

Articles

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Health Infrastructure In Rural India: Pre And Post Nhrm Analysis

Neha Paliwal* Mrs. Kamini Nava**

ABSTRACT

Health is a basic component of human development and determines society's wellbeing. The health development in any country depends on its health infrastructure, both in quantitative as well as in qualitative terms. In order to bridge the gap in existing health infrastructure and to provide accessible, affordable and equitable health care, the Government of India has started a large number of programmes and schemes. The National Rural Health Mission (NRHM) was launched in 2005 to provide accessible, affordable, and accountable quality health services to rural areas with emphasis on poor persons and remote areas. Now the question arises whether the health infrastructure in rural India has been significantly improved after launching of health focused programmes, especially NRHM or not. The present paper focuses on this issue. The paper also tries to analyse the regional disparity of rural health infrastructure in India. To compare the status of rural health infrastructure among states the 'Rural Health Infrastructure Index (RHII)' was computed with health infrastructure related variables for selected states for the years 2015 and 2006. The research concludes that after ten years of implementation of NHRM the norms for efficient rural health care infrastructure are yet to be achieved. There is large shortfall in manpower against required and even sanctioned position are vacant in larger amount. Large percentage of SCs, PSCs and CHCs do not have minimum basic requirements of instruments and manpower. Shortage of the these facilities resulting in low quality with low quantity rural health infrastructure in India. Regional disparity among states regarding rural health infrastructure has not changed much.

I INTRODUCTION

Health is a basic component of human development and determines society's wellbeing. It is a mean to empower the deprived sections of society and thus, an important element in the strategy for poverty alleviation. Health and socio-economic developments are so closely intertwined that it is impossible to achieve one without the other. Health is a priority goal in its own right, as well as central input into economic development and poverty reduction.

The concern for health improvements, especially among the poor and

the disadvantaged, whether espoused in government policies or elsewhere, stems from several considerations. One is the increasing recognition that improvements in health translate into substantial gains in economic performance and overall well-being of society. Second, good health may be considered an end in itself, irrespective of any contribution it can potentially make to enhance economic growth. Third, poor health has significant adverse implications for the economic well-being of affected households and individuals, particularly for poor households (Sundar and Sharma, 2002).

India is the second most populous country and the seventh largest economy in the world by nominal GDP (UNDP report- 2013). The contest between India's GDP and the human development index (HDI), as the most appropriate measure of "quality of life" of a country, has been longstanding. Between 1990 and 2014, India's HDI improved by 1.48 per cent annually. While the education index has pulled up the HDI, it is the health index which constrains its improvement. Despite rapid economic growth, India was ranked 143rd among 188 countries by the First Annual Assessment of Sustainable Development Goals (SDG) Health Performance in Sep, 2016. So, the health development especially of mother and children is the major concern in India for the overall development of the economy.

The health development in any country depends on its health infrastructure, both in quantitative as well as in qualitative terms.

India bears the major responsibility for health care as in the constitutional division of responsibilities across the union government and the states; health has been identified as a state subject. The union government plays an important role in influencing health outcomes of states through its expenditure on centrally sponsored programmes, loans, transfers and grants. The role of the central allocations in health spending varies across states (Prabhu, Seeta and Selvaraju, 2006).

The country has built a well-structured three tier public health infrastructure comprising Primary Health Centres (PHCs) and Sub-Centres (SCs) spread over rural and semi-urban areas as well as tertiary medical care consisting of multispecialty hospitals and medical colleges located almost exclusively in the urban areas. But inadequate health infrastructure, including shortage of doctors and paramedical professionals has resulted in restricted delivery of health services, particularly in rural areas. In order to bridge the gap in existing health infrastructure and to provide accessible, affordable and equitable health care, the Government of India has started a large number of programmes and schemes. The National Rural Health Mission (NRHM) was launched in 2005 to provide accessible, affordable, and accountable quality health services to rural areas with emphasis on poor persons and remote areas.

Now the question arises Are the health infrastructure in rural India has been significantly improved after launching of health focused programmes, especially NRHM ?

What is the present status of rural health infrastructure in India and are these health care services and service providers vary in quantity as well as quality among states?

