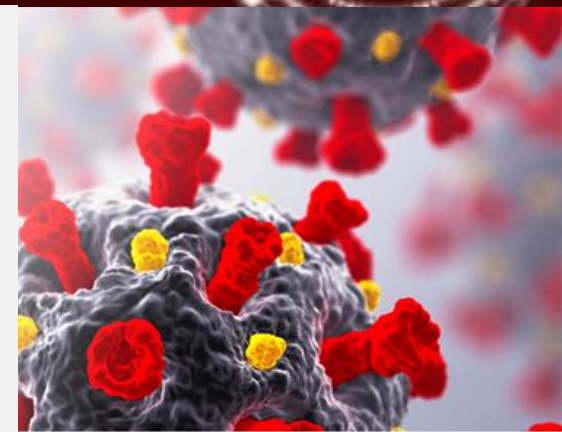




The Indian Healthcare Sector

*A Macro Overview
and
Covid19 Impact*



LSI GROUP OF COMPANIES

Sections	Page Number
Introduction	4 - 8
<ul style="list-style-type: none">• Demographic Overview• Macro-economic Overview• Disease Burden• Major Indicators Related to Healthcare• The Growth of Indian Healthcare Sector	
Overview of Indian Healthcare Sector	10 - 18
<ul style="list-style-type: none">• Structure of Indian Healthcare Sector• Healthcare Infrastructure – Public & Private Sector• Healthcare Workforce• Healthcare Education• Healthcare Financing• FDI and Private Equity Inflows in the Healthcare Industry• Government Investment in the Healthcare Industry• Comparison of India’s Healthcare Status with Other Countries• Hurdles Inhibiting the Growth of the Industry	
Indian Healthcare Post COVID -19 Outbreak	20 - 26
<ul style="list-style-type: none">• The Growth of Domestic Industries to Combat COVID-19• COVID-19 Impact and the Way Ahead• Telehealth• Artificial Intelligence and Other Disruptive Technologies• Health-tech Industry to Deal with COVID-19• Segmentation of Health-tech Start-ups in India• Technologies to Change Indian Healthcare Landscape	
<ul style="list-style-type: none">• Sources & References	27
<ul style="list-style-type: none">• LSI Presence	28

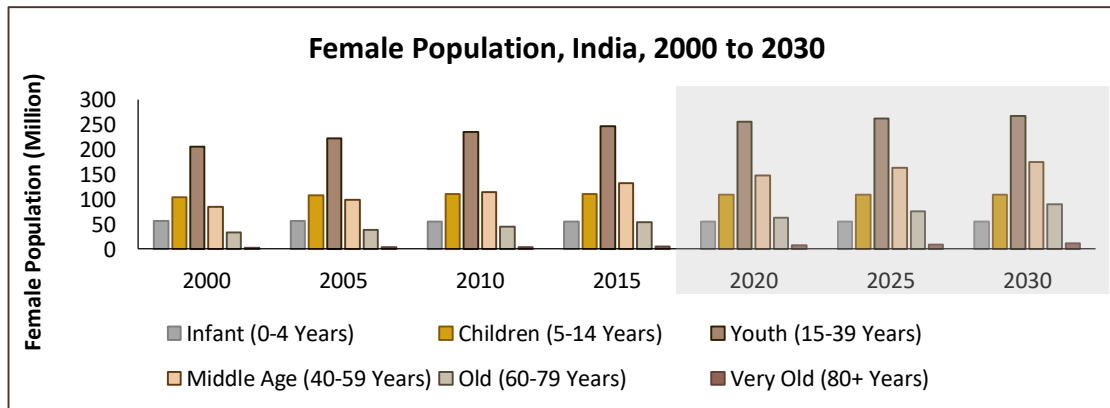
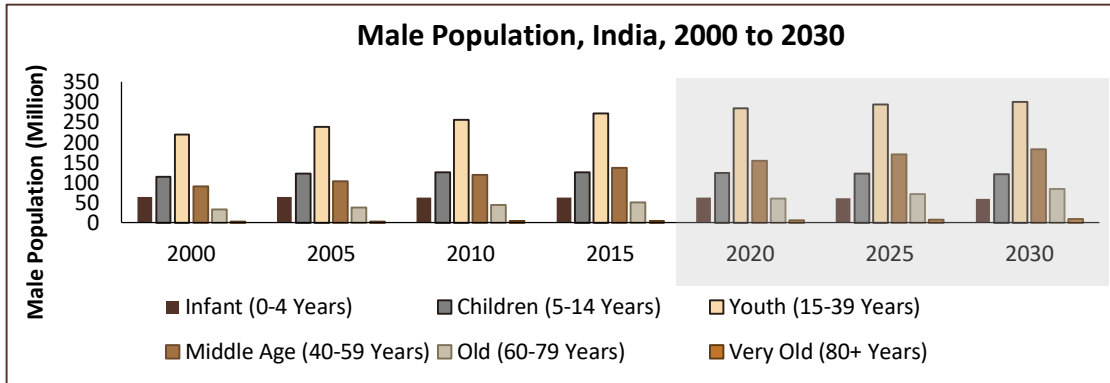
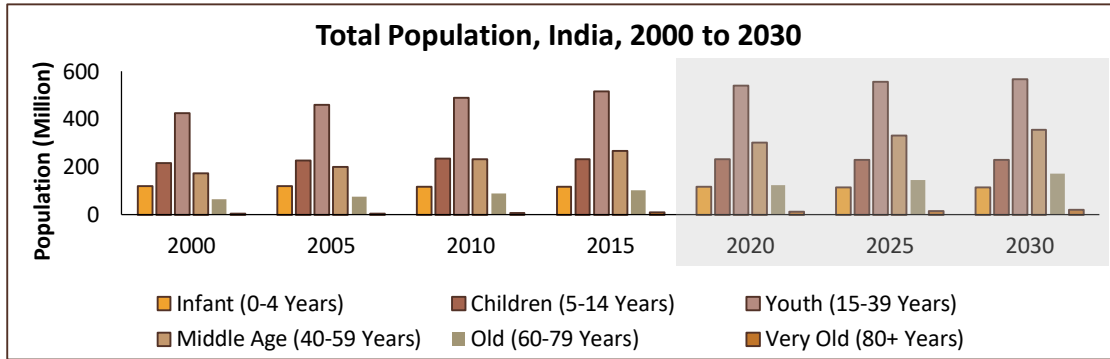




Introduction

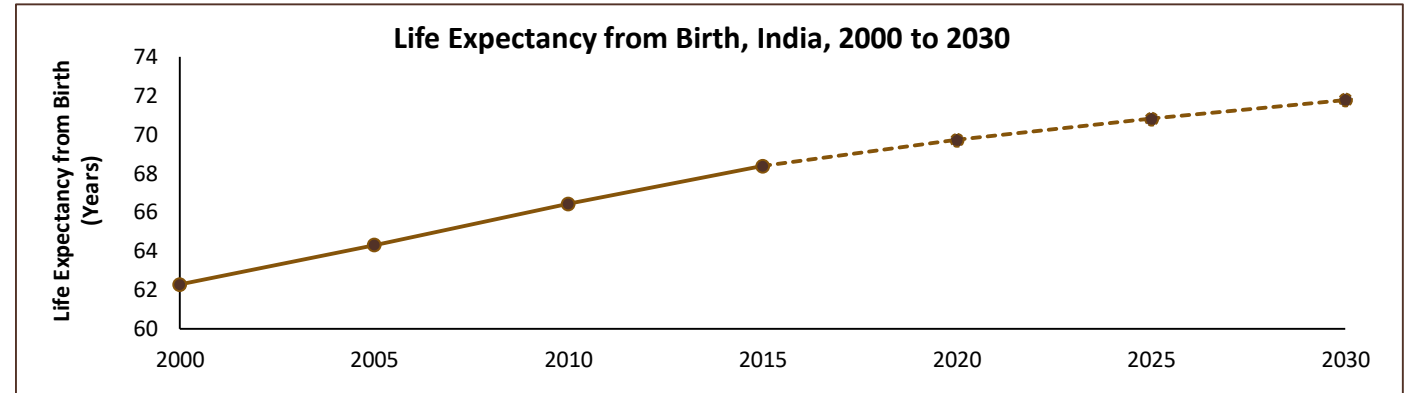


India — Demographic Overview



Shaded area denotes forecast

Source: International Data Base, Macro Trends, LSI Research



--- Dotted line denotes forecast

Age Group	Infant (0-4 Years)	Children (5-14 Years)	Youth (15-39 Years)	Middle Age (40-59 Years)	Old (60-79 Years)	Very Old (80+ Years)	Total
CAGR (Compound Annual Growth Rate) Between 2000 to 2019	-0.15	0.35	1.23	2.82	3.23	4.81	1.4
CAGR (Compound Annual Growth Rate) Between 2000 to 2030	-0.16	0.18	0.97	2.43	3.3	4.84	1.25

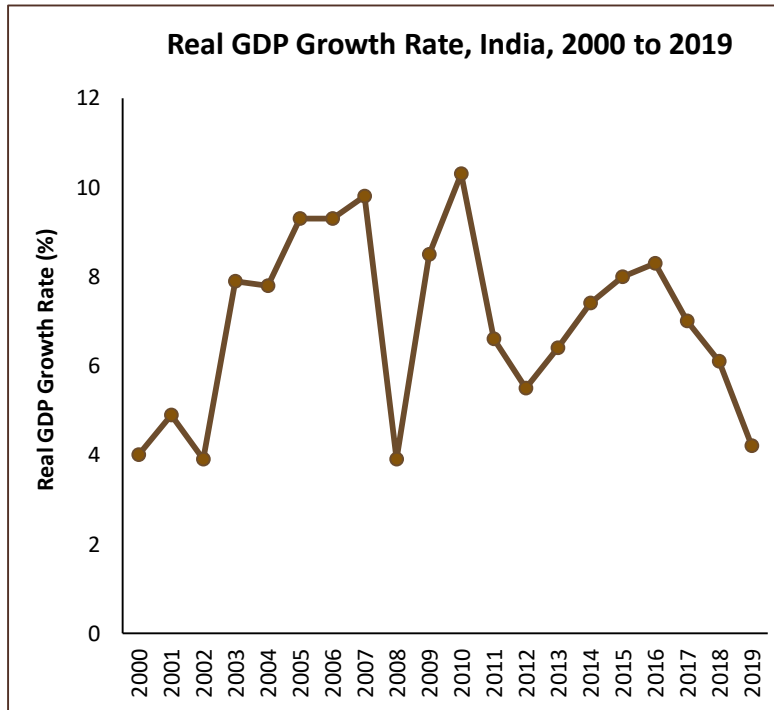
Type	Share in the Entire Population (%)		
	2000	2019	2030
Male Population	51.78	51.9	51.77
Female Population	48.22	48.1	48.23

Indicator	2000	2019	2030
Life Expectancy from Birth (Years)	62.28	69.5	71.79

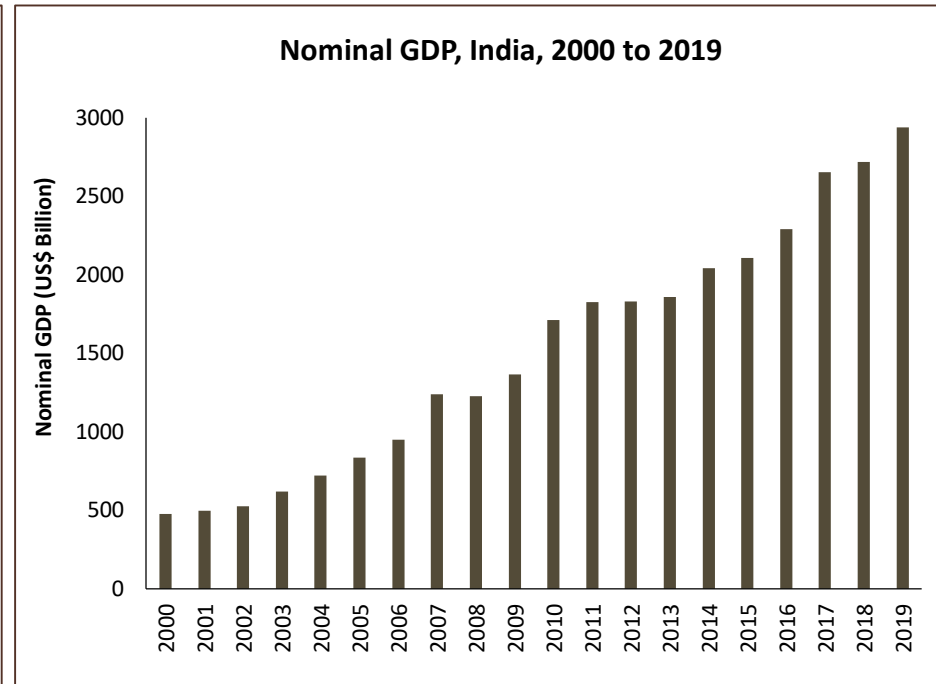
- The forecast ideates a situation of growing population but in a controlled manner. The growing aged population signifies a better life expectancy in the economy which is a result of availability of better medical facilities.
- Moreover, the lower or negative growth rate of infant population indicates birth control.



