

COVID-19 pandemic in India: Chronological comparison of the regional heterogeneity in the progression of the pandemic and gaps in mitigation strategies

Satabdi Datta¹, Nelay Kumar Chakroborty², Deepinder Sharda¹, Komal Attri^{1,3}, Diptiman Choudhury^{*1,3}

¹Department of Chemistry and Biochemistry, Thapar Institute of Engineering and Technology, Patiala, Punjab, 147004, India; ²Department of Liberal Arts and Sciences, Thapar Institute of Engineering and Technology, Patiala, Punjab, 147004, India; ³Department of Engineering and Technology, Virginia Tech (USA) Centre for Excellence in Emerging Materials, Thapar Institute of Engineering and Technology, Patiala, Punjab, 147004, India

Correspondence to: Diptiman Choudhury, Department of Chemistry and Biochemistry, Thapar Institute of Engineering and Technology, Patiala, Punjab, 147004, India, Tel: +91-8196949843; E-mail: diptiman@thapar.edu

SUPPLEMENTARY MATERIAL

Name of the State				
Uttarakhand				
Week before 1 st Shahi Snan or Auspicious Bath (11 th March, 2021) in the river Ganges				
Dates	Total Cases	Total Deceased	Change in Number of New Cases	Change in Numbers of New Deaths
1 st March, 2021	97019	1692	70	0
2 nd March, 2021	97089	1692	45	0
3 rd March, 2021	97134	1692	100	0
4 th March, 2021	97234	1692	51	2
5 th March, 2021	97285	1694	78	0
6 th March, 2021	97363	1694	59	1
7 th March, 2021	97422	1695	67.16666667	0.5

1st week after the end (27th April, 2021) of Kumbh Mela 2021				
Dates	Total Cases	Total Deceased	Change in Number of New Cases	Change in Numbers of New Deaths
3 rd May, 2021	197023	2930	7028	85
4 th May, 2021	204051	3015	7783	127
5 th May, 2021	211834	3142	8517	151
6 th May, 2021	220351	3293	9642	137
7 th May, 2021	229993	3430	8390	118
8 th May, 2021	238383	3548	5890	180
9 th May, 2021	244273	3728	7875	133
Fold change in the number of weekly-averaged cases=(Average change in the number of new cases for the week after Kumbh mela)/ (Average change in the number of new cases for the week before the 1 st auspicious bath)		Fold change in the number of weekly-averaged deaths=(Average change in the number of new deaths for the week after Kumbh mela)/ (Average change in the number of new deaths for the week before the 1 st auspicious bath)		
117.2456576		266		
Name of the State				
Uttar Pradesh				
Week before 1st Shahi Snan or Auspicious Bath (11th March, 2021) in the river Ganges				
Dates	Total Cases	Total Deceased	Change in Number of New Cases	Change in Numbers of New Deaths
1 st March, 2021	603608	8727	103	1
2 nd March, 2021	603711	8728	77	0
3 rd March, 2021	603788	8728	119	1
4 th March, 2021	603907	8729	127	0
5 th March, 2021	604034	8729	130	0
6 th March, 2021	604164	8729	115	8
7 th March, 2021	604279	8737	111.8333333	1.666666667

1 st week after the end (27 th April, 2021) of Kumbh Mela 2021				
Dates	Total Cases	Total Deceased	Change in Number of New Cases	Change in Numbers of New Deaths
3 rd May, 2021	1342413	13447	25770	351
4 th May, 2021	1368183	13798	31111	353
5 th May, 2021	1399294	14151	26622	350
6 th May, 2021	1425916	14501	27763	372
7 th May, 2021	1453679	14873	26636	297
8 th May, 2021	1480315	15170	23175	294
9 th May, 2021	1503490	15464	26846.16667	336.1666667
Fold change in the number of weekly-averaged cases=(Average change in the number of new cases for the week after Kumbh mela)/(Average change in the number of new cases for the week before the 1st auspicious bath)			Fold change in the number of weekly-averaged deaths=(Average change in the number of new deaths for the week after Kumbh mela)/(Average change in the number of new deaths for the week before the 1st auspicious bath)	
240.0551416			201.7	

Table S1: A comparison of fold change in the weekly-averaged numbers of new cases and deaths between the entire India between the week, before the first Shahi Snan and just after Shahi snan of the Kumbh Mela 2021.

