The availability of health workers is closely associated with greater use of health services and better health outcomes (Anand and Bärnighausen 2004, WHO 2006). India is among the 57 countries in the world which facing a crisis in human resources for health (WHO 2006). It faces several challenges in this area. There is an overall shortage of qualified health workers; women physicians are relatively scarce; health workers are concentrated in the urban areas; states with high burden of diseases face a scarcity of health workers and their training institutes; and the skill mix of healthcare workers is not optimal to cater to both the rural and urban healthcare needs of the country. Finally, issues around quality of training and services produced are a source of concern.

In this chapter, we first review the existing state of human resources for health in India. Second, we document some of the strategies that have been undertaken to improve the availability of health workers in underserved areas by the state governments such as compulsory rural service, educational incentives, and task-shifting. We provide evidence for these strategies and discuss their significance in improving the distribution of health workers in India. Finally, we offer direction for the future health human resources reforms.

**Situation Analysis of Human Resources for Health**

**Size, Composition and Distribution of Health Workers in India**

How many health workers do we have in India? While this is an important question for health policy, counting health workers in India is a challenging task. Some reasons for this are that there is no single database that comprehensively records the number of qualified health workers; there is much diversity among the health workforce and there are several state-specific health worker cadres that are difficult to define and classify; there exist many informal practitioners who may or may not be qualified to practice medicine; and in general, sources of information on health workers are fragmented and not completely accurate. In particular, the lack of live registers renders workforce estimates from professional councils (which are also reported in government sources) unreliable due to unclear accounting for health workers leaving the workforce due to death, migration, change of profession, and retirement.

Efforts to estimate the size and composition of health workers in India have been few. Some of the recent efforts (WHO 2007, Anand et al. 2010, Rao et al. 2012 and Hazarika 2013) have been highlighted in Table 20.1. These studies have used different data sources for health worker estimations—the National Census, National Sample Survey, and data available from registered professional councils.

While Table 20.1 provides an overview of estimates from different studies, we have used the study by Rao et al. (2012) to provide a comprehensive picture of the situation of human resources for health in India. This study uses data from the Census 2001 adjusted to reflect the population in 2005 and the 61st Round (July 2004–
<table>
<thead>
<tr>
<th></th>
<th>All health workers</th>
<th>Allopathic doctors</th>
<th>Nurses/midwives</th>
<th>AYUSH doctors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>660,856 (Government of India, CBHI)</td>
<td>1,422,452 (Government of India, CBHI)</td>
<td>726,370 (Government of India, CBHI)</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.

**BOX 20.1 Health Workers in India**

- **Allopathic Doctors**: medical graduates with a Bachelor’s or Post-graduate specialist diploma or degree registered with the Medical Council of India (MCI).
- **AYUSH Doctors**: stands for practitioners of Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy. These are medical graduates with a Bachelor’s or Post-graduate degree in Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy registered with the Central Council for Indian Medicine (CCIM) or the Central Council for Homoeopathy (CCH).
- **Nurses**: have a diploma in General Nursing and Midwifery (3–5 year course) or a 4-year Bachelor’s degree. They may also have a 2–3-year post-graduate degree registered with the Indian Nursing Council.
- **Dentists**: graduates with a bachelor’s or post-graduate degree in dentistry registered with the Dental Council of India (DCI).
- **Auxiliary Nurse Midwives (ANMs)**: have a diploma in Auxiliary Nursing and Midwifery (2-year course).
- **Pharmacists**: have a Bachelor’s degree or a diploma in pharmacy.
- **Technicians**: includes laboratory technicians, radiology technicians, dental assistants, and other technical staff.
- **Allied Health Professionals**: includes dieticians, nutritionists, opticians, physiotherapists and administrators.
- **Community Health Workers**: members of the community who are given some basic training in health-related issues and can provide limited essential primary care in the population.
- **Accredited Social Health Activists (ASHAs)**: community health volunteers who reside in a village, have completed 8 years of formal education, and are preferably aged 25–45 years.
- **Rural Medical Practitioners (RMPs)**: unlicensed health practitioners who give allopathic treatment and work in rural areas. They may have little or no formal medical training.
- **Traditional Medicine Practitioners and Faith-healers**: treat illnesses with the help of selling talismans and charms, and by performing special rites.

