Healthcare

The Indian Constitution makes the provision of **healthcare in India** the responsibility of the state governments, rather than the central federal government. It makes every state responsible for "raising the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties".

The National Health Policy was endorsed by the Parliament of India in 1983 and updated in 2002, and then again updated in 2017. The recent four main updates in 2017 mentions the need to focus on the growing burden of non-communicable diseases, on the emergence of the robust healthcare industry, on growing incidences of unsustainable expenditure due to health care costs and on rising economic growth enabling enhanced fiscal capacity. In practice however, the private healthcare sector is responsible for the majority of healthcare in India, and most healthcare expenses are paid directly out of pocket by patients and their families, rather than through health insurance. Government health policy has thus far largely encouraged private-sector expansion in conjunction with well designed but limited public health programmes.

A government-funded health insurance project was launched in 2018 by the Government of India, called Ayushman Bharat.

According to the World Bank, the total expenditure on health care as a proportion of GDP in 2015 was 3.89%. Out of 3.89%, the governmental health expenditure as a proportion of GDP is just 1%, and the out-of-pocket expenditure as a proportion of the current health expenditure was 65.06% in 2015.

Healthcare system

Public healthcare

Public healthcare is free and subsidized for those who are below the poverty line. The Indian public health sector encompasses 18% of total outpatient care and 44% of total inpatient care. Middle and upper class individuals living in India tend to use public healthcare less than

those with a lower standard of living. Additionally, women and the elderly are more likely to use public services. The public health care system was originally developed in order to provide a means to healthcare access regardless of socioeconomic status or caste. However, reliance on public and private healthcare sectors varies significantly between states. Several reasons are cited for relying on the private rather than public sector; the main reason at the national level is poor quality of care in the public sector, with more than 57% of households pointing to this as the reason for a preference for private health care. Much of the public healthcare sector caters to the rural areas, and the poor quality arises from the reluctance of experienced healthcare providers to visit the rural areas. Consequently, the majority of the public healthcare system catering to the rural and remote areas relies on inexperienced and unmotivated interns who are mandated to spend time in public healthcare clinics as part of their curricular requirement. Other major reasons are long distances between public hospitals and residential areas, long wait times, and inconvenient hours of operation.

Different factors related to public healthcare are divided between the state and national government systems in terms of making decisions, as the national government addresses broadly applicable healthcare issues such as overall family welfare and prevention of major diseases, while the state governments handle aspects such as local hospitals, public health, promotion and sanitation, which differ from state to state based on the particular communities involved. Interaction between the state and national governments does occur for healthcare issues that require larger scale resources or present a concern to the country as a whole.

Considering the goal of obtaining universal health care as part of Sustainable Development Goals, scholars request policy makers to acknowledge the form of healthcare that many are using. Scholars state that the government has a responsibility to provide health services that are affordable, adequate, new and acceptable for its citizens. Public healthcare is very necessary, especially when considering the costs incurred with private services. Many citizens rely on subsidized healthcare. The national budget, scholars argue, must allocate money to the public health sector to ensure the poor are not left with the stress of meeting private sector payments.

Following the 2014 election which brought Prime Minister Narendra Modi to office, the government unveiled plans for a nationwide universal health care system known as the National Health Assurance Mission, which would provide all citizens with free drugs, diagnostic treatments, and insurance for serious ailments. In 2015, implementation of a universal health care system was delayed due to budgetary concerns. In April 2018 the government announced the Aayushman Bharat scheme that aims to cover up to Rs. 5 lakh to 100,000,000 vulnerable families (approximately 500,000,000 persons – 40% of the country's population). This will cost around $1.7 billion each year. Provision would be partly through private providers.

Private healthcare

Since 2005, most of the healthcare capacity added has been in the private sector, or in partnership with the private sector. The private sector consists of 58% of the hospitals in the country, 29% of beds in hospitals, and 81% of doctors.

