

# Current health status of Uttarakhand, Tharu TRIBE on the basis of blood clinical parameters: a bio-cultural perspective

## Abstract

The research paper is an outcome of the fieldwork conducted in a small village of Sitarganj block; district UdhamSingh Nagar (Uttarakhand) among Tharu tribal community. The Tharu Tribe is indigenous people living in Tarai plain on the border of India and Nepal. The Tharu tribe is one of the most populous tribes of India and mostly populations (approximately 80%) of India are living in Khatima and Sitarganj tehsil of UdhamSingh Nagar district (Uttarakhand). Tharu is recognised as a scheduled tribe by the Government of India. The aim of this study to see the health status of Tharu population on the basis of blood parameters i.e. RBC, WBC, Hemoglobin (Hb), Platelet, Hematocrit, MCV, Rh factors etc and find out the factors affecting their health.

Most of the populations were found to be suffering from Anaemia and Malnutrition. The percentage of Anaemia is more in women compared to men in Tharu population. These results indicate a lack of health awareness on healthy lifestyle and also they have no any idea about healthy nutritious diet etc. They are inadequate to take nutritious substances (vitamins, proteins, minerals etc) because health status of this community is directly proportional to economic (financial) and Socio-cultural conditions of these peoples.

Therefore the present study provides important data, to the government and other agencies so is to control health problem of Tharu tribes in Sitarganj block, UdhamSingh Nagar District in Uttarakhand, India. This step will be helpful for improve their health status and development. This study also helpful to apply on other tribes community present in India and another part of the world.

**Keywords:** tharu tribe, health, haemoglobin, anaemia, vitamins, proteins, minerals

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Ankita Rajpoot,<sup>1</sup> Ved Prakash Kumar,<sup>2</sup> Jokhan Sharma,<sup>3</sup>

<sup>1</sup>Zoological Survey of India, India

<sup>2</sup>Wildlife Institute of India, India

<sup>3</sup>Central University of Orissa, India

**Correspondence:** Ankita Rajpoot, Molecular Systematic Laboratory, Zoological Survey of India NRC, Dehradun 248195, Uttarakhand, India, Tel +91-135-2640112-117, Email anku050988@gmail.com

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**Abbreviations:** HDI, human development index; UNDP, united nations development programme; WHO, world health organisation; Hb, haemoglobin; RBC, red blood cells; WBC, white blood cells; CBC, complete blood count; PCV, packed cell volume

## Introduction

The health is one of the major factors to development of human community. The United Nations Development Programme (UNDP) of Human Development Index (HDI) and World Health organisation (WHO) comprises three components i.e. health, education, and income-generating capacity for the development of a community.<sup>1-3</sup> Most of the tribal societies have definite means for identifying and classifying various kinds of ailments and diseases.<sup>4</sup> Health development can be integrated with the larger program of overall development in such a manner that the two become mutually self-supporting. India is the house of different tribe communities. In India mostly tribe communities living in western and eastern part and day wise day Indian governments launch different types of programs and schemes for their protection and development.

## Health status of tharu tribe in India

The health status of the tribal people throughout the country is very poor. Different studies<sup>4-6</sup> have tried to establish this with the help

of morbidity, mortality and health statistics. The health problem of the tribal peoples of India depends upon the socio-economic, socio-cultural and ecological factors.<sup>5,7</sup> Malnutrition is common among them which affect the general physique of them. They try to prevent and protect their health with the help of Ojha-Guni, Jhar -fook and traditional medicine man. In an acute situation, some well established family go to hospital to consult the doctor and taking proper treatment. However, their attitude towards modern medical care is not encouraging.

## Ethnography of tharu tribes

Tharu tribal community is the earliest and biggest endogenous group, surviving in dense forest village of Himalayan region. History of Tharu tribes are very complex, few literature suggest that the Tharu belong to Rajpoot cast and there ancestor lived in western part of India.<sup>8</sup> Although, Anthropologist and Sociologist have different opinion about history of Tharu tribes and described, that Tharu tribes belong to Mongoloid race based on blood group and facial appearance,<sup>9</sup> for this fact they cannot be joint to the Rajputs cast.<sup>10</sup>

Globally most of Tharu peoples living in Himalayan terai part of India and Nepal.<sup>11</sup> More number of Tharu population (approximately 80%) of India are living in western part i.e. Khatima and Sitarganj tehsil of Udham Singh Nagar in Uttarakhand and small population

living in Kheri, Pilibhit, Gorakhpur, Bahirayach of Uttar Pradesh and Champaran District of Bihar.<sup>12</sup> The Tharu are accepted as a scheduled tribe by the Government of India due to their poor status and so they avail all facility given by Constitution of India.

### Family and marriage system

Tharu marriages are monogamous, therefore the elder persons of family arrange the marriage within the group except for some exogamous ‘Gotra’ unit. In past they practiced child marriage but presently marriage age is increased due to social awareness. Tharu is paternal arranged family system, nevertheless women have a good status and play important role in socio-economic structure of her society.

