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## MAINSTREAMING HEALTH CARE INFRASTRUCTURE AND HUMAN DEVELOPMENT IN GUJARAT

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### Abstract:

*The health of a nation is an essential component of development, vital to the nation's economic growth and internal stability. At present India is leading with the human development concept and millennium development goals. Gujarat is one of the State whose approach to human development absolutely determined and attracts the concentration of researchers and policymakers especially in health sector. Improvement in the health and nutritional status of the population of Gujarat has been the major driving force for the social development programs. In this paper we focus on health infrastructure development and human development. Does health infrastructure a facility pushes to the human development? Yes, health care facilities sustainably reduced poverty in Gujarat. The state has consider economic investment in public health, directly and indirectly (Public Private Partnership) across the health sector. And it built strong public healthcare system across the all districts in the state along with human development features.*

### KEY WORDS:

Health Infrastructure, Human Development, Regression and Linear Trends illustrates of basic health indicators

### JEL CLASSIFICATION

I-Health, Education and welfare, I10-General, O15, Human Resource, Human development, Income Distribution, Migration

### INTRODUCTION AND REVIEW OF LITERATURE:

Growth in national income by itself is not enough, if the benefits do not manifest themselves in the form of more food, better access to health and education.

Amartya K Sen

The constitution of India has made health care services largely a responsibility of state governments but has left enough maneuverability for the Centre since a large number of items are listed in the concurrent list. In 1946, the Health Survey and Development Committee, headed by Sir Joseph Bhore recommended establishment of a well-structured and comprehensive health service with a sound primary health care infrastructure. This report not only provided a historical landmark in the development of the public health system but also laid down the blueprint of subsequent health planning and development in independent India. Edward L. Baker Jr. and Jeffrey P. Koplan discussed in their paper about continued vigilance and broad partnership development in health sector. They point to the need for better language,

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compelling case reports, and quantitative capacity assessment to guide policymakers and program leaders and to ensure long-term support. Pillai N., Vijayamohan focus on proposition of a 'chain interaction' between human development and economic growth is suggested whereby the human development Kerala had achieved by means of infrastructure development propelled economic growth (in terms of consumption expenditure) which in turn has led to further human development. Another proposition on an 'invisible hand' a la Adam Smith that translates disparate, individual self-interests into coherent social interest also is put up in explaining the development experiences of Kerala. Developing countries, such as, Cuba and Sri Lanka, and within India in states such as Kerala, which skillfully used their resources, achieved major progress in the health of their population even with a modest per capita income.

The experiences of various NGOs, such as the Jhamked project in India were documented and analyzed. The elements for the successes in providing health for all people became clear. Avneesh Kumar and Saurav Gupta suggested in their paper India can also be inspired by US health care system so the government is required to take an integrated approach, which must take into consideration meeting the regional differences with the help of the local people; it must prepare a decentralized structure which would be district based, involving active role for the local level institutions like Panchayats. The authors have also discussed the impact of national rural health plan (NRHM) initiated by the central government; the authors have pointed out that although the mission has impacted the lives of rural masses.

#### CONCEPT OF HUMAN DEVELOPMENT

Human Development is the process of widening people's choices and their level of well-being. The choices change over time and differ among societies according to their stage of development the three essential choices for people are - to lead a long and healthy life, to acquire knowledge and to have access to the resources needed for a decent standard of living. If these choices are not available, many other opportunities remain inaccessible. Other choices, highly valued by many people include political, economic and social freedom, access to opportunities for being creative and productive and enjoying self-respect and guaranteed human rights. More than that we have come to recognize that given the ongoing process of liberalization, privatization, marketisation, transnationalisation and globalization, there is a strong case for social intervention in the provision of health and education. The principal objective of development planning is human development and the attainment of higher standard of living for the people. This requires a more equitable distribution of development benefits and opportunities, better living environment and empowerment of the poor and marginalized.

#### HEALTH INFRASTRUCTURE FACILITIES IN GUJARAT

Health Infrastructure is an important indicator to understand the healthcare delivery provisions and mechanisms in a country. It also signifies the investments and priority accorded to creating the infrastructure in public and private sectors. Gujarat state has extensive network of Government, private and voluntary health and medical services to meet the primary and secondary needs of health. Health Infrastructure is an important indicator to understand the healthcare delivery provisions and mechanisms.

The three-tier public health system is built on the Sub-Health Centers (SHCs), Primary Health Centers (PHCs) and specific service focused Community Health Centers (CHCs), to the district/civil hospitals; and in the final tier, the referral hospitals. In rural areas especially, the PHC is the most critical health facility. Gujarat health care service delivery is also divided into three parts on the basis of national common structure as well as the need of the community. Distribution of these facilities has been done on the basis of population and geographical situations. These layers are not just different in terms of population only but they also differ in nature of services delivered. Primary health care basically provides basic minimum care with more focus on preventive aspects and public contact. Curative services are also provided there but they are minimal in nature. While secondary care is mix of both curative as well as preventive. Tertiary care is basically meant for high level of curative care and research studies.

Primary Level Care	Secondary Level Care	Tertiary level care
Primary Health Center	Civil Hospitals	Medical College Hospitals
Sub center/Dispensaries	Sub District Hospitals	Super Specialty Hospitals
Village Level Workers	Cottage Hospitals / Referral Hospitals, Community Health Centers	

**Magnitude of Health Infrastructure in Gujarat**

Table 1 : Health infrastructure in Gujarat Health, Medical services and Medical Education							
#	Item	Unit	05-06	06-07	07-08	08-09	09-10
<b>[1] Health Services</b>							
1	Community Health Centers	No.	273	273	273	283	290
2	Primary Health Centers	No.	1,072	1,073	1,073	1,084	1,096
3	Urban Family Welfare Centers	No.	106	106	106	106	106
4	Post Partum Units	No.	88	88	88	88	88
5	Sub Centers	No.	7,274	7,274	7,274	7,274	7,274
6	T.B. Demonstration and Training Centers	No.	1	1	1	1	1
7	Additional/District T.B. Centers	No.	27	29	29	30	30
		Beds	305	305	305	0	0
8	T.B. Clinics	No.	1	1	1	0	0
9	T.B. Sanatoria	No.	2	2	0	0	0
		Beds	237	237	0	0	0
10	Grant-in Aid T.B. Hospitals	No.	12	11	11	0	0
		Beds	2,026	1,944	1,944	0	0
11	TB Units	No.	125	129	132	136	136
12	Diagnostic Microscopic Centre	No.	632	669	633	718	725
13	Trained Dots Provider	No.	20,057	21,168	24,126	35,359	33,675
14	District/Zonal Leprosy Units	No.	8	8	8	8	8
15	Leprosy Control Units	No.	0	0	0	0	0
16	Modified Leprosy Control Units	No.	1	1	1	1	1
17	Urban Leprosy Control Units	No.	21	21	21	0	0
18	Leprosy Training Centers	No.	1	1	1	0	0
19	Reconstructive Surgery Units	No.	2	2	2	2	2
20	S. S. A Units**	No.	1	1	1	1	1
21	Survey Education & Treatment Unit	No.	372	372	372	0	0
22	Temporary Hospitalization Wards	No.	0	0	0	0	0
		Beds	*	*	*	0	0
23	Govt. Leprosy Hospitals	No.	3	3	2	0	0
		Beds	370	370	300	0	0
24	Grant-In-Aid Leprosy Hospitals	No.	4	4	3	0	3
		Beds	590	550	300	0	300
25	District Nucleus Centre (Dist. TB Centers)	No.	16	16	16	16	16

