An Analysis in Relation to Population and Gross State Domestic Product (GSDP) in Addressing the Shortage in Public Health Care Delivery System among Indian States and Union Territories- A Comparative Fact-Finding Study

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Abstract

The aim of this study is to assess the variations in the public health care delivery system in relation to population and Gross state domestic product (GSDP) among Indian states.The parameters obtained were total population, GSDP, Public health care expenditure (PHCE), the number of allopathic doctors, dentists, and nurses presents per 1000 population, Number of Sub Centres, Primary Health Centres (PHC) and Community Health Centres (CHC) and their respective shortfall in each state. The data was obtained from various electronic sources such as the National health profile 2020 and Rural Health Statistics 2019- 2020. The population of each state and UT was obtained from Census 2011 as published by The Registrar General & Census Commissioner, Government of Telangana for Telangana population. The collected data were compiled and tabulated, and descriptive analysis was done using Microsoft Excel version 2016 and SPSS Software Version 20. Shortfalls and variations in the Public Health care delivery system were apparent. The shortfall of Sub- centres, PHC, and CHC were seen in Rajasthan, Jharkhand, and Bihar, respectively. Haryana, Kerala, and Sikkim had the highest number of allopathic doctors, dentists, and Auxiliary Nursing Midwifery (ANM), respectively. Meghalaya, Odisha, and Uttar Pradesh had the lowest number of allopathic doctors, dentists, and Auxiliary Nursing Midwifery (ANM), respectively. Andhra Pradesh (1.9%), Chhattisgarh (1.9%), Himachal Pradesh (1.9%), and Manipur (1.9%) had the highest PHCE percentage based on GSDP.There is an urgent need to develop the healthcare infrastructure and health workforce. Spending less than two per cent of the GDP on public health is really insufficient. Precise measures are required to address the shortage of skilled health manpower, infrastructure and management of finance all over India by spending more on health care needs rather spending on other costly defence utilities.

Keywords: Gross State Domestic Product, India, Public health care system, Population, Variations in health care.

Introduction:

India has 8 Union Territories (UTs) and 28 states. India ranks second place in the world population. According to the Census of India 2011, the population of India stood at 1,210,854,977.[1]

Health is Wealth, and as the saying goes, Health is one of the vital indicators reflecting the quality of life. Though conservancy and exaltation of health care are one of the most rudimentary human rights, India is working hard to apprehend this distant dream. Public health is concerned with the health of the community as a whole. Its key goal is to reduce the population's exposure to disease. Diseases and ill health distress not only the health of the individuals but also the economic status of the people. Subsequently, it implies the growth of financial status and threatens future economic welfare. [2]

India is the world's sixth-largest economy by nominal Gross Domestic Product (GDP) and the third largest by purchasing power parity (PPP). Overall, India's public health expenditure (sum of central and state spending) has remained between 1.2% to 1.6% of GDP between 2008-09 and 2019-20. [3] This expenditure is relatively low as compared to other countries such as China (3.2%), the USA (8.5%), and Germany (9.4%). The first factor that has been looked at is the GDP, which has been found to be strongly and positively correlated with national health expenditure. Another variable related to the state of the economy and more typically to the condition of the government finances, i.e., Government Deficit, has also been found to be associated with public spending on health. [4]

In developing countries like India, inequalities arise not only in health care but also due to other factors such as geography, gender and socioeconomic status are compounded by not sufficient spending of GDP and GSDP on public health care due to high deficiency in healthcare manpower and infrastructure. The hurdles in providing good health care services are inadequacy and imbalance in the allocation of resources, disparities of health services in rural and urban areas, failure to provide adequate quality of health care, health spending inflation, and increase in out-of-pocket expenditure and financing sector. The appropriate implication of equity metrics for planning, assessing and monitoring; more investments in health research; development of a redefined equity-focused process of deliberative decision making in health reform; and redefinition of the specific responsibilities and accountabilities of the system are needed to try to achieve equity in Public health care in India. The implementation of these principles with strengthened public health and primary care services will help to ensure more equitable health care for India's population. [5]

Various studies have been conducted regarding the healthcare delivery system, but none of the studies has focused on the relationship between GSDP and the health care delivery system. Hence this present study aims to assess the variations in the public healthcare delivery system in relation to population and Gross State Domestic Product (GSDP) among Indian states and provide suggestions for enhancing the health care system.

