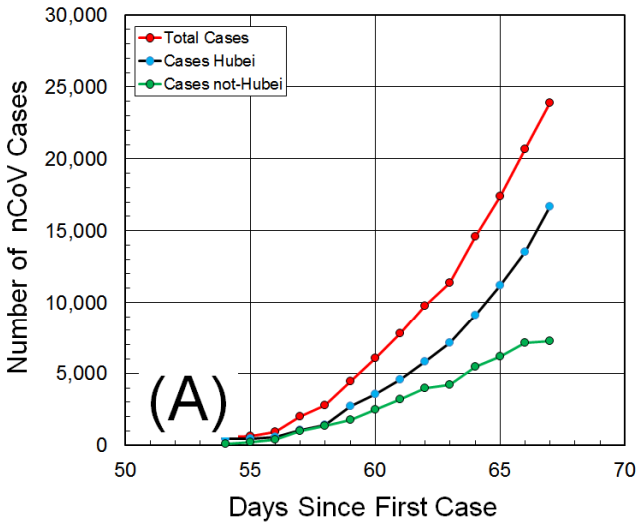
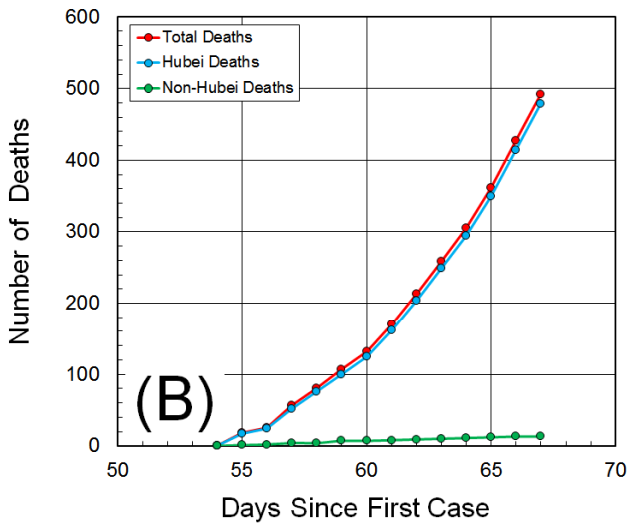
“Analysis of nCov-2019 Data on 2/5/2020” by Michael Levitt, Stanford University, CA

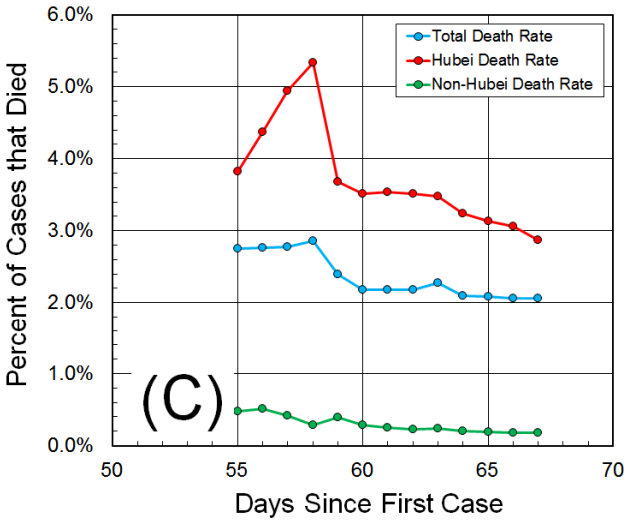
Date	Day	Cases Confirmed			Number Deaths			Death Rate (%)			Ratio Hubei/ Others	Fraction Change Cases Confirmed			Fraction Change Number Deaths		
		Total	Hubei	Others	Total	Hubei	Others	Total	Hubei	Others		Total	Hubei	Others	Total	Hubei	Others
1/22/2020	54	555	444	111	0	0	0	0.00%	0.00%	0.00%	0.0						
1/23/2020	55	653	444	209	18	17	1	2.76%	3.83%	0.48%	8.0	1.177	1.000	1.883	-	-	-
1/24/2020	56	941	549	392	26	24	2	2.76%	4.37%	0.51%	8.6	1.441	1.236	1.876	1.444	1.412	2.000
1/25/2020	57	2019	1052	967	56	52	4	2.77%	4.94%	0.41%	11.9	2.146	1.916	2.467	2.154	2.167	2.000
1/26/2020	58	2794	1423	1371	80	76	4	2.86%	5.34%	0.29%	18.3	1.384	1.353	1.418	1.429	1.462	1.000
1/27/2020	59	4473	2714	1759	107	100	7	2.39%	3.68%	0.40%	9.3	1.601	1.907	1.283	1.338	1.316	1.750
1/28/2020	60	6047	3554	2493	132	125	7	2.18%	3.52%	0.28%	12.5	1.352	1.310	1.417	1.234	1.250	1.000
1/29/2020	61	7783	4586	3197	170	162	8	2.18%	3.53%	0.25%	14.1	1.287	1.290	1.282	1.288	1.296	1.143
1/30/2020	62	9776	5806	3970	213	204	9	2.18%	3.51%	0.23%	15.5	1.256	1.266	1.242	1.253	1.259	1.125
