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Motkuri, Venkatanarayana

Centre for Economics and Social Studies, Hyderabad

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Access to Health Care in Andhra Pradesh : Availability of Manpower[±]

Motkuri Venkatanarayana[#]

Centre for Economic and Social Studies, Hyderabad

I Introduction

Health is the most important aspects of the human well-being. Unless a person leads a healthy life, the choices/options/opportunities available for him/her is not so much valuable as compared that of those who lead healthy life. Although health has been the concern of respective national government at national level, it has received the concerns of global community at larger level in the recent period. In the Millennium Development Goals (MDGs) 4 of the 8 goals are related to health. The thrust of MDGs is to provide the impetus for the national governments, bilateral and multilateral development agencies working in the health sector to develop effective strategies to attain these goals. One specific MDG that commits the global community is to reduce the death rate (mortality and morbidity), among the children in the age group under-five to three quarters by the year 2015 from the 1990 (country specific) baseline rate.

The improvement in health indicators depends upon the access to health care that including not the availability of health care institutions but also sufficient staffing of these institutions and availability of appropriate professional and technical personnel in the health care sector.

In this context, the present paper examines the access to health care with reference to availability of manpower in the health care sector in Andhra Pradesh. Also the paper provides the alternative estimations of workforce in health care sector based on the NSS Employment and Unemployment Survey.

[±] The paper is presented in 29th Annual Conference of Andhra Pradesh Economic Association (APEA) held during 13-14 February 2011 at JKC College, Guntur, Andhra Pradesh, India.

[#] Author of the paper was working as a Research Consultant at Centre for Economic and Social Studies, Hyderabad. Contact mail id: venkatanarayan@gmail.com

II Public Health Care Institutions in the State

Access to health care especially public health care facilities play important role in improving the health conditions of people. According to Facility Survey of Public Health Institutions conducted in Andhra Pradesh in 2008, there are 11978 Primary Health Sub-centres (PHSCs), 1458 Primary Health Centres (PHCs), 254 Community Health Centres (CHCs), 61 Area Hospitals, 19 District Hospitals in the state of Andhra Pradesh. Besides, there are number of private clinics and hospitals especially urban centres.

The coverage of health facilities in terms of population, there are 1461 sub-centre, 178 PHCs, 31 CHCs, 7 Area Hospitals and 2 District Hospitals per 10 million population in the state. Conversely each sub-centre is covering, on an average, seven thousand population in the state. Similarly the coverage of population by the other levels of hospitals are: PHC 56 thousand population and CHC 3.3 lakhs Area Hospital 13.5 lakh and 43.2 lakh. When compared to all-India average the state of Andhra Pradesh is relatively better in terms of availability of public health facility both the per ten million population and per lakh square Kms of geographical area.

Table 2.1: Public Health Care Infrastructure in Andhra Pradesh, 2008

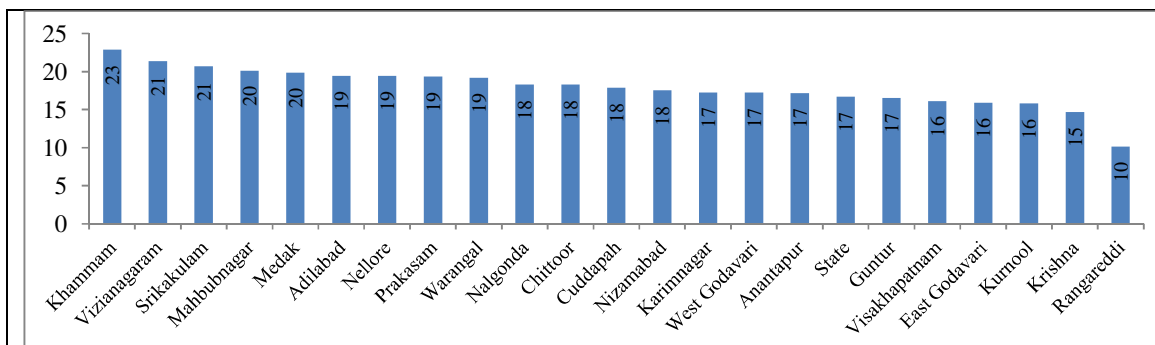
Sno	Parameter/indicator	Number		Per 10 M pop		Per lakh Sq Km GA	
		AP	India	AP	India	AP	India
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
1	Number of Sub-Centres	11978	145894	1461	1257	531	444
2	Number of PHCs	1458	23391	178	202	65	71
3	CHC(30-Beds)	191	4010 [#]	31 [#]	35 [#]	11 [#]	12 [#]
4	CHC(50-Beds)	63					
5	Area Hospital (100-Beds)	61	7603 [@]	7	65 [@]	3	23 [@]
6	District Hospital (200-300-Beds)	15		2 ^{\$}		1 ^{\$}	
7	District Hospital (300-400-Beds)	4					
Total		13770	180898	1679	1558	611	550

Note: 1. # - CHCs combined; \$ - District hospitals combined; @ All the government of hospital including Area and District hospitals (centre and state) excluding SCs, PHCs and CHCs.

