International Journal of Scientific Research and Modern Education (IJSRME)
ISSN (Online): 2455 – 5630
(www.rdmodernresearch.com) Volume I, Issue I, 2016

REGIONAL IMBALANCE IN BODY MASS INDEX AND HEALTH STATUS: A COMPARATIVE STUDY BY RELIGION AND CASTES IN MURSHIDABAD DISTRICT, WEST BENGAL

Dr. S. Waseem Ahmad Ashraf* & Dr. Sabbir Ahmed**
* Associate Professor, Department of Geography, Aligarh Muslim University, Aligarh, Uttar Pradesh
** Senior Researcher, Department of Geography, Aligarh Muslim University, Aligarh, Uttar Pradesh

Abstract:

Body Mass Index (BMI) is a ratio of a person's height and weight. It is a simple calculation of mass in kilograms (kg) divided by height in meters (m) squared (BMI= kg/ (m2). Those with low BMIs may be at risk for malnutrition, osteoporosis and/or an eating disorder. Those with high BMIs may be at risk for heart disease, diabetes and cancer. BMI can be helpful for a quick screen or for assessing entire populations; however it is not always accurate for evaluating individual people. The present paper aims at examining the close relationship between Body Mass Index and Health Status of population in Murshidabad District of West Bengal. The data for the analysis have been obtained from the primary sources (Field Survey, 2012). The paper suggests that enhancement of caloric intake shall reduce the disparities in Body Mass Index and Health Status in Murshidabad District.

Key Words: Body Mass Index, Health Status, Regional Imbalance, Caloric Intake, Overweight, Underweight & Obese

Introduction:

One of the serious problem that world is facing today is the problem of regional imbalances. In India regional imbalances exist at state level, district and even block level also. Regional imbalance means differentiation in values, quantities or qualities of certain items of different regions. These are determined by the application of quantitative methods, however, these are identified on the basis of classes, ranges or categories. Analysis of regional imbalances with reference to health help administrators, policy makers and planners to identify regions of relative level of development in order to know the needs of varied regions and eliminating regional imbalances for balanced development of any regions.

Body Mass Index (BMI) is a ratio of a person's height and weight. It is a simple calculation of mass in kilograms (kg) divided by height in meters (m) squared (BMI= kg/ (m2). Those with low BMIs may be at risk for malnutrition, osteoporosis and/or an eating disorder. Those with high BMIs may be at risk for heart disease, diabetes and cancer. BMI can be helpful for a quick screen or for assessing entire populations; however it is not always accurate for evaluating individual people.

Health is seen as part of the basic human capabilities and an integral part of welfare. Health is most important in the way of development. The World Health Organization (WHO) has defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." However, good health is also recognized as an end in itself, valued by those who own it. Unfortunately, evidence from across the world indicates that ill health disproportionately afflicts the poor, especially since the poor have little or no insurance against risks of ill health (World Bank 1993). Thus, while the probability of ill health is higher for the poor, so is

the impact from ill health; this strengthens the nexus between poverty and poor health, each reinforcing the other. This also implies that health inequities would be stark between the developing and the developed countries. Many vital links between health and development are thus seen as interacting phenomena 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). Medical history gives us many illustrations of the importance of health and disease in the rise and fall of nations and civilization (Quoted in Oliver, 1966). Health is considered as wealth of a community, which undoubtedly determines economic, social, cultural and political development of a region (Kothari and Jhala, 2007). Health is an essential input for the development of human resources and the quality of life and which in turn contributes in the social and economic development of the nation. Improved health is a part of total socio-economic development and is regarded as an index of social development. Provision of basic health care services to rural community is the primary objective of the government as well as non-governmental organizations in the context of rural development (Srinivasan, 2006). The process of development of any economy is characterized by regional inequalities in respect of different socio-economic factors and infrastructural facilities. Okafor has rightly observed that the spatial organization of health care facilities produces basic inequalities between the areas. Rural India is suffering from a long-standing healthcare problem. Now-a-days, health sector has achieved significant importance in providing health related services to rural people in India. Healthcare services are one of the most essential services required by the inhabitants of an area as they reflect the conditions of health or ill-health of the society. 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 centers (Mathur, 1981). The process of development of any economy is characterized by regional inequalities in respect of different socio-economic factors and infrastructural facilities. The spatial inequality in the process of provision of facilities, formulation of specific norms and policies is not always free from ideological shades of one kind or the other, impinging upon people's welfare. Some inequality is inevitable by virtue of the discrete location of facilities amongst spatially continuous but uneven population. However, some inequality results from the insensitive or inefficient allocation of resources between areas. Inequality may also arise through structural barriers such as class, ethnicity or religion, which effectively deny certain sub-groups easy access to medical care. Many vital links between health and development are thus seen as interacting phenomena with far reaching implications.

