

**Review Statement to be laid on the table of both Houses of Parliament along with the Annual Report and Annual Accounts together with Audit Report thereon for the year 2024-25 in respect of Indian Council of Medical Research, New Delhi**

The Indian Council of Medical Research (ICMR) is an autonomous body under Department of Health Research, Ministry of Health and Family Welfare, Government of India. It is the apex and premier medical research organization in the country which spearheads planning, formulation, coordination, implementation and promotion of biomedical research. It is one of the oldest medical research bodies in the world. In 1911, Government of India made a historic decision to establish Indian Research Fund Association (IRFA) with the specific objectives of sponsoring and coordinating medical research in the country. After Independence, in 1949, the IRFA was re-designated as Indian Council of Medical Research (ICMR) with considerable expansion in its functions and activities.

ICMR achieved significant milestones in 2024-25, driving advancements in public health, clinical care, and innovation through groundbreaking research, strategic collaborations, and evidence-based policy support. ICMR sustained its leadership in biomedical innovation and public health advancement during the Financial Year (FY) 2024-25, delivering a series of nationally significant outcomes across diagnostics, medical devices, data analytics, clinical innovation, and programme support.

The development landscape of Indian biomedical science in FY 2024-25 reflects a nation in transition from dependence on imported technologies to an era of indigenous innovation, integrated data systems, and translational efficiency. This year's progress showcases how research and policy, innovation and implementation, and data and decision-making are converging to create a self-reliant, forward-looking health ecosystem.

The following are the key achievements of ICMR during 2024-25:

1. ICMR utilised 99.99% of the allocated budget, demonstrating strong financial discipline, effective programme management, and optimal utilisation of public funds to support research, innovation, and priority public health initiatives.
2. A total of 3052 research publications were generated through intramural and extramural research programmes, reflecting sustained scientific productivity and meaningful contributions to evidence-based public health policy and practice.
3. 41 patents were filed and/or secured during the period, highlighting ICMR's emphasis on innovation, technology development, and protection of intellectual property to enable translation of research into impactful health solutions.
4. 60 outbreak investigations were conducted across various regions, underscoring ICMR's critical role in disease surveillance, rapid response, and strengthening national preparedness and response mechanisms for public health emergencies.
5. ICMR identified *Aedes nr. albopictus* in northeast India, marking the third such discovery globally and the first in India, alongside molecular confirmation of a new sibling species within the *Anopheles maculatus* group for the first time in the world, and identification in Tripura of a morphologically *fluviatilis*-like but genetically *Anopheles minimus* species.
6. India recorded its first detections of *Wolbachia* and *Sodalis* bacterial symbionts in *Anopheles* mosquitoes, advancing understanding of natural vector microbiomes with implications for future biological vector control strategies.

7. Researchers in Bhopal developed India's first climate-response profile of *Aedes aegypti*, demonstrating adaptability across temperatures from 10°C to 40°C, providing critical data for predicting vector expansion under global warming scenarios.
8. India reported its second human case of avian influenza (H9N2), the first Indian detection of Clade Ib mpox virus, and the country's first instance of vaccine-derived poliovirus spillover during the reporting period.
9. Advances included identification of an Indian-specific mechanism for RhD negativity, generation of national neutrophil antigen frequency data, discovery of links between ACE/ACE2 genotypes and hypertension risk in malaria-endemic populations, and identification of a novel IL12Rβ1 defect associated with susceptibility to visceral leishmaniasis.
10. An indigenous antifungal vaccine candidate against *Candida albicans* was patented, underscoring India's contribution to global biomedical science.
11. At Gorakhpur, a patent was filed for a TRL-4 Chikungunya point-of-care molecular diagnostic kit, and a one-tube CRISPR Cas12a Pan-Dengue assay was validated. In Chennai, researchers developed a carnosine nano-peptide tuberculosis (TB) drug-delivery system (patent filed) and built a robust diagnostics pipeline involving CRISPR, ddPCR, and tNGS platforms. Three TB diagnostic kits were validated in Bhubaneswar, where scientists also field-tested digital health applications such as the MAMA maternal-monitoring app and the e-simplified partogram to support safer deliveries.
12. Three indigenous human papillomavirus (HPV) screening platforms (Molbio, MyLabs, Genes2Me) were validated for use in the National Cervical Cancer Screening Programme, while National Institute of Cancer Prevention and Research (NICPR) developed and tested a multi-state HPV genotyping panel and two self-sampling kits to improve access to screening. A dual-specimen RT-PCR HPV kit (urine + swab) is under validation with industry partners, and an anti-HPV therapeutic cleared for Phase-I trials under Indo-US collaboration marks an important step toward preventive oncology.
13. In the domain of haematology and genetic disorders, the validation of a multiplex β - thalassemia PCR kit reduced diagnostic costs by 60%. Two critical technologies, the qualitative point-of-care G6PD test and a multiplex PCR for minor blood groups, were licensed to MyLab Discovery Solutions, representing real commercial success for publicly funded innovation. Environmental diagnostics also progressed with a ₹25 field-tested strip for arsenic and fluoride detection and a patented nanohybrid biosensor for early cancer biomarkers. In addition, the 6-mercaptopurine paediatric liquid formulation (PREVALL), developed under CARE-CP, moved from patent to market, making essential therapy for childhood leukaemia available nationwide at one-tenth the conventional cost.
14. India's medical device ecosystem reached new heights through indigenous innovation supported by ICMR's translational platforms. The year's achievements ranged from high-tech biomedical engineering to low-cost, high-impact tools designed for field use.
15. The Rudhira Ahara Yantra (RAY), a portable artificial mosquito blood feeder developed at Bhopal, simplified vector research and was complemented by an AI-based mosquito species identifier, both of which received industrial design recognition. The neonatal health programme benefited from a new AI-based low-cost bilirubin meter, while microfluidic sperm-sorting devices and digital colposcopes advanced women's reproductive health technologies. Other key innovations included wearable spinal posture monitors for healthcare workers, smart vaccine temperature loggers for primary health centres, and an automated mosquito-rearing device that reduced colony losses by 40%.

