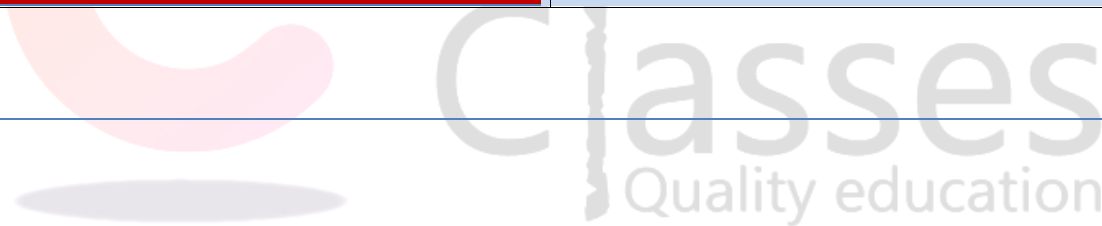


The Hindu Important News Articles For UPSC CSE
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Page 01 : GS III : Indian Economy/ Preliminary Examination

According to the provisional estimates recently released by the Ministry of Statistics and Programme Implementation (MoSPI), India's Real Gross Domestic Product (Real GDP) growth rate for the Financial Year 2025-26 is estimated to be 7.7%. This surpasses the 7.1% recorded in the previous financial year (2024-25) and the advance estimate of 7.6% projected in February 2026. From the perspective of the Union Public Service Commission (UPSC) Main Examination (GS Paper-III: Indian Economy), this data is highly critical for analyzing the country's macroeconomic health, structural reforms, and impending challenges.

Key Points & Economic Analysis

The core pillars of this macroeconomic data and their structural implications can be understood through the following points:

1. Primary Drivers of Growth

- Manufacturing Sector:** This sector registered a stellar growth of 10.7% in FY 2025-26, marking a substantial improvement from the 9.3% clocked in the preceding year. However, the momentum moderated to 7.3% during the fourth quarter (Q4).
- Service Sector:** Segments like trade, hotels, transport, and communication recorded a double-digit expansion of 11% in FY 2025-26, representing a massive leap from the 6.6% witnessed in 2024-25. This momentum accelerated further in Q4, touching 12.4%.

2. Demand and Investment Outlines

- Private Final Consumption Expenditure (PFCE):** This index, which serves as a proxy for domestic demand, rebounded to 7.7% from the 5.8% recorded in 2024-25. This signals a revival in consumption capacity and consumer confidence across both rural and urban markets.
- Gross Fixed Capital Formation (GFCF):** The primary metric measuring capital investment and asset creation in the country surged to 8.2% from 6.4% in 2024-25. This underscores the crowding-in effect of the government's capital expenditure (CapEx) alongside a recovery in private investments.

3. Primary Areas of Concern

- Deceleration in Agriculture:** The growth rate of the agricultural sector is projected to moderate to 3% in FY 2025-26 (and 3.6% in Q4), down from 4.2% in 2024-25. This highlights persistent structural distress in the rural economy and the adverse ramifications of an erratic monsoon.

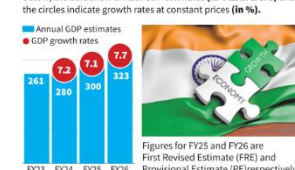
GDP growth estimated at 7.7% in 2025-26: govt.

Provisional estimates are slightly higher than the 7.6% growth projected in February; growth in Q4 stands at 7.8%; PM Modi says the figures show the success of reforms and the hard work of Indians

T.C.A. Sharad Raghavan
NEW DELHI

Stronger estimate

India's GDP is estimated to grow by 7.7% in 2025-26, slightly faster than the 7.6% estimated in February 2026. In the chart below, the bars show annual GDP estimates (in ₹ lakh crore) and the circles indicate growth rates at constant prices (in %).



■ Annual GDP estimates
● GDP growth rates

Figures for FY25 and FY26 are First Revised Estimate (FRE) and Provisional Estimate (PE) respectively.

7.7% in FY 2025-26 and 7.8% in Q4 of FY 2025-26 reflect the inherent strength of our economy, the success of reforms and the hard work of 140 crore Indians," Prime Minister Narendra Modi said on X following the data release.

