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PERFORMANCE OF HEALTH SECTOR IN INDIA DURING COVID-19 AND AFTERMATH-A TESTING TIME FOR SURVIVAL

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Abstract: This paper examines the performance of health sector in India during the pandemic period through different parameters like Health infrastructure and Health Care services. Although there has been overall improvement in the health infrastructure throughout this period, but this improvement is not uniform across all the states. States like Haryana, Bihar, Jharkhand etc. have not been able to reap the benefits of this improvement. Road connectivity to these rural health care institutions has also shown improvement in these years but disparity is seen in this regard too with some states like Sikkim, Goa performing best while some states like Uttarakhand having poor connectivity. We also highlight the progress of India regarding improving the health care services by reducing the gap between the sanctioned and in position health service providers like doctors, paramedical staff, nursing staff etc. In this context also, there is disparity across the states. The performance of J&K in health sector and after covid has been average both during pre and post covid period.

Index Terms- Healthcare, infrastructure, pandemic, disparities, services.

I. INTRODUCTION

The COVID-19 pandemic stressed public health systems around the world and exposed the lacunae in health care sector for people, especially for the vulnerable populations. An efficient and organized healthcare sector has always been a priority for every country's economic wellbeing – a linchpin of sorts. But what would happen when there is an unforeseen strain on the linchpin? The system gives up and breaks down. This is precisely what the COVID-19 pandemic did to healthcare sector across the globe and our country is no exception. The COVID-19 challenge strongly advocated for the development of a resilient and sustainable health system around the world. To achieve this, significant financial investment is needed to improve the health systems, including the growth of the health workforce, the establishment of suitable working conditions, the provision of training and equipment, particularly in respect to personal protection equipment and occupational safety.

II. REVIEW OF LITERATURE

Georges C Benjamin (2020) discussed the importance of public health infrastructure during pandemic. He said that to address health equity, there is a need to build a resilient health infrastructure. The COVID-19 pandemic imposed heavy stress on public health systems and was an example of the need for strong systems to promote and protect health and ensure health equity. Corwin Rhyen, Ani Turner and George Miller (2020) discussed the impact of pandemic on the health sector of the United States. They concluded that this pandemic severely affected the health sector and the labour forces that worked in the health sector. The COVID-19 induced recession in health sector contributed to instead of counterbalancing economic losses and employment. In the United States, during the COVID period, prices of medical equipment continued to rise, thus adding to the problems faced by the people. They had also compared the recession in the 2009 period faced by the US economy with the first nine months of COVID in 2020. The authors concluded that the pandemic induced recession affected the health sector in many ways than which was seen the recession of 2007-2009.

Henry Ajibo (2020) discussed the impact of pandemic on the social well-being of Nigeria and the pandemic preparedness of the health sector. Interviews from various health professionals showed that the Nigerian health sector was both underfunded and thus underprepared for the pandemic. This led to the loss of lives of large number of people. Underfunding of the health sector led to the lack of even basic health amenities such as face masks, sanitizers, test kits etc. Thus, lack of funding to the health sector affected the social well-being of Nigerian population. The author suggested funding the health sector so that the country may be prepared for any such pandemic in future.

Nason Mani and Sandro Galea (2020) focused on the lack of funding on the public health infrastructure of the United States. Discrepancies in the Public Health spending badly affect the coordination and performance of health sector in responding to any health emergency as covid19. Continuous disinvestment, lack of will on the part of political leaders, focusing on a reactionary mechanism rather than focusing on Capacity building were some of the reasons that led to the lack of having a good public health system at a decentralized level in United States.

Susan R Bailey (2021) focused on the significant role played by the public health infrastructure in United States both in the time of pandemic and in the daily emergencies faced by the people during the normal days. She discussed the important role played by the health agencies in our day to day lives was often left unseen until people face a health emergency like COVID-19. The author suggested that the only solution to outcome any such situation in the future was to fund the public health agencies and create jobs in the health sector which can boost the health sector.

Amalesh Sharma, Sourav Bikash Borahb, Aditya C. Moses also discussed the role played by the health infrastructure in the pandemic and to prepare for any such pandemic in the future. Increase in the Health infrastructure of a country lead a country to focus on the health experts internally and health institutions on a global scale externally. Increasing spending on healthcare sector make a country to institutionalize learning which has a positive impact on the responses of an organization during a crisis. They concluded that learning from pandemics such as COVID-19 led to an increase in production knowledge which affected response to pandemics in future.

