi Sarathy.

Joined the Cancer Institute (WIA) in 1981 and was subsequently inducted into the registry as a Social Investigator in 1982. She is working in this capacity till date. She had taken part in the workshop on cancer registration held in Bhopal in 1988. Possessed with a pleasing personality, fluency in many languages and communication skills, she is presently involved in public relations work as liaison between the patients and the by-standers and the institute.

2. Mrs. R. Mahalakshmi.

Joined the Cancer Institute (WIA) in 1981 and was subsequently inducted into the registry as a Social Investigator in 1982. She is serving the registry in this capacity till date. She attended the workshop on cancer registration held in Bhopal in 1988. She participated in the XV Asia Pacific Cancer Conference held in Chennai in 1999 and presented poster paper titled 'Gynaecological Malignancies in Chennai, India'.

REGISTRY STAFF MEMBERS

(Staff members in service more than five years in the registry)

Sl. No.	Name	Designation
1.	Dr. Nalinie Sreedharan	Medical Officer
2.	Mr. R. Swaminathan	Senior Bio-Statistician
3.	R. Rama	
4.	S. Balasubramanian	
5.	T.S. Sambandam	
6.	P. Thangavel	
7.	M. Panneerselvam	
8.	J. Murugan	
9.	S. Sivakumar	
10.	A. Elumalai	
11.	M. Sivakumar	

POPULATION BASED CANCER REGISTRY, NEW DELHI

INSTITUTE ROTARY CANCER HOSPITAL, NEW DELHI-110 029.

Principal Investigator: Dr. Kusum Verma

Highlights of Delhi Cancer Registry.

The Population Based Cancer Registry of Delhi was established in January 1986, with financial assistance from ICMR. It is located in Institute Rotary Cancer Hospital (IRCH), All India Institute of Medical Sciences (AIIMS), New Delhi. The AIIMS complex is a 1545 bedded hospital providing specialized medical care for the population of Delhi and for patients from all over India and neighbouring countries. Dr. N.C. Nayak, former Professor and Head of the Department of Pathology and chief of IRCH was the first principal investigator of the registry. Dr. B.M.L. Kapoor, Professor and Head, Department of Surgery and chief of IRCH was principal investigator from September 1988 to January 1992. Dr. Kusum Verma, Professor of Cytopathology, is the co-principal investigator and officer-in-charge of the registry since inception of the registry. Dr. Kusum Verma became the Principal investigator and Officer-in-charge of the registry since February 1992.

Delhi Cancer Registry completed 15 years of its existence on 31st December 2000. Although still getting partial financial support from ICMR, the staff in the registry are taken over by AIIMS.

The registry covers Delhi UT Urban area of 685.34 Sq.kms. as per 1991 census. The population of the above area for the year 1997 is 1,07,88,627 (Males : 58,48,947; females: 49,39,680).

On an average more than 8,000 newly diagnosed cancer cases per year are reported to ICMR for the past two years. Certain trends are noted in cancer incidence. Incidence of oral cancer is declining while increasing incidence is noticed for gall bladder cancer. Since 1994, breast cancer incidence was more than cervix cancer.

Expansion of IRCH.

IRCH expansion and construction of new building upto 7th floor is going on and is expected to be completed in next 6 months.

Community Oncology project is being conducted in urban slums of Delhi, where people are educated regarding cancer by holding camps and cases detected were referred to AIIMS for treatment. Dr. Kusum Verma, Chief of Cancer Registry played an important role for this programme.

Doctors, Nurses and Paramedical staff are being trained in screening and early detection of cancers of cervix, breast and oral cavity with support of WHO.

Teaching Programs.

The registry organizes teaching programs for Medical Social Service Officers (MSSO's) regarding medical terminologies and coding of medical information.

Mr. Shambu Prasad Bhadola and Mr. S.K. Rai, Medical Social Service Officers attended the pre ARM program held at Barshi in 1999.

Research Activities.

As a result of high incidence of gall bladder carcinoma in New Delhi, a case control study on gall bladder carcinoma was conducted with financial assistance from ICMR.

The aim of the study is to assess the risk factors of gall bladder cancer among the residents of Delhi with special emphasis on the role of gallstone and its antecedent risk factors especially diet. For this study the Delhi Cancer Registry has registered 333 cases and 666 controls.

The incidence of prostate cancer among males in Delhi showed an increasing trend and hence a case-control study on prostate cancer was conducted by DCR with ICMR support.

The aim of the study is to assess the risk factors for prostate carcinoma among the residents of Delhi with special emphasis on the risk of development of prostate cancer after vasectomy. DCR registered 303 cases and 606 controls for this study.

REGISTRY STAFF MEMBERS

(Staff members who completed 10 years of service)

Sl. No.	Name	Designation
1.	Dr. Kusum Verma	Principal Investigator
2.	Dr. Jasmine George (Retired in February, 2001)	
3.	B.B. Tyagi	
4.	Ashok Kumar Singh	
5.	Ratnesh Kumar	

HOSPITAL CANCER REGISTRY, ASSAM
MEDICAL COLLEGE, DIBRUGARH

Principal Investigator: ***Dr. F.U. Ahmed***

Officer-in-Charge: ***Dr. M.S. Ali***

The Hospital Tumor Registry, Assam Medical college, Dibrugarh has completed two decades of its service in 2001. The base institution being a Govt.General Medical College Hospital lacks necessary infrastructure for comprehensive cancer care and research, and hence offers limited scope for undertaking epidemiological and clinical research on cancer. Due to these constraints Dibrugarh registry has not been able to keep pace with the other contemporary registries, which are based at comprehensive cancer centers, in terms of work done on various aspects of cancer over the years. In spite of various constraints the registry apart from the routine registration jobs as envisaged by the NCRP, has been able to render some significant and useful roles in the field of epidemiology and human resource.

