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THE HINDU
INDIA'S NATIONAL NEWSPAPER SINCE 1878

Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

Wednesday, 25 June, 2025

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The Hindu Businessline is organizing the fourth edition of its MSME Conclave on June 25 (Bengaluru) and June 27 (Coimbatore), coinciding with World MSME Day (June 27). The event aims to celebrate and highlight the significant role of Micro, Small, and Medium Enterprises (MSMEs) in India's economic development.

Businessline conclave to celebrate MSMEs' role in India's growth story

The Hindu Bureau
CHENNAI

To celebrate the work of micro, small and medium enterprises (MSMEs), *The Hindu Businessline* is hosting its annual MSME conclave. The fourth edition, to be held in two cities, Bengaluru (June 25) and Coimbatore (June 27), will discuss their contribution to India's growth story.

The first event at Bengaluru, presented in association with NITTE (deemed-to-be university), will feature two power-packed panel discussions – one on defence titled "MSME: Call to Arms (Supplying to Defence)" and the other on "Powering Make in India" – and a fireside chat.

MSME Day is observed world over annually on June 27 to celebrate these enterprises and recognise their importance, shed light on their contributions, and promote their growth and sustainability.

At the Bengaluru conclave, Priyank Kharge, Minister for Rural Development and Panchayat Raj, IT and BT of Karnataka, will be the chief guest. The Guest of Honour is Ananth Narayanan, Founder and CEO, Mensa Brands.

The first panel, "MSMEs: Call to Arms (Supplying to Defence)", will feature Navneet Singh, CEO, Kepler Aero; Priyanka Singhal, Founder, CEO, Ammunic Systems; Lt. Col. Velan (retd.), CEO, Elena Geo; Commander LSS Narendra (retd.), COO and Promoter, C2C Advanced Systems. The session will be moderated by Venkatesha Babu, Resident Editor, *The Hindu Businessline*.

The second panel, "MSMEs: Powering Make in India," will have Rajeev Kaul, MD, Aequs Ltd; Vijay Peri, Vice-President, India Industrials, Zetwerk Manufacturing Businesses; Digbijoy Nath, Co-founder, CTO, Agnit; Sumeet B Patil, Head, Operations, Ethereal Machines. This session will be moderated by M. Ramesh, Consulting Editor, *The Hindu Businessline*.

The fireside chat with Srinivasagopalan Rangarajan, Chairman and Managing Director, Data Patterns (India) Ltd, will be hosted by Raghuvir Srinivasan, Editor, *The Hindu Businessline*.

The past three years too, on MSME Day, *Businessline* had hosted similar conclaves, which saw the participation of many from this sector.With a vast network comprising approximately 6.3 crore MSMEs, this sector generates employment opportunities for around 11 crore people.

The conclave is brought in association with NITTE deemed-to-be-university, and supported by associate partners NABARD, Canara Bank, Karnataka Soaps and Detergents Ltd, SSVM Institutions Coimbatore, Tally, Karnataka Milk Federation, Mysore Sales International Ltd, Milky Mist, Karnataka Udyog Mitra, Government of Karnataka, and Karnataka Industrial Areas Development Board, Government of Karnataka. Office space partner is Puravankara, Insight partner is Trans Union CIBIL, and Industry partner FICCI Karnataka.

Live stream: *https://thbl.news/BLMSMEBL*

Significance of MSMEs in India's Growth Story:

1. **Massive Employment Generator:**
    - India has around 6.3 crore MSMEs.
    - These enterprises provide employment to nearly 11 crore people, second only to agriculture.
2. **Drivers of Economic Growth:**
    - Contribute about 30% of India's GDP.
    - Play a pivotal role in industrialization of rural areas, balanced regional development, and inclusive growth.
3. **Backbone of Manufacturing and Exports:**
    - MSMEs contribute nearly 50% of India's exports.
    - Their role is crucial in sectors like textiles, auto components, food processing, defence manufacturing, etc.

Relevance of the Conclave to Policy and Governance:

1. **Focus on Defence and 'Make in India':**
    - Panel discussions such as "Call to Arms: Supplying to Defence" and "Powering Make in India" indicate the growing role of MSMEs in strategic sectors.
    - Defence indigenization policies and Atmanirbhar Bharat aim to integrate MSMEs in national security architecture.
2. **Collaboration and Stakeholder Engagement:**
    - Participation of government officials, entrepreneurs, financial institutions (e.g., NABARD, Canara Bank), and tech start-ups showcases public-private synergy.
    - Such events create a platform for policy feedback, innovation promotion, and investment linkage.
3. **Digital and Technological Integration:**
    - Involvement of companies like Tally, Ethereal Machines, and Agnit underlines the growing digitization of MSMEs, which is essential for scaling operations and competing globally.

Challenges Facing MSMEs:

- **Credit Access:** Despite schemes like MUDRA, MSMEs struggle with formal credit, especially after COVID-19.
- **Technology Gap:** Many small enterprises lack access to modern tools, automation, and digital platforms.
- **Regulatory Hurdles:** Labour laws, taxation, and compliance burdens hamper ease of doing business.
- **Delayed Payments:** One of the major concerns impacting liquidity and sustainability.
- **Market Linkages and Export Support:** Often disconnected from global supply chains and face difficulties in marketing.

Government and Institutional Support (as highlighted in conclave):

- **NABARD & Canara Bank:** Facilitating credit and rural enterprise development.
- **FICCI Karnataka & Karnataka Udyog Mitra:** Advocacy and facilitation for industrial growth.
- **Karnataka Industrial Areas Development Board:** Infrastructure and land support for MSME clusters.

Way Forward – Policy Suggestions:

1. **Promote Cluster-Based Development:**
   - Create sector-specific industrial corridors and technology parks for MSMEs.
2. **Strengthen Access to Formal Credit:**
   - Expand the reach of Credit Guarantee Schemes and simplify loan approval processes.
3. **Encourage Digital Transformation:**
   - Provide digital literacy, e-commerce integration, and automation incentives.
4. **Streamline Compliance:**
   - Simplify GST, labour laws, and registration processes to reduce bureaucratic burdens.
5. **Enhance Skill Development:**
   - Align skilling initiatives like PMKVY with industry needs and MSME sector demands.
6. **Ensure Timely Payments:**
   - Enforce provisions of MSME Development Act on payment delays by PSUs and large corporates.

