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HIGHLIGHTS OF ICMR RESEARCH ON NONCOMMUNICABLE DISEASES (1987-88)

Noncommunicable diseases which are the leading causes of morbidity and mortality in the developed world, have now emerged as important health problems in the developing countries too. As many of the major noncommunicable diseases have common risk factors relating mainly to changing life styles, an integrated approach to the control and prevention of these diseases has been adopted by the Council. Appropriate research on behavioural factors and lifestyles that have a direct bearing on the prevalence of noncommunicable diseases will also be undertaken. The next phase of research in noncommunicable diseases is expected to involve the transfer of technological know-how and skill from the laboratory to pilot field projects and thence to outreach programmes at the district and state level for interventional strategies.

INTEGRATED APPROACH TO CONTROL OF NONCOMMUNICABLE DISEASES

There is increasing recognition of the emergence of noncommunicable diseases such as cancer, mental illness, cardiovascular and cerebro-vascular disorders and diabetes as public health problems in developing countries such as India as a result of (i) changes in the health structure and demographic structure of the population (ii) changes in life styles; and (iii) changes in the environment (including air, water, food, occupation etc) as a consequence of industrialisation and urbanisation. Some of these health problems have etiological

commonalities such as tobacco use and diet, which in turn, could be related to "behaviour". At present, health services for noncommunicable diseases are limited to larger towns and cities, and largely are only curative.

The ICMR has constituted an Advisory Group to evolve an integrated approach for the control of major noncommunicable diseases with major emphasis on primary and secondary prevention. In phase I of the study, intensive educational programme for bringing changes in the community with regard to life styles will be undertaken. It is proposed to initiate a multicentric study at 3 centres, viz Bangalore, Delhi and Pondicherry. The Bangalore centre will aim at utilizing the primary health care approach and to integrate noncommunicable disease control as part of the total health care at the Primary health centre (PHC) level, the Delhi centre will use the primary and primordial health care approach aimed at school children, while the Pondicherry centre will employ the rural health care infrastructure at the Medical College for an integrated approach to the control of noncommunicable diseases.

ONCOLOGY

The emphasis on cancer research during 1987-88 has been in accordance with the national priorities. The major areas of cancer research are cancer registration (urban as well as rural) and site specific case control studies, primary and secondary prevention of cervical

and oral cancers, clinical trials on buccal mucosal cancers and study of viruses in cervical cancer.

National Cancer Registry Project

The National Cancer Registry Project (NCRP), initiated in 1981-82 by the Council aims at generating authentic data on the magnitude of the cancer problem; understanding its epidemiological aspects and instituting control measures; and human resource development in cancer epidemiology. The network of NCRP consists of six Population Based Cancer Registries (PBCRs), including one rural PBCR and six Hospital Cancer Registries (HCRs). To facilitate smooth taking over of the Registry by the host Institute/State, it is proposed that the new registries should be given 100 per cent assistance by the Council for the first five years. The quantum of ICMR financial support will be reduced by 25 per cent every five years, with corresponding budgetary increase by the host Institution/State. During this period, the registries would undertake epidemiological and intervention studies, besides authentic data collection on cancer occurrence. The Registry would thus be funded by the host Institution/State after 20 years which would run it according to the guidelines already established.

The data for 1985 for various registries have been compiled. The quality of data collection has continued to be high. A rural PBCR located at Barsi, Maharashtra, would provide data regarding cancer incidence in rural areas of India for the first time. Case control epidemiological studies have been initiated on cancers of uterine cervix, pharynx, oesophagus and stomach. Such studies are expected to throw further light on the causation of these cancers.

Other activities during 1987-88 included the finalization of coding manuals, separately for use at the PBCRs and HCRs; on-site review of technical data at Bangalore and Madras; discussion on histopathological slides with differences of opinion, pertaining to oral and breast cancers, during the meeting of the inter Registry Panel of Pathologists; preparation of monographs on oral cancers; and of a standardized tobacco-alcohol questionnaire.

The data from NCRP clearly indicate the need for initiating action on primary prevention of tobacco related cancers and early detection of cervical cancer.

Other studies proposed to be undertaken include (i) annual surveys of tobacco usage of PBCRs within their area, to estimate the prevalence of tobacco habits; (ii) analysis of death certificates in all PBCRs; (iii) study trends of tobacco related cancers, cervical cancer and breast cancers in the registries; (iv) revision of HCR pro-

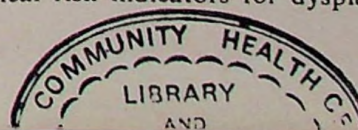
forma and codes for extent of disease; (v) expansion of the Trivandrum HCR to a PBCR; and (vi) constitution of a Task Force to update the WHO histological typing of oral cancers.

Cervical Cancer

The feasibility project for involving the general health infrastructure in prevention and early detection of cervical cancer has completed the preparatory phase, the main contributions of which have been the successful training of paramedical personnel, KAP (knowledge, attitude and practice) survey and preparation of health education material. It was encouraging to note that the paramedical workers could correctly identify the cervical lesions in 81 per cent of cases. Second phase of this study could not be initiated due to unwillingness of the Municipal Corporation of Delhi to issue administrative orders to the concerned personnel at PHC level to carry out the work related to the project; frequent transfers of those trained workers, whose cooperation had been obtained on a non-official basis; non-implementation of ROME (reorientation of medical education) scheme in the true sense; and lack of physical facilities at three subcentres.

