

Comparison of the COVID-19 Pandemic Waves in 2020 and 2021

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Abstract

The daily number of new COVID-19 cases and deaths per capita are important characteristics of the pandemic dynamics indicating the appearance of new coronavirus strains, the effectiveness of quarantine, testing and vaccination. The second year of the pandemic allowed us to compare the averaged daily number of cases and deaths in the period from September to December 2020 with the same period in 2021 in some northern countries and regions: Ukraine, EU, the UK, USA, some countries located in tropical zone and south hemisphere: India, Brazil, South Africa and Argentina and in the whole world in order to find some correlations with seasonal factors, the percentage of the fully vaccinated people and boosters. The results showed that existing vaccines cannot prevent new infections and vaccinated people can spread the infection as intensively as non-vaccinated ones, but vaccinations can diminish the numbers of death per capita

Keywords: COVID-19 Pandemic; Epidemic Dynamics in Ukraine, EU, USA, the UK, India, Brazil, South Africa and Argentina; Efficiency of Vaccinations, Mathematical Modeling of Infection Diseases; Statistical Methods.

Introduction

The daily number of new COVID-19 cases per capita (DCC) and deaths per capita (DDC) may indicate the effectiveness of quarantine, testing, vaccination, treatment, and also the virulence of coronavirus strains circulating in particular regions at some fixed periods of time. The DCC and DDC values can be calculated with the use of the accumulated number of cases per capita (CC) and deaths per capita (DC) and the simple smoothing procedure proposed in [1-3]. The CC and DC numbers are regularly reported by the World Health Organization, [4] and COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU), [5].

Since we are already in the second year of the pandemic, it is reasonable to compare the DCC and DDC numbers for the same periods in 2020 and 2021 in order to find some seasonal and global trends. Since the influence of vaccinations in 2020 can be neglected, the comparison of the COVID-19 pandemic dynamics in 2020 and 2021 enables us to reveal some influences of vaccination levels. In [6] the DCC values for Argentina, Brazil, India, South Africa, Ukraine, EU, the UK, USA and the whole world for the

period from March to August 2020 were compared with the corresponding values in 2021. In this paper we will compare the DCC and DDC values and vaccination levels in the same countries and regions for the period from September to December and try to reveal some trends.

Data and averaged CC and DCC Values

The CC figures (per 1,000,000 persons of population) registered by JHU, [5] are shown in Table 1 (August 25, 2020 – January 6, 2021) and Table 2 (August 25, 2021 – January 6, 2022). The accumulated numbers of deaths per capita DC (per million) are shown in Table 3 (August 25, 2020 – January 6, 2021) and Table 4 (August 25, 2021 – January 6, 2022). We denote these values as V_j corresponding time moments t_j measured in days. Similar to the approach proposed in [1-3], we will use the averaged CC and DC values which can be calculated with the use of smoothing

$$\bar{V}_i = \frac{1}{7} \sum_{j=i-3}^{j=i+3} V_j, \quad (1)$$

and averaged new daily numbers DCC and DDC as follows:

$$\left. \frac{d\bar{V}}{dt} \right|_{t=t_j} \approx \frac{1}{2}(\bar{V}_{i+1} - \bar{V}_{i-1}) \quad (2)$$

Formulas (1) - (2) can yield the averaged DCC and DDC values which are closer to the characteristics at the moments of time t_i in comparison with ones calculated by JHU [5] with the use of V_j corresponding only previous moments of time.

Table 1: Accumulated number of laboratory-confirmed COVID-19 cases per million in different regions for the period August 25, 2020 - January 6, 2021, [5].

	Argentina	Brazil	India	South Africa	United States	Ukraine	European Union	United Kingdom	World
2020-08-25	7885.791	17188.75	2314.142	10209.8	17353.57	2552.499	4014.002	4815.011	3037.289
2020-08-26	8117.121	17413.76	2375.637	10254.51	17485.61	2591.701	4049.832	4830.42	3073.263
2020-08-27	8338.672	17611.25	2431.088	10297.56	17623.74	2637.943	4116.519	4852.734	3109.182
2020-08-28	8595.591	17817.27	2485.969	10328.3	17763.52	2695.665	4171.747	4871.471	3145.251
2020-08-29	8797.977	17991.53	2542.493	10368.59	17896.41	2754.998	4201.316	4887.716	3178.426
2020-08-30	8955.567	18059.45	2598.838	10410.31	18001.33	2805.128	4227.249	4912.86	3206.353
2020-08-31	9159.686	18294.15	2649.018	10443.37	18099.3	2855.787	4301.327	4933.474	3239.921
2020-09-01	9390.007	18501.31	2705.252	10463.66	18228.29	2905.181	4346.102	4952.533	3273.917
2020-09-02	9629.735	18718.38	2765.452	10502.57	18350.37	2963.939	4400.627	4974.657	3309.809
2020-09-03	9893.43	18937.12	2825.263	10542.87	18483.59	3020.695	4457.715	5000.094	3345.953
2020-09-04	10127.7	19121.89	2887.292	10577.23	18635.85	3084.398	4523.528	5028.537	3384.518
2020-09-05	10345.3	19280.11	2952.336	10607.31	18766.54	3151.047	4562.73	5055.118	3419.198
2020-09-06	10498.48	19348.67	3017.501	10634.51	18859.81	3201.775	4595.021	5098.852	3448.469
2020-09-07	10700.54	19393.14	3071.906	10648.58	18931.59	3253.608	4682.769	5142.103	3476.079
2020-09-08	10964.26	19480.92	3136.285	10666.55	19008.76	3310.893	4739.078	5178.184	3507.194
2020-09-09	11233.06	19654.23	3204.991	10699.69	19112.5	3370.64	4802.098	5217.198	3543.585
2020-09-10	11494.1	19844.71	3274.282	10733.12	19220.33	3431.261	4874.947	5259.994	3581.685
2020-09-11	11746.42	20038.8	3344.304	10765.77	19364.57	3505.501	4951.943	5311.909	3622.261
2020-09-12	11982.7	20182.73	3412.032	10796.01	19489.79	3578.776	5004.536	5363.18	3658.392
2020-09-13	12181.27	20248.24	3478.108	10822.31	19593.52	3637.763	5040.662	5412.001	3689.146
2020-09-14	12398.55	20344.56	3538.255	10838.23	19693.14	3696.59	5137.857	5450.429	3723.175
2020-09-15	12659.3	20506.02	3602.933	10851.09	19811.92	3765.585	5205.187	5496.01	3759.15
2020-09-16	12915.28	20680.31	3673.188	10883.12	19928.69	3834.971	5284.936	5554.523	3797.875
2020-09-17	13193.78	20850.43	3742.388	10918.56	20064.61	3919.61	5373.701	5604.371	3837.868
2020-09-18	13455.69	21036.1	3809.372	10952.78	20212.46	3996.22	5474.028	5667.737	3879.262
2020-09-19	13659.09	21174.22	3875.832	10986.58	20340.84	4073.176	5538.159	5732.569	3915.994
2020-09-20	13843.96	21246.39	3938.241	11012.48	20457.74	4143.827	5591.09	5789.733	3947.958
2020-09-21	14036.52	21328.79	3992.125	11024.55	20609.71	4207.807	5703.237	5853.891	3983.365
2020-09-22	14300.24	21492.2	4051.94	11046.97	20730.35	4276.595	5786.515	5926.112	4019.746
2020-09-23	14577.06	21645.13	4114.024	11078.71	20847.05	4359.371	5880.189	6016.718	4058.949
2020-09-24	14872.36	21794.73	4175.78	11109.71	20989.65	4439.386	5983.603	6113.996	4099.497
2020-09-25	15156.73	21945.72	4237.042	11134.36	21135.48	4523.703	6094.567	6214.777	4141.612
2020-09-26	15403.38	22061.23	4300.627	11150.5	21270.44	4614.232	6166.619	6303.345	4177.836
2020-09-27	15597.24	22125.66	4359.597	11171.61	21385.05	4688.611	6226.31	6386.797	4209.768
2020-09-28	15856.13	22204.49	4410.256	11186.65	21482.52	4752.567	6341.679	6446.204	4242.513

2020-09-29	16151.64	22357.99	4468.008	11201.69	21613.22	4838.38	6401.848	6550.93	4278.533
2020-09-30	16467.22	22511.74	4530.317	11231.12	21730.61	4933.556	6528.595	6655.156	4319.872
2020-10-01	16774.22	22678.96	4588.795	11260.19	21869.07	5029.698	6634.293	6756.524	4360.298
2020-10-02	17096.26	22832.32	4645.832	11289.32	22034.67	5139	6750.177	6858.859	4402.327
2020-10-03	17340.29	22939.83	4700.252	11320.68	22186.83	5249.084	6843.104	7047.579	4440.105
2020-10-04	17508.42	22980.56	4753.676	11346.88	22290.86	5347.159	6919.248	7384.215	4473.192
2020-10-05	17754.93	23102.31	4797.645	11362.3	22405.7	5436.997	7036.903	7568.961	4513.008
2020-10-06	18078.13	23249.63	4849.352	11379.4	22541.52	5540.111	7150.324	7782.297	4553.1
2020-10-07	18438.76	23394.2	4905.706	11411.26	22695.37	5652.541	7293.825	7989.973	4597.625
2020-10-08	18777.62	23519.58	4956.298	11440.18	22872.34	5780.11	7455.497	8247.146	4643.431
2020-10-09	19108.7	23649.18	5008.883	11464.51	23042.8	5917.249	7636.252	8450.409	4689.341
2020-10-10	19380.9	23760.14	5062.265	11506.88	23210.23	6053.008	7800.328	8672.746	4734.386
2020-10-11	19607.28	23817.1	5110.156	11533.11	23350.9	6167.118	7919.843	8861.466	4770.941
2020-10-12	19816.11	23857.46	5149.873	11547.9	23476.25	6273.083	8089.458	9066.869	4807.995
2020-10-13	20107.85	23919.89	5195.451	11567.52	23629.72	6395.269	8250.958	9319.57	4848.806
2020-10-14	20435.26	24050	5244.043	11598.78	23807.85	6528.244	8466.412	9608.807	4897.364
2020-10-15	20810.13	24192.19	5289.522	11628.26	24003.44	6649.255	8718.625	9887.092	4949.336
2020-10-16	21172.93	24325.82	5334.17	11661.89	24211.06	6792.008	8971.812	10116.32	5001.336
2020-10-17	21469.17	24422.9	5378.572	11694	24384.36	6944.515	9201.75	10353.41	5048.505
2020-10-18	21700.74	24479.22	5418.562	11721.68	24537.52	7069.783	9407.694	10602.37	5090.258
2020-10-19	21985.39	24556.69	5452.141	11746.01	24737.99	7184.491	9661.658	10878.32	5138.06
2020-10-20	22343.62	24667.75	5490.927	11763.5	24923.31	7315.166	9909.978	11191.06	5187.52
2020-10-21	22745.45	24788.58	5531	11797.73	25113.51	7475.633	10224.92	11582.43	5244.129
2020-10-22	23103.41	24904.3	5570.017	11833.63	25342.48	7644.037	10585.84	11893.94	5304.11
2020-10-23	23448.06	25044.5	5608.319	11865.23	25590.22	7823.024	10982.65	12195.11	5367.303
2020-10-24	23710.48	25161.25	5644.295	11895.77	25841.72	7990.393	11326.51	12532.49	5425.18
2020-10-25	23913.37	25218.51	5676.696	11922.79	26029.96	8137.77	11564.79	12822.64	5470.899
2020-10-26	24170.18	25305.48	5702.869	11937.63	26228.13	8267.179	12054.02	13128.92	5532.866
2020-10-27	24483.91	25445.59	5734.369	11955.82	26459.91	8425.576	12440.41	13464.83	5592.664
2020-10-28	24789.23	25578.07	5770.167	11986.84	26698.01	8604.793	12870.32	13827.12	5657.66
2020-10-29	25080.13	25702.84	5805.08	12021.09	26972.01	8780.582	13362.16	14165.33	5727.665
2020-10-30	25373.49	25816.65	5839.72	12052.93	27272.66	8978.618	13882.08	14523.21	5800.581
2020-10-31	25587.17	25878.19	5873.424	12082.41	27545.21	9187.007	14273	14844.51	5860.581
2020-11-01	25732.09	25925.8	5905.885	12105.24	27862.54	9376.646	14637.26	15185.44	5919.537
2020-11-02	25942.54	25964.35	5933.378	12118.1	28112.86	9537.55	15249.37	15463.33	5990.78
2020-11-03	26208.85	26032.49	5966.572	12138.77	28496.84	9747.273	15731.38	15757.32	6061.728
2020-11-04	26442.41	26141.45	6002.606	12167.28	28809.76	9972.94	16073.83	16126.65	6126.582
2020-11-05	26685.8	26252.88	6036.795	12198.36	29200.3	10206.18	16615.33	16480.72	6205.461
2020-11-06	26944.24	26347.27	6072.933	12227.69	29584.22	10434.74	17171.69	16822.37	6284.7
2020-11-07	27120.46	26430.19	6105.712	12256.52	29981.09	10688.57	17697.66	17188.27	6360.54
2020-11-08	27237.36	26479.27	6138.655	12279.37	30327.58	10910.51	18060.85	17489.88	6422.085
2020-11-09	27419.72	26541.95	6165.978	12300.14	30682.17	11115.44	18432.48	17803.33	6485.78
2020-11-10	27682.34	26758.89	6197.757	12328.94	31103.51	11354.5	18842.79	18102.91	6559.784