26	Upgraded Urban Leprosy Centre	No.	3	3	3	3	3
27	Ophthalmic Unit in Dist. Hosp.	No.	25	25	25	25	25
28	Dist. Mobile Units (Ophth)	No.	14	14	14	14	14
29	Central Mobile Units (Ophth)	No.	6	6	6	2	0
30	District Blindness Society	No.	25	25	25	25	25
31	Vector Borne Disease Control Programme:						
i	Fever Treatment Depots.	No.	12,068	7,902	7,815	9,301	22,249
ii	Drugs Distribution Centers	No.	22,200	23,873	22,137	0	0
iii	Malaria Clinics	No.	1,304	1,276	1,406	1,407	1,389
iv	Dengue Diagnostic Centers	No.	8	8	8	11	11
v	Sentinal Centers for Chikaun Guniya	No.	8	8	8	11	11
#	Item	Unit	05-06	06-07	07-08	08-09	09-10
32	AIDS						
i	Zonal blood Testing Centers	No.	6	6	6	6	6
ii	Clinics for Sexually transmitted Disease	No.	35	35	41	41	41
iii	Voluntary counseling & Testing Centers	No.	34	34	193	204	269
iv	Tele counseling Centre	No.	6	6	6	1	1
<b>[2] Medical Services</b>							
1	General Hospitals Class - I	No.	23	23	23	23	24
		Beds	3,932	3,932	3,932	3,932	4,032
2	Government Hospitals Class - I	No.	23	23	23	23	26
		Beds	1,809	1,809	1,809	1,809	2,033
3	Infectious Diseases Hospital / Eye Hospitals	No.	3	3	3	3	3
		Beds	170	170	170	170	170
4	Mental Hospitals	No.	4	4	4	4	4
		Beds	683	683	683	683	683
5	Govt. Hospitals Class - II \$\$	No.	6	6	6	6	6
		Beds	54	54	54	54	54
6	Grant-in-Aid Institution	No.	125	125	124	123	122
		Beds	5,486	5,486	5,041	5,486	5,129
7	Total Beds ( 1 to 6 )	Beds	12,080	12,080	11,689	12,080	12,101
8	Dispensaries						
i	Government	No.	41	41	41	41	41
ii	S.R.P. Group Hosp.	No.	11	11	11	11	11
iii	Govt. Police Dispensaries	No.	4	4	4	4	4
iv	Dam Site Dispensaries	No.	4	4	4	4	4
<b>[3] Medical Education &amp; Research</b>							
1	Govt. Teaching Hospitals	No.	6	6	6	6	6
		Beds	7,471	7,677	7,677	7,551	7,551
2	Non Govt. Teaching Hosp.	No.	7	7	7	7	7
		Beds	3,295	3,295	3,295	3,295	3,295
3	Govt. Dental Hospitals	No.	2	2	2	2	2
		Beds	25	25	25	27	27
4	Non Govt. Dental Hospitals	No.	2	7	7	7	9



<b>5</b>	Grant-in-Aid Specialized Hospital						
i	Kidney	Beds	250	250	450	450	450
ii	Cardiology	Beds	200	200	202	202	202
iii	Cancer	Beds	450	450	650	650	650
<b>6</b>	Total Beds ( 1 to 5 )	No.	11,691	11,897	12,299	12,175	12,175
	Total Beds ( Medi. Ser. & Medi. Edu.)	No.	23,825	23,447	23,988	24,255	24,276
<b>[4] E.S.I.S.</b>							
		No.	11	11	10	10	11
1	Hospital	Beds	870	870	635	635	635
2	Dispensaries	No.	125	125	125	98	--
\$ L.C.U. / M.L.C.U. merged with DLO as per guidelines of India							
* Beds merged in Dist. / Taluka Hospitals. ** Strengthen under Aids Control Programme ***							
Includes Govt. Hospitals & Taluka Level Hospitals							
\$\$ Chhala (G'nagar), Varasiya (Vadodara), Adipur (Kachchh), Umarpada (Surat), Unjha (Mahesana) & Shahibag (Ahmedabad)							

Health sector is one of the prominent contributors to Gujarat GDP. The reasons behind this Gujarat having a strong economy and pushes increasing option for healthcare financing & opportunities in healthcare delivery. Infrastructure has been described as the basic support for the delivery of public health activities. Five components of health infrastructure can be broadly classified as: skilled workforce; integrated electronic information systems; public health organizations, resources and research. In India present, has a three-tier structure to provide health care services to its people. The first tier, known as primary tier, has been developed to provide health care services to the vast majority of rural people.

The primary tier comprises three types of health care institutions: Sub Centre (SC), Primary Health Centre (PHC) and Community Health Centre (CHC).

The rural health care infrastructure has been developed to provide primary health care services through a network of integrated health and family welfare delivery system.

When we talk about health infrastructure we are not merely talking about the outcomes of health policy of a particular country, but the focus is upon material capacity building in the arena of public health delivery mechanisms. Gujarat having a better health care condition and completion infrastructure comprises the teaching hospital, regional-provincial and Taluka level hospitals, district and sub district hospitals, health centers, and dispensaries, as well as a the private, non-governmental, and traditional/informal sectors. Above table 1 shows the health infrastructure facilities at the state level. CHC and PHC are the main source to provide health care facilities at rural areas. Here data shows CHC (290-2009-10) and PHC (1096-2009-10) are established in increasing mode in the state. In table 1 statistics presents various govt. hospitals /infrastructure facilities concerning to different segment of medical parameters. Private and government hospitals are relatively more accessible as they are typically located in areas well connected by well maintain roads.

Gujarat offers best medical treatment through various hospitals, OHC, SHC and CHS at the Taluka and village level. Share of primary care of total health care market of Gujarat is around 75-80 per cent. While availability of healthcare facilities does not guarantee utilization, utilization is an important indicator of health status, health-seeking behavior, and cost and quality of services. In particular, cost remains a great impediment to utilization, although improvements in quality may offset cost barriers. The state Govt. is taking several initiatives to make a Gujarat a global medical destination. Govt. hospitals having 12101 beds and Medical educational and Research institute having 12175 beds in the state. Rural and Urban bifurcation is not available. Total 24276 beds are available for across the state which shows less no. of beds against of high population.

