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MORNING BRIEF

Scientific Review

10 August 2020

The purpose of the Morning Brief is to summarize and present key information, research articles and other relevant publications pertaining to critical care and COVID-19.

Stellenbosch University Research Response Team

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Content

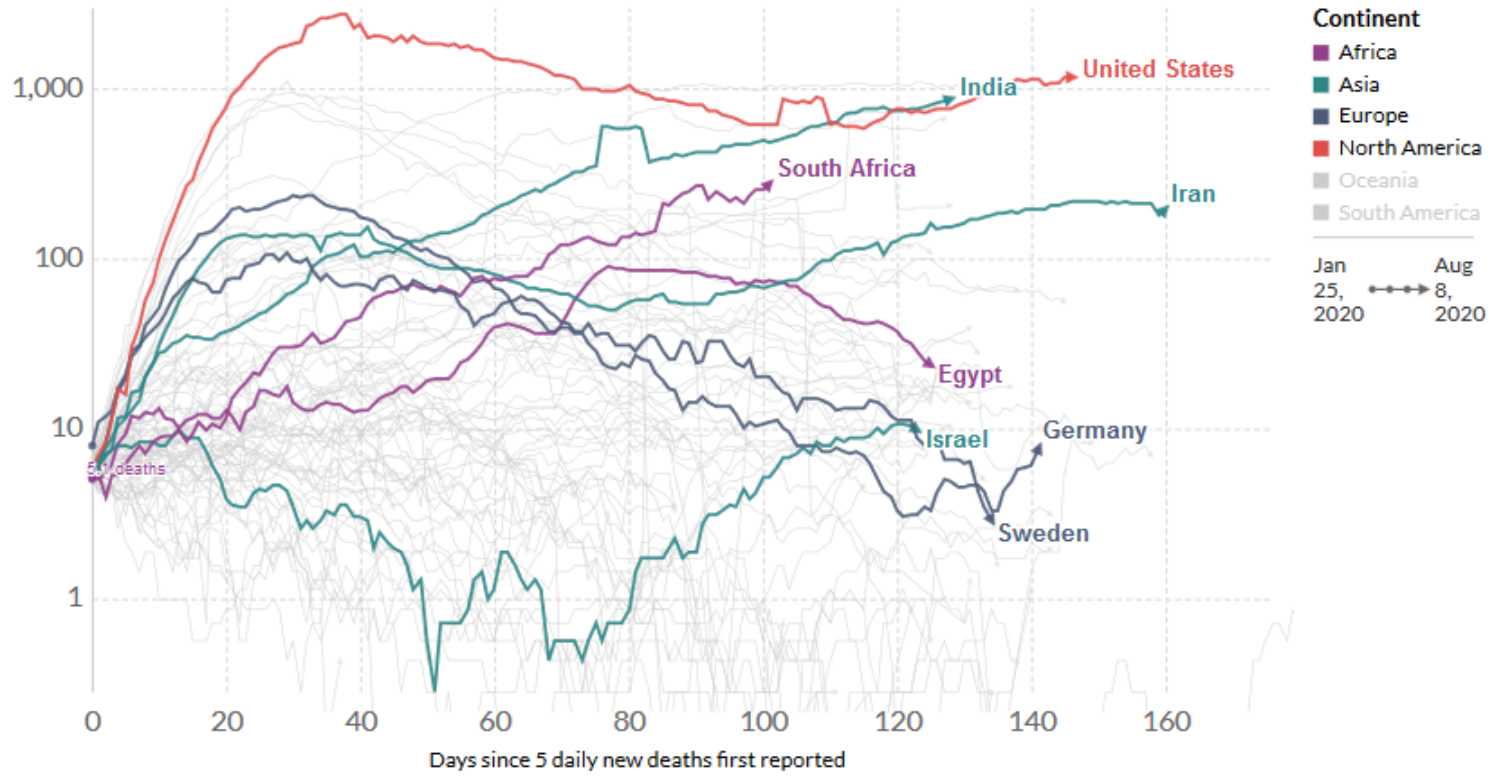
Stats
Complement and coagulation

Daily new confirmed COVID-19 deaths

Our World in Data

Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.

LINEAR | LOG



Source: European CDC – Situation Update Worldwide – Last updated 8 August, 10:34 (London time), Our World In Data

CC BY

Jan 25, 2020 — Aug 8, 2020

Select countries | ☑ Zoom to selection | ☑ Hide countries < 1 million people | CHART | MAP | TABLE | SOURCES | DOWNLOAD

