

DAILY **CURRENT AFFAIRS**

SPECIAL FOR UPSC & GPSC EXAMINATION

DATE : 14-11-25



The Hindu Important News Articles & Editorial For UPSC CSE

Friday, 14 Nov, 2025

Edition : International Table of Contents

Page 05 Syllabus : GS 3 : Indian Economy - Agriculture / Prelims	Centre releases draft Seeds Bill; farm outfits cautious, industry welcomes it
Page 05 Syllabus : GS 3 : Environment / Prelims	India's carbon emission rise slower this year, says report
Page 07 Syllabus : GS 2 : Social Justice	Workplace stress linked to risingcases of diabetes among adults
Page 07 Syllabus : GS 2 : Social Justice	Why Hepatitis A deserves a place in India's universal immunisation programme
Page 10 Syllabus : GS 2 : Social Justice	How is SEC ensuring fair elections?
Page 08 : Editorial Analysis Syllabus : GS 2 : International Relations	Donald Trump shakes up the global nuclear order

Page 05 : GS 3 : Indian Economy - Agriculture / Prelims

The Union Government has released the Draft Seeds Bill, 2025, aiming to modernise India's seed regulatory framework by replacing the Seeds Act, 1966 and the Seeds (Control) Order, 1983. This move comes after two earlier failed attempts in 2004 and 2019, mainly due to resistance from farmers' groups. The new draft seeks to ensure quality seeds, improve farmers' access, and align regulations with international standards, while balancing the interests of industry and cultivators.

Centre releases draft Seeds Bill; farm outfits cautious, industry welcomes it

A.M. Jigeesh
NEW DELHI

After two failed attempts by both the UPA and NDA governments in 2004 and 2019 to pass a similar law, the Union government has brought yet another draft Seeds Bill here on Thursday.

The Union Agriculture Ministry said the new draft is aligned with current agricultural and regulatory requirements. The proposed legislation is intended to replace the existing Seeds Act, 1966 and the Seeds (Control) Order, 1983.

While the seed industry welcomed the move, farmer organisations reminded the Centre that it had to withdraw the Bill on two occasions following their resistance.



The draft Bill seeks to ensure farmers' access to high-quality seeds, the Centre said.

The Centre said in a release that the draft Seeds Bill, 2025 seeks to regulate the quality of seeds and planting materials available in the market, ensure farmers' access to high-quality seeds at affordable rates, protect farmers from losses, and liberalise seed imports to promote access

to global varieties. "On the enforcement side, the draft Bill proposes to decriminalise minor offences, thereby promoting 'Ease of Doing Business' and reducing compliance burden, while maintaining strong provisions to penalise serious violations effectively," the government said.

All stakeholders and members of the public can submit their comments and suggestions on the draft Bill and its provisions by December 11.

As per the draft, every dealer in seeds shall obtain a registration certificate from the State government before selling, keeping for sale, offering to sell, import or export or otherwise supply any seed by himself or by another person on his behalf. The draft law also provides for regu-

lation of sale of seeds so that seed varieties conform to the minimum limit of germination, genetic purity, physical purity, traits, seed health and other seed standards specified in the 'Indian Minimum Seed Certification Standards'.

Speaking to *The Hindu*, senior functionary of Bharatiya Kisan Union (Ekta Ugrahan) Pavel Kussa said: "...On the face of it, this Bill favours seed companies and facilitates ease of doing seeds business. We will study the draft Bill and make our position known to the government and the public."

Federation of Seed Industry of India chairman Ajai Rana said the release of the draft is a timely step toward modernising India's seed regulatory framework.

Key Analysis

1. Static Background: Why Seed Regulation Matters

- Seeds are the foundation of agricultural productivity, contributing to nearly 20–25% of yield improvements.
- The current Seeds Act, 1966 regulates:

- Certification standards
- Seed testing
- Licencing of seed dealers
- However, it does not address:
 - Emerging biotechnologies
 - Protection from spurious seeds
 - Transparency in the seed supply chain
 - Farmers' rights in a liberalised seed market

Thus, regulatory reforms have been long pending.

Key Features of the Draft Seeds Bill, 2025

a. Mandatory Registration of Seed Dealers

- Every dealer must obtain a State-issued registration certificate before selling, exporting, or importing seeds.
- Ensures traceability and accountability.

b. Regulation Based on Quality Parameters

Seed varieties must meet the Indian Minimum Seed Certification Standards regarding:

- Germination percentage
- Genetic purity
- Physical purity
- Seed health
- Trait expression

This aims to curb the circulation of low-quality and counterfeit seeds.

c. Protecting Farmers

- Ensures access to quality seeds at affordable rates.
- Enables farmers to claim compensation if seed failure is due to faulty germination or poor quality.

d. Liberalisation of Seed Imports

- Allows easier import of global seed varieties to promote innovation and competitiveness.
- Supports private sector participation and crop diversification.

e. Decriminalisation of Minor Offences

- Moves towards Ease of Doing Business
- Minor violations attract administrative penalties instead of criminal prosecution.
- Serious offences remain punishable with stronger penalties.

Stakeholder Responses (Current Affairs Linkage)

a. Farmers' Organisations: Cautious and Skeptical

- Past Bills (2004 & 2019) were withdrawn due to farmer protests.
- Farmers fear:
 - Increased corporate control over seed markets
 - Possible dilution of farmers' traditional seed-saving rights
 - Higher prices if market liberalisation favours large companies
- Farmer groups like BKU (Ekta Ugrahan) argue the Bill seems to favour industry and "ease of doing seeds business".

b. Seed Industry: Welcomes the Reform

- Federation of Seed Industry of India (FSII) says the Bill is a timely step.
- Industry advantages:
 - Clearer regulatory environment
 - Faster registration processes
 - Easier import norms
 - Certainty in enforcement provisions

Conclusion

The Draft Seeds Bill, 2025 represents the Centre's renewed attempt to overhaul outdated seed regulations and strengthen India's agricultural productivity through quality assurance, transparency, and market modernisation. While the industry views it as a progressive reform aligned with global standards, farmer organisations remain wary of potential corporate influence and erosion of traditional rights. The success of the Bill will ultimately depend on its ability to strike a fair balance between innovation, affordability, and farmer protection—a critical requirement for sustainable and equitable agricultural growth in India.

