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Science and Technology

Herd Immunity

Why in News?

Recently, AIIMS director has claimed that herd immunity is very difficult to achieve in India and one should not think of it in practical terms, especially due to variant strains of COVID-19 and waning immunity of infected persons.

About Herd Immunity:

- Community immunity or herd immunity occurs when a large number of people are vaccinated or have developed immunity against a disease, lowering the chances of others being infected by it.
- When a sufficient percentage of population is vaccinated, it slows the spread of disease.
- The decline of disease incidence is greater than the proportion of individuals

immunized either by vaccines or recovering from virus.

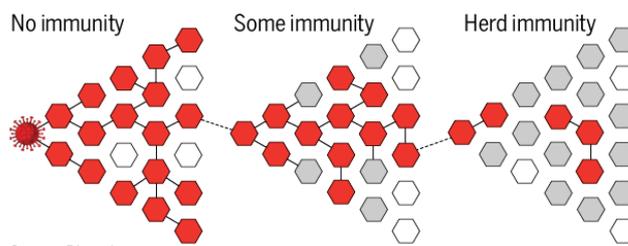
- It happens because vaccination reduces the spread of an infectious agent by reducing the amount and/or duration of pathogen shedding by vaccines, retarding transmission.
- This approach requires infected people to build natural immunity and stop the human-to-human transmission. Thus, the disease spread will be subsequently halted.

The journey to herd immunity

1. A novel pathogen is introduced to a community. Because it's new, no one has immunity and it begins to spread.

2. Those who recover and those who receive a vaccine (if there is one) develop immunity, at least for a period of time. With the coronavirus, it's not known how long. So far, there is no proven vaccine.

3. Herd immunity takes hold when the pathogen can't find new hosts and stops spreading. That happens once a sufficient portion of the community is immune. For this virus, estimates range from 55% to 82%.



NASA's Mars 2020 Mission

Why in News?

NASA's Perseverance Rover, a part of Mars mission has landed on Mars.

About NASA Mars Mission:

It is designed to improve our understanding of the geology of Mars and look for possible signs of ancient life on the planet.

- Its duration is at least one Mars year (about 687 Earth days).
- **Planned Mission Steps:**

- **Collect:** Perseverance Rover will collect rock and soil samples in cigar-sized tubes and seal it.
- **Fetch:** A Mars Fetch Rover (provided by the ESA) will collect all samples sealed by perseverance rover from the different locations and will return to the lander.
- **Transfer:** These samples will be transferred to the Mars Ascent Vehicle which will later meet an Orbiter.
- **Return:** The Orbiter will carry these samples back to Earth.

- Presently, OBCs are granted 27% reservation in jobs and education under the central government.
- The Central List of OBCs consists of over 2,600 communities in it.
- The idea of sub-categorisation arises out of the perception that only a few affluent communities among the listed ones have secured a major part benefits of 27% reservation.
- A commission to examine Sub-categorisation of OBCs was established on October 11, 2017, headed by retired Delhi High Court Chief Justice G Rohini.

About Perseverance Rover:



- It is the most advanced, most expensive and most sophisticated mobile laboratory sent to Mars.
- It was launched on 30th July, 2020
- It's landing site is Jezero Crater.
- **Jezero Crater** is an ancient river delta that has rocks and minerals that could only form in water.

About National Commission for Backward Classes

- Initially, under National Commission for Backward Classes Act, 1993; NCBC was established as a **statutory body** under the Ministry of Social Justice and Empowerment.
- 102nd Constitution Amendment Act, 2018 provides **constitutional status** to the NCBC.
- It examines complaints and welfare measures regarding socially and educationally backward classes.
- Supreme Court had directed the government in Indra Sawhney case of 1992, to create a permanent body to entertain, examine and recommend the inclusion and exclusion of various Backward Classes for the purpose of benefits and protection.
- **Composition of NCBC:** five members which include:
 - Chairperson,
 - Vice- Chairperson and
 - three other members
- They are appointed by the **President by warrant under his hand and seal.**
- The conditions of **service and tenure** of office of the members are determined by **President.**

Polity and Governance

National Commission for Backward Classes (NCBC)

Why in News?

Recently, the NCBC chairperson has spoken in support of sub-categorisation of OBCs.

About Sub-Categorisation of OBCs:

- It refers to creation of categories within OBCs for reservation.

Functions of NCBC:

- Monitoring how safeguards provided to the backward classes under the Constitution and other laws for their protection are being implemented,
- Inquiring into complaints regarding violation of rights, and
- Recommending on socio-economic development of such classes.

Key Takeaways:

- Both the central and state governments are required to consult the NCBC on all major policy matters affecting the socially and educationally backward classes.
- NCBC presents annual reports (and at such other times as the Commission may deem fit) to the President, about working of the safeguards.
- The President lays these reports before each House of Parliament.
- NCBC has powers of a **civil court**.

