



# drishti

## News Analysis (14 Mar, 2020)

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### Speeding up Generation of RBCs in the Lab

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#### Why in News

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A team of Indian researchers have invented a process through which **generation of Red Blood Cells(RBCs) outside the body (in vitro) from Hematopoietic Stem Cells (HSCs) can be speeded up.**

The invented process would help to **fasten the process of transfusion of RBCs** in life-saving treatments for numerous conditions such as severe anaemia, transplant surgery, pregnancy-related complications, and blood-related cancers.

#### Background

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- The blood banks, particularly in developing countries, often face a **severe shortage of whole blood as well as components of blood like red blood cells.**
- Various groups have been able to produce RBCs in the laboratory from HSCs. However, the process takes a **long time - around 21 days.**
  - The umbilical cord blood contains special cells called hematopoietic stem cells that can be used to treat some types of diseases.
  - Hematopoietic stem cells **can mature into different types of blood cells** in the body.
- The resources required to grow cells in the laboratory over such a **long duration can be very expensive** for the generation of RBCs on a large scale for clinical purposes.

#### Key Points

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- The process of generation of RBCs in the laboratory from HSCs can be **speeded up by adding a very low concentration of a small protein molecule called 'Transforming Growth Factor  $\beta$ 1' (TGF- $\beta$ 1), along with a hormone called 'Erythropoietin' (EPO). The whole process takes 18 days.**  
Usually, the addition of only Erythropoietin (EPO) to HSCs generate RBCs in **21 days.**
- Indian researchers have found that the **addition of TGF- $\beta$ 1 with EPO** has **cut down** the processing time by **three days.**
- The physical appearance and the quality of the cells formed has revealed that the RBCs formed using this procedure are **normal.**

## Blood

- Blood is a fluid connective tissue that consists of plasma, blood cells and platelets.
- It helps to circulate oxygen and nutrients to various cells and tissues.
- The major types of blood cells include:
  - **Red Blood Cell**
    - The Red Blood Cells (RBCs) are also known as **Erythrocytes.**
    - RBCs contain the iron-rich protein called **haemoglobin** that gives blood its **red colour.**
    - RBCs are the most copious blood cell produced in bone marrows. Their main function is to transport oxygen from and to various tissues and organs.
  - **White Blood Cells**
    - The White Blood Cells (WBCs) are also known as **Leucocytes** and are the **colourless** blood cells as it is **devoid of haemoglobin.**
    - It mainly contributes to **immunity and defence mechanism.**

Source: PIB

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## AT-1 Bonds

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### Why in News

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Recently, the **Reserve Bank of India (RBI)** has made a proposal to write-down Additional Tier-1 (AT-1) bonds as part of the **SBI-led restructuring package for Yes Bank.**

### Key Points

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- AT-1 bonds are a type of **unsecured, perpetual bonds** that banks issue to shore up their core capital base to meet the **Basel-III norms**.
- There are **two routes** through which these bonds can be acquired:
  - **Initial private placement offers** of AT-1 bonds by banks seeking to raise money.
  - **Secondary market buys** of already-traded AT-1 bonds.
- AT-1 bonds are like any other bonds issued by banks and companies, but pay a **slightly higher rate of interest** compared to other bonds.
- These bonds are also **listed and traded on the exchanges**. So, if an AT-1 bondholder needs money, he can sell it in the secondary market.
- Investors **cannot return these bonds** to the issuing bank and get the money. i.e there is **no put option available** to its holders.
- However, the issuing banks have the **option to recall AT-1 bonds** issued by them (termed call options that allow banks to redeem them after 5 or 10 years).
- Banks issuing AT-1 bonds can skip interest payouts for a particular year or even reduce the bonds' face value.
- AT-1 bonds are **regulated by RBI**. If the RBI feels that a bank needs a rescue, it can simply ask the bank to write off its outstanding AT-1 bonds without consulting its investors.

