

COVID-19 in India : State-wise estimates of current hospital beds, intensive care unit (ICU) beds and ventilators

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*Our COVID-19 modeling estimates for India were produced by a team of researchers affiliated with CDDEP and Princeton University. This work does not reflect the views of CDDEP or Princeton University

Summary

- India has a pluralistic healthcare system with both public and private health sector playing important roles
- This study estimates the existing hospital capacity of India's public and private health sector in terms of number of hospital beds, Intensive Care Unit (ICU) beds, and ventilators, across States and Union Territories (UTs)
 - Estimates suggest approximately 19 lac hospital beds, 95 thousand ICU beds and 48,000 ventilators are available in India
 - Most of the beds and ventilators in India, are concentrated in seven States - Uttar Pradesh (14.8%), Karnataka (13.8%), Maharashtra (12.2%), Tamil Nadu (8.1%), West Bengal (5.9%), Telangana (5.2%) and Kerala (5.2%).
- Existing bed capacity is mostly saturated at government hospitals
- Accommodation of influx of COVID 19 patients, will require rapid expansion of current capacity or modifications in admission policy for routine patient care

Methodology and Assumptions

1. [National Sample Survey \(NSS\) 75th Round Report, 2019](#) provides a percentage break-up of hospitalization rates across government/public, charitable/trust/NGO-run, & private sector, for India and States/UTs.
2. [National Health Profile, 2019](#) (NHP) lists:
 - Number of government hospitals in India and States/UTs.
 - Number of government hospital beds in India and States/UTs.

Based on information 1 & 2, we have made the following assumptions :

- Number of private hospitals in each State/UT can be estimated based on specific percentage break-up of hospitals (as provided in NSS) and number of government hospitals (as provided in NHP) in that State/UT
 - Number of private hospital beds in each State/UT can also be estimated by using the same percentage break-up as used to calculate the number of private hospitals, since the number of government hospital beds were available for each State/UT
 - Number of private hospitals at India level is equal to sum total of private hospitals across all States/UTs
 - Number of private hospital beds at India level is equal to sum total of private hospital beds across all States/UTs
3. Critical care beds constitute 5-8% of total bed strength in large public teaching hospitals. Reference: [Yeolekar, M. E., and S. Mehta. ICU care in India-status and challenges. Journal of Association of Physicians of India 56, no. R \(2008\): 221](#)
 4. 50% of ICU beds may have ventilators. Reference: [Singh, P., Ravi, S., & Chakraborty, S. \(2020, March 27\). COVID-19: Is India's health infrastructure equipped to handle an epidemic](#)

Based on information 3 & 4, we have made the following assumptions:

- ICU bed strength is at 5% of hospital bed strength
- 50% of ICU beds across both public and private sector, are equipped with ventilators.

Hospitals in States/UTs

India Total	Number of hospitals in public sector	Number of hospitals in private sector	Total number of hospitals (public+private)
	25,778	43,487	69,265

	States/UTs	Number of hospitals in public sector	Number of hospitals in private sector	Total number of hospitals (public+private)
1	Lakshadweep	9	4	13
2	Chandigarh	9	4	13
3	Dadra & N Haveli	12	6	18
4	Puducherry	14	6	20
5	Daman & Diu	5	21	26
6	Andaman Nicobar Islands	30	6	36
7	Manipur	30	8	38
8	Sikkim	33	8	41
9	Nagaland	36	13	49
10	Goa	43	22	65
11	Mizoram	90	23	113
12	Jammu & Kashmir	143	14	157
13	Tripura	156	8	164
14	Delhi	109	67	176
15	Meghalaya	157	28	185
16	Arunachal Pradesh	218	20	238
17	Chhattisgarh	214	182	396
18	Andhra Pradesh	258	670	928

