Research

CRISIL
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An assessment of the healthcare delivery market in India

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Global Health Limited
New Delhi

A review of India's GDP growth

GDP grew at 6.6% CAGR between fiscals 2012 and 20

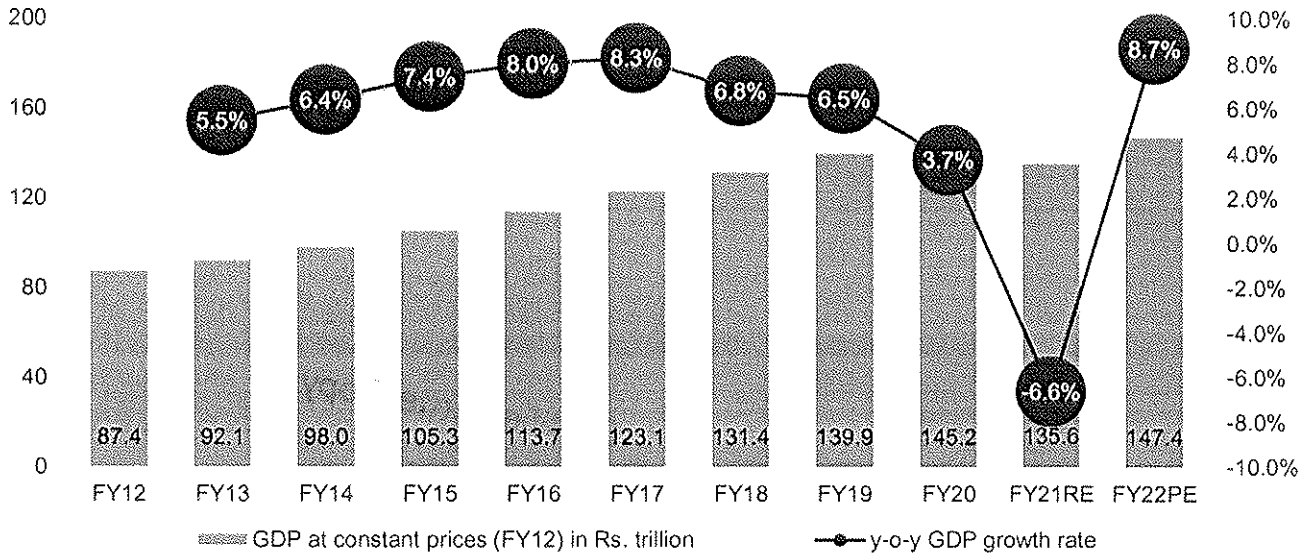
In 2015, the Ministry of Statistics and Programme Implementation (MoSPI) changed the base year for calculating India's gross domestic product (GDP) between fiscals 2005 and 2012. Based on this, India's GDP increased at an eight-year compound annual growth rate (CAGR) of 6.6%, growing to Rs 146 trillion in fiscal 2020 from Rs 87 trillion in fiscal 2012.

Fiscal 2021 was a challenging year for the Indian economy because of the Covid-19 related distress, which was already experiencing a slowdown before the pandemic struck. GDP contracted by 6.6% (in real terms) after growing 3.7% in fiscal 2020. India's GDP (in absolute terms) dropped to Rs 136 trillion in fiscal 2021.

GDP in fiscal 2022 grew at 8.7% on-year

As per the provisional estimates released by the National Statistical Office, India's real gross domestic product (GDP) grew at 8.7% in fiscal 2022, compared with 8.9% estimated in February 2022. This is largely a reflection of a lower base (as the economy had contracted by 6.6% in fiscal 2021). It is noteworthy that given the large output loss last fiscal, GDP is still only 1.5% above the pre-pandemic (fiscal 2020) level.

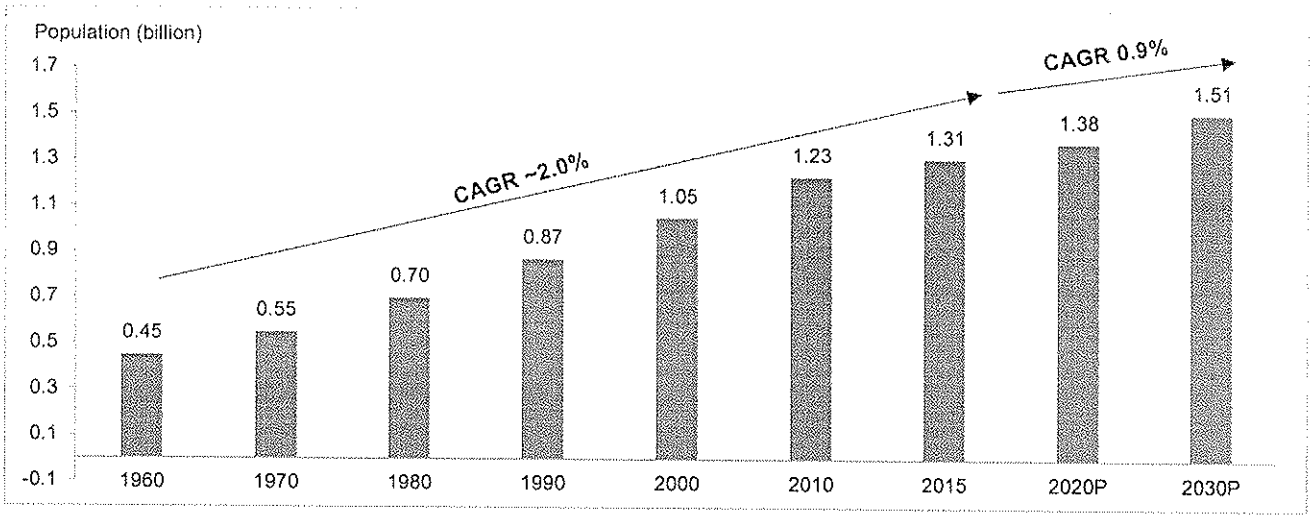
Real GDP growth in India (2011-12 GDP series)



PE: Provisional estimates; RE: Revised estimates

Source: Provisional estimates of national income 2021-22, Central Statistics Office (CSO), MoSPI, CRISIL Research

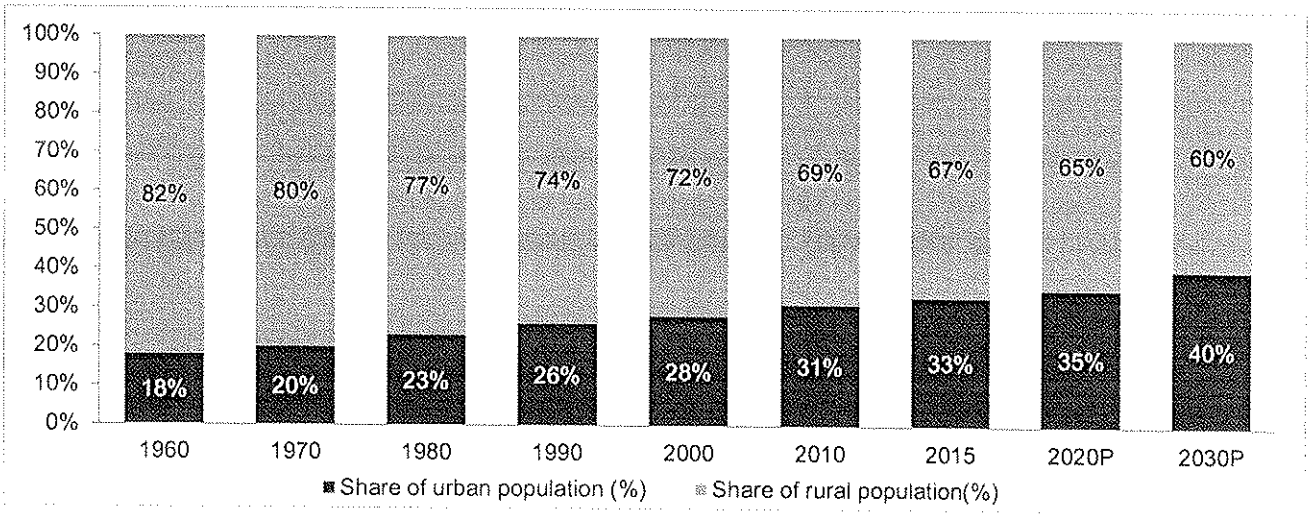
India's population growth



P: Projected

Source: World Urbanization Prospects: The 2018 Revision, United Nations, CRISIL Research

India's urban versus rural population



P: Projected

Source: World Urbanization Prospects: The 2018 Revision, United Nations, CRISIL Research

Per capita net national income at constant prices

	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21RE	FY22PE
Per-capita net national income (Rs)	63,462	65,538	68,572	72,805	77,659	83,003	87,586	92,133	94,270	85,110	91,481
On-year growth (%)		3.3	4.6	6.2	6.7	6.9	5.5	5.2	2.3	-9.7	7.5

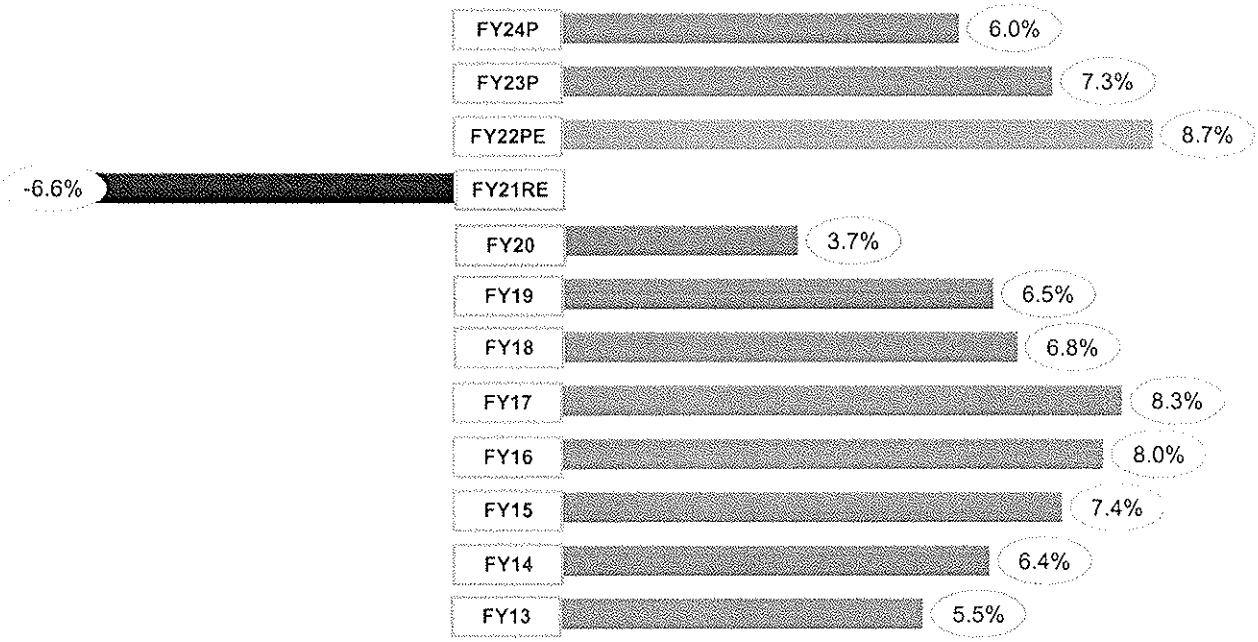
RE: Revised estimates; AE: Advance estimates

Source: Second Advance Estimates of Annual National Income, 2021-22, CSO, MoSPI, CRISIL Research

CRISIL estimates India's GDP growth at 7.3% in fiscal 2023 with downside risk

The growth outlook for fiscal 2023 is fettered by multiple risks. Global growth is projected to slow, as central banks in major economies withdraw easy monetary policies to tackle escalating inflation. This, together with high commodity prices, especially oil, translates into a negative terms of trade shock for India. At the same time, higher and broad-based inflation domestically will create a drag on consumption revival. Uncertainty due to the Russia-Ukraine conflict could put some of the private capex plans on the back burner. In fact, higher input prices could also result in lower government capex, which has already seen fiscal space shrink with attention shifting to relief measures, to fight rising inflation. Amid this gloomy scenario, the forecast of a normal monsoon comes as a silver lining. CRISIL also expects the gaining momentum in contact-intensive services to broad-base and support growth. On balance, CRISIL maintains its real GDP growth projection for fiscal 2023 at 7.3%, with risks tilted to the downside.

Real GDP growth (% on-year)



RE: Revised estimates PE: Provisional estimates; P: Projected by CRISIL Research.
Source: Advanced estimates of national income 2021-22, CSO, MoSPI, CRISIL Research

Key fiscal measures announced by the central government towards healthcare

The healthcare budget has increased year-over-year, with budget for the Ministry of Health and Family Welfare (MoHFW) clocking an 11% CAGR between fiscal 2011 and fiscal 2023. Overall health and wellbeing budget for fiscal 23 has seen an increase of 12% over fiscal 22 budget. Fiscal 2023, especially, has seen a significant rise on account of the high expenses associated with tackling the drinking water and sanitation issues. In recent years, the utilization rate has been 100% or above, as has been the case since fiscal 2016.

Key budget proposals for fiscal 2022-23

- An estimated Rs. 862 billion has been allocated to the ministry of health and family welfare for the fiscal year 2023 from Rs. 859 billion revised estimates in fiscal 2022.
- An open platform for National Digital Health Ecosystem to be rolled out.
- National Tele Mental Health Programme' for quality mental health counselling and care services to be launched

Health and Wellbeing – Expenditure for fiscal 2023

Ministry/departments	Actuals FY20 (Rs. billion)	Actuals FY21 (Rs. billion)	RE FY22 (Rs. billion)	BE FY23 (Rs. billion)
Healthcare	**643.3**	**806.9**	**859.2**	**862.0**
D/o health & family welfare	624.0	775.7	829.2	830.0
D/o health research	19.3	31.2	30.8	32.0
Well-being	**219.3**	**181.0**	**537.0**	**703.0**
M/o Ayush	17.8	21.3	26.6	30.5
D/o drinking water & sanitation	182.6	159.7	510.4	672.2
Overall (health and wellbeing)	**862.6**	**987.9**	**1396.2**	**1,565.0**

BE: Budget Estimates; RE: Revised Estimates;
Source: Budget document

VGF support will aid in the development of hospitals and healthcare centres under public-private partnership

India's Covid-19 emergency response and health-system preparedness package of Rs 150 billion was announced in three phases (for the medium term of 1-4 years)to address immediate requirements in the wake of the pandemic. A separate health-worker life insurance cover of Rs 5 million under Pradhan Mantri Garib Kalyan Yojana (PMGKY) was also announced to offer support to families of frontline health workers fighting the virus.

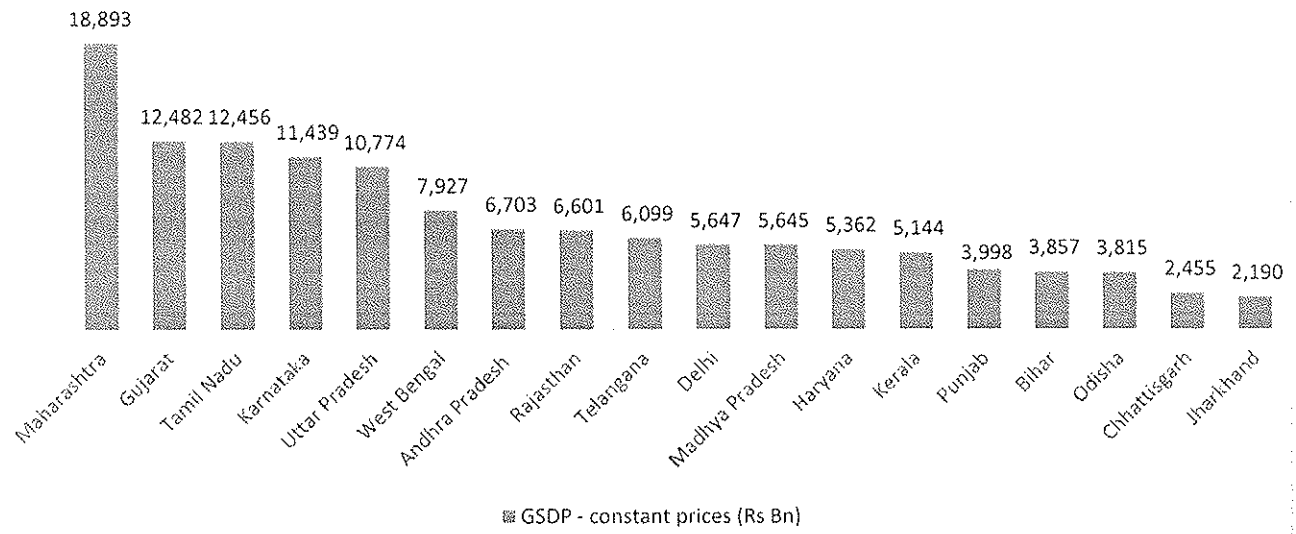
In addition to emergency funding for the pandemic response, the economic package includes long-term measures to improve healthcare infrastructure. The government's emphasis on healthcare offers substantial opportunities for private investment to create affordable-healthcare facilities and services. To boost private investment in social infrastructure, the government has announced an outlay of Rs 81 billion with viability-gap funding (VGF) limits, enhanced from 20% to 30% of project cost for both the Central and state governments to attract private investments in the social infrastructure space.

VGF support will aid in the development of hospitals and healthcare centres under public-private partnership (PPP). It creates an investment opportunity of Rs 150-200 billion under the social-infrastructure space. Support to private investments via enhanced VGF will help grow the current health infrastructure by 4-5%. Increased public expenditure on health (National Health Policy targets public health expenditure at 2.5% of GDP by 2025) also means increased government focus on development of health systems and research centres. Development of healthcare infrastructure will gain preference in the current situation with a rise in healthcare spending / demand in India.

Delhi and Haryana are the top two states with highest per capita NSDP as of fiscal 2021

In fiscal 2021, Maharashtra, Gujarat, Tamil Nadu, Karnataka and Uttar Pradesh were top-rankers in terms of gross state domestic product (GSDP) at constant prices among the non-special states considered in CRISIL Research's analysis. In terms of per-capita NSDP, Delhi and Haryana had the highest per-capita NSDP in fiscal 2021. Northern and eastern states such as Uttar Pradesh, Bihar and Jharkhand had lowest per capita NSDP in fiscal 2021 implying growth potential in those states.

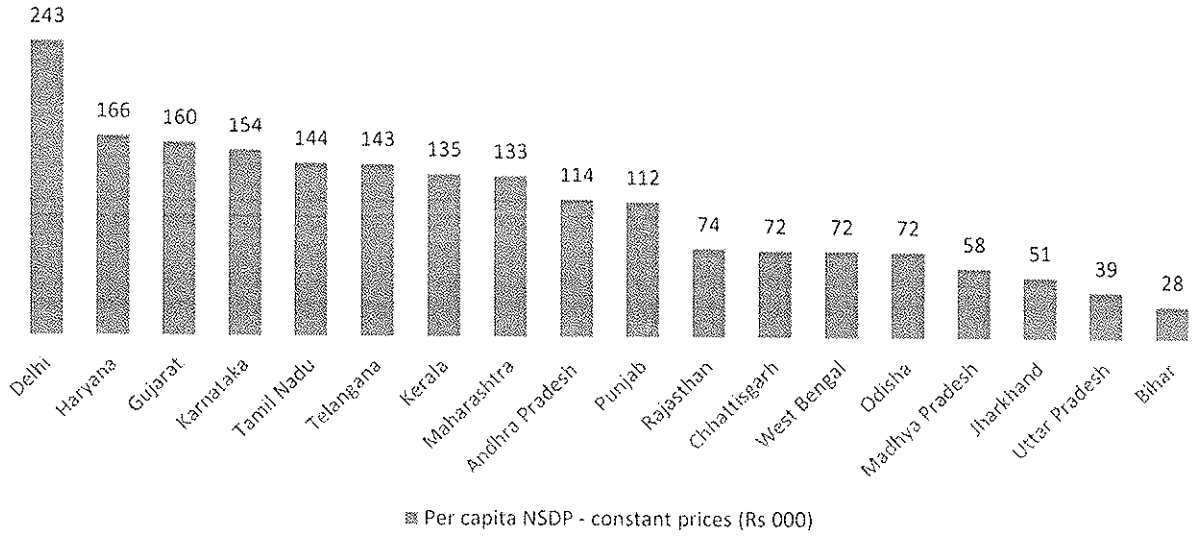
State-wise GSDP at constant prices as of fiscal 2021



Note: 17 states as classified by the RBI under non-special category and Delhi have been considered for this analysis.

Source: CSO, CRISIL Research

State-wise per capita NSDP at constant prices as of fiscal 2021



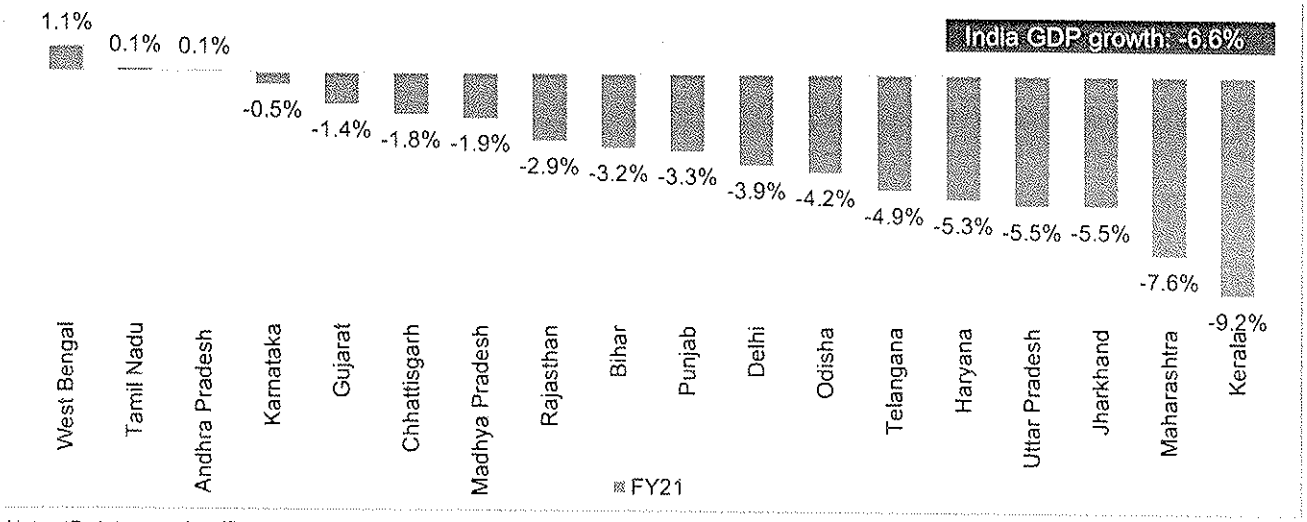
Note: 17 states as classified by the RBI under non-special category and Delhi have been considered for this analysis.

Source: CSO, CRISIL Research

West Bengal, Tamil Nadu and Andhra Pradesh ranked top 3 in terms of GSDP growth in fiscal 2021

In fiscal 2021, West Bengal (1.1%), Tamil Nadu (0.1%) and Andhra Pradesh (0.1%) ranked top three in terms of y-o-y GSDP growth among the non-special states considered in our analysis.

GSDP growth across states in fiscal 21



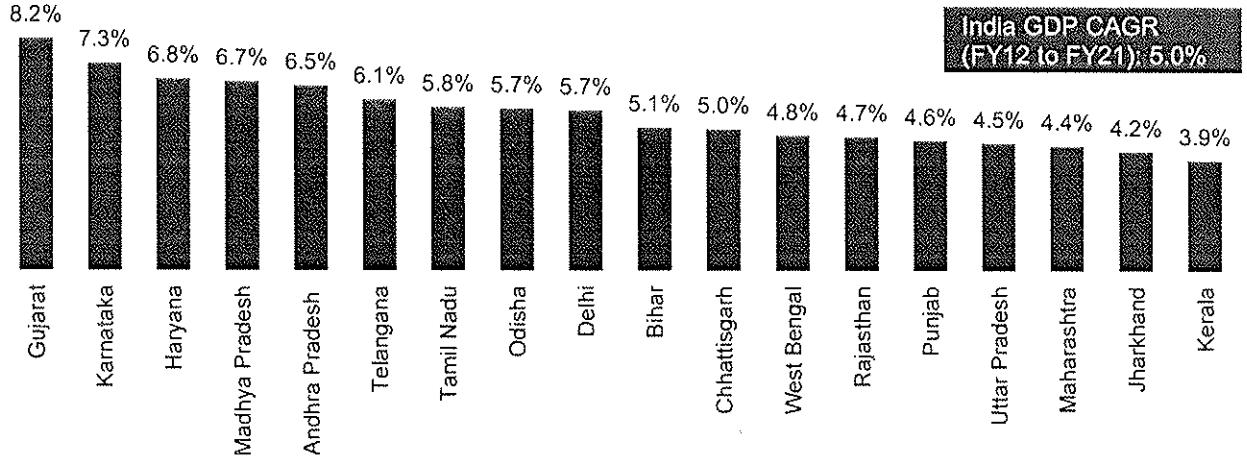
Note: 17 states as classified by the RBI under non-special category and Delhi have been considered for this analysis.

Source: CSO, CRISIL Research

Haryana ranked amongst top three in terms of GSDP growth during fiscal 2012 to fiscal 2021

Between fiscals 2012 and 2021, Gujarat (8.1%), Karnataka (7.3%) and Haryana (6.8%) were the high growing states (CAGR greater than 5.0%) on average followed by Madhya Pradesh, Telangana and Andhra Pradesh. Kerala, Jharkhand and Maharashtra had ranked at the bottom over the same period. Delhi has clocked a CAGR of 5.7% for GSDP during fiscal 2012 to fiscal 2021.

GSDP growth between Fiscal 12 and Fiscal 21 (CAGR, %)



Note: 17 states as classified by the RBI under non-special category and Delhi have been considered for this analysis.

Source: CSO, CRISIL Research

Delhi and Haryana amongst the top three rankers in per-capita income

Delhi, Haryana and Gujarat were the top three rankers (among the non-special states considered in our analysis) both in terms of per-capita NSDP at constant prices in fiscal 2021.

As of fiscal 2021 Uttar Pradesh and Jharkhand were amongst the slower growing states in terms of average per capita income during the period of fiscal 2012-2021. Per capita income for these states in fiscal 2021 was the lowest amongst the states compared here showing that these states have huge growth potential in future.