Scientific Conferences:

1. Dr. M.S. Ali, M.Sc, Ph. D. acted as resource person in the WHO sponsored work-shop on Cervical Cancer held at Guwahati in 1993.
2. Dr. M.S. Ali, M.Sc, Ph. D. acted as resource person in the WHO sponsored training cum work-shop on Cancer Awareness programme held at Dr. B. Borooah Cancer Institute,Guwahati,1999.

Publications:

1. Dr. M.S. Ali, M.Sc, Ph. D. presented a paper 'Oesophagus Cancer in Assam - It's magnitude and Etiology' in the IACR meeting at Bangalore, 1994.
2. Dr. M.S. Ali, M.Sc, Ph. D. presented a paper 'Cancer of Hypopharynx in Assam and it's high risk factors' in the IACR meeting at Bangalore, 1994.
3. Dr. M.S. Ali, M.Sc, Ph. D. - 'Betel nut and tobacco chewing: Potential risk factors of cancer of the oesophagus in Assam, India'. Accepted for publication in British Journal of Cancer.
4. Dr. M.S. Ali, M.Sc, Ph. D. - 'Role of Dietary habits in the development of oesophageal cancer in Assam'. Accepted for publication in Nutrition and Cancer, USA.
5. Dr. R. Akhtar, M.sc, Ph.D. - 'LDH activity in the reduction of toxicity by Vitamin E in indused malignancy of Rat' Published in 16th International Cancer Congress 1994, Monduze Editorie, Italy.
6. Dr. R. Akhtar, M.sc, Ph.D. presented a paper 'Cancer of Hypopharynx in Assam and its high risk factors' at IACR meeting in Bangalore 1994.
7. Dr. R. Akhtar, M.sc, Ph.D. presented a paper 'LDH activity in the reduction of Cisplatin toxicity by Vitaminnes' at 16th International Cancer Congress New Delhi,1994.
8. Dr. R. Akhtar, M.sc, Ph.D. presented a paper 'Chewing habit as risk factor of Oral Cancer in Assam' at 15th Asia Pcific Cancer Conference, Chennai 1999.

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Dr. F.U. Ahmed	Principal Investigator
2.	Dr. M.S. Ali	Officer-in-Charge
3.	S. Ahmed	
4.	K. Saikai	
5.	S.R. Nath	
6.	R. Begum	
7.	P. Dutta	
8.	I. Baruah	
9.	S. Neog	
10.	Dr. R. Akhtar	
11.	J. Sonowal	
12.	P. Deuri	

POPULATION BASED RURAL CANCER REGISTRY, BARSHI, PARANDA & BHUM

NARGIS DUTT MEMORIAL CANCER HOSPITAL, BARSHI.

Principal Investigator: *Dr. K.A. Dinshaw*
Co-Principal Investigator: *Dr. B.M. Nene, Director, NDMCH*

The rural cancer registry: Barshi, Paranda & Bhum which was set up in 1987 is the first Rural Cancer Registry in the country.

The registry area comprises rural area of three sub districts in western India viz Barshi in Solapur district and Paranda & Bhum in Osmanabad district, situated in the vicinity of Nargis Dutt Memorial Cancer Hospital (NDMCH) (located on the out skirts of Barshi town) with a total population about 0.4 million in 346 villages spread over 3713 km^2. The village is the basic administrative unit in rural areas which is defined as having greater than 25% of the male working population engaged in agricultural activities, a population of less than 400 persons per km^2 and a total population of generally less than 5,000. The registry area is situated between latitudes 17.1° & 18.4° N and longitudes 76°and 76.4° E. Most of the population is Hindu (96%), Muslims form 3% and other religious groups 1%. Diagnosis and treatment facilities within the area itself are almost non-existent. The villagers seek care from various centers even as far as 400 kms.

The registry is jointly funded by the Tata Memorial Centre, Mumbai and the Indian council of Medical Research, New Delhi The diagnostic and treatment facilities are provided by NDMCH with technological support from Tata Memorial Hospital.

The usual method of registration has been modified to overcome deficiencies in diagnostic services in the rural setting. Trained field investigators visit the villages regularly and interact with the rural community to identify and motivate likely cancer cases to visit a hospital for early diagnosis and treatment. To screen symptomatic cases cancer detection clinics are held biannually in each of the 12 zones, into which the Registry area is divided. Data on cancer cases from the area are also collected from various hospitals & histopathological laboratories (situated far & wide), which serve the population However 60% of cases, are registered from NDMCH to which the field investigator generally refer the suspected cases. Information on deaths is collected from village death records and also directly from the local community (during village visits). As deaths are not generally medically certified, relatives of all deceased are contacted to collect relevant information to assist in 'follow back' to the medical records in the treating hospital or physician to identify proven cancer cases. The diagnostic charges for all patients from the Registry area are borne by the Registry and for disadvantaged patients, the treatment is free.

It was observed that smoking related cancers had a very low incidence. A tobacco survey confirmed that smoking is not common (only 6% in males) in the population.

The registry activities have enhanced cancer awareness in the population and has resulted in improved stage at diagnosis and improved 5-year survival in cervical cancer cases(1).

Awards:

1. Registry received a Novel Cancer Registry Award at the IACR 1994-Bangalore for the following research poster.

Jayant K., Rao R.S., Nene B.M., Dale P.S. and Dr. F.Y. Khan - Stage Shift in Cervical Cancer Cases in the Rural Cancer Registry at Barshi, India.

2. Mrs. Kasturi Jayant is honored by International Association of Cancer Registries at Khon Kaen, Thailand, 2000 for her exceptional contribution to the development of cancer registration. She was awarded Honorary Membership of IACR.

Special Activity undertaken by the registry.

