



AVAILABILITY AND ACCESSIBILITY OF MEDICAL AND HEALTHCARE FACILITIES IN THE TRIBAL REGIONS OF VISAKHAPATNAM DISTRICT

ARUGOLANU RAJU¹ and Prof. T.V. Krishna²

¹ Research Scholar (ICSSR Doctoral Fellow) Department of Geography, Andhra University, Visakhapatnam.

² (Professor) Department of Geography, Andhra University, Visakhapatnam.

Abstract: According to the 2011 census of India, about 8.6% of the total population of India was recorded as a Scheduled Tribe (ST) population. The entire tribal population is grouped into 705 subgroups /sub-categories/ sub-communities, including about 75 primitive tribal communities. Most of the ST population is distributed in central India and northeastern India. The ST population in India and also in Andhra Pradesh shows stagnant or diminishing population size, low level of literacy rate, particularly in women, isolation from the mainstream population, dwelling in remote areas, inaccessible hilly terrain, and finally, unaffected by the developmental process undergoing in India. Health is an important determinant of economic growth and a component of the population's well-being. India's National Health Policy (NHP) declared in 1983 that a holistic (Primary health care) approach was adopted to ensure Health for All (HEA) through the provisioning of Sub Centres (SCs), Primary Health Centres (PHCs), Community Health Centres (CHCs), district/civil hospitals and medical institutions. The challenges of the health sector in tribal regions include inadequate access to basic healthcare services, such as a shortage of medical professionals, paramedical staff, laboratories, and nurses. In this context, this paper attempts to study the availability and accessibility of medical and healthcare facilities in the tribal region of Visakhapatnam district.

Keywords: - Population, Scheduled Tribe, Literacy, Religion, Mandals, Health Centers, Health infrastructure facilities.

1. Introduction

Health is an essential determinant of economic growth, a component of the population's well-being, and a vital indicator for estimating the quality of human life. It is a basic need along with food, shelter, and education and is a precondition for productivity and growth. Improving the population's health status has become a forefront agenda of most developing countries for a very long time (WHO, 2000). The World Health Organization (WHO) developed the Traditional Medicine Strategy 2014-2023. It emphasized integrating traditional

and complementary medicine in the national health system to promote universal healthcare and ensure the quality, safety and effectiveness of such medicine. The government should work to implement the guidelines and framework provided by the United Nations Declaration on Rights of Indigenous Peoples (UNDRIP) to promote, preserve and protect the rights of tribal people, especially the right to access healthcare and the proper use and practice of traditional medicine. India's public expenditure on health care is only 2% of GDP in 2021-22, while Japan, Canada, and France spend about 10% of their GDP on public health. Even neighbouring countries like Pakistan and Bangladesh spend more than 3% of their GDP on public health care. India's first National Health Policy (NHP) was declared in 1983 (G. Sen, 2012) in which a holistic (Primary health care) approach was adopted to ensure health for all through the provisioning of Sub Centres (SCs), Primary Health Centres (PHCs), Community Health Centres (CHCs), district/civil hospitals and medical institutions.

The Sub Centre (SC) is the first and the most peripheral point of contact between the primary health care system and the community. One Sub Centre provides medical facilities to a population of 3,000 in hilly/tribal/complex areas and a population of 5,000 populations in plains. Above Sub Centres are the Primary Health Centre (PHC), the first contact point between the village community and the medical officer. One PHC provides medical facilities to a population of 30,000 in the plain area while 20,000 populations are in hilly/tribal/difficult areas. The challenges of the Indian healthcare sector include inadequate access to basic healthcare services, such as a shortage of medical professionals, paramedical staff, nurses (human resources), laboratories, and medicines. India's health challenges are not only enormous in magnitude due to its large population, but they are complex due to its diversity and chronic poverty and inequality. India faces a shortage of doctors, resulting in extreme conditions of overcrowded out-patients in hospitals, inadequate paramedical staff, shortage of medicines and other infrastructure facilities. The same situation is prevailing in almost all states of India.

The Scheduled Tribe (ST) population is one of the most disadvantaged groups in Indian society. It shows backwardness in economic conditions, low level of literacy, malnutrition, poor health conditions, poor housing conditions, etc. Hence, developing a scheduled tribe population is a constitutional obligation of the Indian government. According to the 2011 census of India, about 8.6% of the total population of India was recorded as a scheduled tribe population. The entire tribal population is grouped into 705 subgroups/sub-categories / sub-communities, including about 75 primitive tribal communities. Most of the ST population is distributed in central India and northeastern India. According to the 2011 census, about 5.53% of the population was recorded as a scheduled tribe population, and it contains about 34 tribal subgroups were recorded, of which about 7 tribal subgroups were recognized as Particularly Vulnerable Tribal Groups (PVTGs). The ST male population's literacy rate was 68.8%, and the female literacy rate was about 47.7%, which increased many health problems.

Geographically distant, scattered with steep terrain, and inaccessible tribal habitations are making it almost impossible for tribal people to access modern health care services. The traditional methods of treating various ailments with different medicinal plants and herbs are popular among tribes because of their availability in and around their villages. More than 25,000 plant-based formulations are estimated to be used in traditional medicine. Further, traditional medicine is well integrated into the tribe's beliefs and practices, making it an accepted way of life. It is also used by them because cheap, affordable and a viable alternative in the absence of modern medicine near tribal villages.