Present study is an attempt to make an index from the block level statistical data collected from field survey of Murshidabad district for a comprehensive study of different Community Development Blocks in terms of Body Mass Index of adults, their health status by socio-religious communities.

Objectives:

The main objectives of the study are:

1. To prepare an index which can represent the inter block disparities in Body Mass Index by religion and caste.
2. To identify, with the help of the prepared index, the developed, moderately developed and underdeveloped blocks in terms of BMI, nutritional intake and health status within the Murshidabad district.

Database:

As mentioned earlier, the present study aims at analyzing BMI of adults and health status by religion and caste in Murshidabad District. An attempt has been made to see the problem in totality with ground realities. The present study is based largely on primary data supplemented by secondary sources of data too.

A. Primary Sources:

The primary data have been collected through general survey/household survey with the help of comprehensive questionnaires.

B. Secondary Sources:

Secondary data have been collected from the following sources:

a) District Statistical Hand Book of Murshidabad district.
b) Village and Town Directory.
c) Census of India (2001, 2011).
d) National Rural Health Mission (NFHS).
e) Administrative Block, Berhampore, Murshidabad.
f) Health Department, Berhampore, Murshidabad.
g) District Library, Berhampore, Murshidabad; Seminar library of the Department of Geography and Maulana Azad library of Aligarh Muslim University; library of Jawahar Lal Nehru University, New Delhi.

Methodology:

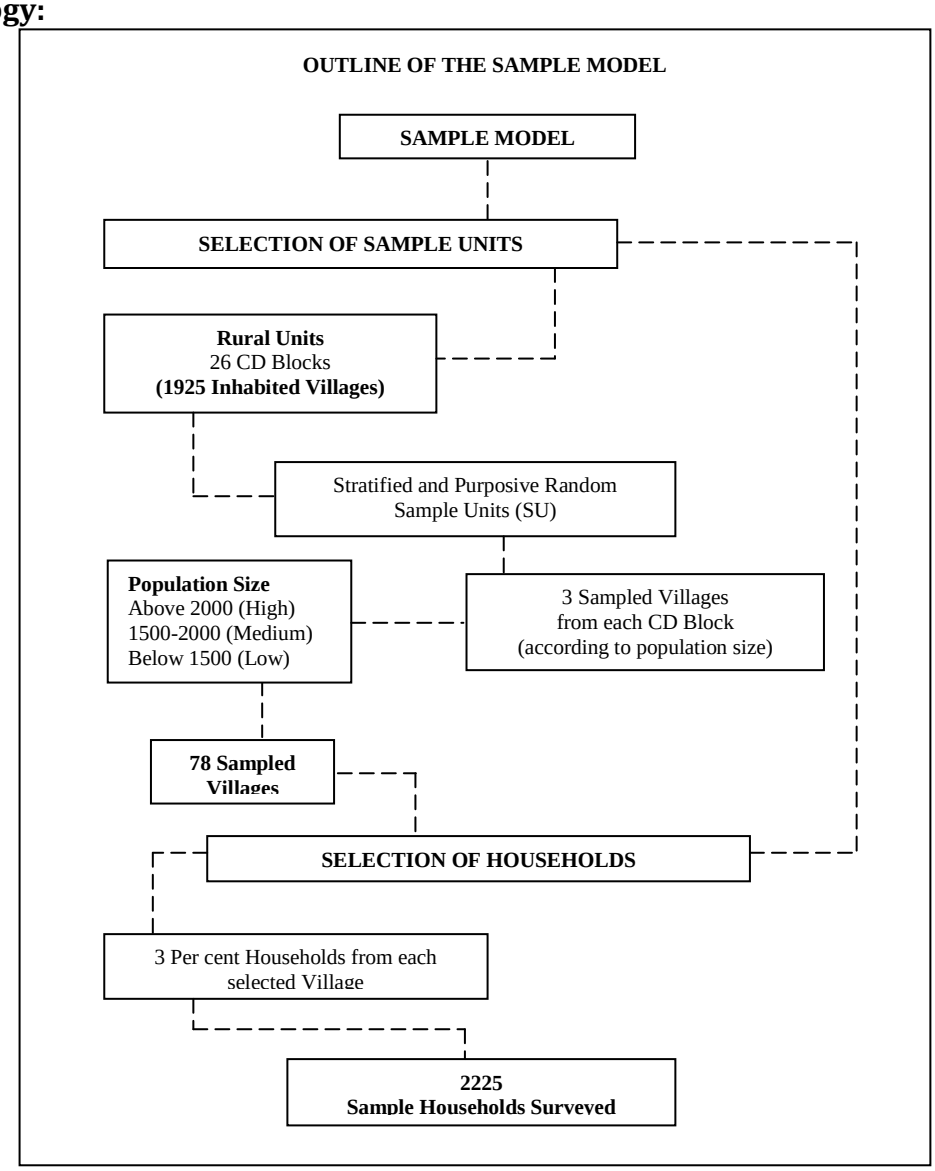

Figure: 1 Source: Prepared by Researcher

In the present study, only development blocks of Murshidabad district have been selected for an enquiry into the inequalities of BMI and health of Murshidabad district in the year 2012. To assess the block wise spatial variations, only rural areas of the blocks have been incorporated in the study. The current work mainly deals with the study of Murshidabad district at micro level. For this purpose villages have been considered as the smallest unit of the study.