	States/UTs	Number of hospitals in public sector	Number of hospitals in private sector	Total number of hospitals (public+private)
19	Madhya Pradesh	465	506	971
20	Himachal Pradesh	801	235	1,036
21	Uttarakhand	460	829	1,289
22	Jharkhand	555	809	1,364
23	Gujarat	438	970	1,408
24	Assam	1,226	503	1,729
25	Haryana	668	1,480	2,148
26	West Bengal	1,566	697	2,263
27	Punjab	682	1,638	2,320
28	Tamil Nadu	1,217	1,222	2,439
29	Odisha	1,806	695	2,501
30	Bihar	1,147	1,887	3,034
31	Maharashtra	711	2,492	3,203
32	Kerala	1,280	2,062	3,342
33	Telangana	863	3,247	4,110
34	Rajasthan	2,850	2,794	5,644
35	Karnataka	2,842	7,842	10,684
36	Uttar Pradesh	4,635	12,468	17,103
37	Ladakh	NA	NA	NA

Hospital Beds in States/UTs

India Total	Number of hospital beds in public sector	Number of hospital beds in private sector	Total number of hospital beds (public+private)
	7,13,986	1,185,242	18,99,228

	States/UTs	Number of hospital beds in public sector	Number of hospital beds in private sector	Total number of hospital beds (public+private)
1	Lakshadweep	300	126	426
2	Dadra & Nagar Haveli	619	322	941
3	Daman And Diu	240	1,010	1,250
4	Andaman Nicobar Islands	1,075	219	1,294
5	Manipur	1,427	363	1,790
6	Sikkim	1,560	392	1,952
7	Mizoram	1,997	499	2,496
8	Nagaland	1,880	681	2,561
9	Arunachal Pradesh	2,404	220	2,624
10	Goa	3,012	1,572	4,584
11	Tripura	4,429	238	4,667
12	Puducherry	3,569	1,603	5,172
13	Meghalaya	4,457	787	5,244
14	Chandigarh	3,756	1,875	5,631
15	Jammu And Kashmir	7,291	704	7,995
16	Himachal Pradesh	12,399	3,641	16,040
17	Chhattisgarh	9,412	8,018	17,430
18	Uttarakhand	8,512	15,331	23,843

	States/UTs	Number of hospital beds in public sector	Number of hospital beds in private sector	Total number of hospital beds (public+private)
19	Assam	17,142	7,036	24,178
20	Odisha	18,519	7,131	25,650
21	Jharkhand	10,784	15,712	26,496
22	Bihar	11,664	19,193	30,857
23	Haryana	11,240	24,901	36,141
24	Delhi	24,383	15,072	39,455
25	Punjab	17,933	43,064	60,997
26	Gujarat	20,172	44,690	64,862
27	Madhya Pradesh	31,106	33,833	64,939
28	Andhra Pradesh	23,138	60,092	83,230
29	Rajasthan	47,054	46,122	93,176
30	Kerala	38,004	61,223	99,227
31	Telangana	20,983	78,936	99,919
32	West Bengal	78,566	34,969	1,13,535
33	Tamil Nadu	77,532	77,843	1,55,375
34	Maharashtra	51,446	1,80,293	2,31,739
35	Karnataka	69,721	1,92,388	2,62,109
36	Uttar Pradesh	76,260	2,05,142	2,81,402
37	Ladakh	NA	NA	NA

ICU Beds in States/UTs

	States/UTs	Number of ICU beds in public sector	Number of ICU beds in private sector	Total number of ICU beds (public + private)
1	Lakshadweep	15	6	21
2	Dadra & Nagar Haveli	31	16	47
3	Daman And Diu	12	51	63
4	Andaman Nicobar Islands	54	11	65
5	Manipur	71	18	90
6	Sikkim	78	20	98
7	Mizoram	100	25	125
8	Nagaland	94	34	128
9	Arunachal Pradesh	120	11	131
10	Goa	151	79	229
11	Tripura	221	12	233
12	Puducherry	178	80	259
13	Meghalaya	223	39	262
14	Chandigarh	188	94	282
15	Jammu And Kashmir	365	35	400
16	Himachal Pradesh	620	182	802
17	Chhattisgarh	471	401	871
18	Uttarakhand	426	767	1,192

India Total	Number of ICU beds in public sector	Number of ICU beds in private sector	Total number of ICU beds (public + private)
	35,699	59,262	94,961

