



# HEALTH CARE INFRASTRUCTURE AVAILABILITY IN RAJASTHAN (2012-13)

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## Abstracts

This paper deals with the availability of health care infrastructure in Rajasthan's districts wise. Report DLHS-4 and Statistical abstracts of Rajasthan 2012-13 data have used in this study. Simple statistical methods, excel sheets and method of map have been using in it. By the analyzing of the represents of data, ANM availability in SHCs are high in the Thar desert and some districts of tribal regions, while male health workers (SHCs) and medical officers (PHC) are high in the Aravali, Plain and Hadoti regions of Rajasthan except some districts of it. India's public health system is a three tier system namely primary, secondary and tertiary levels of health care, which aims to develop as well as deliver health care services to the individuals and communities in the country. In India, despite improvements in access to health care, inequalities related to socio-economic status, geography, and gender, is compounded by high out-of pocket expenditures, with more than three-quarters of the increasing financial burden of health care being met by households

**Key Points:** Primary health care, Sub health care, Community health care, Pediatrician, gynecologist, anesthetist, Ayush Doctor, Auxiliary Nurse Midwife.

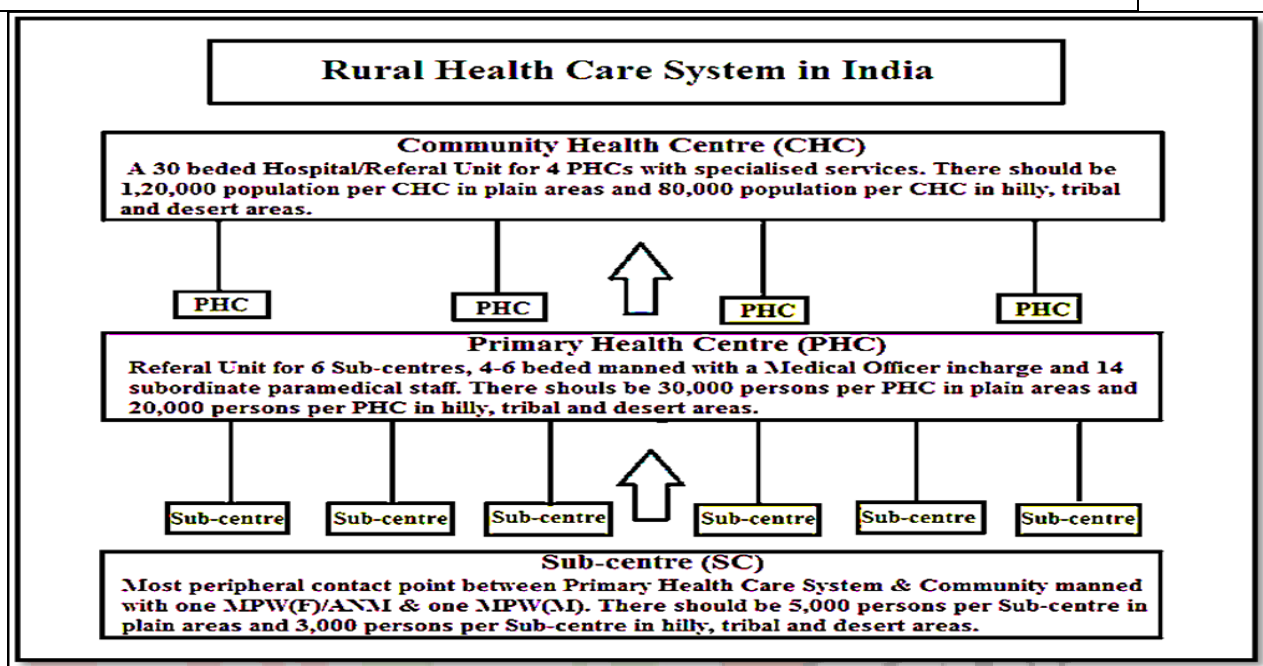
## Introduction

Health plays a vital role in acquisition and management of "life- cycle wealth" by way of building "human capabilities" in developing economies like India. Health and health care are required to be distinguished from each other. The former is often incorrectly seen as a direct function of the latter. In fact, health is not just mere absence of disease. Good health gives freedom from illness and builds ability to realize one's potential. Health is therefore best understood as the indispensable basis for defining a person's sense of well-being (**Srinivasan, 2012**). Health care covers not only medical care but also all aspects of pro-preventive care. It is not just limited to care provided by or financed out of public expenditure but it also includes incentives and disincentives for self-care and care paid for by private citizens to get over ill health (**Srinivasan, 2012**). Maintaining good human health of the people in general and child in particular has become a distinct key issue in public policy discourse.

**Table 1: Health care infrastructure in India: 2012-13.**

Type of Health Care Facility	Total Number	Total Population	Population Facility Ratio
Hospitals	12,760	1,21,05,69,573	94,843
CHCs	4,809	1,21,05,69,573	2,51,652
PHCs	23,887	1,21,05,69,573	50,663
Sub-centres	1,48,124	1,21,05,69,573	5,624
Total	1,89,580	1,21,05,69,573	6,384

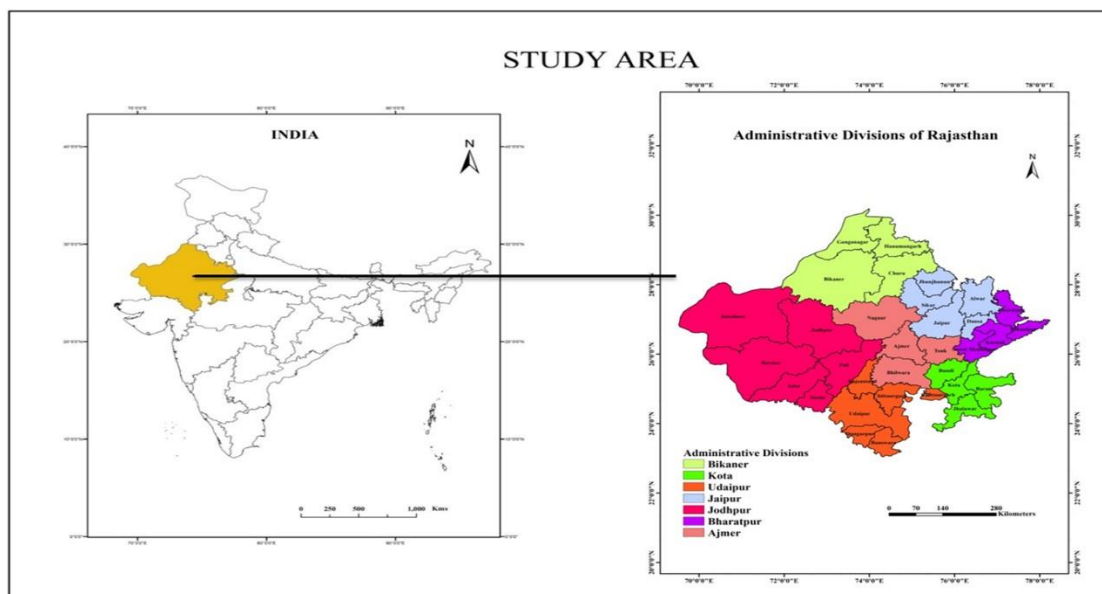
Source: Government of India, “Statistical Abstract of India 2013”, Ministry of Statistics & Programme Implementation, New Delhi.