Conclusion:

The MSME Conclave organized by The Hindu Businessline is not just an event but a symbol of the growing recognition of the sector's role in making India self-reliant, export-competitive, and employment-rich. For UPSC aspirants, it reinforces the importance of public-private partnerships, decentralised growth, and policy-level convergence to unlock the true potential of India's economic backbone.

UPSCMainsPractice Question

Ques : MSMEs are key to achieving inclusive and sustainable development in India. Analyze how policy interventions and institutional support can strengthen their contribution to employment and GDP.**(250 Words)**

Page 05: GS 2 : Governance

The Public Accounts Committee (PAC) has sharply criticized the Central Government Health Scheme (CGHS) Directorate for its continued inaction on long-standing recommendations to reform its drug procurement policy. This follows the review of the 2022 performance audit report by the CAG on drug procurement and supply under CGHS.

CGHS Directorate pulled up by PAC for not revising drug procurement policy

Sobhana K. Nair
NEW DELHI

MPs raise concerns over supply of outdated drugs, delays in claim settlement

The Parliament's Public Accounts Committee (PAC), headed by Congress leader K.C. Venugopal, pulled up the Directorate of the Central Government Health Scheme (CGHS) for ignoring repeated recommendations by the panel to take various steps to improve its services, including periodically revising its drug procurement policy.

Sources said Union Health Secretary Punya Salila Srivastava told the panel that the government was in the process of revising the rate list for various treatments, adjusting to the current rate of inflation. Several hospitals have pulled out of the scheme due to the low rates sanctioned by the CGHS for various medical procedures.

The PAC was reviewing the 2022 performance audit report of the Comptroller and Auditor General on the subject 'Procurement and Supply of Drugs in CGHS'. The report had pointed out that the Ministry had not ensured the drug formulary was periodically revised, and as a result, the CGHS could not buy new drugs.

Tenders for rate contracts for drugs listed in the formulary were not processed in an efficient and timely manner by the Medical Stores Organisation. In absence of rates for drugs, the CGHS could not procure drugs listed in the formulary. The Comptroller and Auditor General (CAG) had recommended the drug formulary be revised on a half-yearly basis.

Mr. Venugopal asked why the Ministry had ignored repeated directions from the panel on the issue. At Tuesday's meeting, members raised concerns over the supply of outdated drugs to beneficiaries, delays in the settlement of claims, and the absence of coverage for the latest medical procedures.

The Health Secretary, according to sources, said that the government was in the process of upgrading the policies governing medical procedures, widening them in both scope and scale.

Significance of CGHS:

- The CGHS is a centralised healthcare scheme that provides medical care to central government employees, pensioners, and their dependents.
- It is meant to be a model healthcare delivery system, offering access to outpatient care, medicines, and hospitalization across empanelled hospitals.

Core Issues Identified:

1. **Non-revision of Drug Procurement Policy:**
   - The CGHS failed to update its drug formulary, which meant new and essential medicines could not be procured.
   - The Medical Stores Organisation (MSO) was slow in processing tenders, causing delays in rate fixation and procurement.
2. **Impact on Beneficiaries:**
   - Many were reportedly supplied outdated or ineffective medicines.
   - Some empanelled hospitals withdrew from the scheme due to outdated and low reimbursement rates for procedures.
   - Beneficiaries also faced delays in claim settlements and lack of access to modern treatments not covered by the CGHS.
3. **Administrative Apathy:**
   - The PAC noted that the Health Ministry had ignored repeated directions to revise policies.
   - The CAG had clearly recommended biannual updates to the drug formulary to ensure the availability of essential and updated medicines.

Systemic and Policy-Level Concerns:

- **Inefficiency in Public Procurement:** Delayed tenders and outdated formularies reflect the lack of agility in public healthcare administration.
- **Inadequate Policy Response to Inflation**: Hospitals withdrew due to non-viable reimbursement rates, showing failure to align policy with inflation and market costs.
- **Weak Accountability:** Despite repeated PAC and CAG recommendations, bureaucratic inertia continues to hinder reforms.
- **Exclusion from Modern Healthcare:** Outdated policies mean non-inclusion of latest medical technologies and procedures, denying cutting-edge care to CGHS beneficiaries.

Government's Response:

- The Union Health Secretary stated that a policy revision is underway, including an update in rates to reflect inflation and the expansion of procedural coverage.
- However, the delay in implementation continues to undermine public trust and service quality.

Implications for Governance and Public Policy:

- Highlights the need for accountability in public health schemes.
- Indicates the importance of periodic performance audits (like CAG reports) in identifying inefficiencies.
- Reflects poorly on public sector responsiveness to changing medical needs and economic conditions.
- Raises questions about the efficacy of parliamentary oversight mechanisms, when recommendations are not acted upon.

Way Forward:

1. **Time-bound Revision of Formularies and Rates:**
   - Implement the CAG's recommendation for half-yearly updates.
   - Ensure dynamic pricing models for drugs and treatments to reflect inflation and market realities.
2. **Strengthen Procurement Mechanism:**
   - Reform the Medical Stores Organisation to streamline tendering and supply chains.
   - Introduce e-procurement systems with strict monitoring and accountability.
3. **Expand Coverage and Modernization:**
   - Include new procedures and treatments regularly.
   - Adopt a technology-driven approach to manage beneficiary data, claims, and drug supplies.
4. **Enhance Stakeholder Engagement:**
   - Engage with hospitals, pharma firms, and patient groups to align CGHS services with actual needs.
   - Regular feedback mechanisms must be institutionalized.
5. **Ensure Parliamentary Oversight is Effective:**
   - Non-compliance with PAC recommendations should attract statutory accountability, including timelines for compliance and public disclosures.

Conclusion:

The CGHS case exemplifies how poor implementation and lack of reform in public health schemes can lead to widespread service delivery failures. It underscores the role of CAG and PAC in strengthening administrative accountability, and the need for responsive, data-backed, and regularly updated public health governance.

UPSC Mains Practice Question

Ques: Despite oversight mechanisms like the CAG and PAC, implementation inertia continues to plague public sector schemes. Critically evaluate the efficacy of parliamentary oversight in improving healthcare governance in India.**(250 words)**

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Page : 06 :GS 2 : Governance

India has entered the top 100 countries in the Sustainable Development Goals (SDG) Index for the first time, achieving 99th rank out of 167 countries in the 2025 Sustainable Development Report by the UN Sustainable Development Solutions Network (SDSN). This marks a significant jump from the 109th rank in 2024, with India now scoring 67 out of 100 on the index.