On the basis of experience gained from the feasibility project on primary and secondary prevention of cervical cancer, a plan of action for district level screening for cervical cancer among women above 35 years of age is proposed to be initiated in state(s) in which cancer control advisory boards have been constituted. The project will test the feasibility of extending such a programme to the national level; its acceptability by the general population; cost-effectiveness of the approach; determine the reliability of Pap test as a screening procedure; and identification of the risk groups in the community.

Through the study on the uterine cervical dysplasia, carried out at the Cytology Research Centre—CRC (now Institute of Cytology and Preventive Oncology—ICPO), New Delhi, it has been possible to delineate 'high risk' dysplasias from those with 'low risk' based on persistence of dysplasias and other clinico-epidemiological and laboratory parameters during the first year of follow up. Women who revealed evidence of dysplasia three or more times in the first year of follow up had 19 times more risk of progression to malignancy, as compared to those who had no dysplasia during the first year of follow up. Progression to malignancy was significantly influenced by the age of consummation of marriage and the literacy status of women. Cervical erosion and blood stained discharge have been identified as significant clinical risk indicators for dysplasia. Colposcopy has also



been found to be an important aid in the management of early cervical lesions.

In another study, nuclear DNA contents of cervical smears of seven dysplasia cases were retrospectively studied including six dysplasia cases which progressed to malignancy and one case which regressed to inflammation. All the dysplasia cases which progressed to malignancy revealed aneuploid DNA pattern which further strengthens the previous observations that aneuploid DNA pattern may be considered as a high risk factor in the process of cervical carcinogenesis. In addition, the nuclear DNA analysis was also performed on paraffin sections of 15 cases of condyloma acuminata not associated with the dysplastic lesions. All these cases showed aneuploid DNA pattern which also supports the histological diagnosis.

Realising the importance of Human Papilloma Virus (HPV) in cervical carcinogenesis, the CRC, New Delhi has undertaken a multidisciplinary approach to this problem. Cyto/histopathological diagnosis vs. colposcopic findings in 77 samples were found to have a sensitivity for colposcopy in 73.1 per cent, specificity of 58.3 per cent, predictive value of 58.8 per cent and agreement in 58.4 per cent. Similarly comparison of cyto/histopathological findings with immunoperoxidase in 66 samples revealed sensitivity of 63.5 per cent, specificity of 40.9 per cent, predictive value of 35 per cent and agreement in 48.5 per cent. On the other hand when colposcopic findings in 77 patients were compared with the results of immunoperoxidase staining for HPV antigens, sensitivity was as high as 85.2 per cent, specificity 42 per cent, predictive value 44.2 per cent and agreement was 57.1 per cent. These results indicate that molecular hybridization is the most sensitive technique for the detection of HPV infected lesions.

Recent observations have highlighted the role of HPV during the process of cervical carcinogenesis. During 1987-88, techniques such as dot blot, Southern blot and *in situ* hybridization have been standardised at CRC, New Delhi for the detection of HPV-DNA sequences with 55 per cent positivity for HPV-16/18 in patients with cervical cancer. *In situ* hybridisation technique has been standardised using paraffin embedded sections with 70 per cent positivity for HPV. As HPV is sexually transmitted, the CRC has initiated a study to elucidate the role of male partners in its spread.

Sero-epidemiological study on Herpes Simplex Virus (HSV) showed that the frequency of HSV-2 antibody positivity among women with dysplasia and controls increased with age and attains a plateau at 40 years of age. The results have largely been inconclusive.

Other studies being continued at CRC, include studies on uterine cervical dysplasia—Part II with the objectives of (a) in depth study of preventable risk factors (HPV infection, smoking and tobacco consumption, and promiscuity of either partner) for cervical carcinogenesis through a multi-disciplinary approach and (b) management of precancerous and early cancerous lesions of the cervix by various treatment modalities; host immune response in cervical cancer with reference to cell mediated immunity and immunocompetent cells; and pilot study on multidisciplinary approach with emphasis on early diagnosis and prognostic parameters for breast cancer.

Oral Cancer

A collaborative demonstration-cum-research project aimed mainly at assessing the effect of an anti-tobacco community education programme, utilizing the existing health infrastructure has been initiated at Bangalore, Goa, Agra and Trivandrum. The Goa centre included school children and teachers among the categories to be trained. PHC personnel have been trained to inspect the oral cavity, identify lesions and classify them into referable and nonreferable categories, at Bangalore, Goa and Agra. Suitable health education material for oral cancer prevention has been prepared at the Bangalore and Goa centres. The health education material is being prepared at other centres also. The baseline survey to assess the knowledge, attitude and practices regarding tobacco usage has been completed at the Bangalore centre, whereas it has been completed in an experimental area at the Goa centre.

A multicentred clinical trial to compare the efficacy of radiation therapy alone on one arm and radiation plus surgery on the other was initiated at Bombay, Delhi and Trivandrum. The case registration had started with the use of a standard proforma.

In the area of tobacco and health, it is proposed to initiate work on tobacco economics and burden of tobacco related diseases. The Council supported and participated in various workshops conducted on primary and secondary prevention of tobacco related diseases.

