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Regional Disparities in the Health Infrastructure and Facilities of Bareilly District, Uttar Pradesh: An Analysis

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ABSTRACT

Health is one of the critical human capital components which has significant contribution in the development of nation. The World Health Organisation (WHO) has defined health as "A state of complete physical, mental and social wellbeing and not merely the absence of disease or illness or infirmity". The health condition has been measured with special reference to health facilities and health infrastructure which contribute significantly for the progress and benefit of society. Health has a vital link between interacting phenomenon with far reaching implications. One such implication is the realization that the availability of health services is the only one of many contributions to health development (UN, 1984). Only healthy and educated people can contribute to productivity in economic growth. The present study is an attempt to measure blockwise disparities in health infrastructure and facilities in Bareilly district. For this study, data is mainly collected from secondary sources like District Census Handbook and Sankhyakiya Patrika. Z-score and composite standard score techniques have been used to analyse the data. The result analysis shows that Nawabganj, Kyara and Bhuta are developed blocks of Bareilly district regarding health infrastructure and facilities. On the other hand, Ramnagar, Fatehganj West, Bhojipura, Richha and Bhadpura are least developed blocks in terms of health facilities and Infrastructure Bareilly district of Uttar Pradesh. There is a need for government interventions and public awareness for the development of backward blocks of Bareilly district.

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INTRODUCTION:

Regional disparity in development is one of the significant challenges the world is facing today. Among all the disparities, regional health disparities are prominent. The reason behind these disparities varies from developed to developing nation. Literal meaning of the term disparity basically means imbalances, inequality, diversity, heterogeneity, variousness, etc. Regional disparity is defined as differences between economic performance and welfare between countries or regions (OECD 2002-2003).

Health is the state of complete mental and physical fitness. It is recognized as one of the critical human capital components which significantly contributes to the nation's development. The term health is a positive and dynamic concept. In common parlance health implies absence of diseases. The World Health Organisation (WHO) has defined health as: "A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". Health is not only a desirable goal in itself but also an indispensable component if not prerequisite. Thus, it has a vital link with the interacting phenomenon with far-reaching implications. One such implication is the realization that the availability of Health services is only one of many contributions to health development (UN, 1984). Poor access and poor quality of health care are two major concerns for any country's ministry of Health (Oppong, 2010). Only healthy and educated people can contribute to productivity to economic growth.

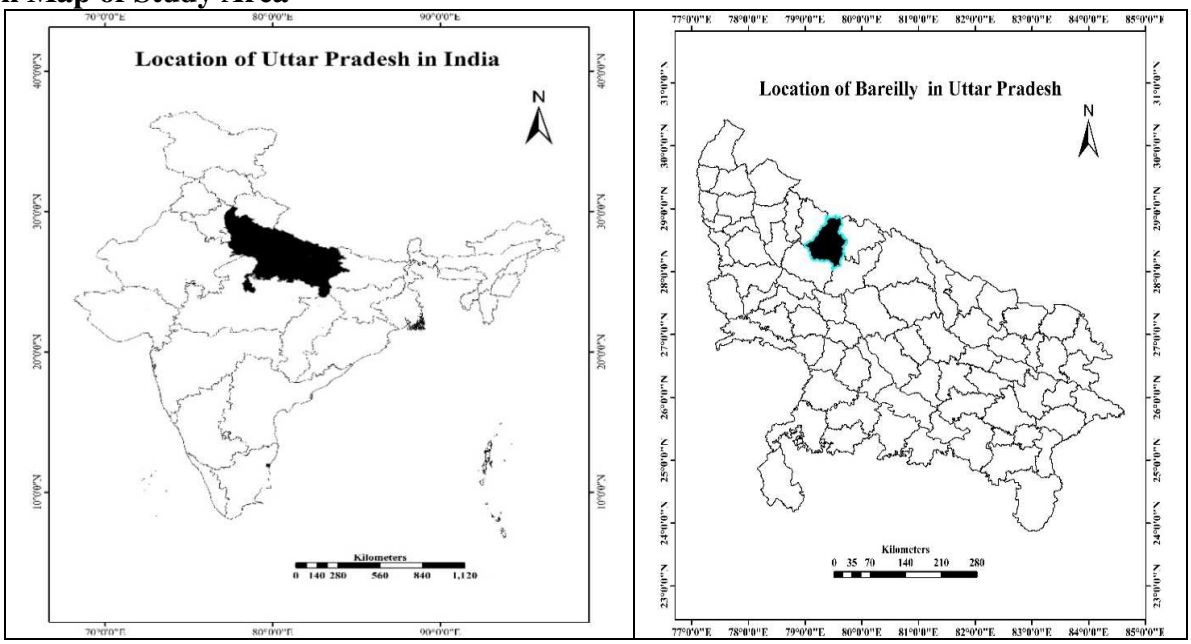
Debapriya and Mohanty (2008) analyzed the importance of education and healthcare facilities in the quality of life of people and tried to develop a