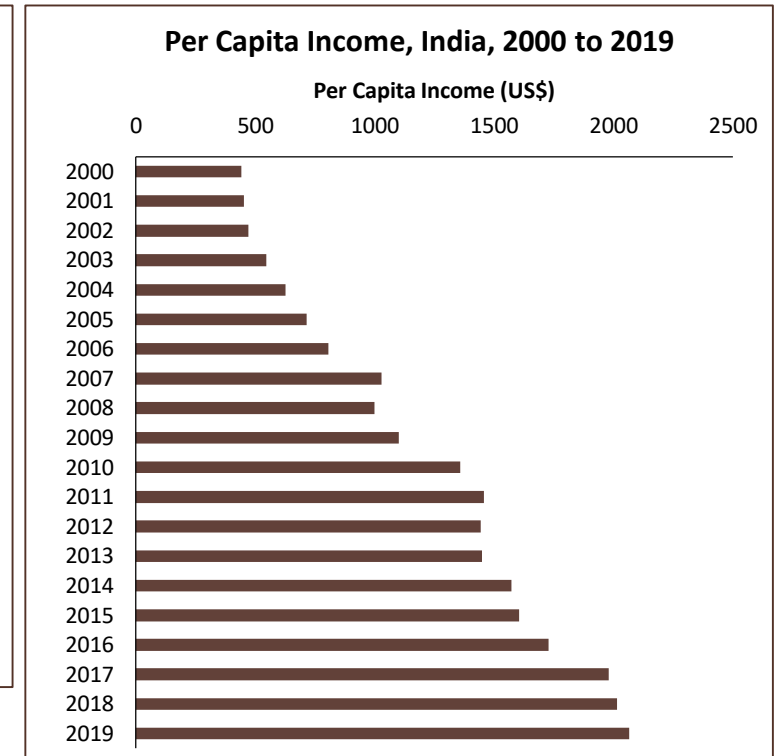
India — Macro-economic Overview



Note: Real GDP is an inflation adjusted measure which reflects the value of all goods & services produced by an economy in a given year.



Note: Nominal GDP is measured in the current market prices and it reflects the value of all the final goods and services that an economy produced during a given year. Unlike Real GDP, the value of it includes the changes in the prices from year to year also known as inflation or deflation.



Note: Per Capita Income measures the average income earned by a person in an economy in a given year.

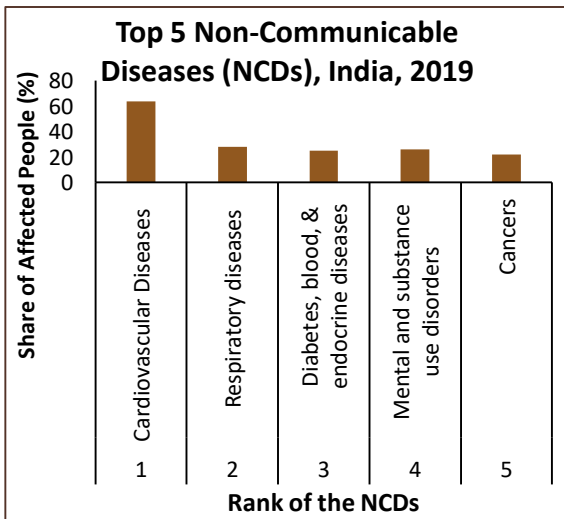
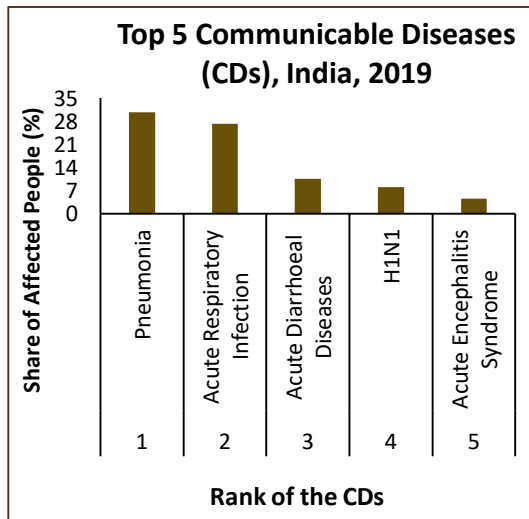
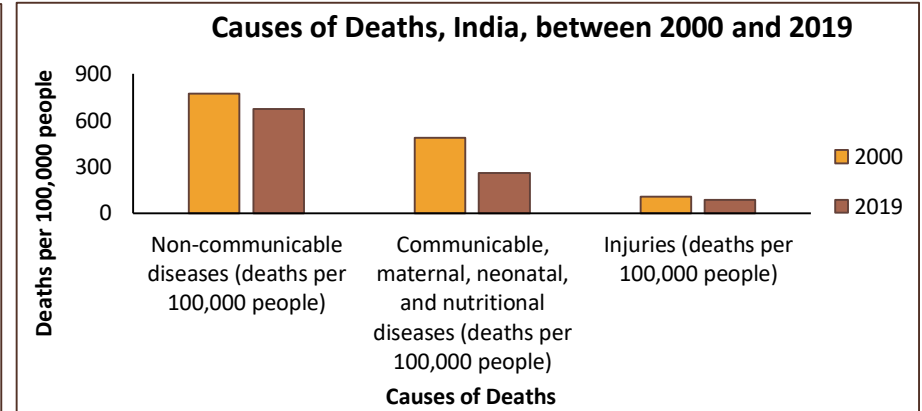
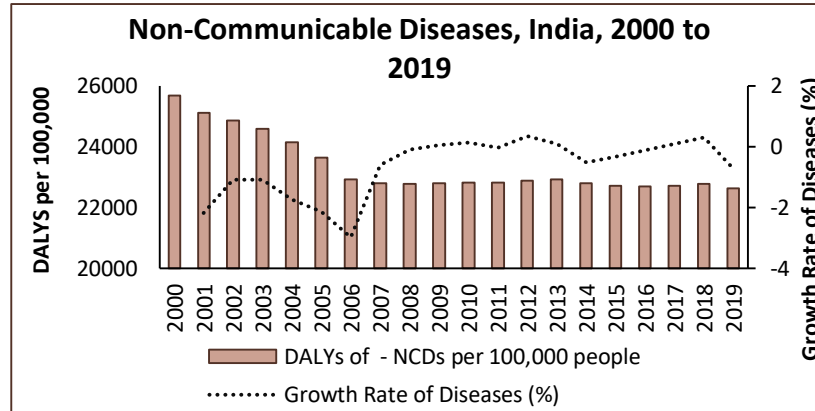
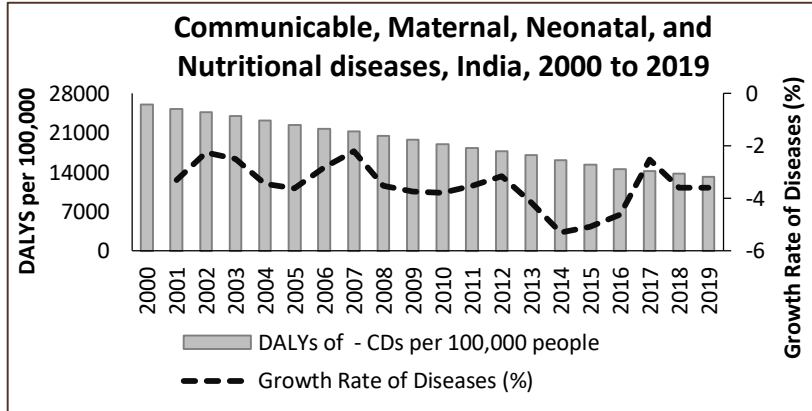
- The nominal GDP of India had grown at the CAGR of **10.04%** between 2000 to 2019.
- The performance of the GDP of India was quite impressive between 2010 to 2016. The Real GDP growth rate which was **4%** in 2000 increased to **10.3%** in 2010 and this growth saga continued for a few years and in 2016, the country witnessed the real GDP growth rate of **8.3%**. Thereafter, it started to decline and in 2019 it was **4.2%**. The outbreak of Covid-19 made the situation worse and the country is all set to witness a severe drop in GDP in 2020.
- Change in consumer preferences, purchasing power, flow of credit, multiple policies and initiatives of the government, foreign trade and declining performance of key industries are some of the reasons behind the lowering GDP in the recent years.
- The per capita income of the country had risen at the CAGR of **8.44%** between 2000 to 2019. The growth of income among all wage groups and in both the rural and urban areas helped the population to improve their standard of living and to do required expenses towards healthcare.

Source: International Monetary Fund, World Bank, LSI Research



India — Disease Burden

- **Communicable Disease (CD)** - These diseases are spread either by direct contact of the affected individual or by the indirect sources (Airborne microorganisms, e.g. bacteria, viruses; bite from insects; or contaminated food or water).
- **Non-Communicable Disease (NCD)** - These diseases are non-infectious but last for long duration. Affected patients require proper care as these diseases do not resolve quickly. In many cases, absolute remedy is not achieved.
- **DALY (Disability- Adjusted Life Year)** - DALY is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death. [DALY = YLL (Years of Life Lost) + YLD (Years Lived with Disability)]



- In the last 20 years, the disease burden of the country has transformed from communicable to non-communicable diseases.
- The DALY from the CDS and NCDs had reduced at the CAGR of **3.52%** and **0.66%** respectively between 2000 to 2019 in India. The share of NCDs behind deaths which was **61.21%** in 2000 increased to **72.16%** in 2019, whereas the share of CDs reduced from **38.79%** to **27.84%** during the same time frame.
- Transformation in the standard of living, advancement of technology, changing nature of environment has led to a situation where people are getting less affected by the CDs and more by the NCDs.
- Covid-19, the new addition in the communicable disease bucket might again skew the disease burden depending on the availability of vaccines and medicine for its prevention and cure.

Source: Our World in Data, National Health Profile, LSI Research



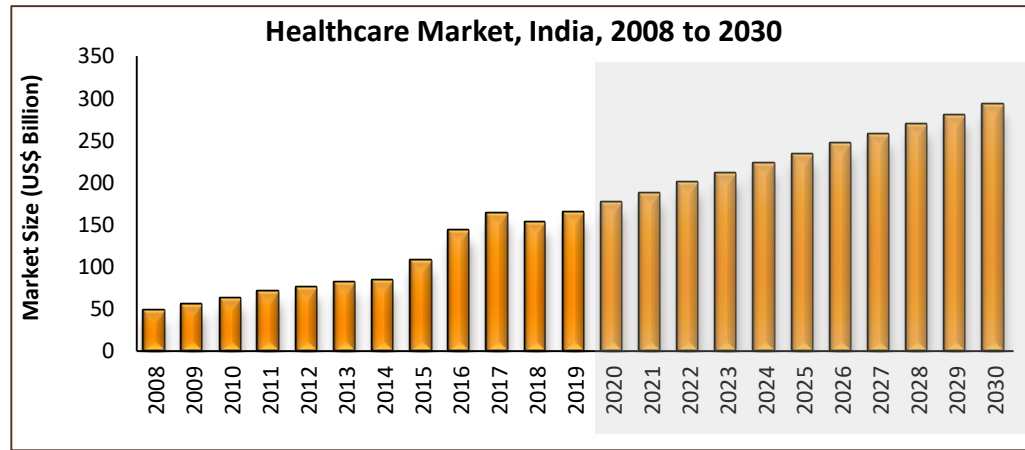
Major Indicators Related to Healthcare, India, 2019

HDI	HDI Rank	129	Health Facts	Life expectancy at birth (years)	69.4	Effect of Selected Diseases on Population	HIV prevalence, adult (% ages 15-49)	0.2	Environmental Sustainability	Carbon dioxide emissions, per capita (tonnes)	1.6	Infrastructure	Population using improved drinking-water sources (%)	93		
	HDI Index Score	0.647		Life expectancy at birth, female (years)	70.7			Malaria incidence (per 1,000 people at risk)		7.7	Forest area (% of total land area)		23.8	Population using improved sanitation facilities (%)	60	
	Human Development Index (HDI), female	0.574		Life expectancy at birth, male (years)	68.2			Tuberculosis incidence (per 100,000 people)		204	Fossil fuel energy consumption (% of total energy consumption)		73.6	Rural population with access to electricity (%)	89.3	
	Human Development Index (HDI), male	0.692		Adult mortality rate, female (per 1,000 people)	136			Age-standardized mortality rates attributed to non-communicable diseases, female		524.9	Fresh water withdrawals (% of total renewable water resources)		33.9	Mobile phone subscriptions (per 100 people)	86.9	
Demographic Factors	Total population (millions)	1,352.60	Health Facts	Adult mortality rate, male (per 1,000 people)	210	Effect of Selected Diseases on Population	Environmental Sustainability	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	184	Initiatives from Government	Proportion of births attended by skilled health personnel (%)	81.4				
	Population under age 5 (%)	8.6		Mortality rate, infant (per 1,000 live births)	32						Birth registration (% under age 5)	80				
	Population ages 15–64 (%)	66.8		Maternal mortality ratio (deaths per 100,000 live births)	174						Mortality rate attributed to unsafe water, sanitation and hygiene services (per 100,000 population)	18.6	Research and development expenditure (% of GDP)	0.6		
	Population ages 65 and older (%)	6.2		Sex ratio at birth (male to female births)	1.1						Age-standardized mortality rates attributed to non-communicable diseases, male	672.5	Renewable energy consumption (% of total final energy consumption)	36	Old-age pension recipients (% of statutory pension age population)	25.2
	Rural Population (%)	66														
	Urban population (%)	34														

Note: Human Development Index (HDI) is a metric developed by United Nations to assess four principal areas: mean years of schooling, expected years of schooling, life expectancy at birth and gross national income per capita

Source: United Nations Development Programme

The Growth of Indian Healthcare Sector



Shaded area denotes forecast

- The Indian Healthcare Sector has grown significantly in the last few years. This is one of the largest sectors of the country in terms of both the revenue and employment.
- The entire sector consists of hospitals, medical devices, clinical trials, outsourcing, telemedicine, medical tourism, health insurance and medical equipment.
- Between 2008 to 2019, the Indian healthcare market had grown at the CAGR of **11.88%**.
- Moreover, the industry also expects to grow at the CAGR of **8.43%** to US\$ 289 Billion by 2030.

