INNOVATION AND SUSTAINABILITY IN HEALTHCARE

Presented by

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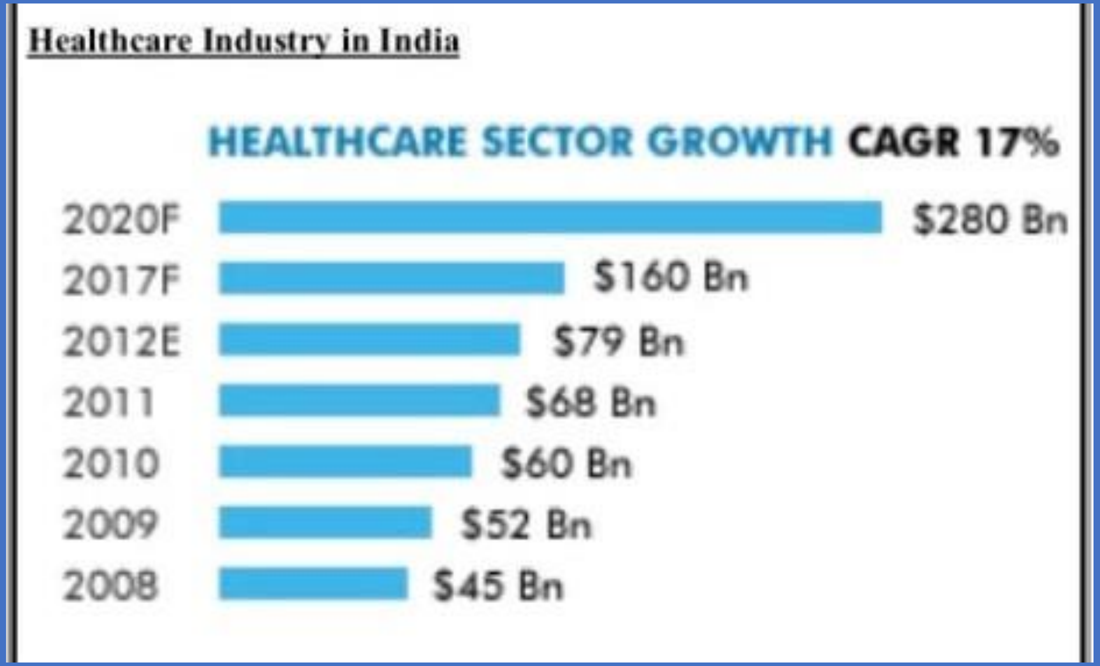
Introduction to Healthcare

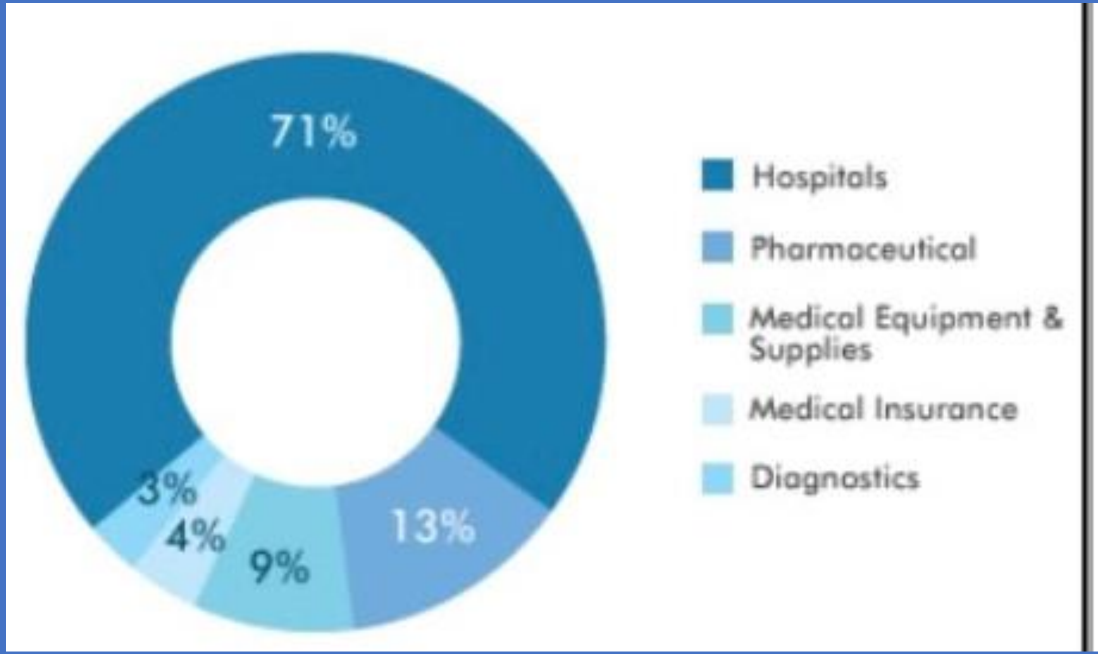
- India's healthcare business is currently valued at more than $70 billion and is predicted to reach $280 billion by 2020.