Xiao *et al.*, 2021 in their work aimed to quantify the impact of COVID-19 on utilization of health services in China. They focused on the effect of the pandemic on in-service and outpatient services on the country. Health services and service utilization could not play a significant role during the initial period of pandemic due to lack of knowledge about the pandemic, but during the later period, the total number of health service providers increased and thus, there was a significant rise in the service utilization also.

III. OBJECTIVES

The main objective of this study is to evaluate the impact of COVID-19 on health infrastructure and health services of India and its viability during pre and post Covid period.

IV. METHODOLOGY

The study is exclusively based on secondary data. The data for the number of Rural and Urban Hospitals, primary health centres and other infrastructure have been taken from the Rural health survey, Ministry of Health and family welfare. Similarly, the data for the health service providers i.e., Nursing staff, doctors has been taken from the rural health survey, Ministry of Health and family welfare.

V. RESULTS AND DISCUSSIONS

5.1 Health Infrastructure

Health infrastructures are both real and intangible, operating both inside and outside the government sector and supporting public health. In last few decades, India has achieved considerable progress in providing access to health care services to the people. So, the basic research question is on distribution of health infrastructure in India. The uneven distribution of health infrastructure among Indian States is the cause of the country's health disparities.

Now, the question arises whether health infrastructure is sufficient and properly distributed in India.

In this study, the following parameters have been taken for the discussion-

- A. State wise distribution of Sub-centres, PHCs, Community Health Centres & District Hospitals (Table 1)
- B. Number of PHCs functioning on 24x7 basis in the country (Table 2)
- C. PHCs functioning without all-weather motor approachable road (Table 3)
- D. PHCs having referral transport facility (Table 4)
- E. PHCs having labor room facility (Table 5)

A. Table 1 shows the trends in the distribution of SCs, PHCs, CHCs & DH in Indian states. The first three make the 3-tier health-infrastructure in rural areas and the fourth one is the major health care facility in a region. Among all the states, Uttar Pradesh has the highest number of Sub-Centers, PHCs, CHCs and district hospitals. Sikkim has the least number of these infrastructural facilities. Among the Union territories, Delhi tops in all the indicators. In terms of sub -centers, Andhra Pradesh has shown the highest increase in post-covid period. In terms of PHCs, Uttarakhand has shown the highest increase post covid period. Madhya Pradesh tops all the Indian states in terms of increase in CHCs pre and post covid period. In terms of DHs, Odisha has shown the highest increasing trend after the Covid Period. The Union Territory Of J&K has not shown any major improvement in any of these infrastructural facilities post COVID period.

Table 1. Number of Sub-Centers, Primary Health Centers, Community Health Centres and District Hospitals in Indian states (2018-2022)

Year	2018-2019				2019-2020				2020-2021				2021-2022			
STATE/UT	SC	PHC	CH C	DH	SC	PHC	CH C	DH	SC	PHC	CH C	D H	SC	PHC	CH C	D H
Andhra Pradesh	6846	121	195	14	7458	1385	198	13	7458	1401	198	14	11480	1689	181	17
Arunachal Pradesh	307	105	63	17	363	124	60	17	347	127	57	19	367	131	57	19
Assam	4034	704	179	25	4680	1002	192	24	4678	1001	199	24	4701	1010	201	25
Bihar	9865	1480	150	36	10280	2027	64	36	10258	2034	306	36	10399	1760	301	36
Chhatisgarh	4919	687	174	26	5569	837	174	26	5485	821	169	26	5494	822	170	27
Goa	219	0	5	2	218	59	6	2	219	27	6	2	219	28	6	2
Gujrat	8353	951	376	22	9162	1795	362	22	9162	1799	360	20	9132	1804	361	20
Haryana	2472	218	128	22	2617	485	131	22	2626	484	137	22	2653	497	131	22
Himachal Pradesh	2097	586	94	12	2104	588	92	9	2115	572	98	9	2115	570	97	9
J&K	2900	560	84	23	2492	972	77	21	2471	973	79	16	2471	973	79	15
Jharkhand	3644	210	177	23	3848	351	177	23	3848	350	176	22	3848	361	178	21
Karnataka	9438	2359	207	15	9435	2534	208	26	9441	2531	212	22	9272	2521	212	16
Kerala	5380	761	229	18	5410	932	227	48	5414	924	229	47	5412	944	230	48
Madhya Pradesh	10226	1146	330	51	10226	1476	330	51	10189	1518	320	51	10287	1572	356	52

