Executive Summary: COVID-19
1 JULY 2020

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The Executive Summary is produced weekly and contains in-depth analysis.
International SOS publishes a COVID-19 Daily Case Summary.

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Today's Executive Summary focuses on COVID-19 illness.

DISTURBING GLOBAL SUMMARY FROM WHO DG

Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization, said on Monday, during a virtual press conference, "Although many countries have made some progress, globally, the pandemic is actually speeding up". "We all want this to be over. We all want to get on with our lives, but the hard reality is that this is not even close to being over….

"The pandemic also is accelerating around the world, as many countries that reopened their economies see a resurgence in cases."

JOURNAL / ARTICLE ROUND-UP

CHINESE MILITARY APPROVES VACCINE

A coronavirus vaccine has been approved by China's military to use on its soldiers.

China has skipped Phase 3 trials and approved a COVID vaccine directly for use by its military. The same vaccine being tested in Canada. China approved it for one year for its soldiers without full long-term data.

The vaccine, Ad5-nCoV, was developed by CanSino and the Beijing Institute of Biotechnology in the Academy of Military Medical Sciences.

CORONAVIRUS IMPACTING LOW-INCOME, AND ESPECIALLY WAR-TORN COUNTRIES

From a report in the Sydney Morning Herald: "Experts say the 10.1 million official cases and more than 500,000 deaths are serious undercounts of the true pandemic toll, due to limited testing and missed mild cases.

"For months, experts have warned of a potential nightmare scenario: after overwhelming health systems in some of the world's wealthiest regions, the coronavirus gains a foothold in poor or war-torn countries ill-equipped to contain it and sweeps through the population. Now some of those fears are being realised.

- **In southern Yemen**, health workers are leaving their posts en masse because of a lack of protective equipment, and some hospitals are turning away patients struggling to breathe.

- **In Sudan's war-ravaged Darfur region**, where there is little testing capacity, a mysterious illness resembling COVID-19 is spreading through camps for the internally displaced.

- **Cases are soaring in India and Pakistan**, together home to more than 1.5 billion people and where authorities say nationwide lockdowns are no longer an option because of high poverty."

WHO TO SEND SECOND TEAM INTO CHINA TO SEEK SOURCE OF COVID-19

The World Health Organisation announced it would send a team into China to investigate the source of the pathogen, which has now killed more than half a million people.

"We can fight the virus better when we know everything about the virus, including how it started," WHO Director General Tedros Adhanom Ghebreyesus said on Monday in Geneva. "We will be sending a team next week to China to prepare for that."

GILEAD CHARGING US $522 PER DOSE OF REMDESIVIR

Remdesivir manufacturer Gilead has set the price for its COVID-19 treatment at US$520 (AU$755) per dose for the United States. According to a report in The Washington Post, an earlier independent analysis suggested Gilead could recover its R&D costs for the drug – which Gilead claims are in the vicinity of US$1 billion – if it distributed it for up to US$160 per dose.

Gilead has said it will charge 25% less for the drug for high-income countries outside the United States and has licensed generic manufacturers in developing economies so they can produce the drug at even lower cost.