The "trade, repair, hotels, transport, communication & services related to broadcasting and storage" sector similarly saw its growth estimate quicken to 11% in 2025-26 from 6.6% in 2024-25. In Q4, the sector accelerated to 12.4% from 6.3% in Q4 of 2024-25.

The agriculture sector, however, is expected to see growth slowing to 3% in 2025-26 from 4.2% in the previous year, with growth in Q4 slowing to 3.6% from 3.8% in the fourth quarter of 2024-25.

Notably, the data also shows that the growth of private final consumption expenditure (PFCE) is estimated to have quickened to 7.7% in 2025-26 from 5.8% in the previous year.

Asset creation and investment, in the form of gross fixed capital forma-

- **Methodological Updates:** The government shifted the GDP base year to 2022-23 this year alongside optimizing calculation methodologies. From a UPSC standpoint, any historical evaluation of these statistics must dynamically account for this recalibration of the base year.

4. Future Outlook & Challenges

- **Deceleration Apprehensions in FY 2026-27:** In the Monetary Policy Committee (MPC) meeting, Reserve Bank of India (RBI) Governor Sanjay Malhotra projected growth momentum to moderate to 6.6% for the upcoming financial year (2026-27).
- **Geopolitical Risks:** The ongoing crisis in West Asia (Middle East)—specifically the escalating US-Iran frictions—is disrupting global supply chains, precipitating a sharp spike in crude oil and energy prices.
- **Domestic Downside Risks:** India faces the threat of a lower-than-normal monsoon this year, which could stoke food inflation and suppress rural demand. Consequently, the RBI has proactively revised its inflation projection upward to 5.1%.

Conclusion

The GDP growth rate of 7.7% in FY 2025-26 vindicates the inherent strength of the Indian economy and the success of recent structural reforms. The near double-digit expansion across the manufacturing and services sectors demonstrates that India remains the fastest-growing major economy despite deep global uncertainties.

However, the deceleration in agriculture, the challenge of maintaining the continuity of private capital expenditure, and external geopolitical shocks like the West Asia crisis could exert downside pressures in the upcoming quarters. To ensure sustained and inclusive growth, policymakers must remain anchored on enhancing the 'Ease of Doing Business' and fostering employment generation for the youth, while simultaneously deploying robust macroprudential measures to insulate the domestic economy from supply-side shocks.

UPSC Prelims Exam Study Questions

Question: What is the primary objective of changing the Base Year for GDP calculation?

- (a) To control inflation
- (b) To increase tax collection
- (c) To better reflect the current structure of the economy
- (d) To attract foreign investment

Ans: (c)

UPSC Mains Practice Questions

Question: Analyze the role of the Manufacturing and Services sectors in India's economic growth. Evaluate their contribution in light of the latest GDP estimates. (10Marks, 150Words)



Page 03 : GS II : International Relations/ Preliminary Examination

During a recent press conference in St. Petersburg, Russian President Vladimir Putin made pivotal statements regarding India-Russia relations, global pressure, and regional geopolitics. He explicitly stated that western nations attempting to pressure a major economy and sovereign nation like India to scale back its ties with Russia would be detrimental to global stability.

Key Points & Diplomatic Analysis

The core pillars of the Russian President's remarks and their strategic implications for India can be contextualized through the following points:

1. Failure of Western Pressure & National Interest

- **Detriment to Global Stability:** Putin emphasized that exerting any form of pressure on Prime Minister Narendra Modi and the world's most populous country is counterproductive to international relations.
- **Prioritizing National Interests:** Despite sanctions and diplomatic objections raised by the United States and western allies regarding India's import of Russian crude oil amidst the Ukraine conflict, India has consistently kept its national interests and energy security paramount. Consequently, Russia has reaffirmed India's status as a 'reliable' strategic partner.

2. India-U.S. Ties & Russian Perspective

- **Absence of Structural Friction:** Putin clarified that India's deepening strategic alignment with Washington (U.S.) does not introduce any diplomatic strain or structural friction into the bilateral relationship between Russia and India.
- **Autonomous Foreign Policy:** Russia acknowledges that India, as a major economy and the largest democracy, is entirely free to cultivate relations with all nations based on its unique requirements. This underscores the global validation of India's policy of 'multi-alignment'.

