

COVID 19: Proposed Testing Strategy 2.0

30 October 2020

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Project: Jeevan Raksha is a initiative of Proxima which focuses on Advocacy, Analytics, and Awareness in the area of healthcare

Mission: Actively contribute towards **Right to Health** as constitutional right of Indian citizen

Project: Jeevan Raksha has been in the forefront of providing sharper analytical insights on emerging pattern of COVID 19 in India to the Central / State Government administrations and general public. The contribution is appreciated by many state Governments.

Project: Jeevan Raksha acknowledges the technical support and guidance of Public Health Foundation of India (**PHFI**)

COVID Status Snapshot: Most affected nations in the world

On 29th October, World witnessed highest single day surge of 5.48 lacs! Number of deaths was 7163 highest since July!!

Comparative Analysis: Nations having highest number of COVID Cases in the world									
Nations	Cases	Active	Recovery	Deaths	Testing	TPM	DPM	PPM	PPR
USA	8962783	2897914	5833824	231045.0	134476092	405549	697	25511	2.7
India	7946429	625824	7201070	119535.0	104420894	75444	86	5489	0.6
Brazil	5411550	388169	4865930	157451.0	21900000	102809	739	24651	2.5
Russia	1531224	358859	1146096	26269.0	57821260	396162	180	9809	1
Peru	890574	45382	810995	34197.0	4407293	133114	1033	26303	2.7
Colombia	1025052	70660	924044	30348.0	4789625	93830	595	18922	2
South Africa	716759	51030	646721	19008.0	4709403	79106	319	11846	1.2
Mexico	895326	151037	655118	89171.0	2301629	17795	689	6610	0.7
Argentina	1102301	163414	909586	29301.0	2850102	62887	647	22124	2.4
						TPM	Testiing Per Million Population		
						PPM	Positive Cases Per Million Population		
						PPR	Positivity Population Rate (%) (Percentage of Positive cases to total population)		
						DPM	Death Per Million Population		

Data as on 26th Oct

Fortunately, India's COVID cases and mortality has receded over the last few weeks. Sustaining the trend is critical

India can declare victory over COVID 19 only if Test Positivity Rate (TPR) becomes

0%

There is a need to revisit the COVID 19 Testing Strategy to reduce the chances of occurrence of 2nd / 3rdWave

Problem Statement

- Nearly 1/5th of the COVID tests conducted in India are re-tests.
- Nearly 50% of the COVID tests are carried out using Rapid Antigen Test (RAT) which has false negative reporting upto 40%

Currently, the calculation of Test Positivity Rate (TPR) does not factor the above most critical drawbacks. Therefore, there is a need to bring in necessary interventions which would enable the local administration to measure the TPR realistically.

WHO Goal

On May 12, 2020 the World Health Organization (WHO) advised governments that before reopening, rates of positivity in testing (TPR) (ie, out of all tests conducted, how many came back positive for COVID-19) of should remain at 5% or lower for at least 14 days.

TPR: India: 7.15%

Mega States: Maharashtra 19.17%; Andhra Pradesh 10.72%; Tamil Nadu 7.49%; Karnataka 10.97%; West Bengal 8.12%; Gujarat 2.92%; Kerala 9.02%; Haryana 6.27%; Punjab 6.27%; Jammu Kashmir 4.24%; Himachal Pradesh 5.53%;

Test Positivity Rate (TPR)

The Test Positivity Rate (i.e, out of all tests conducted, how many came back positive for COVID-19) is the most reliable way to determine if a government is testing enough.

- High TPR Implications: If a positivity rate is too high, that may indicate that the state is only testing the sickest patients who seek medical attention, and is not casting a wide enough net to know how much of the virus is spreading within its communities.
- Low TPR implications: A low rate of positivity in testing data can be seen as a sign that a state has sufficient testing capacity for the size of their outbreak and is testing enough of its population to make informed decisions about reopening.
- In order for governments to identify new cases and effectively respond to the pandemic through tracing and treatment, testing programs should be scaled to the size of the epidemic in the state, not the size of the population.
- Since confirmed case numbers may be dependent on how much testing a state is doing, it is also important to see how many tests have occurred in each state. If people who are infected cannot get tested, they will not be counted as a confirmed case in the state's data.