sound statistical methodology to measure the regional disparities in the levels of educational and healthcare development. Hoque and Hashmi (2023) have analyzed the level of socio-economic development in Uttar Dinajpur district. They have taken thirty-five (35) indicators to measure the level of development in the study area using Z-Score and Composite Z-Score. Correlation matrix have been used to analyze the relationship among the developmental variables. Lakshmi and Sahoo (2013) conducted research on the state of Andhra Pradesh's healthcare system and health indicators. In this paper, they showed that people's health depends on things like the number of service centres, the number of beds, the number of doctors in government hospitals, etc. They also employed the health infrastructure index which is created using data on health related to the number of government hospitals' beds, doctors and hospitals and dispensaries. Hoque and Hashmi (2020) have analyzed the regional disparity in the level of educational development in Uttar Dinajpur. They used Z-score and Composite Z- score techniques to measure the level of educational development. Their study shows a wide range of variation in the level of educational development in terms of the number of educational facilities. It also shows that the number of educational facilities and the level of educational development are positively related. Ashraf and Rawal (2011) described that only educated and healthy person can contribute to productivity in economic growth. It is primary responsibility of a nation to provide health care services to its people. In India there has been an impressive growth of health infrastructure after independence, but the health care system continues to remain weak, deficient and inequitable. India is among those countries which spend least on health i.e. only 0.9 per cent of GDP of the country. There is widespread malnutrition or under nutrition or hunger and prevalence of poor health in the country as a whole. In such situation the need for proper health care facilities become more necessary, particularly when about three forth (¾) of our population lives in subject to social and economic vulnerability.

STUDY AREA:

Bareilly is situated in the north-west of Uttar Pradesh, which touches the boundary of state Uttaranchal. It is located at 28°10′N latitude and 78°23′E longitude. Its maximum length from north to south is about 96 kms. and its maximum. The Bareilly district is a part of southern upper Ganga Plain. The district is remarkably fertile and water is easily accessible. Ramganga is the main river which enters the district from the west and flows towards south-east. The climate of the district is same as that in the other sub-Himalayan districts in the state. The average rainfall of the district is 100-120 Millimetres. Bareilly had a population of 903,668 (according to 2011 census) of which 426,741 were females and 476,927 males. Sex Ratio is 895. The effective literacy rate of Bareilly is 68.3% of which 72.7% comprises of male and 63.2% female literacy rate. The rural area recorded 3841.9 Sq. Km. and urban covers 278.1 Sq. Km. In total there are 1007 Gram Panchayats and 2051 Revenue villages with 1855 inhabited villages and 196 uninhabited villages in the district. Urban area comprises of 21 statutory Towns and 10 Census Towns. Statutory towns comprise of 01 Nagar Nigam (Municipal Corporation), 04 Nagar Palika parishad, 15 Nagar Panchayats and 01 cantonment Board. The district is administratively divided into 06 tehsils and 15 Development Blocks. Total area of the district is 4120.0 Sq. Km.

