Review **Article**

Trends of Communicable and Non-Communicable Morbidities in Uttarakhand State: A Systemic Review

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Abstract:

Objective: To identify the trend of communicable and non-communicable morbidities in Uttarkhand state.

Methods: This systemic review was conducted using the vide range of literature i.e. published reports of Ministry of Health & Family Welfare, Government of India and Uttarakhand State. The published original research papers from original journals, E-journals and electronic data base such as Medline, Pubmed, Indmed etc.

Findings: Uttarakhand is geographically and socio-culturally diverse state because of location and scattered population in hilly and plain region. State has high prevalence of some of the communicable diseases such as tuberculosis (170 cases/Lakh population), malaria (14% in fever cases) and vulnerability of HIV/AIDS. Furthermore, negative lifestyle practices i.e. smoking (20%), tobacco chewing (12%), other form of tobacco use (27%), binge alcohol drinking (52%), low level of physical activity (67%), over weight (14%) and central obesity (18%), consumption of fruits and vegetables less than recommended (89%) are significantly contributing to the ever increasing risk of encountering the non-communicable diseases. Presently over 8% people in Uttarakahnd are hypertensive and 5.7% are diabetic.

Conclusion: This hilly, geographically diverse state is having higher prevalence of some of the communicable morbidities such as TB (170/Lakh population) and malaria (14% of all fever cases) and vulnerability for HIV/AIDS. Because of negative life style practices there are increasing trend in prevalence of non-communicable morbidities; presently over 8% people in Uttarakahnd are hypertensive and 5.7% are diabetic. Therefore, a sound healthcare infrastructure is required to meet healthcare needs of the people in state.

Key words: Communicable diseases, non-communicable diseases, morbidities.

Introduction:

India is a country of genetically homogeneity but geographically, socially, religiously and economically diverse. Thus, prevalence of communicable and non-communicable diseases remains significantly different in distinct geographical regions of the nation. The development in health infrastructure, newer health policies and procedures helped the nations to achieve improved control on occurrence and outbreaks of the several communicable diseases, which remained an issue of worry in past. However, the prevalence of non-communicable diseases (NCDs) is reaching epidemic proportions worldwide including India. A recent largest survey conducted by the Ministry of Health Family Welfare, Government of India under National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS) revealed that 6.5 percent people of the nation are suspected to be suffering from diabetes and 5.5 percent are hypertensive. The situation is more alarming in urban India, where 15 percent people are suspected to be hypertensive and 11 percent are diabetic[1]. Although non-communicable diseases like cancers, diabetes, cardiovascular diseases, chronic obstructive pulmonary diseases, etc are on the rise due to change in life style, communicable diseases continue to be a major public health problem in India.

Communicable diseases, maternal, peri-natal and nutritional disorders constitute 38 per cent of deaths. Non-communicable diseases account for 42 percent of all deaths. Injuries and ill-defined causes constitute 10 percent of deaths each. However, majority of ill-defined causes are at older ages (70 or higher years) and likely to be from non-communicable diseases. About one-

quarter of all deaths in the country are due to diarrhoeal diseases, respiratory infections, tuberculosis and malaria[2].

NCDs are the leading causes of death globally, killing more people each year than all other causes combined. Of the 57 million deaths that occurred globally in 2010, 36 million (almost two-thirds) were due to NCDs, comprising mainly cardiovascular diseases, diabetes, cancers and chronic lung diseases[3]. Sadly, almost 80% of those deaths occur in developing countries[4]. NCDs, once considered "diseases of affluence", are now common even in low and middle income countries. An epidemiological transition model that was introduced 30 years ago is often applied to explain the differences in occurrence of diseases within and between countries. It proposes that disease patterns shift over time so that infectious and parasitic diseases are gradually, but not completely, displaced, as NCDs become the leading causes of deaths in India[5].