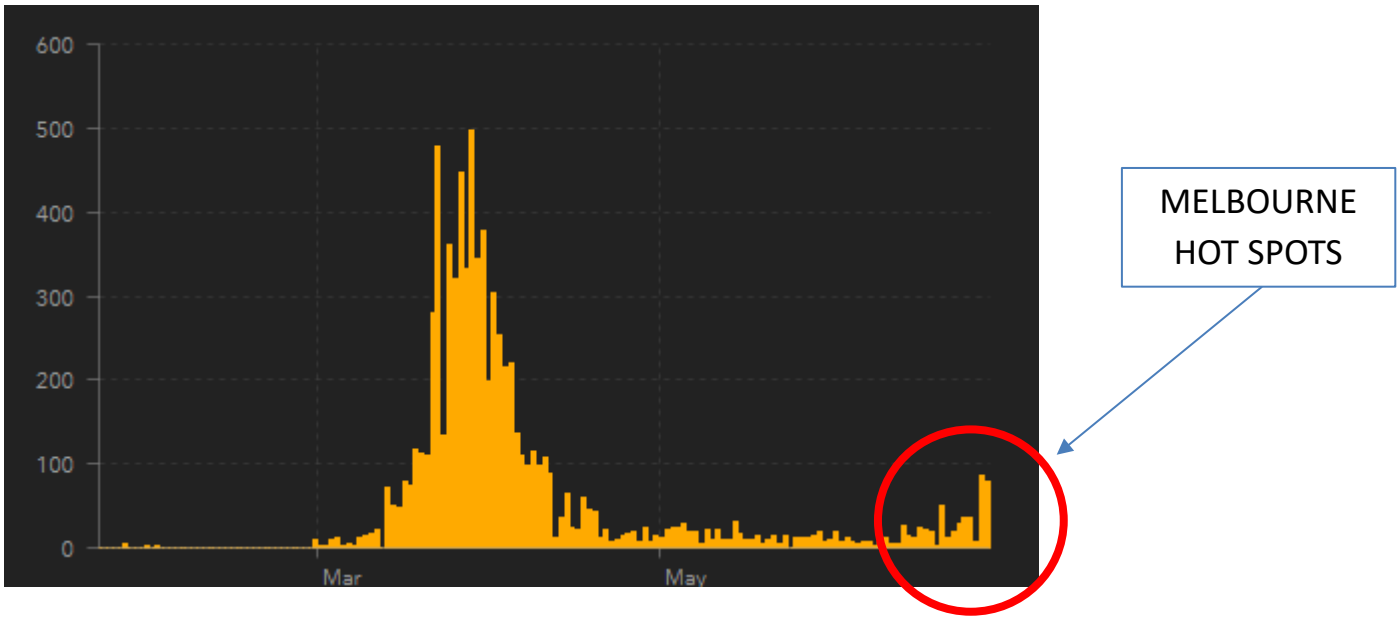
NEW LOCKDOWN IN MELBOURNE, AUSTRALIA

SARS-CoV-2 has been suppressed or eradicated by most Australian states, however there is currently a significant outbreak in Melbourne, Victoria.

- Stay-at-home orders have been issued for 10 postcodes in Melbourne
- There is NO advisory to wear masks
- Schools will remain open

