INTRODUCTION

Education and health have been a matter of universal concern in all times of history and have attracted the attention of both the specialist and non-specialist alike. Education and health has been considered an important subject in every scattered geographical collection since inception of early times of human history and knowledge. Though studies related with education and health of any region have shown many weaknesses in their methods of approach but despite all these weaknesses and sporadic nature of enthusiasm of the geographers or non-geographers has never been completely divorced from the consideration of education and health, so they have formally organised them into subject matters of own-interest.

Dreze and Sen opines that, education and health can be seen to be valuable to the freedom of a person in following ways: Intrinsic Importance-Being educated and healthy are valuable achievements in themselves, and the opportunity to have them can be of direct importance to a person’s effective freedom. Instrumental Personal Roles-A person’s education and health can help him or her to do many things- ‘other’ than just being educated and healthy-that are also valuable. They can, for instance, be important for getting job and more generally for making use of economic opportunities. Instrumental Social Roles- Greater literacy and basic education can facilitate public discussion of social needs and encourage informed collective demands (e.g. for health care and social demands (e.g. for health care and social security); these in turn can help expand the facilities that the public enjoys, and contribute to the better utilisation of the available services. Instrumental Process Roles- The process of schooling can have benefits aside from formal education. For example, the incidences of child labour. The expansion of schooling can reduce the distressing phenomenon of child labour. Empowerment and Distributive Role- Greater literacy and education achievements of disadvantaged groups can increase their ability to resist oppression, to organise politically, and to get a fairer deal. Thus expansion of health and education can have influence that go much beyond the immediate personal effects.

Education is crucial for everyone. It is the level of people that earn respect and recognition. In many opinion, it is an indispensable part of life both personality & socially. An educated person has the ability to differentiate between moral &
immoral, good and evil. The importance of education is undeniable for every single person. Only with the advent of education can people gain knowledge and enlarge their view of the world. Education plays such a rudimentary role in our society that we cannot imagine a life without it. It is a determining element for the civilization of human society. Not only does it help us develop healthy surroundings but it also generates an advanced community. Education is one of the most important aspects of population composition and the factors of development. It is pre-requisite for socio-economic development of country. It is also essential for strengthening of democratic value, feeling of good will and harmony keeping pace with the changing times. It is a human resource development, which is a basic requirement of economic development and national progress. Thus we need an education system that may eradicate illiteracy and provide the common man an access not only to basic education but also to higher & technical education.

Health is an important component of well being and balanced growth. Health is a relative concept, and the health standards vary among cultures, social classes and age groups. Thus, health should be defined in any society in terms of prevailing ecological conditions. There is no denying fact that health standards in India have improved significantly over the years since independence but the fact remains that we are still called poor in terms of public health. The future of the nation lies with its healthy population, sick population is a liability. Health is of utmost importance and it becomes a priority that has to be given full attention and focus by every individual and society. The famous saying “Health is Wealth” stands true to the fact that the level of development achieved by a society is often determined on the basis of the level of health and the system of health prevalent in the society.

Among the social factors that impact health, education is perhaps the most important and education and health are intertwined with each other thus knowing that education is essential for healthy life and living. The analysis of trends and patterns of education and health status is of immense significance for a population geographer. The purpose of this study is to focus on the education and health status of the people of Western Uttar Pradesh. Improvements in education and health are valuable in their own right, but they also have strong linkages with broad-based development and growth. Education is known to have vital important links with the achievement of
income and health security. Improvement in educational performance, especially of women, is closely related to health and fertility behaviour. Female literacy and workforce participation are important determinants of variations in child mortality. Better education is more likely to be associated with greater utilisation of health services by women and children and improved health and hygiene practices again lowering material and child mortality and leading to improvements in health.

Therefore, the present research work entitled “Regional Trends and Patterns of Educational Status and Health in Western Uttar Pradesh” is an attempt to study the trends and patterns of educational levels and educational facilities and Health status and healthcare facilities in depth. Uttar Pradesh is the most populous and fifth largest state in the Union of India. Uttar Pradesh covers a largest part of the densely populated Gangetic Plain. ‘Western Uttar Pradesh’ has been selected as an area for detailed study because the area under investigation is rapidly changing from agriculture to industrial activities thus disparities prevails in terms of social and economical conditions as education and health are the two important elements of society so regional trends and patterns of education and health have been selected for the study. The regional pattern of educational status and health varies from region to region and district to district. The districts of western region which are near to Delhi (capital city of India) are having high educational status and the districts where educational status is high, there the health conditions are also good whereas opposite of that the districts of eastern region are having low educational and health status.