## Basel-III Norms

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- It is an international regulatory accord that introduced a set of reforms designed to improve the regulation, supervision and risk management within the banking sector, post 2008 financial crisis.
- Under the Basel-III norms, **banks were asked to maintain a certain minimum level of capital** and not lend all the money they receive from deposits.
- According to Basel-III norms banks' regulatory capital is divided **into Tier 1 and Tier 2**, while **Tier 1 is subdivided into Common Equity Tier-1 (CET-1) and Additional Tier-1 (AT-1) capital**.
- **Common Equity Tier 1 capital** includes equity instruments where returns are linked to the banks' performance and therefore the performance of the share price. They have no maturity.
- **Additional Tier-1 capital** are perpetual bonds which carry a fixed coupon payable annually from past or present profits of the bank.
- They have no maturity, and their dividends can be cancelled at any time.
- Together, CET and AT-1 are called Common Equity. Under Basel III norms, minimum requirement for Common Equity Capital has been defined.
- Tier 2 capital consists of unsecured subordinated debt with an original maturity of at least five years.
- According to the Basel norms, if minimum Tier-1 capital falls below 6%, it allows for a write-off of these bonds.

## RBI's Regulations Over Banks

- In a situation where a bank faces severe losses leading to erosion of regulatory capital, the **RBI can decide** if the bank has reached a situation wherein it is no longer viable.
  - The RBI can then activate a **Point of Non-Viability Trigger (PONV)** and **assume executive powers of the bank**.
  - By doing so, the RBI can do whatever is required to get the bank on track, including **superseding the existing management, forcing the bank to raise additional capital and so on**.
  - However, activating PONV is followed by a write down of the AT-1 bonds, as **determined by the RBI through the Banking Regulation Act, 1949**.
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## Masks and Hand Sanitizers Under EC Act, 1955

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### Why in News

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Recently, the central government has notified that **masks (2 ply and 3 ply surgical masks, N95 masks) and hand sanitizers as essential commodities** up to June 30, 2020, under the **Essential Commodities Act, 1955 (EC Act)**.

- The invocation of the EC Act aims to ensure that these products, key for preventing the spread of Covid-19 infection, are available to people at the **right price and of the right quality**.
- The Ministry of Consumer Affairs, Food & Public Distribution has also issued an advisory under the **Legal Metrology Act, 2009 to ensure these items are not sold for more than the Maximum Retail Price (MRP)**.

### NOTE:

- **Essential Commodities Act, 1955:** This Act intends to provide, in the interest of the general public, for the control of the production, supply and distribution of, and trade and commerce, in certain commodities.
- **The Legal Metrology Act, 2009:** It aims to establish and enforce standards of weights and measures, regulate trade and commerce in weights, measures and other goods which are sold or distributed by weight, measure or number and for matters connected therewith or incidental thereto.
- Both the mentioned Acts are **regulated and administered** by the **Ministry of Consumer Affairs, Food and Public Distribution**.

## Key Points

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- Under the EC Act, the States and Union Territories **can ensure that manufacturers enhance their production capacity so that masks and hand sanitizers are widely available to consumers.**
  - The invocation of EC Act has empowered the Centre as well as states to regulate the production, quality, distributions of masks and hand sanitizers.
  - It will also help to smoothen the sale and availability of the above items and carry out operations against speculators.
- The Consumer Affairs Ministry has also invoked the **Prevention of Black Marketing and Maintenance of Supplies of Essential Commodities Act, 1980** which would carry out action against those involved in overpricing and black marketing of the products.

Source: TH

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## Effects of Changing Groundwater Levels on Himalayas

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### Why in News

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Recently, researchers from the **Indian Institute of Geomagnetism (IIG)** have found that the Himalayan range subsides and moves up depending on the seasonal changes in groundwater, apart from the normal and common reasons.

IIG is an **autonomous institute** under the **Department of Science & Technology (DST)**.

