

27th June DSC

Indian astronaut reaches space after 41 years, undertakes ISS mission

Mission Overview: Axiom-4 Expedition

Historic Achievement:

Group Captain Shubhanshu Shukla becomes the first Indian in orbit since Rakesh Sharma (1984) and the first Indian to enter the ISS.

Launch Information:

Launched on June 26, 2025 (IST) from NASA's Kennedy Space Center in Florida.

Launch Vehicle: SpaceX's Falcon 9 rocket.

Spacecraft: Dragon crew capsule (commercial and reusable).

Duration and Objectives:

14-day mission aboard the International Space Station.

Crew: Astronauts from India, the U.S., Poland, and Hungary.

Goals: Conducting over 60 scientific experiments, promoting STEM awareness, and facilitating commercial activities.

Relevance: GS 3 (Space, Science)

Impact on India's Space Ambitions

Symbol of Human Spaceflight Readiness:

Shukla described this as "the beginning of India's human space programme," marking a significant operational step toward India's Gaganyaan mission, planned for 2027.

Skill and Capability Enhancement:

Offers essential experience in life support management, microgravity operations, crew dynamics, and ISS procedural standards, all critical for designing Gaganyaan's modules, training, and mission infrastructure.

Scientific and Technological Contributions

Global Research Participation:

Ax-4 covers 60 experiments spanning 31 nations, including studies in life sciences, materials research, and human physiology—presenting India a platform for international collaboration.

ISRO's Contribution:

Indian institutions and ISRO provided 8 experiments, potentially validating Indian instruments in space conditions.

Microgravity Data Collection:

Insights from Ax-4 can inform models of human adaptation to microgravity, critical for deep-space human exploration like Moon and Mars missions.

Strategic and Diplomatic Outcomes

Strengthening Space Diplomacy:

This is India's first involvement in a multilateral human space venture, strengthening ties with NASA, SpaceX, and the Axiom Space ecosystem.

Enhancing Global Standing:

Positions India as an attractive partner for nations exploring alternatives to China-centric space alliances.

Prospects for Bilateral Engagement:

Could pave the way for NASA collaboration on Gaganyaan, or joint technology initiatives with SpaceX and Blue Origin.

Cost and Policy Dimensions

The mission cost ₹548 crore, covering the astronaut's seat and advanced training (including backup astronaut Prasanth Nair).

Part of India's wider ₹20,200 crore Gaganyaan programme budget but raises concerns around:

- Transparency of cost-benefit assessments.
- The need for clearer public messaging on the mission's strategic importance.

Commercial Space Trend:

Reflects India's strategy to leverage private platforms, advancing ISRO's engagement with private enterprises.

Future Directions for ISRO

Learning for Gaganyaan:

Experience gained in operations, safety protocols, crew psychology, and mission readiness.

Public and Institutional Expectations:

ISRO will be expected to show more transparency, engage citizens, and articulate a long-term vision.

Post-ISS Imperatives:

With ISS set to retire by 2030, India must develop its own or joint space station capabilities (like the Bharatiya Antariksha Station planned for 2035).

Conclusion:

Ax-4 represents a critical technological and symbolic turning point in India's space trajectory. Beyond proving capabilities, it tests India's preparedness for leadership in space, requiring cohesive policies, institutional alignment, and public-private collaboration in the years ahead.

Enabling voting rights for migrant populations

Background: Bihar, Migration, and Low Voter Participation

Migration Dynamics in Bihar:

Bihar is among the Indian states with the highest levels of out-migration.

Over half of households report family members migrating, mostly for work-related reasons.

Voter Turnout Challenge:

Bihar's turnout in the 2024 Lok Sabha polls stood at 56%, well below the 66% national figure.

Migration is widely recognized as a major factor behind reduced participation.

Relevance: GS 2 (Elections, Social Issues)

Migration Patterns and Their Complexity

India-Wide Statistics (2021):

Overall migration rate: 28.9%.

While most women migrate for marriage, about 10% move for employment, especially in Bihar and eastern India.

Migrant Categories:

- **Intra-State Migrants (≈85%):** Typically work informally within their home states.
- **Inter-State Migrants:** Face more logistical challenges due to distance.

Voting Barriers for Migrants

Risk of Exclusion:

Many migrants cannot travel back to their constituencies due to work commitments, travel costs, or remoteness.

The absence of suitable voting alternatives effectively excludes them from democratic participation.

Proposed Solutions and Their Prospects

Statutory Holiday + Special Transport:

- Mechanism: Paid leave on election day combined with dedicated bus services.
- Benefit: Makes it easier for intra-state migrants to vote.
- Challenge: Needs active cooperation from employers, especially informal ones.

