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Morning Brief : Scientific Review

19 June 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. We aim to prioritise information, articles and publications released in the preceding 24-48hours.

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Content of the brief

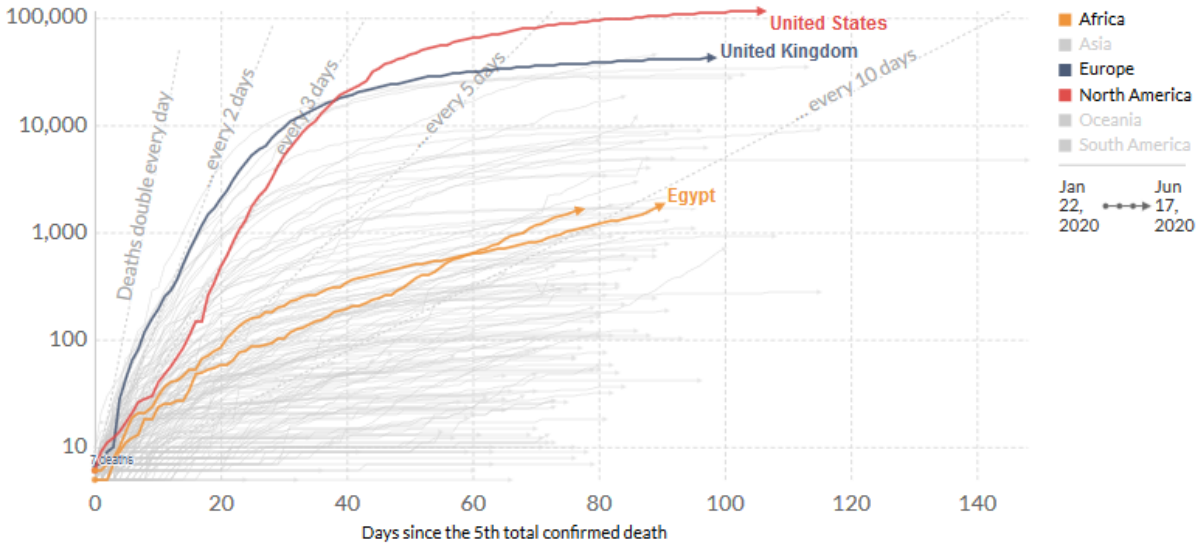
- **Statistics on Covid-19 deaths**
- **Topic: GWAS study**

Total confirmed COVID-19 deaths: how rapidly are they increasing?