The 108 Ambulance has not only enabled effective delivery of emergency services in urban areas but also in the rural areas of the State.

Table -2 : Health Infrastructure in Gujarat							
Item	Unit	05-06	06-07	07-08	08-09	09-10	
<b>[A] : Medical Education Institutions</b>							
<b>(i) : Medical Education</b>							
1	Allopathic Medical Colleges	No	13	13	13	13	14
2	Dental Colleges	No	5	9	9	9	11
3	Ayurvedic Colleges	No	9	9	11	11	11
4	Homeopathic Colleges	No	13	13	16	16	16
5	Physiotherapy Colleges	No	10	17	16	17	25
<b>(ii) : Para Medical Institutions</b>							
1	Nursing Colleges	No	2	54	6	11	20
2	Nursing schools	No					47
3	Public Health Nursing School	No	1	1	1	1	1
4	Multipurpose Health Worker Training School (Male & Female)	No	17	16	16	0	27
5	Multipurpose Female Supervisor Training Institute	No	2	2	2	0	0
6	Others Institutions	No	14	14	14	0	0
<b>[B] : Man-Power</b>							
1	Doctors Registered	No	41,049	41,180	42,855	44,394	46,002
2	Dentist Registered	No	1,889	2,359	2,708	3,486	4,080
3	Nurses Registered	No	17,468	17,499	17,551	18,349	19,722
4	Midwives Registered	No	6,597	6,600	9,585	6,819	7,030
5	Ayurvedic Registered	No	23,035	23,391	24,104	24,657	25,244
	Registration Renewed Ayurvedic Doctors *	No				12,098	12,200
6	Unani doctors registered	No	252	261	266	277	290
	Registration Renewed Unani Doctors *	No				73	74
7	Homeopathic doctors registered	No	7,900	8,443	9,509	10,731	12,101
<b>[C] : Training Institutions</b>							
1	T. B. Demonstration and Training Centre	No	1	1	1	1	1
2	Leprosy Training Centre	No	1	1	1	1	0
3	State Health & Family Welfare Institution	No	1	1	1	1	1
4	Health & F.W - Regional training Centers	No	4	4	4	4	4

Table 2 analyzing about manpower at the health system in Gujarat currently has 46002 in 2009-10, regular doctors registered out of which 4080 (8.86 per cent) are dentist, 25244 (54.87 per cent) Ayurvedic, 290 (0.63 per cent) Unani doctors and 12101(26.30 per cent) Homeopathic doctors are present. Medical education infrastructures in the state shown rapid growth during the last 5 years, there is number of medical educational institutes are working in the state. Allopathic Medical Colleges 14, Dental Colleges 11, Ayurvedic Colleges 11, Homeopathic Colleges 16 and Physiotherapy Colleges 25. It provides the details how health cares infrastructure involving at the grass route level. There is 4 training institute which make available with general and current resolve of the diseases and new technology concerning to health system. Government undertakes efforts to train health workers through various training programmes throughout the state more effective and systematic service delivery.



#	Indicators	Year	Unit	PHC	CHC	Medical Services	Medical Education	E S I S	Total
i	Nos. of Institutions /Hospitals	05-06	No	1072	273	59	8	11	1405
		06-07	No	1073	273	59	8	11	1406
		07-08	No	1073	273	59	8	11	1406
		08-09	No	1084	283	59	8	11	1445
		09-10	No.	1096	290	63	8	10	1467
ii	Indoor Capacity	05-06	No	6432	9636	6648	7496	870	31082
		06-07	No	6438	9636	6648	7702	870	31294
		07-08	No	6438	9666	6648	7702	935	31389
		08-09	No	6504	10026	6648	7551	935	31664
		09-10	No	6576	10109	*6972	7551	635	31843
iii	Annual OPD	05-06	Lakh	11.72	9.62	93.38	42.33	2.38	159.43
		06-07	Lakh	14.14	10.47	87.23	37.88	2.39	152.11
		07-08	Lakh	12.58	9.18	72.72	35.26	5.37	135.11
		08-09	Lakh	11.40	9.51	69.88	40.33	5.42	136.54
		09-10	Lakh	122.90	101.19	70.14	34.53	2.67	331.43
iv	Annual IPD	05-06	Lakh	1.50	9.57	16.82	6.56	0.17	34.62
		06-07	Lakh	1.90	11.15	16.80	2.97	0.19	33.01
		07-08	Lakh	2.01	10.96	16.03	3.00	0.27	32.27
		08-09	Lakh	1.93	12.14	16.51	3.01	0.32	33.91
		09-10	Lakh	1.85	13.53	16.62	3.03	0.19	35.22
v	Average OPD per day	05-06	Nos	36	126	534	2352	72	3120
		06-07	Nos	44	135	492	2105	72	2848
		07-08	Nos	39	120	411	1959	76	2605
		08-09	Nos	35	122	432	1842	77	2508
		09-10	Nos	37	124	441	1918	81	2601
vi	Average IPD per day	05-06	Nos	7	10	79	300	4	400
		06-07	Nos	77	12	78	135	5	307
		07-08	Nos	6	12	74	137	6	235
		08-09	Nos	7	13	76	199	5	300
		09-10	Nos	7	14	85	138	5	249
vii	Major Operations	05-06	Nos	0	88841	57214	56538	754	203347
		06-07	Nos	10055	84028	67420	63579	2155	227237
		07-08	Nos	18401	90289	73272	66761	2207	250930
		08-09	Nos	17390	101926	79816	10822	2073	212027
		09-10	Nos	27510	107684	87649	12935	2103	237881
viii	Minor Operation	05-06	Nos	0	37209	108082	147349	2050	294690
		06-07	Nos	2153	33566	94626	191515	6202	328062
		07-08	Nos	2793	34388	83158	181737	5302	307378
		08-09	Nos	8377	36361	92310	25657	4241	166946
		09-10	Nos	3148	40537	97776	26037	4292	171790

Ix	Laboratory Tests	05-06	Nos	0	1930804	3733981	4154287	396212	10215384
		06-07	Nos	1837287	2159292	3608514	8908923	1024405	17538421
		07-08	Nos	1580127	2043575	3743418	6391616	878792	14637528
		08-09	Nos	1875388	2497904	4581759	2656578	829287	12440916
		09-10	Nos	3182011	2944031	5155537	7528881	933236	19743696
X	X-ray	05-06	Nos	0	69990	289456	871428	27633	1258507
		06-07	Nos	0	73655	282529	953512	80452	1390148
		07-08	Nos	0	81385	292739	977898	80199	1432221
		08-09	Nos	0	102731	351661	1000602	66919	1521913
		09-10	Nos	0	111953	364412	1006622	63377	1546364

#	Item	Unit	2005	2006	2007	2008	2009
	<b>[A] Community Health Centers</b>	No	273	273	273	283	290
I	Out Door Patients	No	9620793	10472163	9187542	9516646	10119430
Ii	In Door Patients	No	957444	1115482	1099849	1214605	1352628
Iii	Average OPD per day per Hosp.	No.	126	135	120	122	124
Iv	Average IPD per day per Hosp.	No.	10	12	12	13	14
	<b>[B] Primary Health Centers</b>	No	1072	1073	1073	1084	1096
I	Out Door Patients	No	11724176	14143042	12683952	11402500	12289907
Ii	In Door Patients	No	150345	190206	207994	193581	185479
Iii	Average OPD per day per Hosp.	No.	36	44	39	35	37

Table 3 shows the details of performance of PHC and CHC in Gujarat OPD is available for the public from 8 a.m. to 1 p.m. and 4 p.m. to 6 p.m. besides this the Doctors are attending to the patient on emergency case for 24 Hrs. In PHC average OPD per day per hospitals in 2005 36 patients recorded and in 2009 37 patients recorded. While in CHC OPD per day per hospitals in 2005 126 and in 2009 124 patients are recorded.