Postal Ballot System:

- Inspired by military postal voting.
- Mechanism: Pre-registration by migrants to receive and return ballots.
- Benefit: Could efficiently serve inter-state migrants.
- Challenge: Requires meticulous preparation and administrative capacity.

Shifting Constituencies:

- Mechanism: Long-term migrants re-register to vote where they currently reside.
- Benefit: Encourages civic integration and political accountability locally.
- Challenge: May trigger opposition from local voters; requires robust proof of residency.

Remote Voting Machines (RVMs):

- ECI piloted RVMs in 2023, capable of handling votes across 72 constituencies.
- Political Concerns: Credibility and transparency issues, enforcement of Model Code of Conduct.
- Operational Challenge: Setting up multiple RVMs in each city for states like Bihar (with 243 constituencies) demands early and massive data coordination.

Special Issues with Women Migrants:

Women often don't re-register after moving due to marriage, leading to disenfranchisement. Targeted awareness and simplified processes are needed to update their registration.

Why a Blended Strategy Is Essential:

Migration's diversity—temporary vs. permanent, intra- vs. inter-state, skilled vs. unskilled—means no single solution works for all.

ECI must combine:

- Postal ballots
- RVMs (refined and phased)
- Transport support

- Flexible re-registration rules

Policy Implications and Next Steps:

Improving migrant voting access strengthens democracy and empowers workers to advocate for better working conditions.

Future research should:

- Examine migrant voting behaviour
- Pilot tech-based interventions (like RVMs and e-postal ballots)
Building consensus among ECI, parties, employers, and civil society is key to successful reform.

State- and sex-wise liver disease data point to underlying causes

Growing Burden of Liver Diseases in India

Liver ailments have become a critical public health issue nationwide.

In 2022, liver disorders made digestive illnesses the 8th leading cause of death, marking a significant rise from earlier years.

This reflects a notable shift in disease patterns, underscoring evolving lifestyles and health challenges.

Relevance: GS 2 (Health, Governance)

Sex-Based Patterns

Men are much more affected:

Male digestive disease deaths in 2022 were 3.5 times higher than female deaths.

This male-to-female death ratio is the highest recorded since 2016.

Breakdown of liver-related deaths:

Among men: 75% of digestive disease deaths were due to liver issues.

Among women: 57.5% were liver-related, a proportion stable since 2012.

Interpretation: Suggests sex-linked biological or behavioural risk factors.

Age-Wise Distribution (2022):

Men:

Mortality peaks in the 35–54 age group, pointing to early emergence of alcohol-related or lifestyle-driven risks.

Women:

Around 30% of digestive disease deaths occurred among those over 65, implying more age-related liver complications than lifestyle origins.

State-Level Observations

Sikkim records the highest share of certified digestive disease deaths (~20%).

Distinct patterns are visible in the North-East:

Five states show over 10% of all deaths due to digestive illnesses, the largest cluster in India.

Insight: There is pronounced regional variation requiring targeted health interventions.

Behavioural Risk Contributors

Alcohol Use:

NFHS data show only 1% of women vs. 19% of men consume alcohol.

Aligns with the male burden of liver disease in midlife.

Meat Intake:

Excess consumption is another factor.

Combined high alcohol and meat consumption is most prevalent in the North-East, potentially explaining the regional spikes.

Inference: Strong correlation, but not proven causation, between these behaviours and liver mortality.

Need for Further Research:

While associations are evident, causality isn't firmly established.

Recommendations:

- Invest in large-scale studies to map risk factors by sex, region, and age.
- Generate evidence to design targeted health policies.

Policy and Healthcare Implications:

- Early screening and awareness for middle-aged men are crucial.
- Regional health programmes should focus on the North-East.
- Health systems must be ready to tackle non-communicable liver diseases.
- Tailored messaging about alcohol and meat consumption should be demographic- and region-specific.

Should the method of caste counting evolve?

Census 2026–27 Design:

Two-phase approach:

- **House-listing (2026):** Catalogues dwellings, amenities, and assets.
- **Population enumeration (2027):** Collects demographic and socioeconomic details, including caste (first time since 1941).

Background:

The 1941 Census gathered caste data but couldn't process it due to World War II; the 1931 figures remain the last usable baseline.

Relevance: GS 2 (Governance, Social Issues)

Purpose of Caste Enumeration:

PM Modi has said it aims to mainstream marginalised communities and address inequalities. However, current design constraints may limit the Census's usefulness for this goal.

Main Limitations in Design:

Questionnaire Constraints:

Past censuses asked caste questions mainly about SCs.

OBCs and others were excluded.