Source: 1. For Andhra Pradesh - *Facility Survey of Public Health Institutions: 2008*, Indian Institute of Health and Family Welfare, Hyderabad; 2. For India – www.indiastat.com.

Across districts there exists a wide variation in number of health care facilities (all types/categories of hospital) available per lakh population; it ranges from the highest 23 to the lowest 10 health centres/hospitals (Figure 2.1). It is the highest in Khammam district followed by Vizianagaram, Srikakulam, Mahabubnagar, and Medak; and the lowest is in Rangareddy district followed by Krishna, Kurnool, East Godavari and Visakhapatnam.

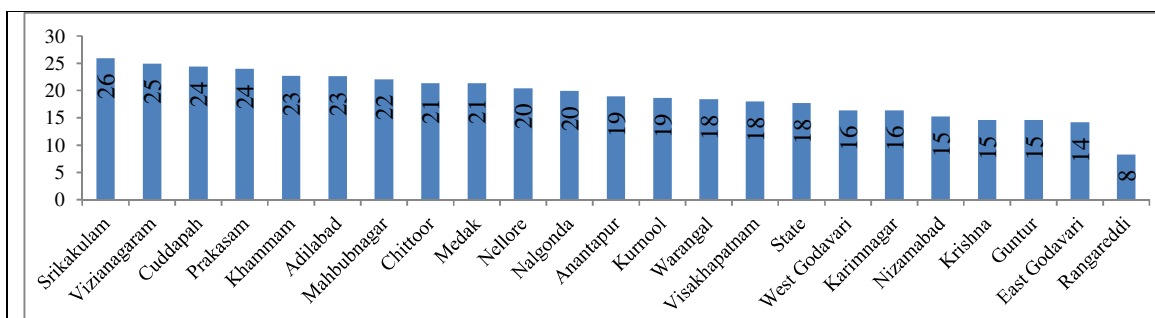
Figure 2.1: Number of Public Health Care Facilities (all types of Hospital) per lakh Population across Districts in AP, 2008



Source: Facility Survey of Public Health Institutions: 2008, Indian Institute of Health and Family Welfare, Hyderabad.

Whereas in the case of PHCs, variation in number of primary health centres (PHCs) available per a million population; it ranges from the highest 26 schools to the lowest 8 (Figure 2.2). It is the highest in Srikakulam district followed by Vizianagaram, Kadapa, Prakasam and Khammam; and the lowest is in Rangareddy district followed by East Godavari, Guntur, Krishna and Nizamabad.

Figure 2.2: Number of PHCs per a Million Population across Districts in AP, 2008



Source: Facility Survey of Public Health Institutions: 2008, Indian Institute of Health and Family Welfare, Hyderabad.

It is not only the availability of the health care institutions but also the availability of the sufficient human resources in these institutions and their functioning is the most important factor in improving the access to health care.

III Human Resources Available in the Health Care Sector

There may not be any disagreement in saying that more than number of institutions, the professional and technical human resources available in the health care sector is important. In this respect the most recent report of WHO (2006) *The World Health Report 2006 - Working*

Together for Health contains an expert assessment of the current crisis in the global health workforce and ambitious proposals to tackle it over the next ten years, starting immediately. The report concludes that there is an estimated shortage of almost 4.3 million health workers in the world. The shortage of health workers and their inefficiency in functioning, especially in the public sector health care system, is not a new phenomenon.

According to the data published in **Health Information of India 2005**, there are about 7.67 lakh registered medical practitioner (RMPs), 6.56 lakh doctors and 55 thousand six hundred dental surgeons (allopathy) registered with respective registered bodies in India. One is not sure about all those who have registered are actually working or not. If one considers those serving in the public sector there are about 77 thousands doctors, two thousand five hundred dental surgeons serving a little above one billion population in India. In addition there were 8.65 and 5.06 lakhs general and auxiliary nursing midwives and 50 thousands of health visitors & health supervisors.