Maharashtra	9729	1887	401	23	1064 9	2675	418	49	1067 3	2490	402	23	10673	2539	398	23
Manipur	429	94	23	9	418	93	17	7	416	95	17	7	416	95	17	7
Meghalaya	445	110	28	11	443	143	28	11	451	145	28	11	459	147	28	11
Mizoram	370	65	9	9	370	65	9	9	377	68	9	12	373	66	9	12
Nagaland	397	126	21	11	415	137	21	11	445	138	21	11	452	136	23	12
Odisha	6595	466	384	32	6688	1377	384	32	6688	1378	384	27	6688	1393	384	32
Punjab	2511	95	152	22	3047	527	155	22	2951	522	160	22	2951	522	160	23
Rajasthan	13429	2097	595	27	1353 0	2477	614	27	1358 1	2394	657	28	13589	2409	685	30
Sikkim	148	25	2	4	153	25	2	4	153	26	2	4	153	26	2	4
Tamil Nadu	9911	955	400	31	8713	1884	400	32	8713	1886	400	20	8713	1886	400	20
Telangana	4658	0	95	6	4841	885	95	6	5000	863	95	5	4910	834	82	5
Tripura	966	82	22	7	1001	112	22	7	999	116	22	7	1000	117	23	7
Uttarakhand	1804	243	67	18	1847	295	68	13	1843	287	72	13	1851	607	80	13
Uttar Pradesh	20056	2227	691	157	2077 8	3473	723	168	2077 8	3516	816	16 8	20781	3513	841	16 9
West Bengal	10195	1088	387	23	1035 7	1369	348	18	1035 7	1369	348	18	10357	1371	348	18
A&N Islands	96	22	4	3	124	27	4	3	124	27	4	3	124	27	4	2
Chandigarh	4	36	2	1	0	48	2	2	0	43	2	1	0	43	2	1
D&N Haveli	47	8	2	1	97	13	4	3	97	14	4	2	97	14	4	2
Daman & Diu	6	0	2	2	97	13	4	3	97	-	-	-	97	-	-	-

Delhi	204	540	0	47	258	546	23	38	15	549	0	37	14	550	0	40
Lakshadweep	14	4	3	1	11	4	3	1	7	4	3	1	9	4	3	1
Puducherry	80	11	4	5	81	39	4	5	81	39	4	5	81	39	4	4
Ladakh	NA	NA	NA	NA	238	32	7	2	289	32	7	2	288	33	7	2
Total	15279	2006	5685	756	1579	3081	5649	810	1577	3056	6003	75	16182	3105	6064	76
	4	9			21	3			49	3		7	9	3		7

Source: Rural Health Surveys, Ministry of Health and Family Welfare

B. As evident from the **Table 2**, among all the Indian states, the highest percentage of PHCs functioning on 24x7 basis are found in Sikkim, while the most poorly performing state in this aspect is Himachal Pradesh. After the Covid period, Rajasthan has shown the highest increase. The Union Territory of J&K has not shown any major improvement after the COVID period in this aspect.

Table 2. PHCs functioning on 24x7 basis in Indian states (2018-2022)

STATE/UT	2018-19		2019-2020		2020-2021		2021-2022	
	Number	%	Number	%	Number	%	Number	%
Andhra Pradesh	0	NA	596	52.2	1142	100	1142	100.0
Arunachal Pradesh	43	42.6	30	25.2	48	39.3	42	33.3
Assam	310	44.4	299	31.6	293	30.9	280	30.4
Bihar	795	53.7	507	29.8	846	43.8	630	42.2
Chattisgarh	224	34.1	481	60.7	464	60.3	477	61.9
Goa	0	NA	13	23.6	14	60.9	13	54.2

Gujrat	0	NA	306	20.7	307	20.8	504	34.2
Haryana	109	56.5	248	64.4	244	63.5	242	61.4
Himachal Pradesh	19	3.4	0	0.0	28	5.1	28	5.1
J&K	201	38.2	105	11.4	192	21.5	190	21.3
Jharkhand	156	76.8	212	72.9	216	74.2	216	74.2
Karnataka	919	46.1	877	40.3	880	41.1	904	42.3
Kerala	170	25.1	128	16.3	639	81.7	159	20.4
Madhya Pradesh	751	72.3	751	62.6	791	64.1	791	62.5
Maharashtra	553	41.0	700	38.3	238	12.9	248	13.4
Manipur	69	81.2	54	63.5	72	83.7	72	97.3
Meghalaya	69	62.7	61	51.3	111	91.7	61	50.0
Mizoram	41	71.9	41	71.9	41	66.1	41	71.9
Nagaland	35	28.2	33	25.4	34	26.0	31	24.0
Odisha	83	18.0	126	9.8	316	24.5	316	24.5
Punjab	64	81.0	183	42.9	206	48.8	206	48.8
Rajasthan	627	35.3	627	29.9	627	29.4	810	38.0
Sikkim	24	100.0	0	0.0	24	100.0	24	100.0
Tamil Nadu	615	87.1	1310	92.3	1316	92.5	1316	92.5
Telangana	0	NA	324	50.9	314	49.4	285	49.3
Tripura	70	85.4	82	76.6	85	78.7	93	86.1
Uttarakhand	76	31.3	76	29.6	76	31.0	59	11.1
Uttar Pradesh	439	22.1	50	1.7	1844	63.1	1775	60.8
West Bengal	234	36.6	229	25.1	229	25.0	229	25.0
A&N Islands	20	90.9	22	100.0	22	100.0	22	100.0
Chandigarh	NA	NA	NA	NA	NA	NA	NA	NA
D&N Haveli	5	83.3	9	90.0	10	83.3	9	75.0

