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Acute Encephalitis Syndrome

Several children have died in the **Muzaffarpur district** of north Bihar, due to **Acute Encephalitis Syndrome (AES)**, which is locally known as **Chamki bukhar (brain fever)**.

- The AES cases in Muzaffarpur, Bihar and adjoining **litchi producing districts** have been observed mostly from April to June, particularly in children who are **undernourished** with a history of visiting litchi orchards.
- **High temperature** during summer, along with humidity, is considered to be an ideal situation for the outbreak of Acute Encephalitis Syndrome.
- Relationship between **consumption of litchi** and **AES** was postulated by National Centre for Disease Control, Delhi (along with Centre for Disease Control US) in acute encephalitis in children, in Muzaffarpur.
- Unripe litchis contain the toxins hypoglycin A (naturally occurring amino acid) and methylenecyclopropyl-glycine (MCPG), which cause vomiting if ingested in large quantities.

Acute Encephalitis Syndrome

- **Acute encephalitis syndrome** is a severe case of encephalitis transmitted by mosquitoes and is characterized by **high fever** and **inflammation of the brain**.
The World Health Organisation (WHO) in 2006, coined the term AES to signify a group of diseases which seem similar to one another but are difficult to differentiate in the chaotic environment of an outbreak.
- The disease most commonly affects **children and young adults** and can lead to considerable **morbidity and mortality**.
- **Causative Agents: Viruses** are the main causative agents in AES cases, although other sources such as bacteria, fungi, parasites, spirochetes, chemicals, toxins, and noninfectious agents have also been reported over the past few decades. **It is not vaccine-preventable**.

- **Japanese encephalitis virus (JEV)** is the major cause of AES in India (ranging from 5%-35%).
- Herpes simplex virus, **Nipah virus, Zika virus**, Influenza A virus, **West Nile virus**, Chandipura virus, mumps, measles, dengue, scrub typhus, S.pneumoniae are also found as causative agents for AES.
- **Symptoms:** include confusion, disorientation, coma, or inability to talk, high fever, vomiting, nausea, and unconsciousness.
- **Diagnosis: The National Vector Borne Disease Control Programme** in India has set up countrywide surveillance for AES through sentinel sites with a focus on detecting Japanese encephalitis (JEV).
 - In the sentinel surveillance network, AES/JE is diagnosed by **IgM Capture ELISA**, and **virus isolation** is done in the National Reference Laboratory.

Government Initiatives

In order to reduce morbidity, mortality, and disability in children due to JE/AES, Government of India under **National Programme for Prevention and Control of Japanese Encephalitis(JE)/ Acute Encephalitis Syndrome (NPPCJA)** has developed a multi-pronged strategy with the convergence of the concerned Ministries.

- **Ministry of Health and Family Welfare:**
 - Strengthening and expanding JE vaccination
 - Strengthening of public health activities
 - Better clinical management of JE/AES Cases
 - Physical medicine and rehabilitation (PMR)
 - Establishing of the district counseling center
 - Monitoring, supervision, and coordination
- **Ministry of Drinking Water and Sanitation** for the provision of safe water supply.
- **Women and Child development** for providing high-quality nutrition to vulnerable children
- **Ministry of Social Justice and Empowerment** for establishing District Disability Rehabilitation Centers for disability management and rehabilitation.
- **Ministry of Housing and Urban Poverty Alleviation (HUPA)** for ensuring the supply of safe water in slums and towns
- **Ministry of Human Resource** (Department of School Education) to provide special facilities for disabled children for their education.

Deadlock in RCEP Trade Negotiations

Senior officials from India and China met in New Delhi to try and reach a common ground on market-opening commitments under Regional Comprehensive Economic Partnership (RCEP) negotiations.

Regional Comprehensive Economic Partnership (RCEP)

- RCEP is a **proposed regional economic integration agreement among the 10 ASEAN countries** and its six free-trade agreement partners—**Australia, New Zealand, Japan, China, South Korea and India**.
- **Once implemented, it would result in one of the largest free trade bloc** accounting for 45% of the world's population, and a combined GDP of about \$21.3 trillion and 40% of the world trade.

