



AN EXPRESSIVE STUDY ON CHILD HEALTH STATUS IN RAJASTHAN

(2012-13)

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Abstract

This paper identifies the features of the child health care in Rajasthan. Children are future resources of any nation, state and district. The basic aim of the study is to look out the child health in the Rajasthan area. This study uses the AHS data of Rajasthan, diagrams, and maps shown with the use of choropleth method using simple statistical techniques. It has been analyzed sources of child health, showing that it is poor in the Thar Desert of Rajasthan. Fully immunized coverage of the children is higher as compared to other regions of rural Rajasthan. All rural areas suffered with high values of IMR and U5MR as compared to the urban areas of Rajasthan. Low awareness about health, lack of health infrastructure, malnutrition problem, economically backward areas and lack of human resources in institutions are the responsible factors for the high IMR and U5MR in rural areas. All northern regions except Bikaner district have a very low proportion of underweight children in overall, rural and urban Rajasthan. High proportions of underweight children in any area show that the area is infected with poverty, underdevelopment and poor health infrastructure. It has been analyzed through many studies, child health is influenced by nurturing practices and health sectors that are further influenced by the maternal and family socio-economic characteristics and maternal attitudes.

Key Words: Stunted children, Wasted children, Fully vaccinated, Infant mortality rate, under-5 mortality rate, Neo mortality rate.

Introduction

The child illness is influenced by nurturing practices and health resources. These are also determined by maternal and family socio-economic characteristics, maternal attitude towards her children's healthcare and treatment (Patil, S., 2012). India's immunization program is one of the largest in the world in terms of quantities of vaccines used, numbers of beneficiaries, and the numbers of immunization sessions organized, the geographical spread and diversity of areas covered. Under the immunization program, six vaccines are used to protect children and pregnant mothers against Tuberculosis, Diphtheria, Pertussis, Polio, Measles and Tetanus (Joshi, 2015). India's rate of under-5 mortality fell from 169 in 1990 to 69 in 2008, averaging an annual rate of decline of just 2.91 percent whereas infant mortality rate (IMR) also fell from 129/1000 live births in 1971 to 55/1000 live births in 2007.

Study area

Rajasthan lies in northern India. It is the largest state of the country, covering an area of 342,239 square kilometers (132,139 sq. meters) or 10.4 per cent of the total geographical area of India. The population of Rajasthan is 68,548,437 (as per the 2011 Census). The state ranks seventh in terms of population. Rajasthan has 33 districts along with Jaipur Capital. Rajasthan shares its borders with five Indian states: Punjab to the north; Haryana and Uttar Pradesh to the northeast; Madhya Pradesh to the southeast; and Gujarat to the southwest. The border of Rajasthan touches with the Pakistani provinces of Punjab to the northwest and Sindh to the west, along the Sutlej-Indus river valley. The geographic features of Rajasthan include the Aravalli Range and the Thar Desert. Most of the North-western part of Rajasthan is replete with the sandy and dry Great Indian Desert, also known as the Thar Desert. Jodhpur is the most extensive city in the desert. The other prominent districts located in the desert are Bikaner, Jaisalmer, Barmer, and Nagour. A famous hill station, Mount Abu, lies in the Aravalli Range. Guru Shikhar is the highest peak with a height of 5,650 feet above sea level. The major river systems of the Marwar and the Godwar regions are the Luni River and its tributaries.

Objective

- To examine the status of child health care in the state of Rajasthan during, 2012-13.

Database and research methodology

The data have been taken from the annual health survey of Rajasthan 2012-13, statistical abstract of Rajasthan 2012-13 and census of India 2011. It 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;

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

$$\text{For Negative Indicators} = \frac{\text{Minimum value} - \text{Actual value}}{\text{Maximum value} - \text{Minimum value}}$$

Value of positive indicators – Value of negative indicators

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

Formula for the simple correlations is as under

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Neo-natal mortality rate: Number of deaths during the first 28 day of life per 1000 live births.

Infant mortality rate: Number of deaths during the first year of life per 1000 live births.

Children under-five mortality rate: Number of deaths during the first five year of lives per 1000 live births.

