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ICMR INTRODUCES 'CEREBO' TO DIAGNOSE BRAIN INJURY

- India records one of the world's highest incidences of head injuries, with more than 100,000 deaths annually and over a million serious injuries.
- Timely diagnosis of **traumatic brain injuries** (TBI) is critical, as nearly half of the fatalities occur within the first two hours.
- However, advanced diagnostic tools like CT (Computed Tomography) and MRI (Magnetic Resonance Imaging) remain inaccessible in many rural and emergency settings.
- Addressing this gap, the **Indian Council of Medical Research** (ICMR) has introduced **CEREBO**, an indigenous, portable, and non-invasive diagnostic tool that can revolutionise TBI care in India.

About the CEREBO Device

- CEREBO is a handheld diagnostic device developed using **near-infrared spectroscopy** combined with machine learning algorithms. It is:
 - **Radiation-free and safe** for infants and pregnant women.
 - **User-friendly**, operable by paramedical staff or unskilled personnel after just 30 minutes of training.
 - **Efficient**, capable of detecting intracranial bleeding and oedema in under a minute.
 - **Cost-effective**, eliminating the need for expensive imaging infrastructure.
- The device provides **colour-coded results** that enable quick triage and decision-making in critical situations.

Development and Collaboration

- CEREBO is a product of collaboration between **ICMR, the Medical Device and Diagnostics Mission Secretariat (MDMS), AIIMS Bhopal, NIMHANS Bengaluru, and Bioscan Research**. It has undergone:

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- **Clinical validation** and regulatory approvals.
- **Multi-centre performance trials** supported by ICMR's mPRiDE scheme.
- **Feasibility studies** at trauma and neurosurgical centres to test diagnostic accuracy and integration in emergency care pathways.
- This groundwork ensures that CEREBO is ready for widespread deployment in hospitals, ambulances, rural clinics, and disaster response units.

Significance for Healthcare

- CEREBO addresses multiple challenges in brain injury diagnosis:
 - **Accessibility Gap** - Rural and semi-urban regions often lack CT/MRI facilities, delaying critical care.
 - **Affordability** - CT and MRI scans are expensive and require trained personnel; CEREBO reduces costs significantly.
 - **Speed and Precision** - Immediate diagnosis improves survival rates and reduces disability.
 - **Emergency Deployment** - Designed for ambulances and trauma centres, the tool strengthens India's disaster and military healthcare response.
 - By offering an indigenous alternative, India also reduces dependence on imported diagnostic equipment.
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VISION OF A TOBACCO-FREE INDIA - STRENGTHENING CONTROL MEASURES

Need for a Holistic Approach:

- **Limitations of current National Tobacco Control Programme (NTCP):**
 - The NTCP focuses on awareness and COTPA enforcement.
 - **It ignores social determinants** like poverty, unemployment, stress, etc.
 - As compared to a large user base, **cessation clinics** have limited reach.
- **Weaknesses in ToFEI (Tobacco Free Education Institute):**
 - It currently promotes awareness in schools through posters and biannual activities, but **lacks the scientific rigour** needed for effective tobacco control.



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- In contrast, the U.S.'s national public health agency, the **Centres for Disease Control and Prevention (CDC)** recommends comprehensive school-based strategies in the U.S., including
 - **Enforcing tobacco-free policies,**
 - **Integrating prevention education** from kindergarten to grade 12,
 - Training teachers, involving families, supporting cessation for students and staff, and
 - **Regularly evaluating programmes.**

Towards Better Regulation and Control:

- **Challenge faced by public health researchers:** The tobacco industry has access to its real-time sales data to adapt sales strategies while public health researchers are unaware of the most recent trends in tobacco consumption.
- **Policy recommendations:**
 - Adopt '**Tobacco Endgame**' strategy through multi-ministry (Education, Finance, Health, Law, Social Justice, Commerce, Information & Broadcasting, Consumer Affairs) **collaboration.**
 - **Greater investment in research institutions** not only for developing and implementing control measures but also for producing regularly updated, robust data.
 - **Independent oversight body** to monitor and expose industry interference.
 - Stronger use of demand-side (tax, awareness, cessation) and supply-side (regulation, enforcement) measures.

