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### RESEARCH ARTICLE

#### CHILD HEALTH IN INDIA: A STUDY OF RAJASHTHAN.

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#### Manuscript Info

##### Manuscript History

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#### Abstract

The present paper is to attempt to analyze the spatial variation in child health with following indicators are infant mortality rate, under five age group mortality, neo-natal mortality, post natal mortality, morbidity of diarrhoea, fever and acute respiratory infection among children. These indicators were chosen because many of studies have proved that they are more suitable indicators to measure the child health. The study area is Rajasthan which lies in BIMARU state, have less developed and poor health, education, economy and infrastructure. The district is selected as the unit of study. The data used in present study is taken from (AHS) 2012-13 annual health surveys and censuses of India 2011. The survey provides district-level estimates on a set of infant mortality, under 5 mortality, neo-natal mortality, post natal mortality, acute respiratory infection, diarrhea and fever among children. We use Arc GIS 9.3 Software to produce map of child health in Rajasthan. The Eastern, South-western Rajasthan shows high rate, and Southern Rajasthan shows moderate and Northern, Central and Western Rajasthan shows lowest rate of IMR, U5MR and NNMR.

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#### Introduction:-

India has highest rate of U5MR, IMR, NNMR, and PNMR. The situation is so challenging in BIMARU states. The government launched several programs and schemes to reduce them. India's large size of population, social system and lack of health services are responsible for all these problems related to child health. Acute Respiratory Infection is the most common among children of India, the major cause behind the ARI is household's fuel use. The large numbers of children died due to ARI. The BIMARU state suffers more because of lack of infrastructures and health facilities. Rajasthan have 55 infant mortality rate, 74 under five mortality rate, 37 neo-natal mortality rate, 18 post-natal mortality rate, 13.4 % of children suffering from diarrhoea, 15.9 % of children suffering from Acute Respiratory infection and 20.3% children suffering from fever. Which are much higher than national average and international average.

#### OBJECTIVES:-

The major objective of the present study is to analyze the spatial pattern and variation of Child health in Rajasthan.

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## DATA AND METHODOLOGY:-

### Data:-

The study area of present study is Rajasthan because it lies in the list of BIMARU States. The child health in BIMARU states is lower than other Indian states. The district is chosen as the unit of study. The data used in present study is taken from (AHS) 2012-13 annual health surveys and censuses of India 2011. The survey provides district-level estimates on a set of infant mortality, under 5 mortality, neo-natal mortality, post natal mortality, acute respiratory infection, diarrhea and fever among children.

### Methodology:-

Description of variables	Source
IMR- Total infant death (0-1 year)/ 1000 live births	AHS 2012-13
U5MR- Total child death (under 5 year)/ 1000 live births	AHS 2012-13
NNMR- Total infant deaths (0-29 days)/1000 live births	AHS 2012-13
PNMR- Total infant deaths (29 days- 1 year)/1000 live births	AHS 2012-13

After collecting the data it is arranged, tabulated, calculated and analyzed. Sex ratio is computed for every individual district; the results occurred from this calculation is further represented by maps which are prepared by Arc-GIS 9.3. and range method is used to form four categories of the data (high, moderate high, moderate low and low).

### STUDY AREA:-

Rajasthan is India's largest state by area (342,239 square kilometers or 10.4% of India's total area). It is located on the north-western side of the country, where it comprises most of the wide and inhospitable Thar Desert and shares a border with the Pakistani provinces of Punjab to the northwest and Sindh to the west, along the Sutlej-Indus river valley. Elsewhere it is bordered by the other Indian states: Punjab to the north; Haryana and Uttar Pradesh to the northeast; Madhya Pradesh to the southeast; and Gujarat to the southwest. Rajasthan is divided into 9 regions; Ajmer State, Hadoti, Dhundhar, Gorwar, Shekhawati, Mewar, Marwar, Vagad and Mewat which are equally rich in its heritage and artistic contribution.

The geographic features of Rajasthan are the Thar Desert and the Aravalli Range, which runs through the state from southwest to northeast, almost from one end to the other, for more than 850 kilometres (530 mi). Mount Abu lies at the southwestern end of the range, separated from the main ranges by the West Banas River, although a series of broken ridges continues into Haryana in the direction of Delhi where it can be seen as outcrops in the form of the Raisina Hill and the ridges farther north. About three-fifths of Rajasthan lies northwest of the Aravallis, leaving two-fifths on the east and south direction. The northwestern portion of Rajasthan is generally sandy and dry. The Aravalli Range does not intercept the moisture-giving southwest monsoon winds off the Arabian Sea, as it lies in a direction parallel to that of the coming monsoon winds, leaving the northwestern region in a rain shadow. The Thar Desert is thinly populated; the town of Jodhpur is the largest city in the desert and known as the gateway of thar desert. The desert has some major districts like Jodhpur, Jaisalmer, Barmer, Bikaner and Nagour. This area is also important defense point of view. Jodhpur airbase is India's largest airbase and military, BSF bases are also situated here. A single civil airport is also situated in Jodhpur. The Northwestern thorn scrub forests lie in a band around the Thar Desert, between the desert and the Aravallis. This region receives less than 400 mm of rain in an average year. Temperatures can sometimes exceed 54 °C in the summer months or 129 degrees Fahrenheit and drop below freezing in the winter. The Godwar, Marwar, and Shekhawati regions lie in the thorn scrub forest zone, along with the city of Jodhpur. The Luni River and its tributaries are the major river system of Godwar and Marwar regions, draining the western slopes of the Aravallis and emptying southwest into the great Rann of Kutch wetland in neighbouring Gujarat. This river is saline in the lower reaches and remains potable only up to Balotara in Barmer district. The Ghaggar River, which originates in Haryana, is an intermittent stream that disappears into the sands of the Thar Desert in the northern corner of the state and is seen as a remnant of the primitive Saraswati river.