Daman & Diu	0	NA	9	90.0	10	83.3	9	75.0
Delhi	1	20.0	0	0.0	1	20.0	1	20.0
Lakshadweep	4	100.0	3	75.0	3	75.0	3	75.0
Puducherry	7	77.8	19	79.2	19	79.2	19	79.2
Ladakh	NA	NA	12	37.5	12	37.5	12	37.5
Total	6733	40.5	8514	34.2	11704	46.6	11250	45.1

Source: Rural Health Surveys, Ministry of Health, and Family Welfare

C. Roads are the lifeline of mankind. As seen from Table 3, among the states, the poorest performing state having highest % of PHCs without all-weather motorable road is Uttarakhand while the good performing states are Goa, Sikkim, Telangana, Tripura. All Union territories have performed good in this indicator except Ladakh. West Bengal has shown tremendous improvement in this aspect after the COVID period. The UT of J&K has shown an improvement of 1 %.

Table 3. Primary Health Centers functioning in Indian States without all-weather motorable approach road (2018-2022)

STATE/UT	2018-2019		2019-2020		2020-2021		2021-2022	
	Number	%	Number	%	Number	%	Number	%
Andhra Pradesh	0	NA	0	0.0	0	0.0	0	0.0
Arunachal Pradesh	26	25.7	32	26.9	30	24.6	25	19.8
Assam	74	10.6	87	9.2	65	6.9	59	6.4
Bihar	0	0.0	323	19.0	460	23.8	362	24.3
Chattisgarh	33	5.0	43	5.4	71	9.2	68	8.8
Goa	0	0	0	0.0	0	0.0	0	0.0
Gujrat	0	0.0	98	6.6	10	0.7	41	2.8
Haryana	13	6.7	14	3.6	0	0.0	0	0.0
Himachal Pradesh	54	9.5	54	9.6	21	3.8	21	3.8
J&K	103	19.6	168	18.2	133	14.9	120	13.5
Jharkhand	30	14.8	17	5.8	17	5.8	17	5.8
Karnataka	151	7.6	78	3.6	109	5.1	110	5.1
Kerala	58	8.6	0	0.0	33	4.2	0	0.0
Madhya Pradesh	91	8.8	81	6.8	111	9.0	112	8.8
Maharashtra	69	5.1	74	4.0	92	5.0	75	4.0
Manipur	6	7.1	18	21.2	3	3.5	15	20.3
Meghalaya	13	11.8	20	16.8	5	4.1	2	1.6
Mizoram	1	1.8	4	7.0	3	4.8	1	1.8
Nagaland	23	18.5	17	13.1	32	24.4	30	23.3

Odisha	4	0.9	4	0.3	36	2.8	39	3.0
Punjab	0	0.0	11	2.6	10	2.4	13	31
Rajasthan	53	3.0	53	2.5	53	2.5	53	2.5
Sikkim	0	0.0	1	4.2	0	0.0	0	0.0
Tamil Nadu	0	0.0	67	4.7	85	6.0	83	5.8
Telangana	0	NA	0	0.0	0	0.0	0	0.0
Tripura	0	0.0	0	0.0	0	0.0	0	0.0
Uttarakhand	51	21.0	51	19.8	97	39.6	272	51.2
Uttar Pradesh	459	23.1	492	17.1	482	16.5	450	15.4
West Bengal	43	6.7	130	14.2	130	14.2	4	0.4
A&N Islands	0	0.0	0	0.0	0	0.0	0	0.0
Chandigarh	NA	NA	N.APP	N.APP	N.APP	N.APP	N.APP	N.APP
D&N Haveli	0	0.0	0	0.0	0	0.0	0	0.0
Daman & Diu	0	0.0	0	0.0	0	0.0	0	0.0
Delhi	0	0.0	0	0.0	0	0.0	0	0.0
Lakshadweep	0	0.0	0	0.0	0	0.0	0	0.0
Puducherry	0	0.0	0	0.0	0	0.0	0	0.0
Ladakh	NA	NA	0	0.0	6	18.8	6	18.8
Total	1355	8.2	1937	7.8	2094	8.3	1978	7.9