### Religious status and economical status

They adoration their own Goddess called as Bhuiyan but although they also believe in other Hindu God and Goddess. Economically they are mostly dependent on farming and timber business.<sup>13</sup> The main production is rice, gram, and wheat. They have engaged in hunting and fishing also. Hunted animals are chital, pig etc. and catch fish with chhaparia (a basket made of made of sticks of bamboo). In studies area, most of Tharu people are small farmers and daily wages labour.

### Food Habit

Traditionally the Tharu people are Non-vegetarians and they mostly prefer curry fish and rice in their food, and so they also used green vegetables, milk product, roti, mutton and chicken etc.

## Materials and method

The present study was conducted among a small village of Tharu tribal community of Sirtaganj Block, Uttarakhand. Human health and status profile depend on different physiological parameters but not all of them are equally important and informative. Although some

physical parameters are really helpful to find out the health profile of individuals (Height, weight, blood pressure and blood parameters), but in present study we only use blood profile data. On the basis of haemoglobin (Hb) value and a complete blood count (CBC), we find important information with regarding of their diseases, nutrition, and awareness of health. In CBC, we examine about blood cells which are necessary to maintain our blood circulation system. Red blood cells (RBC), white blood cells (WBC), platelets, HCT (Hematocrit) and PCV (packed cell volume) are major parameters including in CBCs for blood analysis. Nevertheless, data was also collected about their literacy, ritual social status, and physiological condition (i.e. Age, Sex etc) through the using structured Scheduled, Observation, and unstructured interview. Random blood samples were collected from 108 Tharu individuals (67Females and 41Males) following proper ethical guidelines and to taking written consents from individuals. Blood samples were stored in K2 EDTA vacutainers (6 ml) and samples were processed in Medonic M-Series cell counter for examining to different parameters of blood cell counting.

## Results

In this study, we included some parameters such as; Hb concentration, RBC count, WBC count, HCT (Hematocrit) and PCV (packed cell volume) to find out the current health status of Tharu tribes in Sitarganj Block (Uttarakhand), India.

### Haemoglobin (Hb) concentration

The Hb level is expressed as the amount of Hb in grams per deciliter (dL) of whole blood. If the Hb% is low it is the symptom of Anaemia which may occur by different causes. In the present study, we examine the blood samples of 108 individuals (67Females and 41Males) in which 61Females and 9Males individuals are found low Hb. Mainly 91% females and 22% males are suffering from blood haemoglobin deficiency (Table 1A).

**Table 1** Different parameters of blood among Tharu population (n=108)

**Table A**

Parameter	Normal Range	Male			Female		
		Above	Below	Normal	Above	Below	Normal
RBC (10 <sup>12</sup> /L)	3.50-5.50	7%	3%	90%	1%	15%	84%
WBC (10 <sup>9</sup> /L)	3.5-10.0	5%	5%	90%	6%	-	94%
Haemoglobin	11.5-16.5	2%	22%	76%	-	91%	9%

### Density of different blood groups

Blood group B was found to be more frequent in the Tharu population in the comparison of blood group A, AB, and O. The majority (93%) of Tharu population was found to be Rh+Blood group. Only a few individuals have Rh-blood group (Table 2).

### Density of genes for ABO blood group among Tharus

The density of allele IB was found to be greater (57%) pursue by alleles IO(29%) and IA(14%) respectively (Table 3).

### CBC profile

CBC profile is the one of the important blood profile where we get the information regarding variety and numbers of cells present in blood e.g. platelets, red blood cell and white blood cell.

**RBC number:** In the present study, the RBC number was found to be normal in nearly 84% females and 90% in males. In reaming 15% females and 7% male individual RBC number was found to be low (i.e. Anaemia). Apart from this we observed rest 3% male and 1% female individuals were polycythemic (number of RBC increases) (Table 1A).

**WBC, leukocyte number:** The WBC of nearly 90% males and 94% females were found to be in normal reference range (3.5-10.0×10<sup>9</sup>). Surprisingly 2males and 4females individual were found to be suffering from leucocytosis (WBC number increases after standard value) (Table 1A).

**HCT and PCV values:** HCT and PCV define the volume of RBC in the blood. Approximately 97% of Tharu individual were reported with the low Hematocrit value (below normal), while only 3% individual is found to be in normal range (Table 1B).

