

Sepsis

❖ Context

- Recently, a new research clarifies that **Sepsis is one of the most expensive medical conditions** in the world, and can lead to cell death.

❖ Key Highlights

- Sepsis is a **major medical concern**, affecting 750,000 people in the US and nearly 50 million people globally each year.
- Sepsis accounted for 11 million deaths worldwide in 2017.
- It is the **most expensive medical condition** in the US, costing over tens of billions of dollars annually.

❖ Sepsis

• About:

- Sepsis is the **body's extreme response to an infection**.
- It is a life-threatening medical emergency.
- Sepsis happens when an infection you already have **triggers a chain reaction throughout your body**.
- Infections that lead to sepsis most often start in the lung, urinary tract, skin, or gastrointestinal tract.
- Without timely treatment, sepsis can rapidly lead to tissue damage, organ failure, and death.

• Causes:

- When germs get into a person's body, they can cause an infection.
- If the person doesn't stop that infection, it can cause sepsis.
- Bacterial infections cause most cases of sepsis.
- Sepsis can also be a **result of other infections, including viral infections, such as COVID-19** or influenza, or fungal infections.

• Cytokines

- The body's response to infection starts when immune cells recognise components of the invading pathogen.
- These cells then release molecules like cytokines that help eliminate the infection.
- Cytokines are a **broad group of small proteins** that recruit other immune cells to the site of infection or injury.
- While cytokines play an essential role in the immune response, excessive and uncontrolled cytokine production can lead to a dangerous **cytokine storm** associated with sepsis.

• Vulnerable Population: Anyone can develop sepsis, but some people are at higher risk for sepsis:

- Adults 65 or older.
- People with weakened immune systems.
- People with chronic medical conditions, such as diabetes, lung disease, cancer, and kidney disease

• Symptoms

- High heart rate or weak pulse.
- Fever, shivering, or feeling very cold.
- Shortness of breath.
- Confusion or disorientation

India Australia Economic and Cooperation Trade Agreement (ECTA):

❖ Context

- **India-Australia Economic Cooperation and Trade Agreement (ECTA)** has come into effect, with this India has achieved the unique distinction of operationalizing **two Trade Agreements this year**.

❖ Key Highlights:

- Indian goods on all tariff lines to get access to Australian market with **zero customs duty**.
- Additional 10 lakh jobs to be created in India under ECTA.
- Indian **Yoga teachers and chefs** to benefit from annual visa quota.
- Over **1 lakh Indian students** to benefit from post-study work visa.

❖ How Will The Agreement Benefit India?

- The Ind-Aus ECTA provides an **institutional mechanism** to encourage and improve trade between the two countries.
- It covers almost **all the tariff lines** dealt by India and Australia.
- India will benefit from preferential market access provided by Australia **on 100% of its tariff lines**.
- It **includes all the labour-intensive sectors** of export interest to India, such as Gems and Jewellery, Textiles, leather, footwear, furniture, food, and agricultural products, engineering products, medical devices and Automobiles.

- **Regarding trade in services**, Australia has offered wide-ranging commitments in around 135 sub-sectors and **Most Favoured Nation (MFN)** status in 120 sub-sectors covering key areas of interest to India.

- The Agreement will also eliminate **Double taxation on IT services** which were making India less competitive & making IT sector less profitable.

- Products like **agricultural products and dairy sector** - which were very sensitive for India, have been protected in the ECTA.

- Australia is an important strategic partner of India. They are also part of the four nations, Trilateral Supply Chain Initiative and the Indo-Pacific Economic Forum (IPEF).

❖ How Will The Agreement Benefit Australia?

- **India will be offering** preferential access to Australia on over **70% of its tariff lines**.

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- It includes lines of export that interests to Australia, which are primarily raw materials and intermediaries such as **coal, mineral ores and wines.**
- **Regarding trade in services**, India has offered market access to Australia in around 103 sub-sectors and Most Favoured Nation status in 31 sub-sectors from the 11 broad service sectors.
- It includes **sector such as** 'business services', 'communication services', 'construction and related engineering services'.
- Australia, which is **largely dependent on imports**, will benefit hugely, they will soon start seeing a lot more finished goods coming in from India.