3. Russia's Stance on India-China Relations

- **Policy of Non-Interference:** Putin characterized the border disputes and systemic tensions between India and China (such as those along the Line of Actual Control or LAC) as a 'delicate and multi-dimensional' relationship. He firmly asserted that the intervention of any third country in this bilateral matter is not a sound idea.
- **Strategic Equilibrium:** The Russian President stressed that Moscow's ties with both New Delhi and Beijing have evolved naturally. Russia's deep partnership with Beijing does not come at the expense of New Delhi's core interests, nor does India's closeness with Russia draw objections from China.



4. Military-Technical Cooperation & Su-57 Offer

- **Joint Production Venture:** Russia has formally offered its fifth-generation stealth fighter aircraft, the Su-57, to India, suggesting a joint manufacturing roadmap under India's flagship 'Make in India' initiative.
- **Transfer of Technology (ToT):** Putin expressed readiness to collaborate and share advanced defense technology with India without imposing restrictive clauses, presenting a major window of opportunity for India's defense manufacturing and technological self-reliance.

5. Regional Politics & Pakistan

- **Nuanced Understanding of Border Disputes:** Russia expressed its understanding regarding the complex border dynamics between India and Pakistan. Concurrently, Putin dismissed the conventional narrative that Pakistan is entirely under the geopolitical control of China.

Conclusion

The statements delivered by Russian President Vladimir Putin provide robust evidence of how firmly anchored India's position has become in contemporary global geopolitics. India has successfully preserved its 'strategic autonomy'—sharing strategic closeness with the U.S. via the 'QUAD' framework on one hand, while simultaneously collaborating with Russia and China through 'BRICS' and the 'SCO' on the other.

Russia's choice to remain neutral in the India-China dispute, combined with its pragmatic acceptance of India-U.S. relations, demonstrates that Moscow deeply understands both the diplomatic compulsions and the structural strengths of New Delhi. The upcoming BRICS Summit in India scheduled for September 2026, alongside high-value strategic defense offerings like the Su-57 fighter jet, will chart a new trajectory for the India-Russia 'Special and Privileged Strategic Partnership'. Moving forward, India's chief foreign policy challenge will lie in masterfully balancing its national interests between these two global powers without compromising its core sovereign principles.

UPSC Prelims Exam Study Questions

Question: The term "Strategic Autonomy" in India's foreign policy refers to:

- (a) Permanent alignment with a major power
- (b) Remaining outside all military partnerships
- (c) Pursuing an independent foreign policy based on national interests
- (d) Supporting only the Non-Aligned Movement

Answer: (c)

UPSC Mains Practice Questions

Question: Explain the concept of Strategic Autonomy. How has India demonstrated this principle during the Russia-Ukraine conflict?(10Marks, 150 Words)

Page 06 : GS II : International Relations / Preliminary Examination

During a recent press conference in St. Petersburg, Russian President Vladimir Putin made pivotal statements regarding India-Russia relations, global pressure, and regional geopolitics. He explicitly stated that western nations attempting to pressure a major economy and sovereign nation like India to scale back its ties with Russia would be detrimental to global stability.

Rubio fails to win India back for Washington

For nearly a year, strategic experts in India and the United States have warned that worsening bilateral ties could damage a partnership that former U.S. President Joe Biden called the most consequential of the 21st century. They argue that India remains central to America's Indo-Pacific strategy and indispensable to its competition with China in geopolitics, technology, and securing critical supply chains.

Warnings from think tanks, sense of betrayal

Think tanks have also been sounding the alarm. A March 2026 report by the Center for a New American Security, titled Repairing the Breach: Getting U.S.-India Ties Back on Track, said bilateral ties had "stumbled badly" in the second half of 2025. It cited U.S. President Donald Trump's claims about the May 2025 India-Pakistan ceasefire and his 50% tariffs on Indian exports as the key causes of the breach in trust, and recommended urgent steps to rebuild trust and deepen cooperation.

Similarly, the Hudson Institute's "New India Conference" underscored India's importance to U.S. interests and the Indo-Pacific balance of power. By featuring RSS General Secretary Dattatreya Hosabale, it also signalled a willingness to engage Hindutva nationalists despite concerns over their treatment of religious minorities.

This anxiety is not confined to Washington's think tanks, but also in India too. During a visit to India in January 2026, discussions at academic and policy institutions, as well as engagements with experts, diplomats and Indian foreign policy scholars, pointed to a common concern: New Delhi had lost trust in Washington. The damage was seen as not merely diplomatic or transactional, but also strategic. Many Indian experts believed that even if both sides recognised the importance of the relationship, it would take a long time to repair the trust deficit.