**Significance of the Study**

Paradigm shift from rural to urban and from agriculture to urbanization has added more to the already existing social and cultural problems of the region. Therefore it has become pertinent to have objective understanding in this connection. This study attempts to highlight socio-economic and cultural variables like education, health status, educational and healthcare facilities at district level. The district level data are extremely important for understanding the regional dimension of demographic situation and its implication for contemporary society and polities.

Despite steady improvement in the status of education and health of the population over the last several decades, the level of social development in the state
and the persistent inequalities based on socio-economic status continue to be a cause of significant concern.

Not only Uttar Pradesh, Western Uttar Pradesh too have made progress in the field of education during the last decade. Literacy has increased at a faster rate than ever before. Many more children are in school today than they were a decade ago. The gap between boys and girls and between socially deprived groups and others has narrowed over the decade. Male and overall literacy in the educationally backward districts has improved at a faster rate than overall rates. But at the same time, several challenges remain to be overcome. According to a report by Planning Commission of India (2007), about 30 per cent of rural children and 15 per cent of the urban children are still out of school. Many schools still lack basic minimum infrastructure and teachers. The overall quality of education in the region at each level of education remains low in terms of content, teaching methods, etc. The system is afflicted by low accountability of the administration and teaching staff, affecting performance and overall efficiency. Per capita and per student public resources allocated to education in the region continue to be very low, thus we can say that there is a serious implication for better accessibility, availability, quality, efficiency and adequate resources of the system.

The vicious circle of disease- low production- low income- poor health services- more disease and more poverty not only poses a problem of health and sanitation but also of social welfare and social justice. There has been a steady improvement in the health status of the population of the region, but the resultant achievement still falls short of even the average achievement in the country. Health is acknowledged to be a multiplex issue which has strong linkages with nutritional intake, environmental sanitation, availability of safe drinking water, education and awareness and the access to preventive and curative health care. Western Uttar Pradesh continues to have a high burden of disease, high levels of infant and child mortality, high maternal mortality, low life expectancy which reflects a huge developmental backlog in the health-related spheres.

Under the light of above mentioned drawbacks and loopholes in the sphere of education and health of the region, need of the hour is to plan and do some systematic and comprehensive geographical study. This will help to generate empirical data related to
education status, educational facilities, health status and healthcare facilities for State (Uttar Pradesh) in general and Western Uttar Pradesh in particular. The present study is an attempt in the field of social and medical geography for showing regional trend and pattern of education and health status of the region. The significance of the study lies in the fact that it enables us to understand the comprehensive geographical study of educational status and health status, sickness and mortality incidences which have occurred from time to time in the region. This work will also takes into account of spatial facets of educational facilities and healthcare facilities which emerges as major catalytic and influencing factors of existing scenario of education and health status in study region. It is hoped that this research would help in understanding the present situation of education and health in Western Uttar Pradesh in better way and will provides a base for planning purpose to reduce the existing disparities in the region. Thereby, the study purports to elicit future challenges in education and health and will help in formulation of better directions of reforms.

**Research Design**

The sampled population and the tools and techniques for data collection have been decided as per aims and objectives of the research problem. This research has been carried out on the basis of structure functional approach. It is a descriptive research with diagnostic outlook in some cases. In the present study, an analytical approach has been taken up for the interpretation of the data. The data for this study has been gathered mainly from secondary sources and partially from primary sources. Various published and unpublished material has also been consulted. In order to strengthen the study and to see the authenticity of secondary data the field investigation of nine sampled villages has been conducted.

**Objectives**

Objectives help the reader to understand the implied themes of the work in the form of concrete statement. The defined objectives guard the researcher to keep the feet firmly on the ground and to be in touch with the reality around. The study conceptualizes the regional trends and patterns of education and health status. Precisely the main objectives of the study area are as follows:

1. To analyze the regional trends and patterns of educational status and educational facilities.
2. To analyze the regional trends and patterns of health status and healthcare facilities.
3. To identify the educational and health status disparity regions.
4. To examine the interrelationship between the indicators of education and health status.
5. To suggest suitable measures and programmatic plans for the development of education and health status of study area.