2020-11-11	27920.91	26881.54	6232.137	12364.58	31552.54	11604.78	19343.04	18439.59	6639.692
2020-11-12	28165.68	27040.05	6264.345	12403.52	32038.44	11865.49	19812.42	18930.55	6721.78
2020-11-13	28425.71	27220.98	6296.413	12440.38	32582.51	12142.78	20275.43	19330.81	6805.937
2020-11-14	28611.39	27343.78	6325.909	12477.63	33100.01	12436.91	20655.33	19724.61	6880.544
2020-11-15	28735.17	27408.76	6347.832	12508.31	33514.27	12688.6	20950.98	20090.59	6940.897
2020-11-16	28908.24	27482.33	6368.762	12529.05	33992.4	12919.76	21309.02	20404.43	7008.569
2020-11-17	29141.13	27648.18	6396.476	12562.14	34485.51	13199.91	21761.68	20698.4	7086.276
2020-11-18	29367.68	27810.58	6429.184	12610.24	35006.4	13493.56	22183.24	20986.21	7166.036
2020-11-19	29589.07	27978.16	6462.112	12652.11	35582.82	13807.13	22609.88	21322.34	7249.136
2020-11-20	29799.75	28159.34	6495.291	12703.83	36187.89	14148.4	23033.46	21619.27	7334.611
2020-11-21	29956.31	28300.56	6527.736	12747.89	36734.68	14490.36	23364.16	21910.87	7409.349
2020-11-22	30048.05	28384.33	6559.355	12785.7	37175.17	14774.83	23600.95	22184.48	7471.254
2020-11-23	30141.57	28469.19	6586.609	12820.34	37691.66	15033.12	23870.55	22410.99	7537.856
2020-11-24	30298.65	28630.56	6618.456	12861.86	38224.03	15321.3	24227.99	22577.09	7613.612
2020-11-25	30487.07	28839.11	6650.384	12915.99	38779.4	15647.15	24588.91	22844.45	7694.343
2020-11-26	30685.36	29030.17	6681.302	12967.11	39135.01	16006.58	24946.53	23101.83	7769.58
2020-11-27	30857.4	29186.75	6710.958	13023.24	39744.84	16386.04	25294.25	23318.96	7856.209
2020-11-28	30991.11	29427.34	6740.963	13076.5	40221.7	16767.59	25562.64	23551.65	7931.083
2020-11-29	31110.22	29525.53	6768.788	13119.18	40644.75	17072.91	25756.43	23729.86	7992.819
2020-11-30	31235.77	29636.26	6791.121	13157.52	41112.41	17308.44	25970.9	23911.82	8057.122
2020-12-01	31412	29879.19	6817.39	13195.75	41695.25	17602.32	26261.59	24109.32	8135.984
2020-12-02	31577.17	30105.71	6842.904	13265.25	42309.52	17911.59	26568.38	24347.21	8218.98
2020-12-03	31744.46	30340.01	6869.167	13338.53	42982.83	18252.36	26899.51	24566.24	8307.401
2020-12-04	31895.73	30562.78	6895.471	13420.67	43689.66	18607.94	27206.45	24806.18	8394.843
2020-12-05	32009.77	30751.02	6921.314	13498.04	44356.22	18933.64	27489.44	25034.34	8476.923
2020-12-06	32081.65	30874.53	6944.984	13566.59	44894.54	19208.05	27697.09	25288.96	8545.163
2020-12-07	32151.79	31000.82	6964.05	13621.77	45465.71	19414.76	27872.13	25505.2	8611.459
2020-12-08	32230.95	31224.17	6987.073	13688.57	46159.42	19671.42	28166.12	25686.31	8693.879
2020-12-09	32347.23	31479.27	7009.694	13800.31	46823.66	19969.05	28478.91	25929.92	8779.356
2020-12-10	32500.59	31729.52	7030.774	13936.31	47528.56	20285.06	28829.79	26238.13	8970.312
2020-12-11	32656.53	31975.08	7052.326	14074.87	48250.24	20604.68	29167.29	26557.07	9060.052
2020-12-12	32772.18	32172.87	7074.038	14206.14	48917.56	20908.8	29454.31	26873.05	9141.349
2020-12-13	32850.19	32275.81	7093.466	14339.36	49478.36	21129.77	29684.96	27144.84	9208.695
2020-12-14	32961.19	32403.76	7109.302	14425.35	50081	21287.98	29872.68	27442.86	9276.498
2020-12-15	33114.26	32628.21	7128.235	14551.13	50747.98	21491.36	30198.32	27714.24	9360.01
2020-12-16	33264.31	32937.21	7145.466	14717.82	51470.94	21745.74	30566.98	28084.59	9452.392
2020-12-17	33424.94	33258.24	7161.893	14869.81	52183.5	22032.71	30936.91	28604.77	9546.41
2020-12-18	33578.48	33505.23	7179.944	15015.12	52931.3	22333.31	31298.2	29022.72	9638.081
2020-12-19	33705.54	33730.67	7199.051	15197.31	53539.78	22613.5	31583.8	29421.35	9717.201
2020-12-20	33795.79	33845.08	7216.517	15354.62	54096.51	22815.1	31785.17	29949.6	9784.654
2020-12-21	33924.13	33974.27	7230.552	15501	54666.37	22975.64	32007.03	30440.36	9853.598
2020-12-22	34102.64	34239.06	7247.74	15659.24	55273.02	23181.52	32354.57	30980.49	9937.802
2020-12-23	34290.91	34452.52	7265.475	15893.18	55951.2	23424.74	32712.99	31556.94	10026.09

2020-12-24	34290.91	34724.55	7282.029	16131.43	56566.63	23699.11	33068.41	32129.6	10112.69
2020-12-25	34525.28	34823.54	7298.014	16377.85	56893.09	23962.71	33290.2	32609.38	10173.25
2020-12-26	34606.7	34905.47	7311.457	16570.25	57550.89	24149.85	33423.86	33118.03	10237.76
2020-12-27	34716.99	34987.78	7325.825	16728.51	58016.45	24300.49	33561.34	33593.34	10292.65
2020-12-28	34875.22	35115.99	7337.618	16852.72	58517.12	24411.12	33744.29	34200.52	10355.51
2020-12-29	35130.67	35379.42	7352.365	17012.28	59122.96	24581.42	34080.04	34979.77	10440.6
2020-12-30	35388.64	35639.24	7368.026	17307.24	59792.61	24774.76	34496.79	35713.46	10534.65
2020-12-31	35642.69	35893.77	7382.404	17607.03	60567.91	25007.51	34885.88	36533.4	10633.09
2021-01-01	35732.15	36000.97	7396.097	17885.6	61067.31	25234.3	35179.81	37314.64	10704.83
2021-01-02	35847.05	36072.71	7409.142	18135.46	61956.05	25358.56	35324.58	38160.95	10781.68
2021-01-03	35976.06	36153.04	7420.986	18332.97	62567.76	25470.85	35499.56	38968.08	10848.06
2021-01-04	36156.35	36270.05	7432.738	18542.84	63113.38	25574.24	35725.95	39830.23	10918.58
2021-01-05	36458.72	36541.48	7445.719	18782.84	63807.98	25703.65	36128.01	40723.66	11013.21
2021-01-06	36753.44	36833.57	7460.321	19146.45	64579.54	25869.89	36504.54	41637.81	11113.58

Table 2. Accumulated number of laboratory-confirmed COVID-19 cases per million in different regions for the period August 25, 2021 – January 6, 2022, [5].

	Argentina Africa	Brazil	India	South	United States	Ukraine	European Union	United Kingdom	World
2021-08-25	113035.5	96510.72	23366.1	45338.3	115319.8	54567.94	81364.06	96780.89	27235.58
2021-08-26	113185.7	96655.22	23398.15	45551	115873.8	54616.65	81520.01	97338.04	27328.99
2021-08-27	113313	96784.92	23431.7	45751.61	116605.5	54675.52	81615.48	97891.33	27423.74
2021-08-28	113394.7	96892.16	23464.06	45921.04	116801.7	54735.06	81769.74	98361.76	27493.55
2021-08-29	113440.1	96944.79	23494.85	46049.95	116938.5	54790.13	81859.27	98844.66	27550.42
2021-08-30	113557.6	97004.61	23517.06	46143.95	117695.5	54818.11	81978.8	99229.18	27636.97
2021-08-31	113705.2	97130.06	23547.17	46261.94	118210	54859.41	82106.18	99699.12	27715.89
2021-09-01	113822	97250.38	23580.97	46420.89	118817.5	54916.64	82296.2	100220.1	27808.04
2021-09-02	113924.1	97376.66	23613.52	46574.15	119343.4	54982.7	82441.89	100775.3	27894.11
2021-09-03	114018.8	97486.97	23644.1	46727.36	120051.1	55053.53	82563.05	101392.8	27985.05
2021-09-04	114073.3	97581.94	23674.8	46867.43	120273.6	55113.67	82666.3	101930	28047.01
2021-09-05	114103.9	97641.11	23702.75	46966.21	120415.8	55162.95	82751.7	102465.3	28103.29
2021-09-06	114189.3	97688.64	23725.15	47034.8	120657.9	55189.22	82838.14	103065.5	28159.68
2021-09-07	114279.3	97752.22	23752.34	47130.91	121423.3	55248.16	82991.4	103611.3	28250.37
2021-09-08	114356.7	97818.49	23783.38	47246.48	121973.1	55320.01	83101.22	104175.9	28330.64
2021-09-09	114437	97971.87	23808.48	47350.89	122454	55412.26	83271.92	104726	28411.86
2021-09-10	114498.7	98048.77	23832.44	47448.87	123139.5	55503.09	83379.92	105265.2	28492.43
2021-09-11	114538.1	98113.08	23852.95	47537.29	123360.7	55599.63	83475.44	105688.3	28550.9
2021-09-12	114558.5	98149.81	23872.51	47603.26	123489.6	55657.49	83549.68	106107.8	28597.71
2021-09-13	114608.9	98190.22	23890.74	47647.23	124224.1	55692.5	83638.01	106553.3	28673.35
2021-09-14	114675	98253.64	23910.25	47708.84	124663.2	55776.24	83768.79	106938.7	28743.39
2021-09-15	114730	98315.68	23932.19	47786.57	125175.6	55889.85	83878.46	107376.7	28815.32
2021-09-16	114784.7	98481.33	23956.88	47856.75	125642.7	56029.03	84021.44	107763.4	28888.67
2021-09-17	114835.3	98646.46	23982.47	47917.51	126270.1	56188.7	84139.47	108237.5	28967.11
2021-09-18	114867.1	99230.02	24004.55	47972.24	126463.2	56339.71	84233.74	108669.1	29032.58

