

La Nina and Heat wave

- In most years, meteorologists consider the La Nina to be a friend of India.
- The phenomenon associated with below normal sea surface temperatures in the eastern and central Pacific Ocean, makes the summer monsoon wetter and the winter colder unlike its evil twin, the El Nino, or a warming phenomenon that frequently dries up monsoon rains over India.
- This year, however, the La Nina is being blamed for worsening perhaps the longest spell of heatwaves from March to April in north, west and Central India.

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Periodic pattern

- Formally known as the El Nino Southern Oscillation (ENSO), the La Nina-El Nino phenomenon follows a periodic pattern that roughly lasts three years.
- During a La Nina winter, a north-south pressure pattern sets up over India and normally this influences the trade winds that bring rains to India.

- However, because the La Nina didn't peak, the sea surface temperatures continued to be cold and this drove hot westerly winds and blasts of hot air from the Middle East into Pakistan and India.
- "The north-south pressure pattern has been persisting over India, with La Nina extending its stay over the Pacific.
- This has definitely impacted the weather over India, which has been seen even during 1998-2000 when La Nina had persisted for three years.
- While land temperatures over India begin rising in March, they are usually punctuated by western disturbances, or moisture from the Mediterranean region that fall as rain over north and western India.
- For these currents to make it as far as India, they need a significant difference in temperature between Europe and the latitudes over India.
- "Partly due to La Nina, this temperature difference was absent and so the western disturbances that came to India were weak with hardly any rain,"

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Symmetric body structure

- Having a vertebral column endows vertebrates with many similar

characteristics and one of these is a bilateral or left–right symmetry.

- For instance, if we draw an imaginary line dividing a vertebrate’s body from head to tail through the centre, we will see symmetrically placed eyes, limbs, etc.
- To ask how this symmetric body structure comes into being means going to the embryonic stage and see how the precursors of skeleton and muscles, known as somites, develop.
- A group of researchers studying zebrafish model embryos find that it is in fact surface tension that shapes these cells and not any genetic regulatory mechanism.

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L452R mutation

- Mutations at position L452R was found in Delta along with Kappa and Epsilon, while variant Lambda had L452Q.
- These mutations have been previously reported to be associated with increased infectivity of the virus and also has the ability to evade neutralisation by monoclonal antibodies.
- Preliminary research shows that BA.4 and BA.5 lineages may be capable of escaping immunity gained by a previous BA.1 infection.

- Preliminary evidence emerging in a preprint from South Africa also suggests that vaccines are potentially better in protecting against infection as compared to previous infection with BA.1.
- More evidence is required to understand the clinical outcomes of the new lineages.
- The L452 mutations in the spike protein are not unique to BA.4 and BA.5 Omicron lineages but have also emerged independently in other Omicron sublineages in different countries.
- This includes the mutation L452Q in lineage BA.2.12.1, a sublineage of BA.2, which is recently seen to dominate COVID-19 cases in New York.

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Hearing loss and TBX2

- Hearing loss due to aging, noise and certain cancer therapy drugs and antibiotics has been irreversible because scientists have not been able to reprogramme existing cells to develop into the outer and inner ear sensory cells essential for hearing once they die.
- The North-western Medicine scientists have now discovered a single master gene that programmes ear hair cells into either outer or

inner ones, overcoming a major hurdle that had prevented the development of these cells to restore hearing (Nature).

- The master gene switch Northwestern scientists discovered that programmes the ear hair cells is TBX2.
- When the gene is expressed, the cell becomes an inner hair cell. When the gene is blocked, the cell becomes an outer hair cell.

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Pulsar

- An object that astronomers thought was a distant galaxy has now been discovered as the brightest extra-galactic pulsar ever seen.
- A pulsar (from pulsating radio source) is a highly magnetized rotating neutron star that emits beams of electromagnetic radiation out of its magnetic poles.
- This radiation can be observed only when a beam of emission is pointing toward Earth (similar to the way a lighthouse can be seen only when the light is pointed in the direction of an observer), and is responsible for the pulsed appearance of emission. Neutron stars are very dense and have short, regular rotational periods.