UPSC Prelims Practice Question

Ques: Consider the following statements regarding the Draft Seeds Bill, 2025:

1. It seeks to replace the Seeds Act, 1966 and Seeds (Control) Order, 1983.
2. It makes registration of all seed dealers mandatory.
3. It criminalises all violations related to seed quality.
4. It liberalises import of global seed varieties.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Ans: c)

UPSC Mains Practice Question

Ques: Discuss how the Draft Seeds Bill, 2025 seeks to balance farmers' rights, seed quality regulation, and the interests of the seed industry. **(150 Words)**

Page 05 : GS 3 : Environment / Prelims

The latest Global Carbon Project (GCP) 2025 report indicates that India's carbon emissions are expected to rise by only 1.4% this year — a significant slowdown compared to the 4% rise in 2024. While India remains the third-largest emitter globally, the slower growth signals emerging shifts in energy usage, driven by favourable climatic conditions and rapid expansion of renewable energy. At a time when global emissions are projected to reach a record 38 billion tonnes and the world debates responsibilities at climate summits, India's relative deceleration provides important policy lessons.

India's carbon emission rise slower this year, says report

In 2024, the country's emissions grew by 4%, but a favourable monsoon, which cut demand for cooling, and a growth in renewable energy use, limited the rise to 1.4%, says Global Carbon Project

Jacob Koshy
NEW DELHI

India's 2025 carbon emissions have increased slowly compared to last year. While global carbon emissions are expected to rise to 38 billion tonnes, or by 1.1%, this year, the growth in India's emissions is expected to increase by 1.4%, according to the Global Carbon Project, an authoritative tracker of fossil fuel emissions. This is lower than in recent years — in 2024, India's emissions grew 4% than the previous year.

The slower increase was partly due to a favourable monsoon that reduced cooling demand, as well as a "strong growth in renewable energy", leading to lower coal use.

Global emission trends
China's emissions in 2025 are projected to increase by 0.4% — also a slower growth than in recent years. This was due to a "moderate growth in energy consumption combined with an extraordinary growth in renewable energy."

Emissions are projected to grow in the United States (+1.9%) and the European Union (0.4%) in 2025.

Overall, India is the third largest emitter of carbon at 3.2 billion tonnes annually (2024), led by the U.S. (4.9 billion tonnes) and China (12 billion tonnes). India's per capita emission is 2.2 tonnes of carbon dioxide per year, the second lowest among 20 of the largest economies globally. Coal is the major fuel type contributing to India's emissions.

The projected rise in global fossil CO2 emissions in 2025 is driven by all fuel types: coal +0.8%, oil +1%, natural gas +1.3%. Over the 2015-2024 period, emissions from permanent deforestation remained high around 4 billion tonnes of CO2 per year, while permanent removals through reforestation and forest regrowth offsets about half of the permanent deforestation emissions.

Total CO2 emissions — the sum of fossil and land-use change emissions — have grown more slowly in the past decade (0.3% per year), compared to the previous decade (1.9% per year). The remaining carbon budget to limit global warming to 1.5°C is "virtually exhausted".

The remaining budget for 1.5°C is 170 billion tonnes of CO2, equivalent to four years at the 2025 emissions levels.

"With CO2 emissions still increasing, keeping global warming below 1.5°C is no longer plausible," said Professor Pierre Friedlingstein, of Exeter's Global Systems Institute, who led the study. "The remaining carbon budget for 1.5°C, 170 billion tonnes of carbon dioxide, will be gone before 2030 at current emission rate. We estimate that climate change is now reducing the combined land and ocean sinks — a clear signal from Planet Earth that we need to dramatically reduce emissions."

The latest numbers come even as world leaders are gathered in Belem, Brazil, to attempt progress in transitioning away from fossil fuel use while also negotiating how to pay for the costs of bolstering defence against the effects of human-caused climate change already underway.



Keeping track: India is the third largest emitter of carbon dioxide at 3.2 billion tonnes annually. FILE PHOTO

Key Analysis

1. Current Developments

a. India's Emission Trends

- India's emissions projected to grow 1.4% in 2025.
- Last year's increase was 4%, driven by higher coal and oil demand.
- Slower growth attributed to:
 - Favourable monsoon → reduced cooling/AC demand.
 - Strong rise in renewable energy supply, reducing coal dependence.

b. India in the Global Emission Landscape

- India's total annual emissions (2024): 3.2 billion tonnes CO₂.
- Rank: 3rd largest emitter after:
 - China – 12 billion tonnes
 - U.S. – 4.9 billion tonnes
- Per capita emissions: 2.2 tonnes — second lowest among G20 countries.
- Coal remains India's major emission source.

c. Global Emission Trends

- Projected global fossil CO₂ emissions 2025:
 - +1.1% → total 38 billion tonnes.
- Country-wise:
 - China: +0.4% (slower due to huge renewable surge)
 - U.S.: +1.9%
 - EU: +0.4%

d. Fuel-wise Contribution (Global)

- Coal: +0.8%
- Oil: +1%
- Natural Gas: +1.3%

e. Land-use Change Emissions

- Deforestation emissions: ~4 billion tonnes/year (2015–2024).
- Reforestation offsets: ~50% of deforestation emissions.

f. Carbon Budget and 1.5°C Target

- Remaining carbon budget for 1.5°C: 170 billion tonnes CO₂.
- At current levels, it will be exhausted before 2030.
- Scientists now call 1.5°C "no longer plausible".

g. Global Political Context

- The report aligns with negotiations at the Belem Climate Summit (Brazil) on:
 - Phasing out fossil fuels,
 - Climate finance,
 - Adaptation and resilience measures.

2. Conceptual Background)

a. What is the Global Carbon Project?

- An international consortium tracking annual carbon emissions.
- Widely cited in IPCC assessments and COP negotiations.
- Tracks emissions from:
 - Fossil fuels
 - Cement
 - Land-use and land-use change (LULUCF)

b. Carbon Budget

- Total amount of CO₂ humanity can emit while staying below certain warming thresholds.
- For 1.5°C, the remaining 170 Gt CO₂ ≈ 4 years of emissions at current rate.
- Budget becomes smaller due to:
 - Increased fossil emissions,
 - Weakening natural carbon sinks (oceans + forests).

c. Significance for India

- India argues for:
 - Climate justice,
 - Common but Differentiated Responsibilities (CBDR-RC),
 - Fair share of the global carbon space,
 - Need for green finance and technology transfer.
- India's low per capita emissions strengthen its negotiating position.

d. India's Renewable Push

- Solar capacity now among world's top five.
- Rapid addition of:
 - Rooftop solar,
 - Wind energy,
 - Green hydrogen pilot projects.
- Helps reduce coal dependence, especially in monsoon-heavy months.