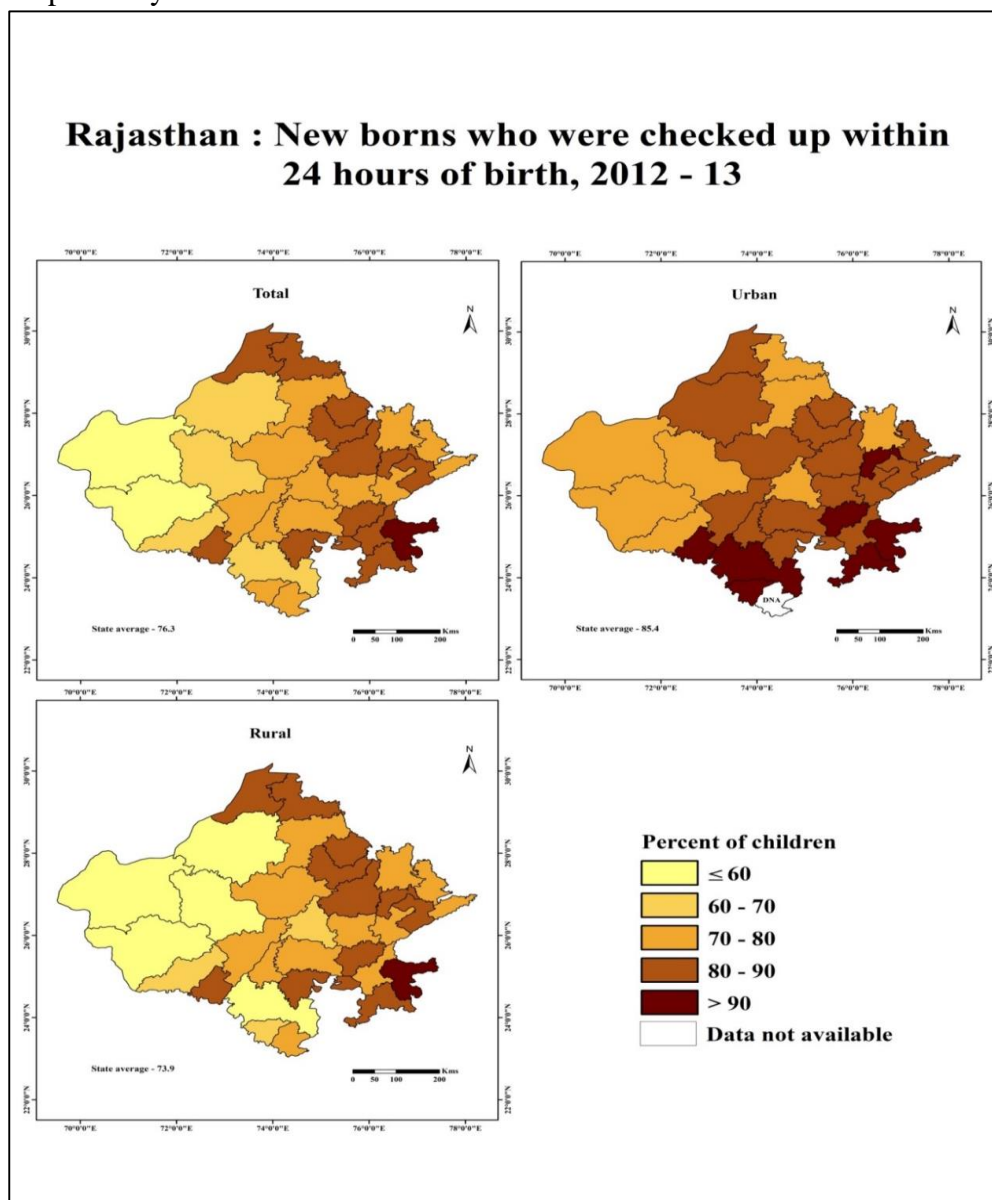
Results and discussions

Spatial variation in new born who were checked up within 24 hours of birth

The figure 1 elaborates new born who were checked up within 24 hours of birth in overall, rural and urban areas of Rajasthan. It is based on AHS data, 2012-13. Overall new born checked up coverage is 76.30 percent. It is almost similar to the Uttar Pradesh where new born checked up within 24 hours of birth is 77.70 percent but comparatively, in Uttarakhand it is less (62.90 percent).

In urban area of Rajasthan newborn were checked up more (85.40 percent) as compared to rural areas (73.90 percent) of Rajasthan. All Aravali areas and all eastern part to it display high and very high proportion of checked newborn excluding two districts namely; Ajmer and Alwar which falls in moderate category.

Overall and rural area depicts similar pattern, it is progressively increased from east to west. Thar region experienced the least coverage especially the district of Bikaner, Jaisalmer, Jodhpur, Barmer and Udaipur. Only Baran district of both areas dropped in very high category. Eastern half of the state and rural eastern area bracketed in moderate and high categories. Urban area has coverage of checked up newborn average of 85.4 percent which is quite high as compared to rural and overall area which is 73.90 percent and 76.30 percent respectively.



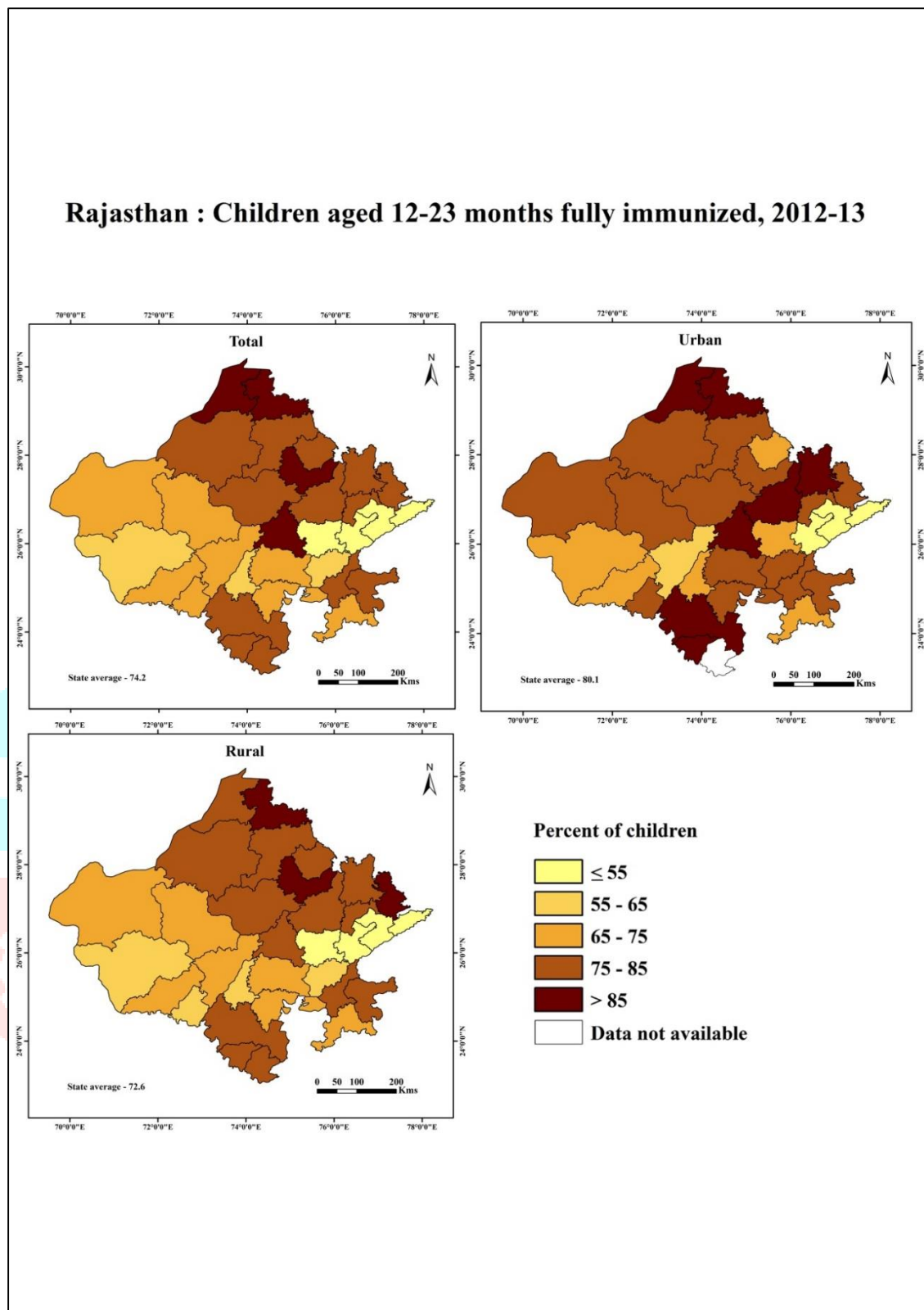
Source: Annual health survey, 2012-13.

