

General Studies-3; Topic – Science and Technology- developments and their applications and effects in everyday life

Technology in Healthcare

1) Introduction

- Healthcare in India has been transformed over the last three decades.
- There is improved indices on life expectancy, infant mortality, maternal deaths and quality of outcomes.
- But we cannot rest on these achievements now, because there is altering disease patterns, patient risk profiles and their expectations.
- Information technology and biotechnology are twin engines, with immense potential to transform the healthcare delivery.

2) Background

- From education and entertainment to healthcare, there is hardly any sector that technology has not influenced.
- Technical advancements are revolutionizing the healthcare industry all around the globe and our country is not far behind.
- India is ushering in technological breakthroughs and the growing start-up culture has a lot to do with it.
- The four important C's in health care — Clinical care, Costs, Connectedness and Compassion — which are pivotal to a successful and sustainable health care model, are the country's strength.

3) Impact of Technology on Healthcare

- Medical equipments with in-built technologies like IoT, AI, etc are solving complex global problems.
- Telemedicine has brought healthcare to the remotest corners of the country.
- The use of artificial intelligence can support clinical diagnosis with evidence-based guidance, and also prevent disease.
- From the virtual reality of 3D-printing, we are now moving towards augmented reality (AR), by which, every piece of node in a malignant melanoma can be completely removed, thereby eliminating the risk of the cancer spreading to any other part of the body.
- Biotechnology, cell biology and genetics help in understanding of human life and disease, and have made personalised medicine a way of life.
- Providing solar-powered systems across primary health centres can improve health outcomes.
- Integration of automation in healthcare is one of the biggest shifts we are seeing today.
- Digitization of health services can have long term benefit at a time when public health spending is less than 2% GDP and more than 60% expenditure is out of pocket.
- Cloud computing allows doctors to access and compare patient data to be able to give better diagnosis and treatment to their patients.
- E-commerce platforms enable easy distribution of healthcare products.
- Other technology applications are smart diagnostics, multipurpose tele-consultation kiosks, remote patient monitoring, more efficient procurement, payment technology, disease surveillance, technology driven large scale trainings etc.

4) Use of ICT in the Indian Healthcare System

- Electronic Health Record (EHR) and the ability to exchange health information electronically can help the providers to extend higher quality and safer care for patients

- Diagnostic accuracy, reduced waiting times, better referral management and greater satisfaction with services.
- SMS-based services, live telemedicine, and interactive voice response service (IVRS).
- Help formation of technological solutions Ex. Health Apps for vaccination reminders etc.
- Digitisation will ensure that health history and status of all patients would always be available to all health institutions. Hence avoid repeated medical tests & reduce paperwork.
- With growing incidence of drug resistance, access to patient's information can be vital
- **International Experience**
 - a. Canada was one of the earliest to start in 2002 to lead the development and implementation of electronic health projects.
 - b. U.K., Australia and Singapore have been other prominent countries who have taken initiatives for setting up nationwide e-Health.

5) Concerns / Challenges

- The poor uptake of electronic records by doctors in India.
- Legitimate concern for privacy, security and safety of medical data.
- Health information going public can cause damage to reputation with regard to disease with which social stigmas are attached like mental health, fertility, HIV etc.
- Technologies like CRISPR raise ethical concerns due to fears of designer babies and the gene editing could have unforeseen and harmful effects elsewhere in the genome

6) Way Forward

- For India to grow, healthcare as an engine of the economy needs to flourish.
- Given its technology talent pool, India has a lot to offer in the domain of health care technology and preventive health and predictive analytics.
- India needs to rapidly adapt, embrace and drive change if it wishes to stay relevant in the global healthcare order.
- We need to achieve a balance between technology and innovation and continue to deliver worldclass care, while finding efficient ways to lower the cost of care.