**Study area**

India’s largest area occupying state Rajasthan is located in the northwestern part of the subcontinent. The areas selected for this study are Bikaner, Jaipur, Kota, Jodhpur, and Bikaner districts of Rajasthan which are the divisional headquarters of the state. The adjoining districts of these headquarters cover almost entire state, and climate change can be accessed for the state. The area of study and geographical position of selected districts are shown in Figure 1. Regarding the geographical redeployment of the districts, historically, in the last three decades (1981-2011), during the period of 1981-1991, Dhaulpur was formed, during 1991-2001, five districts of Baran, Dausa, Hanumangarh, Karauli, and Rajsamand were carved out and during 2001-2011, and the district of Pratapgarh has been carved out of the three districts of Banswara, Chittaurgarh, and Udaipur. According to this provisional data, the population of India is 121.02 crore and of Rajasthan is 6.86 crore (Yadav, 2015).

**Figure 1: Study area of Rajasthan.**



**Objective**

- To examine the health care infrastructure availability in Rajasthan

**Database and research methodology**

For this study, the data of the year 2012-13 are using for availability of health care infrastructure of the districts of Rajasthan. The data obtained from **Statistical abstract of Rajasthan, 2012-13 and DLHS-4**. above sources have tabulated and summary statistics, namely, mean, standard deviation (SD), and composite index. The data has been processed with the help of simple statistical technique and has been displayed by maps prepared in MS excel, SPSS software and GIS software Arc 10.0. Composite Index is based on WHO formulas as mentioned below;

For Positive indicators = 
$$\frac{\text{Actual value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}}$$

For Negative Indicators = 
$$\frac{\text{Minimum value} - \text{Actual value}}{\text{Maximum value} - \text{Minimum value}}$$
 Value of positive indicators – Value of negative indicators

$$\frac{\text{Sum of total value of calculated indicators}}{\text{no. of total indicators}} \text{ Composite Index} =$$

**Results and Discussions Numbers of hospitals, CHCs, PHCs, SHCs in Rajasthan by districts****Table 2: Numbers of hospitals, CHCs, PHCs, SHCs in Rajasthan by districts**

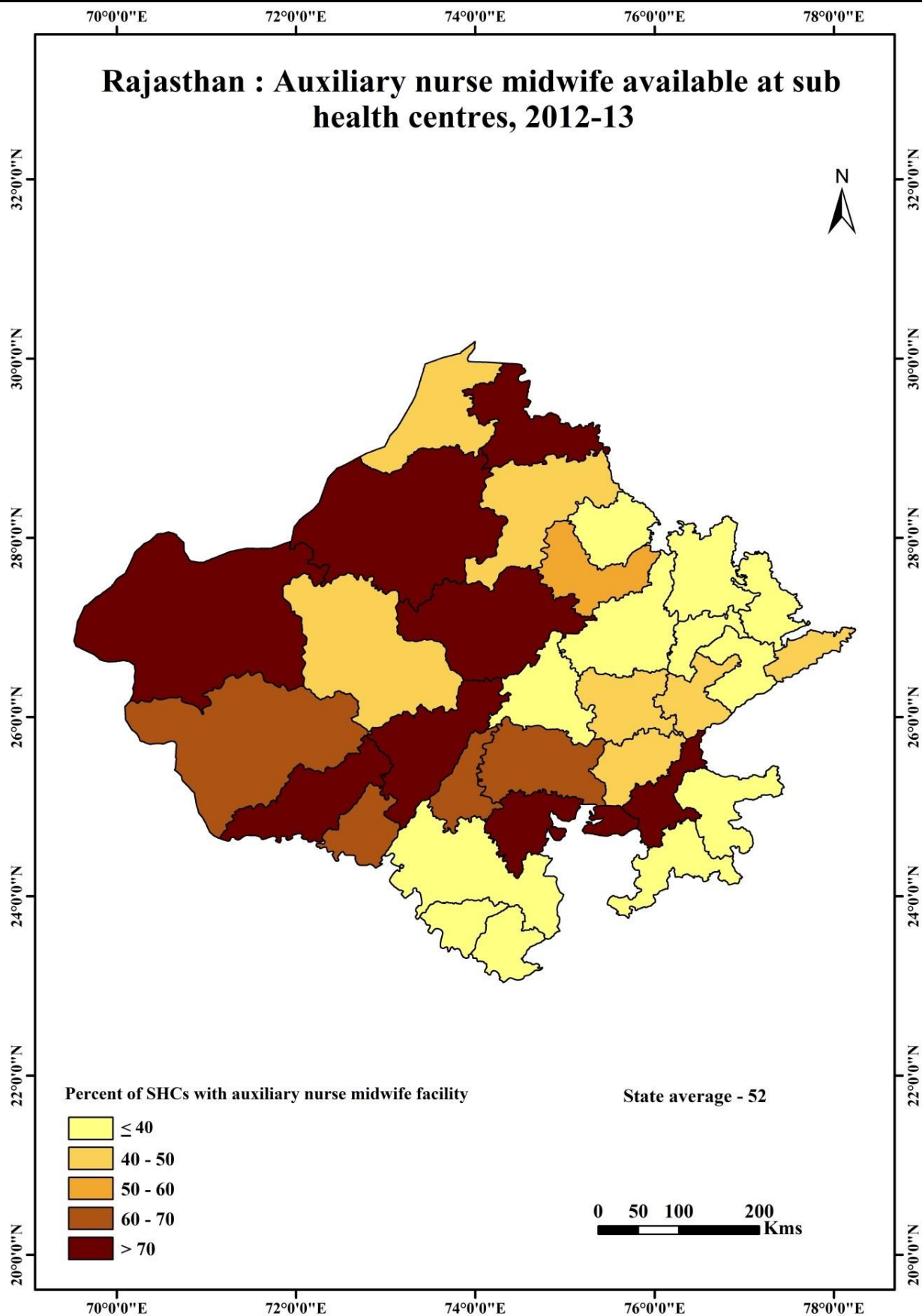
Districts	Hospitals	CHCs	PHCs	SHCs
Ajmer	8	13	45	333
Alwar	5	28	79	626
Banswara	2	17	42	422
Baran	1	9	40	221
Barmer	3	16	69	638
Bharatpur	4	14	59	396
Bhilwara	3	18	67	460
Bikaner	4	10	46	421
Bundi	2	8	28	205
Chittaurgarh	3	15	42	333
Churu	5	10	70	417
Dausa	1	10	32	295
Dhaulpur	1	7	23	215
Dungarpur	3	11	40	332
Ganganagar	1	12	46	402
Hanumangarh	2	9	43	325
Jaipur	12	21	102	575
Jaisalmer	2	7	17	152
Jalore	2	8	56	407
Jhalawar	1	14	33	284
Jhunjhunun	3	18	78	518
Jodhpur	8	19	70	623
Karauli	2	7	27	286
Kota	3	9	32	186
Nagaur	5	22	92	777
Pali	3	17	70	473
Pratapgarh	1	6	23	181
Rajsamand	2	8	39	227
Sawai Madhopur	3	7	22	265
Sikar	1	22	72	598
Sirohi	2	7	23	210
Tonk	3	7	48	273

Udaipur	7	22	74	625
<b>Source - Statistical abstract of Rajasthan, 2012-13.</b>				

The table 2 depicts the current scenario of the health care institutions in Rajasthan which is based on statistical abstract and AHS, 2012-13. Numbers of hospital is higher in Hanumangarh (12), than in Udaipur (7), and in Alwar (5) hospitals. While seven districts of Rajasthan have one hospital each. Number of CHC is highest in Alwar (28), followed by Udaipur, Nagaur and Sikar with facility of 22 CHCs, and lowest in Sirohi, Tonk, Swai Madhopur, Jaisalmer, Dhaulpur districts which have 7 CHCs each. The PHC is available in highest numbers at Jaipur (102) followed by Nagaur (92), Alwar (79) and Jhunjhunun (78). Relatively, low numbers of PHC are available at Swai Madhopur (22), Sirohi (23), and Karauli (27). The facility of SHC is high in Rajasthan's district in Nagaur (777), Barmer (638), and in Alwar (626). Beside it, low no. of SHC exists in Jaisalmer (152). Average area and average population served by each facility is affected by variations in the numbers of all health care institutions.