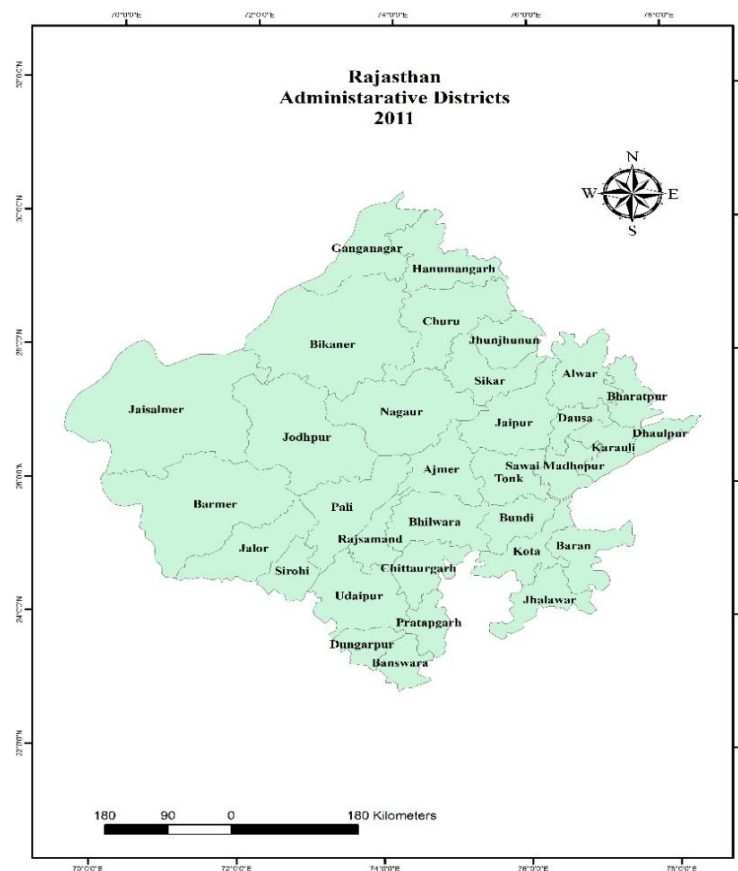
The Aravalli Range and the lands to the east and southeast of the range are generally more fertile and better watered. This region is home to the Kathiwar-Gir dry deciduous forests ecoregion, with tropical dry broadleaf forests that include teak, *Acacia*, and other trees. The hilly Vagad region, home to the cities of Dungarpur and Banswara lies in southernmost Rajasthan, on the border with Gujarat and Madhya Pradesh. With the exception of Mount Abu, Vagad is the wettest region in Rajasthan, and the most heavily forested. North of Vagad lies the Mewar region, home to the cities of Udaipur and Chittaurgarh. The Hadoti region lies to the southeast, on the border with Madhya Pradesh. North of Hadoti and Mewar lies the Dhundhar region, home to the state capital of Jaipur. Mewat, the easternmost

region of Rajasthan, borders Haryana and Uttar Pradesh. Eastern and southeastern Rajasthan is drained by the Banas and Chambal rivers, tributaries of the Ganges.

The Aravalli Range runs across the state from the southwest peak Guru Shikhar (Mount Abu), which is 1,722 meters (5,650 ft) in height, to Khetri in the northeast. This range divides the state into 60% in the northwest of the range and 40% in the southeast. The northwest tract is sandy and unproductive with little water but improves gradually from desert land in the far west and northwest to comparatively fertile and habitable land towards the east. The area includes the Thar Desert. The south-eastern area, higher in elevation (100 to 350 m above sea level) and more fertile, has a very diversified topography. In the south lies the hilly tract of Mewar. In the southeast, a large area within the districts of Kota and Bundi forms a tableland. To the northeast of these districts is a rugged region (badlands) following the line of the Chambal River. Farther north the country levels out; the flat plains of the northeastern Bharatpur district are part of an alluvial basin. Merta City lies in the geographical centre of Rajasthan.

According to final results of 2011 Census of India, Rajasthan has a total population of 68,548,437. Rajasthan's population is made up mainly of Hindus, who account for 87.45% of the population. Muslims make up 10.08%, Sikhs 1.27% and Jains 1% of the population. The state of Rajasthan is also populated by Sindhis, who came to Rajasthan from Sindh province (now in Pakistan) during the India-Pakistan separation in 1947.

Hindi is the official and the most widely spoken language in the state (91% of the population as per the 2001 census), followed by Bhili (5%), Punjabi (2%), and Urdu (2%).