Uttarakhand is geographically and socio-culturally diverse state because of location and scattered population in hilly and plain region with higher population density in plain region; for example, four districts (Dehradun, Haridwar, Nainital, and Udham Singh Nagar) account for 55 percent of the state's population. Between 2001 and 2011, there was a decline in the population growth rate; however, the population density of the state increased from 159 persons per square kilometer in 2001 to 189 in 2011[6]. Furthermore, extreme weather conditions had been responsible for certain negative life-style practice and outcomes such as smoking (20%), tobacco chewing (12%), other form of tobacco use (27%), alcohol drinking (52%), low level of physical activity (67%), over weight (14%) and central obesity (18%), consumption of fruits and vegetables less than recommended (89%)[7]. Furthermore, 38.3% people of Uttarakhand are living below the poverty line. State was already on the high prevalence rate of the some of the communicable diseases such as tuberculosis, malaria and vulnerability for increasing incidence of HIV/AIDS; furthermore because of negative life-style practice people of the state are encountering ever increasing prevalence of Non-communicable diseases, over 8% people in Uttarakahnd are suspected to have high blood pressure and 5.7% are diabetic[8].

Interest in trends of communicable and non-communicable disease in the Uttarakhand state and sacristy of the organized relevant literature on this subject area has sparked an idea to carryout a systemic review on the trends of communicable and non-communicable diseases in the state viz-a-viz with their determinants. This article presents an overview of anthro-geographical profile of this hilly state Uttarakhand, trends of communicable and non-communicable diseases along with the presumed determinant factors.

Material and Methods:
This systemic review was conducted using the vide range of literature of the subject of study i.e. published reports of Ministry of Health & Family Welfare, Government of India and Uttarakhand State. The published original research papers from different sources such as original journals, E-journals and electronic data base for example Medline, Pubmed, Indmed etc. The search of literature was archived by searching the references using several key words related to the title and subject of the review. Literature was also retrieved from official websites of the ministry of Health & Family Welfare, Government of India and Uttarakhand state and general search portals such as Google search.

Findings and Discussion:
The findings and discussion of this systemic review is discussed under flowing headings i.e. anthrop-geographical profile of the state, trends of communicable diseases and trends of non-communicable diseases.

Anthrop-geographical profile of state
Uttarakhand is a small state with a population scattered throughout small, rural settlements. It comprises 13 districts: Almora, Bageshwar, Chamoli, Champawat, Dehradun, Haridwar, Nainital, Pauri Garhwal, Pithoragarh, Rudraprayag, Tehri Garhwal, Udham Singh Nagar, and Uttarkashi. Geographically, the state is divided into three broad zones: the upper Himalayas, middle Himalayas, and plains. The total population, according to the 2011 census, is 1.01 crore, with an annual growth rate of 5.3 percent. The population size of the districts varies considerably. Four districts (Dehradun, Haridwar, Nainital, and Udham Singh Nagar) account for 55 percent of the state's population. If the three districts of Almora, Pauri Garhwal, and Tehri Garhwal are added, these districts account for 79 percent of the population.

About 17 percent of villages have a population ranging between 500 and 1,999, and only 3 percent of villages have a population above 2,000; thus, 80 percent of the population lives in hamlets with less than 500 people and many are in difficult to reach hilly areas.

Uttarakhand's literacy rate, at 79.63 percent, is one of the highest in the country. There are significant inter-district variations in literacy rates. The overall sex ratio, according to the 2011 census, is 963 females for every 1,000 males (see Table 1)[9].

Table 1: Anthropo-geographical profile of the Uttrakhand State

Background Characteristics	Number and/or Percentage
Geographic Area (in sq. Kms)	53,484 sq. Kms
Number of divisions	02
Number of districts	13
Number of Blocks	95
Size of villages (2011 Census) Number of Villages 1 – 5000 people/ village 5001 – 2,000 people/ village 2001 – 5000 people/ village	16,826 13,460 (80%) 2,679 (17%) 426 (3.2%)
Number of towns	31
Total Populations Urban population Rural population	1,01,16752 (1.01 Crore) 3,091,169 (30.55%) 7,025583 (69.45%)
Sex Ratio F/M* 1000 Population sex ratio Child sex ratio	963 886
Decadal Growth	19.17
Density of people/ Sq. Kms	189
Literacy Male Female	79.63% 88.83% 70.70%
Decadal population growth Urban Rural	41.86% 11.34%

