



Human Resources Technical Paper I ¹

Situation Analysis of the Health Workforce in India

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Introduction

Equitable and efficient delivery of health services has a profound impact on population health. Health workers who are responsible for delivering health services play a critical role in the functioning of the health system. Numerical adequacy, appropriate skill mix, geographical spread and ease of financial access, are all vital to achieve better outcomes in terms of reduced morbidity and mortality. Greater availability of health workers has been shown to be associated both with increased service utilization as well as health outcomes such as immunization coverage and child and maternal survival (Anand and Bärnighausen 2004).

This background paper examines the situation of human resources for health in India today. We provide estimates for the health workforce both in terms of size and distribution based on recent studies in this field. In addition we survey the state of medical and nursing education, since the production of health workers today has critical implications for the health workforce of tomorrow.

While the number of doctors, nurses and midwives aggregated at the national level, is about half of the WHO prescribed norm of 24.5 per 10,000 population, the number of unqualified practitioners is staggering. Restricting workforce estimates to qualified providers reduces the size of the health workforce to one fourth of the WHO norm. This coupled with state wise and urban- rural disparities means that a large number of Indians mostly rural dwellers or the urban poor receive care from unqualified or under qualified providers.

It is critical to overcome constraints in the field of human resources if Universal Health Coverage is to be achieved. A national policy on human resources for health, allowing for modifications at the state level is the need of the hour.

This report has four broad parts. We begin with a brief description of the different cadres of workers that constitute the health work force in India. The next section provides numerical estimates of health workers across different cadres. In this section, we discuss the difficulties of accurate enumeration of the health workforce in India and use a number of data sources to provide what we believe are best estimates. We also address issues of distribution of the workforce across states, rural and urban areas, the public and private sector as well as those of female participation in the health workforce. The next part describes the problem of vacancies in the public health system today. This is followed by an overview of the production of health workers in the country, examining both medical and nursing education. We end with a discussion on how appropriate medical and nursing education as it currently exists is to the health needs of the country.

Health Care Cadres in India: a brief overview

Healthcare in India is provided by a variety of cadres with varying skill levels, across a range of systems of medicine and both in the public and private sector. The following table describes the various cadres, and mentions the degree that is typically granted along with the regulatory body, in case such a body is existent.

Table 1 – Cadres of Health workers in India

Doctors (allopathic): medical graduates who hold either an MBBS (Bachelors degree in Medicine and Surgery) degree alone or an MBBS degree with a specialist degree or diploma. Education is imparted in Medical Colleges. The Medical Council of India is acknowledged as the regulatory body for institutions granting these degrees.

Practitioners of Ayurveda, Homeopathy, Unani, Sidha: this group collectively known as AYUSH doctors hold bachelors or post graduate degrees in one of the above systems of traditional medicine. The regulatory body is the Central Council for Indian Medicine or the Central Council for Homeopathy.

Nurses: Nursing qualifications include a three and a half year diploma in General Nursing and Midwifery (GNM) or a four year bachelors degree (B.Sc) which may be followed by a two to three year post graduate degree (M.Sc) registered with the Nursing Council of India.

Dentists: The basic bachelors degree (BDS) which may be followed by post-graduate training in the form of a Masters degree (MDS). The regulatory body is the Dental Council of India.

Pharmacists: with a bachelors or masters degree in pharmacy.

Auxiliary Nurses and Midwives: This group receives a two year diploma in auxiliary nursing and midwifery.

Community Health Workers: This group consists of individuals who have undergone at least ten years of formal education. They receive 23 days of training to perform this function. The broad group of Community Health Workers includes cadres such as Health Assistants and Health Educators.

Accredited Social Health Activists (ASHAs): this is a cadre of health volunteers set up under the NRHM. They are resident in the village that they work in, have a minimum of eight years of formal education and are usually women in the age range of 25-45 years.

Registered Medical Practitioners: This group consists of unlicensed practitioners who mainly practice allopathic medicine. They are found both in rural and urban areas and have little to no formal medical training.

Traditional Healers: this heterogeneous group includes those who use spells, chants and talismans to treat illnesses.

Source –Rao et al (2011)

Numerical Estimates of the Health Workforce

The problems of enumeration

The wide variety of cadres, systems of medicine and regulating bodies along with a large part of the work force which is unqualified and unlicensed makes it difficult to obtain reliable estimates of exactly how many health workers there are as well as the qualifications that they possess.

Three sources that have commonly been used are Professional Councils, the National Sample Survey Organization and the Census.

Professional councils exist for allopathic doctors, AYUSH and homeopathy doctors, dentists, nurses and pharmacists. These councils maintain registration records for these carders. However, they do not maintain live registers and fail to account for migration (both within India and internationally), death and retirement, leading to double counting and an inflation of figures. In addition, some states in north-east India do not have professional councils specific to their states, making it difficult to get data disaggregated at the state level. No such records are maintained for medical technicians, physiotherapists as well as for unlicensed practitioners such as Registered Medical Practitioners and faith healers.

Government reports on the total number of nurses and doctors as reported by the Central Bureau for Health Intelligence are based on data provided by the Medical and Nursing Councils of India. They in turn get their information from state level councils; these suffer from the limitations mentioned above. There are regular reports about all the categories of health workers in the public sector, based on actual staff positions at various levels in the public sector but this sector represents a minority of total health workers.

