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INTERNATIONAL

THE STRAIT WHERE AMERICA STALLED

Tehran's Milad Tower, the tallest structure in Iran, stands as a symbol of the revolutionary state's engineering ambitions. Rising 435 metres, including its 120-metre antenna, the tower's octagonal concrete shaft joins a pod with 12 floors housing observation decks, a cafe and a museum. Above it, the antenna pierces Tehran's smoggy skyline. From the deck of the 12th floor, the highest point accessible to visitors, one can take in the vast sprawl of the city, made the capital of the Persian Empire in the late 18th century by Agha Muhammad Khan, founder of the Qajar dynasty. To the north rise the Alborz mountains, the natural barrier separating the Iranian plateau from the Caspian Sea.

Inside the museum, a large 18th-century map of the Gulf drawn by a French cartographer is on display. "You may have heard some countries call the Persian Gulf the Arabian Gulf today," a local travel assistant told this writer during a visit in February 2022. "Look at this map and reach your own conclusions." A young woman, who described herself as "a huge fan" of Amitabh Bachchan and Aishwarya Rai, the assistant pointed to the mouth of the Gulf on the map. "This is the Strait of Hormuz," she said. "This is the gate of the Persian Gulf. And the Iranians hold its key." It is this geographical key that Iran used to effectively shut the strait after coming under attack by the U.S. and Israel on February 28.

The strait is a narrow corridor, 50 km wide at its entrance and exit, connecting the Persian Gulf waters to the Gulf of Oman, which joins the Arabian Sea. At its narrowest point, between Iran in the north and Oman's Musandam Peninsula in the south — an enclave separated from mainland Oman by UAE territory — the waterway is just 33 km wide, which means it falls within the overlapping territorial waters of Iran and Oman.

As the only gateway to the high seas from the Persian Gulf, the Hormuz Strait has remained one of the world's most important waterways for centuries. In modern times, separate shipping lanes, as wide as 2 nautical miles, have been marked for inbound and outbound vessels. There is a buffer zone of around 2 nautical miles between the shipping lanes. So the tankers carrying fuel and gas typically navigated highly constrained waters even before the war.

In the 1980s, during the eight-year Iran-Iraq war, both sides targeted fuel tankers in the Persian Gulf, effectively weaponising the waters. In recent years, Iran had repeatedly warned that it would close the waterway if it came under attack. There are eight major islands in the strait, seven of which are controlled by Iran. Islands such as Qeshm, Hormuz, Larak, and Abu Musa sit closer to the shipping lanes, giving Iran a commanding physical advantage over the route. The ownership of Abu Musa, Greater Tunb and Lesser Tunb islands is contested between Iran and the UAE, but they are de facto controlled and administered by Tehran.

Strategic significance

The strait's strategic significance grew after the oil discoveries in the Persian Gulf region in the early 20th century. The post-War oil boom transformed the entire region. All Gulf countries — Iran, Iraq, Saudi Arabia, Oman, Qatar, the UAE, Bahrain and Kuwait — have been more or less dependent on the strait to get access to the Arabian Sea.



During 2023-25, 20% of the world's liquefied natural gas (LNG) and 25% of seaborne oil passed through the strait. In 2025 alone, 20 million barrels of oil and oil products passed through this route every day, according to the U.S. Energy Information Administration. About 3,000 ships sailed through the strait each month before the war. Hormuz is also a key route for exports of fertilizer from the region, and Gulf countries import food, medicines and tech products through this route.

In June 2025, when Israel bombed Iran, Tehran's response was largely limited to striking back at Israel. After the U.S. joined the war and attacked Iran's nuclear facilities, Tehran carried out a token attack on the American base in Qatar and agreed to a ceasefire. The 12-Day War, as it's known, did not pose any direct threat to traffic through the Strait of Hormuz. But in early 2026, when the U.S. was mobilising forces in the region amid threats of another war, Iran had warned that it would retaliate by striking American bases and shutting down the strait. The U.S. and Israel started the war on February 28 by assassinating Iran's Supreme Leader Ayatollah Ali Khamenei, and Iran responded by doing what it had vowed to do. It retaliated by attacking Israel and Arab countries in the Gulf. And it took control of the strait. The number of ships passing through the strait daily, which was more than 100 before the war, fell by over 90%.

During the 40 days of bombing, the U.S. and Israel caused immense material damage to Iran. Its aerial and naval infrastructure has been repeatedly hit. But such attacks weren't enough to force Iran, which used asymmetric warfare to weaponise the waters, to reopen the strait. Iran used cheap, disruptive weapons to impose disproportionate costs on the vessels that ignored its restrictions. Several ships that sought to pass the strait without the IRGC's permission came under attack. Fuel prices started rising. Insurance and shipping costs soared. Energy-import-dependent economies, particularly India, were hit hard.

Contested terms

When U.S. President Donald Trump announced a ceasefire with Iran on April 8, he said Iran would reopen the Strait of Hormuz. The truce came into effect, but both sides differed on its terms. Iran demanded a ceasefire in Lebanon as well, but Israel actually stepped up bombing of Lebanon. Mr. Trump later announced a ceasefire in Lebanon and "prevented" Israel from bombing the country — but the bombing campaign continued. When Iran refused to reopen the strait, Mr. Trump, on April 12, announced a blockade of Iranian ports. In response, Iran cancelled direct negotiations with the U.S., and pushed the nuclear file down its priority list.

Mr. Trump has repeatedly said he was close to reaching a deal with Iran. He wants Iran to reopen the strait in return for the lifting of the U.S. blockade. And Iran should abandon its nuclear programme. Iran, on its side, has established a new body, the Persian Gulf Strait Authority, to manage traffic through and maintain the Hormuz Strait, defying Mr. Trump's demands. The PGSA has introduced a new email-based permit system for vessels and says all ships passing through the strait should coordinate with the agency. Result: a diplomatic logjam.

One of Mr. Trump's key demands for a deal today is that Iran should reopen the Strait of Hormuz, which was fully open before Mr. Trump and his ally Benjamin Netanyahu launched this war on February 28.



TRUMP'S CALL TO EXPAND ABRAHAM ACCORDS LEAVES WEST ASIA BAFFLED

US President Donald Trump on Monday (May 25) called on Saudi Arabia, Qatar, Pakistan, Egypt, Turkey and Jordan to sign the Abraham Accords — a step towards recognising and normalising ties with its ally, Israel. The announcement comes amidst continued attempts by the US to negotiate an end to its war with Iran.

Key Takeaways:

- Pakistan, which has been mediating the US-Iran talks, rejected the proposal, with Defence Minister Khawaja Asif saying that joining the accords would clash with the country's "fundamental ideologies", including recognition of an independent and sovereign Palestine.
- Trump's proposition has revived the debate around the Abraham Accords at a time when the region is destabilised by Israel's war on Gaza, tensions with Iran, and growing anger across the Arab world over Israeli military actions in Palestine, Lebanon and Syria.

Do You Know:

- The accords are essentially a series of peace agreements to normalise relations between Israel and Muslim-majority nations, stemming from the fact that upon the establishment of Israel in 1948, Arab states refused to accord diplomatic recognition to it.
- Named after the biblical figure of Abraham, the patriarch in Islam, Christianity and Judaism, the agreements were presented by the US as a framework for peace, regional stability and economic cooperation between Israel and the Arab states.
- Introduced during Trump's first term in 2020, the accords were framed as a negotiated resolution to the Palestinian issue; in practice, they have largely bypassed the question of Palestinian statehood altogether.

DreamIAS



NATIONAL

AMID TIGHTER GREEN CARD RULES IN THE US, WHY INDIANS COULD BE UNIQUELY AFFECTED

On Friday (May 22), the US moved to significantly restrict who can obtain permanent residency in the country, rattling the lakhs of Indians on temporary visas who are awaiting a Green Card.

Key Takeaways:

- The US Department of Homeland Security, which oversees the US Citizenship and Immigration Services (USCIS), announced that those applying for Green Cards must return to their home countries to do so — a sweeping reversal of a practice in place for over half a century.
- People can apply for Green Cards in two ways — going to a US consulate abroad, or applying for one while already in the US, which is called an “adjustment of status”.
- The new USCIS policy memo targets the second, more popular route, used for decades by Indian workers on H-1B visas, students transitioning from F-1 to work visas, and spouses on H4 dependent visas.
- The new policy is especially concerning for Indians because they dominate the decades-long backlog in employment-based Green Card categories such as EB-2 and EB-3. For many Indian professionals, the wait stretches beyond 15 or even 20 years.

Do You Know:

- The USCIS green card policy was not the only setback for Indians in the US. The US State Department announced on the same day that green cards for Indians under the Employment-Based Second Preference (EB-2) category had been exhausted for the financial year ending September 2026.
- While there are approximately 1.5 million Indian Green Card holders in the US, an additional 1.2 million highly skilled Indian nationals and their dependents are estimated to be presently stuck in the employment-based Green Card backlog. Every year, tens of thousands of new Green Cards are issued to Indian nationals, positioning India as the second-largest country of origin for new permanent residents.

QUAD’S STRUGGLE TO FIND MOMENTUM, AS MEMBERS PURSUE DISPARATE OBJECTIVES

The recent Quadrilateral Security Dialogue (Quad) held in New Delhi, among the foreign ministers of Australia, India, Japan and the USA, came as an assurance that the grouping remains relevant.

Key Takeaways:

— The Indo-Pacific has emerged as the world’s strategic and geo-economic centre of gravity. It hosts critical sea lanes, carrying over 50 per cent of global trade and energy flow. China’s rise, its coercive maritime behaviour, and technological dominance have created shared concerns among the Quad partners.



— After the Indian Ocean tsunami of December 2004, India, Japan, Australia, and the US came together in an informal arrangement to coordinate disaster relief operations. In 2007, the Quadrilateral Security Dialogue, commonly known as the Quad, kicked off. It was formalised in 2007 by the efforts of the then-Prime Minister of Japan, Shinzo Abe. It never really picked up momentum, and while it was revived in 2017, the Quad at best has sputtered along since.

— The major reasons for this are that the four constituents don't always have the same aims, and China strenuously opposes the grouping.

— Beijing says the Quad's purpose is mainly to target China. After the recent meeting on May 26, China's foreign ministry spokesperson Mao Ning said at a presser, "We do not support the formation of exclusive cliques or bloc confrontation. No cooperation should undermine mutual trust and cooperation among regional countries."

— For Australia, Beijing's intimidating posturing means it has to expand strategic outreach and security partnerships, but it remains heavily dependent on China economically.

— India needs to balance China in view of the shared border and the security calculus. It is also strongly opposed to China's design of carving out a unipolar Asia, but Delhi remains wary of compromising its strategic autonomy.

— Tokyo views Quad as an essential security imperative, given the tensions in the South-East China Seas due to Beijing's apparently expansionist designs.

— For the US, the Quad is perceived as the pillar of its Indo-Pacific strategy and as the mechanism to balance out China without military confrontation.

— These different priorities explain why the Quad's progress has been incremental rather than decisive. The security cooperation remains constrained, lacking a NATO-like collective defence mechanism, and there is no binding treaty obligation.

— The recent Quad Foreign Ministers meeting has attempted to break fresh ground. The meeting focussed on maritime security, resilient supply chains, critical minerals and energy security amid geopolitical uncertainties.

— Periodic discussions around 'Quad Plus' have surfaced from time to time, although its expansion remains unlikely in the near future. South Korea is among the strongest candidates, given its growing Indo-Pacific orientation. However, China's sensitivities and Seoul's focus on the Korean Peninsula remain a constraint.

— The Quad's future lies in strategic clarity among all members. To ensure organisational depth, the Quad needs to move towards permanent institutional architecture, alongside enhanced military operability, synergised technology partnerships and strengthened maritime capacity building in the Indo-Pacific.

— The real test of Quad is not whether it becomes an Asian NATO, but whether the four democracies, with varying interests, can sustain strategic cooperation in the era of great power competition.

**Note:**

— They launched a series of major initiatives spanning maritime surveillance, port infrastructure, critical minerals, and regional energy security.

Key multilateral frameworks announced:

- I. Indo-Pacific Maritime Surveillance Cooperation Initiative: This aims to improve maritime surveillance and information-sharing across the Indo-Pacific.
- II. Indo-Pacific Maritime Domain Awareness Initiative: This will be expanded to provide near-real-time commercial maritime data to countries in the region.
- III. Quad Ports of the Future Partnership: This is for port infrastructure development in the Pacific Islands. Under this, the Quad will work with Fiji to improve its port infrastructure.
- IV. Quad Critical Minerals Framework: This is aimed at strengthening critical mineral supply chains and their recycling.

Do You Know:

— The Quad is not structured like a typical multilateral organisation, and lacks a secretariat and any permanent decision-making body (like the EU or UN). Additionally, unlike NATO, the Quad does not include provisions for collective defence, instead choosing to conduct joint military exercises as a show of unity and diplomatic cohesion.

— In 2020, the trilateral India-US-Japan Malabar naval exercises expanded to include Australia, marking the first official grouping of the Quad since its resurgence in 2017, and the first joint military exercises among the four countries in over a decade.

TIBET'S POLITICAL HEAD SWORN-IN, AFFIRMS COMMITMENT TO 'MIDDLE WAY POLICY'

The head of the Tibetan “government-in-exile”, Penpa Tsering, on Wednesday reaffirmed his commitment to the “Middle Way Policy” charted by Tibetan spiritual leader Dalai Lama for the resolution of issues with the Chinese government, as he took oath here following his re-election to the post.

Addressing a gathering after the swearing-in ceremony at McLeod Ganj, the Sikyong (head) of the Central Tibetan Administration (CTA), also accused the Chinese government of attempting to “erase” Tibetan identity and spreading “misinformation” aimed at weakening Tibetan unity.

Penpa Tsering said that “Middle Way Policy” which seeks a resolution to the Sino-Tibet conflict through non-violence, dialogue and mutual benefit would be lasting. “We will continue the backchannel communications with caution and steadiness with the Chinese government until a resolution is achieved,” he said.

Primary goal

The CTA will pursue political and social welfare initiatives “with the primary goal of long-term sustainability of the Tibetan struggle until a just resolution of the Tibet-China conflict is achieved”, he said.



Attributing all accomplishments of his administration to the “boundless blessings and far-reaching noble deeds” of the Dalai Lama, he also expressed gratitude to the government and people of India, the United States and other countries “for their continued support for the cause of Tibet”.

THE JUDICIARY’S ROLE IN COMPLETE JUSTICE

Another milestone in the direction of delivery of complete justice by the Supreme Court of India is its recent decision to elevate the Right to safe travel on National Highways as a fundamental right, declaring it an integral part of the Right to Life under Article 21 of the Constitution. The Court took suo motu cognisance of two road accidents in November 2025, which led to a loss of 34 lives and has issued wide-ranging directives. [In Re: Phalodi Accident vs. National Highways Authority of India and Others (2025)]. The Court has clearly held that safe, well-maintained, and motorable roads are no longer just a policy goal, but a constitutional obligation of the state. It is an alarming fact that while National Highways comprise only 2% of roads, they account for 30% of fatalities. In 2025, National Highways in India saw approximately 26,770 deaths in the first six months alone. The government aims to reduce road accidents by 50% by 2030 and to achieve this goal, it has adopted a strategy focusing on strengthening Education, Engineering (roads/vehicles), Enforcement, and Emergency Medical Service has been adopted. Despite fatalities on the National Highways decreasing by 11% compared to 2024, they still remain alarmingly high. These figures must have been a contributing factor in the Supreme Court’s decision while exercising its inherent power under Article 142 of the Constitution which talks about complete justice.

Inherent power of the Supreme Court

The Supreme Court is the custodian of the Constitution. Hence, it has been given such powers which could be exercised where the law is silent or is found incapable of grievance redressal. Such powers are not conferred by statute but are inherent to its role as the highest court, enabling it to go beyond strict procedural constraints to prevent injustice or abuse of process. Another condition to invoke Article 142 is a manifest error and non-exercise of it might lead to travesty of justice. The Supreme Court in *Delhi Judicial Service Association vs. State of Gujarat* (1991) has held that the power to do complete justice is entirely of different level and of a different quality. The Court further says that any restrictions contained in ordinary laws cannot act as limitation on the constitutional power of the Court.

The concept of complete justice

A pertinent question that comes to our mind is whether justice could ever be incomplete. If not, then why has the term ‘complete justice’ been incorporated into Clause (1) of Article 142 of the Constitution? Another question that may arise is whether High Courts may also deliver complete justice.

The power to deliver complete justice is residuary in nature and it may be exercised to ensure the observance of due process of law. This is an extraordinary jurisdiction implicitly vested with trust and faith that it shall be exercised by applying the principle of natural justice, i.e., fairness. The Court also recognises its significance, and therefore, held in *Hitesh Bhatnagar vs. Deepa Bhatnagar* (2011) that extraordinary care and caution shall be observed while exercising this jurisdiction.

Article 142 empowers the Supreme Court to pass any necessary order to deliver comprehensive, equitable justice, even if existing laws or procedural technicalities do not provide a specific



remedy. This power acts as a “constitutional safety valve” to fill legal gaps. It is a well-established fact that the Constitution of India gives precedence to natural justice over other forms of justice. In a landmark judgment, the apex court, in *Canara Bank vs. Debasis Das* (2003), says that the Constitution intends to deliver substantive justice, which is the removal of injustices and it shall be delivered either by way of legal or natural justice. In a situation where legal justice is incapable of doing so, the principles of natural justice must be followed.

Complete justice and High Courts

The question of whether High Courts could also deliver complete justice may be answered on the basis of the Supreme Court’s decision in *Anil Kumar Jain vs. Maya Jain* (2009) in which the Court held that the powers of High Courts under Article 226 of the Constitution are certainly not at par with those of the Supreme Court under Article 142. However, justice is a wide concept and shall always be complete. Thus, the High Courts may also deliver complete justice, though in a more circumscribed manner than the Supreme Court, whose inherent powers under Article 142 serve as one of the tools for applying the concept of due process of law in rapidly changing social, economic, political and value systems within and outside India.

Cause for controversy

The exercise of Article 142 is often criticised as judicial overreach that undermines the principle of separation of powers. Critics point out that the Court bypasses the established laws and procedures and may encroach upon the domain of the Executive or the Legislature. However, such criticisms do not have much rationale. It is true that invoking Article 142 makes the judiciary more active. However, judicial activism involves the proactive and progressive interpretation of laws or constitutional provisions. Its constitutional intent is to deliver justice, be it social, economic, political or legal. The problem arises when new and evolving social realities, such as live-in relationships or matters relating to homosexuality, emerge and established laws and procedures may prove inadequate to deliver justice. In such situations the Supreme Court, as the custodian of the Constitution needs to proactively take steps to ensure that complete justice is delivered.

COERCED CONSENT

The Indian state has not infrequently used the colonial offence of sedition, codified under Section 124A of the Indian Penal Code (IPC), as a tool to quell dissent. In May 2022, the Supreme Court of India asked State and central governments to refrain from registering new first information reports and from taking coercive measures under Section 124A in *S.G. Vombatkere vs Union of India* while the Centre said it would “reconsider” the provision. When the *Bharatiya Nyaya Sanhita* (BNS) took effect in 2024, Parliament effectively replaced Section 124A with Section 152 and increased the minimum sentence to seven years. It was sedition by a new name. In February 2026, Chief Justice of India Surya Kant orally observed that the Centre’s promise in 2022 to review the provision could not bind Parliament. As if to release the pressure on courts, but also effectively easing the country’s passage into the BNS era, on May 21, 2026, the Court said that if an accused person has no objection, courts may proceed on cases involving Section 124A. However, such consent from the accused may be coerced, especially if they lack robust legal representation, because the alternative for the incarcerated persons is indefinite delay. It is effectively a Hobson’s choice between bad and worse outcomes.

Indeed, as the 2022 stay paused the use of Section 124A pending constitutional challenge, how meaningful an accused person’s consent to trial can be where refusal may entail prolonged delay



is unclear. S.G. Vombatkere also provided those charged with sedition to move for bail, meaning liberty rather than restoring proceedings was the intended remedy for frozen trials. The May clarification swings in the other direction, and also stands in contrast to the ‘bail is the rule’ principle that the Court recently reinforced in Syed Iftikhar Andrabi. If the Court wished to preserve agency, it should have paired continuation with a presumption of bail. The 2022 stay was also intended to annul the chilling effect of the charge of sedition on free speech. Now, wealthier or politically connected accused persons may secure bail through sustained litigation and wait out proceedings outside the prison, whereas poorer prisoners who are unable to secure bail will be compelled to consent to a trial, if only to obtain a verdict. As a result, liberty could depend on the capacity to litigate rather than on legal principles. Finally, if the state knows that cases involving constitutionally contested offences can remain in limbo while the accused persons are incarcerated, there is a perverse incentive for bad-faith state actors to not resolve the underlying uncertainty quickly. Instead of determining once and for all whether sedition as a criminal offence is constitutionally sustainable, the Court has passed the burden to the accused and declined to do its own duty.

WHAT DID THE SC SAY ABOUT BAIL UNDER UAPA?

The story so far:

On May 22, the Supreme Court granted six months of interim bail to two accused in the 2020 Delhi riots case — Abdul Khalid Saifi and Tasleem Ahmad. It also referred to a larger Bench the question of whether prolonged incarceration and delay in trial can override the stringent bail curbs under anti-terror laws such as the Unlawful Activities (Prevention) Act, 1967 (UAPA). This particular law empowers the Centre to designate not only organisations but also individuals as ‘terrorists’.

What concerns did the Court raise about UAPA bail rulings by smaller Benches?

A three-judge Bench in the 2021 judgment, *Union of India v. K.A. Najeer*, had settled the principle that an undertrial cannot be made to indefinitely wait behind bars for completion of trial, however grave the offence may be.

On May 18, a Bench of Justices B.V. Nagarathna and Ujjal Bhuyan in *Syed Iftikhar Andrabi v. National Investigation Agency*, voiced serious reservations about smaller Benches “hollowing out” the principle laid down in the Najeer verdict — that constitutional courts must intervene and grant bail in UAPA cases in which accused persons had spent years in pre-trial incarceration.

Justice Bhuyan, who authored the judgment, questioned the Supreme Court judgment of January 5, 2026 (*Gulfisha Fatima v. State, Government of NCT Delhi*), which denied bail to former JNU student leader Umar Khalid and his co-accused Sharjeel Imam, who were charged under the UAPA in the Delhi riots ‘larger conspiracy’ case. While granting five others bail, a Division Bench of Justices Aravind Kumar and N.V. Anjaria had denied the two of them relief, prima facie acknowledging that they were the “alleged masterminds”. Mr. Khalid had already spent over five years in jail.

Justice Bhuyan’s remarks prompted the Delhi Police to raise objections before Justice Kumar, the author of the Gulfisha Fatima verdict, during the bail hearing of Mr. Saifi and Mr. Ahmed.

Additional Solicitor General S.V. Raju argued the Andrabi judgment had muddied the bail waters in UAPA cases. He rhetorically asked whether Ajmal Kasab — or Hafiz Saeed, if extradited from



Pakistan — would also be entitled to bail merely because they had spent five years in prison awaiting trial.

Justice Kumar referred the question of law to a larger Bench, saying that a “perceived conflict” between two coordinate Benches (of equal strengths) of the Court did not need expressions of “serious reservation”, but “resolution”.

Why is bail so difficult under Section 43D(5) of the UAPA?

The section makes securing bail under the UAPA difficult. The proviso to it mandates that an accused person will not get bail if a court, on perusing the case diary or chargesheet, found “reasonable grounds” to believe that the accusations were prima facie true.

The apex court’s 2019 judgment in *National Investigation Agency v. Zahoor Ahmad Shah Watali* saw a Division Bench headed by Justice A.M. Khanwilkar (now retired and currently serving as chairperson of the Lokpal) hold that an “elaborate examination” of evidence was not necessary for a court to establish prima facie guilt. The court was merely required to glance through “broad probabilities” to decide if the allegations were true, and deny bail.

Section 43D(5) turned bail jurisprudence on its head. The normal presumption of ‘bail, not jail’ was reversed. While ordinary bail jurisprudence was rooted in the fundamental principle that a person was innocent until proven guilty, Section 43D(5) turned the burden onto the accused, supposing the person to be guilty until found innocent.

How did the K.A. Najeeb judgment soften the bail bar?

The Najeeb verdict was the Court’s response to the growing use of Section 43D(5) as a weapon in the hands of the state. For incarcerated accused persons with limited financial and legal resources, disproving terror charges becomes an uphill battle even as the prospect of trial recedes with passing years. It was in this context that the Najeeb judgment, authored by Justice Surya Kant (as he was then), clarified that constitutional courts could “melt down” the rigour of Section 43D(5) and grant bail to a UAPA accused who had already spent a “substantial period of time” in jail due to gross delay in trial.

The Najeeb verdict quoted precedents to hold that constitutional courts cannot become mute spectators before the power of Section 43D(5). They had to intervene to protect the fundamental right to life and personal liberty under Article 21 of the Constitution.

What did the Court clarify in the Andrabi verdict about Section 43D(5) and Article 21?

In the Andrabi judgment, Justice Bhuyan said the Court must not play ball to the Centre’s argument that the gravity of offences under UAPA outweighed the human right to bail. The judge pointed out that the conviction rate under UAPA was only 2-6% across the country.

Justices Nagarathna and Bhuyan observed that an undertrial cannot be punished with denial of bail for the state’s ineptitude to hold a trial on time. If the alleged offence was a serious one, it was all the more necessary for the prosecution to conclude the trial expeditiously. Bail cannot be denied solely on the ground that the charges were very serious.

The Andrabi judgment said the Supreme Court in *Gulfisha Fatima* case read Najeeb judgment wrong when it said the three-judge Bench had created an automatic entitlement to bail on account of delay. Justice Bhuyan clarified that the Najeeb verdict had never advanced the proposition that



bail should be given in every UAPA case of prolonged incarceration. Rather, Najeer case only cautioned constitutional courts against treating the statutory embargo under Section 43D(5) as the sole justification for continued detention while ignoring broader constitutional principles of personal liberty and speedy trial. It held that Section 43D(5) was subordinate to Article 21.

Did the Gulfisha Fatima judgment stray from the ‘binding precedent’ of Najeer verdict?

The May 22 order, referring the question of bail in UAPA to a larger Bench, argued that the Andrabi judgment had misunderstood the reasoning behind the Gulfisha Fatima verdict. It said the judgment, which had denied bail to Mr. Khalid and Mr. Imam, had correctly applied the Najeer principle. It said the Najeer judgment had appreciated the strict bail regime of Section 43D(5) while advising relaxation only in cases in which there was no likelihood of completion of trial within the reasonable time and the accused had already spent a long time behind bars.

The May 22 order took pains to clarify that the Gulfisha Fatima judgment accepted the Najeer judgment as a binding precedent. It had recognised the central place of Article 21 in the constitutional scheme and that pre-trial incarceration cannot assume the character of punishment in UAPA cases. It said that the two were denied bail on an “accused-specific evaluation” based on factors such as the evidence, their roles in the alleged conspiracy, and the need to protect the integrity of the trial.

BAIL TO VERDICT: SC PUSHES HIGH COURTS TO SPEED UP JUSTICE

Addressing concerns over undue delay in pronouncement of judgments reserved by judges, the Supreme Court issued directions Friday to all high courts to pronounce verdicts within three months of hearing the case and to “display extra promptitude” in cases of personal liberty and bail.

Key Takeaways:

- A bench comprising Chief Justice of India Surya Kant and Justice Joymalya Bagchi said the directions were intended to strengthen the judicial administration and ensure timely delivery of judgments.
- Among the key directions, the Supreme Court said that bail applications should be heard and the order should preferably be pronounced and uploaded the same day. If it is reserved, it should be pronounced the next day and uploaded on the website.
- The Supreme Court also called for reasoned judgments pronounced in open courts to be uploaded on the High Court website within 24 hours.
- The directions came on a petition filed by four convicts serving life sentences whose criminal appeals had been reserved by the Jharkhand High Court in 2022 but the verdicts were pronounced three years later. While deciding their plea, the Supreme Court chose to address what it described as a wider institutional issue affecting courts across the country.
- The Court said that orders in cases seeking bail or suspension of sentence should be communicated to the jail authorities as soon as it is pronounced, and that the undertrial or convict must be released, preferably the same day or at most the next day.



— The bench also said that at the end of every month, an automated list of reserved judgments that remain pending must be generated and placed before the Chief Justice of the High Court, with a copy to the bench concerned.

— If a judgment is not delivered in three months of reserving the order, the Registrar General must place the matter before the Chief Justice, who is then required to bring the delay to the notice of the bench concerned within two weeks, the top court said.

— A similar string of directions, aimed at improving access to justice were issued in a 2001 case, *Anil Rai v. State of Bihar*, in which the Supreme Court noted that delivering judgments long after arguments had concluded could affect public confidence in the judicial process.

Do You Know:

— *Bharatiya Nagarik Suraksha Sanhita (BNSS)*, Indian criminal statutory law, Section 2(1)(b), “bail” means release of a person accused of or suspected of commission of an offence from the custody of law upon certain conditions imposed by an officer or Court on execution by such person of a bond or a bail bond.

— According to the fourth edition of the India Justice Report (IJR) 2025, in judiciary there is a 20 per cent increase in pending cases, crossing the five-crore mark; shortages in court halls; vacancies in the high courts and district courts that stand at 33 per cent and 21 per cent respectively.

— There is also an increase in the average workload in district courts – 2,200 cases per judge, while case clearance rate is at 94 per cent. This leads to a slower pace of justice and erodes public confidence in the justice system.

— In prisons, overcrowding continues undeterred, with some running at over 400 per cent occupancy. The average overcrowding in prisons stands at 131 per cent. Prisoners awaiting trial stand at 76 per cent. Their guilt is yet to be proven, and the period of detention is constantly increasing, with one in every four undertrials spending between one to three years in prison pending trial.