**Hypotheses**

Ordinarily, a hypothesis simply means assumptions or some supposition to be proved or disproved. Thus hypothesis may be defined as a proposition or a set of proposition set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjecture to guide some investigation or accepted as highly probable in the light of established facts. Quite often a research hypothesis is a predictive statement, capable of being tested by scientific methods, that relates an independent variable to some dependent variable (Kothari, 2004). The following hypotheses have been tested.

1. There is significant association between educational and health status.
2. Where availability and accessibility of educational facilities are better there the educational status is also good.
3. Where availability and accessibility of healthcare facilities are better there the health status is also good.
4. Inverse relationship exists between high female literacy and mortality & morbidity rate.

**DATA BASE AND METHODOLOGY**

**Data Base**

Data have a very vital and significant role in giving the abstract shape of the unit. These also help in either comparing or contrasting unit within the framework of particular geographic phenomena.

As mentioned earlier, that in the present research work “Regional Trends and Patterns of Educational Status and Health in WUP” an attempt has been made to see the problem district wise. Hence, efforts have been made to substantiate the above hypotheses by data and information collected from various sources. The present study is essentially
based on secondary data; which have been collected from the published and unpublished records of various offices and partially based on primary data based on intensive field surveys.

The study has been conducted at two levels:

(a) Meso level- where districts have been taken as unit of analysis and data is collected from secondary sources.

(b) Micro level- where sampled villages have been taken as unit of analysis and data is collected through general survey/household survey with the help of comprehensive questionnaires.

**Secondary Sources of Data**

Secondary data means data that are already available i.e., they refer to the data which have already been collected and analysed by someone else. Secondary data is collected from various published and unpublished records of the government and non-government organization. Secondary data related with population, educational status and literacy for the year (1951, 1961, 1971, 1981, 1991, 2001 and 2011) has been taken from *Census of India*. Data related with health i.e. mortality due to diseases, infant mortality rate, maternal mortality ratio, acute diseases and chronic diseases for the year (1971, 1981, 1991, 2001 and 2011) has been collected from *Directorate of Health Services Department, Uttar Pradesh, Lucknow*. Educational and health facilities data for the year (1971, 1981, 1991, 2001 and 2011) has been taken from *Economic & Statistical Division, State planning Institute, Uttar Pradesh, Lucknow*. Socio-economic data from District Statistical Hand Book (Sankhiyaki Patrika, 2011) has also taken.

Data of literature have been collected from various books, journals and articles from libraries: Maulana Azad Library (AMU), Jawaharlal Nehru University, New Delhi; National Achieves library, New Delhi; Central & secretariat library, New Delhi; and Research Seminar of Geography department of AMU.

**Sources of Primary Data**

Data from primary sources have been collected through general survey/household survey with the help of interviews of the principal of schools of sampled villages, doctors of primary health centres, private medical practitioners,
Health workers of maternity and child welfare centres and respondents of sampled household for the year (2012-2013) with the help of comprehensive questionnaires. Primary data is collected from nine sampled villages of the study area.

**Methodology**

The present work aims firstly to discuss the theoretical framework, secondly to identify the trends and patterns of educational status and health and their determinants, thirdly to delineate the regions of educational status and health and to analyze separately the determinants which may influence the differentials (education and health status), fourthly to demarcate educational and health development regions and as to how they are related with each other and lastly the tabulation, analysis and comparison work between secondary and primary data (to strength the study, primary survey is conducted at village and household level to test the ground reality).

**Unit of Analysis**

The selection of a unit to analyze the character of an area always poses a problem. Robinson in the context of ‘ecological fallacy’ has pointed out that the content and sometimes even the direction of relationships among variables may change with varying size of unit of analysis (Robinson, 1950). McCarty, Hook and Knox in 1964 similarly observed that every change in scale will bring about the statement of a new problem and there is no basis for presuming that associations existing at one scale will also exist at another. Although it is generally said that smaller the unit of analysis, lesser the distortion, however, scale is subject to restrictions in both upward and downward directions. Observation of characteristics and relationships over large areas runs into the risk of over simplifications and fallacious averaging of reality, whereas a smaller unit of analysis poses the problem of fragmentation as process and relationships may cross their boundaries. This problem was strongly felt in the present study. In the present study the political division of the state in the form of districts have been taken as the unit of analysis.