Source: National Census Report, 2011; State chapter

Trends of Communicable diseases

Uttarakhand is undergoing an epidemiologic, demographic and health transition. The expectancy of life has increased, with consequent rise in degenerative diseases of aging and life-styles diseases such as hypertension, diabetes, stroke and other cardiovascular ailments. There had been considerable improvement in controlling the communicable diseases over the years. Polio and leprosy are nearly elimination and diseases like neonatal tetanus, measles shown the decreasing trends in the state. Nevertheless, communicable diseases are still dominant and constitute major public health issues of the state. Tuberculosis (TB) poses a major challenge in the state; the prevalence of TB is estimated to be 170/100,000 population in Uttarakhand[10] while average prevalence at the national level, it is 168/100,000 population.[11] Malaria in the state as a whole has been on the decline yet two districts Hardwar and Udham Singh Nagar are highly vulnerable and account for 79 percent of the total state malaria cases. Uttarakhand is considered as a low endemic state for leprosy (0.28/10,000 population in March 2012)[12], but the disease is more prevalent in Hardwar and Udham Singh Nagar. About 6.17% patients reported with skin problems out of all the patients visited to a medical college in Kumaun region of the state during 5 years of period, where skin diseases i.e. Eczemas predominant followed by fungal infection, while particularly scabies is considered the problem in all areas of the state[13].

The seasonal surge in communicable diseases such as gastroenteritis, typhoid and different type of hepatitis are due to unhygienic practices and unavailability of safe drinking water. One third of currently married women suffer from reproductive tract infection (RTISs) and 19 percent from urinary tract infections.[9] Uttarakhand has very low prevalence of HIV/AIDS (0.1%)[14] but has all the conditions that could rapidly spread the disease to epidemic proportions. The recent-re-emergence of the

plague and H1N1 influenza virus in Uttarakhand may be sporadic event, but it emphasizes the need to have an effective surveillance and supportive healthcare delivery system. Thus state is still vulnerable for communicable diseases. The table 2 is presenting an overview of the trends of different communicable diseases over last few years in Uttarakhand state.

Tuberculosis: Amongst the communicable disease, Tuberculosis (TB) poses a major challenge in the state. In years 2002 Ministry of Health and Family welfare reported the estimated prevalence to be 1,225/100,000 population in Uttarakhand while at the national level, it is 544/100,000 population[9]. Inspite of complete state covered under Revised National TB Control Program (RNTCP) with 30 tuberculosis units and 140 designated microscopic units; even today the overall prevalence of TB in the state is higher then to national prevalence (170/lakh population[10] vs. 168/ lakh population[11]). TB cases in the state are uniformly distributed across all districts, however, Dehradun (237/lakh population), Nainital (206/lakh population), Uttarkashi (192/lakh population), Almora (191/lakh population), Udham Singh Nagar (177/lakh population) and Rudhraprayag (175/ lakh population) are having higher prevalence than other districts. On the other hand, Pithoragarh (113/lakh population), Chamoli (112/lakh population) and Tehri Garhwal (109/lakh population) had lower prevalence of TB cases, even less then the reported national prevalence of TB[10]. A case series reported that majority of patients (64.3%) had pulmonary tuberculosis and rest 35.7% had extra-pulmonary tuberculosis[15]. The increasing trend of HIV seropositivity in tuberculosis patients was reported in the state[15,16]. Further, despite admittedly successful implementation of DOTS strategy in state, MDRTB has emerged as a major public health concern.[16] The increasing trend of MDR-TB could be because of increasing trend HIV sero-positivity among TB patients or inappropriate and inadequate treatment of these patient by the primary physicians/ poor drug compliance. However, at the policy level State has effectively moved towards rolling out DOTS-Plus plan for the control of MDR-TB, which besides being more difficult is also more expensive to treat. The incidence of tubercular mastitis is not uncommon in the sate, however it is generally underreported because unspecific clinical presentation and lack of cyto-histo-pathological diagnostic facilities in remote areas[17].

Malaria: Uttarakhand, the hilly state of India, falls under hypo endemic zone of malaria[18]. Nine anopheles species are reported to cause malaria in Kumaon region[19],while three species are reported dominant to be the vector for malaria in Garhwal region[20]. Saini et al (2010)[21] reported 14% positivity for malarial parasite among suspected fever patients and out of them 30% patients were infested by *P. falciparum* while rest 70% patients were infested by *P. vivax*. It was further reported that about 85% of malarial patients belonged to Below Poverty Line (BPL) and residents of slum area. It indicates that socio-economic conditions play a major role in occurrence of this disease. The month of August and September were found to significantly associated with increased reporting of malaria cases[22]. Plasmodium vivax in considered as most fatal malarial infestation; Srivastava et al. (2011)[23] reported *P vivax* as a predominant type of malarial (67.6%), in a single tertiary care hospital at Dehradum, Uttarakhand, where the complicated malaria was diagnosed in 41/50 cases, with thrombocytopenia being the commonest manifestation.

