

Indian Council of Medical Research

Background

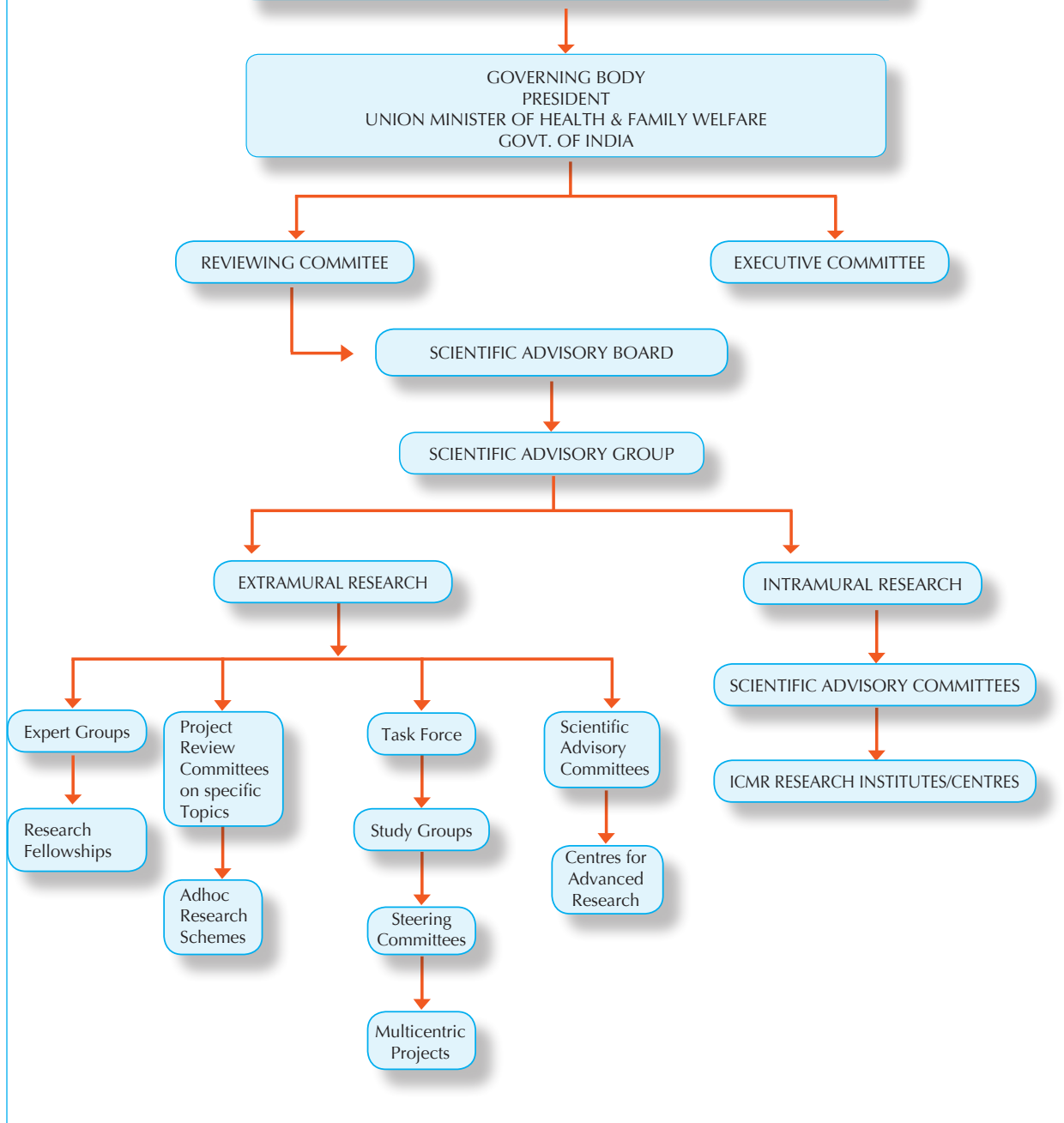
The Indian Council of Medical Research (ICMR) is one of the oldest medical research councils in the world. Administering and monitoring of ICMR is one of the ten business allocated to new Department of Health Research (Ministry of Health & Family Welfare) created in 2007.