BETRAYAL OF MANDATE

Before the indelible ink applied on voters' index fingers could fade, the Tamilaga Vettri Kazhagam (TVK) has introduced in Tamil Nadu a disturbing brand of politics bearing striking similarities to the 'Operation Lotus' model first adopted by the Bharatiya Janata Party (BJP) in Karnataka. By instantly embracing into its fold four All India Anna Dravida Munnetra Kazhagam (AIADMK) legislators who resigned their Assembly membership, the fledgling TVK, which marketed itself as a “pure force”, has adopted a dubious tactic deployed by its “ideological opponent”, the BJP. This model encourages Opposition legislators to resign and join the ruling party, with an opportunity to re-enter the Assembly through by-elections. Irrespective of its legitimacy or the prospects of the four legislators re-entering the electoral fray soon, the operation's objective remains no different from the 'Aaya Ram, Gaya Ram' model of horse-trading. The AIADMK rebels, who voted for the TVK during the trust vote, attributed intra-party concerns to their resignations, which the Speaker accepted in quick time. Apart from dishonouring the people's mandate within just 21 days, the move comes when petitions for their disqualification were pending with the Speaker. Clearly, the TVK is wary of the inherent political checks and balances in the State's fragile first



post-poll coalition government and appears to be preparing to ease out allies should they pose challenges.

The development is not entirely surprising, as the TVK has so far displayed an uncanny political instinct for exploiting support from rival parties to tide over crises, be it after the Karur rally stampede or during government formation. In the wake of the fractured mandate, the TVK simultaneously reached out to constituents of both the DMK-led Secular Progressive Alliance and the National Democratic Alliance that includes the AIADMK and the BJP. Early on, Amma Makkal Munnetra Kazhagam leader T.T.V. Dhinakaran had flagged an attempt to poach his lone legislator. Besides, despite securing the support of the DMK's erstwhile allies, C. Joseph Vijay had no qualms about calling on tainted AIADMK rebel leaders on the eve of the floor test, while calculatedly ignoring the party's general secretary, Edappadi K. Palaniswami. This encouraged divisions within the AIADMK legislature party during the voting, prompting representations for disqualifying the rebels. By now, 'Operation Lotus' has become a familiar playbook for subverting the people's mandate. The trend calls for amendments to election laws, perhaps through the imposition of a "cooling period" restraining candidates from contesting the immediate by-election caused by their resignation. Otherwise, such defections accompanied by resignations will only be seen as subverting democratic processes.

SC RULED RESIGNATION DOESN'T VAPORISE TAIN OF DEFECTION

A question has been raised in Tamil Nadu as to whether the Speaker can accept the resignation of MLAs while petitions for disqualifying them are pending.

The Tamil Nadu Assembly Speaker, J.C.D. Prabhakar, has accepted the resignation of four legislators elected as AIADMK candidates. They have all joined the ruling Tamilaga Vettri Kazhagam (TVK) after their resignations were accepted. The members were part of a group of 25 AIADMK MLAs who voted in favour of the TVK government in the confidence motion.

The AIADMK leadership had earlier sought their disqualification for violating the party's direction to oppose the motion. However, the acceptance of their resignations may have rendered the disqualification proceedings against them infructuous. Against this backdrop, the AIADMK has appealed to the Speaker to take back the acceptance of their resignations and adjudicate the petitions for their disqualification.

An answer to the main question may be inferred from the judgment of the Supreme Court in 2019 in Shrimanth Balasaheb Patel and Others vs. Speaker, Karnataka Assembly. In an apparent bid to topple the Janata Dal(S)-Congress coalition government, a group of MLAs seemed to have acted against the Congress's directions and avoided party meetings and Assembly sittings. On realising that they may be disqualified under the Tenth Schedule of the Constitution for "voluntarily giving up the membership of their party", many of them submitted their resignations, but the then Speaker of the Karnataka Assembly did not accept their decision to quit immediately. Subsequently, many of them were disqualified.

In a judgment that upheld their disqualification, but set aside the Speaker's order declaring that they would remain disqualified for the remainder of the Assembly's term, the top court gave three conclusions relevant to the question arising today. First, the Speaker's role in considering a resignation was limited. The authority could only ascertain if the resignation is "voluntary" (out of one's free will, and not under duress) and "genuine" (authentic). Beyond this, he cannot delve into motive. "Once it is demonstrated that a member is willing to resign out of his free will, the



Speaker has no option but to accept the resignation.” The court further said: “It is constitutionally impermissible for the Speaker to take into account any extraneous factors while considering the resignation. The satisfaction of the Speaker is subject to judicial review.”

However, it made a second point. The taint of disqualification does not “vaporise” just because a member submitted his resignation prior to adjudication. The court reasoned that defection related back to the date when a member incurred disqualification, and the submission of a resignation letter does not render a pending or impending disqualification action infructuous. The court noted that there is a second consequence to defection, apart from loss of membership. It is the provision in the Constitution barring a disqualified member from holding a Minister’s post or any remunerative political office until the end of the term or until the person is re-elected to office, whichever is earlier.

This means no member can join a Ministry formed by defection without facing an election or byelection. (This prospect was real in the Karnataka case in 2019, as the defectors were likely keen on joining an alternative government). As such a possibility exists, the fate of a person facing disqualification may hinge on whether the Speaker accepts a resignation or not. The court also declined to go into the question on the Speaker’s jurisdiction to deal with a disqualification issue after a member has quit. The question did not arise in a strict sense in that case because the act that amounted to defection occurred prior to their resignation, and the court did not want to decide a question of law that did not arise.

A harmonised reading of these conclusions gives a picture of how the law deals with the interplay between disqualification and resignation: the Speaker may disqualify a person if the defection occurred earlier, but does not mean he could reject a voluntary and genuine resignation by delving into its motive. The submission of a resignation is not a reason to close a disqualification complaint, but the acceptance of the resignation may bring it to an end. However, the Speaker’s decision is still subject to judicial review.

WHAT DID THE COURT RULE ON BIHAR’S SIR OF ELECTORAL ROLLS?

The story so far:

The Supreme Court recently upheld the powers of the Election Commission (EC) to conduct special intensive revision (SIR) of the electoral rolls in Bihar. It also upheld the procedure followed by the EC.

What was SIR?

Article 324 of the Constitution provides that the superintendence, direction and control of the preparation of electoral rolls for the conduct of elections shall vest with the EC. Section 21 of the Representation of the People Act, 1950 (RP Act), deals with the preparation and revision of electoral rolls. It authorises the EC to carry out a special revision of the electoral roll, for any constituency at any time, for reasons to be recorded.

In its June 2025 order to carry out the SIR of Bihar electoral rolls, the EC noted that there had been large-scale additions and deletions to the electoral rolls over the last 20 years due to rapid urbanisation and migration. This has increased the possibility of duplicate entries in the electoral roll. The EC stated that it is also constitutionally obligated to ensure that only citizens are enrolled in the electoral rolls. Accordingly, the EC decided to undertake an SIR exercise for the entire country, starting with Bihar.



What issues were raised?

The Association for Democratic Reforms and various other petitioners had challenged the SIR exercise in the Supreme Court. The key issues for consideration in these petitions are summarised below.

First, whether the EC is empowered to carry out the SIR exercise. Section 21(3) of the RP Act authorises the EC to carry out a special revision of the electoral roll for 'any' constituency or part of a constituency in such manner as it may think fit. The petitioners argued that this provision is for special revision of only a particular constituency and not for a State as a whole, as envisaged in the SIR process.

Second, if the SIR is founded on a legitimate purpose, whether the measures adopted by the EC are proportionate to the object being sought to be achieved. Third, whether the procedure is violative of provisions of the RP Act and Registration of Electors Rules, 1960 (RER). The petitioners argued that enrolment in the electoral roll carries a presumption of citizenship and eligibility. Rule 21A of the RER mandates that no name already entered in the electoral roll can be deleted without prior notice to the elector concerned and an opportunity of hearing. The petitioners argued that requiring all electors to fill out the enumeration forms again and deleting the names of those who fail to submit them violates these provisions. Fourth, whether the EC is empowered to scrutinise the citizenship status of persons seeking inclusion or continuation in the electoral roll.

What did the court rule?

The court, after hearing the petitioners and EC, upheld the SIR exercise and procedure followed. The conclusion of the court for the four main issues raised can be summarised as follows. First, the interpretation of the word 'any' in Section 21(3) of the RP Act as 'only' for a particular constituency would be narrow and restrictive. The EC is well within its constitutional mandate to carry out SIR for 'many' or 'all' constituencies in a State. It is an exercise traceable to Section 21(3) read with Article 324 of the Constitution to fulfil the constitutional requirement of free and fair elections.

Second, the SIR exercise satisfies the proportionality requirement. The measures adopted bear a rational nexus to the objective sought to be achieved, are not manifestly excessive, and are accompanied by sufficient procedural safeguards to prevent arbitrary exclusion.

Third, while inclusion in the electoral roll gives rise to a presumption of validity, it does not impose a blanket prohibition on the powers of the EC to undertake an SIR. The safeguards of notice and hearing under RER are preserved in substance, and the process adopted by the EC is within the statutory requirements. The documentation prescribed by the EC, to which the Aadhaar card was subsequently added as per the court's direction, is based on intelligible criteria having a direct nexus with the objective of ensuring the integrity of the electoral roll.

Fourth, the EC is empowered, in the exercise of its constitutional mandate, to undertake a limited enquiry into citizenship for eligibility for inclusion in the electoral roll. It does not amount to a determination of citizenship in the strict sense and is confined to electoral consequences alone.

Any deletion of names on account of the opinion of the EC that they are not citizens should be referred by the commission to the competent authority under the Citizenship Act, 1955, for



adjudication of their citizenship. If the authority holds that such deleted individuals are citizens, they shall be included in the electoral roll.

MANIPUR: EC CONSIDERS SPECIAL REGISTRATION OFFICERS FOR INTERNALLY DISPLACED ELECTORS

THE Election Commission is considering deploying special Assistant Electoral Registration Officers (AEROs) for the internally displaced persons (IDPs) in Manipur, where thousands have been displaced since the ethnic clashes broke out in May 2023, for the Special Intensive Revision (SIR) of electoral rolls, The Indian Express has learnt.

Key Takeaways:

- The SIR exercise, which involves Booth-Level Officers (BLOs) going house-to-house to have all registered electors fill enumeration forms in order to stay on the rolls, is set to start in Manipur on Saturday, as per the EC's schedule announced earlier this month.
- After that, the Electoral Registration Officers (EROs) and AEROs are supposed to issue notices to those electors who have not been able to establish their eligibility by giving the details of themselves or their parents.
- Sources said the office of Manipur Chief Electoral Officer has submitted a proposal to the EC for appointing special AEROs for the IDPs, similar to the deployment of designated Assistant Returning Officers for the conduct of the 2024 Lok Sabha elections in the state.
- A total of 18,620 IDPs were eligible to vote in the 2024 elections. The EC had set up 94 special polling stations for the IDPs in relief camps. As of now, the total number of IDPs has gone down from 62,000 in 2023 to around 57,000, according to government records. Sources said arrangements are likely to be made for around 14,000-15,000 IDPs who are eligible for participation in the SIR exercise.
- According to the EC, there are 20.91 lakh electors spread across 2,996 booths in Manipur. As per the schedule, electors will have till June 28 to fill the enumeration forms.

Do You Know:

- Under The Representation of the People Act, 1950, Electoral Registration Officers and AEROs are appointed for maintaining the electoral rolls of Assembly constituencies. In the case of Manipur, where thousands of electors have been displaced from their home constituencies, the EC is considering appointing special AEROs to decide on eligibility of the electors staying in camps.

HOW HAS THE BCCI RESISTED RTI SCRUTINY?

The story so far:

The Central Information Commission (CIC) on May 18 held that the Board of Control for Cricket in India (BCCI) does not qualify as a "public authority" under the Right to Information (RTI) Act, 2005, and therefore cannot be directed to furnish information under the RTI Act.



What is the legal position?

The BCCI has maintained that it is a private and autonomous body and therefore does not qualify as a “public authority” under Section 2(h) of the RTI Act. The provision defines a “public authority” as “any authority or body or institution of self-government established or constituted” by the Constitution, laws enacted by Parliament or State legislatures, or through government notifications. It also includes entities that are “owned, controlled or substantially financed” by the government, including NGOs receiving substantial public funding. The cricket body has argued that, as an autonomous charitable society registered under the Tamil Nadu Societies Registration Act, 1975 (1975 Act), it does not fall within the ambit of ‘State’ under Article 12 of the Constitution. This Article includes within its scope the Union and State governments, legislatures, and “all local or other authorities” functioning within the territory of India or under government control.

What did expert bodies recommend earlier?

An earlier Bench of the CIC, headed by Information Commissioner M. Sridhar Acharyulu, had in 2018 held that the BCCI qualified as a public authority under the RTI Act and directed it to appoint Public Information Officers and establish an RTI compliance framework. The order was challenged by the BCCI before the Madras High Court, which remitted the matter to the CIC for fresh consideration in light of Supreme Court rulings holding that the cricket body did not fall within the ambit of the RTI Act. The CIC’s May 18 decision was passed pursuant to this reconsideration.

Earlier, the Justice R.M. Lodha Committee, constituted by the Supreme Court in 2015 to recommend reforms within the BCCI, had described the cricket body’s functioning as a “closed-door and back-room affair” and urged Parliament to “seriously” consider bringing it under the RTI Act. The Law Commission, too, in 2018, recommended that sports bodies discharging public functions be brought within the RTI regime. However, neither recommendation was translated into law.

What does the latest CIC order say?

The CIC held that the BCCI, being registered under the 1975 Act as “a private association of individuals”, cannot be treated as a public authority under the RTI Act. It observed that the RTI regime does not extend to every entity “merely because they are registered under a statute”, drawing a distinction between bodies created by law and those formed through private initiative and only later registered under a statutory framework. It noted that the BCCI was formed by cricket administrators and that registration under the 1975 Act merely grants legal recognition, not statutory status.

The Commission also relied on the Supreme Court’s ruling in *Zee Telefilms Ltd. v. Union of India* (2005), which held that “mere supervision or regulation by the state is insufficient to alter the private character of the organisation”. In that judgment, the apex court had observed that although the BCCI performs significant public functions in regulating cricket in India, it would not qualify as ‘State’ under Article 12 of the Constitution in the absence of deep and pervasive governmental control over its affairs.

On the issue of funding, the Commission observed that Section 2(h)(d) of the RTI Act covers bodies that are “substantially financed” by the government. However, it clarified that the term refers to financial assistance so significant that the entity’s survival would depend on it, and not indirect benefits such as tax exemptions. The CIC held that the exemptions relied upon by the BCCI are



uniformly available to non-profit organisations meeting the prescribed conditions under the Income Tax Act, 1961. It also pointed out that the BCCI generates massive revenues through media rights, sponsorships, and broadcasting deals.

What are the implications?

Bringing the BCCI within the RTI framework would have enabled citizens to seek information not only on its finances but also on its day-to-day functioning. Section 14(2) of the National Sports Governance Act, 2025 provides that a recognised sports organisation would be treated as a public authority only “with respect to the utilisation of government grants or financial assistance” received by it. By making government funding the determining criterion, this provision effectively excludes the BCCI from the ambit of the RTI Act.

NOW, CITIZENS CAN LODGE GRIEVANCES ONLINE BY TALKING TO A CHATBOT

The Union government on Saturday unveiled an artificial intelligence (AI)-enabled chatbot to help citizens raise grievances against government departments online.

Launching the chatbot named Samadhan Didi, Union Minister of State for Personnel Jitendra Singh termed it “democratisation of public grievance mechanism” in the nation.

Multilingual solution

Citizens can now lodge their grievances by speaking to the chatbot, in their own language, and describing their concern in plain words, without needing to know the Ministry/department, category or sub-category it comes under, Mr. Singh said.

The chatbot takes in the audio data, asks a few clarifying questions, automatically identifies the appropriate Ministry, department, category and sub-category, and files the grievance with the correct authority, the Minister said.

The Department of Administrative Reforms and Public Grievances (DARPG), in collaboration with Bhashini (an AI-powered tool), developed the chatbot within secure government infrastructure, ensuring data privacy.

At the launch event, the chatbot was demonstrated live and tested in different Indian languages.

Highlighting the paradigm shift in the public grievance mechanism in the country in the past 12 years of the [Narendra] Modi government, he said that when the government assumed office in 2014, the grievance redress system witnessed limited public participation, with only about two lakh grievances being registered annually through the CPGRAMS (Centralised Public Grievance Redress and Monitoring System) portal.

The number of grievances received through the system had now increased to over 25 lakh every year, Mr. Singh said.

BENGAL ORDER ON MADRASAS IS DISTURBING

The BJP’s victory in West Bengal, a milestone in the party’s journey, came after a bitter campaign. In the aftermath of the victory lies the victor’s challenge: To not let the rhetoric of the campaign shrink the agenda and vision of governance, and to send a message that the government will address and respond to all the people of the state, those who voted for it, and also those who did



not. In this context, the Suvendu Adhikari government's decision to make it mandatory for madrasa students to sing 'Vande Mataram' during morning Assembly prayers is a disturbing let-down. It sends out a disquieting signal — that the new government is more focussed on bulldozing a polarising agenda rather than addressing the many pressing economic, social and governance challenges it has inherited.

There is little doubt that West Bengal's madrasas and the state's education system as a whole require urgent reform. Over the decades, several attempts have been made in this regard, including aligning curricula in recognised madrasas with the state board. Yet, the issue of the poor quality of education in unaided khariji madrasas and narrower pipelines to higher education for madrasa students remains. Forcing students to sing 'Vande Mataram' distracts attention from the real problem, and in a diverse democracy, creates a new one. School education — whether in minority institutions, private bodies or state-run facilities — must not become a site for a forced performative nationalism. Students and their families must not be compelled to endorse, for the sake of accessing their right to education, symbols and signifiers that may go against their religious beliefs. In *Bijoe Emmanuel v. State of Kerala* (1986), the Supreme Court held that forcing students belonging to the minority community to sing even the national anthem is a violation of their right to freedom of speech, expression, and religion.

The 'Vande Mataram' order comes on the heels of the government scrapping state assistance schemes based on religious classification, including scholarships for minority students. These decisions may be part of the Adhikari government's attempt to counter what it calls the "appeasement" policies of its predecessor. There may be a case to be made that the Trinamool Congress government, like many others across the country, relied too often on tokenism over substantive reforms for minorities. But the forced recitation of a controversial song is the wrong answer. It does not strengthen Bengal's education system or prepare its young for a job market undergoing epochal transitions. The Adhikari government needs to take all the people along; it must step back from a path that will only lead to exclusion and alienation.

THE REAL COST OF INFERTILITY

Meera and her husband Harsh (names changed to protect privacy) sit quietly inside the waiting room of a fertility clinic in south Delhi. In their late 30s, they have spent the last four years trying to have a child. "We turned to assisted fertility treatment in our early 30s and are now in the geriatric pregnancy category, which comes with additional health risks," Harsh says.

Meera adjusts a pile of prescriptions on her lap to hide her tears before she begins speaking. "Four years ago I quit my job. Trying to get pregnant is a full-time job," she says. "The treatment is exhausting — physically, emotionally, and financially. We borrowed money from relatives. This month I sold the gold my parents gave me for my wedding so we could continue treatment."

"If a robust government service was available, we would never have opted for private treatment," Harsh says as other couples nod in agreement.

While the World Health Organization (WHO) states that one in six adults globally is impacted by infertility during their reproductive years, for India this number stands at 10-15%, according to the Union Health Ministry's estimate.



On the periphery

What makes infertility a challenge in India is that despite the growing numbers, this medical condition has received negligible attention as a public health issue. This translates into no major public health policies and services in the sector. With negligible insurance coverage, hyper concentration of services in the private sector and almost no government facility offering cutting-edge technology, people are funding their treatment.

According to World Bank and National Family Health Survey-5 data, India's total fertility rate has fallen from about 3.4 births per woman in the early 1990s to close to 2.0 today. States such as Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Maharashtra, Punjab, and West Bengal have already fallen below replacement level. Fertility rates in urban India are even lower.

"The absence of a structured public health policy on infertility reflects a serious disconnect between constitutional promises and healthcare realities. Reproductive autonomy cannot be selectively recognised only in the context of contraception, abortion, or maternity while ignoring infertility care," says Sonam Chandwani, managing partner at KS Legal & Associates.

A single in-vitro fertilization (IVF) cycle in India can cost anywhere between ₹1 lakh and ₹2.5 lakh in private hospitals. Many couples require multiple cycles before a woman gets pregnant. Medication, hormone injections, investigations, and travel expenses push costs even higher.

Private clinics provide everything from ovulation-inducing medication and intrauterine insemination (IUI) to IVF, intracytoplasmic sperm injection (ICSI), donor programmes, and egg freezing. Basic fertility treatment may cost between ₹5,000 and ₹25,000. IUI procedures generally range between ₹8,000 and ₹35,000 per cycle. IVF cycles usually cost between ₹80,000 and ₹2.5 lakh, while advanced procedures involving donor eggs, embryo freezing or ICSI can cross ₹5 lakh.

Infertility is one of the country's least discussed healthcare crises, says Richika Sahay Shukla, co-founder and medical director of India IVF Fertility, which operates in several centres in north India. "Couples often come to us after years of trying, after exhausting much of their savings, and carrying enormous emotional pressure."

She says advanced fertility care still remains inaccessible to a large section of the population. "Few government hospitals provide infertility treatment at scale, and most procedures are still paid for entirely out of pocket because insurance coverage remains extremely limited," she says.

Fertility as a business

Over the last two decades, fertility treatment in India has expanded from a niche urban speciality into a rapidly growing healthcare business. Large IVF chains are now moving into tier-2 and tier-3 cities. Industry estimates suggest the Indian IVF market, valued at nearly \$1 billion in 2025, could more than triple over the next decade.

India currently has approximately 3,879 registered Assisted Reproductive Technology (ART) clinics, 835 ART banks, and 681 registered surrogacy clinics, according to the live dashboard of the National ART & Surrogacy Registry under the Ministry of Health & Family Welfare. The registry was established under the Assisted Reproductive Technology (Regulation) Act, 2021, and the Surrogacy (Regulation) Act, 2021, which made registration mandatory for fertility and IVF providers across the country.



Poonam Muttreja, executive director of the Population Foundation of India, says India's fertility debate has historically focused more on population control than on reproductive aspirations. "Infertility treatment in India still depends largely on private healthcare and the ability to pay," she says. "There is no comprehensive public health framework that fully integrates infertility care into reproductive healthcare systems at scale."

According to her, a heavily privatised fertility sector creates deep inequalities in access, affordability, and quality of care.

Legally speaking

Doctors, activists, and legal experts say the rapid commercial expansion of fertility care has created difficult ethical and regulatory questions. Legal questions surrounding infertility treatment are becoming increasingly important. Under Article 21, Indian courts have repeatedly interpreted the right to life as including dignity, healthcare, and reproductive choice.

Those who work with the law argue that reproductive autonomy cannot be recognised only in the context of contraception, abortion, or maternity while infertility treatment remains largely ignored. "Reproductive rights cannot stop at the right to avoid pregnancy," Chandwani says. "They must also include the ability to pursue parenthood with dignity and reasonable access to health care."

In India, infertility isn't just a medical condition but a structural collapse aided by unequal access to remedial health care, inadequate public investment, and a near-total eclipse as a public health issue.

After her consultation, Meera folds her prescriptions carefully into her bag. The couple is scheduled to return next week. "We've stopped planning too far ahead," Harsh says quietly. "Right now, we are only trying to keep going."

FROM BLACK TO GREY

If India wanted proof of its shifting demographic status, then the latest SRS bulletin, 2024 has provided just that. The figures from the Sample Registration System – Statistical Report, 2024, offer incontrovertible proof — falling fertility rate, low crude birth rate — to show that India's pace of population growth is considerably slowing down. While the pundits predict at least three decades of population growth for the country, the plunging fertility rate certainly commands pause for contemplation and forward planning, for India to crest a crisis that several nations are struggling to manage. India's Total Fertility Rate has dropped to 1.9, lower than the replacement level of 2.1, aided, in large, by a falling birth rate. As per the latest SRS data, India's birth rate fell from 21 in 2014 to 18.3 in 2024; while death rate marginally went down from 6.7 to 6.4. The country is well on its way from population 'explosion' to one of ageing population and shrinking workforce expansion. India might still reap its demographic dividend — the median age in India is 29.2 years, in stark contrast to China (median age of 40.2), and several other European nations. In 2026, India has approximately 370 to 380 million youth, aged 15-29 years, representing roughly 27 % of the country's population. Estimates also put India's below 35 years population at over 65% of the total, making it one of the world's youngest cohorts.

In demographic terms, falling birth rate reflects a decline in fertility, linked to factors such as urbanisation, better education, access to contraception, and the desire for smaller families. India's high life expectancy at birth (72 years) and dipping death rate offer the other side of the transition



paradigm, implying better access to health care. India needs to reassess the path ahead and pivot to prepare for the needs of a future greying nation, when the demographic dividend disappears. The SRS data, however, flags a more immediate concern too — one of vast regional and rural/urban disparities. Overall, performance in rural areas is not on a par with the urban centres, and the southern States continue to stay ahead of the northern States. Overall, child survival improvements are real (the Infant Mortality Rate has fallen to 24) but high-burden States in the north are still at a much higher IMR. States and areas that lag will need targeted interventions, whether it is access to health care, awareness or education facilities to effect a national convergence.

AS KERALA SETS UP DEPARTMENT FOR THE ELDERLY, A LOOK AT INDIA'S AGEING CHALLENGE

The newly elected Congress government in Kerala has announced the formation of a department for the elderly people, the first such initiative in India. At present, the welfare of the aged comes under the state's Social Welfare department.

Key Takeaways:

- Kerala is going through a critical phase of demographic transition. With its demographic profile similar to East Asian and European countries, Kerala is India's most rapidly ageing state. As per the Elderly in India Report of 2021, around 16.5% of the state's population is aged above 60 and is expected to touch 20.9% of the total population by 2031 compared with the all-India figure of 13.1%.
- The old age dependency ratio — the number of the aged per 100 persons of working age group — has risen from 19.6% in 2011 to 26.1% in 2021. This figure is expected to go up to 34.3% by 2031. According to state government data, the number of residents in old age homes in Kerala has increased from 19,149 in 2016-17 to 37,895 in 2024-25.
- Three reasons are contributing to Kerala's rapid ageing. Over the years, Kerala's total fertility rate (TFR) — the average number of children that are born to a woman over her lifetime — has declined and is now 1.35 children per woman in 2023 as per the state's Vital Statistics data. This is below the national replacement level of 2.1, which indicates the rate required for a population to replace itself across generations.

Do You Know:

- As per the Longitudinal Ageing Study in India Wave 1 (2017-18), over 70% of Kerala's elderly suffer from at least one chronic ailment, with hypertension, diabetes, arthritis, and cardiovascular diseases most prevalent. The India Ageing Report 2023 said that nearly 1 in 4 older adults in Kerala exhibit symptoms of psychological distress. The Kerala State Initiative on Dementia (Smruthipadham) estimates that approximately 4.86% of persons aged 65 and above are affected. This calls for expansion of dementia care services, caregiver training, and public awareness to counter stigma and ensure early diagnosis.
- In 2025, Kerala formed a first-of-its-kind State Elderly Commission, a quasi-judicial forum for protecting the rights and welfare of senior citizens. Around 75% of the aged population is covered under welfare pension schemes.



BABY BAIT

Departing from decades of family-planning policies in India, the Andhra Pradesh government has proposed new incentives for families in the State to have three or more children. The State's total fertility rate has dropped from around 3 in the 1990s to 1.5 today, well below the replacement rate of 2.1 as well as the national average. According to some projections, nearly a quarter of the State population will be elderly by the mid-century, resulting in a smaller workforce relative to the old-age dependency burden. But while South India is ageing faster than the North, the evidence for cash incentives leading to larger families and doing so without significant socio-economic trade-offs is weak. At present, Andhra Pradesh has proposed ₹30,000 for a third child and ₹40,000 for a fourth; ₹1,000 monthly for five years; free education until the age of 18; provisions for mothers to work from home; enhanced funding for the 'Thalliki Vandanam' scheme, which currently pays ₹15,000 per child for school attendance; longer maternity leave; and other Anganwadi and childcare support. While one-time payments may encourage some families to have children earlier than planned, evidence from India and around the world indicates that they rarely produce large or sustained increases in fertility.

People in the State are having fewer children likely because housing and private education have become more expensive, stable employment is accessible later rather than sooner, and aspirations around children's quality of life have expanded. The proposed incentives are unlikely to offset the 18-year cost of raising one additional child even under optimistic assumptions about public provisions. The State government has also said that it wants to double women's labour force participation, which is antithetical to having more children with the existing social infrastructure. Indeed, France and the Nordic states were able to maintain this two-pronged success only by investing heavily in universal childcare, flexible working arrangements, paid parental leave, high-quality public schooling, and legal protections against career penalties that mothers are at risk of. Otherwise, as is already prevalent in India, mothers end up absorbing more unpaid care work and cannot enter the workforce. Crucially, the economics of the proposed incentives are more likely to influence poorer households seeking immediate cash, leading to an uncomfortable possibility: the State modestly increasing the size of economically vulnerable families without guaranteeing adequate long-term support for child development. Finally, ecological concerns such as water scarcity, urban congestion, waste management, and recycling will also be tested in the long term. While the southern States are anxious about population-based delimitation, asking families to alter personal decisions about having children to address a problem of constitutional design would be a profound mismatch between instrument and objective.

INDIA'S HEALTH & DEMOGRAPHIC INDICATORS

SRS 2024 REPORT + NFHS-6 (2023–24)

Two different official sources have recently put India's vital and health statistics in the spotlight: the **Sample Registration System (SRS) 2024 report**, which tracks annual vital events, and the **National Family Health Survey-6 (NFHS-6)**, a large household survey for 2023–24. Both touch overlapping themes — fertility, infant survival, maternal health — but differ in design and periodicity. This note merges the overlapping data points and organises the rest survey-wise for quick revision.



EXAM ALERT

SRS is a continuous, large-scale demographic surveillance system (dual record + sample registration) run by the Registrar General of India; it is published annually and is the source for India's official birth rate, death rate, IMR and TFR.

NFHS is a periodic (roughly 5-yearly) nationally representative household survey by the Health Ministry with IIPS, Mumbai as nodal agency; it covers a much wider basket of health, nutrition and family-welfare indicators.

Trap to avoid: the two sources report slightly different TFR figures for nearly the same period — SRS 2024: 1.9; NFHS-6 (2023–24): 2.0. Match the figure to the correct source in MCQs.

1. SRS 2024 — VITAL STATISTICS

The SRS 2024 report shows a continuing demographic transition — falling birth rates and infant mortality — but national averages hide sharp rural–urban and inter-State disparities.