Source: Adapted from Rao et al. (2011).
workers per 10,000 population (excluding Accredited Health Social Activists [ASHAs]). Further analyses reveals that among the 2.2 million health workers in India, there are about 6.8 lakh allopathic doctors and 2 lakh AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy) practitioners. Allopathic doctors constitute a majority of the health workforce in India (31 per cent), followed by nurses and midwives (30 per cent), pharmacists (11 per cent) and AYUSH practitioners (9 per cent) and others (9 per cent ophthalmic assistants, radiographers and technicians) (Rao et al. 2012). Community health workers are not included in these estimates.

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 per cent of births attended by skilled personnel in cross-country comparisons (WHO 2006, Rao et al. 2012). When adjusted for qualification, the density falls to around one-fourth of the WHO benchmark. There are 3.8 allopathic doctors per 10,000 population (Figure 20.1). The nurse (1.7) and midwife (0.6) densities are also low leading to 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 (Rao et al. 2012). Although there is no gold standard for a nurse–doctor ratio, a higher ratio is generally desirable. The World Development Report (1993) indicates that, as a rule of thumb, the ratio of nurses to doctors should exceed 2:1 as a minimum with 4:1 or higher considered more satisfactory for cost-effective and quality care (World Bank 1993).

In addition to numerical shortages, India also faces multiple challenges with respect to distribution of health workers. Health workers are unevenly distributed between the rural and urban areas, and across states. Figure 20.2 shows the distribution of allopathic doctors across states of India. Similar patterns are seen in the distribution of other health worker cadres. States in northern and central India with poorer health outcomes and service use have fewer doctors for a given population; the southern states, where health outcomes are much better, tend to have a higher concentration of doctors and better population health (Rao et al. 2012). The distribution of medical schools also appears to follow this pattern, which suggests that the mal-distribution
of health workers across states might be linked to state differences in health worker production capacity.

Across states, health workers in both the public and private sectors are concentrated in the urban areas even though more than two-thirds of Indians live in the rural areas. The density of health workers per 10,000 population in urban (42) is nearly four times that of rural (10.8) areas (see Figure 20.3). There are 11.3 (1.2) allopathic doctors per 10,000 population in urban (rural) areas. Put another way, there is one qualified doctor per 8,333 (885) people in rural (urban) areas of India. Also, there are 1.7 (4.3 in urban and 0.7 in rural) nurses per 10,000 population (Rao et al. 2012).

NSSO 61st Round (July 2004–June 2005) data shows that up to 70 per cent of all health workers in India are employed in the private sector (see Figure 20.4). About 80 per cent of allopathic and AYUSH doctors and 90 per cent of dentists work in the private sector. Remarkably, only 50 per cent of the nurses and midwives are employed in the private sector (Rao et al. 2012). It is important to note that the distinction between the public and private sectors is often not clear, and doctors often practice in both the sectors simultaneously.

Another important point to consider is the gender distribution of the health workforce. In India, it is
Figure 20.3  Rural-Urban Distribution of Health Workers in India (2005)

Notes: Numbers on the Bars Indicate Density (per 10,000 Population); Census data for 2001 has been adjusted to 2005.
Source: Rao et al. (2012).

Figure 20.4  Distribution of Health Workforce by Sector (2005)

Source: Rao et al. (2012).
estimated that there are 7 female health workers per 10,000 population, which translates into women comprising one-third of the total health workers in the country. Approximately 70 per cent of nurses, midwives, and community health workers are female. However, female doctors comprise only 17 per cent of the doctors and account for only 6 per cent of the rural doctors in the country (ibid.). Especially considering societal norms in India that restrict women from seeking healthcare for obstetrical and gynecological issues from male health workers, the presence of female health workers in health institutions becomes important.

Health Worker Production in India: Doctors and Nurses

The opportunities for medical education have expanded rapidly in India, especially over the last 20 years. At the time of Independence, there were 19 medical colleges in the country, with a total of 1,200 doctors graduating each year (Rao et al. 2011). As of March 2014, the MCI reports that there are 381 colleges in India offering the MBBS course, having a capacity for 50,068 seats (MCI 2014). Of these, 287 colleges are recognised by the Council and 86 are permitted by the Council to offer MBBS course (ibid.). 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 fuelled by the expansion of the private sector in medical education (Rao et al. 2011). In 1990, about one-third of all medical colleges were privately run (ibid.). Currently, as of March 2014, there are 176 government colleges (recognised: 143, permitted: 33) and 205 private colleges (recognised: 144, permitted: 53) in India (MCI 2014). Clearly, the number of private colleges is increasing in the country.