### **Availability of Auxiliary Nurse Midwife in SHCs**

The figure 2 represented the ANM (Auxiliary Nurse Midwife) availability in SHCs by districts of Rajasthan, 2012-13, based on DLHS-4. The number of Sub-centres and number of ANMs shall also depend upon the case load of the facility and distance of the village/habitations which comprise the Sub-centres. There are 147069 Sub-centres functioning in the country as on March 2010 as per Rural Health Survey in 2010 (IPHS, 2012). In Rajasthan state, 52.90 percent of SHCs have ANM availability, whereas 93.40 percent SHC having the facility of ANM in Kerala. The highest district is Jalore with 94.70



**Figure 2: Availability of auxiliary nurse midwife at SHCs in Rajasthan**

percent and lowest is Ajmer with 8.30 percent of SHCs with ANM availability. It has been observed that the ANM are high in the western part of Rajasthan while MHW is high in the eastern side of the Rajasthan. ANM working at SHCs are high as compared to MHW. Parts of Thar and southern Aravalli have above 70.00 percent availability of ANM in SHCs while the very low category of below 40.00 percent availability of ANM depicts

in the eastern and some districts of southern areas of the Rajasthan. Only Sikar district dropped in moderate category, here 50.00 to 60.00 percent SHCs have such facility.

### **Availability of male health workers at SHCs in Rajasthan**

The concept of Multipurpose Health Workers (MPHW), (Male and Female) was introduced in 1974 for the delivery of preventive and promotive health care services to the community at the level of sub-health centres (MPHW, 2010). The figure 3 reveals the MHW (Male Health Worker) availability at SHC by districts of Rajasthan, 2012-13, based on DLHS-4. Only about one tenth of SHCs have MHWs in the state, while 76.20 percent SHCs facilitated with the MHW in Kerala. The pattern of MHW is found in a scattered form in Rajasthan. It has been observed from the figure that male health workers availability at SHCs falls in very high category in the eastern part and some districts in middle area of the Rajasthan which is above 15.00 percent. All northern region falls in very low category which shows that this facility is in less than 5.00 percent of SHCs. Moderate districts lies in the Thar desert of the Rajasthan where 5 to 10 percent of SHCs have male health worker. Data is not available about five districts of Rajasthan such as Hanumangarh, Jaisalmer, Jaipur, Udaipur and Banswara.

### **Availability of medical officers at PHCs in Rajasthan**

Primary health centers are the cornerstone of rural health services- a first port of call to a qualified doctor of the public sector in rural areas for the sick and those who directly report or referred from sub-centers for curative, preventive and promotive health care. The overall objective of it is to provide health care that is quality oriented and sensitive to the needs of the community (Srinath, 2015). The figure 4 reveals the medical officers available at PHCs by districts of Rajasthan, 2012-13, based on DLHS-4. Rajasthan has recorded 81.10 percent PHCs with MO (medical officers). Dhaulpur, Sirohi and Rajsamand are the districts where 100 percent PHCs have MO availability. While, the Ganganagar district have 54.00 percent PHCs with medical officers. Almost all Aravali and plain region covered with high and very high category of MO which shows the availability of MO in above 80.00 percent of