3. Analytical Insights

a. Why Did India's Emission Growth Slow?

1. Good monsoon → lower cooling demand.
2. Higher renewable penetration → reduced coal consumption.
3. Efficiency improvements in industrial processes.

b. Implications

- India's energy transition is accelerating, but absolute emissions continue to rise.
- Meeting Net Zero by 2070 will require deeper structural shifts:
 - Transport electrification,
 - Grid-scale storage,
 - Phasing down coal,
 - Sustainable cooling technologies.

c. Global Concern

- Even though growth slowed, the world remains off-track for climate goals.
- Natural sinks (forests, oceans) are weakening due to warming — a worrying long-term trend.

Conclusion

India's slower rise in carbon emissions in 2025 reflects the positive impact of a good monsoon, expanding renewable capacity, and shifting energy patterns. Yet, both India and the world remain far from a decarbonisation trajectory compatible with the 1.5°C climate target, whose remaining carbon budget is rapidly shrinking. For India, balancing development needs with low-carbon growth will require sustained policy commitment, climate finance, and technological innovation. The report is a timely reminder that global cooperation must accelerate if the world is to achieve meaningful climate stabilization.

UPSC Prelims Practice Question

Ques : With reference to the Global Carbon Project (GCP), consider the following statements:

1. It is an international scientific program that tracks global carbon emissions from fossil fuels and land-use changes.
2. It functions under the Intergovernmental Panel on Climate Change (IPCC).
3. Its data is widely used for estimating the remaining carbon budget.

Which of the statements given above is/are correct?

- A. 1 only B. 1 and 3 only C. 2 and 3 only D. 1, 2 and 3 **Ans : b)**

UPSC Mains Practice Question

Ques : Explain the concept of 'land-use change emissions'. Analyse the trends in deforestation and reafforestation globally and their implications for climate mitigation. **(150 Words)**

India already carries one of the world's largest diabetes burdens — 10.1 crore cases as per the ICMR–INDIAB (2023) report. New clinical observations now reveal a worrying trend: chronic workplace stress is emerging as a major contributor to early-onset Type 2 diabetes, especially among younger working adults. As work cultures intensify and sedentary lifestyles expand, metabolic disorders linked to stress are becoming more visible. This trend has significant implications for public health policy, labour regulations, and non-communicable disease (NCD) management in India.

Workplace stress linked to rising cases of diabetes among adults

Clinicians and researchers say the metabolic consequences of chronic job pressure are becoming increasingly visible in younger working populations; doctors point to sharper increase in stress-linked diabetes among workers in tech, finance, customer service, and healthcare; night shift workers are also at risk

WORLD DIABETES DAY

Athira Elissa Johnson

India has an estimated 10.1 crore people living with diabetes according to ICMR-INDIAB, 2023, and growing evidence suggests that workplace stress may be one of the factors heightening this burden. While international research has long linked chronic stress to metabolic dysfunction, emerging Indian data echo these patterns.

For instance, a study among adults with Type 2 diabetes at a medical college in Tamil Nadu found that higher perceived stress scores were significantly associated with poorer glycaemic control and longer disease duration. Physiologically, chronic stress keeps the body in a state of heightened alert, elevating cortisol and adrenaline, disrupting glucose metabolism, and favouring fat accumulation around the abdomen. Over time, this leads to insulin resistance and metabolic instability.

Early metabolic signs

Doctors say the early metabolic effects of stress are frequently misattributed to "busy lifestyles." Elanthalai I. Sundaraman, senior consultant – internal medicine, SIMS Hospital, Chennai, notes that signs such as abdominal weight gain, daytime fatigue, fragmented sleep and sudden cravings are commonly normalised rather than recognised as endocrine warning signals. "Many people assume reduced

Chronic stress keeps the body in a state of heightened alert, elevating cortisol and adrenaline, disrupting glucose metabolism, and favouring fat accumulation around abdomen

appetite or increased tiredness is just part of their routine, but we see insulin sensitivity declining much earlier, along with fluctuations in post-meal blood sugar," she explained.

Pearly Grace Rajan, senior consultant, internal medicine, Iqba Hospital, Chennai, described this as a subtle but progressive pattern. "Persistent fatigue, abdominal weight gain, craving and disrupted sleep are often dismissed as stress. But these can be early metabolic flags. If missed, they progress to impaired glucose tolerance before anyone realises."

Doctors pointed to sharper increase in stress-linked diabetes among workers in tech, finance, customer service and healthcare. "The most worrying trend is among IT and finance professionals and night shift workers," said Dr. Sundaraman. "They tell me they feel guilty switching off their phones even for half an hour. This constant pressure is directly reflected in their sugars."

Narendra B.S., lead consultant, endocrinology & diabetology, Aster Whitefield Hospital, Bengaluru, added that shift work disrupts circadian rhythms, which govern metabolism. "When sleep and meal timing are irregular, insulin sensitivity drops. We see

more unstable blood sugar profiles in people on night shifts, even if they are careful with diet and medication."

Experts emphasise that the solutions do not require elaborate corporate wellness budgets. Small, predictable rhythms have disproportionate benefits. Workplaces that provide scheduled lunch breaks, movement gaps between meetings, limits on late-night logging, healthy cafeteria options, and shift rotations for night workers can significantly reduce stress hormone load, said Dr. Elanthalai, who described these changes as "low-cost, high impact."

Supportive policies

Dr. Pearly noted that such supportive policies may enhance productivity rather than compromise it. "When the body is not constantly under stress, attention and performance improve."

For those already diagnosed, managing stress can meaningfully stabilise blood glucose. Dr. Sundaraman said he has seen patients who adopt mindfulness or therapy achieve smoother sugar patterns. "When the mind is calmer, sleep is better, and the sugars behave better," he said.

Subramanian Kannan, senior consultant, endocrinology & diabetology, Narayana Health City, Bengaluru, said, "Stabilising cortisol through structured breaks, counselling, predictable routines or mindfulness can complement medication in lowering glucose variability."