- This produces a very precise interval between pulses that ranges from milliseconds to seconds for an individual pulsar. Pulsars are one of the candidates for the source of ultra-high-energy cosmic rays.

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Porcine virus

- In January, a person in the United States became the first recipient of a pig-heart transplant.
- He died two months later, and doctors now say the genetically edited pig heart carried a porcine virus that could have contributed to his death.
- The main concern is that the virus can damage the heart.
- Porcine circovirus is a group of four single-stranded DNA viruses that are non-enveloped with an unsegmented circular genome.
- They are members of the genus Circovirus that can infect pigs.

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Wheat crisis

- On May 4, the government lowered its wheat production estimates by 5.7% to 105 million tonnes (MT) from the projected 111.32 MT for the crop year ending June.
- The production is expected to fall on account of unusually warm weather

conditions that persisted during March to April in most parts of the key grain-producing States of Punjab, Haryana, Madhya Pradesh as well as Uttar Pradesh.

Why has wheat production dwindled?

- India is the second largest producer of wheat in the world, with China being the top producer and Russia the third largest. Ukraine is the world's eighth largest producer of wheat. Unprecedented heatwaves across the north, west and central parts of the country, and March and April being the hottest in over 100 years, have caused substantial loss to the yield at 6%, with 20% of the wheat grain shrivelling up.

How will this impact the public distribution of grain?

- Wheat procurement is undertaken by the state-owned Food Corporation of India (FCI) and other agencies at MSP to meet the requirements under the Public Distribution System (PDS) and other welfare schemes such as the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) introduced during the pandemic.

- The government has revised the grain allocation under PMGKAY for May to September 2022.
- According to the new guidelines, the FCI will fill the gap left by wheat with an increased allocation of rice.
- An additional 5.5 MT rice is being allocated to the States to fill the gap in supplying wheat grain.

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Landmark Roe vs Wade case

The story so far:

- The Supreme Court of the United States (SCOTUS) has privately voted to strike down the constitutional right to abortion as determined by the landmark Roe vs Wade case in 1973, according to a leaked draft opinion from February 2022.

What is the Roe vs Wade case?

- Roe, short for Jane Roe, is the pseudonym for a Texas woman named Norma McCorvey who in 1970 sought to have an abortion when she was five months pregnant, notwithstanding Texas' ban on abortions except to save a mother's life.
- Wade refers to Henry Wade, the district attorney in Dallas County, Texas, at the time, who was the defendant in the case.

- The 7-2 majority opinion of the SCOTUS was written on January 22, 1973, by Justice Harry Blackmun, paving the way for the recognition of abortion as a constitutional right in the U.S., effectively striking down a wide range of state-level abortion limitations applied before foetal viability.
- In 2016, NCDs accounted for 55% of premature death and disability in the country.
- Indians also have a disposition for excessive fat around the stomach and abdomen which leads to increased risk of cardiovascular disease and type 2 diabetes.

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Food labelling

- The Food Safety and Standards Authority of India (FSSAI) is expected to issue a draft regulation for labels on front of food packets that will inform consumers if a product is high in salt, sugar and fat.
- It is expected to propose a system under which stars will be assigned to a product.
- An increased consumption of packaged and junk food has also led to a double burden of undernutrition and over nutrition among children.

Why is there opposition to the rating system?

Why do we need front-of-package labelling?

- In the past three decades, the country's disease patterns have shifted.
- While mortality due to communicable, maternal, neonatal, and nutritional diseases has declined and India's population is living longer, non-communicable diseases (NCDs) and injuries are increasingly contributing to the overall disease burden.
- In a health-star rating system, introduced in 2014 in Australia and New Zealand, a product is assigned a certain number of stars using a calculator designed to assess positive (e.g., fruit, nut, protein content, etc) and risk nutrients in food (calories, saturated fat, total sugar, sodium).
- Scientists have said that such a system misrepresents nutrition science and the presence of fruit in a fruit drink juice does not offset the impact of added sugar.

- Experts say that so far there is no evidence of the rating system impacting consumer behaviour.

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