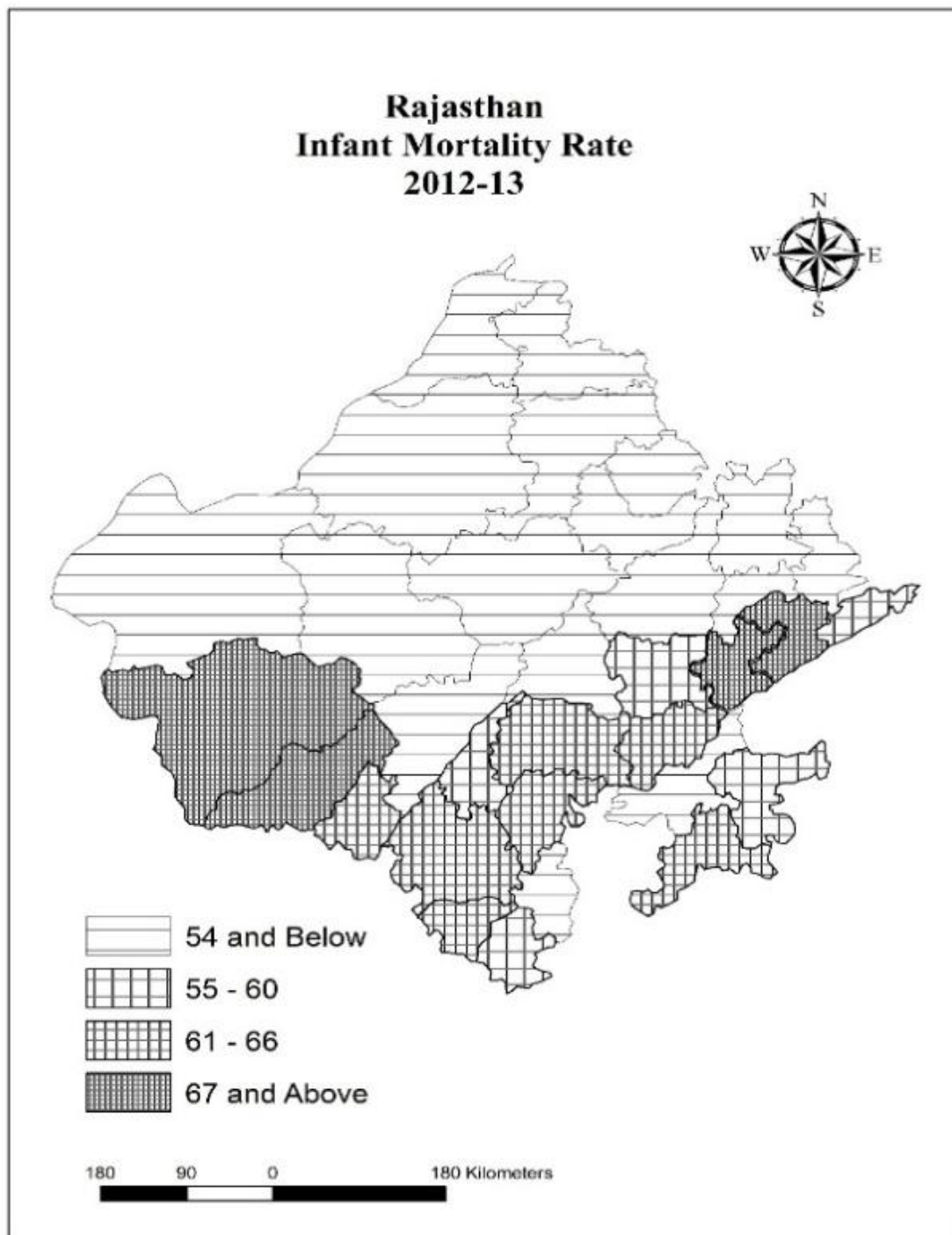


## RESULT AND DISCUSSIONS:-

### IMR:-

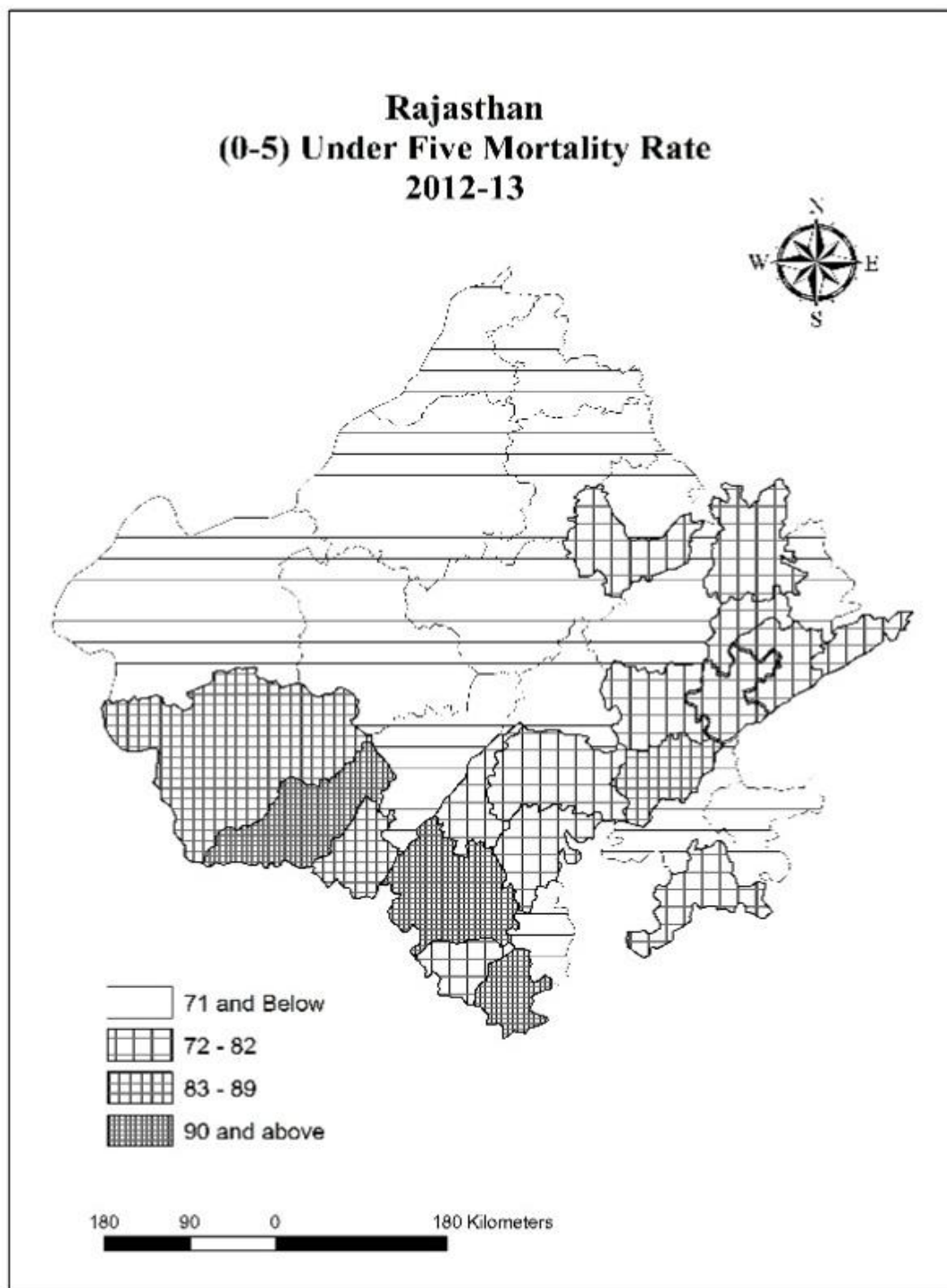
Average IMR of Rajasthan is 55. Jalor (72) at the top followed by Barmer, Karauli, Sawai Madhopur, Sirohi, Bundi, Bhilwara, Chittaurgarh, Jhalawar, Udaipur and Dungarpur, on other side Churu, Jhunjhunun, Bikaner, Jodhpur, Hanumangarh and Kota (36) at the bottom. The northern and central Rajasthan have low infant mortality rate but