Materials And Methods:

The study was conducted to evaluate the variations in the public health care delivery system in relation to population and Gross State Domestic Product (GSDP) among various states and UTs in India. The parameters obtained are total population, GSDP, Public health care expenditure (PHCE), the number of allopathic doctors, dentists and nurses present per lakh population, Number of Sub Centres, Primary Health Centres (PHC) and Community Health Centres (CHC) and their Shortfall in each state, the component-wise breakup of medical and public health expenditure of India, Gross State Domestic Product (GSDP) expenditure percentage. A comparison of Indian states / UT's per capita income with total population and GSDP and public health expenditure is done by dividing the states and UTs into three categories: High per capita income states, Middle per capita income states and low per capita income states.

The calculated data are the number of allopathic doctors, dentists, and nurses present per lakh population, shortage and shortage percentage of Sub Centres, Primary Health Centres (PHC) and Community Health Centres (CHC) in each state are calculated.

The data was obtained from various electronic sources such as the National health profile 2020 [6] and Rural Health Statistics 2019- 2020 [7]. The population of each state and UT was obtained from Census 2011 as published by the Registrar General & Census Commissioner, Government of Telangana for the Telangana population.[8,9] Keywords such as Public health care system, the state-wise population of India, Gross State Domestic Product, India, Variations on Public health care system, the shortfall in health care infrastructure and manpower were used.

The inclusion criteria are only data from 2019-2020 was obtained, and only available data were collected. The data which were not clear and obvious were excluded from the study. The compilation of data was done based on a comparison of UTs and state-wise distribution of population with GSDP and Public health care expenditure and shortage of public health care manpower and infrastructure. The collected data were compiled and tabulated, and descriptive analysis was done using Microsoft Excel version 2016 and SPSS Software Version 20.

Results:

Table I: Comparison of Indian States / UTS Per Capita Income with Total Population and Gross State Domestic Product

	RANK	STATES	PER CAPITA INCOME (INR)	TOTAL POPULATION	GSDP (IN LAKHS) (INR)
HIGH PER CAPITA INCOME STATES	1	Goa	4,35,959	14,58,845	74,82,837
	2	Sikkim	4,03,376	6,10,577	30,80,899
	3	Delhi	3,76,221	16787941	8,30,87,249
	4	Chandigarh	3,30,015	10,55,450	43,67,434
	5	Haryana	2,47,628	2,53,51,462	7,80,61,235
	6	Telangana	2,33,325	3,50,03,674	9,57,20,710
	7	Karnataka	2,23,175	6,10,95,297	16,28,92,793
	8	Kerala	2,21,904	3,34,06,061	8,54,68,899
	9	Puducherry	2,20,949	1247953	38,00,369
	10	Andaman & Nicobar Islands	2,18,649	3,80,581	9,71,923
	11	Gujarat	2,13,936	6,04,39,692	16,30,24,012
MIDDLE PER CAPITA INCOME STATES	12	Tamil Nadu	2,13,396	7,21,47,030	17,97,22,872
	13	Uttarakhand	2,02,895	1,00,86,292	2,53,66,625
	14	Maharashtra	2,02,130	11,23,74,333	28,18,55,457
	15	Mizoram	1,87,327	10,97,206	25,14,857
	16	Himachal Pradesh	1,83,407	68,64,602	1,62,81,593
	17	Arunachal Pradesh	1,69,742	13,83,727	28,04,613
	18	Andhra Pradesh	1,68,480	4,95,77,103	9,71,22,422
	19	Punjab	1,51,491	2,77,43,338	5,39,68,655
	20	Tripura	1,29,675	36,73,917	55,85,694
	21	West Bengal	1,21,463	9,12,76,115	12,07,82,261
	22	Nagaland	1,20,518	19,78,502	29,53,593
LOW PERCAPITA INCOME STATES	23	Rajasthan	1,16,492	6,85,48,437	9,98,99,911
	24	Odisha	1,09,730	4,19,74,219	5,47,95,908
	25	Chhattisgarh	1,04,989	2,55,45,198	3,44,95,535
	26	Jammu &Kashmir	1,04,889	1,22,67,032	1,70,38,211
	27	Madhya Pradesh	98,418	7,26,26,809	9,37,40,518
	28	Assam	86,801	3,12,05,576	3,35,23,811
	29	Manipur	84,746	25,70,390	31,79,030
	30	Meghalaya	83,182	29,66,889	34,71,570
	31	Jharkhand	75,739	3,29,98,134	3,21,15,731

	32	Uttar Pradesh	65,431	19,98,12,341	16,87,81,799
	33	Bihar	46,292	10,40,99,452	5,94,01,640
	34	D & N Haveli and Daman and Diu	NA	5,85,764	NA
	35	Ladakh	NA	2,74,000	NA
	36	Lakshadweep	NA	64,473	NA

Source: Per capita income and GSDP: National Statistical Office, Ministry of Statistics and Programme Implementation, Government of India.[10,11] Population: Data from Census 2011 as published by the Registrar General & Census Commissioner, Government of Telangana, and then Planning Commission.[8,9] Table 1 shows the comparison of Indian states / UT's per capita income with total population and GSDP. Goa had the highest Per Capita Income when compared to its low population and GSDP status. Bihar and Uttar Pradesh (UP), two states, had the lowest Per Capita Income, in UP had the second highest GSDP.