In this context, this paper attempts to study the availability and accessibility of traditional and modern medical and healthcare services in the tribal-dominated and agency region of the Visakhapatnam district.

OBJECTIVES

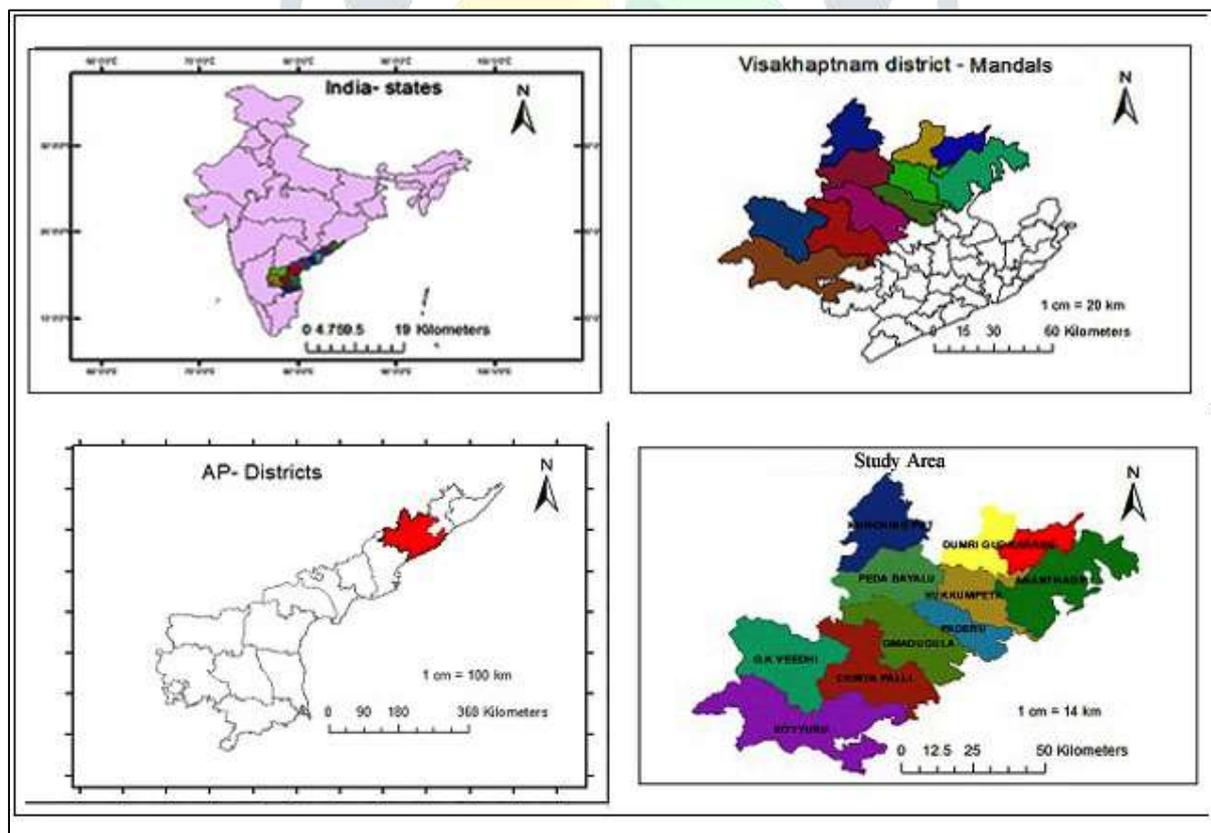
1. To study the changes in ST population growth and literacy rate.
2. To study the availability and accessibility of medical and healthcare facilities in the study region (Tribal region).

DATABASE AND METHODOLOGY

Population number, growth, and literacy rate were collected from the Handbook of Statistics of Visakhapatnam district. Visakhapatnam district census books and records of mandal offices for 2001, 2011, and 2019-20. Scheduled tribe population distribution was calculated in percentages, and population growth was observed for three decades. Medical facilities in tribal regions mainly depended upon secondary data, and it was collected from the District Medical and Health Officer (DM&HO) of eleven mandals of Visakhapatnam district, Statistical Abstract of AP-1991, 2001, 2011, and also from the Primary Healthcare Centres (PHC). Data regarding health infrastructure availability and human resources in Andhra Pradesh collected from Rural Health Statistics 2011-12 to 2021-22, Ministry of Health & Family Welfare, and Government of India.