- The agreement is also likely to increase **investment opportunities**, promote exports, create significant additional employment and facilitate strong bonding between the two countries.



News in Between the Lines

Jupiter Icy Moons Explorer



❖ Context

- In April, 2023 the **European Space Agency (ESA)** is set to launch the **Jupiter Icy Moons Explorer (Juice)**, in what will be Europe's first dedicated robotic mission to Jupiter.

❖ Key Highlights

- Juice is due to **reach the planet in July 2031** after performing an incredible flight path through the Solar System.
- The mission will enter into orbit around Jupiter and perform numerous flybys of its large icy moons: **Europa, Ganymede and Callisto.**
- After four years of moon flybys, Juice will then enter into orbit around Ganymede, the largest moon in the Solar System — becoming **the first spacecraft ever to reach orbit around the moon of another planet.**
- The icy moons of Jupiter are interesting as they are all believed to host oceans of liquid water beneath their frozen surfaces.
- **Europa**, in particular, is regarded as one of the most likely abodes in the Solar System for extra-terrestrial life.
- **Technical Features:** Juice will be equipped with ten scientific instruments including ice-penetrating radar to study the internal oceans.
 - This use of radar is a practical first step in mapping the sub-surface oceans, paving the way for more exotic future missions involving submersible vehicles — some of which have already been put forward.

Study: Rapidly warming Arctic linked to extreme cold weather in the US



❖ Context



- Recently, a new study observed that **rapidly warming Arctic linked to extreme cold weather in the US.**

❖ Key Highlights

- The study largely focused on something called the **polar vortex.**
 - Polar vortex is a mass of cold, low-pressure air that consistently hovers over the Arctic region.
 - It is denoted by the word "vortex" because it spins counter-clockwise, just like a hurricane does.
- Usually, the **polar vortex remains strong and compact**, meaning the mass of frigid air stays at the North Pole.
- But **sometimes it weakens**, like a wobbling top, and **expands to influence the jet stream.**
 - Jet Stream is an area of fast-moving air high in the atmosphere that surrounds the polar vortex.
- Once the jet stream is impacted, the cold polar air finds its way towards the mid-latitude regions.

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	<ul style="list-style-type: none"> In the study, researchers found that the expansion of the polar vortex has been occurring more than twice as often in recent years and the reason for it is the rapidly warming Arctic. The study demonstrated that the melting sea ice in Barents and Kara seas north of Russia and Scandinavia and increasing Siberian snowfall create larger and more energetic atmospheric waves that ultimately stretch the polar vortex, causing extreme winter weather in the US and other places.
<p>Pradhan Mantri Kisan Samruddhi Kendras (PMKSKs)</p> 	<ul style="list-style-type: none"> ❖ Context <ul style="list-style-type: none"> ➤ Recently, Union Minister for Chemicals & Fertilizers, virtually interacted with Farmers and Retailers from over 9000 Pradhan Mantri Kisan Samruddhi Kendras (PMKSKs) across the country. ❖ About PMKSKs <ul style="list-style-type: none"> • Nodal Ministry- Ministry of Chemicals and Fertilisers. • Under the scheme, the retail fertilizer shops in the country will be converted into PMKSK in a phased manner. • It will cater to a wide variety of needs of the farmers and provide agri-inputs (fertilisers, seeds, implements), testing facilities for soil, & fertilizers. • It will generate awareness among farmers. • It will provide information regarding various government schemes and ensure regular capacity building of retailers at block/district level outlets. • More than 3.3 lakh retail fertilizer shops are planned to be converted into PMKSK.
<p>Remote Voting For Domestic Migrants</p> 	<ul style="list-style-type: none"> ❖ Context <ul style="list-style-type: none"> ➤ ECI is ready to pilot remote voting for domestic migrants. Thus the migrant voter would not need to return to his/her home district to exercise his/her franchise of voting. ❖ Key Highlights <ul style="list-style-type: none"> • ECI develops prototype Multi-Constituency Remote Electronic Voting Machine (RVM), invites political parties for demonstration of prototype RVM. • Prototype RVM can handle multiple constituencies from a single remote polling booth. • ECI floats concept note soliciting views from Political Parties on legal, operational, administrative and technological challenges. ❖ Rational behind RVM: <ul style="list-style-type: none"> • Election Commission of India is concerned about the issue of over 30 Crore electors not exercising their franchise and also differential voter turnout in various States/Uts. • It is understood that there are different reasons for a voter not opting to register in a new place of residence, thus missing out on exercising the right to vote. • Inability to vote due to internal migration (domestic migrants) is one of the prominent reasons to be addressed to improve voter turnout and ensure participative election. • Out-migration is predominant among the rural population in overall domestic migration. • Approximately 85% of the internal migration is within the States. • Although there is no central database available for migration within the country, the analysis of available data in public domain points to work, marriage & education related migration as important components of domestic migration.
<p>First Ever Two Storey 3-D Printed Dwelling Unit</p>	<ul style="list-style-type: none"> ❖ Context <ul style="list-style-type: none"> ➤ The Indian Army inaugurated its first 3-D Printed House Dwelling Unit (with Ground plus One configuration) for soldiers at Ahmedabad Cantt. ❖ Key Highlights <ul style="list-style-type: none"> • The dwelling unit has been constructed by the Military Engineering Services (MES) in collaboration with MiCoB Pvt Ltd.

