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"Deversifications Growth of Health Care Services": An Empirical Analysis in Arunachal Pradesh

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Abstract: ***The medical care and health services are the basic necessities of the mankind. The limited health service, increasing health problems, complexities of diseases and decrease in longevity of child and adult persons have led to a hindrance in human resource development in Arunachal Pradesh. The geographical difficulty, scatter human settlement, less population with absent of private participation in health servicedevelopment and poor monopolistic role played by the state government makes the health service marginalized. Health service development is the foremost basic necessity of human being so it should be cared by the government. The paper concludes that the state government should has the responsibilities of development, enhancement and up gradation of health service in entire corner of the state. The present status of health service is highlight with the help of various statistical tables and also gives its comparison in Indian context. The information is based on primary and secondary sources of data collected from the households' survey in field study and government departments.***

Key Words: ***Arunachal Pradesh, Historical Background' Status of Health Services' Health Indicators' Man Power in Health Centres, Status of Immunisation coverage' Allopathic Hospitals; Health Infrastructures; Beds, Average Medical Expenditure' Perceptions on Treatment Process, Distance from Health Centre and Main Road, Determinants of Longevity of Child and adult persons, Regressions Results and Conclusions.***

1. INTRODUCTION

Social sectors consist of education, health, nutrition and social security. These social sectors determine the quality of economic growth and finally the human development. Though economic growth as a means to achieve human development is contested today, balanced attainments in all sectors are called for.

One of the latest measures of economic development is Human Development Index which is a composite index of Income (Material well-being), Life expectancy at birth (Health status) and Literacy rates (Educational skill levels). All the elements of human development

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viz. Health, Education, Nutrition and Fertility reduction are closely inter-related. Developments in one area can facilitate the developments in others and reinforce all spheres of development. So, development of education, health and medical care etc., will indirectly bring about change in knowledge, skill, attitudes, resourcefulness, work motivation, physical ability etc. which in turn contributes to the overall enrichment of the human society.

Enhancing the quality of growth is an important objective of the development paradigm in many developing countries. Better health, education, equal and wider job opportunities to all, trustworthy and transparent people's intuitions, sustainable and cleaner environment, dignity, self-esteem and life security, among others, are key manifestations of the quality of growth. If the quality of human capital is not good; physical capital and natural resources cannot be properly utilized for the race of progress. Health is major segment of human capital. According to WHO, health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The human health status is usually measured in terms of life expectancy at birth, infant mortality rate, fertility rate, crude birth rate and crude death rate. These indicators of health are determined by numerous factors such as per capita income, nutrition, housing, sanitation, safe drinking water, social infrastructure, health and medical care services provided by government, geographical climate, employment status, incidence of poverty and the like. Health is multi-dimensional phenomenon. It is both an end and means of development strategy. The relationship between health and development is mutually reinforcing- while health contributes to economic development, economic development, in turn, tends to improve the health status of the peoplein a country. Health is also an important entitlement that enhances ―capabilities‖ of the poor people leading to increase in ―commodities‖ and further improvement in health status.

2. SIGNIFICANCE OF THE STUDY

The existing health delivery system in Arunachal Pradesh relies basically on the government health infrastructure. The lack of competition from the private Parties especially in remote and rural areas, contributes in making the existing Government Health infrastructure monopolistic in its outlook leading to inefficiency, and lackadaisical approach to the inhabitant tribal society of the state. But as per the increasing financial allocation in health service in the State is concern, there are no equivalent improvement of the Medical andHealth Sector though the health & family welfare service has a basic and prime needs for social wellbeing and socio-economic development of the people of the state. The inadequate facilities for Health, Education and Infrastructure in Arunachal Pradesh forbid the pace of development in the state. The health services ought to be given more priority by the state government as prime need of inhabitant. In remote area of Arunachal Pradesh, the villagers depend on traditional treatment against any sort of ailing. In absence of updated basic facilities, the socio economic progress of the state cannot be expected. Therefore, the endeavour of the researcher is to find out the current status and development of health services in Arunachal Pradesh during the study periods.

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Research Questions

With the above background, the present research is exploratory in nature and tried to give answers to the following research questions as Health parameter like Infant mortality rate is one of the variable of Human Development.

a) What are the health care services provided by the health centers?
b) What are the problems faced by health centers in providing health care services?
c) What are the factors influencing the pattern of utilization and choice of health care services by the households?
d) What are the determinants of high death rate of children?

3. OBJECTIVES OF THE STUDY

The main objectives of the present work are to analyse and to study the access to health facilities as overall development of Arunachal Pradesh in Kurung Kumey district. More specifically, the objectives can be stated as follows:

i) To study the growth and status of health services in various districts of Arunachal Pradesh.
ii) To study the impact of education, sanitation conditions, other infrastructures on health conditions of people in Kurung Kumey district.
iii) Finally to examine the determinant of one human development variable i.e. early death.

4. METHODOLOGY

Health research includes many dimensions and combines both quantitative as well as qualitative methods. In the same line, the study also intended to use both quantitative and qualitative techniques analysis and interpretation in all regards of data collection. A judicious combination of both the methods does enrich the findings. Hence, both primary data and secondary sources would be used to gather, analyze and interpret the data. The present study pertains to the Kurng Kumey district of Arunachal Pradesh. The district is hilly in nature and is located towards the eastern plank of the state which has international boarders as Tibet (China), Bhutan and Myanmar.

All the requisite secondary data will be collected from various authentic sources such as publications of government and non-government organization; published as well as unpublished dissertations, books; journals; souvenir; electronic and print media etc. further, the primary data will be generated through a detailed field work; socio-economic survey of proposed area; Personal or Telephonic interviews; Well-Structured Questionnaires; Schedules; Open Group Discussions.

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This paper is solely based on secondary data has been collected from various sources such as the Bulletin on Rural Health Statistics 2011 and National Health Profile 2011 published by the Ministry of Health and Family Welfare, Government of India; Census 2011 published by Registrar General, Government of India; and the World Bank Online Database. The analysis carried out in this study is descriptive in nature. We have specifically analysed the number of health care institutions, population coverage by health institutions, availability of facilities in the health intuitions, health manpower availability by different categories such as specialist doctors and paramedical staffs, shortfall in health institutions and health manpower, etc.