### Key Points

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- The **Global Positioning System (GPS)** and **Gravity Recovery And Climate Experiment (GRACE)** data were used to quantify the variations of hydrologic mass. The GRACE satellites, **launched by the US in 2002, monitor changes in water and snow stores on the continents**, enabling the researchers to study terrestrial hydrology.
- The combined GPS and GRACE data suggest a **12% reduction in the rate of the subsurface slip.**
  - The **subsidence rate is associated with groundwater consumption.**
  - **Subsurface slip** refers to **how fast the fault is slipping relative to the foot and hanging wall.**
  - The slip occurs at the **Main Himalayan Thrust (MHT)**, due to hydrological variations and human activities, over which there is the periodic release of accumulated strain.

- Water acts as a **lubricating agent** and in the dry season, the **rate of the slip of the fault in the region is reduced**.
- There are **normal and common reasons** also affecting the Himalayas apart from the groundwater levels.
  - The Himalayan foothills and the Indo-Gangetic plain are sinking because its **contiguous areas are rising due to tectonic activity** associated with landmass movement or continental drift.
  - In the Himalaya, **seasonal water from glaciers** as well as **monsoon precipitation** plays a key role in the deformation of the crust and the seismicity associated with it.
- This is the first study to look at the rising Himalayas from a **hydrological standpoint**.
- Since the Himalayas play an important role in influencing climate in the Indian subcontinent, the study will help in **understanding the effects of hydrology on climate**.

## Fault

- It is a **planar or gently curved fracture in the rocks of the Earth's crust**, where compressional or tensional forces cause relative displacement of the rocks on the opposite sides of the fracture.
- When rocks slip past each other in faulting, the upper or overlying block along the fault plane is called the **hanging wall or headwall**; the block below is called the footwall.

## Main Himalayan Thrust

The **Indian plate under thrusts the Eurasian plate** along a northerly dipping detachment surface known as Main Himalayan Thrust (MHT) that separates the downgoing Indian plate from the overriding Himalayan wedge.

Source: PIB

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## National Creche Scheme

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- The National Crèche Scheme is a **centrally sponsored scheme being implemented by the Ministry of Women and Child Development**. The scheme was earlier named as Rajiv Gandhi National Creche Scheme.
- It aims to provide day care facilities to children (age group of 6 months to 6 years) of working mothers.

- The salient features of the National Creche Scheme are as follows:
  - Daycare Facilities including Sleeping Facilities.
  - Early Stimulation for children below 3 years and pre-school Education for 3 to 6 years old children.
  - Supplementary Nutrition ( to be locally sourced)
  - Growth Monitoring
  - Health Check-up and Immunization
- Further, the guidelines provide that :
  - Crèches shall be open for 26 days in a month and for seven and half (7-1/2) hours per day.
  - The number of children in the crèche should not be more than 25 per crèche.
  - User charges will be levied to bring in an element of community ownership.
- The **fund sharing pattern** under National Creche Scheme amongst **Centre, States/UTs & Non Governmental Organisations/Voluntary Organisations** is in the ratio of **60:30:10 for States, 80:10:10 for North Eastern States and Himalayan States and 90:0:10 for UTs.**

## Benefits of Creche Facility

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- It helps women to manage both their career as well as their family responsibility.
- It promotes gender diversity at workplaces.
- Creche facilities help promote gender equality and democracy by increasing participation of women in the economy.

**Source: PIB**

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## Spanish Flu

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### Why in News

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As COVID-19 declared a global health crisis, parallels are being drawn with the Spanish influenza of 1918-19, which is considered the most devastating pandemic in recent history.

### Key Points

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- Spanish flu was caused by an **H1N1 influenza virus**.
- There is **no universal consensus** regarding where the virus originated. It is believed that **World War I** was partly responsible for it's spread.
- **Spain was one of the earliest countries** where the epidemic was identified, but historians believe this was likely a result of wartime censorship.