- India has emerged as one of the most promising and developing areas in recent years. The diversity and enormity of healthcare necessitate large-scale interventions in the form of innovations that produce the desired results.

- Innovation may be a viable solution to ensuring faster and more sustainable responses to the rapidly changing needs of the Indian healthcare system.

- Because of its distinct characteristics, healthcare stands apart from other industries or sectors





OBJECTIVE

- To understand an overview of healthcare industry and role of different stakeholders
- Understanding the need of innovation for each stakeholder
- Understanding the types of innovation
- Understanding challenges which led to product, process & paradigm innovation in
- Vaccine manufacturing companies
- Major Companies in the Nutraceutical Segment (Vitamins & Minerals)
- Major Companies in the Gynaecology & Infertility Segment
- Corporate Hospital
- Importance of innovation in sustaining the business
- How companies drive sustainability and improvement on innovations

1.GOVERNMENT

2.NON-GOVERNEMNT

3.MEDICAL DEVICES COMPANY

4.PHARMACEUTICAL COMPANIES

5.DOCTORS

6.REGULATORY INSTITUTIONS

Government & Non-Government Schemes

Government Schemes

- Dr YSR AAROGYASARI SCHEME for the welfare of poor.
- AAROGYA RAKSHA SCHEME
- REVISED NATIONAL TB CONTROL PROGRAMME
- MISSION INDRADHANUSH
- PRADHAN MANTRI SWASTHYA SURAKSHA

Non-Government Schemes

- INDIAN RED CROSS SOCIETY
- HINDU KUSHT NIVARAN SANGH
- TUBERCULOSIS ASSOCIATION OF INDIA
- THE ALL INDIA BLIND RELIEF SOCIETY

Medical Devices & Pharma Companies

- **Medical Devices**

➢ Regulates the investigational use of medical technology.

➢ Fiscal measures to promote research, development, manufacturing and import of medical devices.

➢ Rules for grant of patent and trademark.

- **Pharmaceutical Companies**

➢ Encourages development for safe and effective drugs.

➢ Looks after safety, efficacy and compliance.

➢ Controls drug prices for affordable healthcare.

➢ Competitive advantage to large companies.

➢ Restricts the drug sector to protect public safety

INNOVATION & ITS TYPES

PRODUCT INNOVATION

PROCESS INNOVATION

PARADIGM INNOVATION

PRODUCT INNOVATIONS

INTRODUCTION OF PRODUCTS WHICH PROVIDE

BETTER RESULTS COMPARED TO SIMILAR PRODUCTS

IN THE MARKET OR WHICH HELP ADDRESS

UNMET NEEDS COULD BE DEFINED AS PRODUCT INNOVATIONS.

Companies incorporating innovations

MEDGENOME

APRECIA PHARMACEUTICALS

Precision medicine is an approach that integrates clinical and molecular information to understand the biological basis of disease.

Epilepsy drug "Spritam" became the first **3D printed drug** to be approved by the FDA. The drug's manufacturer, Aprecia Pharmaceuticals, says that it makes the oral medication through a three-dimensional printing proess.

