

NEWS TODAY

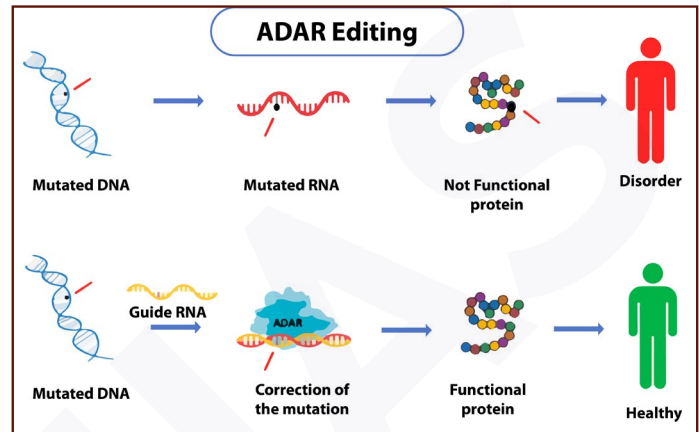
First successful clinical demonstration of RNA editing in humans conducted

Wave Life Sciences (US based biotechnology company) has successfully performed **RNA editing to treat alpha-1 antitrypsin deficiency (AATD, an inherited disorder).**

- In AATD, levels of protein **α-1 antitrypsin build up and affect liver and lungs.**

About RNA (Ribonucleic acid) Editing

- It is a process that **modifies genetic information on RNA sequences** through insertion, deletion or substitution.
- Scientists used technique called '**Adenosine Deaminase Acting on RNA (ADAR)**' with guide RNA (gRNA). (refer image)
 - ⊕ **gRNA** are small RNA molecules that **direct editing machinery by base-pairing with mRNA** in specific regions for modification.
- **Process**
 - ⊕ RNA has **four building blocks**: A (Adenine), G (Guanine), U (Uracil), and C (Cytosine).
 - ⊕ **ADAR converts adenosine in mRNA to inosine**, which mimics function of guanosine. (adenosine and guanosine are nucleosides combining A and G with ribose respectively).
 - ⊕ Cell detects Inosine in Adenosine's position, triggering cellular response to correct the mismatch.
 - ⊕ The process thus **restores mRNA's original function**, and **cell starts making normal proteins.**



Challenges in RNA Editing

- **Lack of Specificity:** ADARs can perform **targeted and non-targeted changes** in mRNA due to **lower accuracy of gRNA** which could lead to side effects.
- **Transient nature and nascent stage of development:** To sustain therapy effects, repeated treatment will be necessary.

Comparison between RNA and DNA editing

- **Form of change:** DNA editing makes **permanent changes** while RNA editing makes **temporary changes** which may **fade over time.**
 - ⊕ Thus, RNA editing is **safer and flexible** compared to DNA editing which may result in **irreversible errors.**
- **Allergic and immune reactions:** DNA editing has **higher risk of undesirable reactions** compared to RNA editing.
 - ⊕ DNA editing tools use proteins from **certain bacteria** to perform **cutting functions** while RNA editing relies on **ADAR enzymes**, already occurring in human body.

Lead exposure causes \$6 trillion in economic losses from premature cardiovascular disease (CVD) mortality: Study

It was highlighted in Lancet Public Health study titled 'Removing lead from the global economy'.

About Lead (Pb)

- **Soft metal** with properties like **low melting point, corrosion-resistant, poor conductor of heat**; do not react with water at all, highly malleable, dense, and ductile.
- Usually **found in ore with zinc, silver and copper.**
- **Used in production of batteries** (automobiles and invertors), ammunition, metal products (pipes), etc.
- **Naturally occurring toxic metal** found in **Earth's crust. Smelting units and Paints** are sources of lead poisoning.

Impact of Lead Pollution

- **On Human growth:** Lead **reduces intelligence quotient (IQ) points** and increases risk of heart disease, kidney failure, and premature death.
 - ⊕ Its exposure leads to **5.5 million premature adult deaths** from CVD and **765 million lost IQ points** among children.
 - ⊕ **Toxic neurodevelopmental effects** begin in womb from **fetal exposure to lead** in maternal plasma.
- **Toxic to plants:** Increase in lead concentration in soil from 0 ppm (parts per million) to 1000 ppm **reduced germination rate of wheat seeds from 98% to 50% and reduced biomass generated by 44%.**
- **On Birds:** They develop anaemia, and brain damage and can have **difficulty flying, landing, and walking**, and face increased mortality.

Initiatives to control Lead Poisoning

- **Global Alliance to Eliminate Lead Paint**, led by WHO and UNEP.
- **WHO Guidelines** on clinical management exposure to lead.
- **Banning use of leaded petrol.**

Recommendations for Lead elimination

- **Global political structure** could be **funded by states in proportion of lead that they mine and export.**
- **Lead should be taxed optimally**, increasing year by year to shift demand to substitutes.
- **Governments should classify lead as toxic waste** that must be safely disposed of, rather than allowing recycling with large associated emissions.