Historical Background of the Health status in Arunachal Pradesh

The tribal society of Arunachal Pradesh is recognized for its sound health. In agrarian society of Arunachal Pradesh, good health is a source to happy and productive life. Health is important for the well-being of the individual, the family, clan and tribe. A person appreciates good health and seeks to achieve it by sticking to a strict diet and life style with the exposure to a new way of life. With new influences (including new illnesses and diseases) the traditional ways of health treatment becomes inadequate and they need better access and provisions of medical care. In the last few decades, the state has made significant progress. At the time of independence, there was no health infrastructure in the state—no dispensaries, no hospitals, no diagnostic facilities, etc. Modern healthcare facilities and diagnostic centres were limited. Before independence, in Arunachal Pradesh, there were only 13 medical units, which were located primarily in the areas that are now in Assam. A less number of medical units were situated in Arunachal Pradesh, especially in the plain or foothills. In the hill areas, particularly in the upper regions, a majority of the people live without medical facility. However, there were no facilities of modern medical and medical technical equipment.

The spread of medical facilities and infrastructure in the neighboring state of Assam took place in the first half of the 20th century. The people of Arunachal Pradesh did seek medical treatment in Govt. Hospitals, and Tea gardens of bordered area of the hilly region. This often necessitated long and difficult journeys. It was largely an exception during emergencies only. In the first two decades after independence, a network of healthcare facilities gradually came into existence. In the administrative centres, these mentioned facilities started spreading up across the state. There is coverage and impact in favour of Government employees and their families. Further, health care provisions were depended on the existence of a military or civil outpost in the proximity of the village. The doctors of the Army and the Assam Rifles were rendering health services to the people. Since then, and particularly after the attainment of Statehood, the health infrastructure has increased manifold. For many reasons, however, the expansion in health coverage and services has been less and at a slower pace than the expansion of educational facilities. This is the reasons why health status of the areas of Arunachal Pradesh is less than satisfactory.

From mention below table 1. there were only 48 doctors who served in 1952-53. They covered an area about 1,745 square kilometers and 6000 people were served by one doctor. The number of medical units, which included hospitals and dispensaries, was 52 in 1952-53.

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Altogether, there were a total of 101 health personnel like doctors, compounders and midwives staffed in the state in 1952-53. In India, while the number of doctors per 10,000 people increased from 1.7 in 1950-1951 to 5.3 in 1997-1998. However, in Arunachal Pradesh, the number of doctors per 10,000 people increased from 1.6 in 1950-1951 to 4.3 in 2000-01. Thus, the numbers of doctors per 10,000 persons are less than the national average. In Arunachal Pradesh human, settlements are scattered. The number of hospital beds in India per 10,000 persons rose from 3.2 in 1950-51 to 9.3 in 1997-98, while in Arunachal Pradesh, it raised from 11.0 in 1960-61 to 20.3 in 2000-01. In fact, the availability of hospital beds in Arunachal Pradesh per 10,000 persons is twice of the availability of hospital beds in India.

Table 1.Trends of Growth of Health Services in Arunachal Pradesh and in India

Year	**Hospital Beds Per 10,000 Persons**		**Doctors Per 10,000 Persons**	
	Arunachal Pradesh	**India**	**Arunachal Pradesh**	**India**
1950-51	-	3.2	1.6	1.7
1960-61	11.00	5.7	2.1	1.9
1970-71	25.40	6.4	3.3	2.8
1980-81	23.33	8.3	4.1	3.9
1990-91	26.4	9.5	3.1	4.7
1991-92	25.5	9.7	3.1	4.8
1995-96	-	9.4	-	5.1
1997-98	-	9.3	-	5.3
2000-01	20.33	*4.60	4.3	*5.6
2010-11	16.04	6.50	4.08	**8.10

Source: From Statistical Abstract of Arunachal Pradesh, Various Years Issue, (APHDR-2005) & Economic Survey, 2002-03, and Government of India. Statistical Year Book of India various Issues, **Note: -** Dash (-) indicates data not available**. ***National Health Policy, 2006 per 1,00000 Population.****** National Health Policy, 2011 per 1,00000 Populations.

The information from Table 1. shows the growth of health services in Arunachal Pradesh and India for different years from 1950 to 2011. The highest hospital beds 10,000 persons in Arunachal Pradesh were 26.40in 1990-91 and lowest was 11.00 in 1960-61. At the National level highest was 9.75 in 1991-92 and lowest was 3.2 in 1950-51. It is found that Arunachal Pradesh is better than the national level scenrio. However, in recent years, hospitalbeds per 1000 population is 16.04 in 2010-2011 in Arunachal Pradesh, which indicates decline from 1970 to 2011. In the case of doctors per 10,000 persons, highest was 4.08 in 2010-2011 and the lowest was 1.6 in 1950-51 in Arunachal Pradesh. While in national level, doctors per 10,000 persons, was 8.1 which was the highest in the 2010-11 and lowest was 1.7 in 1950-51. It is found that doctors per 10,000 persons are better at national level than in Arunachal Pradesh.

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Table 2.Trends of Development of Health Facilities in Arunachal Pradesh

Year	Various Types of Health Facilities					
	Number of Hospitals/Dispensaries/ Me-dicals Units/PHCs, etc.	**No. of Doctors**	**No. of Hospital Beds**	**Popula t-ion Served per Doctor**	**No. of Hospitals/PHCs, etc., per 10,000 Population in (%)**	**No. of Hospital Beds per 10,000 Populatio n in (%)**
1960 -61	77	73	-	4,610	2.28	-
1970 -71	122	152	1,190	3,075	2.60	25.45
1980 -81	171	256	1,475	2,468	2.70	23.34
1990 -91	278	272	2,260	3,155	3.23	26.33
2000 -01	567	464	2,218	2,351	5.19	20.33
2010 -11	699	565	2,219	2,447	5.05	16.04

Source: From Statistical Abstract of Arunachal Pradesh, Various Years Issue, (APHDR-2005). **Note: - Dash** (-) indicates data not available. Statistical Year book of India, various Issue and Economic survey of India various years Issue.

Table 2, reveals the relevant development of health facilities in Arunachal Pradesh. From the data, we find that number of hospitals, dispensaries, medical units, PHCs, CHCs, and HSC's are highest in 2010-11 (699) and lowest in 1960-61 (77). However, there are also variations in total numbers of doctors from 1960-61 to 2010-11. The highest number of doctors was 565 in 2010-11 and lowest was 73 in 1960-61. There is also significant increase in number of hospital beds in the state. The highest total number of beds was 2,260 in 1990-91 and lowest in 1970-71. Nevertheless, in 2010-11, 2219 numbers of beds were reported which was much less compared to 1990-91. The total population served per doctor was highest (4610) in 1960-61 and lowest was 2351 in 2000-01. There is also significant improvement in the total number of hospitals, CHCs, PHCs, HSC's per 10,000 populations. The highest total number of Hospital, CHC, PHC and HSC per 10,000 populations was 5.19 in 2000-01 and lowest 2.28 which was the lowest in 1960-61.

