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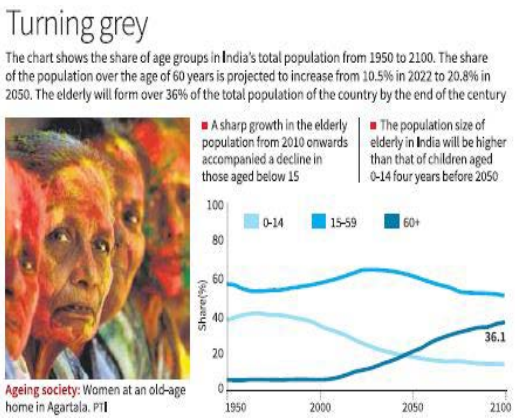
DAILY pre PARE
Current affairs summary for prelims

28 September, 2023

UNFPA India's 2023 Ageing Report

Context: Recently, a UNFPA (United Nations Population Fund) report revealed that India's elderly population is projected to reach over 20% of the total population by 2050,



Elderly Population Projections:

- India's elderly population is growing rapidly, with a decadal growth rate estimated at 41%.
- The elderly population's share of the total population is expected to double to over 20% by 2050.

Elderly vs. Children Population:

- The 2023 India Ageing Report by the United Nations Population Fund (UNFPA) predicts that by 2046, the elderly population may surpass the population of children (aged up to 15) in India.

Poverty Among the Elderly:

- More than 40% of India's elderly population belongs to the poorest wealth quintile.
- Approximately 18.7% of the elderly population in India lives without any income, which can adversely affect their quality of life and healthcare utilization.

Population Aged 80 and Above:

- The report projects a 279% growth rate in the population aged 80 and above between 2022 and 2050.
- This age group is expected to be predominantly composed of widowed and highly dependent very old women.

Gender Disparities:

- Women in India have higher life expectancies at ages 60 and 80 compared to men, with variations across states and union territories.
- States like Himachal Pradesh and Kerala show a significant difference, with women at 60 having a life expectancy four years longer than men in these states.
- Concerns arise about the social and economic well-being of elderly women with high life expectancies.

Changing Sex Ratio Among the Elderly:

- The sex ratio among the elderly has been steadily increasing since 1991, while the general population's sex ratio has stagnated.
- Between 2011 and 2021, the sex ratio increased across India, except in Union Territories and western India.
- Central India, in particular, saw a notable increase, indicating that women surpassed men in survival after the age of 60 over the decade.

Gendered Nature of Poverty in Old Age:

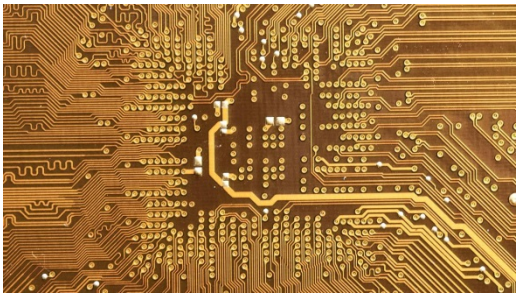
- Poverty among the elderly is gendered, with older women more likely to be widowed, living alone, without income, and dependent on family support.
- Policymaking must consider the specific needs of the aging population, including the feminization and 'ruralization' of the elderly.

Inter-State Variation in Elderly Population:

- There is significant variation in the absolute levels and growth of the elderly population across states, reflecting different demographic transition stages.
- Southern and select northern states report a higher share of the elderly population compared to the national average, with the gap expected to widen.
- States with higher fertility rates, like Bihar and Uttar Pradesh, are projected to see an increase in the elderly population share but remain lower than the national average.
- Central and northeastern regions have states with younger populations, as indicated by the aging index.

Quantum Supremacy and Quantum Computing

Context: Recently, a significant breakthrough in quantum computing was reported in a paper published in Nature Physics.



Quantum Computing:

- Quantum computing is gaining prominence as it prom ises enhanced speed and efficiency in problem-solving compared to classical computers.

Quantum Supremacy:

- Quantum supremacy refers to the ability of a quantum computer to solve certain problems much faster than classical computers, establishing quantum computers as superior machines.

Quantum Bits (Qubits):

- Quantum computers use qubits, which are fundamentally different from classical bits (0 and 1).
- Qubits can have values of 0, 1, or a superposition of both, allowing them to carry more information and perform a significantly greater number of operations.

Entanglement and Complex Problem Solving:
- Qubits exhibit entanglement, enabling quantum computers to address complex problems beyond classical computers' reach.

Scalability of Quantum Computers:
- Quantum computers' real breakthrough is scalability.
- The computational power of quantum computers for certain tasks grows exponentially with the number of qubits, unlike classical computers that grow linearly.