	States/UTs	Number of ICU beds in public sector	Number of ICU beds in private sector	Total number of ICU beds (public + private)
19	Assam	857	352	1,209
20	Odisha	926	357	1,282
21	Jharkhand	539	786	1,325
22	Bihar	583	960	1,543
23	Haryana	562	1,245	1,807
24	Delhi	1,219	754	1,973
25	Punjab	897	2,153	3,050
26	Gujarat	1,009	2,234	3,243
27	Madhya Pradesh	1,555	1,692	3,247
28	Andhra Pradesh	1,157	3,005	4,162
29	Rajasthan	2,353	2,306	4,659
30	Kerala	1,900	3,061	4,961
31	Telangana	1,049	3,947	4,996
32	West Bengal	3,928	1,748	5,677
33	Tamil Nadu	3,877	3,892	7,769
34	Maharashtra	2,572	9,015	11,587
35	Karnataka	3,486	9,619	13,105
36	Uttar Pradesh	3,813	10,257	14,070
37	Ladakh	NA	NA	NA

Ventilators in States/UTs

	States/UTs	Number of ventilators in public sector	Number of ventilators in private sector	Total number of ventilators (public + private)
1	Lakshadweep	8	3	11
2	Dadra & Nagar Haveli	15	8	24
3	Daman And Diu	6	25	31
4	Andaman Nicobar Islands	27	5	32
5	Manipur	36	9	45
6	Sikkim	39	10	49
7	Mizoram	50	12	62
8	Nagaland	47	17	64
9	Arunachal Pradesh	60	6	66
10	Goa	75	39	115
11	Tripura	111	6	117
12	Puducherry	89	40	129
13	Meghalaya	111	20	131
14	Chandigarh	94	47	141
15	Jammu And Kashmir	182	18	200
16	Himachal Pradesh	310	91	401
17	Chhattisgarh	235	200	436
18	Uttarakhand	213	383	596

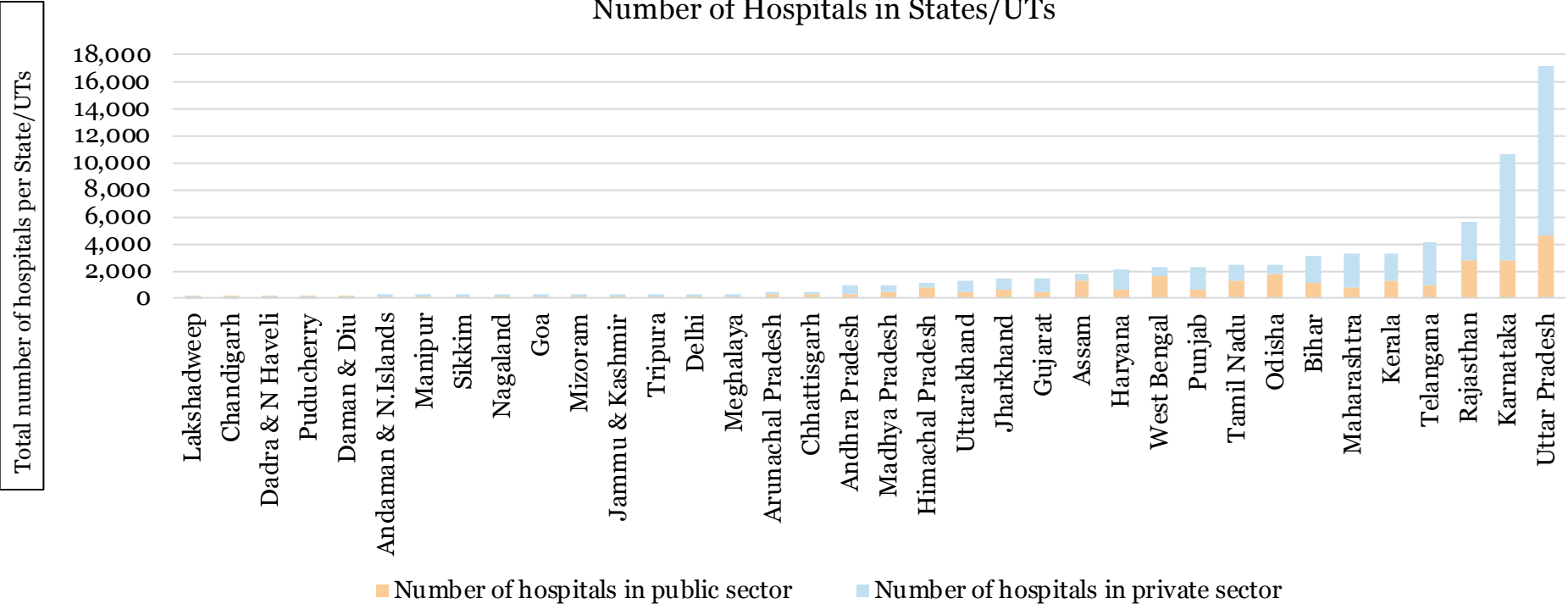
India Total	Number of ventilators in public sector	Number of ventilators in private sector	Total number of ventilators (public + private)
	17,850	29,631	47,481