1/31/2020	63	11374	7153	4221	259	249	10	2.28%	3.48%	0.24%	14.7	1.163	1.232	1.063	1.216	1.221	1.111
2/1/2020	64	14562	9074	5488	305	294	11	2.09%	3.24%	0.20%	16.2	1.280	1.269	1.300	1.178	1.181	1.100
2/2/2020	65	17373	11177	6196	362	350	12	2.08%	3.13%	0.19%	16.2	1.193	1.232	1.129	1.187	1.190	1.091
2/3/2020	66	20679	13522	7157	427	414	13	2.06%	3.06%	0.18%	16.9	1.190	1.210	1.155	1.180	1.183	1.083
2/4/2020	67	23906	16678	7228	492	479	13	2.06%	2.87%	0.18%	16.0	1.156	1.233	1.010	1.152	1.157	1.000

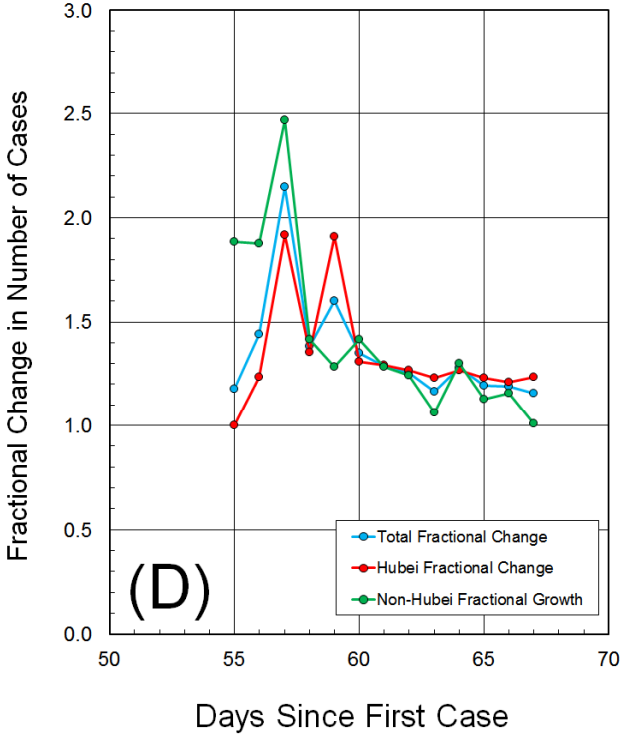
Table 1. Showing data for New Coronavirus 2019 (nCoV) from 22 January to 4 February 2020. The raw data of Cases Confirmed and of Number Deaths is taken from https://www.kaggle.com/sudalairajkumar/novel-corona-virus-2019-dataset/data# and checked against data from https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6 and for regional data from https://jobtube.cn/wv/?from=groupmessage&isappinstalled=0. We separate data into Hubei and Others or non-Hubei as almost all deaths are in a 90 km x 35 km area centered on Wuhan in Hubei (see Fig. 2). The Death Rate is Number Deaths divided by Number Cases Confirmed, and Ratio Hubei/Others is the ratio of the Death Rate for Hubei to Others. The Fraction Change for all raw data is Value_Today divided by Value_Yesterday.