Figure 1: New borns who were checked up with in 24 hours of birth in Rajastha

Spatial variation in children aged 12-23 months fully immunized in Rajasthan

The figure 2 reveals about full immunization of the children aged 12-23 months based on annual health survey, 2012-13 of overall, rural and urban area of Rajasthan. Coverage of fully immunized children in overall area of Rajasthan is 74.20 percent and in Kerala 82.50 percent, it shows the better development and awareness about health in Kerala. While, in the urban areas (80.10 percent) of Rajasthan, fully immunized children is more as compared to Rural (72.60 percent) Rajasthan. The pattern of fully immunized children is almost same in overall, urban and rural area of Rajasthan, high and very high category lies in the north-east and south realms of both areas and moderate districts lies in across





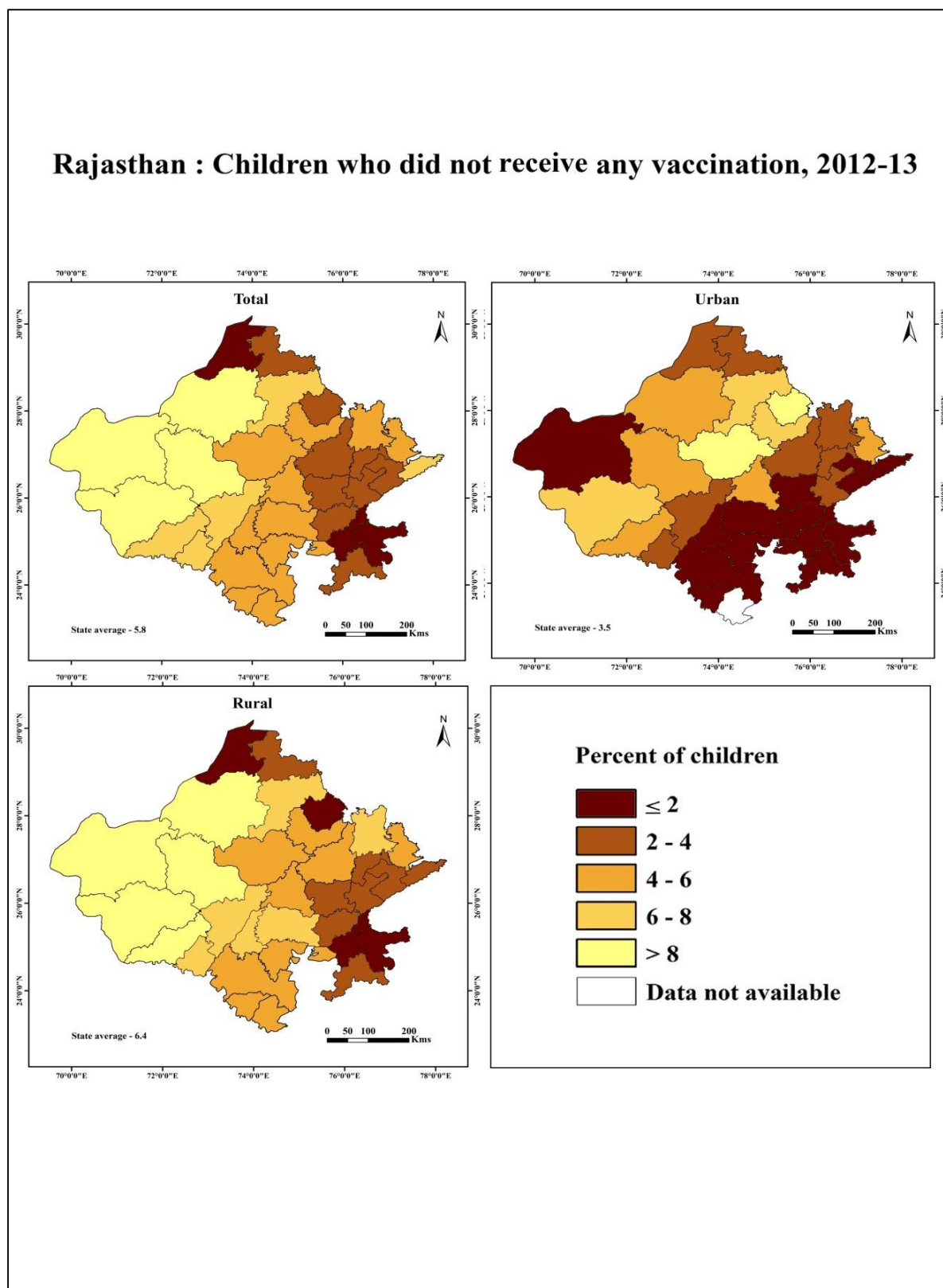
Source: Annual health survey, 2012-13.

Figure 2: Children aged 12-23 months fully immunized in Rajasthan

west to south-east belt while district of low category of those children who were fully immunized are Dhaulpur, Swai Madhopur, Tonk and Karauli in both urban and rural areas as well as overall in the state of Rajasthan.

Spatial variation in children who did not received any vaccination in Rajasthan The figure 3 reveals the children who did not received any vaccination is based on annual health survey, 2012-13 of overall, rural and urban areas of Rajasthan. The proportions of children who did not received any vaccination in overall area of Rajasthan are 5.80 percent and in rural and urban area it is 6.40 percent and 3.50 percent respectively. While in Kerala, only 0.2 percent eligible children did not received any vaccination and in rural areas of Kerala, all children covered with vaccination and 0.3 percent children did not received any vaccination in urban areas according to DLHS-4. If the percentage is high of children who did not received any vaccination in any area that means that area does not have better facilities related to healthcare like health infrastructure, education, income, awareness etc.





Source: Annual health survey, 2012-13.

Figure 3: Spatial variation in children who did not receive any vaccination in Rajasthan

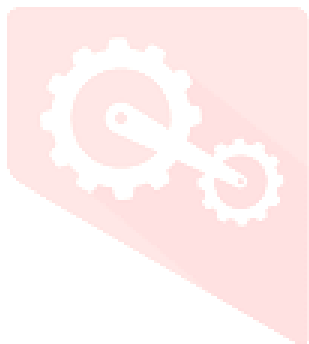
The urban area of Rajasthan registered low proportion of children who did not received any vaccination as compared to rural Rajasthan. The pattern is similar in overall and rural areas of Rajasthan. Those children who have not received any vaccination during the specified period are increasing from eastern to western parts of the state. Entire Thar Desert area falls in high and very high categories of both overall and rural Rajasthan. While, Shekhawati region of urban area drop in high and very high categories. The large area of south-eastern