For first time, India breaks into top 100 in global SDG rankings

The index measures overall progress toward achieving the 17 Sustainable Development Goals adopted in 2015; India takes 99th rank, up from 109

Press Trust of India
NEW DELHI

India has, for the first time, secured a position among the top 100 countries in the Sustainable Development Goals (SDG) Index, ranking 99th out of 167 nations in the 2025 edition of the Sustainable Development Report (SDR), released on Tuesday by the UN Sustainable Development Solutions Network.

The latest report places India with a score of 67 on the SDG Index, a significant improvement from its 109th rank in 2024. China is ranked 49th with a score of 74.4, while the United States stands at 44th with 75.2 points.

The index measures overall progress toward achieving the 17 SDGs adopted by United Nations member states in 2015, with a score of 100 indicating full achievement of all goals.

Among India's neighbours, Bhutan ranks 74th (70.5), Nepal 85th (68.6), Bangladesh 114th (63.9), and Pakistan 140th (57). Maritime neighbours Maldives and Sri Lanka stand at 53rd and 93rd places respectively.

The report noted that since the adoption of the SDGs, India has steadily improved its standing: it ranked 112th in 2023, 121st in 2022, and 120th in 2021.

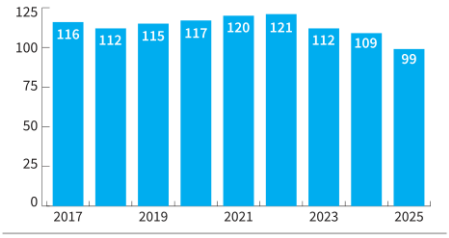
Despite India's gains, the report flagged that global progress on the SDGs has largely stalled. "Only 17 per cent of the SDG targets are on track to be achieved by 2030," it stated, attributing this to "conflicts, structural vulnerabilities, and limited fiscal space" in many regions.

The SDR, authored by a team led by economist Jeffrey Sachs, pointed to continued dominance by European nations on the index. Finland, Sweden and Denmark hold the top three positions, with 19 of the top 20 countries located in Europe.

However, even these nations are facing challenges related to climate change and biodiversity due to unsustainable consumption patterns.

Moving up

India ranks 99th on the 2025 SDG Index with a score of 67, while China ranks 49th with 74.4 and the US 44th with 75.2 points



SOURCE: UNSD

What is the SDG Index?

- The SDG Index tracks global progress toward the 17 Sustainable Development Goals, adopted by all UN member states in 2015.
- A score of 100 indicates full achievement of all SDG targets.
- It includes indicators on poverty, hunger, health, education, gender equality, climate action, peace, partnerships, and more.

India's Performance:

- **Rank Progression:** Improved from 121 (2022) → 112 (2023) → 109 (2024) →99 (2025).
- Score: 67 (up from around 65 in 2024).
- **Neighbourhood Comparison:**
  - Better than Bangladesh (114) and Pakistan (140).
  - Lagging behind Bhutan (74) and Nepal (85).
- **Key Areas of Improvement (implicit):** Health systems, clean energy access, financial inclusion, and infrastructure development.

Global Insights from the Report:

- Only 17% of global SDG targets are on track to be met by 2030.
- European nations dominate the top ranks (Finland, Sweden, Denmark).
- Even top performers struggle with climate change, biodiversity loss, and consumption-led emissions.

Challenges India Still Faces:

1. **Persistent Inequalities:**
   - Gender gap, urban-rural divides, and regional disparities remain.
   - Social indicators like nutrition, maternal health, and education quality still need work.
2. **Climate and Environmental Issues:**
   - India faces challenges in SDGs 13 (Climate Action), 14 (Life Below Water), and 15 (Life on Land), due to rising emissions and biodiversity stress.
3. **Urbanization and Infrastructure Strain:**
   - Rapid urban expansion outpaces sustainable infrastructure, affecting goals like clean water (SDG 6) and sustainable cities (SDG 11).
4. **Fiscal and Governance Constraints:**
   - Limited fiscal space and implementation bottlenecks hinder last-mile delivery of schemes aligned with SDGs.

India's Strengths and Policy Support:

- **Policy Alignment:**
  - Schemes like Swachh Bharat (SDG 6), Ujjwala Yojana (SDG 7), Ayushman Bharat (SDG 3), Beti Bachao Beti Padhao (SDG 5) directly contribute to SDG progress.
- **Localization of SDGs:**
  - NITI Aayog's India SDG Index tracks progress at the state level, encouraging federal participation in SDG goals.
- **Digital Infrastructure:**
  - Use of Aadhaar, JAM trinity, and e-Governance has helped improve delivery and inclusion (SDG 1, 8, 9).

Way Forward:

1. **Strengthen SDG Localisation:**
   - Empower panchayats and municipalities to integrate SDG goals into local planning.
2. **Focus on Underperforming Goals:**
   - Special push needed for climate action, biodiversity protection, and inclusive education.
3. **Data-Driven Governance:**

- Improve real-time tracking of SDG progress and use disaggregated data for better targeting.

4. **Global Partnerships and Finance:**
   - Mobilize green finance and climate adaptation funds, especially through South-South cooperation and G20 forums.
5. **Public Awareness and Behaviour Change:**
   - Promote sustainable consumption patterns through education, civil society engagement, and media.

Conclusion:

India's entry into the top 100 of the SDG Index marks a symbolic yet significant milestone, showcasing its incremental progress on sustainable development, despite socio-economic challenges. However, with just 17% of global SDG targets on track, the report is a stark reminder of the urgency and scale of coordinated action required. For India, the path to 2030 will depend on how effectively it addresses climate, equity, and governance bottlenecks while leveraging its demographic and technological potential.

UPSCMainsPractice Question

Ques:"Only 17% of the global SDG targets are on track to be achieved by 2030."Evaluate the structural and geopolitical factors responsible for the global slowdown in SDG progress, with special reference to India's position. (250 Words)

A **new in vivo technique for CAR T-cell therapy**, published in *Science* (June 2025), could revolutionize cancer and autoimmune disease treatment by **eliminating the need for ex vivo cell manipulation, chemotherapy, and complex infrastructure**. This is particularly relevant for countries like India where access, affordability, and infrastructure remain bottlenecks in advanced therapies.