Study Area:

The present work mainly deals with the study of Murshidabad district at micro level. For this purpose block consider as the smallest unit of the study. The district is the north-western district of the Presidency Division or Commissionership of West Bengal and lies between 23˚43' and 24˚52' North latitude and 87˚49' and 88˚44' East longitude (GoWB, 2003). It has an area of 5,324 sq. km. and contains population of 71,02,430 persons (Census of India, 2011).

Location Map of Murshidabad District:

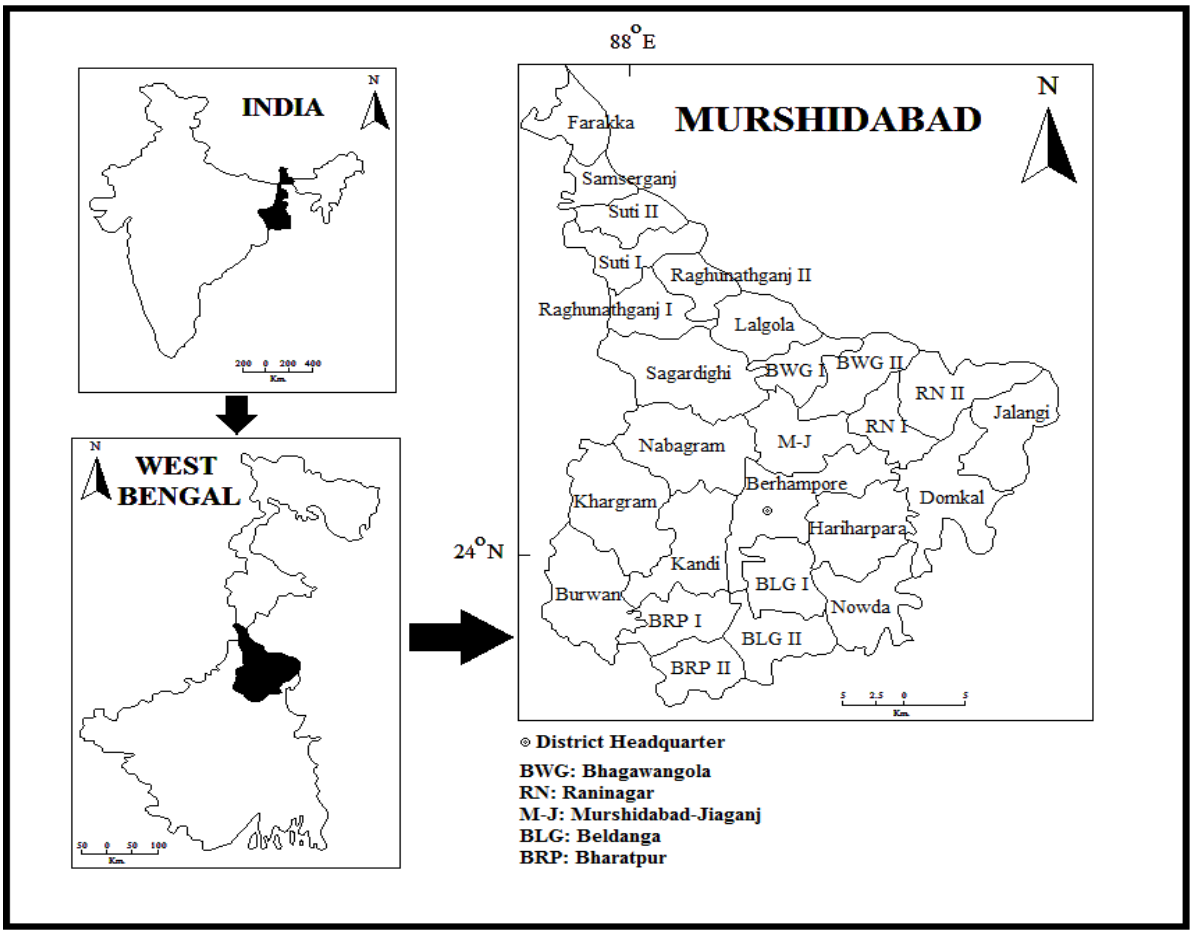

Figure: 2

It was the capital of undivided Bengal during the Mughal rule. The NSS data divide the state of West Bengal into four regions in which Murshidabad district comes under the Eastern Plains Region. About 7.78 per cent of the population of the state is living in the district in 5.10 per cent of the state area. It is an agricultural dominated district with 70 per cent of the land under cultivation. The district is socio-culturally and economically one of the backward districts of West Bengal. The district records literacy rate 67.53 per cent and 10.83 per cent urbanization. The district is inflicted with dire socio-economic and cultural disparities across the region. Population density of the

district is 1334 Persons/ sq. km. (Census of India, 2011) which is higher than the state average i.e. 1029 person/ sq. km. (Census of India, 2011). Overall Sex ratio of the district is 957 (Census of India, 2011) which is higher than the state average (947). According to West Bengal Human Development Report 2004 Human Development Index (HDI) rank and Gender Development Index (GDI) rank of Murshidabad district is 15 and 16 respectively and its HDI and GDI scores are 0.46 and 0.423 respectively.