The expansion of the private sector in medical education is particularly notable in the states of Maharashtra, Andhra Pradesh and Karnataka. As of March 2014, in Andhra Pradesh, only 15 of the 43 medical colleges are in the public sector, in Karnataka the proportion is even lower with only 12 of the 46 medical colleges being run by the government (ibid.).

The increase in the share of private medical colleges has implications for efforts to increase the supply of rural doctors. Medical graduates from these private institutions often take large loans to finance their education, and have an understandable need to recover their investment by seeking high-paying jobs which are in the private sector. Consequently, though the supply of doctors has increased with the presence of private medical schools, ultimately this is unlikely to make a difference to increasing the presence of doctors in rural public service.

The geographical distribution of medical colleges in India also puts states with higher disease burden at a disadvantage. The four southern states of Andhra Pradesh (43 colleges), Tamil Nadu (45 colleges), Karnataka (46 colleges) and Kerala (25 colleges), along with Maharashtra (44 colleges) have 53 per cent of the medical colleges in the country (ibid.), although they account for around 30 per cent of the population as per Census 2011. These are also among the healthier states in the country. On the other hand, the states of Bihar, Madhya Pradesh, Rajasthan, Odisha and Uttar Pradesh—that have poorer health indicators—and possess more than 40 per cent of the Indian population as per Census 2011, have only 19 per cent of medical colleges between them (ibid.).

Statistics from the Indian Nursing Council for the year 2012 indicate that there are 2,670 institutions (public: 209, private: 2,461) offering the General Nursing and Midwifery (GNM) nursing degree programme, 1,578 institutions (public: 93, private: 1,485) offering the BSc degree in nursing, and 535 institutions (public: 31, private: 504) offering the Master’s degree in nursing (Indian Nursing Council 2012). The Ancillary Nurse and Midwifery (ANM) programme is being offered by 1,642 institutions (ibid.). Private sector teaching institutes are predominant in this sector, and to a much greater extent than in medical education. There is some anecdotal evidence that many of these private training institutes are focused on training nurses for jobs abroad.

Regional disparities in the presence of nurse training institutes are similar to those observed in medical education institutes. The four southern states have about half of the GNM schools and nursing schools in the country (ibid.). By contrast, the states of Bihar, Madhya Pradesh, Rajasthan, Odisha and Uttar Pradesh have only 25 per cent of the GNM institutes and 20 per cent of the BSc nursing institutes in the country (ibid.). This imbalance is leading to a crisis in nursing education in several states across the country.
Strategies to Improve Availability of Human Resources in Underserved Areas

The shortage of qualified human resources in India, especially in rural and underserved areas, is a problem that policy-makers have recognised. Over the years, several strategies have been tried to address this issue. At the national level, the National Rural Health Mission (NRHM) has supported initiatives to reduce the shortage of rural health workers (Government of India 2005). An evaluation of the Mission has shown additional appointments of 8,624 doctors with an MBBS, 2,640 specialists, and 26,793 staff nurses through contracts in the public health system in the years 2005–10 (Government of India 2010). In addition, the government has committed itself to expanding medical education. Recently, the Cabinet has approved 10,000 additional medical seats in central and state government medical colleges—with the intention of improving supply of allopathic doctors. Most of these seats are to be accommodated in existing medical colleges (Times of India 2014). In addition to these, 58 new medical colleges are to be set up in various states with central assistance through the upgradation of the district hospitals.

In addition to the national-level strategies, several states in India have actively experimented with different local-level strategies for improving the presence of health human resources in underserved areas. These include offering incentives such as monetary benefits or preferential admission to post-graduate programmes in exchange for a few years of rural service (Sundararaman and Gupta 2011, Shroff et al. 2013). Most states in India have now trained and deployed AYUSH doctors as second medical officers at primary health centres (PHCs) (Government of India 2005). Two states—Assam and Chhattisgarh—have experimented with doctors who have 3 years of medical training (instead of the usual 5-year MBBS degree) for the provision of primary care (Rao et al. 2011). Unfortunately, few of these local strategies have been documented. Further, there is little information available on specific aspects of performance and effectiveness of the local strategies/experiments. Hence, in this chapter, we use evidence from both local and international studies to discuss some of these strategies (see Table 20.2).