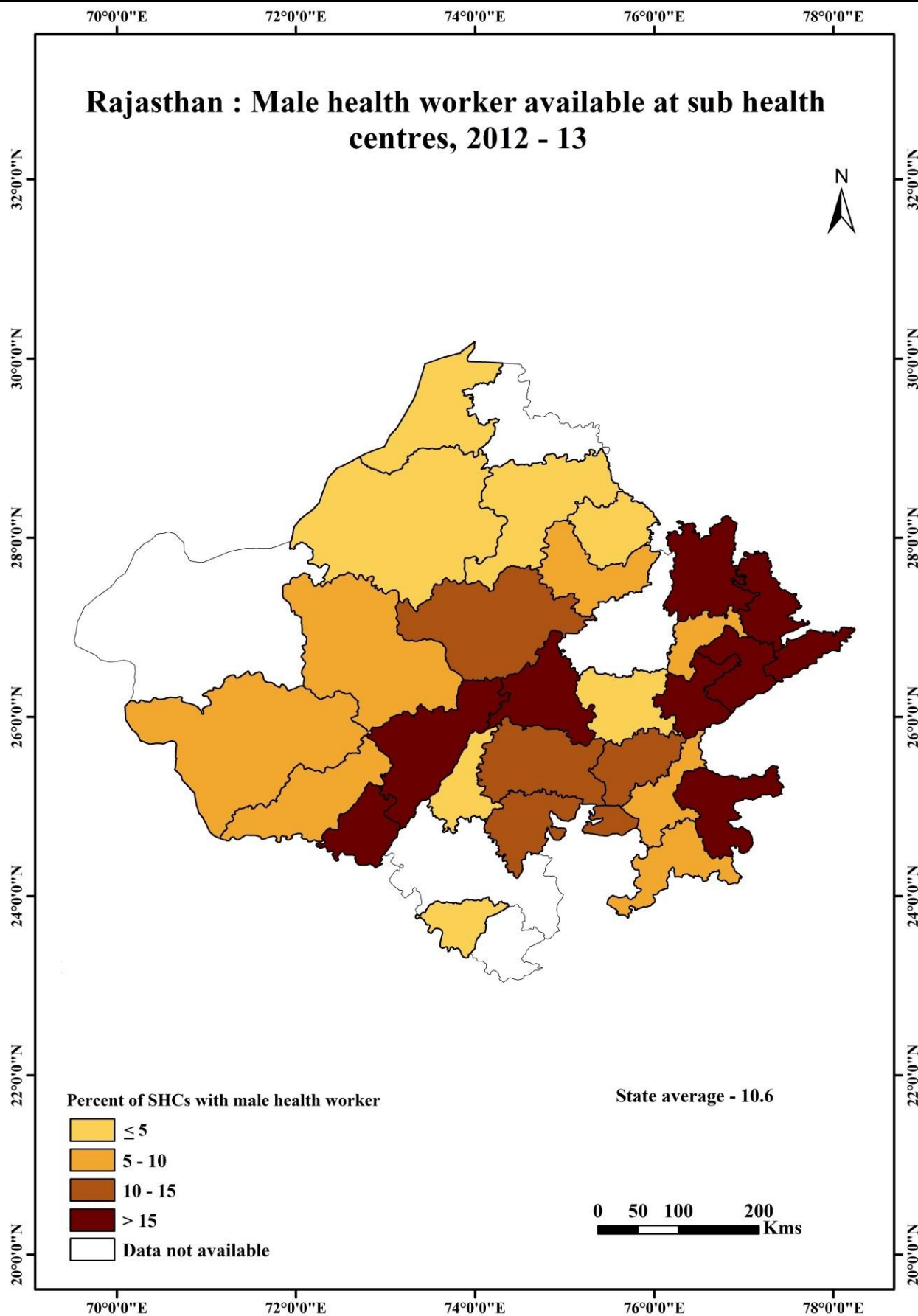




Figure 3: Availability of male health workers at SHCs in Rajasthan

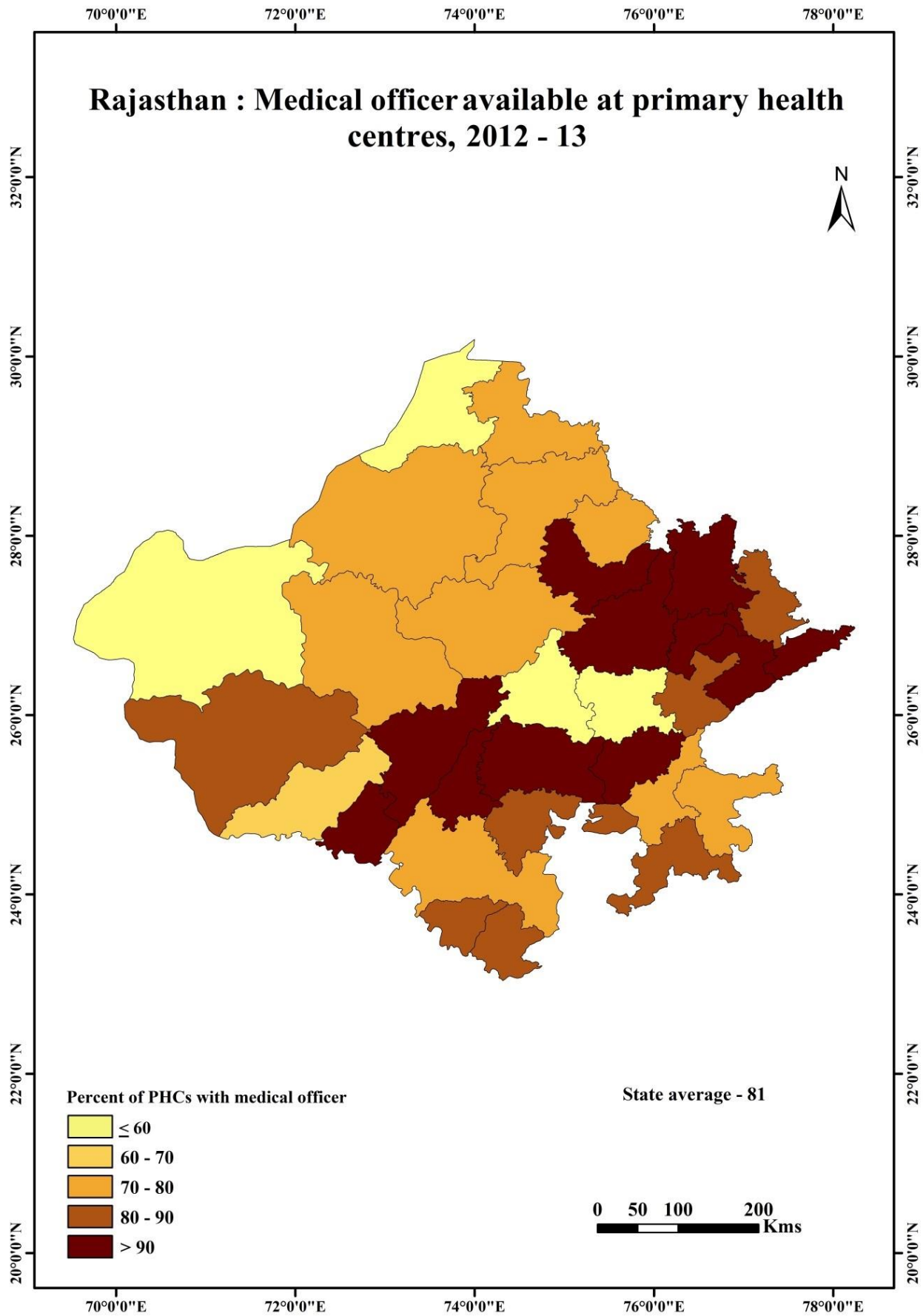


Figure 4: Medical officers available at PHCs in Rajasthan

PHCs. While on the other hand northern part of the Rajasthan is covered with moderate category of MO in PHCs with 70.00 to 80.00 percent availability. The figure shows that four districts falls in low category where M.O. facility is below 60.00 percent, such as Ganganagar, Jaisalmer, Tonk and Ajmer.

### **Ayush Doctors availability in PHCs**

AYUSH systems are popular in Rajasthan as evidenced from the number of outpatients. However, in comparison with Allopathic facilities, the number [location and coverage of rural area] of AYUSH facilities is inadequate. Common diseases treated are about 22 and include diarrhea, fever, skin diseases, anemia among children and women; fever, diarrhea, joint pain skin diseases, piles, etc. [among adult males], obstetrics and gynecological problems, diarrhea, fever, anemia, etc. [among adult female] and joint pain, fever, asthma, etc. [among the elderly] (SEDEM, 2010) .

The figure 5 represent the Ayush Dr. Availability in PHC by districts of Rajasthan, 2012-13, based on DLHS-4. Rajasthan recorded 46.00 percent PHCs assisted with Ayush doctors which is higher than the Kerala state where 17.60 percent PHCs having the Ayush doctors. It has been characterized by the figure that the percent of PHC with Ayush doctors are divided into 5 categories. Those districts which fall in very low and high categories were found in a discrete pattern. Though, the northern region of the Rajasthan falls in high category where 50.00 to 60.00 percent of HC have Ayush doctors. There availability is moderate in the eastern and western side of the state of Rajasthan where 40.00 to 50.00 percent PHC have availability of Ayush doctors.

### **Functioning PHCs 24x7 in Rajasthan**

The figure 6 delineates the 24 hours functioning PHCs by districts of Rajasthan, based on DLHS-4. Rajasthan recorded that more than three fourth (76.50 percent) of its PHCs are functioning 24 hours, while in Kerala 28.20 percent PHCs functioning 24x7 hours as reported in DLHS-4. The pattern of high and very high categories of function PHCs are found in a scattered form in Rajasthan. Bikaner, Ganganagar, Hanumangarh in the northwest and Bharatpur, Ajmer and Karauli districts in the north east lies in very high category with over 90 percent PHCs functioning round the clock. Two clusters, one near Jaipur and another in south Marwar falls in high percentage of PHCs that operate 24 hours. These are Jaipur, Jhunjhunun, Dausa, Bundi, Banswara, Jalore and Sirohi. On the other hand, moderate districts also dispersed all over the Rajasthan but their concentration is more in the south west and south eastern parts of the state. However, Dhaulpur, Swai Madhopur, Baran and Banswara districts dropped in very low category, where less than 60.00 percent PHCs function 24 hours.