Body Mass Index (BMI):

Body Mass Index is a measure of someone's weight in relation to height. Body Mass Index or BMI is a tool for indicating weight status. It is a statistical measure of the weight of a person scaled according to height.

Formula: weight (kg) ÷ [height (m)]^2

With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Since height is commonly measured in centimeters, divide height in centimeters by 100 to obtain height in meters.

Example: Weight= 68 kg, Height= 165 cm (1.65m)

Calculation: 68 ÷ (1.65)^2 = 24.98

For adults 20 years old and older, BMI is interpreted using standard weight status categories that are the same for all ages and for both men and women.

Table 1: Body Mass Index for Adults

BMI	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese

Source: Preferred IPA of California, Provider Bulletin, 2007.

The correlation between the BMI number and body fatness is fairly strong; however the correlation varies by sex, race, and age. These variations include the following examples:

- At the same BMI, women tend to have more body fat than men.
- At the same BMI, older people, on average, tend to have more body fat than younger adults.
- Highly trained athletes may have a high BMI because of increased muscularity rather than increased body fatness.

It is also important to remember that BMI is only one factor related to risk for disease. The BMI ranges are based on the relationship between body weight and disease and death (WHO, 1995). Overweight and obese individuals are at increased risk for many diseases and health conditions, including hypertension, dyslipidemia (for example, high LDL cholesterol, low HDL cholesterol, or high levels of triglycerides), type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea and respiratory problems, some cancers (endometrial, breast and colon)

Block Wise Imbalances in BMI and Health Status:

After the calculation of field survey data it is found that no one (adult person) in the sampled population falls under the obese category in the district (Table 2). The available BMI data shows that the average number of persons under the underweight, normal and overweight category per thousand of population in the district is 527 persons, 455 persons and 18 persons respectively. The people of underweight and overweight groups are more prone to diseases, so here the discussion is made only for the underweight and overweight categories of BMI. The underweight category marked

notable variations in its distribution among the blocks of the study area. It varies from 316 persons in Berhampore to 723 persons in Lalgola (Table 3).

Table 2: The Standard Weight Status Categories Associated with Body Mass Index for Adults in Murshidabad District, 2012

BMI	Weight Status	Dist. Average/ '000 Population
Below 18.5	Underweight	527
18.5 – 24.9	Normal	455
25.0 – 29.9	Overweight	18
30.0 and Above	Obese	0

Source: Based on Field Survey by the Researcher, 2012.

Note: BMI-Body Mass Index

The block wise graded distribution of underweight has been presented in Fig 4. This figure reveals that high value (above 576 persons) is reported in Raghunathganj-I (585 persons), Khargram (607 persons), Suti-I (608 persons), Raghunathganj-II (633 persons), Suti-II (646 persons), Sagardighi (660 persons), Bhagawangola-I (674 persons), Lalgola (723 persons). Medium grade of underweight category (479–576 persons) has been recorded in ten blocks namely, Burwan, Bharatpur-I, Raninagar-II, Kandi, Murshidabad-Jiaganj, Samserganj, Bhagawangola-II, Jalangi, Domkal and Hariharpara. Low grade of underweight (below 479 persons) has been reported in Berhampore, Nabagram, Beldanga-I, Beldanga-II, Nawda, Bharatpur-II, Raninagar-I and Farakka. The population of underweight category is high in the northern part of the district whereas it is low in central and southern parts of the study area. The underweight category is related to the lower economic background, low caloric intake, malnutrition etc. The overweight category marked notable variations in its distribution among the blocks of the study area. It varies from 7 persons in Nawda to 38 persons in Khargram (Table 3).