These are some questions which plot the background for the present research.

II. OBJECTIVES

1. To analyse the status and trend of rural health infrastructure in India.
2. To examine the regional disparity regarding the rural health infrastructure in India.
3. To compare the states according to rural health infrastructure in India.

III. METHODOLOGY

This study is based on secondary data collected from reports of Ministry of Health and Family Welfare, Government of India entitled "Rural Health Statistics" for the period 2005 (the year of Launching of NRHM) to 2015. To analyse the trend, growth equations were applied on various variables of rural health infrastructure and to compare the status of rural health infrastructure among states the 'Rural Health Infrastructure Index (RHII)' was computed with health infrastructure related 25 variables for various states in 2015 and 2006 with the help of ranking method since the results of measure of sample adequacy and Bartlett's sphericity test invalidate the application of Principal Component Analysis Technique. The coefficient of variation, paired sample t-test and radar diagram were used to analyse the disparity among states. The states were classified in three categories -Highly Developed, Medium Developed and Least Developed in Rural Health Infrastructure with the help of clustering technique.

IV. HYPOTHESIS

1. There is no significant improvement of rural health infrastructure in India.
2. There is no regional disparity regarding rural health infrastructure in India.

V. RURAL HEALTH CARE SYSTEM IN INDIA

The Primary Health Care Infrastructure has been developed as a three tier system with Sub Centre, Primary Health Centre (PHC) and Community Health Centre (CHC) being the three pillars of Primary Health Care System.

Chart 1:Rural Health Care System in India

Sub Centre (SC)

Most peripheral contact point between Primary Health Care System & Community manned with one HW(F)/ANM & one HW(M)



Primary Health Centre (PHC)

A Referral Unit for 6 Sub Centres 4-6 bedded manned with a Medical Officer Incharge and 14 subordinate paramedical staff



Community Health Centre (CHC)

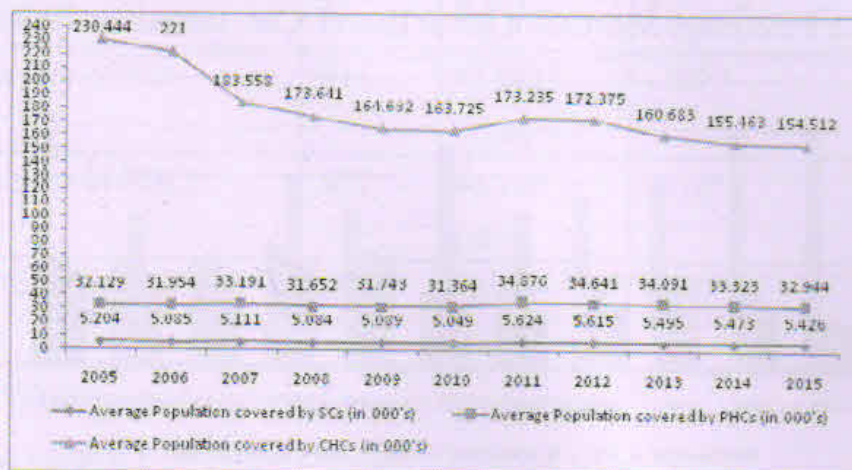
A 30 bedded Hospital/Referral Unit for 4 PHCs with Specialised services

Progress of Sub Centres, which is the most peripheral contact point between the Primary Health Care System and the community, is a prerequisite for the overall progress of the entire system. A look at the number of Sub Centres functioning over the years revealed that in 2005, there were 1,42,655 Sub Centres, which increased to 153655 as on 31st March, 2015.

Similar progress can be seen in the number of PHCs which was 23109 in 2005 and this has rose to 25,308 in 2015.

A number of PHCs have been upgraded to the level of CHCs in many States. In accordance with the progress in the number of Sub Centres and PHCs, the number of CHCs has also increased from 3222 in 2005 to 5,396.

Figure 1: Average Rural Population Covered by Health Care Institutions in India Since 2005 To 2015



A look at the rural population covered by SCs and PHCs functioning over the years revealed that during 2005 to 2015 the rural population covered by them has increased slightly but as may be seen from the figure 1 there is significant downfall in the population covered by CHCs at the end of 2015.

