



Indian Council of Medical Research

A Beacon of Biomedical Research in India

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THE Indian Council of Medical Research (ICMR) has always maintained its research focus on new scientific areas in biomedical research on the one hand, and to the need of finding practical solutions to the health problems of the country, on the other. Today, ICMR's 26 National Institutes dedicate themselves to research on specific diseases like tuberculosis, leprosy, cholera and diarrhoeal diseases, viral diseases including AIDS, parasitic diseases like malaria, kala-azar, vector control, and other health topics such as nutrition, food & drug toxicology, reproduction, immuno-haematology, oncology, epidemiology, medical statistics, etc.

ICMR's six Regional Medical Research Centers located strategically in different geographic regions of the country work on regional health problems, and also strengthen research capabilities in their regions.

ICMR Strategic Plan and Agenda 2030

In 2017, ICMR developed its *Strategic Plan and Vision 2030* document. It is conceptualised on five primary pillars:

1. Strengthen health research capacity in the country;
2. Organize data systems and research platforms;
3. Leverage traditional medicine;
4. Enable evidence to policy translation and
5. Strengthen programme implementation through research.

ICMR's research priorities and projects are well-aligned and harmonised with the National Health Policy (NHP) 2017. In recent years, ICMR has also focused on diseases targeted for elimination (Kala-azar, Filariasis, Leprosy, Malaria, HIV/AIDS and Tuberculosis), child and adolescent health, universal immunisation, communicable diseases.

ICMR has initiated a mission mode project on Tuberculosis, namely "India TB Research Consortium (ITRC)" to boost TB elimination efforts, which has been sanctioned Rs. 139 crore from the Government of India for the next three years. It facilitated the development of Truenat Rif, an indigenous, cheaper, rapid molecular diagnostic kit for diagnosis of Tuberculosis and multi-drug resistant tuberculosis in collaboration with the Department of Biotechnology, Govt. of India and an Indian industry.

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Activities

Research (Intramural & Extramural)

Inter-sectoral Collaboration

Human Resource Development

26
Permanent
**Institutes/
Centres**

1. DMRC, Jodhpur
2. NICPR, Noida
3. NARI, Pune
4. NARF, Hyderabad
5. NCDIR, Bangalore
6. NICED, Kolkata
7. NIE, Chennai
8. NIMR, New Delhi
9. NIMS, New Delhi

57 Field
Stations

10. NIN, Hyderabad
11. NIRT, Chennai
12. NIREH, Bhopal
13. NIV, Pune
14. NJIL&OMD, Agra
15. NIOH, Ahmedabad
16. NIIH, Mumbai
17. NIOP, New Delhi
18. NIRRH, Mumbai

31 Population
Based Cancer
Registries

27 Hospital
Based Cancer
Registries

19. RMRC, Bhubaneswar
20. RMRC, Port Blair
21. NIRTH, Jabalpur
22. RMRIMS, Patna
23. RMRC, Dibrugarh
24. NITM, Belgaum
25. VCRC, Puducherry
26. RMRC, Gorakhpur

Malaria, Leishmaniasis, Filariasis, Diarrhoeal diseases, Leprosy, Tuberculosis, HIV/AIDS, Poliomyelitis, Other viral diseases, Cancer, Occupational Health, Blood Disorders, Reproductive Health, Nutrition, Epidemiology, Medical Statistics, Regional Health Issues

With a target of Tuberculosis elimination by 2025, another ambitious pilot project is focusing on active case finding in five States for bridging the gap in the last mile delivery of services amongst tribal populations using 35 Mobile TB Diagnostic Vans under the TIE-TB project.

ICMR is also working closely with the National AIDS Control Organisation and is committed to the global call to 'End AIDS' by 2030.

ICMR's major thrust in the government's leprosy elimination programme is exploring the prophylactic role of a leprosy vaccine to prevent leprosy transmission in household contacts of leprosy patients in four districts in Gujarat and Bihar.