Present Status of Health Infrastructure in the State

SRS Bulletin published by Ministry of Home Affaire, Health & F.W. GOI of 2012 shows that the health infrastructure of Arunachal Pradesh in terms of the availability of important health personnel and health centres in Arunachal Pradesh.

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Table 3.Access to Health Infrastructure Facilities and Services in Arunachal Pradesh

Types of Discipline Facilities	**Required**	**In Present Position/Existing**	**Shortfall**
Sub-Centre	356	286	70
Primary Health Centre	53	97	-
Community Health Centre	13	48	-
Health Workers (Female) ANM at SCs& PHCs	383	395	-
Health Workers (Female) /ANM at Sub-Centres	286	148	138
Health Assistant (Female)/LHV at PHCs	97	-	-
Health Assistant (Male)/LHV at PHCs	97	78	19
Doctor at PHCs	97	92	5
Obstetricians & Gynecologists at CHCs	48	0	48
Pediatricians at CHCs	48	1	47
Total Specialists at CHCs	191	1	191
Radiographers at CHCs	48	9	39
Pharmacist at PHCs & CHCs	145	56	89
Laboratory Technicians at PHCs & CHCs	145	88	57
Nursing Staff at PHCs & CHCs	433	293	140

Source: Rural Health Statistic (RHS) Bulletin, March 2012, Ministry of Health & Family Welfare, GOI),
Note: - Dash (-) indicates data not available**.**

Table 3, shows that the number of health personnel and health centres are shortfall in Arunachal Pradesh. It is set by the government and the estimate is based on standard requirement criteria. From the figures, it is evident that there is shortage of almost every category of health personnel. There is no shortage of sub-centres, PHC, CHC and Health Works on SC and PHC. In some specialized areas of health, there is scarcity of Specialists like Surgeons, Obestrists and Gynecologists, Physicians, Pediatricians and Specialists in CHCs in the state.

District Wise, Position of Health Personnel in Arunachal Pradesh

The study of this part is to discuss the district wise medical infrastructures and Doctors in the state. There are different kinds of health centres, which exist in the state. They are Sub-Health Centre (SHC), Primary Health Centre (PHCs), Community Health Centre (CHCs), District Hospital, General Hospital and State Hospital. The total number of physicians serving in health centres of Arunachal Pradesh in the period of 2001, 2009 and 2014 are given Table 4.

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Table 4.District-Wise, Number of People per Doctor in Arunachal Pradesh (2001, 2009 & 2014)

District-Wise	No. of People per Doctor			No. of People per Doctor			No. of People per Doctor		
	2001			2009			2014		
	No. of Doctor	Population	Level	No. of Doctor	Population	Level	No. of Doctor	Population	Level
Tawang	17	34705	2041	17	38924	2290	14	49977	3570
West Kameng	24	74595	3108	24	74599	3108	23	83947	3650
East Kameng	19	57065	3003	19	57179	3009	17	78690	4629
Papum Pare	56	121750	2174	56	122003	2179	89	176573	1984
Lower Subansiri	43	97614	2270	43	55726	1296	28	83030	2965
Kurung Kumey	-	-	-	-	**42518**	**0**	**10**	**92096**	**9210**
Upper Subansiri	24	54995	2291	24	55346	2306	16	83448	5216
West Siang	50	103575	2072	50	103918	2078	42	112274	2673
East Siang	53	87430	1650	53	87397	1649	56	99214	1772
Upper Siang	24	33146	1381	24	33363	1390	24	35320	1472
Dibang Valley	17	57543	3385	17	7272	428	7	8004	1143
L/Dibang Valley	-	-	-	-	50448	0	16	54080	3380
Lohit	55	143478	2609	55	125086	2274	30	145726	4858
Anjaw	-	-	-	-	18441	0	7	21167	3024
Changlang	41	124994	3049	41	125422	3059	25	148226	5929
Tirap	41	100227	2445	41	100326	2447	17	111975	6587
Total (A.P.).	**464**	**1091117**	**2352**	**464**	**1097968**	**2366**	**471**	**1383727**	**2938**

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Source: Estimated based on data from Statistical Abstract of Arunachal Pradesh Various Years Issue and (APHDR-2005). Stistical Abstract of India, Stistical year of India various Issue and Economy survey of India various years Issue **Note**:-Kurung Kumey district was undivided of Lower Subansiri district, 2001. Level means number of people per doctor in 2001, 2009 & 2014. **Note:-** Dash (-) indicates data not available and Undivided / attached district functional. Kurung Kumey New District Hospital Approved during 2008-2009 at Koloriang. The information provided in the Table 4, shows the number of people per doctor in Arunachal Pradesh from 2001-2014. In the year 2001, there were 464 doctors in total. Papum Pare (56) and Lohit (55) districts had the highest number of doctors compared to other districts. Tawang (17) and Dibang Valley (17) districts had the lowest number of doctors. It is surprising that Kurung Kumey, Lower Dibang Valley and Anjaw districts had no regular doctors. These districts were attached with other neighboring district hospitals which were newly created. The number of people per doctor in Dibang Valley and West Kameng districts was highest. The lowest number of people per doctor was in Upper Siang and East Siang districts. In 2009, number of doctors was 464, which were constant compared to 2001. The situation remained the same across all the districts in terms of population per doctor. The lowest number of people per doctor in Dibang Valley and Upper Siang are 428 and 1390 persons.

In 2014, the number of doctors has increased to 471 and there was also restructureing in the posting across the districts. The highest number of doctors was 89 and 56 in Papum Pare and East Siang districts respectively. The lowest was in Dibang Valley and Anjaw districts with 7 doctors each. The number of people per doctor are highest in Kurung Kumey and Trap distrcts, 9,210 and 6,587 persons are dependent on one doctor. The lowest number of people per doctor in Dibang valley and Upper Siang districts are 1,143 and 1,472 persons engaged with one doctor. The number of people per doctor are increased from 2001-2014. Thus, it may be concluded that with the growth of population ratio, the ratio of doctors per person is declining.