Delhi tops the list in terms of 'higher than national per-capita income' states in fiscal 21

Based on the data for per capita income, nine states (of the 17 states under analysis) and Delhi stood above the national per capita income average of Rs 85,110. Delhi topped the list in terms of per capita income with Rs 243,110 followed by Haryana

State	Per Capita NSDP*	Average Growth FY12 To FY21	Difference With National Per Capita Income**
Delhi	**2,43,110**	**3%**	**1,58,000**
HARYANA	1,65,617	5%	80,507
GUJARAT	1,60,321	7%	75,211
KARNATAKA	1,54,123	6%	69,013
TAMIL NADU	1,43,528	5%	58,418
MAHARASHTRA	1,33,356	3%	48,246
TELANGANA	1,43,023	5%	57,913
KERALA	1,34,878	4%	49,768

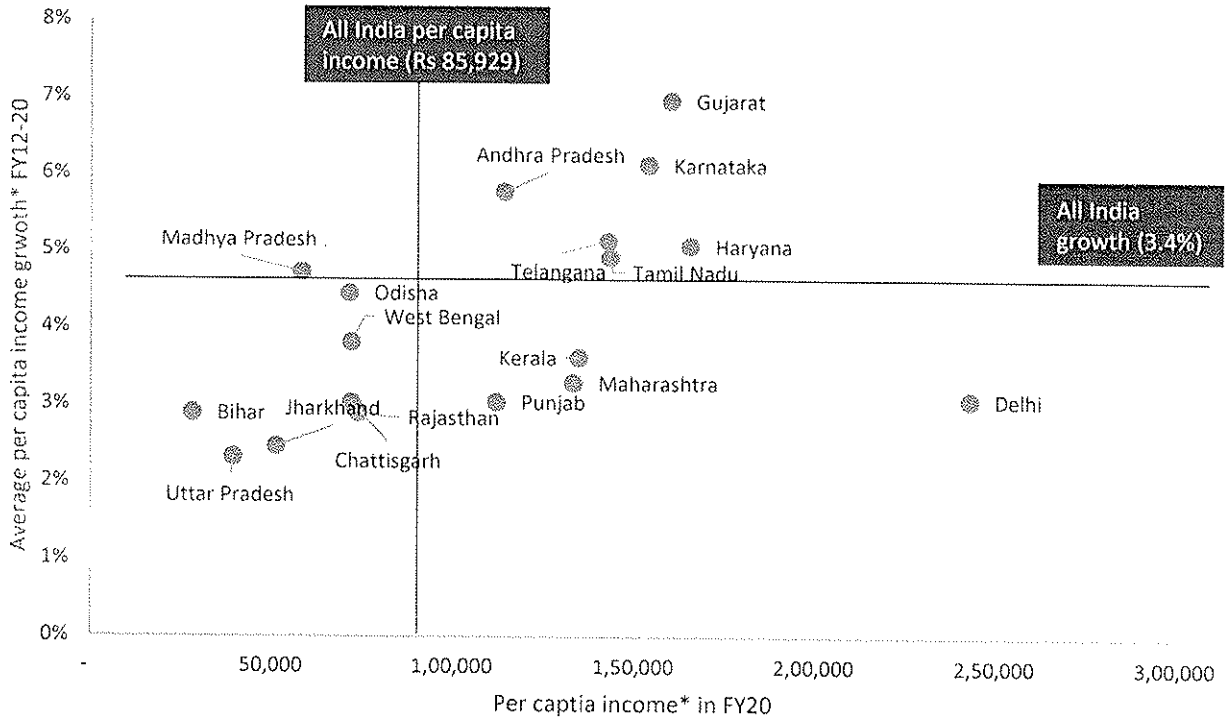
(Rs 165,617) and Gujarat (Rs 160,324)

PUNJAB	1,12,119	3%	27,009
ANDHRA PRADESH	1,14,324	6%	29,214
ODISHA	71,622	4%	-13,488
RAJASTHAN	74,009	3%	-11,101
CHHATTISGARH	72,236	3%	-12,874
WEST BENGAL	72,202	4%	-12,908
MADHYA PRADESH	58,334	5%	-26,776
Jharkhand	51,365	2%	-33,745
Uttar Pradesh	39,371	2%	-45,739

Note: Per capita income for states refers to 'per capita Net State Domestic Product (NSDP) at constant prices as of FY21; base year 2011-12' has been considered; All India per capita income refers to 'Per capita net national income at constant prices as of FY21'.

Source: CSO, CRISIL Research

NSDP growth across states between fiscal 12 and fiscal 21



Note: Per-capita income for states refers to 'per capita Net State Domestic Product (NSDP) at constant prices; base year 2011-12' has been considered; All India per capita income refers to 'Per capita net national income at constant prices'.

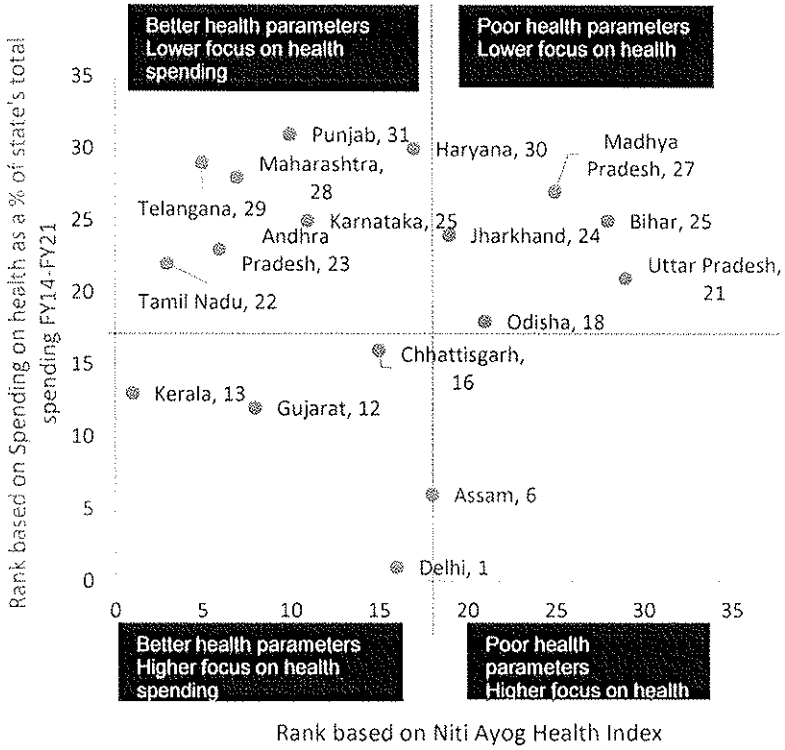
** Average per-capita income growth and per capita income in FY20 are at constant prices.*

Source: CSO, CRISIL Research

Delhi is top ranked in terms of healthcare expenditure as compared to overall expenditure

In terms of healthcare expenditure Delhi topped the list with healthcare expenditure being 12.6% of the overall expenditure of the state in fiscal 21. Haryana, Bihar and Uttar Pradesh have healthcare expenditure being 5.2%, 5.0% & 5.0% of the overall expenditure of the states in fiscal 21 and are ranked 10th, 13th & 14th respectively based on NITI Ayog's report, demonstrating large room for improvement in healthcare facilities in those states.

State-wise rank on healthcare spending versus rank on health index



State (FY21)	Healthcare expenditure#
NCT Delhi	12.6
Chhattisgarh	6.8
Odisha	6.5
Rajasthan	6
Gujarat	5.9
Tamil Nadu	5.9
West Bengal	5.9
Kerala	5.8
Jharkhand	5.4
Haryana	5.2
Andhra Pradesh	5.2
Karnataka	5.2
Uttar Pradesh	5
Bihar	5
Madhya Pradesh	4.7
Maharashtra	4.5
Punjab	3.6
Telangana	3.4

Note: Spending on healthcare as a % of state's total spending refers to 'Expenditure on Medical and Public Health and Family Welfare - As Ratio to Aggregate Expenditure'.

** Based on National Institution for Transforming India (NITI) Aayog publication named 'Healthy States: Progressive India; Report on the Ranks of States and Union Territories: Health Index – Round IV 2019-20'.*

 # Healthcare expenditure refers to 'Expenditure on Medical and Public Health and Family Welfare - As Ratio to Aggregate Expenditure' as of FY20

Source: Budget documents of the state governments, NITI Aayog, CRISIL Research

As per the scale used, 1 indicates the highest rank and 18 the lowest(17 states and Delhi). The scatter plots that follow juxtapose the latest available rankings on each of these metrics from independent sources (X-axis) with CRISIL's rankings based on the states' spending towards healthcare as a percentage of its total spending (Y-axis).

Kerala and Mizoram fare as the leading states in India in terms of both better health parameters as well as higher focus on healthcare spending. Tripura and Sikkim also fall in the quadrant of better health parameters ranked 4th and 12th, respectively, based on NITI Aayog's report.

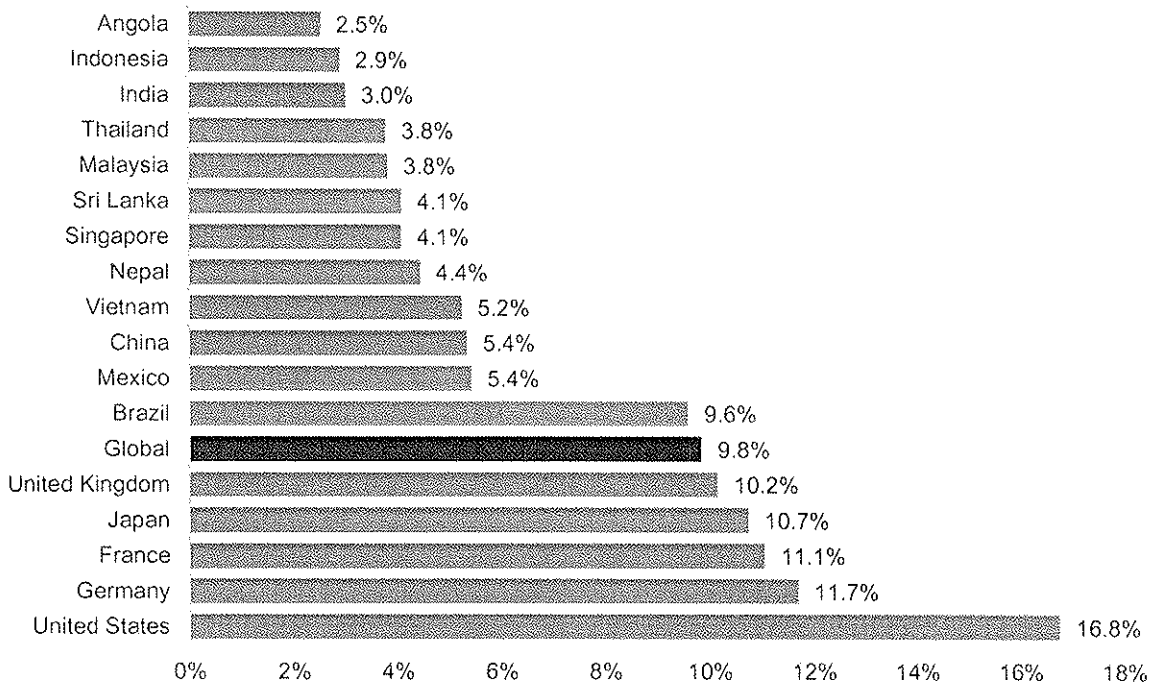
Social and healthcare related parameters

Huge potential for public spending on healthcare services to increase over the coming years

Despite structural demand existing in the country and the potential opportunity it provides for growth, provision of healthcare in India is still riddled with many challenges. The key challenges are inadequate health infrastructure and inequality in the quality of healthcare services provided based on affordability and financing.

India lags peers in healthcare expenditure

Total healthcare expenditure as % of GDP (2019)

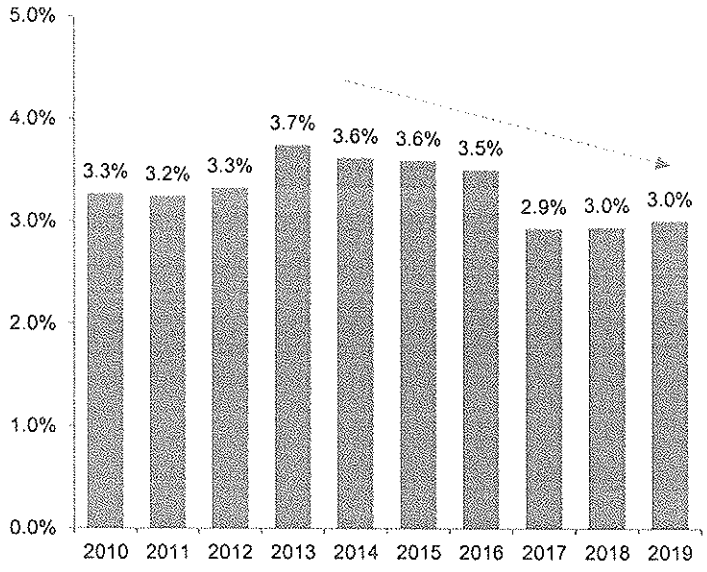


Source: Global Health Expenditure Database- World Health Organisation, CRISIL Research

According to the Global Health Expenditure Database compiled by the World Health Organisation (WHO), India's current expenditure on healthcare was 3,0% of gross domestic product (GDP) in 2019. India's real GDP in fiscal 2019 was Rs 139.9 trillion (constant fiscal 2012 prices. India trails not just developed countries such as the United States (the US) and the United Kingdom (the UK), but also developing countries such as Brazil, Nepal, Vietnam, Singapore, Sri Lanka, Malaysia, and Thailand in terms of healthcare spending as a percentage of GDP as of CY2019.

India spends too little on healthcare

Current healthcare expenditure (CHE) as % of GDP in India (2010-2019)



Per capita current expenditure on health in USD (2019)

India	63.8
China	535.1
Brazil	853.4
Korea	2,624.5
Singapore	2,632.7
United Kingdom	4,312.9
Japan	4,360.5
France	4,491.7
Australia	5,427.5
Germany	5,440.3
Canada	5,048.4
United States	10,921

Source: Global Health Expenditure Database- World Health Organisation, CRISIL Research

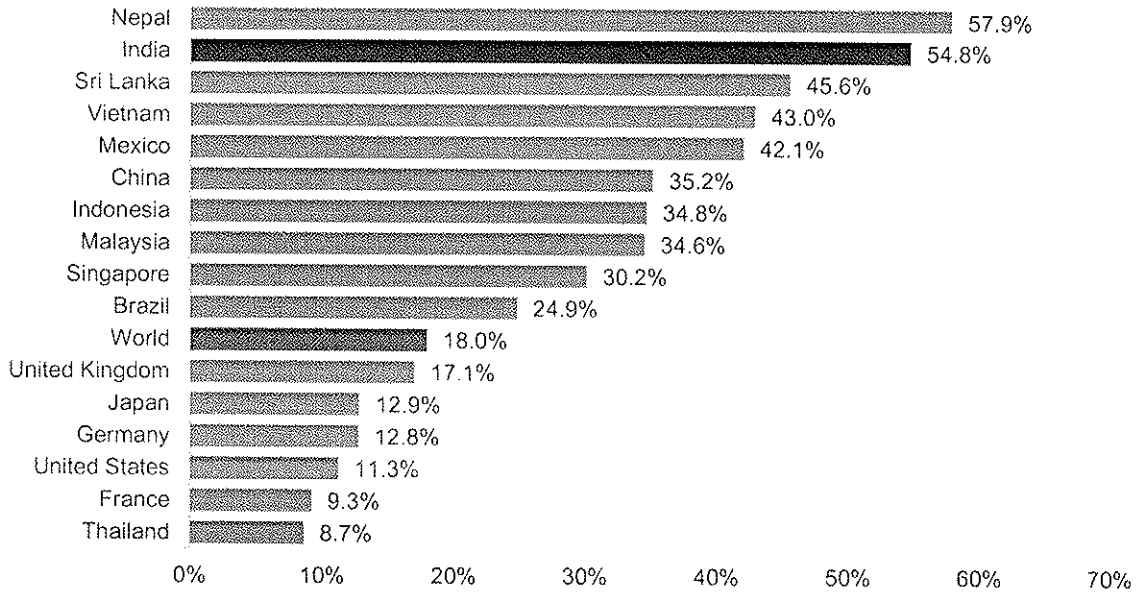
India's current healthcare expenditure decreased from calendar year 2013 to 2019. The skew, however, is more towards private expenditure compared with public expenditure. Low healthcare expenditure in India is primarily due to under-penetration of healthcare services and lower consumer spending on healthcare.

Further, the share of public spending on healthcare services remains much lower than global peers. For example, India's per-capita total expenditure on healthcare (at an international dollar rate, adjusted for purchasing-power parity) was only $63.8 in 2019 compared with $10,921 for the US, $4,313 for the UK and $2,632.7 for Singapore.

Public healthcare expenditure is low, with private sector accounting for a lion's share

India's current healthcare expenditure (CHE) is skewed more towards private expenditure compared with public expenditure. Government expenditure on healthcare has remained range-bound at 20-30% of the current healthcare expenditure from calendar year 2010 to 2016. Over the recent few year share of government expenditure has crossed 30%. The rest of the expenditure is private in nature (expenditure from resources with no government control such as voluntary health insurance, and the direct payments for health by corporations (profit, not-for-profit and non-government organizations) and households. However, the government aims to increase public healthcare expenditure to 2.5-3% of GDP by 2025 from the current 2%, as per the National Health Policy.

Out-of-pocket (OOPS) as % of CHE (2019)



Source: Global Health Expenditure Database- World Health Organisation, CRISIL Research

In India, out-of-pocket (OOP) expenditure on health accounted for nearly 55% of total health expenditure as of 2019 (the second highest among all the other countries compared above).

Nearly 17% of the rural population and 13% of the urban population are dependent on borrowings for funding their healthcare expenditure. And nearly 80% of the rural population and 84% of the urban population use their household savings on healthcare-related expenditure as per "Health in India – 2018, NSS 75th Round. Health expenditure contributes to nearly 3.6% and 2.9% of rural and urban poverty, respectively, and annually, an estimated 60 to 80 million people fall into poverty due to healthcare-related expenditure as per "Health in India – 2018, NSS 75th Round". However, with Pradhan Mantri Jan Arogya Yojana (PMJAY), the affordability aspect of healthcare expenditure is expected to be taken care of to some degree, especially for the deprived population.

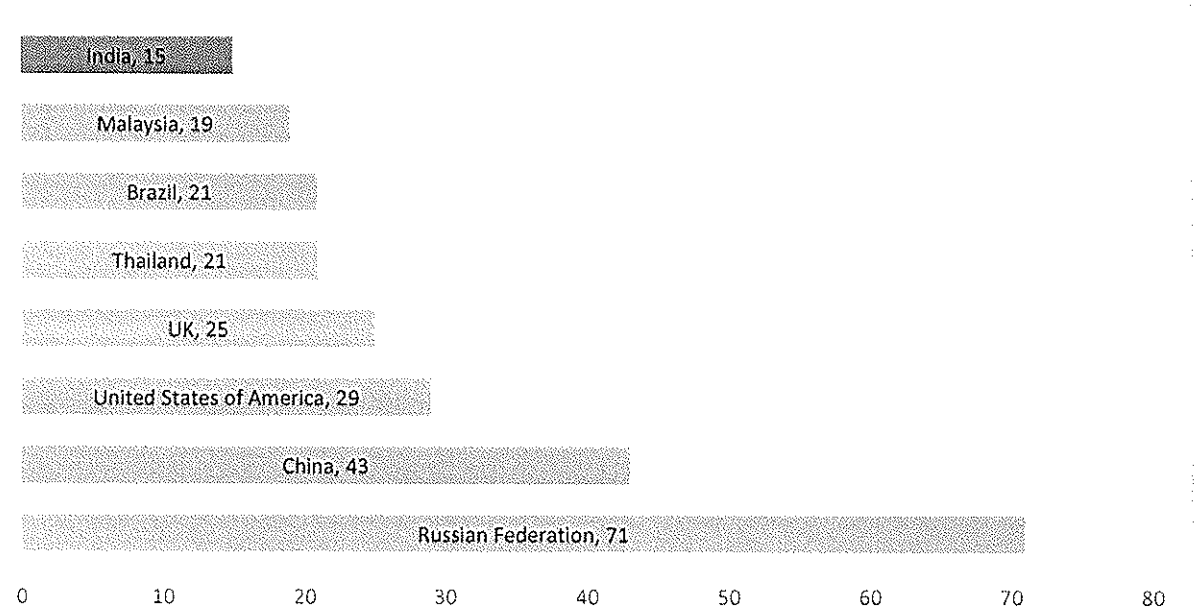
The quality of healthcare in a country can be gauged through the adequacy of healthcare infrastructure and personnel in that country. It can be assessed through bed density (bed count per 10,000 population) and the availability of physicians and nurses (per 10,000 population).

Health infrastructure of India in dire need of improvement

The adequacy of a country's healthcare infrastructure and personnel is a barometer of its quality of healthcare. The country accounts for nearly a fifth of the world's population, but has an overall bed density of merely 15 (for 2021 as estimated by CRISIL Research), with the situation being far worse in rural than urban areas. India's bed

density not only falls far behind the global median of 29 beds (CY2017 data for global median), it also lags that of other developing countries such as Brazil (21 beds for CY 2017) and Malaysia (19 beds for CY 2017). The below bed density given data has been collected from latest reported WHO database accessed on September 26, 2022. India's bed density is for 2021 and estimated by CRISIL Research.

Bed densities across countries - hospital beds (per 10,000 population)

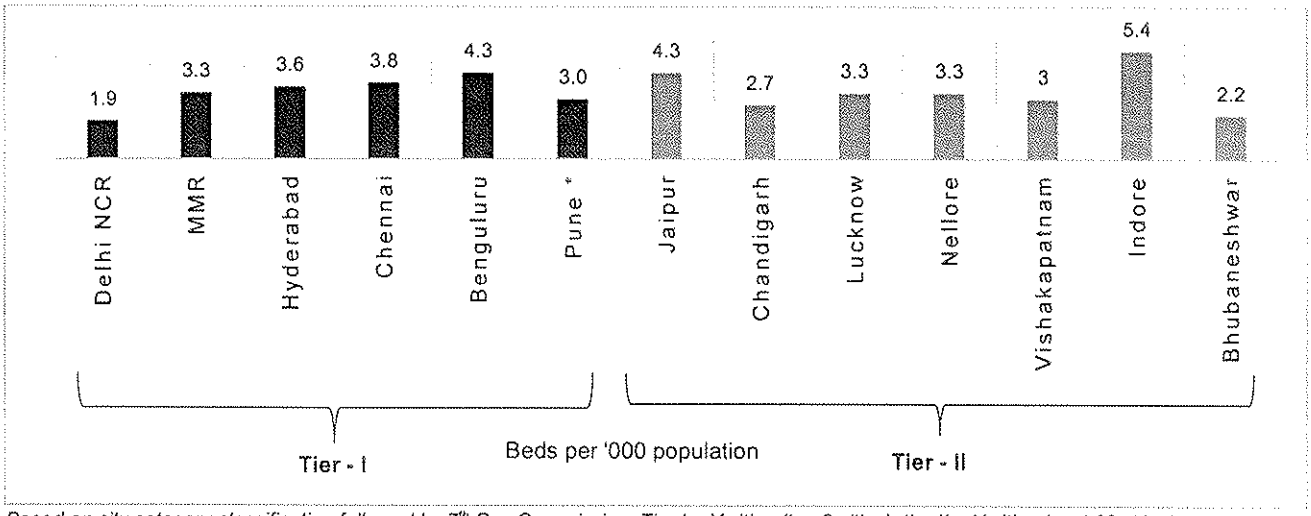


Note: India bed density is estimated by CRISIL Research for 2021. Most recent years data for other countries given above in the chart as per WHO database accessed on 26th September 2022; Brazil: 2017, China: 2017, Malaysia: 2017, Thailand: 2010, UK: 2019, United States of America: 2017, Russian Federation: 2018,

Source: World Health Organization (WHO) Database, CRISIL Research

Estimated bed density across key cities in India

Estimated bed density across key tier – I & II cities in India



Based on city category classification followed by 7th Pay Commission, Tier I – X cities (top 8 cities), tier II – Y cities (next 88 cities)

** Pune metropolitan region*

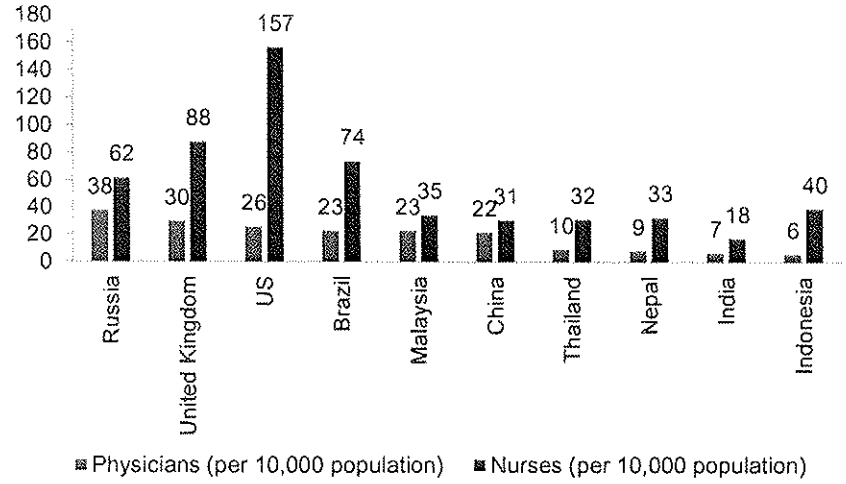
Source: CRISIL Research

The Delhi NCR, Pune Metropolitan and Mumbai Metropolitan regions are highly populous and have a bed density of 1.9, 3.0 and 3.3, respectively. An important facet to consider, while estimating the healthcare infrastructure adequacy in a selected city, is to take into account the availability of healthcare infrastructure in the neighbouring cities/states. Given that the selected cities are key cities with a well-developed hospital infrastructure, they tend to attract patients not only from other cities and towns within the state, but also from the neighbouring states. While this creates an additional burden on the healthcare infrastructure of these cities, it also clearly indicates the willingness of people from nearby tier 1 and 2 cities to travel in order to access quality healthcare facilities. In other tier 1 cities such as Hyderabad, Chennai and Bengaluru, the bed density is higher than Delhi NCR and Mumbai because of presence of big hospital chains with large bed capacities. Another indication of this trend is the expansion of large chain hospitals to tier II cities.