We are conducting the 'Cancer Quiz' for the IX and X standard school children. Since 1998, we have conducted 23 cancer quiz programmes, 1498 school boys and 879 school girls participated in the programme. The above programme seems to generate the 'awareness' even in the adult population, as the children are given the merit certificates.

Training Programmes attended by Registry Staff:

1. Mr. A.M. Budukh, Statistician attended one year postgraduate training Programme in Epidemiology at Tampere School of Public Health, University of Tampere-Finland during the year 1999-2000. He is working on his thesis under the guidance of Prof. Matti Hakama.
2. Mr. M.K. Chauhan, Chief Co-ordinator attended the IARC Course in 'Cancer Epidemiology' at Khon Kaen, Thailand, 1999.
3. Dr. F.Y. Khan, Medical Records supervisor and Mr. N.S. Panse, Field Investigator attended the IARC course in 'Cancer Epidemiology' at Johannesburg, South Africa, 2001.

Presentation and Meeting.

1 Dr. B.M. Nene presented a paper 'Barshi Experience in Cervical Cancer Control' in a workshop organised by Institute of Cytology and Preventive Oncology, New Delhi (Jan 2001).

2 Dr. B.M. Nene was invited by Pune Obstetrics and Gynecological society (May 19-20, 2001) to give a talk on Cervical Cancer Prevention - Barshi Experience.

3 Dr. B.M.Nene was invited to participate in the Western Regional workshop and Mrs. K. Jayant was invited to participate in Southern Regional workshop on development of an Atlas on Cancer in India, A project of NCRP ICMR, supported by WHO.

4. Dr. B.M. Nene and Mrs. K. Jayant attended 22nd annual meeting of International Association of Cancer Registries held at Khon Kean, Thailand between 8-10 November, 2000.
5. Dr. B.M. Nene, Mrs. K. Jayant, Mr. M.K. Chauhan, Mr. A.M. Budukh, Dr. F.Y. Khan. and Mr. Panse N.S. invited as faculty members for the 'Training programme of the Supervisor Doctors Under Modified District Cancer Control Programme - Supported by WHO', organised by Barshi Cervical Cancer Prevention Programme at Barshi during 10-21 October 2001.

Publications:

1. K.Jayant, B.M.Nene, R.S.Rao, P.S.Dale (1995) Improved stage at diagnosis of cervical cancer with increased cancer awareness in a rural Indian population. International Journal of Cancer, 63, 161-613.
2. K.Jayant, B.M.Nene, K.A.Dinshaw, A.M.Budukh, P.S.Dale - Survival from Cervical Cancer in Barshi registry rural India. In: Sankaranarayanan R., Black R.J. Parkin D.M., editors. Cancer Survival in developing countries, IARC scientific. Publication no, 135, International Agency for Research on Cancer, 1998.

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Ms. Kasturi Jayant	Principal Investigator & Honorary Consultant
2.	Dr. K. A. Dinshaw	Principal Investigator
3.	Dr. B.M. Nene	Co-Principal Investigator
4.	M.K. Chauhan	
5.	Mr. D.N. Rao	
6.	B.S. Shukla	
7.	A.M. Budukh	
8.	A.M.I. Shaikh	
9.	Dr. F.Y. Khan	
10.	S.R. Mathapati	
11.	N.S. Panse	
12.	N.P. Gaikawad	
13.	N.V. Kesare	
14.	D.R. Pise	
15.	T.S. Dudhankar	
16.	B.D. Honmane	

POPULATION BASED CANCER REGISTRY, BHOPAL

GANDHI MEDICAL COLLEGE, BHOPAL

Principal Investigator: Dr. V.K. Bharadwaj

A special Population Based Cancer Registry (PBCR) was established by the Indian Council of Medical Research, in the department of Pathology, Gandhi Medical College, Bhopal in the aftermath of the gas tragedy in December 1984. The registry started functioning from January, 1986, with the objective of registration of all cancer cases residing in Bhopal urban area. Long term objective of this special registry is to study the Methyl Iso-Cynate gas exposed population of Bhopal for possible carcinogenic effect. Estimated population of Bhopal registry area as on July 1st 1991 is 5,61,582 males and 5,02,980 females. Approximately, 57% are literate.

The registry collects information from 63 medical centers, dispensaries and primary health centers as well as pathology laboratories. Histopathology facilities are available at Gandhi Medical College, Kasturba Hospital, Jawaharlal Nehru Cancer Hospital and at five private hospitals. JNCH and

Hamidia Hospital attached to Gandhi Medical College, are the major sources for registration of cancer cases.

Registry collects information on all cancer patients from local sources as well as from Bombay, since many cancer cases directly go to these places for diagnosis and treatment. Death registration system in Bhopal is far from adequate.

REGISTRY STAFF MEMBERS

Sl. No.	Name	Designation
1.	Dr. V.K. Bharadwaj	Principal Investigator
2.	Dr. Surange	
3.	Dr. Rajesh Dixit	
4.	Atul Srivatsava	

HOSPITAL CANCER REGISTRY, TRIVANDRUM
REGIONAL CANCER CENTRE, TRIVANDRUM-695 011.

Principal Investigator: ***Dr. M. Krishnan Nair***
Officer-in-Charge: ***Dr. Aleyamma Mathew***

The HCR, Trivandrum started in 1982 under the network of ICMR-NCRP, collects information on cancer patients attending the Regional Cancer Centre, Trivandrum. It records around 8,000 cancer cases annually. The registry has made significant progress in data abstraction and retrieval, which have been made online via internet with easy data management. This is the first paperless registry in the country. Diagnostic, treatment and follow-up details are documented through the website www.onconetkerala.org. This helps clinicians and researchers to obtain the necessary information more easily and resulted wide utilization of the registry database for a variety of analyses resulting in several scientific studies. HCR serves for evaluating the performance, planning, services, and medical audit as well as clinical research.