The **National Sample Survey Organization** conducts a nationally representative, multi stage, cluster sample survey. This survey collects information on employment as well as education and has been used to generate health workforce estimates.

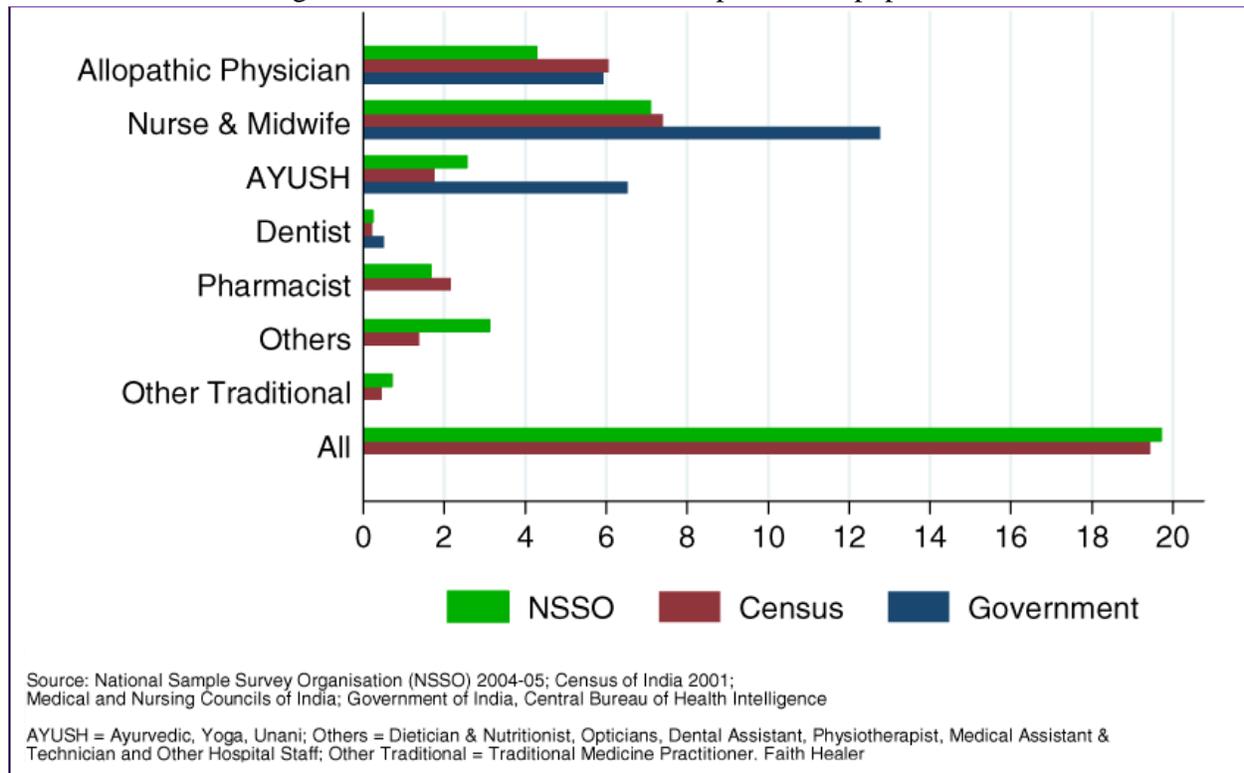
The **Census of India** is the largest and most representative source of data on the country. Both the NSSO and the Census suffer from the limitation of recording self reported occupation. The extent to which self reporting can bias estimates is evident from a study conducted in Udaipur District, Rajasthan which found that 41% of those who called themselves doctors did not have a medical degree and 17% had not even graduated from high school (Banerjee et al 2003).

In addition, the long time lag between rounds of the NSS (held every five years) and Census (held every decade) makes the use of these sources unsatisfactory for routine monitoring and evaluation where more up to date information is needed.

Estimates of Health Workforce Size

Rao et al (2009) have made estimates of the size of the health workforce using information from the NSSO, the Census as well as Government sources. Several adjustments were made to make data from the NSSO of 2004-05 and the Census estimates of 2001 comparable. The total number of health workers reported in the Census was increased by 8% to reflect the growth in the general population between 2000 and 2005, under the assumption that health worker growth rate matched the growth rate of the general population.

Figure- 1 Number of health workers per 10,000 population



Source: Rao et al 2009

Estimates based on the Census show that India has approximately 20 health workers per 10,000 people. The 2.2 million health workers included 677,000 allopathic doctors accounting for 31% of the health workforce and 200,000 AYUSH practitioners accounting for 9% of the health workforce. Nurses and midwives (30%) and pharmacists (11%) are the other two large groups. Others including ophthalmic assistants, radiographers and technicians accounted for 9% of the total.