Tier II cities hold good potential for players to expand

Tier-II cities, such as Jaipur and Indore, indicate comparatively higher bed densities due to the presence of large number of hospitals whereas in other tier-II cities, such as Bhubaneshwar, Chandigarh, Nellore, Vishakhapatnam and Lucknow, there are lesser number of hospital beds compared to the population they cater to. However, tier-II cities like Indore, located at the centre of India, still holds a good potential to expand further in terms of healthcare facilities because of demand arising from both within the city and districts/cities of neighbouring states. On the other hand, cities such as Bhubaneshwar and Chandigarh that lack sufficient number of hospitals also have room for players in the healthcare services to strengthen their foothold and improve healthcare infrastructure of these cities

Healthcare personnel: India vs other countries



The paucity of healthcare personnel compounds the problem. At seven physicians and 18 nursing personnel per 10,000 population, India trails the global median of 16 physicians and 40 nursing personnel. Even on this parameter, India lags developing countries such as Brazil (23 physicians, 74 nurses), Malaysia (23 physicians, 35 nurses) and other South East Asian countries.

Source: WHO World Health Statistics 2022

Physicians (per 10,000 population)

World average 16

India 7

Nurses (per 10,000 population)

World average 40

India 18

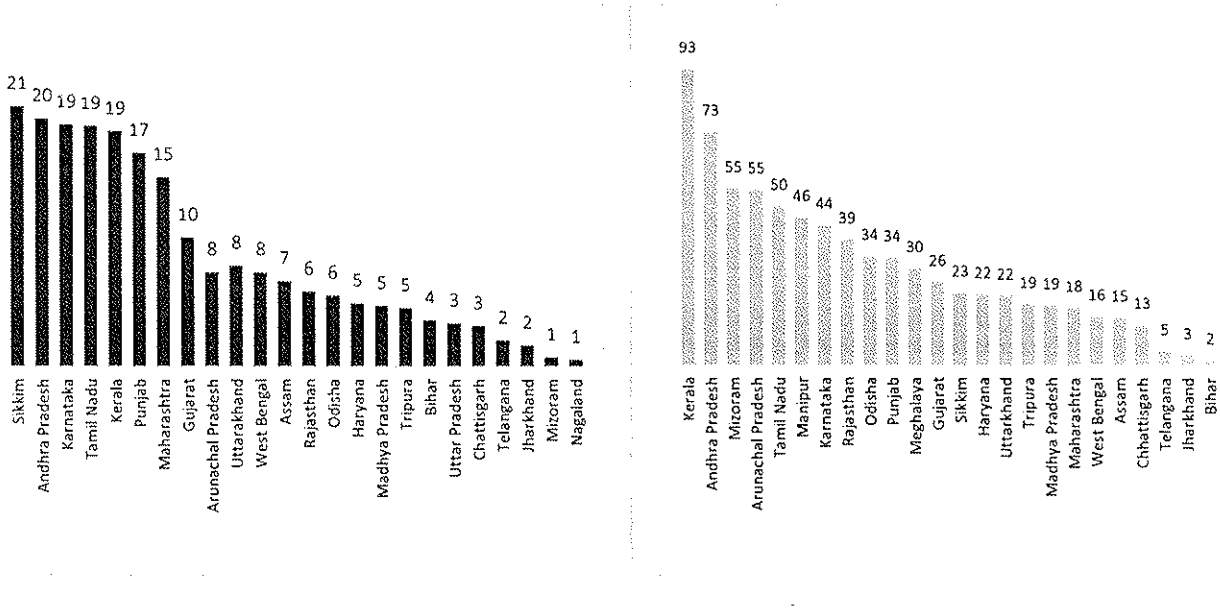
Source: WHO World Health Statistics 2022

Chhattisgarh, Uttar Pradesh and Bihar lag in terms of doctors per 10,000 population as of CY 2019

Availability of allopathic medical practitioners, dental surgeons and nurses per lakh population has improved over the years. The number of doctors with recognised medical qualifications (under I.M.C Act) registered with state medical councils/the Medical Council of India rose to 1,234,205 in CY 2019 from 827,006 in CY 2010.

State-wise count of doctors possessing recognised medical qualifications (under I.M.C Act) per 10,000 population - 2010 to 2019

State-wise count of registered nurses per 10,000 population in India as on December 31, 2020



Note:17 states under the non-special category given by the Reserve Bank of India (except Goa) have been considered for the analysis viz Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh and West Bengal

Source: National Health Profile 2021, CRISIL Research

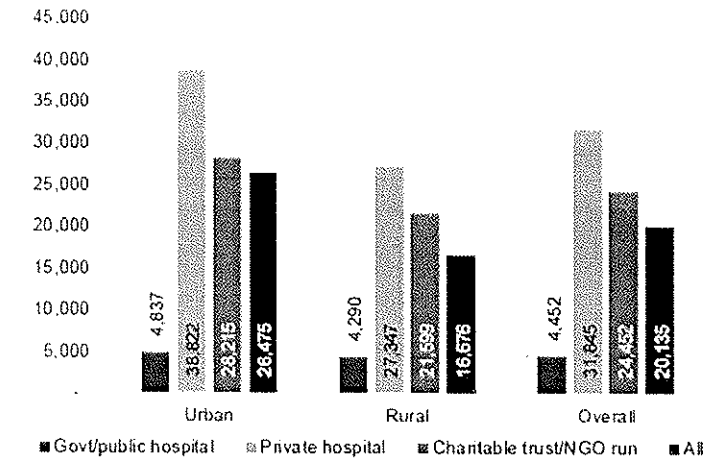
Average medical expenditure and out of pocket expenditure towards hospitalization in government facilities is the lowest

As per the NSS report for the period July 2017 – June 2018, on an average, about Rs. 16,676 in rural India and Rs. 26,475 in urban India were spent on medical expenditure for hospitalisation. However, in Government/Public hospitals, the average stood at about Rs. 4,290 in rural and Rs. 4,837 in urban areas as against and in Private hospitals which was about Rs. 27,347 in rural and Rs. 38,822 in urban areas.

On an average, about Rs. 15,937 in rural India and Rs. 22,031 in urban India were spent as out-of-pocket medical expenditure for hospitalisation. However in Government/Public hospitals, on an average, about Rs. 4,072 in rural and Rs. 4,408 in urban areas was spent as against Rs. 26,157 in rural and Rs. 32,047 in urban areas were spent in Private hospitals

As per the NSS report for the period July 2017 – June 2018, rural households primarily depended on their 'household income/savings' (80%) and on 'borrowings' (13%) for financing expenditure on hospitalisation. Dependence of the urban households on their 'income/savings' was slightly more (84%) for financing expenditure on hospitalisation, than on 'borrowings' (about 9%).

Average medical expenditure (Rs) per hospitalisation case in India



Source: NSS Report (75th round) 2017-2018, CRISIL Research

An examination of the data on average hospitalisation expenditure from the latest National Sample Survey (NSS report (75th round) on health in India, reveals a major differen between rural and urban spen The difference is stark for expenditure at private hospital charitable institutes and overa consideration compared to the expenditure at government hospitals.

However, there isn't much difference between when it co to expenditure at government hospitals.

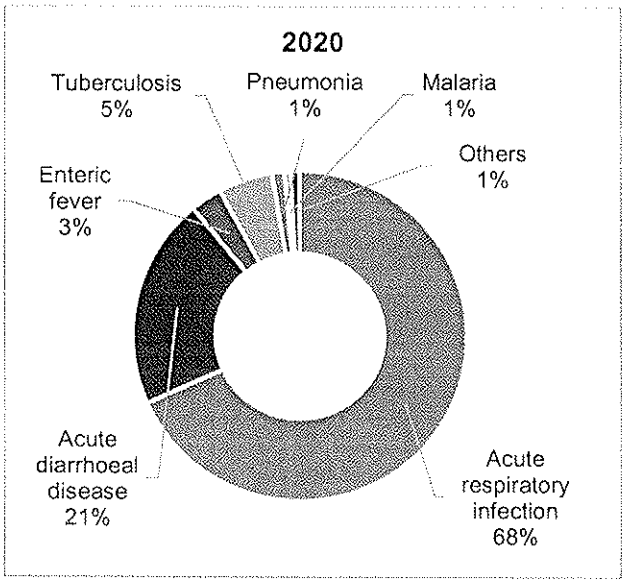
Disease profile in India

A review of communicable diseases in India

Overall, communicable diseases have been decreasing in India, especially with a considerable fall in cases and deaths due to malaria, dengue, chikangunya, chicken pox, encephalitis, and viral meningitis.

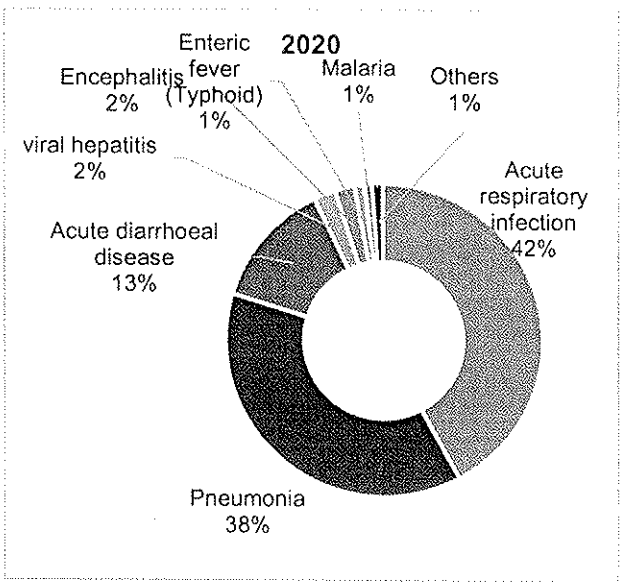
Morbidity reported on major communicable diseases

Among the various communicable diseases reported by states/union territories (UTs) in 2020, the following communicable diseases accounted for the maximum percentage of cases reported



Mortality reported on major communicable diseases

Among the various communicable diseases reported by states/UTs in 2020, the following communicable diseases accounted for the maximum percentage of deaths reported

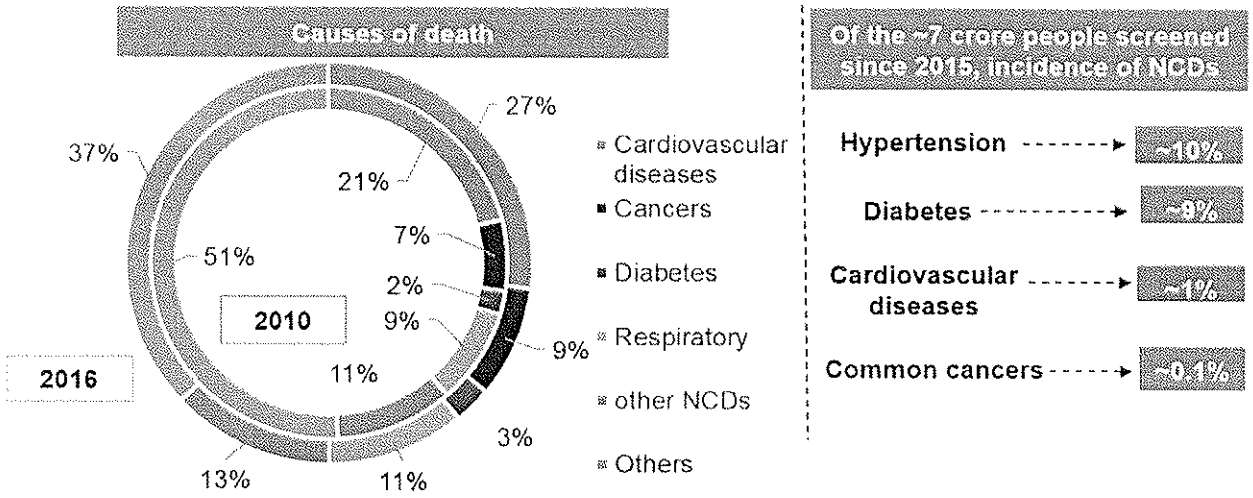


Source: National Health Profile-2021, CRISIL Research

Acute respiratory infection deaths were the highest in 2020. During the year, acute respiratory infection was one of the most prevalent diseases in India both in terms of morbidity as well as reason for deaths; it was followed by pneumonia. Taken together, pneumonia, acute respiratory infection and acute diarrheal disease accounted for 93% of deaths during 2020. Communicable diseases such as enteric fever, tuberculosis, pneumonia, malaria and others formed a smaller share of the total morbidity reported during 2020.

A review of non-communicable diseases in India

Disease epidemiology shifting towards lifestyle diseases



Source: WHO global burden of disease, National Health Profile-2019, CRISIL Research

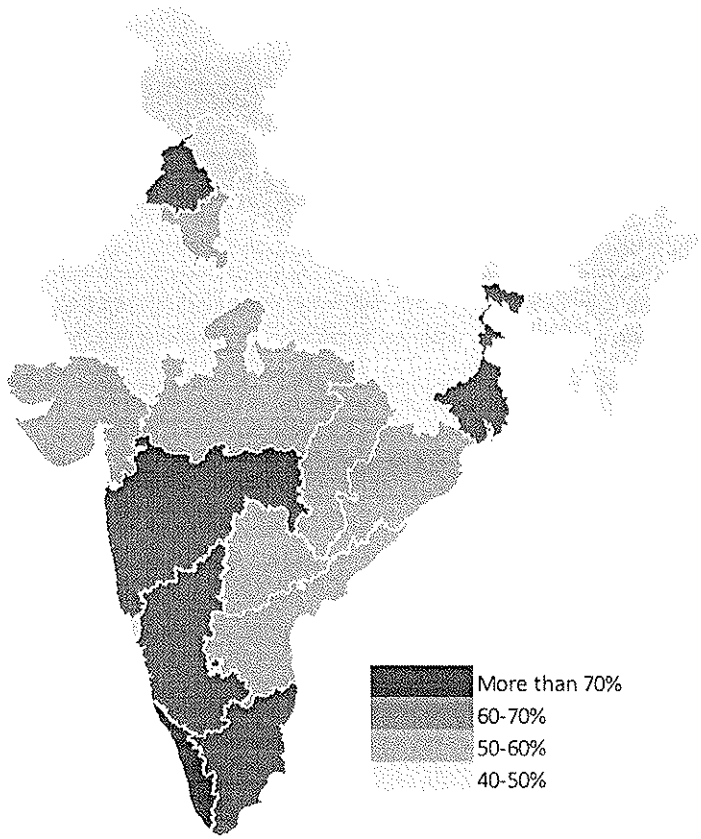
As opposed to the decreasing rate in communicable diseases, lifestyle-related illnesses or non-communicable diseases (NCDs) have been increasing rapidly in India over the past few years. The contribution of NCDs to the disease profile rose from 30% in 1990 to 55% in 2016. Statistics show these illnesses accounted for nearly 62% of all deaths in India in 2016.

Haryana moderately placed state with proportion of NCDs in the range of 50-60%

According to reports, the proportion of NCDs in India's disease burden has increased. Disability-adjusted life years (DALYs) represent the total number of years lost to illness, disability, or premature death within a given population. Of the total disease burden in India measured as DALYs, the share of communicable, maternal, neonatal, and nutritional diseases (termed infectious and associated diseases in this summary for simplicity) dropped to 33% in 2016 from 61% in 1990. There was a corresponding increase in the contribution of non-communicable diseases from 30% of the total disease burden in 1990 to 55% in 2016, and of injuries from 9% to 12%. The wide variations between the states in this epidemiological transition are reflected in the range of the contribution of major disease groups to the total disease burden in 2016: 48% to 75% for non-communicable diseases, 14% to 43% for infectious and associated diseases, and 9% to 14% for injuries.

The contribution of most of the major non-communicable disease groups to the total disease burden has increased all over India since 1990, including cardiovascular diseases, diabetes, chronic respiratory diseases, mental health and neurological disorders, cancers, musculoskeletal disorders, and chronic kidney disease. Among the leading non-communicable diseases, the largest disease burden or DALY rate increase from 1990 to 2016 was observed for diabetes at 80% and ischemic heart disease at 34%. In 2016, three of the five leading individual causes of disease burden in India were non-communicable, with ischemic heart disease and chronic obstructive pulmonary disease being the top two causes and stroke the fifth leading cause.

State-wise proportion of total disease burden from NCDs in 2016



State	NCDs *
Kerala	74.60%
Punjab	66.00%
Tamil Nadu	65.30%
Maharashtra	63.10%
West Bengal	62.70%
Karnataka	62.00%
Andhra Pradesh	59.70%
Telangana	59.20%
Haryana	58.80%
Gujarat	56.70%
Odisha	52.10%
Madhya Pradesh	50.50%
Chhattisgarh	50.40%
Rajasthan	49.30%
Jharkhand	48.30%
Uttar Pradesh	47.90%
Bihar	47.60%

** Proportion of total disease burden from NCDs in 2016.*

Indian Council of Medical Research (ICMR), Public Health Foundation of India (PHFI), and the Institute for Health Metrics and Evaluation (IHME) published report titled 'India: Health of the Nation's States – The India State-Level Disease Burden Initiative'.

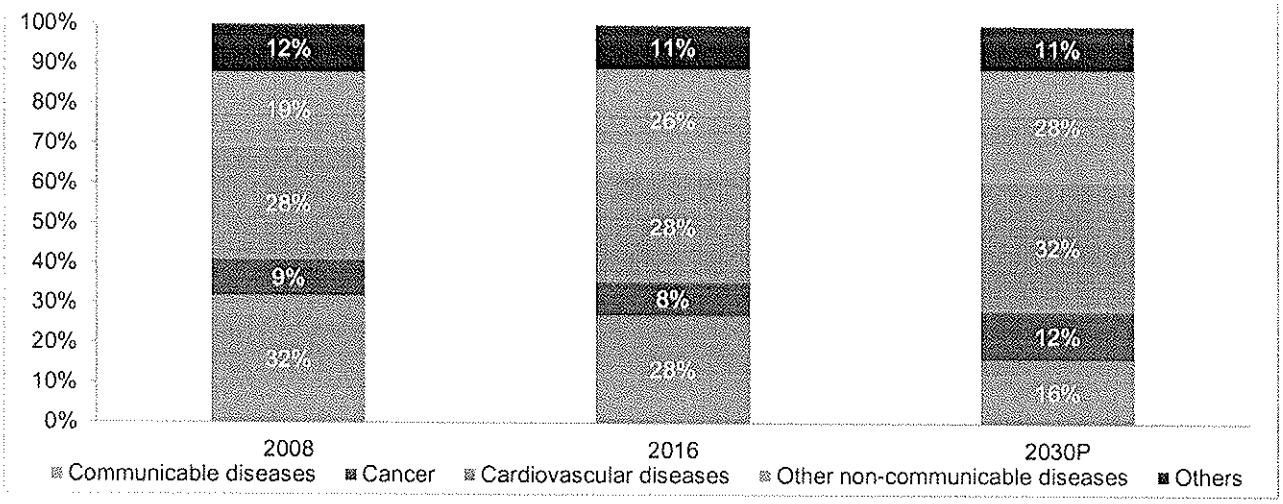
17 states under the non-special category given by the Reserve Bank of India (except Goa) have been considered for the analysis viz Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh and West Bengal

Source: ICMR, PHFI, IHME, MoHFW, CRISIL Research

Non-communicable diseases: A silent killer

CRISIL Research believes NCDs exhibit a tendency to increase in tandem with rising income levels. WHO projects an increasing trend in NCDs by 2030, following which CRISIL forecasts demand for healthcare services associated with lifestyle-related diseases such as cardiac ailments, cancer and diabetes to rise. Another emerging market in the country is orthopedics, which currently comprises a very small proportion compared with NCDs, but has a potential market in the country. The orthopedics market can be classified into four different segments, viz., knee, hip, trauma, and spine, of which the knee replacement market holds the biggest share, followed by trauma and spine. Hip replacement in India is still a very small segment compared with knee replacement in contrast to the worldwide trend.

Causes of death in India



Source: WHO global burden of disease, India: Health of the Nation's States, CRISIL Research

17 states under the non-special category given by the RBI (except Goa) have been considered for analysis - Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, and West Bengal.

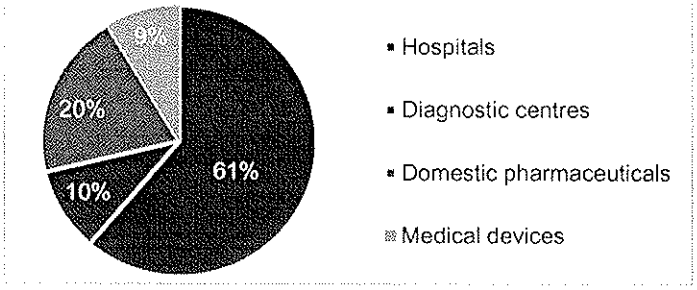
Data for National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) from January 2020 to December 2020.

** Telangana excludes data for cardiovascular disease as it was not reported by the state.*

Source: NHP 2021, CRISIL Research

Structure of the healthcare delivery industry in India

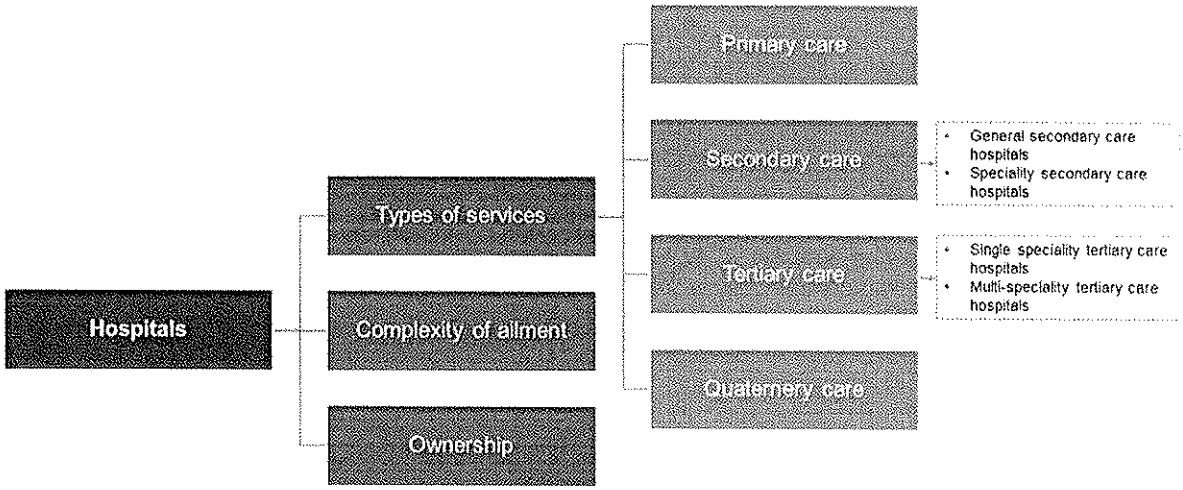
Overview



CRISIL Research estimates the healthcare delivery market, consisting of hospitals and diagnostic centres, to account for a major share of the healthcare pie (71%), followed by domestic pharmaceuticals (20%) and medical devices market (9%) as of fiscal 2020.

Source: CRISIL Research

Classification of hospitals



Classification of hospitals based on services offered

Primary care/ dispensaries/ clinics

Primary care facilities are outpatient units that offer basic, point-of-contact medical and preventive healthcare services, where patients come for routine health screenings and vaccinations. These do not have intensive care units (ICU) or operation theatres. Primary care centres also act as feeders for secondary care/ tertiary hospitals, where patients are referred to for treatment of chronic/ serious ailments.

Secondary care

Secondary care facilities diagnose and treat ailments that cannot be treated in primary care facilities. These act as the second point of contact in the healthcare system. There are two types of secondary care hospitals - general and specialty care.

- General secondary care hospitals

These hospitals are approached for common ailments, and attract patients staying within a radius of 30 km. The essential medical specialties in general secondary care hospitals include: internal medicine, general surgery, obstetrics and gynaecology, paediatrics, ear-nose-throat (ENT), orthopaedics, and ophthalmology. Such a hospital typically has one central laboratory, a radiology laboratory, and an emergency care department. Generally, secondary care hospitals have 50-100 in-patient beds, a tenth of which are allocated for the ICU segment. The remaining beds are equally distributed between the general ward, semi-private rooms, and single rooms.

- Specialty secondary care hospitals

  These hospitals are located in district centres, treating patients living within a radius of 100-150 km. They usually have an in-patient bed strength of 100-200, 15% of which are reserved for critical care units. The balance is for private rather than general ward beds. Apart from medical facilities offered by a general secondary care hospital, specialty secondary care hospitals treat ailments related to gastroenterology, cardiology, neurology, dermatology, urology, dentistry, and oncology. These hospitals may also offer some surgical specialties, but they are optional. Diagnostic facilities in a specialty secondary care hospital include: a radiology department; biochemistry, haematology and microbiology laboratories; and a blood bank. They also have a separate physiotherapy department.

Tertiary care

Tertiary care hospitals provide advanced healthcare services, usually on referral from primary or secondary medical care providers.

- Single-specialty tertiary care hospitals

  These treat a particular ailment (such as cardiac, cancer, etc). Prominent facilities in India include: Escorts Heart Institute & Research Centre (New Delhi); Tata Memorial Cancer Hospital (Mumbai); HCGEL Oncology (Bengaluru); Sankara Nethralaya (Chennai); National Institute of Mental Health & Neuro Sciences (NIMHANS, Bengaluru); and Hospital for Orthopaedics, Sports Medicine, Arthritis and Trauma (HOSMAT, Bengaluru).

- Multi-specialty tertiary care hospitals

  These hospitals offer all medical specialities under one roof and treat complex cases such as multi-organ failure, high-risk, and trauma cases. Most of these hospitals derive a majority of their revenue through referrals.

  Such hospitals are located in state capitals or metropolitan cities and attract patients staying within a 500 km radius. They have a minimum of 300 in-patient beds, which can go up to 1,500 beds. About one-fourth of the total beds are reserved for patients in need of critical care. Medical specialties offered include: cardio-thoracic surgery, neurosurgery, nephrology, surgical oncology, neonatology, endocrinology, plastic and cosmetic surgery, and nuclear medicine. In addition, these hospitals have histopathology and immunology laboratories as a part of its diagnostic facilities. Lilavati Hospital and Hiranandani Hospital in Mumbai, Medanta hospitals in NCR region and NIMS in Hyderabad are multi-specialty tertiary care hospitals.