Proposed 2027 Update:

- Broaden caste questions to cover all non-ST categories.
- Enhance digital tools and instructions for enumerators.

Data Quality and Interpretation Challenges:

Unemployment:

Captured with vague questions about “seeking work,” creating poor-quality data since 1981.

Fertility and Survival:

Better measured by NFHS, not Census.

Migration:

Often undercounted or misclassified, obscuring caste-mobility links.

Household Linkage Problem:

The 6–9 month gap between listing and enumeration disrupts linking housing and caste data—especially for urban poor.

Proposed Fix:

Shift housing and asset questions to the enumeration phase for better integration.

Missed Analytical Potential:

Without restructuring, the Census can’t answer critical questions such as:

- Caste-wise literacy in kutcha houses.
- Urban workforce patterns by caste.

Leaner Questionnaire Needed:

Dropping non-essential questions (like phone or bank account ownership) could:

- Increase accuracy.
- Improve efficiency.
- Reduce fatigue among enumerators and respondents.

Policy Use Going Forward:

Historically, caste-based socio-economic data has been underused.

Future data should:

- Help identify the most backward groups.
- Inform policies beyond reservation—targeted development measures.

Conclusion:

Despite constraints, the Census remains the most comprehensive tool to understand caste in India.

Chemotherapy drugs by Indian manufacturers fail quality checks, study finds

Main Findings:

A University of Notre Dame study assessed 189 chemotherapy samples worldwide.

About 20% failed quality standards, risking treatment failure or toxicity.

Of 17 companies whose drugs failed, 16 were Indian firms.

These drugs reached over 100 countries, including Nepal, Ethiopia, the U.S., the U.K., and Saudi Arabia.

Relevance: GS 2 (Health, Governance)

Problematic Manufacturers:

- **Venus Remedies:** All 8 cyclophosphamide samples failed. The company disputed the results and blamed storage.
- **Zuvius Lifesciences, GLS Pharma, Zee Laboratories:** Supplied substandard drugs to dozens of countries but did not comment.
While companies contested testing validity, lead researcher Marya Lieberman affirmed the methods were peer-reviewed.

Types of Failures:

- Low active ingredients: rendering treatment ineffective.
- Excessive dosage: risking organ damage or death.

Case Reports:

Some patients became unresponsive to treatment or suffered severe side effects, leading to therapy discontinuation.

Global Regulatory Weakness:

Two-thirds of countries lack capacity to assure medicine quality.

Nepal:

- Major importer.
- No cancer drug testing capabilities.
- Never recalled any cancer medicines despite external warnings.
Patients remain unaware of medicine quality, with no recourse for accountability.

India: Major Supplier, Regulatory Gaps:

India is the largest generic drug producer globally.

Activists like Dinesh Thakur allege that regulation protects manufacturers more than patients. The CDSCO says failing drugs are recalled and prosecuted—but provides little transparency on outcomes.

Impact on Patients:

For patients in poorer nations, chemotherapy costs months or years of savings. Receiving substandard drugs is emotionally and financially catastrophic. Treatment is already grueling; low-quality medicine worsens suffering.

Broader Implications:

- Highlights failure of WHO and international surveillance.
- Raises doubts about dependence on generic imports from under-regulated systems.

Recommendations:

- Stronger global pharmacovigilance.
- International accountability.
- Investment in regulatory infrastructure for importing nations.

New ECINET platform improves election data updates

What is ECINET?

A digital system developed by the Election Commission of India to expedite data entry, verification, and dissemination during elections.

Piloted in by-elections across four states.

Relevance: GS (Elections – Reforms)

Key Improvements:

Presiding officers uploaded turnout figures directly, replacing manual processes.

Index Cards summarising constituency results were published within 72 hours, compared to several days previously.

Impact:

Faster, more transparent election data.

Reduces delays and human error.

Boosts accountability in publishing post-election statistics.

Broader Significance:

ECINET is part of the Election Commission's broader digitisation strategy.

If scaled up, it could:

- Become the default for state and general elections.
- Enable digitised voter roll verification, quicker audits, and greater transparency. However, parties still demand more safeguards, showing digital tools alone can't guarantee electoral credibility.

Urban tree choices and bird diversity in cities

Urban Heat and Biodiversity Loss:

Rising temperatures and shrinking greenery in Indian cities—especially Bengaluru—are harming biodiversity.

Urban heat islands have far lower bird diversity.

Biodiversity clusters wherever tree cover and cooler temperatures persist.

Relevance: GS 3 (Environment and Ecology)

Bird Diversity Findings:

IIHS researchers used eBird and satellite data.

Bengaluru, home to over 350 bird species, sees diversity plummet where heat is high and trees are few.

