Status of Health in Himachal Pradesh: An Investigation into the Influencing Environment

Suman[1] and Vivek Nagpal[2]

[1] *Department of Geography Panjab University Chandigarh*
2Senior Consultant Rashtriya Uchhattar Shilksha Abhiyan (RUSA) MHRD, GOI, New Delhi
E-mail: [1]dadhwal.suman@gmail.com, [2]viveknagpal1947@gmail.com

Abstract—*Health is an important aspect of wellbeing. One needs good health to lead an economically productive life. The health of individuals and communities depends upon various socioeconomic, demographic and environmental factors. The objective of the present study is to analyse the health status in Himachal Pradesh. An attempt has also been made to examine the extent to which environmental factors such as sanitation, access to safe drinking water have affected the health status in the state. Health status index was devised with the help of crude birth rate, crude death rate and under five mortality rate by giving due weightage to the highest and lowest values of these indicators. Marked inter-district variations in health status were observed. The health status in terms of crude birth rate, crude death rate and under five mortality rate was significantly affected by various factors such as levels of male and female literacy rate, use of family planning methods, pressure of population and per capita income. A moderate effect of environmental variables i.e. drinking water and sanitation facilities on health status was observed in the state. The availability of health services (i.e. doctors and nurses) was however not found to be very effective in controlling mortality particularly under five mortality rate. The utilisation of health facilities made available by the government needs to be promoted by adequate, good and efficient means of transportation. Regular and adequate access to safe drinking water needs to be given top priority for achieving good health status in all parts of the state.*

1. INTRODUCTION

Health, as defined by World Health Organisation (WHO 1948), is a state of complete physical, mental and social well-being and not merely the absence of a disease or infirmity to lead a socially and economically productive life [1]. And, it is vital for ethical, aesthetic, material and spiritual development of man. Health therefore becomes one among the most crucial requirements for any society's development, especially the developing ones. And it is also an important aspect for human welfare. As a Gujarati proverb says "the first happiness is health, the second is a full stomach". One can't enjoy food if one is not healthy (of course, one cannot be healthy if one doesn't have enough food). The level of health status in any region is a manifestation of human well- being. Better health is central to human happiness and well-being. It also makes an important contribution to economic progress, as healthy populations live longer, are more productive, and save more [2].Perception about physical well being, mental well being and social well being and so on differs from person to person, from one community to another, from one geographical region to another, from onetime of point to another, and from one information/technology state to another state [3].

The world's one sixth population lives in India. The state of the health of the Indians has a significant bearing on the state of the world's health. About 40 per cent of the people cited health as their main concern before other issues such as financial problems, housing or crime .Indian states can be compared with the rest of the developing countries, health performance of some states is no better than worst countries of the world [4]. There are so many plans, health programmes and goals for achieving high health status since independence.

2. STUDY AREA

Himachal Pradesh is a hilly state located in the north- west of the country. There are wide physical variations ranging from low hills to high mountains with lakes and flowing rivers in the state. The state has an area of 55, 673 sq. km, and it accounts for 1.75 percent of India's total geographical area. The state is having 12 districts with a population of 68, 64,602. The density of population is 123 persons per sq.km. Himachal Pradesh with an urban population of only10.03 percent of the total population has 56 cities and towns. The majority (89.9) of the population is in rural habitations varying in size from isolated hamlets to conglomerated settlements. About the half of the area is covered under the tribal belt with a population of just 5.71lakh [5]. Due to peculiar topography the population size of district varies. It varies from a high of 15.10 lakhs in Kangra to a low of 31.5 thousand in Lahaul&Spiti. In spite of that Himachal Pradesh has made significant development on demographic front and stands at 3rd rank followed by Kerala and Punjab in Human Development Report [6].