In 1911, a handful of officers of the then Indian Medical Services (IMS), with vision and foresight, successfully created the Indian Research Fund Association (IRFA). In 1950, the IRFA was renamed as the Indian Council of Medical Research in pursuance of the recommendations of the Health Survey and Development Committee, headed by Sir Joseph Bore. What started in a 3-room office with a skeletal staff of 5 people at the Headquarters has today blossomed into a vibrant network of 32 Institutes including 6 regional centres and over 70 field stations in various parts of the country, employing over 5000 personnel. Its annual budget has grown over the years from Rs.0.05 crores in the year 1911 to the current level of Rs. 803 crores (Rs.531crores plan budget and Rs.272 crores non-plan budget).

ICMR promotes biomedical research in the country through intramural research (by its own Institutes/Centres) and extramural research (through grants-in-aid given to projects through a transparent rigorous review process to non-ICMR Institutes). The extramural research is supported through (i) setting up Centres for Advanced Research in different research areas around existing expertise and infrastructure in selected departments of Medical Colleges, Universities and other non-ICMR Research Institutes; (ii) Task force studies which emphasise a time-bound, goal-oriented approach with clearly defined targets, specific time frames, standardized and uniform methodologies, and often a multicentric structure; (iii) long term projects targeting issues like vector control, nutrition, reproductive health, etc; (iv) Open-ended research on the basis of applications for grants-in-aid received from scientists for medical research from medical colleges and research institutes located in different parts of the country.

Human resource development for biomedical research is encouraged by ICMR through various schemes such as (i) Research Fellowships *i.e.* Junior & Senior Fellowships and Research Associateships; (ii) Short-term Visiting Fellowships (which allow scientists to learn advanced research techniques from other well-established research Institutes in India); (iii) Short-term Research Studentships (for undergraduate medical students) to encourage them to familiarize themselves with research methodologies and techniques; (iv) various Training Programmes and Workshops conducted by ICMR and its Institutes/centres; (v) travel grants for participation in conferences abroad. ICMR also offers the position of Emeritus Scientist to retired scientists/teachers to enable them to continue or take up research on specific biomedical topics.

Review System of ICMR



The ICMR has evolved over the years in line with changing health research needs, effectively addressing the new challenges that have emerged. The current strategy is to have close interaction with national health systems, including disease control programmes, which are supported by the continued exploitation of scientific and technological advances from basic to applied research, from biomedical to health sciences, and from laboratory to field research.

Vision & Mission

ICMR is now one of the constituent bodies of the newly created Department of Health Research (DHR), whose vision is “to bring modern health technology to the people through innovations related to diagnostics, treatment methods and vaccines for prevention; to translate them into products and processes and in synergy with concerned organizations to introduce these innovations into public health systems”.

The Mission of the ICMR is to promote better health in India through research. It provides stewardship, conducts and supports health research, generates knowledge and ensures its utilization, and develops resources for health research in areas of national public health importance.