- Spain was a neutral nation during the war and did not enforce strict censorship of its press, which freely published early accounts of the illness. As a result, people falsely believed the illness was specific to Spain, and the name "**Spanish flu**" stuck.

## How was the Outbreak Tamed

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- **Awareness:** That word got around about this killer disease through government efforts and through informal communications.  
Social Distance: People were practising social distancing and taking other preventive steps.
- **Natural Phenomenon:** The virus evolved to become milder in the process.  
There is a theory that, **as viruses propagate, the more virulent strains are unable to survive, reproduce, and propagate** as effectively as the less virulent strains, because their hosts die before the virus can jump to new susceptible hosts.
- **Climatic Conditions:** Differences in climate across India.  
Influenza viruses tend to not do as well in warm and moist conditions as they do in cooler, drier conditions.

## Learning from the Spanish flu

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- **Quick Response:** A quick initial emergency response to deal with pandemic COVID-19. Locations close to an entry point will have extremely short windows of time to deal with a virulent pathogen.  
While locations that are distant from the entry point will have longer windows of time to prepare for and deal with less-lethal variants of the disease.
- **Hygiene:** To be extra vigilant about hygiene and aggressively practice social distancing.

### H1N1 Virus

- H1N1 influenza virus causes **Swine Flu**.
- Swine Flu is an **infection** of the **respiratory tract** characterized by the usual symptoms of flu — cough, nasal secretions, fever, loss of appetite, fatigue, and headache.
- It is called swine flu because it was known in the past to occur in people who had been in the **vicinity of pigs**.
- The virus is transmitted by short-distance airborne transmission, particularly in crowded enclosed spaces. Hand contamination and direct contact are other possible sources of transmission.

Source:IE

## Public Financial Management System (PFMS)

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- The **Public Financial Management System (PFMS)**, earlier known as Central Plan Schemes Monitoring System (CPSMS), is a **web-based online software application** developed and implemented by the **Office of Controller General of Accounts (CGA), Ministry of Finance**.
  - PFMS was **initially started during 2009 as a Central Sector Scheme of Planning Commission** with the objective of tracking funds released under all Plan schemes of the Government of India, and real time reporting of expenditure at all levels of Programme implementation.
  - **Subsequently in the year 2013, the scope was enlarged to cover direct payment to beneficiaries under both Plan and non-Plan Schemes.**
    - In **2017**, the Government **scrapped the distinction between plan and non-plan expenditure**.
  - The **primary objective of PFMS** is to facilitate a sound Public Financial Management System for the Government of India (GoI) by establishing an efficient fund flow system as well as a payment cum accounting network.
  - At present, the ambit of PFMS coverage includes **Central Sector and Centrally Sponsored Schemes** as well as other expenditures including the **Finance Commission Grants**.
  - PFMS provides various stakeholders with a real time, reliable and meaningful management information system and an effective decision support system, as part of the **Digital India initiative** of GoI.
  - PFMS is **integrated with the core banking system** in the country.
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## Bhoomi Rashi Portal

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- The Bhoomi Rashi Portal is an e-Governance initiative of the **Ministry of Road Transport & Highways**.
- The portal intends to **expedite the process of land acquisition for National Highways**.
- It has **fully digitized and automated** the entire process of land acquisition.
- It has helped to make land acquisition **error-free & more transparent** with notifications at every stage being processed on a real-time basis.
  - Earlier, the acquisition of land for the purpose of National Highway projects, payment of compensation to the landowners etc. was done **manually by physical movement of documents**.
  - It had some constraints viz. delay in issuing land acquisition notification, errors in the land/ area details etc.

- The portal is **integrated with the Public Financial Management System (PFMS)** for depositing the compensation in the account of affected/ interested persons on a real-time basis.