ICMR has also demonstrated kala-azar elimination in Bihar's Vaishali district by adopting strategies combining vector control, active case finding and treatment using single drug therapy. The Vaishali model is now being scaled-up by the Govt. of Bihar and Jharkand. To address post-elimination challenges, ICMR has established Post-Elimination Agenda for

Kala-Azar (SPEAK) India Consortium, which will work in all four endemic States (Bihar, Jharkhand, UP and West Bengal).

Special research programmes are being planned in the areas of Japanese Encephalitis (JE), Acute Encephalitis Syndrome (AES), Filariasis and Malaria.

ICMR has also formulated "Guidelines for Management of Cancers" (for nine cancer sites) which have been widely disseminated to medical colleges and institutes to guide practicing physicians. To understand clinical and genetic risk factors in India centric breast cancer patients, a multi-centric study has been initiated in different geographical regions of the country.

The India Childhood Leukemia Study is aimed to standardise treatment protocol across various medical institutes and is expected to address the treatment related issues in children with leukemia.

ICMR's cancer registries also provide authentic data on cancer estimates across different regions of the country and focus on the pattern of care and survival studies. The North



ICMR won the prestigious Kochon Prize for TB Research in March 2018

East region of the country is shown to have the highest Age Adjusted Incidence Rates amongst males in Aizawl (Mizoram) and amongst females in Papumpare district (Arunachal Pradesh). For early detection and treatment, screening of three common cancers (oral, breast and cervix) is being undertaken in the rural areas of Cachar, Silchar. ICMR in collaboration with the Government of Rajasthan is also undertaking a programme for breast cancer screening in the State of Rajasthan.

In the area of cardiovascular diseases and hypertension:

- **Novel ST Elevated Myocardial Infarction (STEMI)** care pathway developed. Pharmaco-invasive approach has been recommended for the peripheral centres that can extend the golden hour to 24 hours for enabling life-saving intervention such as angioplasty. Similarly, in the area of neurosciences, ICMR supported special skills building training and interactive virtual modules (web based, tele-education and real time simulation) and e-learning platform development by IIT Delhi and AIIMS, Delhi.
- **India Hypertension Management Initiative** has been designed by ICMR to support Government of India's target of 25 percent reduction in high blood pressure

and premature death from cardio-vascular diseases. This aligns well with government's commitment to universal care and projects.

- **Indian Stroke Clinical Network (INSTRuCT)** will provide solutions to unmet clinical needs of stroke patients and will cover areas such as rehabilitation of stroke patients through text and video messages, finding the benefits of early detection of Ischemic condition in stroke, diabetes, prevention of blindness, deafness, oral health, sickle cell anaemia/thalassemia and mental health.
- **Anti-Microbial Resistance (AMR) Surveillance Network (AMRSN)** is a very critical research area for ICMR. ICMR is systematically monitoring anti-microbial resistance (AMR) in its network of five key medical colleges spread all over the country each of which is linking to 4-5 smaller centers to systematically map AMR in the country.

Issues related to nutrition such as pesticide residues, food safety, and genetically modified foods are in the forefront of research. ICMR's National Institute of Nutrition in Hyderabad

has developed a Mobile App on 'Dietary Guidelines for Indians'. ICMR has tested a micronutrient fortification mix containing seven micronutrients (iron, folic acid, B12, B2, zinc, vitamin A and vitamin C) of food supplements (Grow Smart) through ICDS programme of the Government of India in 22 villages of Telangana and conducted impact evaluation of Mid-Day Meal (MDM) in 21 States in India.