India's Concerns vis-a-vis China

- India is not comfortable with opening markets in goods being pushed especially by China. **India wants to offer much lower market access in goods to China compared to other members** such as the ASEAN, Japan and South Korea. However, **China is not willing to accept it**.
- **India wants clearly defined rules of origin** to ensure integrity and sanctity of tariff differentiation. This is **to prevent Chinese goods from flooding the country** through member countries that may have lower or no duty levels.
 - Chinese garments are already making their way into India through the duty-free route under the South Asia Free Trade Pact and the Duty-Free Quota-Free window from Bangladesh.
- **At least 13 countries** including Australia, Japan and New Zealand **oppose India's proposal for strict criteria to determine the source country of a product**, based on which they get tariff concessions in the 16-nation Regional Comprehensive Economic Partnership (RCEP) trade pact.
- India had a trade deficit with 11 RCEP members including China, South Korea and Australia in 2018-19.
- India has so far offered to eliminate tariffs for 70-80 % of goods for China over an extended period of time and it is unwilling to give more concessions.
 - China runs a trade surplus of over \$60 billion with India** and the domestic industry is reeling under heavy competition from Chinese goods.
- **India's aluminium and copper industries are worried about China's presence** in the grouping and anticipate widening of the trade deficit due to an **alarming spike in imports and a potential threat to the Make in India initiative**.
- **China** is also hinting at going in **for a free trade agreement between the ASEAN, China, Japan and South Korea (ASEAN+3)** if the RCEP talks take too long.

The South Asia Free Trade Pact

- The South Asia Free Trade Agreement (SAFTA) is an **agreement** among the seven South Asia countries that form the South Asian Association for Regional Cooperation **(SAARC): Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.**
 - It came into effect on 1st January 2006, with the **aim of reducing tariffs for intra regional trade among the seven SAARC members.**
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Air Pollution and Life Expectancy

An environment think tank **Centre for Science and Environment** in its report **“At the crossroad”** has said that **Life expectancy in India has gone down by 2.6 years** due to deadly diseases caused by air pollution.

The report is based on the study of three different organisations:

- The Global Burden of Disease Study 2017
- WHO publication titled **Air Pollution and Child Health**
- The review papers by scientists from the Forum of International Respiratory Societies

Key Findings

- Air pollution is now the **third highest** cause of death among all health risks ranking just above smoking in India. This is a combined effect of outdoor particulate matter (PM 2.5), ozone and household air pollution.
 - While exposure to outdoor **particulate matter (PM)** accounted for a loss of nearly one year and six months in life expectancy, exposure to household air pollution accounted for a loss of nearly one year and two months. **Household air pollution contributes about a quarter of the outdoor air pollution in the country.**
 - Due to this combined exposure, South Asians, including Indians are dying early. Their life expectancy has reduced by over 2.6 years. This is much higher than the global tally of reduced life expectancy by an average of 20 months.
- Air pollution can harm acutely as well as chronically, potentially affecting **every organ in the body.**
 - Ultra-fine particles pass through lungs are taken up by **cells and carried via the bloodstream** to expose virtually all cells in the body. Air pollution may be damaging every organ and virtually every cell in the human body.
 - The research shows each and every body part, from heart and lung disease to diabetes and dementia, and from liver problems, brain, intelligence, abdominal organs, reproduction, and bladder cancer to brittle bones and damages skin.
 - Fertility, foetuses and children are also affected by toxic air.
 - **Chronic obstructive pulmonary disease (COPD)** are responsible for the 49% of

overall deaths due to air pollution, followed by lung cancer deaths (33%), diabetes and ischaemic heart disease (22% each) and stroke at (15%).

Evidence of Health Risk

This year has seen mounting evidence on the impact of air pollution on public health.