STUDY AREA

Figure 1: Showing the study area



The study area is in the northern and western part of Visakhapatnam district and lies between $17^{\circ} 30'$ to $18^{\circ} 30'$ North latitude and $81^{\circ} 54'$ to $83^{\circ} 30'$ East longitude. Physically, the

study area is situated in the Eastern Ghats hilly region, between 300 mt to 600 mt elevation. The study region is also called the Agency region or Tribal region. Administratively, the study area contains eleven mandals, and they are 1. Munchingput, 2. Pedabaylu, 3. Dumbriguda, 4. Araku, 5. Ananthagiri, 6. Hukumpeta, 7. Paderu, 8. G. Madugula, 9. Chintapalli, 10. G. K. veedhi, and 11. Koyyuru. The study area was in the undivided Visakhapatnam district (Erstwhile Visakhapatnam district). The total geographical area of the tribal region is about 5,82,167 hectares, in which about 60% of the area is covered under forest. About 60% of this region is occupied by forest vegetation and receives about 1300 mm of annual rainfall. The entire study region can be divided into two sub-regions based on their geographical location: northeastern and northwestern regions. 1. Munchingput, 2. Pedabayalu, 3. Dumbriguda, 4. Araku, 5. Ananthagiri, 6. Hukumpeta, and 7. Paderu mandals are present in the northeast part of the study region, and its total area is about 3,01,943 hectares (51.9% of the total study area), whereas 1. G. Madugula, 2. Chintapalle, 3. G.K. Veedhi, 4. Koyyuru mandals are present in the north-western part of the study region and its total geographical area is about 2,80,224 hectares (48.1% of the total study area). About 44.8% of the total forest area is distributed in the northeastern region, whereas the remaining 55.2% is distributed in the northern region of the study area.

Results and Discussion:

1.0. Distribution of the population in the study region (Tribal region) during the 2001-2011 period in the Visakhapatnam district:

1.1. Distribution of the population in the 2001 period:

It can be observed from Table no:1 that about 5,66,893 population recorded in the entire study region during the 2001 period. The highest percentage of population recorded in Chintapalle mandal (11.4%) to the total population the study region followed by Araku (9.9%), G.K. Veedhi (9.9%), Paderu (9.4%), Koyyuru (9.2%), Pedabayalu (9.0%), G. Madugula (8.9%), Hukumpeta (8.8%), Dumbriguda (7.9%), Ananthagiri (7.8%), and lowest percentage of population recorded in Munchingput mandal (7.7%) of the total population of the study region. Regarding the distribution of the ST population in the study region highest percentage of the ST population recorded in Hukumpeta mandal (95.2%) to the total population of the Hukumpeta mandal followed by Munchingput (94.8%), G. Madugula (93.9%), Dumbriguda (93.4%), Pedabayalu (91.7%), Ananthagiri (90.6%), G.K. Veedhi (87.6%), Chintapalle (86.8%), Araku (83.9%), Paderu (81.5%), and lowest percentage of ST population recorded in Koyyuru mandal to the total population of the Koyyuru mandal whereas about 88.9% of ST population recorded to the total population of the study region during the 2001 period.

1.2. Distribution of population in 2011 period:

In 2011, about 6,04,047 total population was recorded in the study region. The highest population recorded in Chintapalle mandal (11.9%) of the total population of the study region followed by G.K. Veedhi (10.5%), Paderu (9.8%), Araku (9.4%), G. Madugula (8.9%), Pedabayalu (8.6%), Hukumpeta (8.6%), Koyyuru (8.4%), Ananthagiri (8.2%), Dumbriguda (8.1%), Munchingput mandal (7.9%) of the total population of the study region. Regarding the distribution of the ST population in the study region highest percentage of the ST population recorded in Pedabayalu mandal (96.2%) to the total population of the Pedabayalu

Mandal, followed by Hukumpeta (95.9%), Dumbriguda (94.7%), Munchingput (93.9%), G. Madugula (92.7%), Araku (91.5%), Chintapalli (90.3%), Anantagiri (90.1%), G. K.Veedhi (89.8%), Paderu (82.5%) and lowest percentage of ST population recorded in Koyyuru (81.3%) to the total population of the Koyyuru mandal whereas about 90.7% of ST population recorded to the total population of the study region during the 2011 period.

1.3. Changes in population growth during the 2001-2011 period:

Highest population growth was recorded in G.K. Veedhi mandal (12.5%) during the 2001-2011 period, followed by Chintapalle (11.2%), Ananthagiri (11%), Paderu (10.6%), Dumbriguda (9.3%), Munchingput (8%), G. Madugula (6.3%), Hukumpeta (3.2%), Pedabayalu (2.1%), lowest growth recorded in Araku mandal (1.3%) during 2001-2011 period whereas population decrease noticed in Koyyuru mandal (-3.4%) during the study period. The entire region recorded a 6.6% growth rate from 2001 to 2011.

1.4. Changes in ST population growth during the 2001-2011 period:

The highest ST population growth was recorded in Chintapalle mandal (15.6%), followed by G.K. Veedhi (15.3%), Paderu (11.9%), Dumbriguda (10.8%), Araku (10.3%), Ananthagiri (10.3%), Pedabayalu (7%), Munchingput (6.9%), G. Madugula (4.9%), and lowest ST population recorded in Hukumpeta mandal (3.8%). In contrast, the ST population decreased in Koyyuru mandal (-3.1%) during the study period. The study region recorded about 8.7% growth in the ST population during 2001-2011.

Table No-1. Distribution of total population and ST population in the study Region (Tribal/Agency region) during the 2001-2011 period.