Location Map of Study Area



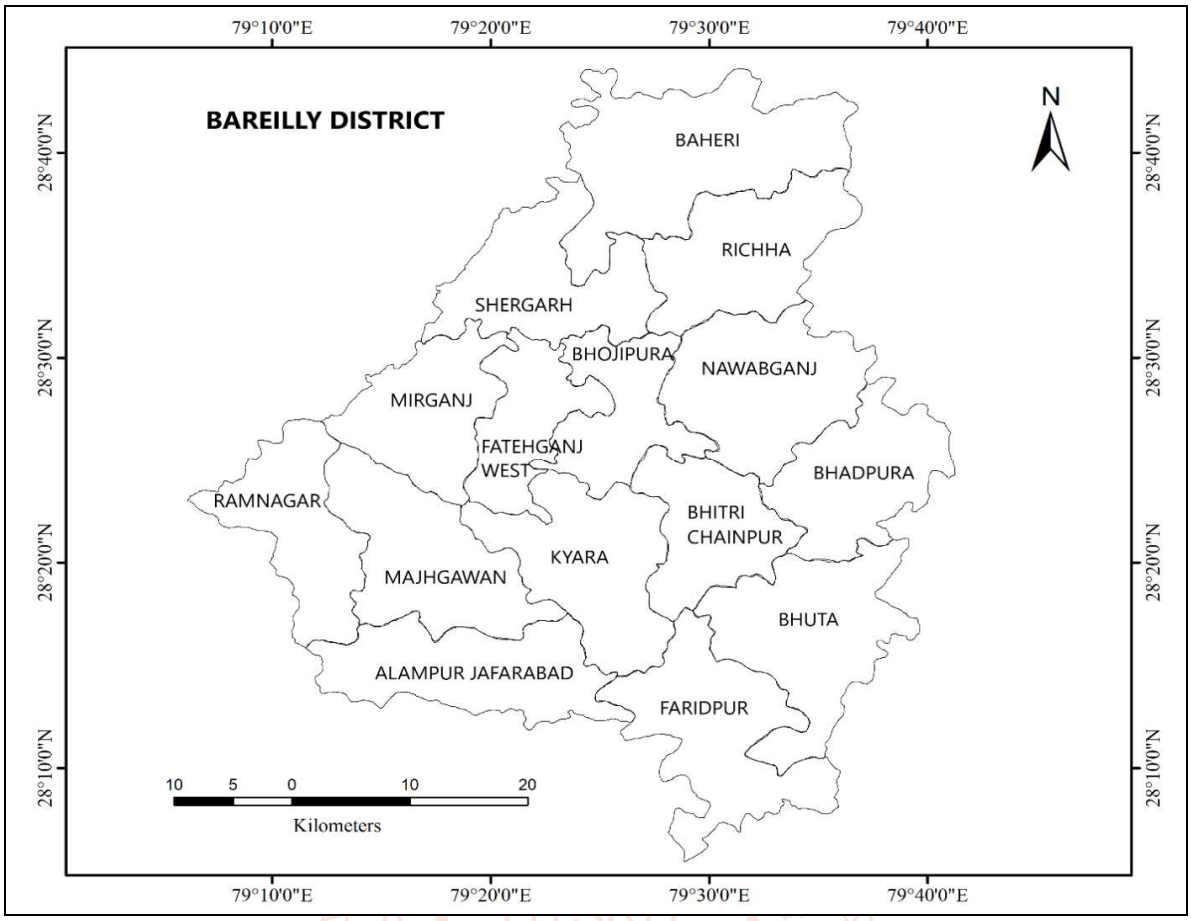


Fig.1

OBJECTIVE

- To analyze the distribution of health infrastructure and facilities in various blocks of Bareilly Districts.
- To analyze the spatial pattern of health care amenities and facilities i.e., Allopathic, Ayurvedic, Homeopathic and Unani at block levels.
- To examine the factor responsible for the disparity and workout measures to minimize the problem of disparity in Bareilly District.

NATURE OF HEALTH CARE FACILITIES

The health establishments which are available include government run Hospitals and medicals, public Allopathic hospitals, Ayurvedic hospitals, Homeopathic hospitals, unani hospitals and family welfare centres and subcentres and dispensaries, etc.

Allopathic system:

Allopathy is the system of medical practice which treats diseases by the use of remedies which produce effects different from those produced by the disease under treatment. The term allopathy was coined in 1842 by C.F.S Hahnemann to designate the usual practice of medicine(allopathy) as opposed to homeopathy, the system of therapy that he founded based on the concept that diseases can be treated with drugs(in minute doses) thought capable of producing the same symptoms in healthy people as the disease itself (www.medicinenet.com).

Ayurvedic system:

Ayurvedic means science of life in Sanskrit. It is one of the oldest and best documented system of treatment in India, based on the herbs and other natural ingredients. Ayurvedic emphasised life and health more than disease and treatment.

Homeopathic system:

Homeopathy is a system of alternative medicine created in 1796 by Samuel Hahnemann, based on his doctrine of like cures. It claims that a substance that causes the symptoms of a disease in healthy people would cure similar symptoms in sick people. Homeopathy is a pseudoscience- a belief that is incorrectly presented as scientific. Homeopathic preparations are not effective for treating any conditions. Large scale studies have found homeopathy is not a plausible system of treatment, as its claim about drugs, illness, the human body, liquids and solutions are contradicted by a wide range of discoveries.

Unani system:
A traditional system of healing and healthy maintenance practiced in South Asia. The origin of Unani medicines is found in the doctrines of ancient Greek physicians Hippocrates and Galen developed by Hakim Ibn Sina in 1025 AD, arrived in India around 12-13 century with Delhi Sultanate and becoming population in North India around 1206-1527.