Stress, doctors emphasise, must be taken as seriously as diet and exercise. (athira.elissa@thehindu.co.in)

THE GIST

India has an estimated 10.1 crore people living with diabetes according to ICMR-INDIAB, 2023, and growing evidence suggests that workplace stress may be one of the factors heightening this burden.

Doctors say the early metabolic effects of stress are frequently misattributed to busy lifestyles. Signs such as abdominal weight gain, daytime fatigue, fragmented sleep and sudden cravings are commonly normalised rather than recognised as endocrine warning signals, they say.

Experts emphasise that the solutions do not require elaborate corporate wellness budgets. Small, predictable rhythms can have disproportionate benefits, they add.

Multiple studies suggest that prolonged occupational stress is associated with a higher incidence of Type 2 diabetes and pre-diabetes in women

SADHANA DHARAPALANI
senior consultant, Apollo Hospitals



Key Analysis

1. Current News Highlights

a. Rising Stress-Linked Diabetes

- Doctors report a sharp rise in stress-related Type 2 diabetes among:
 - Tech and IT workers
 - Finance sector employees
 - Customer service/BPO staff
 - Healthcare workers
 - Night shift staff (highest risk)

b. Physiological Mechanism

- Chronic stress
- High cortisol + adrenaline
- Disrupted glucose metabolism
- Insulin resistance
- Abdominal fat gain

Doctors note increasing cases where:

- Individuals in their 30s and early 40s show high blood sugar despite no significant dietary excess.
- Increased central obesity, sleep disturbance, fatigue, and poor glycaemic control are common.

c. Early Warning Signs Often Missed**Doctors say early metabolic flags are often normalised:**

- Daytime fatigue
- Abdominal weight gain
- Fragmented sleep
- Sudden cravings
- Rising triglycerides
- Borderline BP

These are dismissed as “routine stress” instead of early endocrine dysfunction.

d. Gender Patterns

Studies show that women face a higher incidence of stress-linked metabolic syndromes because of:

- Double burden (work + home)
- Reduced time for meals/sleep
- Greater hormonal sensitivity to stress

e. Night Shift Workers at High Risk

Night shifts disrupt circadian rhythms, which regulate metabolism.

Effects:

- Decline in insulin sensitivity
- Higher blood sugar fluctuations
- Greater long-term diabetes risk

Even disciplined diet/medication cannot fully offset circadian disruption.

f. Low-Cost, High-Impact Solutions

According to clinicians, workplace reforms need not be expensive:

- Predictable meal breaks
- Movement breaks between meetings
- Limits on late-night logging/calls
- Healthier cafeteria food
- Proper shift rotation
- Structured sleep cycles for night shift staff

Such measures reduce chronic cortisol load and improve productivity.

g. Stress Management Improves Glycaemic Control

Doctors report improved blood sugar levels among patients who adopted:

- Mindfulness
- Therapy
- Structured routines
- Counselling
- Yoga/meditation

Stress reduction → better sleep → better sugar regulation.

2. Static Linkages for UPSC

a. NCD Burden in India

- India is the Diabetes Capital of the World.
- NCDs (diabetes, hypertension, CVD) contribute to 63% of total deaths in India.
- Stress and lifestyle disorders now qualify as major epidemiological drivers of NCDs.

b. Policy Context

Relevant government initiatives:

- National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS)
- Ayushman Bharat Health and Wellness Centres → focus on lifestyle counselling.
- Mental Healthcare Act, 2017
- Discussion on modernising Occupational Safety, Health and Working Conditions norms.

c. Circadian Rhythm Science

- Circadian disruption is a recognised risk factor for:
 - Diabetes
 - Obesity
 - Cardiovascular disease
 - Mood disorders

This is part of modern chronobiology.

3. Analytical Insights

A. Why Workplace Stress is Emerging as a Silent Epidemic

1. Longer working hours, tighter deadlines.
2. "Always-online" work culture (especially in IT/finance).
3. Sedentary lifestyles + poor sleep.
4. Skipped meals, erratic eating.
5. Decline in physical activity due to urban work patterns.
6. Psychological pressure, job insecurity, and burnout.

B. Public Health Implications

- Rising early-onset diabetes increases healthcare burden and productivity loss.

- Stress-related metabolic disorders increase:
 - CVD risk
 - Depression and anxiety
 - Economic costs of absenteeism/presenteeism
- India's demographic dividend may weaken due to unhealthy workforce trends.

C. Need for Workplace Policy Interventions

- Mandatory breaks
- Regulating screen time
- Preventing excessive shift rotations
- Corporate wellness standards
- Integration of mental health into workplace policies
- Annual metabolic screenings for high-stress industries

This aligns with global best practices (ILO, WHO Healthy Workplace Model).

Conclusion

The rising incidence of stress-induced diabetes in India marks a critical intersection of workplace culture, mental health, and metabolic health. As the country navigates rapid economic transformation, younger workers face unprecedented job pressures that directly translate into chronic illnesses. Addressing this requires a dual approach: individual stress management and systemic workplace reforms. Promoting predictable routines, reducing burnout, and integrating mental health into occupational policies are essential steps. Recognising stress as a serious metabolic risk factor is not only crucial for public health but is also key to sustaining a healthy, productive workforce in India's modern economy.

UPSC Prelims Practice Question

Ques : With reference to stress-linked metabolic disorders in India, consider the following statements:

1. Chronic stress elevates cortisol levels which can reduce insulin sensitivity.
2. Night shift work disrupts circadian rhythms and is associated with higher risk of Type 2 diabetes.
3. Early signs of stress-related metabolic dysfunction always include loss of appetite.

Which of the statements given above is/are correct?

- A. 1 and 2 only B. 2 and 3 only C. 1 and 3 only D. 1, 2 and 3 **Ans : a)**

UPSC Mains Practice Question : Case Study

Ques : You are the HR head of a large IT company where many employees report chronic fatigue, rising sugar levels, and sleep disturbances due to high workload and late-night calls with foreign clients. The management believes that extended work hours are necessary for business.

Identify the ethical issues involved and suggest balanced solutions that protect employee health without harming organisational productivity.