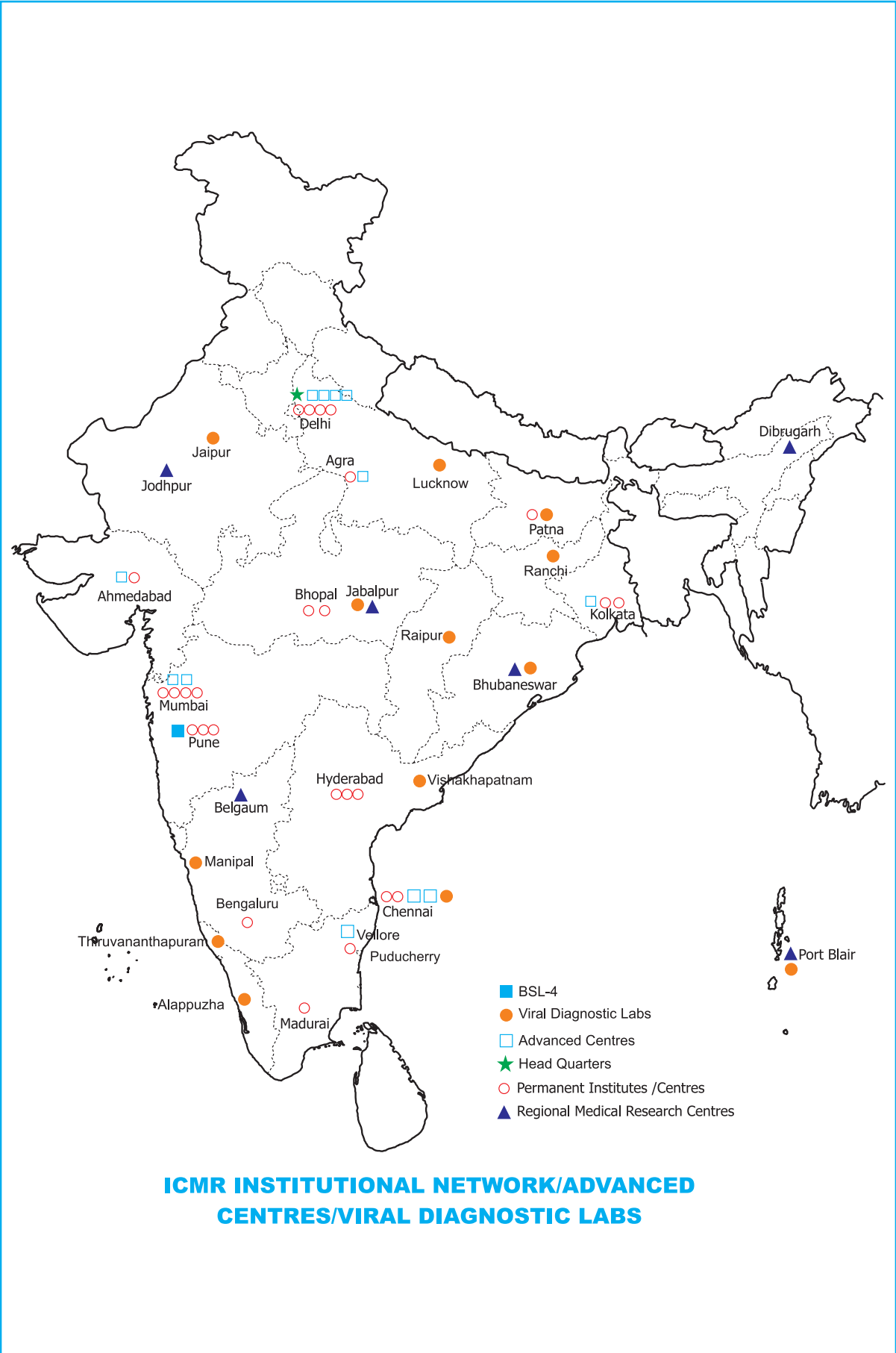
Since the creation of DHR in September, 2007 in the Ministry of Health & Family Welfare, ICMR serves as the fulcrum for DHR by conducting and supporting research and development for the benefit of the Indian public. The seamless integration between the ICMR (generation of new knowledge) and the DHR (putting this new knowledge to public good) has started in earnest.

ICMR also acts as a technical research arm of the Health Ministry to investigate health emergencies, outbreaks of new infections, complementing National Centre for Disease Control (NCDC) and is called upon to provide critical inputs for National Disease Control Programmes, activities of Drug Controller General of India (DCGI) etc. In addition it is required to represent Indian Medical Research in all bilateral and multinational health research commitments of Govt of India. It also provides support to States Govt's health programmes, disease surveillance & surveys, research & diagnostic support program implementation, international cooperation, etc.

Strategy

Besides its traditional approach, in recent years ICMR has adopted two new strategies to strengthen its activities:

- Application of available knowledge, under the prevailing socioeconomic and cultural environment, through Health Systems Research involving interdisciplinary efforts between biomedical, social and behavioural sciences with epidemiology acting as a bridge;
- Application of the powerful tools of modern biology to identify causal factors, basic mechanisms of disease, risk factors, and development of affordable diagnostics and methods/tools of intervention such as new therapeutic agents as well as vaccines.