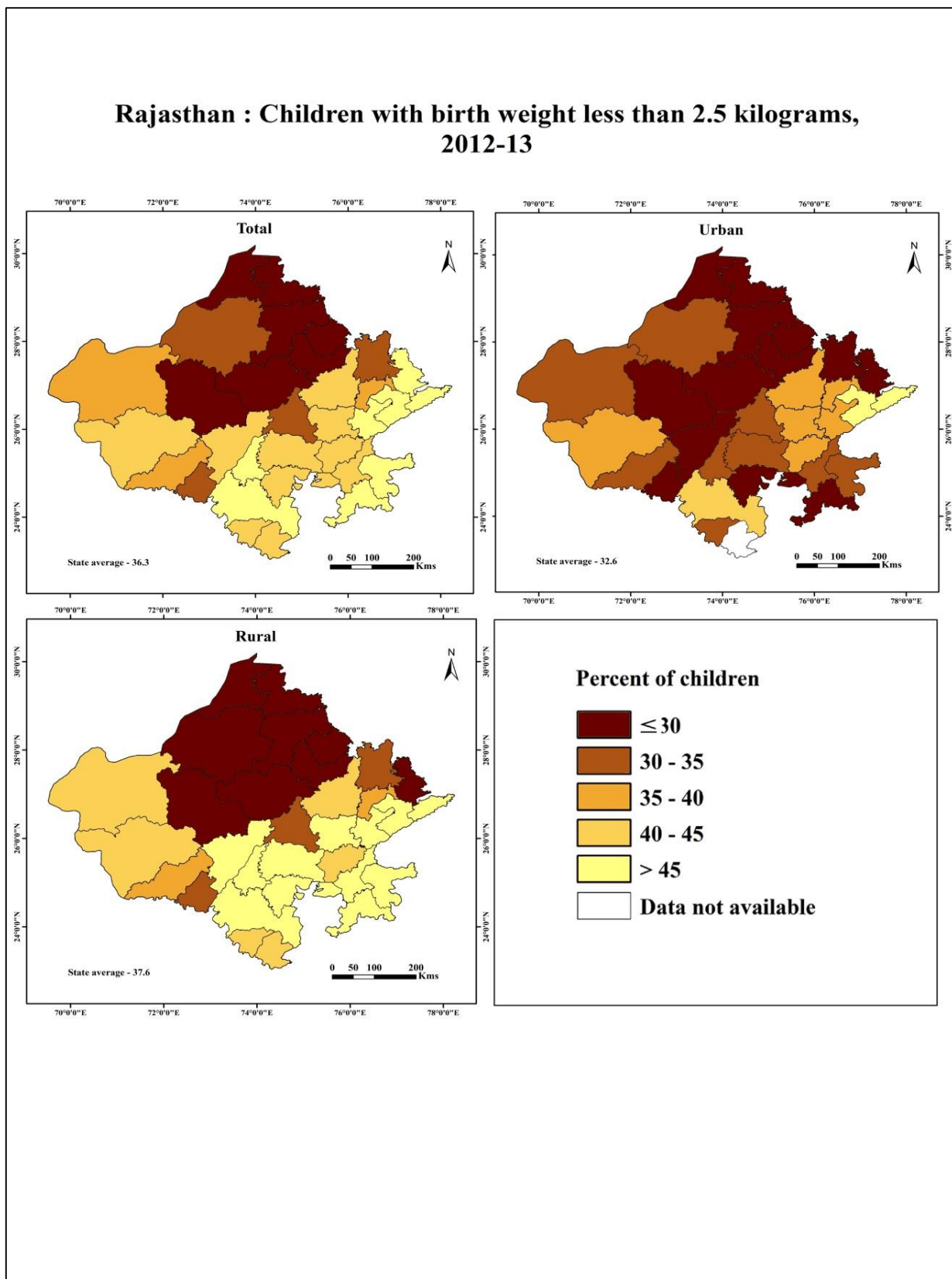
region of urban Rajasthan takes the better facilities of the healthcare; here below 2.00 percent children did not take any vaccination thereby showing better health care.

Spatial variation in underweight children's birth in Rajasthan

The figure 4 shows the proportion of children with birth weight less than 2.5 kilogram based on annual health survey, 2012-13 of overall, rural and urban area of Rajasthan.

The children with high percentage of underweight reflect the backwardness of the area, lack of awareness and poor socio economic conditions. On the other hand, low percent of children means that area has good socio-economic development and health infrastructure condition. Overall area of Rajasthan state recoded 36.30 percent children with birth weight less than 2.5 kilogram. As compared to the Rajasthan state, 9.00 percent children were underweighted in Kerala, while its rural and urban areas have 8.90 percent and 9.00 percent children underweighted respectively. Beside it, the condition of children in rural (37.60 percent) Rajasthan is weak as compared to the urban area (32.60 percent) of Rajasthan. As usual, the pattern is similar in rural and overall area, but it is different in urban Rajasthan. Figure 3.9 displays that children falls in high and very high categories in Dhaulpur and Udaipur districts of urban area, both districts comes under tribal region. Almost all tribal region and Thar desert drops in moderate and low categories of urban areas. Whereas, the rural and overall Rajasthan, tribal region and some districts of Thar desert has fallen in high and very high categories; that area is infected with poverty, under development, poor health infrastructure. All northern regions except Bikaner district has very low proportion of underweight children in Overall, Rural and Urban Rajasthan.





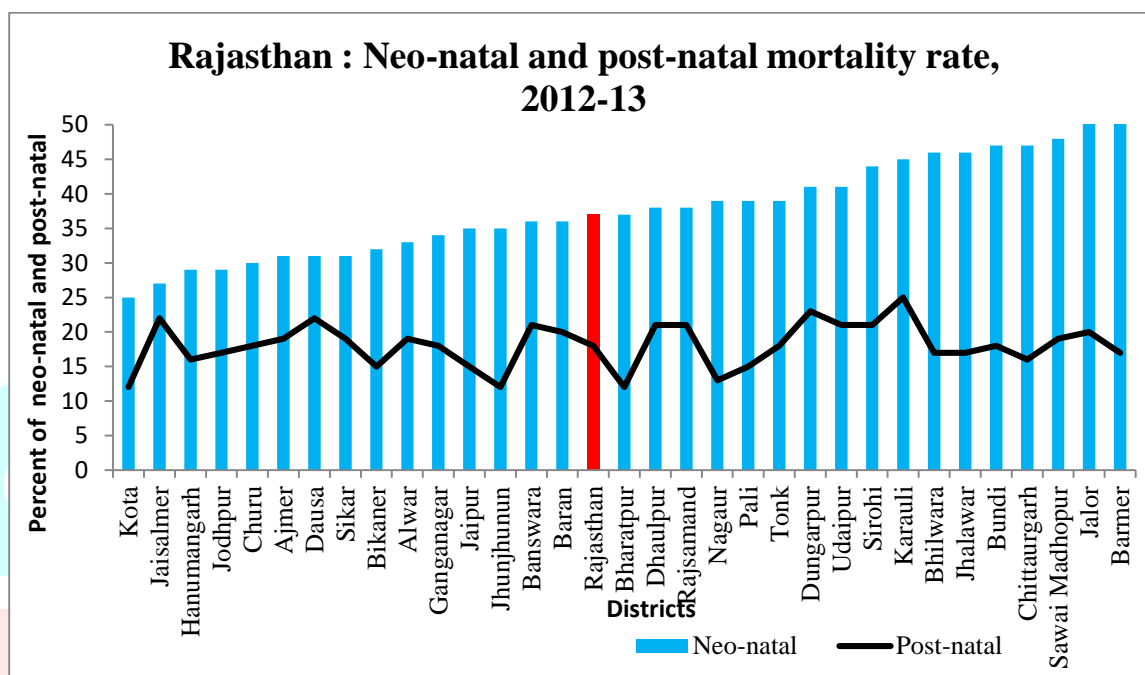
Source: Annual health survey, 2012-13.