According to National Family Health Survey-3, the private medical sector remains the primary source of health care for 70% of households in urban areas and 63% of households in rural areas. The study conducted by IMS Institute for Healthcare Informatics in 2013, across 12 states in over 14,000 households indicated a steady increase in the usage of private healthcare facilities over the last 25 years for both Out Patient and In Patient services, across rural and urban areas. In terms of healthcare quality in the private sector, a 2012 study by Sanjay Basu et al., published in *PLOS Medicine*, indicated that health care providers in the private sector were more likely to spend a longer duration with their patients and conduct physical exams as a part of the visit compared to those working in public healthcare. However, the high out of pocket cost from the private healthcare sector has led many households to incur Catastrophic Health Expenditure, which can be defined as health expenditure that threatens a household's capacity to maintain a basic standard of living. Costs of the private sector are only increasing. One study found that over 35% of poor Indian households incur such expenditure and this reflects the detrimental state in which Indian health care system is at the moment. With government expenditure on health as a percentage of GDP falling over the years and the rise of private health care sector, the poor are left with fewer options than before to access health care services. Private insurance is available in India, as are various through government-sponsored health insurance schemes. According to the World Bank, about 25% of India's population had some form of health insurance in 2010. A 2014 Indian government study found this to be an over-estimate, and claimed that only about 17% of India's population was insured. Private healthcare providers in India typically offer high quality treatment at unreasonable costs as there

is no regulatory authority or statutory neutral body to check for medical malpractices.
In Rajasthan, 40% of practitioners did not have a medical degree and 20% have not completed a secondary education. On 27 May 2012, popular actor Aamir Khan's show Satyamev Jayate did an episode on "Does Healthcare Need Healing?" which highlighted the high costs and other malpractices adopted by private clinics and hospitals. In response to this, Narayana Health plans to conduct heart operations at a cost of $800 per patient.

Medication

In 1970, the Indian government banned medical patents. India signed the 1995 TRIPS Agreement which allows medical patents, but establishes the compulsory license, where any pharmaceutical company has the right to produce any patented product by paying a fee. This right was used in 2012, when Natco was allow to produce Nexavar, a cancer drug. In 2005, new legislation stipulated that a medicine could not be patented if it did not result in "the enhancement of the known efficacy of that substance".

Indians consumed the most antibiotics per head in the world in 2010. Many antibiotics were on sale in 2018 which had not been approved in India or in the country of origin, although this is prohibited. A survey in 2017 found 3.16% of the medicines sampled were substandard and 0.0245% were fake. Those more commonly prescribed are probably more often faked. Some medications are listed on Schedule H1, which means they should not be sold without a prescription. Pharmacists should keep records of sales with the prescribing doctor and the patient's details.

Access to healthcare

As of 2013, the number of trained medical practitioners in the country was as high as 1.4 million, including 0.7 million graduate allopaths. Yet, India has failed to reach its Millennium Development Goals related to health. The definition of 'access is the ability to receive services of a certain quality at a specific cost and convenience. The healthcare system of India is lacking in three factors related to access to healthcare: provision, utilization, and attainment. Provision, or the supply of healthcare facilities, can lead to utilization, and finally attainment of good health. However, there currently exists a huge gap between these factors, leading to a collapsed system with insufficient access to healthcare. Differential distributions of services, power, and resources have resulted in inequalities in healthcare access. Access and entry into hospitals depends on gender, socioeconomic status, education, wealth, and location of residence (urban versus rural). Furthermore, inequalities in financing healthcare and distance from healthcare facilities are barriers to access. Additionally, there is a lack of sufficient infrastructure in areas with high concentrations of poor individuals. Large numbers of tribes and ex-untouchables that live in isolated and dispersed areas often have low numbers of professionals. Finally, health services may have long wait times or consider ailments as not serious enough to treat. Those with the greatest need often do not have access to healthcare.

Electronic health records

The Government of India, while unveiling the National Health Portal, has come out with guidelines for Electronic health record standards in India. The document recommends a set of standards to be followed by different healthcare service providers in India, so that medical data becomes portable and easily transferable.

India is considering to set up a National eHealth Authority (NeHA) for standardisation, storage and exchange of electronic health records of patients as part of the government's Digital India programme. The authority, to be set up by an Act of Parliament will work on the integration of multiple health IT systems in a way that ensures security, confidentiality and privacy of patient data. A centralised electronic health record repository of all citizens which is the ultimate goal of the authority will ensure that the health history and status of all patients would always be available to all health institutions. Union Health Ministry has circulated a concept note for the setting up of **NeHa**, inviting comments from stakeholders.