- Promote the safe, secure and peaceful use of **nuclear technologies** in the globe.
- Promote the peaceful use of **nuclear energy**,
- Inhibit nuclear energy's use for any military purpose, also including nuclear weapons.

The IAEA has three chief areas of work:

- Safety and security
- Science and technology
- Safeguards and verification

Other important aspects of IAEA:

- India is a founding member of the IAEA, i.e., joined it in 1957.
- Presently, IAEA functions as an autonomous organisation within the United Nations system.
- Funding of IAEA: Contributions and donations from non-members.

Note: IAEA is **not** specialised agency of UN.

International Relations

International Atomic Energy Agency (IAEA)

Why in News?

Iran recently had discussions with IAEA chief, to restrict the agency's inspections unless the United States lifts its sanctions.

About IAEA:

- The IAEA is a UN agency working as the international centre for cooperation in the nuclear/atomic field.
- It works with its member countries and many other partners to promote **peaceful uses** of nuclear technologies.
- In 1957, it was set up as the world's "Atoms for Peace" organization within the United Nations.
- It reports to **both** the UN General Assembly and Security Council.
- It has headquarters in Vienna, Austria.

Key functions:

EXPANDING TRANSPARENCY

| MILESTONES | WHAT IT MEANS |
|---|---|
| Aug 1, 2008 Pact reached to place Indian civilian nuclear facilities under IAEA safeguards | <ul style="list-style-type: none">• Enhances transparency of India's civilian nuclear infrastructure• Smoothens ties with the U.S. ahead of Modi's visit to New York, Washington in Sept.• Makes import of nuclear power equipment from diverse sources easier |
| Oct 10, 2008 Indo-U.S. civil nuclear deal inked | <ul style="list-style-type: none">• Boosts India's chances of becoming a member of Nuclear Suppliers Group |
| Mar 15, 2009 Additional Protocol signed between India and IAEA | |
| June, 2014 Modi government ratifies the Additional Protocol | |
| SITES UNDER SCRUTINY | |
| | <ul style="list-style-type: none">• Six facilities in the Nuclear Fuel Complex, Hyderabad• Unit 1 and 2 and two more facilities in Tarapur, Maharashtra• Units 1-6 of the Rajasthan Atomic Power Station• Units 1 and 2 of Kudankulam Nuclear Power Plant• Kalrapar Atomic Power Station |



News in Short

Hyderabad named as Tree City of the World

- Recently, Hyderabad city was recognised as 2020 Tree City of the World by the **Arbor Day Foundation** and the **UN Food and Agriculture Organisation**.
- It is the only city in India to get this recognition.
- Tree Cities of the World Programme is an international effort to recognize cities and towns committed to ensuring that their urban forests and trees are properly maintained, sustainably managed, and duly celebrated.
- Hyderabad's selection occurred because of its commitment to growing and maintaining urban forestry through programmes like
 - Haritha Haram programme and
 - Urban Forest Parks.

- inability to talk,
- high fever,
- vomiting,
- nausea,
- unconsciousness.
- inflammation of the brain

The infographic features a central blue silhouette of a child with a red virus particle on their chest. To the left, under 'SYMPTOMS', are: Dizziness, Nausea, Fever, Bodyache, and Fatigue. To the right, under 'PREVENTIVE MEASURES', are: Vision impairment, Hearing loss, Paralysis, Seizures, and Unconsciousness. Below the child, under 'TREATMENT', are: Antiviral medication, Anti-inflammatory drugs, Bed rest, and Plenty of fluids. At the bottom center is a circular icon of a person wearing a red cap and a white face mask. At the very bottom, it says 'Sources: Media reports, The national medical journal of India, Ministry of health and welfare'.

| SYMPTOMS | TREATMENT | PREVENTIVE MEASURES |
|---|--|--|
| <ul style="list-style-type: none">▶ Dizziness▶ Nausea▶ Fever▶ Bodyache▶ Fatigue | <ul style="list-style-type: none">▶ Antiviral medication▶ Anti-inflammatory drugs▶ Bed rest▶ Plenty of fluids | <ul style="list-style-type: none">▶ Take preventive vaccination▶ Use repellents▶ Wear long-sleeved clothes▶ Wash hands before and after meals |

Acute Encephalitis Syndrome

- First case of this year of AES was reported from Bihar recently.
- AES is a severe case of encephalitis mostly transmitted by mosquitoes in India.
- Vulnerable Population:
 - children and
 - young adults
- Causative Agents: **Viruses** are the main causative agents in AES cases, although other sources such as bacteria, fungi, parasites, spirochetes, chemicals, toxins, and non-infectious agents have also been reported.
- There is no vaccine present of this disease.
- Japanese encephalitis virus (JEV) is the major cause of AES in India.
- Symptoms:
 - Confusion,
 - disorientation,
 - coma,