DAILY CASES IN AUSTRALIA

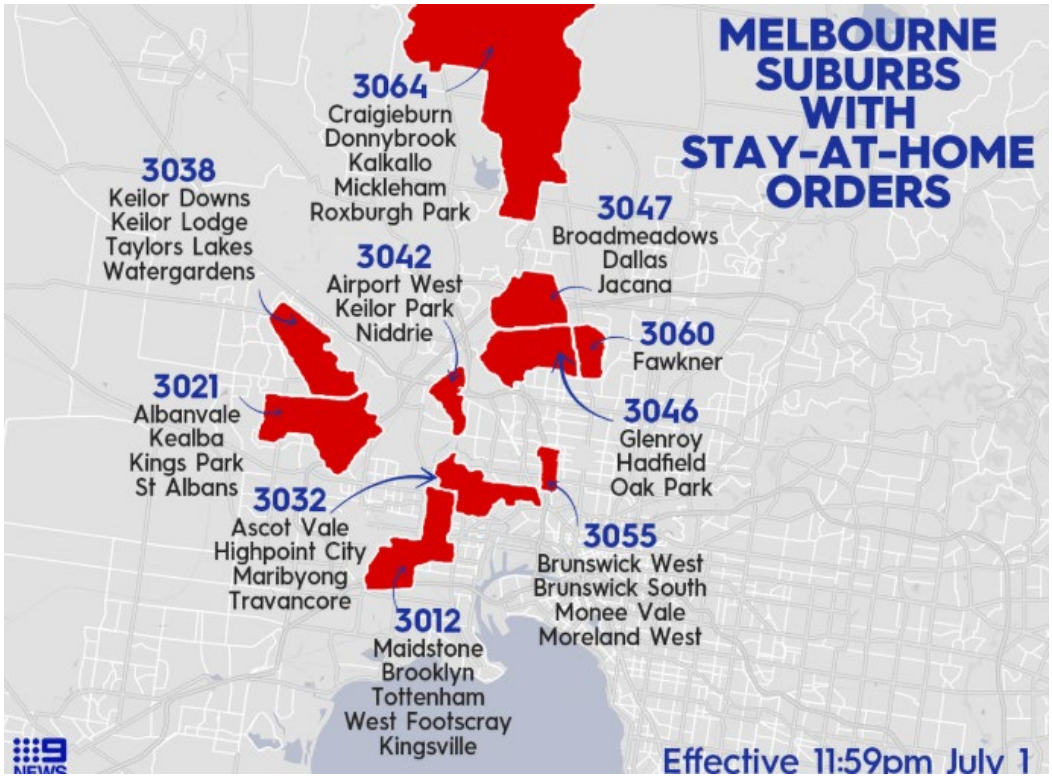
GRAPH: JOHNS HOPKINS UNIVERSITY



DOUBLE DIGIT CASE GROWTH RECENTLY

COVID-19 CASES IN MELBOURNE						
25 June	26 June	27 June	28 June	29 June	30 June	1 July
33	30	41	49	75	64	73

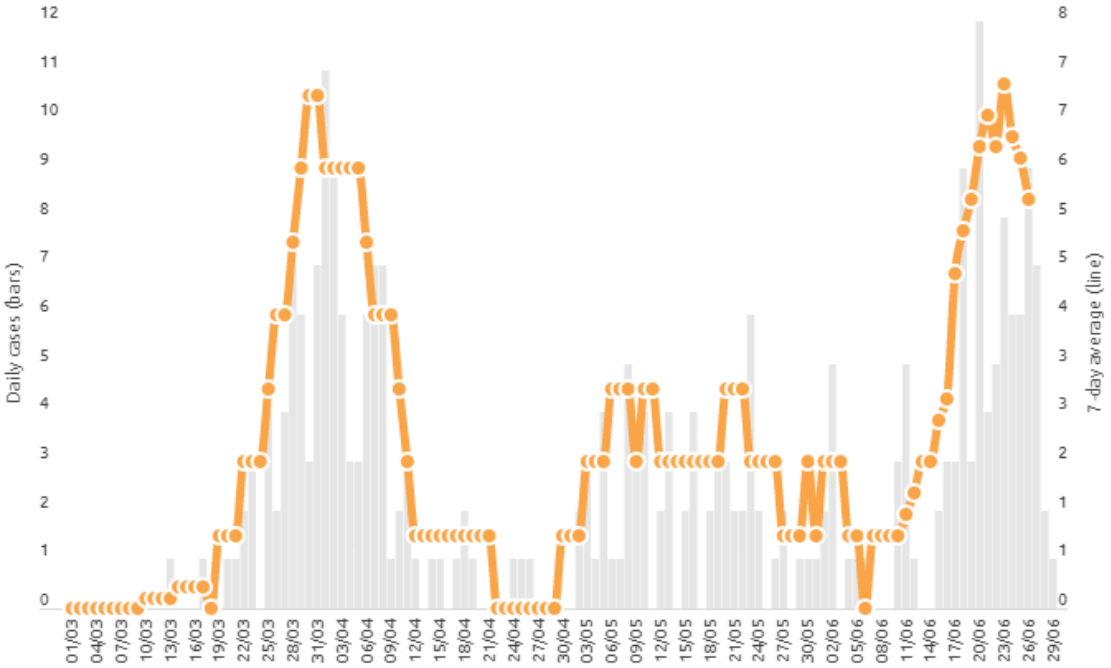
MELBOURNE'S SUBURBS WITH STAY-AT-HOME ORDERS