Three indicators came to define the deterioration in relations. The first was the growing U.S.-Pakistan strategic partnership in the



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The U.S. Secretary of State's visit failed to bridge the widening U.S.-India divide

post-Operation Sindoor period. As India sought to isolate Pakistan internationally, Mr. Trump's repeated praise for Pakistani leaders and the country's role in mediating with Iran was widely seen in India as a betrayal.

The second indicator was trade. The 50% tariffs levied on India – among the highest imposed on any country – came as a shock to New Delhi. The 25% tariff penalty on India, imposed specifically for buying Russian oil, further reinforced the perception that India was being singled out and punished for no apparent reason. The third indicator was the neglect of the Quad (Australia, India, Japan and the U.S.). The absence of head-of-state summits, combined with the lack of visible enthusiasm around the Quad meetings, suggested that one of the central pillars of America's Indo-Pacific strategy had been downgraded. The Quad, and therefore India, were clearly less important to Mr. Trump's plans which now appear to be more focused on carving a more productive partnership with China.

The Rubio visit and after

U.S. Secretary of State Marco Rubio's visit to India (May 23-26, 2026) gave him a clear opportunity to address all three parameters. Unfortunately, there was hardly any progress on the pending trade deal. On top of that, Mr. Rubio essentially gaslit India by asserting in a tweet that India had committed to buying \$500 billion worth of American products over the next five years – a claim that Indian officials had disputed. The Quad Foreign Ministers' summit produced no major breakthrough and no clear announcement about when the heads of state would meet. Finally, when given an opportunity by the Indian press to criticise Pakistan for cross-border terrorism, Mr. Rubio instead chose to praise Pakistan's role in the Iran crisis.

He failed to take positions that would have reassured India that he had come to repair the relationship. Instead, the message he sent was that "America First" would be the only criterion determining U.S. choices, not any desire to repair

the U.S.-India strategic partnership.

The symbolism after Mr. Rubio's return to Washington only reinforced this conclusion. Just hours later, he participated in a public Cabinet meeting. When Mr. Trump asked him about Iran, Mr. Rubio spoke about Iran, Ebola, Cuba, Venezuela, and even his stopover in Armenia, which he described as highly successful. But he did not mention India, his meeting with Prime Minister Narendra Modi, or the Quad meeting. Mr. Trump did not ask about India either. This amnesia is astonishing – coming just hours after a visit to one of America's most important strategic partners. Nor did Mr. Trump use his social media platforms to highlight the Quad or stress the importance of repairing U.S.-India relations.

It is precisely such indicators that make policymakers in New Delhi nervous. They signal that India's strategic significance has diminished in Washington's eyes.

A partnership that still matters

There remain many strategic reasons for the U.S. and India to work together: keeping the Indo-Pacific open, sustaining a partnership between major democracies in an era of rising authoritarianism, and collaborating on technological innovation, artificial intelligence, semiconductors, defence, and energy security. These shared interests have not disappeared and may well bring the two countries back toward closer cooperation. But for now, India and the U.S. are not as closely aligned as they were a year and a half ago.

If Mr. Rubio's goal was to repair the perceived damage done to India-U.S. relations since Mr. Trump's election in 2024, he clearly failed. But if his mission was to reinforce that American foreign policy will be driven by whatever Mr. Trump defines as "America First" on any given day, then perhaps he succeeded – making clear that American national interests are now shaped less by careful strategic thinking and more by the unpredictable thought process of President Trump.

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Russia's choice to remain neutral in the India-China dispute, combined with its pragmatic acceptance of India-U.S. relations, demonstrates that Moscow deeply understands both the diplomatic compulsions and the structural strengths of New Delhi. The upcoming BRICS Summit in India scheduled for September 2026, alongside high-value strategic defense offerings like the Su-57 fighter jet, will chart a new trajectory for the India-Russia 'Special and Privileged Strategic Partnership'. Moving forward, India's chief foreign policy challenge will lie in masterfully balancing its national interests between these two global powers without compromising its core sovereign principles.