Himachal Pradesh also shows steady progress in health outcomes like Infant Mortality Rate declined 85 to 36 per thousand during 1972-2012 period and Crude death Rate also declined from 15.9 to 6.7 per thousand persons in the same period. But instead of this tremendous growth in health outcomes, there are still large differences in these indicators at district level in Himachal Pradesh. So, through this paper an attempt is made to understand differences in the level of health status at district level in the state.

3. OBJECTIVES

- To study the patterns of health status in terms of crude birth rate, crude death rate and under five mortality at district level in Himachal Pradesh
- To examine the effects of environmental variables such as access to safe drinking water and availability of sanitation facilities; and health services variables such as availability of doctors and nurses on health status

Data Sources and Methodology

For the present study, data for crude birth rate and crude birth rate are derived from District Statistical Abstract of Himachal Pradesh (2011) and data for under five mortality is taken from Lancet Global Health (2013).Data for health services variables such as availability of doctors and nurses has been procured from Directorate of Health Services Shimla (2011).For getting information related to drinking water and sanitation facilities in the state, Census of India (2011) has been widely utilized. Due to unavailability of data at lower level, district has been considered as the study unit for the present work. The major limitation of the study is that data has been derived from various sources. Using the same data source for different indicators to identify the health status is not possible due to the unavailability of complete data with one single source. Different sets of data for health status indicators have been tapped from different sources. Composite Index was used to see the pattern of health status at district level in Himachal Pradesh. To see the effect of environmental variables i.e. access to safe drinking water, availability of sanitation facilities and health services and availability of doctors, availability of nurses variables on Health Status at district level in Himachal Pradesh the areal correspondence was also used. Relevant maps, figures, tables are prepared. Arc GIS-9.0 version was also used to prepare maps

4. SPATIAL PATTERN OF HEALTH STATUS IN TERMS OF CRUDE BIRTH RATE, CRUDE DEATH RATE AND UNDER FIVE MORTALITY RATE IN HIMACHAL PRADESH

Health status of any region is mainly determined by crude birth rate, crude death rate, life expectancy at birth, child mortality rate and maternal mortality rate etc.. In the present study spatial patterns of health status in Himachal Pradesh have been examined in terms of index score of crude birth

rate, crude death rate and under five mortality rate at district level.

Table 1: Himachal Pradesh: Health Status Indicators (Data by Districts)

Sr. No.	District	Crude Birth Rate(2010)*	Crude Death Rate(2010)*	Under Five Mortality Rate (2012)**
1.	Solan	19.6	7	33.9
2.	Sirmaur	17.1	4.5	55.5
3.	Shimla	19.7	6	39.3
4.	Mandi	18.1	5.5	23
5.	Lahaul&Spiti	9	5.4	48.6
6.	Kullu	16.9	5	34.9
7.	Kinnaur	11	6	49.5
8.	Kangra	18.7	6.7	59.2
9.	Hamirpur	17.2	7.5	22.1
10.	Chamba	20.7	5.1	54.2
11.	Bilaspur	19.6	5.9	25.7
12.	Una	17.7	7.4	30.8
13.	Himachal Pradesh	17.1	6.1	42.5

Source: * District Wise Statistical Abstract of H.P.,2011 [7]
** Estimates From National demographic and Mortality Surveys, Published by Lancet Global Health (2013) [8]

Crude birth rate plays a vital role in determining the health status of the population of a region. Low birth rate contributes significantly to promote health status as the limited births considerably not only help in maintaining maternal health but