The Para medical staffs of health and family welfare services are also important part of health infrastructure. It has been seen that these health infrastructures are not sufficient and equally distributed across the different districts of the state. Not only the numbers of doctors are less but also specialized doctors are not available in the state. In addition, few CHC and PHC of the sample district have no permanent doctors. They provide service to people with few nursing staffs and temporary arrangement is made with a single doctor who looks after the health centre. All the specialized doctors, sophisticated machines and equipment are available mainly in general hospitals, which are located in town smoothly i,e. district headquarters. Since the number of general hospital in the state is only three; it is very difficult to access these facilities of health services by all patients in the remote areas of Arunachal Pradesh.

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District Wise, Structure of Public Health Infrastructure

There has been a considerable expansion in the health infrastructure across the districts as well as at the state level. It is significant to note that the expansion is faster in the hitherto backward districts and there has been a reduction in the inter-district disparity in the level of infrastructure. The indicators of health in terms of number of people per hospital beds have been presented in table 5.

Table 5.District-Wise, Number of People per Hospital Bed in Arunachal Pradesh (2001, 2009 & 2014)

District-Wise	**No. of People per Hospital Bed**			**No. of People per Hospital Bed**			**No. of People per Hospital Bed**		
	2001			**2009**			**2014**		
	No. of Hospital Bed	Popul-ation	Level	No. of Hospital Bed	Popul-ation	Level	No. of Hospital Bed	Population	Level
Tawang	54	34705	643	54	38924	721	54	49977	926
West Kameng	143	74595	522	143	74599	522	143	83947	587
East Kameng	140	57065	408	140	57179	408	140	78690	562
Papum Pare	362	121750	336	362	122003	337	362	176573	488
Lower Subansiri	162	97614	603	162	55726	344	162	83030	513
Kurung Kumey	-	-	-	-	**42518**	**0**	**78**	**92096**	**1181**
Upper Subansiri	114	54995	482	114	55346	485	114	83448	732
West Siang	237	103575	437	237	103918	438	237	112274	474
East Siang	221	87430	396	221	87397	395	221	99214	449
Upper Siang	78	33146	425	78	33363	428	78	35320	453
Dibang Valley	130	57543	443	130	7272	56	130	8004	62
L/DibangValley	-	-	-	-	50448	0	124	54080	436
Lohit	255	143478	563	255	125086	491	255	145726	571
Anjaw	-	-	-	-	18441	0	253	21167	84

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Changlang	135	124994	926	135	125422	929	135	148226	1098
Tirap	187	100227	536	187	100326	537	187	111975	500
Total (A.P.).	**2218**	**1091117**	**491.93**	**2218**	**1097968**	**495.02**	**2673**	**1383727**	**520**

Source: Estimated based on data from Statistical Abstract of Arunachal Pradesh Various Years Issue and (APHDR-2005).Stistical Abstract of India, Stistical year of India various Issue and Economy survey of India various years Issue. **Note**:- Kurung Kumey district was undivided of Lower Subansiri district, 2001. Level means number of people per hospital bed in 2001, 2009 & 2014. **Note:-** Dash (-) indicates data not available and undivided / attached district functional. Kurung Kumey-New District Hospital Approved during 2008-2009 at Koloriang In Table 5, it reveals the district wise number of people per Hospital Bed in Arunachal Pradesh (2001-2014). Though the number of health service institutes against number of population is better than all India average, the facilities provided in the hospital is miserable. The available beds distributed in different medicals (Viz. General hospital, District hospital, Community health centre, Primary health centre and health sub-centres) are the important issues of health service development in the state. During 2001-2009, there is no change in number of beds in all health service institution.However, in 2014 it was 2,673. It is almost equal. In the year 2001, total number of hospital beds was 2,218.The highest numbers of beds were in Papum Pare (362) and Lohit districts (255) and lowest in Tawang (54) and Upper Siang (78). The number of people per hospital beds was 491.93 in the state. The highest number of people per beds was in Changlang and Tawang districts. The lowest was in Papum Pare and East Siang districts which were 336 and 396 respectively.

In 2014 population per hospital bed increased to 520 for the whole state. In the districts like Kurung Kumey and Changlang, more than one thousand populations are dependent on one bed. In Dibang Valley and Anjaw less than 100 populations are dependent on one bed. The worst afftected districts are Kurung Kumey (1181), Changlang (1098), and Tawang (926) where the ratio population hospital is worse in 2014.

Health Indicators

During independence, the health status of the people of Arunachal Pradesh was undoubtedly very poor. Although, there is no statistical data available to bear out this assertion. It is reflected in administrative records, anecdotal evidence and the collective memory of the people. The health of the people of Arunachal Pradesh has improved gradually. The incidence of morbidity and the life expectancy of the people has increased and mortality has declined. Since 1961, the tribal population has been growing in the state. Assuming that there has been no increase in the fertility rate, this is indicative of better health and longevity. However, while the health condition of the people of Arunachal Pradesh has

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improved, the pace of improvement has been rather slow. The important measures and indicators of health status of people are described below.

Life Expectancy at Birth (LEB)

After independence in 1950-51, life expectancy at birth in India was 32.1 years. It has jumped to 63.3 years in 2000. In 1950-1951, there were no estimates or records of life expectancy in Arunachal Pradesh. In 2000, life expectancy at birth in Arunachal Pradesh is 54.05 years which is 9.25 years less than the national average. It is one of the lowest in the country. Life expectancy of Kerala state is 76.23 years (NHRD, 2001), which is higher by 22.18

Table. 6 Life Expectancy at Birth in the Districts of Arunachal Pradesh: (2000-2001)

District-Wise	Life Expectancy at Birth						
	Total Years	Male	Index	Female	Index	Total Index	Rank
Tawang	49.79	49.75	0.454	50.01	0.375	0.413	11
West Kameng	53.35	53.04	0.509	53.51	0.434	0.473	9
East Kameng	43.36	43.86	0.356	42.47	0.250	0.306	13
Papum Pare	61.80	60.92	0.640	62.45	0.583	0.613	1
Kurung Kumey	**42.50**	**42.83**	**0.339**	**42.30**	**0.247**	**0.292**	**15**
Lower Subansiri	55.65	54.91	0.540	56.33	0.481	0.511	6
Upper Subansiri	46.34	45.50	0.383	47.22	0.329	0.356	12
West Siang	55.37	56.30	0.563	54.36	0.448	0.506	7
East Siang	60.08	59.06	0.609	61.43	0.566	0.585	2
Upper Siang	54.02	55.59	0.552	52.50	0.417	0.484	8
Lower Dibang Valley	58.56	56.95	0.574	59.05	0.526	0.559	3
Dibang Valley	43.20	43.55	0.351	42.46	0.249	0.303	14
Lohit	56.30	55.51	0.550	57.67	0.503	0.522	4
Changlang	55.70	54.72	0.537	56.62	0.485	0.512	5
Tirap	52.66	54.36	0.531	50.51	0.384	0.461	10
Arunachal Pradesh	**54.05**	**53.66**	**0.519**	**54.51**	**0.450**	**0.484**	**--**
All India	63.3	61.86	0.656	64.84	0.622	0.638	--

Source: From Statistical Abstract of Arunachal Pradesh Various Years Issue, (APHDR-2005) &SHDR Survey Data. Statistic Abstract of India, Statistic year of India various Issue and Economic survey of India various years Issue. **Note: -**Dash (-) indicates data not available.