What is CAR T-cell Therapy?

- **CAR (Chimeric Antigen Receptor) T-cell therapy** is a form of immunotherapy where a patient's **T-cells are genetically engineered** to identify and destroy cancer cells or overactive immune cells.
- Conventional therapy involves **extracting T-cells**, modifying them in labs using **viral vectors**, and **re-infusing** them after **lymphodepleting chemotherapy**.
- It is highly **effective but expensive**, technically complex, and limited to advanced centers.

What's New? – The In Vivo Technique

- The new method **reprograms T-cells inside the body** using **mRNA delivered via lipid nanoparticles (LNPs)**.
- These **CD8-targeted LNPs** act like a biological address label, ensuring **specific delivery** to cancer-fighting T-cells.
- It **bypasses the need for lab-based T-cell modification, viral vectors, and chemotherapy**, reducing costs, complexity,

Technique to make CAR T-cells in vivo could transform cancer care

CAR T-cell therapy retrains immune cells to recognise and destroy rogue targets. T cells often fail to identify cancer cells, so scientists insert genetic instructions that make them express the synthetic molecule, CAR. It gives T cells the ability to detect a specific 'tag' implicated in these cancers

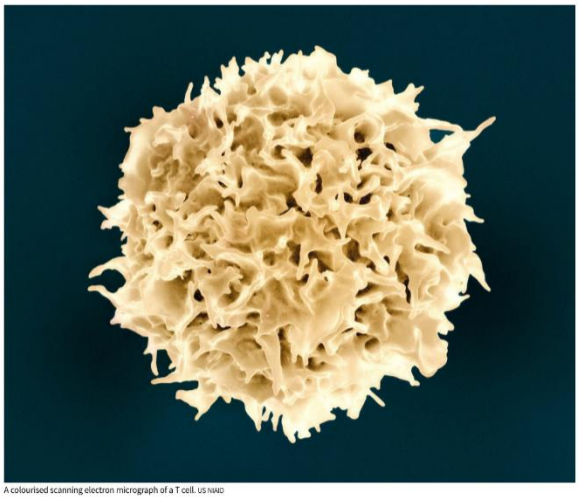
Anirban Mukhopadhyay

In recent years, chimeric antigen receptor (CAR) T-cell therapy has changed outcomes for patients with aggressive blood cancers that no longer respond to standard treatments. In some acute leukaemias, CAR T-cell therapy has led to remissions lasting months or even years. Early-stage trials have explored its use in severe autoimmune diseases like lupus as well, where it may help reset a misfiring immune system.

Originally developed in the early 1990s, the central idea behind CAR T-cell therapy is to retrain the body's own immune cells to recognise and destroy rogue targets. T cells, the patrolling white blood cells, often fail to identify cancer cells. So scientists extract a patient's T cells and insert genetic instructions that make them express the synthetic molecule, CAR. It gives T cells the ability to detect a specific 'tag' – most often CD19, which is found on nearly all B cells – that are the primary culprits in these cancers.

Once these reprogrammed T cells are infused back into the body, they expand, circulate, detect, and eliminate. The process is targeted and potent – but also slow, expensive, and complex. It requires personalised cell harvesting, lab-based genetic engineering using viral vectors, and chemotherapy to prepare the body to receive the modified cells.

Dr. Vishwanath S., a senior consultant in medical oncology, Apollo Hospitals, Bengaluru, estimated from personal practice that CAR T-cell therapy in India typically costs around ₹60-70 lakh. "Roughly ₹30-35 lakh goes toward manufacturing the personalised CAR T-cells through complex *ex vivo* processing," he said. "The rest covers hospitalisation, supportive care, and monitoring for two to three weeks – including side effects, infections, and post-infusion care."



A colourised scanning electron micrograph of a T cell. US NIAID

Engineering T-cells inside the body

A study in *Science* on June 19 by researchers from the US National Institute of Arthritis and Musculoskeletal and Skin Diseases, Capstan Therapeutics, and the University of Pennsylvania takes the core idea of CAR T-cell therapy and moves it entirely inside the body.

Instead of extracting T cells and engineering them in a lab, the researchers delivered messenger RNA directly into circulating immune cells using tiny, fat-based molecules known as lipid nanoparticles (LNPs). Commonly used in mRNA vaccines, they help genetic instructions enter target cells. To make sure the message reached the right cells, the researchers added a kind of biological address label: antibodies that bind specifically to CD8+ T cells, the immune system's frontline killers. This targeted formulation, called a CD8-targeted lipid nanoparticle (CD8-tLNP) allowed the instructions to be delivered with precision.

When injected into mice, tLNPs carrying instructions for a CD19-targeting CAR successfully reprogrammed circulating CD8+ T cells, while in cynomolgus monkeys, a CD20-targeting version was used. Within days, B cells were depleted across multiple tissues, and tumours regressed in mice – all without personalised cell processing, viral vectors or chemotherapy. In monkeys, the treatment turned most CD8+ T cells (up to 85%) and nearly all related immune cells (95%) into cancer fighters after the second or third dose, showing strong results.

Bypassing bottlenecks

The key advantage of this platform is that it avoids several of the most restrictive components of current CAR T-cell therapy, and without compromising function.

Since the CAR instructions were delivered using mRNA rather than viruses, the changes to the immune cells were temporary, lowering the risk of permanent genetic side effects. The therapy also worked without lymphodepleting chemotherapy – a preparatory treatment that wipes out a patient's existing immune cells to make space for the modified T cells. This step carries risks of serious secondary infections due to low immunoglobulin levels, necessitating prolonged and recurrent hospital admissions. And because the entire process took place inside the body, there was no need for custom lab-based cell manufacturing. Dr. Vishwanath noted that the ability to bypass both complex *in vitro* manufacturing and chemotherapy-based lymphodepletion could make CAR T-cell therapies safer and more accessible for frail, elderly, and comorbid patients.

The researchers also introduced a newly developed component, Lipid 829, a biodegradable carrier designed for improved tolerability. It showed faster clearance from the liver and lower inflammatory markers than earlier nanoparticle formulations while still delivering the CAR instructions effectively to T cells.