Rural areas

Rural areas in India have a shortage of medical professionals. 74% of doctors are in urban areas that serve the other 28% of the population. This is a major issue for rural access to healthcare. The lack of human resources causes citizens to resort to fraudulent or ignorant providers. Doctors tend not to work in rural areas due to insufficient housing, healthcare, education for children, drinking water, electricity, roads and transportation. Additionally, there exists a shortage of infrastructure for health services in rural areas. In fact, urban public hospitals have twice as many beds as rural hospitals, which are lacking in supplies. Studies have indicated that the mortality risks before the age of five are greater for children living in certain rural areas compared to urban communities.[1] Full immunization coverage also varies between rural and urban India, with 39% completely immunized in rural communities and 58% in urban areas across India. Inequalities in healthcare can result from factors such as socioeconomic status and caste, with caste serving as a social determinant of healthcare in India.

Case study in Rural India

A 2007 study by Vilas Kovai et al., published in the *Indian Journal of Ophthalmology* analyzed barriers that prevent people from seeking eye care in rural Andhra Pradesh, India. The results displayed that in cases where people had awareness of eyesight issues over the past five years but did not seek treatment, 52% of the respondents had personal reasons (some due to own beliefs about the minimal extent of issues with their vision), 37% economic hardship, and 21% social factors (such as other familial commitments or lacking an accompaniment to the healthcare facility).

The role of technology, specifically mobile phones in health care has also been explored in recent research as India has the second largest wireless communication base in the world, thus providing a potential window for mobile phones to serve in delivering health care. Specifically, in one 2014 study conducted by Sherwin DeSouza et al. in a rural village near Karnataka, India, it was found that participants in community who owned a mobile phone (87%) displayed a high interest rate (99%) in receiving healthcare information through this mode, with a greater preference for voice calls versus SMS (text) messages for the healthcare communication medium. Some specific examples of healthcare information that could be provided includes reminders about vaccinations and medications and general health awareness information.

Rural north India

The distribution of healthcare providers varies for rural versus urban areas in North India. A 2007 study by Ayesha De Costa and Vinod Diwan, published in *Health Policy,* conducted in Madhya Pradesh, India examined the distribution of different types of healthcare providers across urban and rural Madhya Pradesh in terms of the differences in access to healthcare through number of providers present. The results indicated that in rural Madhya Pradesh, there was one physician per 7870 people, while there was one physician per 834 people in the urban areas of the region. In terms of other healthcare providers, the study found that of the qualified paramedical staff present in Madhya Pradesh, 71% performed work in the rural areas of the region. In addition, 90% of traditional birth attendants and unqualified healthcare providers in Madhya Pradesh worked in the rural communities.

Studies have also investigated determinants of healthcare-seeking behavior (including socioeconomic status, education level, and gender), and how these contribute to overall access to healthcare accordingly. A 2016 study by Wameq Raza et al., published in *BMC Health Services Research,* specifically surveyed healthcare-seeking behaviors among people in rural Bihar and Uttar Pradesh, India. The findings of the study displayed some variation according to acute illnesses versus chronic illnesses. In general, it was found that as socioeconomic status increased, the probability of seeking healthcare increased. Educational level did not correlate to probability of healthcare-seeking behavior for acute illnesses, however, there was a positive correlation between educational level and chronic illnesses. This 2016 study also considered the social aspect of gender as a determinant for health-seeking behavior, finding that male children and adult men were more likely to receive treatment for acute ailments compared to their female counterparts in the areas of rural Bihar and Uttar Pradesh represented in the study. These inequalities in healthcare based on gender access contribute towards the differing mortality rates for boys versus girls, with the mortality rates greater for girls compared to boys, even before the age of five.