DATA BASE AND METHODOLOGY

The present study on the health condition is based on the health infrastructure and health facilities of the Bareilly District. For the analysis data from the secondary source such as District statistical handbook, census of India 2011, statistical abstract and sankhiyakiya patrika of Bareilly district, has been used. Both the qualitative and quantitative methods have been used.

Statistical technique used:
The methodology adopted here is z-score and composite standard score method. In order to reach the standardization, the percentages of data of each indicator have been converted into standard scores which is commonly known as z-score or standard score. The formula is

$$zi = \frac{X - \bar{X}}{\sigma}$$

Where zi= standard score for the observation, xi= x original value of the observation, which is the mean for the indicators, σ = standard deviation of x observation (Khan et al., 2009). Obtained values are added block wise and the average is taken out for these indicators, which is known as composite score (CS). The composite standard score may be algebraically expressed as-

$$C.S = \frac{\Sigma Z ij}{N}$$

Where, CS= composite standard score, Zij= Z-score of an indicator j in block i, N= number of indicators Σ= summation (Khan et al., 2009).

Methodology:
For classifying the blocks according to the magnitude of development, the composite score is divided into three classes of high, medium and low. The overall studies of health infrastructure and facilities or health condition are broadly divided into two indicators. 1) Health Facilities: Under this there are 2 main indicators- i) Hospitals and dispensaries under which 4 sub indicators lies i.e., Allopathic, Ayurvedic, Homeopathic and Unani hospitals are there. ii) Family and mother-child welfare centres and subcentres. 2) Health Infrastructures: This includes-i) Available beds, under which all 4 types of hospitals i.e., Allopathic, Ayurvedic, Homeopathic and Unani are included ii) Number of Doctors

Table 1: List of Indicators

1.	**HEALTH FACILITIES**
	Hospitals and Dispensaries
X1	Number of Allopathic Hospitals and Dispensaries
X2	Number of Ayurvedic Hospitals and Dispensaries
X3	Number of Homeopathic Hospitals and Dispensaries
X4	Number of Unani Hospitals and Dispensaries
	Family and Mother-child welfare
X5	Centres for Family and Mother-child welfare
X6	Subcentres for Family and Mother-child welfare
2.	**HEALTH INFRASTRUCTURE**
	Available Beds
X7	Total number of available beds in Allopathic Hospital
X8	Total number of available beds in Ayurvedic Hospital
X9	Total number of available beds in Homeopathic Hospital
X10	Total number of available beds in Unani Hospital
	Number of Doctors
X11	Total number of Doctors in Allopathic Hospital
X12	Total number of Doctors in Ayurvedic Hospital
X13	Total number of Doctors in Homeopathic Hospital
X14	Total number of Doctors in Unani Hospital

FINDINGS AND DISCUSSIONS

1. Health Facilities

Health facility is in general any location where health care is provided. Health facilities range from small clinics and doctor's offices to urgent care centres and large hospitals with elaborate emergency rooms and trauma centres. This section discusses the disparities in the health condition in Bareilly district. To measure the disparities, the statistical techniques z-score has been used to calculate composite standard score for each indicator to turn up general level of health disparity for a region as a whole. The standard deviation method has been used to classify the health condition under three categories of high, medium and low.