Signs of an immune reset

Beyond cancer, the study also explored whether the same platform could target B cells in autoimmune settings, where they mistakenly attack the body's own cells.

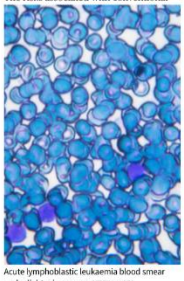
In monkeys, the treatment led to near-complete depletion of circulating and tissue-resident B cells, including in the spleen, lymph nodes, and bone marrow. Over the following weeks, fresh B cells gradually returned – and when they did, they were mostly naïve, like new recruits with no memory of having turned against their own body. This mirrored observations from human trials of conventional CAR T-cell therapy in lupus, where long-term remission has been linked to repopulation by naïve B cells.

The researchers also tested the platform on blood samples from patients with lupus and myositis. In laboratory assays, CD8-tLNPs successfully reprogrammed the patients' own T cells, which then eliminated their B cells *in vitro*.

While these findings remain preclinical, they reinforce that transient CAR expression might offer a way to reset the immune system without long-term immunosuppression.

What the safety data say

The risks associated with conventional CAR T-cell therapy include cytokine release syndrome (CRS), neurological complications, and, in some cases, long-term effects from random integration of viral vectors in the patient's genome.



Acute lymphoblastic leukaemia blood smear under light microscopy. GETTY IMAGES

A patient who received CAR T-cell therapy for primary mediastinal B-cell lymphoma at Tata Memorial Centre in June 2024 said it was her fourth line of treatment after three earlier regimens had failed.

"It finally put my cancer into remission," she said. "But recovery hasn't been simple. I stayed 27 days in the hospital because of sepsis. I've had pneumonia and still get secondary infections due to low immunoglobulin levels. Another friend is facing something similar. One of the others who had the treatment with us – she had leukaemia – passed away recently, possibly from the same. I'm better; cancer free, but I wouldn't say I have been able to get back to how life was before my diagnosis."

She does however call herself an outlier and that others have had easier recoveries.

The new study aimed to minimise some of these risks by using non-integrating mRNA and the new lipid nanoparticle.

In monkeys, the treatment was mostly safe. Inflammation markers rose slightly after infusion but normalised with standard premedication of antihistamines and corticosteroids. Liver side effects, a concern with nanoparticles, were minimal with Lipid 829.

However, one monkey developed a serious immune overreaction resembling hemophagocytic lymphohistiocytosis – a known CAR T-cell therapy risk – after the last infusion and had to be euthanised. While this was a single case, it underscored the importance of careful dosing and clinical monitoring.

Dosing like a drug

In monkeys, two or three intravenous infusions, spaced 72 hours apart, were enough to induce CAR expression in circulating CD8+ T cells and achieve near-complete depletion of B cells across multiple tissues.

Because the formulation was standardised, not patient-specific, and required only intravenous dosing, the procedure resembled a biologic drug infusion more than a cell therapy protocol. In principle, this delivery model could reduce the need for specialised infrastructure.

The platform represents one of the most developed *in vivo* CAR T-cell systems tested to date. It showed functional results in mice and non-human primates, used a defined dosing regimen, and included safety modifications such as enhanced CD8 targeting and premedication.

Dr. Vishwanath said, "Robust human trials will be essential to confirm safety, efficacy, and long-term outcomes". How the body will react to the engineered T cells and repeat dosing remain open questions as well.

The key advantage of this platform is that it avoids the most restrictive components of current CAR T-cell therapy. Since CAR instructions were delivered using mRNA rather than viruses, changes to immune cells were temporary, lowering the risk of genetic side effects

"Reproducibility will be another major issue," Pankaj Prasad, who has worked extensively in cell and gene therapy in India and Singapore, cautioned. "When pilot experiments are performed in the R&D lab by humans and when they are reproduced by automated machines, there is always variability. The small-scale results do not match with the automated machine-generated results and usually require another loop of standardisation."

The study lays the technical groundwork for translation, but the safety, efficacy, and scalability of this approach in humans remain to be established. If future trials succeed, it could expand the scope of CAR T-cell therapy beyond what current platforms allow.

Matters for India

India faces a high burden of B cell-driven cancers. Regional cancer registries show that diffuse large B-cell lymphoma (DLBCL) – one of the most aggressive types – makes up 34-60% of non-Hodgkin lymphoma cases, followed by follicular lymphoma. Acute lymphoblastic leukaemia is the most common cancer in Indian children accounting for 75% of all cases. All of these conditions are candidates for conventional CAR T-cell therapy.

India's burden of autoimmune disorders is also rising, with one study suggesting a 30% increase in prevalence since the COVID-19 pandemic.

The approach described in the new study avoids many of the constraints that have limited the therapy's use in India. If proven safe and effective in humans, it could be ideal for settings where specialised infrastructure is limited and patient volume is high. Furthermore, a simplified, infusion-based platform like this could make advanced immunotherapy more widely feasible, especially in places where few cell therapy units and trained specialists limit access.

If it passes all the quality checks, this platform could shift not just how we deliver CAR T-cell therapy but also who can benefit from it.

(Anirban Mukhopadhyay is a geneticist by training and science communicator from Delhi. anir.deskspace@gmail.com)

and side effects.

Potential Advantages:

1. **Affordability & Accessibility:**
   - Eliminates lab-based ex vivo steps costing ₹30–35 lakh in India.
   - Can potentially **reduce treatment costs** drastically, widening access to under-resourced areas.
2. **Reduced Toxicity:**
   - No viral vector →**No permanent genetic alteration**.
   - No chemotherapy →**Lower risk of infections and side effects**.
3. **Platform Potential:**
   - Works like a **standardised drug infusion**, requiring less hospitalisation and infrastructure.
   - Potential use in **autoimmune diseases** like lupus and myositis.

Implications for India:

- **High burden of B-cell cancers** (e.g. DLBCL, ALL) and **autoimmune diseases** makes India a prime candidate for this innovation.
- **Limited cell therapy units**, high treatment costs, and long hospital stays have limited CAR T-cell therapy's reach in India.
- In vivo therapy could **democratize access**, especially in Tier-2 and Tier-3 cities.