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The information from Table 6, shows the life expectancy at birth among the 15 districts of Arunachal Pradesh. Papum Pare district had the highest life expectancy of 61.80 years and in Kurung Kumey it was 42.50 years. East Siang district had 60.08 years which stood next to Papum Pare District like Dibang Valley (New) and East Kameng are close to Kurung Kumey with life expectancy of 43.20 years and 43.36 years respectively. According to the table, there are five districts based on life expectancy below 50 years. These are Upper Subansiri with life expectancy of 46.34 years, Tawang with 49.79 years, Kurung Kumey (42.5 years) and Dibang Valley (New) 43.2 years). These classification and variation show that the people who live in districts situated in upper hill ranges have lower life expectancies than those who live in districts located in the plains.

Infant Mortality Rate (IMR)

Table 7.Infant Mortality Rate (IMR) in the Districts of Arunachal Pradesh (2000-2001**)**

Districts-Wise	**Infant Mortality Rate in the Districts**	
	IMR	**Rank**
Tawang	98	13
West Kameng	88	9
East Kameng	97	12
Papum Pare	67	5
Kurung Kumey	**113**	**15**
Lower Subansiri	59	3
Upper Subansiri	97	11
West Siang	85	7
East Siang	57	2
Upper Siang	87	8
Lower Dibang Valley	53	1
Dibang Valley	98	14
Lohit	72	6
Changlang	62	4
Tirap	92	10
Arunachal Pradesh	**77**	--
All India	68	--

Source: From Statistical Abstract of Arunachal Pradesh, Various Years Issues, Computed from SHDR, (APHDR-2005), Survey Data and Sample Registration System. Bulletin, April 2002. Statistical Abstract of India, Statistical year of India various Issue and Economic survey of India Various years Issue. Note:- Dash (-) indicates data not available.

Table 7, gives the infant mortality rate of different districts of Arunachal Pradesh in 2000-01. Arunachal Pradesh has an IMR 77 per 1000 live birth, which indicates that out of 1,000

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children born, 77 children did not see their next birthday (APHDR-2005). Orissa has the highest IMR (95) and lowest in Kerala (14 only). Table 4.11, has revealed that Infant Mortitality Rate (IMR) in the districts of Arunachal Pradesh is the highest in the Kurung Kumey district with 113 per 1000 live births and the lowest IMR is in Lower Dibang Valley district with 53 per 1,000 live births.The infant mortality rate in Arunachal Pradesh varies significantly with physically accessibility of the district. It is highest in areas like Kurung Kumey, Dibang Valley (New), Tawang, and East Kameng where accessibilities are difficulty. It is also relatively low in districts like Lohit, Changlang, Lower Subansiri, East Siang and Lower Dibang Valley which are easier to access. Overall, we can generalise that the districts which are hilly in the state have higher IMRs.

Health Infrastructure in the Study Area

The health care infrastructure consists of basic physical and human resources apart from equipment and medicines. Hence, a comprehensive analysis of health care infrastructure should include hospitals, dispensaries, practitioners, doctors, paramedical staff, other health workers, number of beds and pharmacy stores. Hence, the present study has tried to provide data on some of the available information on the different constituents of health care infrastructure available in the state and Kurung Kumey district. The purpose of this analysis is to measure the extent of health care facilities available in the different districts of the state as well as their growth overtime. There has been a considerable expansion in the health infrastructure in the state and different districts. The Department of Health and Family Welfare is the apex body at the state level. It supervises the Directorate of Health and Family Welfare Services, Medical Education, Indian Systems of Medicine and Homeopathy, the Controller of Drugs and Population Center. The District Health and Family Welfare Officer at the district level is responsible for organizing promotional, preventive and curative health services in rural areas. The District Surgeon is responsible for providing medical services (curative) in urban areas. The indicators of health in terms of institutions and others infrastructure is presented in tables 7 and 8

Table 8 Existing Health Institutions and Infrastructure Facilities in Kurung Kumey District

Types of Existing Facilities	**No. of Institutions Established (2014)**		**At Existing Functioning (2014)**	
	A.P	**Kurung Kumey**	**A.P.**	**Kurung Kumey**
MedicalCollege/Others AYUSH	Nil	Nil	Nil	Nil
Nursing Institutions	2	Nil	2	Nil

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General Hospitals	3	Nil	3	Nil
Mental Hospital	1	Nil	1	Nil
District Hospitals	13	Nil	12	Nil
Community Health Centre	54	3	49	3
Primary Health Centre	129	13	97	9
Sub-Health Centre	492	58	286	38
Ayurvedic	13	1	13	1
Unani	Nil	Nil	Nil	Nil
Homeopathic	40	34	2	2
Referral Hospital	Nil	Nil	Nil	Nil

Source: Directorate of Health and Family Welfare, Govt. of Arunachal Pradesh, 2014, District Medical Officer (DMO), 2014.

Table 8, shows the existing Health Institutions and Infrastructure Facilities in Kurung Kumey District. As per data, it is observed that there is no medical college in the state. In Kurung Kumey district, there are no nursing institutes, General Hospitals, Mental Hospital, District Hospitals, Referral Hospital and Unani. Out of 54 Community Health Centres (CHCs) in State, only three CHCs are functioning in the Kurung Kumey district. There are 13 primary health centres (PHCs) in the district out of which only 09 PHCs are functioning. Out of 58 Sub health centres (SHCs), only 38 are functioning. It is surprised to know that out of 34 Homeopathic Hospitals; only 02 Homeopathic Hospitals are functioning in the district.

Circle wise existing health institutions and infrastructure facilities in Kurung Kumey district is shown in table 9, for the year 2010 and 2014. It is observed from the data that total numbers of CHCs are 04 in 2010, which is reduced to 03 in 2014. The number of PHCs has increased from 06 in 2010 to 13 in 2014. Nevertheless, again, it is noted that number of Sub-Centre hospitals is reduced from 61 in 2010 to 58 in 2014.