S. No	Name of The mandals in the study region	Total population during -2001 (% to total pop of the region)	ST population % to total population during 2001	Total population during 2011 (% to total pop of the region)	ST population % to total population during 2011
1	Munchingput	43,918 (7.7%)	94.8%	47,418 (7.9%)	93.9%
2	Pedabayalu	50,831 (9.0%)	91.7%	51,890 (8.6%)	96.2%
3	Dumbriguda	44,873 (7.9%)	93.4%	49,029 (8.1%)	94.7%
4	Araku	55,959 (9.9%)	83.9%	56,674 (9.4%)	91.5%
5	Anantagiri	44,192 (7.8%)	90.6%	49,019 (8.2%)	90.1%
6	Hukumpeta	50,115 (8.8%)	95.2%	51,697 (8.6%)	95.9%
7	Paderu	53,329 (9.4%)	81.5%	58,983 (9.8%)	82.5%
8	G. Madugula	50,685 (8.9%)	93.9%	53,884 (8.9%)	92.7%
9	Chintapalli	64,404 (11.4%)	86.8%	71,640 (11.9%)	90.3%

10	G.K. Veedhi	56,150 (9.9%)	87.6%	63,174 (10.5%)	89.8%
11	Koyyuru	52,437 (9.2%)	81.1%	50,639 (8.4%)	81.3%
	Total region	5, 66,893(100%)	88.9%	6, 04,047(100%)	90.7%

(Source: Computed from Handbook of Statistics of Visakhapatnam district-2001-201

2.0. Distribution of ST population literacy in the study region (Tribal region) during 2001 2011 periods:

It can be observed from Table no.2 that highest percentage of ST population literacy recorded in Araku Mandal (36.40%) followed by Paderu (34.47%), Koyyuru (32.19%), Hukumpeta (27.78%), Chintapalle (26.23%), Munchingput (25.24%), Dumbriguda (24.56%), G. Madugula (23.54%), Ananthagiri (23.06%), and lowest literacy recorded in G.K. Veedhi (22.48%). In contrast, the study region recorded a 27.6% literacy rate in 2001. During the 2011 period highest ST population literacy rate recorded in Paderu Mandal(51%), followed by Araku (44.8%), Koyyuru (41.8%), Hukumpeta (37.4%), Dumbriguda (35.4%), Chintapalle ((34.8%), G.K. Veedhi (34.8%), Munchingput (33.09%), Pedabayalu (32.9%), and lowest literacy rate recorded in G.Madugula (31.9) and Ananthagiri (31.9%) mandals whereas the total study region recorded 37.2% literacy rate.

2.1. Changes in ST population literacy rate during the 2001- 2011 periods:

Regarding changes in the ST population literacy rate during 2001 – 2011 period, highest literacy rate increase noticed in G.K. Veedhi Mandal (78.5%), followed by Paderu (65.8%), Dumbriguda (59.7%), Chintapalle (53.2%) Ananthagiri (53%), G. Madugula (42.9%), Munchingput (40.2%), Hukumpeta (39.9%) Araku valley (35.8%), Pedabayalu (28.1%) and lowest growth recorded in Koyyuru (25.8%). In contrast, the entire study region recorded a 46.8 % growth rate in literacy during the 2001 and 2011 periods.

Table no. 2. Changes in ST population literacy in the study region (Tribal/Agency region during the 2001 – 2011 period

S. No	Name of the Mandals in the study region	Percentage of ST population literacy during 2001	Percentage of ST population literacy during 2011	Changes in ST population literacy during 2001 – 2011 period
1	Munchingput	25.24%	33.09%	40.20%
2	Pedabayalu	27.46%	32.90%	28.10%
3	Dumbriguda	24.56%	35.40%	59.70%
4	Araku Valley	36.40%	44.80%	35.80%
5	Hukumpeta	27.78%	37.40%	39.90%
6	Ananthagiri	23.06%	31.90%	53.00%
7	Paderu	34.47%	51.00%	65.80%

8	G. Madugula	23.54%	32.04%	42.90%
9	G. K. Veedhi	22.48%	34.80%	78.50%
10	Koyyuru	32.19%	41.80%	25.80%
11	Chintapalle	26.23%	34.80%	53.20%
	Total region	27.60%	37.20%	46.80%

(Source: computed from Handbook of Statistics of Visakhapatnam dist-2001 & 2011)

3.0. Status and types of medical & healthcare facilities available in the study region during 2019-20:

3.1. Traditional healers or Herbal folklore medical & healthcare system in the study region (Tribal region):

Tribal people have developed their institutions, customs, and practices in their cultural and religious beliefs. The tribal medicine system is among them, which they have developed based on their traditional knowledge and associated beliefs called traditional medicine. This traditional knowledge is being transferred from one generation to another through oral tradition. Traditional medicine has two streams of medical practices: the classical stream (Ayurveda, etc.) and the folk stream. The folk stream traditional system developed based on tribal knowledge, through observation and reasoning. The traditional medicine system gained popularity because of its availability, acceptability, and affordability in remote tribal regions. The traditional medicine practitioners are called traditional healers or herbal folklore in their tribal villages. The traditional healers in the study area are primarily physiotherapists and midwives of some tribal communities. The traditional healers most commonly see that it was a family tradition to take up the practice of rendering medical services to people of the tribal village. At least one traditional healer family can be seen in every tribal village of the study region. The experienced person in the family would attend to the health problems of the tribal population, and most of the tribal people consult the traditional healer of that particular village for all their common diseases, which are non-urgent and non-serious. Traditional healers diagnose the disease by physical verification based on external features, complaints regarding body parts, symptoms, and also through the pulse count of the patient. Further, these traditional healers are available daily to the patients and accessible in tribal villages.