Not all birds benefit from denser tree cover; open-habitat species prefer sparse areas.

Tree Cover: Quality over Quantity:

Adding trees doesn't guarantee more biodiversity.

About 77% of Bengaluru's trees are exotic, poorly supporting native species.

Ornamental trees like Jacaranda and Tabebuia are attractive but worsen allergies, disrupt insect life, and harm ecosystems.

Problems with Tree Drives:

Afforestation often disregards ecological history, replacing savannahs and wetlands with non-

native plantations.

Simplistic assumptions that “more trees = good” ignore ecological complexity.

Better Urban Biodiversity Planning:

Urban greening must respect local ecosystems and historical land use.

Strategies should include native grasses, shrubs, wetlands, and mixed habitats alongside trees.

Approaches should blend small gardens, green corridors, and parks.

Equity Considerations:

Marginalised communities suffer most from heat and lack of green spaces.

Access to greenery must be expanded; exclusive parks deepen inequality.

Policy Lessons:

Tree planting must be scientifically guided, not arbitrary.

Biodiversity plans should set clear objectives, embrace zonal strategies, and focus on native species.

Climate and biodiversity goals can work together if approached thoughtfully.

27th June Daily MCQs

1. Question

Why does the Axiom-4 mission important for India?

1. It signals the beginning of India’s era of human space exploration.
2. It was entirely developed within India and launched from Sriharikota.
3. It involves scientific studies, commercial activities, and educational outreach in STEM.
4. It aids in shaping design protocols and astronaut training for Gaganyaan.

Options:

- (a) 1, 2, and 3 only
- (b) 1, 3, and 4 only
- (c) 2 and 4 only
- (d) 1 and 2 only

Correct Answer: (b) 1, 3, and 4 only

Explanation:

- Statement 1 is correct: An Indian astronaut’s participation marks a milestone in human spaceflight for the country.
- Statement 2 is incorrect: The mission was launched from NASA’s Kennedy Space Center, not Sriharikota.
- Statement 3 is correct: It includes scientific experiments and initiatives to inspire interest in science and technology.
- Statement 4 is correct: Lessons learned are feeding into training and mission planning for the Gaganyaan program.

2. Question

Regarding migration patterns in India, which of the following pairs are correctly matched?

1. Intra-state migrants – Often engaged in informal work and typically migrate over short distances.
2. Inter-state migrants – Harder to trace and face more logistical obstacles.
3. Women migrants – Primarily move for education and jobs.

Options:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) All of the above

Correct Answer: (a) 1 and 2 only

Explanation:

- Statements 1 and 2 are true: They accurately reflect the realities of migration within and between states in India.
- Statement 3 is incorrect: Most female migrants relocate due to marriage rather than for employment or education.

3. Question

According to 2022 data, which of the following is true regarding liver disease deaths in India?

- (a) Women had higher mortality from liver disease compared to men.
- (b) Liver disease deaths among men peaked in those aged 65 and older.
- (c) A majority of male deaths from digestive diseases were due to liver conditions.
- (d) Liver disease has ceased to be a significant cause of death.

Correct Answer: (c) A majority of male deaths from digestive diseases were due to liver conditions.

Explanation:

- Liver disease caused about 75% of digestive system deaths in men.
- Women's mortality from liver disease was lower.
- Among men, deaths peaked in the 35–54 age bracket.

4. Question

A recent investigation into chemotherapy medications revealed:

1. Around 20% of the tested samples did not meet quality standards.
2. All substandard samples came from non-Indian manufacturers.

3. These faulty medicines were shipped to both developing and developed nations.

Which statement is/are correct?

Options:

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2, and 3

Correct Answer: (b) 1 and 3 only

Explanation:

- Statement 1 is correct: About one-fifth of samples failed quality checks.
- Statement 2 is incorrect: Most of the failed batches (16 out of 17) were produced by Indian firms.
- Statement 3 is correct: These drugs were exported to countries including the U.S., U.K., Nepal, Ethiopia, and Saudi Arabia.

5. Question

With reference to the impact of urban heat on biodiversity, consider the following statements:

- 1. Hotter urban areas have fewer bird species.
- 2. Places with abundant trees and cooler climates support greater bird diversity.
- 3. All bird species thrive when tree cover increases in cities.

Which statement is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2, and 3

Correct Answer: (a) 1 and 2 only

Explanation:

- Statement 1 is correct: Urban heat islands lead to reductions in bird diversity.
- Statement 2 is correct: Cooler, greener spaces tend to have richer bird life.
- Statement 3 is incorrect: Certain birds adapted to open habitats may prefer areas with fewer trees.