It is an antifungal agent used for the treatment of various fungal infections.

Need & gap analysis was performed by the respective product managers of the company and was found that the adsorption rate of molecule was low so the coating was made of (Polyethylene glycol 200, HPMC Polymer) which increases the absorption rate of particular molecule.

Treats Heavy Menstrual Bleeding. It has microcrystalline formulation which helps to cater action in 30 minutes.
Using microcrystalline formulation increases the absorption rate.

Process Innovations

- Process Innovations are defined as new or improved steps undertaken to optimize business performance. Process innovations can range from small internal improvements, improvements in sub-processes, redesign of processes, and going all the way up to redesigning the industry value chain.

MARKETING

Johnson & Johnson specifically uses
AI conversations(Personalized communications is initiated).
Augmented Reality(AR) is used to educate doctors
& stakeholders.

ZYDUS uses Module Based Engagement with doctors.
CME(Continuing Medical Education) for doctors
& stakeholders.

GLENMARK uses
Doctors Tracking Mechanism.
Awareness about disease
is spread on various social media platforms.

SUPPLY CHAIN INNOVATIONS

- **Truck platooning** is an emer ing concept that allow greate vehicle vehicle commu nication, enabling truc s to travel at a closer d stance than usual while in constant communicati

Deloitte.

Using 3D scanning to drive supply chain innovation

- 3D scanning is enabling us to reinterpret the tangible world. It is revolutionizing the way we design, model, and visualize real-world environments and objects, enabling increase design efficiencies and higher precision.

Using smart sensors to drive supply chain innovation

- Integrating smart sensors into the supply chain can decrease operating costs, increase asset efficiency, improve demand planning, and provide critical insight into customer behaviour.

Using blockchain to drive supply chain innovation

- Blockchain benefits greatly from network effect once a critical mass gathers in a supply chain it is easier for others to jump on board and achieve the benefits. Companies could pay attention to other stakeholders in their supply chain and competitors for indication of timing to develop a blockchain prototype.

ARTIFICIAL INTELLIGENCE

Novartis is embracing advancements in AI technology to create new and improved treatments. Novartis is currently using machine learning to classify digital images of cells, each treated with different experimental compounds.

Cyclica is a biotechnology company that combines biophysics and AI to discover drugs faster, safer, and cheaper.

They were granted the [Breakthrough Device Designation] from the FDA for artificial intelligence software that aims to support clinical decision making of chronic thromboembolic pulmonary hypertension (CTEPH).

GNS Healthcare has collaborated with [Genentech] to leverage causal machine learning and simulations to help develop novel cancer therapies.

PARADIGM INNOVATIONS

Paradigm innovation is the creation of new business models or patterns or as the reinvention of the basic value proposition of existing businesses

The first paradigm begins in the mid-19th century, when the influence of chemistry on medicinal research had reached a degree of maturity.

The second paradigm requires a better understanding of organizational features that differ from the old-line pharmaceutical companies that emerged in the 19th century.

The third paradigm reflects geographic shifts of specialization in pharmaceuticals and changes in the composition of organizations involved its setting is more collaborative and networked than previous paradigms.

Patient Involvement in Advisory Boards and Drug Design & New Drug Strategies

Drug companies involve patients in drug designs, trials and even decision-making to better attend to their needs. After all, their drugs are destined to the end consumer and it will benefit both parties to have drugs better designed for patient maximum convenience in a more regulated way.

Rather than focusing on traditional drug manufacturing and marketing, pharma companies will focus on newer approaches relying on technology to appeal more to providers and payers.
The "around the pill" strategy is one such approach. It refers to going beyond just producing and selling drugs as they are but rather developing a drug and attaching a digital health technology.

Innovations in Corporate Hospitals

Fortis Healthcare Ltd. and its subsidiaries across India, committed towards providing healthcare for the socially marginalized and deprived sections of the society.

