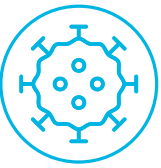
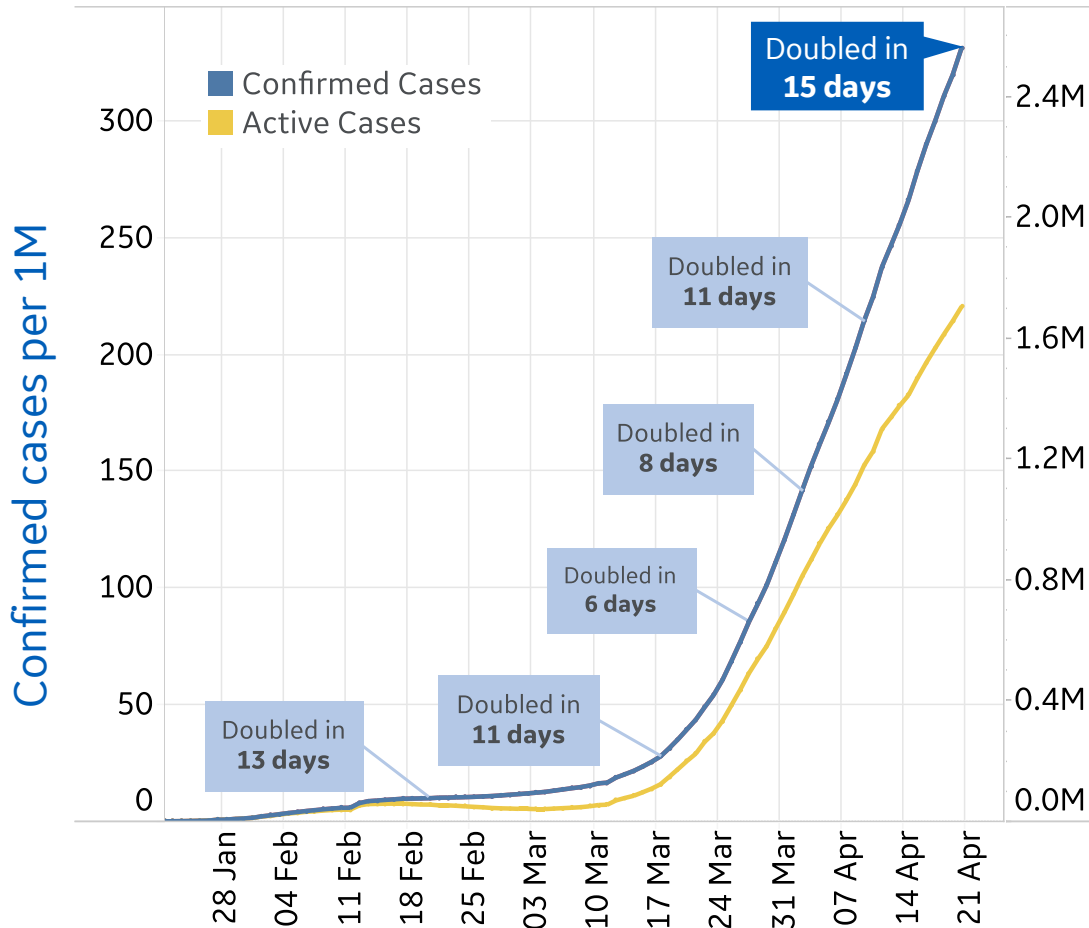


Global Confirmed & Active Cases

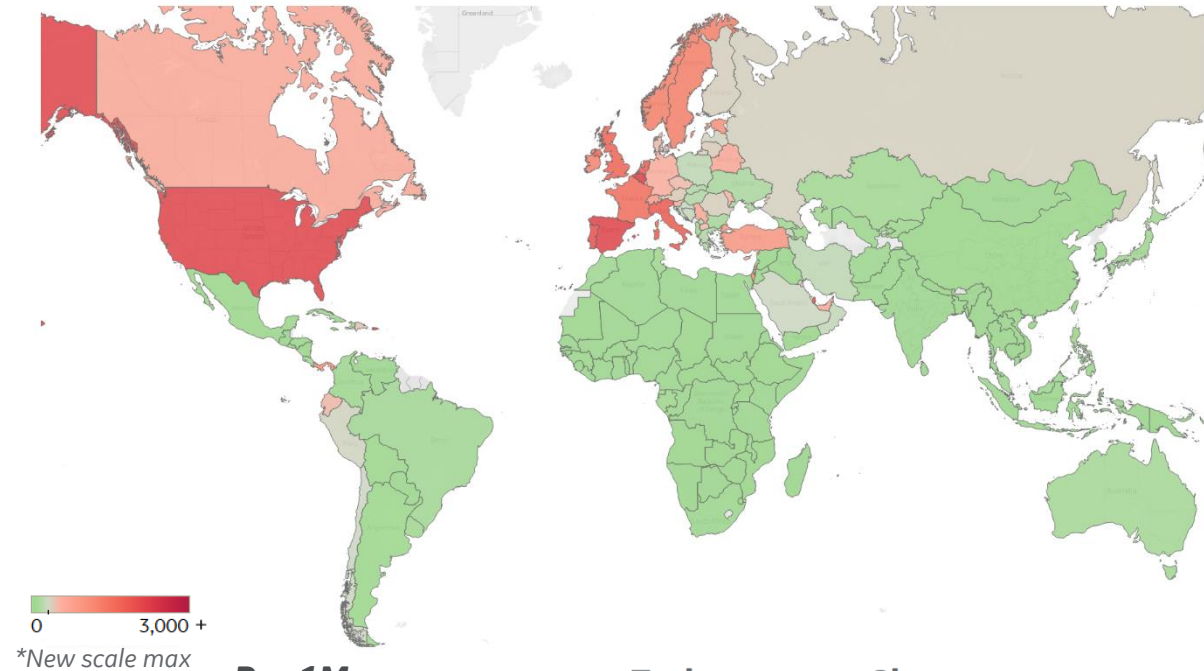


Trend since 22 Jan



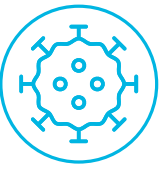
Today per 1M

Active cases = Confirmed - Recovered - Deaths



Per 1M:	Today	Change
Active Cases	220	+3%
Confirmed	11 new	+4%
Deaths	0.9 new	+4%
Recovered	4 new	+5%

Global Summary



* The National Public Health Emergency team of Ireland reported over 9,000 recoveries in one batch on 21 April.

Volume

	Active Cases	Today			Total since 22 Jan		
		Confirmed	Deaths	Recovered	Total Confirmed	Total Deaths	Total Recovered
US	703,737	39,460	2,751	2,875	823,786	44,845	75,204
UK	112,156	4,316	828	192	130,172	17,378	638
Italy	107,709	2,729	534	2,723	183,957	24,648	51,600
Spain	100,382	3,968	430	1,927	204,178	21,282	82,514
France	98,649	2,817	537	1,783	159,297	20,829	39,819
Turkey	78,414	4,611	119	1,488	95,591	2,259	14,918
Germany	48,058	1,226	171	3,700	148,291	5,033	95,200
Netherlands	30,314	729	165	N/A	34,317	3,929	74
Belgium	25,956	973	170	107	40,956	5,998	9,002
Canada	24,305	1,744	183	645	39,401	1,908	13,188
Portugal	19,700	516	27	307	21,379	762	917
Iran	18,540	1,297	88	1,692	84,802	5,297	60,965
Sweden	13,007	545	185	0	15,322	1,765	550
Japan	9,633	338	27	80	11,135	263	1,239
Israel	9,251	229	7	458	13,942	184	4,507
Singapore	8,275	1,111	0	38	9,125	11	839
Norway	6,977	35	1	0	7,191	182	32
Ireland*	6,077	388	43	9,156	16,040	730	9,233
Qatar	5,910	518	0	59	6,533	9	614
South Korea	2,233	9	1	99	10,683	237	8,213
China	1,418	36	0	54	83,853	4,636	77,799
Total World	1,704,241	88,785	6,998	34,081	2,561,043	176,983	679,819

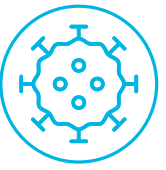
Since 16 Apr, **Global** recovered cases increased 26%

Per 1M

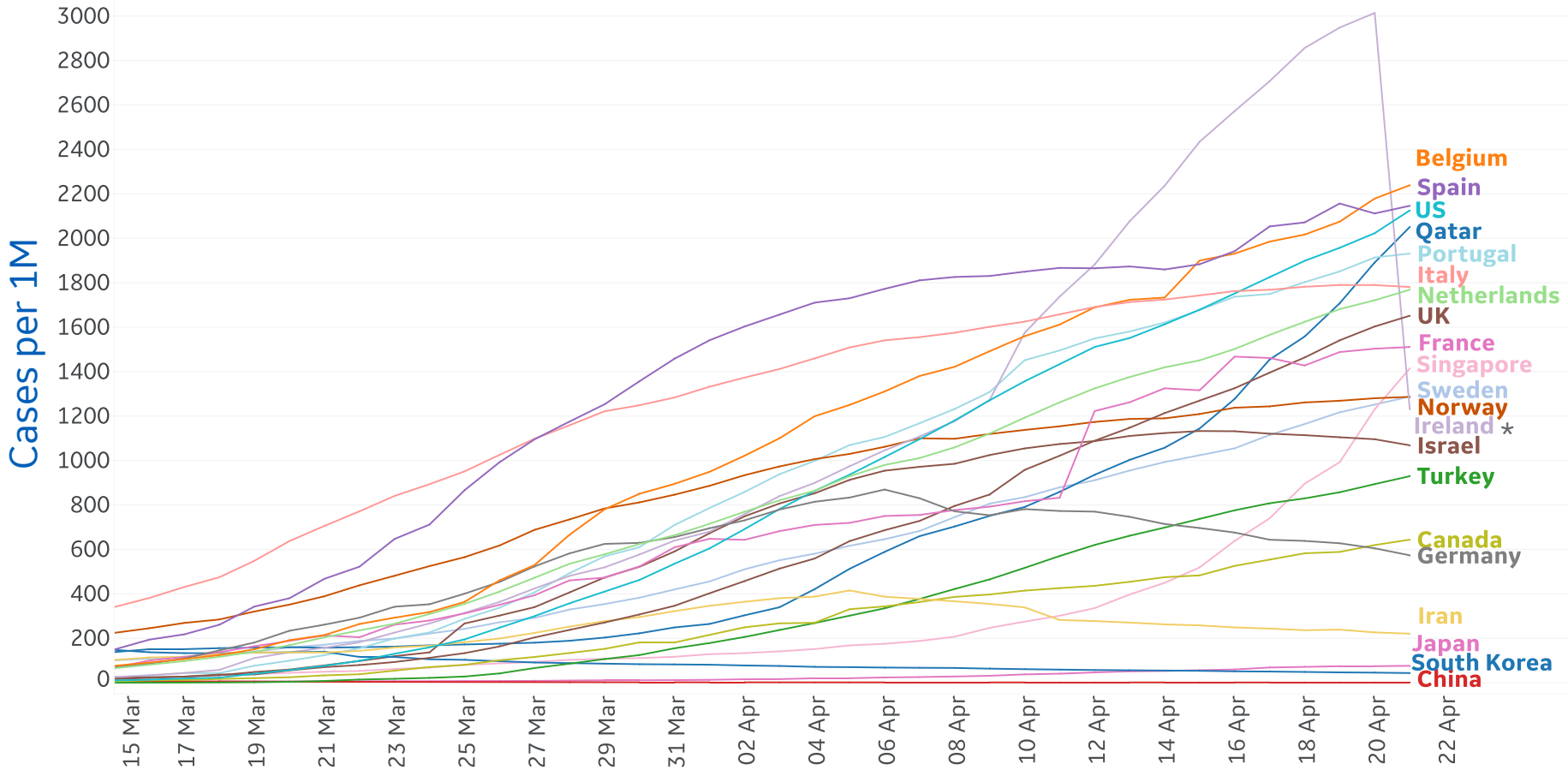
	Active Cases	Today			Total since 22 Jan		
		Confirmed	Deaths	Recovered	Total Confirmed	Total Deaths	Total Recovered
Belgium	2,240	84	15	9	3,534	518	777
Spain	2,147	85	9	41	4,367	455	1,765
US	2,126	119	8	9	2,489	135	227
Qatar	2,051	180	0	20	2,268	3	213
Portugal	1,932	51	3	30	2,097	75	90
Italy	1,781	45	9	45	3,043	408	853
Netherlands	1,769	43	10	N/A	2,003	229	4
UK	1,652	64	12	3	1,918	256	9
France	1,511	43	8	27	2,440	319	610
Singapore	1,414	190	0	6	1,560	2	143
Sweden	1,288	54	18	0	1,517	175	54
Norway	1,287	6	0	0	1,326	34	6
Ireland*	1,231	79	9	1,854	3,248	148	1,870
Israel	1,069	26	1	53	1,611	21	521
Turkey	930	55	1	18	1,133	27	177
Canada	644	46	5	17	1,044	51	349
Germany	574	15	2	44	1,770	60	1,136
Iran	221	15	1	20	1,010	63	726
Japan	76	3	0	1	88	2	10
South Korea	44	0	0	2	208	5	160
China	1	0	0	0	58	3	54
Total World	220	11	1	4	331	23	88

