

COVID 19: Kerala Trend Analysis

September 2020

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 Indian Medical Association (**IMA**) and Public Health Foundation of India (**PHFI**)



satyam-eva jayate, Truth alone triumphs, was adopted as the national motto of India on 26 January 1950

In COVID management, **Truthiness** in the disclosed data (data integrity) of Testing, Positivity, Recovery, and Fatality; or **truthfulness** of a individual about his/her (including family) health condition, is vital for India's efforts to save lives of the people.

A Robust, universally applicable and Scalable Management System is vital to manage Communicable Disease

The management of communicable diseases without clear medical solutions in the vicinity, requires effective data mining, analysis, and appropriate inferences of the virus spread in order to achieve the following key objectives:

- **Assessment:** Assess and examine the velocity of the virus spread and pattern of infection in the given region.
- **Measurement:** Effectively measure the outcome of the various intervention
- **Forecast:** Based on the various critical data pattern, extrapolate the trend which would facilitate the administration to ramp-up the required resources

Proxima Pandemic & Epidemic Management System



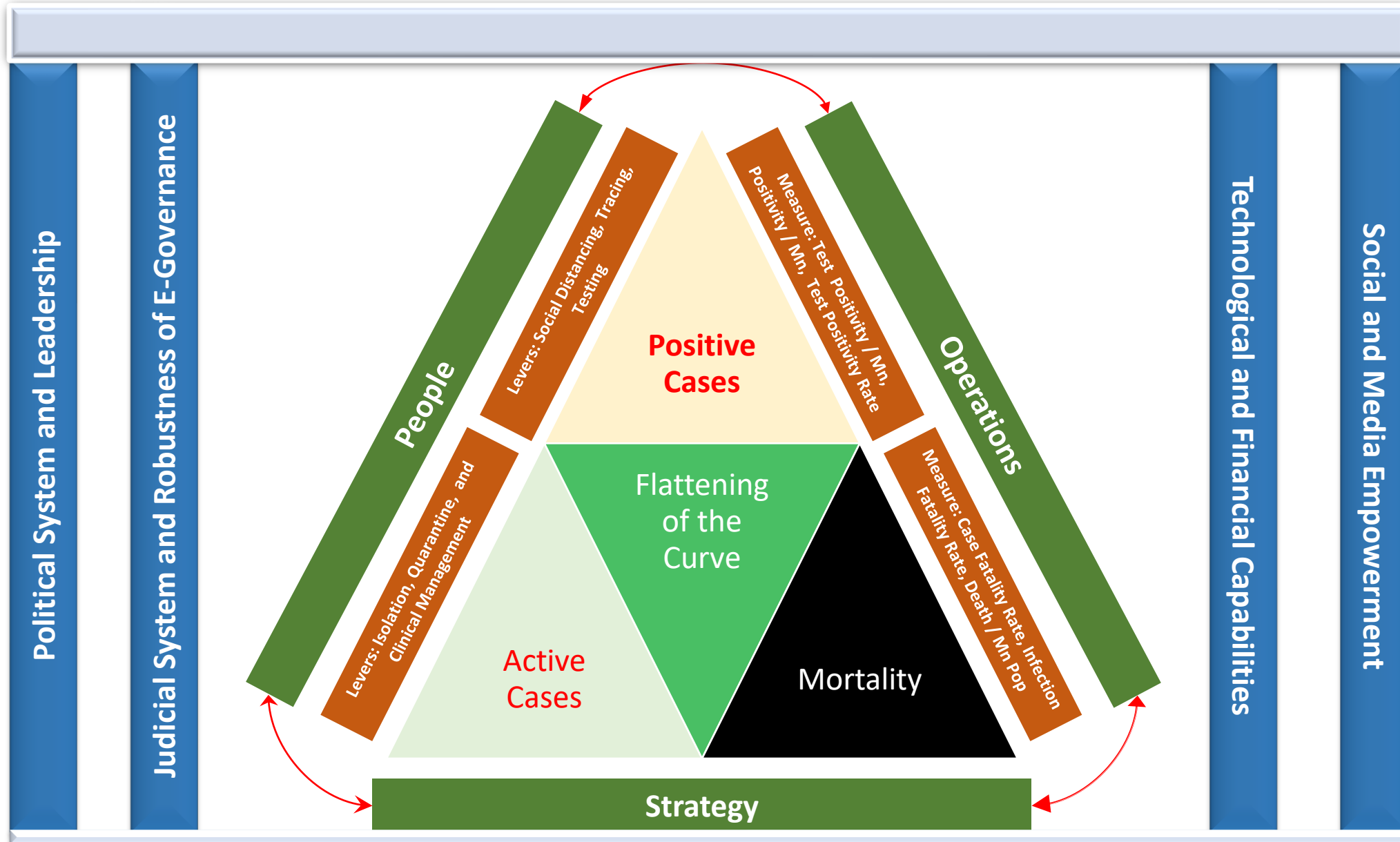
In an Pandemic / Epidemic, the virus spreads linearly and rapidly. The strategy to manage and flatten the growth of the virus depends on various systematic and unsystematic drivers.