Table 20.2 Strategies for Rural Retention of Health Workers

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Potential strengths</th>
<th>Challenges/grey areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-graduate seat reservation for rural service</td>
<td>• Appealing to candidates</td>
<td>• Need for close monitoring, which is difficult in weak governance structures</td>
</tr>
<tr>
<td></td>
<td>• Some evidence of success in filling rural posts in primary care</td>
<td>• Fresh graduates may need orientation to rural service</td>
</tr>
<tr>
<td>Compulsory rural service</td>
<td>• Success in filling rural posts (from opinions of government authorities)</td>
<td>• Not appealing to candidates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Short-term solution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Need for close monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fresh graduates may need orientation to rural service</td>
</tr>
<tr>
<td>Monetary incentives</td>
<td>• Appealing to candidates</td>
<td>• Likely to work better in combination with other incentives</td>
</tr>
<tr>
<td></td>
<td>• Commonly employed strategy, easy to implement</td>
<td>• Practices not widely attempted/evaluated in India</td>
</tr>
<tr>
<td>Workforce management practices</td>
<td>• Evidence of need for such practices</td>
<td>• Likely to work best in combination with monetary or post-graduation incentives</td>
</tr>
<tr>
<td>Employment of rural medical assistants (RMAs)</td>
<td>• Can be a good alternate resource to primary care doctors</td>
<td>• New cadres need careful planning and political acceptance</td>
</tr>
<tr>
<td></td>
<td>• Some evidence of competency and willingness towards rural service</td>
<td>• Career pathways and mechanisms for integration of RMAs need to be designed</td>
</tr>
<tr>
<td>Employment of alternate medicine practitioners (AYUSH)</td>
<td>• Provisions for their contractual recruitment exist (through NRHM)</td>
<td>• Need for clearly defined roles within the system</td>
</tr>
<tr>
<td></td>
<td>• Some evidence of need for training in allopathic primary care</td>
<td>• Some evidence of willingness to work in rural areas</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.
Studies from different parts of the world offer insight into what strategies might be effective in attracting health workers to the rural areas. Research shows that while financial incentives are important, it is not adequate to recruit or retain health workers in rural jobs (Blaauw et al. 2010, Chomitz et al. 1997). Several studies have reported that the interaction between factors, such as career growth, organisational set up, bureaucracy, the work and living environment influences the choices health workers make regarding job location (Lindelow and Serneels 2006, Schofield et al. 2009, Stephen 2007). Recently, there has been some literature on factors affecting rural retention from the Indian context (Saini et al. 2012, Shewade et al. 2012, Sheikh 2012, Ramani et al. 2013). One recent study from India identified several factors that are important for health workers to consider working in a rural area (see Table 20.3) (Ramani et al. 2013). This study found that in India, financial and educational incentives can attract doctors and nurses to rural postings. However, frustration among rural health workers often stems from the lack of infrastructure, support staff, and drugs, local political interference, and lack of security. Mundane quality of life issues such as lack of water, electricity, education facilities for children, and connectivity increase dissatisfaction. In addition, a primary care job generally commands little respect in the medical community.

In the sections below we review strategies that state governments in India have attempted to remedy the scarcity of health workers in rural areas.

### Post-graduate Seat Reservation for Rural Service

Several states in India reserve post-graduate seats for in-service doctors who complete some years of rural service. These include states like Assam, Chhattisgarh, Kerala and Tamil Nadu. Linking post-graduate programmes to rural service appears to be a particularly attractive incentive for attracting doctors to rural posts (see Table 20.4). There is a strong desire for specialisation among doctors after their under-graduate medical degree. This coupled with the intense competition for a few available post-graduation seats is central to what makes this scheme attractive.