Major Achievements of ICMR

Diagnostics: Immuno-diagnostic tests (FLA-ABS, SACT-ELISA, PGL-ELISA, etc.) for multi bacillary leprosy developed. Commercial diagnostic kits for JE, West Nile (WN), Dengue (DEN) and Chikungunya (CHIK) developed and transferred to the industry. Development of indigenous ELISA kits for diagnosis of Hepatitis A&B, and a highly sensitive and specific diagnostic kit for detection of IgG antibodies against paragonimiasis (disease mimicking tuberculosis in north-east India) are close to commercialisation. Other diagnostic products in the final stages of development include a new phage typing scheme for *Vibrio cholerae* biotype El, Immuno-chromatographic dipstick kit for the rapid diagnosis of cholera, Direct Agglutination Test (DAT) for early diagnosis of kala-azar, test for molecular diagnosis of beta thalassemia, test for detection of pathogenic bacteria in food and non-invasive procedure for diagnosis of visceral leishmaniasis from urine or saliva.

Vaccine Development/Drug Efficacy Trials: One of the most significant accomplishments is development of indigenous vaccine (JENVAC) against Japanese Encephalitis (JE) with support from Bharat Biotech Pvt. Ltd. ICMR partnered in the development of indigenous cholera vaccine, conducted the largest BCG clinical trial in the world to demonstrate its efficacy only in children and against disseminated forms of tuberculosis, but not in adults. Clinical Trials of new combination anti-malarial drugs, efficacy of Short Course Chemotherapy (SCC) in pulmonary, extra-pulmonary and MDR-TB, domiciliary treatment of TB was accepted by the whole world after successful trial by National Institute for Research in Tuberculosis in south India.

Medical Technology/Devices: ICMR supported development of various technologies and devices and they include affordable glucometer and strips for diabetes, magnifying device (Magnivisualiser) for cervical cancer screening, bioenvironmental approaches for malaria control (e.g. Larvivorous fishes, biolarvicides, etc.) and demonstration of a successful community based integrated vector management programme at Cherthala, Kerala against filariasis.

Environmental Health: ICMR studies led to shifting of all silver foundries from residential zone to forestall community exposure in Gujarat. Evidence generated by ICMR led to cancellation of registration of Methomyl by the Pesticide Registration Committee. ICMR has also made recommendations in the area of Byssinosis like health conditions following jute dust exposure. ICMR provided evidence in Nickel controversy

in chocolates/hydrogenated oil Integrated Environment Programme on Heavy Metals Pollution (Phase-I & Phase-II) and conducted integrated environmental epidemiology study in identified critically polluted areas of the country.

National Registries/Surveillance/Disasters:

- Clinical Trial Registry-India (CTRI) to register all clinical trials in India.
- National Cancer Registry Programme to provide data on cancers in India.
- Registry of Young Diabetes revealed presence of at least five variants of diabetes and in younger population; type 2 diabetes is increasing over the years.
- National Rotavirus Surveillance Network (NRSN), Bacterial Meningitis, Virus research and diagnostic laboratory network, Polio surveillance and research support for Polio elimination and Antimicrobial Resistance Surveillance Network (AMRSN) established.
- ICMR is an important partner of NACO's HIV sentinel surveillance.

Next Steps

ICMR is working to strengthen the national capacity to carry out multidisciplinary research by training and mentoring researchers in research institutions, universities and govt. medical colleges.

ICMR generates huge volumes of data through intramural and extramural research programmes. Making these datasets as well as the data generated through publicly funded research available to different stakeholders, policy making and programme strengthening to improve public health will be stressed. It will open avenues for estimating/comparing disease burden, hypothesis generation, evidence for policy formulation and evaluation of interventions. ICMR will also transform individual data sources into thematic data repositories and assimilate the repositories to a comprehensive data warehouse. The data warehouse will be made available to stakeholders for use through advance data analytics platform.

ICMR will further strengthen its abilities by focusing on the elimination of existing diseases, and also work on the new emerging diseases with cutting edge translation health research. The focus will be to stand out as a formidable and strong structure of international class and quality to continue to work as per the country's needs. There is a hope, confidence and expectation that health research at ICMR and in India can lead to effective solutions for the problems confronted by our country and also by other countries in the world.

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