Introduction of Effective Test Positivity Rate (ETPR)

- One of the most important metrics for tracking the spread of COVID-19 is the “Test Positivity Rate” — or how prevalent positive cases of the disease are, when compared to the number of tests being done
- A high positivity rate is indicative of higher infection in the community and points to the need for ramping up testing. According to WHO, whenever positivity rate crosses 5%, it is an indication that testing is not keeping pace with rise in cases.
- A low positivity rate is a good sign. Because not everyone who has COVID-19 gets tested, rising case numbers could mean that the disease is spreading, or that testing efforts are identifying a larger share of the sick people in the country / state.

There are two ways to calculate Test Positivity Rate:

Method 1: Divide the number of people who have tested positive by the number of people who have been tested

Method 2: Divide the number of people who have tested positive by the number of total tests

These two methods won't produce the exact same numbers, depending on how many people get tested multiple times and how many people rack up multiple positive tests.

Effective Test Positivity Rate Model

Illustration: Impact of Re-tests on Test Positivity Rate (TPR)%			
Particulars		Rapid Antigen Test (RAT)	RT PCR
Number of People Tested	100000	50000	50000
Number of Positive Patients(8% TPR)	8000		
Re-test: Category-1*: False Negative Report (40%) of RAT			20000
Re-tests: Category-2*: Discharge		2000	2000
		* % is re-tests due to false Negative report as well as discharge could vary from state to state.	
Total Number of People Tested (A)	100000		
Total Number of Tests Conducted (B)	124000		
Effective Test Positivity Rate (%) when denominator is A	8		
Gross Test Positivity Rate (%) when denominator is B	6.5		

Current Test Positivity Rate Calculation gives delusory impression of receding of virus spread

Effective Test Positivity Rate (ETPR)	
Total Positive Cases as on 29 Oct (A)	8089593
Total Number of Tests as on 29 Oct (B)	115198729
Gross Test Positivity Rate (GTPR) % C = $(A/B)*100$	7
Re-tests D = (20% of B)	23039746
Net Tests Conducted E = (B - D)	92158983
Effective Test Positivity Rate (ETPR) % F = $(A/E)*100$	8.8

Effective Test Positivity Rate (ETPR) will be a more realistic measurement of spread of virus in the region

Refer Annexure: For Zonewise / Statewise Effective Test Positivity Rate and Effective Test / Mn Population

Rapid Antigen Test (RAT) False Negative ranges from 37 – 40%

Corona Covid19 India

Sr.No	Districts	Total Antigen Tests	Total Positive by Antigen	Follow-up by RT-PCR	Positive by RT-PCR
1	BAGALKOTE	1403	203	1	0
10	CHITRADURGA	1809	148	7	1
11	DAKSHINA KANNADA	1142	151	40	17
12	DAVANGERE	644	111	6	3
13	DHARWAD	1014	248	7	6
14	GADAG	328	65	1	1
15	HASSAN	2078	285	5	2
16	HAVERI	542	66	5	4
17	KALABURAGI	1320	189	0	0
18	KODAGU	168	4	6	1
19	KOLAR	1050	101	2	0
2	BALLARI	4662	626	186	96
20	KOPPAL	850	45	9	0
21	MANDYA	1874	179	1	1
22	MYSURU	1853	524	3	0
23	RAICHUR	699	88	3	1
24	RAMANAGARA	575	93	0	0
25	SHIVAMOGGA	480	70	15	0
26	TUMAKURU	1812	135	5	2
27	UDUPI	648	192	48	18
28	UTTARA KANNADA	1371	90	9	5
29	VIJAYAPURA	1352	179	7	1
3	BELAGAVI	1258	152	4	4
30	YADGIR	844	77	2	0
4	BENGALURU RURAL	487	65	9	3
5	BENGALURU URBAN	23640	5186	431	138
6	BIDAR	1096	67	0	0
7	CHAMARAJANAGARA	1695	81	0	0
8	CHIKKABALLAPURA	2793	184	5	5
9	CHIKKAMAGALURU	2701	209	5	3
Grand Total	=	62188	9813	822	312

The results of 822 symptomatic patients who were tested by using Rapid Antigen Test was negative. However, when these patients went through the follow-up tests by RT-PCR, results for 312 patients was POSITIVE (38%).