A study area larger than the district level i.e., commisionary, will be simplistic and have no geographical value. On the other extreme, the village is the smaller unit. But considering paucity of data at this level and sheer number of units it is impossible to conduct a research on this level. Besides, relationships and process over space at this level will be fragmented. Therefore, district is an appropriate unit of analysis which presents a better representation of the issues involved. For primary
survey study does not permit us to take into account the entire set of villages for the study of WUP, therefore, an intensive village level study of nine sampled villages has been made on the basis of relevant indicators.

**Methodology Adopted to Analyze Secondary Data**

In fact, the entire study has taken the form of an interpretation of what have emerged on the maps. The district wise data was processed and educational and health status was calculated. For showing the educational status and literacy rate simple percentage have been calculated. To show the health status; mortality rate is used which is shown by using data of mortality due to diseases per 100 thousand of population,, infant mortality rate per thousand of live births and maternal mortality ratio per 100 thousand of live births; morbidity rate is also used which is shown by acute diseases (dysentery/Diarrhoea, malaria, Dengue, Fever (All types) and other acute diseases) per 100 thousand of population and chronic diseases (Diabetes, hypertension, tuberculosis, asthma and other chronic diseases) per 100 thousand of population. To show the availability and accessibility of education and healthcare facilities, again the ratios have been calculated per 1000 sq. Km. and per 100 thousand of population. Subsequently, choropleth maps have been prepared to bring out the real contrast more effectively. A careful selection of class intervals to decide the categories drawn on the maps is done by the mean and standard deviation technique. In order to show the availability and accessibility of data composite z-score technique has been used.

**Methodology Adopted to Collect Primary Data**

Primary information has been collected though general/intensive field survey. For field investigation, nine villages of UP have been selected form three district based on stratified and purposive sampling.

1. **First Stage- Stratification of WUP**

In the first stage, the WUP has been divided into three regions of high, medium and low in education and health status regions on the basis of secondary data in order to find out the volume of impact of education on status of health.

2. **Second Stage- Selection of Villages**

In second stage, from each category, three villages have been selected for intensive study of education and health status in the year 2012-2013. Thus nine villages have been chosen from the study area.
The villages have been selected on the basis of different criteria given below:

a) Population size
b) Accessibility to the village
c) Distance from metalled road and urban centre.

In each village 10 percent of the total number of households was randomly selected. The total sample size consists of nine villages and 480 households. The respondents have been interviewed according to a well prepared questionnaire in the year 2012-2013.

### Sampled Villages

<table>
<thead>
<tr>
<th>Selected Villages</th>
<th>District</th>
<th>Total Household</th>
<th>No. of Sampled households</th>
<th>Total Population</th>
<th>Total Sampled Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dadri</td>
<td>Meerut</td>
<td>889</td>
<td>89</td>
<td>5089</td>
<td>503</td>
</tr>
<tr>
<td>Chhur</td>
<td>Meerut</td>
<td>1219</td>
<td>122</td>
<td>7641</td>
<td>758</td>
</tr>
<tr>
<td>Sakoti</td>
<td>Meerut</td>
<td>1027</td>
<td>103</td>
<td>5594</td>
<td>556</td>
</tr>
<tr>
<td>Kaithwari</td>
<td>Aligarh</td>
<td>278</td>
<td>28</td>
<td>1581</td>
<td>153</td>
</tr>
<tr>
<td>Kasimpur Nagari</td>
<td>Aligarh</td>
<td>259</td>
<td>26</td>
<td>1546</td>
<td>149</td>
</tr>
<tr>
<td>Parliavali</td>
<td>Aligarh</td>
<td>579</td>
<td>58</td>
<td>3289</td>
<td>326</td>
</tr>
<tr>
<td>Bebhai</td>
<td>Bareilly</td>
<td>144</td>
<td>14</td>
<td>924</td>
<td>86</td>
</tr>
<tr>
<td>Badra Kasampur</td>
<td>Bareilly</td>
<td>219</td>
<td>22</td>
<td>1325</td>
<td>149</td>
</tr>
<tr>
<td>Maini</td>
<td>Bareilly</td>
<td>176</td>
<td>18</td>
<td>1258</td>
<td>117</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4790</td>
<td>480</td>
<td>28,247</td>
<td>2797</td>
</tr>
</tbody>
</table>