Most traditional healing families belong to tribal communities like Konda Doras, Bagata, Khonds, Porja (Particularly Vulnerable Tribal Group), Gadaba, Valmiki, etc., and they know the medicinal value of different medicinal plants (Ethno medicine) distributed in the study area. These traditional healers prepare medicine from some selected medicinal plant parts, mainly bark, Leaves, flowers, stems, seeds, gums, etc. Traditional healing practitioners prepare various forms of medicine from the above-mentioned plant parts into tablets, decoction, paste, juice, etc.; one of the prepared medicinal forms will be suggested to patients to consume during treatment for a particular disease. According to information from the Botany department of Andhra University, most of the medicinal plants belong to families like Fabaceae, Zingiberaceae, Rubiaceae, Acanthaceae, Anacardiaceae, Apocynaceae, convolculaceae, Flacourtiaceae, Meliaceae, Asteraceae, Orchidaceae, Lythraceae, Caesalpinaceae, Araceae, Cucurbitaceae, Laminaceae, Mimosaceae, Rubiaceae, Amaranthaceae, Solanaceae, Malvaceae, Euphorbiaceae, Asclipiaceae, Rutaceae, Caesalpinaceae, etc., are commonly used by the traditional healers for the preparation of

herbal medicines. The above-mentioned plant parts are used to prepare medicines for treating ailments like fever, dysentery, eczema, fractures, paralysis, anaemia, headache, boils, burns, stomachache, sprains, etc.,

3.2. Government medical and healthcare facilities in the study region (Tribal region):

The medical and health facilities provided by the government of Andhra Pradesh in the tribal region are the Allopathic medicine system and Indian medicine system which include Homeopathic and Ayurvedic.

3.2.1. Allopathic medical and healthcare facilities during 2019-20:

Among all types of medical facilities the government provides, about 88.7% of the total medical facilities are occupied by the allopathic medicine system. About 55 allopathic hospitals (Table no-3) are located in the study region (tribal region), according to 2019-2020 data. These 55 allopathic hospitals are general hospitals, mobile medical units, primary health centres, area / Taluk, other hospitals, etc. Regarding general hospitals, about 3 hospitals (Table no-3) are present, with one each in Munchingput, G. Madugula, and Chintapalli mandals during the 2019-2020 period. About eleven mobile medical units were recorded during the 2019-2020 period and distributed one each in eleven Mandals. Regarding primary health care centres (PHC), about 37 PHCs were recorded in the study region. The highest number of PHCs was recorded in G.K. Veedhi (7), followed by Chintapalle and Koyyuru (5 PHCs in each mandal), Ananthagiri, Pedabayalu, Araku (3 PHCs in each mandal), Munchingput, Dumbriguda, Hukumpeta, Paderu, G. Madugula, (2 PHCs in each mandal). Regarding Area / Taluk /other allopathic hospitals, about 4 hospitals were recorded in the entire study region, of which the highest of about 2 hospitals were recorded in Munchingput and one each in Araku and Paderu mandals. Allopathic medical and healthcare system facilities cover about 88.7% of the total medical facilities available in the study region.

**Table no-3. Available medical facilities (Allopathic) in the study region
(Tribal/Agency region) during the 2019-20 period**

Name of the Mandal in the study region	General hospitals	Mobile Medical Unit	PH C	Area / Taluk / Other hospitals	Homeo pathic dispensaries	Ayurvedic dispensaries	Total available hospitals
Munchingput	1	1	2	2	0	0	6
Pedabayalu	0	1	3	0	0	1	5
Dumbriguda	0	1	2	0	0	1	4
Araku	0	1	3	1	0	1	6
Ananthagiri	0	1	4	0	0	0	5
Hukumpeta	0	1	2	0	0	0	3
Paderu	0	1	2	1	1	0	5
G. Madugula	1	1	2	0	0	0	4

Chintapalle	1	1	5	0	1	0	8
G.K. Veedhi	0	1	7	0	1	0	9
Koyyuru	0	1	5	0	0	1	7
Total	3	11	37	4	3	4	62

(Source: Handbook of statistics of Vsp & ASR district-2019-20)

3.2.2. Government Homeopathic medical & healthcare system during 2019-20:

It can be observed from Table no- 3 that about 3 dispensaries were recorded in the entire study region, with one each located in Paderu, Chintapalli, and G. K.Veedhi mandals.

3.2.3. Government Ayurvedic medical & healthcare system during 2019-20:

It can be observed from table no- 3 that dispensaries 4 are recorded in the entire study region, with one each located in Pedabayalu, Dumbriguda, Araku, and Koyyuru manuals.

3.2.4. Availability and accessibility of Homoeopathic and Ayurvedic medical facilities:

The Ayurvedic medical and healthcare facilities occupied about 6.5%, and Homeo medical and healthcare facilities occupied about 4.8% only of the total available and accessible medical and healthcare facilities in the study region, and its impact would be very low when compared to the Allopathic medical and health care facilities (88.7%).

4.0. Availability and accessibility of medical facilities (Allopathic) in the study region

(Tribal region):

The availability and accessibility of medical and healthcare facilities are presented in Table no-4.