HEADLINE NATIONAL INDICATORS

Indicator	Earlier Reference Point	2024 (Latest)
Birth Rate (per 1,000 population)	21.0 (2014)	18.3
Infant Mortality Rate (IMR) (per 1,000 live births)	39 (2014–19)	24
Total Fertility Rate (TFR) (children per woman)	Below replacement since 5 years	1.9 (flat)
Population aged 60 years and above	—	~10% of total population

RURAL–URBAN AND INTER-STATE GAPS

Rural IMR stood at **27** deaths per 1,000 live births against an urban IMR of **17**, reflecting continuing gaps in healthcare access, awareness and maternal nutrition. Replacement-level TFR (2.1) has not been reached nationally, but is already crossed in many southern and northern urban States, even as Bihar remains an outlier on the higher side.

Indicator	Best-Performing States (Value)	Worst-Performing States (Value)
Infant Mortality Rate (IMR)	Kerala (8); Tamil Nadu, Delhi, Himachal Pradesh (11 each)	Chhattisgarh (36); Madhya Pradesh, Uttar Pradesh (35 each)
Total Fertility Rate (TFR)	Delhi (1.2); Kerala, Tamil Nadu, West Bengal (1.3 each)	Bihar (2.9)

These gains are attributed to the cumulative impact of the **National Health Mission (NHM)** — wider immunisation coverage and a rise in institutional deliveries. However, the persistence of rural and inter-State disadvantage signals uneven progress in public-health infrastructure, with poorer States/districts still catching up. With nearly a tenth of the population now 60+, India's

economically advanced, low-fertility States are ageing fastest — meaning the country is moving toward two distinct demographic realities rather than a single, uniform demographic dividend.

2. NFHS-6 (2023–24) — HEALTH, NUTRITION & FAMILY WELFARE SURVEY

Conducted by the Union Ministry of Health and Family Welfare with the **International Institute for Population Sciences (IIPS), Mumbai** as the nodal agency, NFHS-6 is the first round conducted after the COVID-19 pandemic. It covered around **6.79 lakh households across 715 districts** in all States/UTs except Manipur, and benchmarks results against NFHS-5 (2019–21).

2.1 MATERNAL HEALTH & FAMILY PLANNING

Indicator	NFHS-5 (2019–21)	NFHS-6 (2023–24)
Institutional deliveries	88.6%	90.6%
Pregnant women receiving any antenatal care (ANC)	—	95.9%
ANC in the first trimester	70.0%	76.2%
Mothers with ≥4 ANC visits	58.5%	65.2%
Iron-folic acid (IFA) consumed ≥100 days	44.1%	54.9%
Iron-folic acid (IFA) consumed ≥180 days	26.0%	37.8%
Total Fertility Rate (TFR)	—	2.0
Contraceptive Prevalence Rate (CPR)	66.7%	69.1%
Hygienic menstrual protection (women aged 15–24 years)	77.6%	79.2%

CHILD HEALTH, NUTRITION & IMMUNISATION

Indicator	NFHS-5 (2019–21)	NFHS-6 (2023–24)
Infants under 6 months exclusively breastfed	—	95.6%
Stunting (children under 5 years)	35.5%	29.3%
Severe wasting (children under 5 years)	7.7%	5.2%
Underweight (children under 5 years)	32.1%	31.8%
Acute Respiratory Infection (ARI) symptoms	2.8%	1.9%
Severe diarrhoea prevalence	—	0.5%
Full immunisation (children aged 12–23 months)	83.8%	87.1%
— of which, via public health facilities	—	95.6%
Rotavirus vaccine coverage	36.4%	85.4%
Measles-containing vaccine (2nd dose)	58.6%	71.8%



Note: *underweight prevalence among children under five is nearly stagnant (32.1% → 31.8%) even as stunting and wasting have improved meaningfully — the survey flags this alongside rising adult obesity as a “dual burden of malnutrition.”*

2.3 THE CAESAREAN (C-SECTION) SURGE

C-section deliveries have risen sharply and now far exceed the WHO's medically optimal range, with wide gaps between public and private facilities, and between urban and rural areas.

Category	C-Section Rate
National – NFHS-5 (2019–21)	21.5%
National – NFHS-6 (2023–24)	27.2%
Urban Areas	~40.5%
Rural Areas	~22.8%
Public Health Facilities	16.9%
Private Health Facilities (2023–24)	54.1%
Private Health Facilities (2019–21, for comparison)	47.4%
Telangana (Highest among States)	62.2%
Andhra Pradesh	52.2%
Tamil Nadu	46.9%
WHO Medically Optimal Threshold	10%–15%

EXAM ALERT

Urban C-section rates (~40%) are roughly **3 times** the WHO's upper optimal threshold of 15% — a recurring data point in Prelims-style statements.

Experts note a **two-way relationship**: maternal obesity/diabetes raises C-section risk, while babies born via C-section face a higher long-term risk of obesity and metabolic disease themselves.

2.4 RISING LIFESTYLE DISEASES: OBESITY & DIABETES

NFHS-6 flags non-communicable diseases (NCDs) and lifestyle-related risk as a growing public-health challenge, with obesity and high blood sugar climbing sharply among adults aged 15–49 (obesity) and 15+ (blood sugar) years — especially in southern States such as Andhra Pradesh, Kerala and Tamil Nadu, which have emerged as a hotspot for both conditions.



Indicator	NFHS-5 (2019–21)	NFHS-6 (2023–24)	Urban (NFHS-6)	Rural (NFHS-6)
Women overweight/obese (15–49 years)	24.0%	30.7%	42.8%	25.5%
Men overweight/obese (15–49 years)	22.9%	27.3%	36.3%	23.0%
Women with high/very high blood sugar or on medication	13.5%	17.8%	—	—
Men with high/very high blood sugar or on medication	15.6%	20.9%	23.9%	19.7%

Over five years (2019–24), overweight/obesity prevalence rose by **6.7 percentage points among women** and **4.4 percentage points among men** — a faster increase than the rise in any single maternal or child health indicator in the survey.

DO YOU KNOW?

World Obesity Atlas 2026 (released by the World Obesity Federation on World Obesity Day, 4 March 2026) ranks India **2nd globally** for the number of overweight/obese children, behind China and ahead of the US and other Western nations.

WHO definition: obesity is abnormal or excessive fat accumulation posing a health risk. For children/adolescents (5–19 yrs), a child is classed as obese if BMI is two standard deviations above the mean for their age; $BMI = \text{weight (kg)} \div \text{height}^2 \text{ (m)}$.

Lancet Commission (January 2025) proposed splitting obesity into ‘*clinical obesity*’ and ‘*pre-clinical obesity*’, using added parameters beyond BMI — waist circumference, muscle mass and organ function.

Mechanism (WHO): excess body fat, particularly around the abdomen, induces insulin resistance — cells become less responsive to insulin, making blood-sugar regulation harder and raising long-term Type 2 diabetes risk.

QUICK REVISION

SRS 2024 — Birth rate 18.3; IMR 24 (rural 27 / urban 17); TFR 1.9 (5th year flat); 60+ population ~10%.

Best IMR/TFR State: Kerala (IMR 8) / Delhi (TFR 1.2). Worst: Chhattisgarh (IMR 36) / Bihar (TFR 2.9).

NFHS-6 fieldwork: 2023–24; nodal agency IIPS Mumbai; 6.79 lakh households; 715 districts; all States/UTs except Manipur.

NFHS-6 TFR: 2.0 (note the SRS–NFHS mismatch with 1.9).

Institutional deliveries 90.6%; full immunisation 87.1%; stunting 29.3%; underweight ~stagnant at 31.8%.

C-section: national 27.2% vs WHO optimal 10–15%; private 54.1% vs public 16.9%; Telangana highest at 62.2%.

Obesity: women 30.7% / men 27.3% (NFHS-6); southern States (AP, Kerala, TN) are obesity-diabetes hotspots.

World Obesity Atlas 2026: India ranks 2nd globally in child obesity, after China.



HEALTHCARE FINANCING & ACCESS IN INDIA

National Health Accounts (NHA) 2022–23 + NSS 80th Round

Two official data sources speak to how India pays for and accesses healthcare. The **National Health Accounts (NHA) 2022–23** estimates who finances health spending and where it goes (the supply/financing side). The **NSS 80th Round (2022–23) survey on health consumption** captures how households actually use health services — hospitalisation, insurance uptake, costs and morbidity (the utilisation side). This note merges overlapping figures and keeps the two sources clearly distinguished.

EXAM ALERT

Know your denominators — a recurring trap: **THE** (Total Health Expenditure) includes capital expenditure; **CHE** (Current Health Expenditure) excludes it and reflects only final consumption of health goods/services; **GHE** is government's own spend; **OOPE** is the part households pay directly. The same OOPE amount can be quoted as a different percentage depending on whether it is measured against THE or CHE — always check the base.

NATIONAL HEALTH ACCOUNTS (NHA) 2022–23

NHA 2022–23 is the **10th report** in the series, prepared by the National Health Accounts Technical Secretariat (NHATS) at the National Health Systems Resource Centre (NHSRC), Ministry of Health and Family Welfare, using the internationally standard **System of Health Accounts (SHA), 2011 framework**. CHE for the year stood at **₹7,66,814 crore**, while Government Health Expenditure (GHE, inclusive of capital expenditure) was **₹3,85,332 crore** — less than half of Total Health Expenditure (THE).

1.1 GOVERNMENT HEALTH SPENDING — THE DECADAL TREND (2013–14 → 2022–23)

Indicator	2013–14	2022–23
Government Health Expenditure (GHE) as % of GDP	1.15%	1.43% (1.48% on new GDP series)
GHE as % of General Government Expenditure	3.78%	4.89%
Per Capita GHE	₹1,042	₹2,786 (~2.7× increase)
Social Security Expenditure (% of Total Health Expenditure)	6.0%	9.9%
Private Health Insurance (% of Total Health Expenditure)	3.4%	9.2%

EXAM ALERT

WHO global recommendation: at least 5% of GDP on public health for meaningful progress toward Universal Health Coverage (UHC).

National Health Policy target: combined Centre + State health spend of 2.5% of GDP.

India's 2022–23 figure (1.43–1.48% of GDP) remains well short of both benchmarks, despite steady year-on-year improvement since 2013–14.



OUT-OF-POCKET EXPENDITURE (OOPE) — FALLING, BUT STILL HIGH

Metric	2013–14	2021–22 (COVID Year)	2022–23
Out-of-Pocket Expenditure (OOPE) as % of Total Health Expenditure (THE)	64.2%	39.4%	43.4%
Government Health Expenditure (GHE) as % of Current Health Expenditure (CHE)	—	41.1%	35.6%
Out-of-Pocket Expenditure (OOPE) as % of Current Health Expenditure (CHE)	—	—	~49.9% (“nearly half”)

The government's own framing emphasises that OOPE/THE has fallen by **21 percentage points** since 2013–14 — attributed partly to the **1.8 lakh+ Ayushman Arogya Mandir** wellness centres (upgraded Sub-Centres/PHCs) offering 12 expanded service packages — reproductive and child health, communicable/non-communicable disease care, free drugs and diagnostics, teleconsultation, and preventive wellness sessions — free at the point of use. The Health Ministry notes that purchase of pharmaceuticals and health supplements is now the main driver of residual OOPE.

Health-economy researchers (e.g., Jan Swasthya Abhiyan) read the same data more cautiously: the **GHE/CHE share fell from 41.1% (2021–22) to 35.6% (2022–23)** — i.e., the modest pandemic-era bump in public financing was not sustained, and the latest level is close to the pre-COVID figure of 35.3% recorded in 2019–20.

1.3 WHERE THE HEALTH RUPEE COMES FROM AND GOES (CHE BREAK-UP, 2022–23)

Category	Component	Share of Current Health Expenditure (CHE)
Who Pays	Households (including OOPE)	56.44%
Who Pays	— of which, Out-of-Pocket Expenditure (OOPE)	49.90%
Where It Goes	Private Hospitals (largest single provider share)	30.83%
Where It Goes	Government Hospitals	16.73%
Where It Goes	Preventive Care (all providers)	8.88%



1.4 INSURANCE AND THE CENTRE–STATE SPLIT

Indicator	Value (2022–23)
Government-financed Health Insurance (including PMJAY) — Total Expenditure	₹26,266 crore (~3% of Total Health Expenditure)
Private Health Insurance Expenditure	9.2% of Total Health Expenditure (~3× government-scheme expenditure)
Centre's Share of Government Health Expenditure (GHE)	~36%
States' Share of Government Health Expenditure (GHE)	~63%+

Private health insurance spending — mostly paid for directly by households — is now roughly three times government-financed scheme spending, suggesting *PMJAY and similar schemes still offer only partial financial protection* against catastrophic health costs. States continue to carry the larger share of the public health-financing burden over the Centre, underlining health's place as a predominantly State-administered subject with Central support.

2. NSS 80TH ROUND — HOW INDIA ACCESSES HEALTHCARE

The NSS 80th round survey on health consumption (field-collected via questionnaire, with the usual caveats of recall bias) provides the utilisation-side counterpart to the NHA's financing data.

2.1 MATERNAL & CHILD HEALTH SERVICE USE

Indicator	Figure
Women receiving antenatal care (ANC)	~98%
Women receiving postnatal care (PNC)	~92%
Institutional childbirths	>95%
Unskilled birth attendance	Very low nationally; Nagaland an outlier (Rural: 13.5%, Urban: 11.5%)
Deliveries in private institutions — Urban	~51%
Deliveries in private institutions — Rural	~29%
Average cost of institutional delivery (All-India)	₹37,630



2.2 HOSPITAL UTILISATION & INSURANCE COVERAGE — TREND VS PREVIOUS ROUND

Indicator	2017–18 Round	2022–23 (80th Round)
Government Hospital Utilisation — Urban	33%	35%
Government Hospital Utilisation — Rural	26%	25%
Insurance Coverage — Rural Population	14%	47.4%
Insurance Coverage — Urban Population	19%	44.3%

Government hospital utilisation has barely moved in five years even as insurance coverage roughly **tripled**. This gap is telling: average out-of-pocket cost for private hospitalisation remains high at **₹50,508** nationally, and about **65% of in-hospital care** is still privately accessed — even the poorest income quintile pays close to **₹25,000** for private treatment, a significant driver of medical indebtedness. Charitable hospitals account for under 1% of care, and informal (unqualified) practitioners are accessed by only 3.6% of rural and 1.4% of urban patients — most care is delivered by qualified practitioners.

EXAM ALERT

The Tamil Nadu paradox: TN combines some of the lowest out-of-pocket spending in government hospitals with some of the highest private-hospital costs nationally — illustrating that a strong public system and an expensive private sector can coexist within the same State.

2.3 MORBIDITY PATTERNS

Morbidity was recorded for 62 ailments across 16 broad categories. **Kerala** shows high morbidity across all age groups, while **West Bengal and Andhra Pradesh** show high morbidity concentrated among those above 60 — a puzzling pattern given Kerala's otherwise strong public-health outcomes, possibly reflecting differences in health-seeking awareness, self-reporting, or data-collection effects rather than true disease burden. Infections remain common across all ages; lifestyle diseases such as diabetes mellitus and hypertension begin appearing around **age 40** and rise steadily thereafter. Injuries — a largely preventable cause — rank as the **second- or third-highest cause of morbidity from age 15 onward**, a public-health concern.

DO YOU KNOW?

Data-quality flags: the released NSS tables show some anomalies needing clarification — an obstetrics entry recorded under the 'male' category, an unusually high gastrointestinal-care entry (₹7.84 lakh) for West Bengal in Table A10, and charitable-hospital costs in Tamil Nadu (₹1.68 lakh) and West Bengal (₹1.51 lakh) that exceed private-hospital costs in the same States (₹72,979 and ₹55,389 respectively) — counter-intuitive, since charitable care is normally cheaper than private care.

More data was collected than published: the survey questionnaire (Appendix E) gathered richer information on patient perceptions and practitioner type than has been released; wider availability of the raw microdata would aid deeper research.



QUICK REVISION

QUICK REVISION

NHA 2022-23: 10th report; NHATS/NHSRC, MoHFW; SHA 2011 framework. CHE ₹7,66,814 cr; GHE ₹3,85,332 cr.

GHE: 1.15% → 1.43% of GDP (2013-14 → 2022-23); per capita ₹1,042 → ₹2,786. Still below WHO's 5% and NHP's 2.5% targets.

OOPE/THE: 64.2% → 43.4%. OOPE/CHE: ~49.9% ("nearly half"). GHE/CHE slipped from 41.1% (2021-22) to 35.6% (2022-23) — post-COVID reversal.

CHE break-up: households 56.44% (OOPE 49.90%); private hospitals 30.83%; govt hospitals 16.73%; preventive care 8.88%.

Govt insurance (PMJAY etc.): ~3% of THE (₹26,266 cr). Private insurance: 9.2% of THE — 3× govt schemes.

Centre : States share of GHE ≈ 36% : 63%+ — States carry the larger public-financing burden.

NSS 80th Round: ANC 98%, institutional births >95%, but govt hospital utilisation flat (~25-35%) despite insurance coverage tripling (14-19% → 44-47%).

Private hospitalisation OOPE: ₹50,508 avg; ~65% of in-hospital care still private. Tamil Nadu paradox: cheap govt care + expensive private care.

THE BATTLE AGAINST AI MISINFORMATION

India is working towards Viksit Bharat 2047 with the objective of achieving economic growth, and in order to emerge as a technology leader. One of the major areas that India is concentrating on is the Artificial Intelligence (AI) front. However, a question that needs a definite answer is: what will India's policy be with reference to rapidly developing AI tools? While India's aspiration to attain the status of a global AI hub is commendable, Indian policies regarding AI tools should not only be looked at through the lens of development and economic growth, but also through the lens of growing misinformation and identity manipulation that could be spread through AI platforms.

A new era

ChatGPT recently launched its latest AI multimodal image generation model which has been successful in generating text-heavy images that could rival the work of a professional. Modern generative AI systems are now capable of producing highly sophisticated, text-heavy images akin to a professional newspaper or a scientific research paper. In most cases, these outputs are almost indistinguishable from authentic images taken with the help of a camera, or scanned originals. This model can pull up data from the web portal and provide details of the image with near accurate information.

Thus, through this launch, AI image generation has entered a new era. It is no longer a simple recreational model for a user to dabble with and post on social media platforms to follow a trend; rather, it poses serious concerns in the domain of cyber-crime, theft and digital deceit.

Social networking platforms such as Facebook, Instagram and even LinkedIn are flooded with AI-generated content often leaving users wondering about the veracity of the information they



consume. The current version of ChatGPT and similar platforms allow such content to be released disproportionately on social media platforms. Since such platforms are primarily accessed by users through their mobile phones, which have limited screen sizes, the ability to verify such content becomes difficult and users may readily accept AI-generated images posted on these platforms as real.

For instance, a post on LinkedIn about publishing a new research paper, along with the image of the first page of the paper which might contain all necessary details such as the name of the journal and author credentials, might just be fake and non-existent. However, this can be verified by other users only if they check the database; most users are unlikely to fact-check such information.

Educational institutions and genuine academic publishers who strive to maintain originality face challenges as AI systems can fabricate mark sheets, degree certificates and research papers. The persuasive effect of AI-generated content significantly amplifies the possibility of misinformation and manipulation, to the extent where genuine photographs, videos and documents themselves may be dismissed as fabricated thus bearing a large impact on academics, journalism, and institutional credibility.

Various implications

Cybercrimes related to identity thefts have also multiplied in the recent past.

Additionally, celebrities have filed petitions before various High Courts of India seeking protection of their personality rights, and protection against the unauthorised usage of their likeness in image, voice and name using AI. Although various individuals have filed such cases, India has yet to formulate a sound legislative response to this emerging challenge. The implications of AI-generated content also pose risks in terms of evidence or pleadings that are submitted before courts using AI platforms. The Supreme Court and other High Courts, such as the Bombay High Court, have disparaged such usage and have also imposed costs on lawyers who adopt AI-generated arguments without verifying the submissions and cases cited therein.

Need for regulation

India therefore stands at a critical crossroads at present. While the country seeks to establish itself as a global AI leader, it must develop a robust legal framework that would effectively address the issues of misinformation, identity misuse and manipulation. The challenge at hand is to craft a balanced regulatory framework — one that encourages innovations and technological advancements while simultaneously ensuring accountability from platforms and safeguarding the authenticity of the digital ecosystem.

India's recently amended Information Technology Rules, 2026 mandate the disclosure of AI-generated/altered content throughout the video. They have also attempted to revamp the age-old intermediary liability framework with the stipulated timeline of three hours to remove synthetically generated content upon receiving a court order or government notification. They also mandate that personal complaints filed by users must be solved within 36 hours of its filing. This is a step in the right direction.

Further, there is a need to develop a code of ethics for AI platforms to prevent them from generating images/videos that would undermine trust in digital news. Beyond the quintessential legal and regulatory frameworks, there is a need for developing digital and AI literacy amongst



the public at large. Unless users themselves develop the capacity to critically evaluate a particular digital content and verify the same before dissemination, these issues will continue to linger.

QUANTUM-SAFE THINKING

The new DST Task Force report on making India's digital ecosystems quantum-safe is a product of contemplating a threat that is both long-term and urgent. Today, public-key cryptography underpins online identity protection and secure communications. Its protective ability rests on mathematical problems that conventional computers cannot solve efficiently; thus, the information is 'hidden' behind a lock whose key is the solution to such a problem. However, a sufficiently capable quantum computer could use, say, Shor's algorithm to open this lock in minutes or hours. Symmetric cryptography, such as AES encryption, is less threatened by the advent of quantum computers but the existential exposure is nonetheless concentrated in public-key infrastructure, which secures everything from HTTPS to telecommunication networks. The shorter-term problem is the possibility of a bad actor harvesting encrypted data today and decrypting them later using quantum computers. Post-quantum cryptography (PQC) is software that can run on conventional computers but with the added benefit of resisting attacks from quantum computers. The DST report recommends three post-quantum standards finalised in 2024 to plan India's efforts on the post-quantum effort and that it begin migrating to this architecture. This prudent advice must be followed, especially vis-à-vis critical infrastructure, financial services, power grids, and defence.

The migration must continue even if "Q-day" — when quantum computers practically endanger public-key cryptography — is pushed back from the report's expected 2029. Indeed, experts disagree on this point, although the mainstream view is that both "Q-day" and migration will take at least a decade. Cryptography is in practice a set of dependencies often spread across — within, say, a ministry — databases, legacy hardware, vendor software, authentication protocols, and control systems. Thus, the challenges of the sprawling organisational transition must not be underestimated. Moreover, since advanced AI can autonomously compromise the software layer today and quantum computers threaten the mathematics of encryption tomorrow, the threat surface is much larger than what "Q-day" alone portends. The report recommends the wider adoption of PQC and, in environments requiring higher security assurances, the more technically demanding quantum key distribution (QKD) as well. For India, that means a new budgetary allocation of at least ₹5,000 crore; upgrading legacy infrastructure for interoperability; rationalising vendor dependence; and fostering and retaining the human capital, as QKD engineers are rare today. India must also periodically reassess its needs considering the acute trade-off QKD poses between security and operational efficiency.

HOW SAFE IS INDIA'S CRITICAL NATIONAL INFRASTRUCTURE?

Our everyday life depends on critical services that we often take for granted: water, electricity, cooking gas, petrol and diesel, groceries, banking, communications, transport, internet, healthcare, governance, law and order, courts and defence. Behind each of these lies a vast network of infrastructure: power plants, refineries, distribution systems, fuel transportation networks, railway stations, airports, hospitals, public utility systems and industrial installations. Any disruption can affect public safety, economic stability and national security.

Over the last few decades, these services have been scaled up through digital transformation. The internet, automation, the Internet of Things (IoT), and artificial intelligence (AI) have improved



monitoring, prediction, control and service delivery. However, the same connectivity that improves efficiency also expands the risk horizon. Systems that were earlier isolated or locally controlled are now linked to digital networks, creating opportunities for remote disruption.

Complexities of the digital landscape

We are familiar with cyber risks in the digital world: server breaches, data theft, denial-of-service attacks, ransomware and online fraud. Governments have responded with cyber-security laws, certifications, protective systems and agencies such as CERT-In (Indian Computer Emergency Response Team). These measures have improved security, but they do not make critical infrastructure completely safe.

The larger emerging concern is that the internet is no longer only a network of people, computers and servers. It has expanded to accommodate billions of connected devices. Cameras, GPS devices, temperature and pressure sensors, wind monitors, water-level sensors and industrial controllers are constantly collecting data and communicating with central systems. In refineries, power plants, chemical plants, manufacturing units and transport networks, such devices enable high levels of automation.

Earlier, many of these systems were local process control systems managed through SCADA (Supervisory Control and Data Acquisition system). Today, they are increasingly connected to the internet for centralised monitoring, optimisation and predictive maintenance.

This creates the important triad of IT, OT and IoT. IT operates in the digital space, processing data and enabling computing. OT, or operational technology, operates in the physical world of plants, machinery, transport, industrial automation and critical assets. IoT connects the two by sensing physical conditions, sending real-time data to digital systems and, in many cases, executing commands through controllers and actuators. This connection is powerful, but it can also become the weak link. If the IoT layer is compromised, the data collected from the physical world can be manipulated, or control over physical processes can be misused.

Critical infrastructure security

Therefore, critical infrastructure security must go beyond conventional cyber security. Physical installations may have heavy security and restricted access, but the devices connecting them to digital systems may still expose them to invisible risks. The real question is whether these devices can be trusted. They must not contain hidden vulnerabilities, unauthorised data-sharing mechanisms, malicious control pathways or embedded Trojans that can be exploited later.

This issue becomes serious when imported devices are deployed in sensitive installations without rigorous scrutiny. India speaks strongly about Atmanirbhar Bharat and Made in India, but this intent has not always translated into procurement practices at lower levels of government departments and public sector undertakings (PSUs). Tender conditions often do not insist on trusted Indian-made products or deep security evaluation. Eligibility is frequently assessed through template-based compliance checks rather than careful examination of design origin, manufacturing authenticity and operational vulnerability. Existing IT guidelines and IoT policies are also not enforced with the seriousness required for national-level infrastructure.

Fuel transportation is a practical example. Earlier, tankers carrying fuel from oil terminals to retail outlets were protected with ordinary seals, locks and keys, leaving room for pilferage. Over time, the system moved to IoT-based keyless and OTP-based e-locking, supported by GPS tracking and



digital monitoring. These solutions improve accountability and security, but they also become critical control points in the fuel supply chain. If vehicle tracking systems or e-locks are imported or unverified or dubiously certified, the oil supply chain can become vulnerable to remote disruption. There are increasing instances of electronic locks with GPS and communication capabilities that are manufactured in China getting certifications in India as an Indian product.

Need for strengthening certification

The recent certification of cameras, by STQC tests devices ensures that they do not perform unintended control or data-sharing functions. However, the certification process is onerous and lengthy. More importantly, similar mechanisms are not yet available or strongly enforced for many other IoT devices used in critical infrastructure.

High level of awareness is needed for economic security. Future attacks may target the industrial base, supply chains, utilities and automated infrastructure that support national growth. A recent attack on systems that monitor U.S. gas stations' fuel storage, reported by CNN is a case in point.

As India moves toward becoming a major global economy and digitally empowered nation, the safety of critical infrastructure cannot be treated merely as a technical issue. It is a matter of sovereignty, resilience and economic security. India must embrace IoT, AI and automation, but it must do so with trust, transparency and strong safeguards. The need of the hour is stricter policy enforcement, rigorous certification, preference for trusted indigenous technologies and continuous vigilance across government and industry. The question is not whether we should adopt connected technologies, but whether we are deploying them securely enough to protect the nation's future.

PARTIAL DIGITISATION

Digitising citizen services is a process full of promise and empowerment. In India, making processes faceless carries the added benefit of relief from the rent seeking that is rife in government offices. The more services are available online, the better. It is possible; in December 2024, Estonia digitised the last citizen service that only remained possible on paper: divorce. In this light, participation of private firms such as WhatsApp in getting digital services delivered to more people, as in Gujarat, is welcome. This being said, the digital service delivery in India has several issues: a lack of trust towards the citizen, in spite of the citizen-centricity touted as the reason for their existence; systematic underinvestment leading to lapses in availability and reliability; and lax cybersecurity. In many cases involving the most dysfunctional online services, the responsibility lies with States, such as property records registration and civil acts such as marriage. But even in those where the remit lies with the Union government, there are serious issues.

While lip service is paid to the importance of securing key cybersecurity infrastructure, serious vulnerabilities remain. Security of data residing on public databases is taken for granted, and institutions such as the Indian Computer Emergency Response Team (CERT-in) have failed to rise to the challenge. Also, on myriad forms online, users are forced to type and submit the same details repeatedly, even though systems such as Digi Locker exist that are purported to ease this process. A shadow of a "mismatch" can anyway result, and few if any processes allow citizens to cure defects without redoing the entire process — a shocking lapse punishing routine variations in names and spellings. Scant regard is paid to the accessibility and intuitive design, leaving persons with disabilities and vast swathes of the population dependent on outside assistance to go through



a self-service process. Some systems are left defunct or sputtering years after their launch: take e-Sanad, launched a decade ago to help people legalise personal documents while travelling abroad or emigrating. Few States have been on-boarded, leaving other residents to deal with middlemen and touts in the pre-verification process that precedes the so-called Apostille stamp they need on a time-bound schedule. As with this process, the analogue equivalents of broken digital services remain inaccessible and cumbersome, such as updating details on Aadhaar, which requires visiting a physical office. The creation of Digital Public Infrastructure such as UPI and Aadhaar are of little use without reciprocal trust by the government and a commitment to uptime and service quality.

HOW WHATSAPP AND A CLOT-BUSTER EASED RURAL ACCESS TO HEART CARE

At 4:40 am on May 4, a 40-year-old man came to Khanna sub-divisional hospital's emergency department with sweating and chest pain. Within minutes, the staff nurse and emergency medical officer had checked his heart rate, blood pressure, blood sugar, and more importantly had conducted an echocardiogram (ECG).

The ECG result was WhatsApped to the hospital's medicine consultant, who diagnosed it as an ST-elevated myocardial infarction (STEMI) and asked the EMO to administer the drug tenecteplase. STEMI is a severe, life-threatening heart attack with significant coronary artery blockage. The injected drug tenecteplase is used for thrombolysis, or to dissolve the clot.