**Source:** Based on field survey, 2012-13.

### Selection of Indicators

In statistical literature, the term ‘indicator’ has been very much in use. Use of indicator is highly common and important in statistical analysis of problem of almost all the major disciplines of knowledge. The function of an indicator is, therefore, to show or point out something or some attributes intended to be projected or emphasized by the analysts. (Chamber’s Twentieth Century Dictionary, 1972). Thus, the indicator are not merely statistical, pure and simple but infect, the information both statistical and non–statistical which are also transformed into incites for measuring relationship between two or more sets of facts under adopted assumption.

### Indicators of Education and Health Status for Secondary Analysis

For the present study six indicators of education and twelve indicators of health status have been used. Indicators of education status are as follows:
<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$</td>
<td>Percentage of Literate population.</td>
</tr>
<tr>
<td>$X_2$</td>
<td>Percentage of primary education.</td>
</tr>
<tr>
<td>$X_3$</td>
<td>Percentage of middle education.</td>
</tr>
<tr>
<td>$X_4$</td>
<td>Percentage of high school &amp; intermediate education.</td>
</tr>
<tr>
<td>$X_5$</td>
<td>Technical &amp; non-Techncial education.</td>
</tr>
<tr>
<td>$X_6$</td>
<td>Graduate and above.</td>
</tr>
</tbody>
</table>

Indicators of health status are as follows:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Y_1$</td>
<td>Mortality due to Disease per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_2$</td>
<td>Infant Mortality Rate per Thousands of Live Birth.</td>
</tr>
<tr>
<td>$Y_3$</td>
<td>Maternal Mortality Ratio per 100 Thousand of Live Births.</td>
</tr>
<tr>
<td>$Y_4$</td>
<td>Person suffering from Dysentery/ Diarrhoea per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_5$</td>
<td>Person suffering from Malaria/Dengue per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_6$</td>
<td>Person suffering from Fever (all type) per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_7$</td>
<td>Person suffering from Other Acute Diseases per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_8$</td>
<td>Person suffering from Diabetes per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_9$</td>
<td>Person suffering from Hypertension per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_{10}$</td>
<td>Person suffering from Tuberculosis per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_{11}$</td>
<td>Person suffering from Asthma per 100 Thousand of Population.</td>
</tr>
<tr>
<td>$Y_{12}$</td>
<td>Person suffering from Other Chronic Diseases per 100 Thousand of Population.</td>
</tr>
</tbody>
</table>

Above mentioned indicators have been used to show the status of education and health in WUP. The education and healthcare facilities are an important part of the statistics of education and health of any region. Thus it becomes necessary to show the accessibility and availability of educational and healthcare facilities of the region. So the trend, spatial pattern, verses map and association through correlation is also shown for education and healthcare facilities.

Thus to show the trend of education and healthcare facilities indicators used are:

**Educational Facilities**

1. Number of schools per 1000 sq. Km.
2. Number of schools per 100 thousand of population.
3. Number of colleges per 1000 sq. Km.
4. Number of colleges per 100 thousand of population.
5. Number of university per 1000 sq. km.
6. Number of university per 100 thousand of population.
7. Number of VEC per 100 thousand of population.
Healthcare Facilities

(1) Number of Hospitals /Dispensaries per 1000 sq. Km.
(2) Number of Hospitals /Dispensaries per 100 thousand of population.
(3) Number of primary health centres and sub-centres per 1000 sq. Km.
(4) Number of primary health centres and sub-centres per 100 thousand of population.
(5) Number of family welfare centres, maternity and child welfare centres and sub-centres per 1000 sq. Km.
(6) Number of family welfare centres, maternity and child welfare centres and sub-centres per 100 thousand of population.
(7) Number of special hospitals per 1000 sq. Km.
(8) Number of special hospitals per 100 thousand of population.
(9) Beds per 100 thousand of population.
(10) Doctors per 100 thousand of population.