Growth Drivers of Indian Healthcare Market

- Increasing urbanization and emerging middle class
- Rising demand for affordable healthcare delivery systems
- Investment in healthcare infrastructure is set to rise, benefiting both 'hard' (hospitals) and 'soft' (R&D, education) infrastructure
- Growing incidences of lifestyle diseases
- Availability of a large pool of well-trained medical professionals in the country
- Participation of both public and private players for strengthening the healthcare coverage
- Initiatives to simplify the healthcare treatment through the digital healthcare facilities like telehealth, mHealth, electronic health records/electronic medical records (EHR/EMR) etc. which are expected to dominate the market in the coming years.
- A sound Indian medical tourism industry which has been expanded over the years by providing medical treatment through advanced facilities, skilled doctors, traditional practices like Yoga and Ayurveda at low costs to the international patients.
- Greater demand of Indian generic drugs and low cost medicines in the International market which are exported to more than 200 countries in the world like United States Australia, Germany, France, Netherlands, Canada Belgium etc.

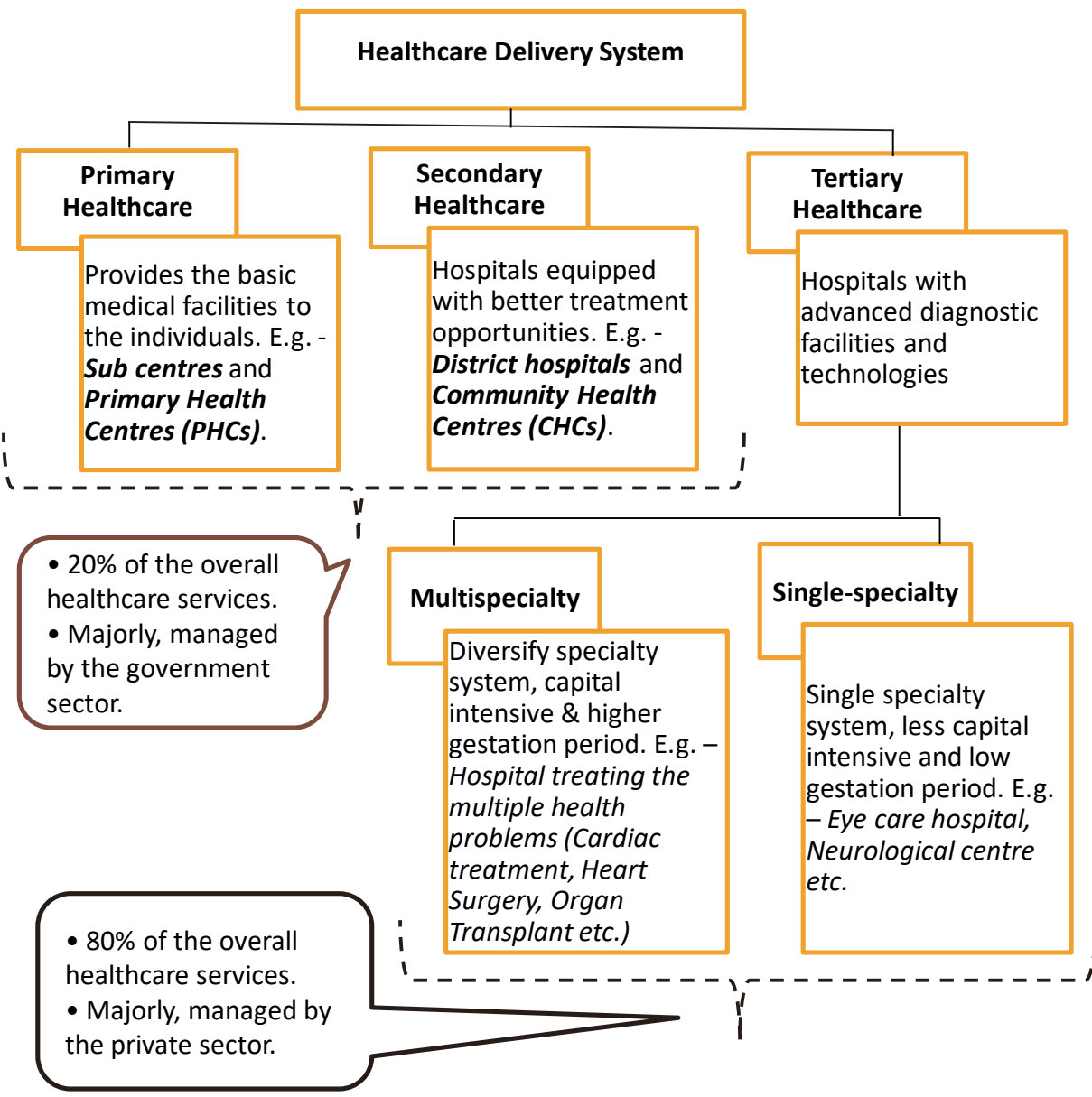
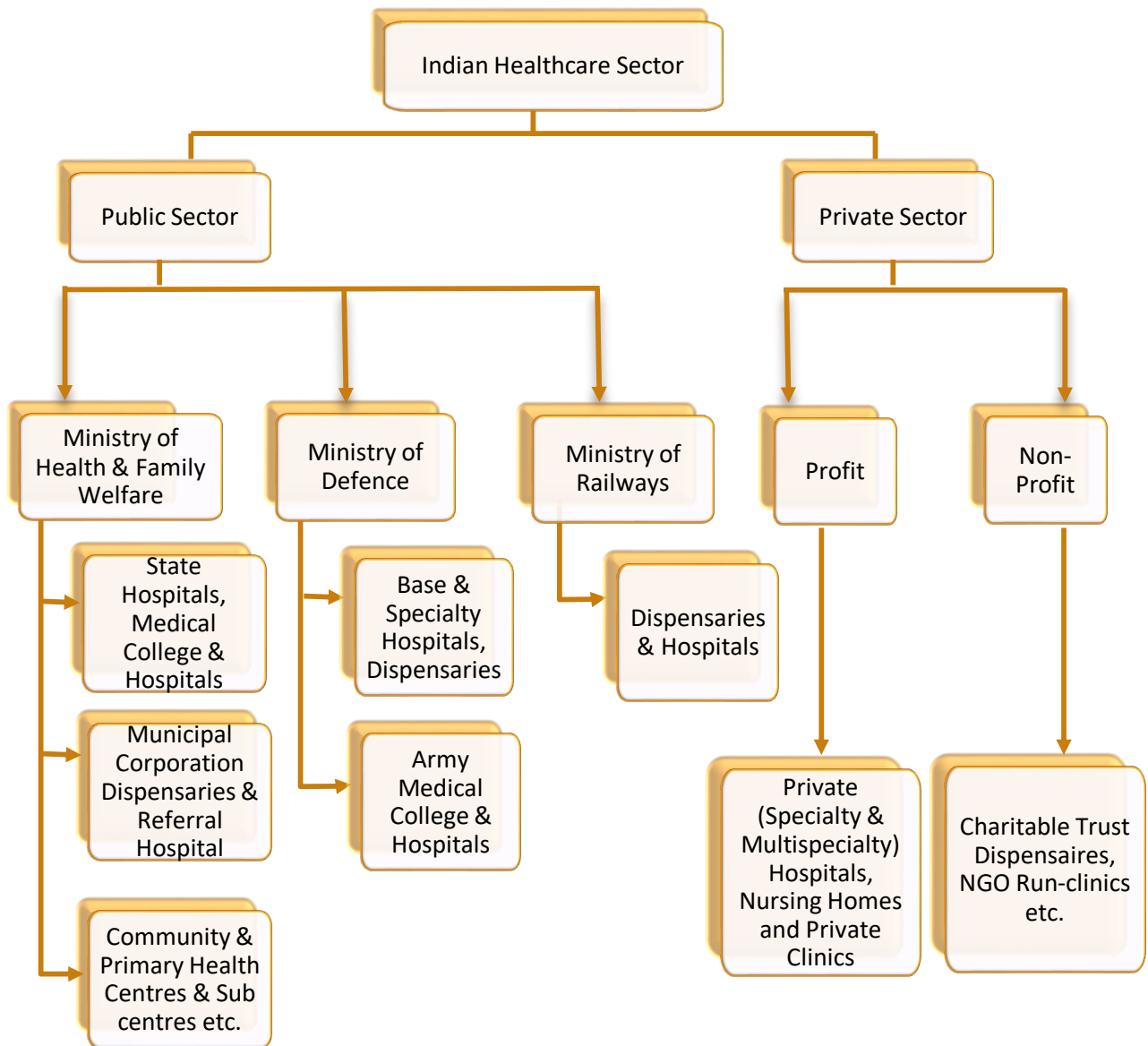
Source: India Brand Equity Foundation, LSI Research





Overview of Indian Healthcare Sector

Structure of Indian Healthcare Sector

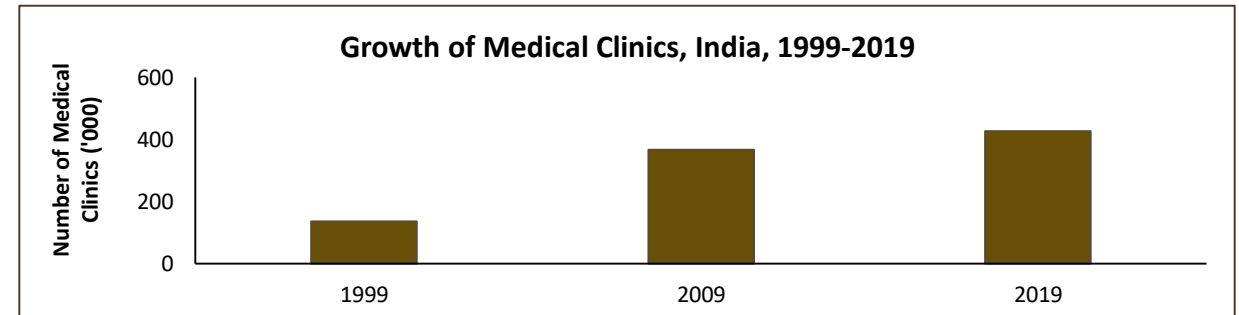
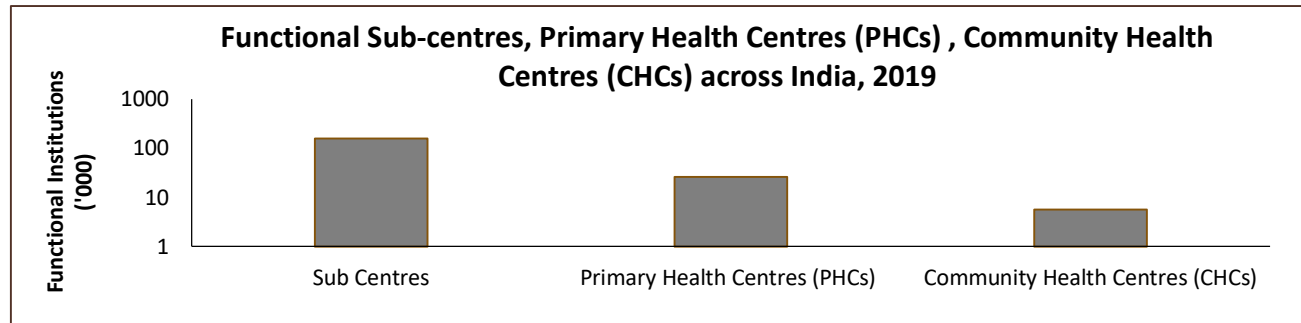
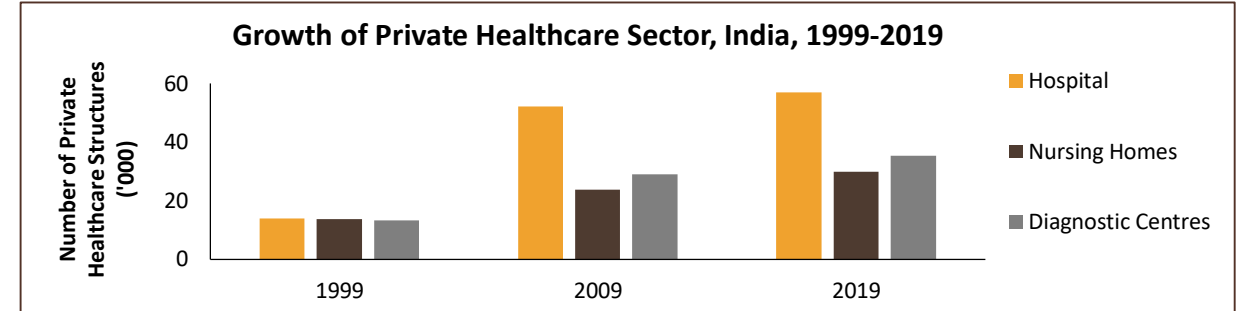
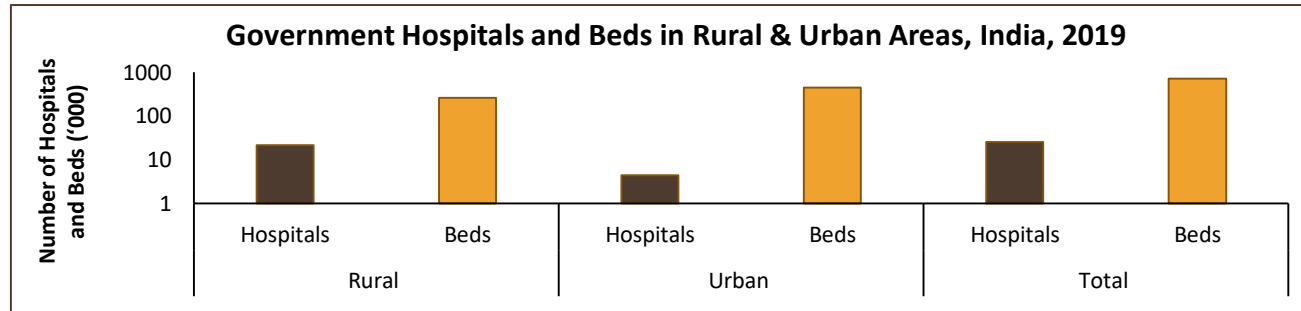