The patient received the injection within half an hour of his ECG results and soon felt better. Out of danger, he was referred to the Government Medical College in Patiala for further treatment.

This case was the 100th thrombolysis case at the hospital, the highest recorded by any centre in Punjab. A few years ago, any chest pain patient in secondary health centres like sub-divisional and district hospitals would have been immediately referred to medical colleges for further treatment. The 40-70 minutes that the patient would lose in transport and further diagnosis would mean irreversible damage to the heart muscles and their ability to work in future.

Since July 2025, the Punjab government has implemented Mission AMRIT (short for 'Acute Myocardial Reperfusion in Time'), where sub-divisional hospital and district hospital staff — the spokes — are equipped with drugs, equipment, and training to conduct thrombolysis under the guidance of a cardiologist or a specialist in the medical colleges, which are the hubs. When a person with STEMI reaches the spoke within up to 12 hours of a heart attack and no complications, they are thrombolysed and referred to a hub for further angiography and angioplasty.

Around 34,000 people with chest pain have been registered in the project's spokes in Ludhiana. Of them, 1,900 were diagnosed with STEMI and 900 received thrombolysis. The initiative has expanded the work of the Indian Council of Medical Research (ICMR) STEMI ACT project from 2020 to 2024.

According to Hitinder Kaur, director of Health Services of the Department of Health and Family Welfare, Punjab, STEMI patients receive Rs 35,000's worth of treatment free of cost within minutes.

The work continued during the 2025 floods and in challenging districts close to the border with Pakistan.



Getting appropriate care at the spokes has also greatly improved patient outcomes in medical colleges.

Amritsar's Government Medical Centre is a hub for six districts around it. In the last 10 months, it has received 272 patients who were thrombolysed at the spokes, of which 265 underwent angioplasty at the centre, Parminder Singh Manghera, assistant professor of cardiology here, said.

The project's success is due to the efforts of health officials like Ashu Gupta, of the Non-Communicable Diseases Cell of the Department of Health and Family Welfare, and Bishav Mohan, who led the ICMR project at Ludhiana.

Many of the emergency departments deal with infrastructure gaps, staff transfer and shortage, and high patient numbers, so keeping the overwhelmed medical teams motivated requires treating nurses as equal partners, using local languages in training and materials, awarding 'best performers' from the districts every month, and organising award ceremonies with the health minister, Dr Mohan said.

After the successful Tamil Nadu STEMI pilot showed a hub and spoke model could reduce mortality, it was implemented in Goa, Karnataka, Andhra Pradesh, and elsewhere. But including only the government hospitals as hubs reduces the model's efficacy, Thomas Alexander, who along with Ajit Mullasari piloted the TN-STEMI model, said. "Patients covered under government insurance schemes should have access to the nearest reperfusion centre — public or private — with safeguards to prevent overuse and overcharging," Dr. Alexander added.

In Punjab, a year after Mission AMRIT was implemented, some other limitations of the model have also become obvious--it relies on individual interest and effort at the spoke level and at present, there is no follow-up as to what happens to patients after they leave the spokes.

That said, thanks to the project, people are more aware and are turning up early: "We are seeing more women from villages above the age of 50 with symptoms turning up in spoke centres because it is close to home and accessible, we would have missed this demographic before," according to Dr Mohan.

DEATHS CAUSED BY LIGHTNING HAVE BEEN CONSISTENTLY RISING

Lightning has emerged as the most lethal natural hazard in India, with the number of fatalities rising consistently over the years. A review of reports published by the National Crime Records Bureau (NCRB) showed that the country reported a total of 1,02,263 deaths due to lightning in the 50-year-period between 1975 and 2024. Over half of these deaths happened between 2005 and 2024.

The decennial averages of deaths caused by lightning in the last three decades jumped from 1,683 (1995-2004) to 2,476 (2005-2014) and 2,809 (2015-2024). This is despite India's broader progress in reducing deaths from natural causes, thanks to better forecasting, modelling and disaster preparedness. From 2016, lightning accounted for at least 50% of all deaths due to natural causes while cyclones and floods accounted for fewer. There were 3,315 deaths caused by lightning in 2016, which was the highest ever since 1974, as per the NCRB. In terms of proportion, lightning accounted for the highest share of all deaths due to natural causes in 2021. There were 2,880 deaths due to lightning, which was 70.4% of the 4,091 deaths due to natural causes.



The number of deaths reported due to lightning has never fallen below the 2,000 mark since 2005. The figure crossed the 2,800 mark in six of the eight years between 2017 and 2024. While there were 2,825 deaths in 2024, the latest year for which the data is available, early indications are that the number could go up in 2026. The unseasonal thunderstorm and lightning on May 13, 2026, in eastern and western Uttar Pradesh resulted in at least 111 deaths, many of which were caused by lightning.

State-wise trends show that the majority of deaths caused by lightning happened in non-peninsular States. For instance, of the 3,315 deaths reported in 2016, nearly 60% happened in just four States — Madhya Pradesh (639), Jharkhand (542), Uttar Pradesh (384), and Odisha (376). The pattern was similar in 2024 as well. The five States of Madhya Pradesh (577), Bihar (360), Uttar Pradesh (275), Odisha (249) and Chhattisgarh (241) accounted for 60% of the 2,825 deaths reported that year.

A study by the Indian Institute of Tropical Meteorology (IITM), using the dataset from the Tropical Rainfall Measurement Mission's Lightning Imaging Sensor, showed a clear increasing trend in lightning activity in India over the last two decades. The findings of the study indicated that seasonal variations showed more lightning activity over northwest India during the monsoon season, and northeast India during the pre-monsoon season. "The increase in lightning activity is due to the rise in Convective Available Potential Energy (CAPE), low-level moisture content and temperature. The increase in temperature and moisture is attributed to changes in India's land use and land cover (LULC)," the study said. Kumar Margasahayam, an early warning systems expert, said, "This is a direct result of a warming planet where warmer air and sudden cooling is leading to more convective thunderstorms. This has led to more and frequent thunderstorms and more lightning phenomena."

The India Meteorological Department currently provides thunderstorm forecasts, while the IITM provides real-time alerts on lightning through its mobile application Damini. The app also shares precautionary guidelines during thunderstorms in 23 regional languages, making safety information more accessible. The increasing fatalities emphasise the need for creating more awareness among the public on precautions to be taken during lightning attacks.

WHY IS CBSE'S EVALUATION SYSTEM FACING FLAK?

The story so far:

Following the release of the Class 12 Board exam results, the Central Board of Secondary Education (CBSE) has been under fire for discrepancies in the evaluation of answer scripts and malfunctioning of the re-evaluation process. The newly introduced On-Screen Marking (OSM) system is under scrutiny, given the widespread sense among students that the marks they received did not match their expectations. The CBSE's pass percentage has dipped to 85.29% this year from 88.39% last year, with the number of students scoring above 90% also dropping.

Due to the sheer volume of requests for answer book copies, the post-results verification portal crashed. As for students who did manage to obtain scanned copies of their answer books, they got a shock when they discovered blurred or missing pages, and unmarked answers. Many even received answer books of other students. The Parliamentary Standing Committee on Education, Women, Children, Youth, and Sports has summoned senior officials from the Union Education Ministry and CBSE Chairman Rahul Singh for a meeting on June 2 to review the use of OSM and the problems faced by the students.



What is On-Screen Marking?

It is a form of digital evaluation of exam answer sheets. Hand-written answer books are digitally scanned, anonymised, and uploaded online. Instead of checking paper copies with a pen, teachers log into a dedicated platform to access the scanned answer books and correct papers on a computer screen, under video surveillance.

What is the history of OSM in India?

The CBSE tried out OSM on a smaller scale in 2013-14. Due to inadequate digital infrastructure and limited digital literacy, the experiment was not a big success. Then it proposed testing the OSM in 2024-25 on “small-volume subjects” where there would be fewer candidates. The idea was to sort out glitches before scaling up. In June 2025, members of the CBSE’s governing body suggested that OSM “may be implemented in all subjects only after completion of pilot projects in some subjects across various regional offices of the board.” But the CBSE ignored the advice of its own governing body. Without adequate pilot testing, it went in for full-scale adoption of OSM across all subjects in 2026.

Were teachers able to familiarise themselves with OSM before it was rolled out?

The first Class 12 Board exam was on February 17, but teachers were informed of OSM implementation barely 10 days earlier. This was a time when teachers were busy with exams in schools, and many had duties as Booth Level Officers as well. Many did not get enough time to familiarise themselves with the user interface of the portal, and learn how to scroll, how to mark, and how to go back and recheck if they had missed something. As a result, many did not have enough practice by the time they came to the evaluation centres for the OSM.

What was the CBSE’s rationale for switching from physical marking to OSM?

In a circular dated February 9, the CBSE listed several benefits of moving to OSM. These included elimination of totalling errors, reduced manual intervention, faster evaluation, elimination of the need for post-result verification of marks, and reduced manpower requirements for verification. But these benefits did not materialise. Class 12 exams were given by 17 lakh students. This meant that 98 lakh answer books, or 40 crore pages, had to be manually scanned in record time. These also had to be checked for legibility before being made available for evaluation. The benefit of reduced manual intervention did not appear to have materialised. Nor is there evidence that OSM reduced totalling errors or accelerated evaluation. Contrary to CBSE’s claims, requests for “post-result verification” have shot up compared to previous years.

Has OSM been used successfully elsewhere? If yes, why did CBSE struggle?

Yes, it has been used successfully by exam boards such as Cambridge (U.K.) and International Baccalaureate (IB) and in countries such as Singapore and Australia. But these have far fewer exam centres and students, and more centralised scanning infrastructure, than CBSE. OSM has been known to work well in an ecosystem of well-resourced, digitally ready private schools, such as those under Cambridge and IB. In contrast, CBSE’s 33,000 affiliated schools include government, rural, and semi-urban schools with uneven digital infrastructure and teacher training.

**What is the controversy with the firm contracted to deliver OSM for CBSE?**

Opposition leader Rahul Gandhi has alleged corruption in CBSE's selection of COEMPT Eduteck as the OSM vendor and demanded a judicial inquiry. In a video statement, he said, "The company that did the OSM for your exams was actually called Globarena. And Globarena has carried out this scam twice in Telengana... [in 2019 and 2023]." He claimed that though this company's track record was known, for "some hidden" reason, the CBSE chose it for the assignment. The CBSE has claimed that COEMPT was chosen "in accordance with the procurement policy" of the government.

What was Sarthak Sidhant's viral blog on CBSE about?

A Class 12 student, Sarthak Sidhant, published an investigative blog post which appeared to show that COEMPT Eduteck was the beneficiary of a rigged tendering process. After poring over CBSE's tenders and multiple Request for Proposals, he claimed to have found that the "CBSE did not just pick a bad software vendor by accident. They lowered financial baselines. They dropped software security certifications. They cut the corrupt practices cooling-off period in half. They removed the physical server isolation requirement. They erased the word 'blacklisting' from their penalty matrix via a last-minute corrigendum, before bidding, and they bypassed their own mandatory CERT-In production audits. They gambled with our data security, our marks, and our mental health."

What were the problems with the re-evaluation portal?

CBSE's portal for obtaining copies of answer sheets went live on May 19. As more than 4 lakh students requested scanned copies of answer sheets, the portal crashed, forcing CBSE to put the site under maintenance.

How did the CBSE respond?

Amid the ballooning crisis, the CBSE extended the deadline for requesting scanned copies, and also kept revising the fees for these services, leading to confusion among parents and students. Following a public uproar, it began responding individually on social media to affected students. It roped in experts from the Indian Institutes of Technology, Madras and Kanpur to resolve the technical challenges, and has announced that the designated portal for verification and re-evaluation will now go live from June 1 to "ensure a transparent and glitch-free process." Meanwhile, it has also launched a public relations campaign by circulating a social media messaging kit to school principals, directing them to post reels defending OSM and CBSE. These included a statement describing CBSE as "highly proactive, empathetic, and communicative regarding these teething issues."

DRDO'S NEW MISSILE OFFERS PRECISION STRIKES, ANTI-DRONE COMBAT

Earlier this week, the Defence Research and Development Organisation (DRDO) successfully carried out final development trials of the UAV-Launched Precision Guided Missile (ULPGM)-V3, paving the way for its critical user trials by the armed forces.

Key Takeaways:

- The DRDO on Tuesday (May 19) completed the final deliverable configuration development trials of the ULPGM-V3 in both air-to-ground and air-to-air modes at DRDO's National Open Area



Range test range in Kurnool, Andhra Pradesh. The trials were carried out using an integrated ground control system (GCS) to command and control the ULPGM weapon system.

- The GCS features state-of-the-art technologies to automate readiness and launch operations. While the final development trials will be followed by user trials by the armed forces, the term “deliverable configuration” suggests that not much will change in the subsequent trials.
- A DRDO scientist said that compared with the earlier ULPGM-V1 and V2 variants, the ULPGM-V3 represents a significant advancement in India’s indigenous drone-launched missile capability.
- The V1 was a basic free-fall precision missile and the V2 introduced propulsion, longer range, and mid-course target updates. The V3 adds the ability to engage both ground and aerial targets, including drones and helicopters. It also features more advanced target-seeking systems, improved day-and-night combat capability, and multiple warhead options for different battlefield roles, making it a far more versatile weapon for modern drone warfare.

Do You Know:

- The ULPGM-V3 is fitted with a high-definition dual-channel seeker, an advanced guidance system using multiple sensors to accurately track targets — allowing it to strike a wide range of threats. The missile can be deployed in both plains and high-altitude regions and is capable of operating during both day and night. It is also equipped with a two-way data link, enabling operators to change or update the target even after the missile has been launched.
- The missile can be fitted with three different types of warheads depending on the mission. These include an anti-armour warhead designed to destroy heavily protected tanks and armoured vehicles — even those fitted with rolled homogeneous armour and explosive reactive armour which are special layers of protection used in modern battle tanks. It also has a penetration-cum-blast warhead meant to pierce and destroy bunkers and fortified structures, and a pre-fragmentation warhead that disperses high-speed metal fragments over a large area to maximise damage. The missile can engage both stationary and moving targets with precision in all-weather, day-and-night combat conditions.
- DRDO has partnered with two production agencies — the public sector company Bharat Dynamics Limited and the private sector firm Adani Defence Systems and Technologies Limited — for the development and production of the missiles.
- The system has been integrated on unmanned aerial vehicles (UAVs) developed by Newspace Research and Technologies, Bengaluru, for current trials. DRDO is actively pursuing integration of ULPGM weapons with long-range and high endurance UAVs from several other Indian companies.
- The ULPGM missile has been developed by Research Centre Imarat, Hyderabad as the nodal lab along with other DRDO laboratories, namely Defence Research and Development Laboratory, Hyderabad; Terminal Ballistics Research Laboratory, Chandigarh; and High Energy Materials Research Laboratory, Pune.



IS INDIA GETTING HOTTER?

The story so far:

Several cities in India are sweltering under heatwaves or quasi-heatwave-like conditions. The delayed onset of the monsoon and near certainty of an El Niño during the monsoon months of June-September will add to heat-related distress.

Was May 2026 an unusually hot month in India?

Not by daytime temperatures, and not nationally. The India Meteorological Department (IMD)'s outlook for May 2026 expected maximum temperatures to run 'normal' to 'below normal' across much of the country, with above-normal readings limited to the southern peninsula and parts of the north-east and north-west. Normal in most cases refers to a 30-year average temperature at a specific station and varies significantly. Above-normal heatwave days were forecast only for specific regions — the Himalayan foothills, the east-coast States, Gujarat, and Maharashtra — while all-India rainfall for May was projected to exceed 110% of the long-period average. The clearer signal is the long-term one: an IMD study of the Core Heatwave Zone (CHZ) over 1961–2020 found heatwave frequency rising 0.1 days per decade and duration 0.44 days per decade, both statistically significant trends. The study also found that nights warmed faster than days, at roughly 0.21°C per decade. The CHZ includes Punjab, Himachal Pradesh, Uttarakhand, Delhi, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, West Bengal, Odisha, and Telangana, plus the meteorological subdivisions of Marathwada, Vidarbha, and Madhya Maharashtra, and coastal Andhra Pradesh. Heatwaves are becoming more frequent and longer over the decades, but May 2026 itself was a wet, regionally uneven month rather than a record-setting one.

A widely shared list claimed all 50 of the world's hottest cities were in India in April. How sound is that?

It should be read with caution. The ranking, compiled by an air-quality website, captured a single day — April 27, 2026 — and presented it as a climate signal. One day cannot establish a trend, as the article itself acknowledges. The list was drawn from the cities the website monitors, overwhelmingly in north and central India. The absence of cities from West Asia, Africa, or Australia reflects the composition of the dataset. Ranking by 24-hour average temperature also favours places with warm nights and penalises desert cities that cool sharply after dark, which is why Rajasthan, home to India's all-time temperature record, appeared near the bottom. The figures also came from the website's own index rather than primary IMD station data, with no published method for the averages.

Was April 2026 hotter than April 2025?

By daytime temperatures, April 2026 was generally cooler. IMD attributed the relatively mild March and April to an unusually active run of western disturbances that brought above-normal rainfall. A year earlier, IMD had forecast above-normal maximum temperatures across most of the country for April 2025. The moderation in 2026, however, was largely a daytime effect: night-time temperatures stayed elevated, running about 2.2°C above normal in Delhi and 2.4°C in Punjab. The national average also masked sharp local extremes.



How do urban heat islands work, and what role does air-conditioning play?

When a city replaces soil and vegetation with concrete and asphalt, those surfaces absorb heat during the day and release it slowly at night. Combined with reduced evaporative cooling, low surface reflectivity, poor ventilation, and waste heat, this can make Indian cities 2–10°C hotter than surrounding rural areas, with the gap largest at night. Air-conditioning compounds it: each unit cools an interior by expelling heat outdoors.

Are urban heat islands a bigger driver of heat than climate change?

The evidence suggests not, in most cities. A 2024 study in *Nature Cities* found Indian cities warming at about 0.53°C per decade, against 0.26°C per decade for the country as a whole. But it attributed only around 38% of that urban warming to urbanisation itself, an enhancement of roughly 60% on top of the regional, climate-driven warming. Urban and background warming were strongly correlated, indicating that regional climate change drives much of the urban signal.

How will the emerging El Niño affect temperatures and the monsoon?

It raises the risk of a hotter, drier season. El Niño tends to weaken the monsoon's moisture-bearing uplift, which can lengthen dry “break” spells and trigger humid heatwaves across the north-west.

THE 4-LETTER WORD THAT EVERYONE IN DELHI NEEDS TO KNOW DELHI'S KILLER DUST

It is persistent, it lingers in the air. It is inhaled deep into the lungs, it even enters the bloodstream. And it carries toxic metals that can trigger disease, damage lungs, and raise cancer risk, especially among children.

Key Takeaways:

- Meet road dust — the main villain in Delhi's pollution story that is quietly putting your life at risk, every day.
- A January 2026 report by a panel of top experts constituted by the Commission for Air Quality Management (CAQM) identified road dust as a major pollution source in Delhi because it acts as “both a primary emission and a persistent source”. The panel defined road dust broadly to include airborne dust from roads and shoulders, vehicle movement, dry soil, and road wear. It said poor road surfaces, potholes, broken edges, unpaved stretches, road-tyre-brake wear, and debris falling from the transport of construction and demolition (C&D) material all contribute to the dust load.
- The report also underlined the mechanism that makes road dust difficult to control: dust deposited on road surfaces is resuspended by vehicular movement, particularly during dry conditions. This keeps pollution levels elevated even in the absence of active dust-generating activities.
- Mohammed Rafiuddin, Programme Lead for Clean Air at the Council on Energy, Environment and Water (CEEW), said, “Scientifically, road dust is a very different kind of source compared to C&D dust. It is a line source (spread along a corridor), but at a construction site, the dust generated is from a point source.” In other words, road dust requires corridor-wide, routine removal and surface management, while construction dust depends on site-level containment and enforcement.



- A road-dust committee set up by the CAQM last year said resuspension is driven by continuous dust deposits along road edges and medians, unsuitable road infrastructure design, poor maintenance, and inadequate dust-management practices.
- The committee noted that dust from unpaved medians frequently blows onto carriageways. Irrigation practices can further worsen the problem, as thick hose pipes used for watering median and footpath plantations often spill soil onto roads, which later dries and adds to dust levels. Encroachments and unauthorised parking were also flagged as operational barriers that obstruct cleaning and allow dust to accumulate.

Do You Know:

- Evidence suggests that road dust is becoming relatively more important as exhaust emissions decline. A multi-city 2023 study led by researchers from IIT Delhi found that even as tailpipe emissions fall with cleaner fuels, non-exhaust sources such as “resuspendable road dust, tyre wear and brake wear” are gaining significance.

The study showed that Delhi’s higher silt load is driven by construction activity, heavy traffic, and dust storms during April and May. Across 32 cities, silt loads ranged from 0.2 g/m² to 111.2 g/m², with Delhi averaging 14.47 g/m².

Researchers also pointed out that the degradation of the Aravalli range has weakened a natural dust barrier around Delhi, allowing more wind-blown dust to enter the city. Nationwide, the study said, exposure to road dust is linked to more than 10,207 premature deaths annually.

- Experts say Delhi’s natural environment places it at a disadvantage. Rafiuddin said that even with improved road conditions, “there is bound to be some amount of dust always”, which then needs to be actively removed and managed. This is due to the city’s natural baseline for dust from dry summers, frequent dust storms, loose alluvial soil, and relatively low rainfall.

Some commonly used mitigation measures offer limited benefits. Dipankar Saha, former head of the air laboratory at the Central Pollution Control Board, who led a 2017 pilot study on the efficacy of anti-smog guns, said such measures are ineffective for dust control.

- Road dust is a major source of PM_{2.5} and PM₁₀, the fine particles that can penetrate deep into the lungs and enter the bloodstream. Inhaling these particles can cause lung irritation and inflammation, and worsen pre-existing conditions such as asthma and chronic obstructive pulmonary disease, often leading to persistent coughing and wheezing. Long-term exposure to PM_{2.5} has been linked to premature death, particularly among people with chronic heart or lung disease, and to reduced lung function growth in children.

JHARIA COAL FIRES MAY BURN HOTTER, EMIT MORE GREENHOUSE GASES

Fires have burnt beneath the Jharia coal fields in Jharkhand for decades now, releasing smoke and gases through cracks in the ground. And according to a new study, parts of this underground fire system may burn hotter and release more greenhouse gases than previously estimated.

Researchers from the U.K. and India, including the CSIR-CIMFR, reported in a May 18 paper in Communications Earth & Environment that the collapsed structures created when underground fires consume coal seams and destabilise the rock above them can stretch vertically for more than 100 m through the earth, venting hot gases into the air.



When mining exposes coal to oxygen, natural oxidation reactions can trigger underground fires that smoulder for decades. Previous estimates suggested fires in the region already emitted copious greenhouse gases, but scientists have struggled to track them accurately because the fires spread irregularly.

The new study focused on the Ena, Bastacolla, and Tisera collieries. In 2018-2023, the researchers used numerical modelling and mineralogical analysis to document collapsed structures up to 10 m wide, collected samples of melted rock and glass-like materials, and analysed their composition. The researchers found that larger cavities often had paralava: rock melted and re-solidified by the heat of coal fires. At Ena and Tisera, they found a kind of fused, glass-enveloped rock they nicknamed “birianiite”, reflecting the rock’s mix of geological ingredients and its resemblance to the popular rice dish.

The researchers combined field observations with computer modelling. Their simulations suggested that large, isolated collapse structures could, on paper, approach 4,000 C in some conditions, much higher than estimates commonly associated with underground coal fires.

Using modelling based on the amount of coal likely burned in the structures, the team also estimated the global warming potential of Jharia’s fires at up to 748.72 MT of CO₂-equivalent per year.

While industrial emissions are subject to rigorous monitoring, fugitive emissions from uncontrolled coal fires like in Jharia are seldom part of global greenhouse gas audits. However, the authors acknowledged their model excluded some real-world processes, including chemical reactions and mechanical deformation, that could alter the temperature estimate. Likewise, the emissions estimate depends strongly on assumptions about the extent of burning, among other factors.

NEW CASCADE FROG SPECIES RECORDED IN NAGALAND’S HILL-STREAM HABITATS

Nagaland has yielded a new-to-science cascade-dwelling frog.

A team of six scientists from the Zoological Survey of India (ZSI) recorded this species in August 2024 from the hill-stream habitats near Singrep village during a field survey in Kiphire district, bordering Myanmar.

The species has been named *Amolops kamal* after Kamal Choudhury, a former teacher of the lead author of the research paper at Guwahati’s B. Barooah College.

The common name of this species is Nagaland cascade frog.

The authors of the study are Bhaskar Saikia, Bikramjit Sinha, A. Shabnam, Prabir Narayan Konwar, Mridul Kumar Borthakur, and K.P. Dinesh. Their study was published in the latest issue of the journal *Records of the Zoological Survey of India*.

The researchers said integrative taxonomic analyses, including molecular phylogenetic studies, confirmed that the specimens represent a distinct evolutionary lineage within the *Amolops indoburmanensis* species complex.



Unmapped diversity

ZSI Director Dhriti Banerjee said the documentation of *Amolops kamal* highlights the rich yet understudied faunal diversity of India's northeastern region and underscores the importance of long-term field surveys in biodiversity hotspots.

Dr. Sinha of the ZSI, Kolkata, who led the field expedition, said the rugged landscapes and isolated stream ecosystems of the northeast continue to harbour poorly known amphibian lineages.

Dr. Dinesh of the ZSI, Pune, underscored the importance of molecular approaches in amphibian taxonomy, particularly in Northeast India, where many frog species are morphologically similar. He said molecular data were increasingly essential for delineating species boundaries, understanding true species distributions, and identifying cryptic species complexes that may otherwise remain hidden under a single species name. The study further demonstrated that *Amolops indoburmanensis*, previously considered a widespread species, may represent multiple distinct evolutionary lineages distributed across Northeast India and neighbouring regions.

The Asian cascade-dwelling frog genus *Amolops* currently comprises 90 recognised species, with 20 reported from India. These species are generally classified into 10 species groups based on morphological similarities.

In India, the *Amolops* species are mainly categorised across three groups: *Amolops marmoratus*, *Amolops monticola*, and *Amolops viridimaculatus*. The first group is the most diverse, represented by eight species.

RARE DRAGONFLY RESURFACES IN ARUNACHAL, UNDERSCORES NEED FOR HABITAT PROTECTION

An insect that enjoys a near-360° vision with thousands of lenses, and can stay still in the air, has resurfaced in Arunachal Pradesh's Changlang district, about 600 km east of where it was first recorded 110 years ago.

A team of four citizen scientists recorded *Gynacantha khasiaca*, a rare dragonfly commonly known as the long-tailed duskhawker, from the Namdapha National Park and Tiger Reserve. This insect with two compound eyes, each with thousands of tiny lenses and photoreceptor clusters, was last described from the erstwhile Abor Hills in 1914.

Mahesh R. from Kerala's Ernakulum, Rajesh Gopinath from Karnataka's BMS Institute of Technology and Management, Gaurav Joshi from Uttarakhand's Haldwani, and Roshan Upadhaya, a policeman from Arunachal Pradesh's Basar, are the authors of a study on the "rediscovery" published in the *Journal of Threatened Taxa*.

According to the authors, the long-tailed duskhawker was sighted at Deban in October 2024 and confirmed through photographs taken in the presence of the forest staff. They said that the finding has underscored the need for continued monitoring and habitat protection in India's easternmost State.

Dragonflies and damselflies, belonging to the order Odonata, are crucial components of freshwater ecosystems, as predators and prey in the aquatic food web. The global diversity of Odonata comprises 6,442 species across 693 genera.



Home to 504 species

India is home to 504 species and 27 subspecies. The total number of species in Arunachal Pradesh is 110.

Beyond Arunachal Pradesh, the long-tailed duskhawker has been documented in Assam, Maharashtra, Meghalaya, Uttarakhand, and West Bengal.

KERALA SCIENTISTS DISCOVER NEW EVERGREEN TREE SPECIES AT SHENDURNEY SANCTUARY

Scientists from the Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), in Palode, Kerala, have discovered a new evergreen tree species from the southern Western Ghats of Kerala. The newly discovered species identified in the riparian forests of the Shendurney Wildlife Sanctuary has been officially named as *Humboldtia nairiana*.

The species, belonging to the genus *Humboldtia*, has been named in honour of G.M. Nair, a distinguished plant biotechnologist and former Director of JNTBGRI. The initial breakthrough for the discovery came in 2010 during a floristic exploration along the Cheenikkala-Pandimotta forest trail within the Shendurney Wildlife Sanctuary. Three scientists from JNTBGRI collected an unusual and taxonomically intriguing specimen.

To carefully observe and safeguard the plant, a few healthy seedlings were brought back and successfully established ex-situ within the JNTBGRI Arboretum. After a prolonged juvenile phase, the cultivated trees began flowering and fruiting in 2022. This allowed the research team to conduct a comprehensive morphological assessment, which confirmed that its distinct vegetative and reproductive characters set it apart as a brand-new species to science.

The species is strictly endemic to Kerala and is presently known only from the biodiversity-rich Agasthyamala Biosphere Reserve. Alarming, field surveys indicate a fragile wild population. Based on the IUCN Red List criteria, the species has been categorised as 'data deficient' to highlight the need for extensive field tracking and habitat protection.

ALPHONSO MANGO CROP RUINED BY WEATHER

India is the world's largest grower of mangoes and produced 28 million metric tons of the fruit in 2024 to 2025, data from research and rating agency CRISIL showed. Maharashtra is renowned for its Alphonso mangoes, but officials say hotter weather has ruined this year's crop of the variety known as the "King of Mangoes".

A sharp difference in day and nighttime temperatures in December and January hurt flowering and fruit setting, while hotter than usual weather in April and May, probably due to the El Nino weather phenomenon, then spoiled the fruits themselves, said Bapusaheb Manikrao Lambade, a government agriculture officer in Devgad, one of Maharashtra's top Alphonso-growing areas. El Nino is a climate pattern that alters global weather and can trigger extreme conditions. A strong El Nino is expected this year and forecast to have an adverse effect on crops across Asia, South America and Africa.