Table II: Comparison Of Gross State Domestic Product And Public Health Expenditure

	S.No	**INDIAN STATES/ UT's**	**GSDP (IN LAKHS) (INR)**	**PERCENTAGE OF PUBLIC HEALTH EXPENDITURE (PHCE) BASED ON GSDP (%)**
BETTER PHCE	1	Jammu &Kashmir	1,70,38,211	2.9
	2	Arunachal Pradesh	28,04,613	2.9
	3	Manipur	31,79,030	2.9
	4	Meghalaya	34,71,570	2.9
	5	Nagaland	29,53,593	2.9
	6	Tripura	55,85,694	2.9
	7	Mizoram	25,14,857	2.9
	8	Sikkim	6,10,577	2.9
	9	Assam	3,35,23,811	2.2
AVERAGE PHCE	10	Himachal Pradesh	1,62,81,593	1.8
	11	Chhattisgarh	3,44,95,535	1.6
	12	Bihar	5,94,01,640	1.6
	13	Rajasthan	9,98,99,911	1.4
	14	Odisha	5,47,95,908	1.4
	15	Uttar Pradesh	16,87,81,799	1.4
	16	Andhra Pradesh	9,71,22,422	1.3
	17	Madhya Pradesh	9,37,40,518	1.3
	18	Jharkhand	3,21,15,731	1.3
	19	Uttarakhand	2,53,66,625	1.1
	20	Delhi	8,30,87,249	1.0
LOW PHCE	21	Kerala	8,54,68,899	0.9
	22	Punjab	5,39,68,655	0.8
	23	West Bengal	12,07,82,261	0.8
	24	Tamil Nadu	17,97,22,872	0.7
	25	Gujarat	16,30,24,012	0.7
	26	Telangana	9,57,20,710	0.7
	27	Haryana	7,80,61,235	0.7
	28	Karnataka	16,28,92,793	0.6
	29	Maharashtra	28,18,55,457	0.6
	30	Goa	74,82,837	NA
	31	Andaman &Nicobar Islands	9,71,923	NA
	32	Puducherry	38,00,369	NA

33	Chandigarh	43,67,434	NA
34	D & N Haveli and Daman and Diu	NA	NA
35	Ladakh	NA	NA
36	Lakshadweep	NA	NA

Source: Union budget documents, State budgets, and MOSPI.[12]

Table 2 shows that states like Jammu &Kashmir and other Northeastern states like Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Tripura, Mizoram and Sikkim had the highest PHCE of 2.9% among all the states/ UTs. Maharashtra and Karnataka had the lowest PHCE of 0.6%.

Table III: Number Of Allopathic Doctors Present Per Lakh Population

	S.NO	INDIAN STATES/ UTS	TOTAL POPULATION	TOTAL NO. GOVT. ALLOPATHIC DOCTORS	DENSITY PER 1000 POPULATION
BETTER DENSITY PER 1000 POPULATION	1	Chandigarh	10,55,450	1999	1.89
	2	Lakshadweep	64,473	96	1.49
	3	Puducherry	12,47,953	1114	0.89
	4	Delhi	1,67,87,941	13879	0.83
	5	Sikkim	6,10,577	328	0.54
AVERAGE DENSITY PER 1000 POPULATION	6	Mizoram	10,97,206	519	0.47
	7	Goa	14,58,845	685	0.47
	8	Manipur	25,70,390	1162	0.45
	9	Arunachal Pradesh	13,83,727	549	0.4
	10	Himachal Pradesh	68,64,602	2620	0.38
LOW DENSITY PER 1000 POPULATION	11	Jammu &Kashmir	1,22,67,032	3402	0.28
	12	Tripura	36,73,917	999	0.27
	13	Andaman &Nicobar Islands	3,80,581	97	0.25
	14	Assam	3,12,05,576	6172	0.2
	15	Uttarakhand	1,00,86,292	2091	0.2
	16	Meghalaya	29,66,889	558	0.19
	17	D & N Haveli and Daman and Diu	5,85,764	113	0.19
	18	Kerala	3,34,06,061	6147	0.18
	19	Nagaland	19,78,502	340	0.17
	20	Andhra Pradesh	4,95,77,103	8042	0.16
	21	Rajasthan	6,85,48,437	10087	0.15
	22	Tamil Nadu	7,21,47,030	10277	0.14
	23	West Bengal	9,12,76,115	12315	0.13
	24	Maharashtra	11,23,74,333	13319	0.12
	25	Haryana	2,53,51,462	2842	0.11
	26	Gujarat	6,04,39,692	6009	0.1
VERY LOW DENSITY PER 1000 POPULATION	27	Odisha	4,19,74,219	3935	0.09
	28	Punjab	2,77,43,338	2193	0.08
	29	Karnataka	6,10,95,297	4973	0.08
	30	Chhattisgarh	2,55,45,198	1731	0.07
	31	Jharkhand	3,29,98,134	1966	0.06
	32	Madhya Pradesh	7,26,26,809	4440	0.06
	33	Uttar Pradesh	19,98,12,341	12138	0.06
	34	Telangana	3,50,03,674	1244	0.04
	35	Bihar	10,40,99,452	3300	0.03
	36	Ladakh	NA	NA	NA