Some regions like Kichha, Nainital reported a very high incidence of malaria as high as 95% than reported high in 1983. As per the reports of the Department of Health and Family Welfare, Government of Uttarakhand[9] malaria in the state as a whole has been on the decline yet two districts Hardwar and Udham Singh Nagar are highly vulnerable and account for 79 percent of the total state malaria cases.

Leprosy: Leprosy has been eliminated as a public health problem in Uttarakhand State. Prevalence rate of leprosy has decreased from 1.90 per 10,000 populations in 2003-04 to 0.28 per 10,000 populations in 2012-13,[12] significantly lower then national average prevalence rate of leprosy (0.69/10,000 populations)[25] but the disease is more prevalent in Hardwar and Udham Singh Nagar.

HIV/AIDS: National level HIV/AIDS is showing declining trends, however, Uttrakhand has shown rising trends in HIV epidemic, warranting a focused prevention efforts in these areas. Reported prevalence rate of HIV in Uttarakahnd[14] had steep increase from 0% in 2007 to 0.1% in 2010 but still lower than the average national prevalence rate (0.31%)[25]. Furthermore, the prevalence rate was found significantly higher in males (0.12%) as compared to females (0.08%) in state. A case study from the state reported 0.56% HIV seropositivity among antenatal women[26]. Ministry of Health and Family Welfare, Government of India has categorized Uttarakhand sate as high HIV vulnerable state. The index

of vulnerability is based on extent of migration, size of population, and poor health infrastructure. State such as Bihar, Rajasthan, MP, UP, Chhatisgarh, Jharkhand, Odisha, and Assam also come under this category[25].

Viral hepatitis: Viral hepatitis is one of the deadly communicable disease especially Hepatitis-C, which did not have preventive vaccination. Though there is scarcity of relevant literature to estimate the exact prevalence of different viral hepatitis infection in general population of state, however, 10.2% patient undergoing haemodialysis were reported positive for HBsAg, 16.1% for anti-HCV and 4.2% were anti-HDV antibodies[27]. More then half of the patients (52.82%) suffering with Chronic Liver Disease were found to be infected with hepatitis-A virus. The frequency of HAV positivity was observed higher in Uttarkashi and Chamoli district and lesser in Rudra Prayag and Tehri Garhwal[28]. This high reported rate of viral infection in selected group of patient is

signifying the immediate need to look seriously about this infection. This could be related with above stated high vulnerability of the state for diseases like HIV.

STDs/RTDs: About one third of currently married women in state suffer from reproductive tract infection (RTISs) and 19 percent from urinary tract infections (UTI)[9]. A recent case series from the state reported 8.8% prevalence of sexually Transmitted Disease (STDs, which was higher among females (12.9%) as compared to males (4.6%). Furthermore, they reported higher prevalence of was observed among young and illiterates[29]. Another case report revealed bacterial vaginosis (40.4%) and vaginal candidiasis (10%) as common RTI among women visited with gynecological clinic and UTI was reported among 1.8% women[30]. Table 3 presents the comparison of prevalence of communicable diseases viz-a-viz with the prevalence of these communicable diseases in India.

Table 2: Trends of communicable morbidity in Uttarakhand State

Type of Morbidity	Uttarakhand			
	2005	2007	2008	2010
Malaria	1242	953	1059	1599
Kala Azar	00	02	00	01
Japanese Encephalitis	---	---	---	07
Dengue	---	---	---	21
Typhoid	4515	10447	---	16489
Acute Respiratory Infection	75511	240038	242800	132998
Neonatal Tetanus	00	00	10	00
Other Tetanus	23	21	15	05
Diphtheria	215	00	00	04
Whooping cough	78	294	112	621
Measles	279	299	304	907
Viral Hepatitis	884	2250	1146	20132
Polio	---	---	---	00
Pneumonia	---	---	---	15188
Meningococcal Meningitis	---	65	76	48
Syphilis	---	20	226	126
Gonococcal infections	---	875	538	338
Tuberculosis				8358
Influenza H1N1	---	---	NA	23
Prevalence of HIV (%)@	00	00	0.08	0.10
Prevalence of Leprosy/10,000 population	---	---	---	0.38

Source: CBHI reports on National Health Profile @: Source: http://pib.nic.in/newsite/PrintRelease.aspx?relid=67292
Doted blank columns represents non-availability of data