This provides the plenty details about PHC and CHC. Each PHC is having Ambulance facility to cater the need of periphery area and where they are referred to the Civil Hospital the Ambulance facility is provided for transporting the patients.

The above table shows comparison between PHC's and CHC's performance in the state PHC serve about 12289907 outdoor patients and 185479 indoor patients in 2009 while CHC serve 10119430 and indoor patients 1352628 in the state on same year.

Table -4 : Medical Manpower / Human Resources									
#	Item	Unit	2003	2004	2005	2006	2007	2008	2009
1	Doctors Registered **	No.	36831	38013	39461	41049	41180	44394	46002
2	Population Served per Doctor	No.	1439	1415	1385	1351	1367	1327	1254
3	Dentists Registered ***	No.	1624	1667	1954	1889	2359	3486	4080
4	Population Served per Dentist	No.	32601	32272	27964	29367	23865	16090	14143
5	Registered Practitioners @								
i	Ayurved	No.	22337	22583	22979	23035	23391	24657	25244
ii	Unani	No.	242	244	250	252	261	277	290
6	Registered Homeopathic Practitioners #	No.	6634	7273	7316	7900	8443	10731	10731
7	Population Served per Practitioner								
i	Ayurved	No.	2370	2382	2378	2408	1826	2275	2286
ii	Unani	No.	218777	220484	218668	220139	215701	202484	198783
iii	Homeopathic	No.	7981	7397	7469	7022	8444	5227	5377
<b>11. Nursing Staff</b>									
1	Registered Nurses	No.	15801	16299	16755	17468	17499	18349	19276
2	Registered A.N.M.	No.	6365	6409	6504	6597	6600	6819	7009
3	Population Served Per								
i	General Nurse	No.	3351	3301	3261	3176	3217	3210	2994
ii	A.N.M.	No.	8318	8394	8401	8409	8530	6799	8233
* Under Training									
** Gujarat Medical Council - as on 31st. Dec.									
@' Gujarat Board of Ayurved and Unani System of Medicine									
*** Gujarat State Dental Council									
# Under Council of Homeopathic System of Medicine Gujarat State.									
Source- Gujarat Nursing Council Ahmedabad									

There is evidence of a significant positive correlation between the level of economic development in a country and its number of human resources for health. The types of human resources for health (HRH) managing the public health system in India have been largely influenced by prevailing health situation recommendations of the Bhore Committee (1946).

The table 4 illustrates the benchmarking analysis of manpower resources are utilized to make better and improved health system in Gujarat. This statistics shows how people resources are planned and improved; how the skills and capabilities of people are preserved and developed in different segment. Though also it needs more efforts by the state govt. to provide many medical resources to the populace. Still number of doctors are too less per person to provide medical treatment. No doubt no. of doctors are increased from 2003 to 2009 but while calculating on and average per person it demonstrates too less. Because proper management of human resources is significant in given that a high quality of health care.

**Table-5 : Medical & Para Medical Education Institutions**

#	Item	Unit	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
<b>[1] Colleges</b>								
1	Allopathic Medical College	No.	13	13	13	13	13	14
2	Dental College	No.	5	5	9	9	9	11
3	Ayurvedic College	No.	9	9	9	11	11	11
4	Homeopathic College	No.	14	13	13	16	16	16
5	Physiotherapy College	No.	10	10	17	16	16	22

#	Item	2005-06	2006-07	2007-08	2008-09	2009 - 10	2010-11
1	<b>State Annual Plan Outlay</b>	11000.0	12503.5	15506.0	19030.0	23500.0	29500.0
2	Plan Outlay for Medical and Public Health	434.9	459.9	555.2	844.7	1132.0	1900.0
3	Percent allocation of Medical and Public Health to State Plan	3.95	3.68	3.58	4.44	4.82	6.44
4	<b>State Annual Non-Plan Outlay</b>	26143.0	25801.0	27247.8	32147.3	36355.0	41809.5
5	Non-Plan Outlay for Medical and Public Health	720.0	745.2	752.5	790.8	893.5	1088.0
6	Percent of NP outlay for Medical and Public Health to State Non-Plan	2.75	2.89	2.76	2.46	2.46	2.60
7	<b>Total State Plan &amp; Non Plan</b>	37143.0	38304.5	42753.8	51177.3	59855.0	71309.6
8	Plan and Non Plan Outlay for Medical and Public Health	1155.0	1205.2	1307.7	1635.5	2025.5	2988.0
9	Percent of Medical and Public Health outlay to total outlay	3.11	3.15	3.06	3.20	3.38	4.19

**Performance of Health Indicators and Human development**

**Table 6 Fertility Statistics - Gujarat**

#	Item	Unit	2001	2002	2003	2004	2005	2006	2007	2008
<b>(1) Fertility Indicator</b>										
<b>Birth Rate (CBR)</b>										
1	Total	Per 1000 population	25.0	24.7	24.6	24.3	23.7	23.5	23.0	22.6
	Rural		26.7	26.6	26.5	26.3	25.5	25.0	24.5	24.1
	Urban		21.5	20.6	20.5	21.1	21.0	21.1	20.7	20.3
<b>Still Birth Rate</b>										
2	Total	Per 1000 live birth	5	8	11	8	8	7	7	5
	Rural		5	8	10	8	8	7	6	4
	Urban		4	9	13	8	8	8	8	6
<b>General Fertility Rate</b>										
3	Total	Live Birth per '000 woman in a reproductive age group	99.3	98.7	92.8	95.7	92.2	91.0	88.0	86.2
	Rural		106.4	107	102.4	106.3	101.2	99.0	95.0	93.8
	Urban		85.2	82	73.4	80.5	79	79.1	76.9	74.9