Therefore, strategy formulation should factor the following:

- Political System and Leadership; Judicial system and robustness of e-Governance; Technological and financial capabilities; and more importantly social and media empowerment.
- There must be complete synergy between 3 critical processes – Strategy, People, and Operations. In case if any of these processes are weak, then there are chances of ending up with poor results
- The flattening of the curve of virus growth will happen only the levers are used effectively and efficiently.
- Robust review mechanism: The Control rooms must have strong process and systems which provides real-time right and appropriate data and analysis which helps the decisions makers to take appropriate and timely decisions.

Proxima Pandemic & Epidemic Management System (PPMS)

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PPRA - Percentage of Persons that Responded as Ailing (PPRA) during a 15-day period

JEEVAN RAKSHA
PROTECTING LIVES

EAG States	
Assam	2.5
Bihar	2.5
Chattisgarh	4.9
Jharkhand	6.7
Madhya Pradesh	3.9
Odisha	9.2
Rajasthan	4.9
Uttar Pradesh	7.4
Uttarakhand	3.5

Mega States	
Andhra Pradesh	14.2
Gujarat	6.7
Haryana	5.9
Himachal Pradesh	10
Jammu & Kashmir	7.1
Karnataka	4.3
Kerala	24.5
Maharashtra	8.8
Punjab	11.2
Tamil Nadu	6.1
Telangana	5.6
West Bengal	13.8

Micro States	
Arunachal Pradesh	2.9
Goa	5.9
Manipur	1.9
Meghalaya	0.4
Mizoram	3.4
Nagaland	0.8
Sikkim	3.4
Tripura	3.1

Union Territories	
Andaman & Nichobar	8.6
Chandigarh	9.4
Dadra & Nagar Haveli	6.3
Ladakh	NA
Puducherry	2.2

Number per 1000 of persons treated as in-patient during last 365 days

EAG States	
Assam	10
Bihar	12
Chattisgarh	20
Jharkhand	14
Madhya Pradesh	22
Odisha	33
Rajasthan	25
Uttar Pradesh	23
Uttarakhand	17

Mega States	
Andhra Pradesh	38
Gujarat	24
Haryana	29
Himachal Pradesh	44
Jammu & Kashmir	24
Karnataka	29
Kerala	105
Maharashtra	31
Punjab	31
Tamil Nadu	33
Telangana	23
West Bengal	42

Micro States	
Arunachal Pradesh	36
Goa	47
Manipur	21
Meghalaya	17
Mizoram	28
Nagaland	14
Sikkim	28
Tripura	55

Union Territories	
Andaman & Nichobar	50
Chandigarh	19
Dadra & Nagar Haveli	26
Ladakh	NA
Puducherry	31