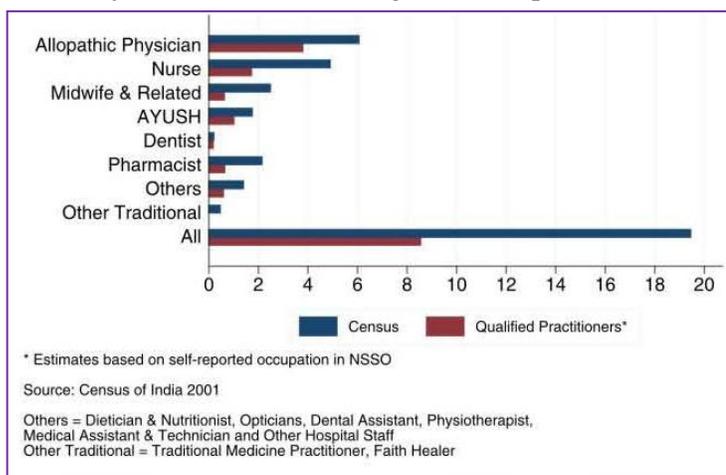
In most cases, estimates from the Census and NSSO are similar and estimates from Government sources tend to be higher (Figure-1). However, in the case of allopathic physicians the Census estimate (6.07 per 10,000) while similar to the Government estimates (5.93 per 10,000) is

substantially higher than that of the NSSO (4.28). The density of nurses and midwives according to the Census (7.39) and NSSO (7.09) are very similar, both figures being a little more than half the estimate provided by the government (12.77). Among AYUSH practitioners too, Government estimates (6.52 per 10,000) are much higher than those reported by the NSSO (2.58) as well as by the Census (1.76) (Rao et al 2009).

Health workforce estimates do not include community workers, although these are intended in part to address the low access to more qualified workers. The Census and NSSO, which classify health workers based on international occupation codes, do not have separate classification codes for community health workers. At the time of the 2001 Census and the 2004/05 NSSO, Accredited Social Health Activists' (ASHA) were not yet introduced into the workforce. Under the National Rural Health Mission (NRHM) the Government will add about five hundred thousand ASHAs to the health workforce. Further, nearly 1 million community workers for the Integrated Child Development Scheme are also not included in the health workforce estimates. Both these groups of health workers add a significant number to the health workforce, especially in rural areas. The inclusion of community workers would increase the size of the health workforce in India by nearly 80 percent.

Information on education as reported by the NSSO was used to correct for self report bias. It was found that that only 38% of those who called themselves doctors had a technical degree in medicine; a further 25% had a post-graduate diploma or certificate in medicine. 12% had only an undergraduate certificate or diploma in medicine and 25% had no technical degree, diploma or certificate. Adjusting the Census data for educational qualifications as reported in the National Sample Survey leads to a figure of eight health workers per 10,000 populations consisting of 3.8 allopathic doctors and 2.4 nurses and nurse midwives (Figure-2).

Figure 2- Density of health workers adjusted for qualification



Source: Rao et al 2011

The combined density of allopathic doctors, nurses and midwives (11.9) is about half of the WHO benchmark of 25.4 workers in these categories per 10,000 population for achieving 80% of births attended by skilled personnel in cross-country comparisons. When adjusted for qualification, the density falls to around one fourth the WHO benchmark. India also has a skewed mix of nurses and allopathic doctors. There is approximately one nurse and nurse-midwife per allopathic doctor and the qualification adjusted ratio falls further to 0.6 nurses per doctor. Although there is no gold standard for a nurse–doctor ratio, a higher ratio is desirable because nurses can deliver basic clinical care and public health services at a lower cost than doctors.

Comparing these adjusted figures to those available for other countries, we observe that India has a higher density of physicians than Indonesia and Thailand, but a substantially lower density when compared to China and Mexico (Table-2). On the other hand the density of nurses and midwives is lower than any of the countries in the table below. However the aggregate number of doctors, nurses and midwives in India is lower than all the countries in Table 2.

Table 2- Density of Physicians and Nurses and Midwives in other middle income countries

| Country | Physicians per 10,000 population | Nurses and Midwives per 10,000 population | Total of physicians,nurses and midwives per 10,000 population |
|-----------|----------------------------------|---|---|
| China | 14.2 | 9.6 | 23.8 |
| Indonesia | 1.3 | 8.2 | 9.5 |
| Thailand | 3.1 | 13.6 | 16.7 |
| Mexico | 28.9 | 39.8 | 68.7 |

Source: WHO, Global Health Observatory

One striking feature of the human resource situation in India in common with China is the low ratio of nurses to doctors. India has approximately one nurse and nurse-midwife per allopathic doctor, while in most countries nurses and midwives outnumber doctors. Nurses have been found to be more amenable to government employment and work in rural areas. In addition they cost the government less in terms of both salary and training (Rao et al 2011). It is imperative for the Central and State governments to look into augmenting capacity for both training nurses as well as employing them in the health system and giving them a greater degree of responsibility than traditionally assigned.

Distribution of Health Workers

There are stark contrasts in the distribution of health workers across states, between urban and rural areas and across the public and private sectors. This greatly affects both physical and financial access of large sections of the population to health and healthcare and is something that will have to be overcome to achieve Universal Health Coverage. All estimates below are calculated on the basis of the Census of India 2001, unless stated otherwise.