4		<b>Total Fertility Rate</b>								
	Total	Average children to be born to a woman in span of reproductive period	2.9	2.8	2.8	2.8	2.8	2.7	2.6	2.5
	Rural		3.2	3.2	3.1	3.2	3.1	3.0	2.9	2.8
	Urban		2.3	2.1	2.1	2.3	2.3	2.3	2.2	2.2
5		<b>Mean Age of Fertility</b>								
	Years		26.8	26.8	26.7	26.3	26.5	26.3	26.1	26.2
5		<b>Births by type of Medical attention</b>								
5.1		<b>Attended by Institution</b>								
	Total	%	36.6	36.6	36.7	51.7*	52.5*	53.2	59.1	71.3
	Rural	%	22.1	22.7	22.9	35.3*	36.1*	36.7	42.3	60.8
	Urban	%	74.7	75.1	75.1	82.6*	83.3*	83.9	90.2	90.4
5.1		<b>Attended by Govt. Institution</b>								
	Total	%	-	-	-	28.7	29.2	29.5	29.8	31.0
	Rural	%	-	-	-	20.7	21.2	21.5	21.6	28.2
	Urban	%	-	-	-	43.8	44.1	44.4	44.9	36.2
5.1		<b>Attended by Private Institution</b>								
	Total	%	-	-	-	23.0	23.3	23.7	29.3	40.3
	Rural	%	-	-	-	14.6	14.9	15.2	20.7	32.6
	Urban	%	-	-	-	38.8	39.2	39.5	45.3	54.2

\* Including Private Hospitals Source: SRS Registrar General India New Delhi.

**Vital Statistics**

**Birth Rate**

The birth rate declined from 25.0 in 2001 to 22.6 in 2008 while the death rate declined from 7.8 to 6.9 per 1000 population over the same period. The population however maintains to grow as the decline in the birth rate is not as swift as the decline in the Death rate. As per the SRS 2008 In Gujarat Out of every 100 births 71.3 births were taking place in the institutions whereas 31.0 births are attended by government institution and 40.3 attended by private institution.

As per SRS Total Fertility Rate for Gujarat was in the year 2001 was 2.9 per woman and varies from 3.2 in rural areas to 2.3 for urban areas. As per provisional results of SRS TFR for Gujarat in the year 2008 is estimated to 2.5 above table 6 presents the percentage change in the average level of TFR between the periods 2001 and 2008 in the state. During the period TFR has declined by 2.5 percent at the state level. Over the periods the decline varies from 2.9 percent in 2001 and continuously declining till 2.5 in 2008.

#	Item	Unit	2001	2002	2003	2004	2005	2006	2007	2008	
	<b>Death Rate</b>										
	Combined	Per 1000 population	7.8	7.7	7.6	6.9	7.1	7.3	7.2	6.9	
	Rural		8.9	8.3	8.2	7.8	8.0	8.2	8.1	8.0	
	Urban		5.6	6.4	6.3	5.5	5.8	5.9	5.8	5.4	
	Males		8.3	8.3	8.3	7.3	7.6	7.8	7.6	7.5	
1	Females		7.3	7.0	6.9	6.3	6.6	6.8	6.7	6.3	

<b>2</b>	<b>Infant Mortality Rate</b>									
	Combined	Per '000 live births	60	60	57	53	54	53	52	50
	Males		61	55	54	50	52	52	50	49
	Females		60	66	61	57	55	54	54	51
	<b>Rural</b>									
	Combined	Per '000 live births	68	68	65	62	63	62	60	58
	Males		69	60	63	62	61	60	59	58
	Females		66	76	67	62	64	64	62	60
<b>2.1</b>	<b>Urban</b>									
	Combined	Per '000 live births	42	37	36	38	37	37	36	35
	Males		41	39	28	30	36	36	34	34
	Females		42	34	44	48	38	37	38	36
	Rural		33	41	25	25	31	29	32	33
	Urban		19	19	20	21	21	23	24	23
<b>2.2</b>										
<b>3</b>	<b>Child Mortality Rate</b>									
	<b>Combined</b>									
	Total	Per '000 Pop. of the same age group	18.5	18.4	16.7	16.0	16.0	16.2	15.1	13.7
	Males		18.4	16.6	15.8	14.9	15.3	15.2	13.9	13.2
	Females		18.6	20.7	17.8	17.2	16.8	17.4	16.5	14.2
<b>3.1</b>	<b>Rural</b>									
	Total	Per '000 Pop. of the same age group	21.3	22.0	19.5	18.9	20.3	19.6	18.5	16.6
	Males		21.2	19.4	19.3	18.7	19.7	18.6	17.2	16.1
	Females		21.4	25.0	19.8	19.1	20.9	20.7	19.9	17.1
<b>3.2</b>	<b>Urban</b>									
	Total	Per '000 Pop. of the same age group	11.9	9.9	9.7	11.0	8.6	10.5	9.2	8.5
	Males		11.8	9.9	7.4	8.7	8.0	9.9	8.3	8.2
	Females		12.0	9.8	12.6	13.8	9.3	11.2	10.3	8.9
<b>3.3</b>										
	<b>% distribution of deaths by type of medical attention received before deaths</b>									
	<b>Government Hospital</b>									
	Total	%	NA	NA	NA	18.4	18.6	18.7	18.8	19.1
	Rural	%	NA	NA	NA	14.5	14.7	14.8	14.9	15.3
	Urban	%	NA	NA	NA	26.9	27.1	27.2	27.4	27.9
	<b>Private Hospitals</b>									
	Total	%	NA	NA	NA	14.4	14.2	14.0	14.1	14.1
	Rural	%	NA	NA	NA	12.3	12.1	12.0	12.1	12.1
	Urban	%	NA	NA	NA	18.8	18.6	18.5	18.5	18.6
	<b>Qualified Professional</b>									
	Total	%	NA	NA	NA	49.8	49.7	49.5	49.5	49.5
	Rural	%	NA	NA	NA	53.1	52.9	52.8	52.7	52.6
	Urban	%	NA	NA	NA	42.8	42.7	42.5	42.4	42.3



Untrained functionaries & others											
	Total	%	NA	NA	NA	17.4	17.5	17.7	17.6	17.3	
	Rural	%	NA	NA	NA	20.1	20.3	20.5	20.3	20.0	
	Urban	%	NA	NA	NA	11.4	11.6	11.8	11.7	11.0	
4	Maternal Mortality Rate (per one lakh live birth)	1999-2001			2001-03			2004-06			
		202			172			160			
5	Expectation of Life at Birth #										
			01-05		06-10		11-15		16-20		21-25
	Male	Years	64.9		67.2		69.2		70.7		71.9
	Female	Years	69.0		71.0		72.5		73.7		74.9
Source: # Report of the Technical Group on Population May'2006.											
Sample Registration System Registrar General India New Delhi.											