2021-09-19	114880.8	99272.89	24026.27	48010.23	126590	56439.37	84304.25	109094.4	29078.71
2021-09-20	114928.2	99316.28	24045.01	48035.28	127155.9	56499.94	84386.06	109618.8	29145.88
2021-09-21	114968.5	99388.15	24064.36	48071.87	127521.3	56627.44	84500.88	110075.2	29207.49
2021-09-22	115013.1	99540.42	24087.27	48121.29	127921.2	56791.98	84623.42	110567.6	29275.34
2021-09-23	115051.1	99656.85	24109.79	48167.64	128301.1	56982.5	84743.21	111092.4	29343.44
2021-09-24	115091.6	99744.08	24131.05	48205.29	128832.5	57200.94	84856.31	111615.2	29412.88
2021-09-25	115113.4	99808.86	24151.38	48232.51	128994.8	57401.67	84946.09	112051.3	29459.67
2021-09-26	115125.7	99850.24	24170.06	48248.61	129143.9	57519.69	85020.1	112535.1	29504.13
2021-09-27	115159.4	99893.91	24183.55	48258.24	129638.5	57600.48	85103.33	113085.1	29562.9
2021-09-28	115199.4	99972.81	24197.1	48281.01	129973.1	57763.16	85226.12	113592.4	29620.17
2021-09-29	115232.2	100051.7	24213.98	48281.01	130343.8	57997.94	85364.39	114106.9	29683.92
2021-09-30	115268.2	100154.3	24233.16	48344.03	130674.1	58281.26	85498.6	114631.3	29744.77
2021-10-01	115302.5	100238.7	24250.64	48371.26	131133.3	58571.2	85623.33	115138.8	29810.1
2021-10-02	115321.9	100296.6	24267.03	48393.01	131268.4	58856.39	85727.41	115569.6	29854.3
2021-10-03	115330.4	100339.4	24281.96	48406.49	131393.9	59053.66	85806.99	116004.6	29893.38
2021-10-04	115351.9	100393.2	24295.13	48413.63	131848.3	59179.09	85899.42	116507.5	29949.49
2021-10-05	115378.6	100496.7	24308.64	48426.42	132140.8	59420.45	86029.04	116992.5	30003.06
2021-10-06	115406.7	100583.3	24324.74	48445.56	132473	59726.8	86179.31	117560.1	30068.28
2021-10-07	115430.5	100651.6	24340	48462.03	132775	60090.15	86325.36	118143.1	30123.12
2021-10-08	115447.1	100738.2	24354.16	48477.42	133154.9	60482.34	86467.37	118655.4	30183.41
2021-10-09	115457.4	100807.4	24367.2	48491.01	133253.5	60864.74	86584.66	119233.3	30225.7
2021-10-10	115464.6	100846.7	24380.21	48501.8	133366.6	61143.16	86674.11	119725.8	30265.85
2021-10-11	115473.7	100879.4	24390.48	48505.15	133668.9	61364.14	86780.88	120306.2	30313.88
2021-10-12	115497.1	100913.8	24401.84	48515.01	133988.4	61657.97	86930.76	120859.2	30368.9
2021-10-13	115525.9	100952.9	24415.47	48530.7	134353.6	62051.37	87095.46	121467.6	30427.8
2021-10-14	115555.5	101024.1	24427.57	48546.47	134613	62504.39	87267.02	122121.8	30484.38
2021-10-15	115585.3	101090.9	24439.04	48558.68	134942.8	62837.01	87438.26	122770.6	30542.3
2021-10-16	115602.6	101136.5	24449.19	48568.99	135052.1	63155.41	87579.53	123398.3	30585.16
2021-10-17	115611.4	101165.4	24458.95	48575.88	135148	63435.23	87689.15	124053.6	30625.11
2021-10-18	115631.4	101209	24468.32	48579.38	135455	63674.84	87827.76	124769.9	30677.69
2021-10-19	115659.9	101270.8	24478.81	48586.91	135698.1	64054.07	88043.82	125406.3	30733.86
2021-10-20	115686.6	101344.2	24492.06	48596.75	135972.8	64510.12	88276.78	126118.9	30793.71
2021-10-21	115720.4	101423.6	24503.38	48605.41	136209.8	65047.04	88505.87	126874.6	30851.76
2021-10-22	115750.8	101486.2	24515.1	48614.02	136495.6	65615.77	88736.28	127590	30913.29
2021-10-23	115770.7	101541.8	24526.52	48621.5	136586.2	66172.03	88911.56	128249.5	30959.22
2021-10-24	115782.5	101563	24536.78	48626.5	136640.9	66672.67	89066.29	128817.5	30999.25
2021-10-25	115809.4	101599.6	24545.7	48628.93	136984.2	67031.95	89256.5	129349.4	31053.98
2021-10-26	115840.5	101662	24555.36	48634.44	137190.6	67494.65	89531.04	129987.2	31110.19
2021-10-27	115873	101742	24566.95	48642.3	137493.7	68037.16	89832.51	130632.3	31175.26
2021-10-28	115907.9	101805.9	24577.25	48651.18	137726.7	68660.55	90079.8	131205.4	31233.36
2021-10-29	115938	101865.2	24587.52	48659.09	138007.8	69302.74	90394.59	131838.2	31297.55
2021-10-30	115955.8	101912	24596.73	48664.04	138105.6	69929.57	90632.22	132435.3	31346.09
2021-10-31	115967.8	101940.6	24605.71	48667.87	138200.8	70354.99	90785.62	132987.6	31386.84

2021-11-01	115992.8	101962.2	24613.19	48669.64	138543.2	70700.48	90968.48	133573.1	31440.46
2021-11-02	116022.1	101989.9	24621.73	48672.45	138756.8	71172.93	91222.44	134065.9	31494.94
2021-11-03	116049.9	102066.1	24630.98	48678.18	139010.9	71736.09	91618.25	134664.1	31561.33
2021-11-04	116081.4	102128	24640.11	48683.49	139256.7	72391.24	92005.88	135202.8	31628.34
2021-11-05	116109.3	102188.8	24647.96	48689.14	139545.3	73026.34	92362.62	135698.5	31693.74
2021-11-06	116129.6	102241	24655.72	48695.1	139647.6	73628.82	92693.52	136140.5	31746.42
2021-11-07	116142.6	102267.4	24663.96	48698.51	139755.4	74055.73	92918.84	136578	31790.53
2021-11-08	116170.9	102299.6	24671.23	48700.45	140087.7	74382.66	93243.89	137051.1	31851.23
2021-11-09	116200.5	102354.8	24679.46	48704.53	140328.9	74846.21	93605.87	137531.8	31912.69
2021-11-10	116234.8	102424.8	24688.85	48709.61	140614.4	75408.6	94104.55	138111.6	31985.97
2021-11-11	116266.8	102497.4	24697.84	48715.54	140786.1	76004.96	94537.92	138736	32051.75
2021-11-12	116302.2	102565.6	24706.34	48722.08	141221.3	76585.63	94974.87	139308.4	32127.06
2021-11-13	116326.2	102609.3	24714.43	48727.18	141349.1	77155.26	95330.29	139860.6	32181.03
2021-11-14	116339.1	102629.4	24721.77	48731.54	141442.5	77516.3	95597.9	140390.3	32225.81
2021-11-15	116370.2	102642.3	24728.13	48733.81	141853.6	77792.64	96010.93	140973.8	32294.72
2021-11-16	116405.8	102672.9	24735.45	48738.35	142117.4	78195.57	96491.03	141515.6	32361.22
2021-11-17	116439.8	102734.2	24744	48747.78	142453.1	78652.91	97094.02	142073.8	32440.76
2021-11-18	116478.3	102787.5	24751.97	48757.52	142784.5	79154.67	97659.17	142762.7	32518.73
2021-11-19	116511.6	102845.3	24759.37	48770.66	143162.6	79644.03	98211.91	143413.9	32596.79
2021-11-20	116535.6	102883.7	24766.89	48785.44	143293.9	80092.05	98683.1	143998.6	32657.54
2021-11-21	116549.8	102907.5	24772.99	48796.88	143410.8	80364.81	99039.83	144577.1	32708.01
2021-11-22	116563.8	102926.8	24778.42	48802.08	143854.5	80562.94	99611.32	145237.1	32787.18
2021-11-23	116599.9	102985	24785.09	49111.63	144133	80881.02	100150.3	145865.1	32864.65
2021-11-24	116648.9	103042.2	24791.63	49132.86	144468.4	81233.66	100858	146490	32949.91
2021-11-25	116698.4	103099.6	24799.2	49173.92	144572.9	81644.85	101526.6	147178.4	33025.89
2021-11-26	116740.3	103150.5	24805.17	49221.02	144729.4	82031.39	102189.3	147904.9	33101.37
2021-11-27	116773.7	103189.3	24811.47	49274.64	144806	82377.11	102679.5	148485	33158.6
2021-11-28	116793.2	103205.8	24817.43	49322.24	144932.6	82566.79	103073.2	149020.2	33210.25
2021-11-29	116836.3	103226.8	24822.45	49360.1	145511.7	82716.19	103628.2	149646.3	33294.44
2021-11-30	116887.4	103274.9	24828.87	49432.93	145864.6	82974.14	104256.2	150232.9	33373.89
2021-12-01	116928.7	103332.3	24835.88	49575.52	146280.9	83264.04	104959.5	150928.7	33463.76
2021-12-02	116987.5	103388	24842.5	49767.63	146696.8	83589.87	105661.8	151710.4	33552.7
2021-12-03	117039.7	103437.6	24848.67	50035.03	147158.3	83920.95	106331.6	152455.4	33643.37
2021-12-04	117076.8	103472.3	24848.67	50307.61	147349.4	84238.57	106845.5	153063.2	33707.88
2021-12-05	117105.1	103494.2	24861.01	50492.89	147499	84404.47	107234.9	153697.8	33763.59
2021-12-06	117159.4	103522.3	24865.91	50599.17	148039.1	84520.53	107640.6	154451.8	33838.86
2021-12-07	117227.2	103569.7	24871.97	50818.13	148379.4	84732.31	108397	155116.5	33926.8
2021-12-08	117268.4	103617	24878.73	51148.6	148832.6	84959.95	108968.7	155861.4	34012.23
2021-12-09	117328.6	103657.9	24884.76	51521.47	149199.7	85256.36	109725.1	156598.6	34104.67
2021-12-10	117406.9	103690.9	24890.49	51838.2	149712.5	85528.22	110335.2	157454.1	34193.2
2021-12-11	117460.5	103703.5	24896.14	52123.88	149877	85772.22	110789.3	158220.6	34256.07
2021-12-12	117495	103711	24901.42	52754.69	150028.9	85903.84	111146.2	158925.4	34311.47
2021-12-13	117572	103724	24905.57	52976	150591.5	86005.6	111636.9	159716.4	34391.65

2021-12-14	117671.9	103744.4	24910.58	53373.34	150940.1	86183.11	112248.3	160592.4	34475.24
2021-12-15	117777.5	103768.2	24916.3	53812.85	151373	86377.77	112917.9	161735.4	34569.05
2021-12-16	117893.8	103785.3	24921.65	54225.65	151798.6	86605.94	113535.2	163022.7	34663.2
2021-12-17	118017.6	103805.7	24921.65	54570.62	152378.1	86817.94	114086.1	164382	34755.73
2021-12-18	118108.9	103816.8	24926.78	54838.43	152607.6	86997.53	114617.6	165687.9	34828.82
2021-12-19	118180.2	103823.6	24936.57	55096	152868.5	87087	114932.4	166889.5	34889.51
2021-12-20	118297.3	103835.9	24940.39	55237.75	153595.7	87151.74	115431.9	168243.8	34985.09
2021-12-21	118502	103853.4	24944.92	55494.62	154133.3	87296.24	116138.9	169553	35085.49
2021-12-22	118745.8	103868.5	24950.3	55846.01	154859.3	87447.82	116866.6	171101.6	35200.03
2021-12-23	119040.9	103886.1	24955.07	56198.37	155668	87621.13	117657.1	172901.5	35325.85
2021-12-24	119397.8	103903.3	24960.23	56512.26	156327.2	87778.21	118215.8	174687.3	35430.85
2021-12-25	119555.3	103920.5	24965.25	56759.22	156498.6	87903.62	118842.2	176474	35511.49
2021-12-26	119722.5	103943.7	24969.94	56852.54	157047	87972.36	119082.5	178217.8	35586.72
2021-12-27	120166.8	103976.2	24974.5	56915.46	158682	88019.25	120008.9	179796.8	35753.28
2021-12-28	120910.2	104018.5	24981.1	57035.65	159747.4	88074.9	121205.7	181820.5	35918.52
2021-12-29	121831.8	104064.1	24990.54	57185.87	161240.3	88204.1	122708	184525.1	36134.36
2021-12-30	122939.2	104123	25002.57	57402.02	163014.1	88344.19	124379.7	187295	36385.73
2021-12-31	123984.3	104170.7	25018.91	57597.79	164433.5	88509.48	125735.3	190088.6	36597.22
2022-01-01	124423.3	104188.3	25038.69	57760.89	164783.2	88628.45	126889.7	192472.1	36740.18
2022-01-02	124872.9	104196.8	25062.91	57833.45	165528.7	88674.65	127354.9	194450.5	36850.77
2022-01-03	125846.3	104251.2	25089.73	57884.69	168780.4	88719.6	129015.3	197198.2	37160
2022-01-04	127627	104340.8	25131.43	58019.22	171391.3	88763.06	131020.2	200441.6	37491.55
2022-01-05	129713.6	104340.8	25131.45	58204.19	173324.6	88871.44	133295.8	203294.9	37797.21
2022-01-06	132117	104340.8	25280.72	58368.38	175683.5	89027.17	135004.2	205942.9	38132.27

Table 3: Accumulated number of deaths per million in different regions for the period August 25, 2020 - January 6, 2021, [5].