However the norms by NRHM for population coverage, which is 5000, 30000 & 120000 for SCs, PHCs and CHCs respectively, have not been achieved during 2005 to 2015. After 2005 there was improvement regarding SCs and PHCs but again it became worsened and at the end of 2015 it remains high for SCs 5426 (8.52 per cent higher) and for PHCs 32,944 (3.15 per cent higher). Though there is significant downfall for CHCs but average rural population covered by CHCs is still very high (24.76 percent) than the norms even after the increase of 5 per cent per annum in number of CHCs (Table 1).

Table 1: Growth Rate of Number of Rural Health Care Institutions

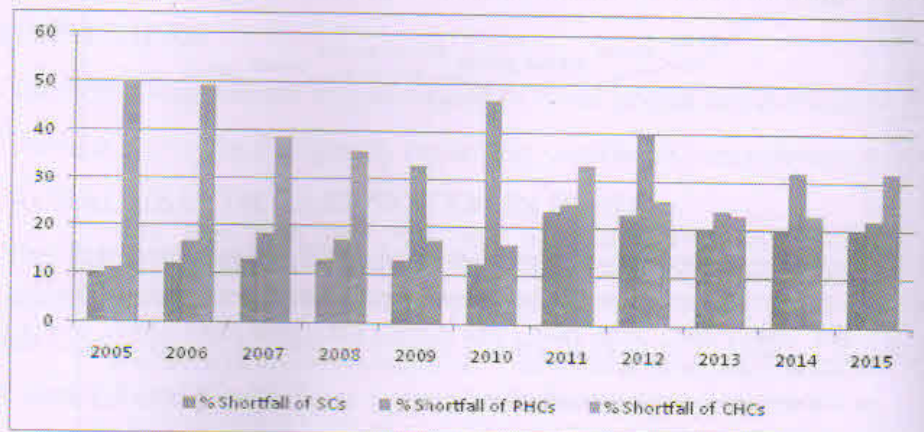
Variable	R2	F-Value	β -Coefficient	t-Value
Number of SCs	.908	88.785 (.000)	.007*	9.423 (.000)
Number of PHCs	.831	44.307 (.000)	.010*	6.656 (.000)
Number of CHCs	.908	88.956. (.000)	.050*	9.432 (.000)

*Significant at 1 per cent level of significance

p-value is given in parentheses

The reason behind that is before NHRM the number of CHCs is very less than the requirement. The percentage shortfall of CHCs in India was approximately 50 percent in 2005 which has been reduced to 32 percent in 2015 (figure 2) and so the average population covered by CHCs is also reduced 33 percent than it was in 2005.

Figure 2: Percentage Shortfall of Rural Health Care Institutions in India



A look at figure 3 and table 2 reveals that rural area covered by SCs and PHC over the years has been decreased by 0.7 and 1 per cent respectively during 2005 to 2015. But the downfall in the rural area covered by CHCs was at higher speed of 5 per cent during this period.

Figure 3: Average Rural Area Covered by Health Care Institutions in India Since 2005 To 2015