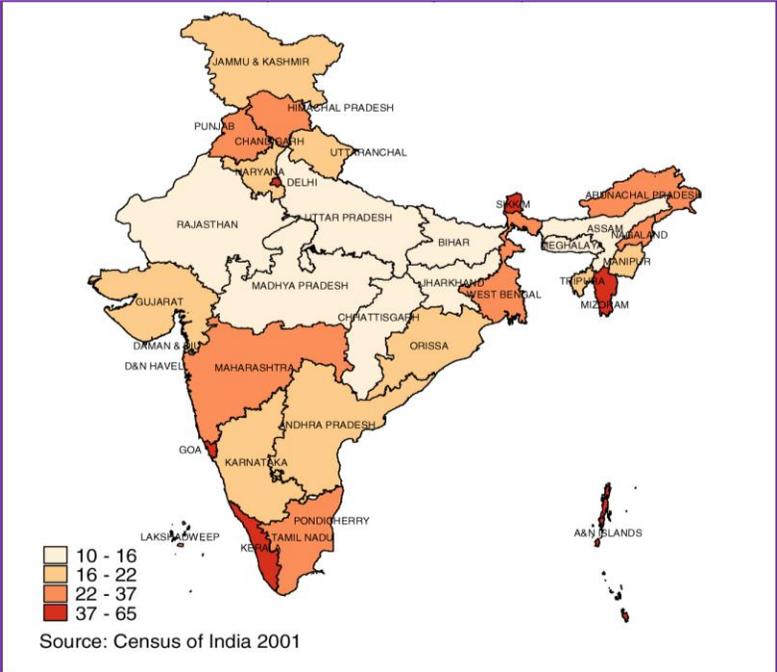
There are significant disparities in the distribution of health workers across states (Figure-3). As a rule the large, poorer states of north - central India have a lower density of health workers when compared to the states in southern India. The total number of health workers per 10,000 population varies from 10 in Bihar to over 40 in Goa (Rao et al 2009). The states that have the highest capacity to produce doctors and nurses tend to be those with the highest density of these cadres, though we would argue that the causal arrow runs both ways in this case. For the most part, states that have a low density of doctors also have a low density of nurses and midwives.

Looking at the health workforce strength in each of the states we observe that the states with low health workforce density (10-16 workers per 10,000 population) include Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, Assam and Meghalaya. The states of Jammu & Kashmir, Haryana, Uttaranchal, Orissa, Andhra Pradesh, Karnataka, Manipur and Tripura have an average of 16-22 workers per 10,000 population (Rao et al 2009).

Higher workforce densities (more than 22 workers per 10,000 population) are found in Punjab, Himachal Pradesh, Maharashtra, Goa, Kerala, Tamil Nadu, West Bengal, Mizoram, Nagaland, Sikkim and Arunachal Pradesh, with Goa, Kerala, Mizoram and Sikkim having more than 37 workers per 10,000 population (Rao et al 2009).

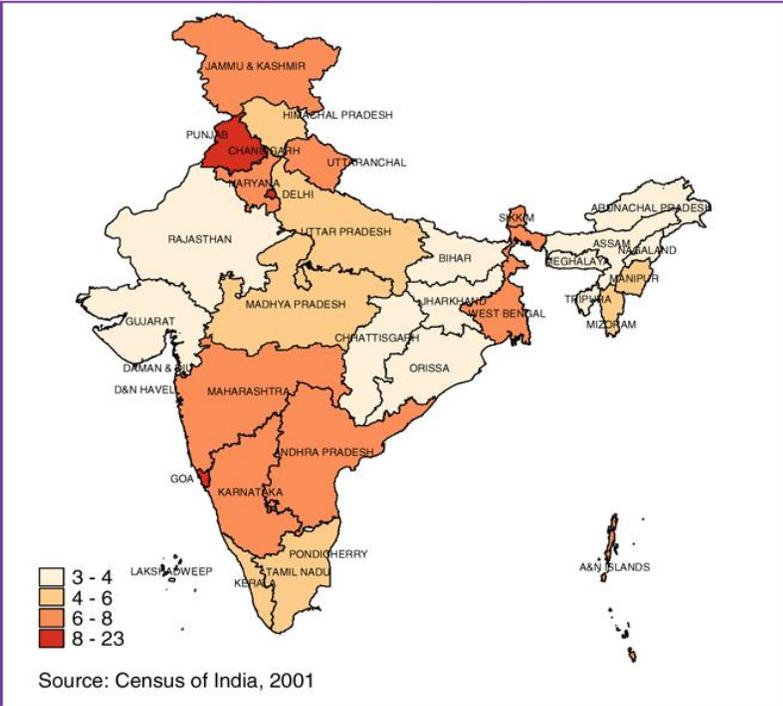
States with low doctor density (3-6 per 10,000 population) include Gujarat, Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, Orissa and Assam. Low doctor density states also include Himachal Pradesh, Kerala and Tamil Nadu. The states of Jammu & Kashmir, Punjab, Haryana, Uttaranchal, Maharashtra, Goa, Karnataka and Andhra Pradesh have more than 6 doctors per 10,000 population with Goa reporting a maximum of 13 allopathic physicians per 10,000 population (Figure-4).