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Table 9.Existing Health Institutions and Infrastructure Facilities in Kurung Kumey District

Sl No.	Name of Circle	No. of Community Health Centre		No. of Primary Health Centre		No. of Sub-Health Centre		Total	
		2010	2014	2010	2014	2010	2014	2010	2014
1	Palin	1	1	Nil	1	11	9	12	16
2	Yangte	Nil	Nil	1	1	4	3	5	4
3	Sangram (NGO,s)	Nil	Nil	1	1	6	5	7	6
4	Nyapin	1	1	Nil	1	8	7	9	9
5	Chambang	1	Nil	Nil	1	3	4	4	5
6	Koloriang	1	1	Nil	1	7	7	8	9
7	Sarli	Nil	Nil	Nil	1	2	2	2	3
8	Damin	Nil	Nil	1	1	4	5	5	6
9	Parsi Parlo	Nil	Nil	Nil	Nil	2	3	2	3
10	Tali	Nil	Nil	1	1	3	4	4	5
11	Langding Koling	Nil	Nil	Nil	1	2	2	2	3
12	Tarak Longdi	Nil	Nil	Nil	1	3	2	3	3
13	Gangte	Nil	Nil	1	1	3	3	4	4
14	Phassang	Nil	Nil	1	1	3	2	4	3
15	**Total**	**4**	**3**	**6**	**13**	**61**	**58**	**71**	**74**
16	**All Arunachal**	**40**	**63**	**98**	**143**	**635**	**584**	**773**	**790**

Source: District Medical Officer (DMO), 2010 & 2014, Statistical Abstract of Arunachal Pradesh, 2011,District Census Handbook of Kurung Kumey, 2011, Directorate of Census Operations, Arunachal Pradesh, 2011 and Census of India, 2011, **Note:- *NGO,s**-Public Private Partnership (PPP) by Kurna Trust.

This trend is because of up gradation of existing medical centers i.e, from community to primary and sub-health center to primary health centers. In Parsi Parlo circle, there are no CHCs and PHCs, and three SCs are functioning. It is important to mention that number of all types of health centers in the state has increased by 2.19% and in Kurung Kumey 4.22% during 2010-2014. In terms of growth of total health centers, the district is above the state average.

Man Power in Health Centres of Kurung Kumey District

In order to gain the benefits from the progress in health centres, facilities should be in other available dimensions of the health care system. The manpower is the heart of the health systems. Its adequacy is one of the important prerequisites for the efficient functioning of the health services. So, availability of the manpower is a significant prerequisite for the efficient

functioning of the health services. The Table 10, shows the availability of manpower in

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different health centers in Kurung Kumey district and the state.

Table 10 Existing Manpower in the Health Centres of Kurung Kumey District

Sl.No	Name of Circle with Health Centres	No. of Doctor		No. of Midwives		No. of Nurses	
		2010	2014	2010	2014	2010	2014
1	Palin (CHC)	2	3	4	5	-	-
2	Yangte (PHC)	1	1	1	1	-	-
3	Sangram*(NGO,s-PPP)	NGO,s	NGO,s	NGO,s	NGO,s	NGO ,s	NGO,s run
4	Nyapin (CHC)	2	2	5	4	-	-
5	Chambang (PHC)	Nil	1	1	1	-	-
6	Koloriang (CHC)	3	3	5	4	-	-
7	Sarli (PHC)	Nil	Nil	Nil	Nil	-	-
8	Damin (PHC)	Nil	Nil	1	1	-	-
9	Parsi Parlo (SC)	Nil	Nil	Nil	Nil	-	-
10	Tali (PHC)	Nil	1	Nil	1	-	-
11	Langding Koling (PHC)	Nil	Nil	Nil	Nil	-	-
12	Tarak Longdi (PHC)	Nil	Nil	Nil	Nil	-	-
13	Gangte (PHC)	Nil	Nil	Nil	Nil	-	-
14	Phassang (PHC)	Nil	Nil	Nil	Nil	-	-
15	**Total**	**8**	**10**	**17**	**17**	**-**	**-**
16	**All Arunachal**	**507**	**471**	**155**	**381**	**-**	**156**

Source: District Medical Officer (DMO), 2010 & 2014, Statistical Abstract of Arunachal Pradesh, 2011,District Census Handbook of Kurung Kumey, 2011, Directorate of Census Operations, Arunachal Pradesh, 2011 and Census of India, 2011.**Note:-*NGO,s**- Public Private Partnership (PPP) by Kurna Trust. **Dash** (-) indicates data not available.

Table 10, shows that the state had 507 doctors in 2010, which are come down to 471 in 2014. Kurung Kumey had 8.6 doctors per lakh population in 2010 and 10.86 in 2014. This shows that Kurung kumey is at a disadvantageous position vis-à-vis the state in terms of doctors per lakh population. Similarly, in terms of number of midwives, the state had 11 per lakh of population in 2010, which increased to 27.5 in 2014, but in Kurung Kumey district, it remained at 18.14 per lakh of population during the same time. So, in terms of paramedical staff also, the district is lagging behind in state. Within the district, some of the health centers are also functioning without any staff. These centers are Sarli (PHC), Parsi Parlo (SC), Langding Koling (PHC), Tarak Langdi (PHC), Gangte (PHC), Phassang (PHC), where not a

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single staff is there. Single doctor and midwives in health centers are Yangte (PHC), Chambang (PHC), and Tali (PHC). In Damin (PHC), no doctor is there and is being run by only one midwife. So, in a nutshell, we can say that in terms of manpower, many of the health centers are malfunctioned in the district.

Determinants of Longevity (Children)

Longevity is one of the important dimensions of Human Development. Life expectancy at birth takes a weightage of "one third" in the Human Development Index. Human Development Report of Arunachal Pradesh-2005, computed life expectancy at birth of Kurung Kumey district as 42. Therefore, it is important to examine the factors that determine longevity of people.

Here, an attempt is made to analyse the determinants of longevity of children in the age group 0-15 and population in the age group 15-45. Table 11, gives the detail regarding variables used in the Regression Analysis.

Table 11 Variables used in Regression Analysis.