Table 3.1: Manpower in the Health Care Sector in India and Andhra Pradesh, 2005

Sno	Category	Year	Number		% of A P
			India	A P	
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1	Allopathic Medical Practitioners (RMPS) registered with MCI	2005	767500	-	-
2	Allopathic Doctors possessing recognized medical qualification (Under I.M.C Act) and registered with respective State Medical Councils	2005	656111	34642	5.3
3	Number of Dental Surgeons registered with Dental Council of India	2004	55344	-	-
4	Number of Government Allopathic Doctors	2005	76925	7991	10.4
5	Number of Government Dental Surgeons	2005	2573	198	7.7
6	General Nursing Midwives	2004	865135	84306	9.7
7	Auxiliary Nursing Midwives	2004	506924	94395	18.6
8	Health Visitors and Supervisors	2004	50393	2480	4.9
9	Pharmacist (Registered)	2003	559408	33938	6.1
Total Manpower – Public Sector			2061358	223308	10.8
Population (in Million) – 2005			80	1096	-
Health Manpower per lakh Population - 2005			188	279	-
Health Manpower in Rural Areas – Public Sector					
10	-Doctors at Primary Health Centres (PHCs)	2004	21974	2137	9.7
11	Multipurpose Workers (Female)/ANM	2004	138906	13740	9.9
12	Multipurpose Workers (Male)/MPW	2004	60756	6327	10.4
13	Health Assistants (female)/LHV	2004	19773	1564	7.9
14	Health Assistants (Male)	2004	20086	1814	9.0
15	Nurse Midwife	2004	29139	2053	7.0
16	Lab Technicians	2004	12553	1437	11.4
17	Pharmacist	2004	17741	1637	9.2
Manpower in rural areas – Public Sector			320928	30709	9.6

Note: 1. '-' Not available; 2. Figures highlighted in bold are total available in register.

Source: GOI (2006) Health Information of India 2005.

If one takes into account the entire figures, there were 20.6 lakh workforce engaged in the public health care sector in India. When one standardises the workforce available, on an average one doctor serving fourteen thousand people and one dental surgeon serving more

than four lakh people and there were about 79 and 46 general and auxiliary midwives per lakh population. Altogether (doctors, nursing and the other health workers) there were 188 health personnel, working at different levels, per lakh population in India. All these estimates are referred to as the available workforce for the public health care services. These figures could not reveal the situation in the private health care services prevalent in the country.

The situation in Andhra Pradesh is better than the all-India average, with one doctor serving ten thousand people¹ and one dental surgeon serving around four lakh people. Altogether (doctors, nursing and the other health workers) there were 279 health personnel, working at different levels, per lakh population in Andhra Pradesh. But it is relatively poor when compared with other states, especially in south India where Tamil Nadu and Kerala are ahead of the state.

In the Indian context, however, the reliable data on human resources available for health care services is inadequate². The published data on workforce in health sector is an underestimate. Most of the published sources reveal only those working in the public sector and the workforce in private health care sector is either not at all estimated, if at all estimated, it is underestimated³. For instance, in rural areas, P/RMPs (Private/Registered Medical Practitioners) were the main health service providers⁴ (see Narayana, 2006) but they have never been accounted while estimating the workforce in health sector. Likewise many of those health workers serving different kinds of needs related to health of the human beings especially in rural India are totally ignored. Moreover, the information provided in the Health Information of India (2005) about the number of doctors registered with Medical Council of India does not ensure that they are working, if at all working whether they are in India or elsewhere in the world. As we know the fact that as many as qualified doctors are serving abroad. Also the number of doctors registered with Medical Council of India (MCI) or the respective states is an accumulated figure.

Whatever is the published data on health-personnel that is available, it indicates the serious crisis in human resources of health care sector. The severe shortage and imbalanced distribution of trained health personnel poses a serious obstacle to the improvement of the overall health of the poor.

Having observed the data constraint, an attempt is made to estimate the total workforce in health sector in India and Andhra Pradesh. Using NSS 61st (2004-05) Round Quinquennial

Employment and Unemployment Survey (EUS) and 64th Round (2007-08) EUS by following the thread of NIC-98⁵ codes, the estimates are made (for methodology See Venkatanarayana and Naik, 2010).

Based on the NSS 61st (2004-05) round on Employment and Unemployment survey data it is estimated that there were 2.6 lakh health workers (including both public and private health care) comprising 0.65 per cent of the total workforce in Andhra Pradesh. On an average there were about 324 health workers engaged in health services per lakh population in the state. The share of the public sector in the total workforce engaged in providing services is almost same in the state and at the country level, 28 per cent. In terms of the availability of health workers (per lakh population) both in general and the public sector in particular, the situation of Andhra Pradesh (i.e. 324 and 95) seems better when compared to the all-India average (304 and 86).