In the last 4 days, recovered cases in **Turkey** increased 56%

Trends in Active Cases

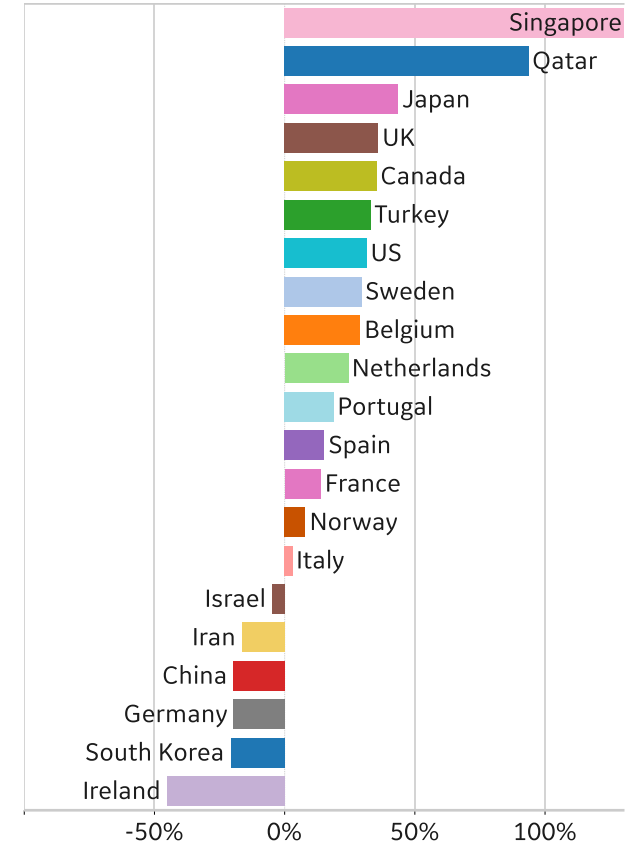


Active Cases by Country Since 15 March 2020

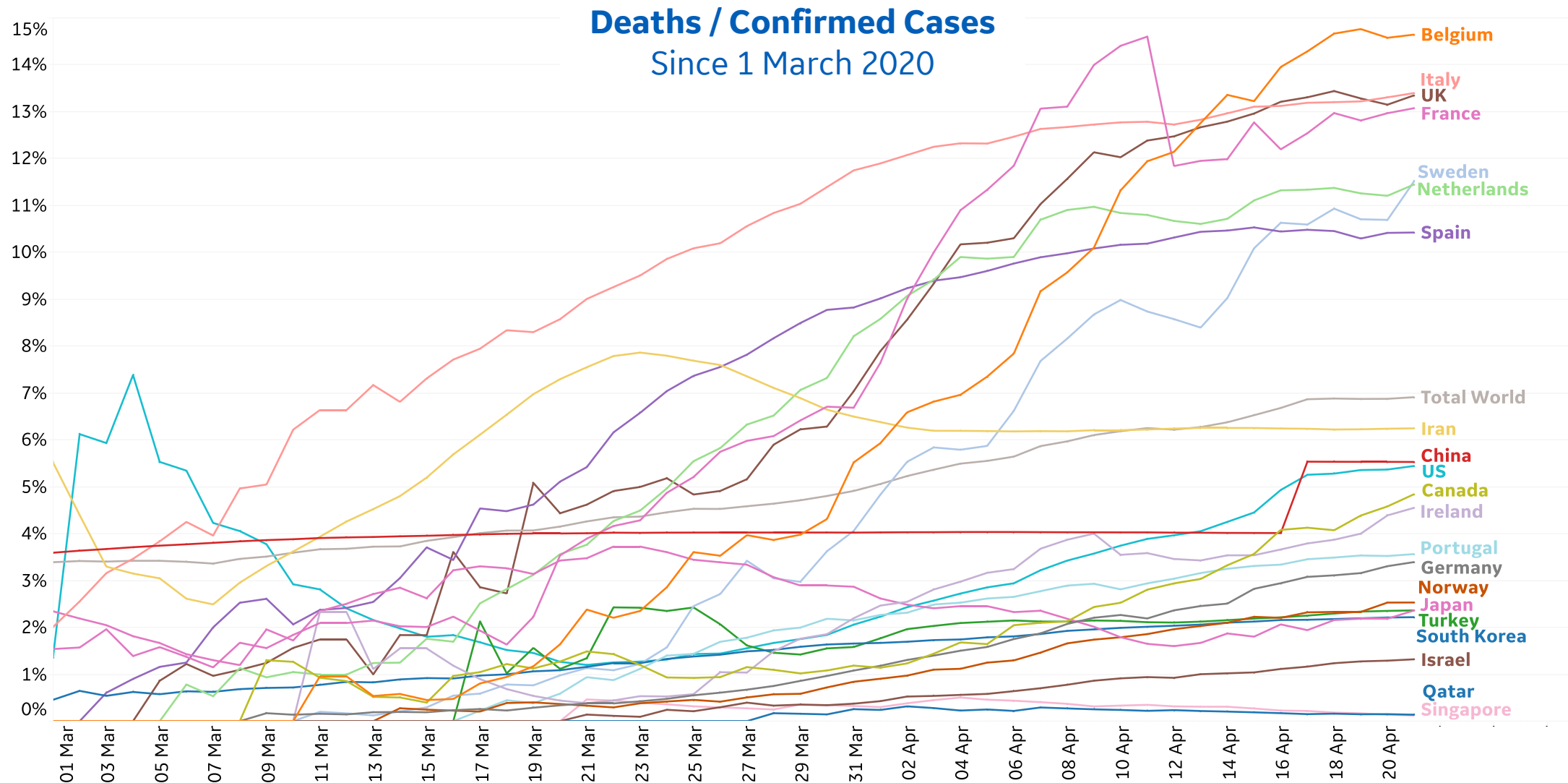
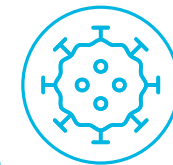


* The National Public Health Emergency team of Ireland reported over 9,000 recoveries in one batch on 21 April.

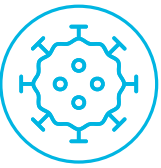
% Change in Active Cases Over Previous 7 Days



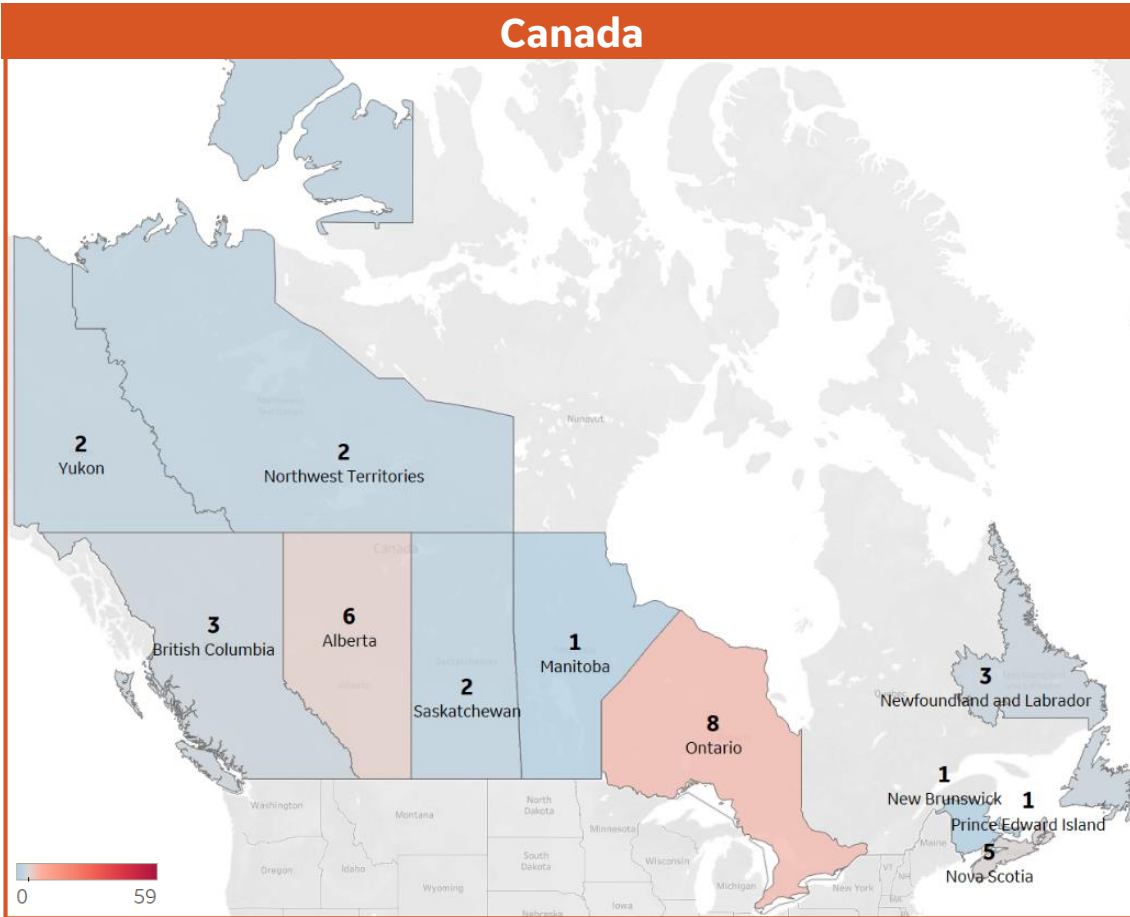
Fatality Rate over time by Country



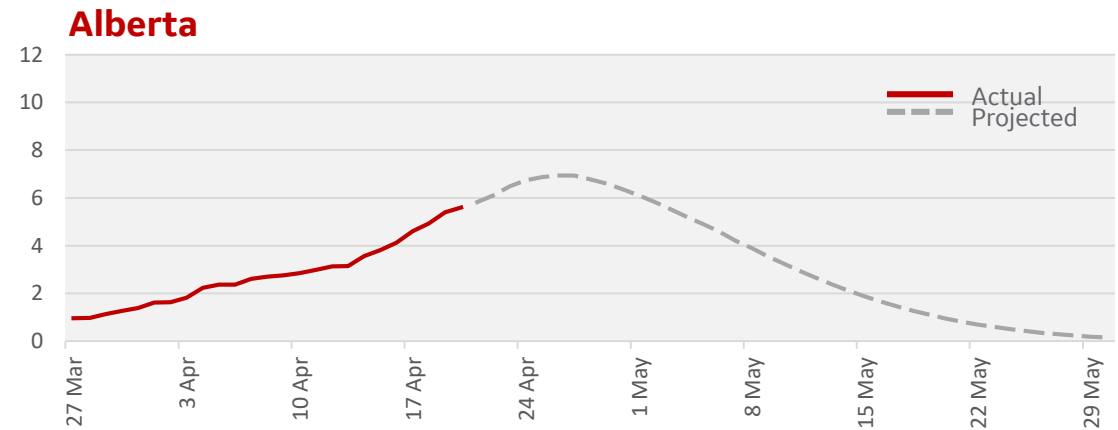
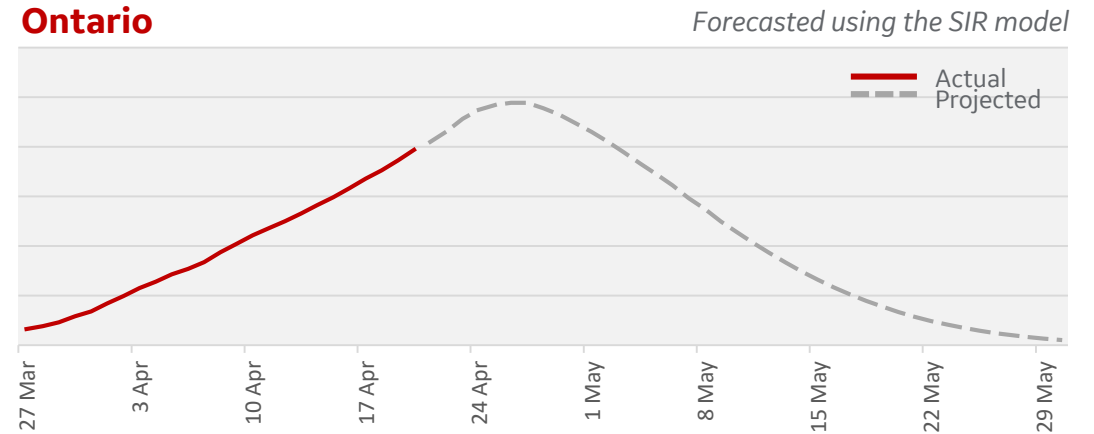
Feature: Hospitalization Trends - Canada



Hospitalized Cases* per 100 Beds



Projected Hospitalizations

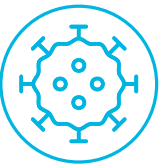


***Assumptions:** Hospitalized Cases_{PROVINCE} = % Hospitalized_{CANADA} × Active Cases_{PROVINCE}
 Active Cases = Confirmed Cases - Deaths - Recovered