Nasopharyngeal Cancer

The Regional Medical Research Centre (RMRC) at Dibrugarh has initiated epidemiological studies on cancer of nasopharynx in Assam, Nagaland and Manipur and case control studies in nasopharyngeal carcinoma. Smoke dried meat, vegetables and soots were collected from villages and processed for Ames test at this Centre. Preliminary studies using *Salmonella*

typhimurium - TA 100 strain suggest that the soots have mutagenic activity.

CARDIOVASCULAR DISEASES

Research in cardiovascular diseases (CVDs) was continued during 1987-88 with emphasis on the pathogenic mechanisms of various CVDs and launching of preventive operations against them. A centre for preventive cardiology is proposed to be established to undertake planned epidemiological studies to determine the prevalence and trends of CVDs, the profile of determinants in the community and formulating as well as evaluating the efficacy of appropriate intervention strategies and establishment of disease specific registries for follow up care. The emphasis will be placed on organising special programmes for primordial and primary prevention of CVDs in the form of dietary and behavioural modifications including control of tobacco smoking and weight reduction by physical exercise.

Rheumatic Fever and Rheumatic Heart Disease

The ICMR's programmes in rheumatic fever-rheumatic heart diseases (RF-RHD) are aimed towards both basic and applied research through its Centre for Advanced Research, Task Force and *ad-hoc* research projects. At the Centre for Advanced Research on RF-RHD, in-depth studies on diagnostic criteria, clinical and immunological profile, genetic marker and bacteriological studies on streptococci are being continued. Reagents have been developed for performing the Strep A direct swab test which enables the rapid identification of group A streptococci within a few minutes, at the field level. Comprehensive humoral and cellular immunological, and immunohistopathological studies have suggested the pathogenetic mechanisms involved in acute rheumatic fever. Evidence of immunodysregulation and heightened cellular and humoral immune responses has been demonstrated. Clinical, immunological and radionuclide scintigraphic methods are being employed for identification of rheumatic activity. Immunogenetic studies are being carried out for identification of high risk subjects for the purpose of primary prophylaxis. A Task Force project on community control of RF/RHD with the aim to test the feasibility of utilising the existing health infrastructure at the PHC level for primary prevention, detection and management of RF-RHD has been completed at the three centres, viz Delhi, Varanasi and Vellore. This study is one of the first in the South-East Asian region to consider the integration of RF-RHD control with primary health care services. The study has confirmed the feasibility of such a programme. Imparting health education has been an integral component in the intervention strategy. The KAP survey results have

been utilized in the preparation of two video films, various posters, flip cards and stickers. The health education material is being utilized in the field to create greater awareness and enhance the response towards seeking treatment for sore throat, RF and RHD by the community. UNICEF has shown keen interest in providing financial and technical help for the preparation of educational material. A workshop for transfer of technology and dissemination of the lessons learnt from the pilot studies was conducted and two more centres were inducted into the programme. An outreach programme for community control of RF/RHD at the existing centres is proposed to be mounted this year. The control of RF-RHD utilizing the existing school health services has also been continued during the year.

Coronary Heart Disease

A collaborative study is being initiated at Delhi and Vellore for evaluation of the epidemiological characteristics of coronary artery disease (CAD) in rural and urban populations. Studies on Indian immigrants in United Kingdom (UK), Trinidad and South Africa have shown a higher mortality due to CAD in this group as compared to the native population. Research in collaboration with UK is proposed through extensive epidemiological data incorporating prevalence and associated risk factor study so as to suggest remedial action in the form of preventive strategies.

Cardiomyopathy

At the Centre for Advanced Research in Endomyocardial Fibrosis (EMF), Trivandrum, studies on myocardial cell cultures, cardiac basement membrane *etc* have been undertaken to identify ultramorphologic and biochemical differences between the normal and diseased hearts. Experimental studies are being carried out for evaluating thorium toxicity. Natural history of EMF is also being assessed with special emphasis on early stages of the disease.

Hypertension

India is one of the 39 participatory countries in the WHO-ISFC international collaborative study on INTERSALT. Population groups at New Delhi and Ladakh have been studied to assess the role of salt intake on blood pressure. The results are under analysis at the central laboratory in Belgium.

MENTAL HEALTH

Earlier studies undertaken on mental health have demonstrated that it is possible to provide basic mental health care in rural areas by integrating mental health

with general health care. The feasibility of integrating health care of the rural aged with the primary health care infrastructure has also been demonstrated and results of this feasibility project will have direct application in the National Mental Health Programme. The results of operational research in extension of mental health care to rural areas are being utilised in the implementation of the National Mental Health Programme. During 1987-88 studies were continued on the course and outcome of schizophrenia, health modernity education, psychopathology of depression and suicidal behaviour, as well as psychosocial stress and coping behaviour in young women, monitoring use of opiate drugs and on developing indicators of mental health.

Schizophrenia

Results of the recently completed study on factors associated with course and outcome of schizophrenia have given important leads to help in the management of schizophrenia patients and reduction of disability due to this mental disorder.