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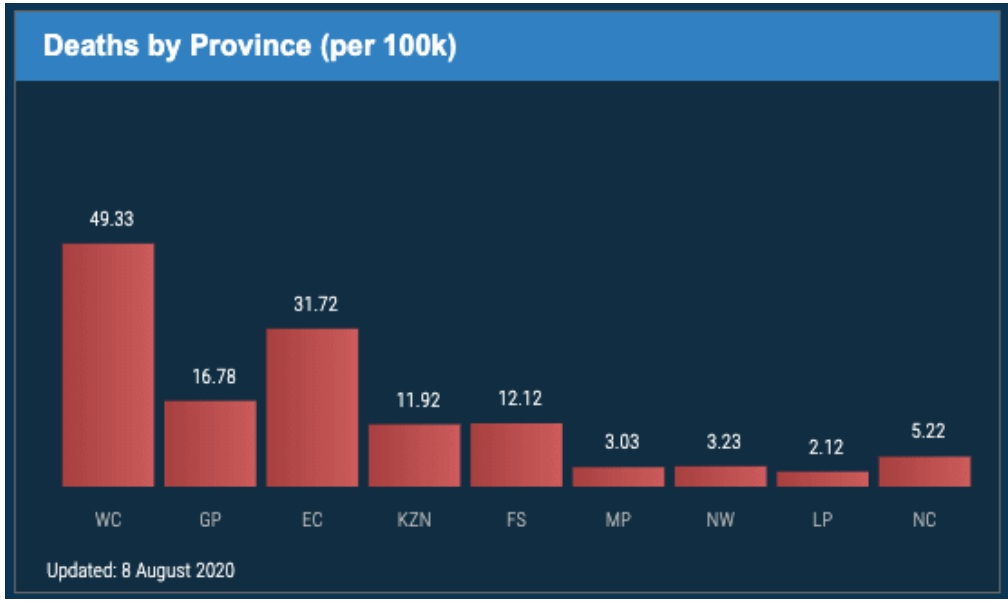

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nature medicine

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https://doi.org/10.1038/s41591-020-1021-2

Check for updates

Immune complement and coagulation dysfunction in adverse outcomes of SARS-CoV-2 infection

Vijendra Ramlall[1,2], Phyllis M. Thangaraj[1,3], Cem Meydan[4,5], Jonathan Foox[4,6], Daniel Butler[4,6], Jacob Kim[7], Ben May[5], Jessica K. De Freitas[8,9], Benjamin S. Glicksberg[8,9], Christopher E. Mason[4,6,10,11], Nicholas P. Tatonetti[1,7] ✉ and Sagi D. Shapira[7] ✉

Retrospective, historic data from data warehouse in New York, and current data, for 11116 patients treated for suspected Covid-19, 6398 PCR positive

Specifically explored

- Macular degeneration (88 patients)
  - proxy for complement activation disorders from a genetic mechanism
- Complement deficiency disorders (4 patients)
- Disorders of coagulation (1179 patients)

Rationale – viral proteins may structurally mimic complement and coagulation factors and contribute to immune pathology

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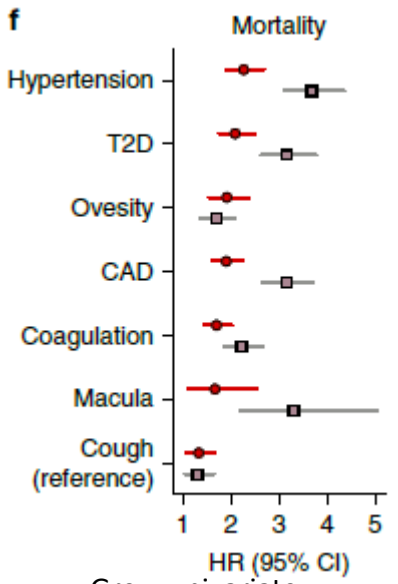
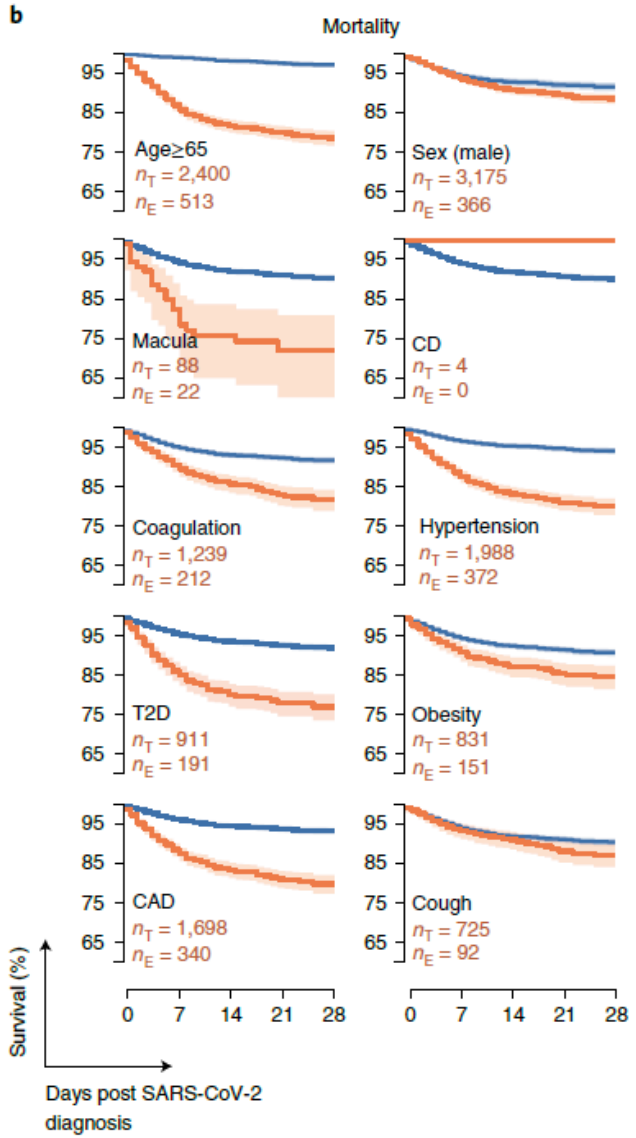