Source: Rural Health Surveys, Ministry of Health and Family Welfare

D. As evident from the table 4, Uttar Pradesh is the best performing state having highest number of PHCs with referral transport facility while the worst performing state is Goa followed by Sikkim. The UT of J&K and Rajasthan have shown a continuous trend of improvement in this regard. The newly formed UT of Ladakh is also one of best performers among UTs.

Table 4. Number of Primary Health Centers functioning having Referral transport Facility (2018-22)

STATE/UT	2018-19	2019-20	2020-21	2021-22
Andhra Pradesh	0	1142	1142	1142
Arunachal Pradesh	58	78	84	80
Assam	652	830	812	795
Bihar	496	568	321	577
Chhattisgarh	422	701	740	747
Goa	0	23	23	24
Gujrat	556	1390	1468	1452
Haryana	181	374	384	394
Himachal Pradesh	566	564	553	553
J&K	378	424	450	512
Jharkhand	203	291	291	291
Karnataka	722	2065	2050	2053
Kerala	54	689	684	685
Madhya Pradesh	1039	1199	1234	1266
Maharashtra	685	1821	1823	1853
Manipur	66	67	74	74
Meghalaya	93	110	116	119
Mizoram	57	34	37	45
Nagaland	53	45	60	57
Odisha	461	1288	1288	1288
Punjab	14	261	287	297
Rajasthan	1038	1890	1939	1943
Sikkim	24	24	24	24

Tamil Nadu	706	1420	1422	1422
Telangana	0	636	636	578
Tripura	82	107	108	108
Uttarakhand	49	79	180	180
Uttar Pradesh	379	2317	2455	2411
West Bengal	297	625	642	586
A&N Islands	22	22	22	22
Chandigarh	N.APP	N.APP	N.APP	N.APP
D&N Haveli	6	10	12	12
Daman & Diu	0	10	12	12
Delhi	1	4	5	5
Lakshadweep	4	4	4	4
Puducherry	9	24	24	24
Ladakh	NA	6	28	29
Total	9373	21132	21422	21652

Source: Rural Health Surveys, Ministry of Health and Family Welfare

E. In terms of PHCs having Labor room facility, Sikkim is the best performer followed by Mizoram while Andhra Pradesh is the best performing state among the larger states. The state not performing well is Himachal Pradesh followed by J&K. Among the UTs, the best performer is A&N islands followed by Ladakh while the UT not performing well is Delhi. The state which has shown significant improvement after the COVID period is Mizoram which has shown a percentage increase of 16%. The UT of J&K has also shown a % increase of 7.4%.

Table 5. Primary Health Centres functioning in Indian states with Labour Room Facility (2018-22)

STATE/UT	2018-19		2019-20		2020-21		2021-22	
	Number	%	Number	%	Number	%	Number	%
Andhra Pradesh	0	NA	1142	100.0	1134	99.3	1134	99.3
Arunachal Pradesh	61	60.4	73	61.3	71	58.2	67	53.2
Assam	556	79.7	762	80.5	742	78.3	721	78.4
Bihar	795	53.7	548	32.2	566	29.3	465	31.2
Chattisgarh	614	93.5	783	98.9	746	97.0	752	97.7
Goa	0	NA	13	23.6	13	56.5	13	54.2
Gujrat	443	62.9	1205	81.6	1183	80.1	1282	87.0
Haryana	134	69.4	330	85.7	317	82.6	318	80.7
Himachal Pradesh	108	19.1	194	34.4	176	31.8	164	29.7
J&K	305	58.0	286	31.0	283	31.8	349	39.2
Jharkhand	156	76.8	212	72.9	244	83.8	244	83.8
Karnataka	1663	83.4	1823	83.8	1625	75.9	1740	81.4
Kerala	62	9.1	0	0.0	5	0.6	0	0.0
Madhya Pradesh	982	94.5	992	82.7	998	80.9	998	78.8
Maharashtra	674	50.0	1729	94.5	1725	93.8	1699	91.7
Manipur	57	67.1	75	88.2	79	91.9	74	100.0
Meghalaya	95	86.4	111	93.3	108	89.3	120	98.4
Mizoram	57	100.0	57	100.0	52	83.9	57	100.0