UPSC Prelims Exam Study Questions

Question: Consider the following statements:

1. Strategic Autonomy means that India will not enter into a partnership with any country.
2. The objective of multi-alignment is to maximize national interests while maintaining relations with various power centers.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: b)

UPSC Mains Practice Questions

Question: Discuss the major reasons behind the emerging trust deficit in India-U.S. relations.(15 Marks, 250 Words)



Page 09 : GS II : International Relations/ Preliminary Examination

During the recently held 'The Hindu Huddle' in Bengaluru, China's Ambassador to India, Xu Feihong, delivered a pivotal address on India-China relations. He remarked that over the past year, the relationship between the two nations has progressed beyond a mere "reset and fresh start" to enter a "new level of development." However, he candidly acknowledged that a "serious deficit of trust" continues to persist between the two sides, which must be overcome by intensifying efforts toward achieving "full normalization."

Key Points & Diplomatic Analysis

The remarks of the Chinese Ambassador and the current trajectory of India-China relations can be analyzed through the following points:

1. Progress and Recent Ease in Ties

- Strategic Guidance:** According to the Chinese Ambassador, the leadership of Prime Minister Narendra Modi and Chinese President Xi Jinping has played a central role in steering bilateral relations from a strategic and long-term perspective.
- Pragmatic Strides:** Significant ground-level progress has been observed across multiple fronts in recent days. India has progressively calibrated its restrictions on Chinese investments (such as the relaxations related to Press Note 3 implemented in 2020). Furthermore, the resumption of the Kailash-Mansarovar Yatra, the restoration of direct flights between major cities, and the easing of trade regulations serve as positive indicators.

2. Trust Deficit & Dialogue Mechanisms

- Stagnation in Bilateral Dialogues:** Xu Feihong pointed out that although approximately 50 government-to-government dialogue mechanisms exist between the two countries, a vast majority of them remain stalled.
- Chasm Between Policy-Makers:** There is a distinct lack of substantive exchange between the policy-makers and top institutional bodies of both nations, which perpetuates an atmosphere of diplomatic mistrust. Reviving these institutional dialogues is absolutely imperative to pave the way for full normalization.

3. Border Situation & Post-Galwan Landscape

- Stability and Peace:** Following the prolonged stand-off triggered by the violent clash in the Galwan Valley in June 2020, the current situation along the border remains "generally stable and peaceful."



- **WMCC Deliberations:** Diplomatic teams from both sides are continuously engaged in resolving the border dispute. Recently, the 35th meeting of the 'Working Mechanism for Consultation and Coordination on India-China Border Affairs' (WMCC) was convened in Beijing. This iteration witnessed exhaustive deliberations on complex and sensitive issues, including border demarcation, border management, and trans-border cooperation. China maintains that both ancient civilizations possess the inherent capability to resolve this historical dispute through dialogue while respecting each other's core interests.

4. Regional Geopolitics & The Pakistan Factor

- **Operation Sindoor and Defense Ties:** India has consistently raised serious apprehensions regarding China's military assistance to the Pakistan Armed Forces, particularly during 'Operation Sindoor'. Responding to this, the Chinese Ambassador adopted a calculated posture.
- **Strive for Neutrality:** China stated that it actively encourages both India and Pakistan to resolve their differences through peaceful dialogue. In diplomatic terms, Beijing signaled that as geographical neighbors, maintaining stable relations between India and Pakistan is indispensable for the overarching peace and prosperity of the South Asian region.

5. BRICS Summit and Upcoming Strategy

- **China's Backing:** China is fully supporting the successful organization of the upcoming BRICS Summit, which is being hosted under India's chairmanship this year.
- **Prospects of Xi Jinping's Visit:** President Xi Jinping has not visited India since the Mamallapuram Informal Summit in 2019. Addressing the probability of his visit for the forthcoming BRICS Summit, the Ambassador noted that logistical preparations are underway, adding that the global community will have to wait a little longer for the final decision.

Conclusion

The address by Chinese Ambassador Xu Feihong underlines that both India and China are profoundly aware that the geopolitical weight of their bilateral equation extends far beyond regional boundaries to carry global significance. Advocating for 'full normalization' and welcoming the relaxation of Indian investment norms indicates that China cannot afford to ignore India's massive consumer market and rising diplomatic stature.