The estimations based on 64th round EUS indicates that the number of health workers was increased to 2.9 lakhs in Andhra Pradesh in 2007-08. During the three years period between 2004-05 and 2007-08 the health sector in the state registered 3.7% growth per annum in terms of its workforce. It is higher than the rate of growth in its population and the rate of growth in total workforce. As a result the number of worker available for health care sector per lakh population in the state has increased to 352 in 2007-08.

Table 3.2: Workforce in Health Care Sector of Andhra Pradesh

Sno	Indicators	2004-05	2007-08	Growth
1	2	3	4	5
1	Estimated Population (in Lakhs)	797	822	1.03%
2	Work Participation Ratio (%)	50.2	50.0	-
3	Estimated Number of Workers (in Lakhs)	400	410	0.83%
4	Percentage of Health Workers in Total (%)	0.65	0.70	-
5	Estimated Number of Health Workers (in lakhs)	2.6	2.9	3.71%
6	Percentage of Urban – Health Workers (%)	55.3	45.0	-
7	Percentage of Rural – Health Workers (%)	44.7	55.0	-
8	Percentage of Health Workers in Public Sector (%)	28	-	-
9	Number of Health Workers per lakh population – All	324	352	-
10	Number of Health Workers per lakh population – Rural	212	269	-
11	Number of Health Workers per lakh population - Urban	652	571	-

Note: 1. NSS based estimates of proportions are applied to projected Census population; 2. '-' Not available; 3. Growth is compound annual growth rate (CAGR).

Source: 1. Census of India; 2. Estimation drawn from NSS 61st round (2004-05) and 64th Round (2007-08) Employment and Unemployment Survey (Sch 10).

Rural-urban differences are quite high both in Andhra Pradesh and at the national level. More health workers are located in urban areas than in rural areas. The availability of health

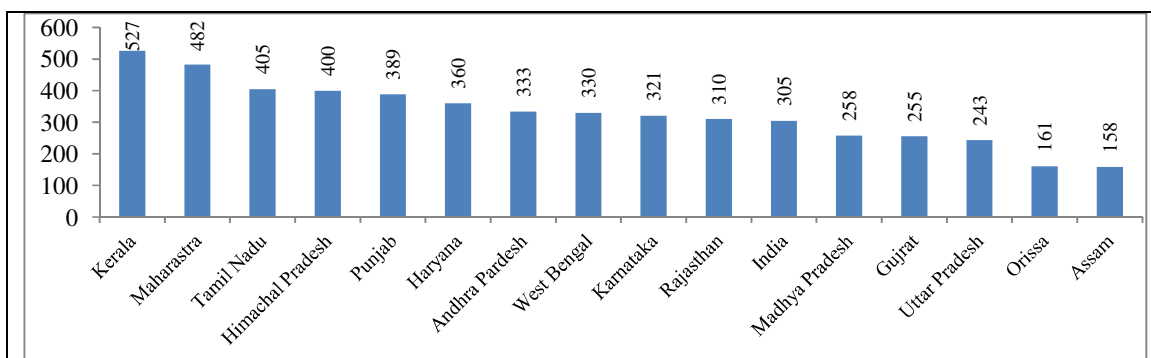
workers and therefore health services is much better for the urban population as compared to the rural. Traditional (Indian) systems of medicine are also mostly practiced in urban areas. In Andhra Pradesh only twenty per cent of the health workers are in the public sector which is well below the national average. There is also a large difference in the per capita availability of health workers between rural and urban sectors, indicating the disadvantage of rural people in terms of access to health services in general and public health services in particular.

The distribution of health workers by nature of activity, as per the 61st (2004-05) EUS, shows that about 38 per cent are engaged in hospital related activities and another 30 per cent in medical and dental practices. About 5 per cent of the total health workers are engaged in the practice of traditional (Indian) systems of medicine. About 18 per cent of workers are engaged in nursing and other paramedical activities and those who engaged in independent diagnostic centres, pathology labs and blood banks constitute about 5 per cent of the health workers in the state. The proportion of health workers engaged in traditional (Indian) systems of medicine in the state is well below the national average and it can be concluded that the demand for such health services is very low in Andhra Pradesh.

In the all-India context, as per the estimations based on the 61st round (2004-05) EUS, the state of Andhra Pradesh stands in the middle (7th position) in terms of the availability of health workers per lakh population. Across major states of India, the number of health workers available per lakh population was the highest in Kerala (527) followed by Delhi (513), Maharashtra (482), Tamil Nadu (405) and Himachal Pradesh (400). On the other side it was the lowest in Bihar (140) followed by Assam (158), Orissa (161), Uttar Pradesh (243), Gujarat (255) and Madhya Pradesh (258).

