

# Patterns of Nutritional Deficiency Diseases Among the Rural Population of Jalgaon District (M.S.)

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## ARTICLE DETAILS

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## ABSTRACT

The disease may be defined as a disorder in a human body caused by infection, diet or by faulty functioning of a process. Deficiency diseases are infected due to deficiency of nutrients. Nutritional deficiency is mainly due to the poor economic condition, illiteracy, lack of sufficient food and negligence about health. The present study deals with the distribution of deficiency diseases in the rural area of the study region. The data regarding the number of cases reported for various deficiency diseases during the reference period has been collected from all PHC regions of the district. The collected data has been analyzed to decide the intensity rate and morbidity index with the help of appropriate statistical methods. The study clearly reveals that major group of the rural population in the district is deficit in various nutrients and fall pray to the nutritional diseases.

## 1. Introduction

There have been many attempts to define disease. Webster defines disease as "a condition in which body health is impaired, a departure from a state of health, an alteration of the human body interrupting the performance vital functions". The nutritional deficiency problem may be considered as the applied aspect of geographical research and it would be immense help in health planning in any geographical region (Alizad, 2005). Nutritional deficiency diseases may cause due to the partial or complex absence of one or more nutrients in the diet of the person. Nutritional deficiency is the major concern among the population of all groups. An individual's nutritional status is dependent on the provision of sufficient nutrient substances and the good utilization of these nutrients. Poor status of nutrition may be caused by eating inadequate amount of food both in terms of quality and quantity and due to failures in digestion and the utilization of these nutrients (Mayer, 2007). Nutrition does make a difference. Due to the lack of sufficient intake of nutrients the metabolic process is disordered and deteriorates the resistant power of the body.

Malnourished children fail to grow at normal rate while work efficiency of an adult reduces due to the poor food habits.

## 2. Objectives

The objectives of the present study are...

1. To analyze the patterns of nutritional diseases.
2. To find out the morbidity cases in the study region.

## 3. Data and Methodology

The present study is mainly based on secondary data. For the analysis of spatial distribution of deficiency diseases, data has been collected from all seventy-seven primary health centers (PHC) located in the different tehsils of the district for the reference period 2011-12. The data regarding population of the study region has been obtained from census 2011.

To show the tehsil wise spatial patterns of nutritional diseases intensity rate has been calculated. Disease intensity rate has been calculated as number of patients/100000 population.

$$\text{Intensity Rate} = \frac{\text{No. of Patients Reported for a Disease in tehsil}}{\text{Total Population of tehsil}} \times 100000$$

