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Statistical Analysis of the Map-Based Sensitive Health Issues in Vidarbha region, Maharashtra

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Abstract: This paper is based on an assessment of the health status and livelihoods of people in Vidarbha. Vidarbha region is one of the most distressed regions in India. The research used secondary data generated from the census and other literature. Vidar-bha region has a complex of eastern eleven districts of Maharashtra. This paper attempts to assess the relationships between different-different health indicators in the overall assessment of a healthy environment. The statistics were calculated by the locational quotient method. This paper would also analyse the spatial distribution of health issues in this region. The study indicates that overall under-nutrition among children, adolescents and married women in the study area is substantially vul-nerable because the Crude birth rate is very high in Gadchiroli and Bhandara.

Keywords: Heath, Location quotient, Vidarbha, CBR, IMR and MMR.

INTRODUCTION

The largest administrative region in the state is called Vidarbha. It encompasses around 31.66% of the state's land area. In the study region, there are 13512 inhabited villages spread among 119 tehsils. There are over 2365 settlements that are uninhabited. All villages and tehsils differ from one another in terms of their soils, climates, and native vegetation. The majority of the territory is made up of rocky, steep, and harsh terrain, with a plateau and alluvial plains making up the majority of the remaining land. The area is generally between 150 and 1050 metres above mean sea level.

Vidarbha is negatively known as suicide prone region of India, especially farmer suicide. According to Dongre & Deshmukh (2012), the complex interaction of social, political, and environmental restrictions was to blame for the high rate of farmer suicides in Vidarbha. Therefore, to prevent farmer suicides soon, a comprehensive intervention is needed to ensure self-reliance and capacity building among farmers in modern farming techniques, monitoring and support systems for vulnerable farmers, and a village-level, transparent system for the distribution of relief packages. Public health, epidemiology, and the study of illness in human communities have long included the mapping of disease incidence and prevalence (Koch, 2005).

The average fertility of Maharashtra is 1.9. Contrarily, the average fertility rate of the Vidarbha region is higher than Maharashtra is 2.05.

METHODOLOGY

This work is entirely based on secondary information gathered from many publications, articles, books, research papers, newspapers, and websites. To begin, raw data from various sources is gathered and categorized into three categories: low, medium, and high. Geometric diagrams such as bar graphs and thematic maps are used to visualize the data for a better understanding. By summing the Location Quotients of each indicator, a Composite index is created in the end to provide an overall assessment. A commonly used geographic indicator is the location quotient (a ratio of ratios). It's used to compare and map the relative distributions of subareas to the entire region. The calculation of the Location Quotient by the given formula:-

$$LQ = \frac{Xi/\sum Xi}{Ni/\sum Ni}$$

Where LQ is the location quotient, Xi is the value of the variable in area I, $\sum Xi$ is the total value of the variable in the district combined, Ni is the value of the variable in the state,$\sum Ni$ and is the total value of the variable in the state combined.

Data for the choropleth map has been extracted from the district census handbook of Maharashtra, census of India, 2011 and primary census abstract for Maharashtra, census of India, 2011 Data was converted into an excel sheet and then it was joined with the digitized map of Vidarbha in version 10.2 of ArcGIS software.

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Study Area

Vidarbha is the eastern region of the Indian state of Maharashtra, comprising the Nagpur Division and Amravati Division. Amravati division's former name is Berar. There are 11 districts in the Vidarbha region of Maharashtra. It occupies 31.6% of the total area and holds 21.6% of the total population of Maharashtra. Such districts are – Akola, Amravati, Bhandara, Buldana, Chandrapur, Gadchiroli, Gondiya, Nagpur, Wardha, Washim, and Yavatmal (Fig.1). It borders the state of Madhya Pradesh to the north, Chhattisgarh to the east, Telangana to the south and the Marathwada and Khandesh regions of Maharashtra to the west. Situated in central India, Vidarbha has its own rich cultural and historical background distinct from the rest of Maharashtra. The largest District in Vidarbha is Nagpur district followed by Amravati district. A majority of Vidarbhians speak the Varhadi and Zadi dialects of Marathi.

