

REGIONAL CANCER CENTRE

TRIVANDRUM-695 011, KERALA, INDIA

REPORT OF ACTIVITIES 1983-84

By

Dr. M. KRISHNAN NAIR, MD, FRCR.

DIRECTOR

Telephone Numbers : Admn. Office : 74546 Hospital : 71206, 71270-Ext. 32

REGIONAL CANCER CENTRE

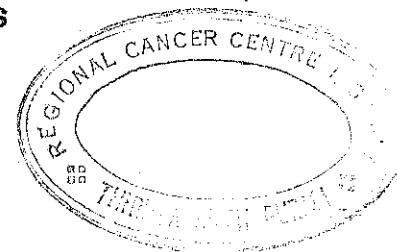
Director:

Dr. M. KRISHNAN NAIR, MD, FRCR.

Superintendent:

Dr. T. K. PADMANABHAN, MD, DMRE.

CONTENTS



Introduction
Governing Body
Executive Committee
Scientific Committee
Decisions of Governing Body
Decisions of Executive Committee
Recommendations of Scientific Committee
Acknowledgements
In Memorium
Activities
Division of Radiotherapy
Division of Surgical Oncology
Division of Cytology
Division of Nuclear Medicine & Imaging
Division of Radiation Physics
Division of Cancer Research
Remarks of Prof. E.J. Ambrose
Hospital Cancer Registry
Hospital Cancer Statistics: 1983
Research Publications
Academic Achievements
Visitors
Staff List
Cancer Control Committee Recommendations
Balance Sheet.

Introduction

REGIONAL CANCER CENTRE : TRIVANDRUM 1983-'84

The following report gives an account of the achievements and short-comings during the financial year 1983-'84. Because of the non-availability of additional physical space the activities mainly concentrated on updating the existing services, training and research. Intensive efforts were made to design the additional building to cater to the future expansion programme of the Regional Cancer Centre. Since 2 years have elapsed after the establishment of the centre this also gives an opportunity to review the achievement of targets at the end of the 1st phase.

The major functional targets for the first phase were fixed as follows:

Clinical Services

1. High energy Photon Therapy
2. Computerized Treatment Planning
3. Better Simulation
4. Cancer Chemotherapy, I.P Service/Intensive Care facility/ Better Nursing facility/better antibiotic, anti-fungal therapy.
5. Composite imaging facility using C.T. Scan, Ultrasound, Gamma Camera, X-ray machines.
6. Establishment of District Cancer Centres/3 additional field programmes in cancer detection.
7. Establishment of Regional Cytology Laboratory
8. Establishment of Tumour Pathology
9. Establishment of population based Tumour Registry
10. Increase of I.P. beds to 235
11. Establishment of 10 multidisciplinary clinics

12. Establishment of a 60 bedded Cancer Surgery wing
13. Establishment of Regional Radioimmunoassay laboratory
14. Patient record system, ambulatory care system and endoscopy
15. Community outreach programmes.
16. Physical facilities – Floor area 1,00,000 sq.ft.

Training

1. Enlargement of the scope of existing services
2. M.Sc. in Radiation Physics
3. P.G. Diploma in X-ray Engineering
4. Post-doctoral diploma in imaging
5. Short term course in
 - (a) Prosthodontics
 - (b) Oral Cancer Control
 - (c) Pap Smear Collection
 - (d) Oncological Nursing
 - (e) Record Keeping
 - (f) Social Service

Research

1. Biological markers and clinical application
2. Hormone receptors laboratory
3. Preparation of epidemiological data on environmental carcinogens.
4. Purification of tumour antigens and their clinical application in specific immunotherapy
5. Nutritional research
6. Plant lectins isolation and their use in clinical medicine

In clinical services, due to the non-availability of an additional building, targets 10, 11, 12 and 16 could not be achieved. But most of the activities which could be undertaken within the constraints of physical space could be achieved.

In the area-training, targets 3, 4 and part 5 could not be achieved. The postgraduate diploma course in X-ray engineering could not be started because of the non-availability of trained man-power to undertake the training programme. Since the equipments for most of the imageology work arrived only towards the end of the first phase, the post-doctoral course in Imageology could not be started. But it will be possible to start this course immediately as commissioning of this equipment will be over very soon. In item No. 5 apart from a short-term training course in Prosthodontics all other courses could be started and have become ongoing programmes of the Regional Cancer Centre, Trivandrum. A detailed assessment on research from a scientist of eminence is included in the part dealing with research.

GOVERNING BODY MEMBERS OF THE REGIONAL CANCER CENTRE, TRIVANDRUM

1. Shri. K.P. Ramachandran Nair, .. Chairman
Minister for Health,
Government of Kerala
2. Shri. M.G.K. Murthy I.A.S. .. Vice-Chairman
Secretary, Dept. of Health,
Government of Kerala
3. Shri. V. Ramachandran I.A.S. .. Member
Commissioner for Economic
Development & Secretary,
Department of Planning,
Government of Kerala.
4. Dr. D. Babu Paul, I.A.S. .. Member
Secretary, Dept. of Finance,
Government of Kerala
5. Dr. D.B. Bisht, .. Member
Director General of Health Services,
Ministry for Health,
Government of India,
New Delhi.
6. Shri. P.P. Chauhan, I.A.S. .. Member
Joint Secretary,
Ministry for Health,
Government of India
New Delhi.
7. Dr. M.S. Valiathan, .. Member
Director,
Sree Chitra Thirunal Institute for
Medical Sciences and Technology
Trivandrum.
8. Dr. V.R. Gowarikar, .. Member
Director,
V.S.S.C., Trivandrum.

9. Dr. M. Balaraman Nair, .. Member
Principal, Medical College,
Trivandrum.
10. Seniormost Pathologist in the .. Member
Medical College Services in
Kerala.
11. Dr. C.V. Korah, .. Member
Director of Medical Education,
Trivandrum.
12. Dr. M. Krishnan Nair, .. Convener
Director,
Regional Cancer Centre,
Trivandrum.

Executive Committee Members of the Regional Cancer Centre Trivandrum

1. Shri M.G.K. Murthy I.A.S. .. Chairman
Secretary, Dept. of Health,
Government of Kerala.
2. Shri. V. Ramachandran, I.A.S. .. Member
Commissioner for Economic
Development & Secretary,
Dept. of Planning,
Government of Kerala,
Trivandrum.
3. Dr. D. Babu Paul, I.A.S. .. Member
Secretary, Dept. of Finance
Government of Kerala.
4. Dr. M. Balaraman Nair, .. Member
Principal, Medical College,
Trivandrum.
5. Dr. M. Krishnan Nair, .. Convener
Director,
Regional Cancer Centre,
Trivandrum.

**Scientific Committee Members of the
Regional Cancer Centre, Trivandrum.**

1. Dr. D.B. Bisht, MD., Ph.D., Chairman
Director General of Health Services,
Nirman Bhavan, New Delhi
2. Dr. (Mrs) Usha K. Luthra, MD., Ph.D., .. Alternate
Senior Deputy Director General, Chairman
Indian Council of Medical Research,
New Delhi.
3. Dr. M. Balaraman Nair, MD. Alternate
Principal, Medical College, Chairman
Trivandrum.
4. Dr. M. Krishnan Nair, MD. Convener
FRCR (Lond.); Director,
Regional Cancer Centre,
Trivandrum.
5. Dr. T.K. Padmanabhan MD. Member
Professor of Radiotherapy &
Superintendent, Regional Cancer
Centre, Trivandrum.
6. Dr. J. Stephen, M.Sc. Ph.D., Member
Assoc. Professor of Cancer Research.
7. Dr. T.P. Ramachandran, M.Sc., Ph.D., ... Member
Assoc. Prof. of Radiation Physics,
Regional Cancer Centre,
Trivandrum.
8. Dr. N. Sreedevi Amma, MD., Member
Associate Professor of Cytology,
Regional Cancer Centre,
Trivandrum.
9. Dr. P. Ramachandran Nair, Member
DRM, MNAMS, Assoc. Prof. of
Nuclear Medicine,
Regional Cancer Centre, Trivandrum.

10. Dr. R.S. Mani, M.Sc., Ph.D., .. Member
Head, Radiopharmaceutical Division,
Bhabha Atomic Research Centre,
Bombay.
11. Dr. A.D. Singh, FRCR, .. Member
Professor of Radiotherapy,
Christian Medical College &
Hospital, Vellore.
12. Dr. R.S. Rao, MS., .. Member
Medical Superintendent & Surgeon,
Tata Memorial Hospital,
Bombay.
13. Col. Lakshmipathy, MD., .. Member
Director, Institute of Nuclear
Medicine and Allied Sciences,
New Delhi.
14. Dr. D.M. Vasudevan MD., .. Member
Director of Cancer Research,
Amala Cancer Hospital & Research
Centre, Amalanagar,
Trichur.

MAJOR DECISIONS OF THE GOVERNING BODY IN THE YEAR 1983-'84

The special meeting of the Governing Body which met on 19-11-1983 decided to nominate Dr. M.S. Valiathan, Director, Sree Chitra Thirunal Medical Sciences & Technology and Dr. V.R. Gowariker, Director, Vikram Sarabhai Space Centre, Trivandrum as eminent Scientists in the Governing Body. The Director of Medical Education was also nominated as member of the Governing Body. The Governing Body will hence forward have 2 nominees of the Union Ministry of Health and Family Welfare as well.

The Regular meeting of the Governing Body which was held on 19-11-1983 decided to change the site of the construction of the new building to the plot in front of the administrative block of the Medical College. It was further resolved that Govt. of India may be requested to allot their grants as building grants for the next 3 years. The Governing Body also insisted that equipment purchase should be limited to Rs. 5 lakhs per year.

Governing Body resolved to levy certain service charges for investigation of patients who have an income of rupees more than 501/- per month considering the costs involved for such investigation both as capital investments and recurring expenditure.

Budget estimates for Rs. 201 lakhs as proposed were approved. An amount of Rs. 95 lakhs were earmarked for building and purchase of equipment.

MAJOR DECISIONS OF THE EXECUTIVE COMMITTEE 1983-'84

The major deliberations of the Executive Committee related to streamlining the administration of the Regional Cancer Centre Society, building construction and scientific advancement of the Centre.

Administration

To enable speedy implementation of the new building plan, an engineering wing was organized with a Project Engineer as the Officer in charge. Necessary posts for his office were created.

A joint meeting of the Executive Committee & Building Committee fixed the terms of contract with the architect.

Dr. A. K. Nagpal was appointed as consultant for the project.

The Executive Committee also sanctioned the construction of two additional buildings in the present premises to commission the Linear accelerator and to expand the O.P. section. Construction of the new operation theatre complex was also sanctioned. The total investment involved was approximately Rs. 10 lakhs. All the construction activities were entrusted with the Public Works Department. Necessary modification in the Physics Laboratory to accommodate the Treatment Planning Computer and Gamma Camera with Computer were also sanctioned at a cost of approximately Rs. 1 lakh.