	States/UTs	Number of ventilators in public sector	Number of ventilators in private sector	Total number of ventilators (public + private)
19	Assam	429	176	604
20	Odisha	463	178	641
21	Jharkhand	270	393	662
22	Bihar	292	480	771
23	Haryana	281	623	904
24	Delhi	610	377	986
25	Punjab	448	1,077	1,525
26	Gujarat	504	1,117	1,622
27	Madhya Pradesh	778	846	1,623
28	Andhra Pradesh	578	1,502	2,081
29	Rajasthan	1,176	1,153	2,329
30	Kerala	950	1,531	2,481
31	Telangana	525	1,973	2,498
32	West Bengal	1,964	874	2,838
33	Tamil Nadu	1,938	1,946	3,884
34	Maharashtra	1,286	4,507	5,793
35	Karnataka	1,743	4,810	6,553
36	Uttar Pradesh	1,907	5,129	7,035
37	Ladakh	NA	NA	NA

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Number of Hospitals in States/UTs

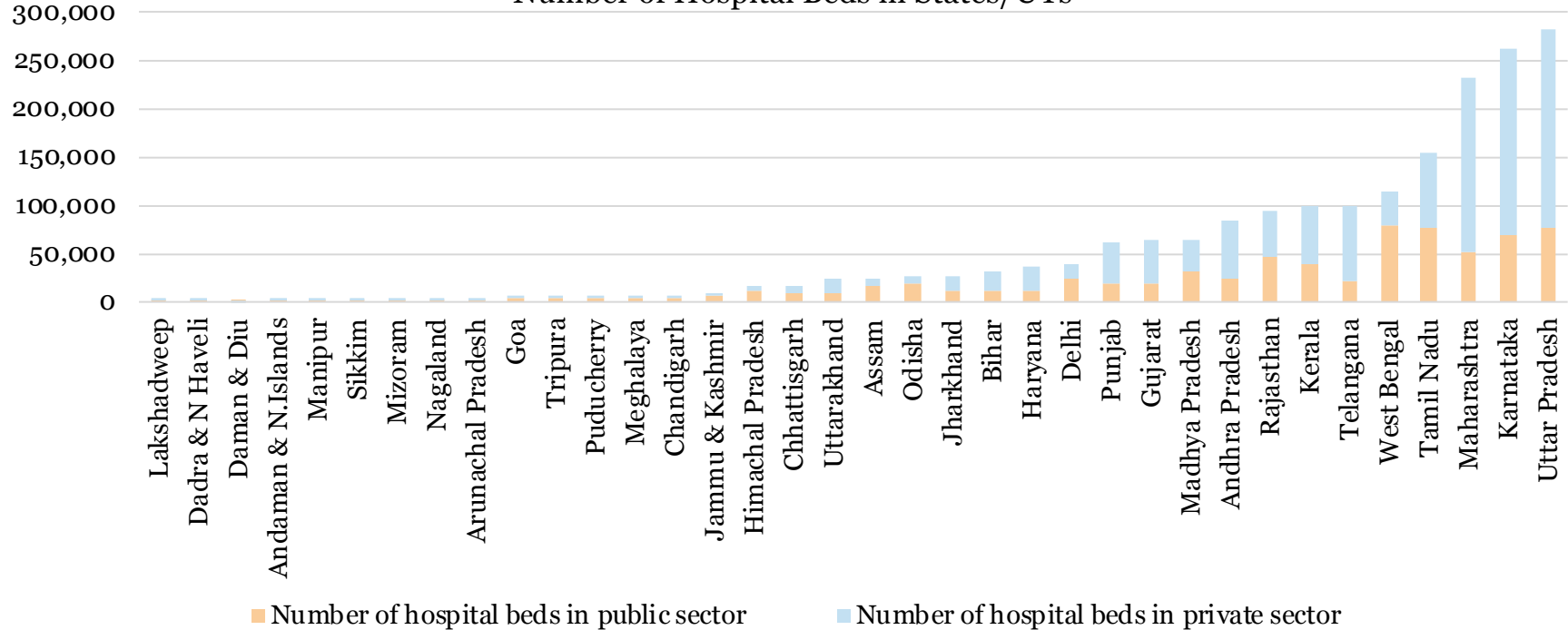


Hospital Beds in States/UTs

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Number of Hospital Beds in States/UTs

Total number of hospital beds per State/UTs



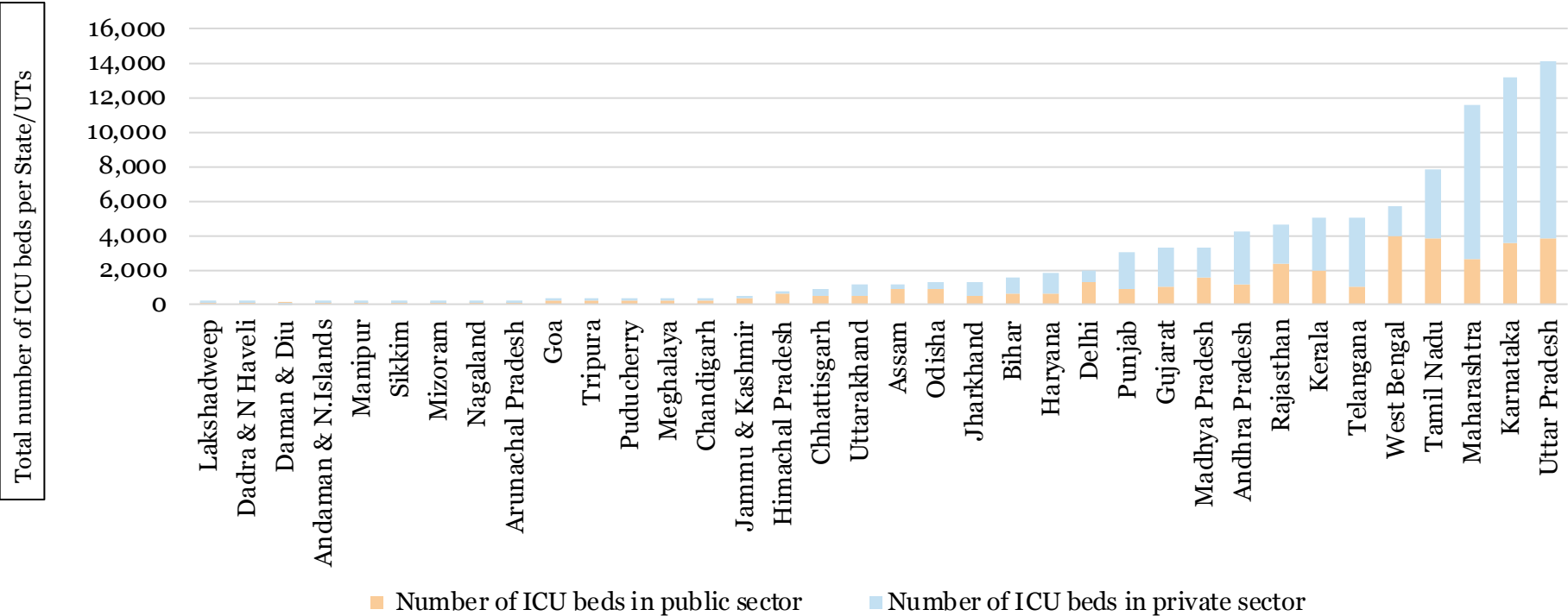
Number of hospital beds in private sector are estimated values