Other than the annual publication of the registry data, a number of scientific papers on Epidemiology & survival from common cancers and rare cancers have been published based on the registry data. Human resource generation is a priority area and the HCR has conducted 5 International training programmes on cancer registration with active support of the WHO, ICMR, University of California, San Francisco, Emory University, Atlanta, and National Cancer Institute, US. On an average of 20-30 participants from other cancer registries attended in each of these programs. The HCR Trivandrum hosted the Annual Review Meeting of NCRP twice. Staff members have presented several scientific papers in national and international conferences both in India and abroad.

The Division of Cancer Epidemiology & Clinical Research was established in 1992 from HCR core staff. The registry has attained an academic status enabling it to contribute to the research environment. This has helped to attract extramural funding from various agencies for different studies. Further, HCR is involved in planning, execution and evaluation of cancer control programmes in Kerala. These are shown below.

ON GOING STUDIES: EPIDEMIOLOGY, CLINICAL RESEARCH & CANCER CONTROL.

A. EPIDEMIOLOGY.

1. **Case-control study of breast cancer in South Asia comparing rural and urban women.**
IARC - RCC Collaborative Study.

Investigators at RCC: Principal Investigator (s): Dr.Aleyamma Mathew and Dr. B Rajan
Co-investigator (s): Dr.Paul Sebastian and Dr.Anita Mathews

This is a multi-centric study involving four other centres in India other than the RCC, Trivandrum. The study aims to investigate the reasons behind the urban: rural differences in breast cancer incidence in South Asia. Incident breast cancer cases within each centre are recruited and interviews are conducted extracting reproductive, lifestyle and dietary information, as well as anthropometric measurements. Controls matched for age, type of hospital (fee-paying or free), and region of residence are recruited and similar information is collected. Blood samples from all cases and controls as well as tumour tissues and paraffin-embedded blocks from breast cancer cases are collected to investigate the association of biological markers as well as genetic susceptibility to the development of breast cancer. A total of 350 breast cancer cases and 300 matched controls are recruited during a period of 6 months at RCC, Trivandrum.

2. **Molecular Epidemiology of Paediatric Leukaemia and Lymphoma in Kerala, India.**
University of Leeds, UK - RCC Collaborative Study.

Principal Investigator (s): RCC - Dr. Cherian Varghese and Dr. Kusumakumary

This study has looked into the immunophenotype of children with acute leukemia and aims to undertake case-control investigations to address the etiological factors. A total of 294 paediatric leukaemia and lymphoma cases and 102 children without leukaemia and lymphoma as controls reporting to the RCC, Trivandrum were recruited during a period of 3 years. Data collection has been completed and analysis is in progress.

3. **Case-control study on occupational exposure and cancer.**
IARC - RCC Collaborative Study.

Investigators at RCC: Dr.Cherian Varghese, Dr.Aleyamma Mathew

This is the first major study on occupational cancers in India and RCC is part of a multi centric study coordinated by the IARC, Lyon. The study was to address the occupational risk factors for cancers of the lung, leukaemia and lymphoma. The data was collected from RCC, Trivandrum and the analysis has been completed.

4. **Exposure to pesticides and risk of breast cancer.**
National Cancer Institute, U.S. - RCC Collaborative Study.

Investigators at RCC: Dr.Cherian Varghese, Dr.Aleyamma Mathew

This study was supported by the division of cancer epidemiology and genetics, National Cancer Institute, U.S. The study addresses the risk of breast cancer associated with exposure

to pesticides. Detailed dietary data and other confounding factors for breast cancer were collected and the analysis has been completed.

5. Cancer ATLAS in India.

NCRP - WHO Project.

Collaborators at RCC: Dr.M. Krishnan Nair, Dr. Aleyamma Mathew

RCC has participated in the project on the development of ATLAS of cancer in India and the creation of the website 'Canceratlasindia.org' in 2002. This project envisages capturing incidence data of all cancer patients reported in the department of pathology of medical colleges/ hospitals and private laboratories all over the country. The data accrued aimed (i) to obtain an overview of patterns of cancers in different parts of the country - in addition to that provided by the network of cancer registries under the National Cancer Registry Programme and (ii) to calculate estimates of cancer incidence wherever possible.

B. CLINICAL RESEARCH.

1. End Result and Survival after Cancer Treatment.

This study is to assess the effectiveness of a given treatment and to understand the biological behaviour of tumours and to plan further prospective clinical research. Detailed site-specific proforma for all common cancers have been developed and the data abstraction is in progress. For those who are not on regular follow up postal and/or telephone enquiries are being made to assess the vital status of patients. This project will provide a summary index of the efficacy of the existing treatment modalities for various types of cancers, which will help in optimising treatment, improve survival of cancer patients and help in planning clinical research programmes.

2. OncoNET in Kerala.

(Collaborator: Electronic Research & Development Centre of India, Trivandrum).

The hospital cancer registry data abstraction and retrieval have been made online via intranet with easy data management. This is the first paperless registry in the country. Medical documentation of case sheets in electronic form has been started at the RCC. Diagnostic, treatment and follow-up details are documented through the website www.onconetkerala.org. This helps clinicians and other researchers to more easily obtain the necessary information.

C. CANCER CONTROL.

1. Cervical Cancer Control Programme in Northern districts of Kerala.

The cancer control programme in northern districts of Kerala under support of the UNFPA is continuing. Training in early cancer detection and management were provided to 16 medical officers, 327 junior public health nurses, 117 junior health inspectors, 30 other senior paramedical staff, and 480 anganwady workers. Several handouts & pamphlets were distributed.