Scientific

As it was felt that Paediatric Oncology required priority in clinical services the required staff positions in Paediatric Oncology were created. The Executive Committee agreed for the development of this speciality because 40% of the population in Kerala are children and that the predominant forms of cancer seen in them are potentially curable (75% cure rate). Arrangements for purchase of drugs to poor patients were also decided on the general terms of the order in this matter.

The Executive Committee recognised the fact that with the installation of Treatment Planning Computer and Linear Accelerator, the Radiotherapy Department of the Regional Cancer Centre would have acquired most of the modern gadgets required for advanced therapy. Staff positions were sanctioned for the same.

The Executive Committee recognising the need for a good Surgical Oncology facility and a pain clinic, decided to develop this speciality and appoint necessary staff.

The Executive Committee proposed to Union Govt. that a composite investigation facility should be set up in the Regional Cancer Centre with financial assistance from the Ministry of Health & Family Welfare.

A proposal to supply drugs free of cost to patients who cannot afford to buy the same was approved by the Executive Committee. With the provision that the clinical evaluation and suitability for such drug administration will be done by an academic forum.

The Committee also decided to purchase the following equipments during this financial year.

1. Mammogram, Endoscopes, Mobile X-ray unit with Image Intensifier and T.V.

2. Deep therapy equipment.

These purchases are being processed.

MAJOR RECOMMENDATIONS OF THE SCIENTIFIC COMMITTEE 1983-'84

The first meeting of the Scientific Committee of the Regional Cancer Centre Society was held under the Chairmanship of Dr. M. Balaraman Nair, Principal, Medical College, Trivandrum on 18-11-1983. This committee has resolved on a number of important scientific and academic matters relating to the Regional Cancer Centre. The scientific Committee recommended certain staff promotional policies for the consideration of the Governing Body.

The Committee also recommended that to assist the National Cancer Control Programme of the Government of India manpower generation in areas of cancer detection, diagnosis and treatment should be immediately undertaken. For this purpose certain areas were identified by this committee such as Cytology, Tumour Registry, Radiation Therapy and Laboratory Technology.

The Committee also felt that the Primary Health Workers could easily be trained in Early detection of oral cancer and collection of cervical smears. For this purpose a mobile team consisting of medical and paramedical staff should be constituted. This team could visit the primary health centres and train the primary health workers in their natural environment on cancer detection procedures.

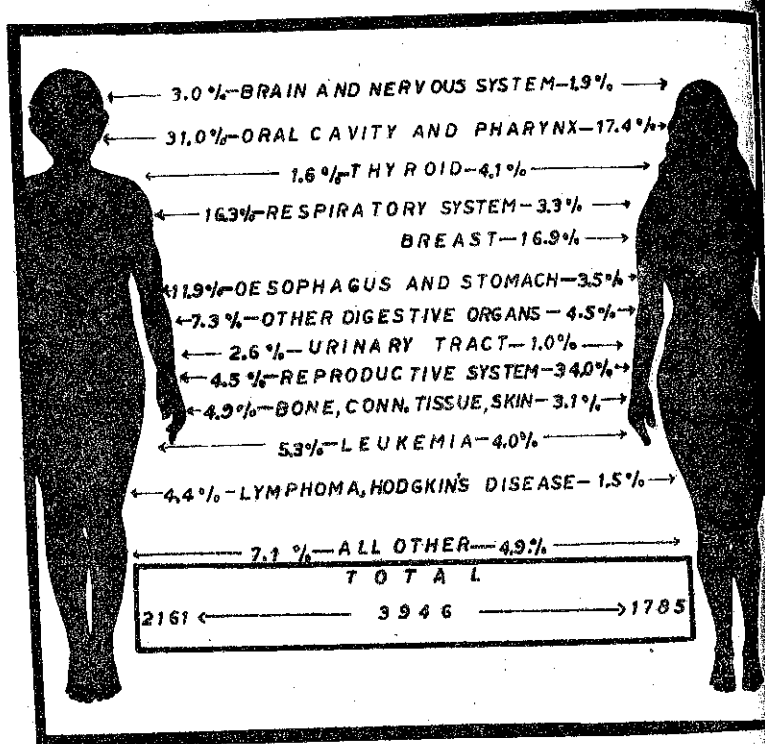
Another major recommendation of the Scientific Committee was regarding the conduct of an Advanced Course in Radiotherapy. Except a few centres radiotherapy has not achieved very high quality in our country. Since the Regional Cancer Centre, Trivandrum has very modern Radiotherapy facilities it was felt that the same should be used for training middle level radiotherapists in our country.

The Committee recognised the fact that as the infrastructure required for a composite imaging department was already present in the Regional Cancer Centre it was recommended that these facilities may be augmented by suitable additions.

The Committee also recommended that a paediatric oncology section should be started immediately and enough trained staff should be posted to this section.

It is worth mentioning at this stage that the Regional Cancer Centre has received information that a C.T. Scan is being offered to this centre as a gift under a Japanese Assistance Scheme through Government of India.

HOSPITAL CANCER REGISTRY - NCRP-ICMR.
REGIONAL CANCER CENTRE, TRIVANDRUM - 1983



Acknowledgements

- Government of India, Ministry of Health & Family Welfare
- Government of India, Department of Science & Technology.
- Government of Kerala, Department of Health.
- Indian Council of Medical Research, New Delhi.
- World Health Organisation, New Delhi.
- International Union Against Cancer (UICC) Geneva, Switzerland.
- British Council, Madras.
- American Cancer Society, New York
- Japanese International Co-operation Agency, Tokyo
- Cancer Registry, Cancer Research Institute, San Francisco.
- Allegheny General Hospital, Pittsburg, U.S.A.
- Christie Hospital & Holt Radium Institute, Manchester
- Chester Beatty Research Institute, London.
- Bhabha Atomic Research Centre, Bombay.
- Director General of Health Services Government of India, New Delhi.
- Director, Vikram Sarabhai Space Centre, Trivandrum.
- Director, Sree Chitra Thirunal Institute for Medical Sciences & Technology, Trivandrum.
- Director of Medical Education, Kerala.
- Director of Health Services, Government of Kerala, Trivandrum.
- Principal, Medical College, Trivandrum.
- Superintendent, Medical College Hospital, Trivandrum.

Superintendent, Sree Avittom Thirunal Hospital for Women & Children, Trivandrum.

Dean, Dental College, Trivandrum.

Dr. Prof. E.J. Ambrose, Professor Emeritus, London University.

Dr. V. Ramalingaswamy, Director General, Indian Council of Medical Research, New Delhi.

Dr. Usha K. Luthra, Sr. Deputy Director General, Indian Council of Medical Research, New Delhi.

Dr. D.J. Jussawalla, Tata Memorial Centre, Bombay.

Dr. P.B. Desai, Director, Tata Memorial Centre, Bombay.

Dr. V. Shanta, Director, Cancer Institute, Madras.

Dr. R.D. Ganatra, Head, Radiation Medicine Centre, Bombay.

Dr. M. Krishna Bhargava, Director, Kidwai Memorial Institute of Oncology, Bangalore.

Dr. B.D. Gupta, Postgraduate Institute, Chandigarh.

Dr. Sneh Bhargava, All India Institute of Medical Sciences, New Delhi.

Mrs. Sarada Devi.
Controller of Stationeries, Government of Kerala, Trivandrum.

Mr. B. Trivikraman Pillai,
Dy. Director of Census Operations, Kerala.

Mr. N. George John,
Director, Bureau of Economics and Statistics, Kerala.



Dr. PANKAJAKSHY AMMA
Lady Medical Officer,
Thrikkadavoor

Died on 17-9-1983

Dr. Pankajakshy Amma was in charge of the Early Cancer Detection Programme at Thrikkadavoor, Quilon from 15-8-'78 to 17-9-1983. In her capacity as Lady Medical Officer of the Primary Health Centre at Thrikkadavoor, she put her heart and soul into this programme and within a short span of three years screened more than 25000 rural women for cervical cancer. This population though composed of low Socio-economic groups readily accepted this programme without any inhibition mainly because of her humane approach. Hers was the ever present helping hand in their hours of need. The crowds which used to collect during her screening sessions in the far flung subcentres bore testimony of their regard, affection and reverence to her and to her services. Till she became a victim — at the young age of 45 — of the same disease which she herself helped several others to get rid of, they gave her all of it in abundance.

In her early demise the medical profession has lost a dedicated humble, sincere and socially committed worker. Our loss is great, but all the same the loss to her husband and her dear children is irreparable. Our sympathies are always with them.

ACTIVITIES

Increase in the new patient registrations has become a significant feature at the clinics and during 1983, the new patient registrations were 3788 which was 4% more than that in 1982. Almost all the ancillary support facilities like that of Laboratory, Inpatient beds etc. however remained at the same level as of previous years.

Patient Service Statistics

Number of New Patients registered	:	3788
Number of new and old patients (daily attendance)	:	84 per day
Number of Inpatient beds	:	120
Number of Haematological examinations	:	9110
Number of Biological examinations	:	2768
Number of Cytology examinations	:	6010
Number of Radiotherapy cases	:	4859
No. of Teletherapy cases-4405	:	
Brachy therapy cases-454	:	
Number of patients seen in Nuclear Medicine	:	1904
Number of reply paid follow up post cards sent. (postal follow up)	:	3966

Training Programmes

- A M.D. in Radiotherapy — 2 candidates every year
- B Ph.D. in Immunology, Biochemistry and Cell Biology
- C CRA (Certified Radiological Assistants Course) — 25 candidates yearly

- D. Technician – Cytology
- E. DMRT – 3 candidates every year.
- F. Field training for one month in clinical Radiological Physics for trainees undergoing one year Diploma Course in Radiological Physics conducted by Division of Radiological Protection, Bhabha Atomic Research Centre, Bombay-3 candidates every year.
- G. Tumour Registrars Training Programme: Two week training for 20 candidates once a year. Faculty advisor Dr. Calvin Zippin, Director, Cancer Registry, San Francisco

DIVISION OF RADIOTHERAPY

OUT-PATIENT SERVICES :

Out Patient Clinics

Out patient clinics were held on all working days except Sundays. The Hospital Cancer Registry ensures complete new case registration, follow-up control and the medical records management.

Radio-therapy Department

The number of Radiotherapy cases during the year was 4859 which was almost the same as last year. Treatment planning was undertaken with the help of the Radiation Physics Division. Simulator was used extensively for localisation of the treatment and to verify the treatment plan. Regular lectures for post graduate students in Radiotherapy, MD, MS, MBBS & GRA students were conducted at the Centre.

Paediatric Oncology Service

The Paediatric Oncology Service which was initiated last year now provide intensive care for the Paediatric Cancer cases. Joint consultations with the Paediatric department of the Sree Avittom Thirunal Hospital were regularly held to arrive at the best course of management of the cases.