States/UTs have been arranged in increasing order of total number of hospital beds
Height of column represents total number of hospital beds in that State

ICU Beds in States/UTs

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Number of ICU Beds in States/UTs

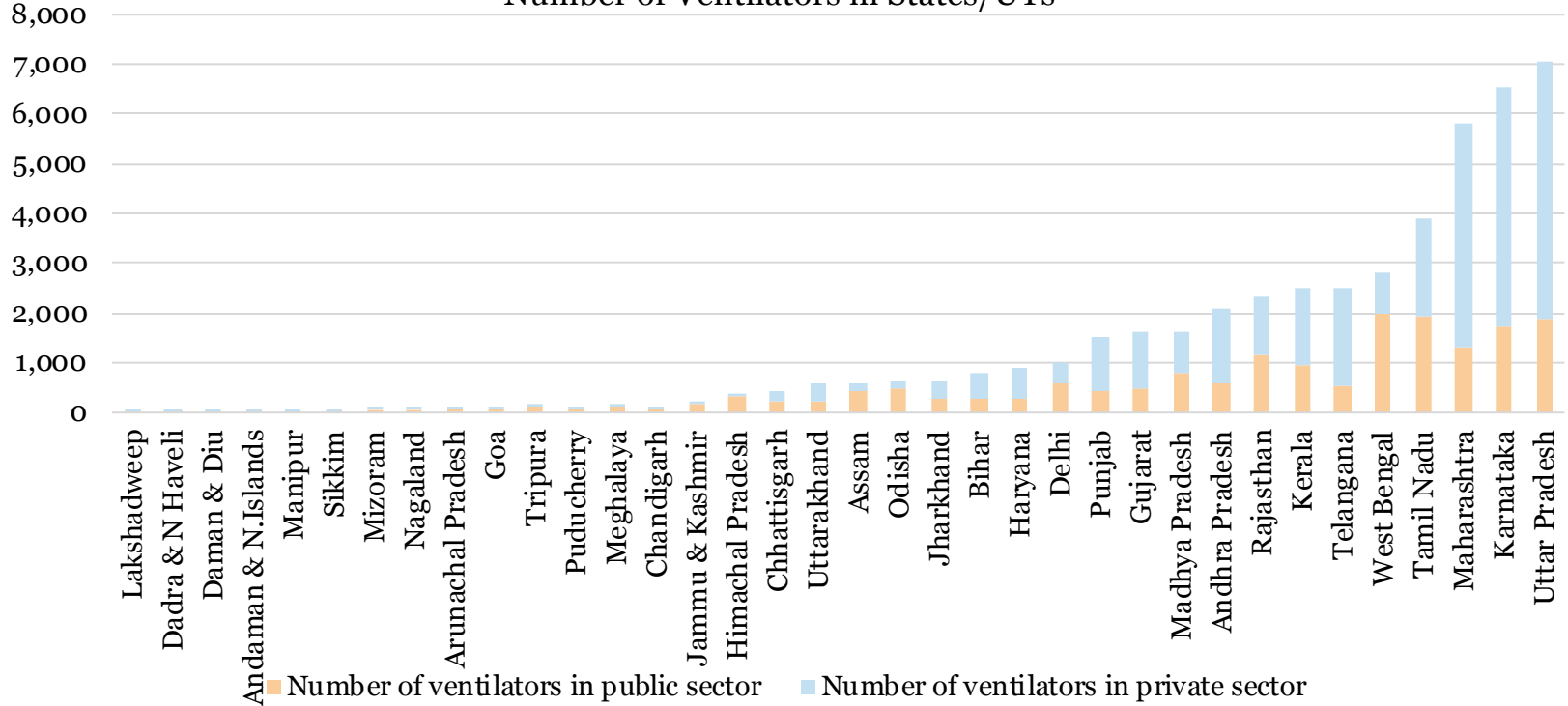


Ventilators in States/UTs

India Total	Number of ventilators in public sector	Number of ventilators in private sector	Total number of ventilators (public + private)
	17,850	29,631	47,481

Number of Ventilators in States/UTs

Total number of ventilators per State/UTs



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Thank you!