Nagaland	98	79.0	98	75.4	105	80.2	105	81.4
Odisha	247	53.6	642	49.8	584	45.3	595	46.2
Punjab	79	100.0	225	52.7	208	49.3	209	49.5
Rajasthan	1702	95.8	1794	85.7	1800	84.5	1800	84.4
Sikkim	24	100.0	24	100.0	24	100.0	24	100.0
Tamil Nadu	658	93.2	1349	95.0	1328	93.4	1347	94.7
Telangana	0	NA	636	100.0	636	100.0	578	100.0
Tripura	70	85.4	107	100.0	108	100.0	88	81.5
Uttarakhand	140	57.6	140	54.5	155	63.3	177	33.3
Uttar Pradesh	1696	85.2	2205	76.6	2174	74.4	2047	70.1
West Bengal	462	72.2	430	47.1	333	36.4	310	33.9
A&N Islands	22	100.0	22	100.0	22	100.0	22	100.0
Chandigarh	N.APP	N.APP	N.APP	N.APP	N.APP	N.APP	N.APP	N.APP
D&N Haveli	5	83.3	9	90.0	10	83.3	10	83.3
Daman & Diu	0	NA	9	90.0	10	83.3	10	83.3
Delhi	1	20.0	0	0.0	1	20.0	1	20.0
Lakshadweep	4	100.0	3	75.0	3	75.0	3	75.0
Puducherry	9	100.0	24	100.0	24	100.0	24	100.0
Ladakh	NA	NA	6	18.8	31	96.9	31	96.9
Total	11979	72.1	18049	72.4	17613	70.1	17568	70.5

Source: Rural Health Surveys, Ministry of Health and Family Welfare

5.2 Health Services

In this paper, 3 parameters have been taken for looking into the trends of Health services-

- A. Sanctioned & in position doctors serving in hospitals (Table 6)
- B. Sanctioned & in position paramedical staff in hospitals (Table 7)
- C. Sanctioned & in position nursing staff in hospitals (Table 8)

A. As seen from the table below, there has been a minor decrease in the gap of Sanctioned and in Position doctors after the COVID period i.e. from 5777 to 5375. After the COVID period, the state having the largest gap in terms of sanctioned and in position doctors is Madhya Pradesh followed by Odisha. On the other hand, the state having the least gap after the COVID period in the above said ratio is Goa followed by Himachal Pradesh. The UT of J&K has shown improvement by narrowing down its gap from 371 to 185. Andaman and Nicobar Islands is the best performer among the UTs.

Table 6. Number of Doctors at District Hospitals across Indian States (2018-22)

STATE/UT	2018-19		2019-2020		2020-2021		2021-2022	
	Sanctioned	In Position	Sanctioned	In Position	Sanctioned	In Position	Sanctioned	In Position
Andhra Pradesh	551	406	590	474	597	445	774	557
Arunachal Pradesh	NA	699	41	249	256	439	NA	315
Assam	NA	774	200	692	409	733	291	789
Bihar	888	1301	1551	875	1872	1204	1485	1252
Chhatisgarh	1042	725	476	445	792	588	938	749
Goa	86	72	79	123	101	140	60	50
Gujrat	413	251	207	115	404	310	697	524

Haryana	821	1049	586	888	1251	957	1070	968
Himachal Pradesh	345	354	NA	356	742	524	283	274
J&K	1016	939	1095	803	1015	644	850	685
Jharkhand	984	671	690	416	690	416	690	456
Karnataka	2088	1562	595	677	1346	1131	2142	1992
Kerala	87	502	1300	1214	1436	1303	1419	1295
Madhya Pradesh	3540	1676	1134	1186	1586	1359	3256	1929
Maharashtra	1292	875	2081	1704	3309	2809	1454	1168
Manipur	271	230	205	246	287	201	284	232
Meghalaya	266	309	114	310	373	236	245	316
Mizoram	NA	201	NA	200	0	195	0	221
Nagaland	83	176	133	133	41	192	122	251
Odisha	1243	1331	1390	1359	1923	1474	2159	1371
Punjab	917	761	904	733	977	801	1090	904
Rajasthan	1624	1210	1786	1348	1786	1613	1998	1613
Sikkim	NA	116	124	99	179	121	199	143
Tamil Nadu	1884	1522	1655	1506	752	727	841	811
Telangana	319	266	319	266	319	266	346	248
Tripura	84	172	N.APP	243	NA	214	NA	189
Uttarakhand	380	257	380	447	330	347	331	357
Uttar Pradesh	2671	1059	3486	2849	4497	3261	5709	4082
West Bengal	1835	1275	1910	804	1307	968	1305	1091
A&N Islands	76	50	28	26	26	26	28	26
Chandigarh	NA	1102	NA	214	200	195	260	160