Figure 3- Health worker density across Indian states



Source: Rao et al 2009

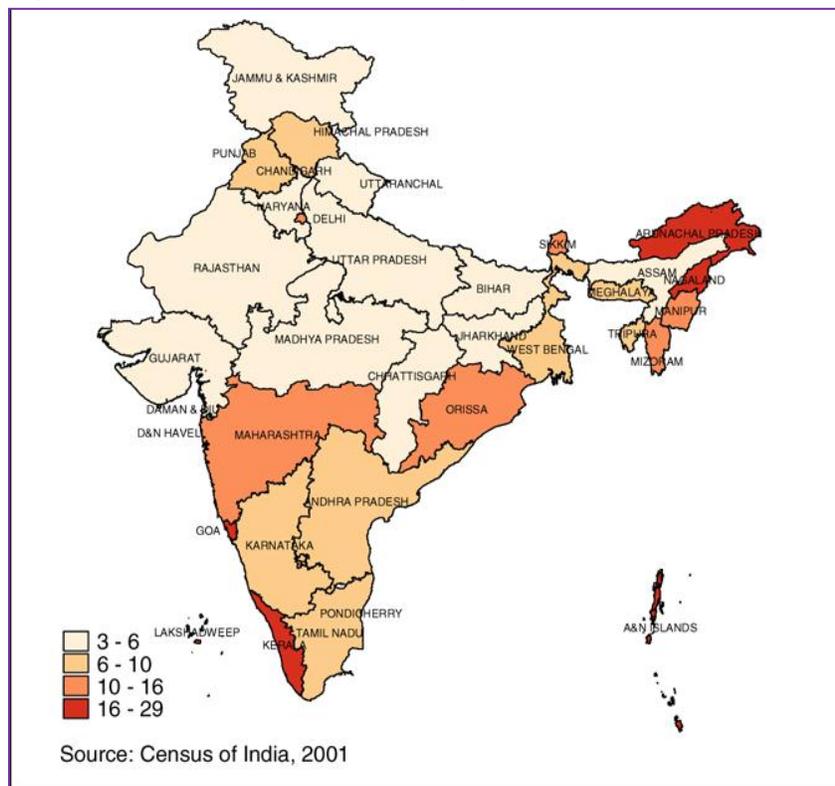
Figure 4- Doctor density across Indian states



Source: Rao et al 2009

Examining the density of nurses and midwives across states we find that Gujarat, Rajasthan, Haryana, Punjab, Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Uttar Pradesh, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, West Bengal and Assam have less than 10 nurses and midwives per 10,000 population (Figure-5). Other states with low density include Karnataka, Andhra Pradesh and Tamil Nadu. Maharashtra, Orissa, Manipur, Mizoram and Tripura have between 10 and 16 nurses and midwives per 10,000 population. Goa, Kerala, Arunachal Pradesh and Nagaland have more than 16 members of this cadre per 10,000 populations, with Goa having the highest density at 20 nurses and midwives per 10,000 population.

Figure 5- Nurse and midwife density across Indian states



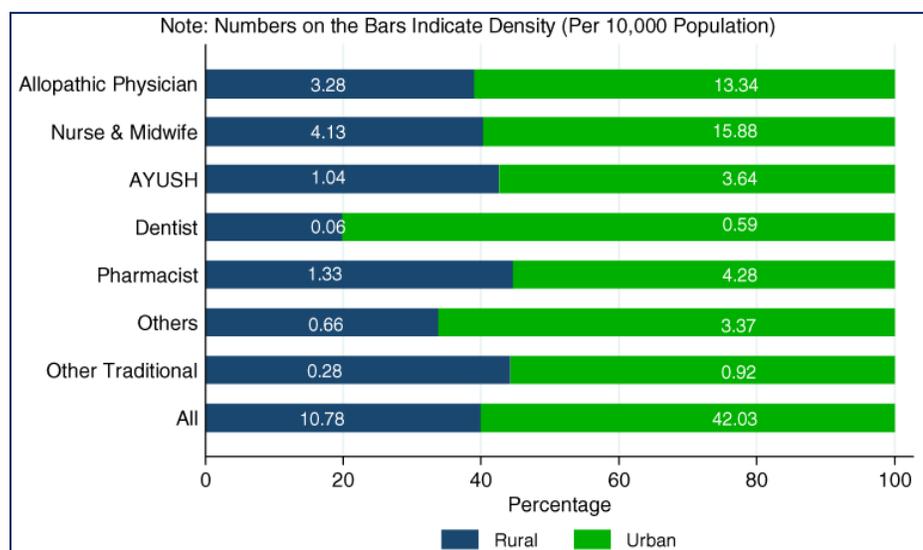
Source: Rao et al 2009

Distribution across Urban and Rural Sectors

Estimates show that almost 60% of health workers live in urban areas, which account for 26% of the country's population. Health worker density in urban areas at 42 per 10,000 is nearly four times higher than rural areas which have only 11.8 workers for a similar size of population,

which is geographically more spread out given much lower population densities in rural India (Figure-6). This skew is consistent across cadres. Doctors, both allopathic and AYUSH as well as nurses have a density in urban areas that is three to four times higher than in rural areas (Rao et al 2009). This is evident from figure below.