PS: The above table is publicly circulated, unconfirmed source.

False Negative-Reported COVID patient: The super spreader?

Suggestion 1

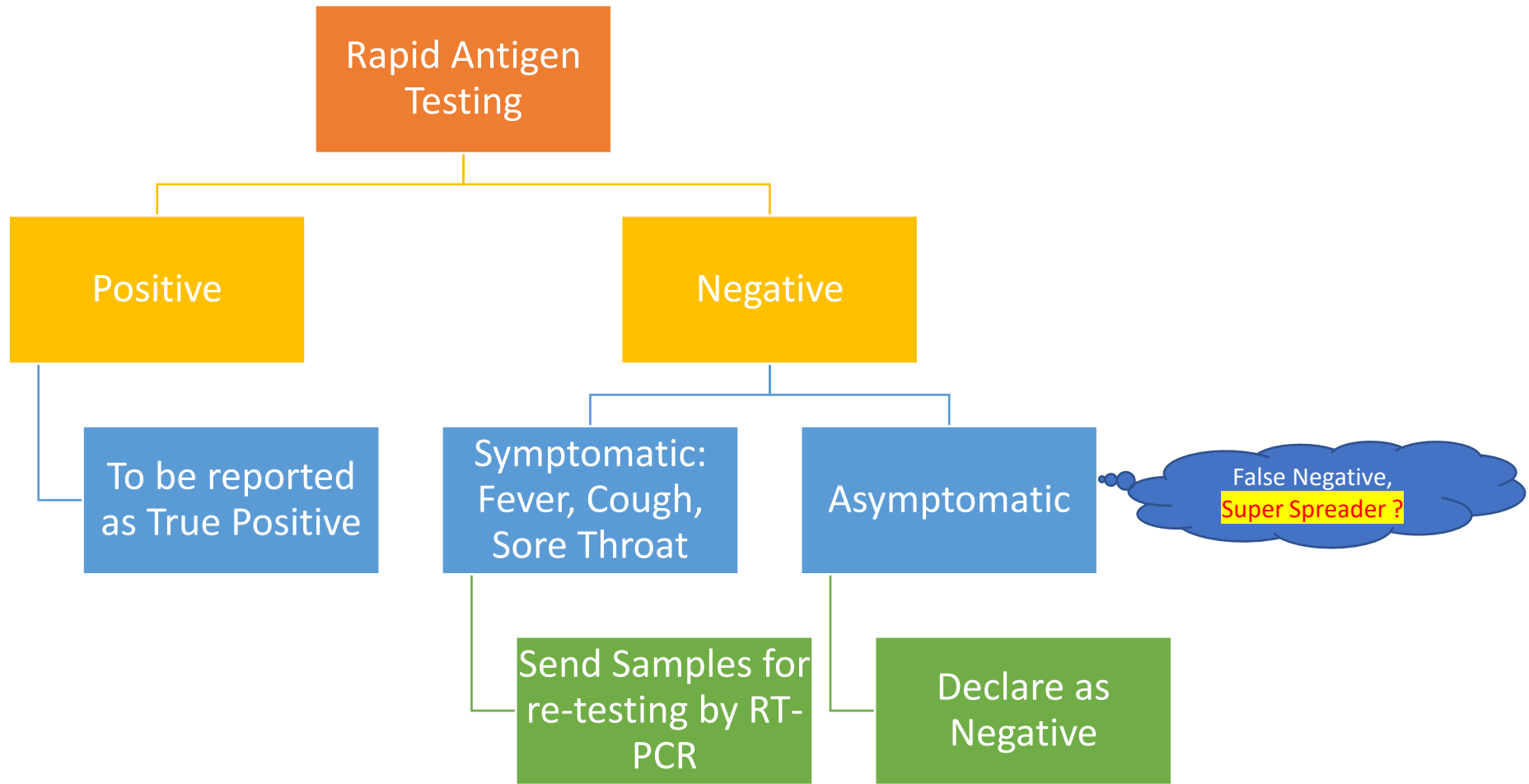
Option 1: 100% RT-PCR Testing for COVID

Option 2: In addition to the current algorithm for Negative tested COVID suspects, it is recommended to test representative sample of atleast 20% of Asymptomatic