A video film on cancer control programme was developed. Around 300 cancer awareness programmes and 250 cancer detection camps were conducted in three districts and nearly 14,000 women were screened for cervical, breast and oral cancers. Twenty-seven cases of CIN II, 47 cases of CIN III and 3 uterine cervix cancers were detected. Cervical pre-cancers are subjected to colposcopic biopsy and cryotherapy or hysterectomy. Cancer patients were referred to medical college, Calicut or RCC, Trivandrum.

2. **District Cancer Care Centre, Kozhencherry, Pathanamthitta.**

Established a good system to deliver cancer care in this centre. Patients from the District Hospital are using the much needed laboratory services established as part of this programme. Follow-up clinics are conducted monthly by specialists from RCC.

3. **District Cancer Control programme, Trivandrum.**

The Trivandrum Corporation has supported for initiating a community based cancer control programme in the Corporation area. Health workers and other related personnel in different parts of the Trivandrum Corporation have received cancer control training. Cancer detection camps are being conducted in various wards in the corporation.

Publications: *(Abstracts Of Papers Published During 1999-2002).*

SURVIVAL ANALYSIS: CAVEATS AND PITFALLS

A. Mathew[1], M. Pandey[2] and N. S. Murthry[3]

Divisions of [1]Epidemiology and Clinical Research and [2]Surgical Oncology, Regional Cancer Centre, Trivandrum, and [3]Division of Biostatistics, Institute of Cytology and Preventive Oncology (ICMR), New Delhi.

Survival analysis in clinical studies is important to assess the effectiveness of a given treatment and to understand the effect of various disease characteristics. A number of methods exist to estimate the survival rate and its standard error. However, one cannot be certain that these methods have been handled appropriately. The widespread use of computers has made it possible to carry out survival analysis without expert guidance, but using inappropriate methods can give risk to erroneous conclusions. The majority of the biomedical journals now recommend that a statistical review of each manuscript should be carried out by an experienced bio-statistician, in addition to obtaining expert referees' comments on the article. The problem is compounded in papers from third-world countries where bio-statisticians may not be available in all institutions to guide clinicians for the selection of proper techniques. The present paper deals with the various techniques of survival analysis and their interpretation, using a modal data set of malignant upper-aero digestive tract melanoma patients treated in the Regional Cancer Centre, Trivandrum since 1982. The Kaplan-Meier method was found to be the most suitable for survival analysis. The median survival time is a better method of summarizing data than the mean. Rothman's method of estimation of the confidence limit is better than Peto's method as the confidence limit for survival probability tends to go beyond the range of 0-1.0 when calculated by Peto's method, especially when the sample size is small. The results from the present study suggest that survival analysis should be carried out by the Kaplan-Meier method. The median survival time should be provided wherever possible, rather than relying on mean survival. Confidence limits should be calculated as a measure of variability. A suitable rank test should be used to compare two or more survival curves, rather than a Z-test. Stratified analysis

and Cox's model, when stratified analysis fails, can be used to define the impact of prognostic factors on survival.

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GLOBAL PERSPECTIVE OF TOBACCO HABITS AND LUNG CANCER: A LESSON FOR THIRD WORLD COUNTRIES

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Divisions of [1]Surgical Oncology, [2]Epidemiology and Radiation Oncology; [3]Director Regional Cancer Centre, Trivandrum.

Over the past 50 years, a dominant role of tobacco smoking in lung cancer causations has been demonstrated. Almost three-quarters of the lung cancer cases can be attributed to tobacco smoking. The global variation in lung cancer incidence is thought to be directly proportional to the smoking habits prevalent in that part of the world. Lung cancer shows a greater upward trend in incidence in the USA, in central and Eastern Europe than ever before, especially in females. Japan too has recorded a 10-fold increase in incidence in both sexes since 1975. In India the problem is further compounded by absence of authentic data on time trend. The recent trends of available data suggest a more or less linear trend. The highest incidence rate has been recorded in Bombay (14.6/100,000) and the lowest in Barshi (2.0/100,000). How much of these can be attributed to smoking cannot be commented on as no case-control or cohort studies have ever been undertaken in India. The situation is more alarming in other developing countries, where there is no authentic data is no authentic data on tobacco use or lung cancer incidences.

The relationship between tobacco and cancer is both simple and complex. The majority of the cancer patients are smokers, while the cancer incidence is not proportional among smokers. To explain this, various factors such as type of smoke, duration of smoke, amount of carcinogens, presence of activation and metabolism pathways, and lately genetic environment interaction, have been put forward. It appears that the relationship is more complex than at first thought. In developing countries, it is further compounded by lack of data on usage and dependence of the economies of these countries on tobacco. The situation is alarming, with ever-increasing incidence among women and non-smokers exposed to smoke (passive smokers). Tobacco use has already become and epidemic.

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SARCOMA OF THE ORAL AND MAXILLOFACIAL SOFT TISSUE IN ADULTS.

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Sarcoma occurring in oral and maxillofacial soft tissue is rare. This study was carried out to evaluate the prevalence of oral soft tissue sarcoma and to record its natural history and survival. Retrospective analysis of the patients with histologically proven oral and maxillofacial soft tissue sarcoma treated at

the Regional Cancer Centre, Trivandrum, etween 1990-1998 was carried out. During this period, ten cases of oral and maxillofacial sarcomas were registered. Three lesions were located on the cheek mucosa, two on the tongue and two on the mandibular alveolus, while there was on lesion each in the parotid region, maxilla and face (nos). Mean age at presentation was 31.3 ± 14.1 years (range 15-54 years). Seven of the patients (70"/0) were males. There were three cases of rhabdomyosarcoma, three cases of spindle cell sarcoma and one case each of angiosarcoma, haemangioendothelioma, malignant schwannoma and malignant fibrous histiocytoma. All the patients were treated with surgery as a primary modality. Median follow-up time was 30 months (range 5-94 months). An overall srvival of 87.5% at 5 years was observed; however, 5-year disease free survival was 60.00/0 (95% CI 19.5-85.2). Soft tissue sarcomas are of comparatively less frequent occurrence in oral and maxillofacial soft tissue than in other tissues. A good survival rate can be achieved by multimodality treatment.