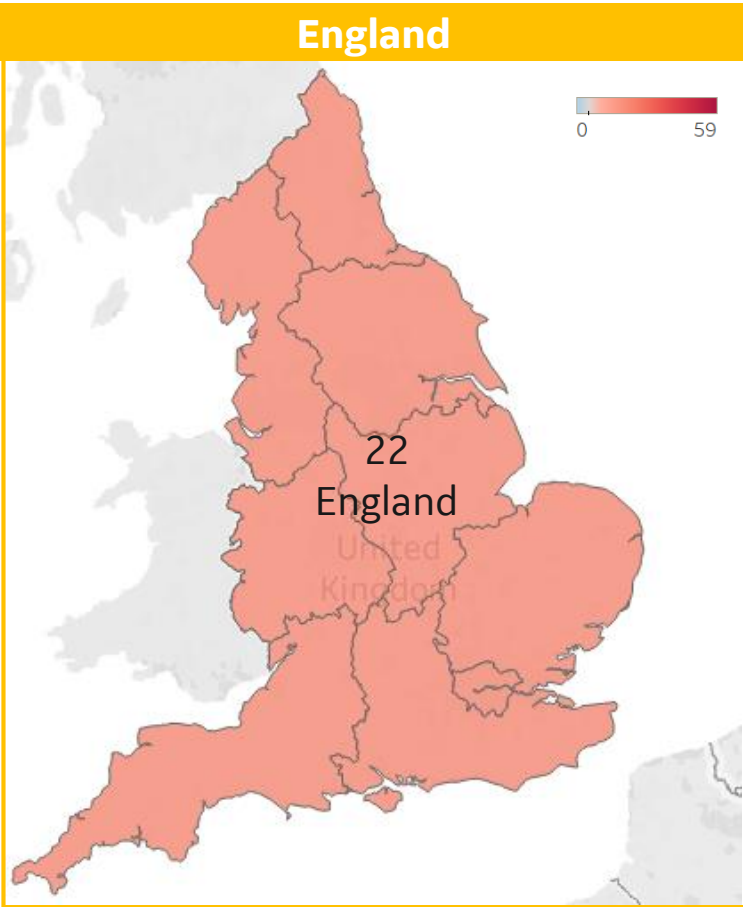
Data on Recovered cases not available at MSA level, so recoveries estimated:
 Estimated Recovered_{PROVINCE} = Recovered Cases_{CAN} × (Confirmed Cases_{PROVINCE} / Confirmed Cases_{PROVINCE})

Data sources: (1) COVID Tracking Project
 (2) Homeland Infrastructure Foundation-Level Data

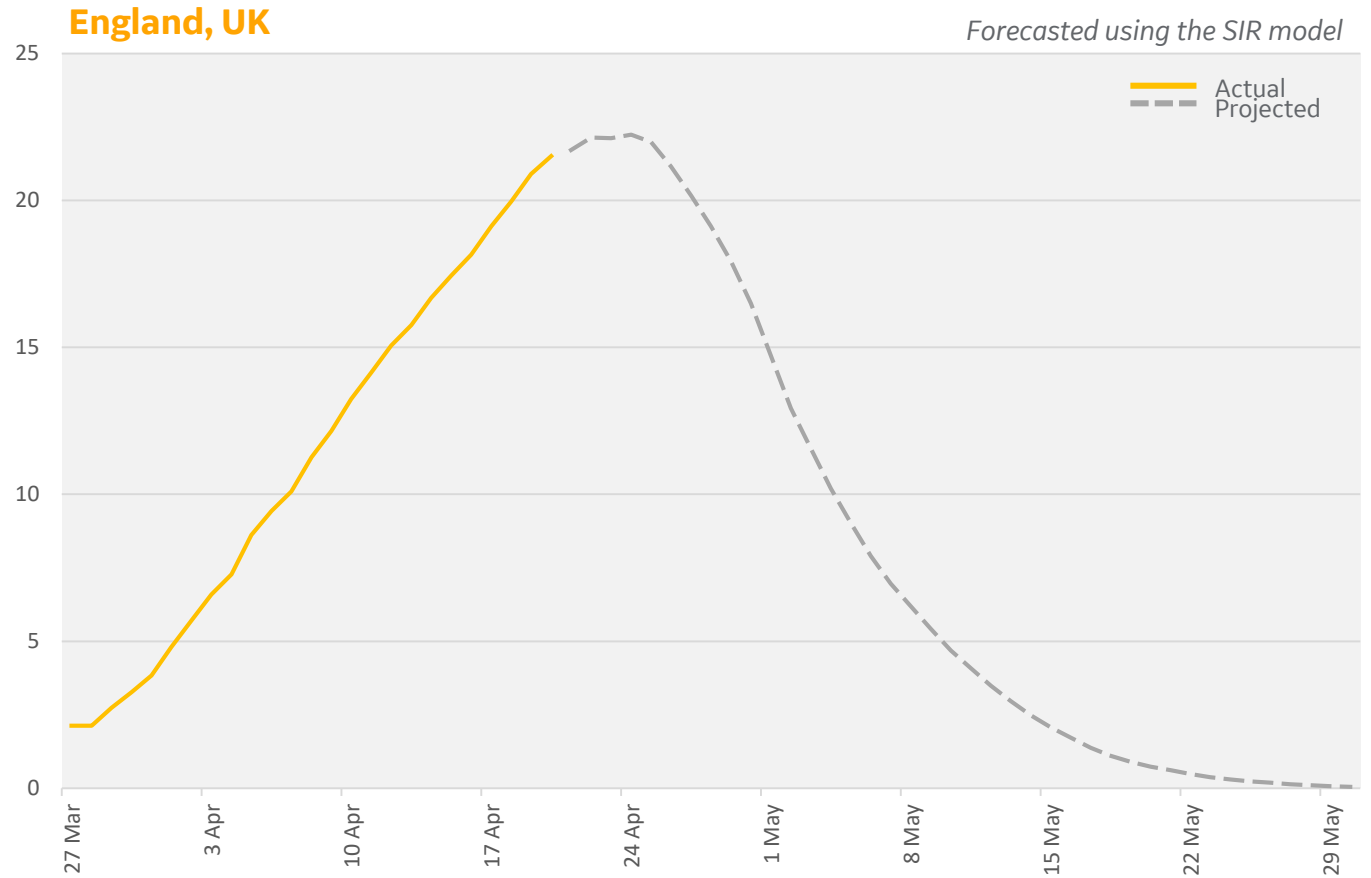
Feature: Hospitalization Trends - UK



Hospitalized Cases* per 100 Beds



Projected Hospitalizations

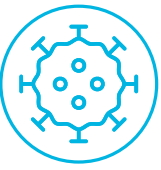


***Assumptions:** Hospitalized Cases_{ENG} = % Hospitalized_{ENG} × Active Cases_{ENG}
Active Cases = Confirmed Cases - Deaths - Recovered

Data on Recovered cases not available at MSA level, so recoveries estimated:
Estimated Recovered_{ENG} = Recovered Cases_{UK} × (Confirmed Cases_{ENG} / Confirmed Cases_{UK})

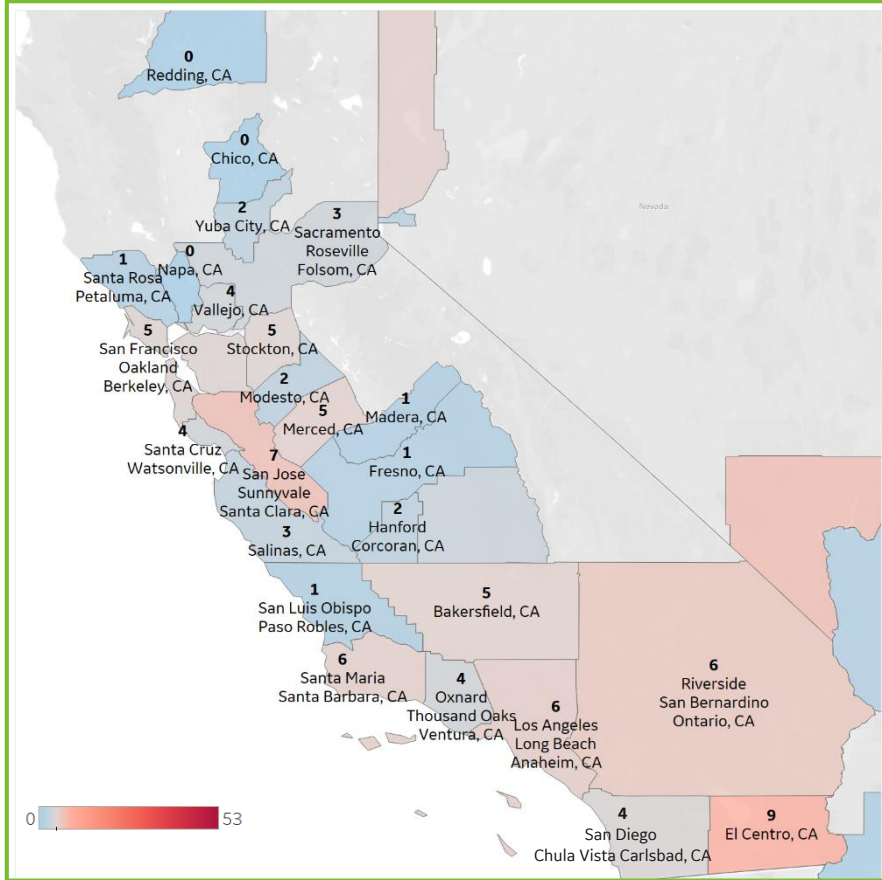
Data sources: (1) COVID Tracking Project
(2) Homeland Infrastructure Foundation-Level Data

Feature: Hospitalization Trends - US



Hospitalized Cases* per 100 Beds

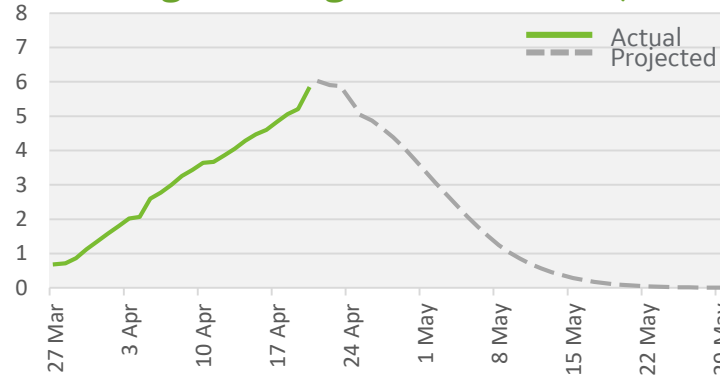
California



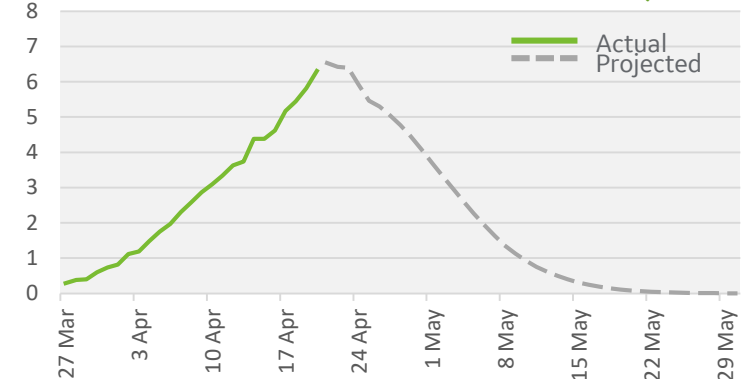
Projected Hospitalizations

Forecasted using the SIR model

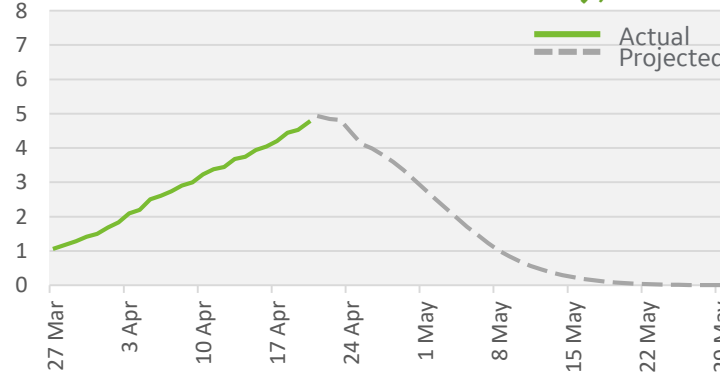
Los Angeles-Long Beach-Anaheim, CA



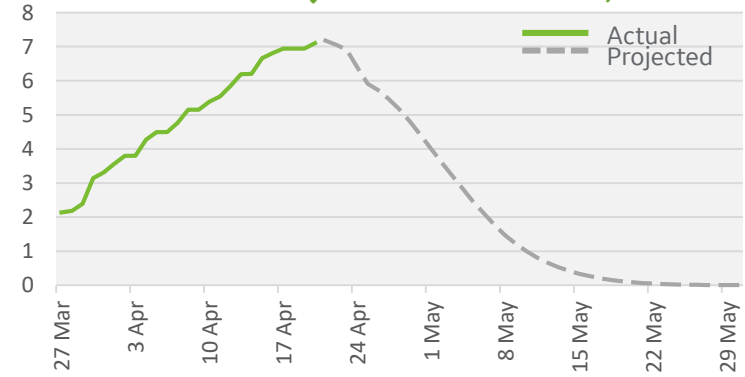
Riverside-San Bernardino-Ontario, CA



San Francisco-Oakland-Berkeley, CA



San Jose-Sunnyvale-Santa Clara, CA

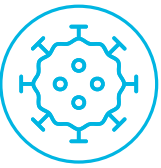


*Assumptions: Hospitalized Cases_{MSA} = % Hospitalized_{STATE} × Active Cases_{MSA}
Active Cases = Confirmed Cases - Deaths - Recovered