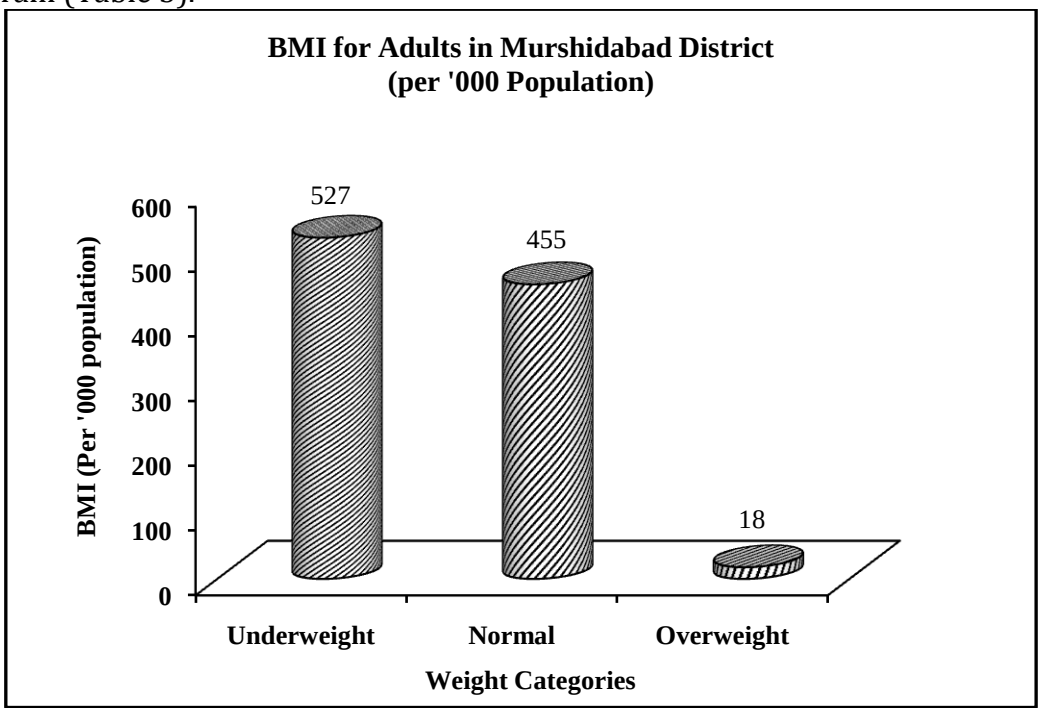

Figure: 3

Table 3: Block wise Distribution of Body Mass Index for Adults in Murshidabad District, 2012 (Per 1000 Population)

Sl. No.	Blocks	Underweight	Normal	Overweight
1	Farakka	464	527	9
2	Samserganj	526	463	11
3	Suti-I	608	373	20
4	Suti-II	646	341	13
5	Raghunathganj-I	585	405	10
6	Raghunathganj-II	633	355	12
7	Lalgola	723	261	16
8	Sagardighi	660	320	20
9	Bhagawangola-I	674	303	23
10	Bhagawangola-II	529	439	32
11	Raninagar-I	463	525	12
12	Raninagar-II	484	501	15
13	Jalangi	552	434	14
14	Domkal	554	429	17
15	Murshidabad-Jiaganj	521	447	32
16	Nabagram	374	593	33
17	Khargram	607	355	38
18	Kandi	500	482	18
19	Berhampore	316	662	22
20	Hariharpara	562	421	17
21	Nawda	449	543	7
22	Beldanga-I	418	569	13
23	Beldanga-II	436	553	11
24	Bharatpur-I	482	496	22
25	Bharatpur-II	460	529	10
26	Burwan	480	511	9
Dist. Average		**527**	**455**	**18**

Source: Based on Field Survey by the Researcher, 2012.

The block wise graded distribution of overweight has been presented in Fig 4. This figure reveals that high value (above 22 persons) is reported in Bhagawangola-I (23 persons), Murshidabad-Jiaganj (32 persons), Bhagawangola-II (32 persons), Nabagram (33 persons) and Khargram (38 persons). Medium grade of overweight category (13-22 persons) has been recorded in twelve blocks namely, Berhampore, Bharatpur-I, Sagardighi, Suti-I, Kandi, Hariharpara, Domkal, Lalgola, Raninagar-II, Jalangi, Beldanga-I and Suti-II. Low grade of overweight (below 13 persons) has been reported in Raninagar-I, Raghunathganj-II, Samserganj, Beldanga-II, Bharatpur-II, Raghunathganj-I, Farakka, Burwan and Nawda. The population of overweight category is high in the central and western part of the district whereas it is low in northern and southern parts of the study area. The overweight category is related to the higher economic background, high caloric intake etc.