To show the spatial pattern of accessibility and availability of educational and healthcare facilities, indicators used are:

Educational Facilities

(1) Total no of educational facilities per 1000 sq. Km.
(2) Total no of educational facilities per 100 thousand of population.

Healthcare Facilities

(1) Total number of healthcare facilities per 1000 sq. Km.
(2) Total number of healthcare facilities per 100 thousand of population.
(3) Beds per 100 thousand of population.
(4) Doctors per 100 thousand of population.

In the latest census data i.e. 2011, educational status is not published by the government till the end of 2014 that’s why only literacy rate has been used to show the educational status of WUP for the year 2011.

Educational Status (Literacy Rate), 2011

1) Total Literacy Rate
2) Male Literacy Rate
3) Female Literacy Rate
4) Rural Literacy Rate
5) Urban Literacy Rate
Indicators of Educational and Health Status for Primary Survey

Information was taken regarding general environment condition, education and health. The socio-economic factors affecting education and health status of respondents in particular and the sampled villages in general were also taken.

Indicators used to show the educational status of sampled villages are almost same as that of the educational indicators selected for secondary work. In case of health status, the indicators are also same except the body mass Index as it is one of the important indicators of health status so it is included in primary survey.

Techniques Applied for Secondary Analyses

Correlation means relation between two variables, i.e., relation between education and health and their determinants. The correlation co-efficient is either +1 or -1 in condition when all actual values are on the regression line, predication is exact and the relation between the two variables is perfect. When actual values are not identical with regression estimates, the predication is not precise and the relation between the variable is not perfect. In such situation, the correlation co-efficient is between -1 and +1 (Walker, 1943).

For analyzing the data, correlation co-efficient technique is also applied. Here correlation matrix has been made to assess the relationship between explanatory variables and educational status. In the same way interrelationship of independent variables of educational status selected and health status is calculated and t-test is applied to find out the significant relationship between educational and Health status at 1 per cent and 5 per cent significance level.

The education vis-à-vis health regions have been worked out on z-score method. In order to reach standardization, the raw data for each variable has been computed into standard scores. It is commonly known as zi value or ‘z’ score. The score measure the departure of individual observations, expressed in arithmetic mean of all observations, expressed in a comparable form. This means it become linear transformation of the original data. This method was first used by Smith in 1968 in his study on inequality in Peru followed by D. Smith (1973) and D. Stater (1975). The formula involved as:
\[ z_i = \frac{X_i - \bar{X}}{SD} \]

Where \( z_i \) is the standard score, \( X_i \) is the original or individual values for observation \( i \), \( \bar{X} \) is the mean for the variable, and so is the standard deviation (Smith, 1973a).

The standard score additive model has been used to develop a composite education and health indicators for each set of variables and general indicators including all criterion and variables.

Six education indicators and twelve health indicators require the addition of z-score for the individual variables taken to measure them.

The model in thus

\[ IJ = \sum_{i=1}^{k} z_{ij} \]

Where \( IJ \) is the magnitude of indicators for district, \( z_{ij} \) is the standard score on variable \( (i) \) in the district \( j \). \( k \) is the number of variables measuring the criteria in equation (Smith, 1973b)

District scores on different indicators can thus be directly compared, irrespective of the number of variables contributing to them. The overall indicators of education and health in equality (EHI) for any district will be

\[ EHI_j = \sum_{i=1}^{m} Z_{ij} \quad \text{or in this case} \]

\[ EHI_j = \sum_{i=1}^{27} Z_{ij} \]

Again these results can be transformed back into z score, so that ‘zero’ indicators average performance and unity (+or -) represents one standard deviation in either direction. Plus (+) and minus (-) indicate high and low values respectively.
Karl Pearson’s Coefficient of Correlation

To measure the association between educational facilities and education status and healthcare facilities and health status, educational condition and health status, the Karl Pearson’s Coefficient (r) of Correlation has been used. The coefficient correlation is calculated with the following formula:

\[ r = \frac{\sum XY - (\sum X)(\sum Y)/N}{\sqrt{[\sum X^2 - (\sum X)^2/N][\sum Y^2 - (\sum Y)^2/N]}} \]

Where,

- \( r \) = Coefficient of Correlation
- \( X, Y \) = the two given Variables
- \( N \) = Number of Observations

If the sign of \( r \) is positive the variables \( X \) and \( Y \) are positively related and if the sign is negative, then they are negatively correlated. The value of \( r \) varies between -1 and +1. The value +1 or -1 indicates a perfect positive or negative correlation. As the extent of correlation decreases the value of \( r \) approaches zero (Mahmood, 2008).