The results indicate that the predictors of outcome during the second, third and fourth year follow up remain almost the same, viz shorter duration of index episode, regular drug compliance, perception of patient as being not dangerous, presence of agitation and absence of symptoms such as worrying and social unease. It has also been found that negative attitudes of key relatives, viz critical comments, hostility and dissatisfaction had negative correlation with the outcome of the disease. Longitudinal data show that the relapses mainly contribute to worsening of outcome. The predictors of relapses are also being studied.

The results so far obtained indicate that outcome of schizophrenia can be improved by reduction in duration of index episode through early detection, better drug compliance and positive attitudes of relatives. The results of offshoot studies when available, can help in the management of schizophrenics and in reduction of disability due to this disease. It would also be possible to include these aspects in the training of primary health care staff for the management of psychiatric cases thus directly helping in the National Mental Health Programme.

Health Modernity Education

The health modernity education project being conducted in a tribal population of Ranchi district has main focus on the personal habits, environmental sanitation and attitudes towards health and disease. The health modernity education material has been developed and is being evaluated.

The dimensions included in personal habits are alcohol and tobacco use, washing of hands after meals and toilet, washing of mouth, regular bath and cleaning of hair. The dimensions for environmental sanitation are safe drinking water and covering of wells, spread of infection through contact with animals, cattle management, garbage disposal, disposal of faeces and drainage of water away from wells and other sources of drinking water. Under attitude to health and disease, the attitude and practices regarding the treatment of the mentally ill, social stigma regarding physical diseases, such as leprosy, tuberculosis, immunisation of children and utilisation of local health services have been included. It has been proposed to use several methods for giving the messages such as flip charts, posters, small group discussions, etc. The outcome of this project is expected to have vast applications.

Monitoring Use of Opiate Drugs

During 1987-88, a project on monitoring use of opiate drugs in the community was initiated at Delhi, Jodhpur and Lucknow with the main objectives of establishing a system of uniform and continuous data collection on pattern and extent of opiate drug use by covering all the treatment/counselling/rehabilitation facilities in a city; and monitoring the trends of opiate drug use on a long term basis.

As a first step, the three centres are in the process of establishing rapport with all governmental and non-governmental treatment/counselling agencies in the respective areas. The scope of this study has been expanded to include all drugs, taking into consideration the report of the Expert Committee of the Ministry of Health & Family Welfare on Deaddiction Services in the Country and the Narcotic and Psychotropic Substances Act 1985.

It has also been proposed to initiate the treatment evaluation study for the existing modalities of treatment of drug dependence.

Non-Medical Use of Drugs in the Community

The intervention study on non-medical use of drugs, being carried out at Bangalore, Delhi, Dibrugarh and Ranchi has been completed. Health education material on alcohol and tobacco has been developed and evaluated and has been found to be effective in reduction/prevention of their use.

Psychopathology of Depression and Suicidal Behaviour

Research on psychopathology of depression and suicidal behaviour as well as on psychosocial stress and

coping behaviour in young women is in progress at the Centre for Advanced Research on Health & Behaviour, at Madurai. The main objectives of the study are evaluating the antecedent behavioural pattern in depressives and suicidal persons, crisis intervention, and stress and coping behaviour.

The study on suicidal behaviour included 250 suicide-attemptors. In suicide completors, a detailed psychological autopsy was carried out, which included collection of relevant information from the surviving members of the family of the deceased. Statements, remarks, evidences of alterations in mood, behaviour, habits and suicidal note, if any, were collected. The survivors of suicidal attempts were submitted to detailed clinical examination and assessed on various psychometric instruments of lethality, depression, hopelessness, personality factors, stressful life events and family and social integration. A few broad diagnostic categories have emerged: inter personal difficulties leading to acute crisis (family, marital, academic, and occupational), mental illness, immature personality characterised by impulsiveness, traits of delinquency, and physical illness like peptic ulcers, bronchial asthma, gynaecological problems, premenstrual syndrome and dysfunctional uterine bleeding.

In the study on psychopathology of depression, a battery of psychometric tests were administered. Blood and urine samples (day and night) at the time of index evaluation were collected for estimation of melatonin and cortisol. From normal control subjects, matched for age and sex, blood and urine were collected for estimation of melatonin and cortisol. The subjects have also been investigated for the presence or absence of cognitive disturbances during the episode of depression. These evidences are being correlated with social factor of stressful life events and with the melatonin and cortisol levels. Following remissions, the subjects were being studied for evidence of cognitive errors in information processing, such as arbitrary inference, selective obstruction, personalisation, overgeneralisation, pseudological thinking. Correlation of these disturbances and cognitive symptoms in the depressive phase and in remission with the hormonal profile is being done.

Indicators of Mental Health

During 1987-88, the Council initiated a Task Force project in collaboration with WHO on indicators of mental health at three centres, viz Bangalore, Delhi and Lucknow with the main objectives to develop indicators in areas of subjective well-being with focus on well-being of young women and healthy child development; to develop intervention strategy to improve the well-being

of young women; and to study the impact of intervention on young women and child development.

In the first phase, development of instruments and reliability exercises are being carried out for measures of subjective well-being, home risk card and nutritional status and cognitive development of children.

The existing psychosocial intervention strategies have been reviewed. The intervention strategies to improve subjective well-being and self-image of young women will be developed after examining the results of phase-I.

It is planned to establish a Centre for Advanced Research on Behavioural Psychopharmacology at the Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, to conduct research on psychotropic drugs, biological basis of behaviour, biological markers in mental diseases and related areas.