Some of its programmes initiated were-

Since three decades, Yashoda Group of Hospitals has been providing quality healthcare for the people in their diverse medical needs-

The sophisticated diagnostic and therapeutic care in virtually every specialty and subspecialty of medicine and surgery.

- 3 independent hospitals
- 3 Heart Institutes
- 3 Cancer Institutes
- 2400 Beds
- 62 Medical specialties
- 700 Specialist doctor

- New bronchial stimulation unit has been set up which provides hands on training to patient
- Telemedicine deparrment has set up post covid for teleconsultation services.
- Robotic surgery Unit is a speciality of Yashoda Hospitals. Doctors ue specialised tools to carry out surgiries.

Innovations in Infertility Centres

Innovation and fertility treatment go hand in hand as clinics across the india strive to achieve better outcomes for patients.

EmbryoGlue: Used for all embryo transfers free of charge, helps the embryo to adhere to the uterus after transfer

Electronic Witnessing: A track-and-trace system safeguarding all eggs, embryos and sperm

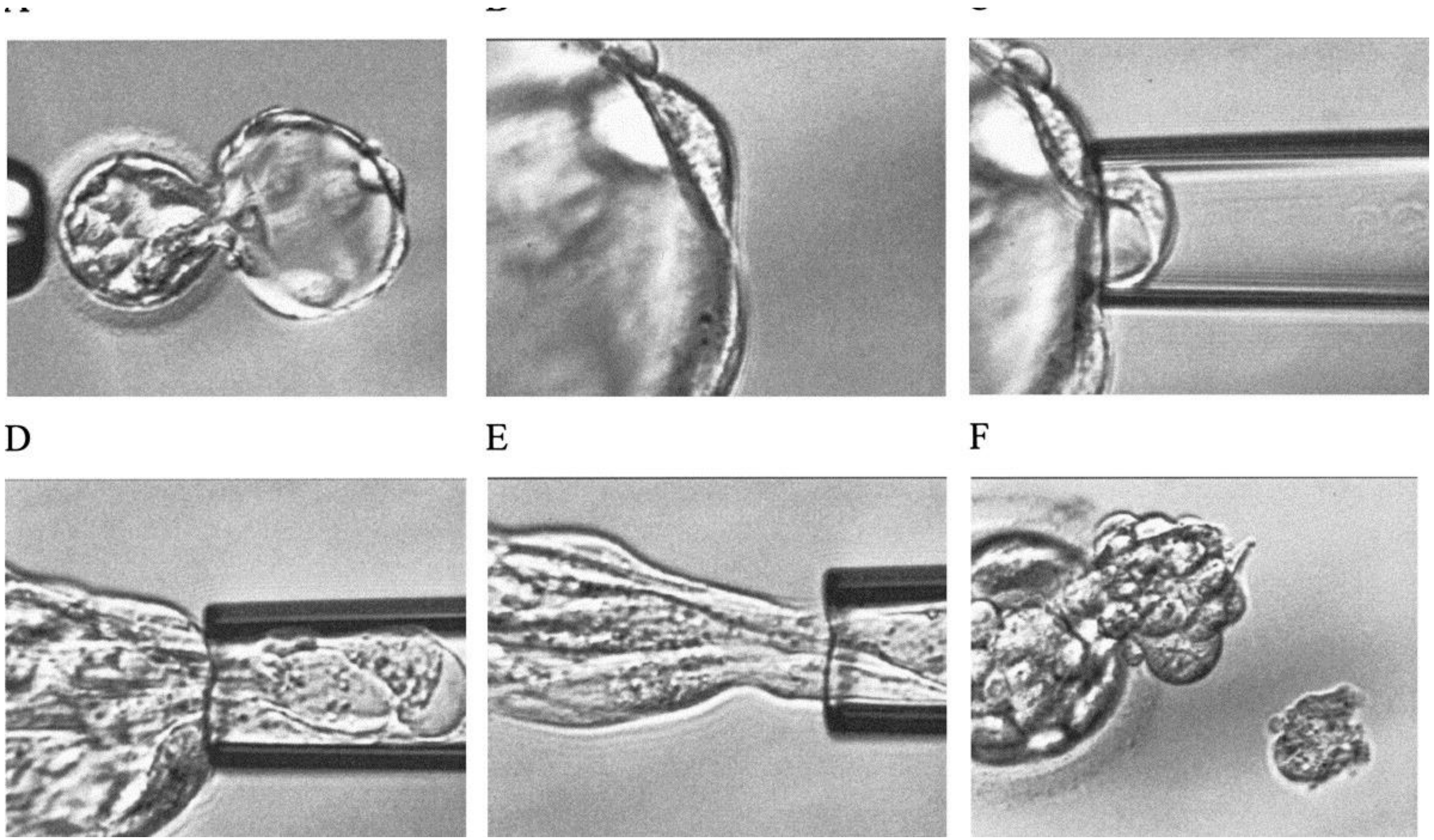
Vitrification: Fast-freezing technology that improves survival rates for frozen eggs and embryos

