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Genome sequencing of COVID-19

- India has shared nine whole genome sequences of the novel coronavirus (SARS-CoV-2) with the Global Initiative on Sharing All Influenza Data (GISAID).
- So far, 3,086 sequences of the virus isolated from humans have been shared by 57 countries.
- With 621, the U.S. has shared the most number of sequences, followed by the U.K. (350), Belgium (253) and China (242).
- The Indian Council of Medical Research (ICMR) has allowed all national research laboratories to conduct testing for the novel coronavirus.
- In India both the Centre for Cellular and Molecular Biology (CSIR-CCMB, Telangana) and the Institute of Genomics and Integrative Biology (CSIR-IGIB, New Delhi) have already started sequencing the virus.
- It has been found that a spike protein of SARS-CoV-2 also known as 2019-nCoV, enables the virus to enter and infect human cells.
- Sequencing the genome of SARS-CoV-2 will help understand

1. Where the virus came from.
2. If there are different strains circulating in India.
3. How the virus has spread.

- Genome sequencing is figuring out the order of Deoxyribonucleic acid (DNA) nucleotides, or bases, in a genome—the order of Adenine, Cytosine, Guanines, and Thymine that make up an organism's DNA.
- On April 2, 2020, the Indian Council of Medical Research (ICMR) allowed all national research laboratories including those under the Council of Scientific and Industrial Research (CSIR) to conduct testing for the novel coronavirus.
- This will help in studying the virus and will be useful while testing vaccines and drugs.

Global Initiative on Sharing All Influenza Data

- GISAID is a public platform started by the World Health Organization (WHO) in 2008 for countries to share genome sequences.

- The GISAID Initiative promotes the international sharing of all influenza virus sequences, related clinical and epidemiological data associated with human viruses, and geographical as well as species-specific data associated with avian and other animal viruses
- This helps researchers understand how the viruses evolve, spread and potentially become pandemics.
- It actively promotes the development of novel research tools for the analysis of influenza data by helping developers to facilitate the integration or connection of their tools to analyze GISAID data.

Biosafety levels

- BSL is used to identify the protective measures needed in a laboratory setting to protect workers, the environment, and the public.
- Activities and projects conducted in biological laboratories are categorized by biosafety level.
- The four biosafety levels are BSL-1, BSL-2, BSL-3, and BSL-4, with BSL-4 being the highest (maximum) level of containment.
- In India the CCMB has both Biosafety Level (BSL)-2 and BSL-3 labs.
- The virus is isolated and deactivated in BSL-3 facility and sequenced in BSL-2 facility.

The Council of Scientific and Industrial Research

- CSIR was established by the Government of India in September 1942 as an autonomous body.
- It is known for its cutting edge R&D knowledge base in diverse S&T areas.
- Council of Scientific and Industrial Research (CSIR) has been ranked first in the Nature Ranking Index-2020.
- The Nature Index provides a close to real-time proxy of high-quality research output and collaboration at the institutional, national and regional level.

Indian Council of Medical Research

- ICMR is the apex body in India for the formulation, coordination and promotion of biomedical research.
- Its mandate is to conduct, coordinate and implement medical research for the benefit of the Society; translating medical innovations into products/processes and introducing them into the public health system.
- It is funded by the Government of India through the Department of Health

Research, Ministry of Health & Family Welfare.

WHO

- The World Health Organization (WHO) is a specialized agency of the United Nations responsible for international public health.
- It is part of the U.N. Sustainable Development Group.
- It is headquartered in Geneva, Switzerland, with six semi-autonomous regional offices and 150 field offices worldwide.
- The WHO was established in 7 April 1948, which is commemorated as World Health Day.
- Its flagship publication, the World Health Report, provides expert assessments of global health topics and health statistics on all nations.
- The WHO has played a leading role in several public health achievements, most notably the eradication of smallpox, the near-eradication of polio, and the development of an Ebola vaccine.
- Its current priorities include communicable diseases, particularly HIV/AIDS, Ebola, malaria and tuberculosis; non-communicable diseases such as heart disease and cancer; healthy diet, nutrition, and food security; occupational health; and substance abuse.
- The WHA, composed of representatives from all 194 member states, serves as the agency's supreme decision-making body.