16. Collaborations with engineering institutions further strengthened device validation pipelines. ICMR-National Animal Resource Facility for Biomedical Research (NARFBR) Hyderabad successfully completed pre-clinical porcine testing of multi-material orthopaedic screws developed with Indian Institute of Technology (IIT) Delhi, demonstrating strong biocompatibility.
17. The AiSteth GTX tele-stethoscope, the SindiColpo digital colposcope, and DBS-based TB drug-level assays reached clinical validation. Headquarters recorded three design patents: a portable breast cancer detector, a portable cancer diagnostic device, and a hybrid non-invasive digital blood pressure (BP) device, symbolising the convergence of Indian engineering and biomedical science.
18. These devices, affordable and intelligent, embody the government's vision of Atmanirbhar Bharat in healthcare technology, empowering both community health workers and advanced medical facilities.
19. Clinical research under ICMR continued to generate direct improvements in patient care and public health delivery. The use of machine learning in diagnostics and the deployment of AI-enabled risk assessment tools is now improving outcomes in real time. In haemophilia management, the low-dose Emicizumab prophylaxis regimen achieved zero bleeding events and was expanded into a multi-centre clinical trial. Machine-learning-based early diagnosis tools for scrub typhus and encephalitis improved outcomes in rural primary care settings, while mobile Biosafety Level-3 (BSL-3) laboratories deployed during the 2024 Nipah outbreak ensured zero secondary transmission, an unprecedented feat in field biosafety.
20. Innovations in maternal and chronic disease care achieved measurable success. AI-assisted high-risk pregnancy screening covered over a thousand women, tele-colposcopy networks increased cervical cancer follow-up by 32%, and integrated diabetes-hypertension counseling improved adherence by 15% across 11 community health centres. Environmental and geriatric health tools further connected clinical data with community well-being, while field-tested models like the Modified Clean Cut surgical protocol and Immediate Kangaroo Mother Care reduced infection rates and improved neonatal survival in hospitals.
21. ICMR's digital transformation accelerated in 2024-25, making research data more accessible, interoperable, and policy relevant. Automated platforms such as ADARV and AI-VRDLN connected laboratories with disease surveillance networks, while MycoNet (1,667 ICU fungal cases) and iRegVed (2,052 venous thromboembolism patients) expanded the clinical evidence base for hospital care.
22. Long-term initiatives such as the Bhopal Gas Cohort and the Environmental Health Data Platform integrated genomics, pollution, and clinical data to support policymaking. Cancer and Non-Communicable Disease (NCD) divisions built digital dashboards visualising disease trends, while the CoWIN-style India Hypertension Control Initiative now tracks 4.2 million beneficiaries in real time across more than 220 districts. National Registry for Rare and other Inherited disorders (NRROID) and the COVID-19 Pregnancy Registry strengthened longitudinal data for precision policy, while AI tools such as DeepCXR and LPA-AI demonstrated the safe integration of machine learning into national health programmes. These data systems have turned ICMR's research ecosystem into an agile, information-rich platform capable of supporting both scientific discovery and health governance.
23. Programme support remained the foundation of ICMR's role in national health governance. Research evidence guided reforms in the National TB Elimination Programme, cervical cancer screening, and maternal health. The Sanjeevan Mission in Madhya Pradesh, launched in April 2025,

was built in collaboration with ICMR, while the Sankalp initiative, supported by the Bill & Melinda Gates Foundation, brought together multiple states to reduce neonatal mortality.

24. The National One Health Mission (NOHM) allocated ₹23.78 crore for biosafety training and standardisation across 22 BSL-3 laboratories, reflecting ICMR's leadership in multi-sectoral coordination. Beyond programmes, ICMR's fiscal management demonstrated exemplary transparency and efficiency. Intramural and extramural grants were disbursed and utilised on schedule, linked to deliverables, and closely monitored through milestone-based funding systems. Technology transfers such as the Monkeypox and Nipah Loop-mediated Isothermal Amplification (LAMP) assays, Glucose-6-phosphate dehydrogenase (G6PD) test, and multiplex RT-PCR for enteric viruses translated public funds into commercial and clinical assets, maximising societal return on investment.

25. The Council's outreach strategy also evolved into a powerful blend of digital communication and community engagement. Campaigns under Swachhata Hi Seva and Ek Ped Maa Ke Naam combined environmental awareness with preventive health, reaching thousands through walkathons, social media, and rural exhibitions.

26. Over 21,000 frontline workers were trained under the National Sickle Cell Anaemia Mission, and the five-day Vishanu Yuddh Abhyas pandemic preparedness drill tested India's emergency coordination across 22 BSL-3 laboratories. These efforts reinforced that research and readiness go hand in hand.

27. FY 2024-25 demonstrated how India's health research system can act as a complete translation pipeline, discovering, validating, and deploying technologies that address real public health challenges. From world-first vector discoveries to AI-driven diagnostics, from indigenous medical devices to large-scale vaccine trials, ICMR's work exemplified scientific excellence with national purpose.

28. Under its disciplined fiscal management and growing ecosystem of collaborations, every innovation, whether a field-tested TB assay, a low-cost cancer screening tool, or a space psychology AI platform, moved closer to serving citizens. ICMR's journey this year stands as a model of how scientific institutions can embody both innovation and accountability, advancing India's vision of health security, technological self-reliance, and equitable public health for all.

Authenticated

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