The share of public sector in the total workforce of health care sector varies across state between the highest 87% in Himachal Pradesh and the lowest 8% in Bihar. The state of Andhra Pradesh stands at 10th position with its public sector share 28% of its total workforce in the health care sector.

Figure 3.1: Number of Health Workers per Lakh Population across Major States in India, 2004-05



Note: 1. States are arranged in ascending order of ranking by health worker per lakh population; 2. The population of the respective states projected based on the rate of growth between 1991 and 2001.

Source: 1. Venkatanarayana and Suresh Naik (2010); 2. Estimation drawn from NSS 61st round (2004-05) Employment and Unemployment Survey (Sch 10).

Figure 3.2: Percentage of Public Sector in the total Workforce in Health Care Sector Across Major States in India, 2004-05

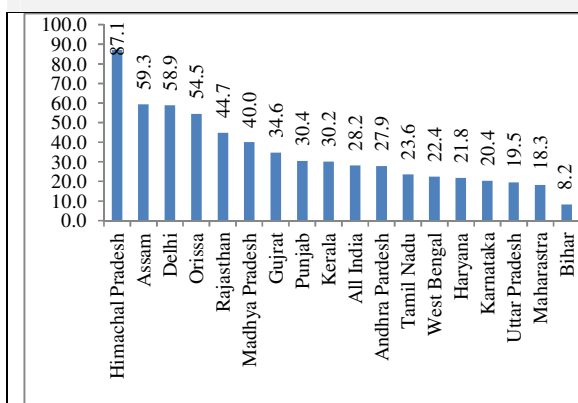
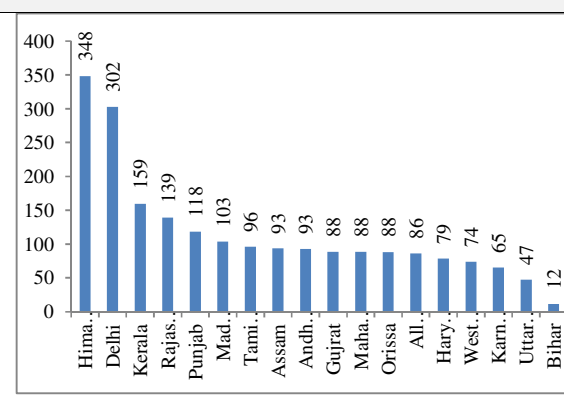


Figure 3.3: Number of Health Workers in Public Sector per lakh Population across Major States in India, 2004-05

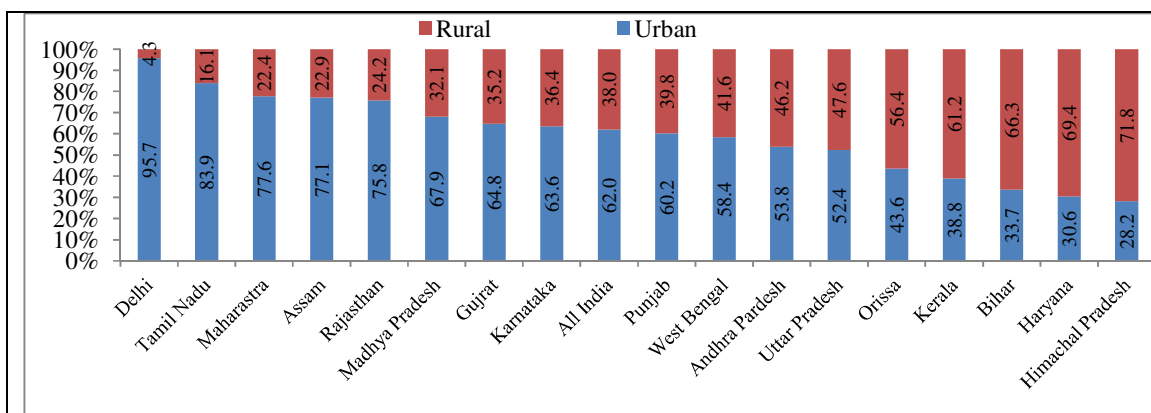


Note: States arranged in ascending order of ranking.

Source: 1. Venkatanarayana and Suresh Naik (2010); 2. Estimation drawn from NSS 61st round (2004-05) Employment and Unemployment Survey (Sch 10).

The distribution of health sector workforce between rural and urban areas is in contrast with the distribution of population. The same pattern is observed at national levels and in Andhra Pradesh as well as in the other states. A majority of the workforce in the health care sector is concentrated in the respective states' urban locations. In Andhra Pradesh 54% of the total health sector workforce is concentrated in urban areas and the rest 46% is located in rural areas.