Table 3: Comparison of trends of communicable disease in Uttarakhand viz-a-viz India

Communicable Diseases	Uttarakhand	India
Tuberculosis	170/lakh population[10]	168/lakh population[11]
Leprosy	0.28/10,000 population[12]	0.67/10,000 population[25]
HIV/AIDS	0.1%[14]	0.31%[25]
STDs/RTDs	1/3rd married women STDs and 19% UTI[9]	-----
Malaria	Decreasing trend with isolated outbreaks[9]	Decreasing trend with isolated outbreaks[25]
Viral Hepatitis (Hepatitis-C)	As high as 5-15% in high risk groups[26]	0.75-5.2% in blood donors

Source: National and State level health reports and pilot research studies.

Trends of Non-communicable diseases

Non-communicable Diseases (NCDs) account for nearly half of all deaths in India. Cardiovascular Diseases (CVD), Cancer, Diabetes, Chronic Obstructive Lung Disease (COPD), Mental Disorders and Injuries are main causes of death and disability due to NCDs. Unless interventions are made to prevent and control NCDs, their burden is likely to increase substantially in future. Considering the high cost of medicines and longer duration of treatment NCDs constitute a greater financial burden to low income groups.

While socioeconomic development tends to be associated with healthy behaviours, rapidly improving socioeconomic status in India is associated with a reduction of physical activity and increased rates of obesity and diabetes. A recent Non-communicable disease risk factors survey in Uttarakhand by Ministry of Health & Family Welfare, Government of India (2007-2008)[7] under Integrated Disease Surveillance Project (IDSP) found that there are significant unhealthy life-style trend in people of state such as smokers (20%), tobacco chewing (12%), other form of tobacco use (27%), binge alcohol drinking (52%), low level of physical activity (67%), over weight (14%) and central obesity (18%), consumption of fruits and vegetables lesser than recommended (five servings per day) (89%). Increased consumption of tobacco and alcohol and reduced physical activity, overweight/ obesity and less then recommended consumption of fruits may be the significant determinants for occurrence of NCDs in the state.

A recent largest survey conducted by the Ministry of Health Family Welfare, Government of India revealed that over 8% people in Uttarakahnd are suspected to have high blood pressure and 5.7% are diabetic[8]. Table 5 illustrates the reported prevalence of hypertension and diabetes in State.

Hypertension: Pooling of epidemiological studies shows that hypertension is present in 25% urban and 10% rural subjects in India[31]. Ministry of Health and Family Welfare in their Non-communicable disease risk factors survey-2007-2008 reported[32] overall 4.4% prevalence of diagnosed hypertension in state. Urban population has higher prevalence of hypertension (7.5%) as compared to their rural counterparts (3.2%). Furthermore urban (9.6%) and rural (3.2%) women were having higher prevalence of hypertension than their man counterparts. Surprisingly majority of these hypertensive patients are taking the treatment from AYUSH practitioners (81.0%). In the time span of 5 years this disease nearly doubled in the state, it is estimated that now over 8% people in Uttarakahnd are suspected to be hypertensive[8].

Surprisingly a study reported as high as 30.9% males and 27.8% females as hypertensive in selected villages of district Dehradun. Furthermore, this study found that increasing age and higher body mass index (BMI) were independent predictors of hypertension in both sexes, with psychosocial stress an additional independent predictor in males[33]. Another study also reported similar findings in rural people of district Dehradum, where the overall prevalence of hypertension and pre-hypertension was 33.2% and 40.6% respectively. The prevalence of

hypertension among females was higher (34.2%) than in males (32.4%) in this study[34].

Elevated level of blood pressure is a major risk factor for cardiovascular diseases. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India[25]. About 16% of ischaemic heart disease in the country is attributable of hypertension. 21% of peripheral vascular diseases and 24% of acute myocardial infraction cases could be attributed of elevated hypertension. The population attributable risk due to hypertension was found to be 29% for stroke[35].

Cardio-vascular diseases and stroke: Cardiovascular Diseases (CVD) denotes a mix of conditions that includes acute myocardial infarction, angina pectoris, congestive heart failure, inflammatory heart disease and cerebrovascular diseases (stroke). As of 2004, of the NCDs, cardiovascular diseases account for one fifth (22%) of the NCD burden in India. The pooled estimates of prevalence rates for urban and rural areas were found to be 6.4% and 2.5% respectively in India[36].