• 20% of the overall healthcare services.
 • Majorly, managed by the government sector.

• 80% of the overall healthcare services.
 • Majorly, managed by the private sector.



Healthcare Infrastructure – Public & Private Sector



- The availability of Hospital beds per **1000** population was **0.55** in 2019.
- The healthcare system in the rural areas hugely depend on Primary Health Centres (PHC), Community Health Centres (CHC), Sub Centres (SC) etc.
- The population of India was estimated to be **132 Crore** in 2019. Whereas, the numbers of Sub centres, PHCs, CHCs are close to **1.6 Lakhs, 26 Thousands** and **6 Thousands** respectively and these numbers are not sufficient to meet the healthcare service demands.
- The subsidised public healthcare system in India helps the population to avail different types of treatment, medicines and regular health check-ups at cheaper rate or at free of cost sometimes. However the poor administration, lesser hygienic and sanitised environment and weaker implementation of health policies have still kept this sector incompetent to serve the entire nation systematically.

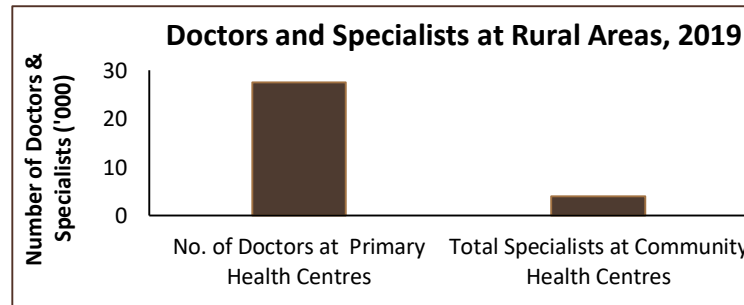
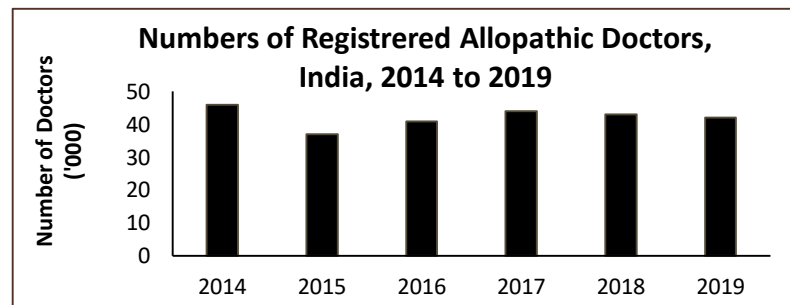
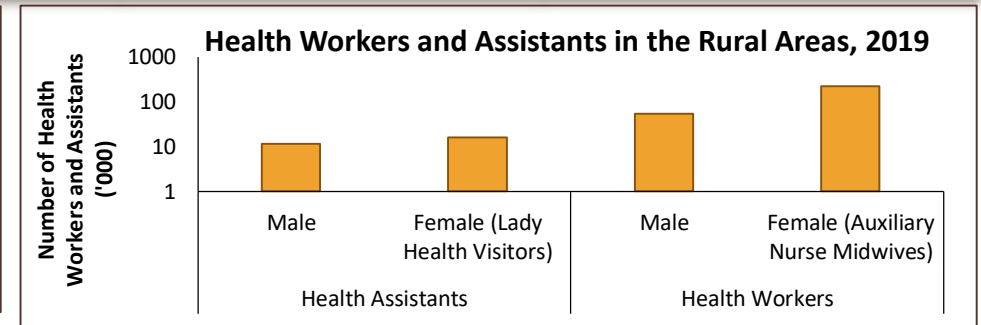
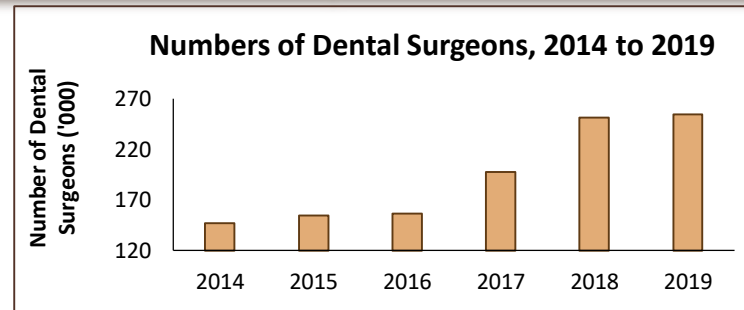
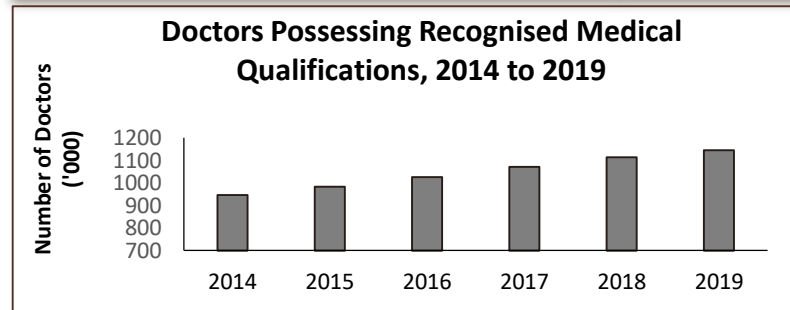
- Over the years the private health sector in India has expanded significantly with the effort to provide world class quality of health care service. The inability of the public sector to provide proper healthcare services to the common people triggered the emergence of private sector in Indian healthcare system.
- Between 1999 to 2019, the numbers of Hospitals, Nursing homes and Diagnostic centres had increased at the CAGR of **7.29%**, **3.96%** and **5.04%** respectively.
- The share of Medical clinics have always been maximum in the overall private healthcare system in India. Between 2009 to 2019, these clinics had grown at the CAGR of **5.85%**. This is to mention the numbers of such clinics were below **50 Thousands** in 90's and now it has increased to **4.5 Lakhs**.

Source: National Health Profile 2019, Institute for Studies in Industrial Development, LSI Research

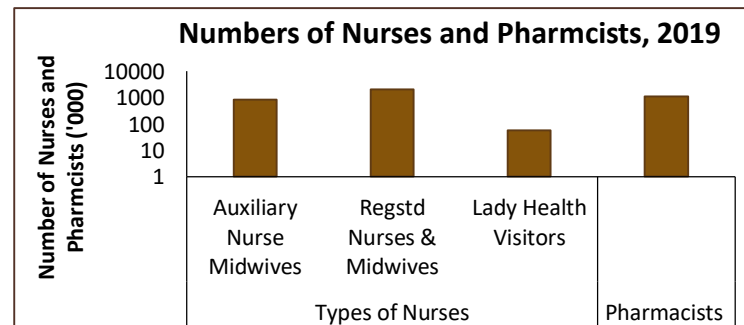
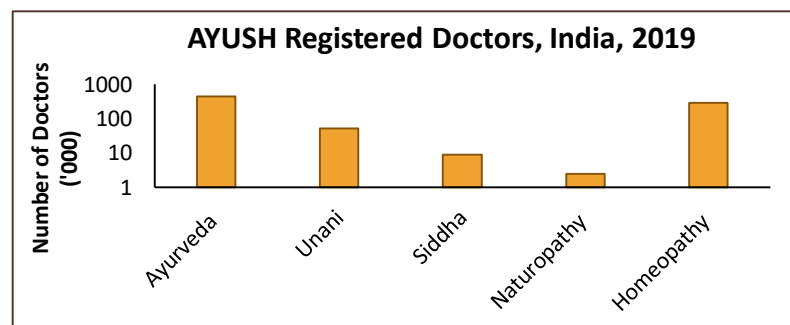


Healthcare Workforce

Health-workers (per 1,000 people), 2019	Nurses and Midwives (per 1,000 people), 2019	Physicians (per 1,000 people), 2019	Beds per 1000 population, 2019	Doctor-Patient Ratio, 2019
20.6	1.63	0.82	0.55	1:1445



- There is acute shortage of health workforce in India. According to the World Bank report, India will require 2 million doctors by 2030.
- Between 2014 to 2019, the doctors with recognised medical qualifications had increased at the CAGR of **3.85%** in India. However, still the doctor-patient ratio in the country is quite vulnerable.
- There is one doctor for every 1,445 Indians and the ratio is lower than the WHO's prescribed norm of 1 doctor for 1,000 people.
- Till 2019, the allopathy doctor-patient ratio was 1:1160 in India. The same ratio for the average AYUSH registered doctors was 1:1658.