Figure 4: Children with birth weight less than 2.5 kilogram in Rajasthan

Mortality rate of neo-natal and post-natal in Rajasthan

The figure 5 illustrates the neo-natal and post-natal mortality rate that's based on the annual health survey of Rajasthan, 2012-13. Neo-natal mortality rate are high as compared to the post-natal mortality rate in Rajasthan thereby indicating the very high mortality in early days of birth. Rajasthan has recorded 37 neo-natal mortality

rate and 18 post-natal mortality rate per 1000 live births. A neo-natal death is defined as a death during the first 28 days of life and post-natal, the numbers of the deaths of live born babies weighing 500 grams or more between 28 and 364 days after birth per 1000 live births. From baseline to second updating round of AHS, Odisha, Chhattisgarh, Bihar, Jharkhand and Rajasthan recorded the highest fall (3) while Uttar Pradesh the lowest fall (1). The figure 3.16 shows that the Barmer and Jalor recorded highest neonatal mortality rate (52) and Kota recorded 25 neonatal mortality rates. Fifteen districts falls under the state average of neonatal mortality rate and seventeen districts above the state average. Post-natal mortality rates is highest in the Karauli (25) and lowest in the Bharatpur and Jhunjhunun (12) district.



Source: Annual health survey, 2012-13.

Figure 5: Neo-natal and post-natal mortality rate

Postnatal mortality rate are above state average in the fourteen districts while eighteen districts have less than state average postnatal mortality rate. Birth asphyxia, low birth weight, infection, diarrhoea, typhoid and hypothermia are leading causes of deaths of infants in the state.

Infant mortality rate in Rajasthan

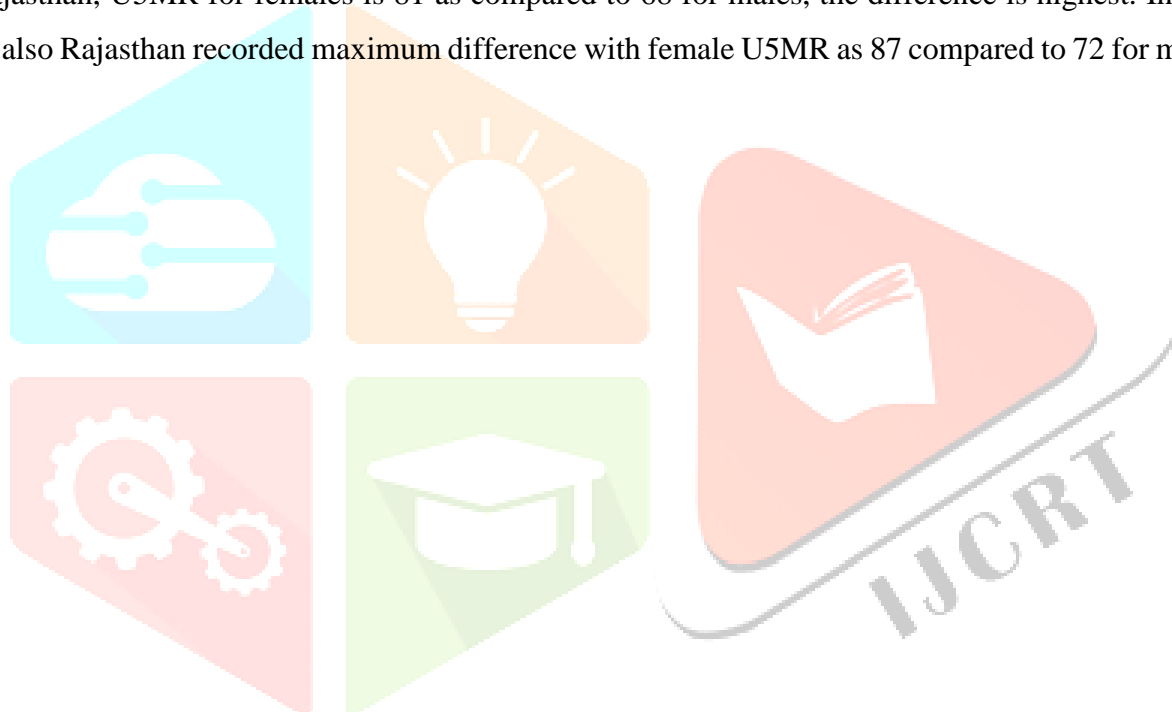
The figure 6 demonstrates the infant mortality rate of Rajasthan (Overall, rural and urban) which is based on the AHS of 2012-13. Infant mortality rate is the number of the deaths of children under one year of age per 1000 live births. Rajasthan recorded 55 Infant Mortality Rate (IMR) in 2012-13. Rural area recorded high IMR (59) as compared to the urban area of Rajasthan (38). Highest value of IMR shows the worst condition of children in any geographical area. Kota districts experienced relatively better condition of children with lowest IMR. Entire southern region has depicts very high IMR.