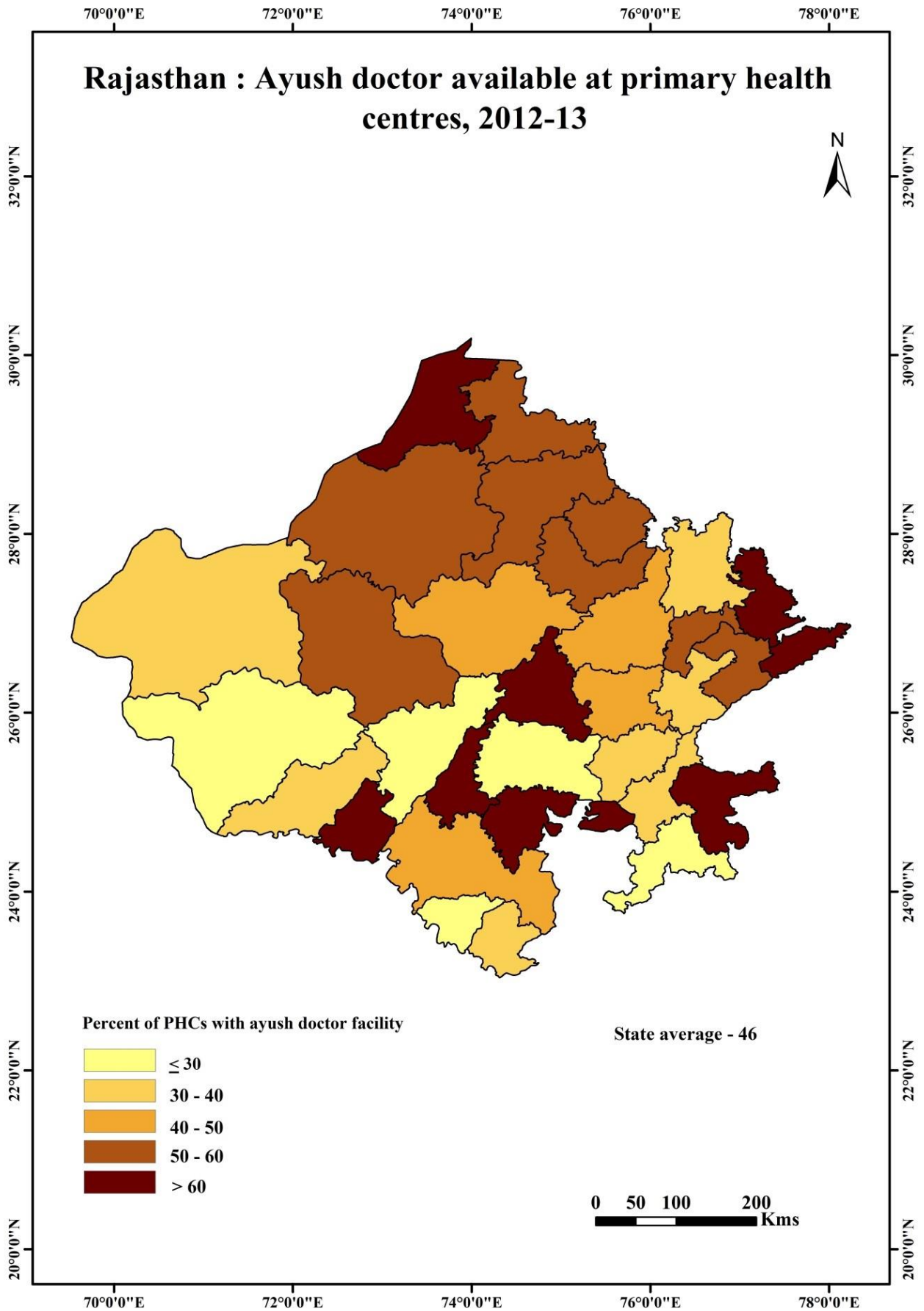


Figure 5: Availability of Ayush Doctor in PHCs in Rajasthan

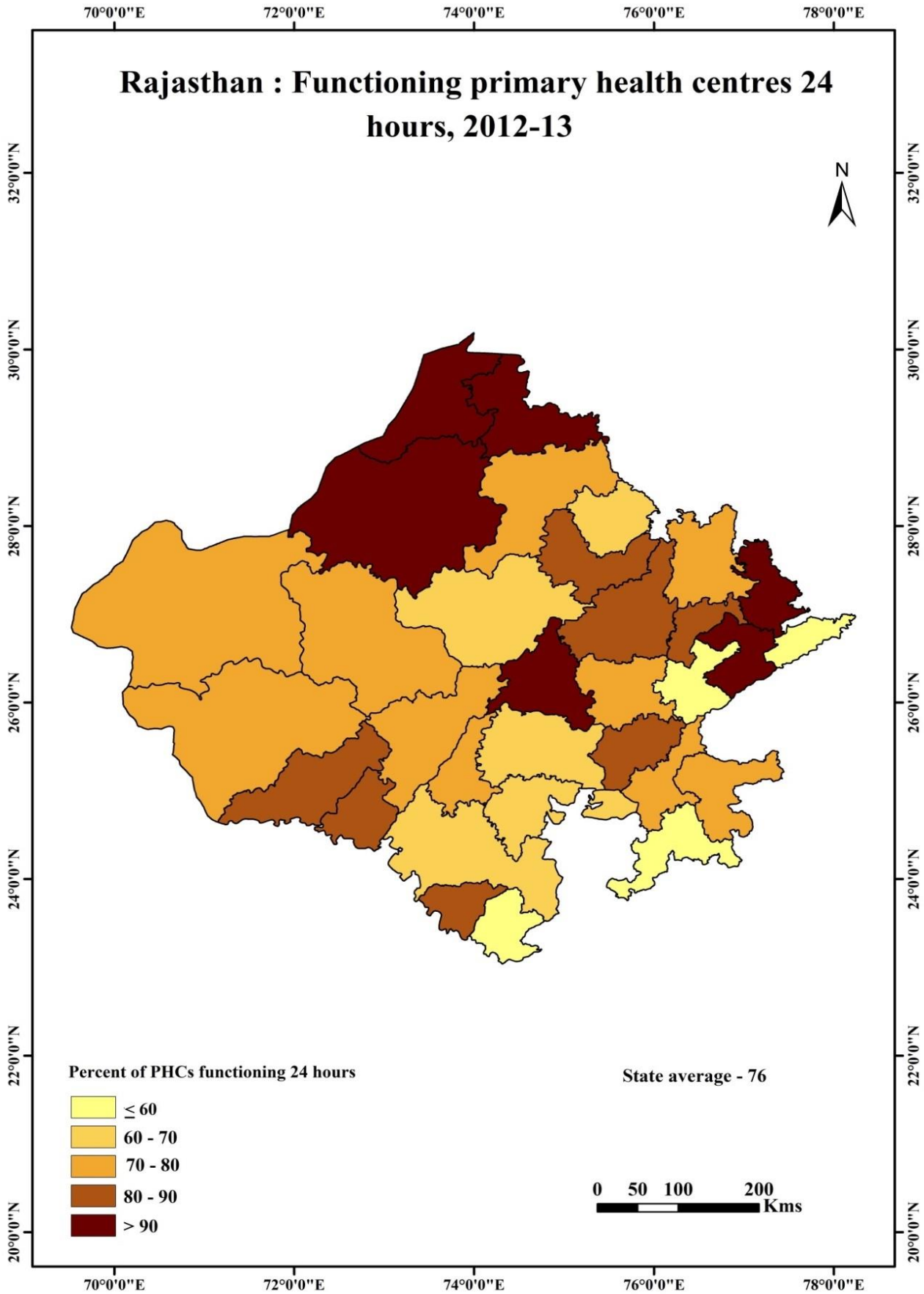


Figure 6: Percent of 24X7 hours functioning PHCs in Rajasthan

Beside it, most of the Marwar and Mewar fall in moderate category of 30.00 to 40.00 percent PHCs with functional vehicles in 2012-13. Some districts of northwestern, northeastern and middle Rajasthan falls in very low category where less than 20.00 percent PHCs have functional vehicles.