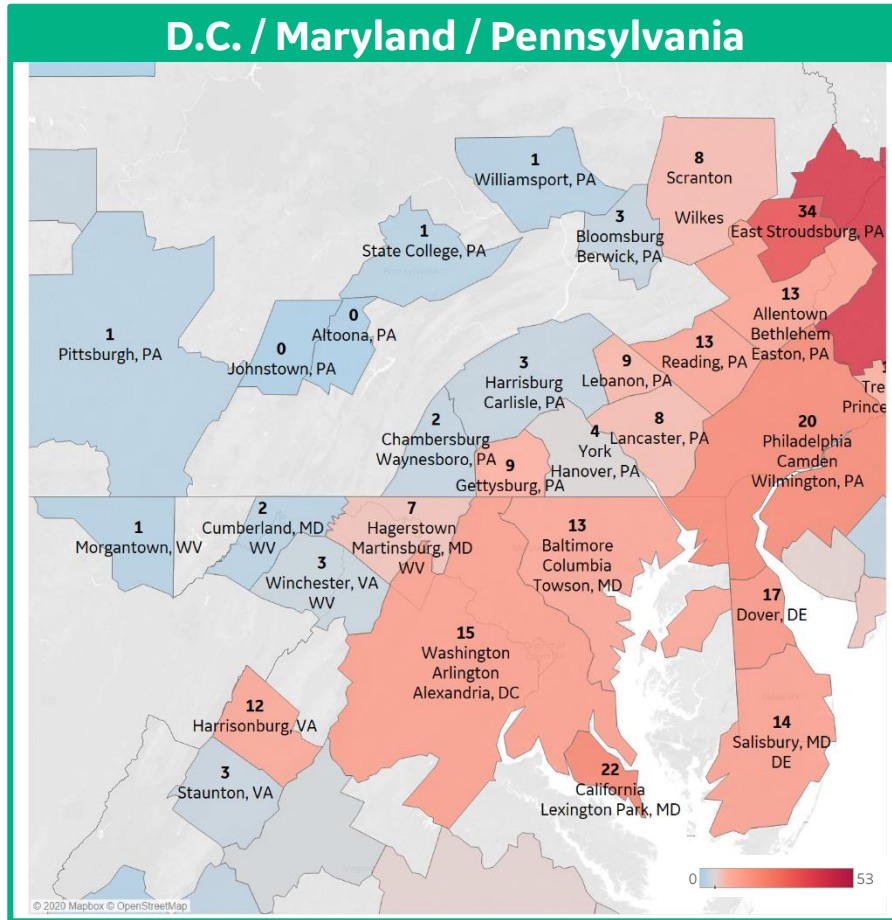
Data on Recovered cases not available at MSA level, so recoveries estimated:
Estimated Recovered_{MSA} = Recovered Cases_{STATE} × (Confirmed Cases_{MSA} / Confirmed Cases_{STATE})

Data sources: (1) COVID Tracking Project
(2) Homeland Infrastructure Foundation-Level Data

Feature: Hospitalization Trends - US



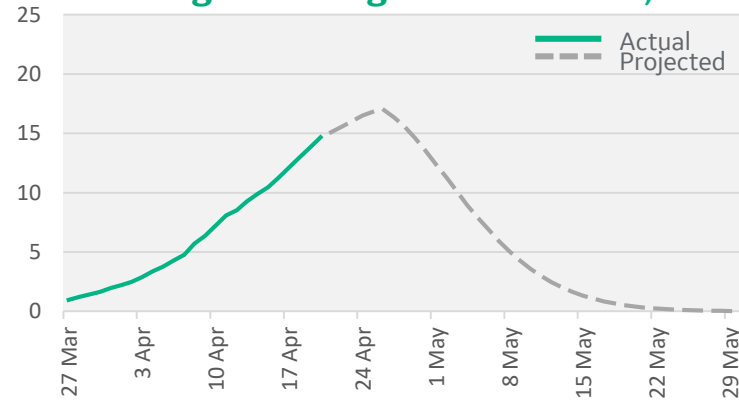
Hospitalized Cases* per 100 Beds



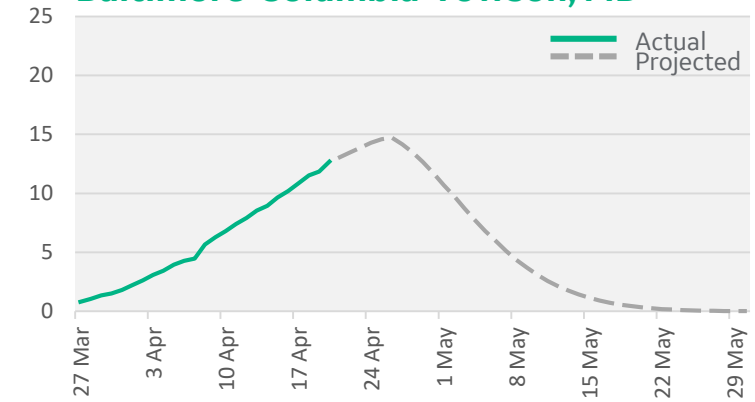
Projected Hospitalizations

Forecasted using the SIR model

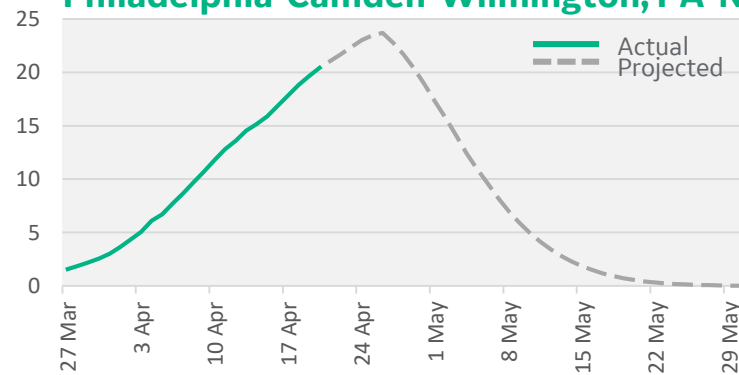
Washington-Arlington-Alexandria, DC-VA



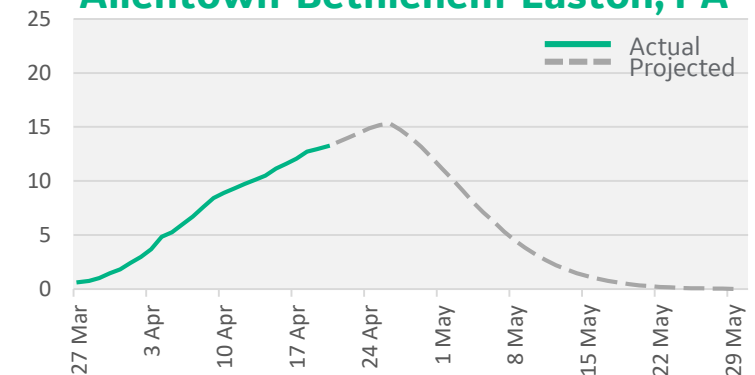
Baltimore-Columbia-Towson, MD



Philadelphia-Camden-Wilmington, PA-NJ



Allentown-Bethlehem-Easton, PA

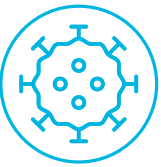


*Assumptions: Hospitalized Cases_{MSA} = % Hospitalized_{STATE} × Active Cases_{MSA}
 Active Cases = Confirmed Cases - Deaths - Recovered

Data on Recovered cases not available at MSA level, so recoveries estimated:
 Estimated Recovered_{MSA} = Recovered Cases_{STATE} × (Confirmed Cases_{MSA} / Confirmed Cases_{STATE})

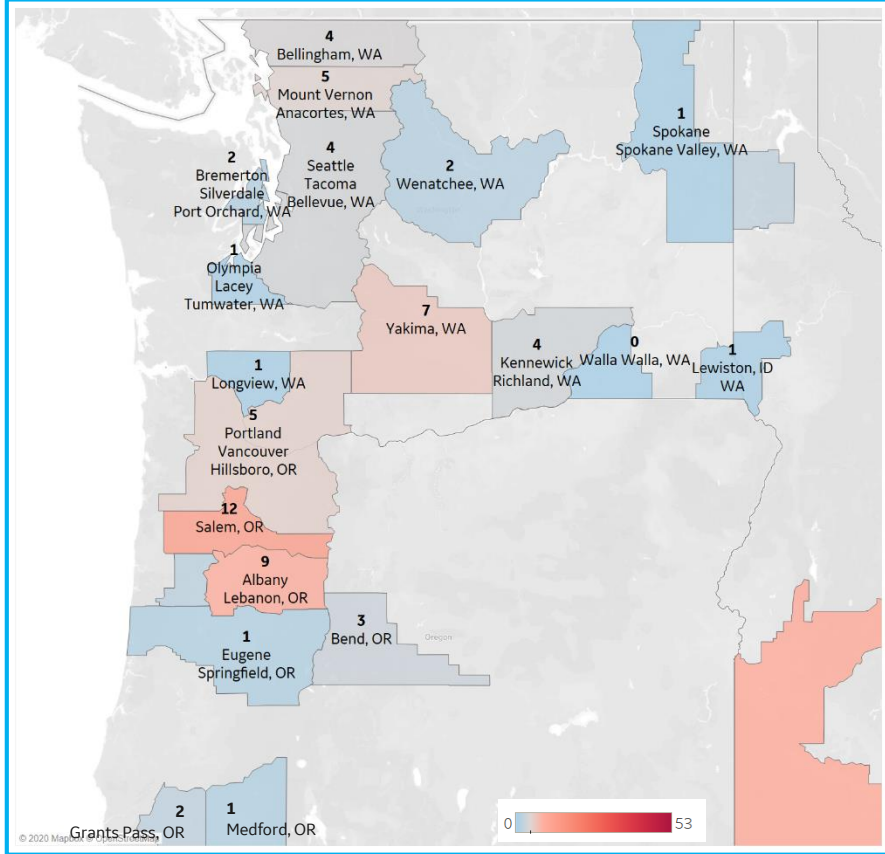
Data sources: (1) COVID Tracking Project
 (2) Homeland Infrastructure Foundation-Level Data

Feature: Hospitalization Trends - US



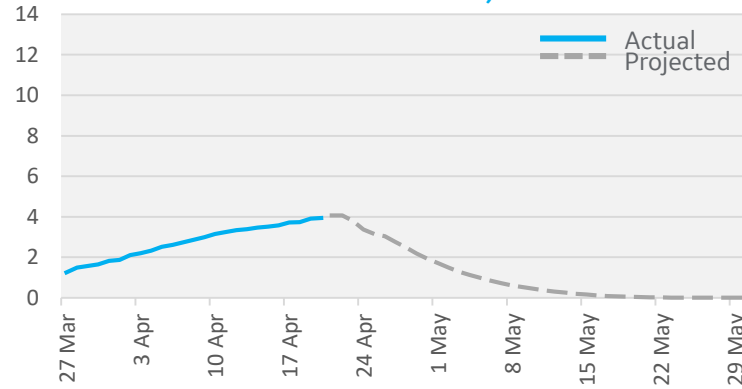
Hospitalized Cases* per 100 Beds

Washington / Oregon



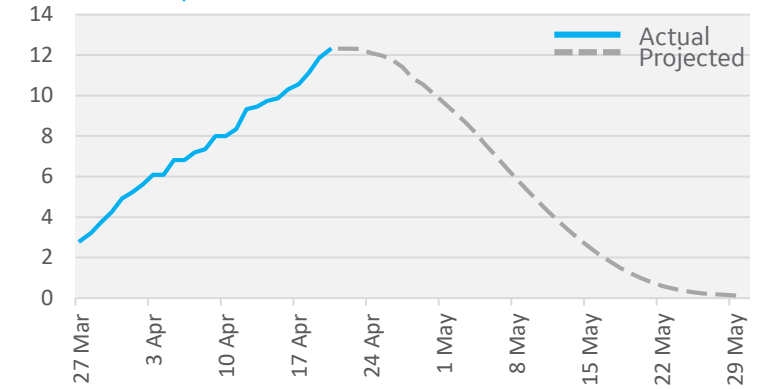
Projected Hospitalizations

Seattle-Tacoma-Bellevue, WA

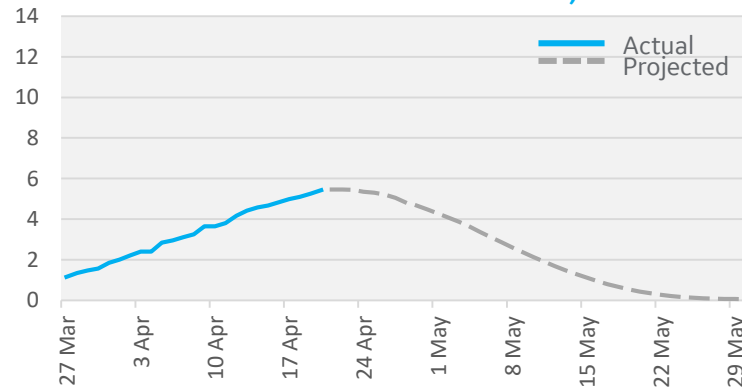


Salem, OR

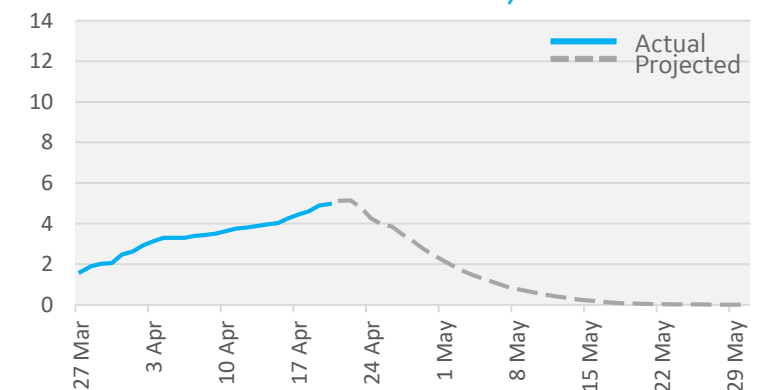
Forecasted using the SIR model



Portland-Vancouver-Hillsboro, OR



Mount Vernon-Anacortes, WA

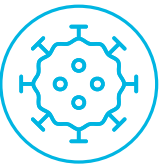


*Assumptions: Hospitalized Cases_{MSA} = % Hospitalized_{STATE} × Active Cases_{MSA}
 Active Cases = Confirmed Cases - Deaths - Recovered