ICMR research priorities match with the National health priorities/policies

- The Control and management of communicable diseases
- Research on major non-communicable diseases like cancer, cardiovascular diseases, blindness, diabetes and other metabolic and haematological disorders; mental health research and drug research (including traditional remedies).
- Fertility control
- Maternal and child health
- Control of nutritional deficiency/disorders
- Health Systems Research: Developing alternative strategies for health care delivery
- Containment within safety limits of environmental and occupational health problems
- Social Behavioural Research
- Human Resource Development

Review System of ICMR

ICMR has well structured system of external review of all its programmes. The reviewing system at ICMR is described below:

The President of the Governing Body (GB) (now renamed as Governing Council) of the ICMR is the Union Minister for Health & Family Welfare, and Vice-President is the Health Secretary. The Governing Body comprises eminent scientists/public health experts as also elected members of the Parliament. The Scientific Advisory Board (SAB) of the ICMR is the highest technical body which reviews the work of ICMR and advises on both short term and long term research policies, strategies, thrust areas of research *etc.* Each of the ICMR Institutes/Centres has, a Scientific Advisory Committee (SAC) which comprises of experts (subject specialists) in the specific areas of research undertaken by the specific Institute/Centre. The full SAC meets at least once a year while the members interact with the Institute throughout the year. Each technical Division at the ICMR Hqrs has a Scientific Advisory Group (SAG) which meets annually and is composed of experts in the respective fields. The SAG essentially reviews the extramural activities of the concerned Divisions, and also deliberates on the linkages between intramural and extramural research activities.

The reports of the SACs of Institutes and SAGs of Technical Divisions of ICMR headquarters are placed before the SAB for its consideration, while the report & recommendations of the SAB are placed before the Governing Body. Like all Federally (centrally) financed Institutions ICMR submits its Annual Report to the Parliament and its Plan document to the Planning Commission.

From time to time the Government of India constituted Review Committees which looked into the working of the ICMR from the scientific, administrative and financial angles, including the working conditions of staff *etc.* in the late 1960s and the early 1980s. The last Reviewing Committee of the ICMR submitted its report in 1984. A 'Performance Appraisal Board' (PAB) was set up in 2004 to evaluate the performance of the ICMR and submitted its Report in 2005. The current High Power Committee constituted in 2012 has specific mandate to review ongoing research activities of ICMR which were initiated in XI five year plan and have been proposed to be continued to XII Plan.

Impact of ICMR's Research on Public Health at Global and National Level

Disease Control/Management

Infectious Diseases

- Kyasanur forest disease (KFD) in the Sagar Soraba area of Shimoga district in Karnataka was discovered. Vaccine against KFD was prepared.
- Developed common regimen for treatment of leprosy, now adopted as Uniform Multi-drug Therapy Regimen (UMDT) by the World Health Organization (WHO).
- The directly observed treatment short course (DOTS) strategy is currently a globally accepted for control of Tuberculosis.
- Demonstrated the presence of HIV infection in India in 1980s and supported initiation of country-wide sero-surveillance.
- Contributed significantly to Polio Research and Global Polio Eradication Program and helped in achieving Polio free status in India.
- The demonstration of oral rehydration (ORS) could prevent mortality due to diarrhoeal diseases was an important milestone.
- Home available fluids (HAF) such as *Sherbat* (salt, sugar, lemon, either singly or in combination) or tender coconut water, pressed rice water has been found to be equally effective and more acceptable than oral rehydration solution (ORS).
- A new toxigenic strain of *Vibrio cholerae*- *V. cholerae* 0139 – was detected and characterized. A new phage typing scheme for *V. cholerae* biotype Eltor strain has been developed.
- An enteroaggregative *Escherichia coli* (E AggEC) has been isolated as possible etiological agent of acute diarrhoea among children in Kolkata.
- Immune-chromatographic dipstick kit for the rapid diagnosis of cholera was developed with ICMR support.
- Partnered with the development of Indigenous cholera vaccine now undergoing evaluation.
- Showed that co-administration of albendazole with DEC is operationally feasible, safe for community use and has an edge over DEC alone for the lymphatic filariasis.
- Direct Agglutination Test (DAT) was established for early diagnosis of Kalazar

Nutrition

- Methods of control and prevention of various nutritional diseases/disorders.
- Development of technology for double fortification of cooking salt with iron and iodine.
- Vitamin A prophylaxis for children to prevent nutritional blindness; iron and folic acid supplementation for pregnant women to improve birth weight of infants.
- Technical support on food testing and safety issues to regulatory authorities in India.

- Determination of nutritive value of Indian foods.
- Establishing Recommended Dietary Allowances (RDA) for Indians.