Crude Birth Rate and Crude Death Rate
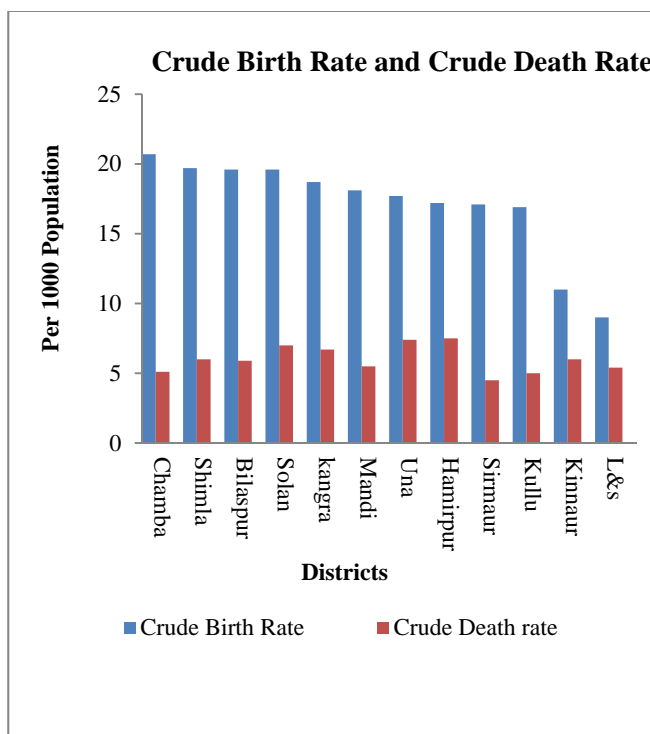
Source: **District Statistical Abstract of H.P., 2011[7]**

Fig. 1

also reducing the pressure on health facilities. Himachal Pradesh had a crude birth rate of only 17.1 per thousand as compared to national average of 22.1 per thousand live births. The main causative factors for low birth rate in Himachal Pradesh are the use of effective family planning measures and high literacy level [9]. The birth rate varies from 20.7 per thousand live births in Chamba to 9 per thousand live births in Lahaul&Spiti district (Fig.-1).

This may be attributed to the state's lowest female sterilization (33.3 percent) and lowest female literacy rate in district Chamba [10, 11]. In Lahaul& district, though (i) the percentage of sterilized females and (ii) the percentage of male and female literates are low yet the percentage of women having contraceptive pills is the highest in the state. Extremely small size of population associated with Buddhism and the tradition of late marriages in the district may be associated with low birth rates.

The crude death rate of Himachal Pradesh, on other hand, was 6.1 deaths per thousand in 2010 which was less than the national average of 7.2 deaths per thousand of total population. It was so as Himachal Pradesh has made remarkable progress in expansion of health facilities and services [12]. Crude death rate, however, varied between the highest value of 7.5 deaths per thousand population in Hamirpur to the lowest of 4.5 deaths per thousand population in Sirmour (Fig.-1). Age specific death rates and age structure of population, traditions of late marriages can further be explored to understand these variations.

Under five mortality(deaths among children upto the age of five years per 1000 live births in a given year), like infant mortality rate, is considered as a sophisticated index of mortality to understand socio- economic development.

The under five mortality rate in Himachal Pradesh was 49 per thousand live births which was less than the national average of 59 per thousand live births. Himachal Pradesh has made tremendous progress in providing access to safe drinking water and has lowered open defecation rate [13].The under five mortality rate varied from the highest of 59.2 per 1000 live births in district Kangra to the lowest of 22.2 per thousand live births in district Hamirpur (Fig.-2). There were five districts in the state which had an under five mortality of more than the state average of 42.5 per thousand live births. In these parts of the state, large population, low literacy rate, difficult accessibility to health services distributed to high under five mortality rate [11,14].

For understanding the level of health Status in Himachal Pradesh, health status index, as explained in methodology is calculated at district level in 2011-13 (Fig.-3).