### **Availability of human resources at CHCs in Rajasthan**

The figure 7 displays the human resource availability at CHCs in Rajasthan, based on data derived from DLHS-4. Data has not been recorded of pediatrician, obstetric and gynecologist about Rajsamand district. Total working doctors of different specialization in government health departments are Pediatrician (91), gynecologist (86) and anesthetist (62). In Kerala state

31.40 percent CHCs having the obstetrics gynecologist and 17.5 percent anesthetist. The figure 4.20 shows wide inter district variations in their distribution. The highest numbers of all three types of doctors at CHCs (Gynaecologist-11, Paediatrician-10 and Anaesthetist-6) are found in Jaipur district. This may be because of large size of 3 million population as well as being state capital. Based on DLHS-4, Figure 4.20 shows that Bikaner, Karauli, Dungarpur, Banswara districts of Rajasthan have no anesthetist. Nor any obstetric gynecologist in Barmer and Jalore. Likewise, pediatrician is not available at CHCs in Dungarpur, Baran and Swai Madhopur districts of Rajasthan. Except Jaipur and to some Ganganagar, Hanumangarh, Jhunjhunun, Alwar, Sikar and Chittaurgarh have five or more than five pediatrician. Likewise, Jaipur, Bhilwara, Kota and Pali, are the four district which have more than five obstetric and gynecologists. Similarly, only two districts, Jaipur and Kota have more than five anesthetists in CHCs. While in Nagaur and Jodhpur districts, numbers of pediatrician, anesthetist and gynecologist are same (3). Some districts which are touching the border of Haryana, there number of pediatricians is high at CHCs.

### **Availability of functional operation theatre at CHCs in Rajasthan**

Government of India has recommended the Indian Public Health Standards (IPHS) for Community Health Centers. According to the IPHS from revised draft (2010), CHC should have Operation Theater, labor room, cold chain facility and laboratory facility with telephone, email and fax facility (Sodani and Sharma, 2012).

The figure 8 shows the availability of functional OT (Operation Theatres) at CHC by districts of Rajasthan based on DLHS-4. About a quarter (25.5 percent) of CHCs in Kerala state are facilitated with the operation theatres. Total number of functional operation theatres is 174 in Rajasthan. Highest numbers of functional operation theatres are in Chittaurgarh and extent in Kota, picture is not so rosy in rest of the state.