negative reported COVID suspects in each district in RT-PCR. In the scenario of over 25% results turning out to be false negative, then scrap the use of Rapid Antigen Test.

Suggestion 2

All Re-Tests carried out will be counted separately under the heading: RE-TEST

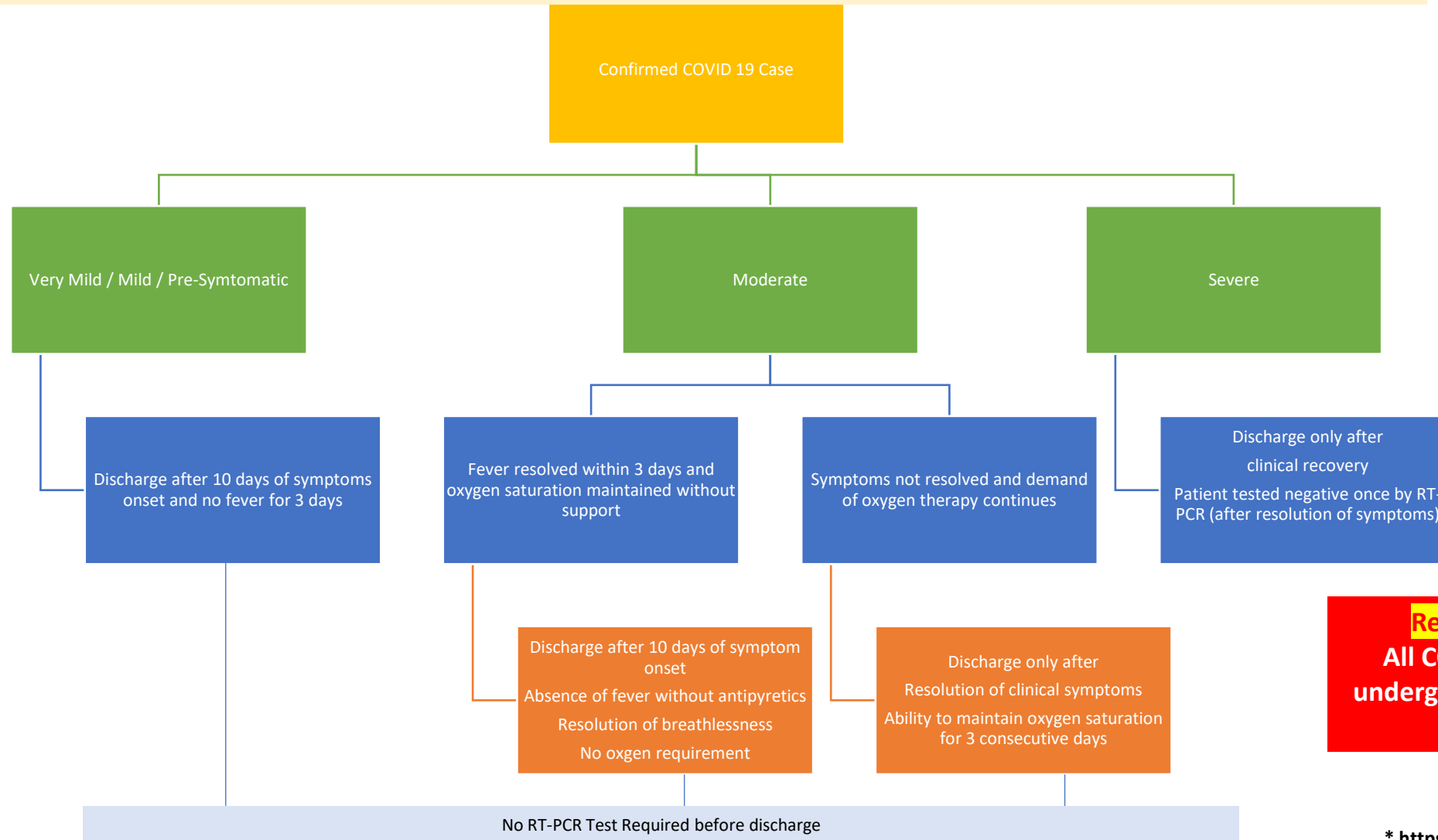
Algorithm for COVID-19 Testing using Rapid Antigen Point-of-care Test *