P-hard Problems:
- Quantum circuits, consisting of qubits and quantum gates, are essential in quantum computing.
- Quantum circuits can manipulate qubits to perform specific functions and solve complex mathematical problems.
- Classical computers face challenges with #P-hard problems, a subset of counting problems, which includes estimating the probability of random quantum circuits yielding specific outputs.

Cayley Path and Quantum Advantage:
- Dr. Ramis Movassagh's study introduced the Cayley path to demonstrate quantum supremacy.
- He showed that estimating the output probability of a random quantum circuit is a #P-hard problem.
- This problem overwhelms classical computers and presents a computational barrier that quantum computers can overcome.

Impact and Quantum Complexity Theory:
- Quantum supremacy has implications for fields like cryptography, with potential benefits once hardware and materials advancements are achieved.
- Quantum complexity theory explores the limits of complexity defined by quantum computers and challenges the extended Church-Turing thesis, suggesting classical computers cannot efficiently simulate all physical processes.

Genetic Legacy from Extinct Human Cousins

Context: Recently, the realm of genetics and anthropology has unveiled fascinating insights into the genetic legacy of extinct human cousins, such as the Neanderthals.

- Modern humans carry genetic material from ancient human cousins, such as Neanderthals and Denisovans, who once coexisted with Homo sapiens.
- Advances in studying ancient DNA reveal the genetic legacy and its impact on modern humans.

Genetic Contributions from Neanderthals and Denisovans:
- Neanderthals and Denisovans interbred with early Homo sapiens, leaving a lasting genetic legacy.
- Recent studies using ancient DNA reveal various traits inherited from these ancient cousins.

Impact of Genetic Inheritance:
- Neanderthal DNA has been linked to autoimmune diseases like Graves' disease and rheumatoid arthritis.
- Interbreeding with Neanderthals provided Homo sapiens with a quick fix to immunity in new environments.
- Some genetic traits from Neanderthals can be both helpful and harmful, affecting immune systems and blood clotting.
- Neanderthal DNA variants influence traits such as skin and hair color, skull shape, behavioral characteristics, and Type 2 diabetes.
- Certain Neanderthal genes affect sensitivity to pain and fertility in modern humans.

Denisovans' Genetic Influence:
- Denisovan DNA, though less studied, has been linked to traits related to fat metabolism and adaptation to high altitudes.
- Evidence of Denisovan DNA has been found in Tibetans, who thrive in low-oxygen environments.

The Concept of "Ghost Populations":
- Scientists have identified genetic evidence of "ghost populations" within modern humans, representing undiscovered ancient groups.

Survival of Ancient Humans:
- The survival story of modern humans is no longer seen as a simple "survival of the fittest" narrative.
- Neanderthals were capable of complex behaviors, including toolmaking, art, and makeup use.
- Homo sapiens' adaptability to diverse climates and the ability to travel widely contributed to their survival.
- Dogs may have played a role in human survival by aiding in hunting.
- Homo sapiens' ability to efficiently utilize calories gave them an advantage in resource-scarce conditions.

The Future of Genetic Research:
- Advances in technology and global biobanks offer opportunities to extract DNA from ancient traces, expanding our understanding of genetic heritage.
- Scientists expect to uncover more evidence of interactions and mixtures between ancient human groups.

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Cancer's Gender Problem

Context: Recently, A Lancet Commission report reveals that a significant percentage of cancer deaths among Indian women could have been prevented or treated.

Preventable Deaths among Indian Women:

- The report reveals that 63% of premature cancer deaths among Indian women could have been prevented.
- These preventable deaths could have been avoided through risk reduction, screening, and early diagnosis.

Treatable Deaths:

- In addition to preventable deaths, 37% of cancer-related deaths in Indian women could have been treated effectively with timely and optimal care.

Global Gender Disparities:

- Globally, women account for 48% of new cancer cases and 44% of cancer deaths, despite some cancers being highly preventable and treatable in women.

Challenges for Women:

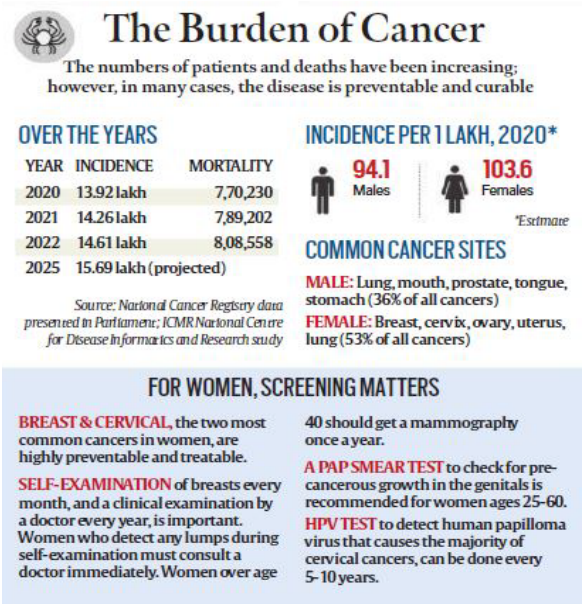
- Women face difficulties in accessing timely and suitable cancer care due to a lack of knowledge, decision-making power, and financial resources.
- They are more likely than men to lack knowledge and power for informed decisions and experience financial hardships due to cancer.
- Women are under-represented in leadership positions, face gender-based discrimination, and constitute a significant unpaid workforce in cancer care, contributing 3.66% of India's national health ex penditure.