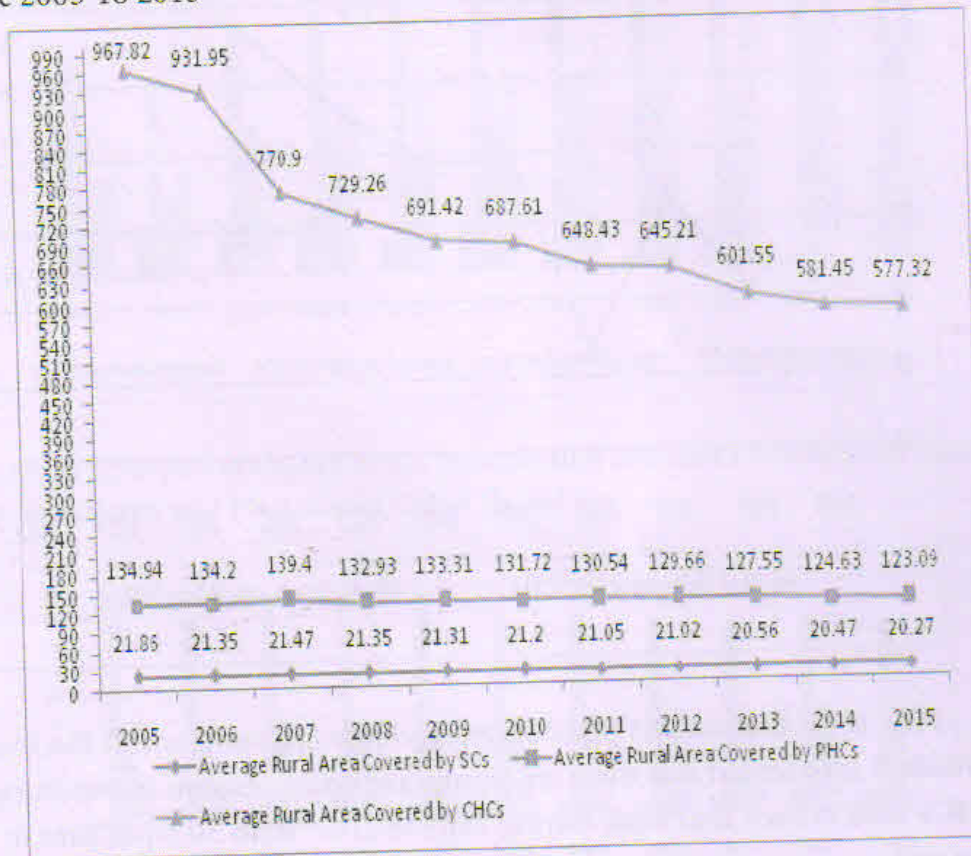


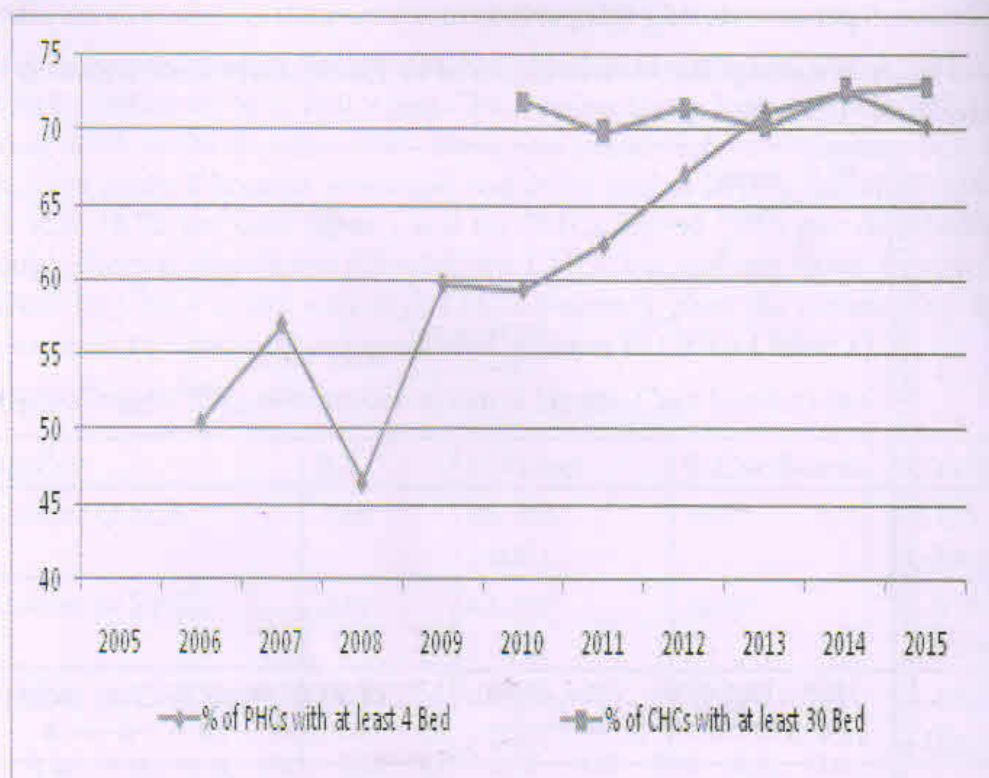
Table 2: Growth in Rural Area Covered by Health Care Institutions in India

Variable	R2	F-Value	β -Coefficient	t-Value
Number of SCs	.911	92.442 (.000)	-.007 *	-9.615 (.000)
Number of PHCs	.831	44.219 (.000)	-0.10*	-6.650 (.000)
Number of CHCs	.909	89.423 (.000)	-.050*	-9.456 (.000)

*Significant at 1 per cent level of significance

p-value is given in parentheses

Figure 4: Percentage of PHCs with at least 4 Beds & CHCs with at least 30 Beds.