Quaternary care hospitals

Quaternary care hospitals are an extension of tertiary care in reference to advanced levels of medicine which are highly specialised and not widely accessed, and usually only offered in a very limited number of hospitals. Experimental medicine and some types of uncommon diagnostic or surgical procedures are considered quaternary care

Classification of hospitals by facilities/ services offered

	Primary care	Secondary care	Tertiary care
Services	Provides all services as required for the first point of contact	Provides all services as required, including organised medical research	Provides all services as required, including provision for experimental therapeutic modalities and organised research in chosen specialities
Multi-disciplinary	Yes	Yes	Single- or multi-speciality
Type of service	Only medical services and excludes surgical services	Overall medical and surgical services	Complex surgical services with sophisticated equipment
Type of patient	Only outpatient	Inpatient and outpatient	Primarily inpatient
No of beds	0 beds	50-200 beds	>200 beds
Dependent on	Secondary and tertiary care hospitals for further diagnosis and support	Tertiary care hospital for diagnostic and therapeutic support on referral and for patient transfer	Tertiary care/secondary hospital for referrals for its workload
Investment	Low investment required	Medium	High

Classification based on complexity of ailment

Healthcare delivery may also be classified as primary, secondary and tertiary, on the basis of the complexity of ailment being treated. For instance, a hospital treating heart diseases may be classified as a primary facility if it addresses conditions such as high cholesterol; as a secondary facility if it treats patients suffering strokes; or as a tertiary facility if its deals with cardiac arrest or heart transplants.

Indicative split of ailments & medical treatments provided basis various categories of hospitals & complexities of ailment

Ailment/ condition	Primary	Secondary	Tertiary
Acute infections	Fever	Typhoid/ jaundice	Hepatitis B,C
Accidents/ injuries	Dressing	Fracture	Knee/ joint replacements / brain haemorrhage
Heart diseases	High cholesterol	Strokes	Cardiac arrest/ heart attacks/ heart transplantation/ heart defects like hole in heart, CABG* surgery for heart ailments
Maternity	Diagnosis/ check-ups	Normal delivery/ caesarean	Normal delivery/ caesarean/ post-delivery complications such as brain fever
Cancer	Lump diagnosis/ check-ups	Tumour – medical and radiation therapy	Medical, surgical-robotic surgery to remove minimal access tumour and radiation therapy

**CABG: Coronary artery bypass graft*

Source: CRISIL Research

Classification based on ownership

Hospitals can also be classified based on their ownership and management:

Type	Examples
Government	• Brihanmumbai Municipal Corporation hospitals, KEM Hospital, Cooper Hospital (Mumbai)
Private	• Asian Heart Institute, Apollo Hospitals,Medanta, Fortis, Max Healthcare
Trust	• Lilavati (Mumbai), Hinduja (Mumbai)
Trust owned, but managed by a private party	• Two operational models are followed by trusts and private parties: • **Medical service agreement** - Max Super Speciality Hospital, Patparganj • **Operation and management contract** - Balabhai Nanavati Hospital in Mumbai; Apollo Hospital in Ahmedabad is owned by a trust but managed by the Apollo Group
Owned by one private player, managed by another	• East Coast Hospital in Puducherry was earlier managed by Fortis Healthcare

Support services

Diagnostic centres and pharmacies are major allied sectors that complement hospitals. Other support services include management services for hospitals such as food and beverages (F&B), housekeeping, and waste management, which are outsourced. In addition to this, foreign healthcare providers outsource medical transcription and claim processing to Indian companies; this sector has boomed over the past few years.

- **Diagnostic centres**

  Diagnostic centres (consisting of independent laboratories, hospital-based centres, and diagnostic chain companies) form an integral part of the healthcare industry. They offer services ranging from routine examinations to complicated hormonal assays and immunological investigations, in case of pathology, and from basic X-rays to MRIs, in case of radiology.

  The diagnostics industry can be broadly divided into pathology and radiology:

  - **Pathology** involves tests from simple blood analysis to sophisticated techniques such as deoxyribonucleic acid (DNA) tests that aid the diagnosis/ prognosis of ailments and other medical conditions.
  - **Radiology** involves using minimally invasive techniques to generate film or video images of the internal anatomy for quick and accurate diagnosis of diseases and injuries.

- **Pharmacy store chains**

  As is the case with almost all verticals within the healthcare delivery industry, pharmacies are highly fragmented and dominated by standalone units. In recent years, however, corporate presence in this segment has increased. Corporate hospital players have in-house pharmacies (within the premises) and some have also ventured into standalone pharmacies.

  Hospital-based pharmacies have direct access to patients and require relatively low investments. In addition, there is a healthy demand for high-margin surgical items at these pharmacies, which boosts their profitability compared with standalone pharmacies.

- **Outsourced non-core activities**

  Hospitals are increasingly outsourcing several non-core activities such as housekeeping, laundry, F&B and security to third parties. There is a clear opportunity for third party providers who add value through economies of scale, specialised skills, and better manpower capabilities. This enables hospitals to reduce costs and improve efficiency.

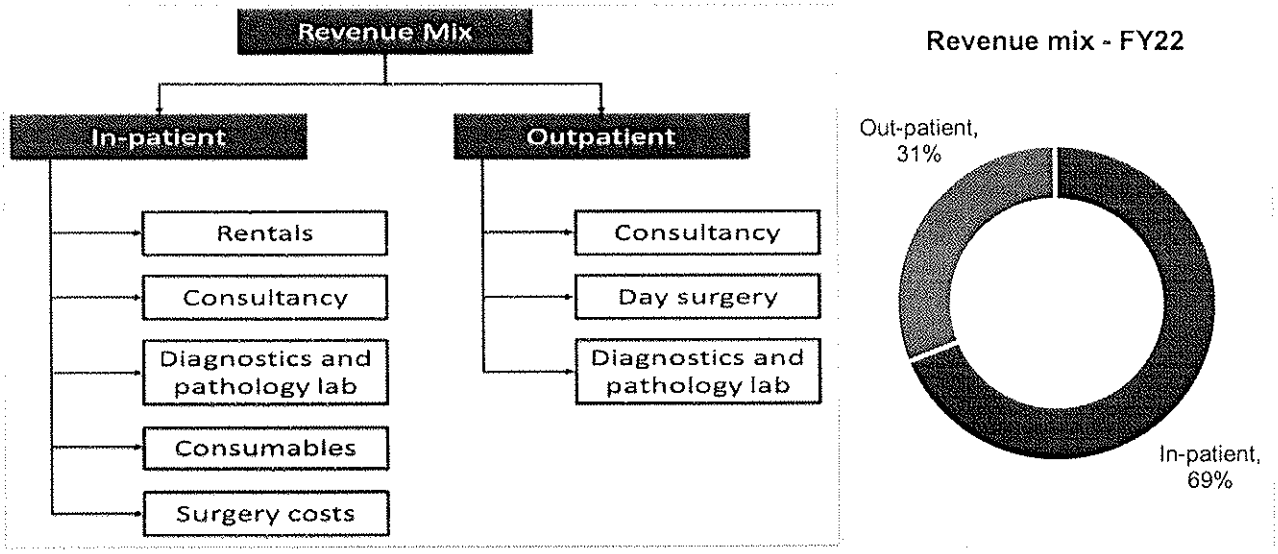
- **Third party administrators**

  A third party administrator (TPA) functions as an intermediary between the insurer and the insured to facilitate claim settlements. TPAs are paid a fixed percentage of the insurance premium as commission for their service. This business has developed on account of a growing need for cost-effective healthcare financing options. Health insurance penetration in the country is merely 37% as of March 31, 2018, according to the Insurance Regulatory and Development Authority annual report 2017-18.

Revenue and cost structure review of hospitals

Hospitals derive bulk of their revenue from in-patient department (IPD)

The primary revenue streams of hospitals are the IPD and out-patient department (OPD) segments. Typically in most hospitals, the OPD contributes to three-fourths of total volumes; whereas, the IPD accounts for as much as approximately 69% of the overall revenue. This ratio could vary with hospitals, depending on the type of services rendered and the ailment mix.



Notes: 1) The IPD in a hospital generally consists of beds, operation theatre(s), intensive care unit, supportive services (such as nursing services, pharmaceutical services, laboratory and diagnostics centres) and central sterile and supply department (CSSD)

2) In the OPD, examination, diagnostics and day surgeries are included

Source: CRISIL Research

Surgeries and diagnostics fetch bulk of the IPD revenue

Surgeries and diagnostics account for the bulk of IPD revenue for most hospitals; however, the share of these verticals vary across hospitals, based on the pricing strategies deployed and specialities offered. However, surgical patients generate more revenue as opposed to medical patients. Hospitals used to enjoy high margins on the consumables used. However, after the government has capped the prices of stents and knee implants, they have rationalised their treatment costs by charging for the services rendered. Some hospitals have in-house facilities such as diagnostic centres and pharmacies, while others outsource these services.

Other monitorables that may boost revenue include:

Occupancy levels: Given the high fixed costs (equipment, beds and other infrastructure), occupancy levels need to be commensurate for a hospital to break-even. Most large hospitals operate at over 65-70% occupancy ratio (OR). The following factors aid in ensuring high occupancy levels:

- Good brand recognition
- Reputed doctors
- A strong referral network

Average length of stay (ALOS): Large hospitals usually operate at high occupancy levels but try to keep the ALOS short, which enables them to record higher utilisation levels and ensure that more patients are treated at the same time.

Ailment-wise length of stay

Ailment	ALOS	Remarks
Cardiac	5 days	In complex, surgical cases, ALOS is 7-8 days Anglography – day care; and angioplasty – 2 days
Orthopaedics	3-4 days	Joint replacement surgeries would have relatively higher ALOS
Oncology	5-6 days	Hospitalisation is for surgical cases only. For chemotherapy, there are day-care beds and for radiotherapy, no stay is required
Neurosurgery	8-10 days	Would vary on case-to-case basis depending on the complexity of the case
Ophthalmology	1 day	Day care

Source: CRISIL Research

Medical patients versus surgical patients: Having a higher number of surgical patients versus medical patients helps hospitals boost revenue. This is because average revenue per surgical patient is higher, given the extensive use of operation theatre and diagnostic facilities.

According to our industry interactions, the OPD contributes almost one-third of in-patient volumes in most hospitals. This is especially evident during the initial years of operations of a hospital. The OPD, typically, also acts as a feeder for a hospital's in-house diagnostic/ pathology centres.

Ailment-wise realisation

Ailment	Average realisation per patient (Rs)
Cardiac	2,00,000 – 3,00,000
Orthopaedics	1,00,000 – 2,00,00
Ophthalmology	15,000 – 20,000
Oncology	70,000 – 1,00,000
Neurosurgery	1,00,000 – 1,50,000

Source: CRISIL Research

Emerging technologies in healthcare delivery

The healthcare industry, like other industries, is constantly evolving in terms of technology. Developments in information technology have helped create systems that ensure faster and reliable services. While, on the one hand, these systems help increase reach and quality of healthcare delivery systems across the country, on the other, they enable healthcare delivery providers to improve efficiency by helping them in resource planning, maintaining patient records, etc. CRISIL Research expects the advent of 5G, smartphone penetration, and increasing health-conscious population to deepen digital healthcare penetration.

Electronic health records (HER)

EHRs are designed to manage detailed medical profile and history of patients such as medication and allergies, immunisation status, laboratory test results, and radiology images. Information stored in EHRs can be in a combination of various formats including picture, voice, images, graphs, and videos. Besides storing information, EHRs have the capability of analysing data with respect to a specific ailment, generating customised reports, setting alarms and remainders, providing diagnostic decision support, etc.

EHRs can be shared between multiple systems allowing doctors from various specialties and hospitals to share the same set of patient data. This feature helps improve coordination between doctors, saves time, and prevents redundancy of recreating medical records. EHRs allow medical histories to be transferred quickly and accurately, thereby ensuring effective and timely treatment. They can be secured with various privacy settings.

Artificial Intelligence (AI) and blockchain

Healthcare establishments like hospitals are looking at opportunities to deploy AI or/and blockchain in improving their operating efficiency – scheduling appointments depending on the gravity of the issue, healthcare monitoring, etc, thereby minimising human error through technological intervention. For instance, NITI Aayog has extended its support to an AI-based project - Radiomics, which is also supported by Tata Memorial Centre Imaging Biobank.

Apollo has partnered with Microsoft to create a cardiovascular disease risk score application programme interface (API) for assigning risk scores to cardiac patients in India. Max Healthcare is also in the process of piloting AI and machine learning (ML) algorithms for prediction of readmission of myocardial infractions, along with being involved in a project concerning speech to text technology for accurately capturing clinical and radiology information in the systems.

The partnership is beneficial not just for the hospitals, but also for the tech companies that test these technologies on hospital patient data, like Google trying to use AI for detecting diabetic retinopathy at Aravind Eye Care hospitals.

Radiology information system (RIS)

RIS is a tool that allows managing digital copies of medical imagery such as X-ray, MRI, ultrasound, and associated data on a network. RIS is used by doctors to access medical imagery data from multiple locations. It is connected to medical equipment such as X-ray, MRI and ultrasound machines, which generate diagnosis results in the form of images and graphs.

The RIS directly captures results and feeds them to EHRs, central databases or remote databases. RIS systems are integrated with a dedicated picture archiving and communication modules which ensures that the pictures are stored in a systematic manner and transferred accurately to the intended database or recipient.

Implementation of RIS allows hospitals eliminate the need of generating and maintaining medical imagery on expensive films. RIS enable hospitals to store complete radiology history of patients together. This feature allows generating detailed analytical reports on patient's medical history.

Clinical decision support system (CDSS)

CDSS is a software designed to assist doctors in taking decisions pertaining to the diagnosis and treatment of patients. A CDSS is supported by a large database that has detailed information on ailments with data aspects ranging from symptoms to diagnosis. The database is supported by a set of rules that help generate accurate results for the query made by the user. It also contains patient specific information such as medical history, allergies, etc, which helps doctors to make effective decisions on the treatment. CDSS databases are open-ended to allow addition of information on newly discovered diseases, procedure and medications, rectification of erroneous procedures, and updating of patient information.

Mobile-based application

Healthcare delivery is also seeing an influx of mobile-based applications (mobile apps) to assist doctors as well as patients. These apps provide features such as self-diagnosis, drug references, hospital/doctor search, appointment assistance, electronic prescriptions, etc. While certain apps allow doctors to obtain information on drugs, dosage, contradictions, disease/ condition references and procedures; others allow patients to locate doctors, fix appointments, and opt for video consultations. Furthermore, there are apps that help patients save their medical records and keep them updated regularly.

Even the government is looking at adopting these measures with the launch of UMANG (Unified Mobile Application), which offers 242 services across 57 departments in 12 states. It has a feature to book hospital appointments, check blood availability, and view medical reports online on registration.

Telemedicine

Telemedicine is a technology designed to improve accessibility of healthcare services from remote locations. Telemedicine, through its extensive use of information technology, creates a connection between doctors at the main hospital and patients at remote locations or telemedicine centres. The doctor analyses the patient through telephonic conversation or video conferencing and is assisted by a junior doctor or health worker who is physically present at the telemedicine center. The junior doctor physically examines the patient and conveys the information, based on which the doctor confirms the diagnosis and prescribes medication. If the ailment is complex, the patient is advised to get admitted at the main hospitals and avail the intensive care facility. This model is useful when there is a dearth of healthcare professionals in the country.

Robotic surgery

Robotic surgery or robot-assisted surgery (RAS) is a surgery conducted by using a robotic arm that is controlled electronically by a control pad. The pad may be located at a local or remote place and is equipped with high-definition cameras allowing surgeons to take a closer look at the areas being operated. Since RAS can be performed from remote locations, it allows patients to avail the treatment from the desired specialist surgeons across the globe without having to travel. RAS has been used to conduct general surgery, bypass surgery, colorectal surgery, gastrointestinal surgery, neurosurgery, orthopedic surgery, etc.

Wearables and sensors

With awareness on healthcare increasing, people have started adopting wearables and sensors that keep a track of the vitals of the user. Wearables and sensors also have data about the user's historical health records and sends out alerts in case of any irregularities. Some sensors are used solely from a curative healthcare perspective, to lead a healthy life with a proper fitness routine.

Regulations pertaining to price controls

The National Pharmaceutical Pricing Authority (NPPA) regulates prices of drugs/ medicines by bringing them under the ambit of the National List of Essential Medicines (NLEM). The medical devices sector is largely unregulated, except for those who have been notified as drugs under the Drugs and Cosmetics Act. In February 2017, the NPPA introduced price controls for cardiac stents – price of bare metal stents (BMS) was slashed to Rs 8,000 and that of drug-eluting stents (DES) was reduced by approximately 85% to Rs 29,600. In February 2019, however, the NPPA revised their prices upwards in line with the WPI numbers of 4.2% (with effect from April 1, 2019). The revised price of BMS stands at Rs 8,261 and that of drug eluting stents (DES) stands at Rs 30,800 at present.

The prices of knee and hip implants were also capped (up to 69%) in August 2017. Cobalt chromium knee implant, which was priced at Rs 158,324 was capped at Rs 54,720 (excluding GST). Implants with special metals, such as titanium and oxidised zirconium, earlier priced at Rs 249,251 was capped at Rs 76,600 (excluding GST).

The NPPA's initial intention was to bring eight new medical device segments – all implantable devices, CT scanning equipment, X-ray equipment, MRI equipment, dialysis machine, bone marrow cell separators, defibrillators, and PET equipment – under the Drugs and Cosmetics Act. This would have subjected them to registration and import licensing under the Medical Device Rules 2017. This was to be done with effect from April 1, 2020. However, all medical devices are expected to be brought under the scope of regulation subsequently. NPPA may also consider capping the trade margins instead of capping the prices of medical devices.

The Bureau of Indian Standards (BIS) is in the process of finalising quality control orders (QCO) for medical devices, which will require all medical devices to be registered with the Central Drugs Standard Control Organisation (CDSO) in the first phase (of 12-18 months). After this period, they will have to conform to the quality standards of the Bureau.

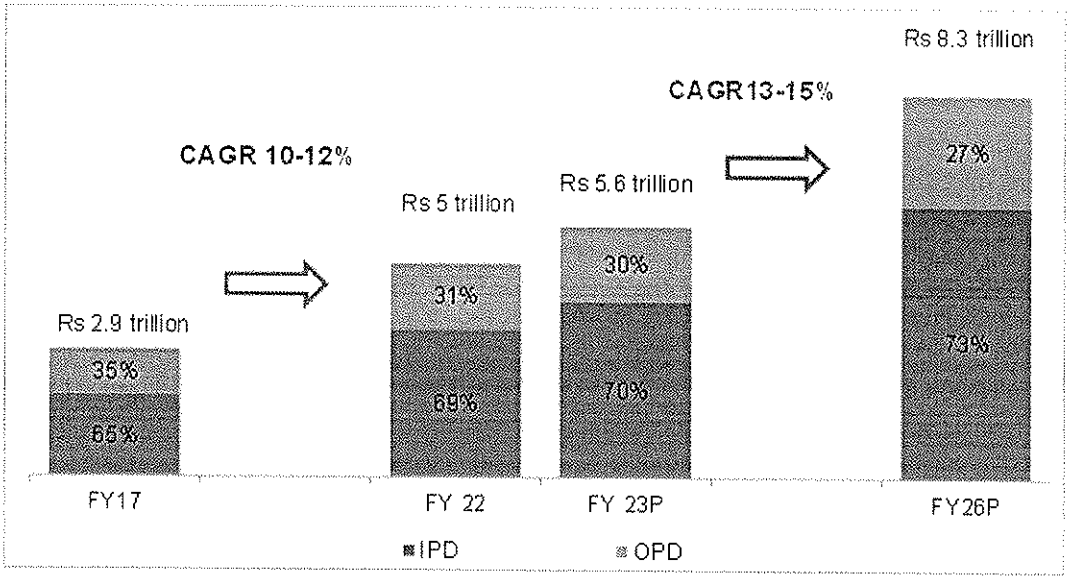
Further, some state governments (such as Karnataka, West Bengal and Delhi) have been contemplating capping costs of medical procedures too in addition to medical devices.

Assessment of India's hospital market

Indian healthcare delivery market poised for robust growth in the medium term

Barring the momentary setbacks in fiscal 2021, CRISIL Research estimates the Indian healthcare delivery industry to post a healthy 13-15% CAGR between fiscals 2022 and 2026, driven by long term structural factors, strong fundamentals, increasing affordability and potential of the Ayushman Bharat scheme, the national health insurance scheme launched in 2018 to provide access to healthcare for low income earners in India.

Overall healthcare delivery market in India



Note: IPD stands for in-patient department and OPD stands for out-patient department. According to CRISIL Research out-patients are those who are not required to stay at the hospital overnight. It includes consultancy, day surgeries at eye care centres, and diagnostics, and excludes pharmaceuticals purchased from standalone outlets.

Source: CRISIL Research

Healthcare delivery industry estimated to grow to ~Rs 5.6 trillion in fiscal 2023

CRISIL Research estimates the Indian healthcare delivery market to reach ~ Rs 5.5 - 5.7 trillion in value terms by end of fiscal 2023, with growth being contributed by stabilisation of regular treatments, surgeries and OPD amid minimization of disruption due to the pandemic and expansion of ARPOB for the sector. A potential upside is also expected from picking up of high realisation medical tourism as international travel restrictions are relaxed. Within the overall healthcare delivery market, the in-patient department (IPD) is expected to account for nearly 70% (in value terms), while the balance is to be catered by the out-patient department (OPD). Though in terms of volumes, OPD volumes outweigh IPD volumes, with the latter contributing the bulk of the revenues to healthcare facilities.

As opposed to fiscal 2021, when government investments in the sector to combat the Covid pandemic via temporary establishments had gained prominence, and private hospitals saw revenue erosion owing to travel restrictions, the private sector complemented the role of the government in fiscal 2022 in the second wave, which was an upside especially for hospitals where occupancies were typically on the lower side. Growth was driven in fiscal 2022 by low base and the pent up demand from deferred treatments due to Covid waves.

The healthcare delivery market is expected to reach a market size of ~Rs 6.4 - 6.6 trillion in fiscal 2024 on back of the fundamental strengths of the sector and inherent structural strengths of the sector in the country.

Healthcare delivery industry to grow 13-15% over next four years

With long term structural factors supporting growth, renewed impetus from PMJAY and government focus shifting onto healthcare sector, the healthcare delivery market is expected to grow at 13-15% compounded annual growth rate (CAGR) and reach Rs 8.3 trillion in fiscal 2026.

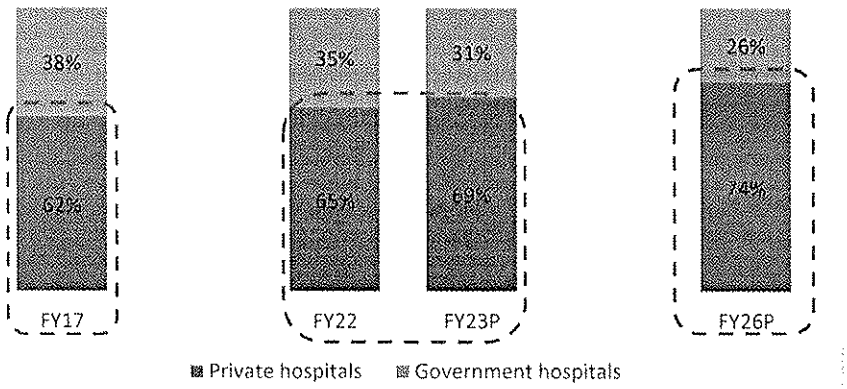
From fiscal 2017 to fiscal 2020, major hospital chains have added supply (~70% of their incremental supply during the period) in tier II and III locations, to create a referral network into their main centre by tapping into the underserved creamy tier II areas. The government is also expected to augment this via the Ayushman Bharat scheme which aims to create 1,50,000 Health and Wellness centers (HWCs) (~1,18,669 HWC's created till May 2022) for strengthening primary and secondary infrastructure in India.

The other contributors to the demand are more structural in nature, like, increase in lifestyle-related ailments, increasing medical tourism, rising incomes and changing demography.

In India, healthcare services are provided by the government and private players, and these entities provide both IPD and OPD services. However, the provision of healthcare services in India is skewed towards the private players (both for IPD and OPD). This is mainly due to the lack of healthcare spending by the government and high burden on the existing state health infrastructure. The share of treatments (in value terms) by the private players is expected to increase from 62% in fiscal 2017 to nearly 74% in fiscal 2026, the share only witnessing a slight dip in fiscal 2021.

The skew is more towards the private players owing to the expansion plans of private players being centered on it, further buttressed by increasing reliance on private facilities till government infrastructure is properly put in place.

Share of treatments in value terms (government hospitals versus private hospitals/clinics)



Source: CRISIL Research

Stabilization of regular treatments and ARPOB expansion will lead to robust growth in fiscal 2023

The second wave which started from late Q4 fiscal 21, saw Covid cases increase rapidly and put an enormous strain on the health infra of the country. The first to feel the impact of inadequate infrastructure was the healthcare delivery market, as hospitals which were witnessing sequential recovery had to divert their beds towards Covid care and unlike the first wave the private hospitals were roped in early onto the second wave to tackle the healthcare emergency. This time around the requirement was more for severe/ critical beds - with oxygen supply, ICU beds and ventilators. But as compared to the situation in the first wave where non-covid regular treatments were hit hard due to the lockdown in the first wave, the second wave saw relatively lesser disruptions with non-covid treatments seeing a recovery from second half of Q1 fiscal 22 as covid cases abated. Similar trend was also witnessed during the third wave(omicron wave) where there was a minor dip in occupancies for larger hospital chains and some hospitals deferred elective surgeries for a week during the peak of the third wave. However overall impact of the omicron wave was muted on the sector and disruptions were minimal.