Importance of Screening:

- Breast and cervical cancers, the most common in women, are highly preventable and treatable.
- Self-examination of breasts monthly and an annual clinical examination by a doctor are recommended, along with mammography for women over 40.
- For cervical cancer, women aged 25-65 should have a pap smear test and, optionally, an HPV test every 5-10 years.

Government Interventions:

- Creating awareness, especially among women, is crucial to encourage screening and care-seeking.
- An HPV vaccination program is in progress to reduce cervical cancer incidence.
- Primary health centers can play a role in early diagnosis and treatment for cervical cancer.
- Simple procedures, like using acetic acid, can be performed by trained nurses to remove precancerous or cancerous lesions in the cervix.



Recommendations of the Report:

- Regular data collection on gender and social demographics for cancer health statistics is needed.
- Laws and policies reducing exposures to known cancer risks should be developed, strengthened, and enforced.
- Equitable access to cancer research resources, leadership, and funding opportunities for women is essential to address gender disparities in cancer care and research.

News in Between the Lines

Kaimur Wildlife Sanctuary

Recently, Bihar is on the brink of establishing its second tiger reserve, located in the **Kaimur Wildlife Sanctuary**.

Location: Kaimur Wildlife Sanctuary is located in **Kaimur** District and **Rohtas** District of **Bihar**, India.

Area: It covers an expansive area of **1,504.96 km²** making it the la rgest sanctuary in Bihar.

Establishment: 1979

Geography Feature:

- It is situated in the plateaued landscape of Kaimur Range in the **south-western** part of Bihar.
- It features numerous waterfalls, including **Karkat** Waterfall, **Manjhar Kund**, **Dhua Kund**, **Tutla Bhawani Waterfall**, **Geeta Ghat Waterfall**, **Kashish** Waterfall and **Telhar**.
- Several dams and lakes are present within its boundaries, including **Anupam Lake**, **Karamchat** Dam and **Kohira** Dam.

Fauna:

- It houses **Bengal tigers**, **Indian leopards**, **sloth bears** and more.
- Over **70 resident bird species**, with **migratory birds** visiting in winter.
- **Notable birds: peafowl**, **hornbills**, **eagles**, and **storks**.
- **Common snakes: cobras** and **kraits**, occasional **pythons**.

Conocarpus Trees

About Conocarpus Trees:

- Conocarpus trees **(Conocarpus erectus)** are considered **water-guzzling**, which means they consume excessive amounts of water.
- They are commonly used for **landscaping roads** and **gardens** due to their **hardy nature** and **low maintenance cost**.
- They are native to parts of **North** and **South America**, as well as parts of **Africa**.

Ban in Gujarat: The Gujarat forest department has imposed a **ban on planting conocarpus** trees in the state.
Root Damage: The trees are known to have roots that penetrate deep into the ground and extend horizontally, causing damage to underground utility services such as **electricity cables**, **communication lines**, **drainage lines**, and **drinking water pipes**.
Health Issues: Pollen from conocarpus trees can **trigger asthma** and **allergies**, **posing health risks** to residents in areas where these trees are grown.

Bolson Tortoise

About Bolson Tortoise:

- Bolson tortoise (**Gopherus flavomarginatus**), **North America's** largest tortoise species.
- While the exact lifespan is uncertain, it is estimated that these tortoises can live for over a century.
- Discovered in **1959** when biologists saw chickens eating from a large tortoise shell.
- The **340,000**-hectare **Mapimi Biosphere Reserve** was established in **1979** to protect the Bolson tortoise and its unique ecosystem.
- **26 Bolson tortoises** (Appleton tortoises) were moved to Ted Turner's Armendaris Ranch in **New Mexico in 2006.**

IUCN Status: Critically Endangered in 2018
Agreement with Endangered Species Fund: An agreement was reached with **Ted Turner's Endangered Species Fund** to release more Bolson tortoises on **Turner's ranch** in central **New Mexico.**