India's Universal Immunisation Programme (UIP) has historically been the backbone of the country's public health success, eradicating polio and drastically reducing vaccine-preventable diseases. As epidemiological patterns evolve, the debate on prioritising new vaccines — particularly Typhoid Conjugate Vaccine (TCV) and Hepatitis A Vaccine — has intensified. The recent article argues that in the current scenario, Hepatitis A may deserve even higher priority for inclusion in the UIP due to rising susceptibility and disease severity among adolescents and adults.

Why Hepatitis A deserves a place in India's universal immunisation programme

Yipin M. Vashishtha

As India debates the inclusion of the typhoid conjugate vaccine in its universal immunisation programme, it is time to ask whether Hepatitis A — a growing cause of acute liver failure — deserves even greater priority. A safe, effective, and long-lasting indigenous vaccine already exists; what is missing is the policy decision. India's Universal Immunisation Programme (UIP) has been one of the most successful public health initiatives in the developing world. It eradicated polio, curbed measles deaths, and saved millions of young lives. Yet as the country's health landscape changes, so too must its immunisation priorities.

A recent article in *The Hindu* made a strong case for introducing the typhoid conjugate vaccine (TCV) into the UIP. The argument is compelling: India bears half of the world's typhoid burden, manufactures multiple WHO-prequalified TCVs, and yet has not included them in its national schedule.

However, as we assess new vaccines for inclusion, scientific evidence and public-health impact must guide our choices. On these counts,

Hepatitis A vaccination may deserve even higher priority.

On Hepatitis A

Hepatitis A, by contrast, is a silent but mounting threat. For decades, the virus infected most Indians in early childhood, causing mild illness and conferring lifelong immunity. With improved sanitation and hygiene, that pattern has changed. Fewer children are exposed early, leaving many adolescents and adults unprotected — groups in whom the disease is far more severe.

In recent years, multiple outbreaks in Kerala, Maharashtra, Uttar Pradesh, and Delhi have underscored this shift. Hospitals have reported clusters of acute liver failure and even deaths. Unlike typhoid, there is no specific treatment for severe Hepatitis A; recovery often depends on supportive care. Seroprevalence studies reveal a steady decline in protective antibodies — from over 90% two decades ago to less than 60% in many urban regions. The result is a growing pool of susceptible young people vulnerable to serious illness. Hepatitis A is no longer a benign childhood infection; it is an



Rethinking priorities: Unlike typhoid, there is no specific treatment for severe Hepatitis A; recovery often depends on supportive care. FILE PHOTO

emerging public health concern.

The good news is that Hepatitis A is entirely preventable. Both live-attenuated and inactivated vaccines offer protection rates exceeding 90% to 95%, with immunity lasting for at least 15 to 20 years — often lifelong. India has its own indigenous success story here. Biological E's Biovac-A, a live-attenuated vaccine developed domestically, has been used in the

private sector for more than two decades with excellent safety and efficacy records.

Unlike typhoid vaccines, Hepatitis A vaccines do not face issues of waning immunity, antibiotic resistance, or carrier states. A single dose of the live vaccine can confer durable, long-term protection. From a public health perspective, it is a model vaccine: safe, effective, long-lasting, and

Hepatitis A is the low-hanging fruit of vaccine-preventable diseases: a single-dose, long-lasting, with an indigenous product ready for universal use

already made in India.

Both typhoid and Hepatitis A cause significant illness, but their epidemiology and control prospects differ sharply. Typhoid mortality has declined with prompt antibiotic treatment and better sanitation, though antimicrobial resistance remains a concern. Hepatitis A, on the other hand, strikes indiscriminately across socio-economic groups, lacks specific treatment, and increasingly affects older children and young adults, where the disease is more severe.

Measurable criteria

When judged by measurable criteria — disease burden, vaccine efficacy, durability, cost-effectiveness, and programmatic simplicity — the balance tilts decisively toward Hepatitis A. It is the low-hanging fruit of vaccine-preventable diseases: a single-dose, long-lasting, with an indige-

nous product ready for universal use.

India could begin by introducing Hepatitis A vaccination in States that have experienced repeated outbreaks or show declining antibody prevalence. The vaccine can be co-administered with existing boosters such as DPT or MR, using the same infrastructure. Periodic serosurveys can track population immunity and guide expansion. This phased approach aligns with the UIP's proven model of gradual, evidence-based rollout.

This is not an argument against typhoid vaccination; it is a plea for rational sequencing. Typhoid control is important, but Hepatitis A control is both easier and more cost-effective at this stage. The disease burden is substantial, the vaccine is home-grown, and the science is clear.

India's immunisation programme has repeatedly shown foresight — from the early inclusion of Hepatitis B to the introduction of rotavirus and pneumococcal vaccines. Adding Hepatitis A would be a natural next step in that continuum of progress.

(Dr. Yipin M. Vashishtha is former national convener, IAP Committee on Immunisation. vipinipsita@gmail.com)

Background

About Hepatitis A

- A viral infection causing acute inflammation of the liver.
- Traditionally considered a benign childhood disease in India.
- Transmitted mainly through the faeco-oral route (contaminated food and water).
- No specific antiviral treatment; severe cases require only supportive care.
- Preventable through inactivated or live-attenuated vaccines.

Universal Immunisation Programme (UIP)

- World's largest immunisation programme.
- Provides free vaccines against 12+ diseases including Polio, Measles, Hepatitis B, Rotavirus, PCV etc.
- Phased introduction model (e.g., Hep B in 2002, Rotavirus in 2016).

Why Hepatitis A Needs Priority

1. Changing Epidemiology

- Earlier, 90%+ children were infected before age 10, developing lifelong immunity.
- Due to improved sanitation, fewer children are infected early.
- Seroprevalence has dropped below 60% in many urban areas.
- Result: Larger pool of adolescents and adults without immunity, in whom the disease is far more severe.

2. Increasing Outbreaks

States such as:

- Kerala, Maharashtra, Uttar Pradesh, Delhi have reported multiple outbreaks resulting in clusters of acute liver failure and deaths.

3. No Specific Treatment

- Unlike Typhoid, where antibiotics exist, Hepatitis A has no specific therapy.
- Severe cases depend solely on supportive care — increasing mortality risk.

4. Highly Effective, Indigenous Vaccine Available

- India produces Biological E's Biovac-A, used successfully for 20 years.
- 90–95% efficacy; immunity lasts 15–20 years or lifelong.
- Single dose for live-attenuated vaccine → programmatically simple.