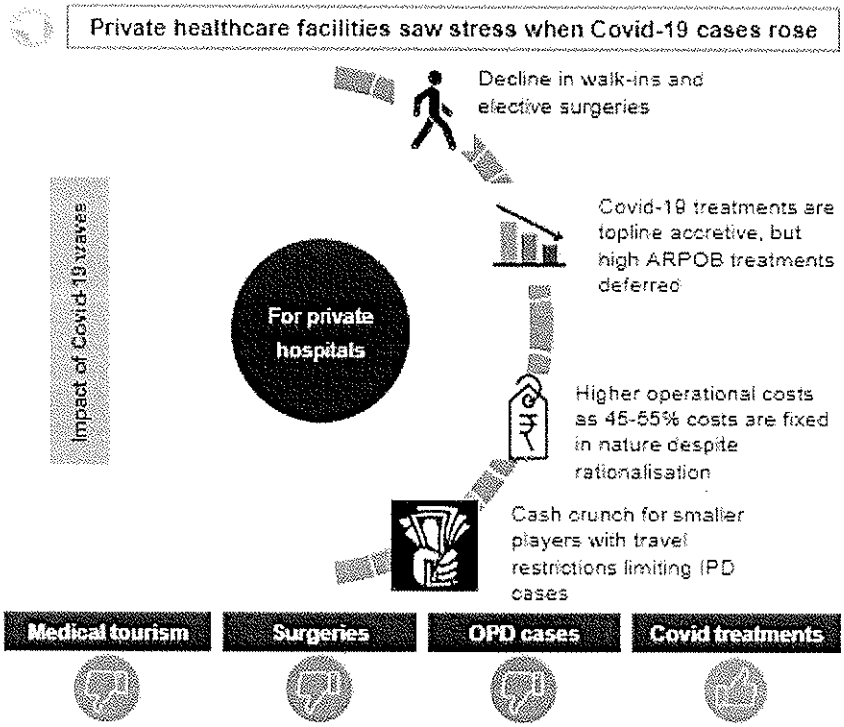
CRISIL Research estimates the recovery in fiscal 2022 to have been strong on the back of pent up demand for regular treatments, elective surgeries and OPDs coming onto the system, with covid treatment revenues also being topline accretive in the first quarter. As the second wave abated, increased demand was witnessed from regular demand channels from Q2 fiscal 2022 onwards, indicating pent up demand. On the margin front, though some of the cost rationalisations of the previous year were carried forward, increase in occupancy levels improved operating leverage and provided a boost to the margins.

Robust growth is expected in fiscal 2023 as underlying fundamental growth factors remain strong. Regular demand drivers such as OPD, elective surgeries & regular treatments are expected to stabilise, ARPOB is expected to increase and demand drivers such as high realisation medical tourism business picks up as international travel restrictions are relaxed in the fiscal. Margins are expected to improve by ~100 bps as compared to the previous fiscal.

CRISIL has not assumed a major/severe covid wave in India going further in our base case scenario. However, Covid curve trajectory in India remains monitorable, as newer virus variants/mutations emerge.

CRISIL Research estimates the healthcare delivery industry size at ~Rs 5 trillion in fiscal 2022 and at ~Rs 5.5 - 5.75 trillion in fiscal 2023. This includes both inpatient treatments forming almost 70% in value share and outpatient consultations contributing the rest 30%. In fiscal 2023, while government's share is estimated at 30-32% , private sector is expected to contribute the lion's share at 68-70%. Within private sector, large hospitals form only 10-15% of the industry with rest of the market dominated by small and medium hospitals, clearly indicating the fragmented nature of the industry.

Impact of Covid-19 on healthcare delivery market



The healthcare delivery market saw reduced footfalls during the pandemic-induced lockdown.

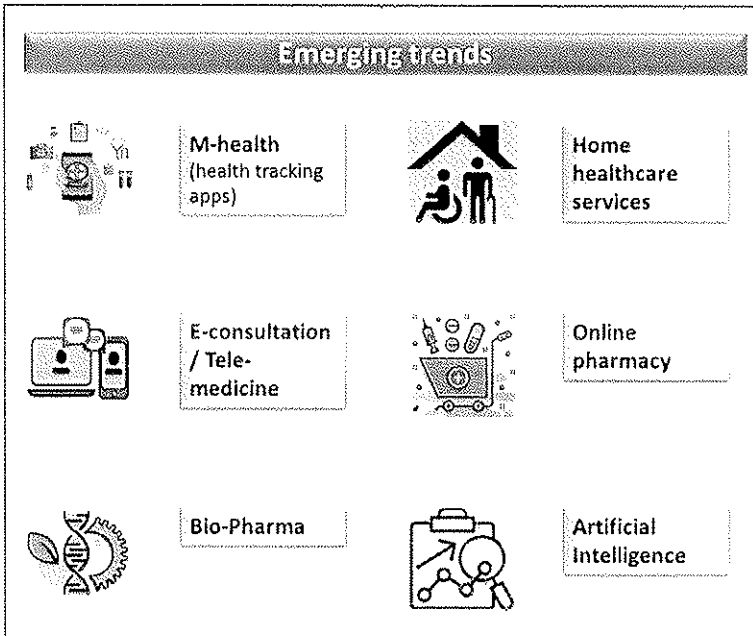
Surgeries were deferred, too. This impacted cash flow of players.

However, the market is driven by strong fundamentals, conducive government policies, improving affordability and geographical diversification of hospital players.

The pace of the sector's growth in the medium term remains robust.

Source: CRISIL Research

Consumers prefer convenient, affordable and personalised treatments



The need for social distancing and contactless services in the post-Covid world has changed consumer preferences.

Already this has resulted in the growth of mobile health (M-health) with increased use of health-tracking apps apart from the growth in e-consultation and tele-medicine. Besides, home and healthcare services such as those provided by Bengaluru-based start-up Portea, online pharmacies are also gaining traction, along with growing acceptance of bio-pharmaceuticals.

Key growth drivers of healthcare delivery industry

A combination of economic and demographic factors is expected to drive healthcare demand in India. CRISIL Research believes the PMJAY scheme launched by the government would also support these drivers.

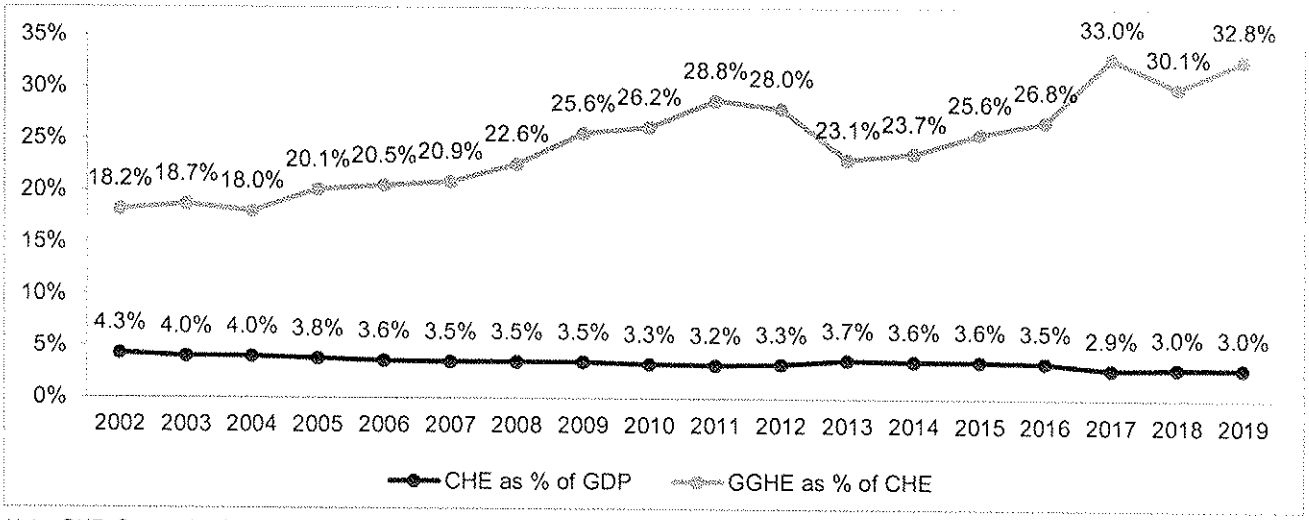
India lags behind global benchmarks in healthcare infrastructure, both in terms of physical as well as personnel infrastructure. However, the picture is not good even on the healthcare indicators front. In case of life expectancy at birth, which reflects the overall mortality of the population, India stands at a distant 70.8 years in comparison to the global peers. This is despite life expectancy at birth growing at a compounded annual growth rate (CAGR) of 0.6% between 2000 and 2019.

The Covid-19 pandemic has changed consumer preferences and led to a higher dependence on the internet to serve basic healthcare needs of individuals.

Government policies to improve healthcare coverage

The government has kept its healthcare budget flat in 2022-23 at Rs 1,025 billion from Rs. 1,023 billion in fiscal 2021-22. Nonetheless, the focus seems to have shifted from curative aspect to preventive health and well-being under the ambit of holistic healthcare. The long-term goal is to raise its healthcare spending to 2.5% of GDP by 2025 under the National Health policy 2017 from the current 1.3% of the GDP.

Government expenditure as a proportion of current healthcare expenditure



Note: CHE: Current healthcare expenditure; DGGHE: Domestic general government healthcare expenditure
Source: WHO Global Healthcare Expenditure Database

The PMJAY was launched on September 23, 2018, with the objective of providing affordable healthcare. The scheme primarily has three objectives:

Strengthening of physical health infrastructure: Sub-centres

Upgradation of .15 million 'Health and Wellness' centres(1,18,669 centres have been made operational as of May 2022) to provide comprehensive healthcare, including coverage of non-communicable diseases and maternal and child health services. These centres would also provide essential medicines and diagnostic services free of cost.

Inclusion of new ailments under the ambit of the scheme would go a long way in ensuring focus on preventive care as opposed to only curative care. A strong referral network is vital in providing a continuum of care.

Strengthening of physical health infrastructure: Government hospitals

Setting up of 24 new government hospitals and medical colleges and upgradation of existing district hospitals. The intention is to have at least one medical college for three parliamentary constituencies. The government already has a scheme in place- Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) to correct the geographical imbalance in the availability of tertiary healthcare. Six AIIMs, each at Patna (Bihar), Raipur (Chhattisgarh), Bhopal (Madhya Pradesh), Bhubaneshwar (Odisha), Jodhpur (Rajasthan) and Rishikesh (Uttarakhand) have been set up, and 16 new ones announced by the government are under various stages of construction and are expected to be operational by 2024-25. Tackling issues of inadequate physical and personnel infrastructure is targeted via this objective. But given the operational and financial.

Expansion of health insurance coverage: Ayushman Bharat

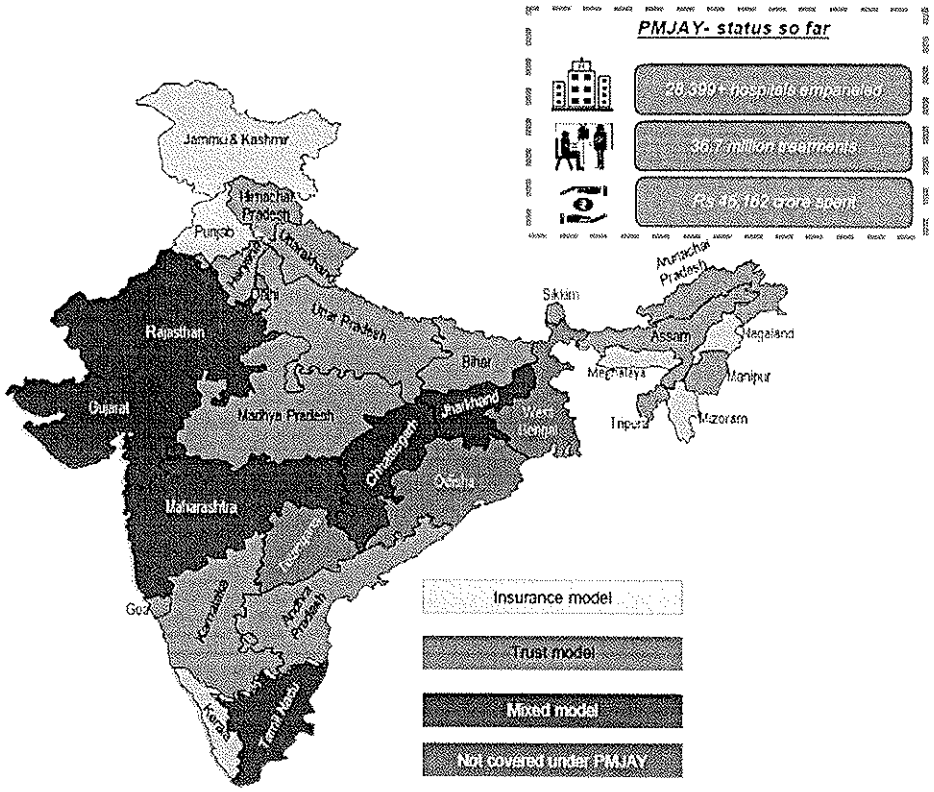
Provision of Rs 0.5 million assured healthcare coverage to each family who is eligible, selected on the basis of inclusion under the Socio Economic Caste Census (SECC) list. Nearly 107.4 million families will be covered under the scheme. All existing central and state health insurance schemes will be subsumed under Ayushman Bharat. However, the model of implementation of the scheme (via insurance company, trust or mixed model) is left to the prerogative of the states.

However, healthcare delivery at affordable prices would require a shift in focus towards capitalising on the volumes (with nearly 50 crore new people coming under a healthcare scheme) rather than on value (via margins)

The government has started an initiative of National Digital Health Mission(Ayushman Bharat Digital Mission) on lines of the proposed National Health Stack (NHS), a shared digital framework for both private and public hospitals, it is expected to digitize all health records and keep track of all details concerning healthcare enterprises in India. The central government has taken the initiative to launch a unique Health ID for all citizens under its National Digital Health Mission (NDHM) or Ayushman Bharat Digital Mission, which can be used to access a digital repository of personal health-related information. The ID or ABHA - Ayushman Bharat Health Account number is 14 digits long, and the account can be created using basic details such as a mobile number or Aadhaar number. This account provides details such as tests conducted, doctor's prognosis, and medicines taken.

The scheme is well intentioned and holds huge potential for the healthcare delivery and allied industries but the mechanism for quality control and monitoring along with raising resources for implementation will be a key monitorable.

Pradhan Mantri Jan Arogya Yojana adds a demand impetus



Note: PMJAY stands for Pradhan Mantri Jan Arogya Yojana
Source: PMJAY-AB updates, CRISIL Research

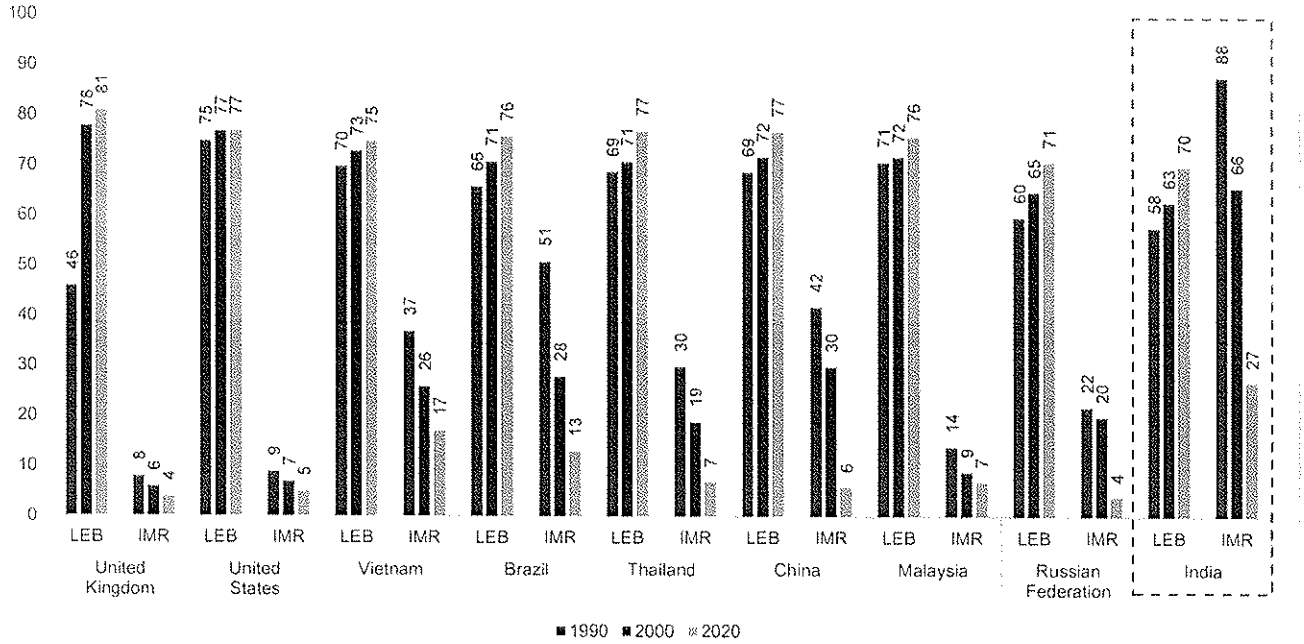
Ayushman Bharat will further provide volume momentum to the sector, with the scheme on its full scale implementation providing healthcare assurance of Rs 0.5 million per family (on floater basis) to nearly 107.4 million families (the actual coverage would be greater on account of states extending the scheme to even some sections of the uncovered populace). As on September 2022, nearly 36.7 million treatments had taken place under Ayushman Bharat since the inception of the scheme in September, 2018.

In terms of implementation till date, most states have signed a MoU with the National Health Agency (NHA) under varied implementation models- trust based, insurance based or mixed model, however, some states are yet to kick start full scale adoption. However, states like Madhya Pradesh, Uttar Pradesh and Bihar which were devoid of any health insurance scheme have extended coverage under PMJAY to more than 25% of their respective population.

With life expectancy improving and changing demographic profile, healthcare services are a must

With improving life expectancy, the demographic profile of the country is also witnessing a change. As of 2011, nearly 8% of the Indian population was of 60 years or more, and this is expected to surge to 12.5% by 2026. However, the availability of a documented knowledge base concerning the healthcare needs of the elderly (aged 60 years or more) remains a challenge. Nevertheless, the higher vulnerability of this age group to health-related issues is an accepted fact.

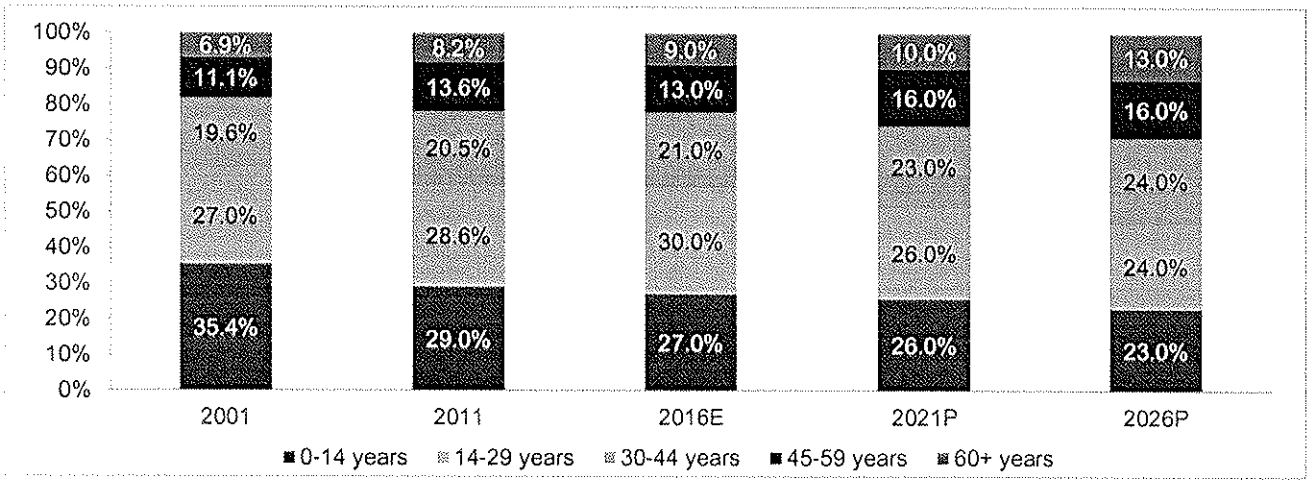
Life expectancy (at birth) and infant mortality rate: India vs others



Note: LEB – life expectancy at birth; IMR – infant mortality rate (probability of dying by age one year per 1000 live births)
Source: WHO World Health Statistics 2020

According to the Report on Status of Elderly in Select States of India, 2011, published by the United Nations Population Fund (UNFPA) in November 2012, chronic ailments, such as arthritis, hypertension, diabetes, asthma, and heart diseases, were commonplace among the elderly, with ~66% of the respective population reporting at least one of these. In terms of gender-based tendencies, while men are more likely to suffer from heart, renal and skin diseases, women showed higher tendencies of contracting arthritis, hypertension, and osteoporosis.

Population in 60+ age group to grow faster



Source: Census, CRISIL Research

With the Indian population expected to grow to ~1.4 billion by 2026 and considering the above mentioned factors, the need to ensure healthcare services to this vast populace is imperative. This also provides a huge opportunity to expand into a space that bears enormous potential.

Rising income levels to make quality healthcare services more affordable

Though healthcare is considered a non-discretionary expense, considering that ~83% of households in India had an annual income of less than Rs 0.2 million in fiscal 2012, affordability of quality healthcare facilities remains a major constraint.

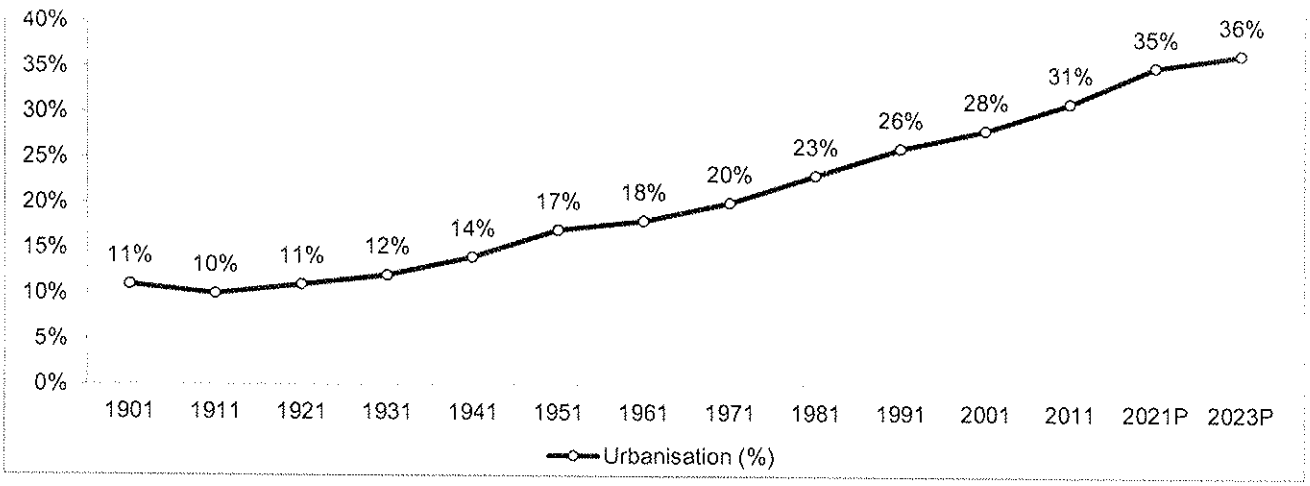
Growth in household incomes and, consequently, disposable incomes, are critical to the overall growth in demand for healthcare delivery services in India. The share of households falling in the income bracket above Rs 0.2 million is expected to go up to 35% in fiscal 2022 from 23% in fiscal 2017. They provide a potential target segment (with more paying capacity) for hospitals.

Increasing health awareness to boost hospitalisation rate

Majority of healthcare enterprises in India are more concentrated in urban areas. With increasing urbanisation (migration of population from rural to urban areas), awareness among the general populace regarding presence and availability of healthcare services for both preventive and curative care is expected to increase.

CRISIL Research, therefore, believes that the hospitalisation rate for in-patient treatment as well as walk-in out-patients will improve with increased urbanisation and increasing literacy.

Urban population in India (% of total population)



Source: UN World Urbanisation Prospects: The 2018 revisions

Non-communicable diseases, a silent killer

As opposed to the decreasing rate in communicable diseases, lifestyle-related illnesses or non-communicable diseases (NCDs) have been increasing rapidly in India over the past few years. The contribution of NCDs to the disease profile has risen from 30% in 1990 to 55% in 2016. Statistics show that these illnesses accounted for nearly 62% of all deaths in India in 2016.

As per the World Economic Forum, the world will lose nearly $30 trillion by 2030 for NCD treatments and India's burden from this will be $5.4 trillion.

In 2016, of the total disease burden, the contribution of group of risks (unhealthy diet, high blood pressure, high blood sugar, high cholesterol and overweight), which mainly causes ischemic heart disease, stroke and diabetes, had risen to nearly a quarter. The combination of these risks was highest for states such as Punjab, Tamil Nadu, Kerala, Andhra Pradesh and Maharashtra, but has increased in all other states as well. There were 38 million cases of cardiovascular diseases (CVDs) in 2005, which rose to nearly 64 million cases in 2015.

CRISIL Research believes that NCDs exhibit a tendency to increase in tandem with rising income. WHO projects an increasing trend in NCDs by 2030, following which CRISIL forecasts demand for healthcare services associated with lifestyle-related diseases such as cardiac ailments, cancer and diabetes to rise.

Another emerging market in the country is orthopaedics, which currently comprises a very small proportion compared with NCDs, but has a potential market in the country. The orthopaedics market can be classified into four different segments, viz., knee, hip, trauma, and spine, of which the knee-replacement market holds the biggest share, followed by trauma and spine. Hip replacement in India is still a very small segment compared to knee replacement, whereas it is the opposite around the world.

Growing health insurance penetration to propel demand

Low health-insurance penetration is one of the major impediments to the growth of the healthcare delivery industry in India, as affordability of quality healthcare facilities by the lower-income groups remain an issue. Health insurance coverage has increased from 17% in fiscal 2012 to ~38% in fiscal 2021. As per the Insurance Regulatory and Development Authority (IRDA), nearly 515 million people have health insurance coverage in India (as of fiscal 2021), as against 288 million (in fiscal 2015), but despite this robust growth, the penetration in fiscal 2021 stood at only 38%.

CRISIL Research sees that while low penetration is a key concern, it also presents a huge opportunity for the growth of healthcare delivery industry in India. With the PMJAY scheme and other growth drivers, the insurance coverage in the country is expected to increase to nearly 46% by fiscal 25.

With health insurance coverage in India set to increase, hospitalisation rates are likely to go up. In addition, health check-ups, which form a mandatory part of health insurance coverage, are also expected to increase, boosting demand for a robust healthcare delivery platform.

Medical tourism in India

The healthcare costs in developed countries is relatively higher in comparison to India. Some of the factors which makes India an attractive destination for medical tourism are presence of technologically advanced hospitals with specialized doctors and facilities like e-medical visa.