	Argentina	Brazil	India	South Africa	United States	Ukraine	European Union	United Kingdom	World
2020-08-25	165.834	545.624	42.598	221.645	535.341	54.34	311.635	608.397	109.528
2020-08-26	171.886	550.666	43.399	224.876	538.879	55.192	311.74	608.632	110.361
2020-08-27	176.513	555.269	44.157	226.974	542.228	56.342	312.098	608.807	111.151
2020-08-28	181.358	559.237	44.89	228.89	545.055	57.492	312.384	608.939	111.892
2020-08-29	183.156	563.428	45.57	232.854	548.008	58.435	312.567	609.115	112.631
2020-08-30	185.437	565.302	46.267	233.636	549.356	59.241	312.717	609.13	113.173
2020-08-31	189.888	568.326	46.855	235.652	550.84	59.931	313.167	609.159	113.735
2020-09-01	195.567	573.7	47.605	237.55	554.027	61.058	313.621	609.203	114.573
2020-09-02	199.931	579.326	48.353	239.649	557.187	62.231	314.03	609.35	115.371
2020-09-03	205.259	583.378	49.14	242.547	560.284	63.474	314.399	609.541	116.146
2020-09-04	211.004	587.345	49.921	244.462	563.225	64.693	314.983	609.687	116.891
2020-09-05	213.547	590.168	50.686	246.144	565.688	65.866	315.231	609.863	117.541
2020-09-06	216.179	592.308	51.415	247.976	567.009	66.672	315.416	609.892	118.065
2020-09-07	222.099	593.803	52.228	249.892	567.971	67.408	315.859	609.936	119.285
2020-09-08	228.151	596.257	53.028	251.257	569.376	68.742	316.349	610.406	119.938
2020-09-09	233.698	601.663	53.869	252.623	572.696	69.8	316.767	610.523	120.732

2020-09-10	239.158	606.215	54.737	254.239	575.471	70.836	317.185	610.728	121.496
2020-09-11	244.442	610.178	55.599	256.121	578.943	72.055	317.67	610.816	122.258
2020-09-12	246.964	613.762	56.398	256.937	581.193	73.757	317.903	610.948	122.9
2020-09-13	248.916	615.654	57.214	257.27	582.395	74.517	318.104	611.021	123.401
2020-09-14	255.823	617.795	57.97	258.136	583.665	75.299	318.621	611.153	123.985
2020-09-15	259.879	622.851	58.896	260.501	587.276	76.518	319.39	611.549	124.82
2020-09-16	265.668	627.346	59.708	261.567	590.145	78.313	320.32	611.842	125.567
2020-09-17	273.211	631.407	60.551	262.683	592.746	79.716	321.063	612.15	126.283
2020-09-18	277.508	635.276	61.446	264.098	595.629	81.326	321.917	612.546	127.027
2020-09-19	280.644	638.459	62.259	265.481	597.765	82.477	322.23	612.942	127.702
2020-09-20	286.213	640.099	63.07	265.697	598.576	83.42	322.516	613.206	128.206
2020-09-21	295.62	642.277	63.825	266.347	599.817	84.018	323.239	613.367	128.766
2020-09-22	305.926	645.987	64.604	268.445	602.926	85.49	324.283	613.91	129.55
2020-09-23	315.223	650.342	65.414	269.911	606.125	87.055	325.128	614.452	130.381
2020-09-24	323.774	654.057	66.233	271.194	608.849	88.297	325.837	615.038	131.102
2020-09-25	333.466	657.899	67.015	271.677	611.597	89.954	326.805	615.537	131.866
2020-09-26	340.812	661.273	67.821	272.742	613.949	91.748	327.355	616.05	132.556
2020-09-27	345.329	662.857	68.567	273.109	614.887	93.036	327.689	616.299	133.044
2020-09-28	353.31	664.684	69.124	276.24	615.911	93.911	328.57	616.49	133.562
2020-09-29	362.213	668.693	69.97	277.589	618.62	95.567	329.187	617.531	134.337
2020-09-30	371.378	673.282	70.818	278.705	621.42	97.109	330.658	618.572	135.156
2020-10-01	444.855	676.895	71.604	280.903	624.171	98.65	331.609	619.437	136.287
2020-10-02	451.675	679.951	72.371	281.62	626.697	100.237	332.648	620.404	137.008
2020-10-03	455.972	682.698	73.045	282.103	628.758	102.4	333.165	621.123	137.609
2020-10-04	460.862	684.371	73.693	282.735	629.866	103.412	333.652	621.607	138.12
2020-10-05	470.729	686.208	74.328	283.402	631.314	104.217	334.594	621.885	139.018
2020-10-06	478.601	689.993	75.035	284.851	633.42	106.38	336.076	623	139.761
2020-10-07	487.35	693.381	75.732	287.266	636.18	108.289	337.219	624.026	140.509
2020-10-08	497.963	696.816	76.424	289.93	639.13	110.59	338.304	625.155	141.317
2020-10-09	509.255	699.872	77.089	292.245	642.053	112.707	339.686	626.43	142.103
2020-10-10	517.061	702.367	77.747	294.344	644.035	115.26	340.464	627.618	142.724
2020-10-11	523.354	703.666	78.333	296.126	645.438	117.285	341.126	628.571	143.247
2020-10-12	530.327	704.573	78.84	297.508	646.633	118.32	342.476	629.304	143.763
2020-10-13	538.791	706.339	79.364	300.257	648.967	120.874	343.872	631.4	144.452
2020-10-14	546.443	709.76	79.852	302.305	651.968	123.427	345.661	633.409	145.237
2020-10-15	555.675	713.564	80.494	304.937	654.506	125.222	347.291	635.432	146.023
2020-10-16	564.029	716.569	81.095	305.953	657.339	127.707	349.301	637.426	146.812
2020-10-17	572.449	718.508	81.836	306.585	659.802	130.421	350.444	639.625	147.535
2020-10-18	575.957	719.606	82.252	307.635	661.193	132.561	351.537	640.608	148.026
2020-10-19	585.802	721.13	82.673	307.984	662.664	134.217	353.409	641.781	148.627
2020-10-20	594.222	724.158	83.187	310.716	665.479	136.84	355.918	645.314	149.47
2020-10-21	603.41	726.826	83.691	312.132	669.005	140.176	358.286	648.114	150.341
2020-10-22	613.014	729.186	84.186	313.83	671.58	142.937	360.813	650.885	151.093

2020-10-23	621.368	731.817	84.653	314.63	674.433	145.766	363.667	654.169	151.989
2020-10-24	627.398	733.625	85.068	315.512	677.326	148.688	365.887	656.72	152.733
2020-10-25	633.603	734.714	85.412	315.912	678.702	151.058	367.296	658.934	153.274
2020-10-26	642.484	736.125	85.762	316.578	680.27	152.783	370.487	660.43	153.989
2020-10-27	651.89	738.583	86.127	317.328	683.306	155.751	374.673	665.81	154.936
2020-10-28	659.368	740.939	86.498	318.294	686.412	159.616	378.204	670.355	155.851
2020-10-29	667.502	743.513	86.902	319.177	689.425	162.377	382.017	674.46	156.766
2020-10-30	675.177	746.191	87.297	320.276	692.621	166.449	386.657	678.478	157.743
2020-10-31	679.782	747.556	87.635	321.042	695.418	170.222	390.232	683.257	158.58
2020-11-01	682.808	748.504	87.991	323.29	696.928	172.89	393.046	685.632	159.232
2020-11-02	693.398	749.275	88.342	324.19	698.602	174.478	397.565	687.626	160.016
2020-11-03	702.805	750.621	88.711	325.422	703.399	178.274	404.819	693.447	161.22
2020-11-04	713.067	753.509	89.216	326.188	706.763	182.944	412.972	700.66	162.51
2020-11-05	718.461	756.327	89.697	327.721	710.262	187.453	418.876	706.202	163.616
2020-11-06	726.574	757.593	90.111	328.92	713.909	192.285	426.081	711.407	164.772
2020-11-07	731.222	758.659	90.513	329.586	717.264	196.771	430.897	717.462	165.747
2020-11-08	735.871	759.547	90.864	329.919	718.955	200.038	434.645	719.749	166.521
2020-11-09	743.48	760.416	91.186	330.519	721.235	202.729	440.334	722.593	167.432
2020-11-10	749.531	761.341	91.553	332.284	725.488	207.469	449.024	730.393	168.71
2020-11-11	757.162	764.023	91.948	333.283	729.823	211.978	457.059	739.116	170.046
2020-11-12	762.666	768.383	92.34	334.366	733.439	216.763	463.671	747.371	171.289
2020-11-13	768.433	771.075	92.714	335.648	737.044	220.95	471.63	752.883	172.528
2020-11-14	774.177	774.505	93.034	336.531	741.168	225.597	477.327	759.657	173.678
2020-11-15	777.006	775.159	93.347	337.114	743.535	227.852	482.052	762.12	174.515
2020-11-16	783.387	776.36	93.669	338.33	745.98	230.107	488.935	765.243	175.523
2020-11-17	791.697	779.529	94.009	340.295	751.113	233.926	498.479	774.01	176.93
2020-11-18	796.982	783.052	94.429	342.36	756.947	239.976	506.941	781.766	178.384
2020-11-19	801.038	786.09	94.848	344.276	763.08	246.027	514.394	789.111	179.8
2020-11-20	806.695	788.487	95.253	345.741	768.935	251.433	523.938	796.603	181.294
2020-11-21	809.151	790.155	95.612	347.174	773.855	256.494	529.969	801.588	182.439
2020-11-22	811.344	790.987	95.979	348.14	777.042	259.784	534.652	807.423	183.382
2020-11-23	813.975	792.646	96.323	349.222	780.265	262.798	541.962	810.443	184.465
2020-11-24	820.772	795.576	96.669	351.138	786.681	267.307	552.425	819.357	186.081
2020-11-25	826.956	798.487	97.045	353.103	793.449	272.783	561.035	829.547	187.619
2020-11-26	831.933	801.805	97.398	354.568	797.663	278.166	569.653	836.848	189.017
2020-11-27	837.963	804.417	97.746	356.051	802.325	282.79	579.476	844.472	190.472
2020-11-28	840.287	806.959	98.102	357.067	806.404	287.231	585.805	851.495	191.646
2020-11-29	843.598	808.048	98.42	357.7	809.561	290.175	590.543	854.647	192.572
2020-11-30	849.234	809.688	98.766	358.666	813.502	292.89	597.815	857.623	193.706
2020-12-01	853.575	812.889	99.125	360.481	821.167	298.204	607.444	866.464	195.322
2020-12-02	858.575	816.062	99.503	361.564	829.668	302.3	616.177	875.964	196.93
2020-12-03	861.842	819.619	99.89	363.129	838.586	308.143	625.054	882.034	198.527
2020-12-04	866.381	822.787	100.258	365.794	846.432	313.826	634.048	889.423	200.107

2020-12-05	869.012	825.81	100.604	367.526	853.611	319.255	640.243	895.244	201.418
2020-12-06	872.038	827.399	100.884	369.841	857.825	323.327	644.959	898.631	202.397
2020-12-07	874.625	829.385	101.161	370.557	862.508	326.87	651.258	901.402	203.503
2020-12-08	877.278	833.114	101.449	373.605	870.267	331.586	659.677	910.184	205.063
2020-12-09	881.949	837.1	101.745	375.97	879.822	338.235	667.622	917.998	206.673
2020-12-10	886.532	840.694	102.041	378.851	888.791	344.654	676.104	925.563	208.281
2020-12-11	890.369	843.783	102.359	382.266	898.947	351.486	685.252	931.78	209.94
2020-12-12	891.728	846.947	102.64	384.831	906.556	357.238	691.545	939.403	211.301
2020-12-13	893.877	848.325	102.881	387.662	911.539	360.988	696.299	941.515	212.29
2020-12-14	899.907	850.722	103.135	390.577	916.492	363.312	702.867	944.916	213.454
2020-12-15	903.481	855.087	103.413	394.074	925.464	368.971	713.283	952.335	215.198
2020-12-16	907.011	859.484	103.667	396.839	936.677	375.321	722.592	961.307	216.959
2020-12-17	910.717	864.442	103.91	399.903	947.04	381.417	731.108	969.107	218.656
2020-12-18	913.743	868.26	104.159	404.467	955.877	387.606	740.256	976.291	220.294
2020-12-19	915.738	871.34	104.404	408.697	964.15	392.759	746.473	984.164	221.684
2020-12-20	916.835	873.298	104.643	411.229	969.463	395.727	750.679	988.944	222.711
2020-12-21	920.869	875.919	104.859	414.826	974.861	397.844	757.39	992.096	223.923
2020-12-22	926.504	880.448	105.098	420.472	984.768	403.411	767.021	1002.227	225.724
2020-12-23	927.82	884.957	105.322	427.318	994.917	410.037	775.623	1013.193	227.479
2020-12-24	927.82	888.509	105.563	432.747	1003.694	415.42	782.057	1021.624	228.98
2020-12-25	930.188	890.761	105.743	437.627	1008.215	419.975	786.444	1029.981	230.083
2020-12-26	931.92	892.144	105.943	441.708	1013.961	423.058	790.203	1033.059	231.041
2020-12-27	935.188	893.719	106.143	445.272	1018.281	424.968	794.032	1038.147	232.02
2020-12-28	939.968	896.233	106.324	450.868	1023.919	426.877	800.758	1043.381	233.249
2020-12-29	943.257	901.144	106.529	459.145	1034.78	432.537	811.512	1050.096	235.165
2020-12-30	946.436	906.832	106.744	466.89	1046.594	438.449	821.329	1064.493	237.149
2020-12-31	948.234	911.579	106.928	474.151	1056.588	443.58	828.44	1078.626	238.832
2021-01-01	949.857	913.771	107.088	481.113	1063.178	447.169	833.576	1087.643	240.06
2021-01-02	951.085	915.14	107.244	485.91	1070.985	448.572	837.465	1094.167	241.134
2021-01-03	953.431	916.594	107.398	492.605	1075.301	451.609	841.226	1100.824	242.102
2021-01-04	956.764	919.383	107.542	499.833	1081.249	453.495	848.096	1106.835	243.379
2021-01-05	960.075	924.935	107.731	508.378	1092.074	458.488	858.62	1119.707	245.337
2021-01-06	964.263	930.687	107.891	522.434	1103.861	464.055	866.723	1134.97	247.254

Table 4: Accumulated number of deaths per million in different regions for the period August 25, 2021 - January 6, 2022, [5].