Plots of this data against time are shown in Fig. 1. Panel (A) shows expected increase in Number of Cases. Panel (B) confirms that almost all the deaths are in Hubei (over 97%). Panel (C) shows that the Death Rate (Mortality) is high in Hubei, but elsewhere it is 16 times lower. At 0.18 %, the rate is comparable to the mortality of influenza. Panel (D) shows that the number of reported cases changes unpredictably in all three regions (Hubei, non-Hubei & Total); of all the measures these numbers seem least reliable. Most interesting is Panel (E), which shows that the number of deaths is increasing more and more slowly. Specifically, the ratio of Deaths_Today to Deaths_Yesterday is decreasing. This decrease is almost monotonic for Total Deaths and Hubei Death since 1/25/2020 and fairly linear for them both since 1/29/2020. Linear extrapolation, which is not necessary applicable, suggests the number of new deaths will stop growing and start to decrease over the next week. The total number of death with then growth more and more slowly.









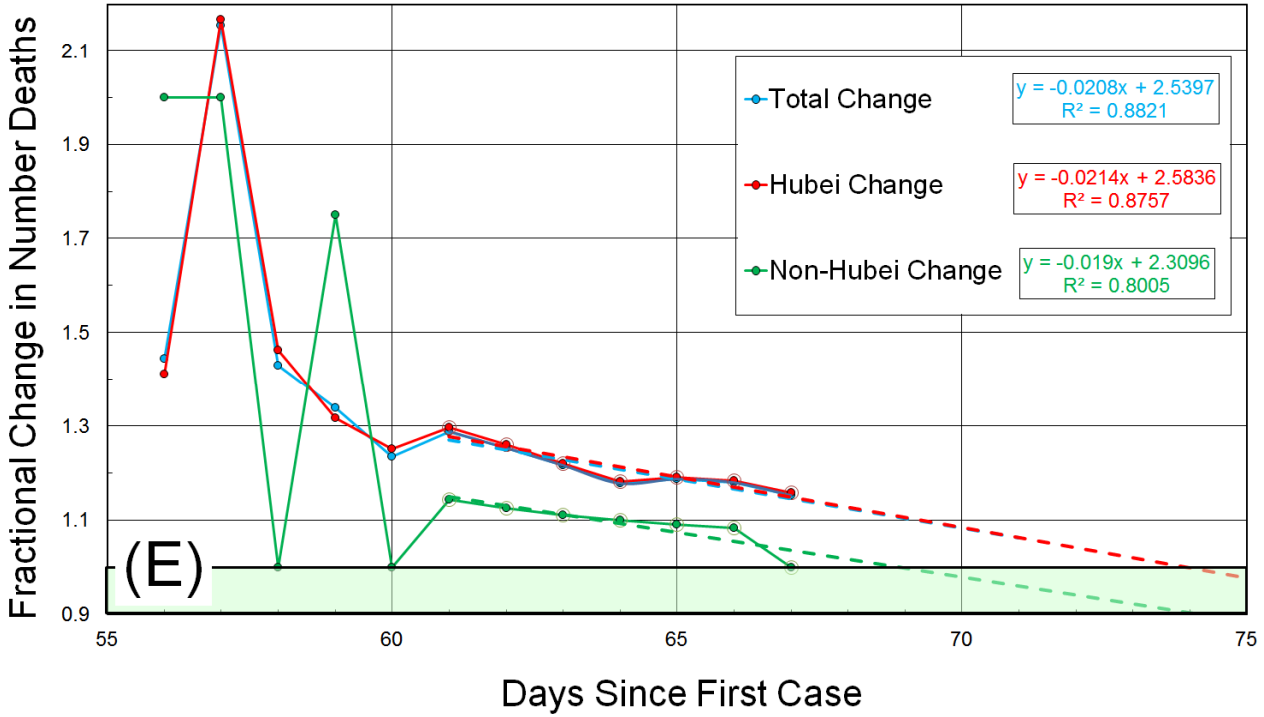


Figure. 1. Variation of nCov-2019 data against time in days since 29 Nov 2019 (guessed date of first case). Table 1 data is plotted from 22 January to 4 February 2020. In Panel (E) linear trend-lines are added using data for last four days from 1/29/2020. For Total Change, Hubei Change and non-Hubei Change, the fit is excellent (correlation coefficient or sqrt(R^2)> 0.89). This suggests the Fractional Change in Number of Deaths will decrease to about 1.0 within a week, after which time, numbers will grow slowly.