Challenges Ahead:

1. **Still at Preclinical Stage:**
   - Tested only in mice and monkeys; **human safety and efficacy unknown**.
   - One monkey showed **life-threatening immune reaction**, raising concerns over **dosing and immune overactivation**.
2. **Reproducibility and Scaling:**
   - Transition from lab to large-scale automated production is **fraught with variability**.
   - Requires **standardization** and **quality control** protocols for global application.
3. **Regulatory Hurdles and Infrastructure:**
   - Indian regulators will need **clear guidelines for mRNA-based immune therapies**.
   - Cold-chain logistics and infusion protocols must be developed.
4. **Monitoring and Risk Management:**
   - Even without chemotherapy, **immune-related complications like CRS and HLH remain a risk**.
   - Requires **trained monitoring and emergency response systems**.

Way Forward for India:

- **Invest in Clinical Trials:**
  - Government and private hospitals should collaborate in **human trials** under ethical and scientific scrutiny.
- **Capacity Building:**
  - Train oncologists and immunologists in **mRNA and nano-delivery platforms**.
  - Expand infrastructure for **biologic drug infusion**, even outside major metros.
- **Public-Private R&D Collaboration:**
  - Support from **ICMR, DBT, and CSIR** to adapt and localize such innovations.
  - Foster **affordable domestic manufacturing** of LNPs and mRNA constructs.
- **Ethical Oversight & Regulation:**
  - Strong regulatory frameworks to ensure **biosafety, ethical deployment**, and **data transparency**.

Conclusion:

This in vivo CAR T-cell therapy platform could be a **game-changer in the global fight against cancer and autoimmunity**, particularly for countries like India that face **resource constraints and high disease burden**. If human trials prove successful, this innovation can **transform not just treatment outcomes but healthcare equity**, enabling access to cutting-edge care at a fraction of today's cost.

UPSC Mains Practice Question

Ques : "Science alone cannot drive health equity." In light of emerging therapies like CAR T-cell treatment, critically examine how socio-economic and systemic factors affect their success in India.**(250 Words)**

Page : 09: GS 2 : Social Justice

According to recent global data highlighted by Hannah Ritchie, around **two billion people still lack access to safe drinking water**, despite improvements in water infrastructure worldwide. This persistent global challenge continues to pose **serious health, economic, and developmental risks**, especially in **low-income countries**.

Two billion people don't have safe drinking water

For billions, this can mean hours spent collecting water. For almost a million, it means dying from disease

DATA POINT

Hannah Ritchie

In the time it would take me to write the next sentence, I could get up, walk to the kitchen, and pour myself a glass of clean water. I've never had to worry about whether that water would make me sick. Almost six billion other people in the world share this reality. They have safe drinking water in their homes.

That still leaves two billion people without. If people don't have safe water, what are they drinking? Before we get into it, it is important to understand how levels of drinking water services are defined and how many people fall on each 'rung' of the ladder. This is summarised in **Chart 1.**

For someone to have 'safe drinking water', their water source needs to meet three criteria: it needs to be free from contamination, located at home, and available whenever needed. Again, this is the reality for almost six billion people. So, what are the other two billion drinking? If you had asked me in the past, I might have guessed that they were collecting water from streams or lakes. The world was binary: you either had safe piped water or were collecting it from a river. But that is not the reality: only around 156 million people get their water this way (1.4% of the global population).

Around three-quarters of the two billion people do have access to a piped water source or protected well that is probably safe to drink. But it is either not located in their home, is not always available, or there is no guarantee it is completely contamination-free. That usually means they must travel to get there.

'Safe drinking water' became the main indicator of progress on clean water only in 2017. Before that, the focus was on the number of people who had access to an 'improved water source'. An improved water source can potentially deliver safe water: it is a protected pipe, spring, borehole, or other system that probably delivers safe water. The problem is that it doesn't guarantee the water is safe at the point of consumption. Imagine you collect a bucket of water from a pipe an hour from home. It might be safe when you collect it, but once you have trekked back and left it sitting in the heat for the rest of the day, there is no guarantee that it is free of pathogens when you drink it the next morning.

That is the key point here. 95% of the world uses an improved water supply. As **Map 2** shows, the majority in every country does, even in the poorest countries. Many countries have rapidly increased this share in the last few decades. In **Chart 3**, you can see the change in the share of the population with improved water across countries income-wise.

Countries can quickly increase access to a (probably) clean piped, spring, or borehole source. The biggest challenge is getting those pipes into each individual household and making sure that the source is completely contamination-free. This often means expanding a single community-shared pipe into a whole water network. But to get universal access to safe drinking water, this is what the world will need to do.

Unsafe water leads to more than 8,00,000 deaths every year. This is because it can lead to the spread of diarrheal diseases, such as cholera or dysentery, and other diseases, including polio and hepatitis. It can also lead to malnutrition, which is attributed to half of all childhood deaths.

These deaths tend to be concentrated in lower-income countries where fewer people have safe water to drink. In some of the worst-off countries, more than 5% of all deaths are attributed to unsafe water.

Water woes

The charts are sourced from "Two billion people don't have safe drinking water: what does this really mean for them?", published at OurWorldinData.org (OWID). The text on the left is an abridged version of the story that appeared on OWID

Chart 1: The safe drinking water ladder that explains where people get their water from

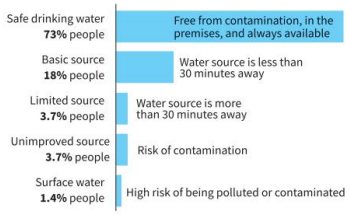
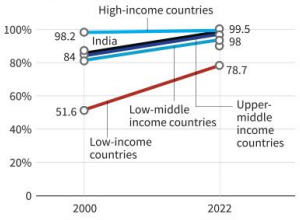
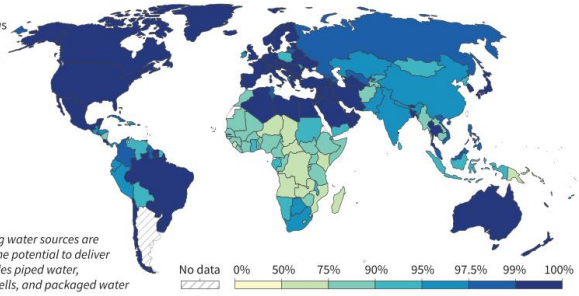


Chart 3: The share of the population using improved water sources (2000 to 2022)



Map 2: This shows the share of the population using improved water sources (2022)



Improved drinking water sources are those that have the potential to deliver safe water. Includes piped water, boreholes, tubewells, and packaged water

No data 0% 50% 75% 90% 95% 97.5% 99% 100%

Hannah Ritchie is the Deputy Editor and science outreach lead at Our World in Data

What is Safe Drinking Water?