	Argentina	Brazil	India	South Africa	United States	Ukraine	European Union	United Kingdom	World
2021-08-01	2319.265	2603.309	304.844	1202.342	1841.833	1278.607	1663.405	1903.115	536.896
2021-08-02	2325.251	2605.851	305.147	1206.439	1842.89	1279.045	1664.054	1903.467	537.92
2021-08-03	2334.066	2611.631	305.551	1215.682	1844.645	1280.126	1664.76	1905.52	539.237
2021-08-04	2340.644	2616.641	305.933	1222.728	1846.246	1281.598	1665.295	1907.279	540.573
2021-08-05	2346.696	2621.903	306.266	1230.355	1847.76	1282.702	1665.89	1908.555	541.967
2021-08-06	2350.862	2626.384	306.709	1238.333	1851.226	1283.554	1666.482	1909.903	543.298
2021-08-07	2352.814	2631.053	307.061	1242.847	1851.983	1284.566	1666.73	1911.414	544.395
2021-08-08	2356.256	2632.87	307.382	1246.011	1852.337	1285.279	1666.938	1911.985	545.34
2021-08-09	2367.263	2635.244	307.65	1249.326	1853.833	1285.808	1667.663	1912.528	546.449
2021-08-10	2371.737	2641.17	308.006	1252.473	1856.431	1286.89	1668.352	1914.668	547.923
2021-08-11	2376.626	2646.053	308.358	1262.017	1858.771	1287.81	1669.034	1916.193	549.256
2021-08-12	2380.595	2650.801	308.778	1269.894	1861.811	1288.822	1669.684	1917.586	550.595
2021-08-13	2385.989	2654.969	309.121	1276.29	1864.983	1290.294	1670.326	1919.052	551.916
2021-08-14	2388.642	2659.231	309.475	1280.254	1865.77	1291.238	1670.695	1920.416	553.018
2021-08-15	2390.945	2661.049	309.774	1284.784	1866.326	1291.997	1670.968	1921.281	553.954
2021-08-16	2392.348	2662.983	310.088	1289.764	1869.441	1292.71	1671.806	1921.662	555.196
2021-08-17	2398.926	2668.096	310.403	1298.974	1872.529	1293.791	1672.755	1924.154	556.562
2021-08-18	2404.342	2672.722	310.784	1305.37	1876.058	1295.172	1673.824	1925.782	557.928
2021-08-19	2408.486	2677.503	311.171	1310.649	1881.408	1296.437	1674.803	1927.453	559.395
2021-08-20	2413.508	2681.68	311.44	1315.463	1885.85	1297.518	1675.677	1929.124	560.727
2021-08-21	2416.731	2684.536	311.73	1319.926	1887.508	1298.853	1676.225	1930.649	561.852
2021-08-22	2419.691	2686.092	312.009	1322.757	1888.046	1299.796	1676.731	1931.367	562.824
2021-08-23	2425.326	2688.04	312.263	1325.472	1892.134	1300.44	1677.985	1931.969	564.109
2021-08-24	2429.646	2692.054	312.728	1331.618	1896.406	1301.521	1679.309	1934.52	565.513
2021-08-25	2433.154	2696.199	313.164	1340.212	1900.881	1302.511	1680.514	1936.704	566.953
2021-08-26	2436.465	2700.27	313.52	1346.158	1907.553	1304.029	1681.646	1938.771	568.428
2021-08-27	2439.82	2704.092	313.885	1352.17	1912.728	1306.031	1682.665	1940.237	569.735
2021-08-28	2441.004	2707.032	314.215	1356.734	1914.629	1307.825	1683.262	1942.187	570.81
2021-08-29	2442.298	2708.331	314.488	1358.965	1915.498	1309.044	1683.745	1943.082	571.663
2021-08-30	2447.209	2709.817	314.739	1362.879	1920.703	1309.827	1685	1943.786	572.873
2021-08-31	2451.704	2713.934	315.069	1370.058	1925.037	1311.437	1686.384	1944.519	574.038
2021-09-01	2455.936	2717.191	315.434	1373.972	1931.147	1312.863	1687.569	1947.553	575.622
2021-09-02	2460.103	2720.845	315.697	1380.933	1940.017	1314.313	1688.837	1950.163	577.048
2021-09-03	2463.633	2724.303	315.934	1385.047	1945.929	1315.762	1689.989	1951.937	578.405
2021-09-04	2465.562	2727.285	316.155	1388.078	1947.836	1316.774	1690.678	1953.697	579.383
2021-09-05	2467.031	2728.551	316.312	1389.344	1949.026	1317.948	1691.223	1954.693	580.21
2021-09-06	2470.584	2729.579	316.52	1392.642	1950.825	1318.684	1692.473	1955.353	581.229
2021-09-07	2474.487	2731.107	316.785	1397.339	1957.07	1320.363	1693.947	1958.417	582.559
2021-09-08	2476.921	2732.271	317.028	1401.552	1963.915	1322.204	1695.215	1961.218	583.834
2021-09-09	2479.925	2736.121	317.214	1404.467	1973.78	1324.044	1696.51	1963.666	585.211

2021-09-10	2483.937	2739.093	317.435	1409.147	1981.079	1326.253	1697.664	1965.821	586.374
2021-09-11	2485.56	2742.22	317.678	1411.529	1983.458	1328.254	1698.285	1968.108	587.432
2021-09-12	2486.568	2743.617	317.835	1413.627	1984.467	1329.106	1698.82	1968.93	588.137
2021-09-13	2491.787	2744.944	318.078	1415.709	1990.94	1329.681	1700.224	1969.839	589.291
2021-09-14	2495.646	2748.112	318.282	1420.706	1996.728	1332.35	1702.111	1972.551	590.551
2021-09-15	2499.001	2751.855	318.591	1423.47	2005.037	1334.926	1703.424	1975.498	591.878
2021-09-16	2501.895	2754.954	318.821	1428.65	2015.433	1337.71	1704.672	1977.814	593.211
2021-09-17	2505.952	2757.935	319.023	1431.531	2022.78	1340.448	1705.855	1980.439	594.354
2021-09-18	2507.728	2760.673	319.244	1434.263	2025.676	1342.702	1706.678	1982.843	595.177
2021-09-19	2509.066	2761.832	319.456	1435.229	2026.718	1344.06	1707.248	1983.664	595.946
2021-09-20	2511.039	2763.071	319.637	1435.928	2033.582	1345.325	1708.726	1984.382	596.986
2021-09-21	2512.377	2766.216	319.912	1438.593	2040.656	1348.822	1710.383	1987.359	598.168
2021-09-22	2514.679	2769.323	320.114	1440.658	2049.204	1351.698	1711.939	1989.792	599.429
2021-09-23	2516.608	2772.263	320.342	1443.24	2059.018	1354.941	1713.393	1992.461	600.668
2021-09-24	2517.836	2775.44	320.551	1448.436	2066.479	1358.576	1714.757	1995.1	601.784
2021-09-25	2518.297	2777.964	320.737	1449.002	2068.852	1362.004	1715.468	1996.888	602.472
2021-09-26	2518.582	2779.207	320.935	1449.852	2070.501	1363.822	1716.148	1997.812	603.161
2021-09-27	2520.599	2780.113	321.064	1452.583	2077.422	1366.191	1717.715	1998.399	604.138
2021-09-28	2522.441	2783.931	321.335	1455.931	2085.111	1369.78	1719.372	2000.847	605.333
2021-09-29	2524.458	2787.113	321.558	1455.931	2092.96	1375.026	1720.989	2003.046	606.523
2021-09-30	2525.533	2789.955	321.757	1459.412	2101.365	1379.903	1722.416	2005.055	607.643
2021-10-01	2526.541	2792.244	321.925	1460.728	2107.781	1384.136	1723.818	2006.917	608.735
2021-10-02	2526.848	2794.366	322.1	1461.527	2110.163	1389.105	1724.737	2008.691	609.48
2021-10-03	2526.98	2795.422	322.229	1461.977	2111.662	1392.188	1725.555	2009.321	610.021
2021-10-04	2527.813	2796.375	322.418	1462.626	2117.546	1394.949	1727.179	2009.805	610.932
2021-10-05	2528.69	2799.572	322.617	1464.342	2123.274	1402.679	1729.138	2012.239	611.875
2021-10-06	2529.918	2802.235	322.846	1465.324	2131.177	1410.478	1731.061	2014.365	613.052
2021-10-07	2530.729	2804.235	323.04	1467.373	2138.623	1418.024	1732.758	2016.153	614.175
2021-10-08	2531.343	2807.179	323.218	1469.571	2144.132	1423.914	1734.69	2017.986	615.137
2021-10-09	2531.65	2809.123	323.372	1470.504	2145.4	1429.987	1735.911	2020.273	615.75
2021-10-10	2531.979	2809.829	323.51	1470.92	2146.806	1434.013	1736.786	2020.83	616.342
2021-10-11	2532.374	2810.796	323.64	1471.403	2150.116	1439.029	1738.449	2021.241	617.074
2021-10-12	2533.602	2811.614	323.802	1472.786	2157.181	1447.564	1740.672	2023.894	618.106
2021-10-13	2534.369	2812.577	323.979	1473.402	2166.868	1458.906	1742.64	2025.888	619.224
2021-10-14	2535.488	2815.25	324.251	1474.068	2173.299	1468.867	1744.666	2028.19	620.243
2021-10-15	2536.08	2817.619	324.37	1475.001	2178.784	1473.952	1746.714	2030.272	621.161
2021-10-16	2536.145	2819.792	324.473	1475.417	2180.364	1480.831	1748.107	2032.442	621.828
2021-10-17	2536.211	2820.39	324.592	1475.834	2181.722	1486.26	1749.315	2033.278	622.37
2021-10-18	2537.044	2821.334	324.71	1475.95	2186.96	1490.723	1751.386	2033.937	623.19
2021-10-19	2537.768	2823.105	324.851	1476.866	2193.379	1503.653	1754.098	2037.207	624.241
2021-10-20	2538.492	2824.97	324.966	1478.199	2203	1515.547	1756.5	2039.831	625.346
2021-10-21	2539.062	2827.147	325.132	1479.548	2208.972	1528.683	1758.803	2041.547	626.323
2021-10-22	2539.566	2829.236	325.61	1480.48	2214.667	1543.407	1760.907	2044.186	627.364