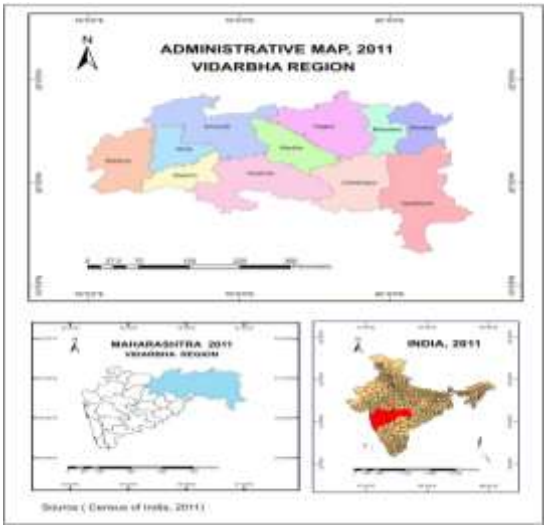

Figure 1: Map of the Study area

The Nagpur region is famous for growing oranges and cotton crops. Vidarbha holds two-thirds of Maharashtra's mineral resources and three-quarters of its forest resources and is a net producer of power. Vidarbha region contains Tadoba Andheri Tiger Project, Melghat Tiger Reserve, Bor Wildlife Sanctuary, Navegaon National Park, Nagzira Wildlife Sanctuary and Umred Karhandla Wildlife Sanctuary. Pench Tiger Reserve is one of the premier tiger reserves of India and the only one to straddle across two states: Maharashtra and Madhya Pradesh.

RESULTS AND DISCUSSION

Most of the villages in Vidarbha are badly in need of basic social infrastructures like all-weather roads, drinking water, regular electricity, primary health care, and basic education. There are various problems in Vidarbha like the absence of adequate social support infrastructure at the level of the village and district, the uncertainty of agricultural enterprise in the region, indebtedness of farmers, rising costs of cultivation, plummeting prices of farm commodities, lack of credit availability for small farmers, the relative absence of irrigation facilities, repeated crop failures, dependence on rainfall for farming, rural living and easy access to poisons, and lack of political will and insight in the region.

The plate entitled “Location Quotient of Infant Mortality Rate of Vidarbha” shows the condition of the primary level health system of child mortality in the Vidarbha region (Fig.2). Infant mortality is the term used to describe infant deaths under the age of one. The infant mortality rate (IMR), which is the number of baby deaths per 1,000 live births, is used to calculate this death toll. For the year 2015, the infant mortality rate was used as a measure of success in achieving the fourth of the United Nations' Millennium Development Goals. It is now a target in the Sustainable Development Goals for Goal Number 3. The regional average of IMR of Vidarbha is 31.72. The infant mortality rate has been classified into three classes high, medium and low. According to location quotient bifurcation, Buldana, Yavatmal, Washim, Wardha and Bhandara are under high and Akola, Amravati and Gadchiroli are under medium and the remaining are under low.

The highest IMR out of Maharashtra's all districts in the Vidarbha region is infamous for farmer suicides. The rise in child deaths and malnutrition cases among children in the Vidarbha region, the part of Maharashtra is all the more shameful given that this is among the richest states in the country and home to some of the world's wealthiest billionaires. The crisis is a manifestation of the state's severe social imbalances. The state's tribal belt, which is in severe need of sources of income and access to social assistance programmes like the job guarantee plan and subsidised rations, has been ignored by successive administrations and legislators. Budget cuts to central and state schemes which provide

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nutrition to young children and emergency care to malnourished children have been the last straw. The highest infant mortality rate of the districts is Akola, followed by Washim and Wardha and the lowest infant mortality rate of the districts is Chandrapur, followed by Nagpur and Gadchiroli.