Source: Population: Data from Census 2011 as published by the Registrar General & Census Commissioner, Government of Telangana, and then Planning Commission.[8,9]National Health Profile 2020.[6]
Table 3 shows Chandigarh had the highest number of government allopathic doctors per 1000 population among all states/ UT's, whereasBihar had the lowest number of allopathic doctors per 1000 population.

Table IV: Number Ofgovernment Dentists Present Per Lakh Population

	S.NO	INDIAN STATES/ UTS	TOTAL POPULATION	TOTAL NO. GOVT. DENTAL SURGEONS	DENSITY PER 1000 POPULATION
BETTER DENSITY PER 1000 POPULATION	1	Lakshadweep	64,473	10	0.155
	2	Sikkim	6,10,577	71	0.116
	3	Chandigarh	10,55,450	114	0.108
	4	Goa	14,58,845	110	0.075
	5	Jammu &Kashmir	1,22,67,032	551	0.045
	6	Himachal Pradesh	68,64,602	322	0.047
	7	Manipur	25,70,390	106	0.041
	8	Mizoram	10,97,206	45	0.041
AVERAGE DENSITY PER 1000 POPULATION	9	Arunachal Pradesh	13,83,727	51	0.037
	10	Delhi	1,67,87,941	478	0.028
	11	D & N Haveliand Daman and Diu	5,85,764	16	0.027
	12	Haryana	2,53,51,462	635	0.025
	13	Meghalaya	29,66,889	73	0.025
	14	Puducherry	12,47,953	30	0.024
	15	Assam	3,12,05,576	563	0.018
	16	Nagaland	19,78,502	32	0.016
	17	Tripura	36,73,917	53	0.014
	18	Andaman &Nicobar Islands	3,80,581	4	0.011
	19	Punjab	2,77,43,338	281	0.01
	20	Uttarakhand	1,00,86,292	102	0.01
LOW DENSITY PER 1000 POPULATION	21	Bihar	10,40,99,452	497	0.005
	22	Odisha	4,19,74,219	332	0.008
	23	Rajasthan	6,85,48,437	499	0.007
	24	West Bengal	9,12,76,115	658	0.007
	25	Andhra Pradesh	4,95,77,103	311	0.006
	26	Gujarat	6,04,39,692	334	0.006
	27	Karnataka	6,10,95,297	363	0.006
	28	Tamil Nadu	7,21,47,030	421	0.006
	29	Bihar	10,40,99,452	497	0.005
	30	Jharkhand	3,29,98,134	157	0.005
	31	Kerala	3,34,06,061	141	0.004
	32	Chhattisgarh	2,55,45,198	86	0.003
	33	Madhya Pradesh	7,26,26,809	113	0.002
	34	Maharashtra	11,23,74,333	168	0.001
	35	Uttar Pradesh	19,98,12,341	236	0.001
	36	Ladakh	NA	NA	NA

Source: Population: Data from Census 2011 as published by the Registrar General & Census Commissioner, Government of Telangana, and then Planning Commission.[8,9] National Health Profile 2020.[6]
Table 4 shows Lakshadweep and Sikkim had the highest number of dentists per 1000 population, whereas Maharashtra and Uttar Pradesh had the lowest number of dentists per 1000 population.