Other previous studies have also delved into the influence of gender in terms of access to healthcare in rural areas, finding gender inequalities in access to healthcare. A 2002 study conducted by Aparna Pandey et al., published in the *Journal of Health, Population, and Nutrition,* analyzed care-seeking behaviors by families for girls versus boys, given similar sociodemographic characteristics in West Bengal, India. In general, the results exhibited clear gender differences such that boys received treatment from a healthcare facility if needed in 33% of the cases, while girls received treatment in 22% of the instances requiring care. Furthermore, surveys indicated that the greatest gender inequality in access to healthcare in India occurred in the provinces of Haryana, and Punjab.

Urban Areas

The problem of healthcare access arises not only in huge cities but in rapidly growing small urban areas. Here, there are fewer available options for healthcare services and there are less organized governmental bodies. Thus, there is often a lack of accountability and cooperation in healthcare departments in urban areas. It is difficult to pinpoint an establishment responsible for providing urban health services, compared to in rural areas where the responsibility lies with the district administration. Additionally, health inequalities arise in urban areas due to difficulties in residence, socioeconomic status, and discrimination against unlisted slums.

To survive in this environment, urban people use non-governmental, private services which are plentiful. However, these are often understaffed, require three times the payment as a public center, and commonly have bad practice methods. To counter this, there have been efforts to join the public and private sectors in urban areas. An example of this is the Public-Private Partnerships initiative. However, studies show that in contrast to rural areas, qualified physicians tend to reside in urban areas. This can be explained by both urbanization and specialization. Private doctors tend to be specialized in a specific field so they reside in urban areas where there is a higher market and financial ability for those services.

Financing

Despite being one of the most populous countries, India has the most private healthcare in the world. Out-of-pocket private payments make up 75% of the total expenditure on healthcare. Only one fifth of healthcare is financed publicly. This is in stark contrast to most other countries of the world. According to the World Health Organization in 2007, India ranked 184 out of 191 countries in the amount of public expenditure spent on healthcare out of total GDP. In fact, public spending stagnated from 0.9% to 1.2% of total GDP in 1990 to 2010.

Medical and non-medical out-of-pocket private payments can affect access to healthcare. Poorer populations are more affected by this than the wealthy. The poor pay a disproportionately higher percent of their income towards out-of-pocket expenses than the rich. The Round National Sample Survey of 1955 through 1956 showed that 40% of all people sell or borrow assets to pay for hospitalization. Half of the bottom two quintiles go into debt or sell their assets, but only a third of the top quintiles do. In fact, about half the households that drop into the lower classes do so

because of health expenditures. This data shows that financial ability plays a role in determining healthcare access.

In terms of non-medical costs, distance can also prevents access to healthcare. Costs of transportation prevent people from going to health centers. According to scholars, outreach programs are necessary to reach marginalized and isolated groups.

In terms of medical costs, out-of-pocket hospitalization fees prevent access to healthcare. 40% of people that are hospitalized are pushed either into lifelong debt or below the poverty line. Furthermore, over 23% of patients don't have enough money to afford treatment and 63% lack regular access to necessary medications. Healthcare and treatment costs have inflated 10–12% a year and with more advancements in medicine, costs of treatment will continue to rise. Finally, the price of medications rise as they are not controlled.

There is a major gap between outreach, finance and access in India. Without outreach, services cannot be spread to distant locations. Without financial ability, those in distant locations cannot afford to access healthcare. According to scholars, both of these issues are tied together and are pitfalls of the current healthcare system.

Initiatives to improve access

Government-led

The Twelfth Plan

The government of India has a Twelfth Plan to expand the National Rural Health Mission to the entire country, known as the National Health Mission. Community based health insurance can assist in providing services to areas with disadvantaged populations. Additionally, it can help to emphasize the responsibility of the local government in making resources available. Furthermore, according to the Indian Journal of Community Medicine (IJOCM) the government should reform health insurance as well as its reach in India. The journal states that universal healthcare should slowly yet steadily be expanded to the entire population. Healthcare should be mandatory and no money should be exchanged at appointments. Finally,

both private and public sectors should be involved to ensure all marginalized areas are reached. According to the IJOCM, this will increase access for the poor.