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THE COHORT DATA ANALYSIS: LOGISTIC REGRESSION OR POISSON RE-GRESSION OR COX-PROPORTIONAL HAZARDS MODEL?

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Cox-proportional hazards (CXR), logistic regression (LR), and Poisson regression (PR) models are currently used in the analysis of prospective epidemiologic studies examining the relationship between exposure and outcome event. The advantages of each are yet to be fully described. However, a theoretical relationship between the models CXR & LR and CXR & PR has been documented. In this paper an attempt has been made to compare the regression estimates of use above three based on empirical findings and also to further understand the conditions under which the results approximate one another. Literature search was undertaken to find out the published reports in which all the three models or any two of the models had been used to compare their performance when analyzing empirical data sets. Special emphasis was laid on the performance of these models when conditions such as disease incidence, risk factor strength, proportion censored, non-proportional hazards or sample size varied.

When the disease prevalence was low over the entire follow-up period, LR and CXR model provided similar results. When the censoring rates varied, the LR model provided seriously biased estimates. The interrelationship between PR, CXR and LR models on the same data sets had shown that PR and CXR models yielded very similar findings whereas LR tended to yield regression estimates that were too large. In general, the CXR model should be regarded as a more appropriate model for the analysis of cohort data. While the CXR model is relatively new as compared to LR and PR, the greater use of the available information in CXR model suggested its superiority of its performance over the other two models. However, further analytic work is needed to fully understand the interrelationship amongst the above three models.

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SCREENING FOR CANCER OF UTERINE CERVIX AND APPROACHES ADOPTED IN INDIA

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Cervical cancer is the leading malignancy among Indian women. It has been estimated that in the absence of any control programme, the incident number of cervical cancer cases in the country would rise to 140 thousand by the turn of this century. Cytology screening remains the main stay for the control of cervix cancer. In the present communication the evidence available for screening for cancer of cervix has been presented. Difficulties in organizing cervical cancer screening programmes in India and the alternative approach have been discussed.

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ESTIMATING CANCER SURVIVAL IN DEVEI.OPING COUNTRIES

Use of reply-paid post cards to augment follow-up information

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Survival from cancer is one of the indices to evaluate cancer control activities. Reliability of survival estimates depends to a large extent on the I of follow-up information available for patients in the Study group. Loss to follow-up (LFU) is one of the potential problems introduced in follow-up of cancer patients. An attempt is made to improve the follow-up system for reducing the LFU of cancer patients by repeatedly sending reply-paid post cards for the LFU patients. A total of 353 ovarian cancer patients registered at the Regional Cancer Centre, Trivandrum during a three year period and followed-up to a total of five years showed 67 percent loss to follow-up. The five-year survival rate of this group calculated using Kaplan-Meier method under the assumption that the LFU's occurred at random was 75 percent. Efforts to improve the follow-up rate for the study population were made through the simple and cost effective method of postal enquiry, which resulted in a reduction of 63 percent of losses to follow-up. Incorporation of this information in the data brought about a revised five-year survival estimate of 55 percent. The reply paid post card system was found to be effective in obtaining useful follow-up data. The result shows that LFU can be reduced by better design of survival study.

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THE PITFALLS OF EAGER USE OF P-VALUES.

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A test of significance deals with the question of weather the observed difference (or more generally, the deviations of observations from that expected under the null hypothesis) is due to chance or due to real effect. It does not deal with the question of how important the difference is, or what caused

the difference. The test does not check the design of the study. The p-value of a test depends on the sample size. With a large sample, even a small difference can be statistically significant, i.e. hard to explain as a chance variation. That does not necessarily make it important. A test of significance does not make sense when the data are available for the whole population because there is no chance to screen out.

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RISK FACTORS FOR PRE-CANCEROUS LESIONS OF THE CERVIX

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Studies on risk factors for pre-cancerous lesions of the uterine cervix have shown strong association with sexual practice. Women with multiple sexual partners and intercourse at early age are at high risk. A role of male partners in further enhancing the risk has been identified. All these support the hypothesis relating to a sexually transmissible etiological agent. An extensive review of the literature on the risk factors for pre-cancerous lesions of cervix has been carried out. The risk factors were grouped into genital, sexual, chemical, dietary and life factors. Human papilloma virus (HPV) is the major infectious etiological agent associated with the development of pre-cancerous lesions of cervix. Other co-factors such as multiple sexual partners of the male as well as the female and early age of first intercourse are also involved at the critical etiological step of progression from low-grade to high-grade lesions. The role of other infectious agents in terms of supportive or interactive effects is not clear. No independent effect for herpes simplex virus 2 on risk is observed. Other risk factors include cigarette smoking, oral contraceptive usage, certain nutritional deficiencies and poor personal hygiene. However, it is not clear whether these factors operate independently from HPV. There is no consistency in the independent effect of these factors on the development of low- to high-grade lesions of cervix. There is a similarity in the patterns of risk between pre-cancerous lesions of the cervix and cervical cancer. Monogamy, late commencement of sexual activity, personal hygiene and use of barrier contraceptive methods help towards primary prevention. In the long-term, primary prevention of cervical neoplasia through HPV immunization of population may be a possibility.

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RISK FACTORS FOR CERVICAL DYSPLASIA IN KERALA, INDIA

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A study in Kerala, India, confirmed the importance of genital hygiene in the fight against infections that have a role in the development of cervical dysplasia and cancer. Many women cannot afford sanitary pads, while adequate facilities for washing after coitus are often unavailable. Health education, satisfactory living standards, and the empowerment of women are prerequisites for reducing the incidence of cervical dysplasia.