However, India's diplomatic baseline has remained unwavering—"peace and tranquility along the border, alongside the restoration of the status quo ante as of April 2020 across the Line of Actual Control (LAC), remains the non-negotiable prerequisite for full normalization." Until comprehensive disengagement of troops is completed and patrolling rights are fully restored, a wholesale normalization of trade and diplomatic ties remains untenable. Moving forward, India must leverage platforms like the upcoming BRICS Summit to keep diplomatic channels open and bridge the 'trust deficit' with China, without making any compromises on its territorial sovereignty.

UPSC Prelims Exam Study Questions

Question: The WMCC mechanism between India and China primarily deals with:

- (a) Trade negotiations
- (b) Border management and coordination on border affairs
- (c) Military alliance building
- (d) BRICS coordination

Answer: b)

UPSC Mains Practice Questions

Question: What are the major factors responsible for the trust deficit between India and China?(10Marks, 150 Words)



India needs innovative strategies to eliminate TB

More than a century after the first tuberculosis vaccine was introduced, the world is struggling to control one of its oldest diseases. Tuberculosis (TB) continues to kill more people annually than any other infectious disease, surpassing even the COVID-19 pandemic at its peak. Yet, there is still no effective vaccine for adolescents and adults.

Once exposed to *Mycobacterium tuberculosis*, individuals may get infected and remain asymptomatic for years. Others develop subclinical disease, showing minimal or no symptoms while harbouring infection. A subset progresses to active TB, which may manifest as pulmonary TB (PTB) – the infectious form that drives transmission – or as extrapulmonary TB (EPTB), which affects organs beyond the lungs and is harder to diagnose, more debilitating, and sometimes fatal.

No one-size-fits-all vaccine

With such diversity in disease pathways, expecting a single “one-shot” vaccine to prevent all forms of TB may be unrealistic. This expectation has shaped global disappointment in TB vaccine development especially since most previous trials have focused primarily on preventing pulmonary TB.

Meanwhile, the burden remains immense. In many low- and middle-income countries, TB incidence ranges between 200 and 300 per 100,000 population. Reducing this to 10-20 per 100,000 – the threshold for elimination – will require sustained effort and enormous public health investment. For India, which carries one of the world's highest TB burdens, the challenge is systemic.

India's goal of eliminating TB is ambitious and necessary. But achieving it will require a holistic approach towards all forms of disease and all age groups moving beyond the search for a perfect solution and embracing a layered, pragmatic approach. As tools are discovered and tested, decisions will need to be made on their deployment.

The first layer is better detection. Advances in diagnostics, including tools for identifying subclinical TB, can help identify individuals at risk earlier. The second is preventive therapy, ensuring that those with latent infection receive treatment before progressing to active disease. The third – arguably the most complex – is vaccination. However, access to diagnostics and preventive therapy remains uneven, making vaccination an especially critical pillar.

Recent findings from the BMJ-published PreVenTB trial conducted by the Indian Council of Medical Research (ICMR) provide such an opportunity. Conducted across 18 sites in India and involving more than 12,700 household contacts of TB patients, the trial evaluated VPM1002 developed by SIPL and Immuvac developed by Cadila, in a real-world, high-risk population aged six years and above, including



Balram Bhargava

Former Director-General, Indian Council of Medical Research (ICMR)



Soumya Swaminathan

Former Chief Scientist of the World Health Organization (WHO)

individuals with comorbidities and varying infection status closely reflecting real life conditions.

The trial reported efficacy of VPM1002 and Immuvac as: 50.4% efficacy of VPM1002 against extrapulmonary TB (statistically significant); 64.6% efficacy of VPM1002 in children aged 6-14 years against all TB (PTB and EPTB); More than 60% efficacy of Immuvac against EPTB in children aged 6-10 years; more than 60% efficacy against progression to disease among those developing latent infection during follow-up and overall 21.4% efficacy of VPM1002 against all TB (Reference: Subho Sarkar, Consultant Intervention Pulmonologist; from LinkedIn). These are not trivial findings.

Extrapulmonary TB is the hidden burden of the epidemic, harder to diagnose, frequently missed, and associated with significant morbidity and mortality. A reduction of over 50% in such cases represents a meaningful clinical and public health impact, including reduced health-care costs and patient suffering.

The data also highlight a strong signal in school-age children and adolescents, where efficacy exceeded 60% which is an add-on benefit of vaccination in this age group. This is particularly relevant because India currently has no structured TB vaccination strategy beyond infancy. If confirmed, this could open the door to a booster-dose TB prevention strategy.