Data on Recovered cases not available at MSA level, so recoveries estimated:
 Estimated Recovered_{MSA} = Recovered Cases_{STATE} × (Confirmed Cases_{MSA} / Confirmed Cases_{STATE})

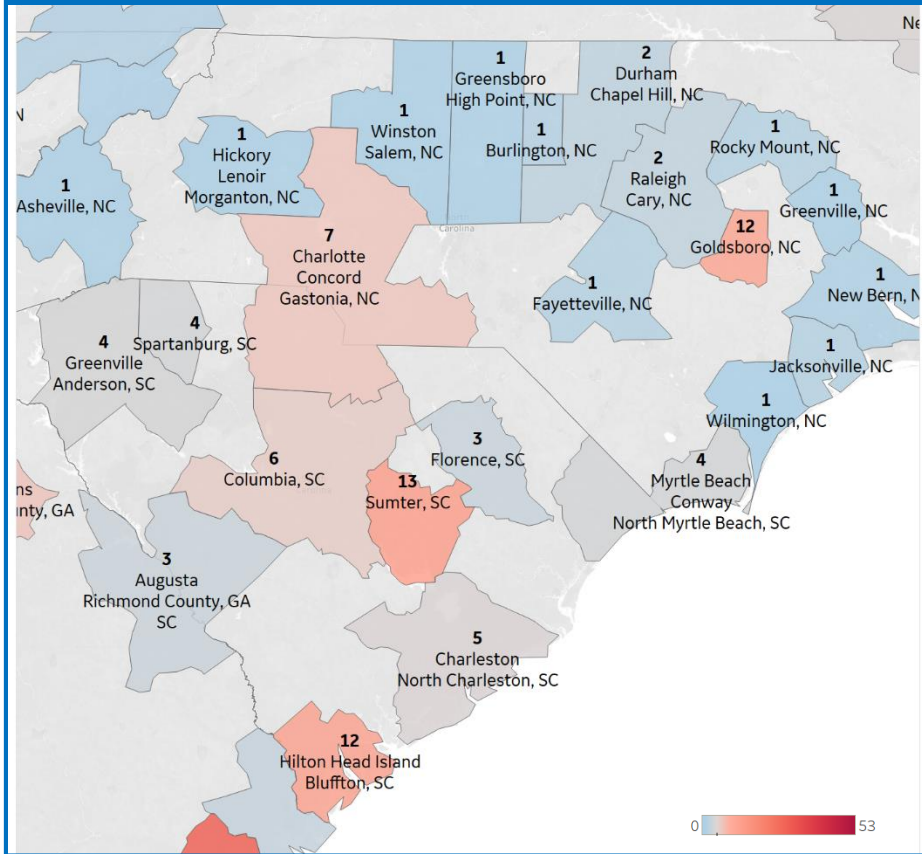
Data sources: (1) COVID Tracking Project
 (2) Homeland Infrastructure Foundation-Level Data

Feature: Hospitalization Trends - US



Hospitalized Cases* per 100 Beds

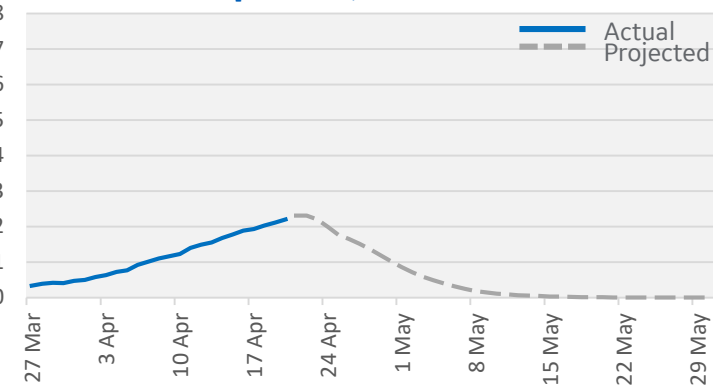
North Carolina / South Carolina



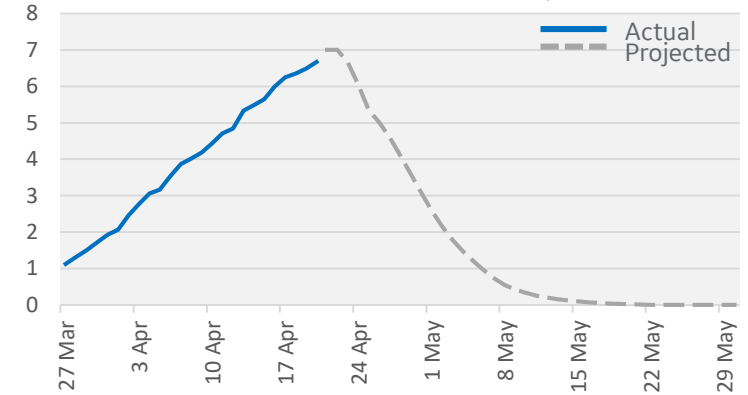
Projected Hospitalizations

Forecasted using the SIR model

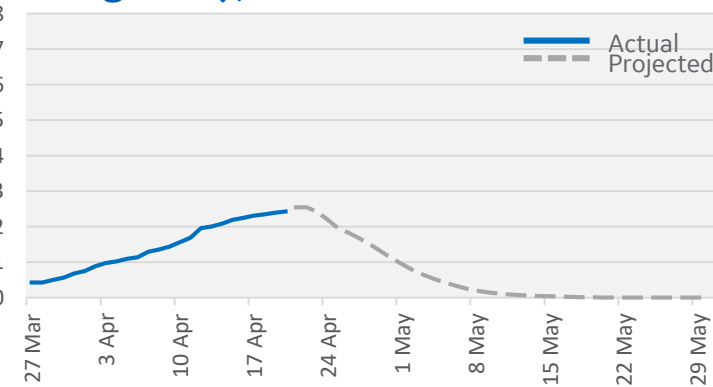
Durham-Chapel Hill, NC



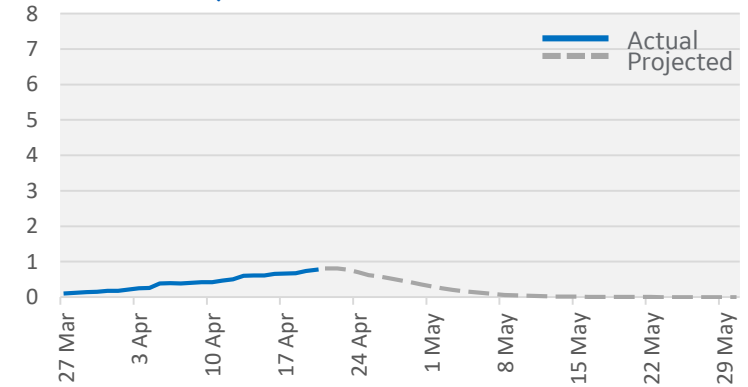
Charlotte-Concord-Gastonia, NC-SC



Raleigh-Cary, NC



Asheville, NC

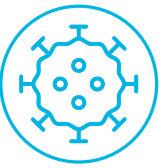


***Assumptions:** Hospitalized Cases_{MSA} = % Hospitalized_{STATE} × Active Cases_{MSA}
 Active Cases = Confirmed Cases - Deaths - Recovered

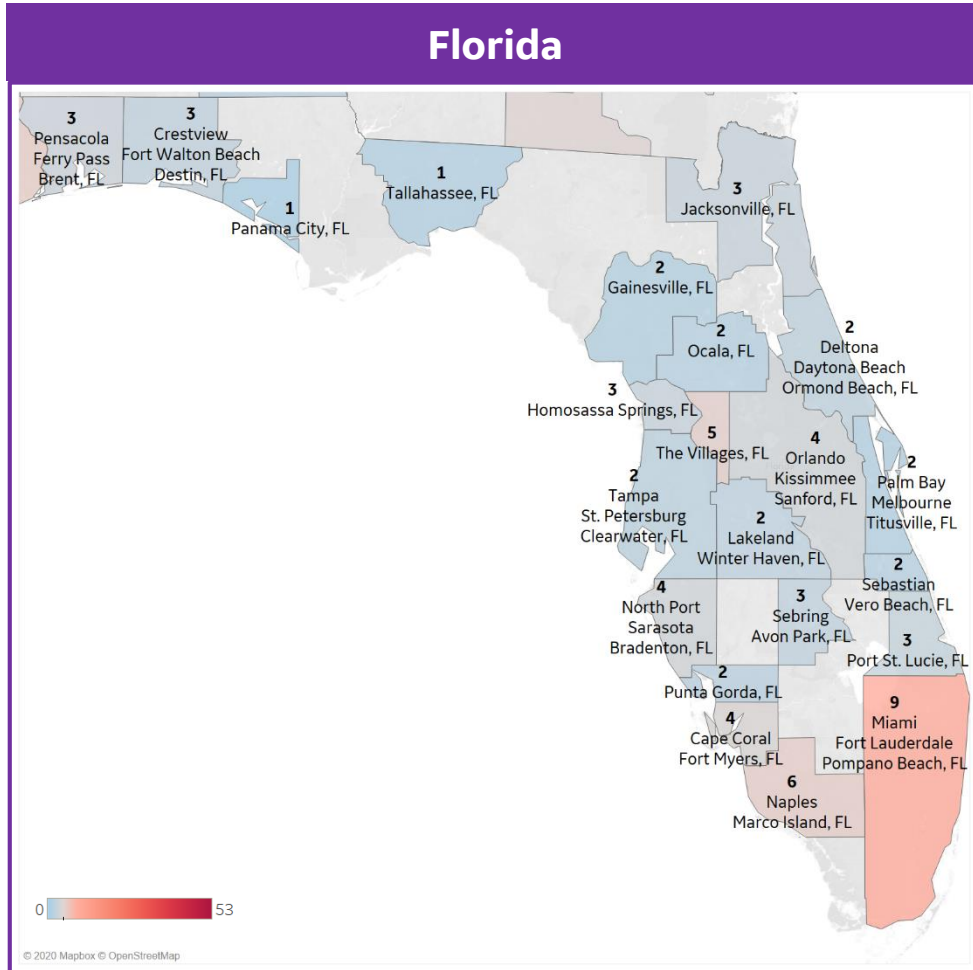
Data on Recovered cases not available at MSA level, so recoveries estimated:
 Estimated Recovered_{MSA} = Recovered Cases_{STATE} × (Confirmed Cases_{MSA} / Confirmed Cases_{STATE})

Data sources: (1) COVID Tracking Project
 (2) Homeland Infrastructure Foundation-Level Data

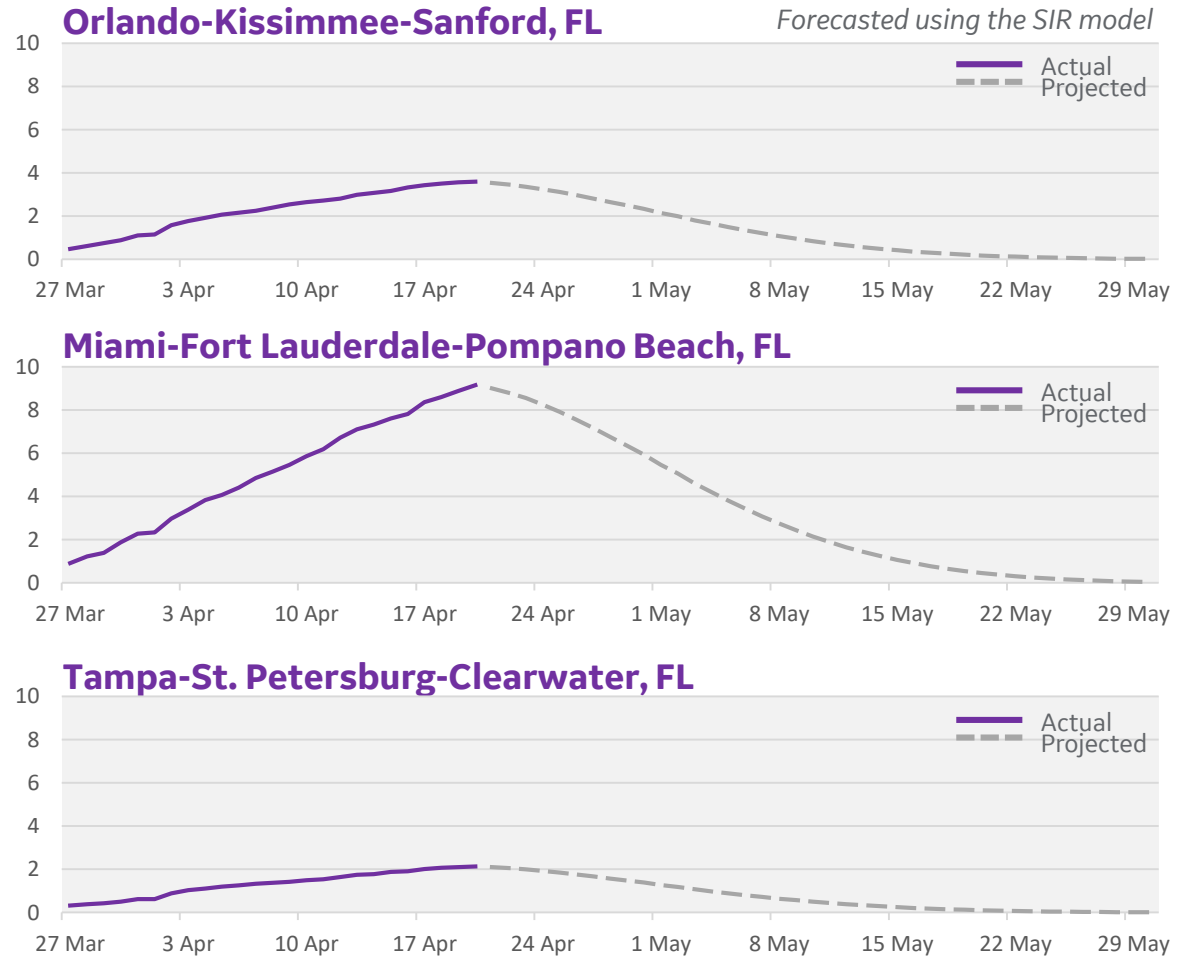
Feature: Hospitalization Trends - US



Hospitalized Cases* per 100 Beds



Projected Hospitalizations



***Assumptions:** Hospitalized Cases_{MSA} = % Hospitalized_{STATE} × Active Cases_{MSA}
 Active Cases = Confirmed Cases - Deaths - Recovered