Grey -univariate

Red – corrected for age and sex



	All patients	SARS-Cov-2 positive (C19+)	Intubated and C19+	Mortality and C19+	Macula and C19+	Complement def. and C19+	Coagulation and C19+	Hypertension and C19+	T2D and C19+	Obesity and C19+	CAD and C19+	Over 65 years and C19+	Cough (reference) and C19+	Smokers and C19+
n	11,116	6,393	484	618	88	4	1,239	1,988	911	831	1,698	2,400	725	723
Age (IQR)	52.0 (34.7-69.5)	57.1 (41.5-72.0)	62.3 (53.0-73.3)	76.3 (69.5-86.3)	74.1 (67.2-84.6)	57.9 (49.1-70.9)	61.8 (48.2-77.0)	66.6 (56.4-78.5)	67.2 (57.9-78.2)	57.9 (43.5-71.8)	66.2 (55.9-79.6)	77.4 (70.4-83.5)	59.2 (46.6-72.0)	63.8 (54.8-74.7)
T2D (%)	12.6	14.2	22.9	30.9	54.5	25	34.5	39.1	100	40.2	38.2	22.3	23.3	27.2
Obesity (%)	12	13	15.9	18.6	38.6	0	34.4	31.6	36.7	100	31.1	13.5	20.4	18.8
Mechanical ventilation	9.2 (8.7-9.8)	7.6 (6.9-8.2)	100 (100-100)	33.0 (29.3-36.7)	15.9 (8.3-23.6)	0 (0-0)	10.2 (8.5-11.9)	10.6 (9.2-11.9)	12.2 (10.1-14.3)	9.3 (7.3-11.2)	11.7 (10.2-13.2)	10.1 (8.9-11.3)	10.5 (8.3-12.7)	11.1 (8.8-13.4)
Mortality	10.2 (9.7-10.8)	9.7 (8.9-10.4)	42.1 (37.7-46.5)	100 (100-100)	25.0 (16.0-34.0)	0 (0-0)	17.1 (15.0-19.2)	18.7 (17.0-20.4)	21.0 (18.3-23.6)	13.8 (11.5-16.2)	20.0 (18.1-21.9)	21.4 (19.7-23.0)	12.7 (10.3-15.1)	15.2 (12.6-17.8)
Intubation HR (95% CI) / univar.	--	--	--	--	2.2 (1.3-3.7)**	--	1.5 (1.2-1.8)**	1.7 (1.5-2.1)**	1.9 (1.5-2.3)**	1.3 (1.0-1.7)*	2.0 (1.7-2.4)**	1.7 (1.4-2.0)**	1.5 (1.1-1.9)**	1.1 (0.9-1.5)
Intubation HR (95% CI) / age and sex corr.	--	--	--	--	1.8 (1.1-3.1)*	--	1.5 (1.2-1.8)**	1.6 (1.3-1.9)**	1.6 (1.3-2.0)**	1.5 (1.1-1.9)**	1.8 (1.5-2.2)**	1.3 (1.0-1.8)	1.4 (1.1-1.8)**	1.0 (0.7-1.3)
Death HR (95% CI) / univar.	--	--	--	--	3.0 (2.0-4.6)**	--	2.3 (2.0-2.8)**	3.8 (3.2-4.4)**	2.9 (2.5-3.5)**	1.6 (1.3-2.0)**	3.7 (3.2-4.3)**	8.8 (7.1-10.9)**	1.3 (1.1-1.7)*	1.5 (1.2-1.9)**
Death HR (95% CI) / age and sex corr.	--	--	--	--	1.5 (1.0-2.3)*	--	1.8 (1.5-2.1)**	2.3 (2.0-2.7)**	2.0 (1.7-2.4)**	1.9 (1.6-2.4)**	2.2 (1.9-2.6)**	1.7 (1.2-2.3)**	1.3 (1.1-1.6)*	1.1 (0.9-1.4)

C19+, COVID-19 positive; HR, hazard ratio; IQR, interquartile range; *$P < 0.05$, **$P < 0.001$.

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RNA-sequencing on nasal swabs of suspected cases, positive vs negative PCR

SARS-Cov-@ induces robust activation of the complement cascade, as well as pathways involving coagulation and wound healing

This is not Covid-19 specific – expected in tissue inflammation

Also discuss some potential genetic markers of susceptibility, linked to complement and coagulopathy – not conclusive, not discussed

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This summary was prepared by Dr E Maasdorp as part of the daily brief to the TBH ICU team.