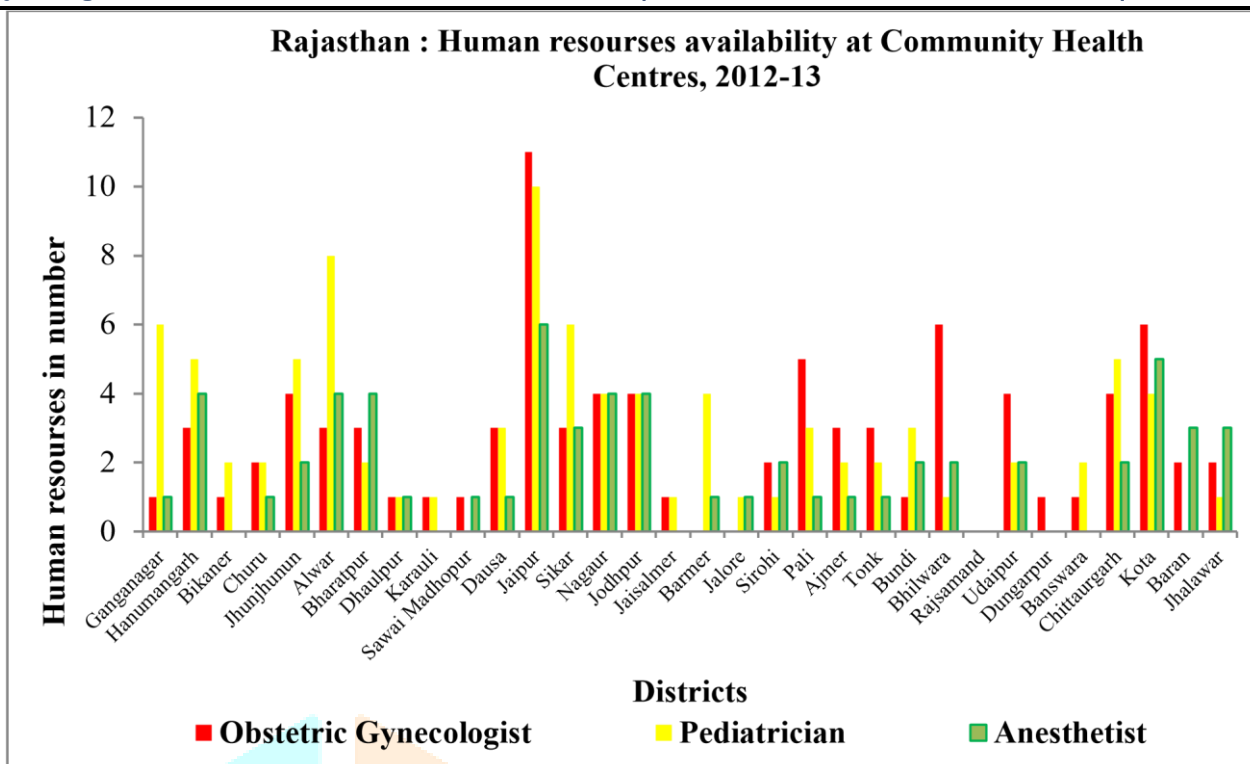


Figure 7: Human resources availability at CHCs in Rajasthan

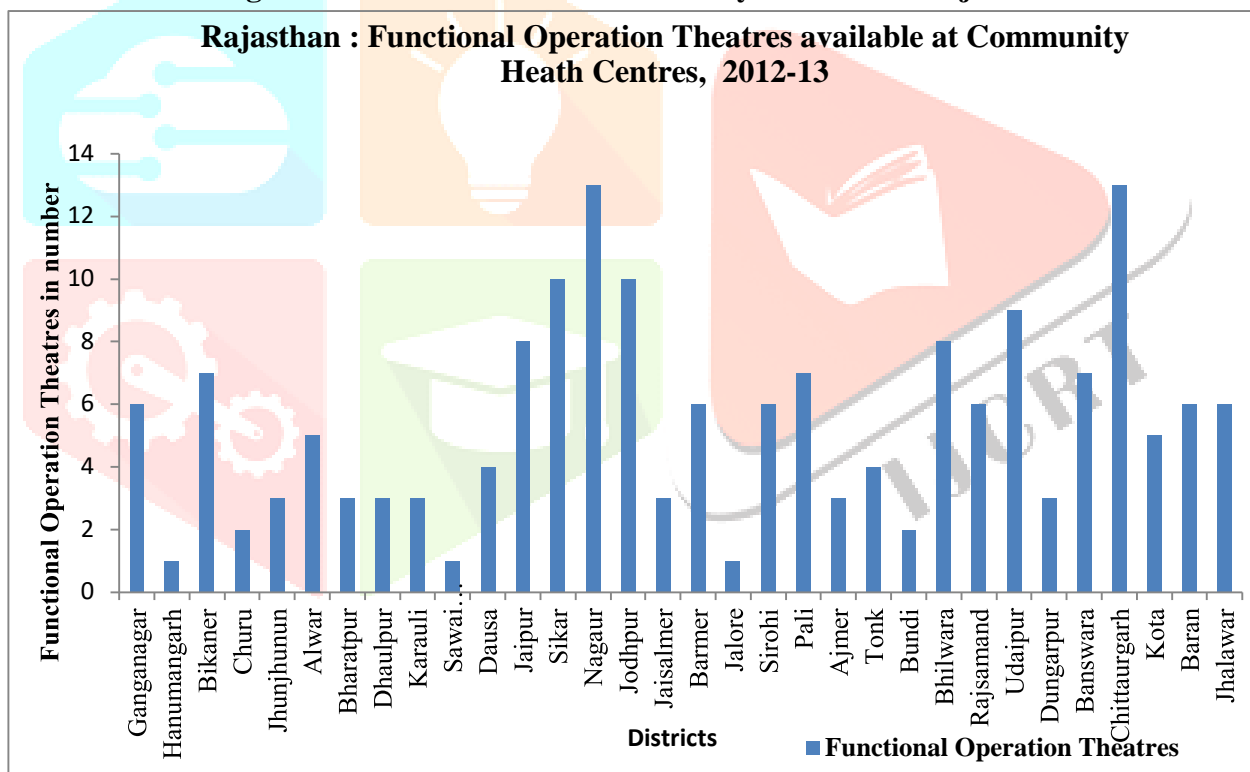


Figure 8: Functional operation theatre available at CHCs in Rajasthan

Nagaur (13). Contrarily, only one functional operation theatre is available at CHC of district Hanumangarh, Swai Madhopur, and Jalore. There is large inter-district variations in numbers of OT such as in Sikar and Jhodhpur (10) , Udaipur (9) , Baran and Jhalawar (6) and Dungarpur

(3).

### Composite index of health care infrastructure in Rajasthan

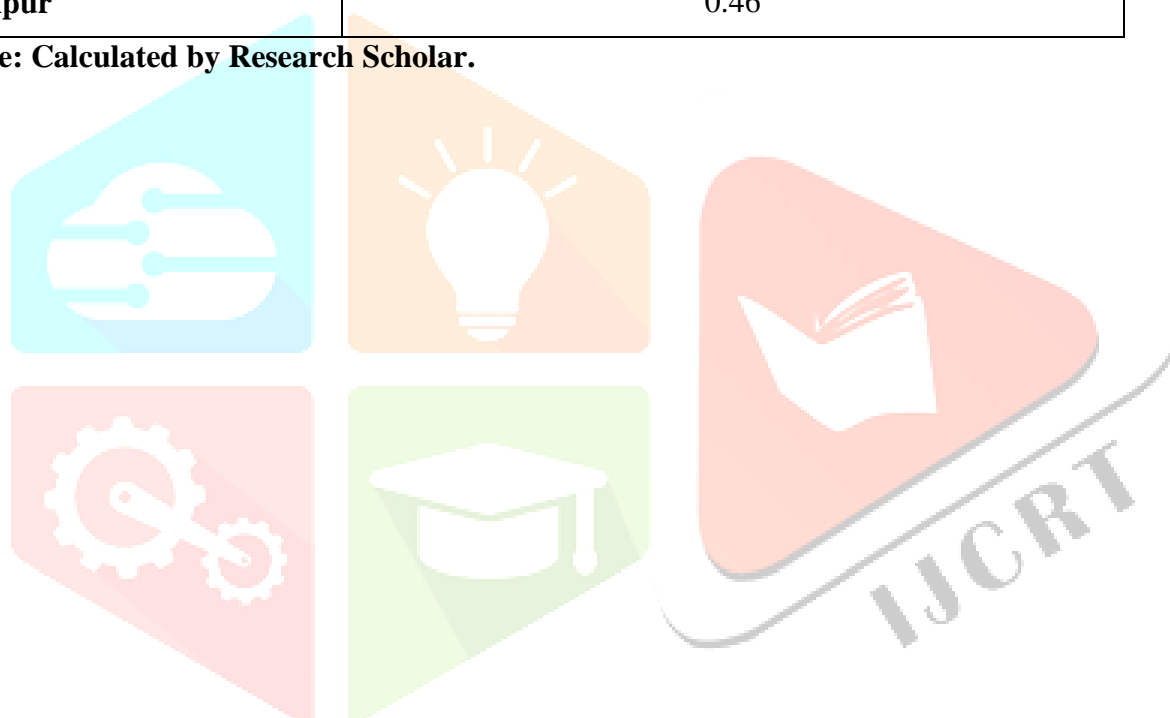
The figure 9 shows the composite index of health infrastructure of Rajasthan based on DLHS4 and statistical abstracts, 2012-13. The indicators related to health infrastructure considered for calculating of composite index are number of hospitals, CHCs, PHCs and SHCs and facilities gets under it, all of these included for calculating composite score. The composite score is divided into four categories. Higher value of composite index depicts high level of infrastructure development and vice versa. The figure 9 depicts the low availability of health infrastructure in Rajasthan because it has economically and agriculturally too backward and is considered as one of the BIMARU states which is renamed as EAG state. It depicts that entire middle Thar desert, Hadoti region and some districts of Mewar region of the state excluding some districts have observed high health infrastructure scenario which progressively declined as one moves towards east and south-east except Dungarpur district which gets very poor health infrastructure. Moderate category found in patches in whole areas of Rajasthan like some districts of northern, tribal region and the Thar desert. It has observed that in Rajasthan state, the water facility, toilet facility, labour room facility, ANM and functioning PHC 24 hours are highly available in middle part of Rajasthan. The Jaisalmer district of Thar desert, where infrastructure facility are at low level is affected by the size of area and numbers of the population. Secondly, this area is economically depressed as compared to other areas of Rajasthan while eastern region also have a poor availability of health infrastructure which is a tribal region and known as bad land therefore development is at low level.