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- The **disaster-resilient structures** comply with Zone-3 earthquake specifications and green building norms.
- ❖ **What is 3D Printing?**
 - **3D printing or additive manufacturing** is a process of making three dimensional solid objects from a digital file.
 - **In an additive process** an object is created by laying down successive layers of material. Each of these layers can be seen as a thinly sliced cross-section of the object.
 - 3D printing is the **opposite of subtractive manufacturing** which is cutting out / hollowing out a piece of metal or plastic with for instance a milling machine.
 - 3D printing enables you **to produce complex shapes** using less material than traditional manufacturing methods.

Brahmos Missile From SU-30MKI Fighter



- ❖ **Context**
 - The Indian Air Force (IAF) successfully test fired the **Extended Range Version of Brahmos Air Launched** missile against a ship target from a frontline SU-30MKI aircraft.
- ❖ **Key highlights**
 - The missile achieved the desired mission objectives in the **Bay of Bengal region**.
 - With this, IAF has achieved a significant capability boost to carry out **precision strikes from SU-30MKI** aircraft against land or sea targets over very long ranges.
 - The extended range capability of the missile coupled with the high performance of the SU-30MKI aircraft **gives the IAF a strategic reach** and allows it to dominate the future battlefield.
 - **Stand-off range missiles** are the ones which are launched at a distance sufficient to allow the attacking party to evade defensive fire expected from the target area. The missile is gravity dropped from the fuselage of the fighter jet, **and the two-stage missile's engine** is then fired up and it propels towards the intended target at the sea.
- ❖ **About BrahMos:**
 - It is a combination of the names of **Brahmaputra and Moskva rivers**.
 - BrahMos missiles are designed, developed and produced by BrahMos Aerospace, a joint venture company set up by Defence Research and Development Organisation (**DRDO**) and **Mashinostroyenia of Russia**.
 - The **first test launch** of the initial version Brahmos took place in 2001.
 - **Various types of the BrahMos**, including those which can be fired from land, **warships, submarines and Sukhoi-30** fighter jets have already been developed and successfully tested and inducted since then.
 - **Brahmos is the heaviest weapon** to be deployed on India's Sukhoi-30 MKI fighter aircraft, which has been **modified by HAL** to carry these weapon systems.

Ethylene Glycol



- ❖ **Context**
 - Uzbekistan's Health Minister claimed that at **least 18 children** died after consuming India-made medicinal syrup.
- ❖ **Key Highlights**
 - It was found that deceased children were **given more than recommended dose** and also the drug was given without a doctor's prescription.
 - India's Central Drugs Standard Control Organisation (**CDSCO**) has **launched a probe** into the allegations of any misconduct.

What is Ethylene Glycol?

- Ethylene glycol is a **colourless and odourless** alcoholic compound that can be fatal if consumed.
- **The sweet-tasting** ethylene glycol is a syrupy or viscous liquid at room temperature. It is mostly used as **automotive antifreeze** and as a raw material for manufacturing polyester fibers.
- It is also found in several products such as **hydraulic brake fluids, stamp pad inks, ballpoint pens, solvents, paints, cosmetics and plastics**.

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