A case study of the post-graduation incentive scheme in Andhra Pradesh provides insights into the effectiveness of this scheme (Shroff et al. 2013). To be eligible for this scheme, a doctor serving in the public sector currently has to work for 2 years in a tribal area, or 3 years in a rural area, or be employed with the government for 5 years. In 2010, 30–50 per cent of total post-graduation seats in public medical colleges, and 50 per cent of post-graduation seats that are filled through the post-graduate entrance examinations in private medical colleges were reserved for candidates competing through the scheme. Students availing this scheme have to serve the state government for 5 years after completing

<table>
<thead>
<tr>
<th>Organisational issues</th>
<th>Contextual issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilities</strong></td>
<td></td>
</tr>
<tr>
<td>• Clinic infrastructure (drugs, equipment, laboratories)</td>
<td>• Living facilities (housing, electricity, water, access to the market, hygiene)</td>
</tr>
<tr>
<td>• Work environment (cleanliness, availability of water electricity, toilet, good furniture)</td>
<td>• Proximity to family (near hometown)</td>
</tr>
<tr>
<td>• Support staff and mentoring staff</td>
<td>• Children's development (availability of good schooling,)</td>
</tr>
<tr>
<td>• Workload (fixed working hours, shift systems, number of patients)</td>
<td>• Family's well-being and comfort</td>
</tr>
<tr>
<td>• Security (physical security, legal protection against political interference)</td>
<td>• Security (physical security, legal protection against political interference)</td>
</tr>
<tr>
<td><strong>Culture and policies</strong></td>
<td></td>
</tr>
<tr>
<td>• Policies on leave</td>
<td>• Connectivity (transport availability, no sense of isolation)</td>
</tr>
<tr>
<td>• Transfer policies and promotions (transparent, no political interference)</td>
<td>• Social life (entertainment facilities, social circle)</td>
</tr>
<tr>
<td>• Job security (permanency of job, pensions)</td>
<td>• Community type (comfort and connect with the community, no language barriers)</td>
</tr>
<tr>
<td>• Management (administration, bureaucracy)</td>
<td></td>
</tr>
<tr>
<td><strong>Growth opportunities</strong></td>
<td></td>
</tr>
<tr>
<td>• Learning opportunities on the job</td>
<td></td>
</tr>
<tr>
<td>• Training opportunities</td>
<td></td>
</tr>
</tbody>
</table>

Source: Ramani et al. (2013).
their post-graduation education against a financial bond. The scheme appears to have led to reducing vacancies in the public health system; as recent as 2007, there were 209 PHCs across the state without a doctor, which has now reduced to zero (ibid.). Further, only 2 per cent of the sanctioned posts are vacant. Moreover, there appears modest improvement in the vacancies of specialists, which government officials attribute largely to the post-graduation scheme.

The case study in Andhra Pradesh shows proof of the scheme’s appeal and potential effect. However, such schemes work well only in certain situations. First, it is feasible only in states that have a substantial number of medical schools so that reserving an adequate number of seats for government doctors is possible. If too few seats are reserved, the competitiveness for these seats will be comparable to that of general seats, and the scheme will have few takers. Second, the eligibility criteria for the scheme, like the required number of years of rural service before and after completion of specialist training, need to be finely tuned so that the scheme remains attractive.

Compulsory Rural Service

Several states in India—Assam, Arunachal Pradesh, Chhattisgarh, Gujarat, Manipur, Meghalaya, Odisha, Tamil Nadu and West Bengal—have made it compulsory for all fresh medical graduates to serve in rural areas. Usually, students are mandated to do rural service for up to 5 years against a financial bond (Gupta et al. 2010).

While there is little evidence from India on the effectiveness of compulsory rural service schemes, international evidence, in general, has not been favourable. At best, such schemes are seen to address health worker mal-distribution in the short term (WHO 2009). A recent review of compulsory rural service schemes recorded that such schemes did not get support from health workers. Health workers rarely continued on the same job after the compulsory stint was over, thus affecting continuity of care provided to communities (Frehywot et al. 2010). Forced service can be regarded as a human rights violation of individuals. Many international studies also point out that compulsory rural service programmes need to be accompanied by support and incentives given to the health personnel (Liaw et al. 2005, Omole et al. 2005).