D&N Haveli	191	88	125	121	58	57	60	50
Daman & Diu	72	47	125	121	58	57	60	50
Delhi	3121	2254	1974	1434	3517	2750	4475	4465
Lakshadweep	38	37	NA	22	22	22	25	25
Puducherry	317	357	198	172	198	172	198	172
Ladakh	N.APP	N.APP	108	78	108	89	108	79
TOTAL	28545	24676	25464	22827	32706	26929	35192	29817

Source: Rural Health Surveys, Ministry of Health, and Family Welfare

B. The table makes it clear that during the COVID period and even before that the state which showed the highest disparity in terms of sanctioned and in position paramedical staff is Madhya Pradesh followed by Bihar and Uttar Pradesh while the least gap is found in Telangana followed by Kerala. Among the Union-territories, the highest gap is found in Delhi followed by Puducherry while the least gap is found Dadra & Nagra Haveli and Daman & Diu. After the COVID period, the state which has shown the highest level of improvement is Madhya Pradesh. The UT of J&K has also shown minor improvement in cutting down this disparity.

Table 7. Paramedical Staff at District Hospitals across Indian States (2018-22)

STATE/UT	2018-19		2019-2020		2020-2021		2021-2022	
	Sanctioned	In Position	Sanctioned	In Position	Sanctioned	In Position	Sanctioned	In Position
Andhra Pradesh	1671	1348	1904	1557	2209	1839	2306	1793
Arunachal Pradesh	NA	913	156	862	744	1094	NA	972
Assam	NA	2818	875	3335	1707	2845	829	2706
Bihar	NA	1916	4856	2305	8208	3020	3749	2751
Chhattisgarh	2488	2200	1594	1619	2140	1788	5336	2097
Goa	216	209	182	605	177	487	97	55
Gujrat	1592	1281	135	106	1626	1316	2253	1943
Haryana	2567	3004	2684	2814	4089	2677	4066	2871
Himachal Pradesh	686	577	1072	938	1460	1252	756	720
J&K	1670	1544	2227	1904	3408	2578	2896	2251
Jharkhand	1132	1122	1748	1171	1748	1043	1748	1043
Karnataka	6762	5252	2539	2311	2966	2532	5916	4884
Kerala	218	1102	4931	4862	5518	5335	5336	5563
Madhya Pradesh	14404	8611	14404	7937	14404	8892	12206	10324
Maharashtra	4721	4036	8916	7706	6196	5361	5904	4921
.Manipur	717	273	504	511	804	380	723	745
Meghalaya	630	1405	336	1315	643	1323	628	1507

Mizoram	NA	850	NA	880	0	652	0	955
Nagaland	475	452	148	927	39	218	381	1000
Odisha	2354	3350	2861	4669	5198	4122	5397	3924
Punjab	2299	2085	3023	2412	2777	2278	3000	2420
Rajasthan	5406	4153	5032	4111	6590	5163	6758	5696
Sikkim	NA	469	95	110	707	395	649	422
Tamil Nadu	5716	5141	5252	3830	2923	2395	2999	2497
Telangana	702	615	698	615	869	708	873	638
Tripura	276	435	N.APP	228	NA	234	NA	541
Uttarakhand	753	592	783	804	731	773	823	853
Uttar Pradesh	7104	5704	10938	9051	14574	11452	15981	12515
West Bengal	8701	6294	1004	865	7856	6131	7024	5664
A&N Islands	66	62	391	59	391	312	391	312
Chandigarh	NA	2267	388	580	314	478	302	491
D&N Haveli	279	320	524	474	150	149	108	108
Daman & Diu	185	118	524	474	150	149	108	108
Delhi	16002	13093	9781	8122	11491	10063	10688	9148
Lakshadweep	38	37	NA	92	85	76	50	50
Puducherry	1769	1546	965	825	965	825	965	825
Ladakh	NA	NA	483	408	265	249	256	239
TOTAL	90969	85194	91429	80920	113972	90435	111394	95444

Source: Rural Health Surveys, Ministry of Health and Family Welfare

C. In terms of disparity in sanctioned and in position employment of Nursing staff, highest disparity during pre-COVID period is found in the state of Bihar followed by U.P while least disparity is found in Chhattisgarh. Among the UTs, the highest gap in sanctioned and in position nursing staff is found in Ladakh and the least gap is found in the UTs of Delhi, Lakshadweep, Dadra & Nagra Haveli and Daman & Diu. The UT of J&K has shown a minor improvement after the COVID period.