4.1. Total area covered by each hospital in the study region:

Regarding the total area covered by each hospital in the study region, the highest area (139 sq. km) covered by each hospital was recorded in G. Madugula mandal followed by Hukumpeta (137.6 sq km) Ananthagiri (117.6 sq km), G.K. Veedhi (105.3 sq km), Paderu (90.8 sq km), Koyyuru (89.1 sq km), Pedabayalu (86.8 sq km), Chintapalle (84.3 sq km), Munchingput (80.7 sq km), Dumbriguda (80.0 sq km area), and lowest area covered by each hospital in Araku mandal (54.5 sq km area) whereas about 93.9 sq km of the total study area covered by each hospital.

4.2. Total villages covered by each hospital in the study area:

Regarding the total number of villages covered by each hospital in the study region, the highest number of villages (about 56) covered by each hospital was recorded in Ananthagiri and also in Hukumpeta Mandal followed by G. Madugula (54.6 villages), Pedabayalu (53 villages), Munchingput (50.5 villages), Paderu (33.6 villages), Araku (26.3 villages), Dumbriguda (21.8 villages), Koyyuru (18.1 villages), and lowest number villages covered by

each hospital in G.K. Veedhi mandal (14.7 villages), whereas about 33.7 villages in the total study area covered by each hospital.

4.3. Total population covered by each hospital in the study area:

Regarding total number population covered by each hospital in the study region, the highest number of the population covered by each hospital recorded in Hukumpeta (17,232 population), followed by G. Madugula (13,471), Dumbriguda (12,257), Paderu (11,796), Pedabayalu (10,378), Ananthagiri (9,803), Araku (9,445), Chintapalle (8,955), Munchingput (7,903), Koyyuru (7,234), G.K. Veedhi (7,019), whereas about 9,742 population in the study region by each hospital.

Table no.4: Availability and accessibility of medical and healthcare facilities in the study region (Agency/Tribal region) according to area, villages and population

S. No	Name of the Mandals in the study region	Area in sq.km	Number of villages	Total Population (2011)	Total number of hospitals available (2019-20)	Total area covered by each hospital (Sq. Km) (2019-20)	Total number of villages covered by each hospital (2019-20)	Total population covered by each hospital (2019-20)
1	Munchingput	484	303	47,418	6	80.7	50.5	7,903
2	Pedabayalu	434	265	51,890	5	86.8	53	10,378
3	Dumbriguda	320	87	49,029	4	80.0	21.8	12,257
4	Araku	327	161	56,674	6	54.5	26.3	9,445
5	Ananthagiri	588	280	49,019	5	117.6	56	9,803
6	Hukumpeta	413	168	51,697	3	137.6	56	17,232
7	Paderu	454	168	58,983	5	90.8	33.6	11,796
8	G. Madugula	556	217	53,884	4	139.0	54.6	13,471
9	Chintapalle	674	179	71,640	8	84.3	22.3	8,955
10	G.K. Veedhi	948	132	63,174	9	105.3	14.7	7,019
11	Koyyuru	624	127	50,639	7	89.1	18.1	7,234
	Total	5,822	2,087	6,04,047	62	93.9	33.7	1,15,493

(source: computed from Handbook of statistics of VSP dist. & ASR dist. -2011,2019-20)

5.0. Total distance (km) covered by each hospital in the study area:

5.1. Number of villages having medical facilities very nearby:

The highest number of villages having medical and healthcare facilities very nearby were recorded in Munchingput mandal (5.9% villages), followed by G.K. Veedhi (4.1%), Koyyuru (3.5%), Araku and Paderu mandals (2.5% each), Dumbriguda (2.3%), Pedabayalu (1.9%), Chintapalle mandal (1.7%), Ananthagiri (1.5%), Hukumpeta (1.2%), G. Madugula (0.3 %) whereas 2.5 % of villages having medical and healthcare facilities very nearby in the entire study region.

Table No. 5, Medical services provided by each hospital according to distance in the study region (Agency/Tribal region)

S.No	Name of the Mandal	Total inhabited villages	Villages having medical facilities nearby	Villages do not have medical facilities according to distance from the nearest medical facility.		
				less than 2 km	2 to 5 km	5 km above
1	Munchingput	304	5.90%	23.70%	31.60%	38.80%
2	Pedabayalu	270	1.90%	35.20%	47.40%	15.60%
3	Dumbriguda	87	2.30%	57.50%	34.50%	5.70%
4	Araku	162	2.50%	40.10%	34.00%	23.50%
5	Ananthagiri	274	1.50%	25.50%	43.80%	29.50%
6	Hukumpeta	168	1.20%	42.90%	41.00%	25.0%
7	Paderu	198	2.50%	10.10%	37.90%	49.40%
8	G. Madugula	294	0.30%	5.40%	10.50%	83.70%
9	Chintapalle	242	1.70%	5.00%	50.0%	43.40%
10	G.K. Veedhi	170	4.10%	14.10%	24.70%	57.10%
11	Koyyuru	141	3.50%	13.50%	44.70%	38.30%
	Total	2310	2.50%	22.30%	35.20%	40.00%

(source: computed from the handbook of statistics of Vsp & ASR dist 2019-20)

5.2. Villages not having medical facilities in less than 2 km distance:

The highest number of villages having medical and healthcare facilities less than 2 km was recorded in Dumbriguda mandal (57.5% villages) followed by Hukumpeta (42.9%), Ananthagiri (25.5%), Munchingput (23.7%), G.K. Veedhi (14.1%), Koyyuru (13.5 %), Paderu (10.1 %), G. Madugula (5.4 %), the lowest number of villages recorded Chintapalle (5 %). In contrast, about 22.3% of villages in the study area did not have medical facilities.