Vector Control

- Cell culture from mosquito (*Aedes albopictus*) tissues was established for the first time at NIV, Pune.
- Bioenvironmental methods of malaria control as an alternative to insecticide based approach were developed and applied in different eco-epidemiological zones of the country which proved cost effective, sustainable and eco-friendly.
- Community based integrated vector management programme achieved significant reduction in vector density for the control of filariasis in Cherthala, Kerala.
- Biological control of mosquitoes through biocides using *Bacillus sphaericus* and *Bacillus thuringiensis* and larvivorous fish such as Guppy (*Poecilia reticulata*) and Gambusia (*G. affinis*) was demonstrated.
- Use of Remote sensing and Geographical Information System was established for assessing the density of malaria vectors.
- A kit for Japanese Encephalitis (JE) developed and supplied for national programme.
- Sibling species in malaria vectors were identified which has helped in malariogenic stratification of the country.

Fertility

- Clinical trials for introduction of contraceptives into the National Family Welfare Programme.
- A low cost high sensitivity test for pregnancy was developed.

Non Communicable Diseases

- Defined the problems of blindness, hearing impairment, cancer and mental illness and haemoglobinopathies.
- Provided the basis for formulation of new programmes for non-communicable diseases (cancer, blindness, deafness, mental health).
- A new blood group, the Mumbai group was discovered by NIIH, Mumbai.
- Developed magnifying devise (Magnivisualizer) for cervical cancer screening in the field.

Policies and Guidelines

ICMR has developed/ partnered with the agencies/department for policies:

- First National Health Research Policy in 2004.
- Ethical Guidelines for Biomedical Research on Human Subjects (2000, 2006, 2008).
- National Guidelines for Stem Cell Research and Therapy (2007, 2012).
- Guidelines for Safety Assessment of Foods Derived from Genetically Engineered Plants (2008, updated 2012)

- Guidelines for evaluation of Probiotics in Food jointly with DBT (2011).
- Guidelines for Biomedical and Behavioural Research in HIV/AIDS, and Guidelines for management of Type-II diabetes.
- National Guidelines for Accreditation, Supervision and Regulation of Assisted Reproductive Techniques (ART) Clinics in India.
- Guidelines and regulations for international collaborative research including transfer of biological material.
- Knowledge Management Policy in partnership with DHR.

Biomedical Communication

- The *Indian Journal of Medical Research* (IJMR) is the one of the oldest (1913) monthly journal of ICMR with Impact Factor of 2.061 which is the highest for biomedical journals in India.
- Bio-informatics Centre at ICMR Headquarters provide information related to different activities of the ICMR and provide open access to information and data-bases of the ICMR.

Intellectual Property/Patents/Technology Transfer

- To encourage the generation of new Intellectual Property and participate in the development of products and processes useful to national health programmes, the ICMR formulated and adopted an Intellectual Property Rights Policy in 2002.
- Over 100 important technologies relevant for public health for the diagnosis of major communicable diseases, genetic diseases, vector control, cancer control and vaccines; more than 50 patents during last five years; 30 technologies to be ready in 2013-14 (diagnosis of tuberculosis, diabetes, kala-azar, dengue, malaria, diarrhoea, cancer, leptospirosis, vaccines for JE & Hepatitis E and products for vector control, etc).

National/International Recognitions for Excellence

WHO Affiliated Centres

Centre for Research in Medical Entomology (CRME), Madurai

- ◆ For Research on lymphatic filariasis and dengue.
- ◆ TDR-WHO Centre for Asian Biosafety Training Course for Genetically Modified Mosquitoes (2008-2011)

Enterovirus Research Centre (ERC), Mumbai

- ◆ WHO's Global Specialized laboratory for Polio.
- ◆ Global Specialized Laboratory for Polio (GSL) – the only laboratory, among the seven laboratories so far recognized, outside the developed world.

Institute of Cytology and Preventive Oncology (ICPO), Noida

- ◆ For Research & Training in Cytology and HPV Vaccine.

National Institute for Research in Tuberculosis (NIRT), Chennai

- ◆ TB Research and Training and a Supranational Reference Laboratory for Mycobacterial Microbiology.
- ◆ Genotypic drug resistance testing of HIV.