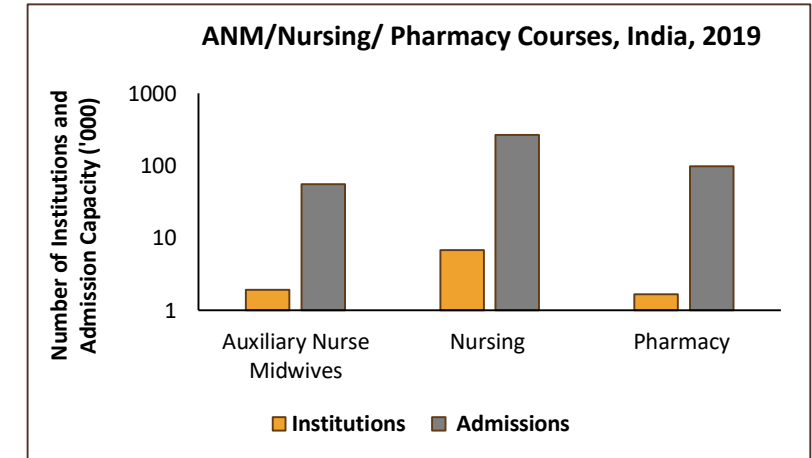
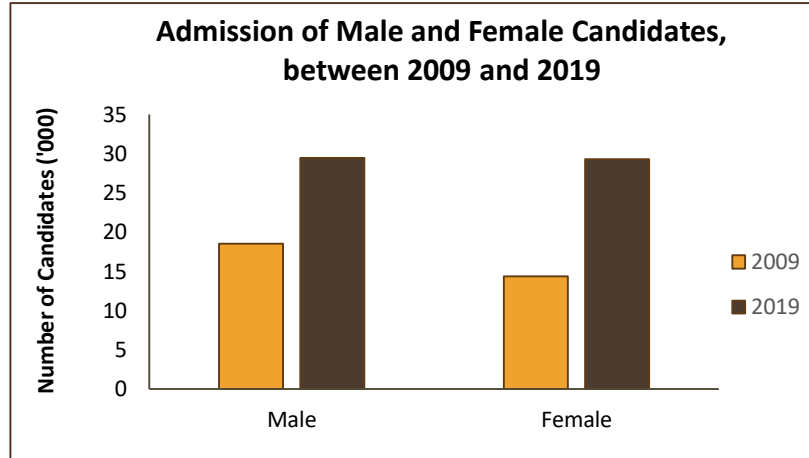
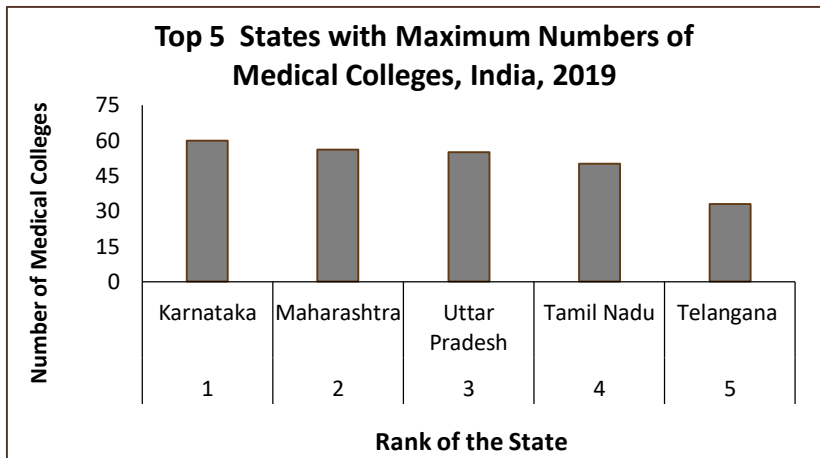
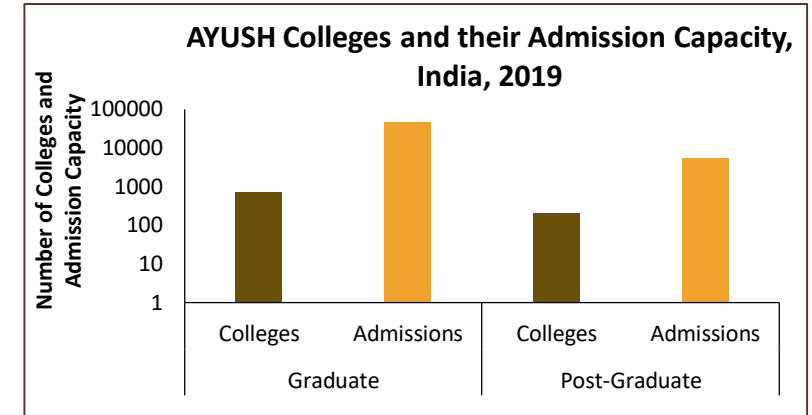
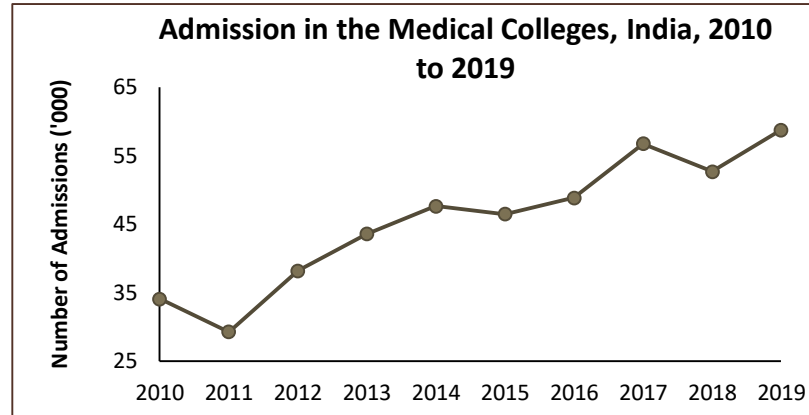
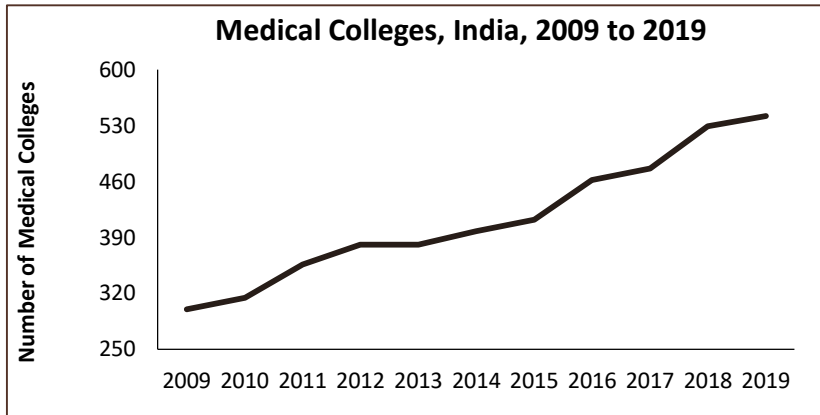


Note: AYUSH stands for Ayurvedic, Yoga and Naturopathy, Unani, Siddha and Homeopathy. The Ministry of AYUSH is purposed with developing education, research and propagation of indigenous alternative medicine systems in India.

Source: National Health Profile, Economic Times, LSI Research



Healthcare Education



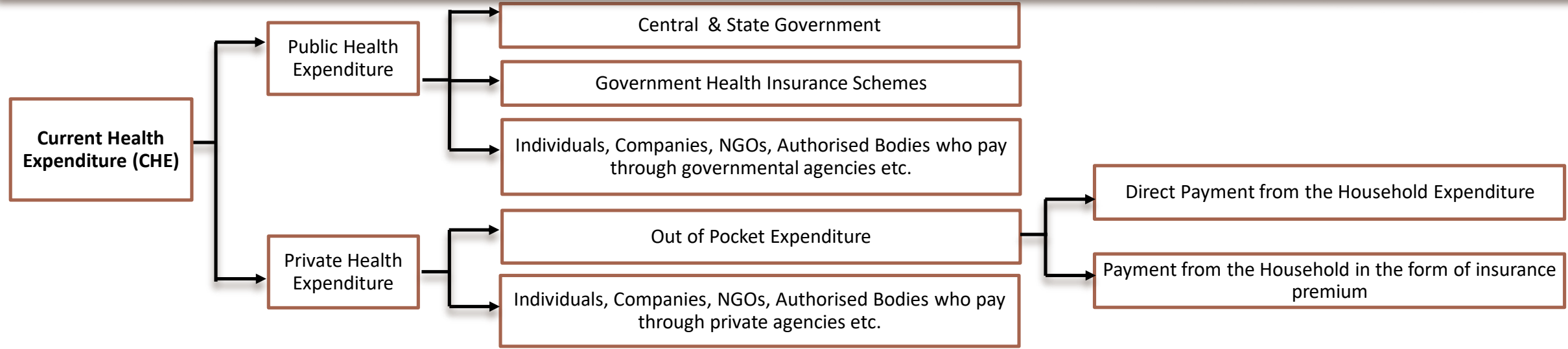
- The number of medical colleges and the admission capacity had increased at the CAGR of **6.23%** and **6%** respectively between 2009 to 2019 in India.
- The share of the male candidates which used to be **56.33%** in the total admission seats in 2009 decreased to **50.1%** in 2019. Whereas, the share of the female candidates increased from **43.67%** to **49.9%** between 2009 to 2019.
- The active participation of the Southern states has been quite impressive in the establishment of the medical colleges.
- It is believed, the growth in the number of medical colleges in the recent years would help to improve the population to doctor ratio to some extent by 2022 by producing **67,972** graduate and **30,228** postgraduate doctors per year.

Source: National Health Profile, Economic Times, LSI Research

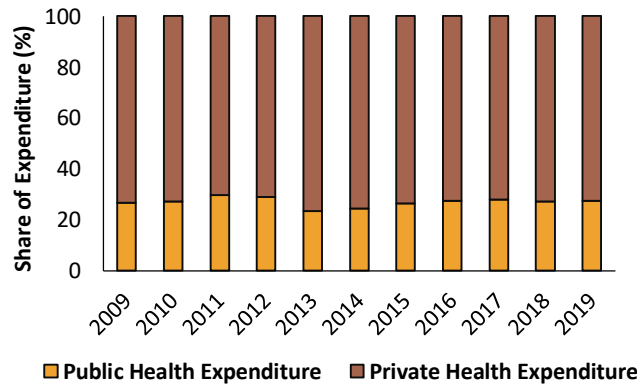


Healthcare Financing

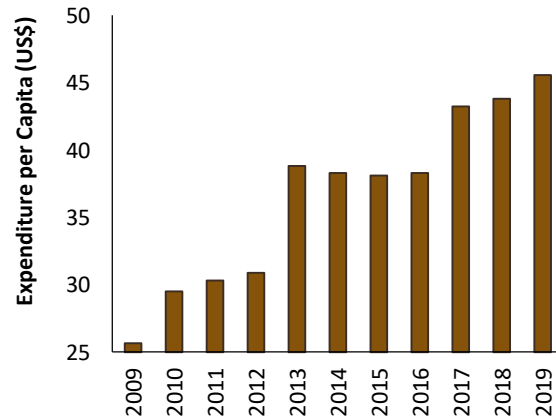
Source of Health Expenditure in India



Share of Public and Private Health Expenditure in Current Health Expenditure, India, 2009-2019



Out-of-pocket Expenditure, India, 2009 to 2019



- The healthcare services available in exchange of subsidised public healthcare expenditure is not always useful as the inadequate infrastructure in most of the hospitals divert the patients to private hospitals where they get better facilities but at a much higher cost.
- Between 2009 to 2019, the public and private health expenditure in India increased at the CAGR of **6.73%** and **6.32%** respectively.
- Around **27%** of the total health spending is contributed by the public sector. Hence, majority people have to depend on out-of-pocket expenses. Between 2009 to 2019, the out-of-pocket expenditure per capita had increased at the CAGR of **5.92%** in India.
- Major sources of hospitalisation expenditure are household income/savings, borrowings, sale of physical assets, contribution from friends and relatives etc.

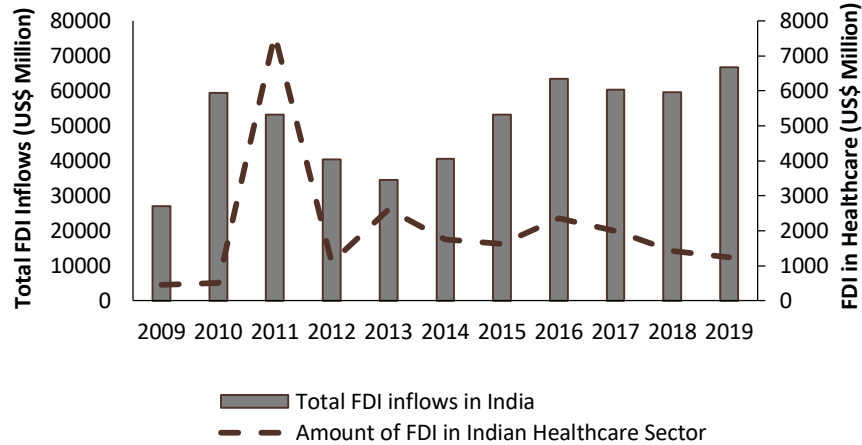
Source: World Bank, LSI Research



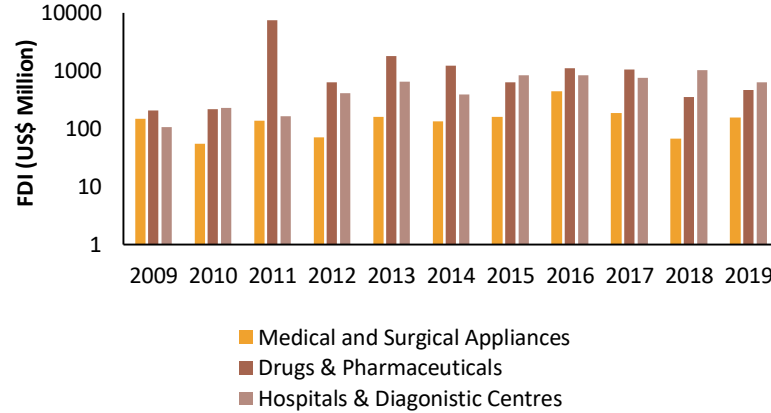
FDI and Private Equity Inflows in the Healthcare Sector

FDI Inflows

FDI Inflows in Healthcare Sector, India, 2009 to 2019



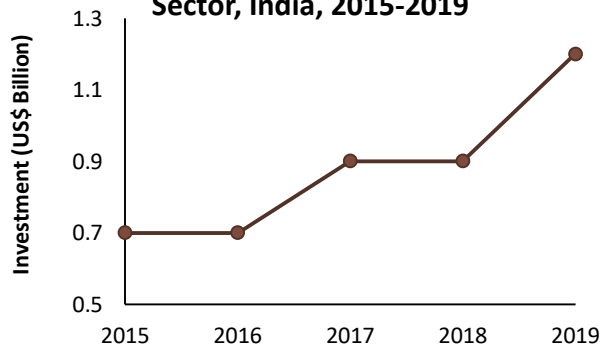
Distribution of FDI Inflows in Different Segments of Healthcare Sector, India, 2009-2019



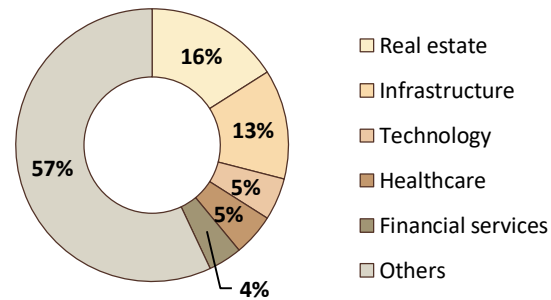
- Between 2009 to 2019, the FDI in Indian Healthcare sector had increased at the CAGR of **10.54%**.
- In the segment called “Hospitals & Diagnostic Centres” under the healthcare sector, the FDI inflow increased maximum at the CAGR of **19.59%** during the same time period.
- The share of healthcare sector in the overall FDI inflow reduced in the recent years. The share which was **14.27%** in 2011 declined to **1.87%** in 2019.