Supreme Court upholds accessibility for PwDs as a Human and Fundamental Right

A 3-Judge bench of the Supreme Court in **Rajive Raturi vs. UoI & Ors.** case confirmed that disabled persons' right to access environments, services and opportunities is an essential human and fundamental right.

- The judgement is based on a report submitted by the Centre for Disability Studies, NALSAR University of Law and upholds the **social model of disability**.
- **Social model of disability** focuses on **social change** for inclusion and equality of PwDs by removing social barriers **preventing their full participation**.

Issues faced by PwDs (as per CDS NALSAR Report)

- **Accessibility barriers:** Lacunae in accessibility measures in courts, prisons, schools, public transport, etc.
- **Intersectionality and compounded discrimination:** Overlap of multiple disabilities like caste, gender etc. with disabilities faced by PwDs compounds discrimination and marginalization.
- **Inconsistency in legal framework:** RPwD Act, 2016 requires mandatory compliance with a set of **non-negotiable rules** whereas, Rule 15 under RPwD Rules, 2017 prescribes only **self-regulatory guidelines**.

Key Highlights of the Judgment

- Rule 15(1) **ultra vires** the scheme and legislative intent of mandatory compliance of the RPwD Act.
- Court listed **principles of accessibility** to be considered - **Universal design, Comprehensive inclusion across Disabilities, Assistive Technology Integration and Stakeholder consultation**.
- **Two-pronged approach:** Ensuring accessibility in **existing institutions/activities** and **transforming new infrastructure and future initiatives**.

Initiatives for Accessibility for PwDs

- **Rights-based approach:** Right of Persons with Disabilities Act, 2016 giving effect to the **United Nations Convention on the Rights of Persons with Disabilities**.
- **Article 9** of the **Convention on the Rights of Persons with Disabilities**.
- **Accessible India Campaign (Sugamya Bharat Abhiyan)**

Important Judicial Pronouncements

- **State of Himachal Pradesh v. Umed Ram Sharma (1986):** Inclusion of right to accessibility under Right to Life (Article 21).
- **Disabled Rights Group v. Union of India (2017):** Directions to ensure reservation of seats in educational institutions for PwDs.

'Participatory Approaches in AI Development and Governance' Paper released by IIT-Madras

The Paper identifies how participatory approach in AI can improve the outcomes of the AI algorithm and enhance its fairness.

About Participative AI (PAI)

- It refers to the **involvement of a wider range of stakeholders** than just technology developers in the creation of AI systems.
 - ⊕ **Core tenets** of PAI are derived from participatory governance. (see box)
- **Need:** Progress in AI and its deployment by public and private actors, like Facial Recognition Technology in Law enforcement, etc.

Benefits of PAI

- **Counter unilateral, top-down decision making in AI deployment:** Addressing **potential contentious breakdowns** in implementation.
- **Inclusion and Fairness:** Mitigate risks like bias, discriminatory output, etc., to communities where an AI system is deployed.
- **Feedback loops:** In flagging technical glitches and post deployment impact assessment.
- **Enhance trustworthiness of AI Systems:** Ensuring minimal false positives and false negatives causing a more enthusiastic adoption of such systems.

Challenges with PAI

- **Co-optation:** Domination by select dominant actors to serve their vested interests.
- **Limited participation of non-experts:** Existing AI governance models primarily see the participation of experts like industry representatives, bureaucrats, select civil society, etc.
- **Participatory washing and tokenism:** Stakeholder participation merely done for formal compliance.
- **Transparency Paradox:** Information shared about algorithms can be misused by malicious actors.

Idea of Participatory Governance In India and Abroad

- **Land Acquisition Act, 2013:** Social impact assessment study in collaboration with affected families.
- **Forest Rights Act, 2006:** Gram Sabha as the statutory institution due to its participatory and democratic nature.
- **Nagoya Protocol on Access and Benefits Sharing:** Benefits arising from the use of traditional knowledge be shared with indigenous communities.

'The State of Food and Agriculture 2024' report released by FAO

Report emphasizes on **value-driven transformation of agrifood systems** and builds on the estimates of the previous edition on global **hidden costs of agrifood systems** (journey of food from farm to table).

- **Hidden cost** refers to **external costs** (i.e., negative externalities) or economic losses triggered by other market or policy failures.