The **United Nations' definition of "safely managed drinking water"** includes three key criteria:

1. **Free from contamination** (microbial and chemical),

2. **Available at home**, and
3. **Available on demand** (whenever needed).

Only when all three conditions are met can water be considered safe.

The Current Global Scenario:

- Nearly **6 billion people** have access to safe drinking water.
- Around **2 billion people** do **not** — many of whom rely on:
  - Community water sources that are **not available at home**,
  - **Intermittent supplies**,
  - Sources **susceptible to contamination** during collection or storage.

Key Insight: Though **95% of the global population uses an "improved water source"**, only a fraction of that actually meets the full definition of "safe water" at the point of consumption.

Impact of Unsafe Water:

1. **Health Consequences:**
   - Over **800,000 deaths annually** from diseases like **diarrhoea, cholera, dysentery, polio**, and **hepatitis**.
   - Contributes significantly to **child mortality and malnutrition**, especially in Sub-Saharan Africa and parts of South Asia.
2. **Time Poverty & Gender Impact:**
   - Collecting water can take **hours daily**, primarily impacting **women and girls**, limiting their time for education or work.
3. **Economic Burden:**
   - Unsafe water and poor sanitation lead to **lost productivity**, **higher healthcare costs**, and **lower educational outcomes**.

Structural and Policy Challenges:

- **Infrastructure Gap:**Many regions have **piped sources or protected wells**, but **lack home-level delivery systems** or continuous access.
- **Quality vs Quantity Mismatch:**Water might be available, but not safe by the time it is consumed due to **storage contamination or lack of treatment**.
- **Urban-Rural Divide:**Rural communities often have **lower levels of service**, with **greater travel time and storage-related risks**.

- **Monitoring and Regulation:**Weak regulatory frameworks in many countries fail to ensure consistent **water quality surveillance** and **maintenance** of supply systems.

India-Specific Relevance:

- India has made significant strides through the **Jal Jeevan Mission**, aiming for **Har Ghar Jal (tap water to every household)** by 2024.
- **However, challenges remain:**
  - **Water quality testing infrastructure is limited** in rural areas.
  - **Fluoride and arsenic contamination** persist in many regions.
  - **Groundwater dependence and depletion** exacerbate the long-term sustainability of supply.

Way Forward – Global and National Strategies:

1. **Invest in Last-Mile Connectivity:**
   - Expand piped networks into individual households, especially in rural and peri-urban areas.
2. **Promote Household Water Treatment:**
   - Distribute affordable filters, chlorine tablets, or UV treatment systems where piped supply is not feasible.
3. **Ensure Water Quality Monitoring:**
   - Implement regular **community-led testing and reporting**, supported by government labs.
4. **Strengthen Governance & Funding:**
   - Prioritise **water security in national budgets**, and **improve inter-agency coordination** between health, rural development, and water ministries.
5. **Leverage Technology:**
   - Use **GIS, IoT, and mobile-based platforms** for monitoring supply, reporting breakdowns, and tracking coverage.
6. **Global Cooperation:**
   - Achieving **SDG 6 (Clean Water and Sanitation)** will require **shared research**, **funding mechanisms**, and **technology transfer**, especially to low-income countries.

Conclusion:

Access to **safe drinking water is a foundational human right** and a prerequisite for achieving **health, dignity, gender equality, and economic growth**. The fact that **2 billion people remain excluded** from this basic necessity is a global failure — one that can only be corrected through **strong political will, inclusive infrastructure development, and sustained community participation**.

UPSC MainsPractice Question

Ques:Despite significant improvements in water infrastructure, access to safe drinking water remains a major global and national challenge. Discuss the structural, policy, and socio-economic dimensions of this issue, with a special focus on India. Suggest a comprehensive strategy to ensure universal access to safe water (250 words)

Tirumal Classes Quality education

Page : 08 Editorial Analysis

The need for gender equity in urban bureaucracy

Karthik Seshan

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India is in the midst of a profound urban transformation. By 2050, over 800 million people, about half the population, will live in cities, making India the largest driver of global urban growth. As cities expand spatially, economically and demographically, they are rewriting the social contract of a modern India and shaping the future of its democracy and development.

In the last three decades, progressive constitutional reforms have advanced gender equity. The 73rd and 74th Amendments mandate 33% reservation for women in Panchayati Raj Institutions (PRIs) and Urban Local Governments (ULGs), further strengthened to 50% by 17 States and a Union Territory. Today, women comprise over 46% of local elected representatives (Ministry of Panchayati Raj, 2024), as a rising presence of mayors and councillors.

However, the bureaucratic apparatus that implements their decisions remains overwhelmingly male. While women's representation in grass-root politics has increased, administrative cadres (city managers, planners, engineers, police) exhibit a stark imbalance, limiting the ability of cities to respond equitably to all citizens. As we invest in highways, metros, and smart cities, we overlook a foundational aspect of inclusive development – gender equity in bureaucracy.

The bureaucratic gender gap

Despite more women entering the civil services, the urban administrative architecture remains male-dominated. As of 2022, women constituted just 20% of the Indian Administrative Service (IndiaSpend-2022), with even lower representation in urban planning, municipal engineering and transport authorities. In policing, only 11.7% of the national force are women (Bureau of Police Research and Development-2023), and often confined to desk roles.

This gap is cause for concern. In cities, the engagement of women is different. They rely more on public transport, make multi-stop journeys for work and caregiving, and depend on neighbourhood-level infrastructure. An Institute for Transportation and Development Policy and Safetipin study found that 84% of women in Delhi and Mumbai used public or shared transport; it was 63% for men. Yet, urban planning prioritises mega-projects over safe, accessible, neighbourhood-level mobility. A 2019 Safetipin audit across 50 cities found over 60% of public spaces were poorly lit. With few women in policing, community safety initiatives often fail to resonate with women.

In India, while women's representation in grass-roots politics has increased, administrative cadres tell a different story

This underrepresentation is not superficial; it affects outcomes. Women officials bring perspectives shaped by lived realities. Studies by the Indian Council for Research on International Economic Relations and UN Women show that they prioritise water, health and safety, and improve public trust in law enforcement through empathetic enforcement. Gender-sensitive design requires gender-diverse institutions.