The level of opposition to compulsory rural service schemes in international literature suggests that we should be careful in the use of such schemes. In India, it has been seen that the implementation of such schemes is a huge challenge. There is anecdotal evidence to show that in the states where the scheme is practised, it is difficult to monitor the scheme. Whether such schemes have any effect at all in filling rural health posts (except on paper)—and improving rural healthcare provision—

### Table 20.4 Examples of Diverse Schemes Related to Post-graduation in India

<table>
<thead>
<tr>
<th>Post-graduation schemes</th>
<th>States—Some examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students are mandated to complete 2–3 years of rural service before getting</td>
<td>Arunachal Pradesh, Maharashtra and Tamil Nadu (since 15 years)</td>
</tr>
<tr>
<td>admissions for post-graduation</td>
<td></td>
</tr>
<tr>
<td>A percentage of the post-graduation seats (10–30 per cent) are reserved for in-service</td>
<td>Andhra Pradesh, Assam, Chhattisgarh and Gujarat</td>
</tr>
<tr>
<td>candidates who serve in the rural areas for 2–3 years. These candidates give the usual</td>
<td></td>
</tr>
<tr>
<td>entrance exams, but complete for only the reserved seats thereby having a better</td>
<td></td>
</tr>
<tr>
<td>chance of admission.</td>
<td></td>
</tr>
<tr>
<td>Additional marks given to candidates who serve in rural areas for 2–3 years. These</td>
<td>Kerala, Mizoram and Uttarakhand</td>
</tr>
<tr>
<td>marks can be added to the total obtained in the entrance exams.</td>
<td></td>
</tr>
<tr>
<td>On completion of certain years of rural service, medical officers are eligible for</td>
<td>Arunachal Pradesh (total 5 years with 3 years rural service)</td>
</tr>
<tr>
<td>state-sponsored post-graduation. For this, medical officers are selected based on</td>
<td></td>
</tr>
<tr>
<td>seniority (not entrance exams).</td>
<td></td>
</tr>
<tr>
<td>After PG, all specialists have to serve in rural areas compulsorily for a certain</td>
<td>Tamil Nadu (government college candidates: 5 years, private college candidates: 3</td>
</tr>
<tr>
<td>period against a bond.</td>
<td>years, Rs 5 lakh bond), Kerala (1 year, Rs 5 lakh bond)</td>
</tr>
<tr>
<td>New post-graduation course for in service candidates</td>
<td>Nagaland has introduced the Diplomate of National Board, Family Medicine course</td>
</tr>
<tr>
<td></td>
<td>equivalent to post-graduation for in-service doctors.</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.
is questionable. Yet, many states in India have currently resorted to this scheme.

**Monetary Incentives**

Monetary compensation for rural service is one of the most commonly used strategies in India for attracting doctors to underserved areas. States often differ in their categorisation of areas that are underserved—this categorisation is based on distance from the urban areas, geographical terrain, accessibility, tribal areas or areas of conflict. A recent article that tabulated monetary incentive schemes in different states found that around 18 states in India compensate doctors for service in underserved areas (Sundararaman and Gupta 2011). Interestingly, monetary incentive schemes seem to be mainly focused on allopathic doctors.

Some studies from India suggest that monetary incentives are important but need to be combined with other kinds of incentives. Qualitative studies show that better remuneration for difficult postings is critical to motivate doctors to serve in underserved areas (Ramani et al. 2013). However, there are two important considerations. First, the value of the additional monetary benefit provided needs to be viewed as substantially lucrative; second, monetary incentives need to be combined with other incentives like better living environment, housing and schooling.

Monetary incentives have not been evaluated in India widely for their effectiveness. However, international experience has shown that these play a limited role, especially if the amount increased is only nominal. One study from India attempted to quantify the effect of higher salary on uptake of rural jobs by trainee and in-service doctors and nurses (Rao et al. 2013c). It found that, overall, for every salary level, a considerably higher proportion of nursing students and nurses were willing to accept a rural job compared to medical students and doctors (see Figure 20.5). The supply of both students and in-service doctors for rural posts was not responsive to increases in salary, particularly at lower salary levels. In contrast, the supply of nursing students and nurses is much more responsive to increases in salaries,

**Figure 20.5** Supply of Trainee and In-service Doctors and Nurses

![Supply of Trainee and In-service Doctors and Nurses](image)

Source: Rao et al. (2013c).
particularly at lower levels, relative to medical students and doctors.

**Improving Workforce Management Practices**

A few countries have employed workforce management practices to improve rural recruitment of health workers (WHO 2009). In India, an important organisational constraint is the lack of a formal transfer and posting policy within the state health services. Transfer policies are often not clearly specified. One consequence of this is that in-service health workers posted in a rural area can remain there indefinitely or have to negotiate their way to a better posting. Anecdotal evidence shows that often getting a desirable post requires a long waiting time and can be determined by political influence and/or bribery.