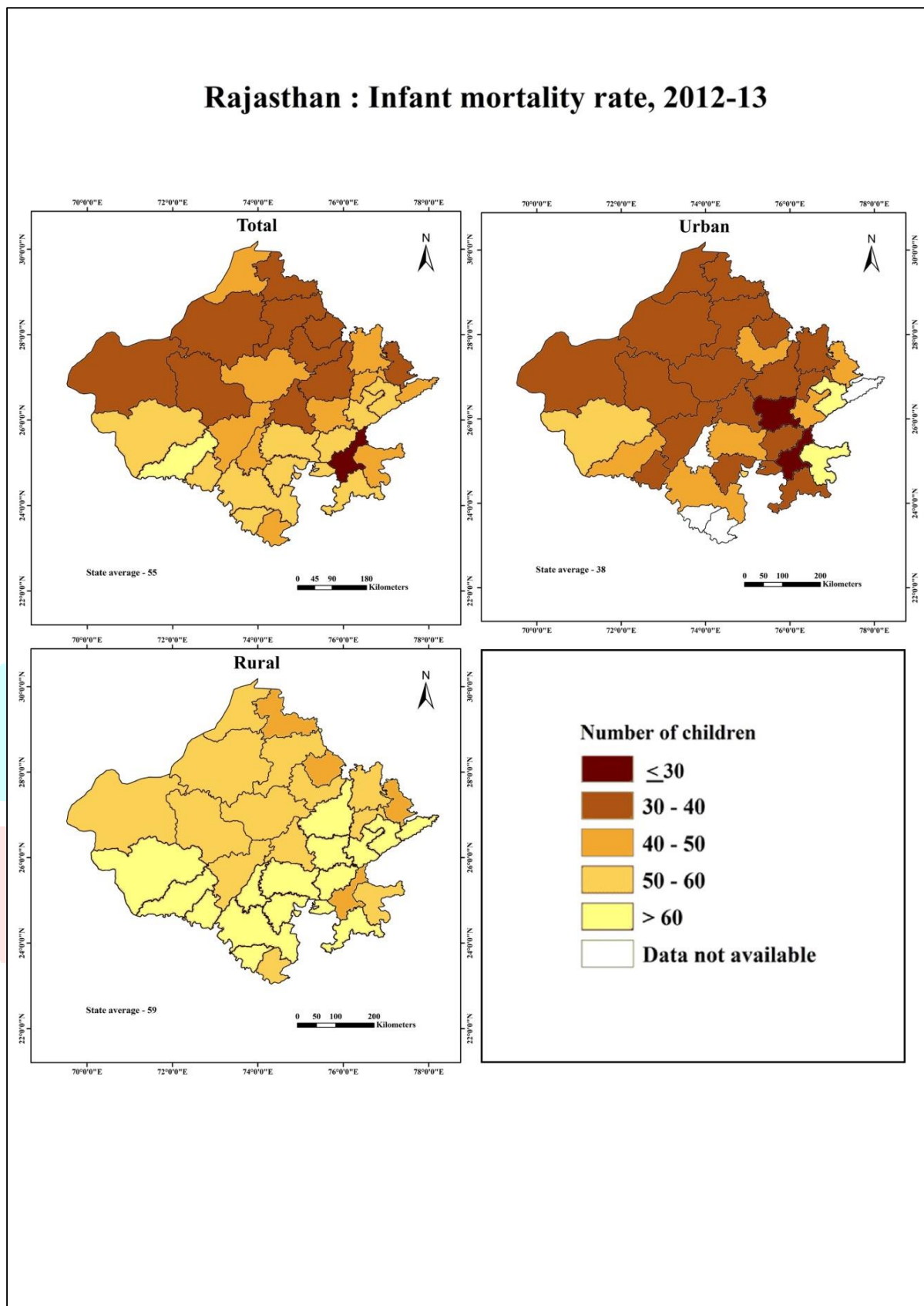
Almost all northern areas and some districts of Thar desert have better condition as compared to the south-eastern realm of Rajasthan where it is less than 30. It may be because of better healthcare infrastructure and awareness about children and maternal health care, while the south-eastern districts of Rajasthan is a tribal

area, and economically and socially backward. Almost all urban area have less than 40 IMR while comparatively, most of the rural area of Rajasthan suffered with high value of IMR (above 50). Even the state average is 59. Because of low awareness about health, lack of health infrastructure, malnutrition problem, economically backward and lack the facility of human resource in institutions are the responsible factors for the high IMR in rural areas.

3.20 Children under five mortality rate in Rajasthan

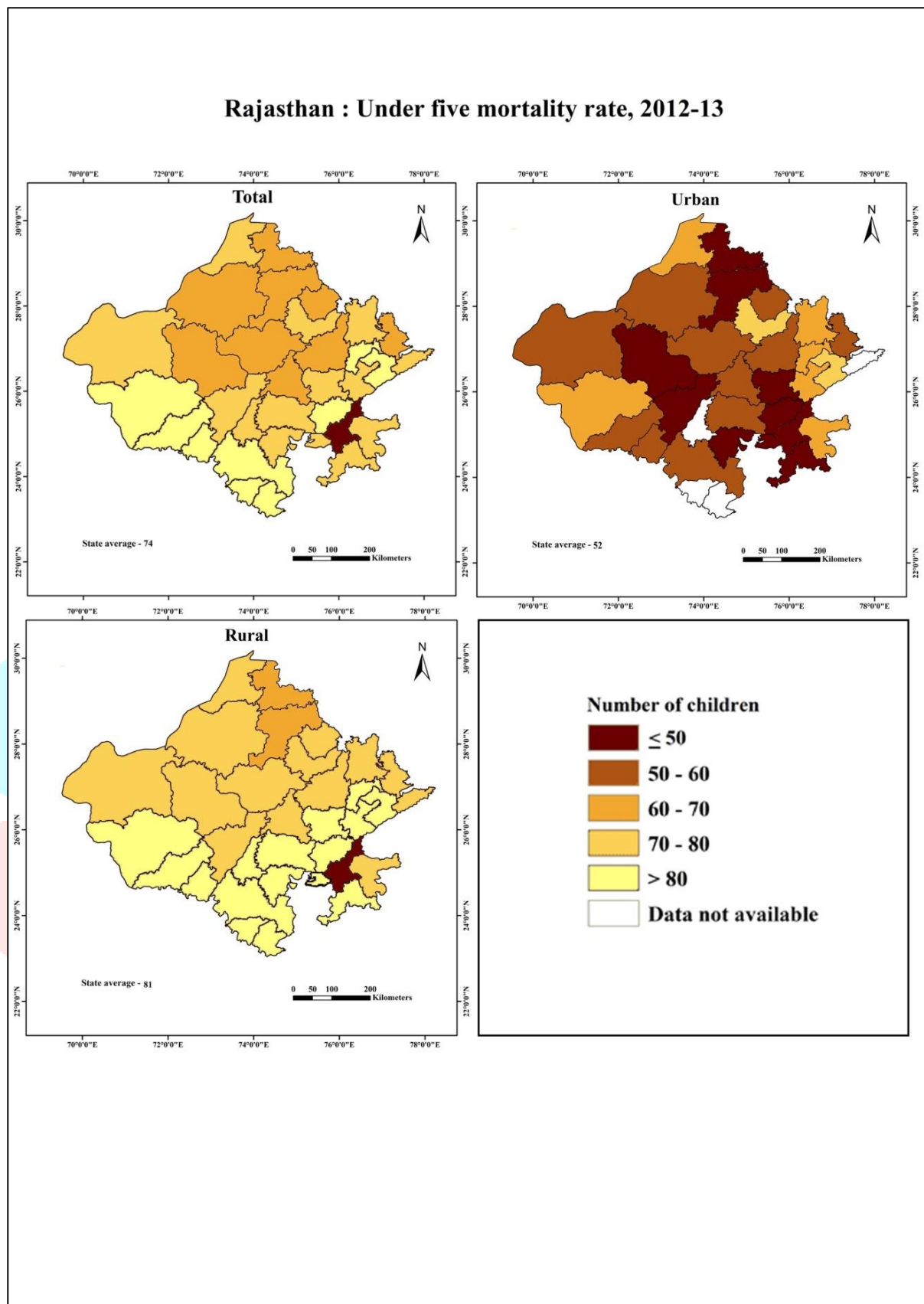
The figure 7 shows the under-five mortality rate of Rajasthan (overall, rural and urban), 2012-13, for that data is derived from AHS. Rajasthan recorded 74 Under Five Mortality Rate (U5MR). As compared to rural (81) Rajasthan, urban area recorded about one third less U5MR (52 U5MR). According to various rounds of NFHS data, the U5MR has declined by a little more than half in the past 23 years, namely, from 109 deaths per 1000 live births in 1990 to 50 deaths in 2013. Gap between male-female mortality differential remained significant. In Rajasthan, U5MR for females is 81 as compared to 68 for males, the difference is highest. In baseline of AHS also Rajasthan recorded maximum difference with female U5MR as 87 compared to 72 for males among the