Figure 6- Distribution of Health workers across urban and rural India

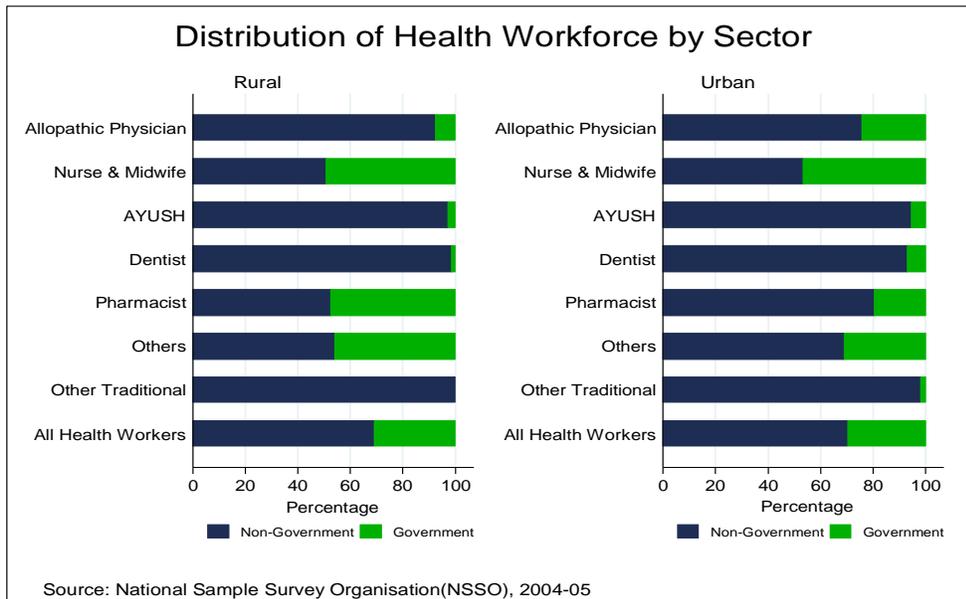


Source: Rao et al 2009

Distribution across Public and Private Sectors

In spite of the government being the dominant provider of preventive care services it is important to note that NSSO data shows that up to 70% of all health workers in India are employed in the private sector. 80% of allopathic and AYUSH doctors and 90% of dentists work in the private sector. However, only 50% of the nurses and midwives are employed in the private sector. Except among pharmacists, there appear to not be any major differences in the sector of employment in urban and rural areas (Rao et al 2009). (Figure-7)

Figure 7- Distribution of Health workers by sector of employment



Source: Rao et al 2009

Qualitative work suggests that public sector employment is often preferred over private employment among nurses and midwives. Job security, better pay in the public sector for nurses as well as fixed working hours are the reasons usually cited for this trend. An important point to note when examining these figures is that the distinction between public and private sector is often blurred, particularly in states that allow public doctors to run private clinics.

From the information it is clear that the private sector is the dominant employer of the health workforce in India. Any human resource policy for health workers in India would need to take this into account, something that has often been ignored when designing public health policy especially for rural areas. Planning done keeping only the public sector in mind would be at the cost of ignoring the reality of the Indian health system.

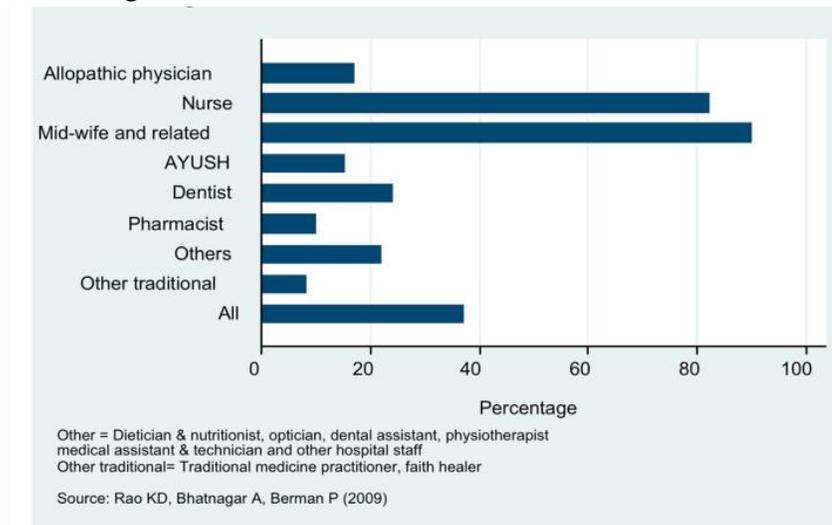
Women in the health workforce

Female doctors and health worker are an important part of the health workforce, particularly for women's health. The importance of gender of the doctor is important since women in large parts of the country are often reluctant to go to male doctors especially for their obstetrical and gynecological problems (Bang et al 2003)

In India, it is estimated that there are seven female health workers per 10,000 populations which translates into women comprising one third of the total health workers in the country. However,

since approximately 70% of nurses, midwives and community health workers are female, the share of female doctors is much lower than a third. Female doctors comprise only 17% of the doctors in the country (Rao et al 2009) (Figure-8).

Figure 8- Women in the Indian health workforce



The distribution of female health workers, particularly female doctors is extremely uneven across states. The states of Gujarat, Rajasthan, Haryana, Himachal Pradesh, Uttaranchal, Uttar Pradesh, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, West Bengal, Orissa and Assam have a low density of female doctors (less than 2 per 10,000 females). States with higher female doctor densities include the states of Jammu& Kashmir, Punjab, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Manipur and Mizoram. The range in female doctor density is evident from the fact that states such as Kerala (4 female doctors per 10,000 females) have densities up to eight times as much as the low density states like Bihar (0.5 female doctors) and Uttar Pradesh (one female doctor) (Rao et al 2009).