Sl. No	Variable	Symbol	Name of Variables
1	Age of Death	AGEDEATH	It takes a value equal to the number of years the person in survived
2	Birth order of the person	BIRTHORD	Takes a value in accordance with order of birth to the mother
3	Size of the Household	HHSIZE	Takes a value equal to the number of person dependent on one kitchen
4	Education level of Father	EDUFATH	It takes value=0, when father is illiterate. Takes value=1, when education of the father is up to class-V. It takes value '2', when educated up to VI-VIII. It takes value '3', when education level is IX-X. It takes value when education level is XI-XII takes value '4', when education level is up to graduation. It takes value when education level is above graduation.
5	Education level of Mother	EDUMOTH	Same as above
6	Log of Per Capita Income	LOGPCI	It is simple transformation of log of per capita income of the household.
7	Distance from the nearest Health Centre	DISHEALTH	It is the distance from the nearest health centre in KM.
8	Distance from the	DISTROAD	It is the distance from the nearest

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	motorable road		motorable road
9	Drinking water	DRIWATER	It is a dummy variable takes value '1', when the household get treated drinking water. It takes value=0, otherwise
10	Electricity	ELECT	It is a dummy variable takes value '1', when the household is electrified and value '0', otherwise
11	Ration card	RATIONCA	It is a dummy variable takes value '1', when the household has a ration card and '0', when it does not have.
12	Toilet	TOIL	It is a dummy variable takes value '1', when the household open field for defecation and '0', when the household has a toilet within the premise of the house
13	Gender	GEN	It is a dummy variable takes value '1', when the person is male and '0', when female
14	Immunization	IMMUN	It is a dummy variable takes value '1', when the person is completely immunized and '0'. Otherwise.

Data Analysis and Regression results Child Death in the age group (0-5)

Table 12 Dependent Variable AGEDEATH (For age group (0-15)

Sl. No.	**Explanatory variable**	**'β' Coefficient**	**'T' statistics**
1	Constant	6.38	0.912
2	BIRTHORD	-0.0037	-0.78
3	DISHEALTH	-0.007	-4.84***
4	DISTROAD	-0.0016	-3.43***
5	DRIWATER	1.97	3.18***
6	EDUFATH	-0.008	-0.3
7	EDUMOTH	-2.11	-0.57
8	ELECT	-1.29	-2.63***
9	GENDER	0.44	1.74*
10	HHSIZE	-0.004	-1.1
11	IIMMUN	0.223	0.765
12	PCINCOME	0.11	0.06*
13	RATIONCA	0.798	0.05**

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14	TOIL	1.37	3.368**
N=598, F=15.537*, R^2 =0.65** *****:-Shows Significance at 99% level,** ****:- Shows Significance at 95% level, and** ***:- Shows Significance at 90% level,**			

Table 12, shows the determinants of longevity of the children in the age group 0-15. The explanatory variable is, Age at Death (AGEDEATH). Table shows that the variables like Distance from the health centre (DISHEALTH), Distance from the main road (DISTROAD) negatively influence the longevity of the child. This finding corroborates the finding of the Arunachal Pradesh Human Development Report-2005, which showed that death rate in the interior areas of Arunachal Pradesh is higher than the accessible area. The other household characteristics like Education level of the mother (EDUMOTH) and father (EDUFATH), household size (HHSIZE), birth order of the child (BIRTHORD), do not have any impact on the longevity of the children. The infrastructure variable like electricity (ELECT) has a negative impact on the dependent variable.

The variable like treated drinking water (DRIWATER), has a positive impact. Perhaps, people having access to safe drinking water have a better longevity than the others. Household having ration card have a higher longevity, as the dummy variable RATIONCA has a negative coefficient which is statistically significant. This particular point shows that household having access to food, have better longevity of children.

The variables logs of Per capita income (LOGPCI), Toilet (TOIL), Gender (GEN), have statistically positive impact on longevity. This shows that higher is the income, higher is the life span of the child. Variable coefficient of the variable gender (GEN) is positive and statistically significant shows that boys have longer life span than girls.

The variable toilet (TOIL), which is a dummy variable, takes value '1', when the household uses open place for defecation and '0', when there is a toilet inside the housing premises. Here, the 'β' coefficient is positive implies that household having toilet inside the premise, have a lesser life span than the household using open space. Thus, the point is very important in the sense that in the tribal traditional house, toilet is kept inside which is not hygienic.

Variable Immunisation (IMMUN), have a positive impact on the dependent variable, which is not statistically significant. Therefore, a feeble conclusion can be derived that children immunised have a higher life span than the other.

Main Findings of the Study are:

i. Majority of the households do not have electricity connection (72.22%).
ii. Around 73.61% of the households do not have ration cards.

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iii. Around 72% of the households are dependent on temporary toilet facility, which are mainly katchha type.
iv. Around 46.9% of the households are dependent on traditional well/spring and river for drinking water.
v. Around 97.6% of the female fetches drinking water for the households and 87.85% of the households are not getting treated water for drinking purpose.
vi. Only 59% of the households travel in between 0-4 km to reach the motorable road.
vii. Almost 100% of the households have access to ICDS facilities in the study area. Only 4.2% of the households reported to have regular nutrition food through Anganwadi centers.

Findings of Availability and Access to Health Care facility

i. As pointed out that the IMR of the district is quite high (113 per 1000). Accurate statistics of death is not available because people do not report death of the family to any government agencies. The secondary data collected from two CHC's reported only 177 death on between 2007 and 2011.
ii. In 2014, out of 492 Sub-Centers established in the state, 286 were functioning. In Kurung Kumey district 38 were functioning out of 58.
iii. There were 3 Community Health Centers (CHC), 9 Primary Health Centers (PHC) and 38 functioned Health Sub-Centers in the district.
iv. In 2014, Community Health Centers were there in Nyapin, Koloriang and Palin, which are medically developed circles. In all circles there were at least one Primary Health Centers and Sub-Health Centers.
v. There were 10 doctors in six health centers and in rest there were no doctors and were mainly managed by midwives. Some of the centres like Sarli, Parsi Parlo, Langding Koling, Tarak Langdi, Gangte and Phassang circles did not have midwives.
vi. Among 61% of the households reported insufficient medical care facility in the study area. Only 13% reported about sufficient medical care facility.
vii. Around 64% of the households reported to have access to some health centres and 36% reported to have no access.
viii. Physical infrastructure is insufficient in the study area as only 46.2% of the households reported the presence of no health centres in their locality. The circles where there is some health buildings presences were reported are Nyapin, Sangram, Yangte, Palin and Chambang. The badly affected circles are Parsi Parlo, Damin and Tali.
ix. Regularity of medical staff is also not satisfactory in the study area as only 23.6% of the households reported the presence of medical staff regularly. The badly affected circles are Parsi Parlo, Damin, Tali, Yangte, and Chambang.
x. More than 60% of the households reported no regular doctor in the study area. In Parsi Parlo, Damin,Tali and Chambang were more than 80% of the households reported to have no regular doctors.