Table V: Number Of Auxiliary Nurses- Midwifery (Anm) Present Per Lakh Population

	S.No	INDIAN STATES/ UTS	TOTAL POPULATION	TOTAL NO. OF AUXILIARY NURSE-MIDWIFERY (ANM)	DENSITY PER 1000 POPULATION
AVERAGE DENSITY PER 1000 POPULATION	1	Andhra Pradesh	4,95,77,103	1,38,435	2.79
	2	Mizoram	10,97,206	2255	2.06
	3	Arunachal Pradesh	13,83,727	2591	1.87
	4	Rajasthan	6,85,48,437	1,08,688	1.59
	5	Manipur	25,70,390	3877	1.51
	6	Himachal Pradesh	68,64,602	11,673	1.7
	7	Odisha	4,19,74,219	62,159	1.48
	8	Haryana	2,53,51,462	26,607	1.05
LOW DENSITY PER 1000 POPULATION	9	Kerala	3,34,06,061	30,706	0.92
	10	Assam	3,12,05,576	27,925	0.89
	11	Karnataka	6,10,95,297	54,039	0.88
	12	Punjab	2,77,43,338	23,029	0.83
	13	Tamil Nadu	7,21,47,030	58,411	0.81
	14	Gujarat	6,04,39,692	48,517	0.8
	15	West Bengal	9,12,76,115	68,670	0.75
	16	Maharashtra	11,23,74,333	71,079	0.63
	17	Meghalaya	29,66,889	1846	0.62
	18	Tripura	36,73,917	2232	0.61
	19	Madhya Pradesh	7,26,26,809	39,563	0.54
	20	Chhattisgarh	2,55,45,198	13,329	0.52
	21	Sikkim	6,10,577	216	0.35
	22	Uttar Pradesh	19,98,12,341	60,258	0.3
	23	Delhi	1,67,87,941	4516	0.27
	24	Uttarakhand	1,00,86,292	2401	0.24
	25	Jharkhand	3,29,98,134	4755	0.14
	26	Telangana	3,50,03,674	3107	0.09
	27	Bihar	10,40,99,452	8624	0.08
	28	Goa	14,58,845	NA	NA
	29	Jammu &Kashmir	1,22,67,032	NA	NA
	30	Nagaland	19,78,502	NA	NA
	31	Chandigarh	10,55,450	NA	NA
	32	D & N Haveli and Daman and Diu	5,85,764	NA	NA
	33	Lakshadweep	64,473	NA	NA
	34	Puducherry	12,47,953	NA	NA
	35	Andaman &Nicobar Islands	3,80,581	NA	NA
	36	Ladakh	NA	NA	NA

Source: Population: Data from Census 2011 as published by the Registrar General & Census Commissioner, Government of Telangana, and then Planning Commission.[8,9] National Health Profile 2020.[6]

Table 5 shows Andhra Pradesh had the highest number of ANM per 1000 population, whereas Bihar had the lowest number of ANM per 1000 population.

Table VI: Number Of Registered Nurses (Rn) And Registered Midwives (Rm) Present Per Lakh Population

	S.No	INDIAN STATES/ UTS	TOTAL POPULATION	TOTAL NO. OF RN AND RM	DENSITY PER 1000 POPULATION
LOW DENSITY PER 1000 POPULATION	1	Kerala	3,34,06,061	2,75,544	8.25
	2	Andhra Pradesh	4,95,77,103	2,32,621	4.69
	3	Tamil Nadu	7,21,47,030	2,93,105	4.06
	4	Delhi	1,67,87,941	67,416	4.02
	5	Karnataka	6,10,95,297	2,31,643	3.79
	6	Mizoram	10,97,206	4006	3.65
	7	Manipur	25,70,390	8798	3.42
	8	Himachal Pradesh	68,64,602	20,934	3.05
	9	Rajasthan	6,85,48,437	2,00,171	2.92
	10	Punjab	2,77,43,338	76,680	2.76
	11	Meghalaya	29,66,889	6637	2.24
	12	Gujarat	6,04,39,692	1,23,170	2.05
	13	Sikkim	6,10,577	1144	1.87
	14	Odisha	4,19,74,219	75,575	1.8
	15	Arunachal Pradesh	13,83,727	2437	1.76
	16	Madhya Pradesh	7,26,26,809	1,18,793	1.64
	17	Maharashtra	11,23,74,333	1,39,247	1.24
	18	Haryana	2,53,51,462	30,430	1.2
	19	Tripura	36,73,917	4140	1.13
VERY LOW DENSITY PER 1000 POPULATION	20	West Bengal	9,12,76,115	67,395	0.74
	21	Assam	3,12,05,576	22,388	0.72
	22	Chhattisgarh	2,55,45,198	13,048	0.51
	23	Uttar Pradesh	19,98,12,341	74,777	0.37
	24	Telangana	3,50,03,674	12,214	0.35
	25	Uttarakhand	1,00,86,292	2613	0.26
	26	Jharkhand	3,29,98,134	3310	0.1
	27	Bihar	10,40,99,452	9413	0.09
	28	Goa	14,58,845	NA	NA
	29	Jammu &Kashmir	1,22,67,032	NA	NA
	30	Nagaland	19,78,502	NA	NA
	31	Chandigarh	10,55,450	NA	NA
	32	D & N Haveli and Daman and Diu	5,85,764	NA	NA
	33	Lakshadweep	64,473	NA	NA
	34	Puducherry	12,47,953	NA	NA
	35	Andaman &Nicobar Islands	3,80,581	NA	NA
	36	Ladakh	NA	NA	NA

Source: Population: Data from Census 2011 as published by the Registrar General & Census Commissioner, Government of Telangana, and then Planning Commission.[8,9] National Health Profile 2020.[6]

Table 6 shows Kerala had the highest number of RN and RM per 1000 population, whereas Bihar had the lowest number of RN and RM per 1000 population.