Kerala is highly densely populated 906 / Sq Kms (India: 426), Weak Public Health infrastructure. **Most impacted COVID state in India?**

Kerala: Positive Cases Growth Pattern in September 2020

Kerala: Positive Cases				
29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
71701	84760	102255	131027	167940

Positive Cases: 07 Day: MGR					
	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	27	18	21	28	28
Pan India	16	16	13	16	11
Mega States	17	17	13	16	10

Positive Cases: 30 Day: MGR					
	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	116	98	81	83	98
Pan India	64	59	53	52	46
Mega States	67	61	55	54	45

- Both 7-Day MGR and 30-Day MGR of Kerala is more than twice of National average and Mega States average
- The trend indicates that, the current level of testing is inadequate and not matching with the velocity of virus spread in the state
- In less than a month, COVID cases has doubled in Kerala.
- Active cases doubles in September: Increase in positive cases will have cascading effect on active cases. Kerala had 23277 active cases as on 29th August. Today, it has reached to 52677

Analysis of Growth Pattern of Active Cases in Kerala in September 2020



Analysis of Growth Pattern of Active Cases in Kerala											
District(s)	Districtwise Active Cases						Active Cases 7-Day: Moving Growth Rate: MGR (%)				
	22-Aug	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kollam	791	1370	1593	2268	2750	4363	73.2	16.3	42.4	21.3	58.7
Ernakulam	1721	1942	2251	2867	3377	5301	12.8	15.9	27.4	17.8	57.0
Thrissur	946	1445	1542	2061	2749	4177	52.7	6.7	33.7	33.4	51.9
Kozhikode	1265	1740	1667	2172	3359	5001	37.5	-4.2	30.3	54.7	48.9
Palakkad	922	975	631	1298	2148	3177	5.7	-35.3	105.7	65.5	47.9
Pathanamthitta	634	1021	1022	1266	1267	1830	61.0	0.1	23.9	0.1	44.4
Thiruvananthapuram	5098	5237	4970	5013	6635	9422	2.7	-5.1	0.9	32.4	42.0
Idukki	347	345	280	482	653	911	-0.6	-18.8	72.1	35.5	39.5
Alappuzha	1819	2238	1377	1929	2774	3840	23.0	-38.5	40.1	43.8	38.4
Kannur	733	928	979	1930	2679	3652	26.6	5.5	97.1	38.8	36.3
Kottayam	988	1322	1594	2109	2632	3404	33.8	20.6	32.3	24.8	29.3
Malappuram	2873	2969	1835	2782	3632	4473	3.3	-38.2	51.6	30.6	23.2
Kasaragod	1094	1495	1778	2155	2196	2428	36.7	18.9	21.2	1.9	10.6
Wayanad	307	250	282	472	639	698	-18.6	12.8	67.4	35.4	9.2

Analysis of surge in Active cases in September				
Districts	29-Aug	26-Sep	Addition	Increase (%)
Kollam	1370	4363	2993	218
Ernakulam	1942	5301	3359	173
Thrissur	1445	4177	2732	189
Kozhikode	1740	5001	3261	187
Palakkad	975	3177	2202	226
Pathanamthitta	1021	1830	809	79
Thiruvananthapuram	5237	9422	4185	80
Idukki	345	911	566	164
Alappuzha	2238	3840	1602	72
Kannur	928	3652	2724	294
Kottayam	1322	3404	2082	157
Malappuram	2969	4473	1504	51
Total	21532	49551	28019	130

- Increase in Moving Growth Rate of active cases will result in decrease in doubling period
- Active cases in Kollam, Palakkad, and Kannur has grown over 200% in September
- Ernakulam, Thrissur, Kozhikode, Idukki, Kottayam has witnessed over 150% increase in active cases
- Kannur has Test Positivity Rate of 12.6%, which indicates the virus is spreading wider and faster. Trebling of active cases validates the same
- Thiruvananthapuram which witnessed negative MGR during the first fortnight of September, has witnessed surge in active cases during the week ending 26th September. Active cases has shot up increased by 90% within 2 weeks. On 12th September it had 5013 active cases, on 26th September it has increased to 9422.