A government-backed survey, a copy of which was reviewed by Reuters, estimates this year's crop losses in Devgad at 85% to 90%. The weather also caused losses in mango-growing areas



elsewhere in the state. India's entire mango crop was worth \$2.3 billion last year, as per Indian research firm Mordor Intelligence, which expects market to grow to \$3.4 billion by 2031.

While much of the fruit stays in India, about \$56 million worth of mangoes and \$80 million worth of mango pulp were exported in 2025. Reuters spoke to more than a dozen farmers in Maharashtra, as well as traders, businesses, exporters and government officials, who said losses had been severe.

War hits trade

The weather damage has coincided with a slump in exports as a result of the Iran war.

India is one of the world's largest exporters of mangoes. The United Arab Emirates, the U.S., the U.K., Kuwait, and Qatar are among the biggest importers of Indian fresh mangoes. Shridhar Pathak, co-founder of mango exporter Shreevali Agro, said freight charges had more than doubled, and delays or cancellations to consignments for the Gulf including Dubai and Oman have cut his shipments by nearly 40% this year. Sanjay Nare, a 52-year-old maker of mango cartons in Malvan, said he had unsold inventory of nearly 1,00,000 boxes in his factory this year.

ORDINARY HOMES AND OFFICES ARE BECOMING DEATH TRAPS FOR BIRDS

In 2008, architect and avid birdwatcher Peeyush Sekhsaria was having breakfast at a traditional homestay in Coorg when he heard a loud thud. Sekhsaria tracked down the cause of the noise to find an emerald dove lying still on the floor after flying into a glass panel.

Bird-glass collisions, also called bird-window strikes, happen because birds are not able to notice clear or slightly reflective glass.

India has no national estimate for bird-glass collisions, nor is there a coordinated monitoring system to track how many birds die or are injured after colliding with windows.

In one October 2025 study from the Nilgiris, researchers from around India documented 35 bird-glass collision incidents in two locations within a year. In Bengaluru, the Avian and Reptile Rehabilitation Centre (ARRC) has recorded more than 500 birds injured in collisions over the last three years.

"At Bengaluru, most of the major threats bringing birds to our rescue centre are human-made: manja is still the worst, but collisions are frequent," ARRC executive director Jayanthi Kallam said.

Beyond skyscrapers

A major concern researchers and birdwatchers have is the nature of buildings involved in such accidents. Contrary to common perception, most collisions do not occur at skyscrapers but at everyday structures like homes, schools, office complexes, and apartment balconies.

"Glass collisions aren't a skyscraper problem but they are a glass problem," Dr. Kallam said. "People often imagine this as something that happens only at IT parks, corporate campuses or large glass buildings. But our cases come from ordinary urban spaces like homes, cafe fronts, schools, resorts and two- or three-storey buildings."



Reflective surfaces mirror sky, foliage, and open space, creating what ecologists call a visual illusion. Transparent panes can also appear as clear flight paths. To birds moving quickly through urban vegetation, the barrier often remains invisible.

According to Mr. Sekhsaria, "The data in the U.S. shows us that 50% of bird deaths actually happen up to third-floor buildings and a lot of birds are active within a certain height range from the ground up to the canopy height."

In Indian cities where residential towers and office buildings are often located alongside fragmented green spaces, the risk increases.

Glass near trees, balconies, and gardens can reflect the vegetation nearby, confusing birds.

Vulnerable migrating birds

Certain bird species are especially vulnerable. Between September and January, when birds migrate, ARRC said it often finds Indian pittas (*Pitta brachyura*) dazed or injured near buildings.

White-cheeked barbets (*Psilopogon viridis*) seem vulnerable during the March-April breeding season.

Asian koels (*Eudynamis scolopaceus*) also appear susceptible during breeding, possibly because of their higher territorial movement, which can bring them closer to reflective surfaces.

Pune-based birdwatcher Parth Barhate began noticing patterns similar to this after moving from Jalgaon: "Small bird species such as sparrows, robins, sunbirds and babblers are particularly vulnerable."

According to experts at ARRC, bird-glass collisions are severely undercounted partly because collisions are hard to observe. Smaller birds may move away after the impact and die elsewhere, while some others are quickly removed by scavengers. The rescue centres eventually receive only a subset of injured or dead birds.

"When we looked more closely at building collision cases, nearly 70-80% involved glass in some form, be it windows, sliding doors, panels, reflective glass or facades," Dr. Kallam said.

"And this is almost certainly an undercount. Small birds are easy to miss, many collisions are never witnessed and if a bird moves away from the impact site, identifying glass as the cause also becomes harder."

Bird-safe cities

Researchers said the absence of regulations does not mean mitigation is impossible. Experts have pointed to many simple, inexpensive interventions. For example, patterns, decals or strips pasted on the outward-facing parts of windows can help birds identify glass surfaces as barriers.

"The first step is simple: make glass visible to birds," Dr. Kallam said.

Awareness and understanding of bird-glass collisions also suffer from their absence in mainstream urban ecological discussions in the country. Conservation debates continue to focus on habitat destruction, air pollution, and infrastructure expansion.



One 2023 petition before the National Green Tribunal filed by a resident in Bengaluru had asked for the Ministry of Environment, Forest and Climate Change to draft bird-safe building guidelines. As of May 2026, no public update or draft framework has been released.

Mr. Sekhsaria said systematic citizen-science reporting may eventually shift that understanding.

RAJA RANDHIR SINGH WAS BRIDGE BETWEEN SPORT'S PAST AND FUTURE

Raja Randhir Singh, who died on Wednesday aged 79, belonged to an era when Indian shooting existed far from the spotlight. It was the time before Olympic medals, corporate backing and shooting academies. Competing in five Olympics between 1968 and 1984, he was among India's earliest international regulars in trap shooting and won the country's first Asian Games gold in the discipline in 1978. But his success can't be measured merely in medals. Singh came to embody a continuity between amateur-era Indian sport and a more globalised Olympic future. He did so first as an athlete who understood the sport intimately, and later as a figure who could represent India within international federations.

Singh was not regarded as a visionary reformer in the modern sense, nor did he cultivate the image of a strongman administrator. Instead, his value lay in relationships, continuity and access. Athletes across generations, from the pre-liberalisation era to India's Olympic medallists, viewed him as someone who could quietly get things done.

Born into Patiala royalty, son of former International Olympic Committee (IOC) member Raja Bhalindra Singh, Singh moved through international sporting circles with ease. The Olympic movement historically drew heavily from aristocracy, old institutions and diplomatic networks. Officials across Asia frequently described him as a "consensus-builder" and a stabilising figure. India's sporting rise owed much to athletes on podiums, but it also depended on figures like Randhir Singh.

SHORT NEWS

ARASH-E KAMANGIR

- Iran has brought down a United States MQ-9 Reaper drone near the Strait of Hormuz using its new air defence system called the Arash-e Kamangir, Al Jazeera reported. The MQ-9 Reaper is a US unmanned aerial vehicle used for surveillance and strike missions.
- Iranian media describe it as a mobile air defence system designed to intercept drones and aircraft.
- The new interceptor system, Arash-e-Kamangir, announced by Fars translates, in Persian, to "Arash the archer".
- It has been named after an eponymous hero from Persian mythology who had fired an arrow to draw the border between Iran and Central Asia, Al Jazeera highlighted. Broadly, Arash stands for a hero who helped Iran in its battle against international domination, it stated.



INDIA-CYPRUS ELEVATE TIES

- President of Cyprus Nikos Christodoulides paid a State visit to India from 20 to 23 May 2026.
- India and Cyprus agreed to elevate their bilateral ties to Strategic Partnership, unveiled a 5-year roadmap for defence cooperation (2026-2031), decided to establish a cyber security dialogue and strengthen cooperation on maritime transport, space and health.
- There were six pacts signed that include an MoU on establishing a joint working group on counter-terrorism, establishment of official coordination and cooperation on Search and Rescue (SAR), on higher education and research and cultural cooperation from 2026-2030.
- The two sides are also working towards the India–Middle East–Europe Economic Corridor (IMEEC) project.
- Cyprus is located close to Turkey and Syria. It's a EU member despite being geographically in Asia. Its location makes it a crucial part of the IMEEC, an infrastructure project that India expects multiple benefits from.
- IMEEC is supposed to boost trade and connectivity between India and Europe via the Middle East, and Cyprus, in the Mediterranean, has an important role to play.

EXTRADITION

- India is working on the extradition of two more criminals from Türkiye wanted by the government — Navpreet Singh from Punjab, who is wanted in several narcotics-related cases, and Mohammad Sartaj from Madhya Pradesh, linked to cases involving threats and violence.
- India and Türkiye share a formal extradition treaty, which was signed in 2001 and came into force in June 2002. The framework allows both countries to formally request the transfer of fugitive criminals and individuals wanted for terrorism and other severe crimes.
- Extradition is the formal process of one country surrendering an individual to another country for prosecution or punishment for crimes committed in the requesting country's jurisdiction. It is typically governed by a bilateral treaty between the two countries involved, or a larger multilateral treaty.

PAROLE

- On 26th May, Dera Sacha Sauda chief Gurmeet Ram Rahim Singh, serving a 20-year sentence for raping two of his disciples, walked out of Rohtak's Sunaria prison on a 30-day parole. This is the 16th time Gurmeet Ram Rahim Singh has moved out of the prison since his conviction in the rape case in August 2017. Parole is a system of releasing a prisoner with suspension of the sentence. The release is conditional, usually subject to behaviour, and requires periodic reporting to the authorities for a set period of time. Parole is considered a reformatory process.

What is the difference between Parole and Furlough?

Furlough is broadly similar to parole, but there are important differences in purpose, legal effect, eligibility and consequences.



Parole	Furlough
The sentence is suspended, but the total sentence remains intact. Time spent on parole does not count toward sentence completion.	The period of furlough is treated as remission of sentence, meaning it reduces the period of imprisonment.
It is not considered a matter of right and is granted for a specific reason.	It is generally granted periodically to help prisoners maintain family and social ties.
Prisoners convicted of multiple murders or under the Unlawful Activities (Prevention) Act are not eligible for parole.	It is usually granted in cases of long-term imprisonment after the prisoner has spent a specified period in custody.
If parole is rejected, the convict can challenge the order before the High Court.	Since furlough is not granted for a particular reason, it may be denied in the interest of society.

HIGH-LEVEL COMMITTEE ON DEMOGRAPHIC CHANGES

- The government has constituted a “High-Level Committee on Demographic Changes” (HLCDC) under the Ministry of Home Affairs.
- It is tasked “to undertake scientific study of the nature, causes and consequences of unnatural demographic changes occurring across the country and to recommend appropriate policy, administrative and legal measures”.
- The committee will be chaired by retired Supreme Court judge Justice Prakash Prabhakar Naolekar and will include other members.

FEDERATION OF WESTERN INDIA CINE EMPLOYEES (FWICE)

- The FWICE has taken a strong stand against Ranveer Singh for his sudden, unceremonious exit from Farhan Akhtar’s directorial Don 3.
- The film body has issued a non-cooperation directive against Ranveer, alleging that he failed to respond to their invitation to appear in person and discuss the issue despite three reminders.
- FWICE, established in 1956, is a film industry workers’ union and the parent body of 32 craft associations. It works towards promoting and safeguarding the economic and cultural interests of its members. FWICE intervenes in matters related to professional disputes, contractual disagreements, and non-payment of wages. It also has the authority to issue non-cooperation directives against actors, directors, producers, or production houses accused of violating industry norms. The organisation can direct its members to refrain from working with a particular individual or banner. In addition, FWICE lays down guidelines regarding working hours, minimum wages, and safety standards for daily-wage workers, technicians, and artists. The body also looks into cases of workplace misconduct and can enforce disciplinary action when required.

‘PRESIDENT OF INDIA’S POLICE COLOUR’

The President Droupadi Murmu presented the ‘President of India’s Police Colour’ to the Sikkim Police. The President’s Police Colour is the highest ceremonial honour awarded to a police force



in the country in recognition of exceptional service, unwavering discipline, and dedication to the nation.

INDIA'S FIRST HYDROGEN TRAIN

— The Railway Board (RB) has given approval to the introduction of the country's first hydrogen-powered trainset. In March, the oscillation trial run of the train was completed. The test was conducted by the Research Designs and Standards Organisation (RDSO) as part of the evaluation process.

— With its introduction into commercial service, India will join the global league of countries including Germany, Sweden, Japan and China – that operate hydrogen-powered trains.

— They use HFC (Hydrogen Fuel Cell) technology, which generates energy through the electrochemical reaction of compressed hydrogen with atmospheric oxygen, emitting water vapour as the sole byproduct. This makes the system a zero-emission mechanism at the point of use.

What are the different types of Hydrogen?

- Grey Hydrogen

It constitutes the bulk of India's production. It is mainly produced through steam methane reforming (SMR), in which natural gas (methane) is used as the feedstock. The process relies on fossil fuels and releases carbon dioxide into the atmosphere

- Blue Hydrogen

Production of hydrogen from coal/natural gas combined with Carbon Capture and Storage (CCS). CCS is a way to catch carbon and trap it beneath the earth. It is different from carbon dioxide removal (CDR) — where carbon is sucked out of the atmosphere. The byproducts, like carbon monoxide and carbon dioxide, are captured and stored.

- Green Hydrogen

In this, hydrogen is produced from water electrolysis—splitting water into hydrogen and oxygen—by using renewable energy-powered electrolyzers. It is considered a virtually emission-free pathway for hydrogen production.

On May 7, a six-member Constitutional Council (CC) headed by Prime Minister Balendra Shah recommended Dr Manoj Kumar Sharma for the post of Chief Justice of Nepal, and the Parliamentary Hearing Committee confirmed it unanimously.

Dr Manoj Kumar Sharma became the 33rd CJI of Nepal. However, there are several disagreements regarding his appointment. According to convention, the seniormost judge of the Supreme Court is appointed to the CJ post. Sharma was the fourth most senior judge, after justices Sapana Pradhan Malla, Kumar Regmi, and Hari Prasad Phuyal. This precedent has been broken only once.

BRAHMOS MISSILES

— Indian Defence Secretary Rajesh Kumar Singh said India has signed a deal to sell BrahMos missiles to Vietnam and it is in final stage for a similar deal with Indonesia.

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



— BrahMos is built through the collaboration of India and Russia. An agreement was signed, which led to the formation of BrahMos Aerospace, a joint venture between the DRDO and Russia's NPO Mashinostroyeniya (NPOM).

— BrahMos is an amalgamation of the names of the Brahmaputra and Moskva rivers. The entity was set up with a mandate to design, develop, and manufacture a supersonic, high-precision cruise missile and its variants.

— India holds a 50.5 per cent share and Russia the other 49.5 per cent share in the joint venture. The first successful test of the missile was conducted on June 12, 2001, from the specially designed land-based launcher at the Integrated Test Range, off the Chandipur coast of Odisha.

— BrahMos is a two-stage missile with a solid propellant booster engine. The first stage brings the missile to a supersonic speed, greater than the speed of sound, and it then gets separated.

— The second stage of the liquid ramjet then fires and thrusts the missile to three times the speed of sound in its cruise phase. A liquid ramjet is an air-breathing jet engine that uses liquid fuel, which is injected into the high-speed airstream and ignited to produce thrust.

— BrahMos is an extremely versatile stand-off range 'fire-and-forget' type supersonic cruise missile that has proved its capabilities in land-based, ship-based, air launched and submarine-based versions.

ORESHNIK MISSILE

— Russia used the Oreshnik hypersonic ballistic missile during a mass drone and missile attack on Kyiv on 24th May that killed at least two people, Ukrainian President Volodymyr Zelenskyy said.

— Russia first used the Oreshnik missile on the Ukrainian city of Dnipro in November 2024. Moscow used it again in the Lviv region in January.

— Putin has said the Oreshnik (meaning hazelnut tree in Russian) travels at mach 10 (ten times the speed of sound) and can destroy underground bunkers several floors deep.

— He has also claimed the weapon remains immune to missile defence systems and said multiple Oreshnik missiles fitted with conventional warheads could cause destruction comparable to a nuclear strike.

HOW ACS CATCH FIRE, AND THE ROLE TEMPERATURE PLAYS IN IT

Retired IAS officer and the first chairman of the Competition Commission of India (CCI), Dhanendra Kumar, 80, died in a fire after a suspected air conditioner (AC) blast at his home in Delhi's Hauz Khas on Thursday (May 28).

During the summer, continuously running electrical appliances can lead to overheating, also due to the high average atmospheric temperature. This overheating can degrade an AC's insulation, melt internal components, and ignite combustible materials inside the unit. Another major reason is short-circuiting, which occurs when the flow of electric current in a circuit takes an unintended path.



A non-inverter AC uses a fixed-speed compressor that runs at full speed until the room reaches the target temperature, then shuts off completely. When the temperature rises, it turns back on at full speed.

During extreme heat and prolonged use, this creates higher electrical and mechanical stress, which can overheat components such as the compressor, capacitor or wiring. If the unit is old, poorly maintained, or exposed to voltage fluctuations, it can lead to short circuits and fires — often referred to as “AC blasts”.

On the other hand, an inverter AC regulates the compressor speed gradually instead of constantly switching on and off. While this variability reduces stress in the system, it's not foolproof. Fires can still occur due to overheating of electronic circuit boards, faulty wiring, refrigerant leakage, poor installation, voltage fluctuations or lack of maintenance.

RBI'S KILL SWITCH

- The Reserve Bank of India is exploring the possibility of introducing a 'Kill switch' mechanism that would allow users at the receiving end of a potential digital scam to immediately stop all financial transactions from their accounts.
- A 'kill switch facility' is a mechanism that allows a system, device, account, or service to be shut down, disabled or blocked immediately in an emergency or under specific conditions.
- The proposal for a 'Kill switch', which is being examined by the government and the RBI, envisages, among other possibilities, an emergency button integrated into payment applications of lenders that could instantly freeze all banking operations when a user suspects they are being targeted by fraudsters.

INTERNATIONAL DAY OF YOGA (IDY) 2026

- The main celebration of the International Day of Yoga (IDY) 2026 will be held in Kolkata on 21 June.
- The theme for this year is “Yoga for Healthy Ageing”, highlighting the role of Yoga in promoting physical health, mental well-being, and healthy ageing.

The word “yoga” finds mention in the Vedic corpus (1,500-500 BCE), the earliest (surviving) literature from the sub-continent. But it appears in a context far removed from postural or even meditational exercise — the sense in which it is understood today. It is in the Mahabharata, composed over six centuries from 300 BCE to 300 CE, that yoga is used in a sense that would be familiar today.

The Yoga Sutra of Maharishi Patanjali is the most well-known text on the matter, and was composed around 350 CE, the oldest text dedicated solely to the subject. Most scholars agree that this text shapes the present understanding of yoga.

VAGDEVI IDOL

- Recently, the Madhya Pradesh High Court declared the 11th-century Bhojshala-Kamal Maula Mosque complex in Dhar a temple. In its judgment, the court addressed claims concerning the idol



of the temple's reigning deity, Saraswati or Vagdevi, which is believed to be housed in the British Museum in London.

— The idol was excavated or recovered during clearing operations in Dhar by a British colonial officer, Major General William Kincaid. Following its removal from the Bhojshala complex, the idol was shipped to England, arriving in the UK in 1886. It was officially acquired by the British Museum in 1909.

— As per the British Museum website, the "Standing figure of the Jaina yakṣiṇī Ambikā carved in a coarse white marble" comes from the Paramara dynasty, and has a 'production date' of year 1034.

The Bhojshala-Kamal Maula Mosque complex in Madhya Pradesh's Dhar has long been the subject of competing claims, with Hindu and Muslim groups asserting religious rights over the medieval structure. Recently, the Madhya Pradesh High Court concluded that the religious character of the disputed Bhojshala-Kamal Maula Mosque complex was that of a temple of Goddess Vagdevi Saraswati. The court said that historical literature and architectural references established that the disputed complex was associated with Raja Bhoj of the Parmar dynasty and functioned as a centre of Sanskrit learning.

HASDEO ARAND FOREST

— Rajasthan State-owned electricity producer has been granted an in-principle approval to clear 1,742.6 hectares in Hasdeo Arand forest in Surguja, Chhattisgarh, classified as 'high-conservation zone' category in the government's own decision support system tool.

— The Hasdeo-Arand forest spans the Korba, Surguja and Surajpur districts in Chhattisgarh.

— It is home to dense Sal forests besides nine Schedule – I species, including leopards, sloth bears and elephants, which are accorded the highest level of protection under the country's wildlife law.

— It is also a catchment for the Hasdeo River and Bango Dam, and a dispersal corridor for tigers.

ALBINO HOG DEER

— A rare albino hog deer was spotted in Kaziranga National Park, drawing attention on social media.

— An albino deer is completely white with pink eyes, nose, and hooves due to the absence of body pigment caused by albinism. It is a genetic trait with the missing gene responsible for hair, tissue, and skin colour.

— The Indian hog deer is one of the smallest species of deer, standing about 70 cm at the shoulder and weighing approximately 50 kg. The hog deer gets its name from the hog-like manner in which it runs with its head hung low.

'NALSAR MODEL'

NALSAR's own campus dog management found an exception in the May 19 judgment of the Supreme Court on stray dog management, which emphasised public safety and allowed for euthanasia of "rabid" stray dogs.



Upon NALSAR University's intervention in the case, allowed educational institutions to run controlled, campus-based stray dog housing initiatives, saying that in the event of any stray dog bite occurring within the NALSAR campus, its Animal Law Centre "shall be liable to face tortious liability for the injury caused to the individual/s concerned".

The 'NALSAR model' is an initiative that has seen students and faculty come together to protect and manage community dogs on campus. Among these measures are the 'We for the Dogs' WhatsApp group of 80-90 people, an Instagram page called the 'Dogs of Nalsar', and, most importantly, the Animal Law Centre.

The Animal Law Centre began in 2018 and claims to be "India's first research centre on Animal Law and Policy which aims to fill critical gaps by producing robust research and building capacity across a collaborative network across academia, grassroots stakeholders, and government agencies".

CLAY COURT OF ROLAND GARROS

— Roland Garros (the French Open) is the only Grand Slam played on a clay surface. This year, as Paris experiences an unusually intense early-summer heatwave, with temperatures exceeding 35°C during the opening week of the tournament, the players are feeling the heat.

— Clay courts are moisture-dependent surfaces. Unlike hard courts, their playing characteristics are directly tied to how much water is retained beneath the top layer of crushed brick.

— When temperatures rise sharply, moisture evaporates faster. The surface becomes drier and harder, which changes the speed and bounce of the ball. Players at Roland Garros have already noticed the difference.

— Traditionally, clay slows the ball down because moisture creates more friction between the surface and the ball. But dry clay reduces that resistance. The bounce becomes quicker and lower, favouring aggressive baseline hitting over attritional rallying.

— The court is actually a complex five-layer structure nearly 80 centimetres deep. They are built using large foundation stones, gravel, volcanic rock residue, compacted limestone, and finally a thin layer of crushed red brick.

— According to Philippe Vaillant, head of court maintenance at Roland Garros, the limestone layer is the most critical component because it retains moisture and provides structural stability. The red brick layer is mainly cosmetic and helps players slide. If the limestone dries out excessively, the court can crack.

— The crushed brick layer is 3 to 5 millimetres thick. It is mainly there for colour and as a material that provides some sliding ability and an important visual contrast, since the limestone is almost white.

— To combat the heat, tournament staff are using calcium chloride, a salt compound spread across the courts in flake form each morning.

— The compound slows evaporation and helps the courts retain consistency through long matches played in direct sun. Groundskeepers say the substance effectively "reactivates" moisture in the crushed brick layer during the day.



BUSINESS AND ECONOMY

WHAT IS CHINA'S HAINAN FTP INITIATIVE?

The story so far:

Hainan, China's southernmost province and a tropical island in the South China Sea, has come to the forefront of the country's modern-era opening-up efforts with the beginning of its free trade port (FTP) and customs closure in December. Envisioned as a 'landmark leap' into economic ease, China is trying to set up a business hub in the island province aimed at attracting global and local customers with the appeal of zero tariffs, low personal taxes, and simplified flow of commuters and data.

What is the free trade port initiative?

The plan for the FTP in Hainan was first unveiled on June 1, 2020. The FTP was officially launched on December 18, 2025, with island-wide special customs operations implementing the policy of "freer access at the first line, regulated access at the second line, and free flow within the island". Under the initiative, tariff barriers on trade were removed from the island with the closure of ordinary customs operations, enabling easier imports. While the island remains an integral part of China, it has now become a neutral zone for international trade, with regular customs procedures and tariffs applying only to goods entering the Chinese mainland from the island. Visa-free entry for people from 86 countries is also expected to boost tourism.

Hainan will be a "new frontier of opening up, hub for regional cooperation and engine for economic globalisation," said Wang Bin, spokesperson for the Chinese Communist Party's Hainan Committee, ahead of the official opening of the FTP. He added that the FTP would help save 860 million RMB in tariffs annually while creating investment opportunities for Chinese enterprises in the Global South.

What does China seek to gain with Hainan?

While Hainan is on its way to further China's strategy of economic opening up, there are multiple factors affecting its success. Unlike Hong Kong — one of the world's leading financial hubs, being a special administrative region under the Chinese government, with its own legal system, currency, and independent membership in international trade organisations — Hainan is China in all perspectives and domain.

With a customs-free, tariff-free, region outside the mainland that follows all other legal and constitutional provisions, China has made both a partner and competitor to Hong Kong in Hainan. China now has an open economic and tourist zone at the northern end of the much-contested South China Sea, with fresh and vast economic opportunities compared to congested Hong Kong.

The geopolitical and economic implications of Hainan, and its output to China, which seeks to attain "socialist modernisation" in the coming decade, will be unveiled in time.

For now, the Hainan experiment is attracting eyes and its baby strides are firm.



THE GLOBAL IMPACT OF INDONESIA'S EXPORT POLICY SHIFT

In a major overhaul of trade policy, resource-rich Indonesia announced that key commodities can soon only be exported via a state-run agency. Speaking to Parliament on May 20, President Prabowo Subianto said the Government Regulation on Natural Resource Commodity Export Governance, as the measure is called, would mean that the Indonesian Government will be the sole exporter of natural resource products, beginning with palm oil, coal and ferro alloys.

The new policy requires the resource producers to sell their commodities to PT Danantara Sumberdaya Indonesia, a state-run agency under the sovereign wealth fund Danantara. From here, the agency will engage in transactions with foreign buyers, eradicating direct sales between private resource companies and international buyers.

Analysts say the announcement signals tightening of the government's grip over the Indonesian economy. Indonesia is the world's biggest producer and exporter of palm oil and thermal coal, and a major source of nickel. The move has sent commodities markets into a frenzy, with experts warning that its impact will be felt globally. The centralisation is set to come into effect by September, with a transition period of three months beginning in June.

In his address, Mr. Prabowo said Indonesia had lost over \$900 billion in revenue over the past 34 years because of fraud and under-invoicing. The new mandate would give the state control over the tax revenue and pricing, while strengthening overall oversight to to minimise revenue leaks. Despite being resource-rich, Indonesia has struggled to convert that wealth into consistent economic growth, with state revenue-to-GDP at around 12%, whereas the Asia-Pacific average is 19.5%, and the OECD average is 33.9%. Increasing tax revenue and plugging leaks allows for investment into the country's development goals and supports its reserves. The plan's State controlled pricing would also ensure fair transfer pricings.

Market response

Following Mr. Prabowo's announcement, Indonesian stocks dropped to the lowest in over a year. The Jakarta Composite Index fell by 2.4% on May 20, with major declines in energy and mining firms.

Traders and buyers are still understanding the impact of the decision and how the immediate changes will unfold. The commodities in question are vital to daily life and found in products globally. Palm oil is used globally in everything from processed foods to cosmetics, and half of the world's thermal coal exports in 2025 came from Indonesia, with China, India, Vietnam and the Philippines being the top importers. Shortages in LNG supply because of the standstill in Iran is further pushing Asian nations, like Japan and South Korea, to lean on coal to fill energy gaps. China, in particular, is a major buyer of Indonesian nickel pig iron, a cheap alternative that is used in stainless steel production. The mineral is also a key material used in electric vehicle manufacturing. Ahead of Mr. Prabowo's announcement, the China Chamber of Commerce in Indonesia, a group representing Chinese companies, wrote a five-page letter to the President, regarding their fears over the rise in "excessively stringent regulation, over-enforcement and even corruption and extortion by competent authorities."

Concerns over the centralisation

In 2020, the then administration banned the export of raw nickel ore. The move intended to force global companies to invest in Indonesian nickel processing plants, thereby increasing the value of



exports and bringing more revenue into the country. Last year, Jakarta created Danantara, the country's second sovereign wealth fund which has become an instrumental part of Indonesia's economic policy. However, it has done little to soothe investors about its commitment and staying power, especially in the face of political uncertainty and corruption risks.

Similar worries have been raised now. Private companies are expected to be hit hardest, as the state-run agency monopolises their role.

INDIAN MOBILE MARKET HIT AS GLOBAL SEMICON INDUSTRY FACES 'SEVERE MEMFLATION'

The semiconductor industry globally is experiencing a severe structural 'memflation' (inflation caused by memory chips shortage), with skyrocketing prices leading to huge disruptions in price sensitive consumer electronics and mobile phone markets in India, said industry experts.

The key reason is that global wafer and advanced packaging capacities are increasingly being allocated toward high bandwidth memory (HBM) and AI infrastructure due to significantly higher demand and margins. A typical HBM takes 2-3x wafer capacity compared with a conventional DRAM.

This is making availability of conventional DRAM and NAND used in mainstream electronics tighter, according to India Electronics & Semiconductor Association (IESA).

Dynamic Random-Access Memory, or DRAM, is a type of computer memory used in PCs, laptops, and smartphones to temporarily store data that the processor needs to actively use. While NAND is a type of memory storage used in smartphones that retains data even without power.

Industry experts also confirmed that there is a shortage of sub ₹10,000 to ₹15,000 phones across the country as leading semiconductor (memory chips) manufacturers are diverting all their energies and production capacities away from standard consumer chips to meet the humongous demand for high-bandwidth memory required to support AI infrastructure.

India very vulnerable

B.V. Naidu, a foundational architect in India's semiconductor and Electronics System Design and Manufacturing (ESDM) ecosystem and a former president of IESA, India is extremely vulnerable to memory chip shortage due to its heavy reliance on electronic component imports and a consumer base driven by price elasticity.