### Mortality Indicators

Mortality is one of the basic components of population change and essential for demographic studies and public health administration. It is the principal ingredient for population projections and life table. The various measures of mortality are Crude Death Rate (CDR) Infant Mortality Rate (IMR) Still Birth Rate (SBR) and Peri-Natal Mortality Rate (PMR)

#### Crude Death Rate

The state has a death rate of 6.9 (SRS-2008) per 1000 population. It has decreased from 7.8 per 1000 population in year 2001 to 6.9 per 1000 population in 2008. The death rate is more in rural area i.e. 8.0 per 1000 population in comparison to urban area (5.4 per 1000 population).

#### Infant Mortality Rate:

Infant Mortality Rate is defined as the infant deaths (less than one year) per thousand live births. At the state level IMR for the year 2001 was reported to be 60 and varied from 68 in rural areas to 37 in urban areas. In Gujarat it was reported to be 52 combined in rural 60 and 42 in urban areas. In Gujarat Infant Mortality Rate has declined considerably (60 in 2001) during last decade and reached 50 per 1000 live births in 2008.

However rural and urban differentials are still very high. This is giving alert to the state govt. for making more efforts to reduce IMR. Female infants experienced a higher mortality than male infants except in urban area. Infants' mortality among females was reported 51 in 2008 across the state.

Child Mortality Rate has gone down by 18.5 % from year 2001 to 2008. It was 18.5 per 1000 population in 2001 which decreased to 13.5 per 1000 population in 2008. As per SRS 2008 percent share of deaths of children below age five to total deaths for Gujarat is estimated and varied from 16.6 percent in rural areas to 8.5 percent in urban areas.

#### Maternal Mortality

Deaths due to pregnancy and child birth are common among women in the reproductive age groups. Reduction of Mortality of women has thus been an area of concern to human development and better health status. The Maternal Mortality Rate which was estimated to 160 per one lakh live birth (SRS 2004- 06) in the state has come down to about 160 in 2004-06.

**Table – 8 : Expectation of Life at Birth**

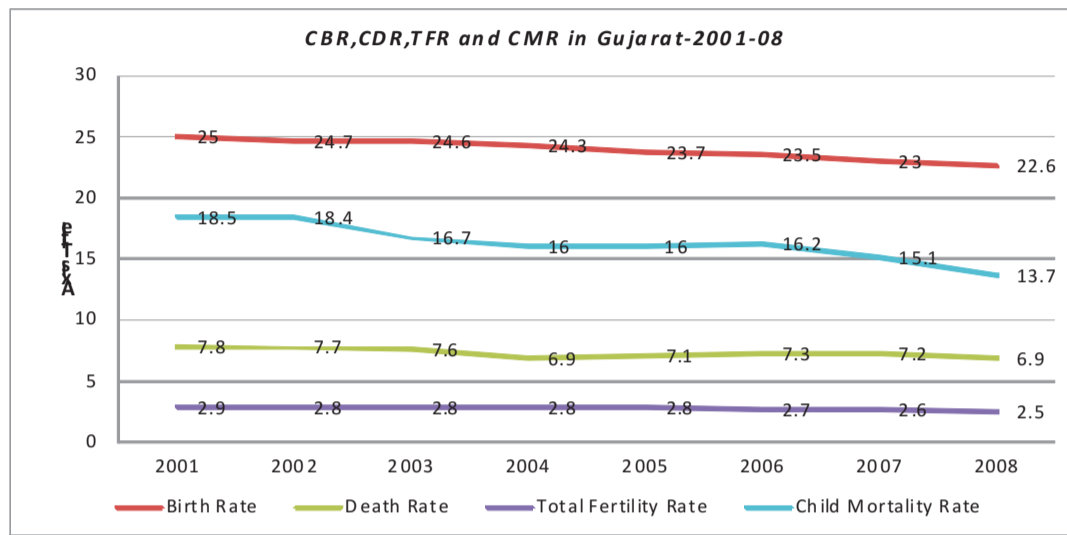
Sr No	Census Year	Gujarat		India	
		Male	Female	Male	Female
1	1951-60	40.8	39.2	41.9	40.6
2	1961-65	47.6	46.0	46.4	44.7
3	1966-70	49.2	47.0	--	--
4	1971-75	49.6	48.4	50.5	49.0
5	1976-80	52.1	51.8	52.5	52.1
6	1981-85	55.8	55.6	55.4	55.7
7	1986-90	58.0	60.5	57.7	58.1
8	1991-95	60.9	62.7	59.7	60.9
9	1996-00	61.5	62.8	61.0	62.7
10	1997-01	62.3	64.2	61.3	63.0
11	1988-02	62.4	64.4	61.6	63.3
12	1999-03	62.5	64.6	61.8	63.5
13	2000-04	62.7	64.8	62.1	63.7
14	2001-05	62.8	65.0	62.3	63.9
15	2002-06	62.9	65.2	62.6	64.2

Source : SRS based Abridge life Table

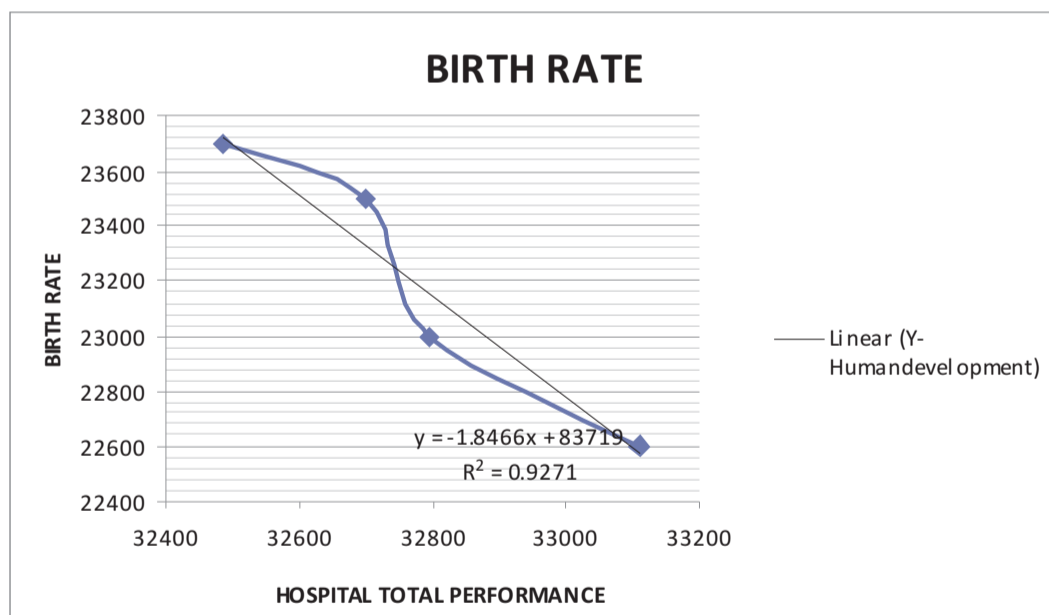
**Life expectancy at birth**

Life expectancy at birth has increase from 40.8 years for males and 39.2 years for females in 1951-60 to 62.9 for male and 65.2 for females in 2002-06. Increasing life expectancy leads to increasing number of elderly persons in the population for which specific health facilities will have to be provided for the state. As compare to national statistics if life expectancy of Gujarat is little ahead for male 62.9 to 62.6 as nation and for female also 65.2 to 64.2 as across the nation as an entire. Which show how populace has improved their health status to utilize health facilitates in the state. Basic Health Indicators