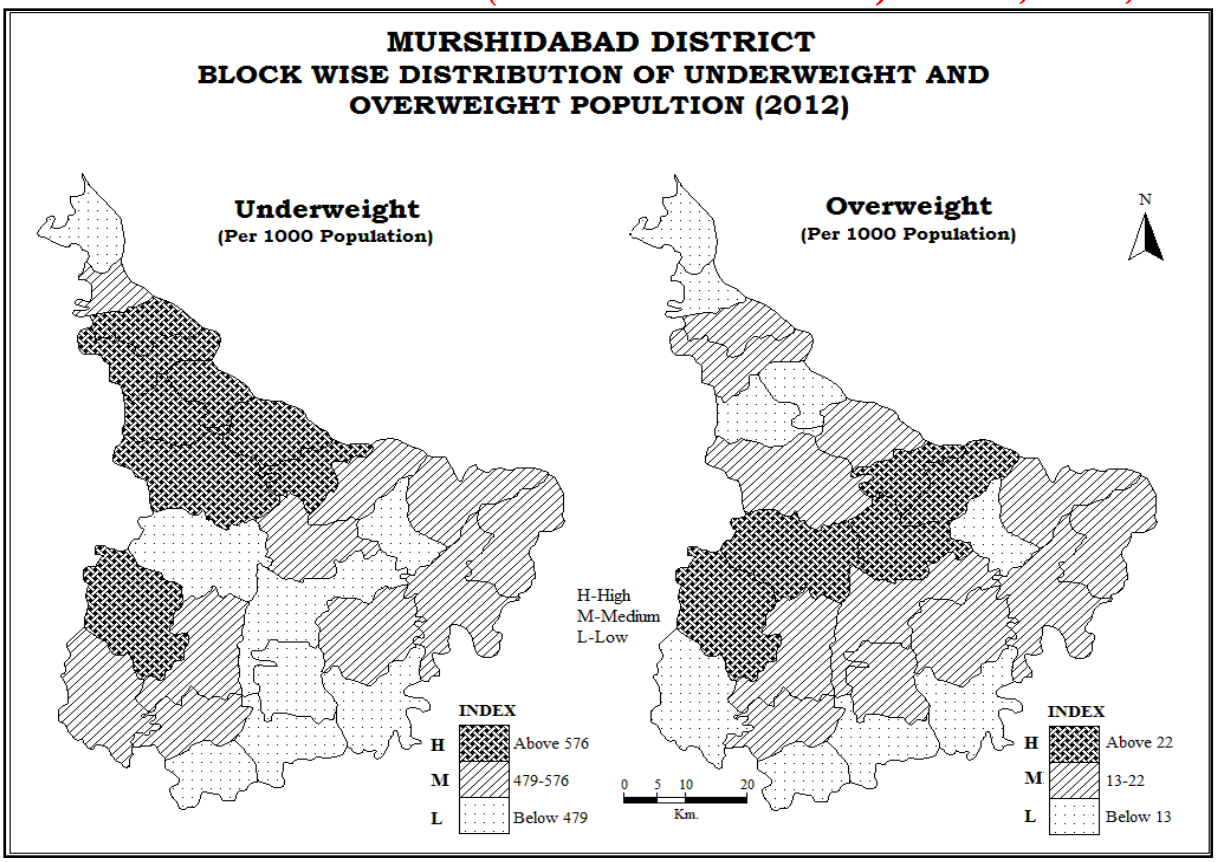

Figure: 4

Health Status:

Health is a state of soundness of mind and body of an individual in which he feels free from any sort of disorder pain of sickness and all organs of body function well and conducive for efficient and prolonged life. Health is the most important and essential aspect of socio-economic development that is the basic need of people for social well-being (Ali, 2008).

The underweight people are mainly suffering from typhoid, jaundice, acute respiratory infections, diarrhoea, conjunctivitis, filarial etc. (Table 4) and overweight categories are mainly suffering from diabetes, hypertension, cardiovascular disease (Heart problem), stroke, gallbladder disease, osteoarthritis etc. (Table 5).

Table 4: Block wise Distribution of Underweight People Suffering from Major Illnesses in Murshidabad District, 2012 (Per 1000 Population)

Sl. No.	Blocks	Typhoid	ARI*	Diarrhoea	Others**
1	Farakka	14	125	4	98
2	Samserganj	18	84	10	122
3	Suti-I	16	110	5	112
4	Suti-II	23	86	6	96
5	Raghunathganj-I	35	108	11	87
6	Raghunathganj-II	21	105	8	135
7	Lalgola	19	110	8	124
8	Sagardighi	38	84	15	125
9	Bhagawangola-I	43	79	12	118
10	Bhagawangola-II	35	100	14	78
11	Raninagar-I	29	71	11	80

12	Raninagar-II	23	47	7	74
13	Jalangi	28	36	8	54
14	Domkal	32	23	12	84
15	Murshidabad-Jiaganj	36	52	8	48
16	Nabagram	40	64	18	75
17	Khargram	47	55	12	83
18	Kandi	13	85	5	90
19	Berhampore	14	55	4	43
20	Hariharpara	29	82	8	58
21	Nawda	15	73	4	58
22	Beldanga-I	17	38	7	43
23	Beldanga-II	21	93	9	125
24	Bharatpur-I	36	31	11	61
25	Bharatpur-II	33	125	14	78
26	Burwan	19	142	15	82
Dist. Average		**27**	**79**	**9**	**86**

Source: Based on Field Survey by the Researcher, 2012.

*ARI- Acute Respiratory Infection, ** Jaundice Fever, Conjunctivitis, Filarial etc.