National Institute of Occupational Health (NIOH), Ahmedabad

- ◆ WHO Collaborating Centre for Occupational Health in South-East Asia region.
- ◆ Participating institute for International Programme on Chemical Safety (IPCS) - a programme organized jointly by WHO, International Labour Organization (ILO) and United Nations Environmental Programme (UNEP).

National Institute of Epidemiology (NIE), Chennai

- ◆ WHO Collaborating Centre for Leprosy Epidemiology and Research and identified as Regional Institute for South India for the Annual HIV Sentinel Surveillance Program of NACO.

National Institute of Nutrition (NIN), Hyderabad

- ◆ WHO Collaborating Centre for Nutrition in health development and serving as the secretariat for the WHO South East Asia Nutrition Research-cum-Action Network (SEARCA network).

National Institute of Cholera and Enteric Diseases (NICED), Kolkata

- ◆ WHO Collaborating Centre for reference & research in vibrios and research & training on diarrhoeal diseases and a Focal Research Laboratory of the Asia Pacific PulseNet Molecular Electronic surveillance.

National Institute of Immunohaematology (NIIH), Mumbai

- ◆ WHO has listed it as a training centre under its Regional Directory of Training Institutes and training centre in "Transfusion Medicine" and "Advanced Haematology and Immunohaematology" for its in Country Fellowship Training Programme.

National Institute for Research in Reproductive Health (NIRRH), Mumbai

- ◆ WHO Collaborating Centre for Research and Training in Reproductive Health.

National Institute of Malaria Research (NIMR), New Delhi

- ◆ WHO Reference Centre for sibling species identification and insecticide testing equipments and a National reference centre for evaluation of insecticides, biopesticides, biological agents, diagnostic kits and resistance monitoring.

National Institute of Pathology (NIOP), New Delhi

- ◆ WHO recognized centre for research & training in advanced molecular techniques in tumour biology and infectious diseases for pathologists & laboratory technicians.

National AIDS Research Institute (NARI), Pune

- ◆ WHO Collaborating Centre for HIV Diagnosis and Monitoring of Antiretroviral Therapy.
- ◆ First WHO accredited laboratory in India for carrying out anti-HIV drug resistance genotyping.

National Institute of Virology (NIV), Pune

- ◆ WHO Collaborating Centre for Arbovirus and Haemorrhagic Fever Reference and Research and a WHO National Influenza Center in India and WHO Influenza A H5 Reference Laboratory for South East Asia.

Rajendra Memorial Research Institute of Medical Sciences (RMRIMS), Patna

- ◆ WHO Reference Centre for Leishmania Parasite and Sera Bank.

Vector Control Research Centre (VCRC), Puducherry

- ◆ WHO Collaborating Centre for Research & Training in Lymphatic Filariasis and Integrated Methods of Vector Control.

National Referral Centres

Institute of Cytology and Preventive Oncology (ICPO), Noida

- ◆ National Referral Centre for HPV and Cervical Cancer Screening.

National Institute for Research in Tuberculosis (NIRT), Chennai

- ◆ National Research Lab for RNTCP Programme of Government of India.

National JALMA Institute for Leprosy & Other Mycobacterial Diseases, Agra

- ◆ Molecular surveillance of the resistance in Leprosy.
- ◆ National Research Lab for Tuberculosis for 4 states (Assam, Himachal Pradesh, Uttarakhand and Eastern UP) and repository centre for mycobacterial strains.

National Institute of Malaria Research (NIMR), New Delhi

- ◆ National biological resource for malaria parasite repository, insectary with different genetic strains.
- ◆ National Pharmacovigilance Centre for Malaria and National Referral Centre for Quality Assurance of laboratory diagnosis of malaria.

National Institute of Medical Statistics (NIMS), New Delhi

- ◆ Nodal institute for NACO's programme on HIV Sentinel Surveillance, Modelling Estimation and Projection of HIV/AIDS in India.

Other International Referral Centres

National Institute for Research in Tuberculosis (NIRT), Chennai

- ◆ Recognized for establishment of International Centre of Excellence in Research by NIH, USA.

National Centre for Disease Informatics (NCDIR), Bangalore

- ◆ Data included in International Agency for Research on Cancer (WHO)'s publication 'Cancer Incidence in Five Continents, Its cancer atlas project helped map patterns of cancer in a cost effective way using recent advances in electronic information technology.