"It seems global chip makers are prioritising premium brands such as Apple and Samsung for standard memory allocation, leaving budget brands in India and in other geographies to starve of chip/component supply. This has resulted in a short supply of economy smartphones in India. Also, I was told prices of several brands of cellphones have gone up by at least 15-20%," Mr. Naidu said.

As per IESA, higher DRAM and NAND prices, combined with the shift to AI-enabled applications and larger storage needs, are making the sub ₹10,000 to ₹15,000 category increasingly difficult to sustain profitably.

"The market is witnessing a structural recalibration toward higher-value devices. That means, phone makers are prioritising premium phone production over entry level phones," explained Ashok Chandak, president, IESA.

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



Confirming the trend, Rajeev Rajput, Senior Principal Analyst at Gartner, in a recent report said, "Memflation will destroy, or at least delay, non-AI demand into 2028, to varying degrees depending on the application. Technology suppliers should prepare for higher prices during the first half of 2026, followed by persistent but moderating price increases throughout the rest of the year." CIOs and IT leaders should be cautious about signing supply agreements with unfavourable pricing terms that extend beyond 2027, he warned.

Echoing a similar sentiment, Mr. Chandak said while capacity expansion announcements were underway globally, meaningful and substantial relief may take up to another two years because semiconductor capacity creation was highly capital-intensive and time-consuming.

"We expect the market to remain tight through 2026-2027, with gradual normalisation thereafter," he added.

On bill of materials (BOM) pressure and smartphone profitability, Mr. Chandak observed, memory pricing has become one of the biggest cost pressures in smartphone and entry level laptop manufacturing.

BAD FENCES

Secretary of State Marco Rubio's four-day visit to India, his first since taking office in January 2025, was understood to have been aimed at smoothing bilateral ties that have been deeply ruptured over the past year. The problems have been multifold, ranging from the U.S.'s high tariffs and cutting down on visas, immigration and outsourcing; to sanctions on India's energy procurement and investment, its moves with China and Pakistan, and the pejorative remarks by President Donald Trump and his cabinet colleagues about India. Although the Modi government has not criticised the U.S. for its actions, there is no doubt that the U.S. attack on Iran on February 28, the wider regional conflict and the Hormuz Strait blockade, have caused immense economic worries for India as well. It was thus hoped that Mr. Rubio's visit, which combined the bilateral agenda alongside the Quad Foreign Ministers' meeting, would help repair one of the worst phases in bilateral ties caused largely by Washington's unilateral moves. Mr. Rubio consistently held that the relationship was well and that "President Trump loves India", while responding to repeated questions on Mr. Trump's post that amplified anti-immigrant sentiments referring to India as a "hell-hole". New Delhi had no doubt laid out the red carpet for Mr. Rubio. In a departure from protocol, Prime Minister Narendra Modi welcomed him on his arrival and External Affairs Minister S. Jaishankar spent much of the weekend in meetings with Mr. Rubio, including two U.S. Embassy receptions. On Sunday, Mr. Jaishankar attended a celebration marking the U.S.'s 250th Independence Day and Mr. Rubio's birthday. Mr. Rubio visited the Missionaries of Charity, in Kolkata, and went to Agra and Jaipur for sightseeing. In bilateral talks, the Foreign Ministers discussed the full gamut of ties, including trade, energy, civil nuclear technological and defence cooperation, as well as the regional and geopolitical conflicts.

However, apart from one agreement on critical minerals cooperation, which replicates their partnership within the Quad and the 15-nation Pax Silica, the visit's bilateral part ended with few outcomes of note. Mr. Rubio's refusal to acknowledge a problem in the relationship indicates that the U.S., once considered India's most trusted partnership, has failed to recognise New Delhi's concerns. It is hoped, however, that Mr. Rubio was informed of them, as both sides prepare for a possible Modi-Trump meeting at the G-7 Summit in Evian, France, in mid-June, where India is a special invitee. This will be the first time that the leaders have come face to face since Mr. Modi's February 2025 Washington visit and all that followed, and an opportunity to mend the



relationship especially in the areas it has frayed the most — economic, energy and regional security.

RBI DATA SHOWS WHY GOVT. IS CONCERNED ABOUT DOLLARS FLOWING OUT

The latest data from the Reserve Bank of India (RBI) shows why the government and the central bank are so concerned about dollars flowing out of the country: the total amount of dollars flowing out of the country exceeded inflows by \$30.8 billion in 2025-26, a more than six-fold increase over 2024-25. This Balance of Payments (BoP) had been a surplus as recently as 2023-24.

The data in the RBI's annual report for 2025-26, released on Friday shows that the BoP deficit grew in 2025-26 because of a sharp fall in net foreign investments into India, which compounded a widening trade deficit. The data for 2025-26 is up to December 31. Further, the deficit in 2025-26 was entirely paid for using the RBI's foreign exchange reserves, denting them significantly.

The overall Balance of Payments is a combination of the current account and the capital account.

The current account captures India's trade in goods and services as well as some cross-border financial transactions.

The capital account largely deals with investments, both direct and portfolio, external borrowings, external assistance, and asset transfers.

India generally runs a current account deficit (CAD) since it imports more than it exports. Over the last five years, this CAD has varied significantly, but came in at a three-year high of \$30.2 billion 2025-26. India's overall merchandise trade deficit — the amount that imports exceeded exports — stood \$251.6 billion in 2025-26, down from \$286.9 billion in the previous year.

On the other hand, the surplus on India's 'invisibles' trade, which includes the services trade, fell to \$221.4 billion in 2025-26 from \$263.9 in 2024-25.

In other words, the services surplus shrank more than the merchandise deficit did, meaning that the overall current account saw its deficit widen.

Capital concerns

In 2023-24, when India had a BoP surplus, this was because the surplus on the capital account was so big, it dwarfed the CAD. That is, the CAD was \$26.1 billion in 2023-24, but the capital account surplus was \$89.4 billion. As a result, the BoP surplus was \$63.7 billion.

This scenario did not play out in 2025-26. The capital account surplus that year shrank to \$72 million, down more than 99.5% over the \$16.6 billion seen in 2024-25.

The big reasons for this seems to have been Indians parking their funds abroad and payments related to trade, even though the financial year 2025-26 included just one month of the ongoing crisis in West Asia. The 'other capital' heading, which includes delayed export receipts, advance payments for imports, and net funds held abroad, stood at a deficit of \$22.6 billion in 2025-26, up from a deficit of \$7.4 billion in the previous year.

The other factor driving the capital account deficit was the outflow of foreign portfolio investments. According to the data, foreign portfolio investors (FPIs) pulled out \$4.3 billion more



in 2025-26 than they put in. This reversed the trend of the previous two years where FPI inflows exceeded outflows.

All of this data provides the backdrop for Prime Minister Narendra Modi's exhortation earlier this month for Indians to reduce their fuel consumption and gold purchases. India imports nearly 90% of its oil requirement, and does not produce any gold of its own, although its gold demand is very big.

As a result, a large part of the dollar outflows go in paying for oil and gold imports. The government earlier this month also hiked the import duty on gold and silver to 15% from the previous 6%, and also restricted the import of most kinds of silver.

CUT IN RBI'S RISK BUFFER RAISED DIVIDEND TO CENTRE BY RS 92K CR

The central board of the Reserve Bank of India (RBI) on Friday approved the transfer of a record Rs 2.87 lakh crore to the Centre as surplus — or dividend — for 2025-26. But it would have been much lower had the board not reduced a key risk buffer to 6.5% from 7.5%.

Key Takeaways:

- The RBI said its board decided to keep the Contingent Risk Buffer (CRB) at 6.5% of the central bank's balance sheet – which expanded 20.6% in 2025-26 to Rs 91.97 lakh crore — “taking into consideration the current macroeconomic factors, financial performance of the Bank and maintenance of appropriate risk buffers”. According to calculations by The Indian Express, had the CRB been maintained at the 2024-25 level of 7.5%, the dividend to the Centre would have been around Rs 92,000 crore lower at Rs 1.95 lakh crore.
- When the CRB is lowered, the amount the RBI must transfer to its Contingency Fund – a rainy-day fund meant to meet unexpected and unforeseen contingencies, including depreciation in the value of securities the central bank holds, risks arising out of monetary and exchange rate policy operations, and systemic risks – decreases. This raises the dividend payable to the Centre.
- Last year, the RBI had internally reviewed its Economic Capital Framework and the board approved widening the CRB range to 4.5-7.5% of the balance sheet from the 5.5-6.5% recommended in 2019 by an expert committee led by former governor Bimal Jalan.
- The Economic Capital Framework provides a rule-based system for the provisions the RBI must make against the risks it faces. These provisions are to be made from the revenue it generates in the normal course of its operations and after it has met its expenses. The Contingent Risk Buffer, or CRB, comprises the RBI's provisions to cover any potential risks — be it credit, operational, financial, or related to monetary stability — and is the proportion of the balance sheet that must be set aside as a buffer.

Do You Know:

- Over the years, the RBI's dividend has become an increasingly important source of income for the government and now makes up around 8% of its revenue receipts, up from around 5% a decade ago. And the increase in the dividend due to the lowering of the CRB to 6.5% will be an enormous source of relief to the government whose finances have been stretched by the West Asia war: a rise in the fertiliser subsidy bill, a hit to tax collections because of cuts to the reduction in



excise duty on petrol and diesel, and likely lower dividends from public sector oil marketing companies who are incurring heavy losses.

- This is the first time the RBI's board has ever reduced the CRB and comes after it was raised three years in a row. When the CRB is raised – as it was in 2022-23, 2023-24, and 2024-25 — the amount the RBI must transfer to the Contingency Fund increases. This reduces the dividend the Centre gets.
- In 2024-25, the RBI's balance sheet grew to Rs 76.25 lakh crore; 7.5% of this is equal to Rs 5.72 lakh crore, which was maintained across the various funds of the central bank: the Contingency Fund, Asset Development Fund, capital, and Reserve Fund. These four together make up the RBI's Available Realised Equity (ARE). ARE divided by the size of the balance sheet is equal to the CRB.

WHY INFLATION RATE IS NOT THE SAME AS AFFORDABILITY

The United States and Israel's war on Iran and the resultant spike in prices of crude oil and other products critical to the smooth functioning of the global economy have made inflation the main worry for policymakers across the world.

Key Takeaways:

- Between June 3 and 5, the Monetary Policy Committee of India's Reserve Bank of India (RBI) will deliberate on this matter. For its part, the Union government has as yet shielded average consumers in India from the full effect of the rise in international prices.
- But while policymakers are focused on containing the inflation rate, average consumers in India focus more on affordability. The notion is best captured in the worries of several consumers, who bemoan that "once prices go up, they never come down".
- In other words, consumers are often more worried about the cumulative effect of past price increases on their household budgets and overall affordability than just the inflation rate in a particular month.
- This difference between the two ideas is also at the heart of the so-called "affordability crisis" in the US and the cost-of-living crisis in the UK. In both countries, affordability, more than just the inflation rate, is also leading voters to change their political choices.
- The inflation rate is the rate at which the general price level rises from one year to another.
- Every country has chosen a representative basket of goods and services that its consumers use, and it tracks how the prices for this basket move. The year-on-year increase in this general price level is called the "headline" inflation rate, the one commonly referred to in policy debates.
- One way to assess whether one is better- or worse-off since the start of April 2014 is to compare incomes. If their income has gone up by 75%, then one is exactly where one was 12 years ago in "real" terms. If their income has grown by a lesser degree, then one is worse-off in real terms, and if the income has grown by a higher percentage, then one is better-off to that extent.
- On the inflation front, too, the RBI can't address the main reason for inflation: inadequate crude oil supply. Under the circumstances, all that the RBI can do is to constrain overall demand for goods and services among consumers by raising interest rates. Higher interest rates would slow down economic activity by making loans (be it for cars, homes or factories) costlier.



— In other words, if RBI wants to arrest inflation, it will have to drag down India's economic growth; an action that mirrors what the government is doing by raising fuel prices and urging people to consume less.

Do You Know:

— Inflation refers to the rate at which the general price level for goods and services increases over a period of time, causing a decrease in purchasing power of money or real income. In other words, as inflation rises, each unit of currency can buy fewer goods and services than before. There are different methods for measuring inflation such as Consumer Price Index (CPI), Wholesale Price Index (WPI), GDP deflator, and more, with each focusing on a specific aspect of price changes.

— CPI inflation, which measures the change in consumer prices of hundreds of goods and services in a given month compared to the same month in the previous year, is the most important economic indicator in the country as it directly influences the level of interest rates set by the Reserve Bank of India (RBI).

— The central bank has a legal mandate to target a CPI inflation rate of 4% in the medium term within a tolerance band of 2-6%. As such, if inflation is seen above 4% on a sustained basis, the RBI increases its policy repo rate to weaken demand and bring down inflation.

WHY SC ONLINE GAMING TAX VERDICT COULD BE A FINAL DEATH BLOW TO SECTOR

The Supreme Court on Wednesday (May 27) upheld the constitutional validity of the government's retrospective 28 per cent Goods and Services Tax (GST) levy on online gaming companies, delivering a massive setback to the country's real-money gaming sector.

Key Takeaways:

- The verdict effectively revives tax demands running into nearly Rs 2.5 lakh crore against gaming firms, fantasy sports platforms and casinos, and could well spell the end of the road for the online gaming sector, already reeling under a ban imposed by the government in 2025.
- A bench comprising Justices JB Pardiwala and R Mahadevan dismissed petitions filed by several gaming companies and industry bodies challenging the GST regime and retrospective tax notices issued by authorities. Companies like Dream11 and Games Kraft would be impacted by the judgment.
- The dispute centred around the gaming sector's contention that the 28% GST on online gaming should apply only prospectively, from 1 October 2023, after the amendments approved by the GST Council came into effect. After the GST council approved the new GST rate for the sector, the Directorate General of GST Intelligence (DGGI) had started issuing tax demand notices to such companies, which they alleged were being carried out on revenue earned before the new rates came into effect.
- Another contention put forth by the industry was whether GST should be imposed only on the platform fee or commission earned by gaming companies — known as gross gaming revenue (GGR) — or on the full face value of bets and contest entry amounts deposited by users. Gaming firms had argued that taxing the entire pooled amount was commercially unsustainable and contrary to the treatment of skill-based games. The court, however, has treated real money



gaming involving uncertain outcomes as betting and gambling for GST purposes, irrespective of skill elements.

Do You Know:

- Under the PROG Act, the government will prohibit any person from offering online games in India, failing which they could be imprisoned for up to three years, and penalised Rs 1 crore. Those promoting such platforms, such as social media influencers, will also face jail time of two years and a penalty of Rs 50 lakh. The government will also prohibit banks and financial institutions from facilitating financial transactions on such platforms. It applies to all online money gaming platforms irrespective of whether they are games of skill or chance, a distinction the industry had lobbied hard for in the past.

HDFC BANK 'CAMOUFLAGED' CRORES AS MARKETING SPEND TO PAY HIGHER INTEREST TO STATE FIRM

When Atanu Chakraborty abruptly resigned on March 18 as chairman of HDFC Bank, the country's largest private bank, citing "certain happenings and practices within the bank" that were not in "congruence" with his personal values and ethics, it didn't ring many alarm bells across the banking establishment.

Key Takeaways:

- The bank's newly appointed interim chairman, Keki Mistry, was quick to step in with a statement. "The bank has very strong ethics," he said on March 19. "I would never remain on the board if there were any issues with governance." He said board members had pressed Chakraborty for details the previous day but he "did not give any specific explanation."
- The Reserve Bank of India, too, moved just as swiftly. In a press statement the same day, it declared, "Basis our periodical assessment, there are no material concerns on record as regards its conduct or governance."
- What went undisclosed was that, just six days earlier, on March 12, the Audit Committee of the Board (ACB), under the chairmanship of M D Ranganath, had ordered a formal "Internal Vigilance Investigation" into payments totalling Rs 45 crore made to the Maharashtra State Road Development Corporation (MSRDC), a state government agency, during FY2024 and FY2025.
- This order came after an internal audit of the bank's marketing department, covering the period 2024-25, which had flagged these payments and rated the department's performance as "unsatisfactory."
- These payments, The Indian Express investigation, based on internal records, has revealed, were meant for MSRDC as "differential interest" i.e., interest over and above the specified rate, on its deposits. But instead of being credited directly to MSRDC's account as interest earned, they were routed through the bank's marketing department, disguised as contributions to a road safety awareness campaign through four local vendors.
- Significantly, records reveal that this payout was approved in the presence of HDFC Bank MD & CEO Sashidhar Jagdishan during senior-level discussions where a higher rate for MSRDC was "verbally" agreed upon. Many officials have testified in the internal probe that Jagdishan "participated in the call convened to examine how the bank could compensate MSRDC and was



part of the decision to provide the differential interest through the marketing budget as a one-off arrangement.”

- HDFC Bank Chief Marketing Officer Ravi Santhanam acknowledged in his testimony during the Vigilance probe that the marketing department acted as a “facilitator to camouflage differential interest reimbursement as marketing spend”.

- Significantly, the Vigilance probe report was sent to two top committees: Audit Committee of the Board (ACB) on April 10, and the Nomination and Remuneration Committee of the board a week later.

Do You Know:

- A code of ethics is a set of guiding principles and values designed to help professionals conduct business with honesty and integrity. It provides a moral framework for decision-making rather than dictating specific rules, ensuring actions align with socially acceptable norms.

ANTI-DUMPING DUTIES ON CHEMICALS A KEY ‘CONCERN’

Industry associations and several government ministries have begun pushing for a suspension or pause in anti-dumping investigations into several chemical intermediaries due to a surge in prices and shortages caused by the ongoing war in West Asia.

Key Takeaways:

- In April, the government exempted import duty on 40 petrochemical products till June 30, but it has begun fresh stocking efforts to ensure domestic availability of key chemicals. Many such requests are made to the Commerce and Industry Ministry by the downstream industry, such as the textiles and footwear sectors. An official said the Textile Ministry has also asked for a pause on several anti-dumping investigations on chemical intermediaries and deferment in anti-dumping duty investigation on input items such as elastomeric fibre yarn and viscose rayon filament yarn due to the war.

- India’s chemical manufacturers are the most protected sector in the country. An independent analysis of India’s trade policy during the last five years by the WTO Secretariat shows that 51% of all anti-dumping measures in force are related to chemical or allied industries, and Chinese products have been the top target of such investigations.

- Anti-dumping investigations have been a subject of deep divide between large manufacturers and the downstream sector, as anti-dumping duties typically protect large manufacturers abroad but lead to a surge in input item prices for MSMEs across the sector. The impact of such duties on the chemical sector particularly translates to high input prices, as chemicals are used in the production of nearly 80,000 downstream products in India, as per NITI Aayog.

Do You Know:

- An anti-dumping duty is a protectionist measure a government uses to safeguard its economy from foreign imports priced lower than their fair market value. This tariff aims to protect local businesses by preventing foreign companies from flooding the market with cheaply priced goods. However, while designed to protect domestic industries, these duties can also lead to higher prices for local consumers and might impact international competition negatively.



ON FERTILISER, CENTRE AND STATES MUST ALIGN POLICY

Prime Minister Narendra Modi wants Indian farmers to cut consumption of chemical fertilisers by 25-50 per cent, in order to conserve precious foreign exchange as well as protect the long-term fertility of Indian soils. However, the governments in Uttar Pradesh, Madhya Pradesh and Maharashtra are doing the opposite. All three — many more may follow — have decreed that manufacturers and suppliers of subsidised fertilisers such as urea and di-ammonium phosphate (DAP) cannot sell nutrient products where no government subsidy or price controls are in place. In other words, fertiliser companies can sell only those products whose usage is being discouraged by the Modi government. They have been banned from selling any bio, nano, water-soluble and liquid speciality fertilisers or micronutrients and bio-stimulants.

The ban orders are not only an example of the Centre and states working at cross purposes, but also of ease of doing business going into reverse. Most of the non-subsidised nutrient products being marketed by the likes of Iffco, Coromandel International and Yara Fertilisers are applied in low doses for high-value crops such as grapes, apple and pomegranate. Moreover, they are notified under the Centre's Fertiliser Control Order after field trials for bio-efficacy and toxicology conducted by the Indian Council of Agricultural Research. What incentive would companies have now to innovate and introduce such products that can deliver nutrients more efficiently either straight into the plant's root zone via drip irrigation or onto leaves by foliar application? If the Modi government is serious about weaning away farmers from urea and DAP — whose applied nutrients are more prone to volatilisation, leaching or locking in soils than being available for uptake by crops — it should crack down on states that are sending contrary signals to the industry and farmers alike.

India has enough land, water and sunshine for growing crops. But that's not the case with fertilisers, where it is overwhelmingly import-dependent. In 2025-26, the country's imports of fertiliser inputs and products were valued at about \$27.2 billion. The unresolved West Asia conflict and closure of the Strait of Hormuz could result in that bill even surpassing the 2022-23 high of \$33.4 billion post Russia's invasion of Ukraine. The current crisis is both a moment of reckoning and an opportunity to transform the existing product-specific fertiliser subsidy regime into an expanded PM-Kisan 2.0 direct income support programme. When fertiliser prices are market-determined, farmers will start using the right nutrients in the required quantities for their crops. And they will be enabled even more when guaranteed a minimum income per acre per crop.

LARGER, POORER STATES SET FOR HIGHER FUNDS UNDER NEW RURAL EMPLOYMENT SCHEME

Larger, poorer States are set to get higher funding under the Centre's new rural jobs scheme, with draft rules for the Viksit Bharat-Guarantee for Rozgar and Aajeevika Mission (VB-G RAM G) proposing to use the 16th Finance Commission's horizontal devolution formula to determine Central allocations. From next year, an unknown percentage of funding will also be allocated on the basis of how well States have implemented the scheme.

These are among the proposals laid out in a gamut of draft rules notified over the last two days for the VB-G RAM G law, which is set to come into effect from July 1, replacing the 20-year-old Mahatma Gandhi National Rural Employment Guarantee Act. Apart from the allocation formula, the rules address provisions for grievance redressal mechanisms, institutional and administrative



frameworks, and transitional provisions to govern the switchover from the UPA-era MGNREGA Act.

One of the key features of the VB-G RAM G legislation passed by Parliament was that it shifts away from MGNREGA's demand-based approach, which was meant to stretch the scheme's budget to match demand on the ground.

Further, while the Centre footed 100% of the wage bill under the MGNREGA, the VB-G RAM G has divided this expenditure between the Centre and States at a 60:40 ratio for most States.

In the draft rules spelling out the "objective parameters" for normative allocation to States under the new law, the Centre said that each fiscal year's allocation would be based on the "objective parameters used for horizontal devolution among States as recommended by the Sixteenth Finance Commission".

This devolution formula is based on metrics with different weightages, including the 2011 Census population, demographic performance, forests, area, per capita Gross State Domestic Product Distance, and contribution to Gross Domestic Product.

The maximum weightage is given to the GSDP Distance (42.5%), which measures how far a State's per capita GSDP falls short of the wealthiest States, effectively prioritising poorer States. The next highest weightage is given to population (17.5%), benefiting larger States, while all of the other metrics carry a 10% weightage each in this formula.

Performance matters

However, the draft rules added that a part of the normative allocation from the second year will be based on "performance criteria". This includes the "timely payment of wages", "compliance with social audit requirements", "percentage of completion of works", and "any other performance-related indicators" that the Centre chooses to notify.

The draft rules do not mention how much of the normative allocation will be based on these performance indicators.

The draft rules provide for continuing ongoing works under MGNREGA, settling pending liabilities, transferring records, and continuing worker rights during the transition period. It also notes that existing e-KYC-verified MGNREGA job cards will remain temporarily valid until new Gramin Rozgar Guarantee Cards are issued, while fresh works may also be opened if ongoing projects are insufficient to meet labour demand.

The draft rules also propose the terms to constitute the National Level Steering Committee, which will "recommend decisions relating to normative allocations to States", among other functions. This 16-member Committee, to be headed by the Union Rural Department Secretary, will also include at least five representatives from State governments nominated by the Centre.

WHY DID KERALA SCRAP THE SILVERLINE PROJECT?

The story so far:

On May 20, the United Democratic Front (UDF) government in Kerala decided to denotify the SilverLine semi-high speed rail corridor, championed by the previous Left Democratic Front administration. Chief Minister V.D. Satheesan said that the government was not against high speed



rail development as such, but that the SilverLine project was both “an environmental disaster” and “financially unviable”. He also announced that all the police cases registered against those opposing the project would be withdrawn.

What was the SilverLine project and why was it projected as a game-changer for Kerala’s transport sector?

The SilverLine project, estimated at ₹64,000 crore, was designed as a semi-high speed rail corridor connecting Thiruvananthapuram to Kasaragod over 530 km. Its objective was to cut travel time from nearly 12 hours to about four. The project was to be implemented by the Kerala Rail Development Corporation (K-Rail), a joint venture between the State government and Indian Railways in a 51:49 equity partnership. K-Rail was created in January 2017 to fast-track railway infrastructure development in the State. In 2021, the Kerala Cabinet granted in-principle approval for the SilverLine project and sanctioned some ₹2,100 crore to be raised through the Kerala Infrastructure Investment Fund Board (KIIFB) for land acquisition.

The proposed line was a standard gauge corridor, planned largely parallel to the existing railway network and mostly elevated on embankments. It envisaged trains running at speeds up to 200 kmph, with nine-coach rakes carrying around 675 passengers and serving 11 stations along the route.

Why did the land acquisition process trigger such intense public outrage?

The project required the acquisition of around 1,221 hectares of land and was expected to affect more than 9,300 structures, potentially displacing nearly 20,000 people. Residents in several regions complained of officials arriving to place survey stones without prior notice. Allegations of heavy-handed enforcement during surveys in places such as Kozhuvallur near Chengannur and Madappally near Changanassery fuelled tensions.

By October 2021, authorities had laid around 1,651 survey stones across 42.6 km in 14 villages under tight police protection. Protests, stone removals, police deployment, and legal action followed. The protests soon snowballed into a State-wide movement backed by Opposition parties, particularly the Congress.

What legal and administrative mechanisms were put in place to acquire land?

In August 2021, special tahsildar offices were set up across districts to oversee the process, followed by survey notices under the Kerala Survey and Boundaries Act, 1961 and acquisition proceedings under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. But the process turned controversial. Land parcels marked for acquisition were effectively frozen, leaving thousands of residents unable to sell, mortgage, or develop their properties for months. The project’s social impact assessment and acquisition procedures were challenged in courts. Faced with mounting resistance, the government unveiled a ₹13,265 crore compensation package in 2022, which promised up to four times the market value of land along with housing assistance. Critics, however, argued that this would further strain Kerala’s finances. Despite these assurances, protests continued, and the government attempted to resume surveys using geospatial technology.

What were the concerns over the technical and financial viability of the project?

First, the Detailed Project Report (DPR) projected a daily ridership of 80,000 passengers and annual revenue of ₹1,605 crore based on a fare of ₹2.75 per km, which many considered optimistic. Second, technical concerns also mounted over the decision to adopt standard gauge



instead of the conventional broad gauge network. Engineers flagged the alignment, pointing to hundreds of sharp horizontal and vertical curves that could limit sustained semi-high-speed operations. Third, while the DPR pegged the project cost at around ₹63,000 crore, a NITI Aayog assessment reportedly placed it closer to ₹1.25 lakh crore. Fourth, as the proposed corridor cut through ecologically fragile wetlands, bird habitats, and flood prone regions, experts warned that massive embankments could disrupt drainage patterns and worsen flooding during monsoon. Finally,

the Railways did not grant final approval to the project, citing incompatibility with existing infrastructure and concerns over future expansion of the national network.

What does the shelving of SilverLine mean for the future of K-Rail?

K-Rail is currently executing projects worth about ₹5,540 crore, including 66 railway overbridges, station modernisation at Thiruvananthapuram and Varkala, automatic signalling on the Ernakulam-Vallathol Nagar section, and implementation of the 'Kavach' train safety system. It also serves as consultant for KIIFB flyovers, Smart City projects, Kerala State Road Transport Corporation ticketing systems, and the Kochi Metro Phase II DPR, indicating that while the SilverLine project has been shelved, the institutional framework built around it remains active.

FOR INDIA, THE ENERGY CHALLENGE IS URGENT, STEP UP TO IT

The US war on Iran has prompted a rethink on the challenges facing the Indian economy. While most of the focus at present has been on the sharp fall in the exchange rate of the rupee, the rupee's fall isn't, by itself, the problem. It is, rather, a reflection of the more substantive weaknesses in the economy. The biggest one is India's high and rising dependence on energy imports. The initial response of austerity — urging people to work from home and other ways to conserve energy — could at best be a short-term fix. It is not a surprise that on his return from the five-nation tour last week, Prime Minister Narendra Modi held a meeting with his council of ministers to review the state of the economy and asked them to urgently explore alternative energy sources.

An economy such as India's that hopes to quadruple average incomes over the next 20 years will need all the energy it can get. For instance, according to the government's own data, between 2013-14 and 2023-24, per capita electricity consumption rose by 46 per cent. But while demand is growing fast, and is expected to grow faster, the supply of energy is a different story. Take coal, for example. India has one of the largest reserves of coal in the world and coal has remained the backbone of its energy supply, accounting for nearly 79 per cent of the total energy supplied domestically in 2024-25. Yet, the government admits in 2026 that the country has "experienced a steady dependency on imported coal over the last decade". The net energy import dependency — an indicator that measures the extent to which a country relies on imports to meet its energy requirements — for coal is more than 23 per cent. This dependence on imports is alarmingly high and rising when it comes to crude oil (almost 90 per cent, up from 85 per cent a decade ago) and natural gas (50 per cent, up from 40 per cent a decade ago).

When it comes to a shift to renewables, India is fourth globally in renewable energy installed capacity, fourth in wind power, and third in solar power capacity. But more needs to be done, and soon. Finally, beyond finding new ways to produce and source energy with a view to reducing import dependence, India must also relook at how it uses its energy. Can it shift to electricity (produced from domestic sources) for cooking food instead of using imported gas? Or so radically improve public transport that it reduces the need for cars? Those are the questions.



AIR POLLUTION CUT INDIA'S SOLAR POWER OUTPUT BY 9.6% IN 2023: STUDY

Aerosols in the air reduced the amount of solar power generated in India by 9.6% in 2023, equivalent to around 15 terawatt-hours (TWh), according to a new analysis published in Nature Sustainability. The same study reported that the global average loss due to the same cause in 2023 was 5.8%.