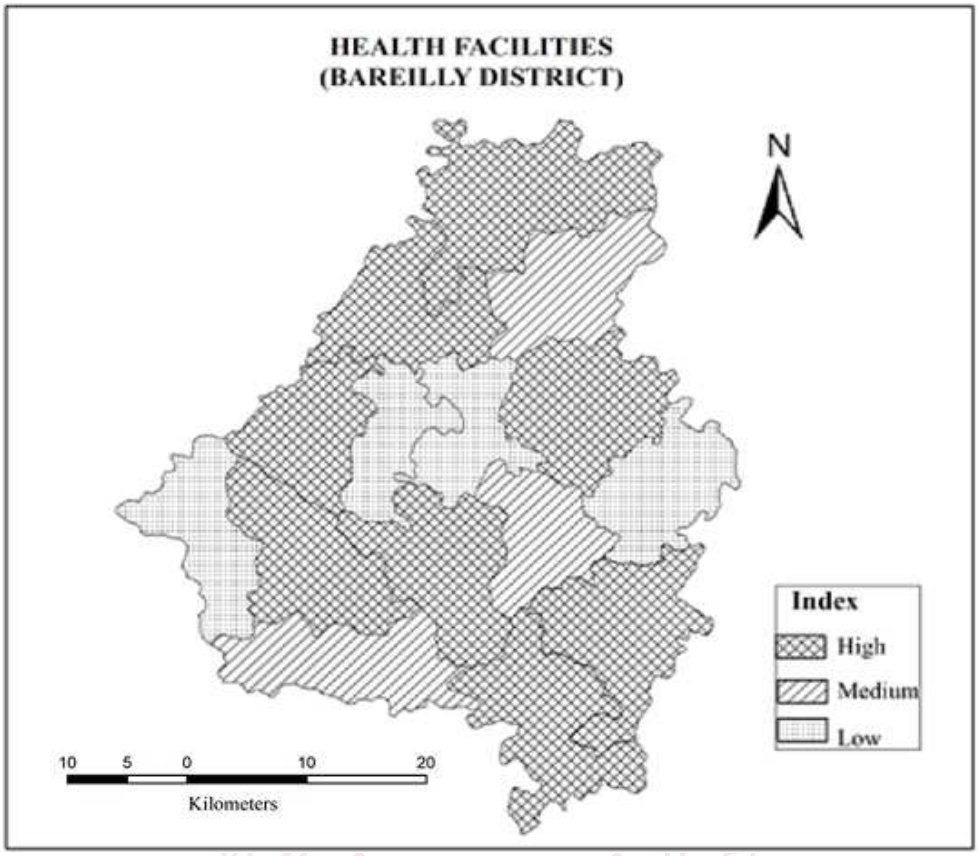


Fig.2

Table 2: Z-Score of the Indicators

Blocks	Z-Score						Composite
	Hospitals & Dispensaries				Family & Mother-Child Welfare		
	Allopathic	Ayurvedic	Homeopathic	Unani	Centres	Sub centres	
Baheri	0.06	-0.09	0.23	-0.72	2.46	0.40	0.39
Shergarh	2.79	-0.09	-0.63	0.63	-0.38	0.98	0.55
Richha	0.06	-0.73	0.23	-0.72	-0.38	-0.17	-0.29
Mirganj	-0.85	2.49	1.09	-0.72	-0.38	-0.75	0.15
Fatehganj West	-0.85	-0.09	-1.49	0.63	-0.38	-0.75	-0.49
Bhojipura	-0.85	-0.73	-1.49	-0.72	-0.38	-1.04	-0.87
Kyara	0.97	-0.73	1.95	0.63	-0.38	-1.04	0.23
Ramnagar	-0.85	-0.09	-0.63	-0.72	-0.38	-1.04	-0.62
Majhgawan	0.97	-0.09	-0.63	0.63	-0.38	2.14	0.44
Alampur Jafarabad	0.06	-0.09	0.23	-0.72	-0.38	0.98	0.02
Bithiri Chainpur	-0.85	-0.09	1.09	-0.72	-0.38	-0.17	-0.19
Nawabganj	0.06	-1.37	0.23	1.97	-0.38	1.56	0.35
Bhadpura	-0.85	0.56	-0.63	-0.72	-0.38	-0.46	-0.41
Bhuta	0.06	1.85	-0.63	1.97	-0.38	-0.17	0.45
Faridpur	0.06	-0.73	1.09	-0.72	2.46	-0.46	0.28

Source: Calculated by Researchers.

The graded distribution of Health Facilities of Bareilly District shows a wide range of variations. Fig.2 reveals that the blocks of high graded score ranges from 0.02 to 0.55 which includes eight notable blocks namely Baheri (0.39), Shergarh (0.55), Mirganj (0.15), Majhgawan (0.44), Kyara (0.23), Faridpur (0.28), Bhuta (0.45) and Nawabganj (0.35). Among all the eight high graded blocks Shergarh (0.55) has the highest value. All the block lies adjacent to one another and are in continuous fashion from northern part of the district to the south and one of the blocks lies in the eastern part of the district.

The medium graded score ranges from-0.40 to 0.02 are registered in three notable blocks out of fifteen total blocks, which are Richha (-0.29), Bhithiri Chainpur (-0.19), Alampur Jafarabad (0.02) lies in north-eastern part, central and the southern part of the district respectively. Among the medium graded blocks Alampur Jafarabad has the highest value. Whereas the low graded scores are recorded in four notable blocks of Bareilly District in terms of health facilities and ranges from -0.87 to -0.41. Among the low graded blocks, Bhojipura (-0.87) has the lowest value of all followed by Ramnagar (-0.62), Fatehganj West (-0.49), Bhadpura (-0.41) which lies on the eastern part and the Fatehganj west and Bhojipura lies in the central part of the district.