The process of recruiting health workers is another area where better management practices can help to improve rural recruitment. Typically, recruitment of health workers is a centralised process with long time lags (up to 2 years in some cases) between the time a post is advertised and when appointment letters are issued. The state of Haryana adopted a policy of directly recruiting doctors to permanent positions through walk-in interviews (Gupta et al. 2009). This removed the long delays experienced through the normal process—advertising for positions, conducting state public service commission exams, establishing a list of candidates, and sending acceptance letters. Now interested doctors simply presented themselves at the health ministry on a designated day, completed an interview, and if successful, were issued their appointment letter. This process, state officials claim, has led to fewer vacancies in the public sector health centres in Haryana (ibid.), and is still being followed in the state.

**Non-physician Clinicians**

In many areas of the world, clinical care providers with shorter duration of medical training perform clinical functions normally expected of physicians. Non-physician clinicians (NPCs) are now increasingly viewed as a cost effective means of delivering primary health services (Huicho et al. 2008, Kurti et al. 2011, Mullan and Frehywot 2007). Where physicians are scarce they offer a way to continue clinical services. In several countries such as Bangladesh, Nepal, Sri Lanka and 25 out of 47 countries in Sub-Saharan Africa, NPCs have become the main providers of primary care, and in some instances, even provide specialist services (Abegunde et al. 2007, McCord et al. 2009, Warriner et al. 2011).

Two states in India, Assam and Chhattisgarh have experimented with NPC cadres. In Chhattisgarh, the RMA course was started in 2001 as a three-and-a-half-year diploma (the under-graduate medical degree in India is five-and-half-years in duration). Graduates from this course are employed at PHCs. However, the RMA course has been discontinued at present.

Currently, the central ministry in India is in the process of creating an NPC cadre. In 2009, a three-and-a-half-year course named Bachelor of Rural Healthcare was proposed, graduates of which were meant to provide primary care in rural areas (Sachan 2013). The initiation of this course faced much opposition. There have been some academic debates on the introduction of a new NPC cadre (Sharma and Sharma 2011, Bhaumik and Biswas 2012, Mudur 2013). Some concerns that have been raised about the development of a new cadre are that these clinicians cannot be forced to serve in the rural areas; and further, there is no mechanism to ensure that they will remain in the rural areas and reduce the current mal-distribution of health workers. Since their training duration is short (3.5 years instead of 5.5 years that MBBS doctors receive), they are perceived as doctors whose competency levels are inadequate. One strong argument against the cadre has been: Why should rural Indians get care from doctors who are less qualified?

However, many of these concerns seem to go against the substantial international evidence about the effectiveness of such cadres. Many countries like Bangladesh, Nepal, Sri Lanka and 25 out of 47 countries in Sub-Saharan Africa employ NPCs. One study in Chhattisgarh that evaluated the competence of RMAs found them to be equally competent to doctors for managing conditions commonly seen in primary care settings (Rao et al. 2013a). Satisfaction of households with clinical care provided by RMAs has been found to be equal to that of doctors (Rao et al. 2013b). Findings from these two studies in Chhattisgarh support the claim that clinicians with three years training can be effective providers of primary healthcare.

The Bachelor of Rural Healthcare course has been a subject of much controversy and faced much opposition in the government. In November 2013, the union cabinet finally approved a 3-year course named Bachelor of Science (Community Health) (The Hindu 2014). This course is a variation of the former course, and the graduates of this course are meant to provide primary care in the rural areas.
Under the NRHM, another type of NPCs, AYUSH physicians, who are trained in alternate systems of medicine, are posted at PHCs to mainstream Indian systems of medicine. These postings are contractual and have taken place in almost all states of India now. However, there is scarce information on the competence and effectiveness of co-located AYUSH.

A comprehensive report from the Department of AYUSH, Ministry of Health and Family Welfare (MoHFW) highlights the need for strengthening the integration process as a whole (Chandra 2012). The report points out that while integration has occurred at policy level and AYUSH providers have been physically placed in PHCs, there are few operational guidelines and frameworks within which AYUSH providers can function. One important issue the report alludes to is the fact that AYUSH doctors are often the only clinicians available in a PHC; and are hence forced to take on allopathic roles. Despite this, policies are unclear on whether AYUSH providers are legally allowed to cross-practice allopathic medicine, and if so, to what extent. An important related question is whether AYUSH providers are competent to take on allopathic roles. Preliminary studies in Chhattisgarh have shown that difference in competencies between AYUSH providers and allopathic providers were not huge with respect to the provision of allopathic primary care (Rao et al. 2013a). However, it is important to make provisions for additional training of AYUSH doctors in allopathy.