5.3. Villages not having medical facilities between 2 km to 5 km distance:

The highest number of villages having medical and healthcare facilities 5 km above distance were recorded in Chintapalle mandal (50%) followed by Pedabayalu (47.4 %), Koyyuru (44.7 %), Ananthagiri (43.8%), Hukumpeta (41%), Paderu (37.9 %), Dumbriguda (34.5%), Araku (34 %), Munchingput (31.6 %), G.K. Veedhi (24.7 %), and lowest number of villages recorded in G. Madugula (10.5 %). In contrast, about 35.2 % of villages in the study area did not have medical facilities.

5.4. Villages not having medical facilities above 5 km:

The highest number of villages having medical and healthcare facilities between 2 km to 5 km distance were recorded in G. Madugula mandal (83.7 % villages) followed by G.K. Veedhi (57.1 %), Paderu (49.4 %), Chintapalle (43.4 %), Munchingput (38.8 %), Koyyuru (38.3 %), Ananthagiri (29.5%), Hukumpeta (25 %), Araku (23.5%), Pedabayalu (15.6 %), and lowest recorded in Dumbriguda mandal (5.7 %). In contrast, about 40% of villages in the study area did not have medical facilities.

6.0. Total number of patients treated in Government hospitals (Allopathic medicine):

It can be observed from Table no: 6 that about 5,36,000 patients were treated in the entire study region during the 2004-2005 period in which highest number of patients treated in G.K. Veedhi mandal (24.4%), followed by Chintapalle (19.7%), Ananthagiri (10.7%), Koyyuru (10.6%), Araku (9.9%), Pedabayalu (6.2%), Paderu (4.9%), G. Madugula (3.6%), Hukumpeta (3.5%), Munchingputtu (3.4%), and lowest patients treated in Dumbriguda (3.1%). It is observed that about 58.3% of the total patients were treated in G.Madugula, Chintapalle, G.K. Veedhi, and Koyyuru mandals (four mandals only).

During the 2008-2009 period, about 3,94,400 patients were treated in the entire study region, in which highest number of patients treated in Chintapalle mandal (30.7%), followed by Araku (9.3%), Pedabayalu (8.9%), G.K. Veedhi (8.4%), Hukumpeta (8.2%), G. Madugula (7.9%), Ananthagiri (7.8%), Dumbriguda (7.4%), Munchingput (7.3%), Paderu (3%), and lowest number of patients treated in Koyyuru mandal (0.1%). About 47.1% of the patients were treated in G.Madugula, Chintapalle, G.K. Veedhi, and Koyyuru mandals only (four mandals only).

Table no-6. Number of Patients treated in the Government hospitals (Allopathic) between 2004 and 2018 period in the study region (Agency/Tribal region)

S. No	Name of the Mandal	Patients treated (Allopathic medicine)					Average for 5 years
		2004-2005	2008-2009	2012-2013	2015-2016	2017-2018	
1	Munchingput	3.4%	7.3%	5.5%	6.3%	2.9%	19,480(5.0%)
2	Pedabayalu	6.2%	8.9%	3.5%	10.7%	2.6%	25,920(6.6%)
3	Dumbriguda	3.1%	7.4%	7.4%	8.1%	3.40%	21,960(5.6%)
4	Araku	9.9%	9.3%	0.8%	5.6%	6.6%	27,800(7.1%)

5	Ananthagiri	10.7%	7.8%	5.9%	8.4%	8.5%	33,560(8.6%)
6	Hukumpeta	3.5%	8.2%	3.9%	8.9%	11.9%	28,200(7.2%)
7	Paderu	4.9%	3.0%	8.2%	9.1%	6.3%	23,800(6.1%)
8	G. Madugula	3.6%	7.9%	1.2%	8.1%	4.0%	20,140(5.1%)
9	Chintapalle	19.7%	30.7%	46.9%	9.6%	16.7%	89,500(22.9%)
10	G.K. Veedhi	24.4%	8.4%	8.2%	13.5%	19.3%	62,160(15.9%)
11	Koyyuru	10.6%	0.1%	8.6%	11.7%	17.7%	39,160(10.0%)
	Total	5,36,000 (100%)	3,94,400 (100%)	2,56,000 (100%)	3,94,000 (100%)	3,78,000 (100%)	3,91,680 (100%)

(Source: computed from the Handbook of Statistics of Visakhapatnam dist 2004 to 2018)

During the 2012-2013 period, about 2,56,000 patients were treated which highest number of patients treated in Chintapalle mandal (46.9%), followed by Koyyuru (8.6%), G.K. Veedhi (8.2%), Paderu (8.2%), Dumbriguda (7.4%), Ananthagiri (5.9%), Munchingputtu (5.5%), Pedabayalu (3.5%), Hukumpeta (3.9%), G. Madugula (1.2%), and lowest patients treated in Araku mandal (0.8%). About 64.9% of the total patients were treated in G.Madugula, Chintapalle, G.K. Veedhi, and Koyyuru manuals only (four manuals only)

During the 2015-2016 period, about 3,94,000 patients were treated in the entire study region, in which highest number of patients treated in G.K. Veedhi (13.5%), followed by Koyyuru (11.7%), Hukumpeta (8.9%), Ananthagiri (8.4%), Dumbriguda (8.1%), G. Madugula (8.1%), Araku (5.6%), and lowest is recorded in Munchingput mandal (6.3%). About 42.9% of the patients treated in G.Madugula, Chintapalle, G.K. Veedhi, and Koyyuru mandals only (four mandals only).