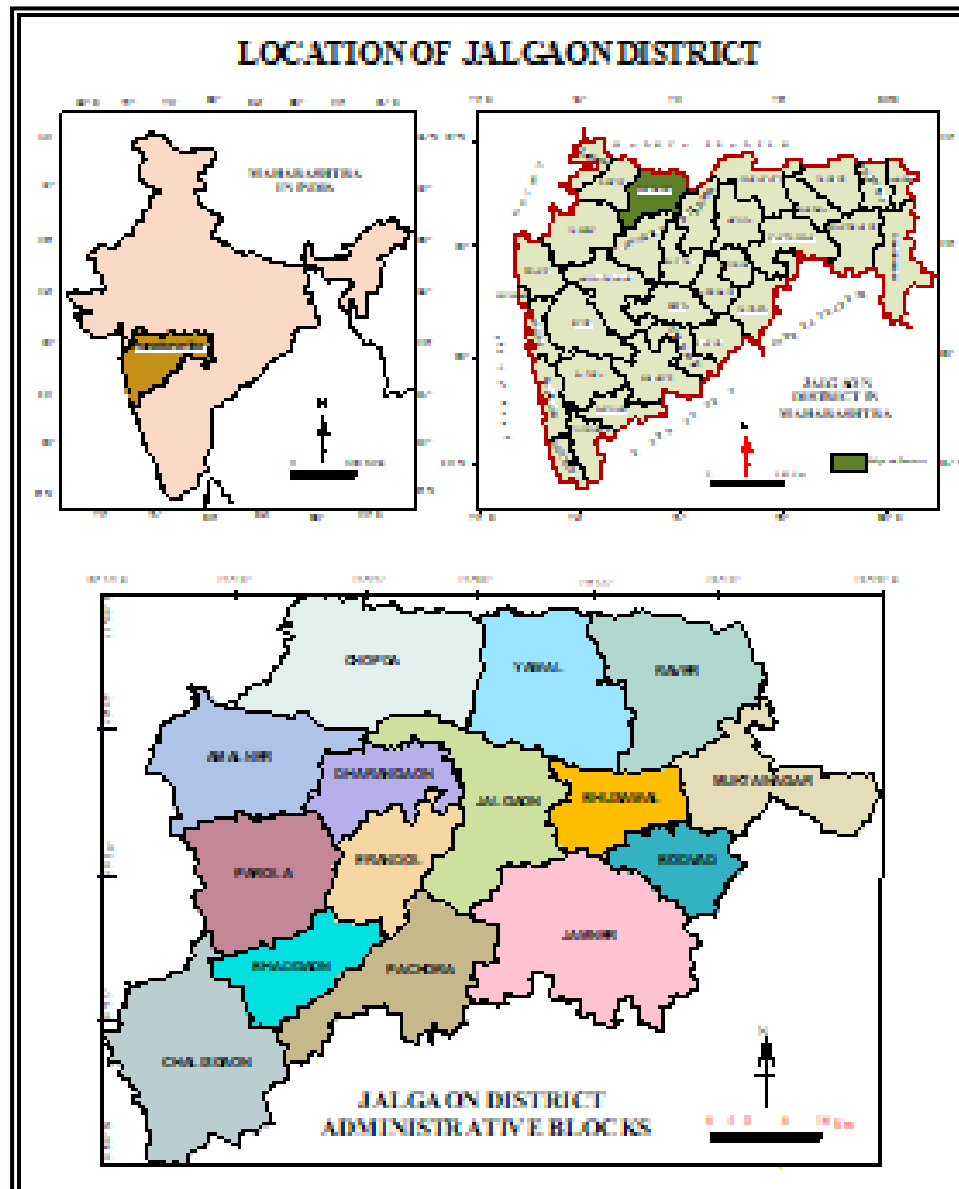
To know the incidence of number of expected ill health persons due to nutritional deficiency in a tehsil Morbidity Index has been calculated using the following equation.

$$MI = \frac{OC}{EC} \times 100$$

Where, MI = Morbidity Index, OC = Observed Cases, EC = Expected Cases

Morbidity refers to the state of being diseased or unhealthy within a population due to affect of disease, an injury or disability. The morbidity index may be expressed as the ratio between number of cases reported in an area to the number of expected cases. The expected cases are assumed to be in proportion to the ratio between total reported cases of a particular disease and population of the region.

#### 4. Study Area



Map No. 1

The Jalgaon district, which is one of the 36 districts of Maharashtra lies between  $20^{\circ}$  N and  $21^{\circ}$  N latitudes and  $74^{\circ} 55'$  E and  $76^{\circ} 28'$  E longitudes (Map No. 1) is selected as a study area. Geographically, this region is unique not only in terms of relief, social, economic and culture but also diet customs and food habits. The total area of the district is 11639 sq. km. As per 2011 Census data, the total population of district is 42, 29,917 persons including 21, 97,365 males and 20, 32,552 females. The district comprises 15 tehsils and 1519 villages. The study region is bounded by the Satpuda upland in the north and Ajanta hills and Chalisgaon plateau in the south. In between these physiographic units, valley basins of Tapi, Girna, Purna, Waghur, Bori and residual hills are significant. Piedmont plain stretches east-west direction which is inhabited by scheduled tribe population while piedmont plain area is inhabited by rich cultivators. Tapi is the main river flowing from the east west direction in the district

#### 5. Discussion

Though the data has been collected at PHC level of actual reported cases, it is not true indicator of level of disease incidence. Therefore, disease intensity rate has been calculated for all nutritional deficiency diseases reported at tehsil level. To identify the spatial patterns of the deficiency diseases intensity rate of the particular disease at tehsil level has been calculated (Table 1).

##### **Spatial Pattern of Anaemia:**

Due to iron deficiency in the body it could be a case of anaemia. Anaemia ranks first among all the nutritional deficiency diseases reported to the PHCs. During the reference period total 22848 cases of anaemia were reported at the PHCs of the district. Average intensity rate of anaemia for all tehsils in the study region is recorded 788 cases per 100000 population. Highest intensity rate among the tehsils is observed in Chalisgaon (1503.43 cases per 100000 population) followed by Jalgaon (1434.11), Parola (1218.98), Muktainager (1078.4) tehsil.