* <https://www.mohfw.gov.in/>

Declaring a COVID patient as fully recovered only after RT-PCR results will be safe for the patient and the community

Current Discharge Policy for COVID 19*



Recommendation
All COVID patients will undergo RT-PCR test before discharge

* <https://www.mohfw.gov.in/>

Annexure

Zonewise / Statewises Gross and Effective: Test Positivity Rate and Test / Mn
Population

Note:
Population Source: UIDAI
COVID cases as on 30th Oct 5 PM

Mega Sates: Gross and Effective: Test Positivity Rate and Test Positivity/Mn Population

Zone	State	Population	Positive Cases	Gross Testing	Gross TPR	Net Testing	Effective TPR	Gross TPM	Effective TPM
Mega State	Maharashtra	123144223	1666668	8837133	18.9	7069706	23.6	71762	57410
Mega State	Karnataka	67562686	816809	7701031	10.6	6160825	13.3	113983	91187
Mega State	Andhra Pradesh	53903393	817679	7862459	10.4	6289967	13.0	145862	116690
Mega State	Kerala	35699443	418485	4531069	9.2	3624855	11.5	126923	101538
Mega State	West Bengal	99609303	365692	4468496	8.2	3574797	10.2	44860	35888
Mega State	Tamil Nadu	77841267	719403	9808087	7.3	7846470	9.2	126001	100801
Mega State	Haryana	28204692	163817	2611412	6.3	2089130	7.8	92588	74070
Mega State	Himachal Pradesh	7451955	21476	384964	5.6	307971	7.0	51659	41328
Mega State	Telangana	39362732	235656	4240848	5.6	3392678	6.9	107738	86190
Mega State	Punjab	30141373	132727	2561105	5.2	2048884	6.5	84970	67976
Mega State	Jammu & Kashmir	13606320	93764	2261736	4.1	1809389	5.2	166227	132981
Mega State	Gujarat	63872399	171040	5950616	2.9	4760493	3.6	93164	74531
Mega Group	Mega States	640399786	5623216	61218956	9.2	48975165	11.5	95595	76476
National	India	1371287168	8089593	115198729	7.0	92158983	8.8	84008	67206

EAG Sates: Gross and Effective: Test Positivity Rate and Test Positivity/Mn Population