Conclusion:

- India needs a **comprehensive, multipronged strategy** to reduce tobacco burden.
 - Combining stringent laws, higher taxation, effective awareness, social support, school-based interventions, and independent oversight is crucial.
 - **Sustained collaboration** between policymakers, researchers, and implementers is essential to realise the vision of a tobacco-free India.
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THE PROBLEM WITH AFRICA'S REPRESENTATION ON MAPS

The **African Union (AU)** has endorsed the Correct the Map campaign, calling for the replacement of the **Mercator projection** with alternatives like the **Equal Earth map**.

The Mercator projection, still widely used in schools and media, distorts geography by **shrinking Africa and inflating Europe, North America, and Greenland**.

Why the Mercator Map Faces Criticism?

- The **Mercator projection**, created in 1569 to aid navigation, allowed sailors to follow straight rhumb lines across seas, revolutionising European exploration and colonial expansion.
 - A **rhumb line** (also called a **loxodrome**) is a line on the Earth's surface that crosses all meridians at the same angle.
 - It represents a constant compass direction (e.g., always going northwest at 45°). On a globe, this path is a spiraling curve toward the poles.
 - On the Mercator map projection, rhumb lines appear as straight lines, which is why the Mercator map was so useful for sailors in the Age of Exploration.
- However, this convenience came at the cost of **distorting scale**: landmasses near the poles appear much larger, while those near the equator are shrunk.
- For instance, **Africa (30 million sq. km)** is shown as nearly the same size as **Greenland**, which is actually 14 times smaller.
- Similarly, Europe appears comparable to Africa, despite being only one-third its size.
- Over centuries, the Mercator map became the default in classrooms, offices, and digital platforms, **reinforcing a Eurocentric view of the world**.
- Critics argue that these distortions have subtly shaped perceptions of power and importance, diminishing Africa, South America, and Asia while inflating Europe, Russia, and North America.



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Why Maps Are Distorted?

- All world maps are distorted because it is mathematically impossible to flatten the Earth's spherical surface onto a rectangle without compromising **area, shape, distance, or direction**.
- The **Mercator projection**, for instance, preserves local shapes and angles but greatly enlarges landmasses near the poles, making Europe and Greenland look much bigger while shrinking Africa and South America.
- In contrast, the **Equal Earth projection** maintains the relative sizes of continents and countries more accurately, but introduces curved or stretched shapes.
 - Equal Earth projection was introduced in 2018 by cartographers Bojan Šavrič, Tom Patterson, and Bernhard Jenny.
 - It minimises distortion of landmass sizes; Africa and other equatorial regions shown proportionally.
- The **orthographic projection** offers a realistic view of Earth as seen from space, yet shows only one hemisphere at a time and compresses areas at the edges.
- Each projection, therefore, reflects a trade-off between accuracy and usability, with political as well as technical implications.

The Road Ahead for Correcting the Map

- The **Equal Earth projection**, developed in 2018, is the leading alternative to the Mercator map as it preserves relative areas, though continents appear stretched or curved.
 - Other options include the **Gall-Peters projection**, which also preserves area but elongates landmasses vertically, and creative efforts like Stuart McArthur's 1979 "Universal Corrective Map" that inverted the world to place Australia on top.
 - The African Union's endorsement of the Correct the Map campaign marks the strongest institutional push yet, with support also coming from the World Bank, National Geographic, NASA, and petitions to the UN for adoption.
 - However, replacing the Mercator projection will be challenging since it is deeply entrenched in **schools, textbooks, digital platforms, and institutional use**.
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SET THE GUARDRAILS FOR AI USE IN COURTROOMS

- **AI tools offer numerous advantages for courts**, particularly in automating routine tasks.
- Document translation, transcription, defect identification in filings, and legal research can all be **significantly accelerated through AI integration**.
- **Pilot projects in Indian courts have already explored AI transcription** of oral arguments and witness depositions, with the potential to standardize records and reduce delays.
- **Beyond speed, AI can also increase accessibility by providing translations in regional languages**, ensuring litigants and lawyers from diverse linguistic backgrounds can engage more effectively.