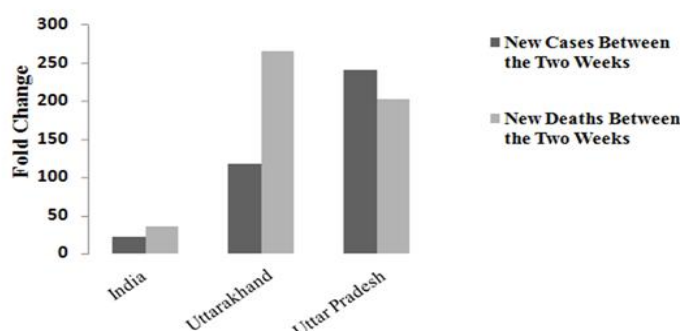


Fig. S1: A comparison of fold change in the weekly-average numbers of new cases and deaths between the entire India and the states of Uttarakhand and Uttar Pradesh. The fold changes were calculated between the week, before the first Shahi Snan (auspicious bath) of the Kumbh Mela 2021, i.e. from March 1st to March 7th, 2021, and the week after the festival ended with the last Shahi Snan on April 27th, 2021. i.e. from May 3rd to May 9th, 2021 for the nation (Cases: 20.9-fold, Deaths: 35.4-fold) and for the state of Uttarakhand (Cases: 117.2-fold, Deaths: 266-fold), and Uttar Pradesh (Cases: 240-fold, Deaths: 201.7-fold). Drastic increase in the average number of new cases and deaths were found for the two states, which organized the festival, compared to the entire nation (calculations for the whole nation was done by excluding these two states). No statistical test was performed in this comparison.

	Fold change of average daily new cases		
	March -2021(Before LAGE)	April-2021(During LAGE)	May-2021(After LAGE)
States that observed lage			
Assam	1	41.32142857	185.3214286
Kerala	1	7.082302569	15.14462417
Puducherry(UT)	1	10.21428571	27.26785714
Tamil Nadu	1	8.240070609	26.56840247
West Bengal	1	21.12335958	47.65879265
States (major cases contributor) with no lage			
Karnataka	1	11.88284775	24.39901585
Maharashtra	1	2.810630228	1.804723998
Delhi	1	1.792859774	2.298956038
Andhra Pradesh	1	17.09249565	50.47025994
Chattisgarh	1	10.70694934	6.254792253
Abbreviations: LAGE: Legislative Assembly General Elections; UT: Union Territory			

Table S2: An account of the fold change in average daily cases before ,during and after elections in5 states/UT that observed LAGE along with 5 other states/UT(Major case contributors) that had no reported major public gatherings.

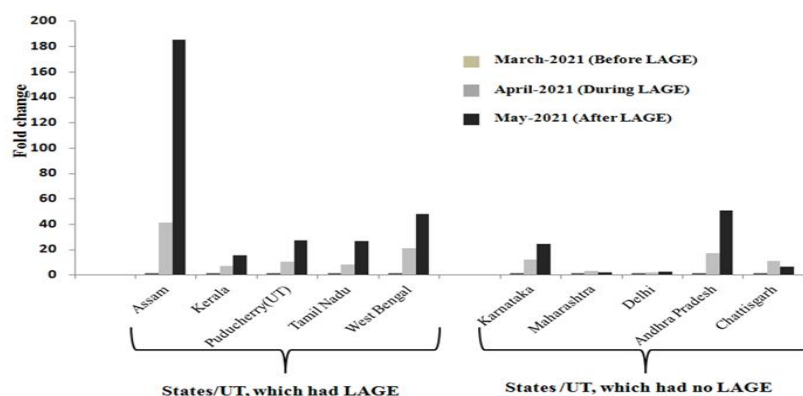


Fig S2: A comparison of fold change in average daily case numbers in the 4 states (Assam, Kerala, Tamil Nadu, West Bengal) and 1-UT (Puducherry) before, during and after their Legislative Assembly General Elections (LAGE), with 4 other states (Karnataka, Maharashtra, Andhra Pradesh, Chattisgarh) and 1-UT (Delhi) (a major contributor of COVID-19 cases) that observed no LAGE.