Need for nutritional support

Another important piece of evidence generated from study is the role of nutrition. Reduced efficacy was observed in individuals with low body mass index (BMI), underscoring the need for nutritional support for vaccines to work optimally in undernourished in context of broader health determinants.

From a programmatic standpoint, VPM1002 offers additional advantages. It is a single-dose vaccine based on a modified BCG platform, making it operationally simpler than multi-dose, adjuvanted vaccines in development. In a country of India's scale, logistical simplicity is a decisive advantage. The vaccine can be manufactured at large scale and cost effectively.

TB is largely a disease of low and middle income countries (LMIC) and their governments must act proactively. Waiting for expansive solutions developed elsewhere is neither practical nor sustainable. LMICs cannot afford to wait for a silver bullet, because there is no one-stop solution for TB, especially when there are results from a Phase III trial conducted in an Indian population across all age groups (six years and above) and against all forms of TB, including PTB and EPTB. It is to be noted that no other TB vaccine trial till date has studied efficacy against EPTB and none of the currently ongoing trials worldwide has included EPTB as the efficacy end-point.

India has navigated similar public health

decisions before. TrueNat was the first ‘make in India’ Molecular test approved and adopted by the National TB Elimination Programme before its World Health Organization pre-qualification study.

During the COVID-19 pandemic, Bharat Biotech's Covaxin was initially approved in “clinical trial mode” to enable early access while additional data continued to accumulate. That decision was driven not by perfection, but by urgency and it helped accelerate protection at a critical time.

India has also demonstrated this approach with indigenous rotavirus vaccines, which were introduced despite modest efficacy and wide confidence intervals. Since then, they have helped reduce severe disease and child mortality and have been incorporated into the national immunisation programme (Bhandari *et al.*, *The Lancet*, 2014).

A smarter TB strategy

TB is, in many ways, a slow-moving pandemic. Yet, it has not always been met with the same urgency in policy action. The policy question, therefore, is how innovations, including moderately effective vaccines such as VPM1002 and Immuvac, can be intelligently integrated into the TB elimination programme. Targeted use among household contacts, deployment in school-age children, and alignment with nutrition and preventive therapy programmes could together lead to a more effective TB control framework. A combination of vaccines effective across different indications and age groups may be needed to have an impact.

India's TB challenge is unlikely to be solved by a single breakthrough. It will require a combination of early detection, preventive treatment, targeted vaccination against both pulmonary and extrapulmonary TB, case-based clinical management, nutritional supplementation, and sustained public health investment.

Waiting for a perfect vaccine may delay progress indefinitely, especially when no trial other than the PreVenTB trial has evaluated vaccine efficacy against both pulmonary and extrapulmonary TB in individuals aged six years and above. In contrast, deploying tools that reduce severe disease, particularly EPTB, can deliver immediate and tangible benefits.

The PreVenTB trial is comprehensive, well-designed and well conducted, offering a meaningful signal – perhaps a light at the end of the tunnel in TB vaccine development. Given the urgency of the challenge and the limited time to act, we must focus on solutions that are available today and supported by robust evidence of efficacy against both PTB and EPTB in individuals aged six years and above under real-world conditions, rather than wait indefinitely in the hope that better options may emerge in the future – an outcome that is far from certain.

New Indian vaccine trial data show meaningful protection against extrapulmonary TB, underscoring the need for targeted vaccination alongside stronger public health strategies

GS Paper II & III: Social Justice & Science and Technology

UPSC Mains Exam Practice Questions: "TB is not merely a medical issue but also a socio-economic challenge." Discuss this in the context of nutrition, poverty, and public health. **(15 Marks, 250 Words)**

Context:

Recently, the results of the 'PreVenTB' Phase-III clinical trial, sponsored by the Indian Council of Medical Research (ICMR), were published in the prestigious journal The BMJ. This landmark study evaluated the efficacy and safety of two new tuberculosis (TB) vaccines—VPM1002 (developed by the Serum Institute of India) and Immuvac/Mw (developed by Cadila Pharmaceuticals). The trial was conducted on a high-risk cohort of over 12,700 household contacts of active TB patients.