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ORAL CANCER AMONG PATIENTS UNDER THE AGE OF 35 YEARS

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Cancer of the oral cavity is one of the commonest cancers among males. The aim is to assess the etiological factors, patient characteristics, treatment and the outcome in young patients with oral cancer. A retrospective descriptive study of patients under the age of 35 years with cancer of the oral cavity treated between 1982-1996, with the last follow-up ti11 2001, using the cancer registry data of Regional Cancer Centre, Trivandrum, Kerala, India. The detailed clinical, treatment and follow-up data were recorded on a preset proforma. This was analyzed with emphasis on age, sex, risk factors, site, histology, clinical extent and treatment methods and survival in the study group. The survival analysis was carried by Kaplan-Meier method and the difference in survival was analyzed using log-rank test. Out of 264 patients analyzed, tongue was the commonest site identified in 136 (52%) patients followed by buccal mucosa in 69 (26%) patients. A male, female ratio of 2.3: 1 was observed with a significantly higher male preponderance in buccal mucosa (4.3:1). Prior exposure to tobacco or alcohol was noted in 59.4% patients, with more habitués in buccal mucosa cancer. Histological confirmation was present only in 83.7% patients and among them the most were squamous cell carcinoma (85.9%). Radiotherapy, surgery or combined modalities of treatment were employed for majority of patients. The 5-year survival was 57.3%. T-stage of the tumor was found to be significant in predicting disease free survival (P=0.03). The importance of early detection for clinical down staging is stressed. There is a need to investigate the etiology of intra oral cancers in younger patients since a significant proportion (almost 40%) of these patients do not have associated risk factors for cancer.

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SQUAMOUS CELL CARCINOMA OF THE TONGUE AMONG YOUNG INDIAN ADULTS

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Oral cancer is one of the commonest cancers among males in India. This study was carried out to evaluate the demographics, risk profile, clinicopathologic features, and treatment outcome in young patients with squamous cell carcinoma (SCC) of the tongue. Patients under the age of 35 years with SCC of the tongue presenting between 1982 and 1996 were identified using institutions centralized electronic database. Demographic, clinical, and pathologic characteristics were abstracted from the case records. Survival was calculated by Kaplan-Meier method. One hundred and fifteen patients with histologically confirmed SCC of the tongue were analyzed. The mean age at presentation was 30.5 years with a 1.7:1 male to female ratio. Prior exposure to tobacco and alcohol was noted in 58 (50.5%) patients. At presentation, 70 (60.9%) were in stages III and IV, and 59 (51.3%) patients had regional lymph node involvement. The overall disease-free survival (DFS) at 3 and 5 years were 63% and 54.9%, respectively. A statistically significant difference in DFS was seen between patients with N(0) and N(1) disease compared to N(2) or N(3) disease. Various other factors like

age, sex, habits, and stage of the disease were found to have no significant effect on DFS. Results of the present study suggest that contrary to the belief, the survival among young patients is almost similar to that in older patients.

Published in:- *Neoplasia, 3:273-7, 2001.*

PRIMARY INTRAOSSEOUS CARCINOMA OF THE JAW: POOLED ANALYSIS OF WORLD LITERATURE AND REPORT OF TWO NEW CASES

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Primary intraosseous carcinoma (PIOC) is a rare malignant neoplasm of the jaw. These tumours are believed to arise from the odontogenic epithelium and hence are also referred to as odontogenic carcinoma. A detailed search was made for squamous cell PIOC of the jaw in English literature using Medline Cancer CD, The data obtained were transferred onto dBase software. Two detailed case reports of patients treated at Regional Cancer Centre, Trivandrum during 1996 and 1997 were also included. A pooled analysis was carried out. Survival analysis was carried out using Kaplan-Meier method and log-rank statistics were used for comparing survival, A total or 15 cases were analyzed. Or which 13 were from published literature. The mean age or the patients at the time or diagnosis was 52.3 years with male to female ratio being 2.5: I. Posterior mandible was the predominant site. The median follow-up time was 28 months. Overall survival at 5 years was 37.8'X. (95%. CI; 14.8-61.0) while the corresponding disease free survival was 29.8'X. (95% CI: 9.2-54.1). Primary intra-osseous carcinoma is a rare tumor of jawbones, characterized by progressive swelling o the jaw, pain and loosening of tooth. The tumor is locally aggressive ant metastasizes to regional nodes. The overall and disease free survival is poor with almost 50% patients failing loco-regionally within the first 2 years of follow-up.

Published in:- *Int. J. Oral Mazillofac. Surg., 30:349-355, 2001.*

PRIMARY MALIGNANT MUCOSAL MELANOMA OF THE HEAD AND NECK REGION: POOLED ANALYSIS OF 60 PUBLISHED CASES FROM INDIA AND REVIEW OF LITERATURE

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Malignant melanoma arising in the head and neck mucosa is a rare entity with incidence ranging from 2% to 10%. Because of the lack of data, the biological behavior of these lesions still remains unpredictable and outcome dismal. We carried out a literature review for cases of mucosal melanoma of the head and neck reported from India and performed a pooled analysis on the available data. A total of 60 cases of head and neck melanomas were reported, of which 46 were in men. Palate and alveolus were the commonest sites. A total of 29 (48.3%) patients had regional node metastasis at presentation while five (12%) had distant metastasis. Three-year overall survival of 27.7% was observed. However, the disease-free survival rates at 3,5 and 6 years were 39.4%, 39.4% and

13.1% respectively. Metastasis at presentation and use of adjuvant radiotherapy were found to be the only significant predictors of survival. Malignant mucosal melanoma had aggressive biological behavior and poor outcome. Radical surgery and adjuvant radiotherapy may provide a better local control and may help in improving survival.

