



8 April, 2024

Smear test for TB

Context: The rate of presumptive TB testing in the country rose from 1,352 per 100,000 population in 2022 to 1,710 per 100,000 population in 2023.

➤ Presumptive TB Testing Methods and Utilization:

- Only 21% of presumptive TB testing in 2023 used rapid molecular diagnostic tests, despite the government's 2025 deadline for TB elimination in India.
- The majority (79%) of presumptive TB testing in 2023 still relied on sputum smear microscopy, which has low sensitivity.
- There was a slight decrease in upfront molecular testing from 23% in 2022 to 21% in 2023.
- The number of molecular testing facilities increased from 5,090 in 2022 to 6,496 in 2023, with a small rise in the rate of molecular testing.

➤ Sputum smear microscopy

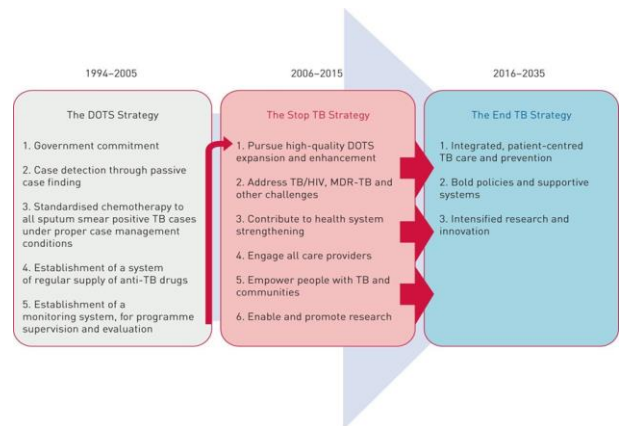
- Sputum smear microscopy serves as the primary diagnostic tool for pulmonary tuberculosis in low and middle-income countries, where the majority of TB cases and deaths occur.
- It is valued for its simplicity, speed, cost-effectiveness, and high specificity in areas with a high prevalence of tuberculosis.
- The method efficiently identifies highly infectious patients and is adaptable across diverse socio-economic populations.
- However, sputum smear microscopy has notable limitations:
 - Sensitivity diminishes when the bacterial load in the sputum sample falls below 10,000 organisms/ml.
 - Performance is subpar in cases of extra-pulmonary tuberculosis, pediatric patients, and those co-infected with HIV and tuberculosis.
 - The necessity of multiple sputum examinations can lead to patients becoming diagnostic defaulters, resulting in loss to treatment and follow-up.
 - Limited resources and a large number of samples reduce the observation time per slide, further compromising test sensitivity.

➤ Diagnostic Test Yield:

- In 2023, 37.19 lakh patients were offered CBNAAT tests, resulting in 7.4 lakh TB diagnoses (yield of 20%).
- TrueNat testing diagnosed TB in 3.3 lakh out of 31.13 lakh patients (yield of 11%).
- Smear microscopy diagnosed TB in only 5.78 lakh out of 1.89 crore patients tested (yield of 3%).

➤ National Strategic Plan Targets:

- The NSP 2017-2025 aimed to reduce presumptive TB patients offered smear microscopy from over 9.1 million in 2015 to 5.1 million in 2023, and increase molecular tests from 40,000 in 2015 to over 14.7 million in 2023.
- - However, in 2023, India fell short of these targets, with 79% of presumptive TB cases detected using smear microscopy and only 21% using molecular tests.



Decline in Female LFPR

Context: In 2023, the male LFPR of 78.5 starkly contrasts with the female LFPR of 37, highlighting a significant gender disparity in labor force participation.

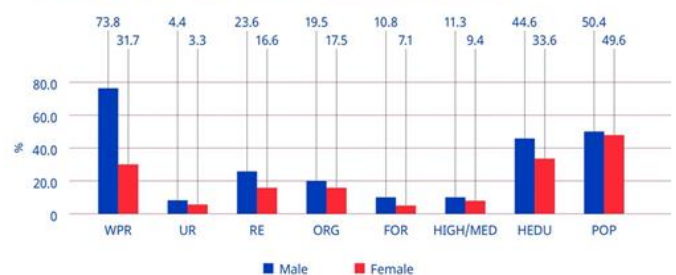
➤ Improvement in Key Labor Market Indicators:

- Long-term deterioration in LFPR, WPR, and UR between 2000 and 2019.
- Improvement observed post-2019, coinciding with periods of economic distress, except for two peak pandemic quarters.
- Despite improvements, employment conditions remain challenging.

➤ Women's Labor Force Participation:

- Female LFPR significantly lower compared to males, with a rate of 37 in 2023 (compared to global average of 49).

Figure 2.11. Employment (UPSS, aged 15+) characteristics, by gender, 2022 (%)



Note: WPR=worker population ratio; UR=unemployment rate; RE=regular employment; ORG=organized sector; FOR=formal employment; HIGH/MED=high- and medium-skill jobs (see box 5 for definitions); HEDU=education secondary level and higher; and POP=population. The WPR and UR are rates while the RE, ORG, FOR, HIGH/MED, HEDU and POP are shares.