National Rural Health Mission

To counteract the issue of a lack of professionals in rural areas, the government of India wants to create a 'cadre' of rural doctors through governmental organizations. The National Rural Health Mission (NRHM) was launched in April 2005 by the Government of India. The NRHM has outreach strategies for disadvantaged societies in isolated areas. The goal of the NRHM is to provide effective healthcare to rural people with a focus on 18 states with poor public health indicators and/or weak infrastructure. NRHM has 18,000 ambulances and a workforce of 900,000 community health volunteers and 178,000 paid staff. The mission proposes creating a course for medical students that is centered around rural healthcare. Furthermore, NRHM wants to create a compulsory rural service for younger doctors in the hopes that they will remain in rural areas. However, the NRHM has failings. For example, even with the mission, most construction of health related infrastructure occurs in urban cities. Many scholars call for a new approach that is local and specialized to each state's rural areas. Other regional programs such as the Rajiv Aarogyasri Community Health Insurance Scheme in Andhra Pradesh, India have also been implemented by state governments to assist rural populations in healthcare accessibility, but the success of these programs (without other supplemental interventions at the health system level) has been limited.

National Urban Health Mission

The National Urban Health Mission as a sub-mission of National Health Mission was approved by the cabinet on 1 May 2013. The National Urban Health Mission (NUHM) works in 779 cities and towns with populations of 50,000 each. As urban health professionals are often specialized, current urban healthcare consists of secondary and tertiary, but not primary care. Thus, the mission focusses on expanding primary health services to the urban poor. The initiative recognizes that urban healthcare is lacking due to overpopulation, exclusion of populations, lack of information on health and economic ability, and unorganized health services.[1] Thus, NUHM has appointed three tiers that need improvement: Community level (including outreach programs), Urban Health Center level (including infrastructure and improving existing health systems), and Secondary/Tertiary level (Public-Private Partnerships). Furthermore, the initiative aims to have one Urban Public Health Center for each population of 50,000 and aims to fix current facilities and create new ones. It plans for small municipal governments to take responsibility for planning healthcare facilities that are prioritized towards the urban poor, including unregistered slums and other groups. Additionally, NUHM aims to improve sanitation and drinking water, improve community outreach programs to further access, reduce out-of-pocket expenses for treatment, and initiate monthly health and nutrition days to improve community health.

Pradhan Mantri Jan Arogya Yojana(PM-JAY)

Pradhan Mantri Jan Arogya Yojana (PM-JE) is a leading initiative of Prime Minister Modi to ensure health coverage for the poor and weaker population in India. This initiative is part of the government's view to ensure that its citizens – particularly poor and weaker groups, have access to healthcare and good quality hospital services without facing financial difficulty.

PM-JAY Provides insurance cover up to Rs 5 lakh per annum to the 100 million families in India for secondary and tertiary hospitalization. For transparency, the government made an online portal (Mera PmJay) to check eligibility for PMJAY. Health care service includes follow-up care, daycare surgeries, pre and post hospitalization, hospitalization expenses, expense benefits and newborn child/children services. The comprehensive list of services is available on the website.

Public-private partnership

One initiative adapted by governments of many states in India to improve access to healthcare entails a combination of public and private sectors. The Public-Private Partnership Initiative (PPP) was created in the hopes of reaching the health-related Millennium Development Goals. In terms of prominence, nearly every new state health initiative includes policies that allow for the involvement of private entities or non-governmental organizations.

Major programs

Fair Price Shops aim to reduce the costs of medicines, drugs, implants, prosthetics, and orthopedic devices. Currently, there is no competition between pharmacies and medical service stores for the sale of drugs. Thus, the price of drugs is uncontrolled. The Fair Price program creates a bidding system for cheaper prices of medications between drugstores and allows the store with the greatest discount to sell the drug. The program has a minimal cost for the government as fair price shops take the place of drugstores at government hospitals, thus eliminating the need to create new infrastructure for fair price shops. Furthermore, the drugs are unbranded and must be prescribed by their generic name. As there is less advertising required for generic brands, fair price shops require minimal payment from the private sector. Fair Price Shops were introduced in the West Bengal in 2012. By the end of the year, there were 93 stores benefiting 85 lakh people. From December 2012 to November 2014, these shops had saved 250 crore citizens. As doctors prescribe 60% generic drugs, the cost of treatment has been reduced by this program. This is a solution to affordability for health access in West Bengal.