Source: Annual health survey, 2012-13.

Figure 6: Rajasthan; Infant mortality rate, 2012-13



Source: Annual health survey, 2012-13.

Figure 7: Rajasthan; under five mortality rate, 2012-13

EAG states. All over Rajasthan, U5MR is above 50 except only Kota district where U5MR is 31 which is lowest rate in Rajasthan. Rural area condition is worse as compared to the urban Rajasthan, all southern region recorded above 80 U5MR and Kota have below 50 U5MR, Hanumangarh and Churu have moderate rate. Except these

districts, all other areas have U5MR in between 70 – 80. While in the urban area of Rajasthan U5MR is better, only two districts dropped in between 70 – 80 and four districts dropped in moderate category (60 - 70). Except these districts, all urban Rajasthan areas have U5MR below 60.

3.21 Composite index of Child health care in Rajasthan

The figure 8 shows the composite index of child health care in Rajasthan on the basis of data derived from AHS, 2012-13. It has been presented with eleven indicators i. e. total child having immunization card, children born with less than 2.5 kilograms weight, immunized children, new born who were checked up within 24 hours, children suffering from Diarrhoea, ARI and fever in which conditions who sought treatment of these disease, infant mortality rate and under five mortality rate.

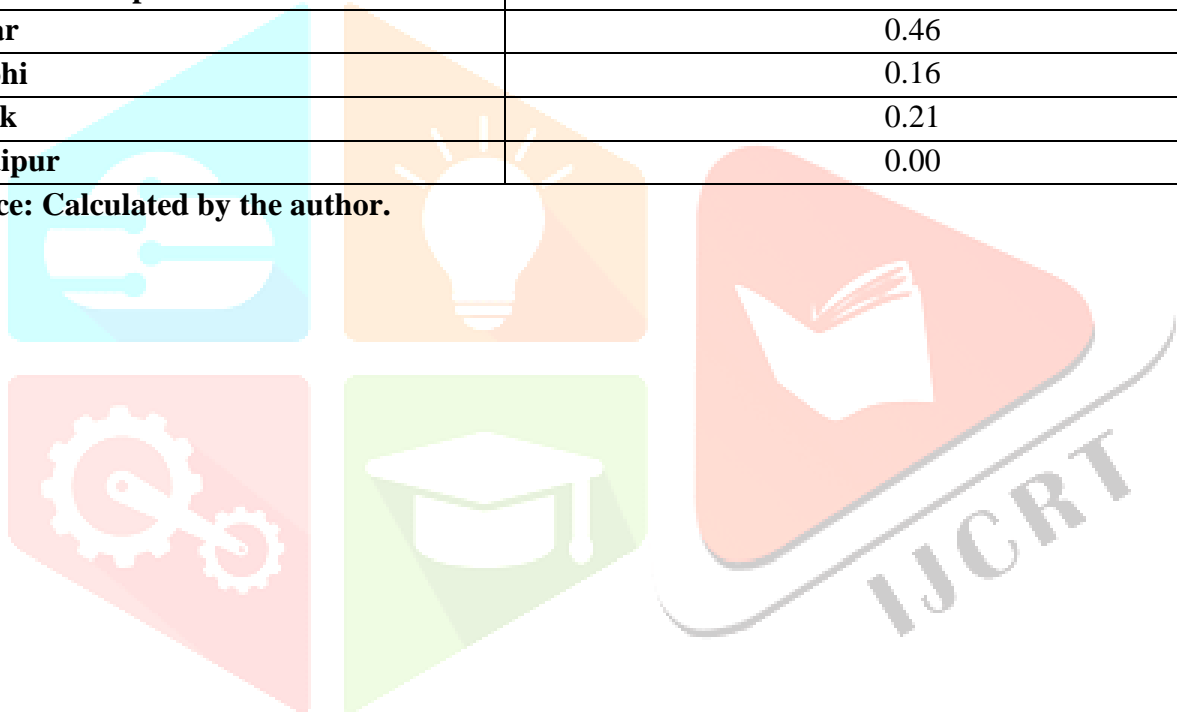
The composite index is based on World Health Organisation formula. On the basis of composite score, child health care level score has been divided into four categories [(high, medium low and very low) figure 8]. High value of composite score shows the better child health care and vice versa. It depicts that entire northern region of Rajasthan falls in high and moderate category. It has observed high level of child health care facilities scenario which progressively declined as one moves towards south. Infact, entire south east and south western region depicts low level of health care facilities with an exception of Kota and Baran in eastern region. Entire southern part of Rajasthan has very poor level of child health care, lowest being in district Barmer and tribal areas of south and eastern region Surprisingly, Hanumangarh and Ganganagar districts have obtained the highest composite score in child health care.