A Centre for Advanced Research on Drug Abuse is proposed for carrying out research on a long-term basis on the epidemiology of drug abuse, culture specific treatment aspects, basic research on etiology of addiction and other related aspects of drug dependence.

Some activities of the Centre for Advanced Research in Community Mental Health at National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, have found application in the National Mental Health Programme. These are (i) preparation of training packages in mental health for primary health care workers, doctors and other para-medical personnel; (ii) preparation of mental health education material; and (iii) long-term epidemiological studies in the field. The Centre has also undertaken the publication of a community mental health newsletter.

To continue research efforts in the field of community mental health, on a long-term basis, it is proposed to convert the existing ICMR Advanced Centre at NIMHANS, Bangalore, into a 'Centre for Research in Community Mental Health' during 1989-90. The main objectives of this Centre will be (i) to undertake epidemiological, phenomenological and intervention research to assist in the development of mental health services; (ii) to develop and evaluate suitable models of care for the rural mentally ill, including rehabilitation and disability reduction, involving the primary health infrastructure and the community; (iii) to serve as a central place for training for mental health personnel in the above area; and (iv) to act as a clearing house for dissemination of information regarding innovations in mental health care and related issues to professionals, planners, administrators and the general public.

OPHTHALMIC SCIENCES

During 1987-88, the thrust areas of research in ophthalmic sciences continued to be cataract, operational research on mobile eye camps and Eales' disease. These programmes are being organised in collaboration with the National Programme for Control of Blindness, and as part of the Indo-US Science and Technology Initiatives (1983).

Cataract

Phase II study has been completed involving screening of selected population and examination of target cases of the collaborative study on cataract (epidemiological study) at 4 centres: two with high/medium prevalence of cataract (Angamaly, Calcutta) and the other two with the low prevalence of cataract (Raipur, Dharamsala). Phase III of the collaborative study on cataract *ie* the intervention phase will be initiated during the next year.

Another hospital-based case control study on senile cataract was initiated to identify the risk factors and assess their importance in the development of senile cataract. So far 4168 persons have been screened and 1210 patients and 512 controls included in the study. Data collection is expected to be completed in September, next year, after which the information will be decoded and analysed.

Eales' Disease

Laboratory and clinical studies on Eales' disease were continued during 1987-88 with the main objective to characterise the immune status of patients with Eales' disease, to evaluate the effectiveness of combined cryo and photocoagulation of specific retinal lesions. Laboratory studies on 48 patients and 29 controls indicated no differences between patients and controls with reference to general immune status, serum immunoglobulin levels, lymphocyte subsets and lymphoproliferative response to mitogens. In clinical studies, of the 57 patients so far included, 22 belong to group I in which one eye of the patients will be treated and the other eye serves as control. In group II, patients are randomised as cases and controls. So far, 40 eyes (22 in group I and 18 in group II) have been treated and patients are being followed up.

Nutritional Blindness

Under the Indo-US Science & Technology Initiatives (1983) Programme in blindness prevention, study was continued during 1987-88 for detecting anterior segment collagenase activity in keratomalacia in 35 children with corneal lesions and 30 controls matched for age

with protein energy malnutrition but without corneal lesions and in 19 normal children. It was found that children with corneal lesions and keratomalacia had significantly higher collagenolytic activity as compared to normals. Serum alpha-2 macroglobulins and vitamin A levels were found to be related to nutritional status and not to corneal lesions.

Mobile Eye Camps

In the study on Operational Research on Mobile Eye Camps, 8 camps have been visited for on the spot assessment by a team consisting of a social scientist and an ophthalmologist. Seven more camps were identified to be visited during 1988 and the report was expected to be ready by September, 1988.

ORAL HEALTH

During 1987-88, studies on the development of feasibility module for primary prevention of dental caries and gingival diseases in children in the community within the existing health infrastructure, development of different biomaterials for oral health and development of dental fillers for restorative dentistry were continued.

It is proposed to estimate the fluoride content in drinking water from different samples and to do the fluoride mapping of the country using the village as a unit. This will be initiated as a new Task Force project as recommended by the expert group. It is proposed to have at least 4 centres which will act as the receiving points for the water samples from the respective regions. The location of these centres will be decided based upon the magnitude of the fluoride problem in that region, availability of laboratory facilities for fluoride estimation and availability of field staff who will work in that region. Four cities identified as strategic points are Dibrugarh (Assam), Jodhpur (Rajasthan), Hyderabad (A.P.) and Pondicherry.

In-depth, long-term studies on prevention of dental caries and periodontal diseases through study of inhibitors of cariogenicity of dental plaque, and role of trace elements are proposed to be initiated through a Centre for Advanced Research.

NEUROLOGICAL SCIENCES

During the past decade, multicentred clinical and epidemiological studies were undertaken on epilepsy, head injury, peripheral neuropathy, subarachnoid haemorrhage, and Landry's Guillain Barre (LGB) Syndrome. These studies have attempted to describe the clinical presentation and associated etiological factors of the various disorders in the Indian population. It is proposed to initiate projects in the field of neuroepidemiol-

ogy, neurotraumatology and stroke. Neuroepidemiological data on the magnitude of occurrence of various types of neurological disorders among the Indian population are largely not available. A tentative plan for undertaking a rural as well as urban based study in 3-4 centres in the country is under preparation.