Private Equity Investment

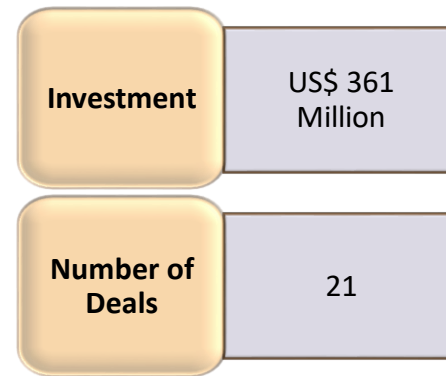
Private Equity/Venture Capital Investments in the Healthcare Sector, India, 2015-2019



Sectoral Shares of Buyout Deals, India, 2019



Health-tech Segment, India, 2019

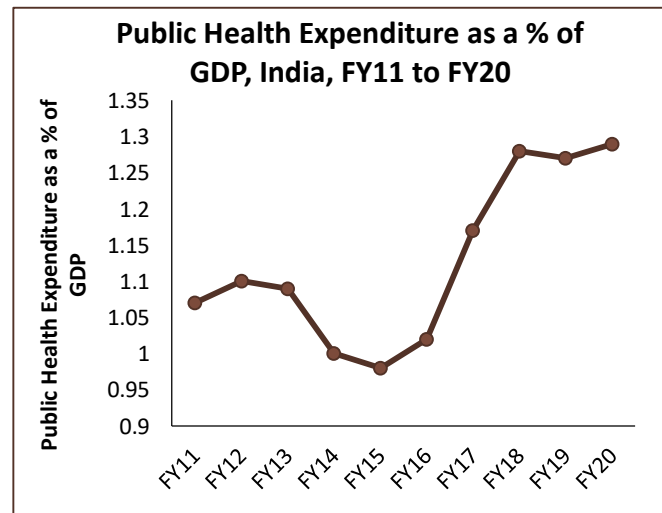
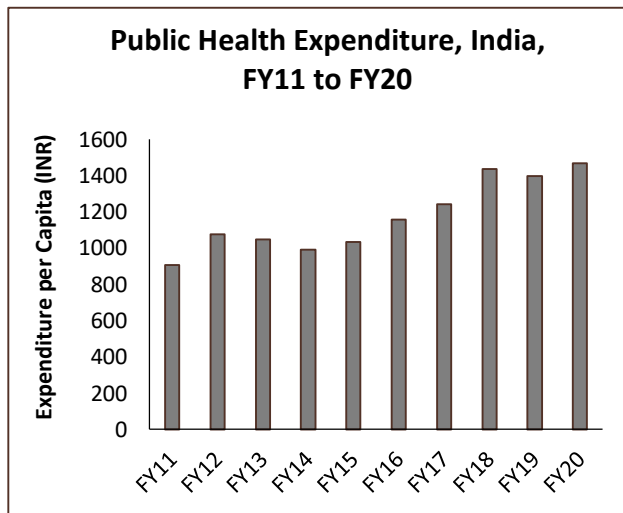
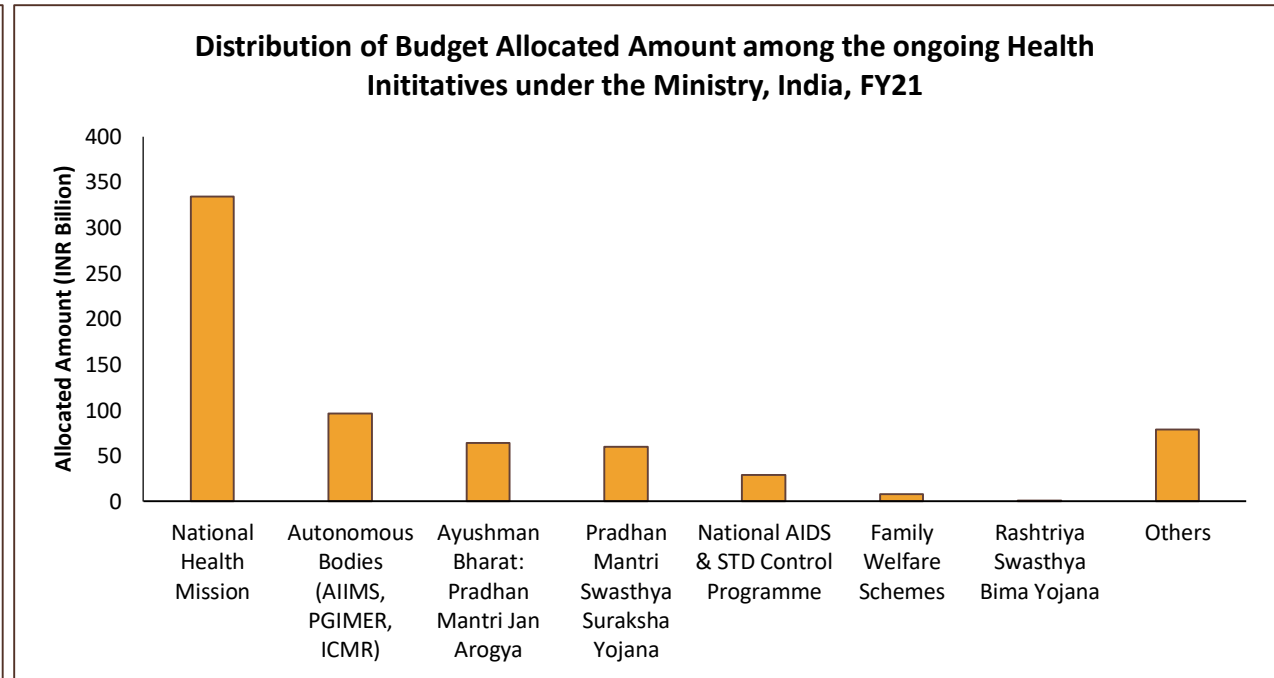
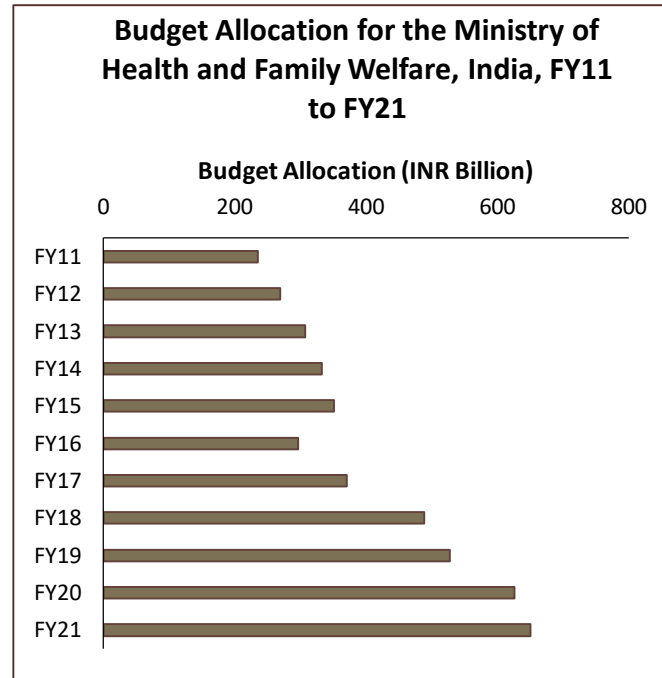
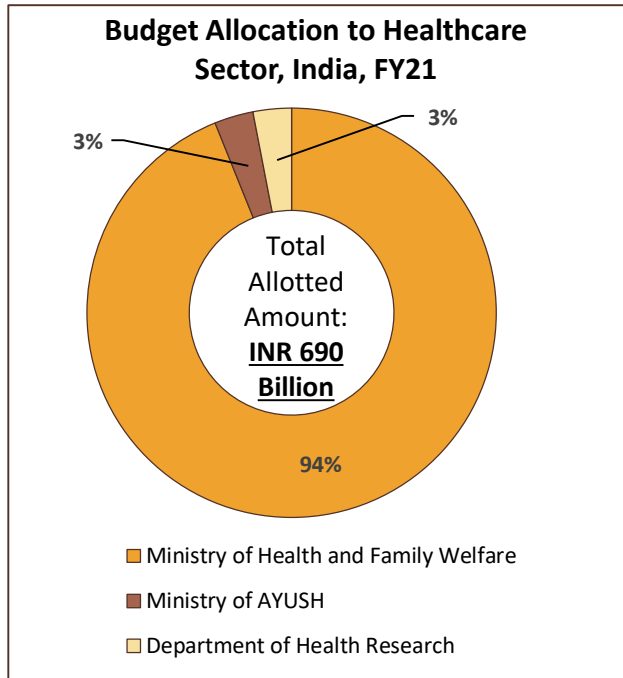


- Between 2015 to 2019, the Private Equity investment in the healthcare sector grew at the CAGR of **14.42%**.
- The industry became successful to attract significant number of investors and in the overall buyout deals of the private equity investments, the share of healthcare sector was **5%** in 2019.
- Moreover, the number of start-up deals in the health-tech sector was **28** in 2019.

Source: Department for Promotion of Industry and Internal Trade, India Trend Book 2020, LSI Research