Figure 3.4: Distribution (%) of the total Health Workers by Location (Rural-Urban break up) across Major States in India, 2004-05

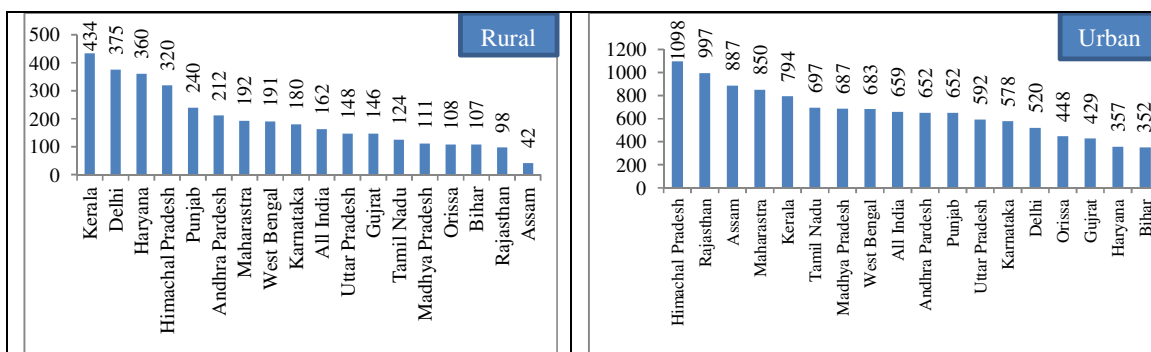


Note: Arranged in Ascending order based on the Urban Proportion.

Source: 1. Venkatanarayana and Suresh Naik (2010); 2. Estimation drawn from NSS 61st round (2004-05) Employment and Unemployment Survey (Sch 10).

As a result the number of health workers per lakh population in rural area is lower than that of the urban areas across states in India. In Andhra Pradesh the number of health workers available in urban per lakh urban population was 652 and in rural areas it was 212 only; the difference is very high.

Figure 3.5: Number of Health Workers Available for lakh Population by Location (Rural-Urban break up) across Major States in India, 2004-05



Note: Arranged in Ascending order.

Source: 1. Venkatanarayana and Suresh Naik (2010); 2. Estimation drawn from NSS 61st round (2004-05) Employment and Unemployment Survey (Sch 10).

In rural areas the number of workers in health care sector available in rural areas per lakh rural population across states is the highest Kerala followed by Delhi, Haryana, Himachal Pradesh and Punjab. Andhra Pradesh stands in the 6th position. In case of urban areas, the number of workers in health care sector available per lakh urban population across states is

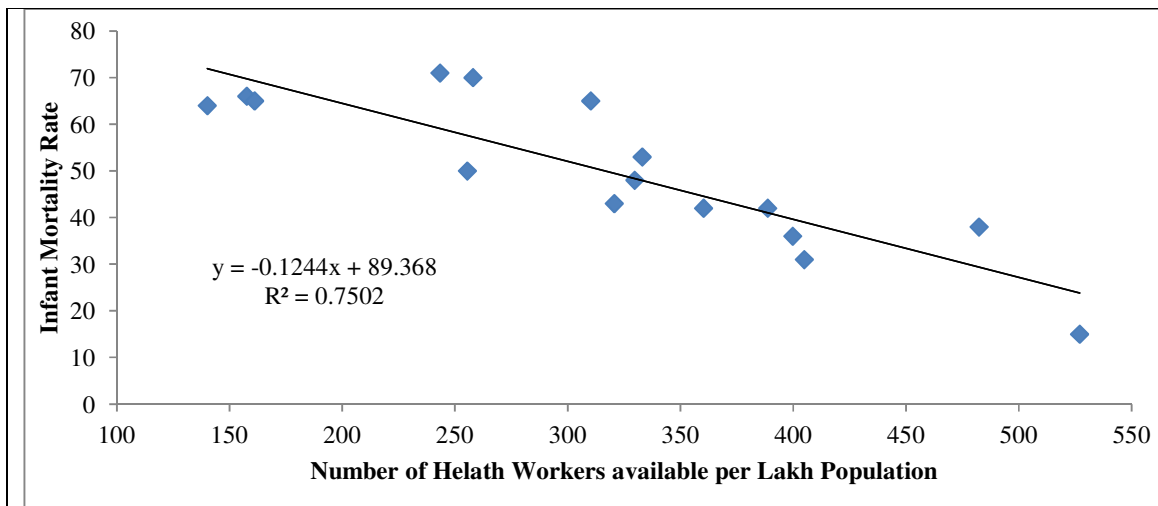
the highest Himachal Pradesh followed by Rajasthan, Assam, Maharashtra and Kerala. The state of Andhra Pradesh stands at 8th position.