2. Health Infrastructure

Health infrastructure comprises buildings- both medical & non-medical. It includes medical equipment, furniture and hospital plant, doctors' availability, facilities and functions of staff housing, theatres, stores, etc. Communications (ICT equipment), and Ambulatory systems are also there and includes ambulances, cars, pickups, vans, etc. are required to health care delivery at different levels.

Table 3: Z-Score of the Indicators

Blocks	Z-SCORE								Composite
	Available Beds				Number of Doctors				
	Allopathic	Ayurvedic	Homeopathic	Unani	Allopathic	Ayurvedic	Homeopathic	Unani	
Baheri	0.42	-0.03	0.00	-0.63	2.61	-1.60	-0.04	-0.54	0.02
Shergarh	0.79	-0.42	0.00	0.95	-0.16	-1.60	-0.72	-0.54	-0.21
Richha	0.42	-0.80	0.00	-0.63	-0.55	0.00	0.63	-0.54	-0.18
Mirganj	0.05	1.12	0.00	-0.63	-0.55	1.60	-0.72	-0.54	0.04
Fatehganj West	-2.37	-0.03	0.00	-0.63	-0.95	0.00	-0.72	0.81	-0.49
Bhojipura	0.05	-0.42	0.00	-0.63	-0.16	0.00	-0.72	-0.54	-0.30
Kyara	0.79	-0.42	0.00	0.95	0.24	-0.80	2.65	0.81	0.53
Ramnagar	0.05	-0.03	0.00	-0.63	-1.34	0.00	-0.72	-0.54	-0.40
Majhgawan	0.79	-0.03	0.00	0.95	-0.95	0.00	-0.72	-0.54	-0.06
Alampur Jafarabad	0.05	-0.80	0.00	-0.63	-0.55	0.00	0.63	-0.54	-0.23
Bithiri Chainpur	-2.37	-0.42	0.00	-0.63	0.24	1.60	1.30	-0.54	-0.10
Nawabganj	0.42	-0.80	0.00	0.95	1.42	-0.80	0.63	2.17	0.50
Bhadpura	0.05	0.35	0.00	-0.63	-0.16	0.00	-0.72	-0.54	-0.21
Bhuta	0.42	3.14	0.00	2.53	0.24	1.60	-0.72	2.17	1.17
Faridpur	0.42	-0.42	0.00	-0.63	0.63	0.00	-0.04	-0.54	-0.07

Source: Calculated by the researchers.