5. Clear Public Health Advantage Over Typhoid Vaccine

Parameter	Typhoid	Hepatitis A
Treatment available?	Yes (antibiotics, though resistance rising)	No
Disease severity shift	Moderate	Increasing among adults; more fatal
Immunity duration	Some waning	Long-lasting
Single-dose possible?	No	Yes
Indigenous vaccine?	Yes	Yes

Conclusion: Hepatitis A is “low-hanging fruit” for UIP.

Policy Recommendations Suggested in the Article

1. Start with high-burden States experiencing repeated outbreaks.
2. Co-administer with existing boosters (DPT, MR) using the same infrastructure.
3. Conduct periodic serosurveys to track immunity.
4. Expand nationwide based on evidence — similar to the rollout model for Hepatitis B, Rotavirus, PCV.

Conclusion

As India revisits its immunisation priorities, the shift in Hepatitis A epidemiology, rising outbreaks, absence of specific treatment, and the availability of a safe and indigenous vaccine make a compelling case for its inclusion in the UIP. While typhoid vaccination remains essential, a rational sequencing based on disease burden, cost-effectiveness, and public health impact suggests that Hepatitis A deserves immediate attention. Incorporating the Hepatitis A vaccine would mark a natural progression in India's continuing commitment to preventive healthcare and strengthened population immunity.

UPSC Prelims Practice Question

Ques Consider the following statements regarding Hepatitis A:

1. It is primarily transmitted through contaminated food and water.
2. Severe Hepatitis A has a specific antiviral treatment.
3. Immunity after infection or vaccination is generally long-lasting.
4. India currently uses only imported Hepatitis A vaccines.

Which of the statements given above are correct?

- A. 1 and 3 only
- B. 2 and 4 only
- C. 1, 2 and 3 only
- D. 1, 3 and 4 only

Ans : a)

UPSC Mains Practice Question

Ques The changing epidemiology of Hepatitis A in India necessitates revisiting the priorities of the Universal Immunisation Programme. Discuss. **(250 Words)**

Page 06 : GS 2 : Social Justice

Free and fair elections are a basic feature of the Constitution and form the bedrock of India's democratic legitimacy. While the Election Commission of India (ECI) supervises elections to Parliament and State Legislatures, the State Election Commissions (SECs) are mandated under Articles 243K and 243ZA to supervise elections to rural and urban local bodies. The ongoing electoral roll controversy in Maharashtra, following Supreme Court directions to complete local body elections by January 2026, highlights structural issues in electoral roll management and the limits of SEC authority.

Current Issue: Why Are Electoral Rolls Under Scrutiny?

The Opposition has raised concerns over:

- **Duplicate names**
- **Missing entries**
- **Voters registered at non-existent or bulk addresses**
- **People from other States wrongly included**
- **Opacity in roll revision**

These concerns acquire urgency because SECs do not prepare their own electoral rolls and depend entirely on the ECI's rolls under the Representation of the People Act, 1950.

How the SEC Is Ensuring Fair Elections**1. Legal Framework: SEC's Powers Are Limited**

- SEC has superintendence, direction and control over local body elections.
- However, they cannot add or delete names from the rolls.
- They must use the Assembly electoral rolls provided by the Chief Electoral Officer (CEO).

This creates structural dependency on the ECI.

2. Tackling Duplicate and Missing Entries

Although additions/deletions cannot be made, the SEC has initiated a corrective marking exercise, not modification.

a. Tool for Detecting Duplicate Names

A digital tool will filter duplicate entries using four parameters:

1. First name
2. Middle name
3. Last name
4. Gender

The SEC will:

- Identify duplicate entries
- Mark them as "double" or "doubtful"
- Forward them to the CEO for field verification
- CEO will verify and star-mark such entries

b. Undertaking by Voters

To prevent double voting:

- Voters with duplicate entries must give an undertaking declaring the booth where they will cast their ballot.
- These undertakings are kept at polling centres.
- A marked copy of the roll ensures that a person cannot vote twice.

This operational safeguard strengthens the transparency of the process.

3. Handling Missing or Wrongly Assigned Names

Four types of objections can be raised by citizens:

1. Name present in Assembly roll but missing in local body roll
2. Name assigned to wrong ward
3. Duplicate/fake entries
4. Multiple voters registered at the same address

Timeline:

- Draft published: November 20
- Objections: Nov 20–27
- Final ward-wise list: December 5
- Polling centre-wise list: December 12

This grievance redressal mechanism gives citizens a formal channel to address errors.

4. Addressing Young Voters' Grievance

Cut-off date for new voters remains 1 January 2025, meaning:

- Youth turning 18 after January will not vote in upcoming polls.
- This has led to dissatisfaction and raises concerns about inclusiveness.

This reflects systemic rigidity rather than SEC failure.

Will Opposition's Concerns Be Fully Resolved?

Strengths of SEC measures:

- Transparent objection mechanism
- Technological detection of duplicates
- Field verification by CEO
- Undertakings to prevent multiple voting

Limitations:

- **Core issue: SEC cannot alter electoral rolls.**
- If the Assembly voters' list itself is defective, SEC cannot correct it.
- Very short time-frame before elections (order of SC).
- Bulk-address and zero-address problems stem from ECI rolls, not SEC data.

Opposition concerns about the "opaqueness" of voter lists and "illegal additions" remain partly unaddressed.

Static Polity Linkages

1. Constitutional Provisions

- Art. 243K: SEC for Panchayats
- Art. 243ZA: SEC for Municipalities
- Modeled on Election Commission of India (independence, autonomy)

2. Supreme Court Judgments

- **Kishan Singh Tomar v. Municipal Corporation of Ahmedabad (2006)** – SEC is an "independent constitutional authority."
- **Recent SC directive (2025):** – Maharashtra to complete local elections by Jan 2026. SEC cannot delay elections on grounds of electoral roll defects.

3. Representation of the People Act, 1950

- Preparation of electoral rolls is entirely an ECI function.

SEC only uses these rolls, giving rise to structural dependence.

Conclusion

Maharashtra's State Election Commission has introduced a technologically assisted and time-bound plan to identify duplicate voters, invite objections, and ensure that procedural safeguards prevent multiple voting. However, because the SEC lacks the authority to add or remove names from electoral rolls, deeper structural problems—such as defective voter lists, bulk-address entries, and missing names—cannot be fully resolved at the State level.