National Institute of Cholera & Enteric Diseases (NICED), Kolkata

- ◆ Collaborative Research Centre for Studies on Emerging and Re-emerging Infections, Okayama University, Okayama, Japan.
- ◆ It is also one of the study sites of the Global Enteric Multi-centric Study supported by Bill and Melinda Gates Foundation.

National Institute of Immunoheamatology (NIIH), Mumbai

- ◆ Recognition by INSERM (Paris) as international associate laboratory

National AIDS Research Institute (NARI), Pune

- ◆ Clinical Trial Unit under AIDS Research Programme of National Institutes of Health, USA.

Human Resource Development

- NIE is a member of global network of field-based training programmes, namely, Training Programmes in Epidemiology and Public Health Interventions Network (TEPHINET).
- National Institute of Immunohaematology (NIIH), Mumbai is a World Federation of Haemophilia (WFH) Training Centre in genetic diagnosis of haemophilia for South East Asia.
- NIE, Chennai initiated Two years master's level training programmes in the field of epidemiology and public health and Ph.D. programmes in epidemiology, biostatistics and social sciences recognized by the University of Madras, Chennai.
- NIE also trained over 90 'in-service' medical officers from 18 States in the field epidemiology/public health and Set up the ICMR School of Public Health and managing the ICMR partnership for Schools of Public Health.
- NIRT, Chennai trained over 5000 RNTCP personnel during the last decade.
- NIN, Hyderabad is running a Postgraduate Certificate Programme in Nutrition. It also offers M.Sc. (Applied Nutrition) with Dr. NTR University of Health Sciences. In 2009, M.Sc. (Applied Nutrition) programme was converted from a 9 month course to a regular two-year masters degree.
- NIN, Hyderabad in collaboration with Ministry of Health & Family Welfare has organized training of trainers for the National Programme for Prevention and Control of Fluorosis.
- NARI, Pune played a major role in 'train the trainers' programme for counselors, feasibility study for prevention of mother to child transmission of HIV, external quality assurance programme for HIV testing and CD4 counts as well for medical officers in the National antiretroviral treatment programme.
- Many of the ICMR Institutes are involved in Ph.D, MD, theses, project dissertations and have also been involved in training of the Laboratory Technicians, Medical Officers, District Health Officers, Students, Nurses, Epidemiologists, Physicians, Public Health Officials, etc and are recognized by different Universities.
- National Institute of Virology (NIV), Pune conducts a two year Master of Science in Virology
- Vector Control Research Centre (VCRC), Puducherry conducts a two year postgraduate programme on M.Sc. Public Health Entomology affiliated to Pondicherry University

ICMR Completes Hundred Years in the Service of the Nation

ICMR completed 100 years in the service of the Nation on 15th November 2011. Many events were organized by the ICMR Hqrs and its Institutes/centres to mark the occasion.

- For Centenary celebration a special centenary logo of ICMR was designed.
- The ICMR conceived and developed a centenary calendar depicting electron micrographs of important microorganism (viruses, bacteria, cells).
- The Department of Post and Telecommunication released Rs.5.00 commemorative postal stamp on ICMR to commemorate its centenary.
- The Ministry of Finance, Govt. of India issued Commemorative Rs.5.00 and Rs.100.00 coins on ICMR.
- The ICMR also organized a day long medical symposium on the occasion of year long closing ceremony of ICMR centenary celebrations. Many distinguished medical professionals, academicians, scientists highlighted the contributions of ICMR in medical research.

Following books/documents were also prepared and brought out:

- Compendium of ICMR Research Papers (1919-2010)- a consolidation.
- ICMR's Most Cited Research Papers: A Chronicle (1950-2010).
- Citation Classics of ICMR's Research Papers (1950-2010) – Five Most Cited Papers in Priority Areas of the Council.
- Bibliographic Details of Ten Most Cited Papers (Categorized under priority areas of the Council).
- Directory of Health Research Institutions of India.
- DVD's on research activities and contributions of ICMR Institutes/Centres.
- The ICMR Institutes/Centres also organized many seminars/symposia/conferences brought out many publications, and organized scientific lectures in connection with the celebration of ICMR Centenary.