Between 2017 and 2023, pollution-related electricity generation losses from existing installations averaged 74 TWh a year — roughly one third of the electricity generated every year by new solar capacity.

According to the study, India's loss is one of the world's highest, with the most electricity generation potential lost in the country's heavily polluted north.

The researchers assembled what they called the first global facility-level database of solar photovoltaic generation and losses, totalling 1.4 lakh facilities worldwide. They analysed the numbers together with satellite data, atmospheric data, and machine-learning.

Aerosols are fine particles of sulphates and carbon, among other constituents, and they directly reduce the amount of sunlight reaching solar panels, thus undermining an important source of power meant to replace coal in India.

India's neighbour with an even bigger appetite for power, China, lost the most power generation potential in 2023, 61.3 TWh, but which was lower than India's as a fraction of the total generation (7.7%). In fact, China both illustrates the scale of the problem and a way through it.

China generated 793.5 TWh of solar electricity in 2023 and accounted for 54.9% of aerosol-related losses worldwide. Many of the country's solar farms lie within 30 km of coal power plants, increasing the former's exposure to pollution that blocks sunlight.

However, China reduced pollution-related loss of solar power by around 1.4% a year from 2013 to 2023 and at the same time it expanded coal power. It reduced the losses by retrofitting coal plants with high-efficiency filters that curtailed sulphur dioxide and particulate emissions.

A key technology in reducing these emissions is flue-gas desulphurisation (FGD), which removes sulphur dioxide from flue gas vented into the air.

India's aerosol-induced losses in solar power production did not decline from 2013 to 2023, staying flat. In 2025, the Indian government also significantly weakened a target to install FGD units by limiting them to coal plants near major cities and, on a case by case basis, plants in critically polluted areas.

WHY IS INDIA PUSHING FOR COAL GASIFICATION?

The story so far:

In a roadshow promoting surface coal gasification, Union Coal and Mines Minister G. Kishan Reddy said the technology, which can also yield a range of downstream products, has the potential to substitute imports worth up to ₹3 lakh crore. To encourage coal gasification, the Union Cabinet approved a ₹37,500-crore incentive package.



What is coal gasification?

Coal gasification entails the conversion of coal into synthetic gas, or syngas, which can be further used to produce downstream products such as urea, methanol, ammonium nitrate, synthetic natural gas (SNG), hydrogen, ether, and dimethyl, among others.

According to government data, India possesses approximately 401 billion tonnes of coal and about 47 billion tonnes of lignite. The rationale behind coal gasification is greater utilisation of these resources besides putting in place a sustainable mining method to produce the downstream products. This, the government believes, will reduce import dependence.

According to the Union Coal Ministry, India imports one-fifth of its urea requirement, almost its entire ammonia requirement, and approximately 80-90% of its methanol requirement.

The Ministry has set itself a target of gasifying 100 million tonnes of coal by 2030. With the recently announced scheme in place, the government aims to support the gasification of about 75 million tonnes of coal and/or lignite to reach its 2030 target.

Where does India stand with coal gasification at present?

Before the ₹37,500-crore package was announced this year, the government had approved an ₹8,500 crore package in January 2024. Of this, ₹6,233 crore has been disbursed to eight projects owned by private sector and public-sector undertakings. These include projects being executed through separate joint ventures of Coal India with Bharat Heavy Electricals and Gas Authority of India Ltd, and as well as Coal India's own project in Western Coalfields. Private-sector participants include companies such as Jindal Steel and Greta Energy and Metal.

The Talcher Coal-based Ammonia-urea complex is expected to be commissioned in FY2027-28. The others that include conversion of coal to syngas, ammonium nitrate, direct reduced iron, ethanol, and hydrogen are expected to be commissioned in FY2029-30. In April this year, in response to a query from The Hindu, the Ministry had stated that "in the coming months, more projects are expected to be sanctioned".

Where does India stand with respect to the technology for coal gasification?

Large-scale commercial deployment of gasification in India hinges on navigating issues such as the high ash content of coal, variability in its gross calorific value, and the presence of complex mineral matter, all of which can impede the gasification process. This is why fluidised-bed gasification is considered particularly suitable for Indian coal. The technology utilises a gas stream that lifts the coal out of ash, thereafter gasifying it with heat.

The high-ash content of Indian coal also differentiates the gasification technology that could be employed in India from that in other countries such as China, which is the world leader in gasification, Australia, or the U.S.

Another aspect relates to the adequate presence of indigenous technology. By their very nature, coal gasification projects are highly capital-intensive and involve long gestation periods. According to independent research by the Chintan Research Foundation (published March 2026), "Recent techno-economic assessments of circulating fluidised bed gasifiers in the Indian context indicate that capital costs constitute the largest share of syngas production costs, accounting for nearly 30% of the total production costs." Thus, financial viability becomes particularly



imperative. It is for this reason that the latest package, which provides financial incentives amounting to one-fifth of plant and machinery costs, is essential.

For perspective, state-owned Bharat Heavy Electricals Ltd has developed their pressured fluidised bed gasifier technology tailored specifically to handle the high ash content and variability of Indian coal. Additionally, according to Niti Aayog, its 16 facilities are capable of producing all the critical components required for gasification. In the private sector, Jindal Steel Ltd and Greta Energy and Metal have been able to indigenise about 80–90% of their production. Naveen Ahlawat, Head of Sustainability and Decarbonisation at Jindal Steel, said: “It (indigenising technology) will save costs; your project cost will come down by 30-40%.”

At its maturing stages, coal gasification may still require technological imports. It for this reason that industry has also sought the government’s consideration of exemptions from provisions of the Department for Promotion of Industry and Internal Trade for acquiring necessary technologies, especially from China. Officials said that the Ministry would support participants in securing clearances for technology imports, though the regulatory requirement will continue.

INDIA’S ONLY FUNCTIONAL GOLD MINE REAPS A WINDFALL AS INTERNATIONAL PRICES SOAR

The soaring price of gold in the global market alone has helped Hutti Gold Mines in Karnataka — the only functional gold mine in the country — earn a whopping ₹633.34 crore more in 2025-26, when the average gold selling price increased by 34.11%. The year also saw the highest average recovery grade in the last five years, with 2.61 grams of gold recovered per tonne of ore mined.

The average selling price of gold for The Hutti Gold Mines Company Ltd. — the State PSU at Hutti in Raichur district — during 2025-26, was ₹11,603 per gram, an increase by ₹3,958 per gram over 2024-2025 when the average selling price was ₹7,645 per gram. Owing to geopolitical factors, the gold price in India has been fluctuating, and the retail gold price fluctuated between ₹12,000 and ₹15,000 per gram.

The company produced 1,691.57 kg of gold, and earned a revenue of ₹1,910.62 crore by selling 1,521.36 kg of gold, data shared by the company shows. The profit after tax was ₹844.71 crore.

Hutti’s gold production meets less than 1% of India’s annual demand for gold that is estimated to be over 700 tonnes. The company also produced 145.76 kg of silver as a by-product of the gold ore beneficiation process, and sold 131.59 kg at an average price of ₹1,58,750 per kg during the year.

The spurt in the gold price has brought a windfall to the company as it saw its revenue increase by 42.23% and net profit nearly double over the previous year. The total revenue increased from ₹1,342.90 crore in 2024-2025 to ₹1,910.62 crore in 2025-2026.



LIFE AND SCIENCES

CHANDRAYAAN-2 IDENTIFIES 'POSSIBLE PRESENCE' OF ICE IN LUNAR SOUTH POLE

Nearly six years after it was launched, India's second moon mission Chandrayaan-2 continues to provide valuable data on the satellite.

In a new finding, scientists have found the possible presence of sub-surface ice in the Lunar South Polar Region. These were the findings of scientists from the Physical Research Laboratory (PRL) who used observations from the Chandrayaan-2's Dual Frequency Synthetic Aperture Radar (DFSAR) payload.

In this study, the scientists focused on doubly shadowed craters, which are special craters located in permanently shadowed regions (PSRs) of the moon.

Due to continuous shielding from sunlight and thermal radiation, these regions remain extremely cold (temperatures -25K) and are considered favourable locations for preserving water-ice over long geological timescales. Using advanced radar polarimetric analysis, the scientists identified radar signatures consistent with the possible presence of sub-surface ice beneath the floors of four doubly shadowed craters in the lunar South Polar Region.

"Among the investigated craters, one crater of 1.1 km diameter within the Faustini crater shows particularly strong evidence of subsurface ice, supported by both radar observations and distinctive lobate-rim morphological characteristics," the ISRO added.

The findings are expected to have significant implications for future lunar exploration missions.

OUTER CORE: UNAFRAID OF DRAMA

The earth's outer core is a voluminous liquid layer that lies around 2,800 km beneath the surface. This hot, churning sea is filled with molten iron and nickel.

As the outer core moves constantly, it acts like a large generator, creating the planet's magnetic field, which shields the earth from harmful solar radiation.

Researchers from the University of Edinburgh and the British Geological Survey have reported that around 2010, the liquid iron in the outer core below the equatorial Pacific Ocean changed direction from a slow westward crawl to a more rapid eastward surge.

They found this after mapping 27 years of iron movement in the outer core using data from ground stations and four European satellites. They identified two important patterns in the flow.

The main pattern accounted for 95% of the movement: it consisted of a steady flow westwards — which also explains why the earth's magnetic field has historically drifted west. The second pattern revealed the dramatic shift in 2010. The researchers also found that this shift began to weaken around 2020.

The researchers were able to link the 2010 reversal to seismic and geodetic shifts in the earth's solid inner core. According to their model, the flow is also roughly 10% lopsided between the northern and the southern hemispheres.



These details could explain sudden 'jerks' in magnetic field readings and suggest that deep-earth liquids can change direction much faster than the traditional theory predicts.

PENTAGON AT ODDS WITH SPACEX OVER STARLINK PRICE HIKE DURING IRAN WAR

Background

The United States launched a bombing campaign against Iran on 28 February, deploying LUCAS suicide drones — cheap kamikaze drones comparable to Iran's Shahed — guided by SpaceX's Starlink satellite network. The Pentagon uses a military-specific variant of Starlink called Starshield, acquired under a 2023 agreement, which can connect to both commercial Starlink satellites and a separate, more secure Starshield constellation.

The Pricing Dispute

Within weeks of the campaign starting, SpaceX executives met Pentagon officials and argued that the military had been paying approximately \$5,000 per terminal connection, while actually using a higher-tier service worth around \$25,000. SpaceX's position was that drone operations aligned with its aviation-tier subscription rather than the lower-priced land or mobility tier. The Pentagon countered that the \$25,000 monthly fee was designed for aircraft, not kamikaze drones that used connectivity for just minutes or hours. Despite this objection, the Pentagon ultimately agreed to pay the increased price, nearly doubling the cost of each LUCAS drone from around \$30,000 to approximately \$55,000.

The Direct-to-Cell Row

After Iran confiscated the 6,000+ Starlink terminals that had been smuggled in to help citizens bypass government communication blackouts, the Pentagon began discussions with SpaceX about deploying direct-to-cell service — a 5G-like capability requiring no ground terminals. SpaceX proposed charging up to \$500 million to launch the capability, plus a \$100 million monthly operating fee, causing alarm among defence officials.

Musk's Public Contradiction

On 1 March, Elon Musk publicly posted on X that using commercial Starlink terminals in weapon systems violates the platform's terms of service and is shut down when discovered, directing attention to the Starshield programme instead. The Pentagon denied any violation of its agreement with SpaceX.

Wider Implications

The disputes highlight several key concerns:

- **Growing leverage:** Unlike traditional defence contractors, SpaceX has a large commercial market and generates only about 20% of its revenue from the US government, giving it considerable leverage. Analysts note the government is effectively "over the barrel."
- **No viable alternative:** No other company currently offers a comparable satellite connectivity service, leaving the Pentagon with little negotiating power.
- **Precedent from Ukraine:** Similar risks emerged during the Ukraine war when Musk ordered Starlink switched off in areas where Ukrainian forces were advancing, disrupting



counteroffensive operations. US Navy tests were also disrupted by a global Starlink outage last summer.

- **IPO timing:** These disputes are occurring just ahead of a SpaceX IPO expected next month, with the company seeking to boost revenue.

The Pentagon stated it is working to find alternative suppliers, but none currently offer a comparable alternative to Starlink.

TECH NEEDED TO CREATE MATTER FROM LIGHT IN PLACE

Matter can become energy. You might have seen this in the film *Oppenheimer* or in videos of nuclear explosions. Just as the nuclei fuse, a blinding light fills the air and sky, so bright that simply closing your eyelids does not help.

Physics allows physicists to do the opposite as well: to create matter from light. The problem is the scale at which the required technologies need to work. Scientists need to pack a great quantity of light into a really small volume of space, and hold it there for long enough for the light to 'condense' into matter.

Specifically, scientists need to create extremely intense electromagnetic fields (photons are packets of electromagnetic energy).

Recently, researchers from Germany, Ireland, the U.K., and the U.S. reported clearing a key technical hurdle on the path to doing so. Their findings were published in *Nature*.

The theory that describes how light and matter interact is called quantum electrodynamics (QED). Normally, empty space appears empty. But at extremely high energy, QED predicts that a sufficiently powerful electromagnetic field can stir up a pair of subatomic particles from the vacuum. The problem? The strength of the electromagnetic field required far outpaces what current technologies can achieve.

In the new study, the researchers used a different technique. They fired an extremely intense laser pulse at a polished target, immediately parting the atoms in its surface of all their electrons. The electric field in the laser light set the electrons oscillating back and forth at nearly the speed of light. This caused the target's surface to reflect the laser pulse in multiple copies at higher frequencies, called harmonics. Physicists have hoped to further compress these harmonics and focus them into small spots. Such coherent harmonic focusing (CHF) would make the harmonics extremely intense, approaching the levels required to create matter.

But while the idea has been around for two decades, physicists have struggled to realise it efficiently. Previous experiments produced harmonics but with much less energy than in the original pulse.

A pulse's intensity increases from the leading point to its middle, roughly. The time taken for the pulse's peak intensity to enter the target is called its rise time. The authors of the new study reduced the rise time to well under one-trillionth of a second. At peak performance, then, the experiment generated enough energy within the 12th to 47th harmonics to show for the first time that the efficiency required by theory may be within reach.

The authors have stressed that they have not yet demonstrated the final focused state, only that the essential technical ingredients are now in place. At the next generation laser facilities that the



U.K. and China, among others, are currently building, the technique is projected to reach an intensity of 1029 W per sq. cm — the threshold where QED effects become apparent.

“The reward would be access to a new regime of physics, where light becomes strong enough to tear down the vacuum and create particles from nothing,” Alexander Pukhov, of the University of Dusseldorf and who helped lay the foundations of CHF, told Physics.

THE PHYSICS OF THERMOMETERS, TEMPERATURES AND COLD ATOMS

People from Bengaluru should not be allowed to complain about their weather turning hot. The other day, as a namma friend called to express disappointment over their daytime temperatures reaching as high as 33 degrees, I wondered in what Awadhi words should I inform her about the pleasant 42 degrees here in Kanpur. The baked earth, the breezily burning air and the blindingly bright sunny afternoons are clearly things she would not be missing.

Even while you drink a glass of nimbu paani to cool yourself, have you ever wondered: what does a ‘degree’ really mean? By that I don’t mean your qualifications, but just the temperature. Also have you ever thought how does one even measure it?

Units of temperature

The standard unit of temperature is called Celsius, named after Swedish physicist Anders Celsius who designed some of the early thermometers. But there is a fundamental catch with measuring temperature. While we can feel anxiously hot or depressingly cold depending on the weather or global news, one challenge in measuring temperature is defining the zero for it. After all, unlike the number of gas cylinders or valid ID cards – can you really count them on your fingers, and say when you have ‘zero’?

To define this zero – we use one of our common day magical materials – water. So, how does water help decide this? To proceed, we need to understand what temperature really is.

Temperature is a way of estimating how hot something is. Now when we heat a material, what we are really doing is making the atoms and molecules of that material more and more restless. They shake more and more vigorously as we pump in energy. Similarly when we cool something we make the atoms more sluggish, that is, we take away their energy. Not very different from us. So can we really continue to heat or cool something as long as we want?

Turns out the answer is no. For a while, the material may decide to get heated or cooled, but at some point it may decide to completely change its character. This is called a phase transition. You see this everyday. When water is kept in a refrigerator, it would first start cooling and appear as - just colder water.

But at some point, it won’t cool as a liquid - but will start turning into ice, which as we know is a solid. This “temperature” at which water turns to ice was named ‘zero’ degree Celsius. Similarly, when water is heated, it gets hotter and hotter until it starts boiling and turning into vapour. After this particular “temperature” after which the water cannot get hot anymore – was named ‘100’ degrees Celsius.

Therefore the zero and 100 of temperature was marked and divided into a hundred divisions so that we can measure everything else in these units. It is on this scale that our body temperature is 37 degrees Celsius. There is another popular scale — Fahrenheit, where zero and 100 is marked



using a different protocol. On that scale our body temperature is supposed to be 98.6 degrees Fahrenheit. In 1948 physicists finally decided to use Celsius as a standard unit.

Now that we have defined zero and 100 of temperature, the next question is how do we measure it? Here comes another magical material —mercury, no — not the planet.

Mercury thermometers

Mercury is a metal, like iron or aluminium, i.e., which conducts current and shines, but unlike our metallic utensils or spoons, it is in a liquid state. Now most metals expand a bit when heated. This is because the atoms within the materials tend to get away from each other when they are hot. But one of the most amazing properties of mercury is that it expands only as much as it is heated. Think of it like a rod whose length changes depending on how hot it is. So we have found the measurement trick.

The idea is simple: put mercury in a glass bulb attached to a tube. Keep the bulb in a bucket of ice. See the level of mercury in the tube and mark it as zero. Now put the same bulb in boiling hot water. Mercury will expand and the level will rise in the tube. Mark that new level as 100. Use your favourite scale to equally divide the distance between the two marks into 100 divisions. And you have a thermometer. Now you can put this thermometer in your favourite soup, or soil, or your mouth to measure how much the mercury expands to tell you what the temperature is!

In fact, this is how regular thermometers used to look until a few years ago, when phones were still non-smart. Most of the school going students today may not have seen these thermometers. They could easily break for no good fault of ours and would lead to a huge hue and cry from the adults nearby.

But in any case, mercury thermometers, then, could be found in every household. But as the quantity of greenhouse gases, global temperatures, homes, gadgets, and governments changed – our thermometers changed too.

Digital thermometers

So to measure temperature, one basically needs a material which changes its behavior depending on how hot something is, and whose change of behavior can be measured accurately. After all, measuring something correctly is fundamental to all of science. This branch of physics which specialises in the principles behind measurements is called metrology.

With advances in condensed matter physics — the physics of materials — physicists created a new class of materials called semiconductors in the 1950s. Semiconductors are neither metals (i.e. conductors) like aluminum or copper, nor insulators (i.e. things which do not conduct current) like glass or wood. Hence the prefix “semi”. They conduct a small amount of current, but the amount of current they carry can increase if the temperature rises.

This is because semiconductors have a rather interesting arrangement of atoms and electrons.

In metals, electrons move freely from atom to atom, like a soup - so they can easily conduct electricity whenever a battery is attached. In insulators, the electrons are tightly bound to the atoms. So even when a battery is put - they refuse to budge. In semiconductors, electrons are loosely bound to the atoms. They mostly stay close to atoms, but when the atoms become agitated due to heat, they shake off these electrons. These “free” electrons can now move and create an electrical current.



Now when a battery is attached to a semiconductor and if the temperature rises, the atoms shake more vigorously and more electrons are made free. So the hotter the surrounding is, more current will be generated and if we can measure that current we can find what the temperature is!

This is what happens in a digital thermometer which you find in your homes now – with 70 years of technological progress, humans have perfected the art of measuring changes in currents and voltages.

Absolute zero and cold atoms

Now, even while water turns to ice at zero degree celsius – the atoms in the ice are still shaking, though more slowly. Now if we continue to take away their energy even further, is there a point where it can essentially have “no” energy? What temperature would that mean?

That temperature is now defined as the Absolute zero - in another unit called Kelvin (K): the scientific unit of measuring temperatures. In terms of Celsius, this means -273 degrees Celsius.

When temperatures fall to just a few Kelvins, they become even harder to measure. We cannot use our mercury or semiconductors to measure them, since the properties of these thermometers themselves would change completely.

In fact, even atoms themselves become very funny at these temperatures and we need to use the whole power of quantum mechanics to understand them. Study of such atoms at ultra-low temperatures is cold-atomic physics.

Bose and his condensate

Atoms, in general, can be considered as one of the two types of personalities. One: ‘fermions’ type, where they do not like to stay together in one room. And another: ‘bosons’ where they like to all stay together whenever given a chance. ‘Bosons’ is named after Satyendra Nath Bose, an Indian physicist. In 1924, he first theoretically predicted the statistical behaviour of these ‘bosons’.

Many cold atoms are bosonic in nature and when they reach temperatures very close to zero Kelvin they form an exotic phase of matter called the Bose-Einstein Condensate (BEC), named after Bose and Albert Einstein. In 2001, three U.S. scientists Eric A. Cornell, Wolfgang Ketterle and Carl E. Wieman were awarded the Nobel Prize in Physics for achieving the BEC in experiments at a temperature of 20 nanoKelvins (nK). 1 nK is 0.000000001 Kelvin, just slightly above Absolute zero.

So, the next time when the heat bothers you, whether in Bangalore or Kanpur, and you call a friend to complain about the rising temperatures – don’t forget to express gratitude to the long, illustrious line of thermometers that have accurately measured temperatures for you.

SEA LEVEL: HANDS ON A SKATER

A new study in JGR Solid Earth has suggested that climate change is changing the distribution of water and ice in a way that may be affecting how long one day is on the earth more dramatically than scientists expected.

The study’s authors, from Austria and Switzerland, analysed palaeoclimate records going back 3.6 million years along with a new deep-learning method to understand how the sea levels changed over time.



Just as a spinning skater can slow down by extending their arms, changes in the distribution of water between the oceans and the ice sheets can, in small ways, alter how fast the earth rotates.

Scientists have long known that the moon, the earth's atmosphere, and even processes deep underground influence the length of day. The contribution of climate change however remains poorly understood.

In the study, the researchers combined climate models with proxies for the earth's past climate, including geological evidence from fossils, to estimate the sea level at various points of time since the Late Pliocene epoch. According to the team, modern climate change may be increasing the length of day at a rate among the fastest in the last 3.6 million years: around 1.33 ms per century. That is roughly 13 microseconds per year. This is just the climate-induced component of the change. At this pace, it would take around 75,000-80,000 years one day to become one second longer. Of course, in the meantime, the rate at which a day is lengthening may also increase.

BLOWING COLD AND HOT

When the temperature climbs to the mid-30s after a cooler weekend, does the heat feel worse?

Yes, and the reason is not just psychological. Researchers know of at least three reasons.

First, the human body adjusts surprisingly quickly to temperature. However, this also means that after even one or two cooler days, you may lose a bit of heat adaptation as your blood vessels are less prepared to expand and you may sweat less readily. So then, when the temperature jumps back to the mid-30s, the heat can feel more aggressive.

Second, humans perceive changes by comparison. A 35 C day after several 30 C days can seem manageable but after two 29-31 C days, it can seem oppressive. The reason is that your nervous system is assessing the temperature according to the most recent baseline.

Finally, you may be sensing changes in temperature as well as humidity. After cooler days, humidity, cloud cover, wind, and the overnight minimum temperature also often change. A still, humid 35 C after pleasant weather can strain your body more than a dry and breezy 37 C after pleasant weather.

EUROPE HEAT WILL ABATE SOON, BUT EL NIÑO LOOMS

Large parts of western and central Europe are in the grip of an extraordinary heatwave phase, with many places registering temperatures 10 to 15 degrees Celsius higher than normal. Both the UK and France have recorded their highest ever temperature for May. Other countries, including Italy, Germany, Switzerland and Spain, have also been reporting unusually high temperatures.

Key Takeaways:

- A warm spell in May is not entirely unusual for western Europe, but the average temperatures during this time usually hover around 20-22 degrees Celsius. This week, however, several places have seen temperatures above 35 degrees Celsius — unprecedented for this month.
- The prevailing heatwave has brought back uncomfortable memories of the unprecedented summers of 2022 and 2023 when temperatures in excess of 40 degrees Celsius were recorded at



many places in Europe. A large-scale drought in 2022, the worst in living memory, and the record-breaking temperatures in both years resulted in the deaths of tens of thousands of people.

- Things are not that bad right now, but this is just the month of May. The core summer months in Europe happen to be June and July, and it was in these months that most of the record-breaking temperatures in 2022 and 2023 were reached.
- Incidentally, the extreme European heat of 2022 coincided with a very strong La Niña phase in the equatorial Pacific Ocean, which tends to have a cooling impact on the planet. This year, an opposite phenomenon, a strong El Niño, which has a warming effect, is taking shape.
- El Niño and La Niña are two distinct phases of a large ocean-atmosphere interaction over the Pacific region that influence weather patterns worldwide.

Do You Know:

- The unusual heat in Europe right now is being attributed to the formation of a “heat dome” that is preventing warm air near the ground from rising and dissipating. This is leading to an increase in surface temperatures.
- Heat dome’ is just a fancy way to describe how heatwaves normally occur. Heatwaves anywhere, including over India, are caused by the emergence of high-pressure air systems in the mid-troposphere, about 7-10 km above Earth’s surface, that trap the heated surface air near the ground. They push down the air and compress it, increasing the temperature in the process.
- This same system also prevents cloud formation and precipitation. Local influences can then amplify or weaken this phenomenon. For example, the heat dome effect over India often gets aggravated by the presence of dry soil, the “urban heat island effect” and the movement of hot air blowing from the deserts in the west. The urban heat island effect is a phenomenon where urban areas record higher temperatures than surrounding rural areas because their concrete traps heat during the day and radiates it at night.
- The formation of a heat dome is not an unusual phenomenon in European summers. This year, however, it has happened a little early, resulting in an extremely warm May — possibly the warmest May in several places.
- The Climate Prediction Centre of the US’s National Oceanic and Atmospheric Administration, one of the world’s most authoritative agencies tracking the Pacific Ocean, however, says it is too early to make any reliable prediction about its strength.

GOOGLE’S NEW ‘INFORMATION AGENTS’ ARE A PRIVACY AND WEB INFRASTRUCTURE PROBLEM

At its annual developer conference a few days ago, Google unveiled something called information agents, a feature that will be built into Search to monitor the web on your behalf. This bot’s feature will continuously scavenge the web for updates you’ve told it to watch for. It sounds genuinely useful, and it probably is. But it also raises serious questions around user privacy, web traffic and concentration of data on one platform. For starters, this type of agentic feature works best when the user gives the agent details about themselves. To monitor housing listings on your behalf, it needs your location preferences, budget, family size, commute constraints, and timeline. If you



want to plan your travel and stay during a vacation, you will end up sharing your personal and financial details with the bot.

The simple rule with these agents is that the more you tell them, the better it works. That means Google will be able to build a more intimate profile about you.

The company already sits across your search history, Gmail, Calendar, Maps, Chrome, YouTube, and Android. Information agents are designed to sit at the intersection of all of those applications, connecting them in a way that's different from what any single Google product does today.

Data and privacy

In that process of connecting multiple applications, these agents will pick several bits of data from the user, which in turn can be used as feed for the massive ad tech industry.

A prompt to an agent for a specific type of house in a particular area will include details about financial position and location details. And this information will very likely be stored indefinitely.

In terms of what people ask AI agents, we have only scratched the surface. As more use cases emerge, people may end up sharing a lot more sensitive, personally identifiable data like religious and political views, sexual orientation, medical history, and financial behaviour.

At this point, it is unclear how Google plans to use this data and how long it will keep it on its systems. The company has said that, when it comes to agentic commerce and payments, buyers' data will not be shared with the sellers. But that's a narrow assurance for a significant issue.

Google is not the only player in this race, as other AI companies are building similar personal intelligence systems. But Google is unrivalled when you look at the company's comprehensive data infrastructure.

Web traffic will accelerate

Apart from data management and user privacy concerns, information agents can also accelerate automated traffic on the internet.

According to the Thales 2026 Bad Bot Report, bots now account for 53% of all global web traffic. That means the majority of activity on the internet is no longer human.

AI-driven bot attacks specifically surged 12.5x in 2025, and daily blocked bot requests jumped from 2 million to 25 million in a single year, per the report.

Information agents will worsen this trend. For instance, a normal Google search triggers one crawl when you hit enter. But an information agent monitoring apartment listings or stock prices triggers potentially hundreds of automated fetches per day, every day, on behalf of every user who sets one up.

Now, multiply that across millions of Google AI subscribers and you have an enormous, continuously crawling load placed on third-party websites that never agreed to host it.

For publishers, this could be brutal as the traffic from AI-driven searches will hardly lead to click-throughs. They will have to carry the server costs of being crawled as their content gets harvested and synthesised into answers. This could potentially lead to publishers blocking Google's crawlers entirely — a change that could degrade the quality of agents themselves.



In the hands of a few

The feature also deepens Google's position in the AI market.

If you build a sophisticated set of agents monitoring your housing search, financial watchlist, and health queries, all running inside Google's ecosystem on Google's models with data in Google's infrastructure, switching away from Google becomes a genuinely costly exercise.

There's a liability question too. If a Google information agent nudges you toward a financial opportunity and you act on it and lose money, no regulatory framework currently exists for recourse. The agents are framed as assistants, not advisors.

And then there's who gets access in the first place. Information agents launch exclusively for Google AI Pro and Ultra subscribers, meaning wealthier users get persistent AI scouts monitoring the web on their behalf while everyone else searches manually.

If these agents become as consequential as Google is suggesting, that will widen the informational divide.

Others are in the race

Google is not alone in building persistent, always-on agents. Perplexity already offers autonomous multi-model agents on its top tier. Microsoft has embedded monitoring agents across Outlook, Teams, and SharePoint. Meta is building ambient AI into WhatsApp, Instagram, and Facebook.

Every major AI company is converging on the same model: agents that watch the world for you, indefinitely. That means data accumulation, web scraping, and publisher revenue erosion. So, the question isn't whether to accept them from Google specifically, but whether anyone has a plan for what the internet looks like when it's mostly machines talking to machines.