PHC is the first contact point between village community and the Medical Officer. It is observed that there are significant improvements in percentage of PHCs with at least four beds during 2005 to 2015 from 50.5 per cent to 70.3 per cent.

In case CHCs at least 30 beds data available are from 2010 which shows it was already 70.4 per cent in 2010 and there was slight increase of 1 percent at the end of 2015.

Health institutions cannot perform better without human resources. The availability of manpower is one of the important pre-requisite for the efficient functioning of the Rural Health services. Figure 5 shows the percentage shortfall of Health workers and Health Assistants (Female and Male both). It can easily assessed that percentage shortfall of Health workers and Health Assistant female and male has been increased except health worker female. The highest short fall is of health workers and health assistant in male category is highest (more than 60 per cent), whereas it is 50 per cent for health assistant female. So there is large shortage of health workers and assistants.

Figure 5: Percentage Shortfall of Health Worker (HW) (Female And Male) at SCs and Health Assistants (HA) (Female And Male) at PHCs Since 2005 To 2015

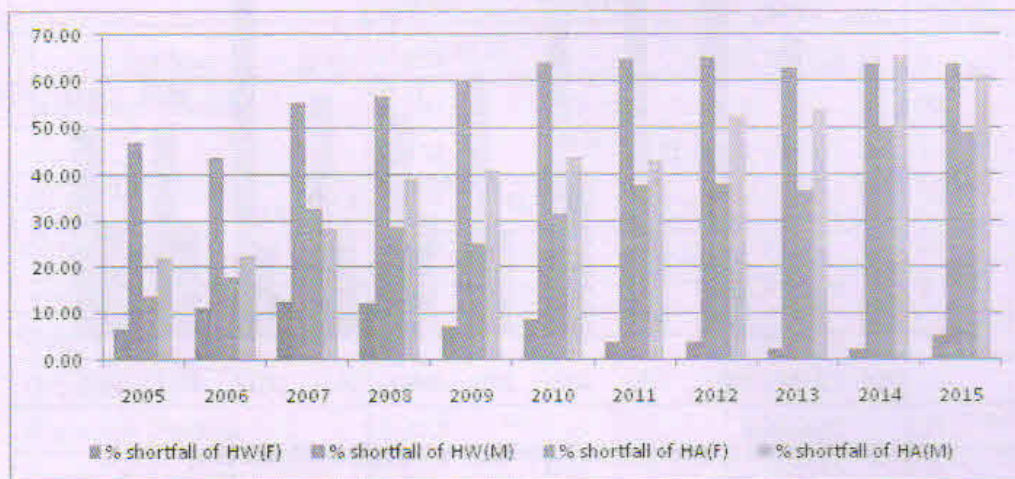
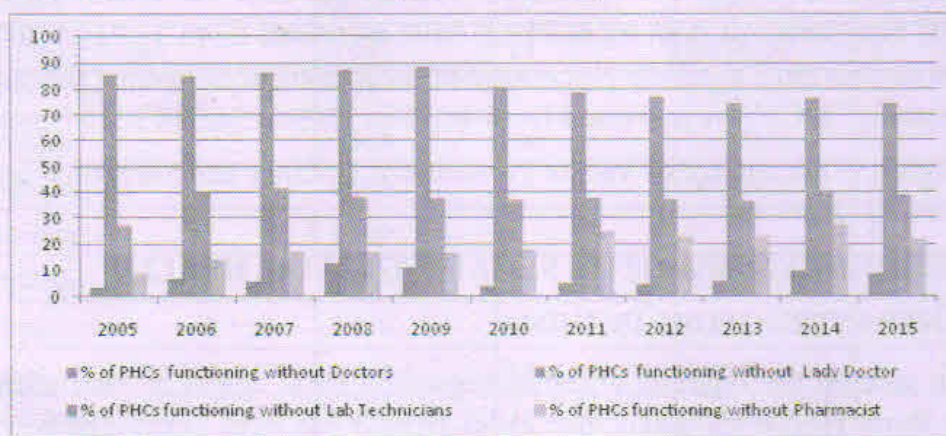