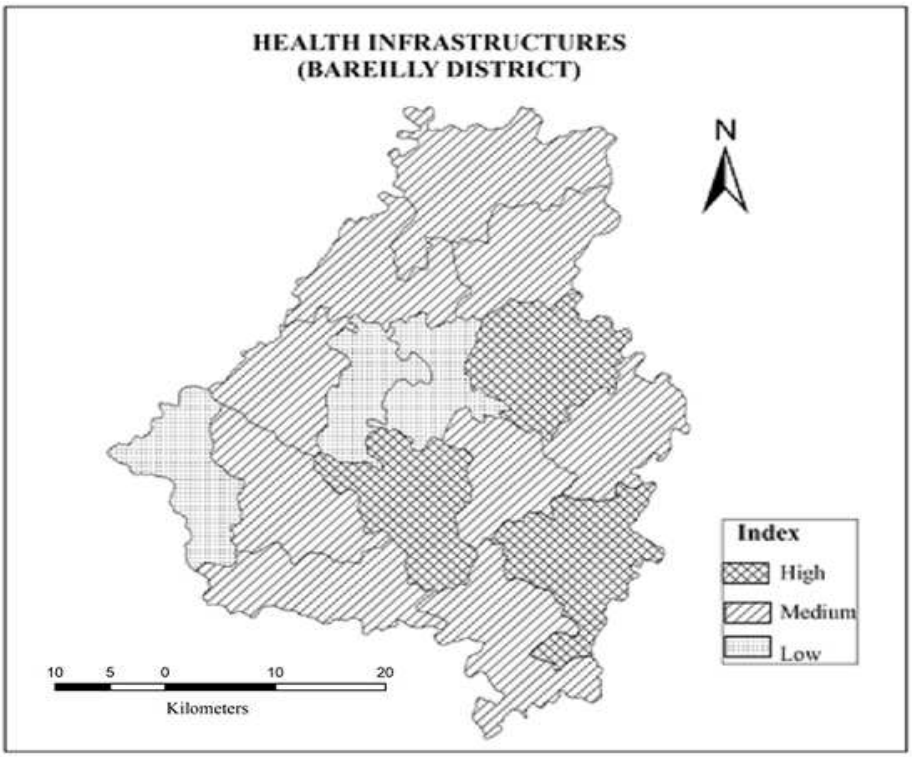


Fig.3

The graded distribution of Health Infrastructures of Bareilly District shows a wide range of variations. Fig.3 reveals that the blocks of high graded score ranges from 0.04 to 1.17 which includes three notable blocks namely Bhuta (1.17) being the highest recorded value, Kyara (0.53) and Nawabganj (0.50) in terms of health infrastructure. The medium graded score blocks ranges from -0.29 to 0.04 and includes nine notable blocks of the district. Among these nine medium graded blocks, Mirganj (0.04) recorded to be the highest recorded value while Bhadpura (-0.21) and shergarh (-0.21) being the lowest score value and rest medium graded blocks include Baheri (0.02), Richha (-0.81) Majhgawan (-0.06), Faridpur (-0.07), Alampur jafaradad (-0.23), Bhithiri chainpur (-0.10). The block of low graded score ranges from -0.49 to -0.30 and includes Fatehganj (-0.49), Bhojipura (-0.30) and Ramnagar (-0.40). Whereas, the low graded blocks ranges from -0.49 to -0.30 and includes three notable blocks namely Fatehganj West (-0.49), Bhojipura (-0.30) and Ramnagar (-0.40). Among all the three blocks Fatehganj west being the highest value. The point here to be noted is the homeopathic hospitals and dispensaries have zero available beds in their health infrastructure table because this system of medicine is used for long term treatment and not required to treat for the diseases of quick relief, thus people do not go for urgent treatment in these hospitals and need not to be admitted.

Composite Score of Health Infrastructure and Facilities

The composite score of Health condition that is the aggregate of z-score of Health Infrastructure and facilities are discussed in this part. The positive value of 0.21 to 0.81 means high level of Health Infrastructure and Health facilities and three blocks lies under this category and includes Bhuta (0.81), Nawabganj (0.42) and Kyara (0.38). Among the three high graded blocks, Bhuta possess the highest and kyara has the lowest (Fig.4). Since all the three blocks i.e., Nawabganj, Bhuta and Kyara has the highest health infrastructure and facilities as well as they possess high literacy rate also and therefore peoples are aware about their health status. Large number of hospitals & dispensaries, number of beds and doctors are also available here with respect to the other blocks which comes under medium and low graded blocks and thus to fulfil the needs demands of the peoples therefore these blocks have overall good health infrastructure and facilities.