**Conclusion**

Human resources for health in India is in a dismal situation. For one, there is an overall deficit in the number of qualified health workers. Further, a large number of unqualified health workers operate in the sector, particularly in areas where formal service delivery systems are weak. While several factors drive health outcomes, having few health workers profoundly influences the health system’s ability to deliver preventive and curative services. The geographic mal-distribution of the qualified health workforce in India is another cause for concern. States with few health workers are observed to have poor health indicators. Moreover, the large disparity in workforce availability between the urban and rural areas is alarming. The rural deficit confirms the difficulty rural Indians report in accessing healthcare from qualified health workers and thus their reliance on unqualified providers. Findings from this study also draw attention to the sub-optimal mix of health workers in the workforce—the nurse-doctor ratio is approximately 1:1. Having similar number of nurses and physicians is internationally seen as an inefficient human resource skill mix.

The reasons behind the geographic mal-distribution of qualified health workers needs to be better understood by examining supply-side (e.g. training production capacity of health workers) and demand-side (e.g. incentives to recruit and retain, institutional factors and policy environment) factors. It is essential, of course, to increase production of health workers, given the overall numerical deficit India faces. However, the sort of growth witnessed in medical and nursing training institutions is not going to help improve the situation. First, this growth in training institutions is concentrated in a few states and is hardly there in states that have the largest human resource and health deficits. Second, the essentially private nature of this growth makes it less likely for graduates from these institutions to take up government service or live and serve in rural areas. Finally, the personal and professional ambition of medical graduates is incompatible with the life of a rural doctor. The ambition of medical graduates is to become specialists—once they specialise, there is little likelihood of them serving as a rural doctor.

While increasing production of health workers is important, doing this alone will not improve the great rural deficit in health workers. This, however, can be addressed by specific rural recruitment and retention strategies. These include the monetary incentives, reserving seats for specialist training in lieu of rural services, better management practices, and providing better living conditions for rural postings. Some of these strategies work well. For instance, the reservation of post-graduate seats for doctors on the completion of a rural tenure appears to be a powerful motivator for attracting doctors to rural areas. For governments, the additional cost of implementing this strategy is low since it takes advantage of existing educational facilities. Monetary incentives can be a powerful tool for attracting or retaining doctors in the rural areas if they are sufficiently high. However, at the levels they are currently offered they are not so effective. On the other hand, the salary levels required for attracting large number of doctors to the rural areas might ultimately be unaffordable to the government. Other strategies are also important; the provision of better housing, education for children, access to transport, better work facilities, and clear and transparent transfer policies that guarantee rotation between hardship and non-hardship
posts. Since multiple factors play a role in the job choices health workers make, we emphasise that any successful rural recruitment and retention strategy should be an optimal ‘package’ of pecuniary and non-pecuniary incentives rather than singular incentives (e.g. better salary) that are tailored for specific contexts.

While strategies to recruit and retain doctors to rural posts can be successful, a more fundamental question is whether one is focusing on the ‘right’ type of health worker. It appears that the professional and personal ambitions of medical graduates are not compatible with the life of a rural doctor. Their ambition is to become a specialist. However, after specialisation there is even less likelihood that rural service will be attractive. So while there will always be some doctors who will choose a government job and work in the rural areas, for the vast needs of this country it would appear that alternatives in the form of NPCs might offer a more lasting solution. Two states in India have successfully used three-year trained clinicians to provide primary healthcare in the rural areas. Nurse-practitioner trained to deliver basic clinical care is another alternative. They have been found to be more amenable (more than allopathic doctors) to join government service, and can be more easily placed in underserved areas. Evidence from many countries in Sub-Saharan Africa, Bangladesh, Nepal and India indicates that such non-physician clinicians can provide basic health services as well as fully qualified doctors. This places them in an important position for delivering quality health services in the rural areas.

**References**


MCi (Medical Council of India), www.mciindia.org, accessed on 12 March 2014.