Morbidity index is being calculated for the true presentation of spatial distribution of disease. It is found that highest morbidity index (302.76) is observed in Chalisgaon tehsil. In five tehsils namely Raver, Jalgaon, Parola, Pachora and Jamner having morbidity index for anaemia is more than 100 persons. In remaining tehsils morbidity index is less than 100 persons. Lowest morbidity index is recorded in Dharangaon tehsil (4.00) of the district.

#### **Spatial Pattern of Eye Diseases:**

Eye diseases rank second among the nutritional deficiency diseases in the area under study. The average intensity rate for eye diseases in the study region is 314.82 cases per 100000 population. An eye disease includes various types of diseases in which night blindness and xerophthalmia are important. The causative factors of nutritional blindness are poor intake of vitamin-A rich foods, associated with poverty, ignorance and faulty feeding habits among the people. The intensity rate for eye diseases reveals that the north western tehsils of the district has high prevalence of eye diseases. The highest intensity rate of eye diseases is observed in Muktainager (555.66) followed by Raver (416.83), Yawal (414.37), Jalgaon (409.15) tehsils.

The highest morbidity cases of eye diseases are observed in Chalisgaon tehsil (191.28) followed by Raver (184.05), Yawal (160.53), Jamner (156.06) Jalgaon (145.23) Muktainager (127.47). Remaining nine tehsils of the district have morbidity index less than 100. Lowest morbidity index is observed in Bodwad (6.74) tehsil.

#### **Spatial Pattern of Teeth and Gum Diseases:**

The teeth and gum diseases include dental carries bleeding and swelling of gums and contact pine in the inner part of the mouth. Teeth and gum diseases are observed at the average rate of 234.73 cases per 100000 population in the study region during 2011-12. The intensity of teeth and gum diseases rank third in the study region. The highest intensity rate of teeth and gum diseases is observed in Muktainager tehsil (471.77 cases per 100000 population), followed by Erondol, Bhadgaon, Chalisgaon and Jalgaon tehsils. In the district lowest intensity rate for teeth and gum disease is observed at Dharangaon tehsil (60.21).

There are seven tehsils of the district which have shown high morbidity index (above 100) namely Chalisgaon (217.12),

Muktainager, Jalgaon, Erondol, Chopda, Pachora and Raver. Moderate morbidity index ranging between 50 – 100 is observed in six tehsils namely Bhadgaon, Amalner, Yawal, Jamner, Parola, Bhusawal of the district. While in two tehsils Bodwad and Dharangaon have low morbidity index 41.44 and 18.74 respectively.

#### **Spatial Pattern of Malnutrition:**

Malnutrition means imperfect or faulty nutrition and is defined as a state in which the amount of various ingredients of diet is deficit in proportion to requirement of the body. Malnutrition patients are observed at the average rate of 65.33 cases per 100000 population. The highest intensity rate of malnutrition is observed in Yawal tehsil (142.23 cases per 100000 population) followed by Chalisgaon (137.27 cases/100000 population), Chopda (124.57 cases/100000 population), Bhadgaon (91.11 cases/100000 population).

Highest morbidity index is observed at Chalisgaon (333.41) followed by Yawal (265.30), Chopda (236.79) tehsil. In Jamner and Bhadgaon tehsil morbidity index observed more than 90.

#### **Spatial Pattern of Goiter:**

The term goiter is applied to an enlargement of the thyroid gland. This enlargement of thyroid gland is due to the iodine deficiency. Goiter is also called as an endemic disease. In mountainous region iodine is removed from the soil because of high surface runoff and other reasons. Thus, the iodine present in the soil is transported from the mountainous region consequently more cases of goiter are observed in the mountainous region. In the study region goiter cases are reported in seven tehsils namely Chopda, Yawal, Raver, Jalgaon, Erondol, Parola and Jamner. Out of these, three tehsils are located in the northern mountainous part of the district mostly covered by Satpuda upland. The goiter intensity rate in the study region is 1.31 cases per 100000 population. Highest intensity rate of goiter is observed in Chopda tehsil (8.75) followed by Erondol, Jamner and Raver tehsil (2.27, 1.98, 1.12 cases respectively per 100000 population).