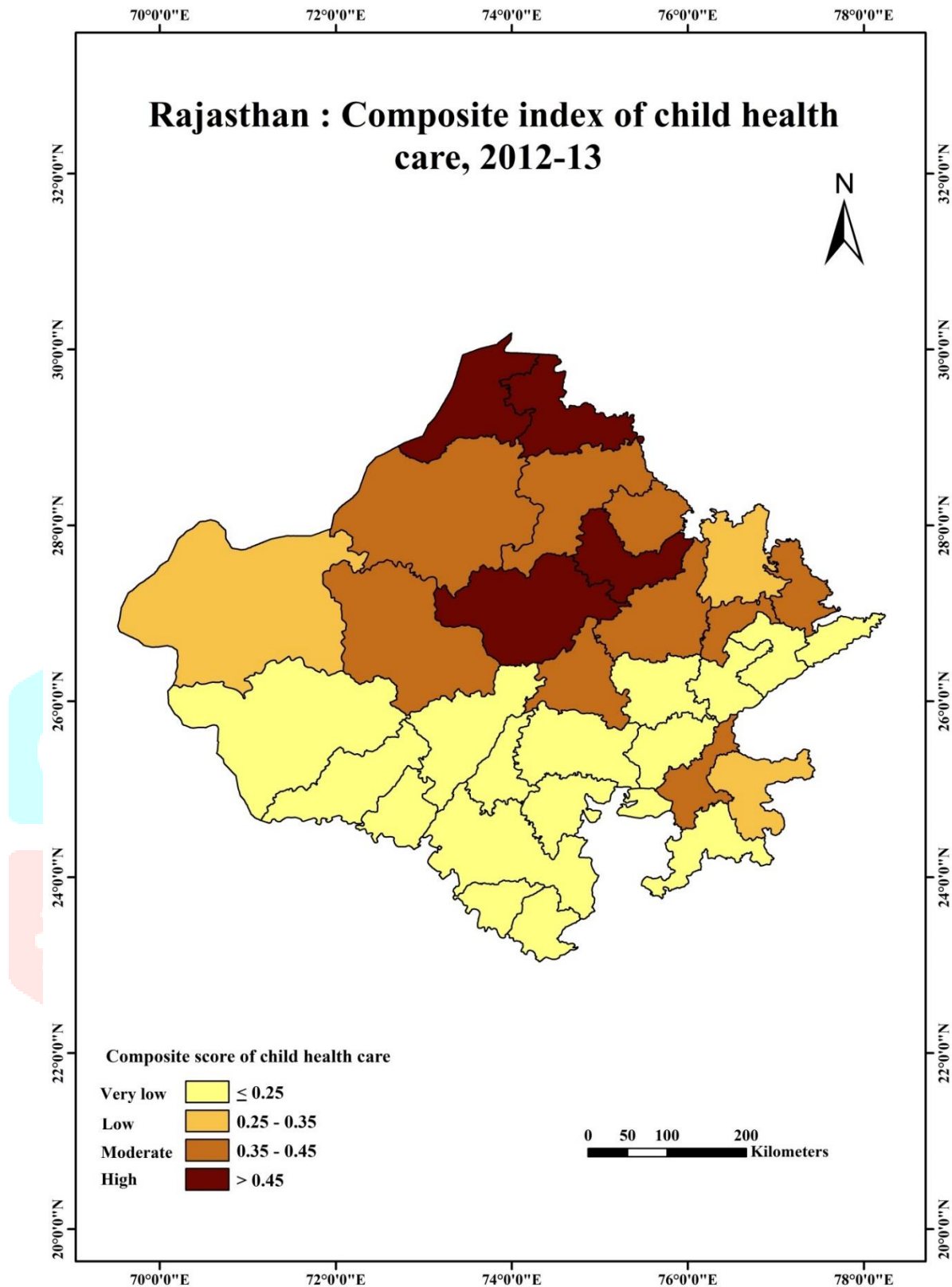
Though, it is a desert area but due to wide irrigation network of Indira Gandhi canal, agriculturally, this area is quite advanced now and thus economically in fairly good condition. The adjoining districts also performed impressively and depicts high level of children health care. Barmer district obtained very low composite score and has the poorest health care level in the state of Rajasthan. This is because of poor awareness and female education as literacy level of females is only 41 percent in the district which is one of the lowest in the state. Apart, various socio-economic, demographic, cultural, logistic and behavioural factors were found to influence the child health status.

Indicators	Composite Score
Rajasthan	0.29
Ajmer	0.43
Alwar	0.29
Banswara	0.06
Baran	0.30
Barmer	-0.04
Bharatpur	0.44
Bhilwara	0.16
Bikaner	0.41
Bundi	0.24
Chittaurgarh	0.21
Churu	0.42
Dausa	0.36

Dhaulpur	0.14
Dungarpur	0.19
Ganganagar	0.52
Hanumangarh	0.54
Jaipur	0.42
Jaisalmer	0.27
Jalor	0.06
Jhalawar	0.21
Jhunjhunun	0.44
Jodhpur	0.41
Karauli	0.11
Kota	0.44
Nagaur	0.48
Pali	0.23
Rajsamand	0.17
Sawai Madhopur	0.13
Sikar	0.46
Sirohi	0.16
Tonk	0.21
Udaipur	0.00

Source: Calculated by the author.





Source: Annual health survey, 2012-13.

Figure 8: Composite index of child health care in Rajasthan, 2012-13

Summing up

This paper includes the child health care in the context of the new born checked up, immunization, birth weight and IMR, NNMR, PNMR and U5MR in all areas of the Rajasthan. A new born child has several tests and examinations to check that he or she is healthy and well. In urban areas of the Rajasthan, new born checked

up within 24 hours is higher in all southern, eastern and some districts of the northern side particularly in Shekhawati region and Jaipur while in the rural area only Baran districts in the east has observed high percentage of new born checked up. It has been affected by mothers who stay in institution more than 24 hours after delivery, number of institutions and human resource availability at the institutions. Fully immunized coverage of the children are higher as compared to other regions of rural Rajasthan. Children did not received any vaccination is a negative indicator. Almost all urban Rajasthan has more than 94.00 percent children who received vaccination except the Shekhawati region. The Thar Desert of the overall and rural Rajasthan have more than 8.00 percent of children who did not take any vaccination because here average area served by institutions are high as compared to other regions. A child with birth weight less than 2.5 kilograms is a negative indicator. All northern regions except Bikaner district have very low proportion of underweight children in overall, rural and urban Rajasthan. High proportion of underweighted children in any area show that area is infected with poverty, under development and poor health infrastructure. All rural areas suffered with high value of IMR and U5MR as compared to the urban area of Rajasthan. Low awareness about health, lack of health infrastructure, malnutrition problem, economically backward area and lack the facility of human resource in institutions are the responsible factors for the high IMR and U5MR in rural areas.

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