Data on Recovered cases not available at MSA level, so recoveries estimated:
 Estimated Recovered_{MSA} = Recovered Cases_{STATE} × (Confirmed Cases_{MSA} / Confirmed Cases_{STATE})

Data sources: (1) COVID Tracking Project
 (2) Homeland Infrastructure Foundation-Level Data

Europe & Middle East

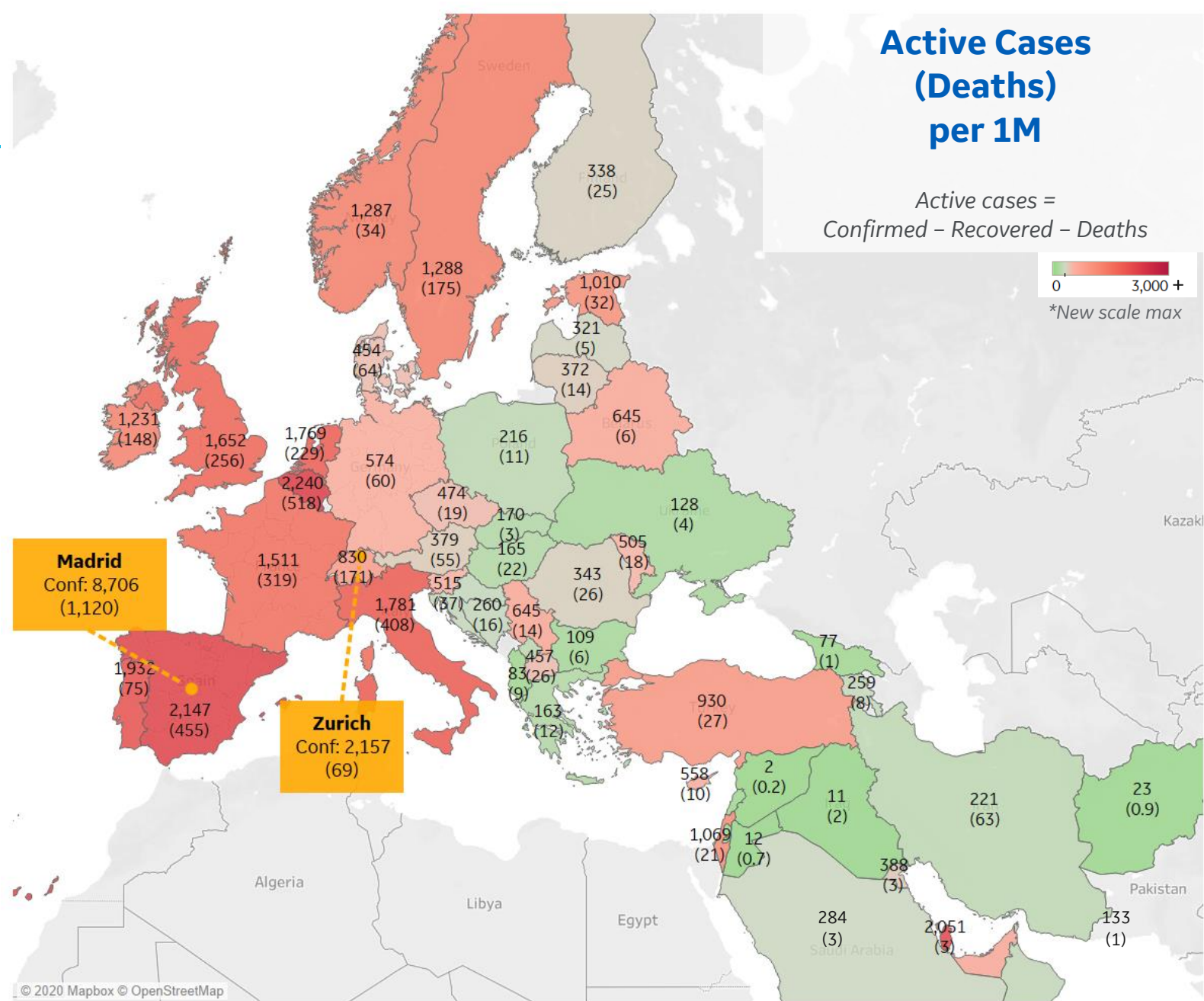
Per 1M in Region

	Today	Change
Active Cases	805	-0.1%
Confirmed	31 new	+2%
Deaths	4 new	+3%
Recovered	28 new	+7%

Most Active Cases per 1M

Belgium	2,240
Spain	2,147
Qatar	2,051
Portugal	1,932
Italy	1,781
Netherlands	1,769
UK	1,652
France	1,511
Sweden	1,288
Norway	1,287

* Excludes regions with population < 1M



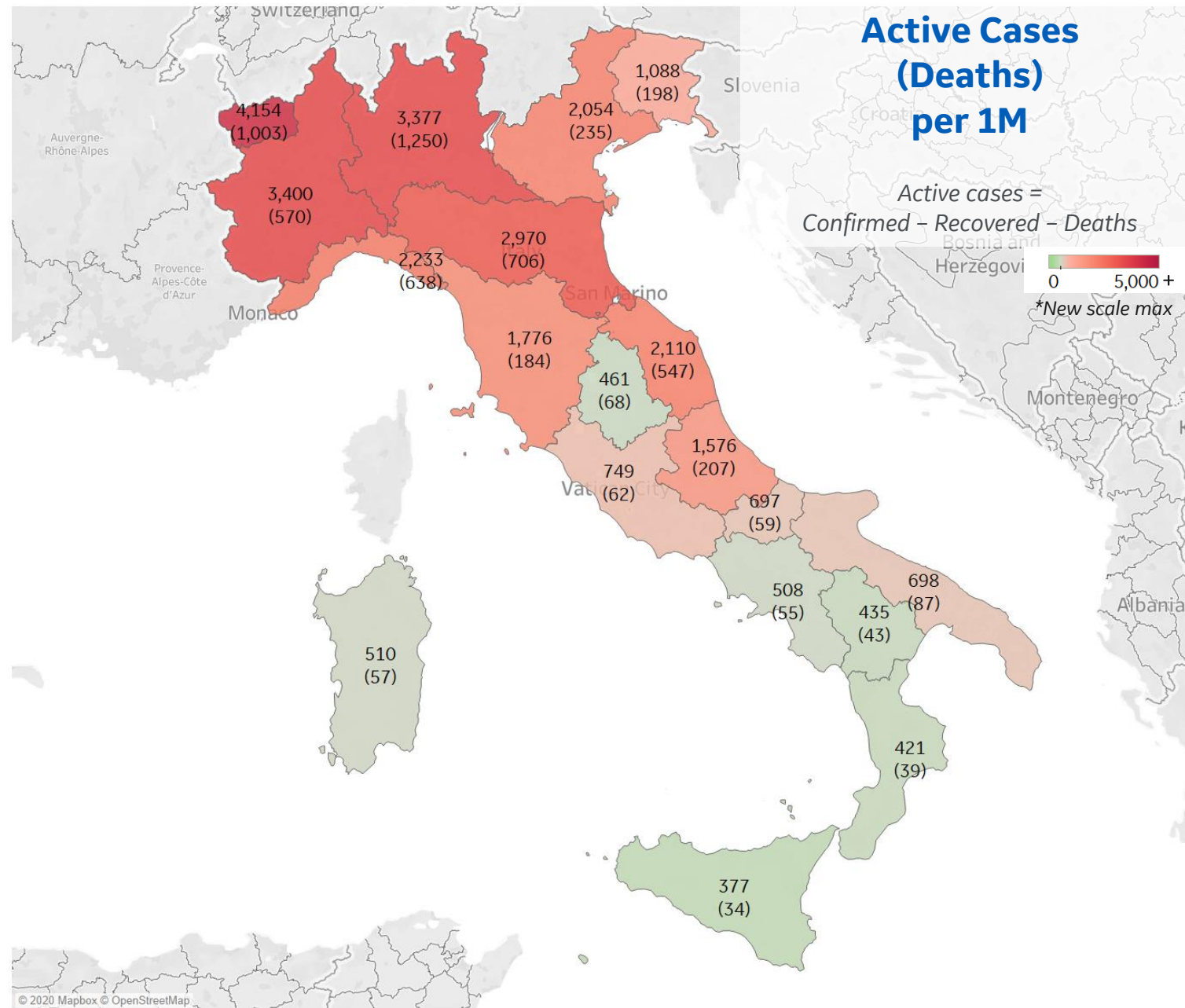
Italy

Per 1M in Region

	Today	Change
Active Cases	1,781	-0.5%
Confirmed	45 new	+4%
Deaths	9 new	+4%
Recovered	45 new	+5%

Most Active Cases per 1M

Piemonte	3,400
Lombardia	3,377
Emilia-Romagna	2,970
Liguria	2,233
Marche	2,110
Veneto	2,054
Trentino-Alto Adi..	1,780
Toscana	1,776
Abruzzo	1,576
Sudtirolo	1,432



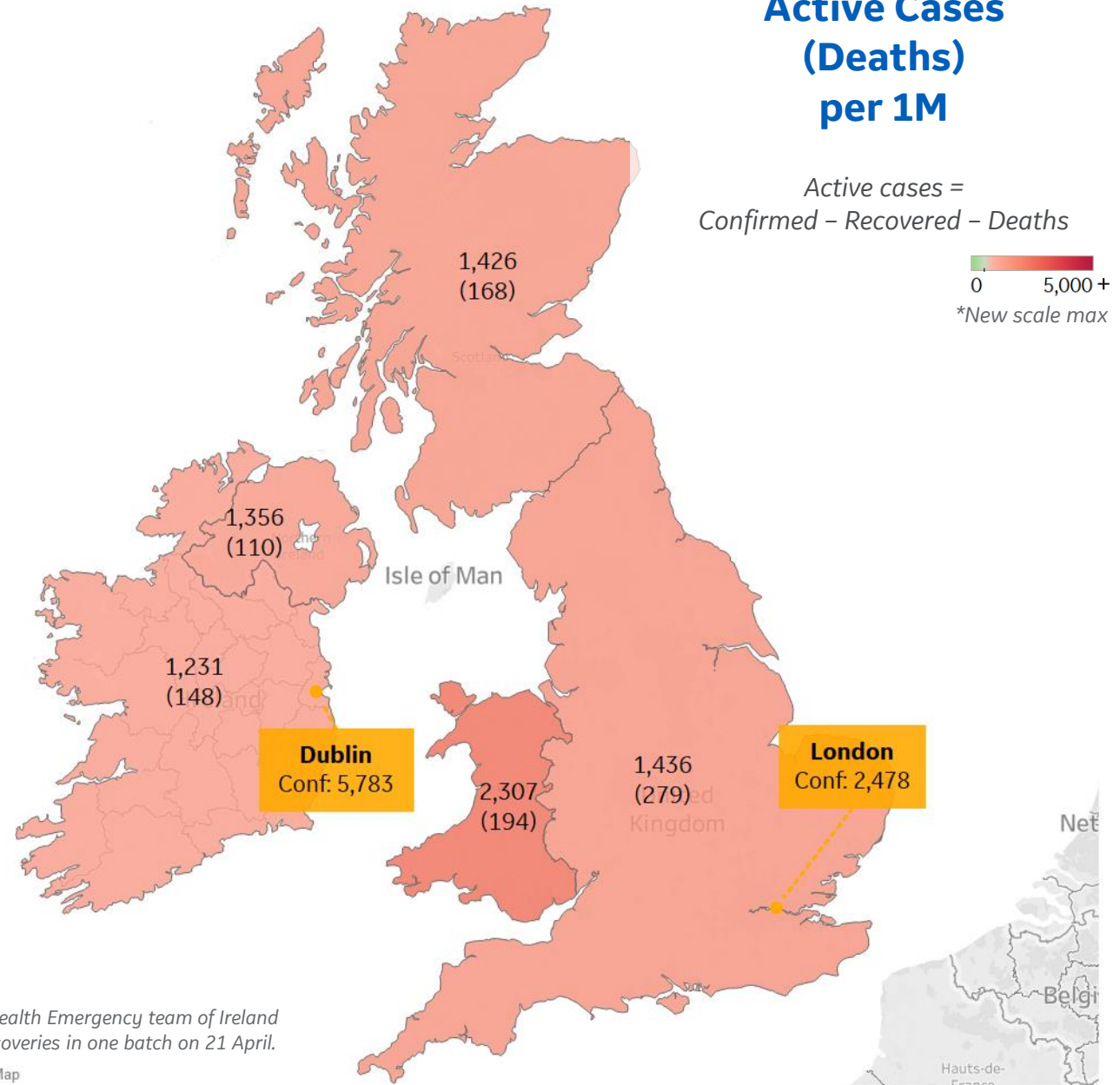
UK & Ireland

Per 1M in Region

	Today	Change
Active Cases	1,624	-4%
Confirmed	65 new	+3%
Deaths	12 new	+5%
Recovered*	128 new	+1787%

Most Active Cases per 1M

Wales	2,307
England	1,436
Scotland	1,426
Northern Ireland	1,356
Ireland	1,231



* The National Public Health Emergency team of Ireland reported over 9,000 recoveries in one batch on 21 April.