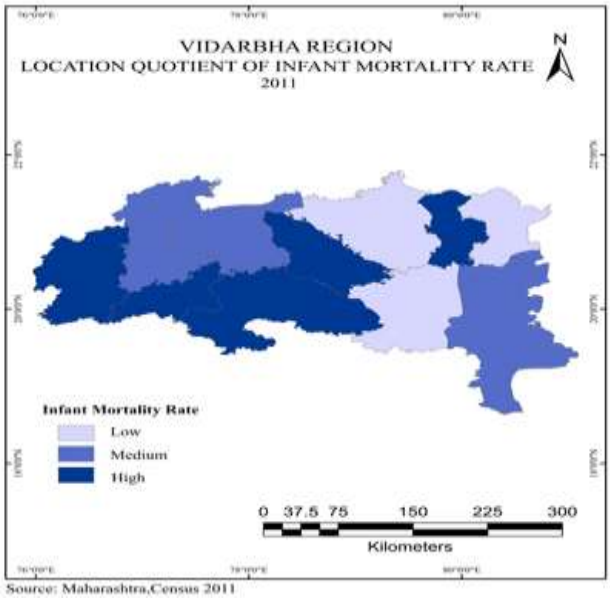

Figure 2: Location quotient of IMR

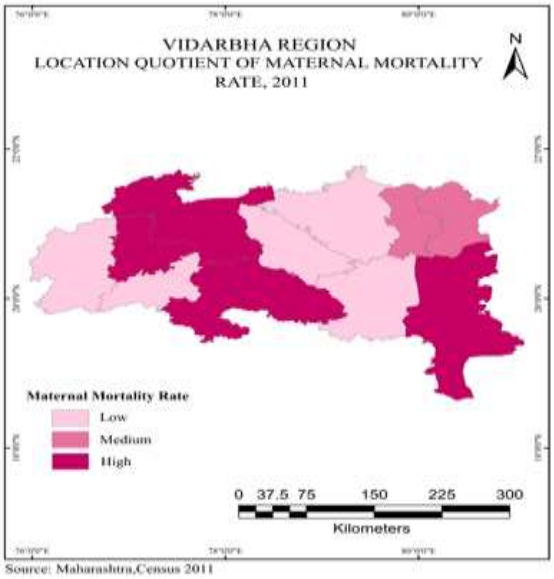

Figure 3: Location quotient of MMR

The plate entitled "Location Quotient of Maternal Mortality Rate of Vidarbha" shows the condition of maternal mortality in the Vidarbha region (Fig.3). Maternal mortality rate is defined as the number of registered maternal deaths due to birth or pregnancy-related complications per 100,000 registered live births. The maternal mortality rate is high in the eastern part of the region as compared to the western part of the region. The maternal mortality rate has been classified into three classes high, medium and low. According to location quotient bifurcation, Akola, Amravati, Yavatmal and Gadchiroli are under high and Bhandara and Gondiya are under medium and the remaining are under low.

The maternal mortality rate is also one of the Sustainable Development Goal's indicators. The goal is to reduce maternal mortality. Maharashtra's mortality is 68 in 2004 to reduce 61 in 2011. Maternal health is very important for pre-natal, during-natal and post-natal for a child. The gap in maternal healthcare between urban and rural areas is often blamed for the overall poor score and the inequalities are also evident through varying maternal mortality rates across the region. The highest mortality was in the districts of Akola, followed by Gadchiroli and the lowest maternal mortality was in the districts of Nagpur, followed by Wardha and Buldhana.

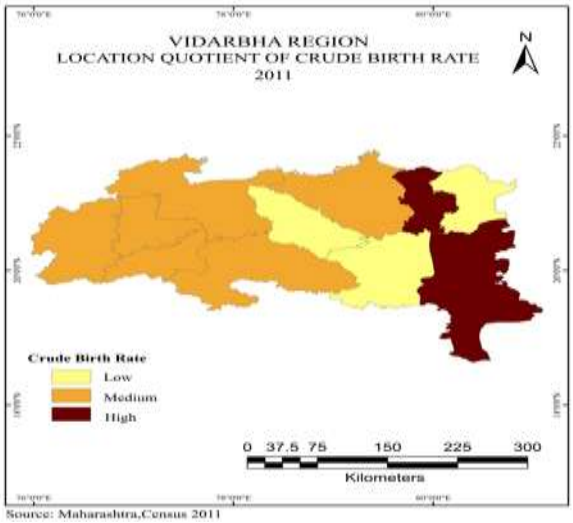

Figure 4: Location quotient of CBR

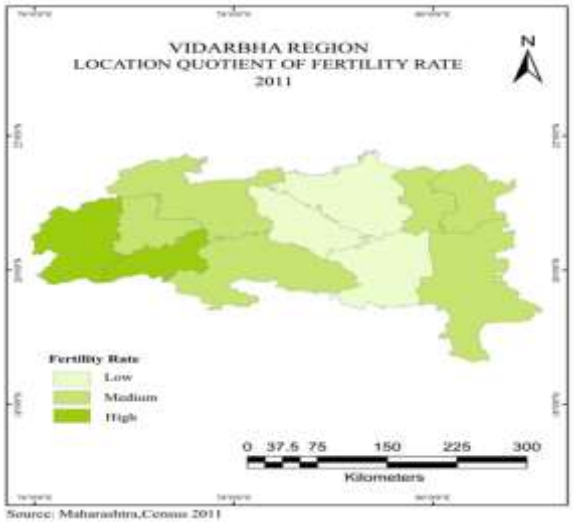

Figure 5: Location quotient of FR

The plate entitled "Location Quotient of Crude Birth Rate of Vidarbha" shows the condition of the birth rate in the Vidarbha region (Fig.4). Birth Rate is the factor that affects population growth. The total number