The largest segment of the PPP initiative is the tax-financed program, Rashtriya Swasthya Bima Yojana (RSBY). The scheme is financed 75% by the central government and 25% by the state government. This program aims to reduce medical out-of-pocket costs for hospital treatment and visits by reimbursing those that live below the poverty line. RSBY covers maximum 30,000 rupees in hospital expenses, including pre-existing conditions for up to five members in a family. In 2015, it reached 37 million households consisting of 129 million people below the poverty line. However, a family has to pay 30 rupees to register in the program. Once deemed eligible, family members receive a yellow card. However, studies show that in Maharashtra, those with a lower socioeconomic status tend to not use the service, even if they are eligible. In the state of Uttar Pradesh, geography and council affect participation in the program. Those in the outskirts of villages tend to use the service less than those who live in the center of villages. Additionally, studies show household non-medical expenses as increasing due to this program; the probability of incurring out-of-pocket expenses has increased by 23%. However, RSBY has stopped many from falling into poverty as a result of healthcare. Furthermore, it has

improved opportunities for family members to enter the workforce as they can utilize their income for other needs besides healthcare. RSBY has been applied in 25 states of India.

Finally, the National Rural Telemedicine Network connects many healthcare institutions together so doctors and physicians can provide their input into diagnosis and consultations. This reduces the non-medical cost of transportation as patients do not have to travel far to get specific doctor's or specialty's opinions. However, problems arise in terms of the level of care provided by different networks. While some level of care is provided, telemedical initiatives are unable to provide drugs and diagnostic care, a necessity in rural areas.

Effectiveness

The effectiveness of public-private partnerships in healthcare is hotly disputed. Critics of PPP are concerned of its presentation as a cure-all solution, by which the health infrastructure can be improved. Proponents of PPP claim that these partnerships take advantage of existing infrastructure in order to provide care for the underprivileged.

The results of the PPP in the states of Maharashtra and West Bengal show that all three of these programs are effective when used in combination with federal health services. They assist in filling the gap between outreach and affordability in India. However, even with these programs, high out-of-pocket payments for non-medical expenses are still deterring people from healthcare access. Thus, scholars state that these programs need to be expanded across India.

A case study of tuberculosis control in rural areas, in which PPP was utilized showed limited effectiveness; while the program was moderately effective, a lack of accountability forced the program to shut down. Similar issues in accountability were seen by the parties involved within other PPP schemes. Facilitators and private practitioners, when asked about PPP, identified lack of state support, in the form of adequate funding, and a lack of coordination, as primary reasons why PPP ventures are unsuccessful.

In the most successful PPP ventures, the World Health Organization found that the most prominent factor, aside from financial support, was ownership of the project by state and local governments. It was found that programs sponsored by the state governments were more effective in achieving health goals than programs set by national governments.

India's has setup a National Telemedicine Taskforce by the Health Ministry of India, in 2005, paved way for the success of various projects like the ICMR-AROGYASREE, NeHA and VRCs. Telemedicine also helps family physicians by giving them easy access to speciality doctors and helping them in close monitoring of patients. Different types of telemedicine services like store and forward, real-time and remote or self-monitoring provides various educational, healthcare delivery and management, disease screening and disaster management services all over the globe. Even though telemedicine cannot be a solution to all the problems, it can surely help decrease the burden of the healthcare system to a large extent.

Quality of healthcare

Non-availability of diagnostic tools and increasing reluctance of qualified and experienced healthcare professionals to practice in rural, under-equipped and financially less lucrative rural areas are becoming big challenges. Rural medical practitioners are highly sought after by residents of rural areas as they are more financially affordable and geographically accessible than practitioners working in the formal public health care sector. But there are incidents where doctors were attacked and even killed in rural India In 2015 the British Medical Journal published a report by Dr Gadre, from Kolkata, exposed the extent of malpractice in the Indian healthcare system. He interviewed 78 doctors and found that kickbacks for referrals, irrational drug prescribing and unnecessary interventions were commonplace.