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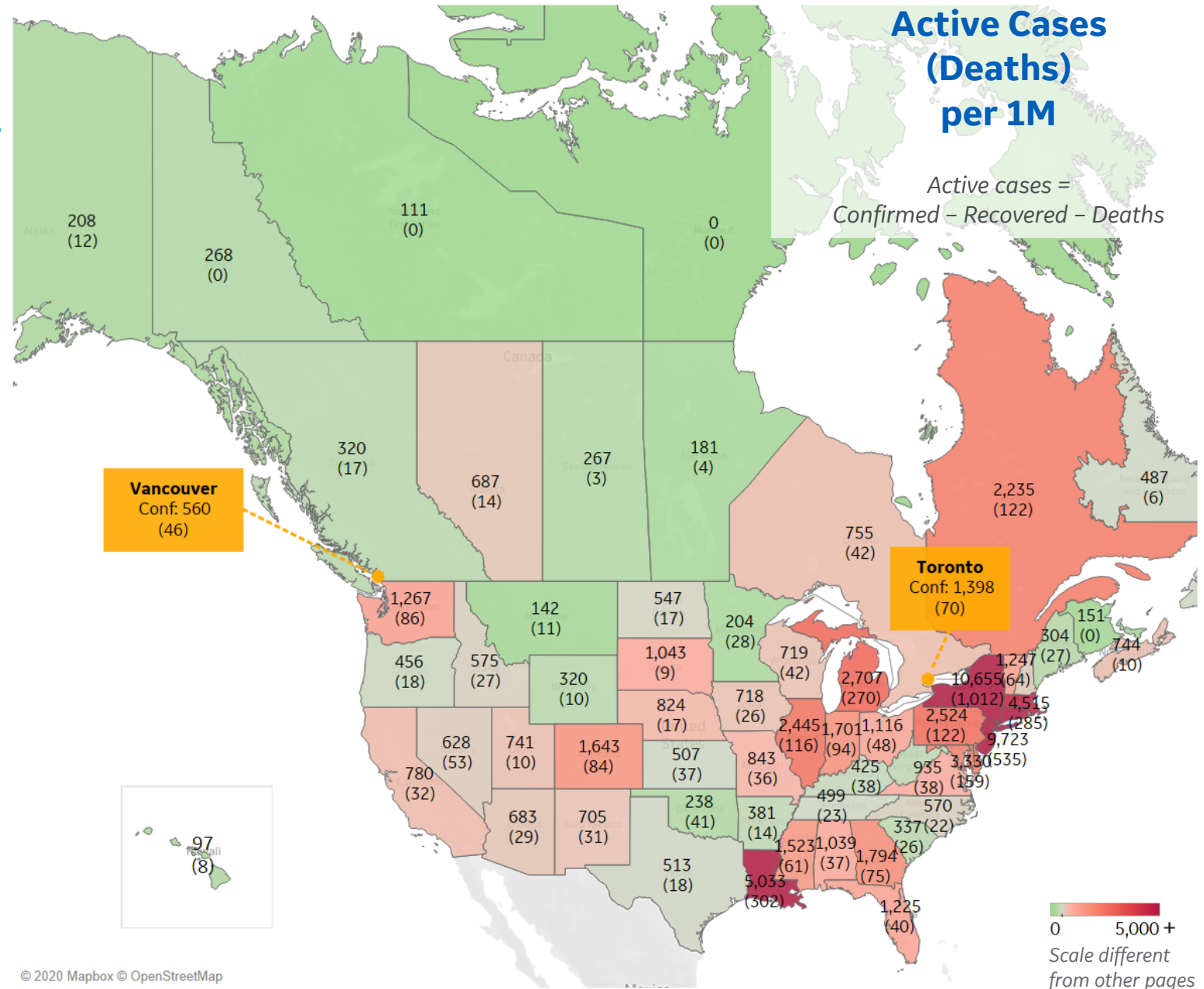
US & Canada

Per 1M in Region

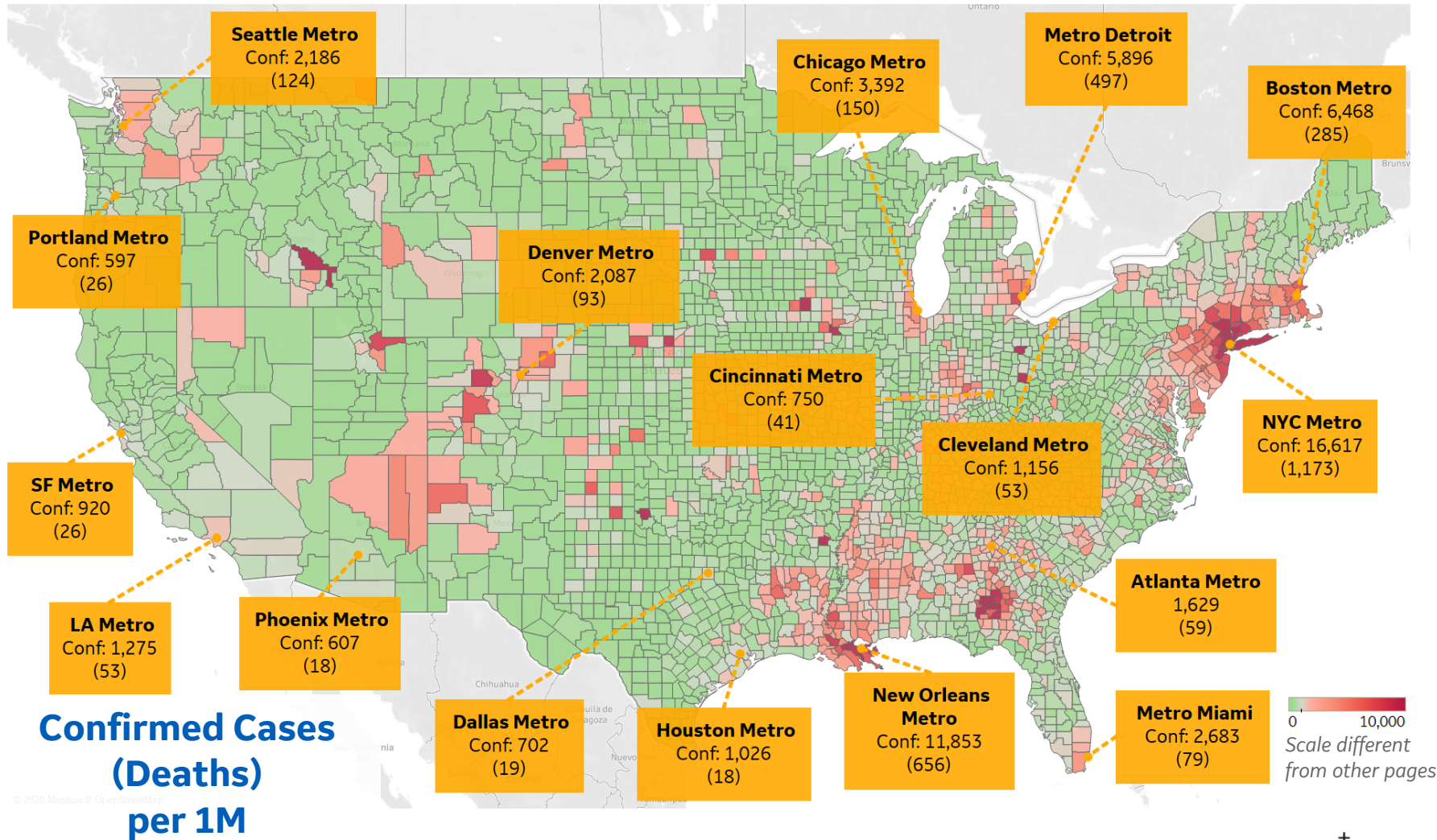
	Today	Change
Active Cases	1,974	+5%
Confirmed	112 new	+5%
Deaths	8 new	+7%
Recovered	10 new	+4%

Most Active Cases per 1M

New York	10,655
New Jersey	9,723
Connecticut	5,293
Louisiana	5,033
Rhode Island	4,754
Massachusetts	4,515
DC	3,330
Michigan	2,707
Pennsylvania	2,524
Illinois	2,445



US by County & Metro Area



Top 10 Northeast Counties

Confirmed Cases per 1M

Rockland County, NY	29,369
Westchester County, NY	25,484
Nassau County, NY	22,904
Suffolk County, NY	19,437
Orange County, NY	18,260
Union County, NJ	17,924
New York City*	17,296
Passaic County, NJ	16,896
Hudson County, NJ	16,688
Bergen County, NJ	14,327

Top 10 Other US Counties

Confirmed Cases per 1M

Orleans Parish, LA	15,812
Jefferson Parish, LA	13,415
Wayne County, MI	7,953
Macomb County, MI	5,199
Oakland County, MI	5,014
Cook County, IL	4,501
District of Columbia, DC	4,390
Marion County, IN	4,329
Prince George's County, MD	4,106
St. Tammany Parish, LA	4,097

Note: Includes counties ≥ 250K population

* New York City counties aggregated into one reporting area

Oceania

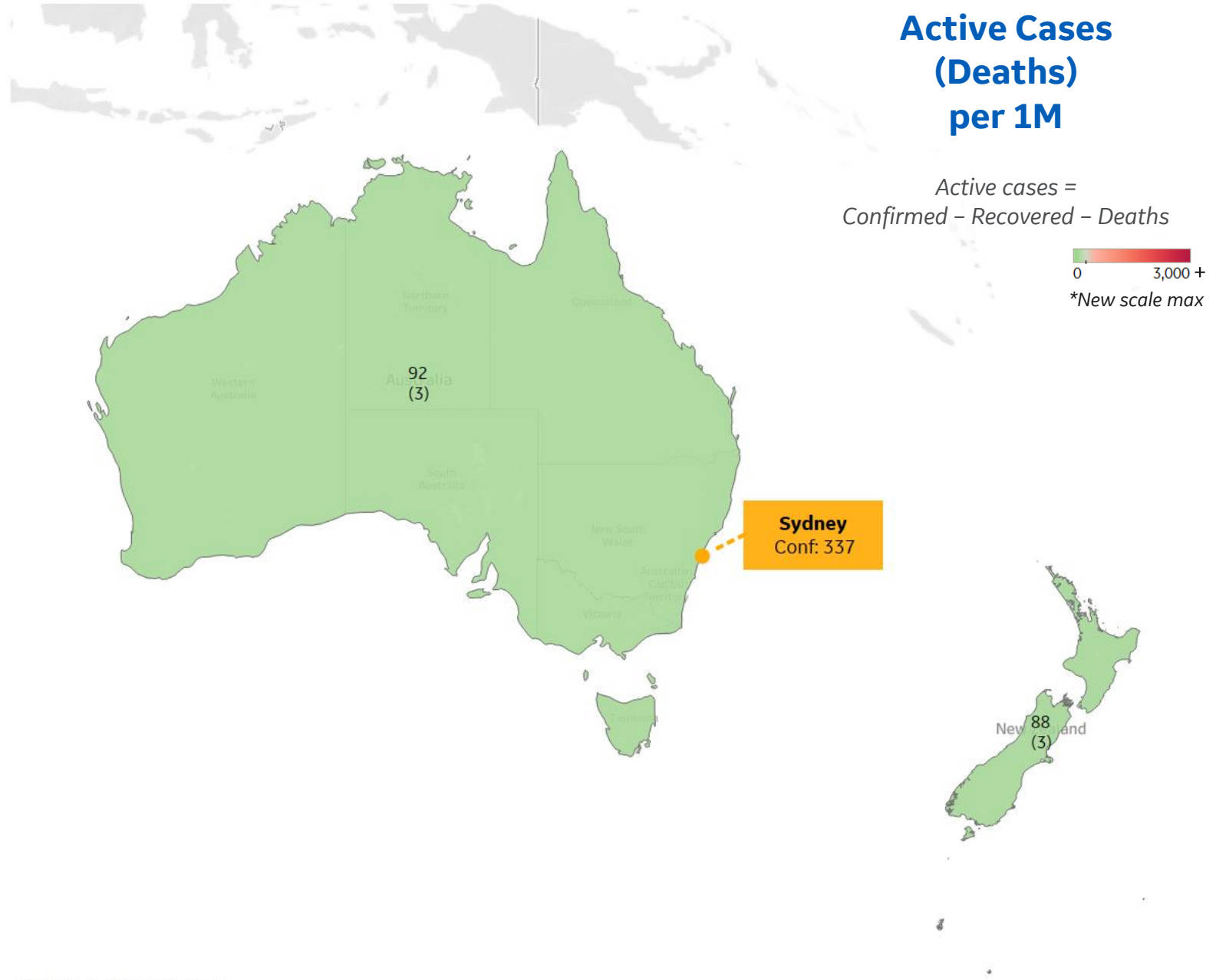
Per 1M in Region

	Today	Change
Active Cases	90	-1%
Confirmed	0.2 new	+0.1%
Deaths	0.03 new	+1%
Recovered	1 new	+1%