Government Investment in the Healthcare Sector

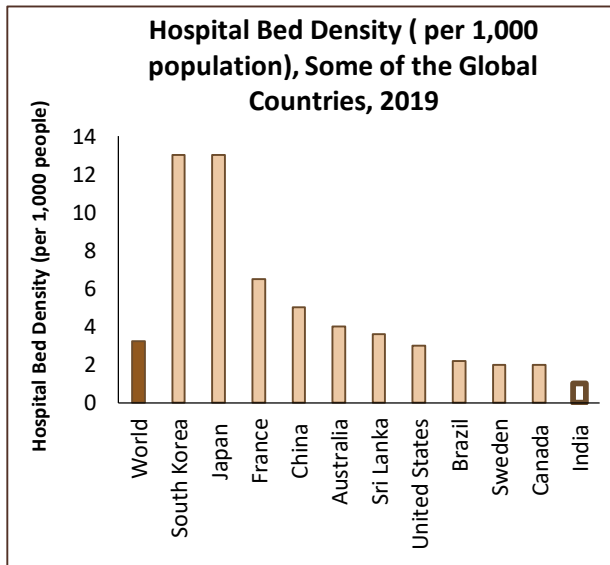
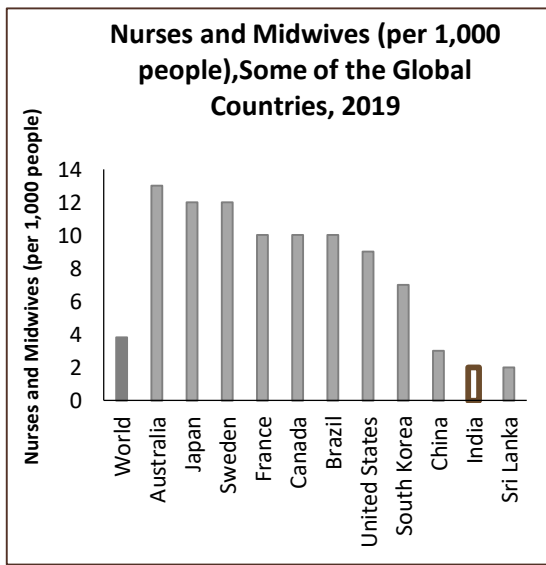
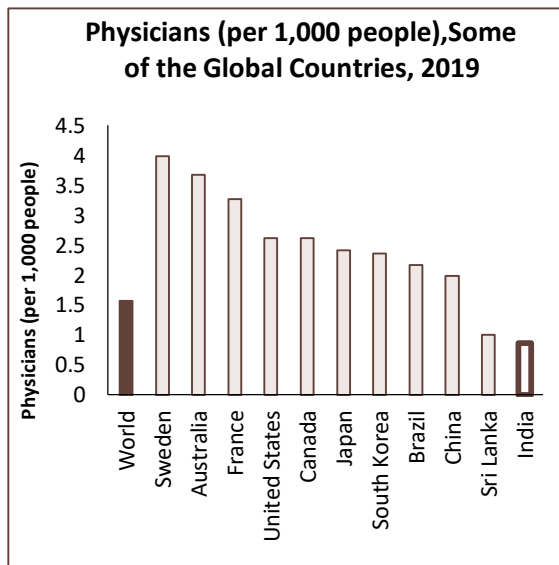
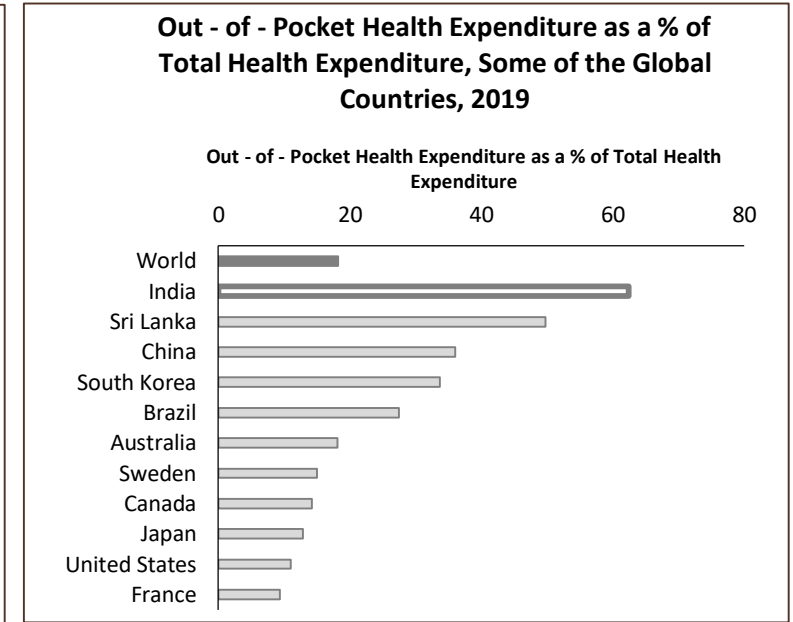
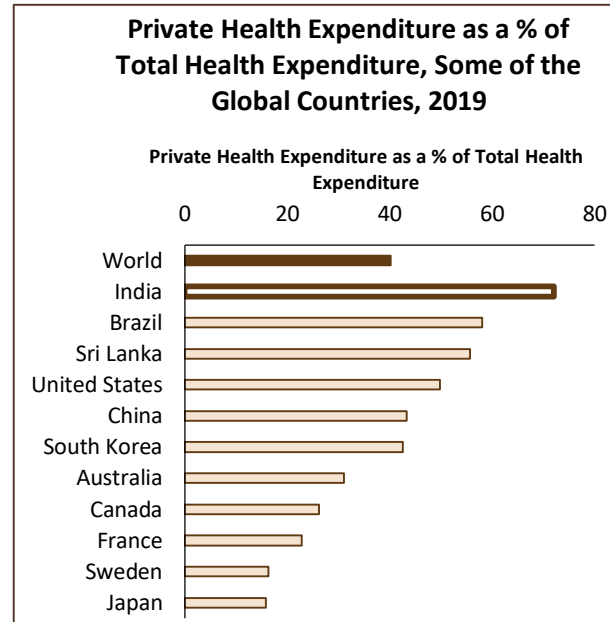
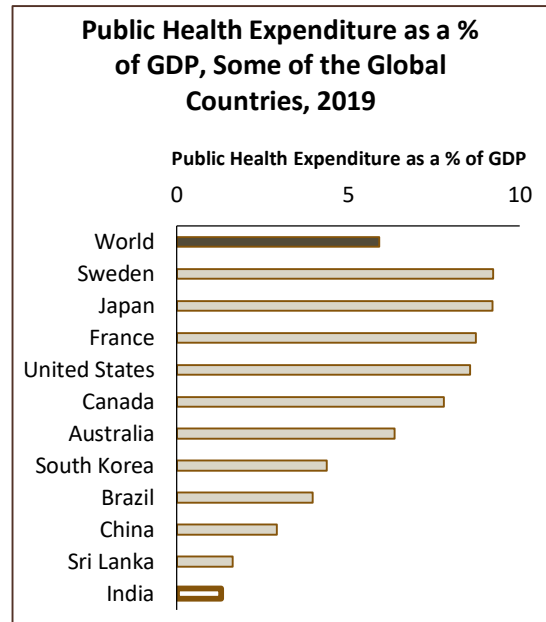
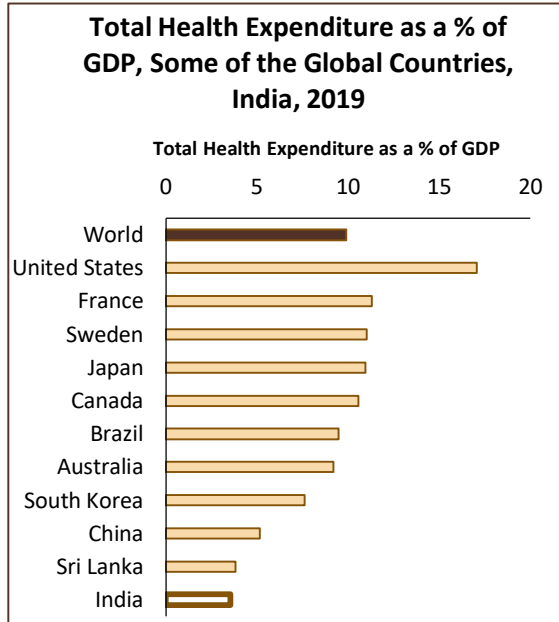


- The budget allocation to the healthcare sector has increased at CAGR of **10.7%** between FY11 to FY21.
- The major share of the allotted amount is provided to Ministry of Health and Family Welfare (MoHFW) which takes care of implementation of health schemes, and regulation of medical education and training in India.
- Though the Public Health Expenditure per capita had increased at the CAGR of **5.51%** between FY11 to FY20 in the country, but the share of government in the overall health expenditure is significantly low in India compared to other countries.
- The total expenditure by the Centre and states for FY20 was **1.29%** of GDP.

Source: PRS Legislative Research, Livemint, LSI Research



Comparison of India's Healthcare Status with Other Countries



- The Indian government aims to achieve **2.5%** of the GDP by 2025 under the National Health Programme which is much lower than the world average of **9.0%**.
- The expenditure in the healthcare sector in a populous country like India has always been insignificant.
- In FY20, the public health expenditure in India was **1.29%** of its GDP.
- Compared to its peer nations, the healthcare status of the country is lagging behind in every respect.

Source: World Bank, NationMaster: Global Industry Market Sizing, LSI Research



Sector Growth Challenges



Healthcare Expenditure

- India has traditionally spent less on health, 90% of government expenditure being on the revenue side.
- Lack of government facilities force the people to seek private healthcare which is very expensive. It triggers the growth of Out-of-pocket healthcare spending.



Healthcare Education & Workforce

- Graduate doctors are forced to work as junior resident doctors due to lesser number of postgraduate medical seats. 18,000/year seats are available for post graduation whereas around 50,000 doctors graduate each year. In long term, it creates the scarcity of specialised doctors and surgeons.
- Besides, providing adequate physical infrastructure and human resources critical for achievement



Medical Research

- Medical research in the country needs to be focused on drugs and vaccines for tropical diseases which are normally neglected by international pharmaceutical companies on account of their limited profitability potential. The healthcare sector requires to allocate more funds to boost medical research in this direction.
- However, the expenditure budget on medical research has not increased significantly over the past few years.



Medical errors

- More than 5 million incidents of medical errors happen due to the absence of skilled doctors and health assistants.
- Irrelevant medical test procedures instructed by unskilled staff lead to higher medical expenses.



Inadequate Medical Infrastructure

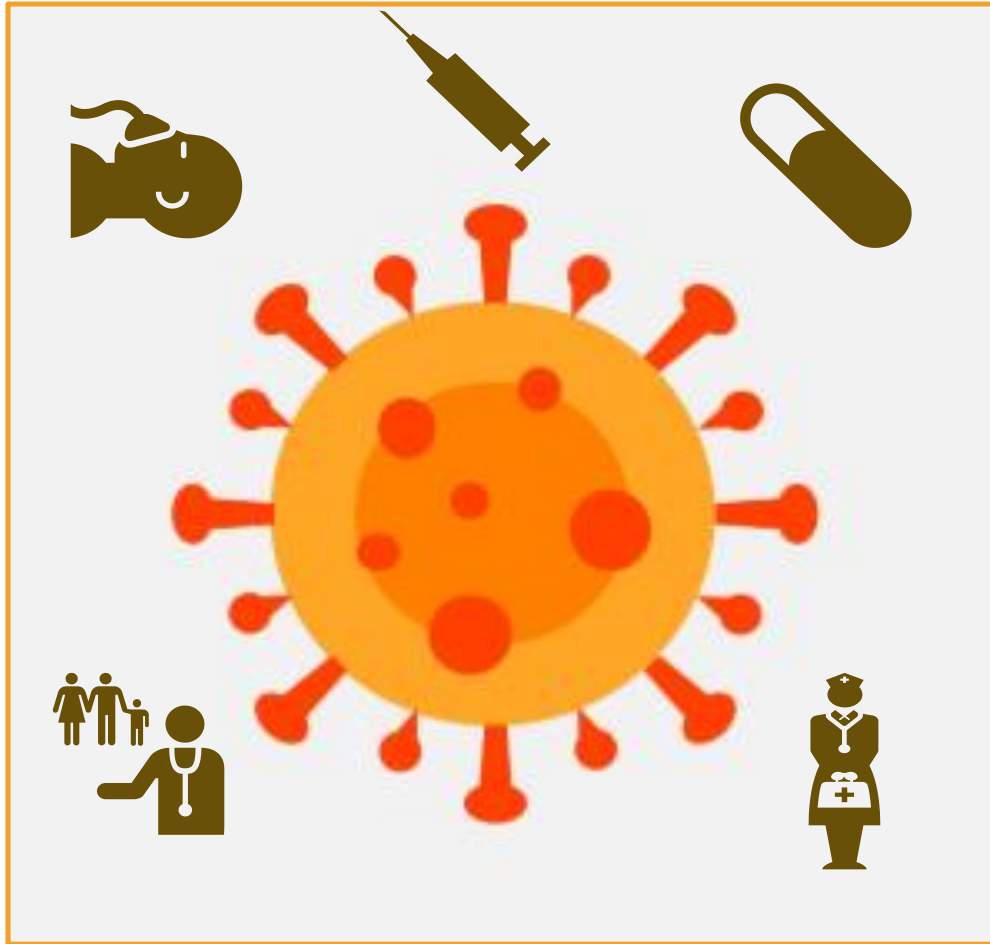
- Hospitals struggling with outdated technology, lower number of beds and other quality workforce, are unable to deliver proper healthcare service to patients



Rising Dual Disease Burden

- Spurt of Non Communicable Diseases along with the continuous increase in Communicable ones is the reason behind majority of deaths



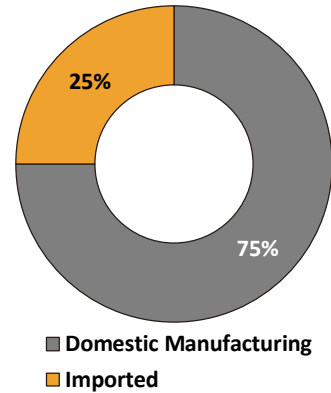


Indian Healthcare Post COVID -19 Outbreak

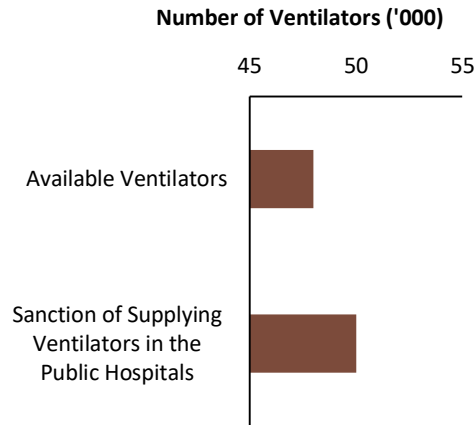


The Growth of Domestic Industries to Combat COVID-19

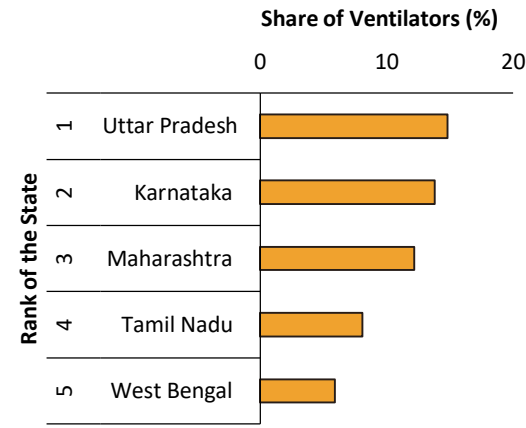
COVID-19 Testing Kit Production, India, as on Jun'20



Availability of Ventilators in Public Hospitals, India



Top 5 States with Maximum Number of Ventilators, India



Status of PPE Production

A PPE (Personal Protective Equipment) kit consists of mask, eye shield, shoe cover, gown and gloves, which doctors and healthcare workers wear during the treatment of COVID-19 patients.

- Previously, the production of PPE kits in India raised from **50,000** to **1.5 lakhs/day**.
- The highest single day production has been **4.5 lakhs**.
- Currently, over 600 companies in the country are certified to manufacture PPEs.

- The best defence against any outbreak is a strong health system. COVID-19 is revealing how fragile many of the world's health systems and services are, forcing countries to make difficult choices on how to meet the needs of their people.
- India is the 2nd populous country in the world and it is quite expected that outbreak of such a severe pandemic would definitely affect the entire nation.
- We also need to keep in mind the size and diversity of the country, where the size of many states are compared with many European countries. Hence, the COVID-19 outbreak status also varies from state to state. Some of the states seem to become capable to control while many of them are not.
- The central and state governments might have taken several initiatives to deal with the pandemic but many of them might not be felt as sufficient enough in front of the territory size, population and its density, economic status of majority people of India.
- The current situation requires adequate testing. Without which we will not be able to realise the true scale of the epidemic, and it becomes next to impossible to predict the healthcare resources required.
- Those who test positive need to be promptly isolated and their contacts also required to be traced and quarantined, preventing further spread of the infection.
- As the central and state governments lift lockdown restrictions, testing assumes a greater role in infection control, which makes it very relevant in these times.
- Until we have a treatment or a vaccine for COVID-19, 'test, trace, isolate' will be a significant tool in our repertoire, in addition to physical distancing. Testing is what we would medically call a public health intervention that is both diagnostic (enables us to know the problem and its depth thereof) and therapeutic (helps us in alleviating the problem).