Treatments mostly sought after in India are for heart surgery, knee implant, cosmetic surgery and dental care, due to the low costs of these treatments in India. Medical tourism in India is driven by the private sector in India.

As per the Ministry of tourism, countries like Singapore, Malaysia and Thailand also offer medical care facilities to foreigners but what differentiates India apart from state-of-the-art infrastructure with reputed healthcare professionals is traditional healthcare therapies like Ayurveda and Yoga combined with allopathic treatments providing holistic wellness.

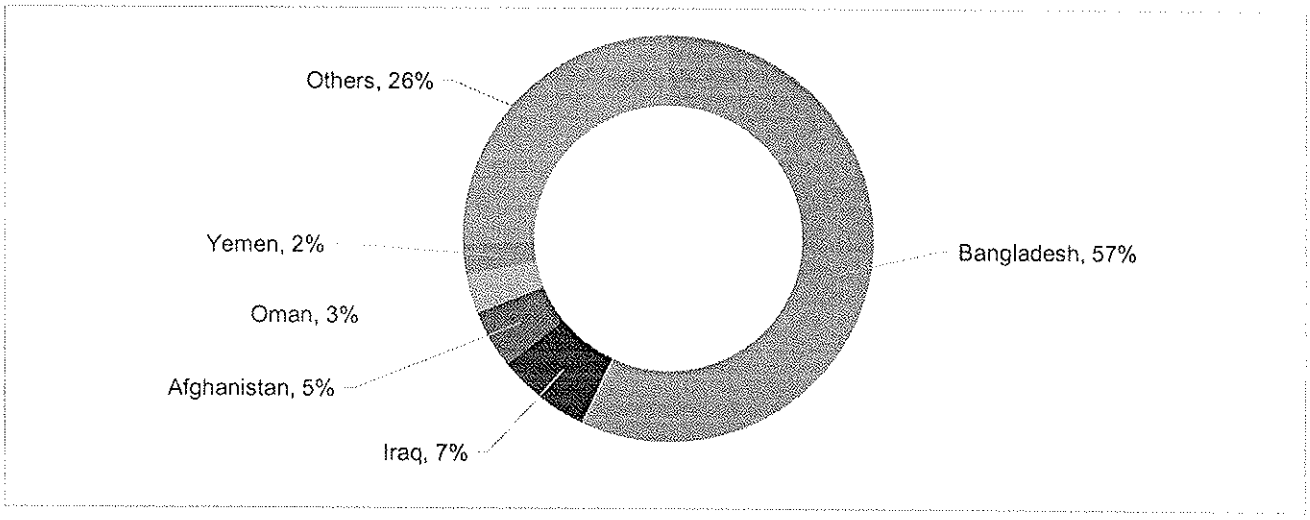
According to the latest data available with the Ministry of Tourism, of the total foreign tourist arrivals in India, the proportion of medical tourists has grown from 2.2% (0.11 million tourists) in 2009 to 6.38% (0.62 million tourists) in 2019. However, the number of medical tourists fell sharply in 2020(0.18 million tourists) because of international travel restrictions due to covid 19. The number of medical tourists recovered to 0.32 million tourists in 2021. The government has constituted a National Medical and Wellness Tourism Board along with provision of financial

assistance to the tune of Rs 0.6 million to medical tourism service providers under market development assistance (MDA) to develop medical tourism in India. The government had estimated medical tourism to be worth 9 billion USD by 2020 garnering 20% of the global share, up from the 3 billion USD in 2015, however we might have fallen short of this figure in the year 2020 owing to travel restrictions put in place due to Covid pandemic.

About two-thirds of medical tourism demand from South Asia

More than 94% of medical tourists are from countries in Africa, west and south Asia. Medical tourists from countries like United Kingdom and Canada are also seeing an increase, given long waiting periods for availing of treatments in these regions.

Break-up of medical tourists (includes all types of medical and medical attendant visa) by major country of origin



Note: Based on data as of CY19 as CY20 and CY21 were impacted due to Covid-19

Source: Ministry of Tourism

Bangladesh makes up absolute majority when it comes to medical tourists visiting India

57% of medical tourists who visited India in 2019, were from Bangladesh. This was followed by Iraq, who made up 7% of medical tourists, while Oman and Yemen accounted for 3% and 2% of medical tourists respectively. India did not see any medical tourists from Nepal and Bhutan, while Maldives accounted for almost 1% medical tourists in 2019. India did see some medical tourists coming from Sri Lanka which accounted for 0.6% of all medical tourists in the country.

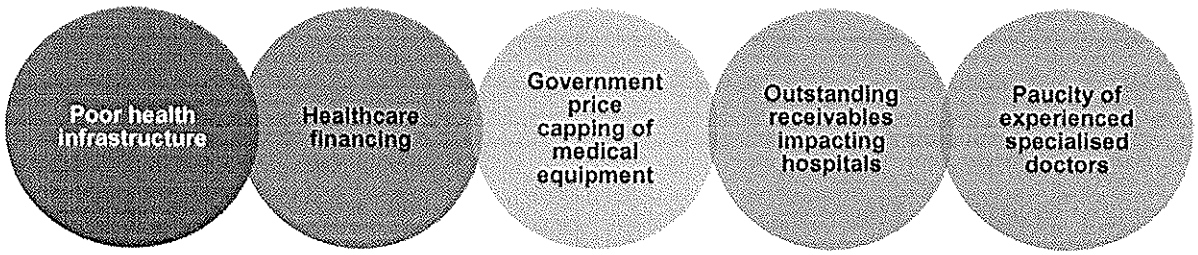
Country-wise cost of key treatment procedures (in $)

Ailments ($)	US	Korea	Singapore	Thailand	India
Hip replacement	50,000	14,120	12,000	7,879	7,000
Knee replacement	50,000	19,800	13,000	12,297	6,200
Heart bypass	144,000	28,900	18,500	15,121	5,200
Angioplasty	57,000	15,200	13,000	3,788	3,300
Heart valve replacement	170,000	43,500	12,500	21,212	5,500
Dental implant	2,800	4,200	1,500	3,636	1,000

Source: CRISIL Research

Key challenges for the healthcare delivery industry

The potential demand and opportunities in healthcare in India aside, many challenges exist, mainly: inadequate health infrastructure and unequal quality of services provided based on affordability and healthcare financing.

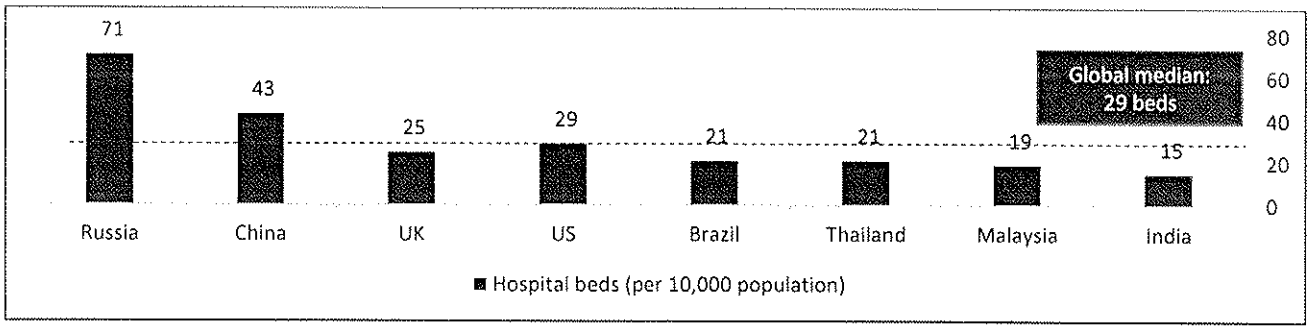


Health infrastructure in dire need of improvement

The adequacy of India's healthcare infrastructure and personnel is a barometer of its quality of healthcare. This, in turn, can be assessed from bed density (bed count per 10,000 population) and availability of physicians and nurses (per 10,000 population).

India comprises nearly a fifth of the world's population, but has an overall bed density of merely 15 (for 2021 as estimated by CRISIL Research), with the situation being far worse in rural than urban areas. India's bed density not only falls far behind the global median of 29 beds (CY2017 data for global median), it also lags that of other developing nations, such as Brazil (21 beds for CY2017) and Malaysia (19 beds for CY2017). The below given bed density data has been collected from latest reported WHO database accessed on September 26, 2022. India bed density is for 2021 and estimated by CRISIL Research.

Hospital bed density: India vs. other countries (2021 for India and latest available for other countries)



Note: India bed density is estimated by CRISIL Research for 2021. Most recent years data for other countries given above in the chart as follows, Brazil: 2017, China: 2017, Malaysia: 2017, Thailand: 2010, UK: 2019, United States of America: 2017, Russian Federation: 2018,

Source: World Health Organization Database, CRISIL Research

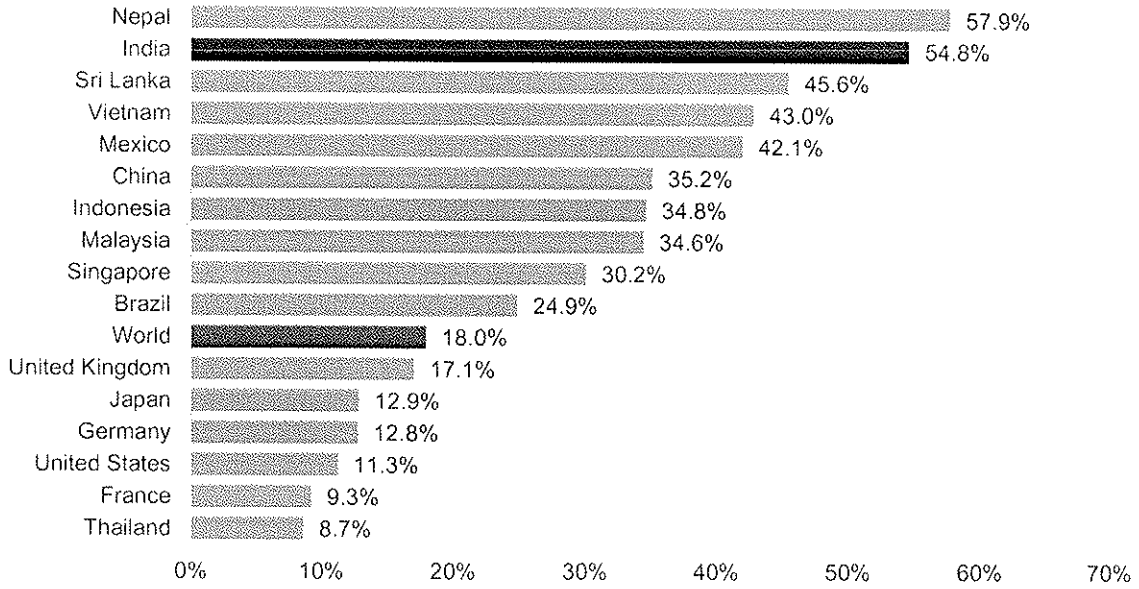
The total number of government beds in India are estimated at ~0.83 million. An estimated population of ~1.37 billion in 2019 implies that 1,660 people on average are served per government bed in the country. Sikkim (34), Mizoram (17), Arunachal Pradesh (16) and Himachal Pradesh (20) have the highest government bed density per 10,000 population. Telangana (1), Bihar (2), Maharashtra, Chhattisgarh and UP (3 each), and MP and Jharkhand, (4 each) have the lowest.

Healthcare financing has been a pain point

In India, out-of-pocket (OOP) expenditure on health accounted for nearly 55% of total health expenditure as of 2019 (the second highest among all the other countries compared below in the chart). Insurance earlier did not cover out-patient treatments (Insurance companies started covering OPD treatments under health insurance only recently). Hence, OOP expenditure on out-patient treatments greater than in-patient treatments.

Nearly 17% of the rural population and 13% of the urban population are dependent on borrowings for funding their healthcare expenditure. And nearly 80% of the rural population and 84% of the urban population use their household savings on healthcare-related expenditure as per "Health in India – 2018, NSS 75th Round. Health expenditure contributes to nearly 3.6% and 2.9% of rural and urban poverty, respectively, and annually, an estimated 60 to 80 million people fall into poverty due to healthcare-related expenditure as per "Health in India – 2018, NSS 75th Round. However, with Pradhan Mantri Jan Arogya Yojana (PMJAY), the affordability aspect of healthcare expenditure is expected to be taken care of to some degree, especially for the deprived population.

Out-of-pocket expenditure as % of current health expenditure: India vs other countries (2019)



Source: World Health Organization Database, CRISIL Research

Government price capping of medical equipment

The government has restricted price capping to four devices – cardiac stents, drug-eluting stents, knee implants and intra-uterine devices. However, the National Pharmaceutical Pricing Authority (NPPA) is proposing to bring in capping of trade margins instead of extending the list of devices under the National List of Essential Medicines.

Even state governments have been resorting to measures to curb profiteering by hospitals. The Delhi government had, earlier this year, proposed norms for restricting hospitals and nursing homes from marking up prices of consumables and medicines from their procurement prices, to limit their profits.

Price capping on cardiac stents introduced in February 2017, and on knee-implants, in August 2017 was a deterrent for the industry, which is majorly run by the private sector. However, players have since been able to come back to normalcy after taking a hit on operating margins initially, through price rationalisation via bundle pricing. The National Pharmaceutical Pricing Authority (NPPA) has further extended the capping of prices of knee implants, ranging from Rs 54,000 to Rs 0.114 million, for one more year.

Post implementation of price caps on stents and implants, the government has identified 23 medical devices to put price controls on.

Outstanding receivables affecting fiscal profile of hospitals

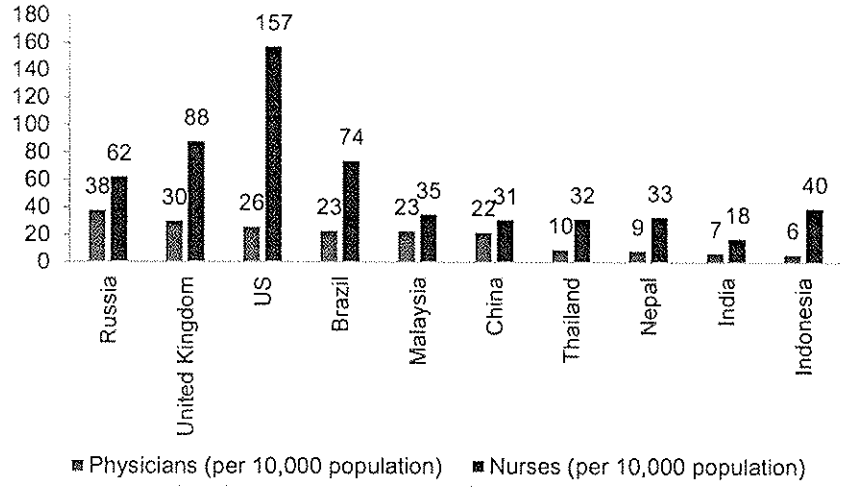
The financial profile of many hospitals empanelled under state schemes became weak due to rising outstanding receivables from the government (state and Centre) for providing treatments to beneficiaries under health insurance schemes. However, this challenge is expected to be dealt with on priority under the PMJAY, by fixing a particular timeline for reimbursements of claims.

Paucity of experienced specialised doctors

Paucity of experienced specialised doctors is another challenge. Experienced specialised doctors also contribute to the reputation and brand of the hospitals. Paucity of such doctors, thus, impacts the growth of the hospital sector. At seven physicians and 18 nursing personnel per 10,000 population, India trails the global median of 18

physicians and 40 nursing personnel. Even on this parameter, India lags behind Brazil (23 physicians, 74 nurses), Malaysia (23 physicians, 35 nurses).

Healthcare personnel: India vs. other countries



Source: WHO World Health Statistics 2022

Key actionable areas

While the healthcare delivery sector in India faces several teething issues currently, it also presents immense opportunities for the players involved. While, on one hand, factors such as inadequate bed density and insufficient personnel highlight the India's poor healthcare infrastructure vis-a-vis global levels, on the other hand, it reflects the immense potential in store for healthcare delivery players in the country.

This potential is further augmented with information and communication technology-enabled services gaining widespread popularity (CRISIL Research expects internet subscriber base to increase to ~1,000 million by fiscal 2026; while the wireless subscriber base (mobile phone users) is expected to increase to ~1,200 million by fiscal 2026). Not only do these technologies increase reach of the healthcare facilities to the hitherto remote locations, but they also help players achieve better efficiencies.

Data from the healthcare space is growing at a steady pace and this has driven hospitals to adopt artificial intelligence (AI) based patient intelligence systems. These are expected to improve the operating metrics of the hospitals and drive timely detection of diseases.

Shortfall in bed capacity: Major opportunity for healthcare delivery players

India needs to increase its bed capacity to reach the global median by almost 2.1 million beds. With the population growing at almost 1% annually, India is expected to have more than 1.4 billion people by 2026, stressing the need for increased number of hospital bed capacity. This need was accentuated during the Covid-19 pandemic.

Compounding the bed shortfall, dearth of healthcare personnel (physicians and nursing personnel) continues to be immense. India had ~0.9 million physicians in 2013. The physician count needs to be almost doubled to meet the global median. According to the national health profile (NHP) 2021, the average population served by an allopathic doctor is 1,113 and there are nearly 1.23 million doctors registered with the Medical Council of India (MCI) as of 2019.

Currently, there are only 542 medical colleges offering a total of about 81,400 MBBS seats as per NHP 2021, producing nearly 8 doctors (MBBS) per lakh of population being added annually.

The shortage of nursing personnel (nurses and midwives) is also critical (18 nurses in India versus 40 globally). As per the NHP 2021, there are 1,892 auxiliary nurse Midwives institutions producing 0.055 million auxiliary nurses and 6,894 nursing institutions producing 0.272 million nurses annually.

Diversification into different format/areas to increase reach and efficiency

Despite the challenges present in the healthcare delivery system in India, innovations and newer business models are being explored. The main objective of these innovations are to increase efficiencies through optimum resource utilisation and widen the reach of healthcare services. Though different business models might being applied depending on the location and services to be provided, the PMJAY is expected to lead to the adoption of new business models focusing on volume-driven, affordable healthcare.

Single speciality healthcare units

Single-specialty healthcare units are those that treat patients with specific medical conditions, with the need of specific medical/surgical procedures. A single-specialty healthcare unit can be a hospital, clinic, or care centre. The advantage of these units is that, by focusing on providing care in a single segment, they can increase efficiencies as well as create a niche in the target segments. Nowadays, birthing centres are among the fastest growing single specialty centre. Specific regulatory headwinds, however, can affect the margins of these business units.

Day-care centres

The objective of day-care centres is to reduce the need for overnight hospitalisation. In this type of setup, a patient is allowed to go home on the same day after being treated. These centres have also given rise to the concept of outpatient surgeries.

While this model is very popular in the eye care segment, other segments such as arthroscopic, general, cosmetic, and dental surgery have also been using this as a popular care delivery model. The advantage of the day-care centre model is that patients can save on bed/room rentals associated with overnight hospitalisation. The healthcare units, on the other hand, can have a streamlined setup with optimum equipment, staff and infrastructure, which helps bring down operational costs.

End-of-life/geriatric care centres

The objective of end-of-life care centres or hospices and palliative care centres is to provide care and support to patients, who are suffering from terminal illness with a life expectancy of six months or less. Hospice and palliative care focus more on pain management and symptom relief rather than continuing with curative treatment. These centres are designed to provide patients a comfortable life during their remaining days and cover physical, social, emotional, and spiritual aspects apart from the medical treatment. Such type of care can be delivered onsite, where special facilities are set up, in the hospital premises, or at the patient's home.

Palliative care is delivered with the help of an inter-disciplinary team which may consist of the patient's physician, hospice doctor, a case manager, registered nurses, counsellor, a dietician, therapist, pharmacologist, social workers, and various trained volunteers. Depending upon the patient's ailment and medical condition, the team prepares a customised care programme which comprises services such as nursing care, social services, physician services and trained volunteer support.

Home healthcare

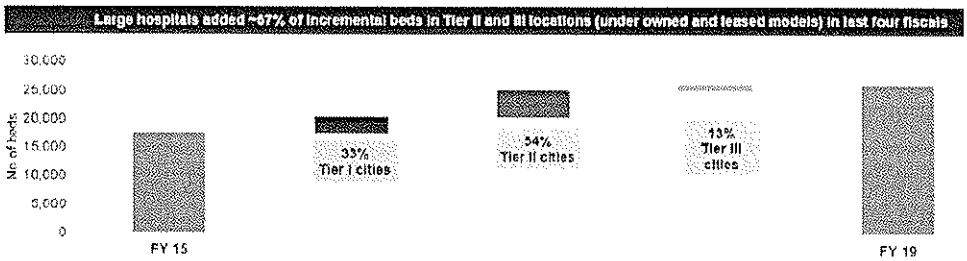
The primary objective of home healthcare services is to provide quality health care at the patient's premises. In India, these services are still in the nascent stages. CRISIL Research believes that with increasing geriatric population, nuclearisation of families and increasing disease burden causing a strain on conventional health delivery systems, home healthcare will be a preferred alternative. A number of healthcare start-ups have started vying for growth in this space.

The revenue from ICU beds decreases as weeks pass by and, hence, reducing the strain (both on hospitals and patients) can be explored through home healthcare. Patients can avail of ICU care at home at nearly a fifth of the prices of hospital care. Hospitals can also benefit by this model not just through reduced overcrowding, but also prevention of associated hospital acquired infections.

The services currently offered are: post-intensive care, rehabilitative care and services of skilled/unskilled nurses. But areas such as home therapeutic care for infusion and respiratory therapy, dialysis and convenience centred teleconsultation, have more potential for growth. Apollo HomeCare (by AHEL) & Max@Home (by MHIL) are home care services provided by two largest hospital chain operators in the country.

Increasing penetration of hospital chains in tier II and III locations

Increasing penetration of hospital chains in tier 2 and 3 locations



Note: Based on city category classification followed by 7th Pay Commission, tier I – X cities (top 8 cities), tier II – Y cities (next 88 cities)
Source: Company reports, CRISIL Research

The Indian healthcare delivery system has seen consolidation in recent years. A highly competitive industry, coupled with tightening of healthcare regulations, has made it difficult for smaller players in the industry to stay profitable. Larger hospital brands typically have stronger financial discipline and negotiating power with suppliers, better ability to attract medical talent, and greater capital and administrative resources to meet these needs over standalone hospitals. Many of the established players in the healthcare delivery industry follow inorganic growth to expand into the geographies where they have limited presence. In terms of supply creation, major hospital chains have expanded into the next level of creamy tier 2 and 3 locations (with approximately 67% aggregate bed additions by 10 large hospitals players in the past four years being in these areas).

Rise in demand for health infrastructure, modern technologies and multi-disciplinary healthcare have been some of the key driving factors for consolidation in the industry. Investments by private equity (PE) players is also gaining traction. Majority of the PE deals in the industry in the past 3-4 years have been towards hospital portfolio consolidation, also enabling formation of regional clusters that provide base for further expansion and consolidation. Recently, Manipal Health acquired 100% stake in Columbia Asia hospitals, strengthening its presence in southern India. IHH healthcare Limited also has gained stake in Fortis Healthcare in 2018. In the past two years, deals worth approximately Rs 126 billion and approximately Rs 22 billion have taken place in multi-speciality and single-speciality hospitals, respectively.

Innovative business models to help penetration in tier 2 and 3 cities

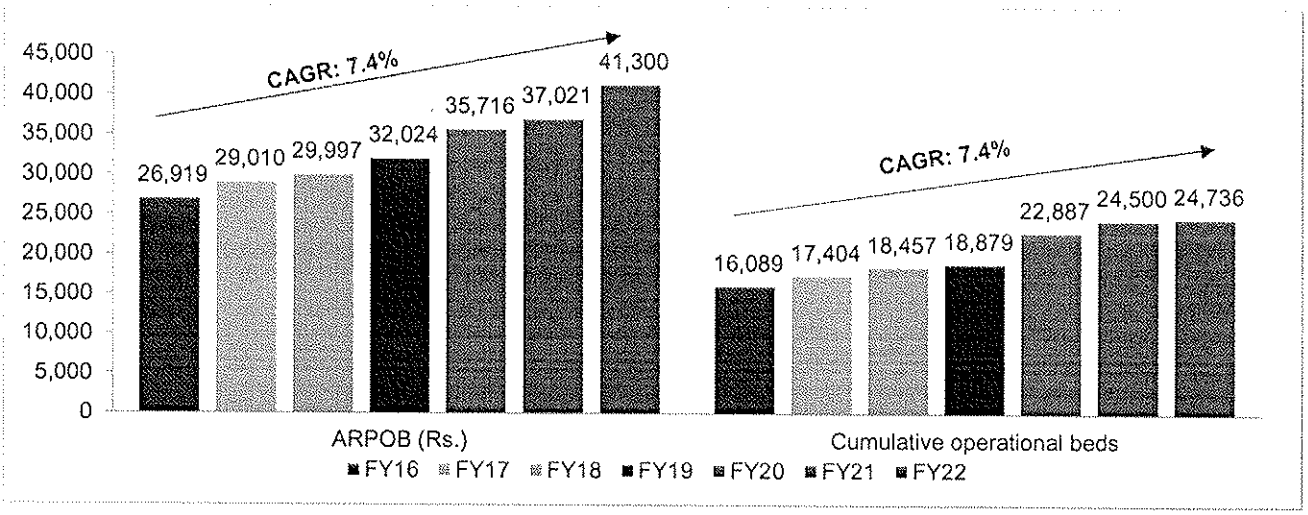
Given that 65% of the population lives in rural areas, the government is incentivising private investments in these regions. But private players find it difficult to replicate the model that worked for them in tier 1 and creamy tier 2 locations, due to the relatively lower revenue per bed in these regions (due to the low paying capacity in these areas and occupancy of existing facilities). CRISIL Research believes that a volume-centric model focusing on secondary and lower level tertiary care segments with tight control on costs will allow private players to enter and be profitable in rural areas, too.

Healthcare providers generally operate under one of the three models – owned, leased and operated & maintained. In an owned model, the company constructs and installs medical equipment and is wholly responsible for day-to-day operations. This model is highly capital intensive in nature. In case of a leased model, the landowner develops building as per specifications of the company, which takes it on a long-term lease. Capital intensity in a leased model is ~50% lower than that of an owned model. In an O&M model, the company signs a contract for managing a standalone hospital against a fixed management fee and share in revenue/profit. This is a low capital-intensive model.