south-eastern and south western Rajasthan shows high infant mortality rate. And the southern Rajasthan shows moderate infant mortality rate. This is due to safe drinking water supply in these northern parts and northern Part is near the capital New Delhi.

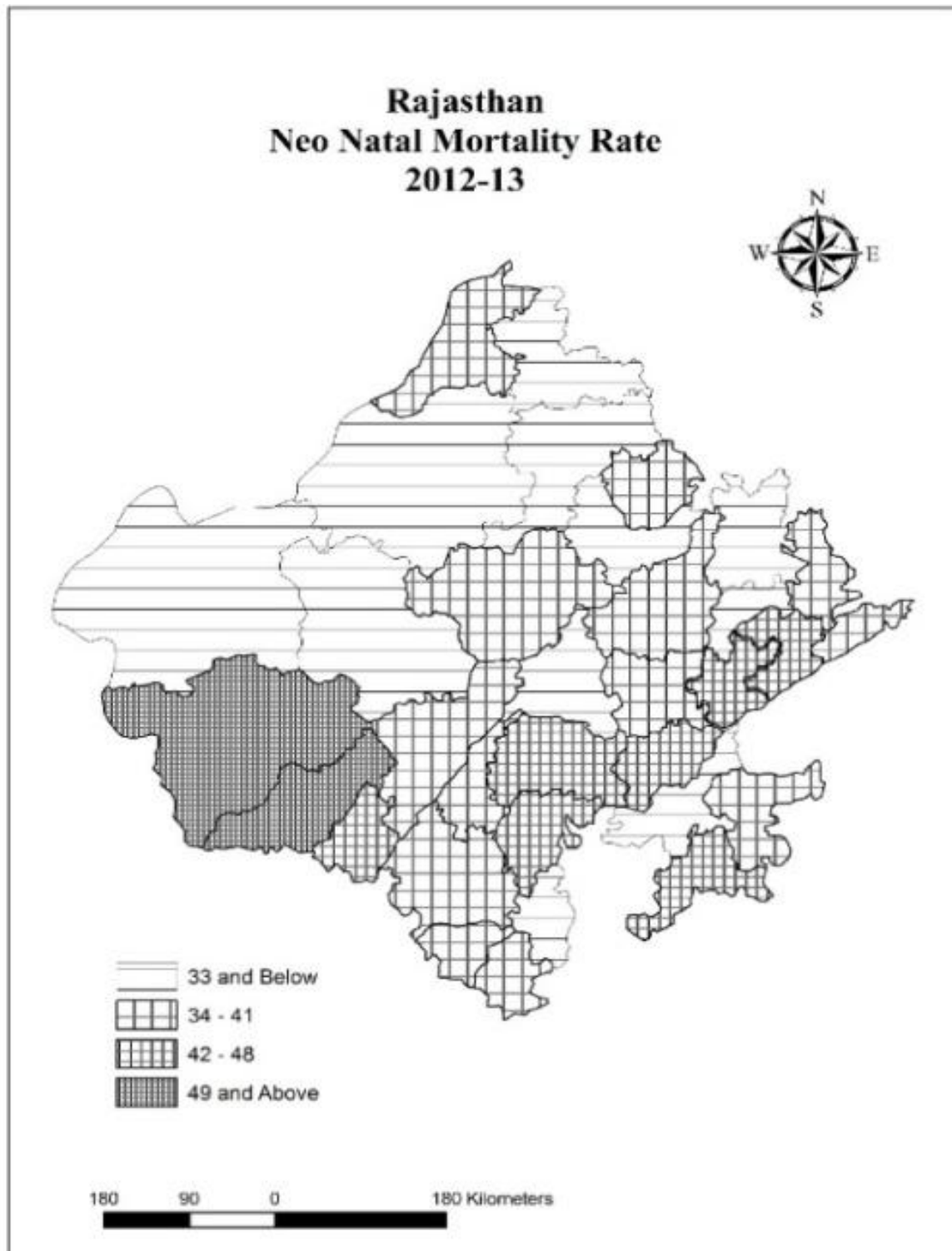


#### U5MR:-

Average U5MR of Rajasthan is 74. Banswara (95) is at the top followed by Jalor, Udaipur, Sirohi, Bundi, Barmer, Dausa, Karauli, Dungarpur, Bhilwara, Sawai Madhopur, and Rajsamand, on other hand Jhunjhunun (69) followed by Nagaur, Bikaner, Jaipur, Hanumangarh, Churu and Kota (47) at bottom. The northern, central and western Rajasthan show low rate of under five mortality, eastern part shows moderate rate and Southern part shows highest among them.