Dental Services

The Out Patient Department's Dental Services is an important service of the centre and during the year, 2820 patients were attended to by this department. The number of oral biopsies performed during the year was 830 and dental extractions carried out were 2160. For 475 patients, bite blocks were made.

Oncology Seminars, Noon Clinics

Academic activities have been pursued more vigorously during the year. Apart from the eminent scientists who were invited to deliver lectures at the Regional Cancer Centre, Oncology seminars on special topics were regularly conducted. The noon clinics held daily discussed interesting and difficult cases of the day and therapeutic directions were arrived at through these clinic discussions. Speciality clinics like the paediatric oncology clinic and Trophoblastic Tumour Clinics are regularly held with active participation of the Paediatricians and the Gynaecologists at the Sree Avittom Thirunal Hospital.

SURGICAL ONCOLOGY DIVISION

Since there was no surgical facilities in the Radiotherapy department efforts were made to get operating time allotted for cancer surgery in the main theatre complex of the Medical College Hospital, which however did not materialise. Hence it was decided to set up a small operation theatre facility within the existing set up and the work was entrusted to the Kerala P.W.D. The work is yet to be completed. Routine minor biopsies were however started using the Radiotherapy theatre facility of Regional Cancer Centre.

Currently major surgeries like Wide excision, Hemi-mandibulectomy with upper deep cervical block, Radical cervical block dissection, Total thyroidectomy, simple and segmental mastectomies etc. are also undertaken using the above available facility. We have made it a policy to do primary repair in all cases of oro-mandibular ablative surgery. It is very gratifying to report that the post-operative infection and complications have been almost nil.

We have innovated a cheap simple readymade continuous vacuum suction drain for closed wounds from readily available materials in the hospitals. This has a great potential for the third World countries. The innovation is awaiting report publication. We have developed newer techniques in the reconstructive surgery which are also awaiting publication.

DIVISION OF CYTOLOGY

The Regional Cancer Centre has instituted the first chair of Cytology in the Department.

Clinical Services

The Cytology division renders diagnostic services to both Gynaecological and Paediatric sections of the Sree Avittom Thirunal Hospital (S.A.T.H.) all units and specialities of Medical College Hospital, Sanatorium for Chest Diseases, Pulayanarkottah and a few other nearby Government and private hospitals in addition to the services rendered to the Regional Cancer Centre.

The investigations carried out were the following :

(a) Routine Cervical smear screening of patients attending the Gynaecologic O.P. of S.A.T. Hospital.

During 1983-84 a total of 6010 smears were collected from 5804 women who attended the Gynaecological O.P. for various complaints. Analysis of the results show the following salient features. The majority of the lesions were nonspecific inflammations (63.43%).

Total cervical smears	5804	
Normal smear	1554	- 26.8%
Nonspecific inflammations	3680	- 63.4%
Trichomonas vaginalis	223	- 3.8%
Fungal infection	24	- 0.4%
Herpes simplex infection	2	-
Dysplasias without inflammation	28	- 0.4%
Malignancies	196	- 3.4%
Suspicious of malignancy	25	- 0.4%
Miscellaneous conditions	72	- 1.4%

(b) Population Screening in Thrikkadavoor, Quilon and Trivandrum Corporation were continued and a total 1604 cases were registered.

In a number of cases of nonspecific inflammation and Trichomonas Vaginalis infection, there were associated dysplastic changes. This was observed in 8.75% of nonspecific inflammation and 26.9% of cases of T.V. infections.

(c) Hormonal Cytology (3780 cases) - was done in pregnant women with a bad obstetric history like repeated abortions, attending the S.A.T. Hospital. This was also done as a part of investigation of cases of primary and secondary amenorrhoea and occasionally in carcinoma breast patient after treatment.

(d) Non Gynaecological Cytology including body fluids, sputum, C.S.F., endoscopic aspirates etc. and diagnostic aspiration and imprint cytology of all sites were undertaken. During the year 3810 such smears from 2812 patients were examined.

The following table indicate the work performance in this area.

Non Gynaecological Cytology examinations - 1983

Type	No. examined	malignant	Others
Pleural fluid	199	43	156
Ascitic fluid	359	51	308
C.S.F.	213	12	201
Gastric & Oesophageal aspirates	56	10	46
Bronchial washings	44	5	39
Bone Tumour aspirates	85	45 ¹	40
Breast Lumps	209	86	123
Liver aspirates	214	50 ²	164
Lymph node aspirates	437	200	237
Skin nodule aspirates	147	60	87
Parotid "	36	9	27
Thyroid "	58	14	44
Lung Tumour "	19	8	11
Sputum	441	52	389

1. Primary - 7. Secondary - 30. Lymphoma, Leukaemia, Multiple myeloma - 8

2. Primary - 33, Secondary - 17

Other rare samples included a few cases of synovial fluid, pericardial fluid, cystoscopic sample, Pouch of Douglas aspiration, endometrial aspiration, nipple discharge, intra abdominal and retroperitoneal mass aspiration, brain tumour impression, impression smears of other tumours, aspiration or scrape smears from lesions of oral cavity, tonsils, nasopharynx etc. The numbers of individual samples are too small to analyse separately here but together they contribute to the work load.

- (a) Second opinion on HP slides .. 70
- (b) Bone Marrow and peripheral smear of R.C.C. Patients .. 500 cases
- (c) Pregnancy test (immunological) for diagnosis of pregnancy & for follow up of vesicular mole and choriocarcinoma cases .. 482 cases

III. Academic programme: Undergraduates, pathology post-graduate students and MLT students are posted in the Lab. for different periods of time and were given training. The post-graduates of various other departments are given guidance in their research work which involve cytological aspects.

Ongoing Research

1. Evaluation of rapid staining techniques in cytology which started last year is continuing.
2. Value of needle aspiration of thyroid swellings in diagnosis and management.

NUCLEAR MEDICINE DIVISION

1904 patients were referred to the Nuclear Medicine Division for various investigations during 1983. This includes patients referred for Thyroid function tests, Brain scans, Liver scans, Bone, Kidney scans etc. A total of 1500 Radio Immuno Assay studies were done during the year for Thyroid Hormones T3, T4 and β -HCG. 17 patients were given Radio Iodine therapy for Hyperthyroidism in this period.

The following projects sponsored by ICMR were completed during this year.

1. Thyroglobulin as biochemical marker for thyroid cancer.
2. Thyroid function tests in Radio Therapy of head and neck malignancy.

Routine classes were undertaken for Certified Radiological Assistants (CRA) students, undergraduate and post graduate medical students.

The Gamma Camera and the Ultrasound Scanner are awaiting installation.

RADIATION PHYSICS DIVISION

Patient Service

All patients requiring radiotherapy (both external therapy and brachy therapy) are registered in this department. Treatment planning and relevant dose calculations are carried out routinely for each patient. During the year, 4859 patients were registered in this division. Plaster of Paris shells were made for 173 cases, mostly of head and neck region, requiring medical beam directed radiotherapy and associated treatment planning was carried out.

In brachytherapy, moulds were made for 8 patients requiring radium mould treatment. Planning and interstitial implantation using radium was done for 122 patients. All such implants are radiographically controlled.

Selectron intracavitary treatments were given for 324 patients. Measurement of rectal dose was made in a few cases using Thermoluminescent Dosimeter. Stage I cases of Ca. Cervix uteri and cases not suitable for Selectron treatment were treated using conventional radium applicators.

This Centre has four Cobalt-60 therapy machines, one Simulator, one Selectron Low Dose Rate Remote Controlled Brachytherapy after loading system and various dosimeters for the calibration of dose measurements and protection surveys. All these equipments are routinely checked and maintained for ensuring quality performance. All machine breakdowns are attended to by this division and possible repairs are undertaken. This has helped in providing almost uninterrupted treatment and hence improved patient services.

RESERACH DIVISION

The Research Division of the Regional Cancer Centre has undertaken clinically oriented research on cancer in Biochemistry, Immunology, Cell Biology and Cytogenetics.

Biochemistry

In Biochemistry, the work on plant lectins was continued to find new lectins which may have tissue specificity. Several lectins have been isolated in this laboratory and these have been tested for tissue specificity. Most encouraging results have been achieved this year in the studies with lectins especially with the lectin isolated from the seed of jack fruit (*Artocarpus integrifolia*). Peroxidase staining of cryostat sections and smears of cancer tissues using jack fruit lectin and winged bean lectin separately were carried out in 350 cases. Jack fruit lectin showed preferential staining to epithelial cells of the cancer of the uterine cervix. It also showed binding to bone marrow cells of some leukemia patients.

Inhibition of attachment using Carbohydrate was carried out in all positive cases. Jack fruit lectin attachment was inhibited by galactose and that of winged bean lectin by glucose. Toxicity studies of the lectin by injecting IP in rats and mice were carried out upto 500 μ g. per kg. of body weight and even at this concentration there was no sign of toxicity. Injected animals were sacrificed and various organ homogenates were taken and HPLC analysis was carried out to ascertain the presence of the lectin. The results were negative in the two cases carried out.

Pharmacokinetics of drugs used in cancer chemotherapy is another area under investigation. Samples of blood from patients undergoing chemotherapy were collected at fixed time intervals and the quantitative estimation of drug in circulation was made using HPLC. The procedure has been standardised and further work in progress.

Studies on biochemical changes in malignancy were also being carried out. Enzyme pattern (including isozymes)

sera and tissues of cancer patients are being studied. Trace elements were studied in sera and tissues of 100 cancer patients and 50 normal controls using Atomic absorption spectrophotometric and colorimetric techniques.

Immunology

Research in Immunology related to the following aspects:

- (1) Immunological and clinical assesement of oral cancer patients on levamisole therapy.
- (2) Role of tumour associated antigen in the total management of cancer of the tongue.
- (3) Characterisation of oral cancer antigen.
- (4) Biological markers in squamous cell carinoma.
- (5) Association of Herpes virus with oral cancer and cancer of the uterine cervix.
- (6) Serum and tissue immunoglobulins and
- (7) Circulating immune complexes in oral cancer patients.

The effects on the immune system of patients treated with levamisole was assessed using various parameters such as total leucocytes, lymphocytes, T-lymphocytes, B-lymphocytes Tg-lymphocytes, Tm-lymphocytes, leucocyte migration inhibition assays, circulating immune complexes etc. These were compared to the response in the placebo group and normal controls. Clinical evaluation was done by the recurrence free interval, metastasis, survival period etc. Levamisole did not appear to have significant beneficial effects in the management of oral cancer patients.

In an attempt to develop an immunotherapeutic procedure, biopsy specimens of cancer of the tongue were collected, pooled and stored at -70°C . The pooled tissues were minced and the antigen fraction prepared by 3 M KCl extraction. The work is in progress. For the characterization of oral cancer antigen, highly sophisticated HPLC system with automatic recorder and fraction collector is being employed. Extracts from oral cancer tissues obtained from surgical specimens were used in these experiments. The search for the antigen is in progress.