Funding Pattern of WHO

- There are four kinds of contributions that make up funding for the WHO, these are
- **Assessed contributions -** Assessed contributions are the dues countries pay in order to be a member of the Organization.
- The amount each Member State must pay is calculated relative to the country’s wealth and population.
- In recent years, assessed contributions to the WHO have declined, and now account for less than one-fourth of its funding.
- These funds are important for the WHO, because they provide a level of predictability and minimize dependence on a narrow donor base.
- **Specified voluntary contributions -** Voluntary contributions come from Member States (in addition to their assessed contribution) or from other partners.
- They can range from flexible to highly earmark.
- **Core voluntary contributions -** Core voluntary contributions allow less well-funded activities to benefit from a better flow of resources and ease

implementation bottlenecks that arise when immediate financing is lacking.
- Voluntary contributions make up for most of the remaining funding.
- **PIP contributions -** Pandemic Influenza Preparedness (PIP) Contributions were started in 2011 to improve and strengthen the sharing of influenza viruses with human pandemic potential, and to increase the access of developing countries to vaccines and other pandemic related supplies.

- The United States is currently the WHO's biggest contributor, making up 14.67 per cent of total funding by providing USD 553.1 million.
- The US is followed by the Bill & Melinda Gates Foundation forming 9.76 per cent or USD 367.7 million.
- The biggest programme area where the money is allocated is polio eradication (26.51 per cent), followed by increasing access to essential health and nutrition services (12.04 per cent), and preventable diseases vaccines (8.89 per cent).
- Recently US administration threatened to freeze US funding to the World Health Organization (WHO), saying the international group had "missed the call" on the coronavirus pandemic.

SIDBI

- Small industrial Development Bank of India (SIDBI) is a development financial institution in India, headquartered at Lucknow and having its offices all over the country.
- It was established on April 2, 1990, through an Act of Parliament.
- It operates under the Department of Financial Services, Government of India.
- Its promotion & development program focuses on rural enterprises promotion and entrepreneurship development.
- Its purpose is to provide refinance facilities and short term lending to industries, and serves as the principal financial institution in the Micro, Small and Medium Enterprises (MSME) sector.
- SIDBI also coordinates the functions of institutions engaged in similar activities.
- SIDBI is one of the four All India Financial Institutions regulated and supervised by the Reserve Bank, other three are
    1. EXIM Bank,

2. NABARD
3. NHB (but recently NHB is in government control by taking more than 51% stack)

- They play a salutary role in the financial markets through credit extension and refinancing operation activities and cater to the long-term financing needs of the industrial sector.
- State Bank of India is the largest individual shareholder of SIDBI with holding of 16.73% shares, followed by Government of India and Life Insurance Corporation of India.
- Recently SIDBI announced that it would provide emergency working capital of up to Rs 1 crore to MSMEs against their confirmed government orders.

SAFE PLUS Loans

- The SIDBI Assistance to Facilitate Emergency response against Corona virus - SAFE PLUS will be offered collateral free and disbursed within 48 hours.
- In a press release, SIDBI informed that the loans will be offered at an interest rate of five per cent.
- Meanwhile, the bank further informed that the limit of SAFE loans, announced a few days back has been enhanced from 50 lakh rupees to two crore rupees.
- The scheme was launched to provide financial assistance to MSMEs engaged in manufacturing of hand sanitizers, masks, gloves, head gear, bodysuits, shoe-covers, ventilators and goggles used in dealing with COVID-19.

Madhuban Gajar

- Madhuban Gajar, is a biofortified carrot variety with high β-carotene and iron content.
- It is developed by Shri Vallabhhai Vasrambhai Marvaniya, a farmer scientist from Gujarat, it is benefitting more than 150 local farmers in the area.
- It is being planted in an area of over 200 hectares in Junagadh, and the average yield, which is 40-50 t/ha, has become the main source of income to the local farmers.
- The variety is being cultivated in more than 1000 hectares of land in Gujarat, Maharashtra, Rajasthan, West Bengal, Uttar Pradesh during the last three years.

- The Madhuvan Gajar is a highly nutritious carrot variety developed through the selection method with higher β-carotene content (277.75 mg/kg) and iron content (276.7 mg/kg) dry basis and is used for various value-added products like carrot chips, juices, and pickles.
- Among all the varieties tested, beta-carotene and iron content were found to be superior.
- For his innovation Shri VallabhaiVasrambhai Marvaniya was conferred with a National Award by the President of India, during Festival of Innovation (FOIN) 2017 and conferred with Padma Shri in the year 2019 for his extraordinary work.

National Innovation Foundation (NIF)

- National Innovation Foundation (NIF) is an autonomous body of the Department of Science and Technology (DST).
- It was set up in February 2000 at Ahmedabad, Gujarat to provide institutional support for scouting, spawning, sustaining and scaling up the grassroots innovations across the country.
- NIF conducts a biennial national competition for grassroots green technologies, developed by farmers, mechanics, artisans and others, through their own genius, without any recourse to professional help.
- To determine the feasibility of the commercializing of technology, NIF conducts market research and test marketing.
- NIF is mandated to build a national register of ideas, innovations and traditional knowledge (TK) practices related to agriculture, plants, animal health and human health.

Source: PIB, Indian Express, the Hindu

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