PILGRIMS CONGREGATE ON MOUNT ARAFAT AS HAJ REACHES PEAK

Muslim pilgrims from around the world congregated on Mount Arafat in Saudi Arabia on Tuesday, the second official day of the annual Islamic pilgrimage, considered the pinnacle of Haj.

Despite the sweltering heat, the pilgrims gathered on a rocky hill and surrounding plains for intense prayers that often mark a spiritual peak. Typically, they fervently murmur prayers and pour their hearts out in supplications, asking God for forgiveness, mercy, blessings and good health. It is common for many pilgrims on that day to raise their hands in worship, with tears streaming down their faces.

Hajj, one of the Five Pillars of Islam, is required once in a lifetime for every Muslim who can afford it and is physically able to perform it.

For pilgrims, Haj, performed over several days, can be a deeply moving spiritual experience and a chance to seek God's forgiveness and the erasure of past sins. As they brave the intense heat to perform religious rituals, many pilgrims have been using umbrellas for shade.

A Saudi official said on Friday that more than 1.5 million pilgrims have arrived in Saudi Arabia from outside the country.

Hajj brings together large numbers of Muslims of diverse races, ethnicities, languages and economic classes, creating a sense of unity for many. It's a mass, communal experience, with

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



Muslims performing rituals together. But it is also deeply personal as every pilgrim brings their own yearnings and experiences.

DOG BRAINS SHRANK SIGNIFICANTLY BY 5,000 YEARS AGO, THANKS TO HUMANS

Domestic dogs have significantly smaller brains than their wolf ancestors. Researchers have long known that dogs' brains shrank in the past, but when has been a mystery. Some theories also argue that strict aesthetic standards and intensive, selective modern breeding over the last 200 years could have been the cause.

In a new study, researchers from Europe have suggested that canines' brains had already shrunk by at least 5,000 years ago — and possibly due to human interference.

During the Upper Pleistocene period, around 35,000 years ago, and long before humans started settled agriculture, dogs and wolves had similar brain sizes. This was around when humans and dogs began to interact more often. But by the Late Neolithic period, around 5,000 years ago, by when agricultural societies had become widespread, dogs living in Western European settlements had brains nearly 46% smaller than those of wolves at the same time, the researchers reported on April 29 in Royal Society Open Science.

They noticed this shrinkage in the remains of dogs in a Middle/Late Neolithic site in Chalais in France.

This study provides “new evidence” for the evolutionary reduction in the brain size of dogs that correlates with their domestication, Ian Kuijt, a zooarcheologist at the University of Notre Dame in Indiana, who was not involved in the research, said.

“It is fascinating to see the overall trajectory, even if this is a very small sample,” he added.

Virtual endocasts

To trace how dog brains evolved, Thomas Cucchi, a bioarchaeologist at the French National Centre for Scientific Research (CNRS), Paris, and his colleagues and peers analysed the skulls of 185 modern and 22 prehistoric wolf and dog specimens. The specimens included two dog-like animals from about 35,000 and 15,000 years ago, and Late Neolithic wolves and dogs from about 5,000 to 4,500 years ago.

The researchers used this data to create virtual endocasts — models of the space inside the skull where the brain once sat.

Even though, the brain decomposes rapidly after death, the skull's inner cavity preserves an imprint of the brain's size and general shape, so the endocast served as a proxy for the brain, Eniko Kubinyi, a biologist at Eotvos Lorand University in Hungary and another author of the study, said.

Using the volume of these endocasts and the skull size, the team could track how brain size, relative to body size, changed at different points of time.

Disproportionate drop

As humans transitioned from hunter-gatherers to a settled lifestyle around 5,000 years ago, dogs in Western European farming settlements adapted as well, becoming widely domesticated as a result.



Dogs face pressure to evolve from predators, foraging, and mating, but domestication relaxes all of them. The high energy cost of neural tissues combined with the lower cognitive demands of a captive environment results in smaller brains in domesticated animals.

That said, the researchers found that dogs' brains shrunk disproportionate to the drop in their body sizes — so much so that their brains were as big as those of Chihuahuas and pugs today. The researchers did note that the samples from Chalain alone were based on eight to ten dogs, meaning the findings from here alone cannot be generalised.

Previous studies have suggested that when brain size drops drastically, brain regions are reorganised. Often, this means a smaller cortical brain — which is responsible for learning, self-control, and cognitive ability — and a larger subcortical brain, which is involved in controlling emotions, Dr. Cucchi said.

Extrapolating from neuroanatomical research and studies of modern breeds, the researchers also suggested that the reorganisation resulted in dogs that were likely less trainable but more anxious, fearful, and prone to barking. Since small-brained dogs are more temperamental and wary of everything, they could have served the purpose of alerting humans to unusual activities nearby, Dr. Cucci said by way of one example of a role they could have played.

Dr. Kuijt noted that dog skulls and mandibles had also been found in refuse pits, meaning they were likely used as food as well.

“The link with changing temperaments serving as an alarm system is an intriguing speculation, but of course inferring behaviours from the archaeological and palaeontological records is challenging,” Michael Buckley, a bioarchaeologist at the University of Manchester, who was not involved in the study, said.

A dingo story

The study also examined dingoes, the East Asian dogs introduced to Australia and which returned to the wild at least 3,300 years ago. They have since been living largely independent of humans. Despite this long separation, dingoes' brain volumes are between the smallest and largest-brained modern dogs, and larger than village dogs of comparable skull size.

According to experts, this suggests living as a free-ranging apex predator and facing the cognitive demands of hunting and survival without human support may have exerted some positive selection pressure favouring larger brains.

However, dingoes have not regained the brain size seen in wolves.

Even though dingoes could grow a larger brain, Dr. Kubinyi said, “brain tissue is metabolically very costly [to maintain], so brain size is unlikely to increase without strong selection pressure.”

Since dingoes do not rely on cooperative hunting against large and dangerous prey the way wolves do, “it seems that dingoes do not need a larger brain for their survival,” she added.



WHEN DOES PURPOSEFUL WRITING EVOLVE IN CHILDREN?

The story so far:

Most of us have seen a two-year-old child hold a crayon and scribble. In most cases, school educators see that a kindergarten child can grip a pencil and therefore encourage them to write. But we need to assess if the child writes without pain and fatigue. Most importantly, does the child enjoy writing at this age?

In what stages does purposeful writing evolve?

At 1-2 years, the palmar grasp is established, and the child uses the entire arm movement to scribble. At 2-3 years, the child can rotate the forearm. The child can now hold the pencil with fingers, but the shoulder still dominates when writing. Between 3 and 4 years, the four-finger grasp is established. The child uses all fingers except the little finger and can draw a fairly straight line, an incomplete circle, and may colour within a picture outline.

At 4-5 years, the grasp improves and becomes a three-finger grip. The pencil is held between the thumb and index finger, while the middle finger supports it from below. The ring and little fingers rest on the writing paper. However, the movement depends on the wrist since the finger muscles are weak. At this age, a child can write, but doing so for a long period will result in pain in the hand, elbow, or shoulder.

The middle finger may hurt since it supports the pencil. The thumb or index finger can hurt due to the pressure of holding the pencil firmly for a long time. The elbow may hurt because of constant bending and pressure on the writing surface. The shoulder may be painful because the muscles around it must continuously contract to keep the elbow in position.

What are the mechanics of writing?

Writing requires coordination of many nerves, muscles, and joints. We can start with shoulder stability. You will notice that your shoulder barely moves while writing.

The elbow moves only sideways, helping the hand move across the page. This movement often happens in the air and sometimes with support from the table or another surface. The wrist, too, holds its position and does not bend sideways as the hand moves from left to right. Only the thumb and index finger actively move. The other fingers move along without any movement in and of themselves. This is just what happens in the upper limb.

Writing is controlled by the brain. Here enters the hand-eye coordination, the child's memory of the shape of letters, the sequence of letters, and, more importantly, attention and patience.

What is the difference between circle and alphabet drawing?

The Centers for Disease Control and Prevention (CDC) in the U.S. lists that a three-year-old "draws a circle when you show the child how to do it". When drawing a circle, the shoulder rotates freely, so shoulder stability is less important. The wrist and the finger grip move as a whole when drawing a circle. In other words, the child holds the crayon or a pencil between the thumb and index finger or even with the whole palm and rotates the shoulder with decent accuracy to complete the circle.



Writing requires precise motor planning. When a child switches between complex letters, direction changes along with the curve, size of deflections, stopping and turning, spacing and many more.

What should be the norm?

A kindergarten child can use a crayon to colour designs with large spaces. A pencil grip should be avoided at this age. In upper kindergarten, a child may try to write alphabets like A, C, E, F, H, I, K, L, M, N, O, T, V, W, X, Y and Z which have straight lines or circles with no complex curves as in B, D, G, J, P, Q, R, S and U.

By the age of five, the child can be assessed for a proper hand grip, and if found capable, more complex writing can be attempted. We should remember that each child may have variations in their ability to do all that is required for writing. This is where parents' and teachers' efforts in the kindergarten and pre-school phase at home determine if the child starts to love writing or considers it a burden.

WHA MARKS STROKE AS PUBLIC HEALTH PRIORITY FOR THE FIRST TIME

The World Health Assembly (WHA) passed the first-ever resolution on strokes on Friday, urging member states to recognise the medical condition as a public health priority and to strengthen national policies across the full care pathway. This involves prevention and risk-factor control, timely acute treatment, expanded rehabilitation, and long-term support.

The WHO definition of stroke is a medical emergency that occurs when blood flow to the brain is interrupted, either due to a blockage or bleeding. This lack of blood flow can lead to brain cell death and serious complications. Strokes can be fatal and need immediate treatment. It is estimated that strokes affect 12 million people every year, killing over half of them, and leaving two out of three survivors with a lasting disability.

The resolution calls for stronger national and global action to reduce the burden of strokes, through prevention, acute care, rehabilitation, and improved health system readiness. It also reinforces reporting accountability.

Kouamivi Agboyibor, WHO's medical officer for cardiovascular diseases and strokes, called the resolution "historic".

As per estimates published in an article in the peer-reviewed International Journal of Stroke, the crude incidence of stroke in India ranges from 108 to 172 per 1,00,000 people per year, with a one-month case fatality rate between 18% and 42%. There are only 8,000-odd neurologists and neurosurgeons for India's entire population, and this compounds concerns about the inadequacy of care.

The good news is that risk factors such as hypertension, diabetes, tobacco use, obesity, physical inactivity, unhealthy diet, air pollution, and alcohol misuse are all reversible. For countries like India, where stroke-related disability is rising rapidly, the emphasis on prevention, rehabilitation, health-system readiness and scalable neurorehabilitation models is especially important."



A DEADLY PATHOGEN

At the heart of the current outbreak of Ebola in Central Africa is a quirky name — Bundibugyo. The less-known Bundibugyo ebolavirus strain that causes an often-fatal viral haemorrhagic fever is the primary causative agent in the outbreak in the Democratic Republic of Congo (DRC) and Uganda. While related to the more common Zaire ebolavirus and the Sudan ebolavirus, there have been only two documented Bundibugyo-related outbreaks (Uganda in 2007, and another in the DRC in 2012). Currently, there are no vaccines or specific therapies against it, though efforts are on to fast-track the development of a vaccine.

The World Health Organization (WHO) declared with unusual alacrity, a Public Health Emergency of International Concern (PHEIC) even bypassing conventional consultations with expert bodies to do so. Soon after the DRC and Ugandan governments declared an outbreak of Ebola, on May 15, the WHO announced a PHEIC.

The name Bundibugyo comes from the days when pathogens used to be named after the places they were discovered in, though that naming convention is no longer considered fashionable. It was first identified in 2007 in the Bundibugyo district of western Uganda. Bundibugyo, in the Western Region of Uganda, bordering the DRC, is the headquarters of the Bwamba Kingdom. After a mysterious illness broke out in 2007, the Bundibugyo ebolavirus was identified in diagnostic samples submitted to the Centers for Disease Control and Prevention, Atlanta, U.S., in November 2007, according to a 2010 article in the journal *Emerging Infectious Diseases*.

Previously documented Bundibugyo outbreaks have reportedly had case fatality rates of 30% and 50% — more or less the same fatality rate as the more common Zaire ebolavirus strain that caused havoc in Africa between 2014 and 2016. While this has caused fears that the virus is probably as deadly, the extra concern is because the outbreak has started in a conflict-ridden area, making case detection and contact tracing difficult and access to care uneven.

Similar symptoms

According to an article in the *Scientific American*, the symptoms of an infection with the Bundibugyo virus resemble those of other orthoebolaviruses. Early on, they include an intense headache, high fever, body ache and fatigue. This is known as the “dry symptoms”, but as the infection progresses, people can develop “wet symptoms” or intense vomiting and diarrhoea, which can become life-threatening. It further says: the viruses are also known to cause haemorrhagic fever, infecting specific immune cells and triggering a massive inflammatory response that can lead to internal bleeding and organ failure.

Meanwhile, the WHO has raised the public risk from the Ebola outbreak in DRC from ‘high’ to ‘very high’. The scheduled India-Africa Forum Summit has been cancelled due to the ongoing crisis. British media has reported that scientists at Oxford University are working on developing a new vaccine to tackle the Bundibugyo strain, and that it might be ready for clinical trials in two or three months. Additionally, the Coalition for Epidemic Preparedness Innovations, a global partnership working to accelerate the development of vaccines and other biologicals, has claimed that it is working at pace with partners, including Africa CDC, WHO and national authorities, to identify opportunities to rapidly advance vaccine development.



THE EBOLA SPECIES WITH NO VACCINE

There is no licensed vaccine yet for the Bundibugyo species of the ebolavirus because the resources required to develop one have not been mustered and because of the specific economic realities of neglected tropical diseases (NTDs).

BSL-4 facilities

To study, develop, and test a vaccine, medical researchers need the virus itself or its genetic sequence to ensure the vaccine's antigens match the circulating strain. In mid-May, the National Institute of Biomedical Research in the Congo and the Central Public Health Laboratories in Uganda delivered this sequence.

Second, to work with a live ebolavirus, scientists need Biosafety Level (BSL) 4 facilities. These are research facilities with the highest level of biological containment, required when dealing with deadly viruses — like ebolavirus and Nipah virus — or viruses that are very easily transmitted or which have no known treatment.

BSL-4 facilities are strongly isolated, with monolithic walls, floors, and ceilings, tightly sealed pipes and wires, multiple sterile rooms with specialised airlocks, negative air pressure (so that a leak causes air to flow into the facility), dedicated ventilation systems, and redundant HEPA filters. All waste from the facility is first sterilised before being disposed of.

Personnel in a BSL-4 facility have to don positive-pressure suits (leak causes air to flow out) and pass through decontamination showers. They also have to undergo rigorous medical tests. There are just over a hundred BSL-4 facilities worldwide, including two in India.

Primate trials

To design the vaccine, researchers need to identify which proteins of the virus provoke the antibody responses in the human body. Then, they need to select a platform — the technology that will carry the antigen into the body and present it to the immune system. The options for ebolavirus include viral vectors such as rVSV or ChAdOx1, mRNA-based approaches, and protein subunits.

Finally, the vaccines may be tested in animal models, in particular non-human primates, as they are the gold standard to assess the safety and efficacy of a vaccine against a disease with a mortality rate of 25% to 90%.

Human clinical trials would be better but such an enterprise would be extraordinarily complicated during an ongoing outbreak.

Once a vaccine is ready, manufacturing it will require hundreds of millions of dollars in addition to development costs, including specialised facilities, cold storage and transport chains (at -80° to -60° C), quality control, regulatory approvals, and advance purchase commitments.

Then, at the very last stage of this long pipeline, healthcare workers and public health officials must detect an outbreak early and administer the vaccine to avail its benefits.

What 'neglect' means



The ebolavirus is not a single virus species but a genus with multiple species, including 'Zaire', 'Sudan', 'Bundibugyo', and 'Tai Forest'. If a person has become immune to one species, they are not expected to be sufficiently cross-protected against infection by another species. This is because the different species have different surface proteins, so each outbreak may require species-specific research.

Ebolavirus outbreaks are also sporadic and hard to predict as to their location — which is unlike influenza or COVID-19, which circulate continuously in populations. So by the time an ebolavirus vaccine reaches the third phase of a clinical trial, the outbreak may have already subsided, leaving fewer cases to track for the trial.

The commercial market for ebolavirus vaccines is small and concentrated in lower-income countries, which means the financial incentive for pharmaceutical companies to invest without substantial backing from governments and/or coalitions like Gavi and the Coalition for Epidemic Preparedness Innovations (CEPI) is minimal.

All of the same factors attend to most NTDs, and illustrate what the 'neglect' in their name entails. NTDs are almost always diseases of poor, rural, and politically marginalised populations in the world's tropical and subtropical areas. In fact, these people are neglected — and that's why their diseases are neglected as well.

Two declarations

Historically, funding for infectious diseases was dominated by just three: HIV/AIDS, tuberculosis, and malaria. The situation changed somewhat following the London Declaration in 2012 and the Kigali Declaration in 2022.

With the participation of the WHO, the World Bank, 13 pharmaceutical companies, and representatives from seven countries, the London Declaration committed to eliminate or control 10 NTDs by 2020 with more than \$785 million for research and development. The Kigali Declaration, sponsored by Rwanda, aimed to reinvigorate commitments to eliminate the NTDs; at a June 23, 2022, event, the country reported a pledge of \$1.5 billion by various governments, pharmaceutical companies, and NGOs.

However, R&D has often been patchy, compounded by weak healthcare delivery and poor (disease) surveillance. Governments have also often prioritised diseases afflicting patients in richer countries. But the worst is perhaps market failure, as affected populations have little purchasing power while developing a single vaccine these days costs more than a billion dollars. The vaccines also cannot be sold for much in countries most of whose populations live on two dollars a day.

Many NTDs are caused by eukaryotic parasites, i.e. worms and protozoa, which develop in multiple stages across multiple hosts, complicating researchers' efforts to identify a stable antigen for vaccines to target. The immune system also struggles to confer lasting protection against infections by these organisms, making them categorically harder to vaccinate against than, say, measles.

Local response

At this time, there are two licensed Ebolavirus vaccines — Ervebo and a combination of Zabdeno and Mvabea — but they are both for the 'Zaire' species. The Bundibugyo species is also much rarer,



having caused only two outbreaks before the current one. As a result, research on it hasn't drawn significant investments.

Promising Bundibugyo vaccine candidates are currently in preclinical or early development, with the WHO and the Oxford Vaccine Group estimating at least six months more to manufacture enough doses for a small clinical trial.

Taken together, the local healthcare systems — already strained by conflict and climate change — are left with reliably detecting cases, isolating patients, contact-tracing, safe burial practices, and community engagement to manage the Bundibugyo ebolavirus outbreak.

Causes for hope

That said, in the meantime, the Road Map 2021-2030 of the WHO has specified eliminate-by targets for particular NTDs and has been pushing domestically led programmes that combine mass drug administration, vector control, sanitation, and surveillance.

In February this year, the African Union launched 'ACHIEVE Africa', a programme to build indigenous R&D for vaccine development for NTDs that western manufacturers have overlooked. Using the help of such programmes, the African Union plans to manufacture 60% of the continent's vaccine needs by 2040. Likewise, CEPI has increasingly funded work on pathogens that currently present weak commercial incentives.

Also earlier this year, India initiated phase I human clinical trials for an indigenous vaccine against Kyasanur forest disease, a regional NTD. Hubs established in South Africa and Senegal to manufacture mRNA vaccines for COVID-19 are being repurposed to produce experimental vaccines for NTDs, including leishmaniasis.

Brazil and Cuba have built state manufacturing capacity to address diseases that multinational firms have skipped (although this may no longer be a priority in Cuba, which has faced prolonged fuel and medicine shortages thanks to crippling U.S. embargoes).

But for now, the Bundibugyo ebolavirus outbreak continues to unfold against infrastructure and financing gaps and a broader system that struggles to respond to diseases of the poor and the peripheral.

WHOLE BODY SCANS: WHY INVESTORS LOVE THEM BUT DOCTORS HATE THEM

When doctors express scepticism about whole-body scanning, a predictable counter-argument surfaces on social media within hours. Physicians, the theory goes, have a vested interest in keeping you undiagnosed. Healthy patients do not fill hospital beds. Early detection threatens the treatment economy and the doctor is the last person you should trust to tell you whether to scan. It is a compelling narrative.

It is also precisely backwards.

India now has a rapidly growing market for direct-to-consumer body scanning. Providers offer packages combining ultra-low-dose CT, full-body MRI, DEXA scans, blood biomarkers, and AI-generated health scores — all without a clinical referral, all marketed to urban professionals who want to know if something is wrong before a health calamity hits. The incentive structure is not to keep you healthy and out of the system. It is to bring you into a parallel one, charge you at the door, and generate findings that justify further investigation.



The metric these companies report is the number of abnormalities identified — not disease states confirmed, not findings that were clinically actionable, not conditions that required treatment. No company publishes outcome data showing their customers live longer. Yet all are growing rapidly.

The public conspiracy theory gets the incentives wrong in another way, too. When a scan returns an ambiguous finding — a nodule, a cyst, or a vascular irregularity, say — the patient does not stay home. They see specialists, undergo follow-up imaging, possibly biopsies, occasionally surgery. Every step generates clinical revenue. The scanning industry does not threaten the treatment economy; it feeds it.

What the evidence says

Earlier this month, two radiologists from leading American universities published an editorial in JAMA making the profession's collective unease plain. Elective whole-body MRI screening lacks evidence of mortality or quality-of-life benefit and may cause harm through overdiagnosis, unnecessary procedures, and psychological distress. No major medical society recommends it for the general population.

But despite a similar warning three years prior, the commercial sector has only grown. Roughly three in ten people who undergo these scans will require follow-ups, most of which will resolve in a finding that needs no treatment.

Patients who enter the scanner feeling well leave feeling like patients, anchored to findings of uncertain significance that may shadow them for years. In effect, the scan has not caught a disease. It has manufactured a worry. This is the paradox at the heart of the industry.

Medicine has always known that oversimplification provides only temporary relief. It does not resolve uncertainty. Anxiety rooted in the complexity of the body cannot be treated with a protocol that flattens that complexity into a single report.

Double-edged sword

The standard criticism of whole-body scanning is overdiagnosis, i.e. detecting conditions that would never have caused harm. But there is an opposite failure as well. Covering the entire body in a clinically acceptable scan time requires compromises. Sequences are chosen for breadth, not precision. A dedicated brain MRI with sequences tuned for cerebral arteries is a fundamentally different investigation from the neurological portion of a whole-body scan. One is optimised for what it is looking at. The other is optimised for coverage.

There is currently an active malpractice case in which a patient received a clean whole-body MRI report and suffered a deadly stroke months later. Independent neurologists have alleged that significant narrowing of a major cerebral artery was present but undocumented — i.e. it was treatable but the scan had missed it. The defendants deny the allegations. Whatever the case's legal outcome, it raises a question the industry has not answered: when a whole-body scan tells you nothing is wrong, what exactly has been excluded, and with what confidence?

Any test's usefulness depends almost entirely on whom it is applied to. A test that is 95% sensitive and 95% specific applied to a population of 10,000, where true disease prevalence is 1%, will generate roughly five false positives for every genuine finding. This is the pre-test probability: the likelihood that disease is present before any test is ordered, estimated from symptoms, history, and risk factors. In a healthy, self-selected population, that probability is lower for nearly



everything the scanner is looking for. An industry built on scanning the well is, by definition, built on this gap.

Overdiagnosis trap

There is a third failure: finding conditions that are real, accurately identified, and still best left undiscovered. Not all diseases require treatment. Autopsy studies from Finland found occult papillary thyroid cancers in up to 36% of adults who died of entirely unrelated causes — tumours that would never have surfaced clinically. In South Korea, fee-for-service providers began offering thyroid ultrasound as a cheap add-on to government cancer screening visits, though it was never part of official policy.

Thyroid cancer diagnoses rose fifteen-fold between 1993 and 2011. Surgical rates followed. Yet mortality did not budge. Tens of thousands underwent thyroidectomies and acquired lifelong hypothyroidism for a disease that was never going to shorten their lives. The pattern recurs in prostate and kidney cancer. Detecting subclinical disease and treating it is not always medicine — sometimes it is the harm.

Where the evidence points

The U.S. National Lung Screening Trial showed that annual low-dose CT reduced lung cancer deaths by roughly 20% compared with chest X-ray in a tightly defined population of heavy smokers. The Dutch-Belgian NELSON trial found a similar benefit against no screening at all. Cardiac calcium scoring carries guideline endorsement from major cardiology societies for adults at intermediate cardiovascular risk, where it resolves genuine uncertainty about whether to start statin therapy.

What all these checks share is specificity: a well-defined disease, a well-defined population, and a protocol built to answer a particular clinical question.

Scanning everyone for everything simultaneously answers no question well. The doctors raising concerns are not protecting a treatment monopoly. They are asking for the same standard applied to any other medical intervention: evidence that the thing being sold actually helps the people buying it. That is not a conflict of interest. It's the job.

WOMEN LIVE LONGER BUT SPEND MORE OF THOSE YEARS WITH ILLNESS

That women outlive men is a long-established fact that the data on Life Expectancy (LE) at birth have repeatedly shown. However, the healthy-life advantage that should have come with a longer life has barely moved in two decades for women. The shifts that happened during the COVID-19 pandemic in LE and Healthy Life Expectancy (HALE) — a metric that adjusts the LE by discounting the time spent with illnesses, disability, chronic pain and poor health — partially showed why women continued to lag behind in HALE.

While the world had largely recovered from the pandemic with global LE returning almost close to pre-pandemic levels by 2023, HALE recovered to 63 years, which is 0.5 years lesser than what it was in 2019. Female life expectancy stood at 76 years, compared to 71 for men. But the gap narrowed when healthy years were considered: women's HALE was 64 years, compared to 62 for men (Chart 1). In 2000, women's LE was 4.8 years higher than men while the gap in HALE was just 2.3 years. By 2021, it had narrowed slightly, to 2.2. Despite a generation of medical progress, the gap between how many healthy years women get and how many men get has not moved. This



pattern points to a deeper structural divide in global health: women survive longer, but spend more of those years living with illness, pain and untreated conditions.

Across the world, men die at significantly higher rates from cardiovascular disease, lung disease, accidents, violence and suicide. Lower mortality from ischaemic heart disease alone adds 0.63 healthy years to women's lives. Reduced deaths from stroke contribute another 0.31 years, chronic obstructive pulmonary disease (0.26), road injuries (0.32), interpersonal violence (0.17) and suicide (0.12) (Chart 2). As per the World Health Organization, all these lower mortality factors together should have given women a 3.85-year advantage in HALE.

However, higher morbidity among women offsets 1.56 years of that advantage. Women carry a disproportionately high burden of pain disorders, gynaecological diseases and mental health conditions. Back and neck pain alone reduces women's healthy lifespan by 0.44 years; depressive disorders cost 0.21 years and anxiety 0.16. Many remain underdiagnosed. The size of the female health gap varies sharply across WHO-defined global regions (Chart 3).

COVID-19 should have widened the HALE of women over men as the latter died at substantially higher rates than women throughout the pandemic. Lower female mortality from COVID-19 and pandemic-related causes alone gave women a 0.89-year HALE advantage over men, which was bigger than the contribution from ischaemic heart disease (Chart 2). However, the advantage did not widen since the pandemic also erased two decades of progress on the mental health conditions that disproportionately erode women's healthy years.

The disadvantages could be more pronounced in India. As per the WHO Global Health Statistics Report 2026, over half of Indian women (53.7%) of reproductive age are anaemic, nearly double the global rate. One in every five partnered Indian women has faced intimate partner violence in the past year, almost double the world figure. Nearly a third of Indian households spend more than 40% of their discretionary budget on health, putting sustained treatment out of reach for most (Chart 4). These conditions may not dominate mortality charts, but they profoundly shape everyday life, limiting mobility, productivity, and financial independence.

COLOUR BLINDNESS: A HIDDEN VISION CONDITION MANY DON'T REALISE THEY HAVE

Despite being prevalent among Indians, knowledge and understanding of colour blindness in India is extremely poor. Most of the general population believes that colour blindness is when one sees the world only in shades of black and white. But this is not the case: most people with colour blindness cannot discriminate only between certain colours, namely red-green or blue-yellow combinations. The disorder is congenital and thus, many people may be unaware of their condition all their lives.

Indian scenario

According to various studies in India, around 8% of men and 0.5% of women suffer from colour blindness, which means almost 70 million Indians are potentially colour blind. Red-green type of this vision problem is the most common type of colour blindness, caused by a gene mutation located on the X chromosome. Thus, since men have just one X chromosome, they are much more susceptible to inheriting this condition from their parents compared to women.

A serious problem with colour-blindness is that this condition influences one's life unnoticed. Common problems that people with this condition might face on daily basis range from the serious to the minor: misinterpreting traffic lights, a negative impact on academic performance of



students, an inability to match clothes, problems working with colour-coded charts or maps, issues with choosing ripe fruit, and problems with interpreting colour signals. Many of these issues can go unnoticed until the person gets diagnosed with the problem.

It should be noted that there are multiple types of colour blindness. For example, red-green is the most common type, while blue-yellow type and complete colour blindness are rather uncommon. Besides, while this problem is usually genetic, it can also develop due to diabetes mellitus, glaucoma, cataracts, retinal diseases, optic nerve disease, brain injury, with ageing and certain medicines.

Any changes in colour vision should be checked by an ophthalmologist, as it can mean an underlying serious eye or neurological condition.

Testing of colour vision is necessary for children and adults who have diabetes or any chronic eye diseases. Unfortunately, colour blindness awareness is not high enough in India to allow for testing in schools for every child.

Addressing myths

There are also certain myths that should be addressed. First of all, it is a misconception that colour blindness leads to total blindness. It also has no connection to intelligence. Despite the fact that there are no ways to treat genetically-determined colour blindness permanently, some individuals can be helped by colour-filter glasses, which allow for discriminating between different colours. However, there is no permanent cure for colour blindness.

More awareness

Schools, workplaces, and other areas use colour codes extensively, making the creation of colourblind-friendly environments necessary. Teachers and other educators need to be aware that students should not be punished for colour blindness.

Accommodating this need in individuals may involve the use of labels instead of colours, adding patterns or symbols, improving lighting, and using certain apps that can help identify colours.

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