In the detection of biological markers, radioimmunoassay is being employed using special kits for the detection of alpha-fetoproteins, Carcino embryonic antigen, β 2 microglobulin etc. and the results are highly encouraging. The work is in progress.

It has been possible to establish the association of *Herpes simplex* Virus type I with oral cancer and type II with carcinoma cervix.

Vero and HEP-2 cell lines were maintained for culturing the viruses and preparing *Herpes simplex* viral antibody by immunising rabbits. Presence of *Herpes simplex* virus type I and type II antibodies in sera of eight hundred oral cancer patients and three hundred normal control individuals was screened using complement fixation test, indirect haemagglutination test and neutralisation test. As a control, adenoviral antibody was also determined. *Herpes simplex* viral antigen was detected in oral cancer tissues in comparison with 30 normal tissues and 30 cases of premalignant conditions in the oral cavity.

Circulating immune complexes were detected isolated and quantitated from 165 oral cancer patients, 15 breast cancer patients 10 cancer cervix and 25 healthy controls.

A strong association has been reported in literature between *Herpes Simplex Virus-2* infection and cancer of the uterine cervix. Studies already made in this laboratory has revealed high titres of HSV-2 antigen in the sera of patients with ca. cervix compared to normal controls. Moreover it was also possible to demonstrate cytologically the presence of antigen in the ca. cervix cells by immunofluorescence tests using fluoresced antibody against HSV-2 antigen. The following works were also being pursued.

(1) Extraction and purification of tumour associated antigens from carcinoma cervix biopsies (2) Detection and estimations of immune complexes in the sera of ca. cervix patients (3) Neutralization of antibody titres against HSV-2 in the sera of ca. cervix patients and controls and (4) In vitro cell mediated immunity studies on ca. cervix patients and controls.

Measurement of individual Immunoglobulins IgA, IgG, IgM, IgD and IgE in the serum were carried out by Radial Immunodiffusion methods. Immunodiffusion plates were used for the quantitative estimation of Immunoglobulins. Out of 175 cases tested 125 were with oral cancer and 15 with carcinoma of

breast and 10 with carcinoma of uterine cervix and 25 normal healthy controls.

Studies of Hepatitis B surface antigen 'HBsAg' in the blood of cancer patients have also been undertaken. This was done by ELISA, RPHA, CIEP and Immunodiffusion in 150 cancer patients and 50 healthy controls and this revealed higher association of Hepatitis B viral antigen in cancer patients.

Cytogenetics

Cytogenetics of human cancer was undertaken with particular reference to oral cancer, ca. cervix, leukaemias and lymphomas. Gross chromosome abnormalities were encountered in majority of human cancer cells.

The study aims to critically analyse the association of chromosomal abnormalities (breakages, missing arm, transposition etc.) with malignant change and also to evaluate the cause-effect relationship.

In the case of leukaemias and lymphomas a total of 115 samples have been studied. Increase in the number of chromosomes, chromosome stickiness, deletion of chromosome arms etc. are some of the abnormalities seen. Nuclear polymorphism, variations in the number and size of nuclei were also encountered in the study.

In an oral cancer cell line, the modal chromosome number ranged between 50-60. In another cell line of the carcinoma of the larynx, chromosome numbers ranging below the diploid level as well as above the diploid level were observed.

Cell Biology

One of the major objectives in Cell Biology has been the establishment of cultures of the various solid tumours in order to study the morphology and behaviour of different tumour cells in monolayer cultures, their metabolism and response to drugs and radiations. Monolayer cultures have been established in oral cancer and cancers of the uterine cervix, breast, larynx etc. and the morphology and behaviour of these cells were studied. The aspects mentioned above are being pursued.

Another area of interest has been the characterization of premalignant lesions by a combination of techniques in Cytology, Cytochemistry, Cell Biology, Immunology and Biochemistry. Some premalignant conditions of endometrial tumours and of cervix have been identified by cytological techniques. Attempts are also being made to characterize those oral leukoplakias which turn malignant. Also, critical studies made on bone marrow preparations have revealed some unique cytological features which may prove useful in the characterization of preleukemic stages. Characterization of premalignant lesions will obviously be a great step in the "nipping in the bud" of this deadly disease.

Some aspects of breast cancer are also under investigation. They include studies on the cytological constitution of breast tumour, characteristics of invading malignant cells found in affected lymph nodes, mechanism of the development of drug resistance in tumours and hormonal dependence of breast tumours. In the reporting year, 50 specimens have been investigated.

Prof. E.J. Ambrose, Professor Emeritus, Chester Beatty Research Institute, Royal Cancer Hospital London paid a visit to our laboratory in March 1984 to review the research work in progress and to plan future programmes. His impressions are separately given.

Clinical Laboratory Services

Except a few microbiological tests (urine culture & CSF culture) all the clinical investigations are now carried out by the clinical laboratory of the Regional Cancer Centre. During the year, the routine haematological investigations done were 9110 and the biochemical investigations numbered 2768. Similar large numbers of routine urine examinations, CSF and pleural fluid examinations were also undertaken.

The Research Activities were Evaluated by Prof. E.J. Ambrose of Commonwealth Foundation (Formerly Director, Chester Beatty Institute & Royal Cancer Hospital London) and has recommended as follows:-

Lectin studies

The problem of cell specificity in cancer constitutes the chief problem in all forms of therapy. There is now general agreement that the most likely region in which to find this specificity is the cell surface. Recent work with the oncogene, confirms that changes take place in cell surface receptors. The probability of achieving Ehrlich's magic bullet with an effect localised entirely on the malignant cells can now be accepted.

The monoclonal antibodies are being explored from this point of view and the lectins provide an important alternative approach in which the molecular structure of the receptor can be identified using various molecules. Even with an extremely small change in the surface of the malignant cell a simultaneous interaction with the two sugar receptors could provide a high degree of tumour specificity. Most encouraging results have already been achieved at the Regional Cancer Centre, Trivandrum. Several lectins showing tissue specificity have been isolated, while one of these isolated from *Atrocarpus Integrifolia* showed specificity to cervical cancer cells.

Further detailed studies should be carried out.

Cervical Cancer

- A. Comparison of non-positive smears by Pap-staining from the Cytology Division, with smears from malignant tissues in detail.
- B. Tissue section by cryostat should be prepared in pairs one section for lectin staining and one section mounted identically is stained after fixing with histological stain. Detailed structure of lectin stained and normal histologic stained sections should be compared under oil immersion. These studies would reveal in detail the level of specificity achieved with the lectin.

C. Cultures of the cervical cells should be prepared in Leighton tubes. A long working distance phase contrast condenser should be obtained and phase objective up to x 32 for the Leitz inverted microscope. In this way a good optical image of the living culture should be obtained. Effects of the *Atrocarpus* Lectin and other lectins on both non-malignant epithelium and malignant cells should be observed directly and photographed.

II. Detection of Herpes simplex type 2 associated antigen

This is most interesting and should be followed up. Although not completely specific for malignancy, this is true of the other markers at present in use. It could play an important role by the use of discriminative analysis. (To be described below).

Induction of malignancy in normal cervical cells. This would be an important result if experimentally possible. How to obtain and culture non-malignant cervical cells?

The uninvolved region from an operation, possibly a lesion which proves to be benign might give a source. The nonmalignant cell should be identified both by forming continuous and coherent epithelial sheets and by failure to grow in soft agar and in nude mice. Confirmation should be detectable by disturbance of sheets, irregular leading edge, etc. (Similar to criteria described in paper by D. Easty et al, for oral epithelium).

Can the facilities for labelled HSV 2 Virus be made available?

Chromosome banding might be useful but would require extremely detailed study.

III. Oral Cancer

Markers for oral cancer

1. Again the presence of HSV-1 Antigen is not completely specific for oral cancer but it could be used in discriminative analysis.

2. Levels of IgG, IgM, IgD and IgA could be used in discriminative analysis.
3. Circulating immune complexes could provide another marker.
4. HBs Ag by indirect Haemagglutination is another marker. These markers taken together with other related criteria could give an excellent discriminative separation for non-malignant conditions.
5. The separation of the immune complexes into Immunoglobulin (IgG and IgM) and a separate Antigen for oral cancer is important. Can Immunoglobulins be denatured after 8 molar urea treatment? If so they could be used to look for the specific oral cancer Antigen in suspected cases. This could be checked by seeing whether the Immunoglobulins would recombine with specific Antigen.

Discriminative analysis

	Criteria					Total
	1	2	3	4	5	
Normal	—	+	—	+	—	2
Leukoplakia	+	+	—	—	—	2
Malignant	+	+	+	+	—	4
Criteria are scored as	+					
in quantitative tests as lying above a certain level						

IV. Oral cancer chemotherapy

1. The Oral Cancer should be grown according to the procedure described in the paper by D. Easty, et al, every effort should be made to remove fibroblasts according to one or all of the methods described in her publication. One should be left with some islands of non-malignant epithelium with spread out clear cytoplasm and irregular borders. The malignant epithelium should outgrow the non-malignant. It would not

National Cancer Registry Project (ICMR)

The Hospital Based Cancer Registry, one of the six registries funded by the Indian Council of Medical Research, started functioning in 1982. During the year 1983, the major effort had been to improve and standardise case registration methodology. A majority of cancer patients were registered through the out patient department of the Regional Cancer Centre, where cancer patients were referred from the Medical College Hospital out patient department's registration counter and other speciality clinics. Hence special efforts were made to streamline case registration and follow-up of cancer patients at the cancer centre.

The National Cancer Registry Project at its 1983 annual review meeting has asked the hospital cancer registry at Trivandrum to co-ordinate a case control epidemiologic study on stomach cancer with two other registries viz. the population based cancer registries in Bombay and Madras.

The Regional Cancer Centre has initiated a programme for systematic training of cancer registry personnel which is not available now in any other institution in the country.

The 1st such Tumour Registrars Training Programme was conducted with active support from the Hospital Tumour Registry in February '84. The course was inaugurated by Dr. Jan Stjernsward, Director, Cancer Unit, W.H.O. Dr. Zippin, Director, Tumour Registry, Cancer Research Centre, University of California, San Francisco was the faculty advisor. Ms. Diana Lum from the same institute also gave lectures along with Professors of Medical College Hospital. The course was attended by 18 participants from various parts of India. The content of the course was designed to meet international standards with special emphasis on requirements of developing countries. It was the 1st time that such a course was conducted anywhere outside U.S. There was wide appreciation of the course from WHO, UICC and ICMR. The course was partially supported by UICC & ICMR. 2nd such course will be organised in 1985.

generally be required that a cell line should be established. The culture were set up on cover slips in Leighton tubes. They could be observed in the phase contrast inverted microscope. Those with good growth could be selected and tested with various drugs, fixed and auto-radiographed with Thymidine and Uridine.