Source: Computed from the Periodic Labour Force Survey data for 2022.

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- Decline in female LFPR since 2000, reaching 24.5 in 2019 before a slight increase, especially in rural areas.
- Increase in self-employment and unpaid family work predominantly among women after 2019.
- Decline in the share of regular work observed after 2018.

➤ **Factors Contributing to Low Women's Participation:**

- Barriers include lack of job opportunities, caregiving responsibilities, low wages, patriarchal norms, and safety concerns.
- Women's choices constrained by social norms, limited mobility, and primary caregiving roles at home.
- Decline in LFPR attributed to India's less job-intensive growth pattern and structural limitations.

➤ **Interventions for Improvement:**

- Policies promoting labor-intensive sectors and higher productivity services needed to create more jobs.
- Public investment in safety, transportation, and affordable childcare essential to enable women to work outside the home.
- Supportive measures can help women access better-paying opportunities and increase their participation in the labor force.

Total Solar Eclipse

Context: A rare total solar eclipse will occur on Monday, April 8, crossing North America and passing over Mexico, the United States, and Canada.

➤ **Solar Eclipse Occurrence:**

- Solar eclipses happen when the Moon passes between Earth and the Sun, blocking its view either partially or fully.
- They occur approximately every six months during the new moon phase, when the Moon's orbital plane aligns closely with Earth's.
- Solar eclipses can be total, partial, annular, or hybrid, each with varying frequencies and characteristics.

➤ **Frequency and Types:**

- Total solar eclipses occur roughly every 18 months globally but are rare at any specific location, happening only once every few centuries.
- The Moon's slight tilt causes its shadow to usually miss Earth, resulting in solar eclipses occurring during eclipse seasons.
- Cultural and historical perspectives often attributed solar eclipses to supernatural causes or considered them as bad omens.
- Astronomical predictions of eclipses have been made since ancient times, with modern forecasts accurately predicting eclipses hundreds of years in advance.

Types of Solar Eclipses:

➤ **Total Solar Eclipse:**

- Occurs roughly every 18 months globally but is rare at any specific location, happening only once every few centuries.
- The Moon's shadow completely obscures the Sun, revealing the solar corona.

➤ **Partial Solar Eclipse:**

- Happens about twice a year when only a portion of the Sun is obscured by the Moon.
- Visible from a large part of Earth outside the track of a total or annular eclipse.

➤ **Annular Solar Eclipse:**

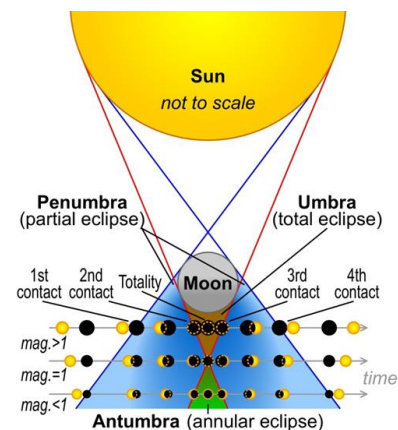
- Occurs once every one or two years when the apparent size of the Moon is smaller than that of the Sun.
- The Sun appears as a bright ring, or annulus, surrounding the dark disk of the Moon.

➤ **Hybrid (Annular/Total) Solar Eclipse:**

- Shifts between a total and annular eclipse depending on the observer's location on Earth.
- Relatively rare phenomenon with some areas witnessing a total eclipse while others experience an annular one.

➤ **Visual Phases of a Total Eclipse:**

- **First contact:** Occurs when the Moon's edge is tangential to the Sun's limb.
- **Second contact:** Begins with Baily's Beads and the diamond ring effect as the Moon covers almost the entire Sun's disk.
- **Totality:** The Moon obscures the entire Sun, revealing only the solar corona.
- **Third contact:** Marks the appearance of the first bright light as the Moon's shadow moves away from the observer. Another diamond ring may be observed.
- **Fourth contact:** Ends the eclipse as the trailing edge of the Moon no longer overlaps with the solar disk.



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NEWS IN BETWEEN THE LINES

Changpa Tribe



Recently, climate activist Sonam Wangchuk and the Leh Apex Body (LAB) decided to cancel the Pashmina border march, which aimed to draw attention to the challenges faced by the Changpa nomadic tribes.

About the Changpa Tribe:

- The Changpa, also known as Champa, are a **semi-nomadic Tibetan tribe**.
- They live mainly in the **Changtang plateau of southeastern Ladakh** and some parts of **Jammu and Kashmir**.
- A smaller number of Changpa live in the western regions of the Tibet Autonomous Region in China.
- The Changpa are **pastoralists** who live at an average altitude of 4,500 meters above sea level.
- They are **known for raising yaks** and goats, including the **Changra goat**, which produces the **rare Pashmina (Cashmere) fiber**.
- The Changpa's primary means of livelihood is raising animals and selling their produce.
- The Changpa are **identified by their conical yak-skin tents called reboo**.
- They share linguistic and cultural affinities with Tibetans and all Changpa families profess **Tibetan Buddhism**.