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of live births per 1,000 people in a population in a year or period is known as the birth rate (technically, births/population rate). The birth rate depends on several factors like existing age-sex structure, availability of family planning services, female employment, economic prosperity, poverty levels, infant mortality rate, age of marriage, etc. The crude birth rate is moderate shrink from 2001 (25.1%) to 2011 (16.5%). The crude birth rate has been classified into three classes high, medium and low. According to location quotient bifurcation, Gadchiroli and Bhandara are under high and Akola, Nagpur, Buldana, Washim, Amravati and Yavatmal are under medium and the remaining are under low.

Table 1: Composite index of Vidarbha, 2011

Akola	0.94	3.01	1.03	1.05	6.03
Amravati	0.94	1.17	0.9	0.96	3.97
Bhandara	1.16	0.68	1.11	1.01	3.96
Buldana	1.1	0.41	0.97	1.29	3.77
Chandrapur	0.66	0.47	0.81	0.77	2.71
Gadchiroli	0.88	2.12	1.56	1.01	5.57
Gondiya	0.81	0.75	0.77	1	3.33
Nagpur	0.75	0.27	1.06	0.88	2.96
Wardha	1.38	0.41	0.69	0.85	3.36
Washim	1.16	0.54	1.03	1.21	3.94
Yavatmal	1.16	1.16	1.03	0.95	4.3

Population growth in turn depends on the birth rate. Birth rates can vary to a greater extent by region and can have drastic effects on the overall human population. According to the 2011 census, there is a fall in the birth rate in the Vidarbha region both in rural as well as urban areas. In some countries, government policies have focused on reducing birth rates by improving women's rights, and sexual and reproductive health. Typically, high birth rates are associated with health problems, low life expectancy, low living standards, and low social for women and low educational levels. Demographic transition theory postulates that as a country undergoes economic development and social change its population growth declines, with birth rates serving as an indicator. The highest crude birth rate in the districts of Vidarbha region is Gadchiroli followed by Washim and Yavatmal. In this region, the high birth rate is due to the worst condition of the medical facility. And the lowest crude birth rate in the districts of Vidarbha region is Wardha, followed by Gondiya and Chandrapur.

The plate entitled “Location Quotient of Fertility Rate of Vidarbha” shows the condition of the fertility rate in the Vidarbha region (Fig.5). The total fertility rate (TFR), sometimes also called the fertility rate, absolute/potential natality, the period total fertility rate (PTFR), or total period fertility rate (TPFR) of a population is the typical number of children a woman would have over her lifetime if:

- She was to experience the exact current age-specific fertility rates (ASFRs) throughout her lifetime, and
- She was to survive from birth to the end of her reproductive life.

The fertility rate has been classified into three classes high, medium and low. According to location quotient bifurcation, Buldana and Washim are under high and Akola, Bhandara, Gondiya, Washim, Amravati and Yavatmal are under medium and the remaining are under low.

The Total Fertility Raye (TFR) is not based on the fertility of any real group of women nor is it based on counting up the total number of children born during their lifetime. The TFR is a measure of the fertility of a woman imagined to be passing through her reproductive life subject to all the age-specific fertility rates for 15-49 recorded for a given population in a given year. TFR is a more direct measure of the level of fertility than the crude birth rate since it refers to births per woman. TFR at or below 1.3 is the definition of "lowest-low fertility."But all the districts of the Vidarbha region are more than this. The families of the Vidarbha region desire children for their labour and as caregivers for their parents in old age. The lack of access to contraception, stronger adherence to traditional religious views, often lower levels of female education, and lower rates of female employment in the industry all contribute to higher fertility rates. The total fertility rate for the world has been declining very rapidly since the 1990s. The highest fertility in the Vidarbha districts is Buldana (2.65), followed by Washim (2.49), Gadchiroli (2.08) and Bhandara (2.08). On the other hand, the lowest fertility rate in the districts of Vidarbha is Chandrapur (1.59), followed by Wardha (1.75) and Amravati (1.97) (Table 1).