2021-10-23	2539.654	2830.872	326.013	1480.863	2216.286	1555.14	1762.848	2046.165	628.102
2021-10-24	2539.72	2831.428	326.331	1481.047	2217.016	1564.596	1764.248	2047.22	628.676
2021-10-25	2540.268	2832.395	326.586	1481.197	2221.263	1572.809	1766.525	2047.778	629.521
2021-10-26	2540.597	2834.278	327.006	1482.079	2226.12	1590.408	1769.635	2051.633	630.525
2021-10-27	2541.101	2836.311	327.532	1483.112	2232.356	1607.065	1772.882	2054.668	631.69
2021-10-28	2541.693	2838.054	328.11	1484.028	2237.889	1621.352	1775.434	2057.102	632.777
2021-10-29	2542.11	2839.961	328.504	1484.811	2243.104	1636.674	1778.39	2059.829	633.803
2021-10-30	2542.263	2840.97	328.824	1485.011	2244.191	1649.764	1780.431	2062.263	634.563
2021-10-31	2542.438	2841.592	329.004	1485.244	2244.891	1658.115	1782.131	2063.348	635.132
2021-11-01	2543.294	2842.073	329.322	1485.277	2248.646	1665.684	1784.727	2063.934	635.931
2021-11-02	2543.754	2842.783	329.545	1485.577	2252.505	1682.571	1788.019	2068.215	636.86
2021-11-03	2544.171	2843.671	329.876	1485.96	2258.414	1699.871	1791.559	2071.397	637.924
2021-11-04	2544.741	2845.699	330.034	1486.476	2262.039	1716.643	1795.193	2074.534	638.903
2021-11-05	2545.355	2847.484	330.316	1487.209	2268.416	1733.414	1798.52	2077.364	639.993
2021-11-06	2545.53	2848.9	330.693	1487.609	2269.801	1752.486	1801.031	2079.636	640.824
2021-11-07	2545.815	2849.228	330.884	1487.825	2270.36	1763.575	1802.621	2080.545	641.392
2021-11-08	2546.67	2849.788	331.122	1488.158	2274.006	1775.055	1805.913	2081.381	642.241
2021-11-09	2547.153	2850.76	331.453	1488.741	2278.47	1794.863	1809.945	2085.222	643.287
2021-11-10	2547.569	2852.017	331.697	1489.541	2283.522	1814.372	1814.22	2088.36	644.323
2021-11-11	2548.118	2853.139	332.056	1489.824	2286.1	1830.085	1817.876	2091.219	645.301
2021-11-12	2548.403	2856.041	332.454	1490.107	2293.579	1848.076	1821.126	2093.345	646.446
2021-11-13	2548.534	2857.475	332.659	1490.224	2295.246	1864.733	1823.865	2095.647	647.239
2021-11-14	2548.622	2857.779	332.749	1490.357	2295.817	1874.579	1825.674	2096.57	647.824
2021-11-15	2549.017	2858.106	332.89	1490.44	2299.629	1885.3	1829.458	2097.259	648.711
2021-11-16	2549.981	2858.775	333.106	1490.69	2303.654	1905.2	1833.778	2100.397	649.687
2021-11-17	2550.398	2860.536	333.443	1490.873	2308.709	1923.513	1838.651	2103.344	650.855
2021-11-18	2551.012	2861.807	333.773	1491.539	2312.692	1941.55	1842.712	2106.261	651.906
2021-11-19	2551.429	2862.92	333.964	1491.656	2318.114	1958.988	1846.831	2108.563	652.927
2021-11-20	2551.736	2863.887	334.189	1491.822	2319.453	1975.001	1849.722	2110.762	653.697
2021-11-21	2551.801	2864.335	334.368	1491.856	2320.045	1984.502	1851.336	2111.657	654.27
2021-11-22	2551.911	2864.924	334.537	1492.022	2323.752	1992.669	1855.887	2112.316	655.19
2021-11-23	2552.635	2866.303	334.851	1492.872	2327.876	2010.062	1860.487	2114.735	656.213
2021-11-24	2553.577	2867.569	335.135	1493.238	2333.118	2024.51	1865.523	2116.92	657.313
2021-11-25	2554.06	2868.915	335.485	1495.137	2334.514	2039.809	1870.23	2119.075	658.306
2021-11-26	2554.608	2870.34	335.819	1495.337	2335.614	2054.602	1874.472	2121.421	659.165
2021-11-27	2554.871	2871.401	336.265	1495.47	2336.539	2068.497	1877.464	2123.342	659.911
2021-11-28	2555.134	2871.775	336.434	1495.57	2337.191	2078.482	1879.51	2124.089	660.514
2021-11-29	2555.682	2872.326	336.57	1495.986	2342.946	2086.028	1884.045	2124.602	661.501
2021-11-30	2556.45	2873.85	336.762	1496.336	2347.515	2099.716	1889.233	2126.948	662.51
2021-12-01	2556.625	2875.102	337.104	1496.802	2353.615	2113.336	1894.269	2129.455	663.677
2021-12-02	2557.064	2876.018	337.385	1497.535	2365.288	2126.173	1899.171	2131.523	664.954
2021-12-03	2557.546	2877.112	337.683	1498.018	2370.16	2138.643	1904.204	2133.619	666.034
2021-12-04	2557.634	2877.794	337.683	1498.368	2372.197	2149.363	1907.42	2135.481	666.731

2021-12-05	2557.7	2878.126	339.841	1498.385	2373.125	2156.449	1909.12	2136.273	667.661
2021-12-06	2558.445	2878.742	339.999	1498.534	2377.156	2162.615	1913.274	2136.889	668.55
2021-12-07	2558.95	2879.962	340.138	1498.984	2382.214	2174.049	1919.509	2139.528	669.598
2021-12-08	2559.059	2881.084	340.253	1499.584	2387.654	2185.092	1924.274	2141.917	670.624
2021-12-09	2559.3	2882.018	340.517	1499.95	2392.163	2196.572	1930.162	2144.087	671.738
2021-12-10	2559.936	2883.084	340.799	1500.283	2397.696	2207.477	1935.493	2145.847	672.768
2021-12-11	2560.199	2883.331	341.202	1500.883	2399.375	2218.405	1938.512	2147.782	673.517
2021-12-12	2560.441	2883.715	341.347	1501.233	2400.222	2224.57	1940.516	2148.544	674.091
2021-12-13	2560.901	2883.925	341.528	1501.416	2404.322	2229.517	1945.122	2149.101	674.921
2021-12-14	2561.647	2884.453	341.705	1501.815	2408.758	2239.133	1950.889	2151.301	675.898
2021-12-15	2562.326	2885.845	341.951	1502.715	2415.466	2248.013	1956.473	2153.705	677.056
2021-12-16	2562.699	2886.42	342.232	1503.314	2419.052	2256.825	1961.54	2155.86	677.98
2021-12-17	2563.094	2887.346	342.232	1503.897	2424.438	2265.015	1965.874	2157.517	678.856
2021-12-18	2563.247	2887.99	342.439	1504.697	2426.147	2272.285	1970.067	2159.35	679.614
2021-12-19	2563.335	2888.247	342.723	1504.747	2426.76	2276.955	1972.059	2160.009	680.153
2021-12-20	2563.927	2888.635	343.049	1506.496	2431.218	2281.119	1976.605	2160.64	681.025
2021-12-21	2564.431	2888.967	343.277	1507.078	2436.856	2289.746	1981.635	2163.176	681.996
2021-12-22	2564.672	2889.649	343.588	1508.727	2443.001	2297.292	1986.704	2165.243	683.03
2021-12-23	2565.001	2890.238	343.857	1509.976	2453.175	2304.263	1991.362	2167.399	684.195
2021-12-24	2565.637	2891	344.134	1511.326	2454.962	2310.567	1994.743	2169.407	684.925
2021-12-25	2565.9	2891.145	344.251	1511.825	2455.311	2317.331	1997.684	2169.554	685.446
2021-12-26	2566.229	2891.36	344.477	1512.508	2455.617	2321.104	1999.104	2169.598	685.886
2021-12-27	2566.909	2891.663	344.687	1512.758	2460.955	2324.739	2003.265	2171.694	686.719
2021-12-28	2567.326	2892.509	344.904	1513.174	2467.849	2328.489	2007.954	2171.973	687.642
2021-12-29	2567.896	2893.056	345.096	1514.523	2474.448	2336.219	2013.769	2172.823	688.643
2021-12-30	2568.663	2893.776	345.254	1516.622	2478.689	2343.097	2018.368	2177.691	689.583
2021-12-31	2569.168	2894.173	345.545	1518.021	2480.44	2348.642	2022.273	2180.667	690.398
2022-01-01	2569.431	2894.327	345.749	1518.904	2481.242	2353.519	2024.753	2182.925	690.918
2022-01-02	2569.935	2894.486	345.837	1519.403	2481.975	2356.303	2026.005	2183.995	691.303
2022-01-03	2570.834	2894.822	345.926	1520.802	2487.046	2359.455	2029.798	2184.611	692.047
2022-01-04	2571.908	2895.668	346.31	1523.117	2493.525	2363.113	2034.699	2185.329	693.032
2022-01-05	2573.049	2895.668	346.543	1524.949	2499.49	2369.946	2039.921	2190.373	694.016
2022-01-06	2573.926	2895.668	346.76	1534.126	2505.107	2374.8	2043.988	2193.759	694.932

Tables 5 and 6 represent the accumulated numbers of fully vaccinated people and boosters per hundred for the period of August 25, 2021 to January 6, 2022 for the same countries and regions according to [5]. Since the booster figures in Ukraine, India and

South Africa for this period were negligible, they are not listed in JHU statistics [5] and Table 6. We will use datasets from Tables 5 and 6 without any smoothing.

Table 5: Numbers of fully vaccinated persons per hundred in different regions for the period August 25, 2021 - January 6, 2022, [5].

	Argentina	Brazil	India	South Africa	United States	Ukraine	European Union	United Kingdom	World
2021-08-25	27.49	27.03	9.66		52.68	7.65	56.7	61.92	24.79
2021-08-26	28.32	27.48	9.78		52.8	7.93	56.98	62.13	26.37
2021-08-27	29.1	27.92	10.01	9.33	52.96	8.18	57.19	62.33	26.57
2021-08-28	29.87	28.23	10.22		53.06	8.31	57.37	62.52	26.69
2021-08-29	30.42	28.35	10.37		53.12	8.38	57.65	62.64	26.89
2021-08-30	30.99	28.69	10.49	9.69	53.25	8.61	57.89	62.74	27.03
2021-08-31	31.55	29.3	10.61	9.97	53.37	8.84	58.17	62.91	27.2
2021-09-01	32.42	29.79	10.9	10.23	53.49	9.03	58.42	63.08	27.39
2021-09-02	33.16	30.33	11.06	10.5	53.61	9.27	58.65	63.25	27.53
2021-09-03	34.01	30.89	11.19		53.76	9.54	58.83	63.41	27.65
2021-09-04	34.64	31.2	11.25		53.84	9.66	58.98	63.6	27.77
2021-09-05	35.29	31.3	11.42	10.81	53.89	9.73	59.24	63.71	27.91
2021-09-06	35.79	31.64	11.53		53.91	9.95	59.42	63.83	29.05
2021-09-07	36.72	31.79	11.75	11.24	54.06	10.18	59.63	63.95	29.21
2021-09-08	37.36	32.31	11.99		54.17	10.42	59.83	64.08	29.43
2021-09-09	38.08	32.99	12.22	11.47	54.29	10.67	60	64.22	29.63
2021-09-10	38.77	33.73	12.28	11.91	54.44	10.93	60.17	64.36	29.78
2021-09-11	39.49	34.14	12.52	11.97	54.53	11.03	60.3	64.5	29.94
2021-09-12	39.88	34.28	12.7	11.99	54.58	11.1	60.51	64.58	30.09
2021-09-13	40.07	34.76	12.94	12.21	54.69	11.28	60.65	64.67	30.25
2021-09-14	40.53	35.43	12.99	12.45	54.8	11.46	60.82	64.77	30.39
2021-09-15	41.09	35.98	13.24	12.67	54.92	11.57	60.98	64.86	31.08
2021-09-16	41.82	36.44	13.53	12.88	55.03	11.69	61.13	64.95	31.25
2021-09-17	42.54	37.17	13.73		55.17	11.81	61.25	65.04	31.38
2021-09-18	43.03	37.5	14.27		55.25	11.87	61.36	65.15	31.69
2021-09-19	43.51	37.61	14.54	13.18	55.3	11.9	61.54	65.2	31.83
2021-09-20	43.88	37.97	14.76		55.41	12.01	61.69	65.27	31.97
2021-09-21	44.46	38.54	15.03	13.5	55.51	12.12	61.83	65.33	32.14
2021-09-22	45.18	39.09	15.19	13.7	55.61	12.24	61.98	65.4	32.27
2021-09-23	45.7	39.66	15.5	13.9	55.7	12.37	62.11	65.46	32.43
2021-09-24	46.05	40.24	15.81	13.93	55.82	12.51	62.23	65.53	32.58
2021-09-25	46.52	40.56	15.97		55.89	12.57	62.33	65.6	32.69
2021-09-26	46.79	40.71	16.09	13.98	55.93	12.61	62.46	65.63	32.8
2021-09-27	47.03	41.04	16.47	14.16	56	12.72	62.56	65.68	33.04
2021-09-28	47.44	41.64	16.61		56.09	12.85	62.66	65.73	33.5
2021-09-29	47.97	42.18	16.82		56.18	12.97	62.78	65.78	33.63
2021-09-30	48.43	42.73	17.04	14.69	56.27	13.1	62.88	65.83	33.8
2021-10-01	48.98	43.35	17.26		56.38	13.23	62.97	65.88	33.92
2021-10-02	49.53	43.67	17.51		56.44	13.29	63.04	65.93	34.04
2021-10-03	49.9	43.77	17.68	15.11	56.48	13.33	63.14	65.96	34.15