IV Availability of Health Workers and Health Outcomes

Herein the impact of the availability (per lakh population) of health workers on health outcomes like infant mortality rates is examined. Information related to infant mortality rate (IMR) across major states is drawn from the estimations of NFHS (2005-06) III and presented in state specific *fact sheets*.

A statistical (correlation) analysis through scatter diagram across 16 major Indian states⁶ indicates that there is a significant and strong negative correlation (-0.87 is the coefficient) between availability of health workers and the health outcomes (IMR). It means that higher the per capita availability of the health workers (per lakh population), lower the IMR. The R2 value (0.75) also indicating per capita availability of the health worker is strong explanatory variable for this particular health outcome (IMR).

Figure 4.1: Relationship between Availability of Health Workers (per lakh population) and the Health Outcome (IMR) across Major States in India



Note: IMR – Infant Mortality Rate.

Source: 1. Venkatanarayana and Sursh Naik (2010); 2. Based on NSS 61st Round (2004-05) and NFHS III (2005-06)

A strong association between the availability of health workers and the health outcomes especially IMR, indicates a strong need for enhancing the availability of human resources in the health care sector in India. To elaborate on the linkage between availability of health workers and the health outcome, the important risk factors affecting these child health

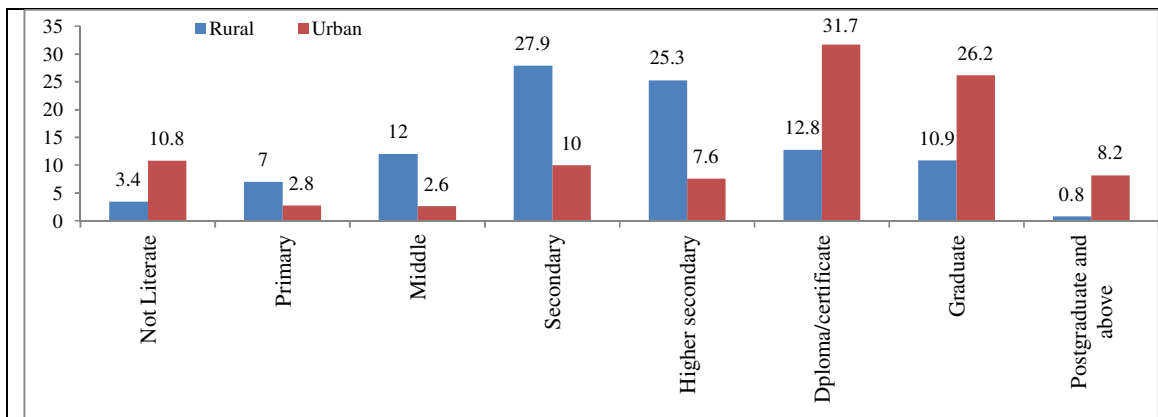
outcomes are mother’s health and nutritional levels in general and during pregnancy in particular. Mother’s health and nutritional levels in turn depends upon the availability of health care facility along with her family’s socio-economic factors. Health care includes medical and non-medical care (e.g. information sharing, counseling and monitoring on better health practices including hygiene and sanitation practices). Antenatal care, place of delivery and professional assistance during delivery are the few important factors affecting the health of the women and health and survival of the infants.

Availability of adequate public health care services at free-of-cost, may neutralise the role of socio-economic factors at the households level. Improved access to health care facility and the availability of required technical and professional human resources in the health care sector are the necessary factor while achieving the goal of Safe Motherhood and Childhood in the Indian context as well in Andhra Pradesh.

V Availability of Professional Health Personnel

The analysis above, however, could not bring out the estimates of health workforce with different levels of skills in the health care sector. Although the data related to different levels of skills of those engaged in health care sector is not available at the moment but the educational levels which implicitly indicate their skills, is available for the analysis.