**Table 3: Composite score of health care infrastructure**

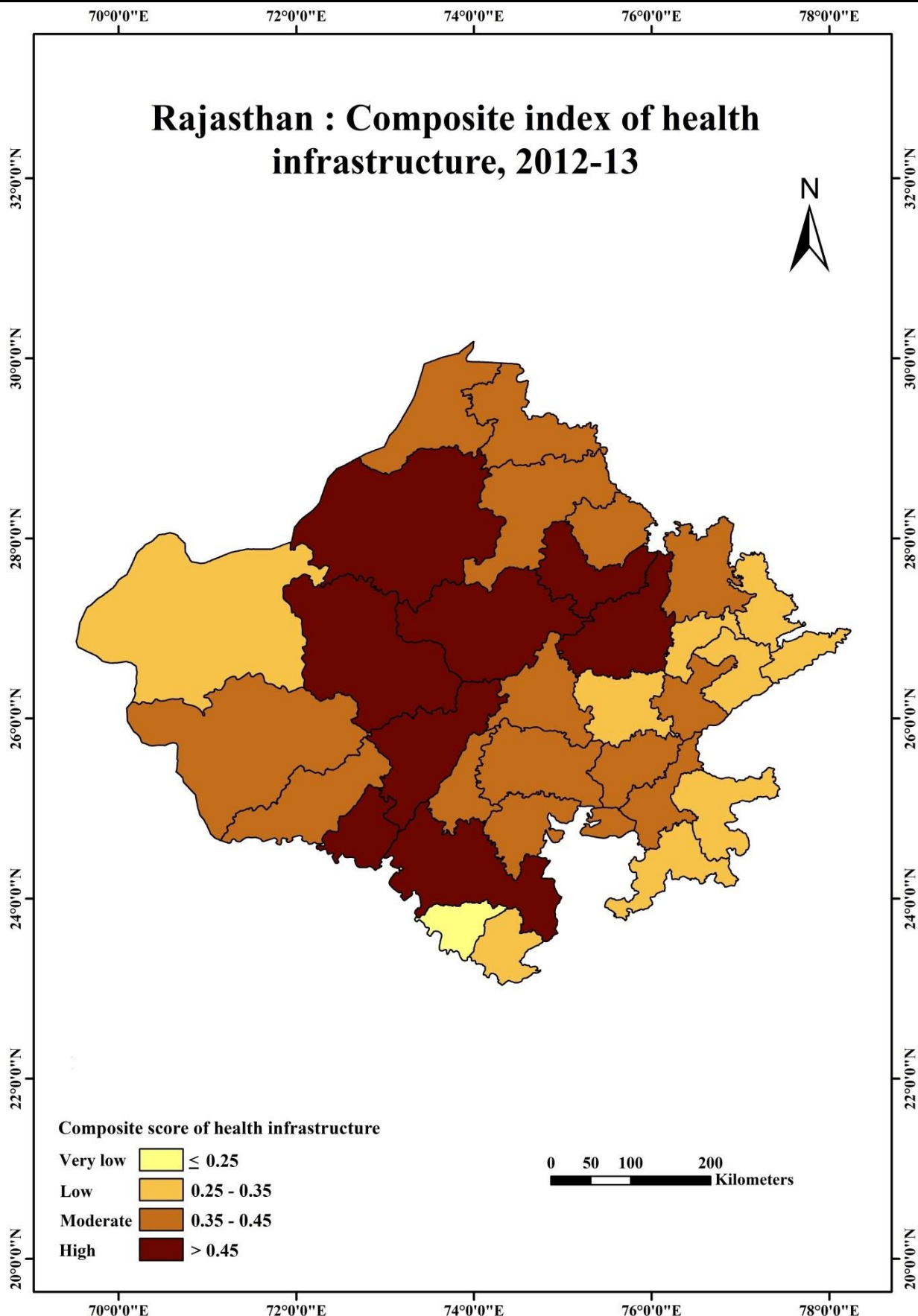
Districts	Composite score
Ajmer	0.36
Alwar	0.44
Banswara	0.32
Baran	0.28
Barmer	0.38
Bharatpur	0.33
Bhilwara	0.41
Bikaner	0.49
Bundi	0.41
Chittaurgarh	0.42
Churu	0.43
Dausa	0.32
Dhaulpur	0.32
Dungarpur	0.23
Ganganagar	0.43
Hanumangarh	0.37
Jaipur	0.60
Jaisalmer	0.35
Jalore	0.37

<b>Jhalawar</b>	0.29
<b>Jhunjhunun</b>	0.39
<b>Jodhpur</b>	0.52
<b>Karauli</b>	0.34
<b>Kota</b>	0.43
<b>Nagaur</b>	0.58
<b>Pali</b>	0.52
<b>Rajsamand</b>	0.36
<b>Sawai Madhopur</b>	0.37
<b>Sikar</b>	0.49
<b>Sirohi</b>	0.48
<b>Tonk</b>	0.32
<b>Udaipur</b>	0.46

Source: Calculated by Research Scholar.







**Figure 9: Composite index of health infrastructure in Rajasthan Summing up**

This paper analyzed the health care infrastructure available in government sector at primary, secondary and tertiary level. High coverage of population and areas by the health institutions shows the lack of the health facilities at those areas. SHCs, PHCs, CHCs and hospitals are serving large areas especially in the Thar desert and some parts of the northern region of Rajasthan. ANM availability in SHCs are high in the Thar desert and some districts of tribal regions, while male health workers (SHCs) and medical officers (PHC) are high in the

Aravali, Plain and Hadoti regions of Rajasthan except some districts of it. Ayush doctors are available in above 50.00 percent PHCs in the northern region and some districts of Aravali, Plain and Hadoti regions of Rajasthan. Above 70.00 percent PHCs are functioning 24x7 hours in all Rajasthan except some districts which lies in the Mewar region and Dhaulpur, Swai Madhopur, Jhalawar and Banswara districts of Rajasthan. Human resource available at CHCs depicts the grim picture. OG's availability is better as compared to the Pediatrician and Anesthetists. In Jaipur district OG, Anesthetist and Pediatrician availability is highest. Functional operation theatres availability at the CHC is more in the Chittaurgarh, Sikar, Nagaur and Jodhpur districts of Rajasthan. However, Hanumangarh, Jalore and Swai Madhopur districts have only one operation theatre each in their CHCs.

## Reference

- Srinivasn, K., Saxena, P.C., and Kanitkar, T. (1979). Development of maternal and child health services in India. *Himalaya Publishing House, Bombay*.
- Singh, G. and Stella, M. (2019). Infant mortality in the United States, 1915-2017: Large social inequalities have persisted for over a century. *International Journal of MCH and AIDS* (2019), Vol. 8(1), 19-31.
- Soman, K. (2002). Rural health care in West Bengal. *Economic and Political Weekly*, Vol. 37(26), 2562-2564.
- District Level Household and Facility Survey (DLHS-4 Report). (2014). Rajasthan district level household and facility survey 2012-13. Ministry of Health and Family Welfare, International Institute for Population Sciences (Deemed University), Mumbai, India.
- Sunder, R. and Sharma, A. (2002). Morbidity and utilisation of healthcare services: A survey of urban poor in Delhi and Chennai. *Economic and Political Weekly*, Vol. 37(47), 47294740.
- Susan, Z. (1989). Relationship between fertility and maternal mortality. In contraceptive use and controlled fertility, Allan M. Parnell, Julie DaVanzo (eds), *National Research Council, United State*.
- Thomas, T. and Maliekal, A. (2016). Maternal and child health from a human rights perspective: The Indian scenario and nuns as community health enablers. *Christian Journal for Global Health*, Vol. 3(2). Educating for Health Globally and the formative years.
- Tiwari, R., Kumar, D., Srivastava, Bansal, M., Adhikari, P. and Chouksey, M. (2014). An assessment of utilization of reproductive and child health services and client satisfaction in Gwalior district of Madhya Pradesh. *Indian Journal of Maternal and Child Health*, Vol. 16(2), 1-10.
- Usmani, G. and Ahmad, N. (2017). Health status of children in India. *Journal of Perioperative and Critical Intensive Care Nursing*, Vol. 3(1).
- Sing, S. and Awadesh, K. (2006). Reproductive child health in the north east region, *Serial Publication*, New Delhi (India).
- Sharma, P. (2016). Regional disparities in socio economic development in Thar desert. *International Journal of Research in Geography (IJRG)*, Vol. 2(3), 1-10.
- Sharma, J.K., and Narang, R. (2011). Quality of healthcare services in rural India: The user perspective. *Vikalpa*, Vol. 36(1), 51-60.