GRAPHIC: NINE NEWS

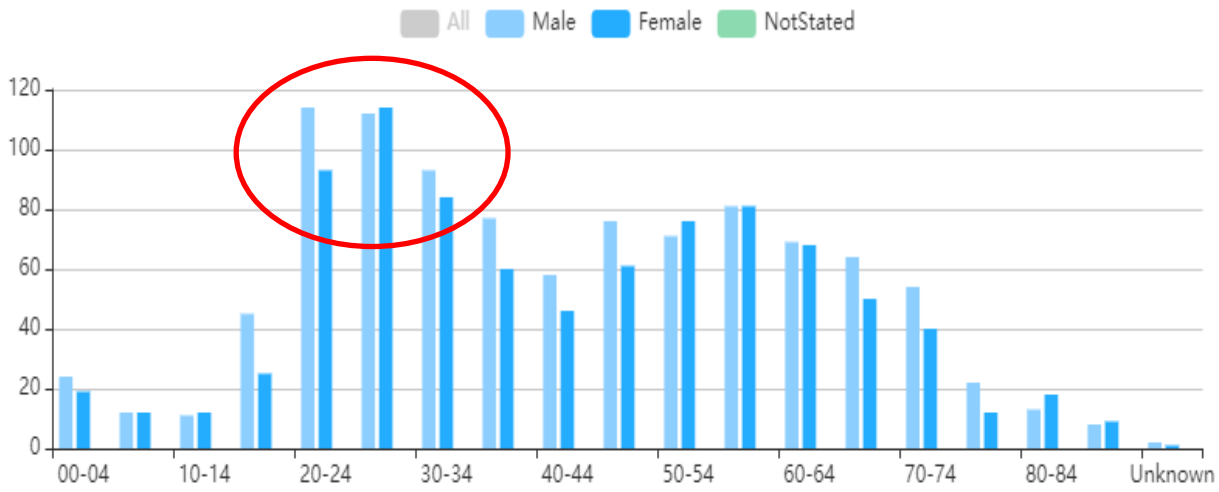
COMMUNITY SPREAD IN VICTORIA

There is the same level of community spread in Victoria now as there was during March/April 2020



GRAPHIC: COVID19DATA.COM.AU

YOUNGER AGE GROUP MORE INVOLVED



WHAT WENT WRONG?

1. **Breach of protocols in quarantine hotels**
   - Since early in the pandemic, thousands of returning overseas travellers have spent a fortnight quarantined in hotel rooms as part of efforts to contain the spread of the coronavirus
   - A breach of infection protocols allowed staff at these hotels to become infected and spread COVID to their families. This has been confirmed by genomic testing
   - An enquiry into the spread from quarantine hotels has begun
2. **Victoria has a decentralised public health system**
   - Most states are organized around populations & have considerable local public health capacity. Victoria has over 80 disconnected standalone hospitals which have no or little public health responsibility for their local population
3. **It has been suggested that COVID communications were not satisfactorily multi-cultural**
   - COVID information not translated
   - COVID information not given by people respected in the community
   - People not remaining in self-quarantine
   - People not respecting physical distancing
   - Large family gatherings
4. **It is winter in Melbourne**
   - Unknown parameter

INTERVIEW WITH BRETT SUTTON, CHIEF HEALTH OFFICER, VICTORIA (before the lockdown was announced)

This is worth reading or listening to. It is an interesting **mix of epidemiology and humanity**

QUESTION: Do you think Australia made a mistake not going for eradication?

ANSWER: I'd be very happy if all of Australia had got to the point of eradication because then you are not fighting to sustain good behaviours into the long term. I think that we can manage it for now, but it will become increasingly difficult. Can we do it for six months more? I doubt it. Twelve months, impossible. And so if that's how long it's going to take to get a vaccine, then it's much more comfortable if you have eradication.

That's the challenge with a suppression strategy, **YOU NEED TO KEEP AT IT, AND AT IT AND AT IT.**

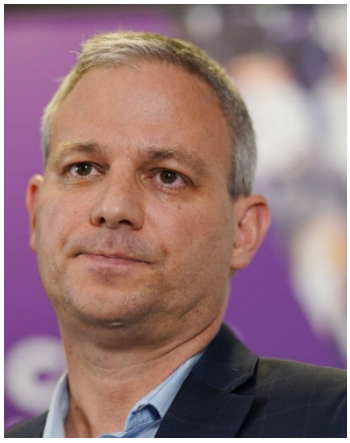


Image: Australian Government

QUESTION: How scared are you that this outbreak (Melbourne) is going to slip out of your control?