Table 8. Nursing Staff at Primary Health Centers in Rural areas across Indian States (2018-22)

STATE/UT	2018-19		2019-2020		2020-2021		2021-2022	
	Sanctioned	In position	Sanctioned	In Position	Sanctioned	In Position	Sanctioned	In position
Andhra Pradesh	2132	1920	2349	2119	3103	2695	3326	2870
Arunachal Pradesh	NA	166	NA	201	190	218	NA	239
Assam	NA	2177	835	1751	1977	1645	1923	1652
Bihar	NA	1296	2381	884	7336	2126	3303	2454
Chhattisgarh	1535	1075	1312	1152	1709	1683	1976	1545
Goa	72	73	87	113	106	114	144	85
Gujrat	2554	1708	1152	766	1799	1454	1914	1512
Haryana	1221	1076	1205	912	1389	993	1368	962
Himachal Pradesh	514	220	205	50	283	122	230	118
J&K	845	648	788	622	752	605	703	568
Jharkhand	409	61	203	162	291	229	291	207
Karnataka	1569	2464	2754	3137	2939	2623	3492	3226
Kerala	1097	1259	1195	1145	1429	1366	1530	1489
Madhya Pradesh	1705	614	1199	1137	1234	1331	1266	1812
Maharashtra	833	682	1384	898	1962	1319	1933	1310
Manipur	255	208	168	221	256	223	246	210
Meghalaya	NA	373	166	372	392	384	388	392
Mizoram	NA	154	NA	202	0	179	0	176
Nagaland	NA	190	210	210	153	193	153	200
Odisha	292	475	367	475	1213	280	2149	546

Punjab	1111	883	985	583	1103	604	1098	572
Rajasthan	4805	3703	4165	3197	4779	4053	4851	4097
Sikkim	NA	52	72	79	96	100	108	112
Tamil Nadu	4045	3801	4713	4073	5057	4484	5118	4527
Telangana	1350	1186	1350	1186	1350	1186	1730	1326
Tripura	NA	487	N.APP	537	NA	517	NA	514
Uttarakhand	79	61	79	42	290	143	366	140
Uttar Pradesh	557	1087	2805	1613	3674	1494	3674	1247
West Bengal	2258	1686	2157	1838	2798	1742	1757	1685
A&N Islands	103	103	66	95	96	95	96	95
Chandigarh	0	0	N.APP	N.APP	N.APP	N.APP	N.APP	N.APP
D&N Haveli	34	34	31	31	62	62	49	49
Daman & Diu	18	11	31	31	62	62	49	49
Delhi	0	0	6	6	6	6	6	6
Lakshadweep	11	11	16	16	16	16	11	11
Puducherry	72	127	99	114	99	114	9	114
Ladakh	N.APP	N.APP	17	21	56	42	12	11
TOTAL	29476	30071	34521	29973	47995	34420	45310	36079

Source: Rural Health Surveys, Ministry of Health, and Family Welfare

VI FINDINGS AND CONCLUSION

There is huge disparity in the distribution of health infrastructure and health care services in Indian states as evident from the discussion on their status pre- and post-covid period. This disparity was seen during the Pandemic when the states having poor health infrastructure suffered the most. In terms of the number of rural health care services and district hospitals, U.P tops all the states, while states like Haryana, Jharkhand and Sikkim need attention

of the government for improvements. Some states like Uttarakhand have good level of improvement after the covid period. Another aspect of this infrastructure facilities is PHCs which work on 24x7 basis, in this regard the state of Himachal Pradesh needs improvement due to its poor performance. The state of Rajasthan has shown high level of improvements post covid period. Having motor-approachable road also enhances the connectivity and health services of this infrastructure. States like Sikkim, Goa, Telangana, Tripura have good road infrastructure while this road infrastructure sector needs immediate focus of the government in states like Uttarakhand which is the poorest performing state in this regard. After the Covid period, some states like West Bengal have shown improvements in this regard by improving their services. The UT of J&K has not shown any major improvements in any of these indicators. Although performing average in the regard of having labor room facilities in PHCs, J&K has shown increasing trends of improvement after the COVID period. Health care services too show levels of disparity among states. Although there has been a minor decrease in the gap of sanctioned and in position doctors, while states like Madhya Pradesh and Odisha still need the focus of government due to high prevailing gap. Likewise in case of services like gaps in sanctioned and in position status of Paramedical staff and Nursing staff, states like Madhya Pradesh, Bihar etc. need improvements. The UT of J&K has shown minor improvements. Thus, major improvements are needed in health sector, to overcome these disparities, so that we may achieve our aim of '**India 2.0: Vision for India in 2047**'.

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