Key findings of the report

- **Hidden Costs: Industrial and diversifying agrifood systems** contribute maximum to global quantified hidden costs (around 5.9 trillion 2020 PPP dollars), dominated by health hidden costs linked to non-communicable diseases.
 - ⊕ **Unhealthy dietary patterns** (like low intake of whole grains, high intake of sodium, etc.) account for **70% of all quantified hidden costs**.
 - ⊕ **Other contributing factors include: Social costs** (due to undernourishment and poverty); **environmental costs** (emission of greenhouse gases, etc.).
- **India-related findings:** India's total hidden costs stands around **\$1.3 trillion annually** (3rd largest after China and the USA), largely driven by **unhealthy dietary patterns**.

Major Recommendations on transforming the Agrifood value chains

- **In industrial agrifood systems (Long value-chains with high urbanization):** Upgrade food-based dietary guidelines to an agrifood systems approach, mandatory nutrient labels and certifications, and information campaigns, etc.
- **In traditional agrifood systems (Short value-chains with low urbanization):** Complement conventional productivity-enhancing interventions with environmental and dietary levers to avoid the increase in environmental footprint.

India's Initiatives to reform Agrifood Systems

- **Sustainable Farming Practices:** Parampragat Krishi Vikas Yojana (PKVY), Per Drop More Crop (PDMC), National Bamboo Mission (NBM), etc.
- **Agricultural Infrastructure:** Agriculture Infrastructure Fund (AIF); Agricultural Marketing Infrastructure (AMI) scheme, etc.
- **Boosting Farmers' Welfare:** Pradhan Mantri Kisan Samman Nidhi (PM-KISAN); Formation and Promotion of Farmer Producer Organizations (FPOs), etc.

Concerns raised with declining fertility rates in some states

Recently, Chief Ministers of Andhra Pradesh and Tamil Nadu have raised concerns about the **low fertility rates, slowing population growth** in their respective states.

Fertility Rate in India

- **NFHS-5** in 2019-21 showed a **decline in Total Fertility Rate (TFR) to 2.0**, with TFR being the average number of children born to women during their child-bearing years.
 - ⊕ This is **below replacement level fertility of 2.1**, at which population can maintain its size across generations.
- Decrease in fertility rates is **not uniform across India** with southern States and smaller northern States seeing a much sharper decrease in TFR.
 - ⊕ For instance, **Tamil Nadu and Andhra Pradesh** have TFR of **1.4 and 1.5** respectively, while **Uttar Pradesh and Bihar** have TFR of **2.7 and 3** respectively.

Factors behind declining fertility rates

- **Family Planning:** Implementation of family planning policies and increase in its demand among married women from 66% in 2015-16 (NFHS-4) to 76% in 2019-21 (NFHS-5).
- **Educational Empowerment of Women:** Consequent increase in labour market participation led to a higher opportunity cost for having more children.
- **Increasing Living Costs:** Concerns about increasing cost of living and housing become barrier to having more children.

Concerns with decline in fertility rate

- **Ageing societies:** Places significant social and economic pressures on government to increase expenditures on pension and health services.
 - ⊕ **Increasing old age dependency ratio** burdens young workers **economically and emotionally**.
- **Political Challenges:** Potential loss of political representation of states having slow population growth after the expiry of current freeze on number of Parliament seats in 2026.
- **Labour shortages:** Declining fertility rate can create labour shortages. Eg. Japan.

Also in News



Eurasian Otter

A Eurasian Otter was sighted in **Pune, Maharashtra, for the first time**.

About Eurasian Otter (Lutra Lutra)

- It is **one of the three otter species found in India**, alongside **Smooth-coated Otter** and **small-clawed otter**.
- **Distribution: Europe, Asia and Africa.**
 - ⊕ In **India**, it is mainly confined to **Himalayan foothills, parts of Northeast India, and Western Ghats**.
- **Characteristics:**
 - ⊕ **Solitary** and **nocturnal** creatures.
 - ⊕ As **apex predators in river ecosystems**, they help **regulate fish populations** and maintain **ecological balance**.
- **IUCN Status: Near Threatened.**
- **Threats:** Habitat pollution through pesticides and oil spills and river bank destruction.



Biotechnology Research and Innovation Council (BRIC)

Biotechnology Research and Innovation Council (BRIC) has completed one year of its formation.

- It was **established by the Department of Biotechnology (DBT), Ministry of Science and Technology**, by subsuming 14 Autonomous Institutions (AIs).
- **Objectives:**
 - ⊕ **Promoting cutting-edge research** in biotechnology aligned with national priorities,
 - ⊕ **Fostering innovation** and translation across institutional boundaries,
 - ⊕ **Developing indigenous technologies** and capabilities.
- BRIC aims to **establish a centralized and unified governance mechanism** for its research institutions through **intra-mural core grants**.
- BRIC plays a crucial role in **bringing together scientists and researchers from various institutions**.



Salad Bar Extremism

Various reports suggest rising instances of 'Salad bar extremism' in some western countries.