Key Points & Policy Analysis

The structural conclusions of this historic trial and its strategic implications for India's national health paradigm can be understood through the following points:

1. Complexity of the TB Epidemic and Current Impediments

- **Global and National Burden:** Tuberculosis remains one of the world's deadliest infectious diseases. India shoulders the highest global burden of TB, with several high-prevalence pockets reporting rates as high as 200 to 300 cases per 100,000 population. To achieve complete elimination, this trajectory must be aggressively driven down to 10–20 cases per 100,000.
- **Anatomical Diversification:** TB is not uniquely confined to the lungs (Pulmonary TB); it also manifests in non-pulmonary organs, classified as Extrapulmonary Tuberculosis (EPTB). Diagnostic confirmation of EPTB is exceptionally complex, often leading to delayed treatment and high mortality.

2. Core Findings of the 'PreVenTB' Trial and Clinical Impact

Although both vaccines missed the primary endpoint of showing absolute efficacy against all cumulative forms of TB and pulmonary TB, their sub-group and site-specific performance yielded revolutionary trends:

- **Mitigation of Extrapulmonary TB (EPTB):** The VPM1002 vaccine demonstrated a statistically significant efficacy of 50.4% against EPTB. Notably, this is the first clinical trial globally to systematically measure vaccine efficacy specifically against extra-pulmonary manifestations.

- **Enhanced Efficacy in Children:** Among school-going children and adolescents (aged 6 to 14 years), VPM1002 demonstrated an efficacy of 64.6% against all forms of TB. Similarly, Immuvac registered over 60% efficacy against EPTB in the 6–10 years age cohort.
- **Logistical Suitability:** VPM1002 is a single-dose vaccine built on a recombinant BCG platform. For a geographically vast nation like India, its single-dose regimen significantly eases cold-chain logistics, distribution, and low-cost mass production.

3. The Crucial Intersection of Nutrition and TB Efficacy

- **The Low BMI Bottleneck:** A critical revelation of the study was that the real-world efficacy of these vaccines dropped drastically in individuals suffering from low Body Mass Index (BMI) or chronic malnutrition.
- **Policy Implications:** This clinical finding proves that immunization alone cannot serve as a silver bullet for TB eradication. For vaccines to achieve optimal immunological expression, they must be strictly paired with robust nutritional support, such as expanding the fiscal reach of the Nikshay Poshan Yojana.

4. India's Pragmatic Past Approach to Public Health Crises

Historically, during public health emergencies, India has chosen a pragmatic route, prioritizing sound, available data and immediate field requirements over a long wait for technical perfection:

- **TrueNat Platform:** India proactively integrated the indigenous molecular diagnostic tool 'TrueNat' into its National TB Elimination Programme long before it received formal global endorsement from the WHO.
- **Covaxin and Rotavirus:** During the COVID-19 pandemic, Covaxin was granted early emergency authorization in 'clinical trial mode'. Similarly, the indigenous Rotavirus vaccine was institutionalized into the National Immunization Programme despite showing moderate efficacy, a step that drastically brought down infant mortality rates nationwide.

5. Architectural Framework for a Multi-Tiered TB Strategy

Instead of waiting for a single "perfect vaccine," India must deploy a multi-tiered public health strategy that integrates these moderately effective tools immediately:

- **Tier 1 (Advanced Diagnostics):** Scaling up indigenous molecular diagnostics for early, aggressive interception of subclinical TB cases.
- **Tier 2 (Preventive Therapy):** Enforcing rigorous prophylactic or preventive therapies among household contacts to halt latent infections from mutating into active disease.
- **Tier 3 (Targeted Immunization):** Deploying VPM1002 and Immuvac strategically as booster doses tailored specifically for school-going children and high-risk adolescent cohorts.

Conclusion

The ICMR's PreVenTB trial offers a beacon of hope and represents "light at the end of the tunnel" for global TB vaccine research. It is clear that the roadmap to a TB-free India will not be carved by a single, hundred percent effective vaccine, but rather by an innovative mix of layered, targeted interventions.

As the epicenter of the global TB burden, India's policymakers cannot afford to lose precious time waiting for a global, flawless solution. The country must act decisively on this newly generated indigenous evidence. By leveraging its unparalleled domestic vaccine manufacturing capabilities, integrating nutritional safety nets, and ensuring the targeted field deployment of these vaccines, India can successfully defeat this long-standing threat to public health.