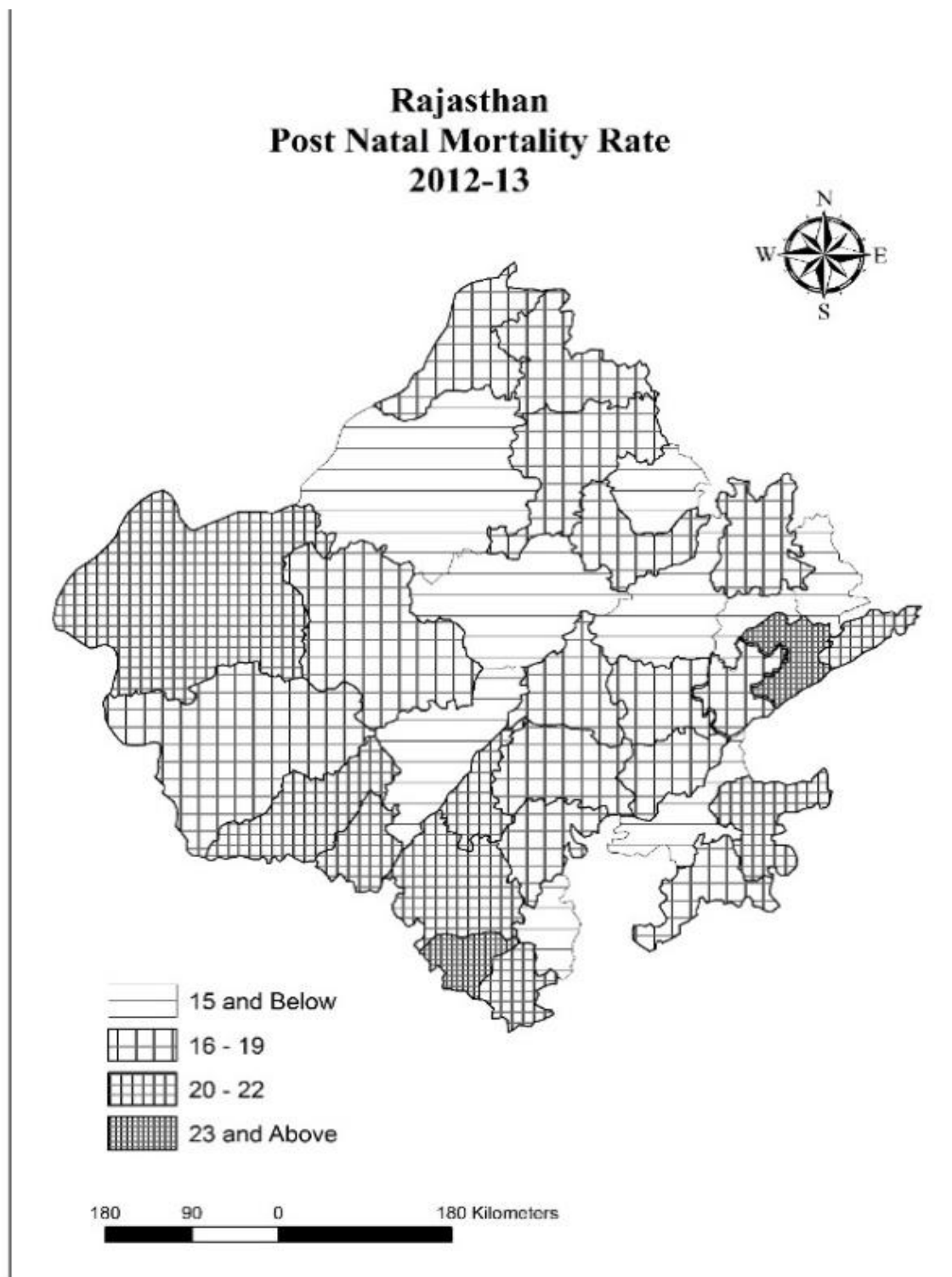
**NNMR:-**

Average NNMR of Rajasthan is 37. Barmer (53) at the top followed by Jalor, Sawai Madhopur, Bundi, Chittaurgarh, Bhilwara, Jhalawar, Karauli, Sirohi, Udaipur, and Dungarpur (41), on other side Dausa, Sikkar, Ajmer (31) followed by Churu, Jodhpur, Hanumangarh, Jaisalmer and Kota (25) at the bottom. The northern, central and western Rajasthan show low rate of under neo natal mortality, eastern part shows moderate rate and Southern part shows highest among them.

**PNMR:-**

Average PNMR of Rajasthan is 18. Karauli (25) at the top followed by Dungarpur, Dausa, Jaisalmer, Sirohi, Udaipur, Rajsamand, Dhaulpur and on other side Pali, Jaipur, Bikaner (15) followed by Nagaur, Bharatpur, Jhunjhunun and Kota (12) at the bottom. It shows the dispersed spatial pattern of Post natal Mortality rate.