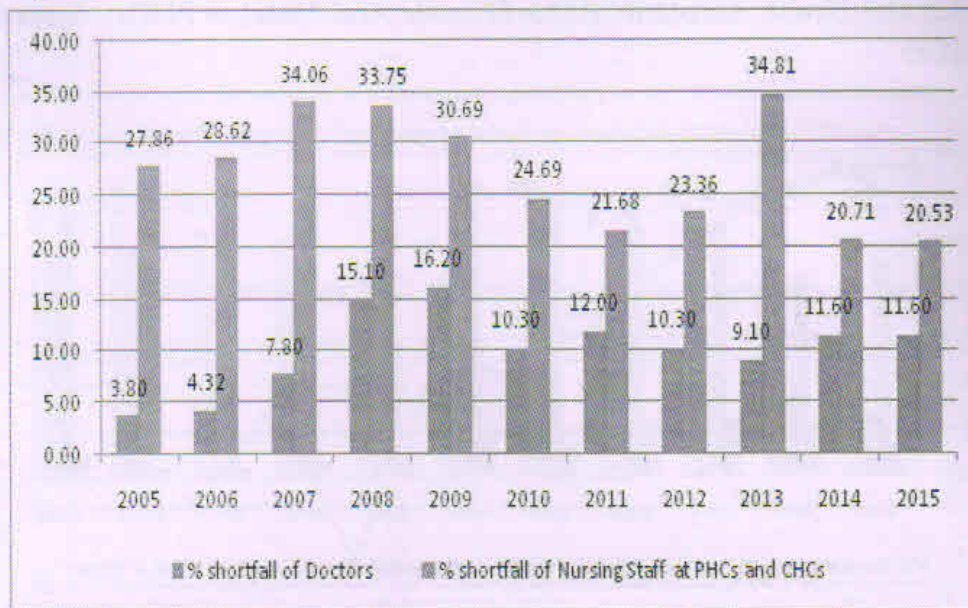
FIGURE 7: Percentage of PHCs Functioning Without Doctor, Lady Doctor, Lab Technician and Pharmacist (2005 To 2015)



The figure 7 shows per cent of PHCs working without man power is increasing except in case lady doctor but percentage of PHCs without lady doctor has remained highest than others in all subsequent years after 2005. As on 31st March, 2015, 8.1 per cent of the PHCs were without a doctor, 74.57 per cent without lady doctors, 38.1 per cent were without a Lab Technician and 21.9 per cent were without a pharmacist.

Though very less percentage of PHCs are working without at least doctors but this ratio has increased from 3 per cent in 2005 to 8 per cent in 2015 and overall shortfall of doctors against requirement is increased from 3.8 to 11.6 per cent during this period. Though the data of per cent shortfall of nurses declines during 2005-15 but is still very high in 2015 (20.53 per cent) (figure 8).

Figure 8: Per cent Shortfall of Doctors and Nurses (2005-2015)



There is not only the short fall of doctors against requirement but large positions of doctors and surgeons are vacant. Per cent of vacant positions against sanctioned of doctors at PHCs have increased from 10.91 in 2005 to 27 per cent in 2015 similarly percentage of vacant positions against sanctioned surgeons at CHCs have increased from 40.99 in 2005 to 74.6 in 2015 (figure 9).