**Table B**

Parameter	Normal range	Below	Normal	Above
Platelet (109/L)	100-400	19% pop	79%	2%
Hematocrit (%)	35-55	97%	3%	-
Mean corpuscular volume (MCV)	75-100	95%	5%	-

**Table 2** Frequency of different blood groups among Tharu population (n=108)

Blood group	Frequencies
A	17
B	48
AB	12
O	31
Rh+	97

**Table 3** Distribution of gene frequencies for ABO blood group in Tharus population (n=108)

Allele	Gene Frequency (%)
IA	p-14%
IB	q-57%
IO	r-29%

## Discussion and conclusion

RBCs, also known as erythrocytes, play an essential role in the circulation and metabolism of tissue. They contain haemoglobin, which transports oxygen from the heart to lungs and removed carbon dioxide from tissues. RBC count was found to be low is related to Anaemia where the transport of oxygen in body is low according to their needs. In polycythemia condition (the RBC value too high) there is a possibility that the RBC block blood capillaries due to clumping. WBC is responsible for immune system and plays a major role in developing immunity in our body cells through kill the bacteria, virus, or other organisms which are causing infection in our body. The number of white cells increases very quickly due to infection. The number of WBC is an indicator to diagnose infection.

Most of people in world particularly in developing country, Anaemia is a major public health problem.<sup>14</sup> The finding of present study showing that the most of individual of studied area present in Sitarganj in Uttarakhand, India is suffering from Anaemia. As we discussed above, Anaemia is a disease where the Hb or RBC number is less than normal, usually different in males and females. In women, if Hb level is less than 11 grams/100 ml blood, while in male, if the Hb level less than 12gram/100ml blood people suffer with Anaemia .

**Platelet number:** Platelet is the one of the major components of the blood that helpful in blood clotting. In present study, 21% individuals were low, 2% individuals were high and 85% were found in normal platelet value within entire population (Table 1B).

**MCV value:** MCV used for measures the RBC size in blood. In the present study, 95% entire individuals were suffering from microcytic Anaemia (MCV below normal range). The most common cause of microcytic Anaemia is the iron deficiency (Table 1B).

A low value of Hematocrit may be due to blood loss, Anaemia and nutritional deficiency. MCV represent average volume and size of RBCs in blood. If the value of MCV is lower from normal level the RBC size is small (i.e. microcytic RBC)<sup>15,16</sup> and it occur due to the insufficient Hb synthesis.<sup>17</sup> Infection and inflammation are another reason responsible for Anaemia due to their effects on the bone marrow.<sup>18,19</sup> Iron and folic acid deficiency in diet inhibit RBC synthesis, including, may create nutritional Anaemia.<sup>20-22</sup> The ratio of MCV to RBCs, also known as Mentzer’s Index, indicates Anaemia. Increased Mentzer index (greater than 13) indicates that Anaemia is due to iron deficiency.<sup>23,24</sup> In few previous studies described, Hb concentration also depends on a number of physiological (e.g. sex and age)<sup>25,26</sup> and environmental factors (changes in altitude).<sup>27,28</sup> Alcoholism, smoking habits,<sup>29</sup> Vitamin ‘A’ deficiency<sup>30</sup> and inflammation due to infection<sup>31,32</sup> are also increased the chance of low Hb concentration. In current Tharu population, mostly women are suffering from Anaemia due to iron deficiency in their dietary intake. Heavy menstruation and jaundice are also other factors to loss of iron and RBC in females. There are many social factors which are correlated with the present situation of Tharu women’s such as marriage in young age, early pregnancy, lack of knowledge (family planning), illiteracy, poverty etc.

Tharu tribal groups are highly diseased prone. In present survey most of the individuals belong to a lower class family and completely lack of education or awareness for their health, therefore we suggest some special schemes of development should be launch by different organizations. Major steps should be taken to improve the health and nutritional status of Tharu communities. Women and child development programs should be implemented on the adolescent girl from below poverty line families. Therefore the present study provides important data and valuable suggestions, to the government and other agencies so is to control this problem in future in India. This step will be helpful for their development and their health status.

## Suggestion

Since most of the health programs in the state are a centrally sponsored program, better monitoring and evaluation strategies are needed in order to ensure proper implementation and access to people.

There are some following specific intervention strategies steps to be used for the advancement of health among the Tharu people:

- i. Appoint qualified doctors from tribal communities to serve tribal areas and Develop area-specific strategies to improve access to and utilization of health services.
- ii. To create awareness for regular medical checkups to ensure prevention and early detection of the disease.
- iii. Awareness and preventing program about nutrition and health related issues in self-help groups, schools and in the community on the regular basis.
- iv. Spreading awareness through information dissemination by preparing booklets (containing the big picture with small texts), audio-video cassettes and conducting street play show on health and nutritional related issues.
- v. Training of local Tharu women leaders in disease prevention, and referral services.
- vi. It is necessary to set up subsidized health care for the elderly with special units in hospitals with free or highly subsidized medicines.
- vii. The preventive approach like immunization, anti-infection measures, and various other prophylactic aspects should be given more importance.
- viii. Providing social and economic incentives and support for combating the common prevalent communicable and non-communicable diseases in the tribal community through government and non-government organization (NGOs).

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## Conflict of interest

The author declares no conflict of interest.

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