			4-Feb				3-Feb				2-Feb				1-Feb				31-Jan		
Province	Population	Confirmed/ million pop	Cases	Deaths	Death Rate	Death Change	Cases	Deaths	Death Rate	Death Change	Cases	Deaths	Death Rate	Death Change	Cases	Deaths	Death Rate	Death Change	Cases	Deaths	Death Rate
Hubei	58,500,000	285.1	16,678	479	2.87%	1.16	13,522	414	3.06%	1.18	11,177	350	3.13%	1.19	9,074	294	3.24%	1.18	7,153	249	3.48%
City in Hubei																					
Wuhan	11,080,000	753.7	8,351	362	4.33%	1.16	6,384	313	4.90%	1.18	5,142	265	5.15%	1.18	4,109	224	5.45%	1.17	3,215	192	5.97%
Ezhou	1,050,000	363.8	382	18	4.71%	1.00	332	18	5.42%	1.20	306	15	4.90%	1.15	278	13	4.68%	1.44	227	9	3.96%
Jingmen	3,023,000	139.6	422	16	3.79%	1.14	400	14	3.50%	1.27	345	11	3.19%	1.57	329	7	2.13%	1.40	251	5	1.99%
Tianmen	1,731,000	73.9	128	10	7.81%	1.00	117	10	8.55%	1.00	115	10	8.70%	1.43	99	7	7.07%	1.00	82	7	8.54%
Huanggang	7,403,000	222.2	1,645	25	1.52%	1.32	1,422	19	1.34%	1.12	1,246	17	1.36%	1.13	1,002	15	1.50%	1.07	726	14	1.93%
Xiaogan	4,900,000	298.4	1,462	18	1.23%	1.06	1,120	17	1.52%	1.21	918	14	1.53%	1.00	749	14	1.87%	1.17	628	12	1.91%
Jingzhou	3,692,000	193.1	713	9	1.26%	1.29	613	7	1.14%	1.17	499	6	1.20%	1.50	333	4	1.20%	1.00	287	4	1.39%
Suizhou	2,500,000	282.4	706	8	1.13%	1.33	641	6	0.94%	1.20	458	5	1.09%	1.67	384	3	0.78%	3.00	304	1	0.33%
Xiantao	1,175,000	191.5	225	4	1.78%	1.33	188	3	1.60%	1.00	169	3	1.78%	1.00	140	3	2.14%	3.00	97	1	1.03%