2. Dr. M. Krishnan Nair is using Bleomycin followed sometimes by Methotrexate.

Dr. Padmanabhan has used Vincristine, Bleomycin, Methotrexate (with Folic Acid and Hydro-cortizone) in multiple drug therapy. He has also used Cisplatin. As an initial approach, it would be well worthwhile to examine the response of a marker of oral cancers to these drugs at several concentrations.

Further work could proceed in multiple drug therapy to look for synergistic effects.

3. It is hoped that new lectins may be found with specificity towards Oral Cancer epithelium. Should these be found, a sophisticated therapy based on the 'Target Biology-Chemotherapy' of Dr. Forester's Department at the Chester Beatty in London could be developed.

4. It might be worthwhile to explore the specificity for malignant cells to some of the plant toxins, which might attach to similar receptor size to the lectin from the same plants.

V. Cell Biology of Human Breast Tumours

This subject is being intensively investigated in a number of cancer centres in various countries particularly at the Ludwig Institute of Human Cancer Biology in Sutton.

I would suggest that it would be advisable to concentrate on a limited aspect of this problem at the Regional Cancer Centre, particularly those areas in which the expertise is already available.

5. e.g. Characterisation of invading malignant cells from inflamed lymph nodes.

6. Investigation on development of drug resistance in tumours

The cancer registry staff has taken active part in all academic programmes, both professional and public.

Highlights of Registry findings - Problem of Cancer in Kerala

Kerala is a small state in the South Western part of the Republic of India. It is the most densely populated state with a total population of 25 million and density of population of 654 persons/Sq. Km. It has advanced medical care facilities with 5 medical colleges, 5 radiotherapy facilities and 2 cancer detection centres. The birth rate in Kerala is the lowest in India, so also the death rate, 25.5/1000 and 6.4/1000 (1981 census). The average life expectancy at birth in Kerala was 63.8 years for men, 66.9 years for women as against 52.6 and 51.6 at the national level. The literacy rate is also far higher than the national average, being 74.0% for male against 46.7% at the national level for men, 64.5% against 24.9% for the female at the national level.

With the establishment of the cancer registry, accurate and meaningful data have become available for the first time. Based on the Greater Bombay incidence rates (Population based) it is estimated that annually almost 23,000 new cancer cases would be diagnosed in Kerala.

Till the end of 1983, (2 year period) the hospital cancer registry has accumulated data on cancer from 7439 cancer patients and systematic analysis of the data are regularly undertaken. Almost 80% of the cases are microscopically confirmed. Such analysis have identified cancers of Lung, Buccal Mucosa, Cervix, Lymphomas, Leukaemias, Tongue, Thyroid and Brain Tumours as cancers of special interest in Kerala. Studies are underway to identify factors associated with these cancers.

The ten predominant types of cancer in the male and female registered by the Hospital Cancer Registry in 1983 is shown below.

HOSPITAL CANCER REGISTRY: 1983

Ten leading sites of Cancer

No.	Site	Male %	Site	Female %
1.	Mouth	12.36	Cervix	26.22
2.	Lung	10.41	Breast	16.86
3.	Tongue	6.94	Mouth	7.17
4.	Stomach	6.02	Ovary	4.50
5.	Oesophagus	5.92	Tongue	4.09
6.	Larynx	4.26	Thyroid	4.09
7.	Hypopharynx	3.42	Gum	3.25
8.	Gum	2.78	Oesophagus	1.96
9.	Brain	2.78	Body uterus	1.85
10.	Leukaemia (Myeloid)	2.78	Leu. (Myeloid)	1.74

In the 0-14 age group lymphatic leukaemia was the commonest malignancy both in boys and girls-27.2% and 24.7% respectively. The second commonest tumour was brain tumour in both sexes (15.2% and 11.0%).

In the 35-64 age group mouth cancer topped the list in the male-14.3%; with lung cancer coming as a close second 13.19%. Whereas in the female Ca. cervix was the predominant type of cancer-32.36%; with cancer breast as the second-19.59%.

In the older age groups, mouth cancer, oesophageal cancer and lung cancer in the male and cervix, mouth and breast cancer in the female became the dominant types of cancer.

The distribution of cancer according to the religion was proportionate to the percentage of religious groups in the society.

Distribution of cancer according to religion in male and female: 1983

Religion	Male %	Female %	Population
Hindu	65.29	68.29	59.74
Muslim	11.29	10.14	19.50
Christian	23.42	21.57	21.00

*General Population

The risk due to various habits were estimated in this study on the basis of prevalence of chewing, smoking and alcoholism in the population and in the male cancer patients.

Site	% Chewers	% Smokers	% Alcohol* Drinking	% No habits
B. Mucosa	88.3	85.1	39.7	0.35
Ant. Tongue	76.7	80.6	61.1	—
Oro pharynx	52.6	89.4	59.4	2.6
Lung	34.4	93.0	44.1	2.3
Non cancer (control)	57.4	75.0	31.6	12.6

*Habituated to taking Alcohol.

The relationship between chewing and Buccal Mucosa cancer, smoking and lung cancer and smoking and oropharyngeal cancer are quite clear from this data.

The population incidence of oral cancer in Trivandrum city was calculated on the basis of the data available from the tumour registry. This was found to be highest when compared to similar data available from Connecticut, Singapore and Bombay.

Lung cancer which is the second common cancer in males was found to occur mostly between the ages of 40 and 60 years with a mean age of 55.4 years and male to female ratio of 9:1

probably because of the absence of smoking habits in the female due to cultural factors. The histological types of cancer in males were those attributable to smoking and in the female, predominantly the ones occurring in non smoker (Adenocarcinoma). Studies are in progress on these aspects.

The commonest form of cancer in the female was cervical cancer & constituted 26.22% of all cancer in the female. More than 70% of the cancers occurred in women above the age of 50 years. The mean age of cancer cervix in this group was 55 years which was higher than the mean age of cancer cervix patients seen elsewhere in India. This should be expected because of the longer life expectancy in Kerala. The average number of children in each age group for cancer cervix patients was higher than in the general population.

NUMBER OF CHILDREN

Age of Women	India Average	Kerala Average	Cancer cervix
15 — 19	0.17	0.06	—
20 — 24	1.13	0.74	—
25 — 29	2.41	1.94	2.28
30 — 34	3.46	2.91	3.00
35 — 39	4.26	3.89	3.89
40 — 44	4.71	4.49	5.05
45 — 49	4.99	4.99	5.01
50 +	4.74	5.03	5.86

It appears from the study that higher the number of the children greater the risk for development of cervical cancer.

Early age of marriage was also found to increase the risk of development of cervical cancer. The average age of marriage of girls in Kerala was 21.7 years as per the 1981 census. The average age of marriage of cervical cancer patients from hospital data was 18.15 years with a 'p' value of <0.001 which is highly significant.

HOSPITAL CANCER REGISTRY-SITE DISTRIBUTION OF CANCER

- 1983 -

ICD No.	SITE	MALE		FEMALE		TOTAL	
		No.	%	No.	%	No.	%
140	Lip	8	0.37	11	0.62	19	0.48
141	Tongue	150	6.94	73	4.09	223	5.48
142	Salivary gland	15	0.69	9	0.50	24	0.61
143	Gum	60	2.78	58	3.25	118	2.93
144	Floor of Mouth	18	0.83	3	0.17	21	0.53
145	Other Mouth	267	12.36	128	7.17	395	10.01
146	Oropharynx	46	2.13	5	0.28	51	1.29
147	Nasopharynx	25	1.16	8	0.45	33	0.82
148	Hypopharynx	74	3.42	15	0.84	89	2.26
149	Pharynx	6	0.28	1	0.06	7	0.18
150	Oesophagus	128	5.92	35	1.96	163	4.18
151	Stomach	130	6.02	28	1.57	158	4.00
152	Small Intestine	2	0.09	3	0.17	5	0.13
153	Colon	21	0.97	8	0.45	29	0.73
154	Rectum	45	2.08	26	1.46	71	1.80
155	Liver	52	2.14	17	0.95	69	1.75
156	Gall Bladder	4	0.19	9	0.50	13	0.33
157	Pancreas	24	1.11	11	0.62	35	0.88
158	Retroperitoneum	10	0.46	6	0.34	16	0.41
159	Other Digs. Syst	—	—	—	—	—	—
160	Nose	29	1.34	25	1.40	54	1.37
161	Larynx	92	4.26	7	0.39	99	2.51
162	Lung	225	10.41	24	1.34	249	6.31
163	Pleura	1	0.05	2	0.11	3	0.08
164	Thymus etc.	5	0.23	1	0.06	6	0.16
165	Other Resp.	—	—	—	—	—	—
170	Bone	33	1.53	22	1.23	55	1.39
171	Conne. Tissue	21	0.69	14	0.78	35	0.89
172	Skin Melanoma	15	0.69	5	0.28	20	0.51
173	Other Skin	36	1.67	15	0.84	51	1.29
174	Female Breast	—	—	301	16.86	301	7.63
175	Male Breast	7	0.32	—	—	7	0.18
179	Uterus Unsp.	—	—	—	—	—	—
180	Cervix	—	—	468	26.22	468	11.89

ICD No.	SITE	MALE		FEMALE		TOTAL	
		No.	%	No.	%	No.	%
181	Placenta	—	—	7	0.39	7	0.18
182	Body Uterus	—	—	33	1.86	33	0.84
183	Ovary etc.	—	—	82	4.59	82	2.08
184	Other Female Gen.	—	—	16	0.90	16	0.41
185	Prostate	45	2.08	—	—	45	1.14
186	Testis	14	0.65	—	—	14	0.35
187	Penis etc.	39	1.80	—	—	39	0.99
188	Urinary Bladder	43	1.99	6	0.34	49	1.24
189	Kidney	14	0.65	11	0.62	25	0.63
190	Eye	6	0.28	5	0.28	11	0.28
191	Brain	60	2.78	31	1.74	91	0.31
192	Nervous system	5	0.23	3	0.17	8	0.20
193	Thyroid gland	34	1.57	73	4.09	107	2.71
194	Endo. Glands	4	0.19	6	0.34	10	0.25
195	Ill. Def. Sites	2	0.09	1	0.06	3	0.08
196	Sec. Lymph Nodes	38	1.76	8	0.45	46	1.17
197	Sec. Resp. Sites	17	0.79	15	0.84	32	0.81
198	Sec. Other sites	19	0.88	14	0.78	33	0.84
199	Primary Unknown	38	1.76	18	1.01	56	1.42
200	Lympho Sarcoma	47	2.17	12	0.67	59	1.50
201	Hodgkin's Disease	23	1.06	5	0.28	28	0.71
202	Lymphoid Tissue	26	1.20	10	0.56	36	0.91
203	Multiple Myeloma	23	1.06	20	1.12	43	1.09
204	Leuk. Lymphatic	49	2.27	29	1.62	78	1.98
205	Leuk. Myeloid	60	2.78	31	1.74	91	2.31
206	Leuk. Monocytic	—	—	—	—	—	—
207	Leuk. specified	—	—	—	—	—	—
208	Leuk. Unspecified	6	0.28	11	0.62	17	0.43
		2161	100.00	1785	100.00	3946	100.00