Risks and Challenges

- **Translating and Transcription Errors**
 - Instances such as the **mistranslation of leave granted into holiday approved or transcription software mistaking Noel for no** underscore the dangers of over-reliance on imperfect systems.
 - **Large Language Models (LLMs), while powerful, are prone to hallucinations**, generating false case laws or misrepresenting facts, an unacceptable risk in legal contexts where accuracy is paramount.
- **Lack of Clear Framework**
 - **AI risks reducing adjudication into mechanical, rule-based outcomes**, neglecting the contextual interpretation, human reasoning, and **moral judgment that underpin justice**.
 - Furthermore, without clear frameworks for data storage, access, and security, the use of sensitive personal information through AI could lead to breaches of privacy.



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- **Absence of Robust Risk Management**
 - Equally concerning is the absence of robust risk management frameworks in AI procurement by courts. **Current practices reveal little attention to ethical safeguards**, technical accountability, or error mitigation.
 - Even where human oversight exists, such as retired judges manually vetting AI translations, the problem remains **that AI systems continuously learn and adapt, introducing new forms of error in evolving contexts.**

Safeguards and Frameworks for Responsible Adoption

- **AI Literacy**
 - Judges, lawyers, and court staff **require training not just in using AI tools but also in understanding their limitations** and risks.
- **Clear Guidelines**
 - Second, **Clear Guidelines** must govern the individual use of generative AI in research and judgment writing.
 - **Litigants should have the right to know if AI has been used in a case**, whether for transcription, legal research, or drafting.
- **Standardised Procurement Frameworks**
 - These **should include pre-procurement assessments** to evaluate whether AI is the most suitable solution, followed by strict criteria for explainability, accountability, and data security.

The Way Forward

- As Indian courts cautiously move toward AI adoption, **it is essential not to lose sight of the ultimate purpose of judicial processes, the pursuit of justice.**
 - **Efficiency cannot come at the cost of fairness, transparency, or accountability.**
 - **The challenge lies not in rejecting AI altogether but in ensuring its careful, ethical, and context-sensitive adoption.**
 - **If deployed with appropriate literacy, guidelines, procurement frameworks, and institutional support, AI can become a valuable ally to the judiciary.**
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USES OF WASTEWATER SURVEILLANCE

The **Indian Council of Medical Research (ICMR)** will launch wastewater surveillance for **10 viruses** across **50 cities** in the next six months.

Currently operational in five cities, the initiative aims to **detect early signs of virus spread and growth trends**, enabling timely public health interventions.

About Wastewater

- It is any water that has been affected by human use.
- It comes from a variety of sources, including households (think sinks, showers, and toilets), industries, and agricultural processes.
- Essentially, it's the used water that needs to be cleaned before it can be safely released back into the environment or reused.

ICMR's Plan for Expanded Wastewater Surveillance

- Over the next six months, ICMR will scale up wastewater and environmental surveillance (WES) across India to detect early rises in virus load within communities.
- At present, **COVID-19 and polio are under watch**, but the system will now monitor pathogens linked to fever, diarrhoea, acute encephalitis syndrome, and respiratory distress.
- ICMR is also setting up surveillance for **Avian Influenza Virus (AIV)** by testing surface water and wastewater in outbreak-prone regions, creating an early warning system.
- This will complement India's existing surveillance networks for Influenza-Like Illness (ILI) and Severe Acute Respiratory Illness (SARI) under ICMR and the Integrated Disease Surveillance Programme (IDSP).

Importance of Wastewater Surveillance

- The ICMR highlights that India, like many countries, faces rising **emergence and re-emergence of pathogens** due to population growth, urbanisation, environmental changes, and human-animal interactions.



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- In this context, **Wastewater-Based Epidemiology (WBE)** has emerged as a vital tool for **early detection of disease outbreaks**, especially after COVID-19.
 - WBE provides real-time, community-level insights into infection trends, including among asymptomatic and pre-symptomatic individuals, enabling timely public health interventions.
 - It is a **cost-effective, non-invasive method** that covers large populations, helps identify **transmission hotspots**, and supports efficient resource allocation for containment.
 - By detecting pathogens such as viruses and bacteria in human waste, WBE strengthens global health security by predicting and mitigating future pandemics before clinical cases appear.
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