There are substantial differences in the presence of female health workers between urban and rural areas in the country. The density of the urban female health workforce more than five times that of rural areas. The situation among doctors alone is even more skewed. Among this group density in urban areas is 15 times that in rural areas. Female doctors comprise 17% of all doctors but only account for 6% of the rural doctors in the country. The urban-rural disparities among nurses and midwives are significant though not as great, with their urban density being approximately four times the density of this cadre in rural areas (Rao et al 2009).

Vacancy Position in the Public Sector

Almost all Indian states have unfilled sanctioned posts in their public health sector though the proportion varies across states. At the national level, we can estimate based on government data that 10% of primary health centres are without a doctor, 34% don't have a laboratory technician and up to 16% are running without a pharmacist on the rolls. Since this is a national level estimate, there are large regional variations. For example at the PHC level, Andhra Pradesh has less than 10% of positions vacant whereas in Uttarakhand over half the posts are vacant in (Bulletin of Rural Health Statistics in India 2009).

The situation is even worse among specialists in public sector peripheral institutions. It is estimated that up to 46% of sanctioned posts for specialists at CHCs are vacant.* Based on states where information is available for sanctioned posts as well as staff in position, it is estimated that 49% of posts for surgeons, 39% for gynecologists, 52% of physician posts and 47% of sanctioned posts for pediatricians are vacant in the country as a whole. Even in a state like Andhra Pradesh, which has few vacancies at the PHC level has 28% of specialist posts lying vacant at the CHC level (Bulletin of Rural Health Statistics in India, 2009).

While incentives such as PG education can be used to attract MBBS doctors, attracting specialists is more challenging. Those with specialist training in clinical subjects tend to be the brighter students of their MBBS class; they have far greater career options in the private sector. Also, those with specialist training require a far greater level of medical and surgical infrastructure to be satisfied professionally. Health Departments around the country need to develop attractive job packages to satisfy this group to attract them to work at sub district hospitals and CHCs.

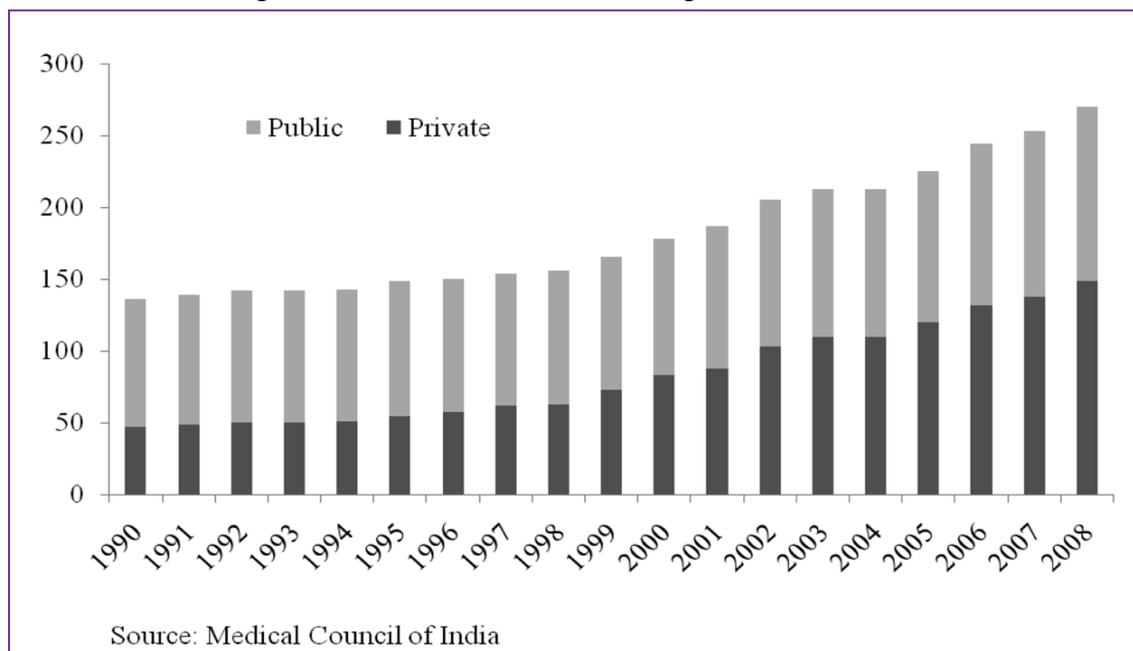
Health Worker Production

Medical Education

The opportunities for medical education have expanded rapidly in India, especially over the last twenty years. At the time of independence there were 19 medical colleges in the country, with a total of 1200 doctors graduating each year. Current estimates from the Medical Council of India indicate that there are 270 medical colleges with over 28,000 students graduating each year (Rao et al 2011).

Traditionally, medical education in India was largely provided by colleges funded by state governments, municipal corporations as well as a few central government funded institutions. However, the rapid increase in the number of medical college seats, particularly in the last few decades has been fueled by the often poorly regulated expansion of the private sector in medical education (Rao et al 2011). This is evident from the graph below (Figure-9).