An Advanced Centre for Research on Neurobiology has been proposed with a multidisciplinary approach for the study of various neurological conditions, ranging from molecular biology to bio-behavioural aspects. This centre will be provided with up-to-date facilities and human resources from various disciplines to undertake both basic and applied frontline research.

ACCIDENTS, DISABILITY AND REHABILITATION

In the past decade, there has been a concerted effort to undertake research on the magnitude of different types of accidents, rehabilitation and possible preventive measures. Having completed the collaborative study on the prevalence and etiology of hearing impairment, an intervention study on hearing impairment has been initiated in Delhi and Trivandrum with the objective to test the feasibility of its primary and secondary prevention involving the Integrated Child Development Services scheme, PHC, and school health services. Baseline survey and preparation of appropriate health educational material has been completed, while the intervention phase has been initiated.

In order to develop health education material for prevention of physical disability, a study has been completed to gather and consolidate the existing information on this subject. It is proposed to be followed up with an appropriate intervention programme to develop health education models aimed at reducing the prevalence of physical disability.

HAEMATOLOGY

The Institute of Immunohaematology (IIH) at Bombay continued its research and service activities in the field of immunohaematology.

Immunological Studies

Uptake of human anti-H specific antibodies for t_1 and t_2 type H chain on red cells was studied on 50 normal individuals. Similar uptake of t_1 and t_2 specific antibodies was observed on cord as well as adult 'O' group cells. t_1/t_2 ratio was 0.43 for adult 'O' cells and 0.32 for cord 'O' cells. While t_2 antigenic sites were 2 to 3 times more on 'O' cells as compared to A, B or AB cells, almost the same number of t_1 antigenic sites were observed on all types of cells.

AIDS surveillance resulted in detecting 2 subjects positive for anti-HTLV-III antibodies. One was a patient of SLE (a female of 16 yrs age) and another a drug addict (a male French national aged 41 yrs). Positivity was confirmed by Western blot in both subjects.

Systemic lupus erythematosus (SLE) patients were investigated for anti-nucleoside antibodies. Antibodies were detected against all the nucleosides though most of the patients had antibodies to cytidine (79%) followed by uracil (56.3%), guanosine (44.5%), adenosine (30.9%) and thymidine (20%). There was a change in the specificities of antibodies to nucleosides in some patients after treatment with steroids or immunosuppressive drugs.

Peroxidase anti-peroxidase technique was used on bone-marrow and peripheral blood smears to classify leukaemia. Since leukaemia patients have a large number of leucocytes it was easy to judge the results. The peripheral blood smears from normal persons will now be subjected to the same techniques.

Genetic studies are being continued in tribal populations to get a comprehensive and comparative information on Bhils from Rajasthan, and Pardhan, Raj Gonds and Naik Gonds from Maharashtra.

Thalassaemia

The thalassaemia screening programme was continued in high school children at Bombay, Calcutta and Delhi centres in order to assess the prevalence of thalassaemia variants. The study also covers patients of homozygous thalassaemia and cord blood for screening of alpha thalassaemia. So far, 8803 school children, 5986 samples of cord blood and 78 patients of thalassaemia have been covered.

Leukaemia

A collaborative study on leukaemia initiated earlier at Bombay and Calcutta was extended to Delhi and Trivandrum for assessing the efficacy of different treatment regimens in acute myeloid (AML) as well as acute lymphatic leukaemia (ALL) in both adults and children. In all, 75 patients of AML and 97 of ALL were inducted into this study, which was concluded during 1987-88. The salient preliminary findings are that most of the ALL patients fall into L_1 and L_2 groups as per FAB classification. Remission rates using ALL-2 regimen (Vincristine 1.4 mg/ M^2 /wk x 6 wks, L-asparaginase 6000 units/ m^2 IM x alt. days x 10 days and prednisolone 40 mg/ m^2 daily x 6 wks) appear to be higher than with ALL-1 regimen (Vincristine 1.4 mg/ m^2 /wk x 6 wks, Adriamycin 30 mg/ m^2 /wk x 6 wks, and prednisolone 40 mg/ m^2 daily x 6 wks). Relapse rates were higher with ALL-1 regimen.

In the case of AML patients, M₂ group of FAB system was most common, with M₁, M₄, M₃, M₅ and M₆ in descending order of frequency. Remission in one third of the cases was achieved using either of two regimens AML-1 (Adriamycin 30 mg/m² x 2 wks, cytosine arabinoside 100 mg/m²/day iv infusion over 12 hrs x 5 days, 6-mercaptopurine 100 mg/m²/day x 5 days) and AML-2 (Cytosine arabinoside and 6-mercaptopurine as in AML-1). Relapse rates were of the order of 60 per cent. The data are being further analysed.

Haemophilia

A collaborative study on haemophilia to assess the magnitude of the problem, quality control of various tests and reagents, and production of blood components was initiated at three centres viz Delhi, Bombay and Vellore in 1985. It has been observed in All India Institute of Medical Sciences (AIIMS), New Delhi that one of every 10,000 new patients seen at the outpatient department is a haemophiliac. The proportion of haemophilia A was 66.6 per cent at Vellore, 75.0 per cent at Delhi and 81.2 per cent at Bombay, while that of haemophilia B was 15.5, 10.0 and 6.2 per cent respectively. Severe haemophiliacs constituted 52 and 18 per cent of the patients at Delhi and Bombay respectively; the reasons for this difference are not clear at present. A comprehensive laboratory manual for performing the various investigations in haemophilia patients has been prepared. Production of cryoprecipitates increased two to three fold in the different study centres since the initiation of this study.