The break-even for each model also differs on a case-to-case basis. However, a typical break-even at operating level under ownership model lies between 2-3 years in a tier 2 city. In case of a leased model, the break-even gets delayed because of payment of lease rentals. In an O&M model, a company is not generally impacted by the duration of break-even for fixed fees (variable fees will, however, be dependent on break-even).

Operating metrics of key listed players

Average revenue per occupied bed (ARPOB) of key listed players clocked ~7.4% CAGR over fiscals 2016-22



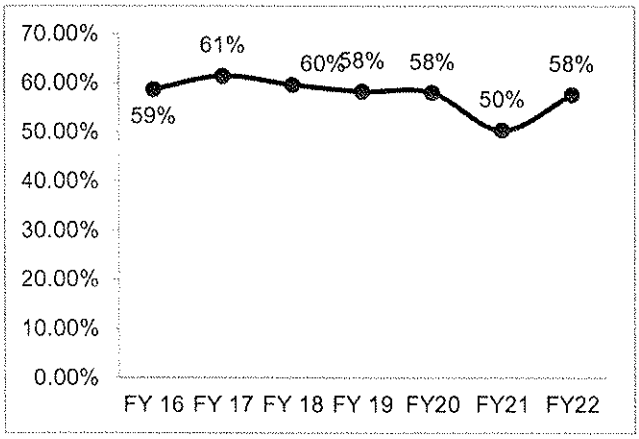
Note: Companies considered for analysis are AHEL, Fortis Healthcare Ltd, Narayana Hrudayalaya Ltd, MHIL, Shalby Ltd, and Healthcare Global Enterprises Ltd (HCGEL)

Source: Company annual reports, investor presentations, CRISIL Research

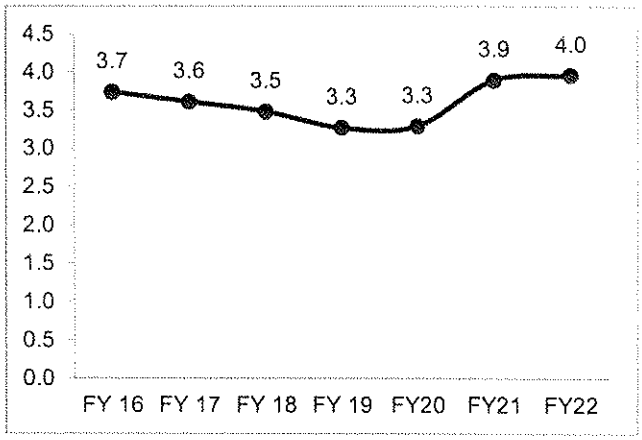
ARPOB of key listed players increased at a CAGR of ~7.4% over fiscals 2016-22, and operational beds logged a similar 7.4% CAGR. Operational beds for key listed players grew at the highest rate of 21% in fiscal 2020 in the past six fiscals.

Aggregate occupancy rates and ALOS of key listed players

Occupancy rate (%)



ALOS (days)

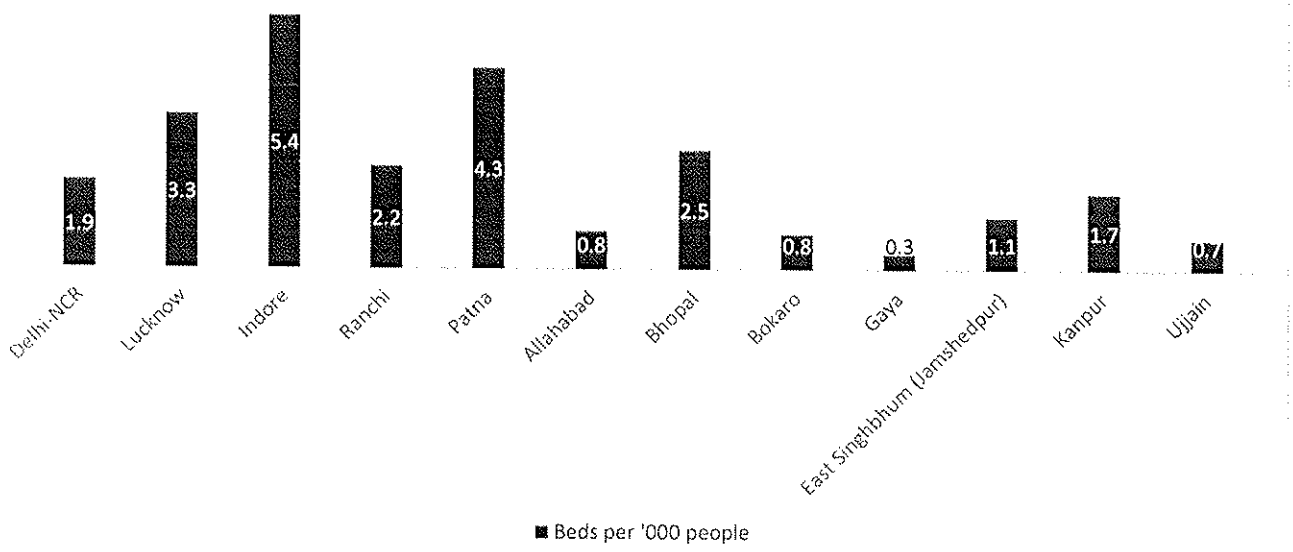


Note: Companies considered for analysis are AHEL, Fortis Healthcare Ltd, Narayana Hrudayalaya Ltd, MHIL, Shalby Ltd, and HCGEL
Source: Company annual reports, investor presentations, CRISIL Research

Occupancy rates of key listed players have remained steady (57-61%) between fiscal 16 and fiscal 22 except fiscal 21, when occupancy rate fell to 50% on account of Covid pandemic. Although aggregate occupancy rates are in the range of 57-61%, the metric is skewed at the individual company level – e.g. MHIL had an occupancy rate of 75% in fiscal 22 and Shalby, 48% in fiscal 22. A steady aggregate occupancy rate and a declining ALOS are a positive for these players. ALOS, on an aggregate basis, of key listed players decreased to 3.3 days in fiscal 2020 from 3.7 days in fiscal 2016. ALOS rose to 3.9 days in fiscal 21 and 4.0 days in fiscal 22 which may be attributed to longer stay of patients due to Covid. Hospitals typically focus on reducing their ALOS, as it increases their ARPOB and ensures more patients are treated at the same time.

Healthcare infrastructure across key micro-markets

Private hospital chains have started expanding in the underpenetrated micro-markets



Note: Beds per 1000 people for Lucknow, Indore, Ranchi & Patna are at city level, all other micro-markets are at district level

Source: CRISIL Research

Delhi-NCR

Delhi NCR Region is a highly populous region with a total population of ~57.8 million and have a bed density of 1.9 which is low when compared to the global averages. An important facet to consider while estimating the adequacy of healthcare infrastructure in the region is to also take into account the availability of the same in the neighbouring cities/states. Given that Delhi-NCR region has a well-developed hospital infrastructure, they tend to attract patients not only from other cities and towns within the state, but also from the neighbouring states. While this creates an additional burden on the healthcare infrastructure of this region, it also clearly indicates the willingness of people from nearby tier I and II cities to travel in order to access quality healthcare facilities. Another indication of this trend is the expansion of large chain hospitals to such cities. Major hospital chains in the country have their presence in the region with some players such as Max Healthcare and Medanta having large proportion of beds in Delhi NCR region.

Key hospitals	Bed capacity in Delhi NCR region
Max Healthcare	2,463
Medanta Hospital	1,391
Apollo Hospital Enterprise Ltd*	768

*Note: Data as of March 31, 2022; * Apollo Hospitals data only for Indraprastha Apollo and Apollo Spectra Hospitals as bed capacity for other hospitals in NCR is not available*

Source: Company data, Secondary research, CRISIL Research

Lucknow

Lucknow city has a population of ~2.8 million. The city is estimated to have a total of 250-255 hospitals and nursing home with ~9,300 beds. Sahara Hospital, Medanta Hospital, Mayo Hospital, Apollo Medics Super Specialty Hospital and Tender Palm are amongst the top private hospitals in the city. Sahara Hospital belongs to Sahara group which is one of the leading business houses in the country. The Sahara hospital is equipped with key specialities such as cardiology, neurology, oncology, orthopaedic, gynaecology etc. Medanta Hospital has all key specialities covered including cardiology, urology, oncology and digestive & hepatobiliary sciences

Key hospitals	Bed capacity
Sahara Hospital	378
Mayo Hospital	300
Apollo Medics Super Specialty Hospital	330
Tender Palm Hospital	300
Medanta Hospital	410

Note: Bed capacity data as of March 2022

Source: Company data, Secondary research, CRISIL Research

Indore

Indore city has a population of ~1.9 million. The city is estimated to have a total of 200-210 hospitals and nursing homes with ~10,800 beds. Some of the key private hospitals in the city are Bombay Hospital, Choithram Hospital, Arihant Hospital and Research Centre, Apollo Hospital and Medanta Hospital. Bombay Hospital is the largest hospital among the list of hospitals mentioned above with bed capacity of ~600 beds. Bombay Hospital has key specialities such as Neurology, Cardiology, Nephrology, Oncology, Gastroenterology etc. Choithram Hospital is another large private hospital with a bed capacity of ~350 beds with key specialities such as neurology, oncology, urology, pathology etc. Large hospital chain operators such as Apollo Hospitals and Medanta also have their unit in Indore.

Key hospitals	Bed capacity
Bombay Hospital	600
Choithram Hospital	350
Arihant Hospital & Research Centre	300
Shalby Multispecialty Hospital	200
Apollo Hospital	180
Medanta Hospital	175

Note: Bed capacity data as of March 2022

Source: Company data, Secondary research, CRISIL Research

Ranchi

Ranchi city has a total population of ~1.1 million. It is estimated to have a total of 90-100 hospitals and nursing homes with ~2,400 beds. Ranchi city is the capital of the state of Jharkhand. Bhagwan Mahavir Medica Super Specialty Hospital (BMMSH), Orchid Medical Centre, Medanta Hospital, Sentevita Hospital, Paras HEC Hospital and Medanta Hospital are some of the large private hospitals present in the city. BMMSH is one of the largest

facility in the city with ~300 beds providing services across key specialties such as cardiac sciences, neurological diseases, orthopaedics, kidney diseases, gastroenterology and GI surgery, obstetrics and gynaecology etc. Medanta Hospitals in Ranchi has a bed capacity of 200 beds. Key specialties covered at Medanta Hospital in Ranchi are cardiology, digestive & hepatobiliary sciences, neurology and urology. Paras HEC Hospital is a public private partnership between Paras hospitals and Heavy Engineering Corporation (HEC).

Key hospitals	Bed capacity
Bhagwan Mahavir Medica Superspecialty Hospital	300
Medanta Hospital	200
Orchid Medical Centre	135
Gurunanak Hospital and Research Centre	100
Sentevita Hospital	80

Note: Bed capacity data as of March 2022

Source: Company data, Secondary research, CRISIL Research

Patna

Patna city has a total population of ~1.7 million. It is estimated to have a total of 215-225 hospitals and nursing homes with ~5,200 beds. Patna city is the capital of state of Bihar. Paras Hospital, Ford Hospital and research centre, Jagdish Memorial Hospital and Sahyog Hospital are among the large private sector hospitals in the city. Paras Hospital has a bed capacity of ~350 beds covering key specialities such as neurology, cardiology, oncology, orthopaedics and joint replacement, gynaecology etc. Paras Hospital was amongst the first corporate hospitals in the city. Ford Hospital is another private hospital with bed capacity of 105 beds. It is a multispecialty hospital offering services in specialities such as cardiology, endocrinology, ENT, neurology, nephrology etc. Medanta Hospital is one of the recently functional key private hospitals in the city providing services for major key specialities.

Key hospitals	Bed capacity
Paras Hospital	350
Medanta Hospital	228
Jagdish Memorial Hospital	150
Ford Hospital and Research Centre	105
Sahyog Hospital	100

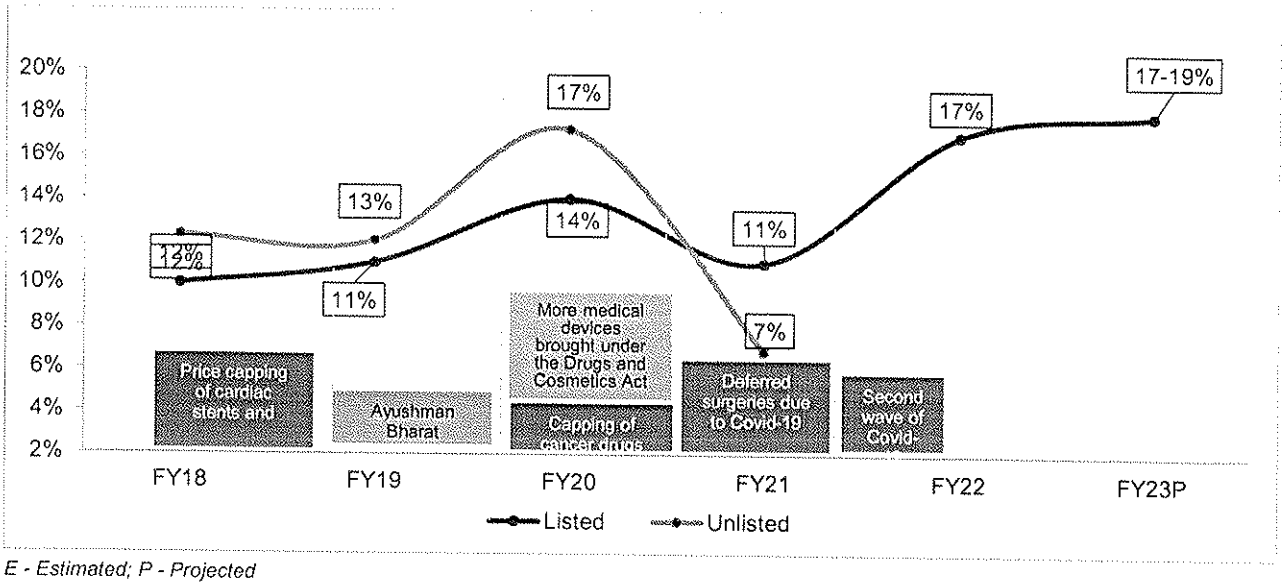
Note: Bed capacity data as of March 2022

Source: Company data, Secondary research, CRISIL Research

Review of industry profitability

Operating margins of listed hospital chains to further improve in fiscal 23

Profitability of healthcare delivery (hospital) industry



E - Estimated; P - Projected

**Companies included are Apollo Hospital Enterprise Limited, Narayana Hrudayalaya Limited, Healthcare Global Enterprises, Shalby Hospitals, and MHIL for listed; Unlisted companies include Amri Hospitals Ltd, Global Health Ltd, Kailash Healthcare, Rainbow Children's Medicare Pvt LTd, Wockhardt Ltd and Yashoda Hospital and Research Centre Ltd*

Source: CRISIL Research

Earlier, with the addition of new hospitals and expansion of operational beds, operating margins of key listed players had seen a muted improvement and remained range-bound due to a rise in consumable costs and employee costs associated with new supply additions and certain regulatory hiccups.

It usually takes 24-30 months for a newly opened hospital to stabilise its operations. However, this period may be longer for standalone hospitals than chains due to the latter's operational efficiency. But, it could vary depending on the location and specialties offered.

CRISIL Research expects the operations of private entities to have been adversely impacted in fiscal 2021. Despite not earning requisite revenue, hospitals were still bearing personnel costs, which account of 50-55% of total operating costs for hospitals. Hospitals with a tighter operating structure and higher realisations, resulting in higher EBITDA per operational bed, are expected to have witnessed relatively low revenue erosion at the end of the fiscal 2022.

In terms of listed entities compared above, operating margins dropped by ~300 basis points in fiscal 2021 but recovered strongly to ~17% margins in fiscal 22. Margins are further expected to improve in fiscal 2023.

The sector remains sensitive to regulations. In fiscal 2017, the government had capped prices of drug-eluting stents and knee implants, which hurt operating margins (the effect being more pronounced for single-specialty hospitals). But the effect of price capping was neutralised in the later part of fiscal 2018 via price rationalisations in bundle pricing. Even during the Covid-19 pandemic, states such as Maharashtra capped treatment costs at private hospitals following reports of profiteering and as the state government took control of 80% of the private bed infrastructure in cities such as Mumbai in its fight against Covid-19. The rationale behind price capping was to make healthcare affordable, and the government is likely to introduce a policy regarding trade margin

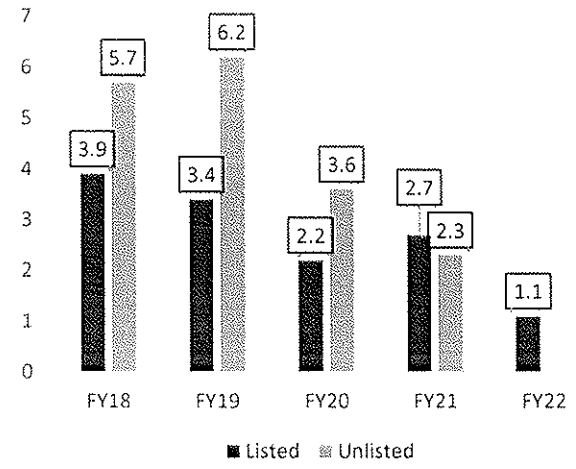
rationalisation for medical devices and consumables. In the long run, however, this move could aid in expansion of hospitals, providing affordable healthcare in smaller towns.

Financial metrics of listed players better than those of unlisted counterparts

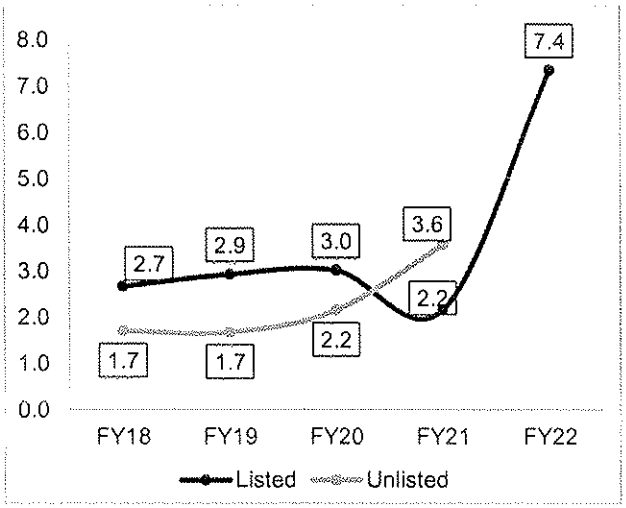
According to CRISIL Research, operating margins of unlisted yet large hospital chains were more stable than those of smaller listed entities in the space. For listed companies, the gearing ratio remained range-bound, with regional players being more dependent on debt for expansion. Coverage ratios of listed players were better than those of their unlisted peers except in fiscal 21.

Financial performance metrics of hospitals

Debt/EBITDA



Interest service coverage ratio



Note: Listed hospitals – Apollo Hospital Enterprise Limited, Narayana Hrudayalaya Limited, Healthcare Global Enterprises, Shalby Hospitals, and MHIL

Unlisted hospitals – Amri Hospitals Ltd, Global Health Ltd, Kailash Healthcare, Rainbow Children's Medicare Pvt LTd, Wockhardt Ltd and Yashoda Hospital and Research Centre Ltd

Interest service coverage ratio: Profit before depreciation, interest and taxes (PBDIT)/ interest and finance charges

Source: CRISIL Research

Competitive mapping of key players operating in the Indian healthcare delivery market

Comparative analysis of players in the hospitals sector

In this section, CRISIL Research has compared key players in the hospital industry. Data in this section is obtained from publicly available sources, including annual reports and investor presentations of listed players, regulatory filings, rating rationales, and/or company websites as relevant.

For this assessment, CRISIL has considered key hospital players namely included Global Health Ltd (GHL) (Medanta), Apollo Hospital Enterprises Ltd (AHEL), Fortis Healthcare Ltd, Max Healthcare Group, Shalby Ltd, Narayana Hrudalaya Ltd, Park Hospital, Medica Hospitals Pvt Ltd, Sahu Estate Pvt Ltd (operating Santevita hospital in Ranchi), Paras Healthcare Pvt Ltd, Sahara India Medical Institute Ltd and Healthcare Global Enterprises Ltd.

Company	Geographic Presence
Apollo Hospital Enterprise Ltd	Pan India
Fortis Healthcare Ltd	Pan India
Global Health Ltd (Medanta)	North & East India
Max Healthcare Group*	North India
Medica Hospitals Pvt Ltd	East India
Narayana Hrudayalaya Ltd	Pan India
Paras Healthcare Pvt Ltd	North & East India
Park Hospitals	North India
Sahara India Medical Institute Ltd	North India
Sahu Estate Pvt Ltd	East India
Shalby Ltd	Pan India
HealthCare Global Enterprises Ltd. (HCGEL)	Pan India

** Representing Max Healthcare Institute Ltd and its associate trust owned hospitals*

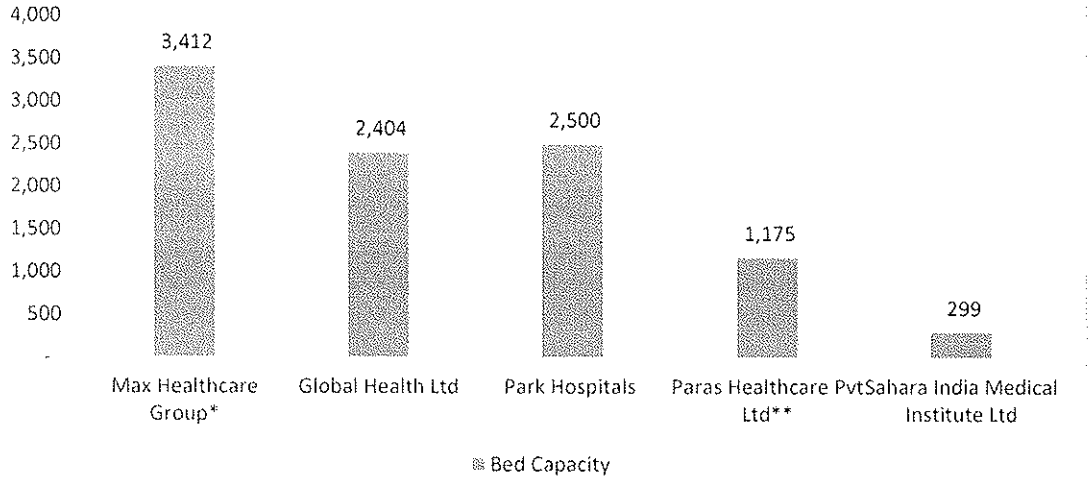
Source: Company annual reports/investor presentations, CRISIL Research

These hospitals are involved majorly in the provision of secondary and tertiary healthcare services (across a myriad of specialties). But hospital players are also expanding into allied healthcare services like diagnostics and pharmacy. Diversification of business from core healthcare delivery, has helped hospital players to increase their revenue generating channels in the sector as well as expand their addressable market through provision of a continuum of care.

With the focus shifting to provision of healthcare services by private hospitals, bed addition is by private players is happening at a faster pace as compared to government hospitals. The demand for healthcare remaining on an uptrend complimented by various factors, makes the demand- supply gap in the sector an attractive proposition to bridge.