- According to the **State of Global Air 2019** estimates, over 1.2 million Indians died early due to exposure to unsafe air in 2017.
- **Type 2 diabetes:** this study has, for the first time, accounted for risks from type 2 diabetes linked to air pollution. This has serious implications for India where type 2 diabetes has taken an epidemic form.
- Epidemiological studies in Asia, Europe and North America, supported by toxicology research, have provided strong evidence that exposure to ambient and household PM2.5 contributes to type 2 diabetes incidence and mortality.
- Globally for type 2 diabetes deaths and **disability-adjusted life years (DALYs)**, after high blood sugar and excess body weight.
- Exposure to PM 2.5 pollution has contributed to 276,000 deaths and 15.2 million DALYs from type 2 diabetes in 2017 worldwide.
- Approximately 80% of Indians breathe air that is worse than the levels recommended by **National Ambient Air Quality Standards**, the entire population of the country lives in areas with PM2.5 concentrations above the WHO Air Quality Guideline of 10 µg/m³.
- **Premature death:** India records the highest premature deaths of children under five years due to toxic air. Over 1 lakh children under the age of five fell victim to air pollution. In 2016, for almost every ten deaths in children under the age of five, one was due to air pollution.

Disability-Adjusted Life Year (DALY)

- It quantifies the burden of disease from mortality and morbidity.
- DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences.

Phosphine as Fumigant

Scientists from the **National Centre for Integrated Pest Management (NCIPM)** and **Indian Council of Agricultural Research (ICAR)** have conducted experiments in four different agro-climatic locations for the use of Phosphine as replacement of methyl bromide.

- Phosphine is 100% effective against the pests as a fumigant in a gaseous form. It is

normally produced using aluminium phosphate as substrate.

- Phosphine may be as effective as the methyl bromide in killing insect pests and can be used as quarantine fumigant at ports.

Methyl Bromide

- Methyl bromide is used for killing insect pests and can be used as quarantine fumigant at ports. Methyl bromide is an **ozone-depleting substance**.
- India has signed and ratified the Montreal Protocol, and is committed to phasing out methyl bromide and other ozone-depleting substances (ODS) by 2015.

The fumigant is still used at Indian ports for treating cereals and pulses imported from other countries to quarantine insect pests.
- The fumigant is said to have **60 times ozone-depleting potential** than refrigerant chlorofluorocarbons, which has already been phased out globally.
- 95% of the countries in the world have phased out methyl bromide and only India and a few South East Asian countries currently permit its use.
- India has been penalising those who are exporting food products without treating them with methyl bromide and this has been an issue of contention in many bilateral trade deals.

Use of Phosphine

- India has banned the use of methyl bromide in domestic warehouses, phosphine is used in its place as a fumigant.
 - This is because **methyl bromide is not good for repeated use** as it leaves residues in the grains.
 - The grains stored in warehouses need to be fumigated every three months and phosphine, which has no residual build-up should be preferred over methyl bromide.
- Currently, methyl bromide is preferred as **quarantine pest fumigant** as it is fast-acting and provides an advantage of time.
 - It is capable of killing pests like grain borers, beetles and weevils in less than 24 hours.
 - Phosphine, on the other hand, takes almost five days.

Ozone-depleting substances

- These are man-made gases that destroy ozone once they reach the ozone layer. The ozone layer exists in the **stratosphere (upper atmosphere)** and reduces the amount of harmful ultraviolet radiation that reaches Earth from the sun.
- Ultraviolet radiation can have detrimental effects on both humans and the environment such as inducing skin cancer and cataracts, distorting plant growth and

damaging the marine environment.

- Ozone-depleting substances include:
 - Chlorofluorocarbons (CFCs)
 - Hydrochlorofluorocarbons (HCFCs)
 - Hydrobromofluorocarbons (HBFCs)
 - Halons
 - Methyl bromide
 - Carbon tetrachloride
 - Methyl chloroform
 - These substances have been used as refrigerants in commercial, home and vehicle air conditioners and refrigerators, foam blowing agents, components in electrical equipment, industrial solvents, solvents for cleaning (including dry cleaning), aerosol spray propellants, fumigants.
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Vaccine for Alzheimer's Disease

Dr. Kiran Bhaskar (an Indian-American scientist at the University of New Mexico) led team has developed an early version vaccine for **Alzheimer's disease**.