Figure 9: Percentage of Vacant Positions of Doctors and Surgeons against sanctioned (2005-15)

VI. REGIONAL DISPARITIES REGARDING RURAL HEALTH INFRASTRUCTURE IN INDIA

To analyse the regional disparity regarding rural health infrastructure in India Rural Health Infrastructure Index (RHII) has been computed with the help of 25 variables – Average Rural Population and Area covered by SCs, PHCs and CHCs (6), Percentage of SCs with ANM Quarters (1), Percentage of PHCs with Labour Room, Operation Theatre, with at least 4 Beds (3), Percentage of CHCs with Labour Room, Operation Theatre, Corner for New Born, having regular supply of Alopethic drugs for common Ailment, with function X-Ray Machine, with at least 30 Bed, with Quarter of Doctors(7), Percentage of PHCs functioning without Doctors, without ANM and HW(M), without Lady Doctor (3), Percentage Shortfall of Nursing Staff at PHCs and CHCs, Pharmacists, Lab Technicians, Radiographers, doctors (5) for 29 states of India for the year 2015 and 28 states in 2006 (Except Telangana). Method of computing index is explained earlier. The RHII values of states and their ranks for 2006 and 2015 have been given in table 3.

Table 3: Rural Health Infrastructure Index (RHII) of States and Their Ranks (2006 and 2015)

States	Index (2015)	Rank (2015)	Index (2006)	Rank (2006)
Andhra Pradesh	0.688	6	0.766708	6
Arunachal Pradesh	0.000	29	0	28
Assam	0.432	20	0.594603	11
Bihar	0.219	26	0.100699	26
Chhattisgarh	0.506	13	0.22487	25
Goa	0.772	3	0.992474	2
Gujarat	0.543	10	0.555994	14
Haryana	0.466	16	0.397957	23
Himachal Pradesh	0.472	15	0.465687	21
Jammu & Kashmir	0.537	12	0.473213	20
Jharkhand	0.093	28	0.60585	10
Karnataka	0.639	8	0.623723	9
Kerala	0.432	20	0.390432	24
Madhya Pradesh	0.482	14	0.036732	27
Maharashtra	0.732	5	0.480738	18
Manipur	0.303	24	0.695216	7
Meghalaya	0.460	18	0.770471	5
Mizoram	1.000	1	1	1
Nagaland	0.614	9	0.582333	12
Odisha	0.229	25	0.57857	13
Punjab	0.540	11	0.476975	19
Rajasthan	0.438	19	0.808099	4
Sikkim	0.863	2	0.676402	8
Tamil Nadu	0.753	4	0.979059	3
Telangana	0.685	7		
Tripura	0.466	16	0.555994	14
Uttarakhand	0.204	27	0.431822	22
Uttar Pradesh	0.383	22	0.507078	17
West Bengal	0.349	23	0.525891	16
Mean	0.493		0.546343	
SD	0.225859		0.254977	
C of V	45.80431		46.66979	

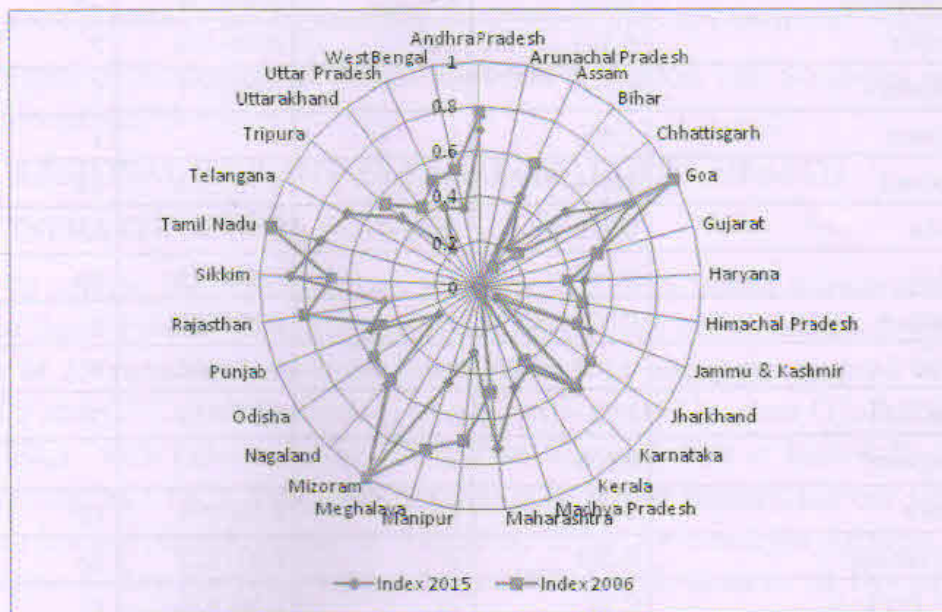
Table 3 reveals that while some states (Chhattisgarh, Madhya Pradesh, Bihar, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Nagaland, Punjab, Sikkim, Maharashtra) have shown improvement in their RHII score in 2015 as compared to 2006, there are others which have shown decline in RHII scores (Andhra Pradesh, Assam, Goa, Gujrat Jharkhand, Manipur Meghalaya, Odisha, Rajasthan, Tamilnadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal).

