AI AND HEALTHCARE - GS III MAINS

Q. Discuss the potential application of artificial intelligence in the healthcare system. Also mention the steps taken by the government to promote artificial intelligence in India. (15 marks, 250 words)

News: *GenAI has potential to completely transform India's healthcare system: PwC India*

What's in the news?
- Generative Artificial Intelligence (GenAI) has the potential to completely transform India's healthcare system by improving the efficiency with which doctors treat patients, said a report.

Key takeaways:
- PwC India's report -- Understanding the impact of GenAI on the Indian healthcare ecosystem -- notes that one of the forerunners in the country to use GenAI was healthcare, and this innovation has had a big impact on the industry.

Artificial Intelligence:
- Artificial intelligence (AI) refers to the simulation of human intelligence in machines.
- These are programmed to think like humans and mimic their actions. Artificial intelligence has a lot of potential applications especially in the healthcare sector.
- It can be used in diagnosis, treatment design, imaging diagnosis, early detections of disease outbreaks, robot assisted surgeries, virtual nurse assistants etc.

Significance of Artificial Intelligence in the Health-care System:
1. Save lives:
- A lot of organisations and medical care centres are relying on AI to save lives.
- An organization called Cambio HealthCare developed a clinical decision support system for stroke prevention that can give the physician a warning when there's a patient at risk of having a heat stroke.

2. Managing Medical Records:
- It helps in compiling and analysing information (like medical records and other past history), data management is the most widely used application of artificial intelligence and digital automation.
- Robots collect, store, format and trace data to provide faster, more consistent access.

3. Treatment Plan:
- Artificial intelligence systems analyse data and reports from a patient's file, external research and clinical expertise to help select the correct, individually customized treatment plan.

4. Virtual Nurses:
- The AI has been used to develop a digital nurse to help people monitor patient's condition and follow up with treatments, between doctor visits.
- In 2016, Boston Children's Hospital developed an app Alexa that gives basic health information and advice for parents of ill children.

5. Medication Monitoring:
- AI helps monitor medication courses of patients. It is very important to ensure proper dose regime to be followed by the patient.
- For instance, the AiCure app monitors the use of medication by a patient.

6. Drug Development:
- Developing pharmaceuticals through clinical trials can take more than a decade. AI can make this process faster and cheaper.
- Amidst the recent Ebola virus scare, a program powered by AI was used to scan existing medicines that could be redesigned to fight the disease.

7. Precision Medicine:
- Genetics and genomics look for mutations and links to disease from the information in DNA.
- With the help of AI, body scans can spot cancer and vascular diseases early and predict the health issues people might face based on their genetics.

8. Health Monitoring:
- Wearable health trackers like those from FitBit, Apple and others monitors heart rate and activity levels.
- They can send alerts to the user to get more exercise and can share this information to doctors (and AI systems) for additional data points on the needs and habits of patients.

Government Measures:

1. National Programme on Artificial Intelligence:
- It was announced in the Interim Budget 2019.
- The programme would be catalysed by the establishment of the National Centre on Artificial Intelligence as a hub along with 6 centres of excellence.

2. National Strategy for AI:
- NITI Aayog came up with a National Strategy for Artificial Intelligence in India focusing on economic growth and social inclusion.

- It provides over 30 policy recommendations to invest in scientific research, encourages reskilling and training, accelerates the adoption of AI across the value chains and promotes ethics, privacy and security in AI.

3. Task Force on Artificial Intelligence:
- AI Task Force was formed by the Commerce and Industry Department, Government of India that focuses on India's economic transformation.

4. International Center for Transformative Artificial Intelligence:
- NITI Aayog and Tata Institute of Fundamental Research (TIFR) initiated collaboration to set up International Center for Transformative Artificial Intelligence (ICTAI) to conduct advanced research to incubate AI-led solutions in three important areas – healthcare, agriculture and smart mobility.

5. AI 4 All Global Hackathon:
- NITI Aayog launched AI 4 All Global Hackathon to promote awareness and develop solutions to address the infrastructure challenges, without compromising on the data privacy while training the AI algorithms.

6. National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS):
- It is a programme led by the Union Ministry of Science & Technology to enhance capabilities of cyber-physical systems. Budget 2019 allotted Rs. 5crore for the mission.

7. AI Ecosystem:
- In order to create a policy framework and to develop the ecosystem for Artificial Intelligence, the Ministry of Electronics & Information Technology, has constituted 4 committees covering all the aspects of AI. These Committees are as follows.
  - Committee on Platforms and Data for AI.
  - Committee on leveraging AI for identifying National Missions in key sectors.
  - Committee on Mapping Technological Capabilities, Key Policy Enablers, Skilling, Re-skilling and R&D.
  - Committee on Cybersecurity, Safety, Legal and Ethical issues.

Artificial intelligence has a lot of potential for India. Nearly 200 Artificial Intelligence start-ups in India are today innovating and creating AI-based solutions for various industries. It can complement Digital India Mission by helping in the big data analysis which is not possible without using AI. 'Make in India' programme can be strengthened and help India in becoming a major manufacturing hub with AI-assisted technology.