From the Table 4 it is clear that the underweight people suffering from various diseases are mainly confined to the northern and western part of the district because the people of this region are economically backward, literacy and employment rate are low, caloric intake is low etc. On the other hand the Table 5 reveals that overweight people are suffering from the diseases are found in the central and eastern part of the district because these part are economically advanced, literacy and employment rate are high, nutritional intake is high etc.

Table 5: Block wise Distribution of Overweight People Suffering from Major Illnesses in Murshidabad District, 2012 (Per 1000 Population)

Sl. No.	Blocks	Diabetes	Hypertension	Others*
1	Farakka	5	27	21
2	Samserganj	43	61	43
3	Suti-I	77	23	13
4	Suti-II	13	21	21
5	Raghunathganj-I	14	10	21
6	Raghunathganj-II	14	14	37
7	Lalgola	17	11	13
8	Sagardighi	21	28	31
9	Bhagawangola-I	47	20	75
10	Bhagawangola-II	22	39	35
11	Raninagar-I	11	9	23
12	Raninagar-II	4	15	15
13	Jalangi	15	31	8
14	Domkal	26	14	30
15	Murshidabad-Jiaganj	24	48	12
16	Nabagram	12	46	35
17	Khargram	32	32	24
18	Kandi	15	30	18

19	Berhampore	58	11	11
20	Hariharpara	10	14	14
21	Nawda	18	17	8
22	Beldanga-I	14	22	10
23	Beldanga-II	6	25	15
24	Bharatpur-I	15	56	15
25	Bharatpur-II	13	43	25
26	Burwan	6	22	25
Dist. Average		**21**	**27**	**23**
Dist. Percentage		**2.1**	**2.7**	**2.3**

Source: Based on Field Survey by the Researcher, 2012.

* Cardiovascular disease (Heart problem), Stroke, Gallbladder disease, Osteoarthritis etc.

Comparative Analysis by Religion and Caste:

Body Mass Index (BMI) for adults is not uniform among the socio-religious communities (SRCs). Underweight people are more found (572 persons per thousand of population) in Muslim religion rather than the Hindus (331 persons). Among the caste categories OBCs are found having highest underweight people (569 persons) followed by SCs (530 persons) and General (458 persons). It is due to the fact that in OBC category Muslim OBCs are more in number than the Hindu OBCs, therefore OBCs have more underweight people than SCs. Normal BMI is recorded highest in number in Hindu religion and General caste and low in Muslim and SCs. Overweight BMI is recorded highest in number in Hindu religion and General caste and low in Muslim and SCs. After the calculation of field survey data it is found that no one (adult person) in any SRCs in the sampled population falls under the obese category in the district. From the Table 6 and Fig. 5 it is clear that Muslims religion and marginalized section of the society have very poor status of BMI as they are having the poor economic background and it may be due to the fact that as their economic condition is worst therefore they are not having adequate diet and as a result they are more prone to any kind of acute diseases.

Table 6: The Standard Weight Status Categories Associated with Body Mass Index for Adults by Religion and Caste in Murshidabad District, 2012

(Per 1000 Population)

BMI	Weight Status	Religion		Caste		
		H	M	G	SC	OBC
Below 18.5	Underweight	331	572	458	530	569
18.5 – 24.9	Normal	618	416	552	199	393
25.0 – 29.9	Overweight	50	12	20	2	8
30.0 and Above	Obese	0	0	0	0	0

Source: Based on Field Survey by the Researcher, 2012.

Note: BMI-Body Mass Index, **H**-Hindu, **M**-Muslim, **T**-Total, **G**-General, **SC**-Scheduled Caste, **OBC**-Other Backward Class.

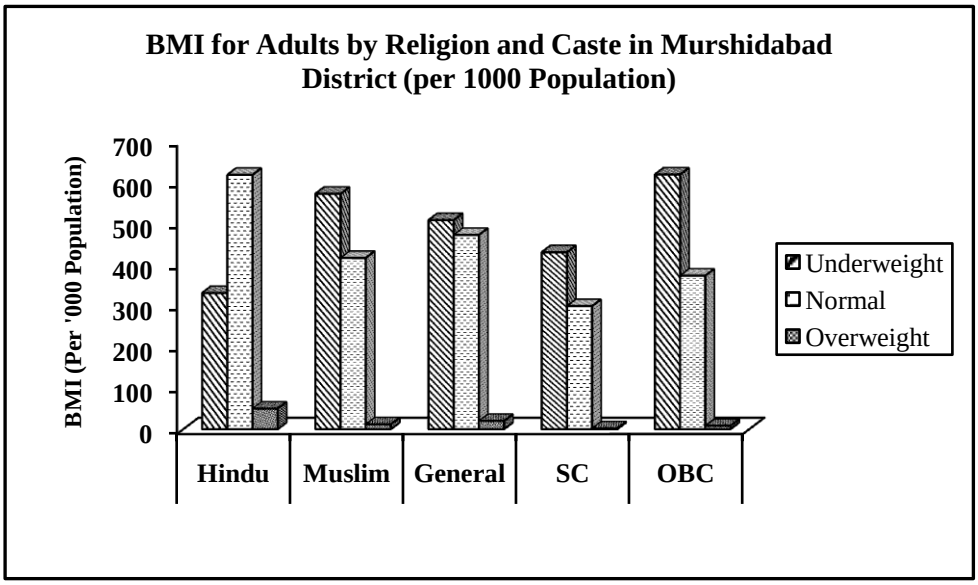

Figure: 5

Conclusion:

The blocks situated in the central part of the district are the most developed in terms of BMI as compared to other blocks of the study area. The district headquarter plays an important role to make these blocks developed in terms of all sectors of human welfare. The population of underweight category is high in the northern part of the district whereas it is low in central and southern parts of the study area. The underweight category is related to the lower economic background, low caloric intake, malnutrition etc.

The underweight people suffering from various diseases are mainly confined to the northern and western parts of the district because the people of these regions are economically backward, literacy and employment rates are low, caloric intake is low etc. On the other hand the overweight people are suffering from the diseases are found in the central and eastern parts of the district because these parts are economically advanced, literacy and employment rates are high, nutritional intake is high etc.

This study may help to formulate appropriate policy design in order to understand and to reduce the regional inequality in respect of all sectors of human welfare. So the assessments of the state of development and identification of the lacuna in the planning process have become essential. Planners should change their properties of expenditure. Education and health along with economic status of population should be prime concern of the state government in general as well as district administration in particular.

After going through the detailed discussion the conclusion which is drawn is that the impact of economic condition and health care facilities is clearly seen on the health status in the study region. Normal BMI was recorded for Hindus and general castes and they are less prone to disease.

References:

1. Ali, M.J. (2008). Regional Planning for Socio-Economic Development in Malda District, Unpublished Ph.D. thesis, Department of Geography, A.M.U., Aligarh, p. 99.

2. Armstrons, R.W. (2010). Population Health and Environmental Health as Determinants of Socio-Economic Development, in Akhtar, R., Izhar, N. (eds.) Global Medical Geography, Rawat Publications, Jaipur, pp. 335-345.
3. Desai, S. B., Dubey, A., Joshi, B. L., et al. (2010a). Human Development in India: Challenges for a Society in Transition, Oxford University Press, New Delhi, p. 97.
4. Desai, S.B., Dubey, A., Joshi, B.L., et al. (2010b). Human Development in India: Challenges for a Society in Transition, Oxford University Press, New Delhi, pp. 113-114.
5. District Statistical Handbook, Murshidabad (2007). Bureau of Applied Economics and Statistics, Government of West Bengal, Kolkata, p. 1.
6. Leisch, H. (2010). Medical Infrastructure and Demographic and Socio-Economic Development in Northern Thailand, in Akhtar, R., Izhar, N. (ed.) Global Medical Geography, Rawat Publications, Jaipur, pp. 346-360.
7. Massam, B.H., et.al (1997). Location Patterns of Health Centres in Salcette, Goa, Annals of the National Association of Geographer, Vol. 7, No. 2, pp. 13-14.
8. Mathur, H.S. (1981). Medical Facilities in the Rural Areas of Rajasthan: Spatial Perspectives, in Mishra, B.N. (ed.) Rural Development in India: Basic Issues and Dimensions, Sharda Pustak Bhawan, Allahabad, p.158.
9. Oppong, J.R. (2010). The Changing Face of Disease and Health Care in Ghana", in Akhtar, R., Izhar, N. eds. (2010) Global Medical Geography, Jaipur: Rawat Publications, pp. 290-304.
10. Singh, A.L., Rahman, A. (1998). Housing and Health in the Low Income Households of Aligarh City, India Journal of Regional Science, Vol. 30, No. 2, pp. 108-116.
11. Singh, J., Kumra, V.K. (1995). Utilization pattern of Health Care Facilities in rural areas of Varanasi, Geographical Review of India, Vol. 57, No. 2, June, pp. 156-168.
12. Srinivasan, S. (2006). Health Care Services in Rural India: Current Status and Future Challenges, in Verma, S.B., Jiloka, S.K., Pathak, A.C. (eds.) Rural Health Care and Housing, Deep and Deep Publications Pvt. Ltd., New Delhi, p. 321.
13. Government of West Bengal (GWB) (2003). Murshidabad District Gazetteer
14. United Nations (1984). Population, Resource, Environment and Development, Oxford University Press, London, p.457.
15. World Bank (1993). Investing in Health. World Development Report 1993. New York: Oxford University Press for the World Bank.
16. World Health Organization. Physical status: The use and interpretation of anthropometry. Geneva, Switzerland: World Health Organization 1995. WHO Technical Report Series