Figure 9- Number of Medical Colleges in India



In 1990, one third of all medical colleges were privately run, that figure has now increased to 57% of medical colleges (Rao et al 2011). The expansion of the private sector is particularly notable in the states of Maharashtra, Andhra Pradesh and Karnataka. In Andhra Pradesh, only 13 of the 36 medical colleges are in the public sector, in Karnataka the proportion is even lower with 10 of the 38 medical colleges being run by the Government (Medical Council of India, 2011).

Some private medical colleges including those run by private trusts and faith based societies rank among the best in the country. However, a large number of private medical colleges are run

purely for profit backed by strong political and business interests. Several have serious shortages both in terms of faculty as well as physical infrastructure and have thus been imparting a quality of training that leaves much to be desired.

In addition, fees for private medical colleges are extremely high. Tuition fees for the MBBS program of four and a half years at one of the country's leading private medical college are approximately Rs. 2.5 million. Several reports indicate that a number of private medical colleges have been charging irregular fees, termed as 'donations' in addition to their published tuition fees. By contrast, tuition fees at the AIIMS are Rs 3000 for the same program, highlighting the enormous public subsidy that is going into medical education (Rao et al 2011).

The increase in the share of private medical colleges has serious implications for the supply of doctors to work in rural areas as well as the public sector more generally. Medical graduates, who have often taken large loans to finance their education, have a natural and understandable desire to recover this money through working in the comparatively lucrative private sector.

In addition to this there are great imbalances in the distribution of medical colleges around the country. The four southern states of AP, Tamil Nadu, Karnataka and Kerala, along with Maharashtra have 58% of all medical colleges in the country, but account for only 31% of the national population. In these states in particular, political interests have invested deeply in medical education, leading to the creation of an entrenched interest group that is difficult to regulate. On the other hand, the poor states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh which have 36% of the Indian population have only 15% of medical colleges between them (Rao et al 2011).

Nursing Education

There are several cadres of nurses and schools are often equipped to train a particular cadre. In 2006 there were 1312 institutions offering the GNM program, 580 offering the B.Sc. Degree in nursing and 77 offering the Masters program in nursing. The ANM program was being offered by 271 teaching institutions (Rao et al 2011).

The private sector is predominant in this sector, to a greater extent than in medical education. 88% of GNM programs are held in privately managed institutes for the country as a whole (Rao et al 2011).

Regional disparities are even sharper than in medical education. The four southern states have 63% of the GNM schools in the country, 95% of these being in the private sector. Among institutions offering higher level programs i.e. B.Sc and Masters Degrees, 78% are located in the four states of the south. By contrast, the states of Bihar, Madhya Pradesh, Rajasthan and Uttar

Pradesh have only 9% of nursing schools in the country. This imbalance, particularly at the higher levels of education is leading to a crisis in nursing education in several states. In the states of Assam, Bihar, Gujarat, Uttarakhand and West Bengal, 20% of posts for Principal Nursing Officer and 28% for Senior Tutor are vacant (Rao et al 2011).

A survey has shown that 61% of nursing colleges lacked the basic infrastructure for teaching. Libraries and demonstration rooms were inadequately equipped and little practical experience was imparted to students. In addition, the teaching staff was often found to be overworked and provided few opportunities for training in teaching skills and methods (Rao et al 2011).

While medical education has been the subject of much discussion and debate in India, nursing education remains deeply neglected. The lack of autonomy of nurses, compounded by the lower social and educational position they occupy vis-a vis doctors, the influence of the medical profession in setting the agenda as well as poor financing of nursing education by the government are all cited as reasons for this (Rao et al 2011).

Indian Nurses are in high demand abroad, and several corporate hospitals have begun training institutes to cater to the foreign market. Attractive salaries and working conditions abroad when contrasted with the poor salary and lack of autonomy that nurses often encounter in the Indian scenario, is leading to the departure of a large number of nurses from the country.

Conclusions

On the basis of the situational analysis above we can conclude that health worker density at the aggregate level remains low especially after one accounts for the fact that a large number of those who call themselves doctors often have no medical training at all.

Secondly, the distribution of health workers remains a serious barrier to Universal Health Coverage. The states with the poorest health outcomes have the greatest shortages. There is a serious problem of vacancies in the public sector, both at PHCs as well as specialists at the district level. Attractive job packages need to be developed to attract specialists to government service. In addition MBBS doctors could be trained to perform certain functions such as providing anesthesia for emergency Cesarean sections that have traditionally been performed by specialists. At the level of primary care, developing new cadres of non-physician practitioners is a way forward. Assam and Chattisgarh have developed three year programs to train high school graduates to work at the sub centre and PHC level respectively.

The private sector is the predominant provider of health services in the country; this fact needs to be acknowledged by policy makers when planning for UHC. The resources of the private sector

could be harnessed to meet public health goals through partnerships and collaborations. Public financing of privately provided services must be examined. It is important to note that this is not to mean that the public sector should not be reinvigorated, the public sector has a very important role to play, especially in primary care.

The growth of medical and nursing education opportunities has been rapid and impressive; however there is an urgent need for better regulation and the enforcement of minimum standards.

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