Significance test of Correlation Coefficient

To find out significance levels, ‘t’ test has been applied. It is computed with the help of following formula:

\[ t = r \sqrt{\frac{(n - 2)}{1 - r^2}} \]

Where,

- \( n \) = Number of Observation
- \( r \) = Computed value of Coefficient of Correlation

Techniques Applied for Primary Data Analysis

Demographic structure, literacy rate and educational status of the sampled villages have been shown by simple percentage method. To show health status; ratios has been calculated. Mortality rate: Mortality due to diseases per 100 of population, infant mortality ration per 100 of live births and maternal mortality ratio per 100 of
live births, Morbidity Rate: Acute Diseases (dysentery/diarrhoea, acute respiratory infection, fever (all types), malaria/dengue and other acute diseases) per 100 population; chronic diseases (diabetes, Hypertension, Tuberculosis, Asthma, Arthritis, Cancer, other Chronic diseases) per 100 population; BMI (Body Mass Index) in percentage.

Total educational facilities and healthcare facilities of sampled villages have been calculated on per 100 sq. Km. and per 1000 population of a sampled village.

**Problems Encountered During the Research Work**

There were number of problems faced during the research work. Some of the important problems are as follows:

*Problems Encountered During Secondary Data Collection*

- Most of the health related departments and vital facts offices do not have the confidence that the material supplied by them will not be misused and as such they were often reluctant in supplying the needed information which proves an impermeable barrier during data collection.
- Library management and functioning is not satisfactory at many places and much of the time and energy was spent in tracing out the books, journals, reports, etc., rather than in tracing out relevant material from them.
- There was also the difficulty of timely availability of published data from various government and other agencies doing this job. Problem was also faced on account of the fact that the published data vary quite significantly because of differences in coverage by the concerning agencies.

*Problems Encountered During Primary Survey*

- Difficulties were faced in finding out the exact location and route of the sampled villages according to the maps.
- Sometimes people totally disregarded to provide any kind of information due to the successive surveys conducted by different organization for different purpose in every year. In every survey, surveyor convinced the people to solve their problems but nobody executed that. So, they got angry and reluctant to give the information.
• In some areas at the time of cross-questioning problems were faced to take information because some respondents were illiterate and not able to understand what was asked.

• Overall impression of such surveys in the public opinion is that they are superfluous or at least irrelevant. Many of them said that surveys are done but nothing concrete took place.

In spite of all the above mentioned limitations the study has a significant scope in the field of social geography as well as health geography. No effort has been spared to make the study a comprehensive one.

Organization of the Study

The present research work entitled “Regional Trends and Patterns of Educational Status and Health in Western Uttar Pradesh” is studied under six chapters with the exclusion of introduction and conclusion. The first two chapters are being purely theoretical, while the last four are mainly experimental. The first chapter presents the conceptual framework; it incorporates the education and health determinants and literature survey is also discussed in this chapter. Second chapter deals with the study area in four main points of physical features and the demographic, socio-economic and social- infrastructures. The third chapter is trifocal, first describes educational status under three main headings of general trends of literacy, educational status and educational facilities, second explains regional trends and patterns of educational status and third shows the regional trends and patterns of educational facilities. The fourth chapters explains the health under two main headings; trends of health status and healthcare facilities and spatial patterns of health status and healthcare facilities. Chapter fifth deals with two major points; one devoted to examine the educational status and health disparity regions and the second, the association between educational status and health with reference to interrelationship among indicators of educational status and health and test of simple linear correlation between educational status and health. The last chapter i.e., the sixth deals with primary survey of nine sampled villages. Finally, the work concludes with some suggestive remarks in order to reduce the existing disparities in educational status and health of WUP.
REFERENCES