During the 2017-2018 period, about 3,78,000 patients were treated in the entire study region, in which highest number of patients treated in G.K. Veedhi (19.3%), followed by Koyyuru (17.7%), Chintapalle (16.7%), Hukumpeta (11.9%), Ananthagiri (8.5%), Araku (6.6%), Paderu (6.3%), G. Madugula (4%), Dumbriguda (3.4%), Hukumpeta (2.9%), and lowest is recorded in Pedabayalu mandal (2.6%). About 57.7% of the patients were treated in G. Madugula, Chintapalle, G.K. Veedhi, and Koyyuru mandals only (four mandals only).

Further, it is also observed for the average of five years (between 2004-2005 and 2017-18) to determine the number of patients treated in government hospitals (Allopathic medicine). It is found that the highest percentage of patients treated in Chintapalle mandal (22.9%) followed by G.K. Veedhi (15.9%), Koyyuru (10%), G. Madugula (5.1%), and these four mandals constituted about 53.9 % of the total patients treated in the entire study region. The remaining mandals were Ananthagiri (8.6%), followed by Hukumpeta (7.2%), Araku (7.1%), Pedabayalu (6.6%), Paderu (6.1%), Dumbriguda (5.6%), and lowest number of patients treated in Munchingput mandal (5%).

CONCLUSION

The study observed that one hospital provided medical facilities to about 93.5 % of sq km of area, about 33.7% of villages, and about 9,742 persons in the study region. Regarding not having medical facilities in the villages according to distance from the nearest medical

facility, about 22.3% of villages recorded under less than 2 km distance from not having medical facilities category, about 35.2% of villages recorded under 2 to 5 km distance from not having medical facilities category and about 40% villages recorded under above 5 km distance from not having medical facilities category. Further, the study observed that about 53.9% of the total patients of the study region were treated in the government hospitals of Chintapalle, G.K. Veedhi, Koyyuru, and G. Madugula mandals (four mandals) only. Hence, it is concluded that the medical and healthcare facilities provided by the government hospitals in the study area were not sufficiently available and inaccessible, due to which the tribal people approached traditional healers / herbal folk for urgent medical emergencies.

References

1. Ali A (2003) - The health status of tribes in India published in Adak (ed) Demography and Health profile of the tribe Anmol Publications, New Delhi.
2. Balgir RS. (2004a) - Dimensions of rural tribal health, nutritional status of Kond tribe and tribal welfare in Orissa: a biotechnological approach. Proceedings of the UGC-Sponsored National Conference on Human Health and Nutrition:
3. A Biotechnological Approach (Lead Lecture), 12-13th December 2004. Thane. pp. 47-57.
4. Basu SK (1993) - Health status of tribal women in India Social Change 1993:23 (4): 19-39.
5. Gorachand Khan (1986) - Tribal Health -Impact of rural development programme in Tribal Health socio-cultural dimensions edited by Chaudhuri et al., Inter India Publishers, New Delhi.
6. Javid A. Chowdhury (2006) - Developing an Appropriate Health care Services; An Indian Overview, Health for the Millions, Vol 32, No. 6.
7. Kupputhai U and Mallika N (1993) - Nutritional status of adult women belonging to Khond, Gadaba and Pojra Tribes of Andhra Pradesh, "The Indian Journal of Nutrition and Dietetics 1993: 30: 173-179.
8. Majumdar and Upadhyay (2004) - An analysis of the primary health care system in India with focus on reproductive health care services, Appeared n: Artha Beekshan, Vol. 12, No. 4, p. 29-38.
9. Murthy PSR (2011) - Health Care System in Tribal Areas – An Insight (With Reference to Andhra Pradesh State, India), Social Science Research Network, January 24, 2011.
- 10 R.S.Balgir,(2007) - Tribal Health Problems, Disease Burden and Ameliorative Challenges in Tribal Communities with Special Emphasis on Tribes of Orissa. Jabalpur: Regional Medical Research Centre for Tribal (ICMR), page No.161-176
- 11 Rao, K Sujata (1998) - Health care services in Tribal Areas of Andhra Pradesh: A public policy perspective, Economic and political weekly, 33(9), Feb 28- Mar. 6, p. 481-486.
- 12 Salil Basu, (2000) - Dimensions of Tribal Health in India, Health and Population, prospective and issues 23(2), page no.61-70
- 13 Singh Amar Kumar and Rajya Lakshmi C (1993) - Status of Tribal Woman in India Social Change, Vol.23 (4), pp.3-18
- 14 Singh K.P (1988) - Tribal Development in India: Problems and Implications Uppal Publishing House, New Delhi.
- 15 Shah Vimal (1967) - Tribal Economy in Gujarat paper published n Tribal.Vol.4, No.2.