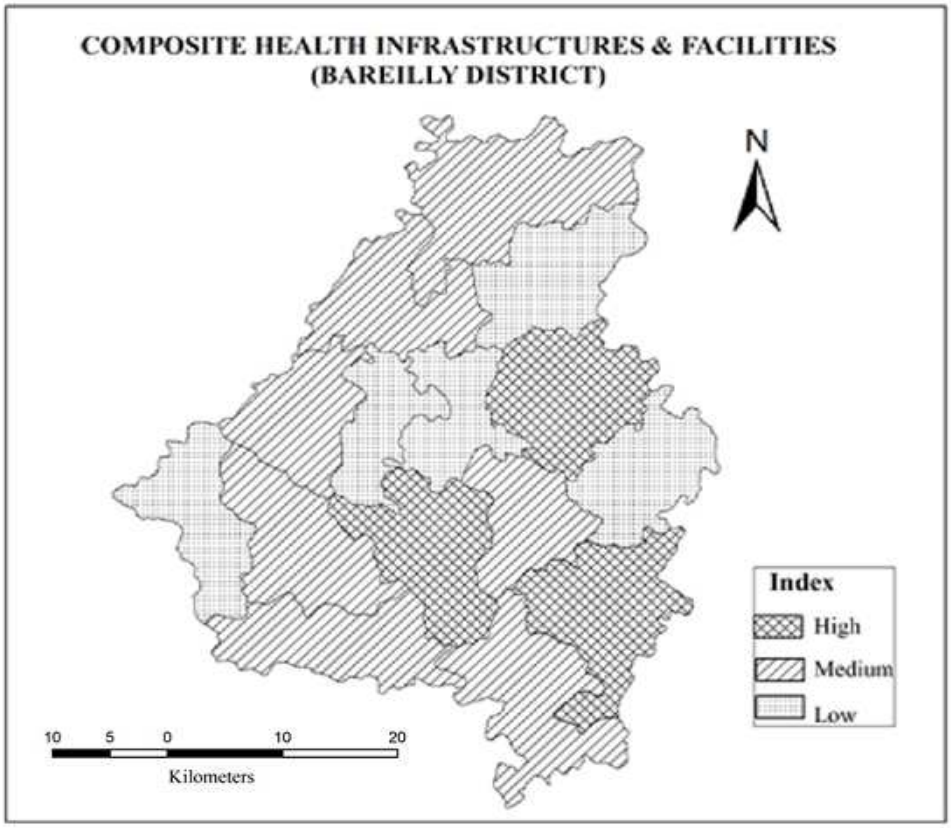


Fig.4

Table 4: Composite Standard Score of Health Facilities and Infrastructure

Blocks	Z-Score		Composite Z-Score
	Health Infrastructure	Health Facilities	
Baheri	0.39	0.02	0.21
Shergarh	0.55	-0.21	0.17
Richha	-0.29	-0.18	-0.23
Mirganj	0.15	0.04	0.09
Fatehganj West	-0.49	-0.49	-0.49
Bhojipura	-0.87	-0.30	-0.58
Kyara	0.23	0.53	0.38
Ramnagar	-0.62	-0.40	-0.51
Majhgawan	0.44	-0.06	0.19
Alampur Jafarabad	0.02	-0.23	-0.11
Bithiri Chainpur	-0.19	-0.10	-0.14
Nawabganj	0.35	0.50	0.42
Bhadpura	-0.41	-0.21	-0.31
Bhuta	0.45	1.17	0.81
Faridpur	0.28	-0.07	0.11

Source: Calculated by the researchers.

Whereas seven blocks Baheri (0.21), Shergarh (0.17), Mirganj (0.09), Majhgawan (0.19), Alampur Jafarabad (-0.11), Bithiri Chainpur (-0.14) and Faridpur (0.11) comes under moderately developed which ranges from -0.22 to 0.21 and lies in a regular fashion from northern part of the district to central and southern part. While five notable blocks of the district come under least developed blocks in terms of health infrastructure and facilities which ranges from -0.58 to -0.23 and includes Ramnagar (-0.51), Fatehganj West (-0.49), Bhojipura (-0.58), Richha (-0.23) and Bhadpura (-0.31). Among all the five least developed blocks Richa has the highest and Bhojipura possess the lowest recorded value and lies in the eastern and central part of the district.

Table 5: Level of Health Facilities and Infrastructure of Bareilly District

Category	Composite Z-score Range	Number of Blocks	Name of Blocks
High	0.21 - 0.81	3	Nawabganj, Kyara, Bhuta
Medium	-0.22 - 0.21	7	Baheri, Shergarh, Mirganj, Majhgawan, Alampur Jafarabad, Bhithiri chainpur, Faridpur
Low	-0.58 - -0.23	5	Ramnagar, Fatehganj west, Bhojipura, Richha, Bhadpura

Source: Calculated by the researchers.

Conclusions:

It is concluded from the above discussions that there exist a large number of disparities in the overall health infrastructure and health facilities in the Bareilly district. Out of 15 blocks, high level of health infrastructure and facilities is only seen in three blocks of south-eastern district where the population is urbanised, developed and literacy rate is also high and so the health infrastructure and facilities are also found to be highly developed. While those in moderately developed and least developed blocks, peoples have less opportunities for higher education and therefore in moderately developed and least developed blocks people have less health opportunities because there is less number of dispensaries and hospitals, available beds and number of doctors as compared to highly developed blocks and therefore approach towards health awareness are less.

India has built-up a vast health infrastructure and manpower at primary, secondary and tertiary care in Government, voluntary and private sectors. Technologies advancement and improvement in access to health care has resulted in substantial improvement in health indices of population and decline in mortality. However, the extent of excess to and utilization of health care varies substantially between states, districts and different segments of society. Since health is multi-dimensional i.e., physical, mental and social. But the health policies are aimed at 3D's, death, disease and disability. Thus, the reduction of high levels of mortality (death), morbidity (disease) and disability (the residual effect of disease) is the main purpose of health policy. Planning for more equitable health care services has become the growing concern of most of the states and nations in respect to the spatial and temporal perspectives of patent behaviour and location of medical centres (Mathur, 1981).

For bridging the gap in health conditions among different blocks of the study area, there is a need of government interventions and detailed survey. Special attention is needed in the least developed blocks and backward blocks of Bareilly district to find out the gap in the health infrastructure and facilities at microlevel for better planning by emphasising regional approach. Poor peoples and especially rural areas need to be more focussed on health and better health opportunities. Government agencies along with local people need to involve people in an awareness program focussing the importance of health in life and society. However, a planned health management along with financial assistance and strong will should be taken up by the government for uplifting every section of society and attainment of proper health management of a region.

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