Pre-Implantation Genetic Screening: Advanced embryo selection where all chromosomes in the developing embryo are tested

SpermComet: Analyses levels of DNA damage in each individual sperm

Skype consultations: For maximum patient convenience

Custom-designed smartphone App to further support patients on their individual journeys to pregnancy.



TROPHOECTODERM BIOPSY

The new technique for screening patient embryos and selecting those most likely to result in a pregnancy. This powerful new technique known as Trophectoderm Biopsy allows the removal of multiple cells at the blastocyst stage.

By testing a patient's embryos for chromosomal abnormalities and selecting only normal embryos for transfer, the patient's opportunity for a pregnancy with a healthy baby is increased. The Genesis-24 technique is quite powerful and allows transfer of embryos in the same IVF cycle.

Innovations in Vaccine Manufacturing Companies

Panacea Biotec

- **2018** Collaboration with Serum Institute of India to expand market access for the World's First Fully Liquid wP-based hexavalent vaccine, EasySix. It vaccinates children against DTwP, Hib, Hep B, and Polio

- **2017** Launched the World's First Fully Liquid wP-based hexavalent vaccine, EasySix. It vaccinate's children against DTwP, Hib, Hep B, and Polio

- **2013** Received WHO PQ for EasyFive TT

- **2004** Marketing Joint Venture with Chiron (now Novartis) Vaccines, UK

- Science and technology are helping to better understand the genetic make-up of these diseases and create innovative vaccines where there were none before.

- Adjuvants, SAM (Self Amplifying Messenger RNA), Bioconjugates, GMMA (Generalized Modules for Membrane Antigens) and Chad (Chimpanzee adenovirus) are just a few of the examples.

- The reverse vaccinology, an approach pioneered has helped to create a vaccine for meningococcus B bacteria, which is a common cause of meningitis. Principle behind reverse vaccinology is that by decoding the genomic sequence of the bacteria, our scientists are able to identify potential antigens – the substances that induce an immune response in the body – common to Meningitis B strains and use these as a basis to develop new vaccines.

Innovations in Nutraceutical Companies

- Zeotum Chewable Nano Curcumin Turmeric Tablets.Zeon turmeric curcumin **chewable tablets** are packed with Vitamin C which acts as an antioxidant to boost immunity. ... A strong well-supported immunity plays a key role in dictating how well your body can fight everyday germs.

CONCLUSION

- The key to sustainable future is innovations. Innovations is the only way to outweigh the competition from the market and excel.
- Teleconsultation services have seen a surge in recent times and patients are more friendly towards it.
- The internal and external stakeholders have the key role to play in a healthcare and comes up with a great responsibility.
- In addition, product innovations have been observed in many pharmaceutical and biotech organizations including new technological and innovative changes. **Patient- Centricity** has increased and is being center focus of these companies.
- Key aspect where pharma companies need to do more are **co-creating with customers.**
- The sustainability of healthcare innovations and technologies are much higher in this era where the use of AI, Augmented reality, mobile robots and various other technologies have incorporated successfully.

- s the opportunities in Healthcare Sector are tremendous so as the innovations.