Zone	State	Population	Positive Cases	Gross Testing	Gross TPR	Net Testing	Effective TPR	Gross TPM	Net TPM
EAG State	Chattisgarh	29436231	183588	1767270	10.4	1413816	13.0	60037	48030
EAG State	Odisha	46356334	288646	4463559	6.5	3570847	8.1	96288	77030
EAG State	Uttarakhand	11250858	61566	1034819	5.9	827855	7.4	91977	73582
EAG State	Madhya Pradesh	85358965	169999	2879262	5.9	2303410	7.4	33731	26985
EAG State	Rajasthan	81032689	193419	3699339	5.2	2959471	6.5	45652	36522
EAG State	Assam	35607039	205635	4606145	4.5	3684916	5.6	129361	103488
EAG State	Uttar Pradesh	237882725	477895	14569242	3.3	11655394	4.1	61245	48996
EAG State	Jharkhand	38593948	100964	3233520	3.1	2586816	3.9	83783	67026
EAG State	Bihar	124799926	214946	10630170	2.0	8504136	2.5	85178	68142
EAG Group	EAG States	690318715	1896658	46883326	4.0	37506661	5.1	67915	54332
National	India	1371287168	8089593	115198729	7.0	92158983	8.8	84008	67206

Micro Sates: Gross and Effective: Test Positivity Rate and Test Positivity/Mn Population



Zone	State	Population	Positive Cases	Gross Testing	Gross TPR	Net Testing	Effective TPR	Gross TPM	Net TPM
Micro State	Goa	1586250	43201	297075	14.5	237660	18.2	187281	149825
Micro State	Nagaland	2249695	8894	97298	9.1	77838	11.4	43249	34600
Micro State	Sikkim	690251	3893	56150	6.9	44920	8.7	81347	65078
Micro State	Tripura	4169794	30563	456957	6.7	365566	8.4	109587	87670
Micro State	Manipur	3091545	18051	347026	5.2	277621	6.5	112250	89800
Micro State	Arunachal Pradesh	1570458	14668	314749	4.7	251799	5.8	200419	160335
Micro State	Meghalaya	3366710	9305	200391	4.6	160313	5.8	59521	47617
Micro State	Mizoram	1239244	2656	109476	2.4	87581	3.0	88341	70673
Micro Group	Micro States	17963947	131231	1879122	7.0	1503298	8.7	104605	83684
National	India	1371287168	8089593	115198729	7.0	92158983	8.8	84008	67206

Union Territories: Gross and Effective: Test Positivity Rate and Test Positivity/Mn Population



Zone	State	Population	Positive Cases	Gross Testing	Gross TPR	Net Testing	Effective TPR	Gross TPM	Net TPM
Delhi	Delhi	18710922	375753	4576724	8.2	3661379	10.3	244602	195681
National	India	1371287168	8089593	115198729	7.0	92158983	8.8	84008	67206

Zone	State	Population	Positive Cases	Gross Testing	Gross TPR	Net Testing	Effective TPR	Gross TPM	Net TPM
Union Territory	Puducherry	1413542	34761	305068	11.4	244054	14.2	215818	172655
Union Territory	Chandigarh	1158473	14292	105409	13.6	84327	16.9	90990	72792
Union Territory	Andaman & Nichobar	417036	4305	85378	5.0	68302	6.3	204726	163781
Union Territory	Ladakh	289023	6139	72336	8.5	57869	10.6	250278	200222
Union Territory	Dadra & Nagar Haveli	615724	3238	72410	4.5	57928	5.6	117601	94081
UT Group	Union Territories	3893798	62735	640601	9.8	512481	12.2	164518	131615
National	India	1371287168	8089593	115198729	7.0	92158983	8.8	84008	67206

Data source and disclaimer

1. The data collated and analysed based on secondary data. The primary sources are:
<https://www.mohfw.gov.in/> <https://www.covid19india.org/> www.google.com; www.wikipedia.org;
<https://www.worldometers.info/coronavirus/#countries> / <https://coronavirus.jhu.edu/>
2. Updated testing data of 4 mega cities (Ahmedabad, Bengaluru, Chennai, Delhi, and Mumbai) are available in the public domain. Whereas, updated testing data of Kolkata and Hyderabad is not to be found by our researchers. The analysis of average testing data has limitation with respect to data of 5 mega cities. Therefore, readers of this report need to factor the same for further inferences.
3. Information related to current status of Telangana and its districts are not available in the public domain. Therefore, readers of this report need to factor the same for further inferences.
4. The user of this presentation is advised to revalidate the shared data from authorised public institutions.

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Thank you