RESEARCH PUBLICATIONS

1. Kurup, P.G. and Smith.C. : Leakage and Scatter radiation levels outside the Radiotherapy field in Linear accelerator. Brit. JI. Radiology (in Press).
2. Kumari T.V; Prabha.B. and Vasudevan, D.M : Brief communication. Herpes Simplex Virus antibodies in sera from patients with Nasopharyngeal carcinoma, Oral Carcinoma and Cervical Carcinoma in South India — in "Nasopharyngeal Carcinoma, Current Concepts." Eds. Prasad V., Ablashi D.V., Levine, P.H. and Pearson, P.R. University of Malaysia, Kuala Lumpur, '83.
3. Prabha, B; Kumari.T.V; and Vasudevan, D.M. : Leukocyte adherence inhibition assay (LAI) in cancer of the Oral Cavity. Euro. JI. of cancer & Clini. Onco. 20:891-897, 1984.
4. Krishnan Nair, M. and Sankaranarayanan, R. Role of post-operative radiotherapy in breast cancer. Indian JI. of cancer 20:116-118, 1983.
5. Abdulkader, M; Vasudevan, D.M; Leena Devi, K.R. and Nair, V.J. Experimental Production of Keloids. Indian JI. of cancer 20 :27-31, 1983.
6. Parameswaran, S; Srinivasan, G.; Jagadeesan, M; Bellarmine, A.B. and Seethalakshmi, R. Value of Papanicolaou Smear in Follow-up of Cancer Cervix. Indian JI. of Radiology 37:267-269, 1983.
7. Mathew, C.P. and Parameswaran S. Osteosclerotic Bony Metastases from Carcinoma Stomach. Indian JI. of Radiology 37: 361-363, 1983.
8. Jagadeesan, M. Parameswaran S., Somarajan, K. and Maheswar, K. Secondary Carcinomatous Deposits in Thyroid from Oesophagus. Indian JI. of Radiology 37:249-251, 1983.

Papers Presented in Scientific Conferences

1. Dr. T.K. Padmanabhan: "Radiotherapy in sellar and parasellar tumours. National conference on sellar and parasellar tumour held at SCTMC, Trivandrum November, 1983. L35
2. Dr. T.K. Padmanabhan: "The Role of Radiotherapy in the treatment of cancer in Uterine Cervix" Indian Radiological Association, Southern Regional Council, Bangalore October, 1983. L36
3. Dr. S. Parameswaran: "Spectrum of Bronchogenic cancer in Kerala" 5th Annual Congress of the Association of Radiation Oncologists of India, (AROI) New Delhi, October, 1983. L37
4. Dr. S. Parameswaran : "Bronchogenic Carcinoma" 37th Annual Congress of IR & IA—Bangalore, January, 1984. L38
5. Sri. P.G. Gopalakrishna Kurup: "Dose levels outside the radiotherapy beam" 6th conference, of Association of Medical Physicists of India, Srinagar, October, 1983. L39
6. Dr. S. Parameswaran: *Guest Lecture:* Modern Trends in Oncology. Indian Medical Association, Mavelikara, 1983. L40

Community Anti Cancer Programmes

The staff of the Regional Cancer Centre participated in several health camps organised by the medical college departments and have conducted cancer check-ups in these camps. A special cancer detection camp was conducted on October 2, 1983 under the auspices of the Lions Club at Valiathura, which is a fisherfolk suburb and the Regional Cancer Centre staff actively participated in the programme: 133 people (men, women and children) were examined at the camp.

ACADEMIC ACHIEVEMENTS

1. Dr. M. Satya Murthy, Tutor, awarded M.D. degree — Kerala University.
2. Dr. P.G. Jayaprakash, Tutor, awarded M.D. degree — Kerala University.
3. Dr. T.P. Ramachandran, Associate Professor awarded Ph.D. degree Banaras, H.U.
4. Dr. S. Parameswaran, Tutor was awarded "Dr. P.K. Haldar Memorial Travel fellowship in Radiation Oncology 1984" Presented by Indian College of Radiology & Imaging

DISTINGUISHED VISITORS

1. Sir Robert Wade-Gery — British High Commissioner for India, New Delhi.
2. T. Stubbs — British Deputy High Commissioner, Madras.
3. Jan Stjernsward — Chief, Cancer Unit, WHO, Geneva.
4. Prof. E.J. Ambrose — Emeritus Scientist, London University
5. Harm Meertens — Physicist, Antoni Van Leeuwen Hock Hospital Amsterdam, Holland.
6. Sripathmanathan — Consultant, Maxillo Facial Surgeon Glasgow, England.
7. G. Difronzo — Medical Oncologist, Inst. National Tumoury Milan, Italy.
8. T.K. Dutta — Radiation Oncologist, Allegheny General Hospital, Pittsburgh, USA.
9. Carl J. Von Essen — Director, Swiss Institute of Nuclear Research, Switzerland.
10. Calvin Zippin — Director, Cancer Registry, Cancer Research Institute, University of California, San Francisco USA.
11. Brian I Carr — Medical Oncologist, City of Hope Medical Centre, California, USA.

STAFF

Director : Dr. M. Krishnan Nair
Superintendent : Dr. T.K. Padmanabhan

Radiotherapy

Dr. M. Krishnan Nair : Professor
Dr. T.K. Padmanabhan : Professor
Dr. F. Joseph : Asst. Professor
Dr. V.G. Sudhakaran : Asst. Professor
Dr. B. Rajan : Asst. Professor
Dr. G. Suresh Chandra Dutt : Asst. Professor
Dr. C.S. Rafeeka Beegum : Tutor
Dr. P.G. Jayaprakash : Tutor
Dr. S. Parameswaran : Tutor
Smt. B. Vimala : Radiographer
Mr. N. Sadasivan Nair : Radiographer
Mr. Viswanathan : Radiographer
Smt. S. Suseelamma : Radiographer
Mr. V. Gangadharan Nair : Radiographer
Smt. P. Seetha : Radiographer
Smt. K.M. Saramma : Radiographer
Smt. M. Leela : Radiographer
Mr. S. Sreenivasan : Radium Technician

Dental Section

Dr. Sasidharan Nair M. : Tutor
Smt. Krishnambal : Hygienist
Mr. P.R. Chandrasekharan Nair : Hygienist

Nuclear Medicine

Dr. P. Ramachandran Nair : Associate Professor
Dr. V.M. Pradeep : Research Officer
Mr. Raghu Ram K. Nair : Lecturer
Dr. V. Padmanabhan : Senior Scientific Officer
Mr. Gopinathan Nair : Radiographer
Smt. Sheela : Radiographer

Radiation Physics

Dr. T.P. Ramachandran : Associate Professor
Mr. P.G. Gopalakrishna Kurup : Asst. Professor
Mr. C.A. Davis : Lecturer
Smt. Raheena Beegum : Radiographer
Mr. Georgy Mathew : Radiographer

Cytology

Dr. N. Sreedevi Amma : Associate Professor
Dr. M.K. Lalitha Bai : Asst. Professor
Dr. B. Kumari Chandrika : Asst. Professor
Dr. B. Chandralekha : Asst. Professor
Smt. J. Ambikakumari : Senior Scientific Officer
Mr. G. Raghunathan Nair : Cytologist
Mr. K.V. Vijayagopal : Junior Research Officer
Mr. P. Gopalakrishnan : Research Assistant
Smt. K.S. Ponnamma : Laboratory Technician
Mr. R. Muraleedharan : Laboratory Technician
Smt. Anandavally : Laboratory Technician
Smt. S. Najeeya : Laboratory Technician
Smt. M. Sathy Ammal : U.D. Typist.

Cancer Surgery

Dr. Thomas Cherian : Asst. Professor.

Paediatric Consultant

Dr. Alphonsa J. Erinjeri : Consultant Paediatric Oncologist.

Cancer Research

Dr. J. Stephen : Associate Professor
Dr. B. Prabha : Asst. Professor
Mr. T. Vijayakumar : Senior Research Officer
Mr. K.K. Vijayan : Lecturer
Mr. V.K. Sasidharan : Research Scholar
Mrs. P. Remani : Sr. Research Fellow
Mrs. V. Thankamani : Research Scholar
Mr. Ravindran Ankathil : Research Scholar
Mrs. T.V. Kumari : Research Scholar

Mr. Thomas Abraham	:	Research Scholar
Smt. B. Padamavathi Amma	:	Laboratory Technician
Mr. P. Robinson	:	Laboratory Technician
Smt. C. Gangadevi	:	Laboratory Technician
Mr. Thomas Mathew	:	Laboratory Technician
Mr. Vikraman Nair	:	Animal House Keeper cum Attender
Smt. A. Leela	:	Animal House Keeper cum attender

Hospital Cancer Registry and Medical Record

Mr. P. Gangadharan	:	Biostatistician
Dr. R. Sankaranarayanan	:	Senior Research Officer
Mr. S. Muraleedharan Nair	:	Medical Statistician
Mr. R. Raveendran Nair	:	Medical Records Officer
Miss. G. Padmakumari Amma	:	Senior Research Fellow
Mrs. P.T. Latha	:	Social Investigator
Miss. Anita Nayar	:	Social Investigator
Smt. V. Jalajakumari	:	Clerk
Mr. C.P. Balachandran Nair	:	Clerk
Mr. M.G. Amal Das	:	Clerk
Mr. Rajasekharan Nair	:	Clerk
Smt. Kumari Jaya	:	Coding Clerk
Smt. C. Sreedevi kutty	:	Typist
Smt. S. Ponnammal	:	Receptionist
Mr. K. Sibu Kumar	:	Clerk Typist
Mr. S. Rajayyan	:	Technical Helper

Administrative Office

Mr. E.U. Aravindakshan	:	Administrative Officer
Mr. K. Ramakrishnan Potty	:	Financial Assistant
Mr. K. Parameswaran	:	Secretary & Confidential Assistant
Mr. A. Radhakrishnan	:	Confidential Assistant
Miss. C.G. Thankamani	:	Confidential Assistant
Mrs. K. Lalitha Bai	:	U.D. Clerk
Mr. P. Krishna Pillai	:	U.D. Typist
Smt. J. Ragini Amma	:	Typist-Clerk
Mr. M. Subair	:	Peon
Mr. P. Krishnan Nair	:	Driver.

RECOMMENDATIONS OF THE STATE CANCER CONTROL COMMITTEE

The 1st meeting of the Committee for Cancer Control, Radiotherapy and Cancer Research of Kerala was held on 12th April, 1983, in the Seminar Room of the Regional Cancer Centre. The following members were present.