The episode reinforces a long-standing debate in Indian electoral governance: the need to strengthen coordination between ECI and SECs and modernize voter roll management, ensuring local body elections are as credible, inclusive, and error-free as those for Parliament and State Assemblies.

UPSC Prelims Practice Question

Ques: With reference to the State Election Commission (SEC), consider the following statements:

1. The SEC has the power to add or delete names from the electoral rolls used in local body elections.
2. The SEC conducts elections to urban and rural local bodies under Articles 243K and 243ZA.
3. The electoral rolls used for local body elections are prepared by the State Election Commission.

Which of the above statements is/are correct?

- A. 1 and 2 only
- B. 2 only
- C. 2 and 3 only
- D. 1, 2 and 3

Ans : b)

UPSC Mains Practice Question

Ques: The SEC's use of a duplicate-detection tool using four filters (first name, middle name, last name, gender) and booth-wise undertakings demonstrates India's gradual shift towards data-driven electoral roll purification. **(250 Words)**

Donald Trump shakes up the global nuclear order

Today, the global nuclear order offers a curious contradiction – since the bombing of Hiroshima and Nagasaki in August 1945, nuclear weapons have not been used during the last 80 years. The global nuclear arsenals have come down from a high of 65,000 bombs in late 1970s to less than 12,500 today. And, despite concerns in the 1960s that by 1980, there may be at least two dozen states with nuclear weapons, the total today remains nine – five (the United States, Russia, the United Kingdom, France and China) are permanent members of the United Nations Security Council who had tested before the Nuclear Non-Proliferation Treaty (NPT) came into being while four more developed their nuclear arsenals later (Israel, Pakistan, India and North Korea).

Looking back, these would seem to be impressive achievements but nobody is celebrating. In fact, the prevailing sentiment is that the global nuclear order is under strain and the recent announcements by U.S. President Donald Trump may weaken all three elements of the global nuclear order.

Resumption of 'nuclear tests'

On October 30, 2025, on his way to a meeting with China's President Xi Jinping in Busan, Mr. Trump announced on Truth Social, "Because of other countries testing programs, I have instructed the Department of War to start testing our Nuclear Weapons on an equal basis. That process will begin immediately." He added, "Russia is second, China is a distant third, but will be even within 5 years."

While it was clear that the message was directed at Russia and China, it was unclear whether Mr. Trump was referring to 'nuclear explosive testing' or the testing of nuclear weapon systems. Second, the nuclear labs (Los Alamos, Lawrence Livermore, and Sandia) and the Nevada testing facilities fall under the Department of Energy and not the Department of War.

It is no secret that China, Russia, and the U.S. are designing and developing new nuclear weapons. In late October, Russia tested a nuclear-powered cruise missile (Burevestnik) that travelled 14,000 kilometres, following a week later, with a test of an underwater nuclear-powered torpedo (Poseidon). China has been testing hypersonic missiles and, in 2021, tested a nuclear capable hypersonic glide vehicle carried on a rocket, capable of orbiting the earth before approaching its target from an unexpected direction that was passed off as a satellite launcher.

The U.S. is producing new warheads – a variable yield B61-13 gravity bomb, a low yield W76-2 warhead for the Trident II D-5 missile, while working on a new nuclear armed



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submarine launched cruise missile.

Yet, they have refrained from explosive testing. Russia's last explosive test was in 1990 while the U.S. declared a moratorium on tests in 1992. In 1993, the U.S. created a Stockpile Stewardship and Management Programme under the National Nuclear Security Administration to work on warhead modernisation, life extension and development of new safety protocols in warhead design. U.S. President Bill Clinton also took the lead in pushing negotiations in Geneva for a Comprehensive Test Ban Treaty (CTBT). China and France concluded their tests in 1996, six months before the negotiations ended.

Why the CTBT lacks a definition

Twenty-nine years later, the CTBT has not entered into force despite 187 countries signing it. Among the necessary ratifications, the U.S., China, Israel, Egypt, and Iran have not done so, Russia did and withdrew its ratification in 2023, and India, Pakistan and North Korea have neither signed nor ratified it. India and Pakistan tested in 1998 and have since observed a voluntary moratorium, and North Korea conducted six tests between 2006 and 2017. Given today's geopolitics, the prospects for the CTBT entering into force appear bleak.

Second, the CTBT obliges states "not to carry out any nuclear weapon test explosion or any other nuclear explosion". The U.S. was opposed to defining the terms, and instead, worked out private understandings with Russia and China on 'zero-yield-tests'; this permitted hydro-nuclear tests that do not produce a self-sustaining supercritical chain reaction.

The U.S. had conducted over a thousand nuclear tests and Russia 727 tests, giving them an adequate data base. China, with only 47 tests, also went along with this understanding. Thus, the CTBT delegitimised only nuclear-explosive testing, not nuclear weapons, the reason why India never joined it.

In 2019-20, the U.S. State Department assessed that Russia and China "may have conducted low yield nuclear tests in a manner inconsistent with the U.S. zero-yield standard" though this was negated by the CTBT organisation that declared that their monitoring network with over 300 monitoring stations spread over 89 countries had not detected any inconsistent activity.

In a TV interview on November 2, Mr. Trump doubled down on resuming nuclear testing, this time including Pakistan and North Korea among the countries testing. A clarification came the same day from U.S. Secretary of Energy Chris Wright on Fox News, calling the U.S. tests 'systems-tests'. "These are not nuclear explosions. These are what we call noncritical explosions," he said. However, Mr. Trump's intention remains unclear.

The new low-yield warheads being designed make them more usable and the new systems (hypersonics, cruise and unmanned systems) are dual capable systems, leading to renewed research for missile defences such as the U.S. 'golden dome'. Meanwhile, doctrinal changes are being considered to cope with new technological developments in cyber and space domains. This raises doubts about the nuclear taboo in the coming decades.

The sole surviving U.S.-Russia arms control agreement, the New Strategic Arms Reduction Treaty (New START) that limits the U.S. and Russian strategic forces to 700 launchers and 1,550 warheads is due to expire on February 4, 2026 with no prospects of any talks on the horizon. China is not a party to any arms control and its nuclear arsenal that had remained below 300, is undergoing a rapid expansion, estimated at 600 today, and likely to exceed 1,000 by 2030. An incipient nuclear arms race was already underway; a resumption of explosive testing will just take the lid off.