Among the tehsils Chopda (830.04) rank first followed by Jamner (237.15), Raver, Erondol (158.58), Jalgaon and Yawal (79.05) tehsils having high morbidity index of goiter patients.

**Table 1: Tehsil wise Observed Cases, Morbidity Index and Intensity Rate of Nutritional Deficiency Diseases**

Diseases	Tehsil															
		Chopda	Yawal	Raver	Muktainagar	Bodwad	Bhusawal	Jalgaon	Erondaol	Dharangaon	Amalner	Parola	Bhadgaon	Chalisgaon	Pachora	Jamner
Eye disease	OC	517	976	1119	775	41	390	883	481	120	478	535	444	1163	256	949
	MI	85.03	160.53	184.05	127.47	6.74	64.14	145.23	79.11	19.74	78.62	87.99	73.03	191.28	42.11	156.09
	IR	215.39	414.37	416.83	555.66	60.67	263.18	409.15	363.27	85.00	256.90	337.55	351.78	379.20	111.40	313.00
Anemia	OC	1425	865	1764	1504	222	887	3095	574	61	1513	1932	550	4611	1763	2082
	MI	93.57	56.80	115.82	98.75	14.58	58.24	203.22	37.69	4.01	99.34	126.85	36.11	302.76	115.76	136.70
	IR	593.67	367.25	657.09	1078.34	328.51	598.57	1434.11	433.51	43.21	813.14	1218.98	435.76	1503.43	767.16	686.69
Mainnutr ion	OC	299	335	88	49	33	100	55	83	38	38	27	115	421	94	119
	MI	236.79	265.30	69.69	38.81	26.13	79.20	43.56	65.73	30.09	30.09	21.38	91.07	333.41	74.44	94.24
	IR	124.57	142.23	32.78	35.13	48.83	67.48	25.49	62.69	26.92	20.42	17.04	91.11	137.27	40.90	39.25
Teeth & Gums disease	OC	580	327	535	658	188	264	603	598	85	414	291	445	985	538	294
	MI	127.85	72.08	117.93	145.04	41.44	58.19	132.92	131.81	18.74	91.26	64.14	98.09	217.12	118.59	64.80
	IR	241.63	138.83	199.29	471.77	278.20	178.15	279.41	451.64	60.21	222.50	183.60	352.57	321.16	234.11	96.97
Goiter	OC	21	2	3	0	0	0	2	3	0	0	1	0	0	0	6
	MI	830.04	79.05	118.58	0.00	0.00	0.00	79.05	118.58	0.00	0.00	39.53	0.00	0.00	0.00	237.15
	IR	8.75	0.85	1.12	0.00	0.00	0.00	0.93	2.27	0.00	0.00	0.63	0.00	0.00	0.00	1.98
Stunted growth	OC	12	1	0	0	0	0	2	3	0	0	0	12	23	2	3
	MI	310.08	25.84	0.00	0.00	0.00	0.00	51.68	77.52	0.00	0.00	0.00	310.08	594.32	51.68	77.52
	IR	5.00	0.42	0.00	0.00	0.00	0.00	0.93	2.27	0.00	0.00	0.00	9.51	7.50	0.87	0.99
Night blindness	OC	28	7	0	0	0	0	4	0	0	3	11	11	51	18	5
	MI	304.35	76.09	0.00	0.00	0.00	0.00	43.48	0.00	0.00	32.61	119.57	119.57	554.35	195.65	54.35
	IR	11.67	2.97	0.00	0.00	0.00	0.00	1.85	0.00	0.00	1.61	6.94	8.72	16.63	7.83	1.65
Pellagra	OC	2	1	2	0	0	5	1	0	0	0	0	0	5	1	2
	MI	157.48	78.74	157.48	0.00	0.00	393.70	78.74	0.00	0.00	0.00	0.00	0.00	393.70	78.74	157.48
	IR	0.83	0.42	0.74	0.00	0.00	3.37	0.46	0.00	0.00	0.00	0.00	0.00	1.63	0.44	0.66
Kwashiorkor	OC	2	0	0	0	0	0	2	0	0	0	0	2	8	1	7
	MI	136.05	0.00	0.00	0.00	0.00	0.00	136.05	0.00	0.00	0.00	0.00	136.05	544.22	68.03	476.19
	IR	0.83	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	1.58	2.61	0.44	2.31

Source: Primary Health Centers Jalgaon Dist. & Compiled by Author

**Spatial Pattern of Stunted Growth:**

Stunted growth cases are reported in eight tehsils of the district. Average intensity rate for stunted growth patients in the study region is 2 cases per 100000 population. The highest intensity rate is observed in Bhadgaon tehsil (9.51 cases/100000 population), followed by Chalisgaon (7.50), Chopda (5.00), Erondol (2.27) and Jamner (0.99).