Source: PIB

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## National Biopharma Mission

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- The National Biopharma Mission (NBM) is an **industry-academia collaborative mission** for accelerating **biopharmaceutical development** in the country.
- It was **launched in 2017** at a total cost of Rs 1500 crore and is **50% co-funded by World Bank loan**.
- It is being implemented by the **Biotechnology Industry Research Assistance Council (BIRAC)**.

BIRAC is a **Public Sector Enterprise**, set up by the Department of Biotechnology (DBT).
- The oversight to the mission activities is provided by the inter-ministerial Steering Committee chaired by the Secretary-DBT (Ministry of Science & Technology).
- The **Technical Advisory Group (TAG)** chaired by an eminent scientist provides scientific leadership to the mission drawing upon global expertise.
- Under this Mission, the Government has launched **Innovate in India (i3) programme** to create an enabling ecosystem to promote **entrepreneurship and indigenous manufacturing** in the biopharma sector.
- It has a focus on **following four verticals**:
  - **Development of product leads for Vaccines , Biosimilars and Medical Devices** that are relevant to the public health need by focussing on managed partnerships.
  - **Upgradation of shared infrastructure facilities** and establishing them as centres of product discovery/discovery validations and manufacturing.
  - **Developing human capital** by providing specific training.
  - **Developing technology transfer** offices to help enhance industry academia inter-linkages.

Source: PIB

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## Railway Development Authority

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Government **approved the constitution of the Rail Development Authority (RDA)** in **April, 2017**. The role/mandate of RDA inter-alia includes providing expert advice to Government to make informed decision on:-

- **Pricing of services** commensurate with costs;
- Measures for **enhancement of non-fare Revenue**;
- **Protection of consumer interests**, by ensuring quality of service and cost optimization;
- Promoting competition, efficiency and economy;
- Creating positive environment for investment;
- Providing framework for non-discriminatory open access to the **Dedicated Freight Corridor (DFC)** infrastructure and others in future;
- Suggesting measures to absorb new technologies for achieving desired efficiency and performance standards;
- Suggesting measures for **human resource development** to achieve any of its stated objectives, etc.

**Source: PIB**

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## Pi Day

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Pi Day is celebrated on **March 14 dedicated to Pi (Greek letter  $\pi$ )**. The idea originated in the United States, where the convention is to write dates in a **format that expresses March 14 as 3/14**. These three digits match the value of pi up to two decimal places, at **3.14**.

31415926535897932384626433832795028  
84197169399375105820974944592307816  
40628620899862803482534211706798214  
80865132823066470938446095505822317  
25359408128481117450284102701938521  
10555964462294895493038196442881097  
566593344673811665131652712  
0190914566482340648510454326648  
213393605602881412702458700660631  
55881748815200962092540917153643  
6789259036001305348820466521384  
146951941511604330027036575959195  
309218611738032611181051185480744  
623799627495035188052724891227938  
1830119491200936733044065664308602  
13949463950737190001705609437027  
70539217159817675011704818467669  
4051320005681714526350827785771342  
75778960917363717872146844090122495  
34301465495853710507922796892589235  
42019956112129021960864034418159813  
62977477130996051870721134999999837  
29780499510597317328160963185950244

- By definition, pi is the **ratio of the circumference of a circle to its diameter**. Pi is also the area of a circle divided by the square of its radius. The ratio is **always constant**.

Pi is an **irrational number**, it is denoted by a **symbol 'π'**.

- Pi has its use in geometry, trigonometry, physics, astronomy and other sciences. It appears in various formulae. Few important formulae are:
  - **Area of a circle** is  $\pi r^2$ .
  - **Volume of a cylinder** is  $\pi r^2 h$ .
  - **Surface area of a sphere** is  $4\pi r^2$ .
  - **Volume of a sphere** is  $\frac{4}{3} (\pi r^3)$ .
  - **Volume of a cone** is  $\frac{1}{3} (\pi r^2 h)$ .

**Source: Indian Express**

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