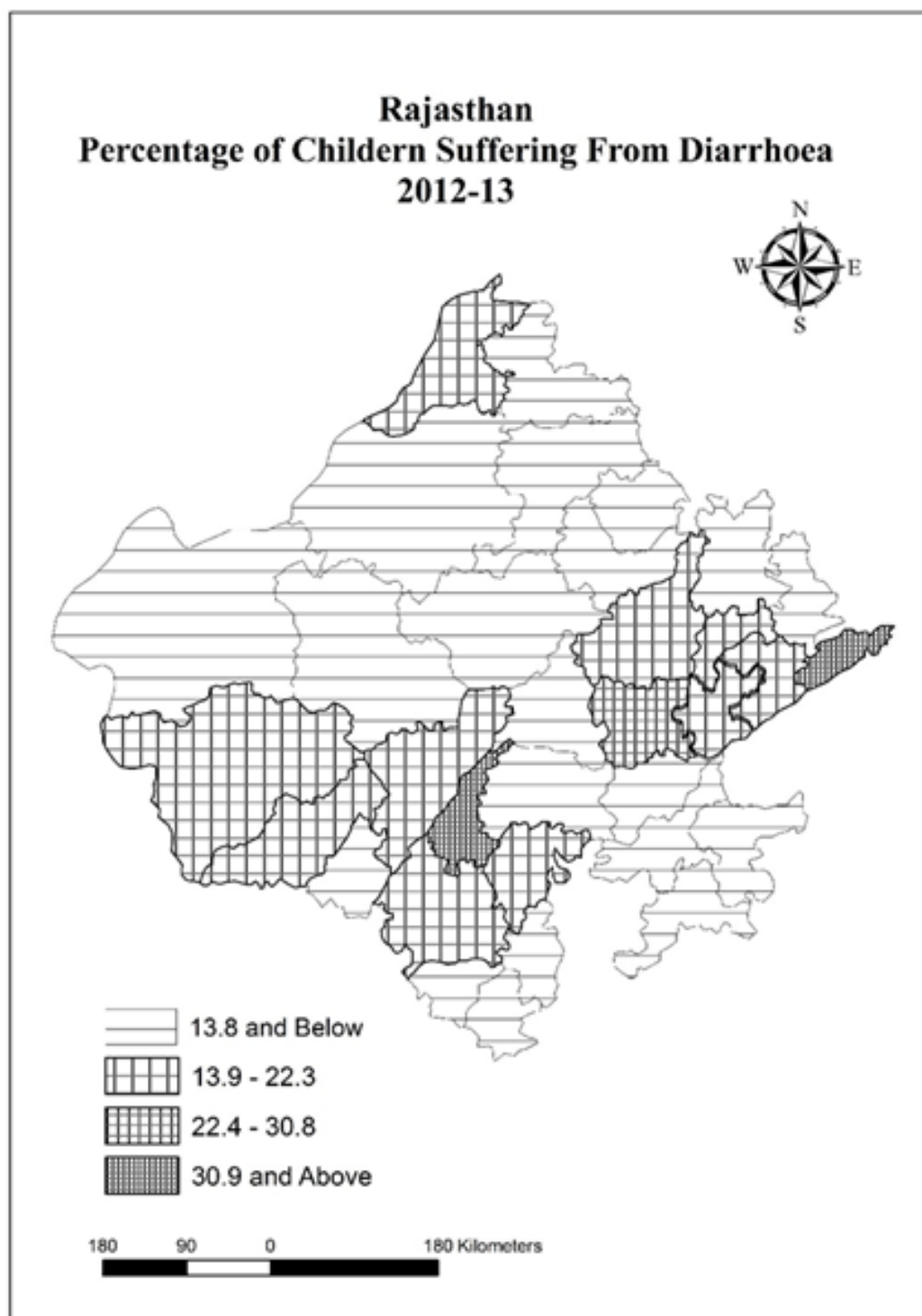




**% OF CHILDREN SUFFERING FROM DIARRHOEA:-**

Average % of Children suffering from Diarrhoea of Rajasthan is 13.4 %. Rajsamand (39.3 %) at the top followed by Dhaulpur, Tonk, Chittaurgarh, Barmer, Sawai Madhopur, Jalor, Jaipur (17.9 %) and on other side Sirohi & Banswara (9.4) followed by Bikaner, Hanumangarh, Jaisalmer,