Published in:- *Eur J Cancer Prev., 11:3-10, 2002.*

MALIGNANT PHYLLODES TUMOR

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Divisions of [1]Surgical Oncology, [2]Epidemiology, [3]Cytopathology, [4]Radiation Oncology; Regional Cancer Center, Trivandrum.

The study aims to evaluate the survival and prognosis of patients with malignant phyllodes tumor. Between 1982 and 1998, 37 women with malignant phyllodes tumor were treated at the Regional Cancer Center, Trivandrum. Twelve patients were recurrent. Survival was estimated using the Kaplan-Meier method. Patient, disease, and treatment factors were compared using log-rank test. The Cox-proportional hazard model was employed to identify the prognostic factors. Thirty-six patients had surgery. Twenty-five patients received postoperative radiotherapy, and 2 received chemotherapy in addition. The median follow-up was 43 months (range 1-170 months). Eight patients failed locally, and 7 of these were successfully salvaged by surgery. The 5-year overall survival was 74.2% (95% CI, 0.44 to 0.89), whereas 5-year disease-free survival was 59.6% (95% CI, 0.39 to 0.7). The margin of surgical excision was found to be the only independent prognostic factor (p=0.003). However, patients with tumor size more than 5 cm (hazard ratio 2.9) were found to have increased hazard, whereas those receiving adjuvant radiotherapy (hazard ratio 0.6), married women (hazard ratio 0.4), and those women over the age of 35 years (hazard ratio 0.7) showed a decreased hazards. Cystosarcoma phyllodes is a rare malignancy of the female breast. Surgery with adequate margins is the primary treatment. Adjuvant radiotherapy appears to improve the disease-free survival.

Published in:- *The Breast 2002.*

GLOBAL INCREASES IN KIDNEY CANCER INCIDENCE, 1973-1992

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Reports of increasing rates for kidney cancers in several count prompted this analyses of global incidence trends for kidney cancers and by subsite. International incidence data for 5-year periods 1973-1977, 1978-1982, 1983-1987 and 1988-1992 were obtained from volumes IV to VII of cancer incidence in five continents published by the international agency for research on cancer. The USA data for the same 5-year periods were obtained from the surveillance, epidemiology, and end-results program of the national cancer institute. Percentage changes in incidence rates were computed using the relative difference between the time periods 1973-1977 and 1988-1992, and annual percentage changes in incidence rates were computed using log linear regression. In 1988-1992, kidney cancer incidence rates (age-adjusted to the world-standard population) were highest in France (16.1/ 100,000 man-years and 7.3/100,000 woman-years) and lowest in India (2.0 and 0.9, respectively). Between 1973-1977 and 1988-1992, incidence rates rose among men and

women in all regions and ethnic groups, with a few exceptions, mostly in Scandinavian countries. The largest percentage increase for men was in Japan (171%) and for women in Italy (107%). Rates for renal pelvis cancer were less than 1/100,000 person-years in almost all regions in both sexes, and the temporal trends were inconsistent. Incidence trends for renal parenchyma cancer tracked those for total kidney cancers, and appeared to result from increases in the prevalence of risk factors and in use of diagnostic imaging procedures.

Published in:- *Eur J Cancer Prev., 11: 171-178, 2002.*

CANCER INCIDENCE IN THE SOUTH ASIAN POPULATION OF ENGLAND (1990-92).

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Cancer incidence among English south Asians (residents in England with ethnic origins in India, Pakistan or Bangladesh) is described and compared with non-south Asian and Indian subcontinent rates. The setting for the study was areas covered by Thames, Trent, West Midlands and Yorkshire cancer registries. The study identified 356 555 cases of incident cancer (ICD9:140-208) registered between 1990 and 1992, including 3845 classified as English south Asian. The main outcome measures were age specific and directly standardized incidence rates for all cancer sites (ICD9:140-208). English south Asian incidence rates for all sites combined were significantly lower than non-south Asian rates but higher than Indian subcontinent rates. English south Asian rates were substantially higher than Indian subcontinent rates for a number of common sites including lung cancer in males, breast cancer in females and lymphoma in both sexes. English south Asian rates for childhood and early adult cancer (0-29 years) were similar or higher than non-south Asian rates. English south Asian rates were significantly higher than non-south Asian rates for Hodgkin's disease in males, cancer of the tongue, mouth, oesophagus, thyroid gland and myeloid leukaemia in females, and cancer of the hypopharynx, liver and gall bladder in both sexes. The results are consistent with a transition from the lower cancer risk of the country of ethnic origin to that of the country of residence. They suggest that detrimental changes in lifestyle and other exposures have occurred in the migrant south Asian population.

Published in:- *British Journal of Cancer, 79 (3/4), Pg. 645-654, 1999.*

Other Publications:

Primary Malignant Melanoma Of The Mucosal Membranes : A Distinct Biological Entity. M. Pandey, A. Mathew, E. K. Abraham and M. I. Ahamed. Quarterly J Surgical Sciences, 39-48, 1999.

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AWARDS AND FELLOWSHIPS

1. Dr. Aleyamma Mathew received young scientist award (Smt. Suraj Kali Jain award) for the best-published work related to medical statistics, by the Indian Society for Medical Statistics in 2000.
2. Dr. Aleyamma Mathew was awarded Post-doctoral fellowship, National Cancer Institute, National Institute of Health, USA 2000-2001.
3. Dr. Aleyamma Mathew received Prof. B G Prasad award for the best-published work related to Epidemiology, by the Indian Society for Medical Statistics in 2001.

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Sl. No.	Name	Designation
1.	Dr. M. Krishnan Nair	Principal Investigator
2.	Dr. Aleyamma Mathew	Officer-in-Charge
3.	Padmakumari	
4.	Anitha Nayar	
5.	V. Jalaja Kumari	
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