About Salad Bar Extremism

- It is a **new kind of extremism** where the **primary motivation** behind violent attacks is a **combination of beliefs and views** rather than a **coherent ideology**.
- It is also called **composite extremism or mixed, unstable, or unclear (MUU) extremism**.
- It incorporates **multiple extremist agendas** and may also reach **across ideological lines** to forge alliances based on **shared interests**. e.g., misogynistic, anti-minorities, anti-semitic ideologies.
- Recent examples:** Edmonton city hall shooting in Canada (2024), Texas Mall attack (2021), etc.



QS World University Rankings

Recently, the **QS World University Rankings: Asia (2025)** was released.

- It assesses **984 institutions** covering **25 countries** in **Eastern, Southern, South-Eastern, and Central Asia**.
- Quacquarelli Symonds (QS)** offers data, expertise and solutions for the **global higher education sector**.
- Indicators:** Academic and Employer Reputation, Faculty Student Ratio, International research Network etc.

India's Performance

- India has **2 institutions** in the **top 50** and **7** in the **top 100**.
- Inclusion of **46 institutions (2025)** from India, a **318% increase** compared to 2015.
- IIT-Delhi** is the **highest ranked** institution at **44th** followed by **IIT-Bombay (48th)**.



EV-as-a-Service Programme

Recently, the Union Minister of Power, Housing & Urban Affairs unveiled 'EV as a Service' Programme of **Convergence Energy Services Limited (CESL)**, a subsidiary of **Energy Efficiency Services Limited**.

- It follows the launch of the **PM E-DRIVE Scheme** to fast-tracking India's shift to electric mobility.
- EV-as-a-Service model** offers **subscription-based access to electric vehicles**, eliminating the high upfront costs of purchasing an EV.

About EV-as-a-Service Programme

- Aims to **deploy 5,000 E-Cars** in government departments over the **next two years**.
- Aligns with India's ambitious goal of **achieving net zero emissions by 2070**.



Cairo Call to Action

World Urban Forum (WUF) concluded its twelfth edition, held in Cairo (Egypt), with the adoption of **10-point Cairo Call to Action**.

- WUF, established in 2001 by UN, is the premier **global conference on sustainable urbanization**.

Cairo Call to Action

It calls for:

- Urgent action to address the global housing crisis**, sharing **urban spaces** inclusively, and urban planning to deliver better local outcomes.
- Achieving **global goals through local action, representation of local actors** at all levels, and building alliances to scale local impact.
- Unlocking finance for cities** and communities, and ensuring **equity and justice**.
- Leveraging local and grassroots data** for decision-making.
- Harnessing culture and heritage** as an asset for sustainability.



Exercise AUSTRAHIND

Recently, the 3rd edition of joint military Exercise AUSTRAHIND commenced in Pune.

About Exercise AUSTRAHIND

- It is an **annual military exercise** conducted **alternatively in India and Australia**.
- Aims to **enhance interoperability** between Indian and Australian military in conduct of **joint sub-conventional operations** in **semi-urban environment in semi-desert terrain** under **Chapter VII of the UN mandate**.
- It will be **conducted in 2 phases** – combat conditioning and tactical training phase and validation phase.



Thrombotic Thrombocytopenic Purpura

A recent study found an association between the inactivated COVID-19 vaccine CoronaVac and Thrombotic Thrombocytopenic Purpura (TTP).

About TTP

- A **rare blood disorder** in which **thrombi (blood clots)** are formed in **small blood vessels** throughout the body.
 - Clots can limit or restrict the **flow of oxygen-rich blood to the organs** including brain, kidneys and heart.
- It can be **inherited or acquired** and occurs due to **lack of an enzyme, ADAMTS13**, that controls blood clotting.
- Major symptoms may include **thrombocytopenia** (lower than normal platelet count), **purpura** (purple bruises under the skin); **hemolytic anemia** (abnormal destruction of red blood cells), etc.

Personality in news



Maulana Abul Kalam Azad (1888 - 1958)

National Education Day honoring the **birth anniversary of Maulana Abul Kalam Azad** is celebrated on November 11 (since 2008).

About Maulana Abul Kalam Azad

- Born in **Mecca, Saudi Arabia**, he was a noted educationist, polyglot.
- He served as the **first education minister of independent India** from 1947-1958.

Key Contributions

- Served as the **President of the Indian National Congress** in 1923 (Delhi special session) and 1940 (Ramgarh).
- Served as the **President of All-India Khilafat Committee** during the **Khilafat Movement (1920-24)**.
- Participated in the **Dandi March (1930)** and the **Quit India Movement (1942)**.
- Was a member of Constituent Assembly** from the United Provinces.
- Played role in establishing institutions like **Indian Council for Cultural Relation; University Grants Commission**; etc.

Rewards and Recognition: Awarded **Bharat Ratna (1992)**, posthumously.

Values: Patriotism, Integrity, Tolerance, etc.