2021-10-04	50.18	44.08	17.86		56.56	13.44	63.22	66.01	34.3
2021-10-05	50.49	44.51	18.09	15.6	56.63	13.57	63.29	66.05	34.51
2021-10-06	50.85	45.02	18.27	15.87	56.71	13.72	63.37	66.09	34.65
2021-10-07	51.27	45.51	18.39		56.78	13.87	63.45	66.13	34.81
2021-10-08	51.67	46.01	18.66	16.13	56.87	14.04	63.53	66.18	34.99
2021-10-09	51.91	46.3	18.93		56.92	14.12	63.59	66.22	35.12
2021-10-10	52.22	46.51	19.21		56.95	14.16	63.67	66.25	35.29
2021-10-11	52.47	46.77	19.35	16.51	57.02	14.31	63.76	66.29	35.42
2021-10-12		46.88	19.57		57.09	14.48	63.85	66.33	35.56
2021-10-13	52.7	47.13	19.73	17.02	57.15	14.66	63.93	66.37	35.68
2021-10-14	52.99	47.79	19.82		57.22	14.69	64.01	66.41	35.81
2021-10-15	53.3	48.38	19.93	17.55	57.3	14.85	64.1	66.45	35.92
2021-10-16	53.75	48.75	20		57.34	14.93	64.16	66.5	35.99
2021-10-17		48.89	20.15	17.92	57.37	14.98	64.23	66.53	36.13
2021-10-18		49.17	20.26		57.43	15.17	64.29	66.56	36.31
2021-10-19	54.29	49.7	20.6	18.38	57.49	15.37	64.36	66.61	36.47
2021-10-20	54.59	50.27	20.92		57.54	15.56	64.45	66.65	36.64
2021-10-21	54.73	50.56	21.07		57.6	15.76	64.53	66.69	36.79
2021-10-22	55.04	50.93	21.35		57.67	15.96	64.6	66.73	36.94
2021-10-23	55.32	51.13	21.5	19.23	57.71	16.07	64.67	66.77	37.34
2021-10-24	55.5	51.38	21.86		57.74	16.13	64.73	66.8	37.49
2021-10-25	55.56	52.13	21.94	19.48	57.8	16.29	64.79	66.83	37.61
2021-10-26	55.8	52.61	22.23		57.86	16.47	64.87	66.86	37.75
2021-10-27	56.08	53.11	22.47		57.92	16.65	64.95	66.9	37.87
2021-10-28	56.3	53.56	22.74		57.98	16.82	65.03	66.93	38.03
2021-10-29	56.63	54	23.15		58.05	17.02	65.11	66.96	38.3
2021-10-30	56.77	54.16	23.44	20.49	58.08	17.12	65.16	67	38.47
2021-10-31	56.91	54.26	23.62	20.51	58.1	17.19	65.21	67.02	38.69
2021-11-01	56.98	54.34	23.83		58.16	17.34	65.24	67.05	38.81
2021-11-02	57.1	54.39	23.92	20.88	58.22	17.52	65.31	67.08	38.92
2021-11-03	57.16	54.68	24.15	21.02	58.27	17.72	65.38	67.11	39.04
2021-11-04	57.81	55.11	24.24	21.21	58.33	17.91	65.45	67.14	39.17
2021-11-05		55.72	24.27		58.4	18.13	65.52	67.17	39.34
2021-11-06	58.06	55.92	24.39	21.32	58.43	18.23	65.57	67.2	39.42
2021-11-07	58.41	56.03	24.54	21.34	58.45	18.31	65.61	67.23	39.53
2021-11-08	58.59	56.49	24.79	21.54	58.5	18.54	65.66	67.26	39.65
2021-11-09	58.73	56.89	24.99	21.7	58.55	18.81	65.73	67.29	39.79
2021-11-10	58.93	57.31	25.28	21.86	58.6	19.11	65.8	67.36	39.94
2021-11-11	59.16	57.76	25.54		58.65	19.42	65.86	67.39	40.11
2021-11-12	59.4	58.14	26	22.19	58.7	19.8	65.93	67.42	40.28
2021-11-13	59.65	58.35	26.39	22.28	58.73	19.98	65.99	67.46	40.45
2021-11-14	59.95	58.47	26.57	22.32	58.75	20.11	66.04	67.48	40.58
2021-11-15	60.26	58.63	26.77	22.47	58.8	20.49	66.1	67.51	40.69

2021-11-16		58.84	27.1	22.62	58.85	20.91	66.17	67.54	40.81
2021-11-17	61.08	59.33	27.47	22.77	58.9	21.35	66.24	67.57	40.95
2021-11-18		59.65	27.86	22.92	58.95	21.79	66.31	67.6	41.12
2021-11-19	61.99	59.99	28.09		59.01	22.27	66.38	67.63	41.28
2021-11-20	62.23	60.21	28.59	23.1	59.04	22.51	66.43	67.67	41.44
2021-11-21	62.36	60.38	28.78	23.11	59.06	22.67	66.48	67.69	41.57
2021-11-22	62.5	60.67	29.15	23.23	59.11	23.11	66.53	67.72	41.71
2021-11-23	62.81	61	29.55	23.37	59.15	23.57	66.59	67.75	41.84
2021-11-24		61.32	30.05	23.51	59.2	24.02	66.66	67.78	42.01
2021-11-25	63.57	61.55	30.29		59.2	24.46	66.73	67.82	42.13
2021-11-26		61.87	30.87	23.76	59.25	24.91	66.8	67.85	42.28
2021-11-27	64.11	62	30.96	23.8	59.31	25.14	66.87	67.9	42.39
2021-11-28	64.29	62.1	31.47		59.35	25.28	66.92	67.94	42.56
2021-11-29	64.71	62.17	31.73	23.96	59.46	25.64	67.08	67.98	43.12
2021-11-30	65.15	62.58	32.15	24.11	59.57	26	67.14	68.03	43.29
2021-12-01	65.46	62.92	32.57	24.25	59.69	26.31	67.21	68.07	43.46
2021-12-02	65.79	63.24	33.11	24.68	59.8	26.62	67.28	68.12	44.06
2021-12-03	66.09	63.76	33.4		59.94	26.94	67.36	68.16	44.36
2021-12-04	66.25	63.94	34.02	24.87	60.07	27.11	67.42	68.22	44.54
2021-12-05	66.36	63.98	34.26	24.9	60.13	27.21	67.47	68.26	44.66
2021-12-06		64.19	34.51	25.02	60.22	27.47	67.53	68.3	44.77
2021-12-07	66.65	64.44	34.92	25.16	60.32	27.75	67.6	68.34	44.89
2021-12-08	67.18	64.6	35.32	25.29	60.42	28	67.67	68.38	45.07
2021-12-09		64.92	35.75		60.52	28.24	67.75	68.43	45.27
2021-12-10	67.69	65.11	35.95	25.53	60.63	28.49	67.84	68.48	45.86
2021-12-11	67.85	65.14	36.75		60.72	28.62	67.91	68.53	46.09
2021-12-12	67.94	65.15	36.94	25.58	60.76	28.71	67.96	68.58	46.25
2021-12-13	68.18	65.32	37.14	25.67	60.84	28.91	68.02	68.62	46.36
2021-12-14	68.48	65.49	37.7	25.77	60.92	29.13	68.1	68.68	46.55
2021-12-15	68.76	65.84	38.03	25.87	61	29.35	68.19	68.73	46.7
2021-12-16	68.98	65.97	38.25	25.96	61.04	29.55	68.28	68.8	46.8
2021-12-17	69.19	66.08	38.74		61.12	29.77	68.38	68.86	47.27
2021-12-18	69.32	66.11	39.16		61.16	29.87	68.45	68.93	47.39
2021-12-19	69.4	66.12	39.34	25.98	61.19	29.93	68.5	68.98	47.58
2021-12-20	69.61	66.22	39.54		61.25	30.1	68.57	69.06	47.77
2021-12-21		66.32	40	26.12	61.32	30.28	68.66	69.14	47.9
2021-12-22	69.88	66.53	40.14		61.38	30.46	68.75	69.22	47.99
2021-12-23	70.15		40.54		61.43	30.64	68.81	69.28	48.12
2021-12-24	70.45		40.89	26.25	61.45	30.82	68.83	69.3	48.25
2021-12-25			41.4		61.45	30.86	68.84	69.3	48.48
2021-12-26	70.45		41.44	26.26	61.47	30.91	68.85	69.31	48.55
2021-12-27	70.5	66.71	41.63	26.26	61.54	30.98	68.92	69.34	48.64
2021-12-28	71.07	66.81	42.05	26.32	61.6	31.2	69.01	69.38	48.87

2021-12-29		66.96	42.55	26.37	61.67	31.39	69.08	69.45	49.01
2021-12-30	71.57	67.01	42.74		61.72	31.56	69.14	69.51	49.12
2021-12-31	71.61	67.03	43.29		61.75	31.65	69.16	69.54	49.26
2022-01-01	71.61	67.03	43.57	26.43	61.75	31.65	69.17	69.55	49.35
2022-01-02	71.66	67.04	43.7	26.44	61.78	31.65	69.26	69.57	49.39
2022-01-03		67.16	43.92	26.49	61.83	31.71	69.33	69.62	49.49
2022-01-04	72.09	67.18	44.1	26.61	61.86	31.88	69.42	69.68	49.61
2022-01-05		67.23	44.33		61.87	32.04	69.51	69.74	49.69
2022-01-06	72.33		44.56		61.87	32.14	69.54		49.77

Table 6. Numbers of boosters per hundred in different regions for the period August 25, 2021 - January 6, 2022, [5].

	Argentina	Brazil	United States	European Union	United Kingdom	World
2021-08-01				0.03		0.1
2021-08-02				0.03		0.1
2021-08-03				0.03		0.1
2021-08-04				0.03		0.1
2021-08-05				0.03		0.11
2021-08-06				0.03		0.11
2021-08-07				0.03		0.11
2021-08-08				0.03		0.11
2021-08-09				0.03		0.12
2021-08-10				0.03		0.12
2021-08-11				0.03		0.13
2021-08-12				0.03		0.13
2021-08-13			0	0.03		0.14
2021-08-14			0.01	0.03		0.14
2021-08-15			0.02	0.03		0.14
2021-08-16			0.05	0.03		0.15
2021-08-17			0.08	0.04		0.16
2021-08-18			0.11	0.04		0.17
2021-08-19			0.15	0.04		0.18
2021-08-20			0.18	0.04		0.18
2021-08-21			0.2	0.04		0.19
2021-08-22			0.21	0.04		0.19
2021-08-23			0.24	0.04		0.2
2021-08-24			0.27	0.04		0.2
2021-08-25			0.3	0.04		0.21
2021-08-26			0.33	0.04		0.22
2021-08-27			0.37	0.04		0.22
2021-08-28			0.39	0.04		0.22
2021-08-29			0.4	0.04		0.23
2021-08-30			0.43	0.04		0.23
2021-08-31			0.46	0.12		0.24

2021-09-01			0.49	0.13		0.25
2021-09-02		0	0.53	0.15		0.26
2021-09-03		0	0.56	0.16		0.27
2021-09-04		0	0.57	0.16		0.27
2021-09-05		0	0.58	0.17		0.27
2021-09-06		0.01	0.58	0.19		0.28
2021-09-07		0.01	0.61	0.2		0.28
2021-09-08		0.01	0.64	0.22		0.29
2021-09-09		0.02	0.67	0.24		0.3
2021-09-10		0.02	0.7	0.26		0.3
2021-09-11		0.03	0.71	0.26		0.31
2021-09-12		0.03	0.72	0.27		0.31
2021-09-13		0.04	0.74	0.29		0.31
2021-09-14		0.06	0.76	0.31		0.32
2021-09-15		0.09	0.79	0.34		0.33
2021-09-16		0.1	0.81	0.38		0.33
2021-09-17		0.12	0.84	0.4		0.34
2021-09-18		0.12	0.85	0.41		0.34
2021-09-19		0.12	0.86	0.42		0.34
2021-09-20		0.16	0.88	0.44		0.35
2021-09-21		0.18	0.91	0.48		0.36
2021-09-22		0.2	0.93	0.51		0.36
2021-09-23		0.21	0.96	0.55		0.37
2021-09-24		0.24	1.04	0.58		0.39
2021-09-25		0.25	1.11	0.59		0.39
2021-09-26		0.26	1.15	0.6		0.4
2021-09-27		0.38	1.3	0.63		0.41
2021-09-28		0.41	1.46	0.67		0.43
2021-09-29		0.44	1.62	0.71		0.44
2021-09-30		0.51	1.78	0.75	1.27	0.47
2021-10-01		0.61	1.96	0.78	1.5	0.49
2021-10-02		0.66	2.03	0.8	1.78	0.5
2021-10-03		0.68	2.07	0.8	1.91	0.5
2021-10-04		0.77	2.21	0.84	2.1	0.52
2021-10-05		0.88	2.37	0.95	2.33	0.55
2021-10-06		1.01	2.52	1.01	2.56	0.57
2021-10-07		1.17	2.67	1.07	2.82	0.59
2021-10-08		1.32	2.83	1.13	3.08	0.61
2021-10-09		1.42	2.9	1.15	3.45	0.63
2021-10-10		1.46	2.93	1.18	3.58	0.63
2021-10-11		1.53	3.05	1.22	3.77	0.65
2021-10-12		1.55	3.19	1.28	4.01	0.66
2021-10-13		1.66	3.32	1.35	4.68	0.69