Haematological Studies in Tribals

In Orissa, individuals with G-6-PD deficiency and sickle cell disease have been reported. The RMRC, Bhubaneswar, has organized a sub-centre for studying sickle cell disease-trait in western districts of the State. Studies

on G-6-PD deficiency are being carried out in Keonjhar district—a tribal area endemic for malaria.

Studies on sickle haemoglobin and G-6-PD deficiency in tribals carried out by RMRC for Tribal Health at Jabalpur, have shown a higher incidence of sickle haemoglobin (22.8 per cent) in the *Baiga* tribe than the *Gond* tribe. Even the backward classes in the Baiga Chak area have a high incidence (22.72%). Three homozygous cases have been detected. There was not much difference in the mean Hb levels between sickle cell group and normal group, indicating that sickle cell may not be playing an important part in the incidence of anaemia. Mating pattern and marital distances were also studied in the same area. The high frequency of endogamy in the area with an average short marriage distance of about 20 km will enhance the possibility of exposing the deleterious recessive genes.

A cross-sectional study on the impact of sickle cell disease on the growth of tribal children of Mandla district is in progress.

The RMRC, Dibrugarh, has studied the distribution of haemoglobinopathy and G-6-PD deficiency among the tea garden labour population of Bokel, Dikom, Muttack and Nudwa Tea Estates of Dibrugarh district. A total of 208 blood samples have been collected at random from the labour population and analysed. Thirty (14.4%) samples had the abnormal haemoglobin pattern. Sickle cell trait was observed in 29 individuals (13.9%), and one subject with sickle cell anaemia was also detected. The frequency of abnormal sickle cell haemoglobin observed was 44.4 per cent, 40.0 per cent, 28.8 per cent and 28.6 per cent among the *Lohars*, *Karmakars*, *Tantis* and *Das* communities respectively. A total of 55 samples screened for G-6-PD deficiency did not reveal any abnormality. Further studies are in progress.

ICMR NEWS

Shri Ram Niwas Mirdha, Hon. Union Minister for Health & Family Welfare and Textiles, presented various ICMR Awards and Prizes for the year 1988 to outstanding Biomedical Scientists, at a function held at the ICMR Headquarters, New Delhi, on June 10, 1989.

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The 64th meeting of the Governing Body of the ICMR was held on June 10, 1989, at the ICMR Headquarters, New Delhi. Concurrently, a 'brain storming session' of the Governing Body was also held on June 10-11, 1989 in which highlights of research activities of three permanent Research Institutes of ICMR viz. the

Tuberculosis Research Centre, Madras; National Institute of Nutrition, Hyderabad; and National Institute of Virology, Pune were presented. The presentation was made with the assistance of audio-visual programmes and transparencies by the Directors and Senior scientists of the concerned Institutes.

Project Review Committee (PRC)/Project Advisory Committee (PAC) meetings of the Council, held during the month:

PRC on Tuberculosis

June 13, 1989
(at New Delhi)

PRC on Leprosy	June 16, 1989 (at New Delhi)
PAC on Ophthalmology	June 19, 1989 (at Bhopal)
PRC on Malaria, Leishmaniasis and Filariasis	June 19, 1989 (at New Delhi)
PRC on Diarrhoeal Diseases	June 21, 1989 (at New Delhi)
PRC on Microbiology	June 23, 1989 (at New Delhi)

Dr. S.P. Tripathy, Addl. Director-General, ICMR and Dr. K. Banerjee, Director, Council's National Institute of Virology, Pune, participated in the V International Conference on AIDS, at Montreal, Canada (June 4-9, 1989).

Dr. Usha K. Luthra, Addl. Director-General, ICMR, participated in the meeting of the WHO Advisory Committee on Health Research, at Yogyakarta, Indonesia (June 4-12, 1989).

Dr. S.P. Tripathy has taken up an assignment as a WHO short-term consultant on Tuberculosis, at Manila, Philippines (June 19-July 18, 1989).

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Participation of ICMR Scientists in Scientific Events:

Dr. A.S. Paintal, Director-General, ICMR, participated in the meeting of the Executive Council of the Society for Scientific Values, at New Delhi (June 2, 1989).

A meeting of the Working Group of the Planning Commission for formulation of 8th Plan proposals for Medical, Health Research & Development Sector, was held at the ICMR Hqs., New Delhi (June 27, 1989).