Meta

Meta has recently launched the "**Meta Quest 3,"** the next-generation virtual reality device, highlighting its investment in **VR technology**.
What is Meta?
Meta is a **technology company** with a focus on **connecting people**, **fo stering communities**, and **supporting** businesses.
Founder: Founded by Mark Zuckerberg in 2004
Name Change and Vision:

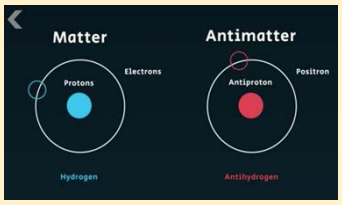
- **Name Transition:** Facebook officially rebranded as Meta to reflect its vision for a virtual world experience.
- **Virtual Focus:** The name change signifies a strategic shift towards immersive virtual technologies.

Owned Platforms:

- **Facebook:** Meta owns and operates the popular social media platform Facebook.
- **Instagram:** Instagram is another prominent platform under Meta's ownership.
- **Threads:** Threads is a messaging app.
- **WhatsApp:** WhatsApp, a widely used messaging app, is also part of the Meta portfolio.

India Transition:
Headquarters: Meta is based in Menlo Park, **California, USA**.

Antimatter



About Antimatter?

- Antimatter is the **opposite of matter** and was created in **equal amounts** during **the Big Bang**, but it is now rare to find.
- The simplest atom is **hydrogen, abundant in the Sun**, consisting of a positively charged **proton** and a **negatively** charged electron.
- Antimatter has **electric charges reversed** compared to matter.
- **Antihydrogen** is the **antimatter counterpart of hydrogen**, used in **Cern experiments**.
- Antihydrogen has a negatively charged proton (antiproton) in the **nucleus** and a positively charged electron (**positron**) orbiting it.

Gravity Discovery: Recent studies show that both matter and antimatter respond to gravity in the same way, challenging previous expectations.
Significance: Understanding antimatter's behavior, including its response to gravity, is crucial to solving the mystery of why the Universe is dominated by matter instead of antimatter.

Place in News

Nicaragua

Nicaragua (Capital: Managua)
Location: Nicaragua is the largest country in **Central America.**
Political Boundaries: It shares its borders with **Honduras** to the **north** and **Costa Rica** to the **south**.
Geographical Features:
Rivers: Nicaragua is home to several rivers, including the **San Juan**, **Coco** and **Río Grande de Matagalpa**.
Lakes: Prominent lakes in Nicaragua include Lake **Nicaragua**, **Lake Managua** and **Lake Tiscapa.**
Volcanoes: The country features notable volcanoes such as **Mombacho**, **Masaya**, **Cerro Negro** and more.
Highest Peak: Mogotón peak is the highest point in Nicaragua.

Personality in News

Lata Mangeshkar

Lata Mangeshkar (28 September 1929 – 6 February 2022)

Lata Mangeshkar (Hema Mangeshkar) was born into a **Marathi family** with a rich musical heritage.

Contributions:

- She recorded approximately **50,000 songs in 36 Indian** and a **few foreign languages**.
- Her first song was recorded at age 13 for the Marathi film **"Kiti Hasaal" (1942).**
- First Hindi film playback song: "**Paa Lagoon Kar Jori"** for **"Aap Ki Seva Mein" (1946).**
- Her major breakthrough came with the song "**Dil Mera Toda**, **Mujhe Kahin Ka Na Chhora**" from the film **"Majboor" (1948).**
- She sang across various genres, from the bhajan **"Allah Tero Naam**" to the western-themed **"Ajeeb Dastan Hain Yeh."**

Honors and Awards:

- Honored with titles such as "**Nightingale of India,"** "**Voice of the Millennium**," and **"Queen of Melody."**
- Received numerous accolades, including the **Padma Bhushan (1969)** and **Padma Vibhushan** (**1999**).
- Received the **Filmfare Lifetime Achievement Award in 1993** and **Filmfare Special Awards in 1994 and 2004.**
- Won three National Film Awards and **15 Bengal Film Journalists'** Association Awards.
- Titled "**Officer of the French Legion of Honour" in 2009**.

POINTS TO PONDER

- **What is the papermaking process involving wood chips treated with a mixture of water, sodium hydroxide, and sodium sulphide at high temperature, known for its strength?** - Kraft pulping
- **What ancient writing surface, made from plant pith and found in the Nile Delta, was used for writing, making boats, and rope, but was susceptible to mold in wet weather?** -Papyrus
- **Who is the 53rd Dadasaheb Phalke Lifetime Achievement Awardee for 2021?** - Waheeda Rehman
- **When was TESS (Transiting Exoplanet Survey Satellite) launched, and how was it launched?** - April 18, 2018
- **When was Chincholi Wildlife Sanctuary declared a sanctuary?** - 2011