Qianjiang	1,000,000	54.0	54	1	1.85%	1.00	44	1	2.27%	1.00	35	1	2.86%	1.00	35	1	2.86%	0.00	27	1	3.70%
Yichang	4,060,000	122.2	496	4	0.81%	1.33	452	3	0.66%	3.00	392	1	0.26%	1.00	353	1	0.28%	1.00	276	1	0.36%
Huangshi	2,450,000	207.8	509	2	0.39%	1.00	405	2	0.49%	1.00	334	2	0.60%	1.00	252	2	0.79%	1.00	209	2	0.96%
Xiangyang	900,000	816.7	735	2	0.27%	1.00	632	1	0.16%	1.00	548	0	0.00%	1.00	441	0	0.00%	1.00	347	0	0.00%
Enshi	750,000	184.0	138	0	0.00%	1.00	123	0	0.00%	1.00	111	0	0.00%	1.00	105	0	0.00%	1.00	87	0	0.00%
Shennongjia	76,000	131.6	10	0	0.00%	1.00	10	0	0.00%	1.00	7	0	0.00%	1.00	7	0	0.00%	1.00	7	0	0.00%
Shiyan	3,340,000	95.2	318	0	0.00%	1.00	291	0	0.00%	1.00	256	0	0.00%	1.00	212	0	0.00%	1.00	177	0	0.00%
Xianning	2,800,000	137.1	384	0	0.00%	1.00	348	0	0.00%	1.00	296	0	0.00%	1.00	246	0	0.00%	1.00	206	0	0.00%

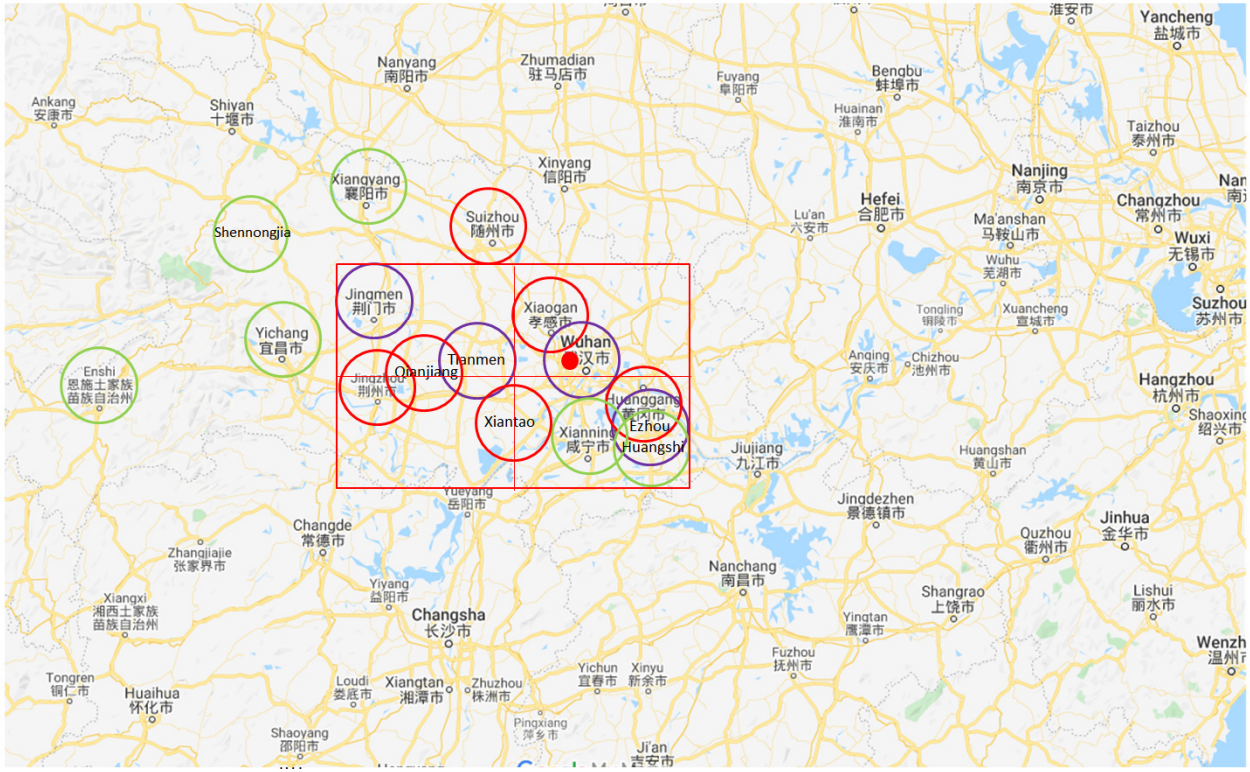


Figure. 2. Map of Hubei circling in purple cities cities with a death rate >= 3%, in red cities with a death rate > 1% and in green other cities for which there is tabulated data. Deaths are localized to a 90km x 35km area centered near Tianmen near (The table shows that high death rates are concentrated in four cities Wuhan, Ezhou, Jingmen and Tianmen. Other cities in the same area have low death rates comparable to areas elsewhere in China and the rest of the world data (1/4/2020 from jobtube.cn). The red dot marks the Wuhan South China Seafood Market.