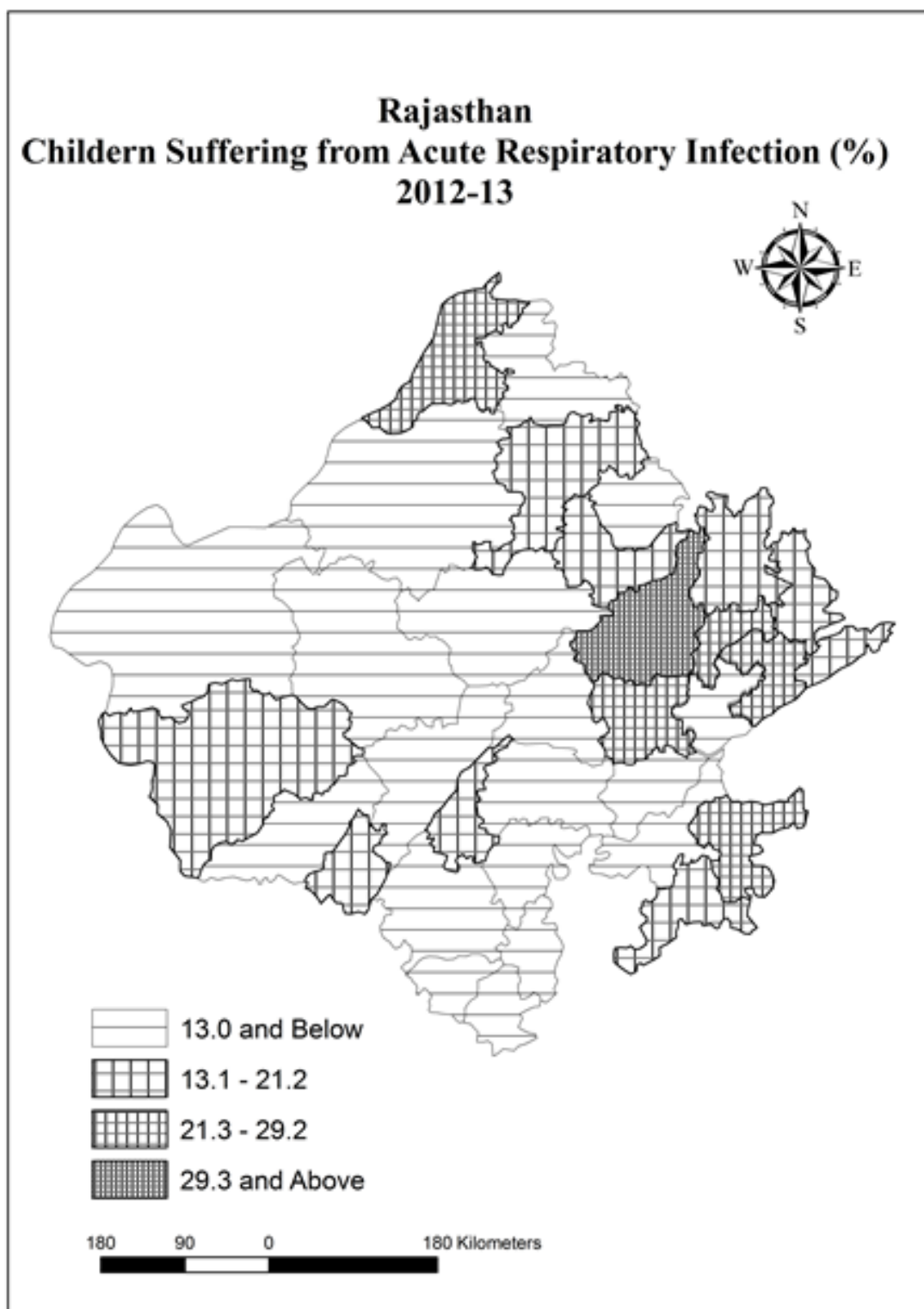
Bharatpur, Churu, Sikkar, Jhunjhunun and Nagaur (5.2 %) at the bottom. It shows the dispersed spatial pattern, high in eastern Rajasthan



#### **% OF CHILDREN SUFFERING FROM ARI:-**

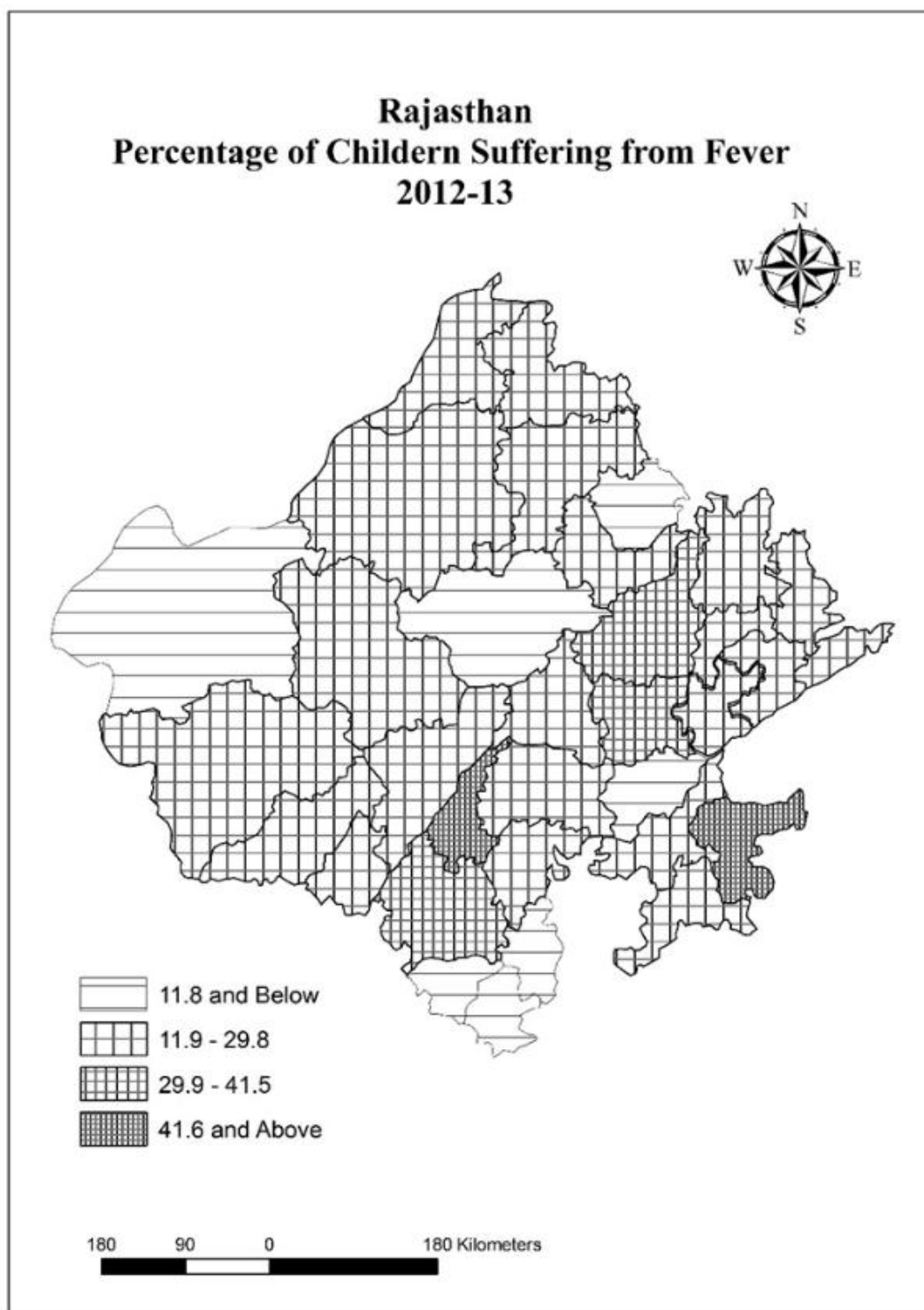
Average % of Children suffering from ARI of Rajasthan is 15.9 %. Jaipur (37.2 %) at the top followed by Karauli, Tonk, Ganganagar, Baran, Dausa, Sirohi and Sikkar (21 %) and on other side Hanumangarh (10) followed by Bundi, Ajmer, Pali, Jhunjhunun, Jalor, Bikaner, Jaisalmer, Nagaur and Bhilwara (3.5 %) at the bottom. Eastern part shows highest, northern shows moderate and central and southern shows low percentage of acute respiratory infection.