Most Active Cases per 1M

Australia	92
New Zealand	88

* Excludes regions with population < 1M



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Updated 22 April 2020, 1:00 GMT

Latin & South America

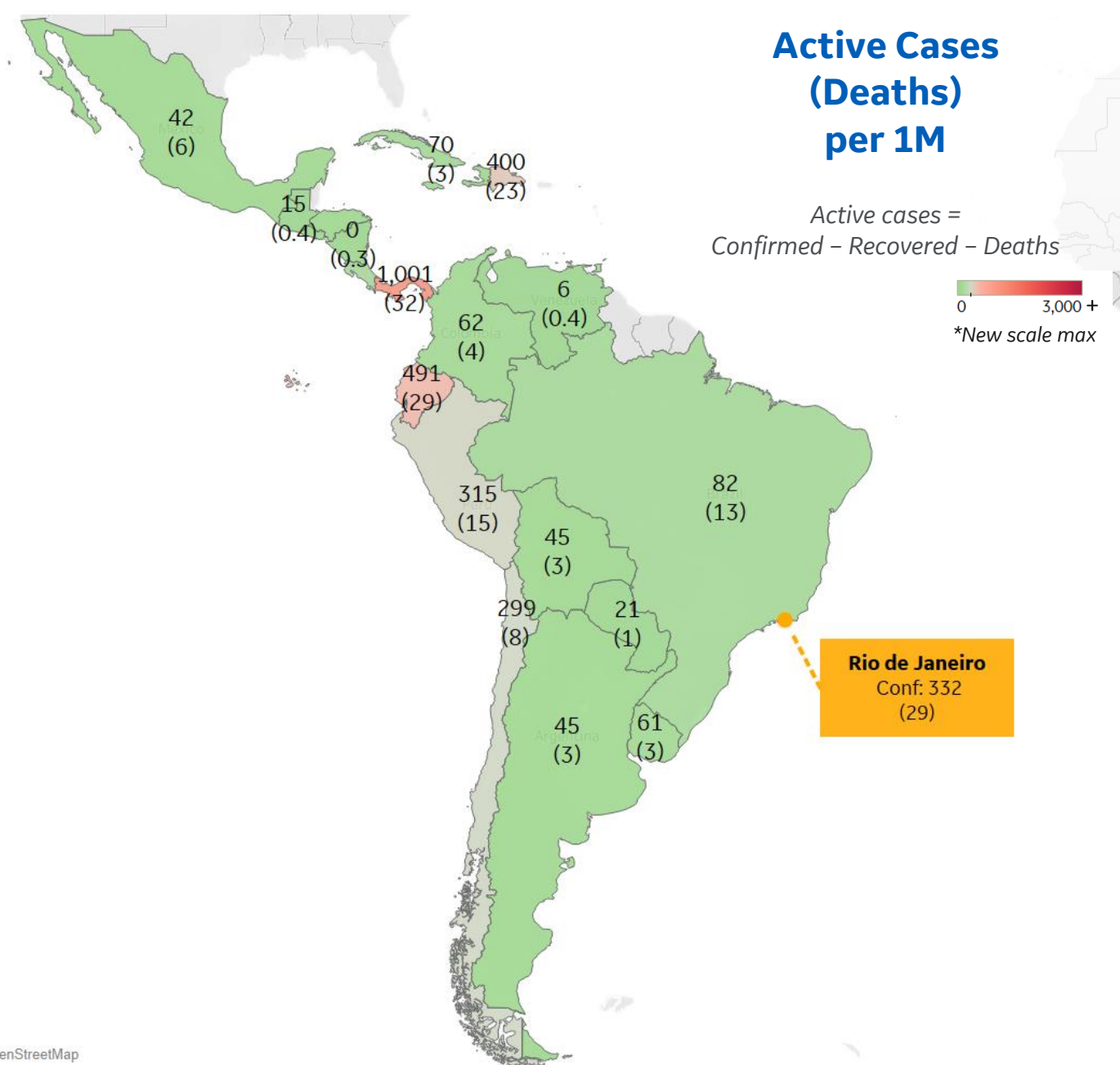
Per 1M in Region

	Today	Change
Active Cases	100	+6%
Confirmed	9 new	+5%
Deaths	0.4 new	+5%
Recovered	2 new	+4%

Most Active Cases per 1M

Panama	1,001
Ecuador	491
Dominican Repub..	400
Peru	315
Chile	299
Costa Rica	101
Brazil	82
Cuba	70
Jamaica	64
Colombia	62

* Excludes regions with population < 1M



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Updated 22 April 2020, 1:00 GMT

Asia

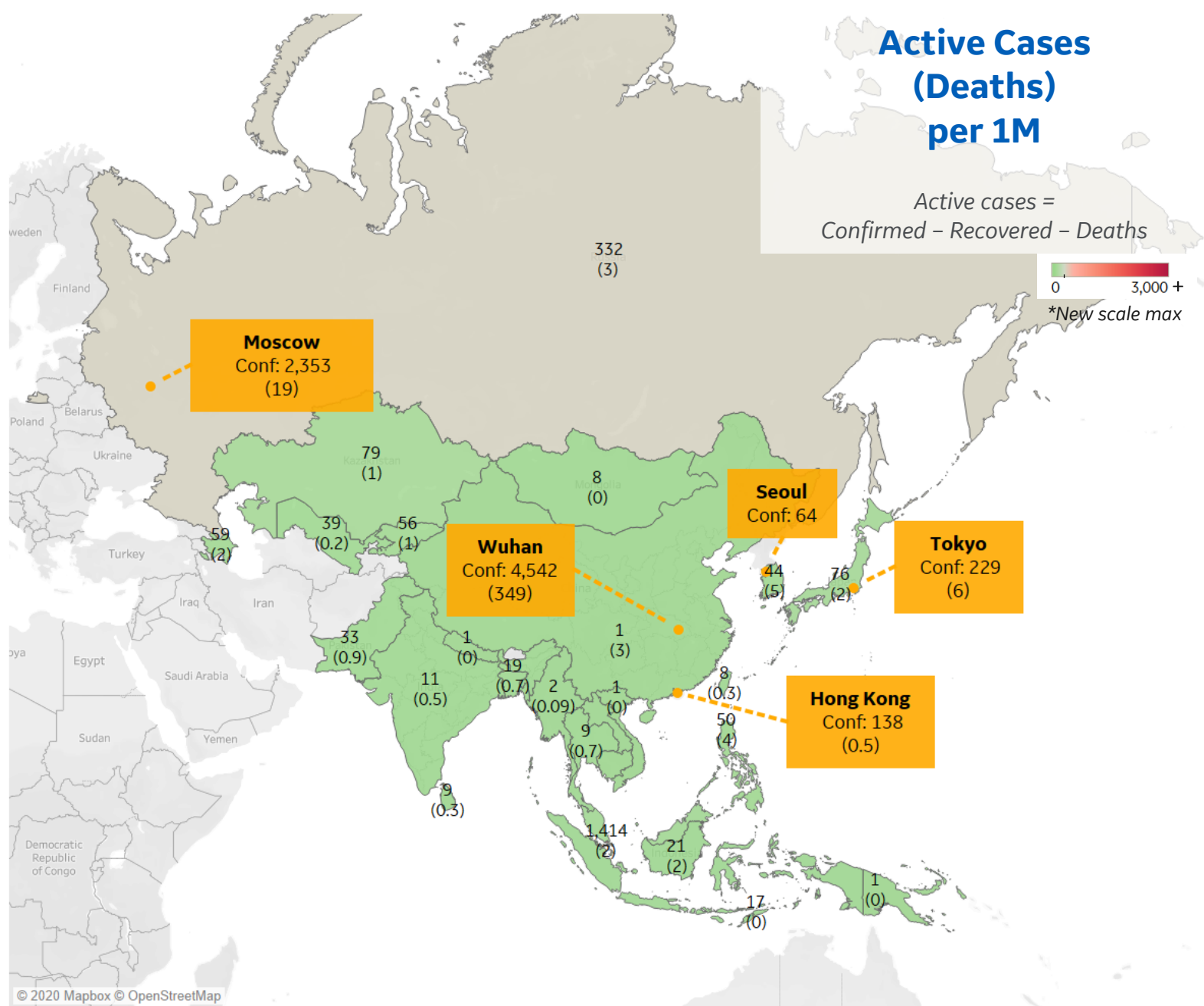
Per 1M in Region

	Today	Change
Active Cases	26	+8%
Confirmed	3 new	+5%
Deaths	0.05 new	+3%
Recovered	0.5 new	+2%

Most Active Cases per 1M

Singapore	1,414
Russia	332
Kazakhstan	79
Japan	76
Malaysia	63
Azerbaijan	59
Kyrgyzstan	56
Philippines	50
South Korea	44
Uzbekistan	39

* Excludes regions with population < 1M



Africa

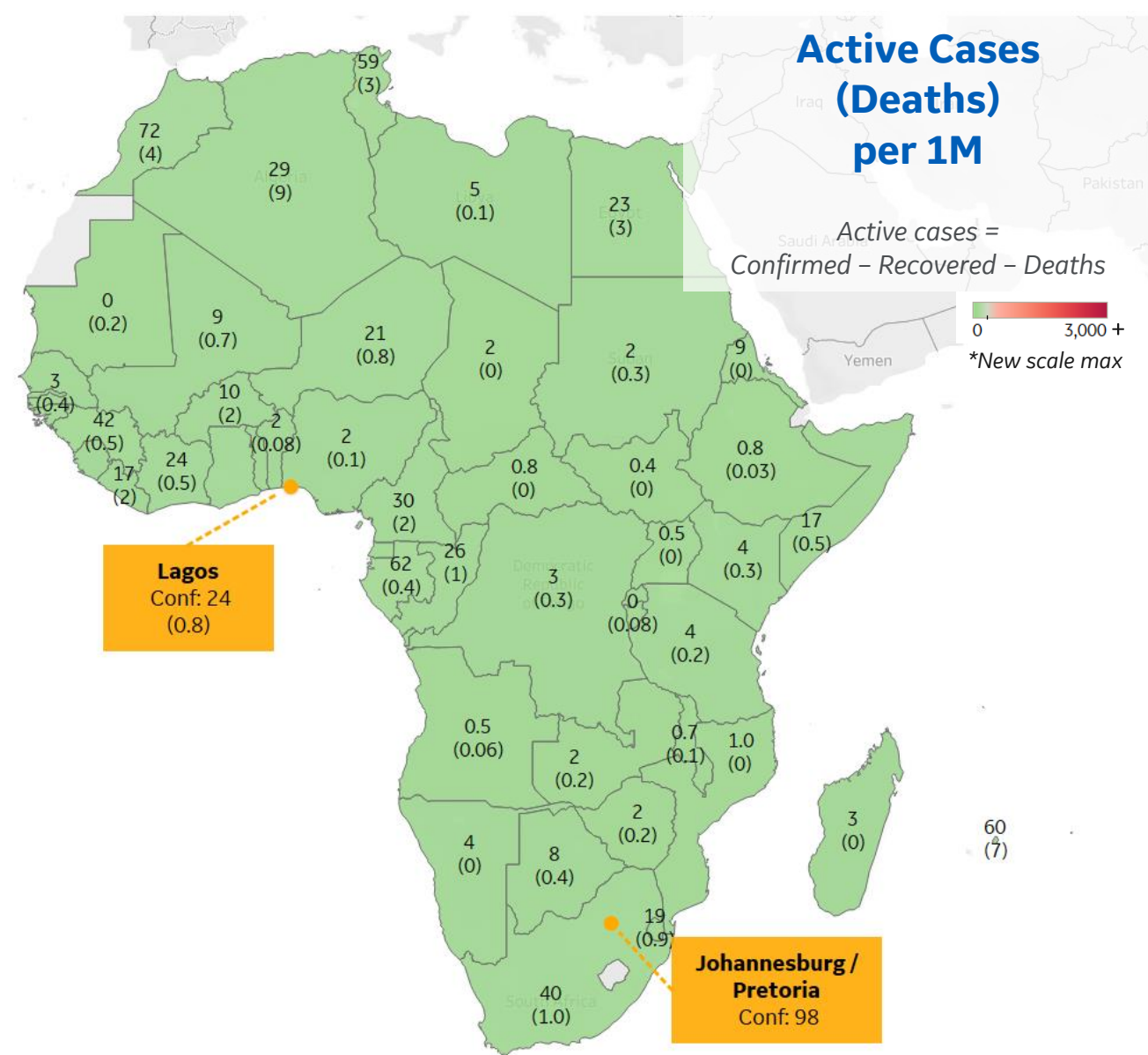
Per 1M in Region

	Today	Change
Active Cases	13	+4%
Confirmed	0.8 new	+4%
Deaths	0.02 new	+3%
Recovered	0.2 new	+5%

Most Active Cases per 1M

Morocco	72
Gabon	62
Mauritius	60
Tunisia	59
Equatorial Guinea	54
Guinea	42
South Africa	40
Ghana	30
Cameroon	30
Algeria	29

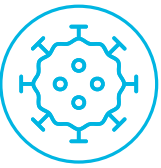
* Excludes regions with population < 1M



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