1	Shri. C. Ramachandran, I.A.S., Secretary for Health, Government of Kerala.	..	Chairman
2	Dr. (Mrs) V.T. Jayalakshmy, Director of Health Services, Kerala.	..	
3	Dr. (Mrs) G. Santhakumari, Principal, Medical College, Trivandrum	..	
4	Dr. M. Krishnan Nair, Director, Regional Cancer Centre, Trivandrum.	..	Alternate Chairman
5	Dr. V.J. Nair, Director & Prof. of Surgery, Medical College Hospital, Calicut.	..	
6	Dr. C.P. Mathew, Prof. of Radiotherapy, Medical Collège, Kottayam.	..	
7	Dr. Gracy Ramachandran, Prof. of Pathology, Medical College, Alleppey.	..	
8	Dr. K. Sreenivasan, Prof. and Head of the Dept. of Radiotherapy, Medical College Hospital, Calicut.	..	
9	Dr. Willie George, Radiotherapist, District Hospital, Ernakulam.	..	

10. Dr. C.D. Joseph, Chief Radiotherapist, Amala Cancer Centre, Trichur. ..
11. Dr. T.K. Padmanabhan, Prof. of Radiotherapy, Regional Cancer Centre, Trivandrum. ..
12. Dr. N. Sreedevi Amma, Assoc. Prof. of Cytopathology, Regional Cancer Centre, Trivandrum. ..
13. Dr. R. Sankaranarayanan, Senior Research Officer, Hospital Cancer Registry, Trivandrum. .. Convener
14. Mr. P. Gangadharan, Biostatistician, Hospital Cancer Registry, Trivandrum. .. Alternate convener
15. Dr. J. Stephen, Assoc. Professor of Cancer Research, Regional Cancer Centre, Trivandrum. } .. (by special invitation)
16. Dr. T.P. Ramachandran, Assoc. Prof. of Physics, Regional Cancer Centre, Trivandrum. }

A successful programme on cancer control covering the country's population can be organised only with active participation and support from the Health care delivery system of the Government, Medical Colleges, Private agencies, and International Health organisations. Further, such a programme should be accessible to the largest sections of the people.

The following are the procedures suggested.

1. Organisation

Cancer control programme should be organised as part and parcel of the general health care delivery system. The

Primary Health Centre should be the first level in undertaking cancer detection. The P.H.C. workers should be trained to do oral examination and to take cervical smear and should also be conversant with warning symptoms of cancer. They should be trained to take the necessary steps in case a suspected case is noted by transferring them to the nearest District/Taluk Hospital for further advice without delay.

The District Hospital should have facilities for diagnosis of cancer and assessment of the extent of disease. 10 beds should be made available for cancer patients. An Oncology unit should be established to co-ordinate the cancer control activities within the District.

The Medical College Hospitals should have all facilities for Cancer diagnosis and treatment and should have 100 beds earmarked for cancer patients. At least two therapy machines are required for each centre. Radiotherapists (atleast two) and complementary staff like Physicist, technicians and nurses should be provided in these centres proportionate to the bed strength.

The Regional Cancer Centre should act as the apex body for cancer control activities in the State, provide all modern facilities for diagnosis and treatment of cancer. It should have facilities for Cancer Research, Central Cytopathology Laboratory, Central Biostatistics cell and Central Rehabilitation Services. It should organise public and professional education programmes and should co-ordinate the activities of cancer control for the State. The Regional Cancer Centre should evolve a programme of education of Primary Health Workers in cancer detection.

Each Medical College may be assigned two/three districts for cancer control work.

An interactive patient referral system, a forum for exchange of scientific information and exchange of visits by technical personnel etc. should be organised between the Co-operating Centres (i.e. the Regional Cancer Centre, the Medical Colleges and specialized cancer hospitals).

Cancer Hospitals and programmes organised in non-Governmental sector should be encouraged to co-operate with the State's Cancer Control Programmes.

Whenever there is a problem regarding the diagnosis, assessment or treatment due to paucity of staff, techniques or facilities, the patient must be referred to the next higher unit without delay.

2. Professional Education

Primary Health Centre

The Primary Health Centre worker's training should be conducted in the nearest District or Taluk Hospital by a team from the Medical College and Regional Cancer Centre. By an organised programme all PHC workers should receive this training in 5 years. The course would be for one month. Content of the course would consist of information about cancer symptoms, oral examination, cervical smear taking, management (advice) of suspected case, public education about cancer, highlighting the positive aspects like curability when detected early, self examination, treatment results of cancer etc. which will be done in the institution and a 3 weeks fixed programme on patient examination and cervical smear collection in the field.

General Practitioners

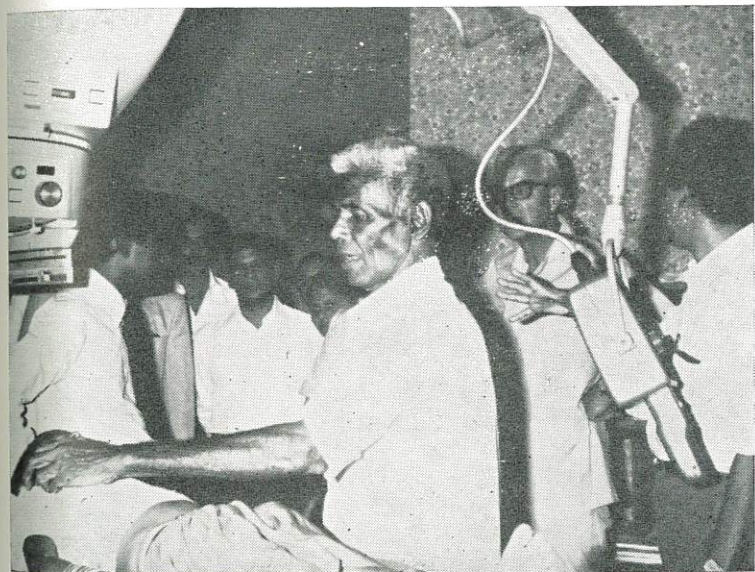
The G.P.'s could be provided with half day orientation/seminars twice a year on cancer conducted in the District/Taluk Hospital. The theme should be to inform the G.P.'s about recent advances made in the detection and treatment of various forms of cancer. They should also be made aware of follow-up procedures after treatment, the chemotherapy administration, its reactions, and management etc.

The Professional Information Service by Regional Cancer Centre

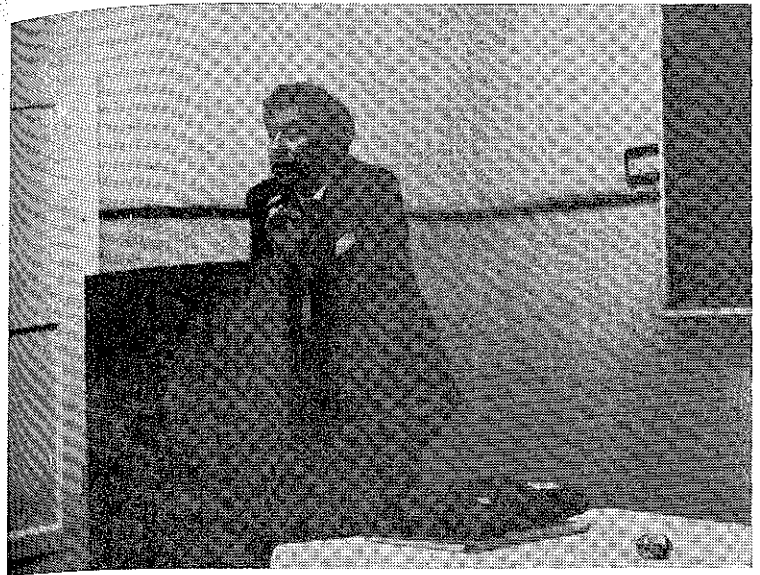
The G.P.'s should be informed periodically by leaflets, publications and seminars about recent advances in the fields of cancer prevention, diagnosis and management.



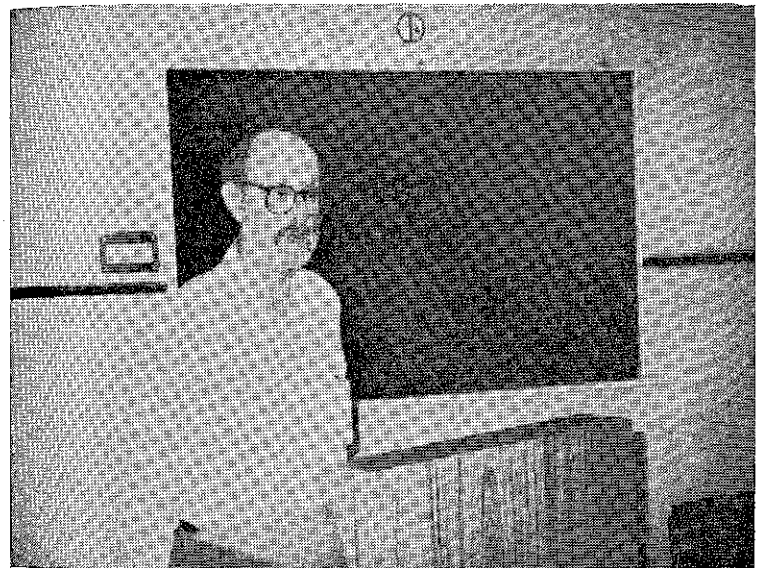
His Excellency Sir Robert Wade-Gery, British High Commissioner for India & Mrs. Wade-Gery



His Excellency at the Theratron 760 tele Cobalt therapy unit



Dr. Jan Stjernsward, Chief Cancer Unit, WHO, Geneva
Inaugurates the Tumour Registrars Training Programme



Dr. Calvin Zippin, Director, Cancer Registry, San Francisco
Faculty Advisor Tumour Registrars Training Programme

The specialists & District/Taluk Hospital Medical Officers

Orientation courses on modern management of cancer by Medical College Staff and Regional Cancer Centre staff would be conducted regularly at District/Taluk Hospitals. There would be periodical feed back of the performance of the programme.

Evaluation of programme

An annual evaluation of the programme is most essential. This would include statistical data analysis in cancer patterns, performance and difficulties of the Co-operating units like PHC, District/Taluk Hospitals, etc. The annual evaluation would be presented by the Regional Cancer Centre. Certain amount of uniformity of data collection is essential for comparisons and evaluation. A uniform Core data form has to be evolved to record both cancer patient information and evaluation of cancer treatment uniformly.

Based on the findings of the annual reports, appropriate research topics both clinical and fundamental should be undertaken collaboratively.