The Satpula Dam



Recently, the neglected Satpula Dam has been restored by the Archaeological Survey of India (ASI) to safeguard its historical and architectural importance.

About Satpula Dam:

- The Satpula Dam was **commissioned in 1340 by Mohammad Bin Tughlaq**, serving a **dual role** as both a water supply system for irrigation and a defensive fortification against potential threats.
- Notable for its seven arched openings, the dam regulated the flow of water while also functioning as a boundary wall for Jahapanah, the fourth city of Delhi.
- The engineering ingenuity of the structure is evident in its use of grooved side walls, facilitating the operation of sliding gates to control water flow.
- Documented in **Sir Sayyid Ahmad Khan's Asar-us-Sanadid**, the Satpula Dam stands as a testament to the architectural prowess and strategic planning of the Tughlaq dynasty in medieval India.
- The association of the dam with Sufi saint Nasiruddin Mahmud attributed healing properties to its canal water, fostering a belief in its spiritual significance.
- Constructed using Delhi quartz stone, the Satpula Dam exemplifies the advanced **masonry skills** of the Tughlaq era, contributing to Delhi's rich architectural legacy.

Sounding Rockets



Recently, the Jawaharlal Nehru Planetarium in Bengaluru launched a new sky theatre show titled "Indian Odyssey: Sounding Rockets to Gaganyaan," now open to the public.

About Sounding Rockets:

- Sounding rockets are **solid propellant rockets** that are used to study the upper atmosphere, test new components and perform space research.
- They are also used to launch instruments from 48 to 145 kilometers above the Earth's surface.
- The theme of the show centers on "**Indian Space Odyssey: Sounding Rockets to Gaganyaan**."
- Unlike a satellite launch vehicle, a sounding rocket performs an observation mission during its flight before impact and then dives into the sea along with its observation instruments.
- The Indian Space Research Organisation (ISRO) has been launching sounding **rockets since 1965**.
- The **RH-200, with a payload capacity of 10 kilograms** and reaching an altitude of 80 kilometers, is utilized for meteorological purposes.
- The RH-300-Mk-II has a payload capacity of 60 kilograms and can reach altitudes of 160 kilometers, making it suitable for aeronomy research purposes.
- Rohini is a series of sounding rockets designed to carry payloads weighing between 2 to 200 kilograms to altitudes ranging from 100 to 500 kilometers.

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Personality in News

Laxman Nayak



Recently, the Ministry of Tribal Affairs spotlighted the contributions of freedom fighter Laxman Nayak.

Laxman Nayak (22 November 1899 – 29 March 1943)

Laxman Nayak, belonged to Bhumia tribe of Odisha was a tribal civil rights activist of South Odisha in eastern India.

Contributions:

- Laxman Nayak led the **Kandha tribal** uprising known as the "**Kalahandi Movement**" against British colonial rule in Odisha in the early 20th century.
- Nayak actively participated in the **individual Satyagraha movement in 1940**, showcasing his commitment to nonviolent resistance against British colonial rule.
- During the **Quit India Movement in 1942**, Nayak urged his fellow tribesmen to heed **Gandhiji's call of "Do or die."**
- He fervently advocated for the principle of **Swaraj (self-governance) by promoting the use of the Charkha (spinning wheel)** through extensive door-to-door campaigns, emphasizing self-reliance and the development of indigenous industries.
- He advocated for social reforms and the rights of tribal communities, addressing issues such as land rights, exploitation, and discrimination faced by the indigenous people.

Ethical Values: Integrity, Compassion, Non-violence, etc

Place in News

Rwanda

Rwandan President Paul Kagame blamed the inaction of the international community for allowing the 1994 genocide to happen as Rwandans on April 7, 2024 commemorated 30 years since an estimated 800,000 people were killed by government-backed extremists.

Rwanda (Capital: Kigali)

Location: Rwanda is a landlocked country located in East Africa.

Boundaries: Rwanda shares its borders with **Tanzania** (East), the **Democratic Republic of the Congo** (West), **Uganda** (North) and **Burundi** (South).

Physical features:

- The highest point in Rwanda is **Mount Karisimbi**, located in the volcanic Virunga Mountains range.
- The major rivers in Rwanda include the **Nile River** (forming as the Kagera River), **Rusizi River**, **Akagera River** and **Nyabarongo River**.
- Rwanda possesses significant mineral resources, including **tin**, **tantalum**, **tungsten**, and **gold**.
- Rwanda is home to several major lakes, including **Lake Kivu**, **Lake Muhazi** and **Lake Ihema**.



POINTS TO PONDER

- What was the theme of the 'National Maritime Day 2024'? – "**Navigating the Future: Safety First**"
- Which country recently developed the world's most powerful laser? – **Romania**
- In which state is the Sannati Buddhist site, recently in the news, located? – **Karnataka**
- Which country conducted a joint naval exercise with the US, Australia, and Japan recently? – **The Philippines**
- Where is Papikonda National Park, recently in the news, located? – **Andhra Pradesh**

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