Our World in Data

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



Daily confirmed COVID-19 deaths

Our World in Data

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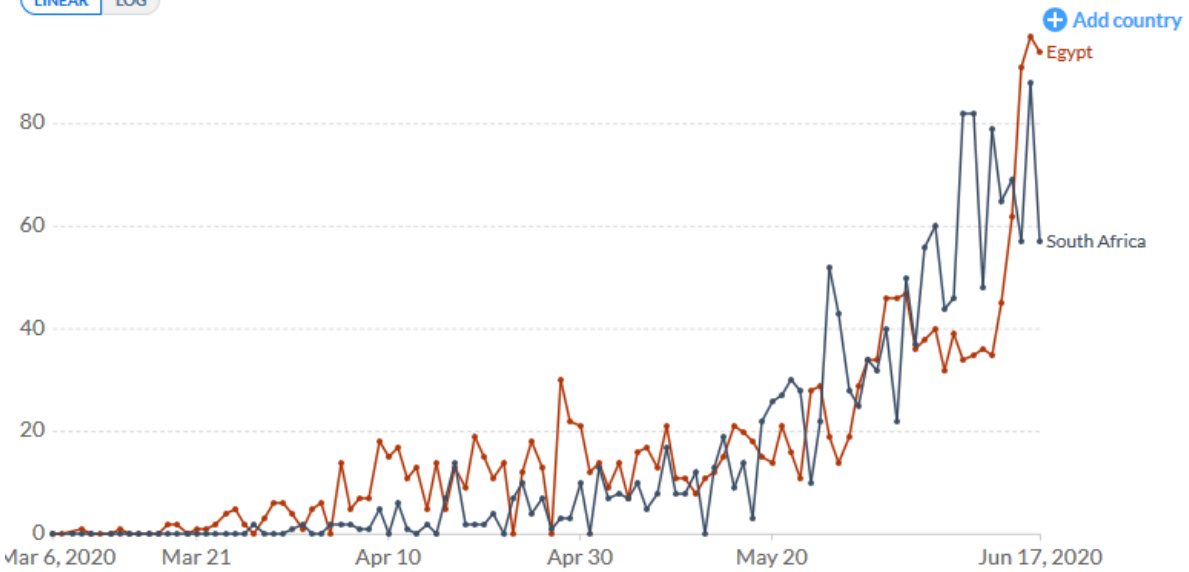
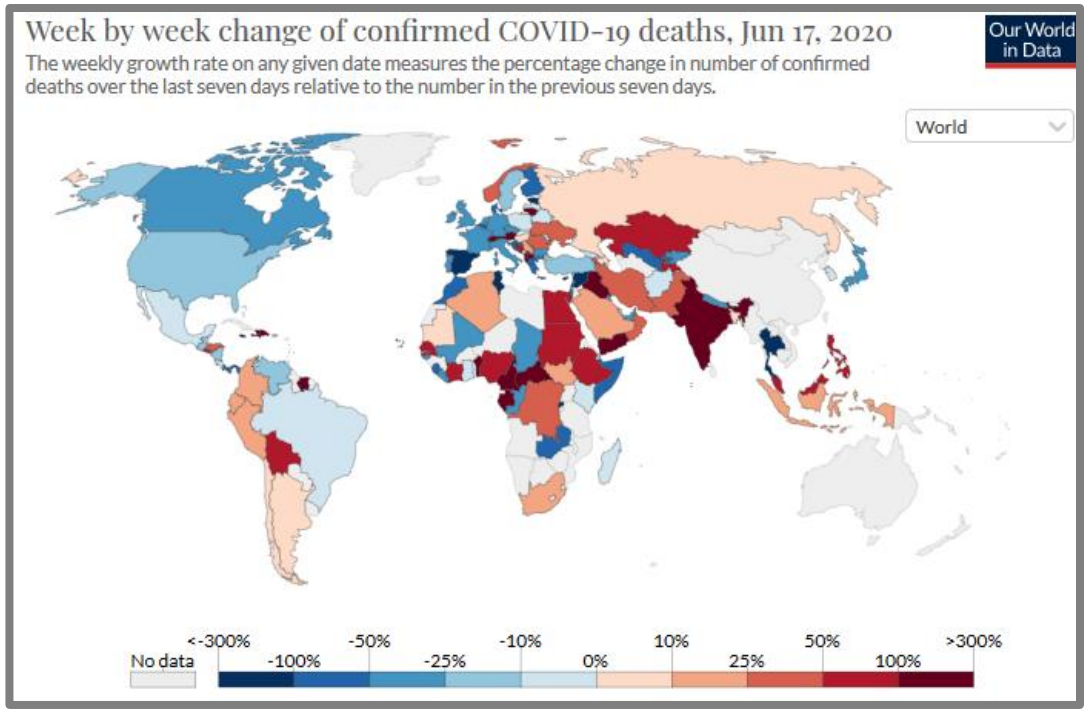
LINEAR | LOG



Week by week change of confirmed COVID-19 deaths, Jun 17, 2020

Our World in Data

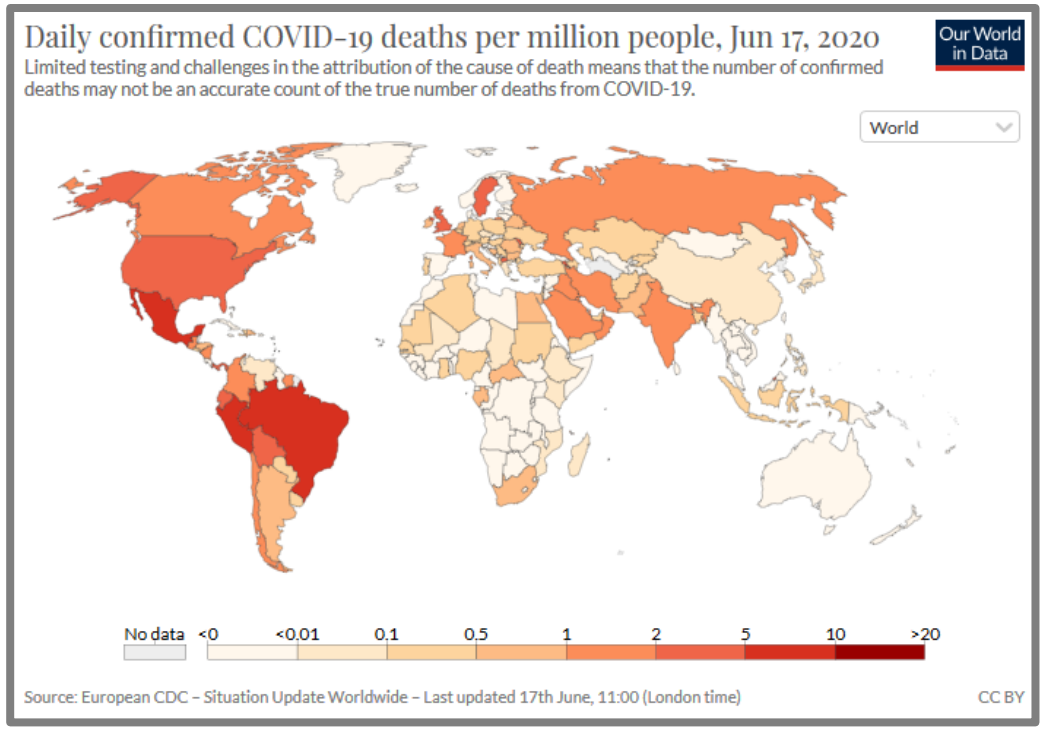
The weekly growth rate on any given date measures the percentage change in number of confirmed deaths over the last seven days relative to the number in the previous seven days.