There were large variations among districts in terms of index of health status of population in Himachal Pradesh (Fig.-3).The districts falling in the category of high health status index of more than 0.60 were Lahaul&Spiti, Kullu and Mandi. The districts ofKinnaur, Bilaspur, Sirmaur and Hamirpur all were in medium category of health status index with an index value of between 0.40 and 0.60. The districts included in the low level of health status with an index value of less than 0.40 were the districts of Shimla, Una, Solan, Chamba and Kangra. The lowest level of health status (0.15) was observed in Kangra which accommodated more than twenty percent population of the state and experienced high crude birth rate, high crude death rate and highest under five mortality rate in the state. Lahaul&Spiti with the highest index value of 0.66 of health status was at rank one in the state. It accommodated less than one percent of the total population of the state.
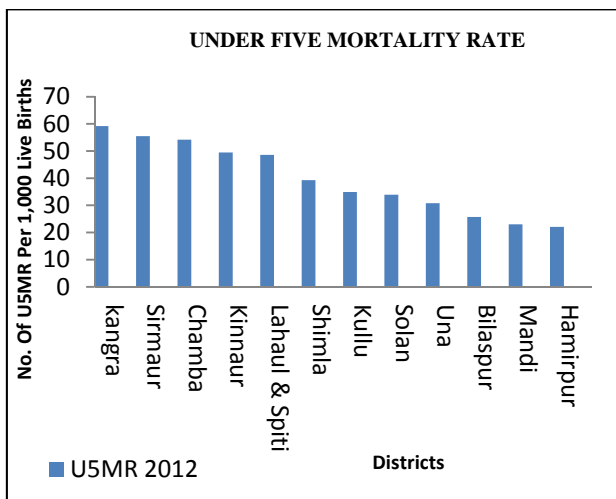

Fig.-2

Source: Estimates from National Demographic and Mortality Surveys, Published by Lancet Global Health (2013)[8]
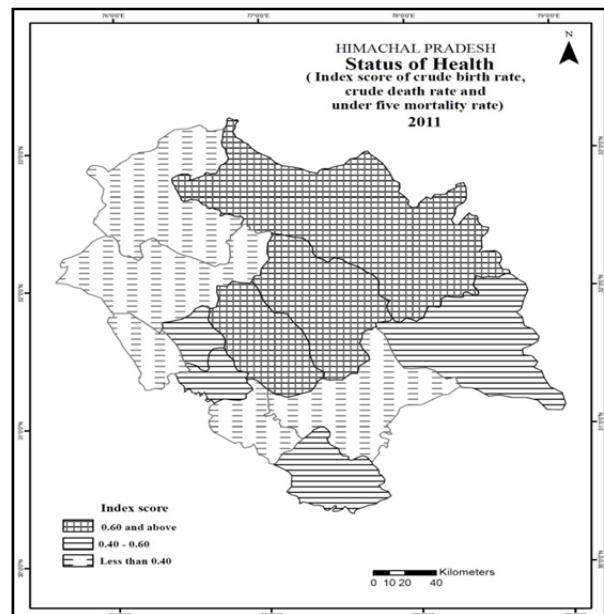

Fig. 3

District Chamba on the other hand, with an extremely low level of health status had the lowest levels of total male and female literacy, lowest rate of contraceptive prevalence and lowest per capita income in the state [10,15]. Kinnaur, Bilaspur, Sirmaur and Hamirpur registered a moderate index of between 0.40 and 0.60 as these were the districts which had moderate percentage of sterilized females and literate females and had lower capita income than the state average. The health status in terms of crude birth rate, crude death rate and under five mortality rate was thus significantly affected by various factors such as levels of total, male and female literacy rates, use of family planning methods, pressure of population , per capita income etc.

II. Relationship between Health Status and (i)Environmental Variables; (ii)Availability of Health Services

In this study an attempt is also made to understand the relationship between health status and (i) environmental variables i.e. access to safe drinking water and availability of sanitation facilities and (ii) availability of health services i.e. availability of doctors and nurses.