Analysis of Mortality in Kerala in September in 2020

Analysis of Mortality in Kerala											
Districts	Districtwise Mortality						Mortality: Moving Growth Rate: MGR (%)				
	22-Aug	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kottayam	2	3	3	3	3	12	50	0	0	0	300
Alappuzha	10	14	14	18	18	33	40	0	29	0	83
Pathanamthitta	3	3	3	3	3	5	0	0	0	0	67
Malappuram	18	24	26	35	45	64	33	8	35	29	42
Kozhikode	24	28	31	42	47	61	17	11	35	12	30
Thrissur	12	13	17	25	36	45	8	31	47	44	25
Palakkad	3	3	4	7	21	26	0	33	75	200	24
Kollam	12	18	24	26	39	48	50	33	8	50	23
Thiruvananthapuram	58	85	109	140	169	207	47	28	28	21	22
Kasaragod	21	25	31	37	41	48	19	24	19	11	17
Ernakulam	31	32	37	46	53	59	3	16	24	15	11
Kannur	19	25	31	36	37	41	32	24	16	3	11
Idukki	3	3	3	3	3	3	0	0	0	0	0
Wayanad	3	5	5	5	5	5	67	0	0	0	0

- Kollam, Pathanamthitta, Kottayam and Alappuzha have a limited number of critical care infrastructure. The surge in active cases in these location will lead to increase in mortality. The Mortality 7-Day MGR of Kottayam, Kollam, Alappuzha validates the assessment
- Thrissur, even though it has relatively better Infrastructure, but beyond a threshold point, it would be difficult to sustain the demand for critical care infrastructure. Active cases in Thrissur has shot-up from 1445 to 4177. Mortality has also trebled in Thrissur in over the last 4 weeks, from 13 to 45
- Surge in Thiruvananthapuram active cases has led to 140% increase in mortality over the last 4 weeks. Mortality has increased from 85 to 207

Low and Slow Testing resulting in faster and wider spread of virus in Kerala



Testing: 07 Day: MGR					
	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	19	11	12	16	14
Pan India	18	17	13	15	12
Mega States	17	17	12	15	11

Testing: 30 Day: MGR					
	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	71	59	48	45	48
Pan India	67	62	55	52	46
Mega States	63	60	53	51	43

Testing: 7 Day: MGR					
	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	19	11	12	16	14
Delhi	10	13	16	23	15
Puducherry	15	14	15	41	27

Testing: 30 Day: MGR					
	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	71	59	48	45	48
Delhi	33	35	43	61	65
Puducherry	56	52	51	85	106

Comparative Analysis

- Delhi and Puducherry also witnessed surge in COVID cases in August.
- Both states quickly and adequately ramped-up testing which resulted in reduction of the Test Positivity Rate (TPR%)
- Testing: 30-Day MGR of Delhi and Pudcherry increased from 33 to 65% and 56 to 106% respectively.
- During the same period, Kerala Testing 30-Day: MGR decreased from 71% to 48%, resulting in surge in COVID cases

Comparison: Testing Per Million Population					
TPM	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	46041	51325	57530	66797	76109
Delhi	82768	93232	108103	133216	153565
Puducherry	51760	58818	67857	95688	121370

Comparison: Test Positivity Rate (%)					
TPR	29-Aug	05-Sep	12-Sep	19-Sep	26-Sep
Kerala	4.4	4.6	5.0	5.5	6.2
Delhi	11.1	10.8	10.4	9.7	9.3
Puducherry	18.5	19.9	19.8	16.6	15.2

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>
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.
3. The user of this presentation is advised to revalidate the shared data from authorised public institutions.

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Thank you