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xi. Some is the condition with Paramedical staff as 46% of the households reported no staff. Here also, Parsi Parlo, Damin, Chambang and Tali, around 60% of the households reported no staff in the health centres.
xii. Mother room availability is also important for the safe delivery of the child. In the entire study area only 1.73% of the households reported to have mothe labour room in their respective health centres.
xiii. Availability of Laboratory equipment also an indicators of medical infrastructure 68.05% of the households reported no medical equipment/laboratory in their area. In Parsi Parlo, Damin,Tali and Chambang 100% of the households reported no medical equipments. In the entire study area 74.3% of the households reorted absence of free medicines. In Parsi Parlo, Damin,Tali, Yangte and Chambang more than 90% of the households reported absence of free medicines.
xiv. Immunisation also plays a crucial role in the survival of the children. In the entire study area 37.15% of the children reported the presence of immunization programme. The better of circles in immunization are Nyapin, Sangram, Yangte and Palin.
xv. Presence of Pharmacy and Dispensaries is an indicator of the health services. Around 59.6% of the households reported absence of these services in their area. The badly affected circles are Damin and Tali where as 100% of the households reported absence. In Parsi Parlo and Chambang more than 66% reported absence of Pharmacy and dispensaries in their circles. Monthly average medical expenditure per household is Rs. 5436.00 and monthly per capita is Rs. 718.87 in the study area. It is found that average per capita expenditure as medical is lower in the circles where medical facility is poor.
xvi. A question was asked "What do you do, when you fall sick?". In response to this question 77.8% of the households reported that they usually go for traditional treatment. In Parsi Parlo, Damin,Tali and Chambang the response for traditional treatment is around 90% and above.
xvii. Distance travelled by the patients to reach health centres is also an important indicator of accessing better health services. Around 36% of the households travel a distance of 0-8 km, 39.8%, a distance of 8.15 km and 25% travel a distance of 15+ km to reach the medical centres.
xviii. In the last 15 years (with respect to the date of interview of the households), 52% of the total death in the sample area occurred in the age group 46-55 Year.
xix. Most important reasons of death in descending order are (i) Malaria/Typhoid/Fever/Cold, (ii) Diarrhea/Dysentery, (iii) Tuberculosis, (iv) Jaundice, (v), Cholra and (vi) Other diseases.
xx. Prior to the date of interview, in the last 15 years, 602 child dealth was reported from the sample area. Out of the 602 child death 52% were male and 48% were female. Among 50% of the child death occurred in the age group 0-5 and 37.9% in the age group 6-10. The pattern of death is almost same across the circles.
xxi. Most important causes of death in descending order are (i) Pneumonia, (ii) Diarrhea, (iii) Choleria, (iv) Malaria/ Typhoid/ Fever/ Cold and (v) Jaundice.

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xxii. A regression analysis is attempted to understand the main determinants of death of children. The dependent variable is Age at death and the Explanatory variables are (I Birth order of the child, (ii) Household size, (iii) Education level of the father, (iv) Education level of mother, (v) Log of Per capita income of the household, (vi) Distance from the nearest health centre, (vii) Distance from the motorable road, (viii) Availability of safe drinking water, (ix) Availability of electricity in the household, (x) Availability of ration card in the household, (xi) Availability of toilet facility, (xii) Gender of the child and (xiii) Immunisation of the child.

xxiii. The variables that affects the Age at death, negatively are distance from the health centres, Distance from the motorable road. This findings corroborates the findings of APHDR that death rate in interior areas are more than the accessible area in Arunachal Pradesh.

xxiv. The infrastructure variable electricity has a negative impact on Age at death. Most probably the better off household with electricity reported the death cases and others did not.

xxv. The variables ration card and per capita income have positive impact on Age at death. This shows that people with access to ration card have better access to food as a result survival chance of the child for higher age is more.

xxvi. Variable TOILET has a positive impact on Age at Death. Thus is important findings in the sence household within house toilet facility have a lesser chance for survival. Thus is because, in the traditional housing pattern in house toilet is not at all hygienic which leads to many diseases.

xxvii. The variables like treated drinking water has a positive impact on Age at Death.

xxviii. The other variables like per capita income, Gender have expected impact on Age at Death.

Some Policy Recommendations and Suggestions

i. Network of rural health services should be made more efficient by covering the remote part of the region.

ii. Since there is a shortage of health personal and infrastructure in the area, effort may be made to increase them on a priority basis. Health awareness campaign should be done to make the rural mass more aware of the basic hygiene and diseases.

iii. Monitoring of the health workers is a must for better health services.

iv. Education also promotes better health. So, health camp in every school should be conducted.

v. One important problem in the study area is poor road and telecommunication. So, effort may be made to improve which may improve the health condition of the people.

vi. Given the limited resources of the state, public-private partnership programme in the health sector may be initiated.

vii. Mobile clinic scheme may be initiated to habitations with small population.

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viii. Most important variables in our findings are safe drinking water and toilet facility. Effort may be made to remove all in house traditional toilet, which will definitely enhance survival of the children.

5. CONCLUSIONS

The analysis made above reflects some important conclusions. In the determinant analysis of age at death of children, the important variables that affect the dependent variable, i.e. age death are distance from the main road, distance from nearest medical centres, treated drinking water, gender of the child, per capita income, and ration card holding, availability toilet facility. Therefore, state can intervene in the following areas.

- Since remoteness of the village affect the longevity negatively, realignment of the household with medical facility can improve the accessibility of the households to medical facility and thereby improve longevity of the children.

- Drinking water is an important determinant of higher longevity. Therefore, effort may be made to provide treated drinking water.

- Ration card holding indicates that access to food item improves the longevity of the people. Therefore, states can intensify the provisioning of food grains in the remote part. One of the most important factors of longevity of the children is toilet facility. From the regression analysis it is clear that household having toilet inside the housing premises have low level of longevity. Therefore, effort may be made to remove the toilet from the traditional houses to make it more hygienic.

- As log of the per capita income affects the longevity of the children positively effort may be to increase the income of the rural poor.

Finally, there is a gender bias against the girl child in longevity. If necessary measures one taken as indicated above, certainly it will benefit the girl child. If necessary measures one taken as indicated above, certainly.

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