Table 2: Correlation between Under Five Mortality Rate and Environmental Variables and Health Services Variables

Variables	Co-efficient Value
Access to safe drinking water	-0.51
Availability of Sanitation facilities	-0.54
Availability of Doctors (Per 10,000 persons)	0.085
Availability of Nurses (per 10,000 Persons)	-0.020

Source: Estimates From National demographic and Mortality Surveys, Published by Lancet Global Health (2013)[8]
Census of India, 2011[16]
Directorate of Health Services Shimla,2011 [17]

Water and sanitation are integral aspects of good human health. Safe water and improved sanitation lower the risk of many diseases and keep people healthy. Results indicated that environmental factors such as access to safe drinking water and availability of sanitation facilities played a much more important role than availability of health services like availability of doctors and availability of nurses in controlling under five mortality. Access to safe drinking water was negatively and moderately (-0.51) related with the under five mortality rate in the state and an areal correspondence of 0.66 was observed between them (Table-2),(Fig.-4). As far as the supply of safe drinking water is concerned, as per the statistics available, about ninety per cent of the households in the state had this facility [16].In spite of a good percentage of households privileged with this facility, the supply of clean and safe drinking water was, however, irregular and restricted on many occasions [18-20]. Not only this, clean and safe drinking water was not adequately available to the people in far flung areas who were forced to drink polluted water from khuds[21]. Due to old sewerage, drain water percolates into water pipes [20] and people are forced to consume

contaminated water during the periods of crisis. Moreover, the traditional sources of water are not cleaned properly and regularly [22]. In severe winters the situation worsens as water freezes in water pipes and people use traditional and unclean sources of water. Spread of diseases like diarrhoea, viral fever etc. is quite common among people using water from these sources and hundreds of people have been infected in the past few years[23]. It can, therefore, be concluded that it is not only the access to safe drinking water which is important, but also the regularity and frequency with which the safe water is distributed among the population. Availability of sanitation facilities, however had a greater effect on under five mortality rate in the state as a co-efficient value of -0.54 was recorded between the two variables and the degree of areal correspondence was, however, only 0.58(Table-2), (Fig.-5).
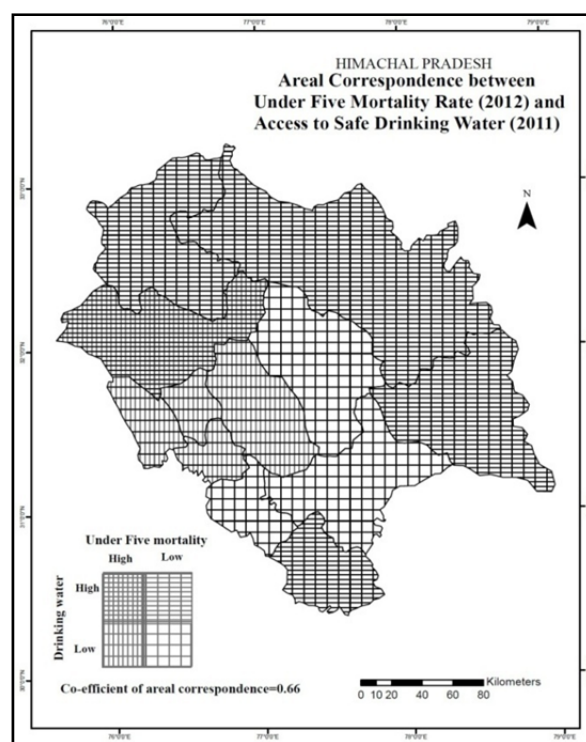