ANSWER: I think it's a genuine challenge now. I think we are right at the edge of being able to manage it. And we know that as three quarters of the country goes back to a normal way of living, that it becomes even more challenging to tell people in Victoria that it's not the same here…..

QUESTION: How much are we picking up per day? Early on the CMO said that the modelling suggested that we were picking up 80-90% of cases.

ANSWER: What's happened here and in the United States is that there is a shift to a younger population and it's going to be harder to pick up. I think they are less motivated to come forward for testing as they are less likely to get severe illness and therefore less likely to be hospitalized…and so that it might be that we are not getting 80-90% now.

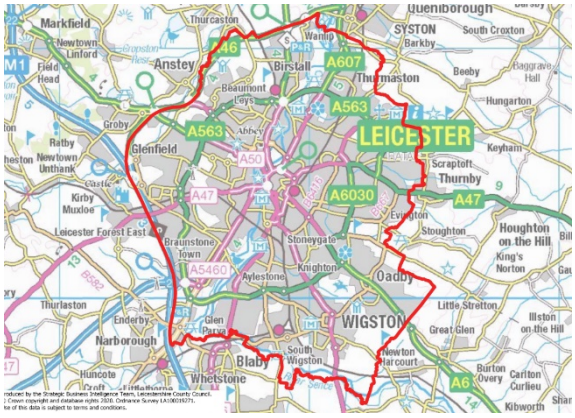
OTHER LOCATIONS GOING INTO LOCKDOWN AGAIN

LOCKDOWN IN LEICESTER, UK

Leicester currently has seven-day infection rate of 135 cases per 100,000 people - three times greater than Britain's next highest city. The city had 10% of all positive cases in the country over the past week and there have been 944 positive tests in the two weeks to 23 June.

In keeping with Boris Johnson's analogy of "whack-a-mole" management of COVID-19, the government has announced that Leicester, and its surrounding area, will have to follow stricter lockdown restrictions for at least another two weeks.

Bars, restaurants, hairdressers, and non-essential shops that reopened on 15 June will close from 30 June until 4 July. Schools will close from Thursday 2 July except to vulnerable children and children of key workers.



Map: Leicester Council

CHINA LOCKS DOWN 400,000 PEOPLE AFTER VIRUS SPIKE NEAR BEIJING

Lockdown restrictions have come into force in Anxin county in Hebei province near Beijing to manage a small COVID-19 cluster of 18 cases that have been confirmed in the last two weeks. This will affect around 400,000 people.

Officials announced on Sunday that Anxin would be "fully enclosed and controlled". Only essential workers are allowed to leave their homes, while one member of a household is allowed to go out once a day to shop for necessities. No non-residents will be allowed to enter buildings, communities or villages.

Map: Guardian

BEIJING LOCKDOWN: SUCCESS SHOWS CHINA'S PLAN FOR PREVENTING A SECOND WAVE

On June 11, Beijing reported its first new coronavirus case in nearly two months. Over the next two days, the city government swung into action, implementing a targeting lockdown, including a remain at home orders, for certain neighbourhoods.

The vast Xinfadi wholesale market, where the outbreak is believed to have begun, was closed and thousands who worked there or visited were tested, and contacts traced. The government has also managed movement in and out of specific neighbourhoods and has tried to stop the virus spreading beyond the city.

It seems the approach is working. As of 24 June the number of confirmed cases in the outbreak was 269 and the daily infection rate had fallen to below 15. Importantly, there was no reported spread to a secondary infection point.

Beijing's response may be the blueprint for containing the virus in China until a vaccine is found.

UPDATE ON COVID APPS

There is currently a discussion that excessive focus on the merits of COVID-tracing apps may blunt the messaging about the importance of social (physical) distancing, hygiene, masks, and testing contact tracing in controlling COVID-19.