- **Vaccine intervention** could rescue **memory impairments** and **prevent neurons** from dying by **reducing tau tangles** in parts of the brain that are critical to **memory and learning**.
- The vaccine uses **virus-like particles (VLP)** that helps mice to develop **antibodies** to get rid of tau tangles in them, which are responsible for breeding symptoms of Alzheimer's in humans also.
- **Tau** is a protein that when it occurs in tangled formations in the brain of Alzheimer patients, disrupts the ability of neurons to communicate with one another in the brain.
- Body's **immune system** is capable of **generating antibodies** that are responsible for eliminating tau tangles.

Alzheimer's

- Alzheimer's disease is a **neurological disorder** which causes brain cells to **degenerate and die**. This leads to **loss of memory**, problems with words in **speaking or writing**, **poor judgment**, changes in **mood and personality**, **confusion with time or place**, etc.
 - At the first stage, these symptoms are mild but they become **more severe with time**.
- Alzheimer's is the most common **cause of dementia** among older adults.
 - Dementia is a group of brain disorders that cause the loss of intellectual and social skills.

- It is caused by the build-up of proteins known as **tangles or plaques** within the brain and is also known as the third type of diabetes.
- **Ageing** is the greatest risk factor for Alzheimer's disease but sometimes symptoms may occur at the age of 30s or so because of rare genetic changes in the people.
- Alzheimer's is an **incurable disease**, as the death of brain cells cannot be reversed.
- **Women** have a **higher risk** of having Alzheimer's disease than men.
According to the US Department of Health and Human Services nearly twice as many women have Alzheimer's disease as men.

Fact and Findings

- **India** houses more than **4 million** people suffering from some form of dementia and this number is set to **triple by 2050**.
Worldwide, at least 44 million people are living with dementia, making the disease a global health crisis that must be addressed.
 - **Western countries** report a high rate of Alzheimer's, mainly on account of better diagnosis compared to countries like India where it is often ignored as a natural process of ageing.
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Defence Space Research Agency (DSRA)

The Cabinet Committee on Security chaired by the Prime Minister has cleared the setting up of the Defence Space Research Agency (DSRA) which has been entrusted with the task of **creating space warfare weapon systems and technologies**.

- The agency would be provided with a team of scientists and **would be working in close coordination with the tri-services integrated Defence staff officers**.
- It would provide **the research and development support to the Defence Space Agency (DSA)** which comprises members of the three services (Army, Naval and Air Force).
 - **The DSA has been created to help the country fight wars in outer space.**
 - The DSA has been **set up in Bengaluru** under an Air Vice Marshal-rank officer and will gradually take over the space-related capabilities of the three forces.

Integrated Defence Staff (IDS)

- The Integrated Defence Staff was set up in **October 2001** under the Ministry of Defence in the aftermath of **'Operation Vijay' (Kargil Operations)**.
- The main objective was **to promote synergy among the three Services** and to integrate these with the Ministry of Defence.
- The organisation has representation from all three services, Ministry of External Affairs (MEA), Defence Research and Development Organisation (DRDO) and

Department of Defence and Department of Finance.

- **The overarching aim of IDS is to achieve 'Victory through Jointness'.**
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El Salvador Recognises Forests as Living Entities

- On 5th June, 2019 i.e. **on the World Environment Day**, the Legislative Assembly of **El Salvador approved a pronouncement recognising the forests as living entities.**
 - The pronouncement states that each person must commit to caring for, preserving, and respecting forests, and to promoting concrete actions that expand forests in El Salvador.
 - **El Salvador lost about 85 % of its native forests since the 1960s, while the Earth lost about 80 % of its native forests.**
 - El Salvador is the smallest and most densely populated of the seven Central American countries. It's capital is San Salvador.
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National Maritime Heritage Museum