Several well designed studies indicate a reversal of socio economic gradient for cardiovascular disease (which is a major contributor to NCD's) and its risk factors.[37] The poorer sections of the society, the less educated and the rural population have high prevalence of smoking and in certain settings such as worksites, high prevalence of diabetes and high blood pressure are seen among less educated groups. While self reported surveys such as National Family Health Survey-3 (NHFS-3) suggest that it is the rich who have high prevalence of risk factors, well designed studies show the risk for heart attack is higher (more than twice) among the uneducated, under-educated and the poor. The differences observed between NFHS-3 and comprehensive surveys are largely due to low risk factor awareness and control among the less educated and poor.[38] Though there is lack of relevant literature to estimate the exact disease burden of cardio-vascular diseases and stroke in Uttarkhand State, however, it is fact that there is reversal of socio-economic gradient for these diseases and its factors; Uttarakhand is a state where there are more then 57% people are residing below the poverty line and some of the districts of the state such as Champawat, Haridwar, Tehri Garhwal, Udham Singh Nagar, and Uttarkashi has the literacy rate below the state average. This may place the state in the category of vulnerability to acquire this category of diseases[6].

Diabetes: International Diabetic Federation estimates the India is presently home of a whooping 63 million diabetics. The national average prevalence of diabetes is estimated to be 7%. Presently Uttarakand state has prevalence of diabetes as high as 5.7%[8], which was only 1.2% in a ICMR survey (2008)[28]. A recent survey reported 11% prevalence diabetes mellitus in selected areas of Hardwar district of the state[39]. Increase in the prevalence of diabetes has also been reported among the marginalized and the poor. Urban locations have been observing a reversal of socio economic trends with the burden of disease increasing among the poor[40].

Cancer: Over 70 percent of cases are diagnosed during the advanced stages of the disease, resulting in poor survival and high case mortality rates[41]. Tobacco use is the major cause of cancer for both lung and oral cavity diseases.[42] A national survey reports significant higher number of smokers (20%), tobacco chewing (12%), other form of tobacco use (27%) in Uttarakhand state[31]. In Nainital and adjoining area the leading type cancer in man is tobacco use related cancer i.e. lungs (26.21%), larynx (11.16%), oropharynx (9.7%), oral cavity (6.79%), and esophagus (6.79%). Women suffered mainly with breast cancer (22.29%) followed by cervical (14.86%) and ovarian cancers (13.51%) in this region of the state[43].

Chronic Obstructive Pulmonary Disease (COPD): Prevalence among men is in a range of 2–9 percent in north India and 1–4 percent in south India. Among men, tobacco smoke is the major cause of COPD, while smoke from indoor combustion of solid fuels is the major cause for women[44]. The state has significant numbers of dwellers as tobacco users (59%) which may impose a higher of vulnerability COPD. Prevalence of Asthma is reported as high as 631 males/ Lakh population and 469 females/ Lakh population in the state[45].

Injuries: Road traffic injuries and deaths are on the increase along with the rapid economic growth. Annually, they result in more than 100,000 deaths, 2 million hospitalizations, and 7.7 million minor injuries[46]. Uttarakhand being a hilly state had higher prevalence of road traffic accidents and injuries i.e. 14.5 accidents/ Lakh population[47] .Being the hilly area these road traffic accidents results in more serious injuries and traumatic morbidity.

Table 5: Reported Prevalence Non-Communicable morbidities in Uttarakhand

Non-communicable diseases	Reported Prevalence in Percentage
Hypertension	
MHFW-NCD Risk Survey (2008)[28]	4.4
MHFW-NPCDCS Survey-2010[8]	>8
Bansal et al. (2012)[30] (Rural pilot study)	29.35
Pooja and Yashoda (2013)[31] (Rural pilot study)	40.6
Diabetes	
MHFW-NPCDCS Survey-2010[8]	5.7
ICMR (2008)[28]	1.2

Conclusion:

This hilly, geographically diverse state is having higher prevalence of some of the communicable morbidities such as TB (170/Lakh population) and malaria (14% of all fever cases) and vulnerability for HIV/AIDS. Because of negative life style practices there are increasing trend in prevalence of non-communicable morbidities; presently over 8% people in Uttarakahnd are hypertensive and 5.7% are diabetic. Therefore, a sound healthcare infrastructure is required to meet healthcare needs of the people in state.

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