Year	Birth Rate	Death Rate	Total Fertility Rate	Child Mortality Rate
2001	25.0	7.8	2.9	18.5
2002	24.7	7.7	2.8	18.4
2003	24.6	7.6	2.8	16.7
2004	24.3	6.9	2.8	16.0
2005	23.7	7.1	2.8	16.0
2006	23.5	7.3	2.7	16.2
2007	23.0	7.2	2.6	15.1
2008	22.6	6.9	2.5	13.7



Year	Hospital performance			Human development		
	No of hospitals	Indoor capacity	Total performance	Birth rate	Death rate	Total fertility rate
2005	1405	31082	32487	23700	7100	2800
2006	1406	31294	32700	23500	7300	2700
2007	1406	31389	32795	23000	7200	2600
2008	1446	31664	33110	22600	6900	2500



**Regression Analysis of Hospital Performance and Birth Rate**

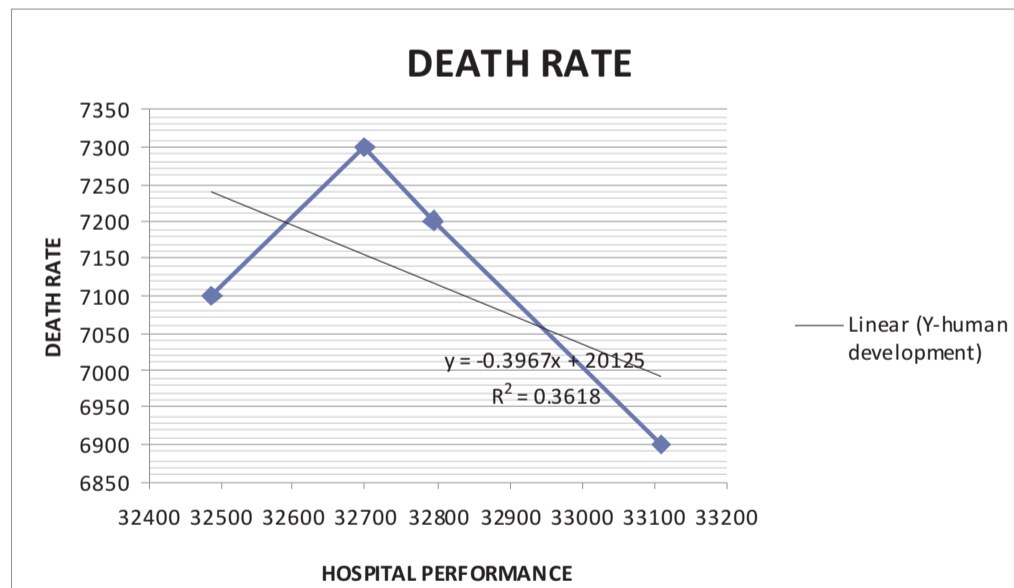
R Square	0.962837
Adjusted R Square	0.927055
Standard Error	85.65909
Observations	4

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	186503.0405	186503	25.41786	0.037163
Residual	2	14674.95946	7337.48		
Total	3	201178			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	44420.03	2310.575722	19.22466	0.002695	34478.42	54361.63	34478.42	54361.63
X Variable 1	-0.50203	0.09957667	-5.04161	0.037163	-0.93047	-0.07358	-0.93047	-0.07358

An analysis of four -year periods between 2005 and 2008 reveals major improvements in hospital performance due to related indicator are going up in hospital performance indoor capacity include technology medical education indoor capacity and Government undertakes efforts to train health workers through various training programmes throughout the state more effective and systematic service delivery. Here we found in Gujarat birth rate decreases due to increasing number of women who marry late and closely associated with the rise of employment and better economic status and women received higher education and better employment which causes less birth rate in Gujarat.

Hospital performance and birth rate is co related with each other closely because R2 shown the 0.927055. R2 is very near by 1 which illustrates hospital performance and birth rate having strong relationship. Medical performance has improved the birth rate but due to the changing scenario of lifestyle and modern point of view birth rate is going to be decrease. Somehow hospital performance is not only the source to increase birth rate but some other factor is also affected that is why both this indicators having strong correlation but their coefficient is negative. So they are not dependent on each others. Some other factors are also exaggerated.



*Analysis of Hospital Performance and Death Rate*

	0.601463
R Square	0.361757
Adjusted R Square	0.042636
Standard Error	253.3776
Observations	4

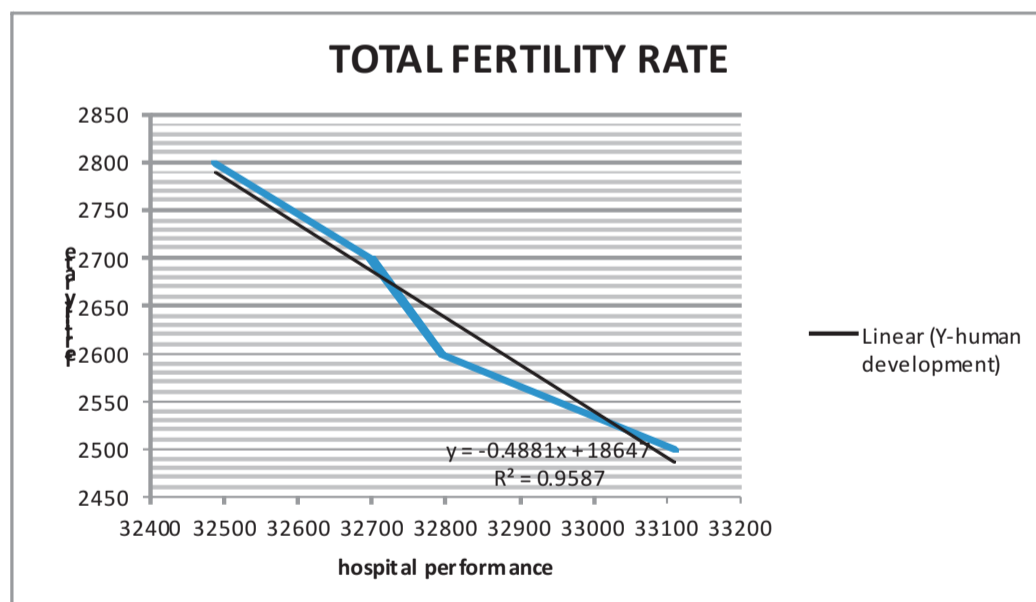
ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	72777.6	72777.6	1.133604	0.398537
Residual	2	128400.4	64200.2		
Total	3	201178			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	39271	6104.394	6.433234	0.023321	13005.91	65536.09	13005.91	65536.09
X Variable 1	-0.912	0.856573	-1.06471	0.398537	-4.59753	2.773534	-4.59753	2.773534

Death rate is going to decrease day by day in compare to past decades it's shown the better performance of medical system and it's helpful in rise the rate of human development. Hospital performance going rise means the available facility and system in hospitals are rise and increase in utilize the medical resources the number of hospitals in surround area is also increase that any person can get the benefit of medical system easily and for lower income and middle income peoples get the more benefit of Govt schemes of Health. The number of death per '1000 peoples is decrease as the medical facility and human well being is growing.