Table VII: State/Ut Wise Number Of Sub Centres Functioning (2019) And Their Shortfall

	S. No	STATE/UTS	SUB - CENTRES		SHORTFALL	
			PRESENT	REQUIRED	No.	%
HIGHEST SHORTFALL	1	Delhi	12	83	71	86
	2	Bihar	10,280	18,637	8357	45
	3	Meghalaya	443	759	316	42
	4	Jharkhand	3848	6060	2212	37
	5	Puducherry	54	79	25	32
AVERAGE SHORTFALL	6	Haryana	2617	3301	684	21
	7	Maharashtra	10649	13,512	2863	21
	8	West Bengal	10357	13,083	2726	21
	9	Assam	4680	5850	1170	20
	10	Madhya Pradesh	10226	12,415	2863	18
	11	Manipur	418	509	91	18
	12	Odisha	6688	8193	1505	18
	13	Punjab	3047	3468	421	12
	14	Nagaland	415	455	40	9
NO SHORTFALL	15	Andhra Pradesh	7458	7261	0	-
	16	Arunachal Pradesh	363	318	0	-
	17	Chhattisgarh	5569	4885	0	-
	18	Goa	218	122	0	-
	19	Gujarat	9162	8008	0	-
	20	Himachal Pradesh	2104	1285	0	-
	21	Jammu & Kashmir	2492	2009	0	-
	22	Karnataka	9435	7951	0	-
	23	Kerala	5410	3551	0	-
	24	Mizoram	370	172	0	-
	25	Rajasthan	13530	11459	0	-
	26	Sikkim	153	113	0	-
	27	Tamil Nadu	8713	7533	0	-
	28	Telangana	4841	4708	0	-
	29	Tripura	1001	691	0	-
	30	Uttarakhand	1847	1442	0	-
	31	Uttar Pradesh	20778	31,200	0	-
	32	A & N islands	124	50	0	-
	33	Chandigarh	17	5	0	-
	34	D & N Haveli, Daman & Diu	97	69	0	-
	35	Lakshadweep	11	4	0	-
	36	Ladakh	NA	NA	NA	NA

Source: National Health Profile 2020. [6] Roadmap to Improve Health System. Ministry Of Health and Family Welfare. [13]

Table 7 shows Delhi (86%) faces the highest shortfall of Sub- centres, whereas states like Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Goa, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Mizoram, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttarakhand, Uttar Pradesh, A & N islands, Chandigarh, D & N Haveli, Daman & Diu, Lakshadweep faces no shortfall of Sub- centres.

TABLE VIII: STATE/UT WISE NUMBER OF Phcs FUNCTIONING (2019) AND THEIR SHORTFALL

	S. No	STATE/UTS	PHCs		SHORTFALL	
			PRESENT	REQUIRED	No.	%
HIGHEST SHORTFALL	1	Jharkhand	351	966	615	64
	2	Delhi	5	13	8	62
	3	West Bengal	1369	2153	784	36
	4	Bihar	2027	3099	1072	35
	5	Uttar Pradesh	3473	5194	1721	33
AVERAGE SHORTFALL	6	Madhya Pradesh	1476	1989	513	26
	7	Haryana	485	550	65	12
	8	Punjab	527	578	51	9
	9	Manipur	93	91	2	2
NO SHORTFALL	10	Andhra Pradesh	1385	1197	0	-
	11	Arunachal Pradesh	124	48	0	-
	12	Assam	1002	954	0	-
	13	Chhattisgarh	837	774	0	-
	14	Goa	59	19	0	-
	15	Gujarat	1795	1290	0	-
	16	Himachal Pradesh	588	212	0	-
	17	Karnataka	2534	1306	0	-
	18	Kerala	932	589	0	-
	19	Maharashtra	2675	2201	0	-
	20	Meghalaya	143	114	0	-
	21	Mizoram	65	25	0	-
	22	Nagaland	137	68	0	-
	23	Odisha	1377	1315	0	-
	24	Rajasthan	2477	1861	0	-
	25	Sikkim	25	18	0	-
	26	Tamil Nadu	1884	1251	0	-
	27	Telangana	885	768	0	-
	28	Tripura	112	109	0	-
	29	Uttarakhand	295	238	0	-
	30	A & N islands	27	8	0	-
	31	Chandigarh	48	0	0	-
	32	D & N Haveli, Daman & Diu	13	8	0	-
	33	Jammu & Kashmir	972	327	0	-
	34	Lakshadweep	4	0	0	-
	35	Puducherry	13	13	0	-
	36	Ladakh	NA	NA	NA	NA