UK CHANGING TO GOOGLE-APPLE TECHNOLOGY

Following an attempt to develop its own COVID-tracking app, which was supposed to be released in May, the UK has decided to build a new app on Google-Apple platform which was developed for this purpose. The problem was that the homegrown app did not work well enough on Apple iPhones – it was not able to measure distance sufficiently accurately. Some of the work done on the original app will be able to be used on the new version.

QUESTIONS ABOUT THE PERFORMANCE OF THE AUSTRALIAN APP

When the Australian COVID-tracking app was released, the Prime Minister of Australia, Scott Morrison, said "If you want to go outside when the sun is shining, you have got to put sunscreen on. This is the same thing."

Testing data provided to the Senate showed the effectiveness of the Australian app, particularly on Apple iPhones, remains an issue. The app only worked 25 to 50 per cent of the time during locked iPhone-to-iPhone testing on 26 May. At launch, it was worse, working only 25 per cent of the time, or less for a locked iPhone. When running in the background, it also didn't work well.

Two months after launch, health authorities have not declared that the app has identified any people exposed to COVID who were not already found by traditional contact tracing. Mr. Morrison is now rarely speaking about the app in press conferences.

AUSTRALIA RULES OUT APPLE-GOOGLE CORONAVIRUS TRACING METHOD

Australia's coronavirus contact tracing app will not switch to the model supported by Apple and Google because doing so would not provide the details of potentially exposed people to tracing teams, Australia's Deputy Chief Medical Officer, Nick Coatsworth, says.

WHO DESCRIBES THE CHALLENGES OF DIGITAL TOOLS

Although several countries and areas have deployed digital tools for their COVID-19 response, there is currently limited evidence to evaluate the effectiveness and impact of these tools. As such, digital tools should not be considered as “single solutions” for contact tracing, but rather as complementary tools.

Additionally, the implementation of digital technologies in contact tracing carries the potential to do harm through privacy breaches, provision of incorrect medical advice based on self-reported symptoms, and the systematic exclusion of some members of society who cannot access such technologies. It is therefore important to have sufficient regulatory oversight of digital tools for contact tracing.

A FEW NOTES ON THE USA

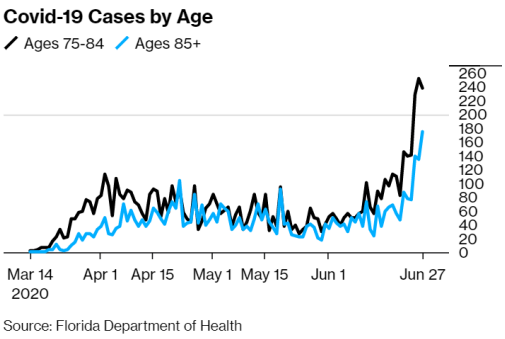
FAUCI WARNS U.S. COULD HIT 100,000 DAILY CASES IF SURGE CONTINUES

Dr. Anthony S. Fauci, the nation's top infectious disease expert, warned on Tuesday that the number of new infections in the United States could more than double to 100,000 a day if the country fails to contain the surge that is now underway in many states. He noted that the recent sharp rise in cases, largely in the South and the West, "puts the entire country at risk."

COVID-19 SURGE BEGINS REACHING OLDER, MORE VULNERABLE FLORIDIANS

Florida is reporting an unprecedented number of COVID-19 cases, however the median age of the sick is 36 years, suggesting that there may be less serious clinical consequences.

However, a large number of elderly Floridians, 75 and over, are now testing positive for COVID-19.



Source: Florida Department of Health

FOCUS ON TEXAS

This is our ninth report on the number of cases per day in Texas since "re-opening" in stages began on 1 May. Texas represents a microcosm of many US states that with significant COVID epidemics since reducing restrictions.