Key operational parameters of major hospital players

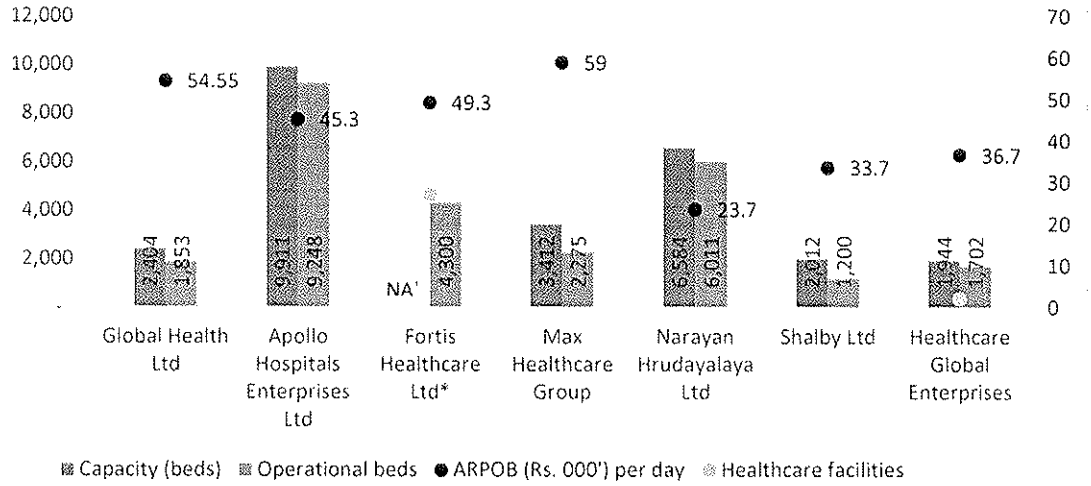
Pan-India bed capacity for players having major operations in north region (FY22)



*Note: *Max Healthcare Group includes beds in associate trust owned hospitals; **as of December 2021*

Source: Company annual report, company website, management interview, credit ratings CRISIL Research

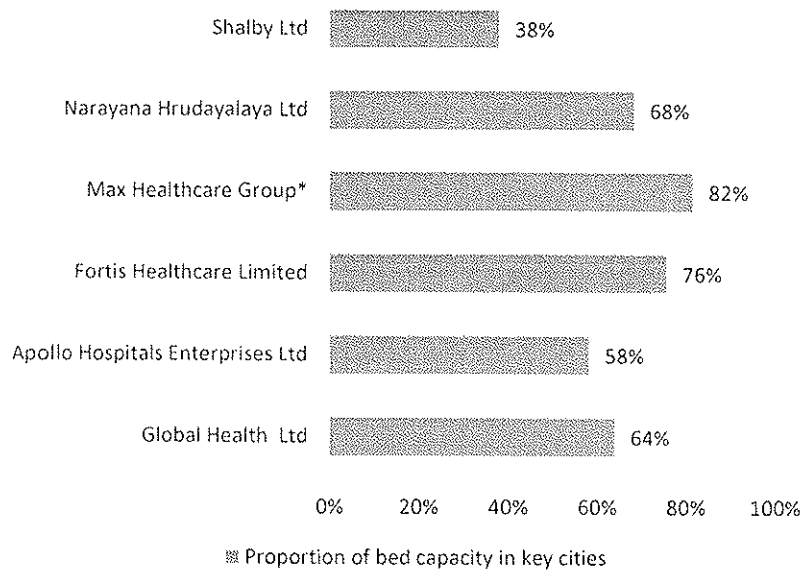
Bed capacity, operational beds and ARPOB of major hospital players (FY22)



*Note: Max Healthcare Group includes beds in associate trust owned hospitals, *Fortis Healthcare Ltd capacity beds not available*

Source: Company annual reports, Company investor presentations, CRISIL Research

Proportion of bed capacity in key cities of key listed players (FY21)

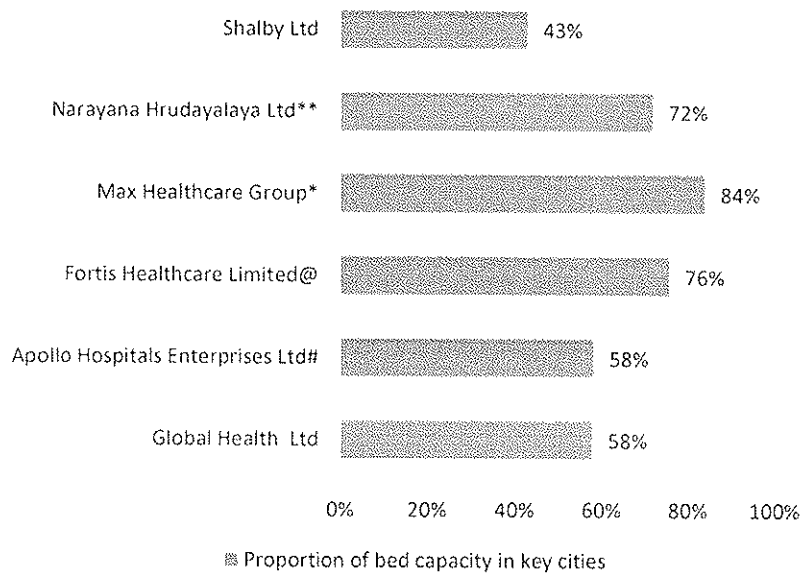


Note: Key cities include NCR, MMR, Chennai, Hyderabad, Bengaluru, Kolkata and Ahmedabad; Proportion of beds in key cities for Fortis Healthcare and Apollo Hospitals Enterprises have been derived from the list of hospitals on their website;

**Max Healthcare Group includes beds in associate trust owned hospitals; Global Health Ltd includes beds in Medanta Holdings Pvt Ltd*

Source: Company annual report, investor presentation, CRISIL Research

Proportion of bed capacity in key cities of key listed players (FY22)



Note: Key cities include NCR, MMR, Chennai, Hyderabad, Bengaluru, Kolkata and Ahmedabad; Proportion of beds in key cities for Fortis Healthcare and Apollo Hospitals Enterprises have been derived from the list of hospitals on their website; Fortis Healthcare Lts data for FY21. #Apollo NCR hospitals data available for only two hospitals, Indraprastha and Apollo Spectra

*Max Healthcare Group includes beds in associate trust owned hospitals; Global Health Ltd includes beds in Medanta Holdings Pvt Ltd, ** Narayana Hrudalaya bed capacity calculation includes operational beds from the following markets defined in their FY22 investor presentation: Bangalore, Kolkata, Western (only added beds from Mumbai and Ahmedabad for Western), Delhi NCR*

Source: Company annual report, investor presentation, CRISIL Research

Key observations:

- Global Health Ltd's (Medanta) is one of the largest player amongst the players considered above which operate in north region with a capacity of 2,141, 2,176 and 2,404 bed in fiscals 2020, 2021 and 2022 respectively. Max Healthcare Group has the highest bed capacity of approximately 3,050, 3,050 and 3,084 beds in fiscals 2020, 2021 and 2022, respectively, in north region among the hospitals players considered above. (Note: Max Healthcare have additional 328 beds in West region)
- Global Health Ltd's (Medanta) proportion of bed capacity in key cities of India is at 58% just behind Max Healthcare Group's 84% amongst the players considered above operating in north and east regions in India in fiscal 2022.
- Global Health Ltd's (Medanta) reported second highest ARPOB of Rs. 54.55 thousand per operating bed in FY22 following Max Healthcare Group that reported ARPOB of Rs. 59.0 thousand per operating bed

Key financial parameters of major listed hospital players

Key financial parameters (FY21)

Key financials (FY21)	Operating income – FY21 (Rs million)	y-o-y growth (%)	OPBDIT (Rs million)	y-o-y growth (%)	PAT (Rs million)	y-o-y growth (%)
Apollo Hospital Enterprise Ltd	105,669	-6%	11,431	-28%	1,367	-68%
Fortis Healthcare Ltd	39,796	-13%	3,471	-38%	-562	-161%
Global Health Ltd (Medanta)	14,566	-4%	2,076	-6%	288	-21%
Max Healthcare Institute Ltd*	36,290	-17%	6,360	8%	-950	NA
Medica Hospitals Pvt Ltd	4,516	2%	422	-2%	193	-20%
Narayana Hrudayalaya Ltd	25,896	-17%	2,012	-54%	-143	-113%
Paras Healthcare Pvt Ltd	5,971	-1%	399	-43%	-102	-1,162%
Park Hospitals	859	19%	221	75%	146	337%
Sahara India Medical Institute Ltd**	1,926	2%	477	9%	114	106%
Sahu Estate Pvt Ltd	289	8%	71	21%	49	34%
Shalby Ltd	4,309	-12%	864	3%	424	54%
Healthcare Global Enterprises Limited	10,146	-7%	1,278	-26%	-2,211	-76%

Note: n.a.: not applicable/not available

**Group financials (operating income, EBITDA and PAT from investor presentation of MHIL), ^: Values for Sahara India Medical Institute Limited are for FY20 as per latest data available*

***Values for Sahara India Medical Institute Limited are for FY20 as per latest data available*

Source: Company annual reports, CRISIL Research

Key financial parameters (FY22)

Key financial parameters (FY22)	Operating Income- FY22 (Rs Mn)	y-o-y growth (%)	OPBDIT (Rs Mn)	y-o-y growth (%)	PAT (Rs Mn)	y-o-y growth (%)
Apollo Hospital Enterprise Ltd	146,769	39%	22,040	93%	11,084	711%
Fortis Healthcare Limited	56,567	42%	10,097	191%	7,899	Nap
Global Health Limited (Medanta)	21,772	49%	4,659	124%	1,962	581%
Healthcare Global Enterprises Limited	13,978	38%	2,385	87%	389	Nap
Max Healthcare Institute Limited*	52,180	44%	13,900	119%	8,370	Nap
Narayana Hrudayalaya Limited	37,013	43%	6,573	227%	3,421	Nap

Key financial parameters (FY22)	Operating Income- FY22 (Rs Mn)	y-o-y growth (%)	OPBDIT (Rs Mn)	y-o-y growth (%)	PAT (Rs Mn)	y-o-y growth (%)
Shalby Limited	7,020	63%	1,230	42%	540	27%

Note: Nap: Not applicable

**Group financials (operating income, EBITDA and PAT from investor presentation of MHIL)*

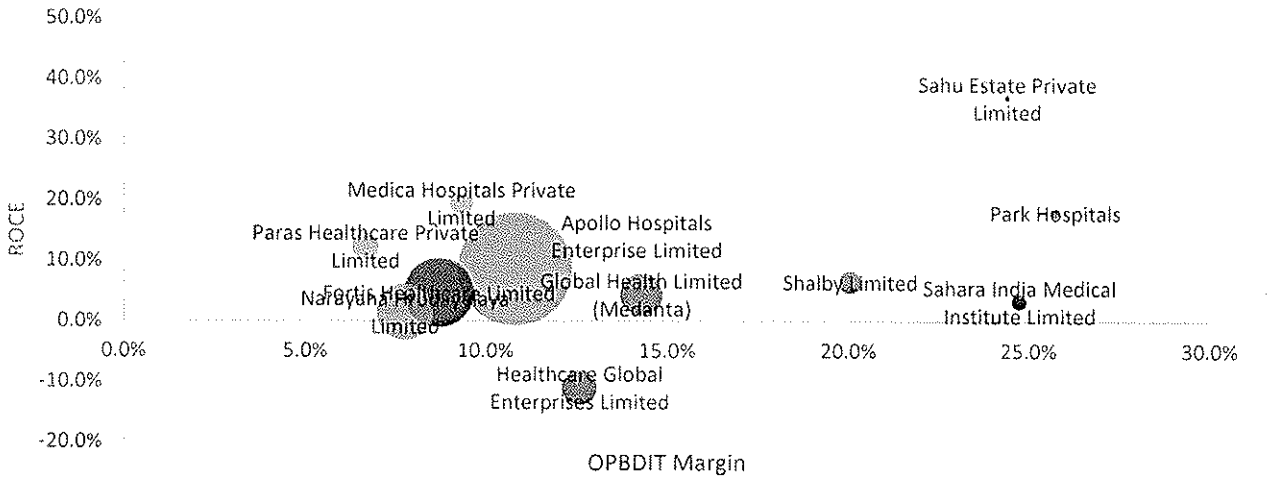
Source: Company annual reports, CRISIL Research

Key observations

- Amongst the companies compared above, Global Health Ltd ("GHL") (Medanta) is one of the largest private multi-speciality tertiary care providers operating in North and East regions of India. In fiscals 2020, 2021 and 2022, Max Healthcare Group had the highest operating revenues of Rs. 43,710 million and Rs. 36,290 million and Rs.52,180 million respectively, while GHL had operating revenues of Rs. 15,232 million, Rs. 14,566 million Rs. 21,772 million, respectively.

- Amongst the companies compared above, GHL had the second highest y-o-y growth in operating revenues for FY22 at 49%. Shalby Ltd had the highest y-o-y growth in operating revenues for FY22 at 63%.

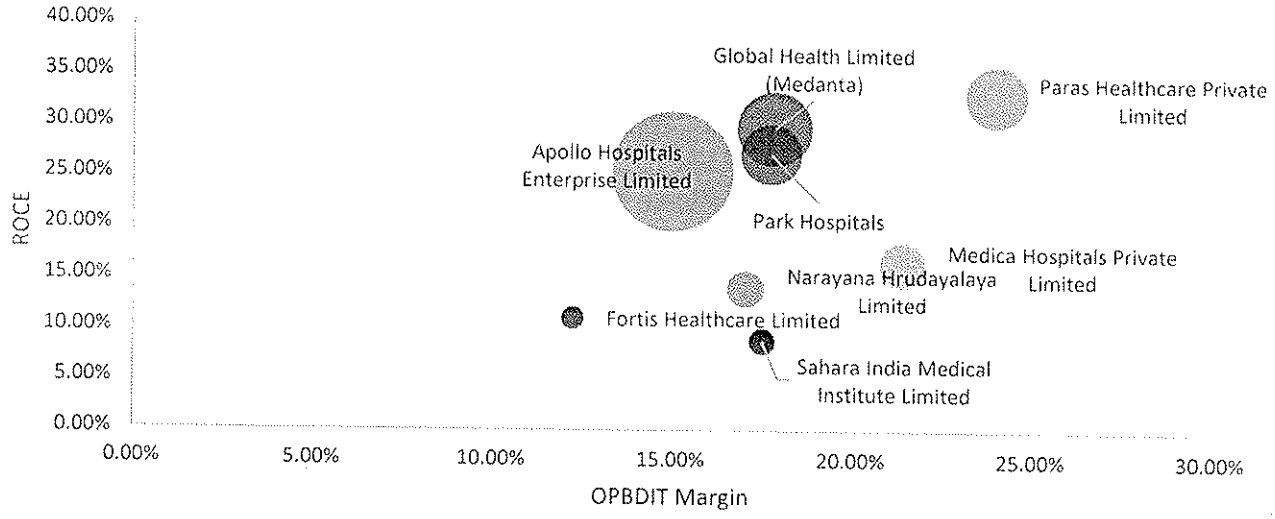
ROCE and OPBDIT Margin for major hospital players (FY21)



OPBDIT Margin: Operating Profit Before Depreciation Interest & Taxes Margin

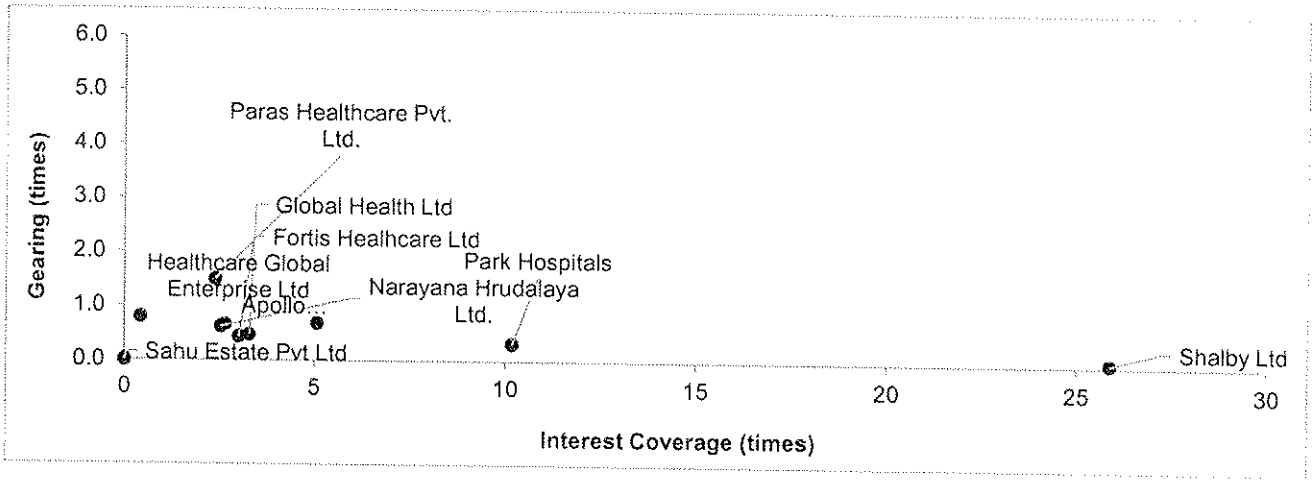
Source: Company annual reports, CRISIL Research

ROCE and OPBDIT Margin for major hospital players (FY22)



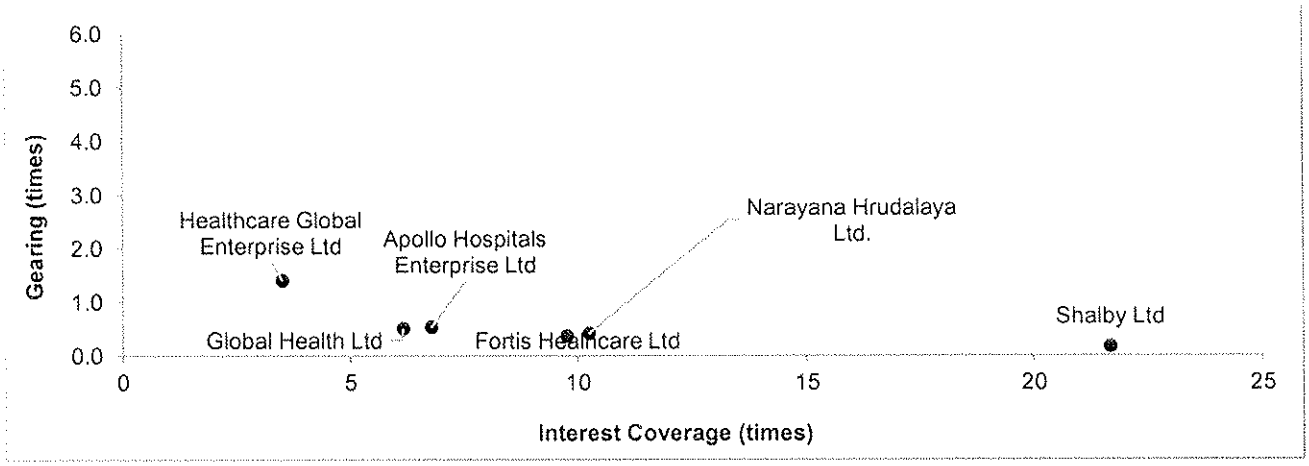
OPBDIT Margin: Operating Profit Before Depreciation Interest & Taxes Margin
Source: Company annual reports, CRISIL Research

Gearing and Interest Coverage for major hospital players (FY21)



Source: Company annual reports, CRISIL Research

Gearing and Interest Coverage for major hospital players (FY22)



Source: Company annual reports, CRISIL Research

Key Financial Ratios for major hospital players (FY21)

Key financial ratios (FY21)	Operating Income-FY21 (Rs million)	Operating margin (%)	Net profit margin (%)	RoCE	Interest coverage (times)	Gearing (times)
Apollo Hospitals Enterprise Limited	105,669	10.8	1.3	8.7	2.7	0.7
Fortis Healthcare Limited	39,796	8.7	-1.4	4.8	3.0	0.4
Global Health Limited (Medanta)	14,566	14.3	2.0	5.0	3.3	0.5
Max Healthcare Institute Limited*	36,290	17.5	-2.6	NA	NA	NA
Medica Hospitals Private Limited	4,516	9.3	4.3	19.5	5.1	0.7
Narayana Hrudayalaya Limited	25,896	7.8	-0.6	1.5	2.5	0.6
Paras Healthcare Private Limited	5,971	6.7	-1.7	12.4	2.4	1.5
Park Hospitals	859	25.7	17.0	18.1	10.2	0.3
Sahara India Medical Institute Limited(**)	1,926	24.7	5.9	3.4	6.1	2.5
Sahu Estate Private Limited	289	24.4	16.9	37.0	0.0	0.0
Shalby Limited	4,309	20.1	9.8	6.55	25.9	0.1

Ratios calculated as per CRISIL Research standards as described below:

- *Operating margin = OPBDIT / Operating income*
- *Net profit margin = Profit after tax / Operating income*
- *RoCE = Profit before interest and tax (PBIT) / [Total debt + Tangible Network]*
- *Interest coverage ratio = Profit before depreciation, interest, and tax (PBDIT1)/ Interest and finance charges*

- *Gearing = Adjusted total debt /Adjusted net worth*

**Group financials (operating income, EBITDA and PAT from investor presentation of MHIL), NA stands for not available*

***Values for Sahara India Medical Institute Limited are for FY20 as per latest data available*

CRISIL Research has taken into account 'Tangible net worth' for calculation of both ROCE and gearing ratio.

Source: Company annual reports, CRISIL Research

Key Financial Ratios for major hospital players (FY22)

Key financial ratios (FY22)	Operating Income-FY22 (Rs Mn)	Operating margin (%)	Net profit margin (%)	RoCE	Interest coverage (times)	Gearing (times)
Apollo Hospitals Enterprise Limited	146,769	15.0	7.6	25.5	6.8	0.5
Fortis Healthcare Limited	56,567	17.9	14.0	29.7	9.8	0.4
Global Health Limited (Medanta)	21,772	21.4	9.0	16.3	6.2	0.5
Healthcare Global Enterprises Limited	13,978	17.1	2.8	13.9	3.5	1.4
Max Healthcare Institute Limited*	52,180	26.7	16.0	NA	NA	NA
Narayana Hrudayalaya Limited	37,013	17.8	9.2	27.2	10.3	0.4
Shalby Limited	7,020	17.5	7.7	8.8	21.7	0.2

Ratios calculated as per CRISIL Research standards as described below:

- *Operating margin = OPBDIT / Operating income*
- *Net profit margin = Profit after tax / Operating income*
- *RoCE = Profit before interest and tax (PBIT) / [Total debt + Tangible Network]*
- *Interest coverage ratio = Profit before depreciation, interest, and tax (PBDIT)/ Interest and finance charges*
- *Gearing = Adjusted total debt /Adjusted net worth*

**Group financials (operating income, EBITDA and PAT from investor presentation of MHIL), NA stands for not available*

CRISIL Research has taken into account 'Tangible net worth' for calculation of both ROCE and gearing ratio.

Source: Company annual reports, CRISIL Research

Key observations:

- Global Health Ltd (Medanta) reported second highest operating margin of 21.4% amongst players compared above in FY22. Max Healthcare reported the highest operating margin of 26.7% amongst the players compared above

Key specialties undertaken by key players

Key players	Key Specialties undertaken (Top 3-5)
Apollo Hospital Enterprise Ltd	Cardiology, Oncology, Neuro Sciences· Gastroenterology
Fortis Healthcare Ltd	Cardiology, Neurology, Orthopaedic, Plastic and Reconstructive Surgery
Global Health Ltd (Medanta)**	Cardiology & Cardiac Science, Oncology, Digestive & Hepatobiliary sciences, Neurosciences, Kidney & Urology, Ortho, Liver Transplant.
Max Healthcare Group*	Oncology, Cardiac Science, Transplants*
Narayana Hrudayalaya Ltd	Cardiac Sciences, Gastro Sciences, Oncology
Shalby Ltd	Arthroplasty, Cardiac Science, Oncology

*Note: *Max Healthcare Group includes associate trust owned hospitals,**-We have considered 7 specialties for Global Health Ltd (Medanta) and three-five for other players.*

Source: Company annual report, investor presentation, CRISIL Research

- Global Health Ltd (GHL) (Medanta) is one of the largest private multi-speciality tertiary care providers operating in the North and East regions of India in terms of bed capacity and operating revenues amongst the players that operate in the North and East regions of India, as of and for the financial year ended March 31, 2022 with key specialties of cardiology and cardiac science, neurosciences, oncology, digestive and hepatobiliary sciences, orthopaedics, liver transplant, and kidney and urology.

Analysis of key industry players

CRISIL Research has used the following financials:

Standalone financials for: Paras Healthcare Private Limited, Medica Hospitals Private Limited, Park Hospitals, Sahara India Medical Institute Limited, Sahu Estate Private Limited as the company reports standalone financials as per MCA filings

Consolidated financials for: Apollo Hospitals Enterprise Limited, Fortis Healthcare Limited, Global Health Limited, Max Healthcare Institute Limited (group financials (operating income, EBITDA and PAT from investor presentation of MHIL), Narayana Hrudayalaya Limited, Shalby Limited

Standalone financials of Paras Healthcare Private Limited for FY2021 due to unavailability of consolidated financials, for the rest of the years consolidated financials have been used for the company.

N.A. stands for not available in all the below tables

Particulars	Apollo Hospitals Enterprise Ltd (AHEL)			Fortis Healthcare Ltd			Global Health Ltd (Medanta)			Max Healthcare Institute Ltd			Medica Hospitals Pvt Ltd			Narayana Hrudalaya Ltd		
	FY 20	FY 21	FY 22	FY 20	FY 21	FY 22	FY 20	FY 21	FY 22	FY 20	FY 21	FY 22	FY 20	FY 21	FY 22	FY 20	FY 21	FY 22
Operating Income (₹ million)	1,12,527	1,05,607	1,46,769	45,606	39,796	56,567	15,232	14,566	21,772	43,710	36,296	52,180	4,445	4,516	N.A.	31,314	25,896	37,013
CAGR Fiscal 2020 – Fiscal 2022 (%)	14.2%			11.4%			19.6%			9.3%			N.A.			8.7%		
Operating Profit Before Depreciation Interest & Taxes (₹ million)	15,921	11,431	22,040	5,570	3,471	10,097	2,295	2,076	4,659	5,870	6,360	13,980	432	422	N.A.	4,418	2,012	6,573
CAGR Fiscal 2020-Fiscal 2022 (%)	17.7%			34.6%			45.4%			53.9%			N.A.			22.0%		
Operating Expense (₹ million)	96,606	94,226	1,24,729	40,031	36,325	46,470	13,027	12,490	17,112	37,840	29,936	38,280	4,013	4,094	N.A.	26,896	23,884	30,440
CAGR Fiscal 2020 – Fiscal 2022 (%)	13.6%			7.7%			14.6%			0.6%			N.A.			6.4%		
Return on Equity (ROE) (%)	14.1%	3.7%	24.2%	2.7%	-1.8%	28.9%	2.7%	2.1%	13.1%	0%	-46.0%	59.9%	39.4%	23.6%	N.A.	11.8%	-1.4%	28.7%
Return on Capital employed (RoCE) (%)	17.0%	8.7%	25.5%	7.0%	4.8%	29.7%	5.9%	5.0%	16.3%	20.0%	4.7%	32.9%	22.9%	19.5%	N.A	14.1%	1.5%	27.2%
Return on Assets (RoA) (%)	1	1	1.2	0.6	0.6	0.8	0.6	0.5	0.7	0.7	0.7	1	1.5	1.5	N.A	1.1	1	1.2
Current ratio (i.e. liquidity ratio)	1.1	1.8	1.7	0.4	0.8	0.9	1.3	1.2	1.9	0.4	1.4	1.3	0.4	0.5	N.A	1	0.8	1
Debt Equity ratio	1.2	0.7	0.5	0.4	0.4	0.4	0.5	0.5	0.5	-5.2	1.1	0.8	0.9	0.7	N.A	0.7	0.6	0.4
Interest coverage ratio	3.4	2.7	6.8	3.6	3	9.8	4.5	3.3	6.2	2.4	1.5	10.5	6.3	5.1	N.A	4.7	2.5	10.3
Average Collection Period (Days)	33.6	46.4	44.4	37.2	35.9	28.7	36.6	34.1	30.5	96.9	71.4	45.8	35.7	36.3	N.A	30.8	39.7	43.1

10. Days cash on hand = (Net Cash Accruals*365)/ (Cost of Sales-depreciation)
11. Cash ratio = (Cash + Marketable securities)/current liabilities
12. Net working capital = Current Assets - Current Liabilities
13. Debt equity ratio = Total Debt / Tangible Net worth
14. Debt service coverage ratio = Operating income/(short term debt + current portion of long-term debt)
15. Interest coverage ratio = PBDIT / Interest and Finance Charges
16. Total assets turnover ratio = Operating income/Total Assets
17. Fixed assets turnover ratio = Operating income/Net Fixed Assets
18. Capital turnover ratio = Operating income/net working capital
19. Current asset turnover ratio = Operating income/current Assets
20. Inventory turnover ratio = Cost of Goods sold/Average inventory
21. Receivables turnover ratio = (365/Average collection period) = operating income / net receivables
22. Payables turnover ratio = (365/Average payment days) = Total credit purchases/ average account payables
23. Earnings per share (EPS) = Reported Post Tax Earnings Per Share
24. Net Asset value (NAV) = Reported Book Value (in Rs Per share)

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