- **India and Portugal** will cooperate in the setting up of a **National Maritime Heritage Museum** at the ancient Indian site of **Lothal in Gujarat.**
 - The museum **will display the India's heritage of inland waterways** and trade through water route.
 - **Lothal was chosen because it has lots of archaeological remains**, showcasing the trade route through water. It was a **major maritime activities center of Harappans.**
 - Lothal displays engineering standards used in creating an artificial dock that shows high standards of scientific and engineering skills, far more advanced than anywhere else in the world in the 3rd millennium BC.
 - The Government of India has allocated grant for building the maritime museum and the foundation stone for the project was laid by the Prime Minister in March, 2019.
 - The project is **being implemented by the Ministry of Shipping through its Sagarmala programme**, with the involvement of the Archaeological Survey of India (ASI), the State government and other stakeholders.
 - **Sagarmala project was approved by the Union Cabinet on 25th March 2015.** It aims to leverage the country's coastline and inland waterways to drive industrial development.
 - Its main **objective** is to **promote port-led direct and indirect development** and to provide infrastructure to transport goods to and from ports quickly, efficiently and cost-effectively.
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Micryletta aishani

Scientists from **Delhi University** and the **Wildlife Institute of India**, in collaboration with researchers from **Indonesia and the US**, have discovered a new species of 'paddy frog' from **Northeast India**, specifically from Assam.



- The newly found species has been named **Micryletta aishani**, derived from the **Sanskrit word 'aishani'** or aisani meaning Northeast.
- **Micryletta aishani** belongs to the **microhylid genus Micryletta**, a group of **narrow-mouthed frogs** more commonly known as paddy frogs (found primarily in Southeast Asia).
- First known species of microhylid genus was found in the **island of Sumatra in Indonesia**.
- It is **endemic to Northeast India**, particularly the **Indo-Burma biodiversity hotspot region** that lies south of River Brahmaputra. Apart from Assam, it is also present in **Tripura and Manipur**.

How **Micryletta aishani** is different from other Frog species?

- Unlike most frogs that breed during the monsoon, **Micryletta aishani**, **breeds before the onset of monsoon** and then go into hiding for the rest of the year.
- **Micryletta aishani**, are generally found very **close to human settlements**.
- **Aishani** differs from other narrow-mouthed paddy frogs by characteristics such as **reddish-brown coloration on back, prominent dark streaks and ash-grey mottling on the lateral sides**, the shape of the snout, and absence of web on its feet.
- **Micryletta aishani** is the **fifth species** of the genus of paddy frogs.

Tripartite Agreement with French Railways

Indian Railway Station Development Corporation (IRSDC), has signed a tripartite agreement with **French Railways (SNCF) and AFD, a French Development Agency**.

- Under this agreement, AFD has agreed to support **capacity building** for the railway station development program in India by providing in-kind grant financing up to 7,00,000 EURO, through **French National Railways (SNCF)-Hubs** as well as

Connexions as a Technical Partner to the corporation.

- This will **not impose any financial liability** on Indian Railways or IRSDC.
- IRSDC is responsible for developing and redeveloping the existing and new railway stations across India.
- The agreement will help Indian Railways in positioning stations across the country as **world-class transport** hubs.

Indian Railway Stations Development Corporation (IRSDC)

- It is a special purpose vehicle (SPV) of the Ministry of Railway that has been designed to develop new stations and redevelop existing Indian railway stations.
 - IRSDC is a joint venture between Indian Railway Construction Company Limited (IRCON) and Rail Land Development Authority (RLDA).
 - IRSDC was incorporated under the Companies Act, 1956 on 12 April 2012
 - The core purpose of IRSDC is to build world-class railway stations that apply state of the art sustainable technologies. The redevelopment effort is being administered as a PPP project, i.e. a Public Private Partnership People project.
 - One of the primary facets is the involvement of developers and the lease of surplus railway land. Thus, monetizing existing assets without stressing the budgetary resources of the nation.
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Kheer Bhawani Mela

- Jammu and Kashmir's two separated communities, Muslims and Pandits, witnessed a **rare union on the annual festival** of Zyesht Ashtami at the **Kheer Bhawani temple** in **Ganderbal district of Jammu and Kashmir**.
 - Keeping the age-old tradition alive, local Muslim shopkeepers were seen selling earthenware lamps, marigold flowers and other puja paraphernalia at the temple.
 - The festival is fast emerging as a **source of healing of relationships between the Pandits and Muslims of Kashmir**.
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