Source: Times of India, The Wire, Center for Disease Dynamics, Economics & Policy, LSI Research



COVID-19 Impact and the Way Ahead



Pandemics are large-scale outbreaks of infectious disease with high burden of morbidity and mortality over a wide geographic area and cause significant economic, social, and political disruption.



Globalization, with increased global integration and travel, urbanization, and greater exploitation of the natural environment, has led to pandemics spreading quickly. As an outcome, COVID-19 has become a deadliest disease in the recent time.



The COVID-19 pandemic is straining health systems worldwide. The disease requires rapid level of health facilities. However, the infectious nature of it also threatens the health care workers leading to an haphazard health system many a times.



The outbreak of such kind of infectious disease can decelerate the national or global growth for sometimes. However, the people also need to adapt themselves for a **'New normal'** when the pandemic seems to be long-lasting and various vaccines to eliminate the disease from its root might also take some time to be available publicly.



Moreover, the appropriate health treatment also needs to be developed to reduce the spread and fear of the disease among the mass. Till then, we need to be ready to explore the **'New normal'**.



Ways to strengthen the Indian Healthcare Sector

Digitization

Growth Factors

Telehealth

Artificial Intelligence

Other Disruptive Technologies

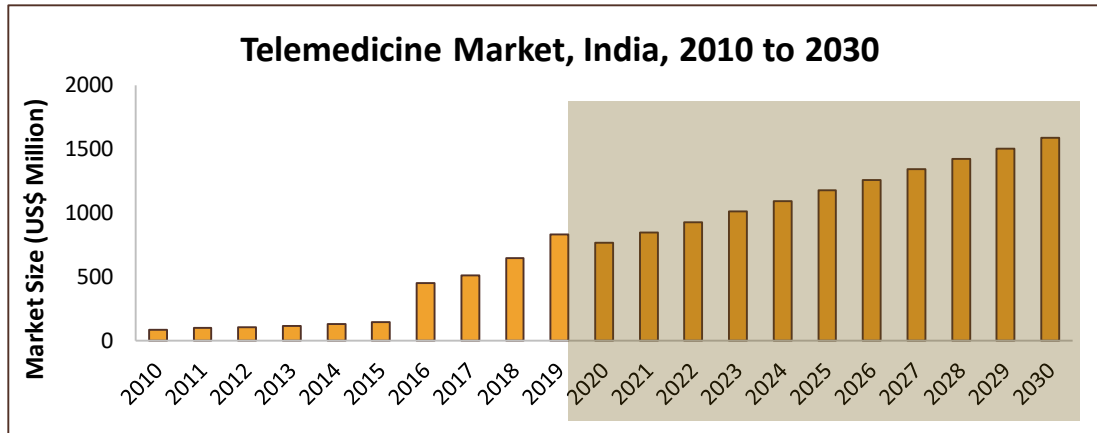
Pharmaceutical Industry

Generic Medicine

Healthcare Research

Drug Regulatory System





Shaded area denotes forecast

- Innovation in the healthcare industry in country like India is complex due to various factors like geographical, demographical and landscape etc. and the platform like telemedicine reduces such complexities to some extent.
- Telemedicine allows health care professionals to evaluate, diagnose and treat patients at a distance using telecommunications technology.
- Telemedicine is a fast-emerging sector in India. Though compared to the developed countries, the Indian telemedicine market is still nascent, but the outbreak of the COVID-19 has accelerated the use of telemedicine apps in the country.
- Between 2010 to 2019, the Indian Telemedicine market had increased at the CAGR of **28.8%** and it expects to reach the value of **US\$ 1600 Million** by 2030.

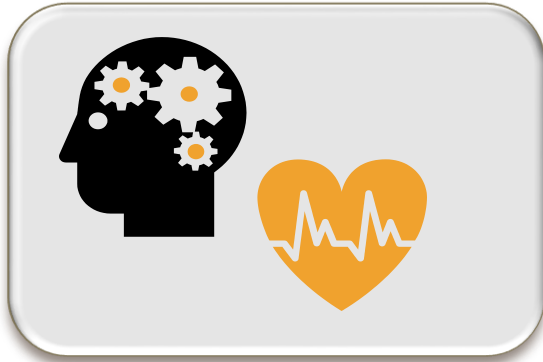


1. The telemedicine system enables the patients to access delivery of monthly medication, booking online appointments with their specialists and even booking for home-based sample collection for testing. Basically, it helps patients save travel and wait time as they can consult a doctor at their own convenience and at the comfort of their home.
2. The sector bridges the healthcare gap between rural India and urban India. In rural India, where the access to medical facilities, specialists opinion and advance healthcare amenities are limited, telemedicine acts as a healthcare provider bringing access to the specialist doctors to these areas.
3. The unexpected COVID-19 outbreak created massive challenges in traditional healthcare systems of India. Due to countrywide lockdown and the infectious nature of COVID-19, patients have faced severe difficulties while consulting doctors physically.
4. The Indian government had launched guidelines for telemedicine solutions on March 25, 2020. Previously, telemedicine operations were governed by several statutory guidelines in India.
5. Now, an increasing number of medical professionals are signing up for offering tele-consultancy to their existing and new patients. Major hospitals (Apollo, AIIMS, Narayana Hrudayalaya) have adopted telemedicine services.
6. Some of the telemedicine apps like Practo, mfine which are being used by doctors, health specialists and patients for online consultation have witnessed increase in the patient volumes since the outbreak of COVID-19 in the country.

Source: Inc42, LSI Research

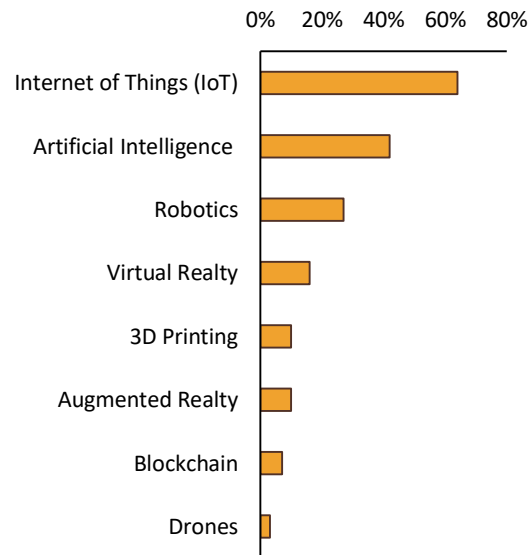


Artificial Intelligence and Other Disruptive Technologies



- Artificial intelligence (AI) is wide-ranging branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence. AI is an interdisciplinary science with multiple approaches, but advancements in machine learning and deep learning are creating a paradigm shift in virtually every sector of the tech industry.
- Innovative technologies like AI are allowing health organisations to enhance the access and reduce the burden on hospitals through real-time consultation with doctors through smartphones, tablets, laptops or PCs.
- With the appropriate use of AI, doctors and scientists can make better decisions.

Investment in Disruptive Technologies, India



Application of Artificial Intelligence in Healthcare Sector-

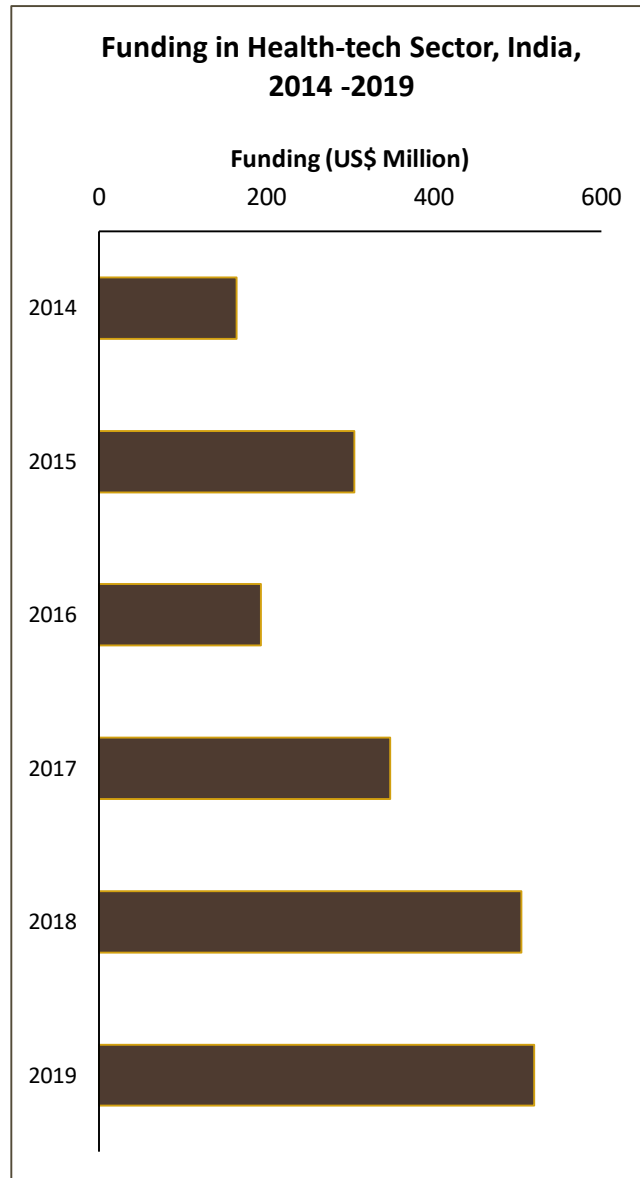
- ✓ The deep learning algorithms help to provide better insights to doctors in predicting diseases in patients.
- ✓ The upgraded technology of AI is capable to do efficient disease tracking and management, particularly for fast spreading diseases.
- ✓ Creating diagnostic tools with the help of predictive analytics and machine learning that will diagnose diseases faster and more accurately.
- ✓ Efficient management and tracking of electronic data of patients, including their age, medical history, tests, medical images, DNA sequences, and other factors leading to effective and error-free treatment of patients. It ultimately minimizes the documentation workload of hospital staffs, updates and stores error-free information of patient, eliminates the billing/coding errors, saves time of both patient and doctor, and guides patients through live chat-bot.
- ✓ Maintaining confidentiality of hospitals through Data Saving and Password protection.
- ✓ Use of robots to deal with the patients in the cases of document verification, clinical report explanation etc.
- ✓ Categorization of the patients in various groups (eg. high risk or very high risk group) after modifying the intensity of treatment.

- *The acceptability and incorporation of artificial intelligence tools, such as deep learning in day-to-day medical decision making will ultimately result in improving patient care in an affordable manner.*

Source: Inc42, PwC, LSI Research



Health-tech Industry to Deal with COVID-19



Source: Inc42, LSI Research

As of 2019, there are a total of 4,800+ start-ups in the Indian health-tech sector.

Between 2014 to 2019, the funding in the Indian Health tech sector had increased at the CAGR of **25.91%** .

Advanced technologies, increased internet penetration, and enhanced healthcare policies is triggering the healthcare market to be valued around **INR 8.6 Trillion** by 2025.

With the increasing cases of Covid-19 every day, the healthcare professionals are troubling everyday. India's health-tech start-ups are also trying their best to beat the pandemic and its impact.

Health-tech start-ups have been creating Covid-19 trackers, low-cost ventilators and more to tackle the current situation.

One of the major challenges faced by the country today is health workers falling prey to the coronavirus. To prevent that, healthtech startups such as *Dozee* and *InnAccel* have devised innovative solutions that can help them monitor and treat low-risk patients remotely.

To address the shortage of beds, Bengaluru-based *Dozee* is working to convert normal beds into a mini ICU bed. The technology provided by them offers artificial intelligence (AI) enabled sensor sheets that are placed under the patient that needs constant monitoring. The sheet measures vitals such as breath rate, heartbeat, sleep, stress, among other things.

Another startup that has responded swiftly to the shortage of medical equipment and devices is Bengaluru-based *InnAccel*. The medical device startup has developed SAANS, a proprietary continuous positive air pressure (CPAP) ventilator machine for babies.



Segmentation of Health-tech Start-ups in India



Online pharmacy



Tele-medicine



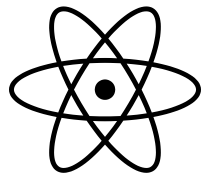
Personal Health Management



Home Healthcare



Diagnostics



Biotech R&D



Medical Devices



Healthcare IT/Data



Biopharma



Genomics

Technologies to Change Indian Healthcare Landscape

Connected Devices
for Home Use

Internet of Medical
Things

3D Printing

Smaller Implants



Surgical Robotics
Tools

Ancillary Services

Patient Facing
Mobile Apps

Remote Monitoring
Solutions



Less Invasive
Diagnostics

Digital Platform
Integration

Medical Wearables

Big Data Analysis

Predictive Analysis

Disease Prevention



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