Daily confirmed COVID-19 deaths per million people, Jun 17, 2020

Our World in Data

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.



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Articles of Interest

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Genome wide association studies (GWAS)

Methods:
Large sample size – attributable risk usually low (e.g odds ratio 1.2)
Searches in millions of places through-out the whole genome of participants for nucleotide differences in the same locations in the genome – these places are called single nucleotide polymorphisms (SNPs)
Most differences will be random - people in both groups will have random differences in the SNPs – GWAS looks for consistent places in the genome, where the disease group differs from the non-disease group

Usefulness:
Genetic component of risk of disease
Predict response to pharmacotherapy (for example some anti-depressants)

Important points:
Association only – needs to be followed up with functional genetic studies to determine if the specific genetic difference is involved in causing the disease
The risk it contributes to the development of disease is usually low – not simple to translate population risk into individual risk
Many false positives, because testing millions of places in the genome

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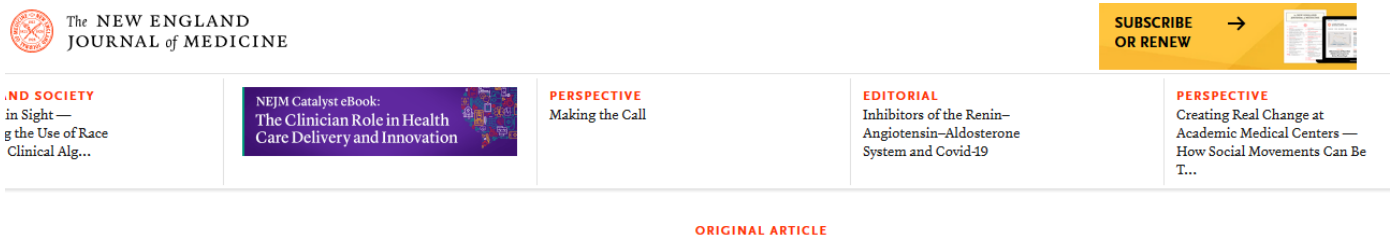

ORIGINAL ARTICLE

Genomewide Association Study of Severe Covid-19 with Respiratory Failure

David Ellinghaus, Ph.D., Frauke Degenhardt, M.Sc., Luis Bujanda, M.D., Ph.D., Maria Buti, M.D., Ph.D., Agustín Albillos, M.D., Ph.D., Pietro Invernizzi, M.D., Ph.D., Javier Fernández, M.D., Ph.D., Daniele Prati, M.D., Guido Baselli, Ph.D., Rosanna Asselta, Ph.D., Marit M. Grimsrud, M.D., Chiara Milani, Ph.D., et al., for The Severe Covid-19 GWAS Group*

Genome wide association study (GWAS)
Recruited cases with severe Covid-19 from 7 hospitals in Italy and Spain
835 cases and 1255 controls from Italy, 775 cases and 950 controls from Spain
Severe = any O2 respiratory support
Screened for 712189 variants
Performed SNP imputation according to a standard method
Included about 9 million SNPs in each cohort

2 SNPs were significantly associated with severe Covid-19 disease
OR 1.77; 95% CI, 1.48 to 2.11; $P=1.15\times10^{-10}$
OR 1.32; 95% CI, 1.20 to 1.47; $P=4.95\times10^{-8}$

The 2 SNPs are associated with genes coding for cell surface proteins on pulmonary cells and genes involved in determination of ABO blood group

Higher risk in patients with blood group A vs other groups (OR 1.45; 95% CI, 1.20 to 1.75; $P=1.48\times10^{-4}$

Protective effect for blood group O vs other groups (odds ratio, 0.65; 95% CI, 0.53 to 0.79; $P=1.06\times10^{-5}$)

Discussion
One of the associations also found in preliminary results of another group

Small risk of bias in the association with blood group as controls were blood donors – the authors deem this risk to be low

Pragmatic approach – no information on comorbidities were collected

Limited info on SARS-CoV-2 infection status of controls

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