According to a study conducted by Martin Patrick, CPPR chief economist released in 2017 has projected people depend more on private sector for healthcare and the amount spent by a household to avail of private services is almost 24 times more than what is spent for public healthcare services.

South India

In many rural communities throughout India, healthcare is provided by what is known as informal providers, who may or may not have proper medical accreditation to diagnose and treat patients, generally offering consults for common ailments. Specifically, in Guntur, Andhra Pradesh, India, these informal healthcare providers generally practice in the form of services in the homes of patients and prescribing allopathic drugs. A 2014 study by Meenakshi Gautham et al., published in the journal *Health Policy and Planning*, found that in Guntur, about 71% of patients received injections from informal healthcare providers as a part of illness management strategies. The study also examined the educational background of the informal healthcare providers and found that of those surveyed, 43% had completed 11 or more years of schooling, while 10% had graduated from college.

In general, the perceived quality of healthcare also has implications on patient adherence to treatment. A 2015 study conducted by Nandakumar Mekoth and Vidya Dalvi, published in *Hospital Topics* examined different aspects that contribute to a patient's perception of quality of healthcare in Karnataka, India, and how these factors influenced adherence to treatment. The study incorporated aspects related to quality of healthcare including interactive quality of physicians, base-level expectation about primary health care facilities in the area, and non-medical physical facilities (including drinking water and restroom facilities). In terms of adherence to treatment, two sub-factors were investigated, persistence of treatment and treatment-supporting adherence (changes in health behaviors that supplement the overall treatment plan). The findings indicated that the different quality of healthcare factors surveyed all had a direct influence on both sub-factors of adherence to treatment. Furthermore, the base-level expectation component in quality of healthcare perception, presented the most significant influence on overall adherence to treatment, with the interactive quality of physicians having the least influence on adherence to treatment, of three aspects investigated in this study.

North India

In a particular district of Uttarakhand, India known as Tehri, the educational background of informal healthcare providers indicated that 94% had completed 11 or more years of schooling, while 43% had graduated from college. In terms of the mode of care delivered, 99% of the health services provided in Tehri were through the clinic, whereas in Guntur, Andhra Pradesh, 25% of the health care services are delivered through the clinic, while 40% of the care provided is mobile (meaning that healthcare providers move from location to location to see patients), and 35% is a combination of clinic and mobile service.

In general throughout India, the private healthcare sector does not have a standard of care that is present across all facilities, leading to many variations in the quality of care provided. In

particular, a 2011 study by Padma Bhate-Deosthali et al., published in *Reproductive Health Matters*, examined the quality of healthcare particularly in the area of maternal services through different regions in Maharashtra, India. The findings indicated that out of 146 maternity hospitals surveyed, 137 of these did not have a qualified midwife, which is crucial for maternity homes as proper care cannot be delivered without midwives in some cases. In addition, the 2007 study by Ayesha De Costa and Vinod Diwan analyzed the distribution of healthcare providers and systems in Madhya Pradesh, India. The results indicated that among solo practitioners in the private sector for that region, 62% practiced allopathic (Western) medicine, while 38% practiced Indian systems of medicine and traditional systems (including, but not limited to ayurveda, sidhi, unani, and homeopathy).

In certain areas, there are also gaps in the knowledge of healthcare providers about certain ailments that further contribute towards quality of healthcare delivered when treatments are not fully supported with thorough knowledge about the ailment. A 2015 study by Manoj Mohanan et al., published in *JAMA Pediatrics,* investigate the knowledge base of a sample of practitioners (80% without formal medical degrees) in Bihar, India, specifically in the context of childhood diarrhea and pneumonia treatment. The findings indicated that in general, a significant number of practitioners missed asking key diagnostic questions regarding symptoms associated with diarrhea and pneumonia, leading to misjudgments and lack of complete information when prescribing treatments. Among the sample of practitioners studied in rural Bihar, 4% prescribed the correct treatment for the hypothetical diarrhea cases in the study, and 9% gave the correct treatment plan for the hypothetical pneumonia cases presented. Recent studies have examined the role of educational or training programs for healthcare providers in rural areas of North India as a method to promote higher quality of healthcare, though conclusive results have not yet been attained.

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