Russia and China have denied Mr. Trump's allegations regarding clandestine tests, but will follow if the U.S. resumes explosive testing. China will be the biggest beneficiary because with only 47 tests (compared to over 1,000 by the U.S.), resumed tests will help it to validate new designs and accumulate data.

India has been observing a voluntary moratorium. But if explosive testing resumes, India will certainly resume testing to validate its boosted fission and thermonuclear designs, tested only once in 1998. Undoubtedly, Pakistan will follow but given its growing strategic linkages with China witnessed during Operation Sindoor, this need hardly adds to India's concerns.

Though the CTBT is not in force, it did create a norm. But a resumption of explosive testing will lead to its demise. It will also tempt the nuclear wannabes to follow and mark the unravelling of the NPT led non-proliferation regime.

The taboo against use must remain intact

The U.S. has been the most significant player in shaping the global nuclear order. It would be ironic if Mr. Trump's actions now become the catalyst for its demise. The reality is that the present global nuclear order was shaped by the geopolitics of the 20th century. The challenge today is to craft a new nuclear order that reflects the fractured geopolitics of the 21st century while ensuring that the taboo against their use remains intact.

The United Nations Secretary General has cautioned that "current nuclear risks are already alarmingly high" and urged nations "to avoid all actions that could lead to miscalculation or escalation with catastrophic consequences." But is anyone listening?

The United States has shaped the global nuclear order and it would be ironic if its President's actions now become the catalyst for its demise

GS. Paper 2 International Relations

UPSC Mains Practice Question: Technological advancements such as hypersonic weapons, low-yield warheads, and autonomous systems are redefining the logic of deterrence. Evaluate the impact of emerging technologies on the global nuclear balance and India's strategic posture. (250 Words)

Context :

The global nuclear architecture—constructed over decades through treaties, moratoria, verification mechanisms, and great-power consensus—is entering a phase of unprecedented strain. The United States’ recent signal, under President Donald Trump, that it may resume nuclear explosive testing marks a historic departure from nearly three decades of self-imposed restraint.

- This development has far-reaching consequences for arms-control regimes such as the Comprehensive Nuclear-Test-Ban Treaty (CTBT), nuclear doctrines, and the strategic calculus of both established and emerging nuclear powers.
- The CTBT regime is witnessing its gravest crisis since its adoption in 1996. President Trump’s declaration that the U.S. could restart explosive testing sharply diverges from the post-Cold War consensus that upheld a global testing moratorium.
- This comes at a time when Russia has reversed its ratification of CTBT and China remains unwilling to commit to explosive-test restraint. Together, these shifts threaten to unravel decades of arms-control progress and may re-ignite competitive nuclear weapons development—especially dangerous for regional theatres such as South Asia.

Evolution of the nuclear order**1. Post-1945 Restructuring**

- Global nuclear stockpiles fell from ~65,000 warheads in the 1970s to ~12,500 today.
- Nine states now possess nuclear weapons, formal and informal.

2. Non-Proliferation Treaty (NPT)

- Established a hierarchical system between the five recognised nuclear-weapons states (NWS) and non-NPT states such as India, Pakistan, and North Korea.
- Criticised for unequal obligations and slow disarmament progress.

3. The Moratorium Phase (1992–present)

- Even though the CTBT never entered into force, global consensus led to a near-universal halt on explosive testing.
- Verification mechanisms expanded under the International Monitoring System (IMS) with 300+ stations detecting seismic, hydroacoustic, infrasound, and radionuclide activity.

Why U.S. signals of the resumption are significant

1. Reversal of a 30-year moratorium : The U.S. Department of Energy and the Pentagon have been instructed to prepare for renewed testing—ending a halt observed since 1992.

2. Shift in Nuclear Doctrine

- Emphasis on low-yield warheads and submarine-launched cruise missiles.
- Indicates a shift towards “usable” battlefield nuclear options, increasing escalation risks.

3. Erosion of Arms-Control Norms

- U.S. allegations that Russia and China conduct “non-explosive yield” tests have provided political space for Washington to challenge earlier commitments.
- Undermines mutual trust and the architecture of verifiable restraint.

Why the CTBT framework is fraying

1. Treaty not in force

- CTBT requires 44 specific states to ratify; crucial holdouts include the U.S., China, India, Pakistan, and North Korea.

2. Russian withdrawal (2023)

- Moscow withdrew ratification citing U.S. non-ratification and doctrinal asymmetries.

3. Divergent interpretations

- Zero-yield versus sub-critical tests continue under opaque national frameworks.
- Despite advanced IMS monitoring, ambiguity persists, feeding suspicion among major powers.

New technologies intensifying arms race dynamics

1. Low-yield, highly accurate systems

- U.S. W76-2 and similar systems in other states increase temptation for early use and reduce the traditional threshold for nuclear escalation.

2. Hypersonic and unmanned systems

- Hypersonic glide vehicles, missile defences, and autonomous delivery platforms narrow decision times and disrupt deterrence stability.

3. Counterforce orientation

- Major powers increasingly pursue counterforce-capable designs to neutralise adversary arsenals pre-emptively—further destabilising deterrence regimes.

Implication for India

1. Potential Regional Chain Reaction : Any resumption of explosive testing by the U.S., China, or Russia could incentivise Pakistan to follow suit, widening India’s deterrence asymmetry.

2. Strengthening China–Pakistan Nuclear Axis : Deepening cooperation in delivery systems, warhead miniaturisation, and missile technology complicates India’s strategic environment.

3. Strategic Dilemma: To Test or Not to Test

- India maintains a voluntary moratorium on testing since 1998.
- If global norms collapse, New Delhi may face renewed pressure to recalibrate its nuclear posture and technological depth.

Conclusion

The weakening of CTBT norms marks the most consequential shift in the nuclear order since the mid-1990s. Great-power moves towards explosive testing threaten to revive arms races, dilute global verification mechanisms, and destabilise deterrence equations across regions. For India, the challenge is to balance credible minimum deterrence with its longstanding commitment to restraint-based nuclear behaviour, while preparing for a more uncertain and competitive strategic landscape.