Source: National Health Profile 2020. [6] Roadmap to Improve Health System.Ministry Of Health and Family Welfare. [13]

Table 8 shows Jharkhand (64%) faces the highest shortfall of PHC. Assam, Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Goa, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Meghalaya, Mizoram, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttarakhand, Uttar Pradesh, A & N islands, Chandigarh, D & N Haveli, Daman & Diu, Puducherry, Lakshadweep faces no shortfall of PHCs.

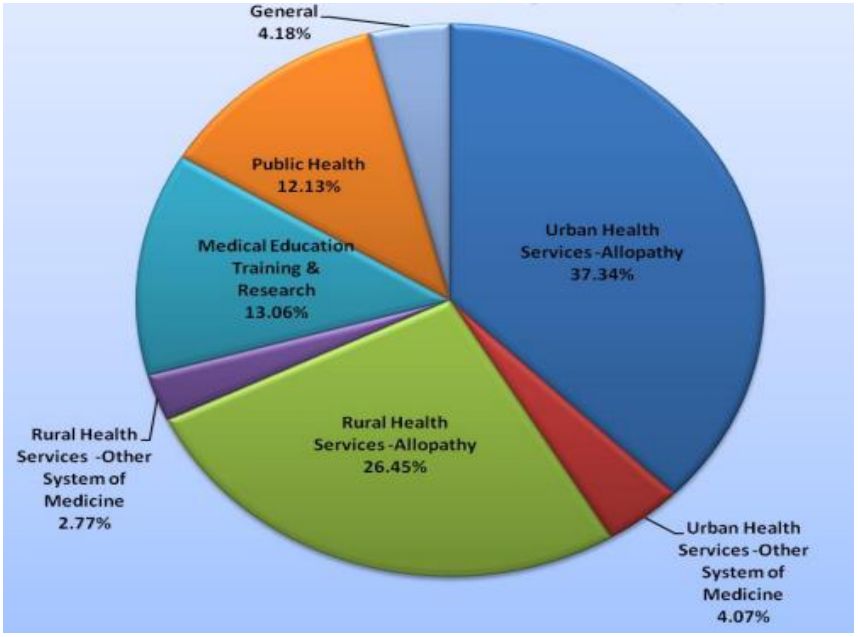
TABLE IX:STATE/UT WISE NUMBER OF Chcs FUNCTIONING (2019) AND THEIR SHORTFALL

	S. No	STATE/UTS	CHCs		SHORTFALL	
			PRESENT	REQUIRED	No.	%
HIGHEST SHORTFALL	1	Bihar	64	710	710	92
	2	Sikkim	2	4	2	50
	3	Telangana	95	192	97	50
	4	Uttar Pradesh	723	1298	575	44
	5	Karnataka	208	326	118	36
	6	West Bengal	348	538	190	35
	7	Andhra Pradesh	198	299	101	34
	8	Madhya Pradesh	330	497	167	34
AVERAGE SHORTFALL	9	Jharkhand	177	241	64	27
	10	Maharashtra	418	550	132	24
	11	Tripura	22	27	5	19
	12	Manipur	17	20	3	15
	13	Chhattisgarh	174	193	19	10
	14	Jammu & Kashmir	77	81	4	5
NO SHORTFAL	15	Arunachal Pradesh	60	12	0	-
	16	Assam	192	238	0	-
	17	Goa	6	4	0	-
	18	Gujarat	362	322	0	-
	19	Haryana	131	137	0	-
	20	Himachal Pradesh	92	53	0	-
	21	Kerala	227	147	0	-
	22	Meghalaya	28	28	0	-
	23	Mizoram	9	6	0	-
	24	Nagaland	21	17	0	-
	25	Odisha	384	328	0	-
	26	Punjab	155	144	0	-
	27	Rajasthan	614	465	0	-
	28	Tamil Nadu	400	312	0	-
	29	Uttarakhand	68	59	0	-
	30	A & N islands	4	2	0	-
	31	Chandigarh	2	0	0	-
	32	D & N Haveli, Daman & Diu	4	2	0	-
	33	Delhi	23	3	0	-
	34	Lakshadweep	3	0	0	-
	35	Puducherry	4	3	0	-
	36	Ladakh	NA	NA	NA	NA

Source: National Health Profile 2020. [6] Roadmap to Improve Health System. Ministry Of Health and Family Welfare.[13]

Table 9 shows Bihar (92%) faces the highest shortfall of CHC. Assam, Arunachal Pradesh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Kerala, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttarakhand, A & N islands, Chandigarh, D & N Haveli, Daman & Diu, Puducherry, Lakshadweep faces no shortfall of CHCs.