Mizoram has maintained its highest position with RHII score of 1 while Arunachal Pradesh continued its lowest position with least score of 0 in 2015 and 2006. The coefficient of Variation have shown that regional desparit regarding rural health Infrastructure has declined very slightly from 46.67 to 45.80. The table 4 reveals that null hypothesis of paired t-test that there is no difference in scores of RHII in 2006 and RHII in 2015 is accepted since p-value is greater than .05 so there is no significant difference in scores of RHII in 2006 and 2015.

Table 4: Comparison of RHII : Paired Sample t-Test

Pair	t	df	Sig. (2-tailed)
RHII2015 and RHII2006	1.441	27	.161

Figure 10: Rural Health Infrastructure Index 2006 and 2015



The figure 10 shows that spread of states from centre to periphery has been large and not changed much from 2006 to 2015. The higher the state is developed in rural health infrastructure farther it will be from the centre and less it is developed in rural health infrastructure nearer it is to the centre.

Table 5: Classification of States according to RHII

Category	2006	2015
Highly Developed in Rural Health Infrastructure	Andhra Pradesh, Goa, Manipur, Meghalaya, Mizoram, Rajasthan Sikkim, Tamil Nadu (8)	Andhra Pradesh, Goa, Maharashtra, Mizoram, Sikkim, Tamil Nadu, Telangana (7)
Medium Rural Health Infrastructure	Assam, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand Karnataka Kerala, Maharashtra, Nagaland, Odisha Punjab Tripura, Uttar Pradesh, Uttarakhand, West Bengal (16)	Assam, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka Kerala, Madhya Pradesh, Meghalaya, Nagaland, Punjab, Rajasthan, Tripura, Uttar Pradesh, West Bengal (16)
Least Rural Health Infrastructure	Arunachal Pradesh Bihar, Chhattisgarh, Madhya Pradesh (4)	Arunachal Pradesh, Bihar, Jharkhand, Manipur, Odisha, Uttarakhand (6)

*Clustering factor = (max-min)/3

Table 4 reveals that clustering of states according to the scores of RHII is also strengthening the fact that regional disparity in rural health infrastructure has not changed much. The difference in number of states in highest and lowest category is changed by two only (except Telangana) and in medium category it remained same. Only Maharashtra, Chhattisgarh, Madhya Pradesh has improved their category while Rajasthan, Meghalaya, Jharkhand, Manipur, Odisha, Uttarakhand have been downgraded in 2015 as compared to 2006.

VII. CONCLUSION

The National Rural Health Mission started in 2005 to provide effective healthcare to rural population throughout the country. All India analysis for infrastructure and manpower presented concludes that though actions are taken to improve the rural health infrastructure in India and number of health care institutions are tried to increase but after ten years of implementation of NHRM the norms for efficient rural health care infrastructure are yet to be achieved. There is large shortfall in manpower against required and even sanctioned position are vacant in larger amount. Large percentage of SCs, PSCs and CHCs do not have minimum basic requirements of instruments and manpower. Shortage of the these facilities resulting in low quality with low quantity rural health infrastructure in India.

Regional disparity among states regarding rural health infrastructure has not changed much. Majority of the states (16 out of 29) are still categorised with medium rural health infrastructure developed states. Arunachal Pradesh,

Bihar, Jharkhand, Manipur, Odisha, Uttarakhand, Uttar Pradesh, West Bengal are some states that needs higher attention in development of rural health Infrastructure in India since these states have the least developed rural health infrastructure in 2015.

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