Composite Index

The plate entitled “Composite Index of Vidarbha” shows the overall condition of the Vidarbha region’s negative growth. Composite Index is an average of the location quotient of indicators of demography. It is a measure of development which helps in understanding the demographic profile of a region so that accordingly planning can be done. In the health sector, there are two composite indexes. In this composite index - A region with a higher composite index is less developed and vice-versa. Like the statistics of IMR,

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MMR, CBR, etc. are high then the composite index is low. Means it is inversely proportional to each other. With the help of composite index analysis, a regional planner can reduce inter or intra-regional disparity and can promote the economic, social, cultural and political growth and development of a region (Fig.6).

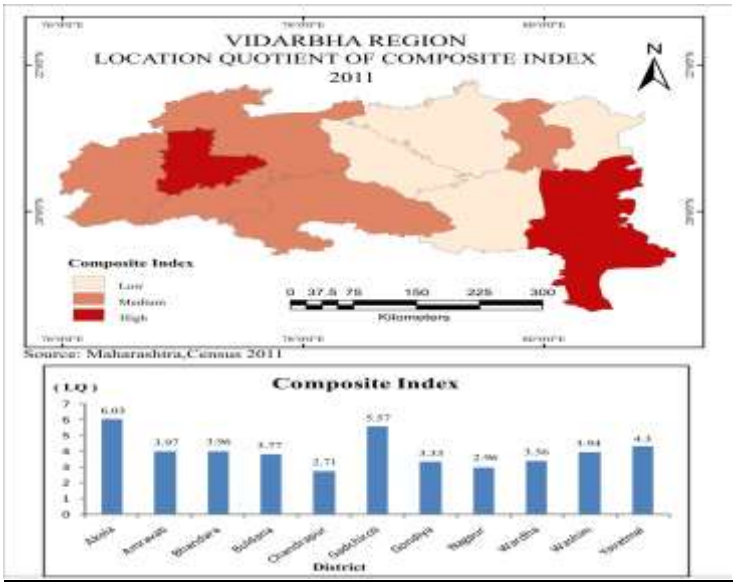

Figure 6: Composite index of the Health status of Vidarbha

After looking at the health status of Vidarbha region and looking at the recent trends we can say that the district as a whole is developing at a very high pace to control the Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR), Crude Birth Rate (CBR) and Fertility Rate (FR) If we look into the first indicator IMR is concerned in this region has a very high level of reducing the infant mortality rate from 2001 to 2011. So far in MMR then we can see that this region has an increasingly controlling the MMR by the government's approach. The Fertility rate of the state is equal to that of the country and last the average CBR of Vidarbha is 16.09. It is also good to work with the help of state and central government to increase awareness about family planning and also give many precautions to reduce the birth rate. As a whole Vidarbha region has the good composite Index with Chandrapur as the lowest composite index followed by Nagpur. Districts like Gondiya, Buldana, Washim and Amravati have a moderate composite index. The rest of the district has the highest composite index. In the inset diagram of columns, graphs have been drawn to show trends of different indicators in the districts.

CONCLUSIONS

Amravati division has 5 districts and 56 Talukas and the Nagpur division has 6 districts, 31 Subdivisions and 64 Talukas. The survey shows one of the biggest problems in Vidarbha was the high infant mortality rate. However, the state government has no specific allocation for tackling this issue. These issues are cured by the central government with many central policies like the National Rural Health Mission (NRHM) and another the Ayushman Bharat Yojana (it has two goals, one, creating a network of health and wellness infrastructure across the nation to deliver comprehensive primary healthcare services, and another is to provide insurance cover to at least 40% of India's population).

At last, it can be concluded that this region is already on its path of development and improvement in all the fields and has good prospects. If some more regional planning and strategy work out here, it will soon prosper more. But it all depends on the government the administration and the people's choice. The government also doing more to help the targeted tribal people with various policies. Such policies are the National Urban Health Mission, National Rural Health Mission (NRHM), Mission Indradhanush, Janani Suraksha Yojana, Mother Absolute Affection, Ayushman Bharat Yojana (it has two goals, one, creating a network of health and wellness infrastructure across the nation to deliver comprehensive primary healthcare services, and another is to provide insurance cover to at least 40% of India's population which is majorly deprived of secondary and tertiary care services) etc. Slowly this region will turn out to be one of the developed regions of India.

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