Though, the intensity rate is highest at Bhadgaon tehsil the highest morbidity index is observed in Chalisgaon tehsil (594.35) followed by Bhadgaon, Chopda (310.08), Erondol (77.52), Jalgaon, Pachora and Jamner tehsil (51.68).

**Spatial Pattern of Night Blindness:**

In nine tehsils night blindness cases are reported in the area under study. The intensity rate for night blindness disease is 4.76 cases per 100000 population. It is found that highest intensity rate is from Chalisgaon tehsil (16.63 cases per 100000 population) while the lowest intensity rate is observed in Jalgaon tehsil (1.85 cases per 100000 population).

It is observed very high morbidity index of night blindness cases are observed in Chalisgaon (554.35) followed by Chopda tehsil having morbidity index 304.35. The areas of medium morbidity ranging between 100 and 200 comprises Parola, Bhadgaon, and Pachora tehsils from the district. There are four tehsil which have low morbidity index (below 100). These are Yawal, Jalgaon, Amalner, and Jamner tehsil. During field survey it is observed that unbalanced and lack of vitamin 'A' diet is common in the population leads to problems such as night blindness and bitot's spot etc.

**Spatial Pattern of Pellagra:**

Pellagra is a disease related to poverty. It results due to the deficiency of niacin. There are nine PHC regions of the district which have reported pellagra cases. The overall intensity rate for the region is 0.66 cases per 100000 persons. The highest intensity occurred in Bhusawal tehsil (3.37 cases per 100000 persons), while the lowest is found in Yawal (0.42 cases per 100000 persons).

Tehsil Chalisgaon is having highest morbidity index of pellagra (393.70) while lowest morbidity index is observed at Yawal, Jalgaon and Pachora tehsils (78.74). It is observed that the incidence of pellagra is very high in the tribal population of the region. The high incidence of pellagra is due to poverty and lack of groundnut, legumes, fish and milk in the diet of population. During survey it is observed that in all sample villages acute niacin deficiency is observed and it is the main cause of pellagra prevalence.

**Spatial Pattern of Kwashiorkor:**

It is a condition primarily caused due to protein malnutrition. The factors responsible for protein malnutrition are insufficient and lack of good quality food, faulty feeding habits, poor surroundings and hygienic condition. During the survey such adverse conditions are commonly observed in the poor families of the population.

There are six tehsils of the district which have recorded kwashiorkor cases. The overall intensity rate of kwashiorkor for the study region is 0.76 cases per 100000 population. The highest intensity of kwashiorkor is observed in Chalisgaon (2.61 cases per 100000 population) followed by Jamner tehsil

(2.31), Bhadgaon (1.58), Jalgaon (0.93), Chopda (0.83), and Pachora (0.44) per lakh population.

High morbidity index is noticed in the Chalisgaon tehsil (544.22), followed by Jamner (476.19), Chopda, Jalgaon, and Bhadgaon (136.05), and lowest morbidity index is identified in Pachora (68.03) tehsil.

## 6. Conclusion

Nutritional deficiency diseases may cause due to the partial or complex absence of one or more nutrients in the diet

of the person. Nutritional deficiency is the major concern among the rural population.

Anaemia ranks first among all the nutritional deficiency diseases reported to the tehsil. Average intensity rate of anaemia for the district is recorded 788 patients per 100000 population. Eye diseases rank second with the intensity rate 314.82 cases followed by Teeth and gum diseases at the average rate of 234.73 cases per 100000 population. Intensity rate for Malnutrition diseases is observed 65.33, Night Blindness 4.76, Stunted growth 2.00, Goiter 1.31, followed by Kwashiorkar and Pellegra 0.76 and 0.66 cases respectively per 100000 population.

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