Figure 5.1: Distribution (%) of the Workers in Health Care Sector of Andhra Pradesh by their Educational Levels, 2007-08



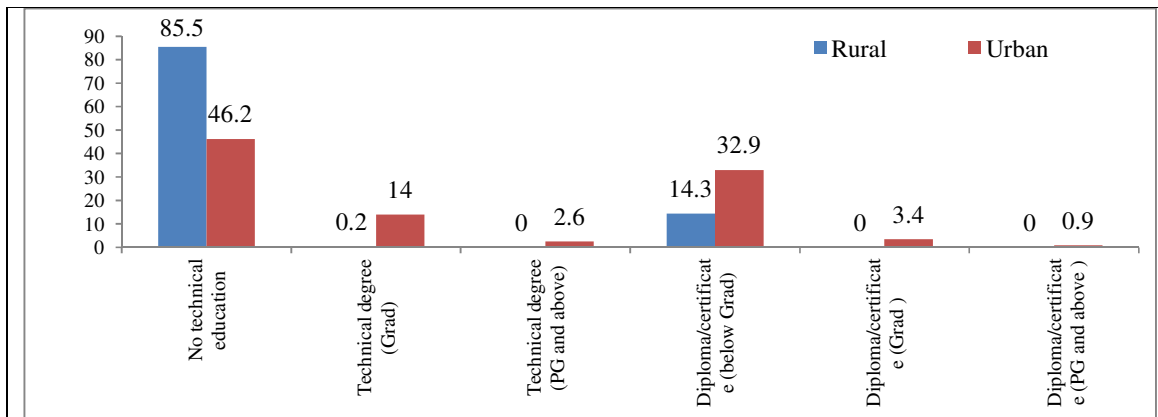
Note: Figure are percentages.

Source: Using NSS 64th Round (2007-08) Employment and Unemployment Survey raw data.

The general educational levels of the workforce which engaged in the health care sector of Andhra Pradesh indicates that about half of the workforce in rural areas engaged in the health

care services are having secondary or below educational levels and in urban areas about one-fourth of them are having similar levels of education.

Figure 5.2: Distribution (%) of the Workers in Health Care Sector of Andhra Pradesh by the Level of Technical Education, 2007-08



Note: Figure are percentages.

Source: Using NSS 64th Round (2007-08) Employment and Unemployment Survey.

With respect to the levels of technical education of these persons engaged in the health care sector in the state, in rural areas 85.5% of them do not have any technical education whereas in urban 46% do not have the technical education but the rest of them one or the other technical degrees.

The educational levels of workforce in general and health care service in particular indicate the quality services provided by the workforce. In rural areas a lion’s share of those who have engaged in health care services with very low educational levels could be private medical practioners. In this kind of health care service prevailing in rural areas more than the educational levels and technical degrees, the persons informally obtained expertise and experience matters.

In the urban areas, the prevalence private medical practioners and market for their services would be very low. Thus the workforce with lower educational levels and engaged in health care services in urban areas of the state could be those of working as office attendants of public health care institutions and hospitals/clinics and those who provide auxiliary services in hospitals/clinics. In the total workforce engaged in the health care sector, the availability actual health professionals especially in rural areas are very less in the state.

Therefore there is a strong need for increasing the availability of health professional for the health care services in the state. For this purpose the number of institutions providing formal education and training in health care services may have to be increased in the state. More than the quantitative expansion of the health education and training system, it is the quality of the education and training provided in the system.

VI Conclusions

In this paper an attempt is made to examine the problem of access to health care with reference to availability of manpower in the health care sector of Andhra Pradesh. It has provided an alternate estimate of the workforce in the health sector using NSS 61st (2004-05) round Employment and Unemployment Survey unit level record data following the thread of NIC-1998 activity classification codes. The analysis has shown inadequacy/shortage of workforce that engaged in health care services, rural-urban disparity in the location of health care services providers (i.e. workers) and regional disparities across major Indian states. It has also examined the relationship between the availability of health workers and the health outcomes and found a strong association between them. Of the total workforce engaged in the health care sector most of them are not trained professional as their low education levels indicate. Therefore there is a strong need for enhancing the availability of human resources especially those of trained in health care services, technical persons and professionals in the health care sector.

* * *

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End Notes

¹ There are 7991 doctors and 198 dental surgeons serving a population of 80 million in the state.

² When available they remain difficult to standardize and compare internationally.

³ In the available literature, these underestimated figures were quoted (see Misra et al., 2003; World Bank, 2001).

⁴ For instance, as per Narayana (2006) estimate, there were around 3000 RMP in a District of Andhra Pradesh. At the all India level Jayaprakash Narayana quotes an estimate of around 5 lakh RMP at all India level (Narayana, J P, 2004).

⁵ It follows National Industrial Classification (NIC) while enumerating the particular activity in which the sample worker is engaged. In the 61st (2004-05) round survey, NSS followed NIC 1998 which is revised Indian version in consonance with the revision 3 of International Standard Industrial Classification (ISIC) made in 1990.

⁶ The newly emerged states (Jharkand, Chattisgarh and Uttaranchal) are merged into their parent states (respectively, Bihar, Madhya Pradesh and Uttar Pradesh) using their proportion of population as weights.