REGIONAL CANCER CENTRE
Income and Expenditure Account for

<i>EXPENDITURE</i>	<i>Rs.</i>	<i>Ps.</i>	<i>Rs.</i>	<i>Ps.</i>
To Opening stock of chemicals, films etc.			28,162.	.00
.. Purchase of chemicals, films etc.			1,33,222.	.36
.. Salaries and allowances			2,97,127.	.58
.. Printing and stationery			12,778.	.29
.. Travelling expenses			77,236.	.45
.. Postage, telegram and telephone			25,577.	.32
.. Advertisement charges			29,017.	.00
.. Repairs and maintenance— Equipments	2,42,307.	.99		
—do— Vehicles	30,565.	.52		
—do— Others	9,659.	.76	2,82,533.	.27
.. Purchase of Medicine			4,575.	.97
.. Audit fee			3,000.	.00
.. Bank charges			98.	.50
.. Interest paid			15,141.	.10
.. Miscellaneous expenses			35,969.	.15
.. Grant received for other schemes disbursed			85,380.	.00
Carried over			10,29,818.	.99

SOCIETY. (Rgen. No. 567/81)
the year ended 31-3-1984.

<i>INCOME</i>	<i>Rs.</i>	<i>Ps.</i>	<i>Rs.</i>	<i>Ps.</i>
By Unspent balance of grant received from Government of India during previous year			34,80,576.	.10
<i>Add:</i> Grant received from Ministry of Health and Family Welfare, New Delhi				
Ist instalment as per letter No.V.-22015/1/83-R dated 1-8-1983			8,00,000.	.00
IInd instalment as per letter No.V.-22015/1/83-R dated 13-12-1983			17,00,000.	.00
			59,80,576.	.10
<i>Less:</i> Unspent balance of grant transferred to B/s.			25,00,000.	.00
			17,93,543.	.54
Unspent balance of grant received from Government of Kerala during previous year				
<i>Add:</i> Grant from Government of Kerala Health (J) Department received during the year. Balance of Grant for 1982-83 as per letter No. 1385/83/HD dated 27-5-1983			3,33,000.	.00
Carried over			34,80,576.	.10

REGIONAL CANCER CENTRE
Income and Expenditure Account for

<i>EXPENDITURE</i>	<i>Rs.</i>	<i>Ps.</i>	<i>Rs.</i>	<i>Ps.</i>
Brought forward			10,29,818.	99
To Depreciation w/off for the year	5,34,269.	44		
Less: Excess depreciation w/off in previous years	8,328.	72	5,25,940.	72
" Grants and other receipts of National Hospital Based Tumour Registry Programme disbursed			2,19,846.	42
" Amounts utilised during the year for acquisition of capital assets adjusted to capital Fund in Balance Sheet			84,30,387.	87
Total			1,02,05,994.	00

SOCIETY, (Regn. No. 567/81)
the year ended 31-3-1984

<i>INCOME</i>	<i>Rs.</i>	<i>Ps.</i>	<i>Rs.</i>	<i>Ps.</i>
Brought forward			34,80,576.	10
By 1st instalment of grant for 1983-84 as per G.O.Rt.No. 2939/83/HD dated 15-11-1983			11,67,000.	00
" 11nd instalment as per G.O. Rt.No. 699/84/HD dated 3-3-1984	5,00,000.	00	37,93,543.	54
" Interest from Bank			1,57,524.	25
" Miscellaneous receipts			2,201.	20
" Closing stock of chemicals, films sundry medical instruments etc. as taken, certified and valued at cost by the Technical Director			32,277.	00
" Grant received for other schemes from I.C.M.R. and B.A.R.C.			85,380.	00
" Grants and other receipts of Hospital based National Tumour Registry Programme			2,19,846.	42
" Excess of expenditure over income for the year			24,34,645.	49
Total			102,05,994.	00

REGIONAL CANCER CENTRE

Balance Sheet

LIABILITIES	Rs.	Ps.	Rs.	Ps.
Capital Fund:				
Amounts utilised by way of acquiring capital assets out of the grant received from Government of India and Government of Kerala as per last B/s.	20,94,716.	27		
Add: Cost of capital assets acquired during the year	84,30,387.	87	1,05,25,104.	14
Unspent balance of grant received from Government of India for purchase of equipments			25,00,000.	00
Expenses payable			3,31,792.	07
Earnest money deposit			66,918.	00
Total			134,23,814.	21

(Sd/-)
Technical Director

SOCIETY, TRIVANDRUM (Regn. No. 567/81)

as at 31-3-1984

ASSETS	Rs.	Ps.	Rs.	Ps.
Fixed assets as per schedule			95,37,375.	43
Deposits for OYT Scheme			8,000.	00
Advances			1,38,908.	98
Prepaid expenses			21,260.	00
Closing stock of chemicals, films, sundry medical instruments etc. as taken, certified and valued at cost by the Technical Director			32,277.	00
Closing balances:				
Cash and stamp balances as certified by the Technical Director:				
Cash in hand	5,701.	68		
Stamps in hand	549.	28		
Balance with State Bank of Travancore in S.B. a/c. No. 9610	3,26,871.	96		
Balance with Govt. Treasury in S.B.a/c	5,00,020.	00	8,33,142.	92
Income and Expenditure Account:				
Balance as per last B/s.	4,18,204.	39		
Add: Excess of expenditure over income for the year	24,34,645.	49	28,52,849.	88
Total			134,23,814.	21

AUDITOR'S REPORT

We have verified the foregoing Income and Expenditure Account for the year ended 31-3-1984 and the Balance Sheet as at 31-3-1984 of Regional Cancer Centre Society, Trivandrum with the cash book, ledger, vouchers and bank pass books produced before us and we certify the same to be correct as disclosed by these records.

Trivandrum,
Dated : 26-10-1984

(Sd/-)
Chartered Accountants

REGIONAL CANCER CENTRE SOCIETY (Regn. No. 567/81)

Schedule of Fixed Assets forming part of Balance Sheet as on 31-3-1984.

No.	Nature of Assets	Written Down value as on 1-4-1983	Additions during the year	Assets of Tumour Registry transferred	Total	Depre- ciation Rate	Depreciation for the year	Written down value as on 31-3-1984
1.	Building under construction	14,840.00	5,500.00	..	20,340.00	..	..	20,340.00
2.	Furniture and fixtures	96,540.00	52,587.48	15,901.00	1,33,226.48	10	13,322.48	1,19,904.00
3.	Office equipments	49,478.00	5,603.68	11,689.00	43,392.68	15	6,508.68	36,884.00
4.	(a) Hospital and Laboratory Equipments	14,57,543.00	18,63,664.40	6,412.00	33,14,795.40	15	4,97,219.40	28,17,576.00
	(b) -do-(Not installed)	..	57,28,190.43	..	57,28,190.43	..	..	57,28,190.43
5.	Vehicles	56,858.00	..	..	56,858.00	20	11,372.00	45,486.00
6.	Library Books	920.00	58,463.88	920.00	58,463.88	10	5,846.88	52,617.00
7.	Capital work-in-progress	..	7,16,378.00	..	7,16,378.00	..	..	7,16,378.00
	Total	16,76,179.00	84,30,387.87	34,922.00	100,71,644.87		5,34,269.44	95,37,375.43

(Sd/-)

Varma & Varma
Chartered Accountants

Trivandrum,
Dated : 26-10-1984

Regional Cancer Centre Society, Trivandrum
Schedules to Balance Sheet as at 31-3-1984

Advances	Rs.	Ps.	Rs.	Ps.
For Purchase of equipments				
Microscope		1260.00		
RTP System		13371.00		
Accelerator		38728.37		
Air conditioner				
(Bank charges for guarantee)		21670.60		
				75,029.97
For purchase of chemicals				
Isotopes (BARC)		5,605.00		
Glassware		660.35		6,265.35
Mr. Mahesh (Architect)				25,000.00
Staff Advance				21,487.00
National Tumour Registry				11,126.66
				<u>1,38,908.98</u>
Expenses payable				
Salaries and Allowances				22,007.11
Service charges				12,626.96
Agency Commission				2,94,158.00
Audit fee				3,000.00
				<u>3,31,792.07</u>

Regional Cancer Centre Society, Trivandrum

Bank Reconciliation statement with State Bank
of Travancore as on 31-3-1984.

Balance as per pass book

Rs. Ps.
3,66,385.56

Add: Cheque deposited on
31-3-84 but not
credited by bank

29,000.00

3,95,385.56

Less: Cheques issued but not
debited by bank

Cheque No.	Amount
139014	855.00
139022	400.00
139025	660.35
139026	520.00
139027	20,000.00
139031	5,619.00
139034	1,329.00
139035	2,533.44
139037	7,800.00
139039	20,000.00
139040	4,816.81
139041	1,550.00
139043	2,430.00

68,513.60

Balance as per cash book

3,26,871.96

UTILISATION CERTIFICATE

Certified that out of the total grant sanctioned to the Regional Cancer Centre Society, (Regn. No. 567/81), Trivandrum during the year ended 31-3-1984 of Rs. 25,00,000/- (Rupees Twenty five lakhs) by the Government of India, Ministry of Health and Family Welfare, New Delhi, towards grant for 1983-84 as per letter Nos. V-22015/1/83-R dated 1-8-1983 as 1st instalment of Rs. 8,00,000/- and letter No. V-22015/1/83-R dated 13-12-1983 as 11nd instalment of Rs. 17,00,000/- for purchase of hospital equipments and to meet the plan expenditure for the development of Regional Cancer Centre and including the unspent balance of grant of Rs. 34,80,576.10 (Rupees Thirty four lakhs eighty thousand five hundred and seventy six and paise ten only) of the previous year, the Society has utilised a sum of Rs. 34,80,576.10 during the year ended 31-3-1984 for the purpose for which the grant was sanctioned and there was an unspent balance of grant of Rs. 25,00,000/- (Rupees Twenty five lakhs only) as on 31-3-1984.

Vazhuthacaud
Trivandrum-14
8-12-1984

Varma & Varma
Chartered Accountants

UTILISATION CERTIFICATE

Certified that out of the total grant sanctioned to the Regional Cancer Centre Society, (Regn. No. 567/81), Trivandrum during the year ended 31-3-1984 of Rs. 25,00,000/- (Rupees Twenty five lakhs) by the Government of India, Ministry of Health and Family Welfare, New Delhi, towards grant for 1983-84 as per letter Nos. V-22015/1/83-R dated 1-8-1983 towards 1st instalment of Rs. 8,00,000/- and letter No. V-22015/1/83-R dated 13-12-1983 towards IInd instalment of Rs. 17,00,000/- for purchase of hospital equipments the Society has utilised a sum of Rs. 3,57,557/- (Rupees Three lakh fifty seven thousand and five hundred and fifty seven only) for the purpose for which the same was granted upto 30.11.1984 and there is an unspent balance of grant of Rs. 21,42,443/- (Rupees Twenty one lakhs forty two thousand and four hundred and forty three only) as on 30-11-1984.

Vazhuthacaud
Trivandrum-14
8-12-1984

Varma & Varma
Chartered Accountants