ICMR AIDED SYMPOSIA/SEMINARS/WORKSHOPS/COURSES/CONFERENCES

Symposium/Seminar/Workshop/ Course/Conference	Date & Place	Contact Address
Workshop on Techniques in Human Cytogenetics.	June 19 to July 22, 1989; Bangalore	Dr. I.M. Thomas, Professor & Head, Department of Anatomy and Head, Division of Human Genetics, St. John's Medical College, Bangalore.
International Symposium on Biology and Chemistry of N-Nitroso Compounds.	June 23-25, 1989; Bombay	Dr. S.V. Bhide, Organising Secretary, Association for Cancer Research and Head, Carcinogenesis Division, Cancer Research Institute, Bombay.
International Workshop on Women and Development: A Critical Appraisal of Household Level Research Methodologies.	July 2-11, 1989; Baroda	Dr. Amita Verma, Child Development Department, Faculty of Home Science, M.S. University of Baroda, Baroda.
I National Workshop on Enzyme Histochemistry and Immunohistochemistry.	July 5-22, 1989; Madras	Dr. M. Madhavan, Professor & Head, Department of Pathology, Dr. ALM Postgraduate Institute of Basic Medical Sciences, Madras.
Continuing Medical Education on Nuclear Medicine in Today's Practice.	July 15-16, 1989; Hyderabad	Dr. Kakarla Subbarao, Director, The Nizam's Institute of Medical Sciences, Hyderabad.
Continuing Medical Education Programme on Rheumatology Update.	August 12-13, 1989; Hyderabad	Dr. Kakarla Subbarao, Director, The Nizam's Institute of Medical Sciences, Hyderabad.
VII IMA/CGP National Conference on General Practice.	August 18-20, 1989; Varanasi	Dr. S.P. Gupta, Organising Secretary 7th IMA/CGP National Conference, IMA House, 7/31, Chetganj, Varanasi.
National Seminar on Strategies for Optimal Management of Cancer in Developing Countries.	August 24-27, 1989; Srinagar	Dr. Shad S. Akhter, Department of Medical Oncology, Sher-I-Kashmir Institute of Medical Sciences, Srinagar.

Symposium/Seminar/Workshop/ Course/Conference	Date & Place	Contact Address
Seminar on New Trends in Methodology for Social and Population Research.	October 1-3, 1989; Tirupati	Prof. K. Mahadevan, Department of Population Studies, S.V. University, Tirupati.
National Workshop on Burns Injuries and their Sequele.	October 7-8, 1989; Chandigarh	Dr. C.P. Sawhney, Professor & Head, Department of Plastic Surgery, Postgraduate Institute of Medical Education and Research, Chandigarh.
Brachytherapy Workshop for Cancer Cervix.	November, 1989; Betul (M.P.)	Dr. Anand Vijay Kumar, Secretary, Paramedical Section, Christian Medical Association of India, Smruti Theatre Compound Nagpur.
All India Symposium on Biophysics of Cell Structure and Function.	November 6-8, 1989; Chandigarh	Dr. P.C. Mangal, Chairman, Department of Biophysics, Panjab University, Chandigarh.
Seminar on Zoonoses.	November 9-10, 1989; Dibrugarh	Dr. L.P. Datta, Director, Regional Medical Research Centre (ICMR), P.B. No. 105, Dibrugarh.
Workshop on Recent Advances in Intensive Care.	November 26-30, 1989; New Delhi	Dr. H.K. Kaul, Professor & Head, Department of Anaesthesiology, All India Institute of Medical Sciences, New Delhi.

COUNCIL'S TRAINING PROGRAMMES

Leprosy

At the Central Jalma Institute for Leprosy, Agra:

- ... Training Course on Leprosy for Medical Officers (August/September, 1989).

Virology

At the National Institute of Virology, Pune:

- ... Short-term Course on Detection and Isolation of Arboviruses Using Mosquito Inoculation and Mosquito Cell Culture (October, 1989).

Endocrinology

At the National Institute of Nutrition, Hyderabad:

- ... Annual Training Course on Endocrinological Techniques and their Application (August/September 1989).

Nutrition

At the National Institute of Nutrition, Hyderabad:

- ... Annual Certificate Course in Nutrition (December 1, 1989 to February 28, 1990).

Occupational Health

At the Regional Occupational Health Centre (Southern), Bangalore:

- ... Refresher Course for Industrial/ESIS Medical Officers (July 24-28, 1989).

At the National Institute of Occupational Health, Ahmedabad:

- ... Refresher Course for Industrial/ESIS Medical Officers (October 9-14, 1989).
- ... Training Course on Disaster Management of Hazardous Chemicals in Industry for Industrial Physicians, Chemists, Safety Officers, Hygienists (November 6-10, 1989).

Cytology

At the Institute of Cytology and Preventive Oncology, New Delhi:

- ... Indo-US Workshop on Chemoprevention of the Uterine Cervical Dysplasia with Nutrient Intervention (December, 1989).

Haematology

At the Institute of Immunohaematology, Bombay:

- ... Training Course in Blood Banking Technology and Immunohaematology for Technicians (August 1-31, 1989).
- ... Training Course in Blood Banking Technology and Immunohaematology for Medical Officers (August 1 to September 30, 1989).

Medical Entomology

At the Vector Control Research Centre, Pondicherry:

- ... Two year M.Sc. Course (Trimester pattern) in Medical Entomology (from July 1989).

Laboratory Animal Technology

At the Laboratory Animal Information Service Centre, National Institute of Nutrition, Hyderabad:

- ... Training Course for Laboratory Animal Supervisors (September 1 to November 30, 1989).

Clinical Pharmacology

At the Seth G.S. Medical College, Bombay:

- ... Training Course in Clinical Pharmacology (November/December, 1989).

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