Figure 1: Component-Wise Breakup Of Medical And Public Health Expenditure In India



Source: Health Sector Financing by Centre and States/ UTs in India (2015-16 to 2017-18). [14]

Figure 1 shows the component-wise breakup of medical and public health expenditure in India is divided into urban health services- allopathy 37.34%, urban health services- others 4.07%, rural health services- allopathy 26.45%, rural health services- others 2.77%, medical education training and research 13.06%, public health 12.13%, general 4.18%.

Discussion:

One important finding in earlier studies concluded that the ratio of healthcare expenditure to GDP increased as countries were getting developed economically and industrially. The pioneering work of Abel Smith brought out this issue in World Health Organisation studies in 1963, and 1967 suggested that after adjusting for inflation, exchange rates and population, GDP was a major determinant of health expenditure. [15, 16] The total public health care expenditure was comprised of allocations from both central and state governments. The Government of India has initiated and sponsored many health programmes and policies for the improvement of the health sector. There was a rapid decline in the shares of revenue expenditure by the state governments. This might be a reflection of the fact that state governments are going through serious financial problems. Hence the role of central government support in-state budgetary allocations should be increased.

WHO recommendation for the doctor-population ratio is 1:1000. India produces about 67,218 allopathic doctors in a year from 479 medical colleges recognized by the Medical Council of India (MCI). [17] Public health infrastructure is grossly insufficient to serve the health-care demands of the huge population of India. There are gross shortages of skilled health-care workers at the primary care level. Whatever resources are available, they are either overburdened or underutilized. [18]

Innovations in the field of public health to reduce expenditure on health care with quality are the immediate need of the hour. Management and planning are necessary to reduce the wastage of public funds and resources. Research should be taken up to provide evidence-based guidelines from an Indian perspective to bring uniformity in management. National Health Policy 2017 recommendations for public health care expenditure from GDP are 2.5% by 2025. [19]

According to the 2011 Census, about 37.7 crores (377 million) people live in urban areas, and the projected population estimation is 43.2 crores (432 million) by 2021. [1] Despite the hurdles of the poor to health care facilities, their access to

these facilities was restricted, and they are 'overcrowded' because of an inadequate urban public health care delivery system. Further, the lack of guidelines for the urban health care delivery system makes the urban poor worsened than their rural counterparts. Unlike in the case of rural health services, no efforts have been planned and organized to improve primary, secondary and tertiary healthcare services in urban areas. Ineffective outreach and a weak referral system also limit the access of the urban poor to health care services. As a result, primary healthcare facilities were not available in many areas; some of the existing institutions were underutilized and overcrowded in most of the secondary and tertiary centres. [20]

India shows an enormous increase in GDP from the year 2011 but still lacks in attaining a good quality of health. This might be due to the fact that government spends only a minimum amount on health care. Currently, India ranks sixth place over the entire world in GDP, but still, there is no improvement in the welfare of people. The proverb “Health is Wealth” is prioritized more than anything in the world; hence the government should focus on health care services and increase the health expenditure in the upcoming year for the beneficiaries of people. [21]

Limitations of the study include data on some UT’s, especially Ladakh was not included as the data was not available. Only available data were collected, and those data which are not clear and obvious are excluded from the study. Data on the total population of each state was taken from the Census of India 2011. It cannot be used for the state Telangana as it was formed only on June 2nd, 2014. So, the population of Telangana is taken from the official website of the Government of Telangana.

Conclusion:

There is an urgent need to develop the healthcare infrastructure and health workforce. The government should ensure proper measures to address the shortage of skilled manpower in health care facilities all over India. More permanent government postings were created for doctors and dentists. It is not done as sufficient funds are not allocated by the Indian government for healthcare; rather, it is spent on other costly defence utilities. The central and state governments are responsible for the provision of primary healthcare in the country. The government of India spends only less than 2 per cent of the GDP on public health, which is very low rather to the actual needs. The large existing network of public primary care facilities should be used more effectively with the help of private partnerships to enable better health care delivery to the citizens of India. Building better past, present and future linkages through a superior referral system would cause the secondary and tertiary care facilities to be more manageable and prevent them from being overburdened.

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