2021-10-14		1.75	3.46	1.43	5.03	0.71
2021-10-15		1.91	3.61	1.49	5.36	0.73
2021-10-16		2.02	3.67	1.51	5.81	0.75
2021-10-17		2.07	3.7	1.54	5.98	0.75
2021-10-18		2.26	3.82	1.6	6.24	0.77
2021-10-19		2.4	3.94	1.67	6.58	0.79
2021-10-20		2.58	4.07	1.77	6.96	0.82
2021-10-21		2.7	4.21	1.85	7.85	0.85
2021-10-22		2.86	4.45	1.93	8.29	0.88
2021-10-23		2.91	4.6	1.97	8.84	0.9
2021-10-24		2.96	4.69	1.99	9.09	0.91
2021-10-25		3.21	4.98	2.27	9.44	0.95
2021-10-26		3.43	5.29	2.37	9.83	0.99
2021-10-27		3.61	5.62	2.56	10.26	1.02
2021-10-28		3.79	5.94	2.7	10.69	1.06
2021-10-29		3.99	6.3	2.8	11.11	1.1
2021-10-30		4.06	6.45	2.87	11.66	1.12
2021-10-31		4.11	6.53	2.89	11.9	1.13
2021-11-01		4.15	6.81	2.95	12.25	1.15
2021-11-02		4.18	7.11	3.08	12.69	1.19
2021-11-03		4.33	7.42	3.26	13.21	1.23
2021-11-04		4.45	7.74	3.44	13.7	1.27
2021-11-05		4.65	8.1	3.59	14.18	1.79
2021-11-06		4.74	8.25	3.66	14.8	1.81
2021-11-07		4.75	8.33	3.74	15.1	1.83
2021-11-08		4.93	8.57	3.9	15.51	1.87
2021-11-09		5.09	8.84	4.15	16.01	1.91
2021-11-10		5.25	9.14	4.39	16.79	1.96
2021-11-11		5.41	9.4	4.62	17.33	2
2021-11-12		5.58	9.73	4.81	17.86	2.19
2021-11-13		5.66	9.88	4.91	18.54	2.22
2021-11-14		5.68	9.97	5.02	18.86	2.23
2021-11-15	1.96	5.77	10.23	5.26	19.28	2.28
2021-11-16		5.86	10.53	5.53	19.79	2.33
2021-11-17	2.29	6.02	10.84	5.87	20.35	2.38
2021-11-18		6.2	11.16	6.19	20.92	2.44
2021-11-19	2.64	6.39	11.54	6.48	21.45	2.7
2021-11-20	2.77	6.49	11.73	6.63	22.13	2.73
2021-11-21	2.84	6.56	11.84	6.77	22.48	2.75
2021-11-22	2.91	6.73	12.17	7.13	22.93	2.81
2021-11-23	3.11	6.89	12.5	7.52	23.46	2.87
2021-11-24		7.05	12.74	7.94	24.02	2.92
2021-11-25	3.49	7.16	12.74	8.51	24.6	2.98

2021-11-26		7.32	12.95	8.91	25.14	3.03
2021-11-27	3.88	7.38	13.08	9.28	25.82	3.08
2021-11-28	3.94	7.43	13.17	9.47	26.24	3.11
2021-11-29	4.14	7.46	13.44	10	26.71	3.17
2021-11-30	4.36	7.73	13.77	10.5	27.28	3.24
2021-12-01	4.67	7.88	14.13	11.15	27.88	3.32
2021-12-02	4.99	8.05	14.51	11.79	28.5	3.39
2021-12-03	5.22	8.26	14.92	12.4	29.07	3.87
2021-12-04	5.38	8.4	15.13	12.91	29.75	3.93
2021-12-05	5.46	8.42	15.24	13.14	30.17	3.97
2021-12-06		8.63	15.55	13.74	30.66	4.04
2021-12-07	5.65	8.86	15.88	14.33	31.23	4.11
2021-12-08	5.96	9.03	16.21	15	31.84	4.2
2021-12-09		9.28	16.55	15.67	32.53	4.29
2021-12-10	6.43	9.49	16.91	16.41	33.15	4.69
2021-12-11	6.6	9.56	17.09	17.05	33.96	4.76
2021-12-12	6.71	9.6	17.19	17.95	34.54	4.84
2021-12-13	6.99	9.8	17.47	18.58	35.3	4.92
2021-12-14	7.28	10.01	17.77	19.43	36.26	5.03
2021-12-15	7.68	10.17	18.07	20.29	37.35	5.14
2021-12-16	8.03	10.41	18.39	21.13	38.62	5.26
2021-12-17	8.37	10.6	18.74	21.86	39.87	5.37
2021-12-18	8.56	10.66	18.93	22.56	41.24	5.5
2021-12-19	8.7	10.68	19.04	23	42.49	5.59
2021-12-20	9.05	10.9	19.36	23.67	43.8	5.71
2021-12-21		11.11	19.71	24.44	45.22	5.85
2021-12-22	9.39	11.34	20.03	25.18	46.45	5.97
2021-12-23	9.72	11.54	20.28	26.18	47.34	6.11
2021-12-24	9.98		20.34	26.34	47.59	6.15
2021-12-25			20.34	26.6	47.61	6.18
2021-12-26	10		20.42	26.77	47.64	6.22
2021-12-27	10.07	11.78	20.66	27.25	48.04	6.31
2021-12-28	11.01	12.04	20.94	27.91	48.52	6.42
2021-12-29		12.25	21.2	28.47	49.15	6.52
2021-12-30	12.1	12.39	21.44	28.96	49.74	6.61
2021-12-31	12.22	12.42	21.54	29.12	49.98	6.66
2022-01-01	12.26	12.42	21.55	29.53	50.01	6.69
2022-01-02	12.46	12.43	21.62	29.78	50.17	6.73
2022-01-03		12.63	21.79	30.27	50.38	6.8
2022-01-04	13.83	12.92	21.93	30.9	50.71	6.89
2022-01-05		13.18	21.95	31.46	51.07	6.98
2022-01-06	14.58		21.95	31.68		7.03

Results and Discussion

The DCC values calculated with the use of (1), (2) and datasets presented in Tables 1 and 2 are shown in Figs. 1 and 2 for northern and southern regions, respectively. Dashed and solid lines correspond to the years 2020 and 2021, respectively. The vaccination levels from Tables 5 and 6 are represented by “circles” and “crosses”, respectively. Fig. 1 illustrates that for the Nordic countries and the world as a whole, the DCC values in 2021 mostly exceeded the corresponding numbers in 2020, despite the relatively high levels of vaccinations (compare solid and dashed lines). The case of the United Kingdom is particularly significant, where the DCC values differed 1.5-25 times at the highest percentages of vaccinated individuals and persons who received a booster dose of a vaccine. These facts support once more the conclusion of statistical analysis performed in [7] that existing vaccines cannot prevent new infections and vaccinated people can spread the infection as intensively as non-vaccinated ones. Probably, it is connected with new strains of coronavirus and limited in time effectiveness of antibodies.

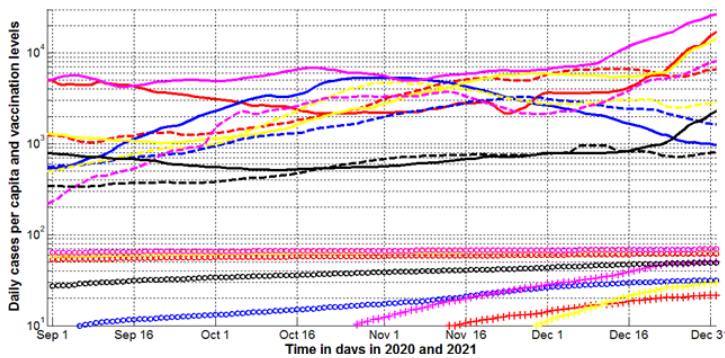


Figure 1: Averaged daily number of new cases per capita and vaccination levels for northern region in September-December, 2020 and 2021 (Ukraine – blue, EU- yellow, USA – red, UK – magenta, the whole world –black).

Lines correspond to $DCC \cdot 10$ values calculated with the use of eqs. (1), (2), Table 1 (2020, dashed), and Table 2 (2021, solid). “Circles” and “crosses” show the numbers of fully vaccinated people and boosters per hundred, respectively (2021, Tables 5 and 6).

Opposite trend is visible in Fig. 2 for India, Brazil and Argentina (DCC values in 2020 mostly exceeded the corresponding numbers in 2021, compare solid and dashed yellow, green and blue lines, respectively). In June and July (cold season for southern countries) the DCC values were higher in 2021 in comparison with 2020 for these countries (including South Africa), [6]. Probably we see the influence of seasonal factor, since the vaccination levels in Southern countries were much lower than in the Northern ones (compare corresponding markers in Figs. 1 and 2).

Probably, a new omicron strain is responsible for very sharp increase of DCC values in South Africa after November 12, 2021 (see the solid magenta line in Fig. 2). Later the omicron caused sharp increase in DCC values in Argentina (see the solid blue line in Fig. 2), the UK (see the solid magenta line in Fig. 1), USA (see the solid red line in Fig. 1), and the whole world (see the solid black line in Figs. 1 and 2). New strains are probably the reason of the sharp increase of DCC values in Ukraine (see the solid blue line in Fig. 1) and India (see the solid yellow line in Fig. 2). Since the new severe epidemic wave in Ukraine started in September 2021, it is not connected with the omicron.

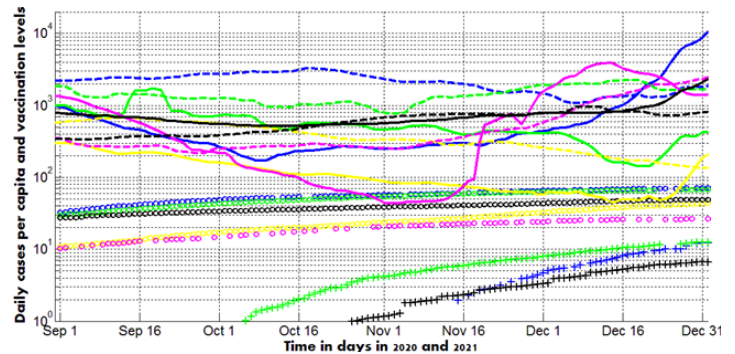


Figure 2: Averaged daily number of new cases per capita and vaccination levels for southern region in September-December, 2020 and 2021 (Argentina – blue, India - yellow, Brazil – green, South Africa – magenta, the whole world –black).

Lines correspond to $DCC \cdot 10$ values calculated with the use of eqs. (1), (2), Table 1 (2020, dashed), and Table 2 (2021, solid). “Circles” and “crosses” show the numbers of fully vaccinated people and boosters per hundred, respectively (2021, Tables 5 and 6).

Fig. 3 and 4 illustrate the influence of vaccination levels on the daily numbers of deaths per capita. In October-November 2021 the DDC values became smaller than corresponding values in 2020 for UK, USA, EU and the whole world (compare solid and dashed magenta, red, yellow, and black lines in Fig. 3) These countries and regions have much higher vaccination levels than Ukraine (see markers in Fig. 3), where DDC values in 2021 were much higher than in 2020 (compare blue solid and dashed lines in Fig. 3). In Argentina and Brazil the DDC values were smaller in 2021 in comparison with 2020 (compare solid and dashed blue and green line in Fig. 4). In less vaccinated India and South Africa (see markers in Fig. 4), DDC values in 2021 were sometimes higher than in 2020 (compare solid and dashed yellow and magenta lines in Fig. 4). These facts support the conclusion of paper [7] that vaccinations can diminish the numbers of death per capita. The efficiency of boosters needs special statistical analysis.

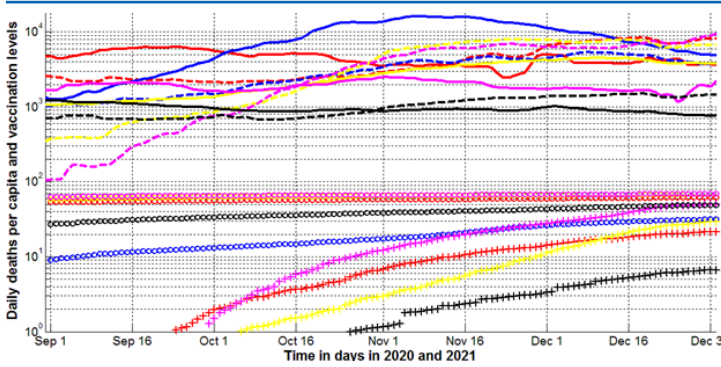


Figure 3: Averaged daily number of deaths per capita and vaccination levels for northern region in September-December, 2020 and 2021 (Ukraine – blue, EU- yellow, USA – red, UK – magenta, the whole world –black).

Lines correspond to $DDC \cdot 1000$ values calculated with the use of eqs. (1), (2), Table 3 (2020, dashed), and Table 4 (2021, solid). “Circles” and “crosses” show the numbers of fully vaccinated people and boosters per hundred, respectively (2021, Tables 5 and 6).

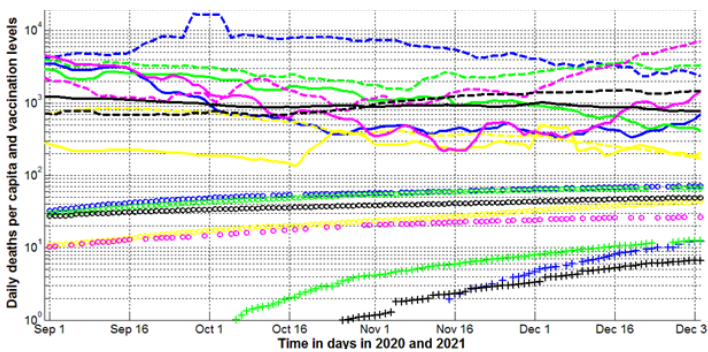


Figure 4: Averaged daily number of new cases per capita and vaccination levels for southern region in September-December, 2020 and 2021 (Argentina – blue, India - yellow, Brazil – green, South Africa – magenta, the whole world –black).

Lines correspond to $DDC \cdot 1000$ values calculated with the use of eqs. (1), (2), Table 3 (2020, dashed), and Table 4 (2021, solid). “Circles” and “crosses” show the numbers of fully vaccinated people and boosters per hundred, respectively (2021, Tables 5 and 6).

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