Fig. 4

It may be mentioned here that the status of health in Himachal Pradesh which is significantly determined by access to safe drinking water and availability of sanitation facilities also needs to be studied in the context of availability of doctors and nurses (Fig.-6). The coefficient values of correlation between under five mortality and availability of doctors (per 10,000 persons) and availability of nurses (per 10,000 persons) were 0.085 and -0.020 respectively. Such an observation puts a question mark on the utilisation of these resources in the state.
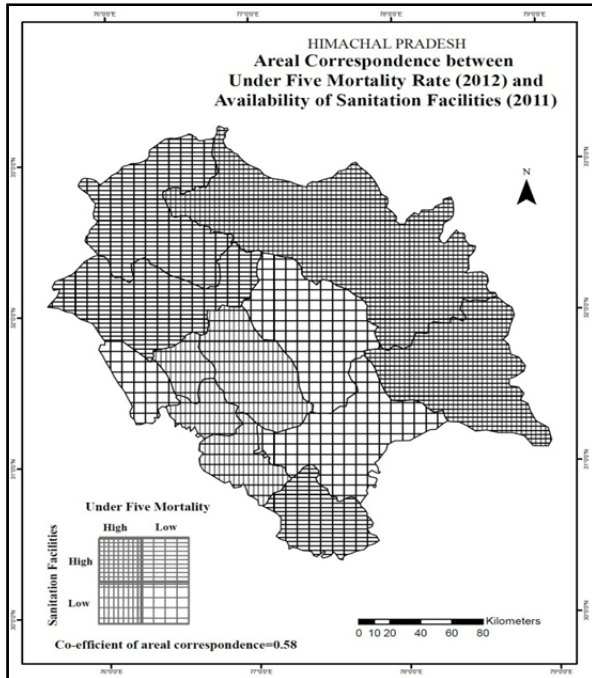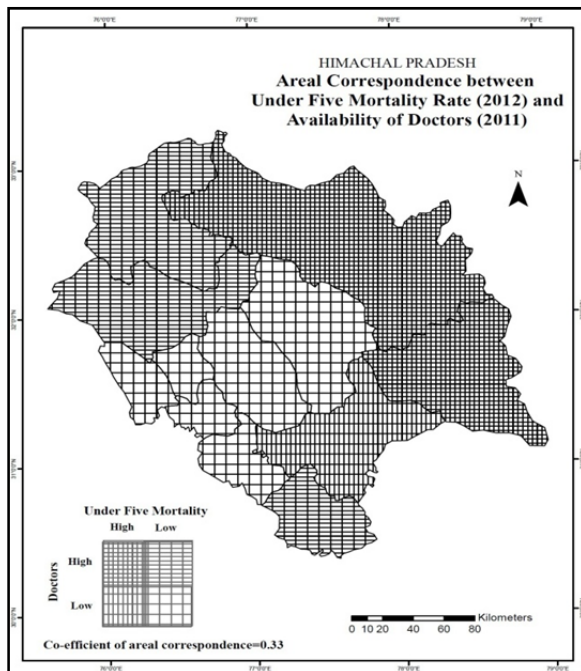
Fig. 5

Fig. 6

Himachal Pradesh is, no doubt, much better than many other states in the country in terms of availability of doctors and nurses but utilization of these health services in different districts in the state may suffer due to difficult terrain insufficient and inefficient means of transportation, uneven distribution of health services, shortage of staff, shortage of

facilities etc. Such a situation may delay the meeting objective of 'Health for All'. [24-30]. Micro level studies may also be conducted to have an in-depth understanding of the relationship between availability of doctors and nurses and the utilisation of these services.

5. CONCLUSION

In order to study health status in Himachal Pradesh health status index was devised with the help of crude birth rate, crude death rate and under five mortality rate by giving due weightage to the highest and lowest values of these indicators. Marked inter-district variations in health status were observed. District Lahaul&Spiti had the highest level of health status in the state as it had tradition of late marriages;highest rate of contraceptive prevalence; highest per capita income; lowest density of population in the state. On the other hand, district Chamba had an extremely low level of health status with lowest contraceptive prevalence, lowest literacy levels and lowest per capita income in the state. The health status in terms of crude birth rate, crude death rate and under five mortality rate was significantly affected by various factors such as levels of male and female literacy rate, use of family planning methods, pressure of population and per capita income. A moderate effect of environmental variables i.e. drinking water and sanitation facilities on health status was observed in the state. The availability of health services (i.e. doctors and nurses) was however not found to be very effective in controlling mortality particularly under five mortality rate. The utilisation of health facilities made available by the government needs to be promoted by adequate, good and efficient means of transportation. Regular and adequate access to safe drinking water needs to be given top priority for achieving good health status in all parts of the state.

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