Missed opportunity in gender budgeting

Gender-responsive budgeting (GRB), which integrates gender considerations into public finance, is a promising but underutilised tool in India's urban governance. Introduced globally in the 1990s, GRB recognises that budgets are not neutral and can reinforce inequities if left unchecked.

India adopted a Gender Budget Statement in 2005-06, with Delhi, Tamil Nadu and Kerala leading efforts. Delhi has funded women-only buses and public lighting; Tamil Nadu applied GRB across 64 departments in 2022-23, and Kerala embedded gender goals through its People's Plan Campaign. Yet, studies by UN-Women and the National Institute of Public Finance and Policy show that most such efforts suffer from weak monitoring and limited institutional capacities, especially in smaller cities. For many ULGs, GRB remains tokenistic, overlooking essentials such as pedestrian safety or childcare in urban planning.

In contrast, countries such as the Philippines mandate 5% of local budgets for gender programmes; Rwanda integrates GRB into national planning with oversight bodies; Uganda mandates gender equity certificates for fund approvals; Mexico ties GRB to results-based budgeting; and South Africa pilots participatory planning to anchor GRB in lived realities. These are not just fiscal reforms but also a reimagining of citizen-centric governance in cities.

Building inclusive cities requires moving beyond political quotas to ensure women's presence in bureaucracy. This demands systemic reforms in recruitment, retention and promotion across administrative and technical roles. Affirmative action, through quotas and scholarships in planning and engineering, is key to dismantling structural barriers.

Globally, countries as varied as Rwanda, Brazil, and South Korea show the impact of representation. Rwanda boosted maternal health and education spending; Brazil prioritised sanitation and primary health care; South Korea's gender impact assessments reshaped transit and public spaces and Tunisia's parity laws gave women more technical roles, improving focus on safety and health. The Philippines uses gender-tagged budgeting to fund gender-based violence shelters and childcare. Gender-balanced bureaucracies are not about fairness alone. They are essential for building safer, equitable, responsive cities.

The cities we deserve

As India aspires to become a $5 trillion economy, its cities must also aspire to be more than economic growth engines. They must become spaces of inclusion and equity. Gender must be mainstreamed into planning and implementation through mandatory audits, participatory budgeting, and linked evaluation. GRB should be institutionalised across ULGs, supported by targeted capacity-building.

Representation must also translate into agency, and help dismantle glass ceilings. Local gender equity councils and models such as Kudumbashree offer templates, especially for small and transitioning cities. Women are already reshaping governance as elected leaders. They must now shape how cities are planned, serviced and governed. When cities reflect women's lived experiences, they work better for all. To build cities for women, we must start by building cities with women.

Paper 02 : Governance

UPSC Mains Practice Question: Despite increased political representation of women in local bodies, India's urban governance remains male-dominated. Examine the structural and institutional barriers to gender equity in urban bureaucracy and suggest policy measures to overcome them.(250 words)

Context :

India's urbanisation is accelerating rapidly — by 2050, over 800 million Indians will be urban dwellers. However, this transformation is failing to be gender-inclusive, especially in urban administrative structures. While political representation of women has improved at the local level, their representation in urban bureaucracy and planning remains deeply skewed.

Key Issues Highlighted:

1. Urban Bureaucratic Gender Gap:

- Women form only 20% of IAS officers (2022).
- In urban planning, engineering, and police, the figures are worse (e.g., 11.7% women in policing, mostly in desk roles).
- Implication: Urban infrastructure and services are designed and implemented without adequately incorporating women's lived realities.

2. Why Representation Matters:

- Women's urban experiences differ — they rely more on public/shared transport, make multi-stop trips, and are more affected by local infrastructure, lighting, sanitation, and safety.
- Studies show women bureaucrats prioritise water, health, childcare, and community safety — leading to empathetic and trust-enhancing governance.

3. Underutilisation of Gender Responsive Budgeting (GRB):

- India adopted GRB in 2005-06, but its implementation at the urban local level remains tokenistic.
- States like Delhi, Kerala, Tamil Nadu show promise, yet most ULGs lack capacity, monitoring, and integration.
- In comparison, countries like Philippines, Rwanda, Uganda, Mexico, and South Africa have embedded GRB into their planning and funding structures.

India-Specific Insights:

- Constitutional amendments (73rd & 74th) ensured 33%-50% reservation for women in local governments.
- Women constitute 46% of elected local representatives (2024), but this political presence has not translated into bureaucratic power.

- Jal Jeevan Mission, Smart Cities Mission, and urban renewal projects continue to ignore gender inclusion in design and execution.

Challenges to Gender Equity in Urban Governance:

1. Recruitment & Retention Gaps in technical fields like planning, engineering, and transport.
2. Lack of Institutional Capacity for GRB in ULGs.
3. Weak inter-departmental coordination on gender issues.
4. Invisibility of women's needs in city design (e.g., poor lighting, unsafe public transport).
5. Absence of local mechanisms like gender equity councils in small and mid-sized cities.

Recommendations & Way Forward:

Administrative Reform:

- Affirmative action in recruitment for planning, civil engineering, and policing roles.
- Scholarships, technical training, and mentorship for women in city governance roles.

Institutionalise Gender Budgeting:

- Mandate gender audits in urban budgets.
- Build capacity in ULGs to implement GRB with measurable outcomes.

Participatory Urban Planning:

- Involve women in all stages of city planning, from budgeting to implementation.
- Use tools like community-based safety mapping and feedback systems.

Leverage Global Best Practices:

- Learn from countries that link budget allocation with gender outcomes, such as:
  - Rwanda (gender equity certificates),
  - Philippines (minimum 5% budget allocation),
  - South Korea (gender impact assessments).

Build Local Gender Institutions:

- Replicate successful models like Kerala's Kudumbashree in other states.
- Establish gender equity councils in municipalities.

Conclusion:

Urban development must move beyond economic infrastructure to include social and gender justice. Without gender-balanced bureaucracies, India's urban future will be uneven and exclusionary. "To build cities for women, we must build cities with women." True gender equity demands not just quotas, but structural reforms, institutional support, and inclusive planning frameworks.

Tirumal Classes Quality education