Death rate is going to decrease the reason behind that is to improvement in Govt facilities in public health care unit awareness among the public for their health. In this hospital performance is going to rise so the death rate is going to decrease which shown the positive relationship between these two variables But R2 is 0.361 which signing alarming situation to the local state Govt. to put more efforts to decrease death rate. Here also we found the same situation, corelationship with two indicators are high but coefficient is negative that means other variables are also performing to decrease death rate not only hospital performance.



**Regression Analysis of Hospital Performance and Total fertility Rate**

	0.979120723
R Square	0.95867739
Adjusted R Square	0.938016085
Standard Error	64.47169922
Observations	4

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	192864.8	192864.8	46.39965356	0.02087928
Residual	2	8313.2	4156.6		
Total	3	201178			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower .0%</i>	<i>Upper 95.0%</i>
Intercept	37977.6	764.7441533	49.66053	0.000405241	34687.1715	41268.029	34687.17	41268.0285
X Variable 1	-1.964	0.288326204	-6.81173	0.020879277	-3.2045675	-0.7234325	-3.20457	-0.72343247

Fertility rate means - the ratio of live births in an area to the population of that area; expressed per 1000 population per year. Fertility is going to down because of changing scenario of the women. They are going outside for employment so thinking about the economic development and economic wellbeing and another one causes is also that the modern facilities of medical is using by them for decreasing the rate of fertility. But the hospital performance is rise now a day's and Govt is also helpful in development of medical system. And the fertility rate and hospital performance is co- related with other which shown in scatter diagram that R2 is near to 1 which is 0.95867739. The fertility rate is going to down due to the other causes not due to the hospital performance because hospital performance is rise from last two decades. TFR and hospital performance having strong corelationship but like birth rate and death rate it having negative coefficient with hospital performance at all. That means all the three indicators (BR, DR and IMR) having strong relationship with hospital performance but their coefficient is negative, the empirical result shows how correlation and coefficient performing in analyzing the health indicators!

**Public Private Participation in Health Care System.**

“The Public Private Partnership (PPP) model in medical care is on a fast track and a lot of hospitals in Gujarat today have adopted this successful model in various practices. To further boost the PPP model the state has have received encouraging response from private companies wanting to adopt this model. In PPP state Govt. has clear view about involvement of private medial institute with Govt. venture here some examples given below.

- 1. 122 grant in aid hospitals and they are oldest mode of PPP in Gujarat.
- 2. 5 CHC ( Malav Shamlaji Sitapur Mota Phospholia Golagand) and 4 PHC (Chansad Dahej Khoreli Mato no Madh) being run up by Community Based Organizations.
- 3. Center for health education training and nutrition awareness has been actively supporting a total 23 Mother NGO and 4 Service NGOs working effectively to implement reproductive and child programme (RCH)

**Medical Tourism**

The Gujarat medical tourism is sustained to observe speedy enlargement during the last few years owing to rising healthcare infrastructure in the state. Gujarat state having a world class hospital with large quality pools of medical professional.

Apart of this discussing about cost of the medical treatment in Gujarat it has lowest cost compare to other developed countries like US Japan etc. The key factor for rising medical tourists to the state is the low cost of cardiac surgery angiography joint replacements radiation and other medical services which is a portion of what they would have to incur abroad. Gujarat is no. 1 in the world in eye donation knee joint replacements piles operation single location kidney transplant cancer care blood donation (in blood-donation Ahmedabad as a city is ranked no. 1 in India and no. 5 globally).



**CONCLUSION:**

Improvement in health due to health care infrastructure and better health care system in Gujarat leading overall development of the society and welfares'. Above statistics and information illustrates that effective strategy and better health policy indicated transparency in improvement in health condition of common man. Gujarat is the evidence for the healthy workforce who performing well in agriculture and industrial development. We analyzed in this paper hospital performance and human development and found due to efficiency of hospitals and better health care system all the health indicators performing better as the aspect of human development. Birth rate and Total Fertility Rate trends decreasing due to some other reasons while Death Rate Infant Mortality Rate and child Mortality Rates Maternal Mortality Rates are decreased.

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- 3) Health Review of Gujarat 2009-10

<sup>1</sup> 11th five year plan-social sector analysis-2007-2012, Planning commission of India

<sup>2</sup> The Constitutional provisions (Schedule 7 of article 246) are classified into three lists, including a Concurrent list which both centre and states can govern but the overriding power is with the centre. The list here includes original entry numbers Central List: 28. Port quarantine, including hospitals connected therewith; seamen's and marine hospitals 55. Regulation of labour and safety in mines and oilfields State List: 6. Public health and sanitation; hospitals and dispensaries 9. Relief of the disabled and unemployable Concurrent List: 16. Lunacy and mental deficiency, including places for the reception or treatment of lunatics and mental deficient 18. Adulteration of foodstuffs and other goods. 19. Drugs and poisons, subject to the provisions of entry 59 of List I with respect to opium 20A. Population control and family planning 23. Social security and social insurance; employment and unemployment. 24. Welfare of labour including conditions of work, provident funds, employers' liability, workmen's compensation, invalidity and old age pensions and maternity benefits 25. Education, including technical education, medical education and universities, subject to the provisions of entries 63, 64, 65 and 66 of List I; vocational and technical training of labour.] 26. Legal, medical and other professions 30. Vital statistics including registration of births and deaths. (<http://alfa.nic.in/const/schedule.html>)

<sup>3</sup> <http://planningcommission.nic.in/plans/planrel/fiveyr/9th/vol2/v2c3-4.htm>

<sup>4</sup> The Regional Director's Office WHO/SEARO, Speeches/Statements - Striving for Better Health in South-East Asia Selected Speeches by Dr Utton Muchtar Rafei Regional Director, WHO South-East Asia Region Volume II : 1997 – 2000, Communicable and Non-Communicable Diseases, Health Care Infrastructure, [http://www.searo.who.int/en/Section980/Section1162/Section1167/Section1171\\_4779.htm](http://www.searo.who.int/en/Section980/Section1162/Section1167/Section1171_4779.htm)

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<sup>6</sup> [http://www.thehindu.com/multimedia/archive/00952/Chapter\\_13\\_952321a.pdf](http://www.thehindu.com/multimedia/archive/00952/Chapter_13_952321a.pdf)

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