#### **% OF CHILDREN SUFFERING FROM FEVER:-**

Average % of Children suffering from fever of Rajasthan is 20.3 %. Rajsamand (52.2 %) at the top followed by Udaipur, Jaipur, Tonk, Dhaulpur, Bhilwara, and Kota (23.1%) and on other side Bundi (11.3) followed by Dungarpur, Jhunjhunun, Jaisalmer, Banswara and Nagaur (6.4 %) at the bottom. Eastern part shows highest, northern shows moderate and central and southern shows low percentage of Fever.



Name	IMR	U5MR	NNMR	PNMR	% of Children Suffering from Diarrhoea	% of ARI Children Suffering from ARI	% of Children Suffering from Fever
Ganganagar	52	71	34	18	16.4	22.2	22.2
Hanumangarh	45	63	29	16	8.3	10	17.8
Bikaner	47	67	32	15	8.8	7.4	12.4
Churu	48	62	30	18	7.1	15.5	13.3
Jhunjhun	48	69	35	12	6.5	8	9.5
Alwar	52	74	33	19	10.5	19.1	16.4
Bharatpur	49	70	37	12	7.6	17.1	16.2
Dhaulpur	58	73	38	21	33.3	19	29.4
Karauli	69	81	45	25	14.1	27.3	13.7
Sawai Madhopur	67	80	48	19	20.3	10.3	21.5
Dausa	53	82	31	22	15.4	21.8	23.1
Jaipur	50	65	35	15	17.9	37.2	33.6
Sikkar	50	74	31	19	6.5	21	17.4
Nagaur	52	68	39	13	5.2	4.7	6.4
Jodhpur	46	63	29	17	10.9	10.8	13.8
Jaisalmer	50	71	27	22	7.6	5.2	9.1
Barmer	70	85	53	17	20.5	15	17.9
Jalor	72	94	52	20	18.3	7.6	17.7
Sirohi	65	85	44	21	9.4	21	14.2
Pali	54	71	39	15	14.6	8.5	12.1
Ajmer	50	70	31	19	11.2	8.9	19.7
Tonk	57	79	39	18	23.5	26.8	32.9
Bundi	65	85	47	18	12.3	9.6	11.3
Bhilwara	64	80	46	17	10.9	3.5	26.6
Rajsamand	59	80	38	21	39.3	19	52.2
Dungarpur	63	81	41	23	10	13	9.9
Banswara	57	95	36	21	9.4	11	7
Chittaurgarh	63	77	47	16	21.1	12.2	20.6
Kota	36	47	25	12	13.5	13	24.3
Baran	55	71	36	20	11.9	22.2	53.2
Jhalawar	63	78	46	17	11	19.1	20.4
Udaipur	63	91	41	21	14	11.7	35.6
RAJASTHAN	55	74	37	18	13.4	15.9	20.3

Source: Census of India, "Annual Health Survey, 2012-13" Fact Sheet- Rajasthan.

### CONCLUSION:-

The northern and central Rajasthan have low infant mortality rate but south-eastern and south western Rajasthan shows high infant mortality rate. And the southern Rajasthan shows moderate infant mortality rate. This is due to safe drinking water supply in these northern parts and northern Part is near the capital New Delhi. The northern, central and western Rajasthan show low rate of under five mortality, eastern part shows moderate rate and Southern part shows highest among them. The northern, central and western Rajasthan show low rate of under neo natal mortality, eastern part shows moderate rate and Southern part shows highest among them.

In case of PNMR the Southern and Eastern part shows highest rate, Northern and Western shows moderate rate and Central Rajasthan shows lowest PNMR rate. The percentage of children suffering from diarrhea is highest in Eastern and South-Western, lowest in Northern, Central, Western and Southern Rajasthan. The percentage of children suffering from ARI is highest in Eastern Rajasthan. The percentage of children suffering from fever is highest in Eastern Rajasthan, moderate in Northern and lowest in Central, Southern and Western Rajasthan.

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