- Cases per day continue to increase
- COVID-related hospitalizations continue to increase
- COVID-related ICU admissions continue to increase

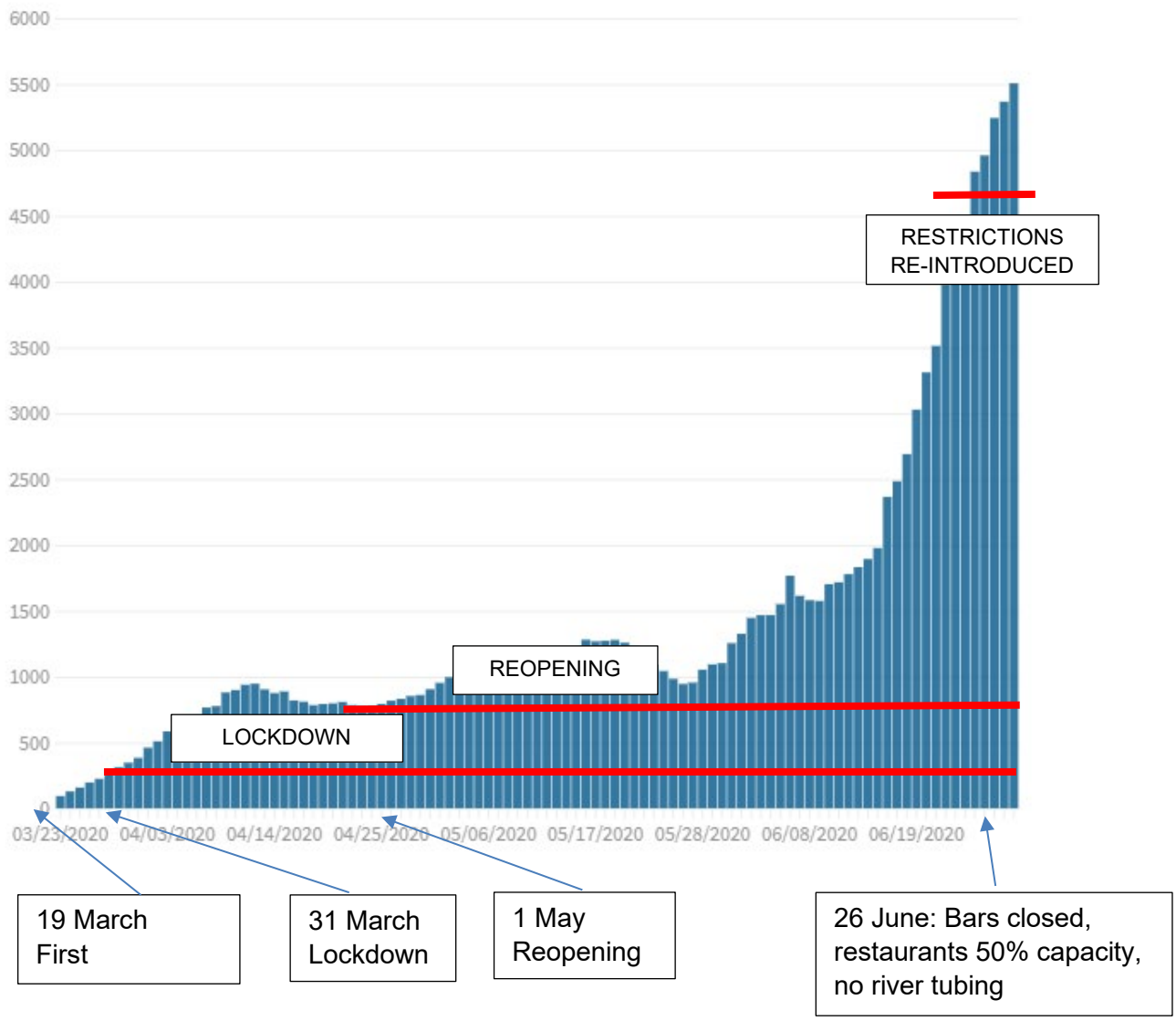
NEW CASES PER DAY

The graph below from the Houston Chronicle shows a sharp increase in new coronavirus cases. The rate remains a multiple of both when lockdown occurred and when re-opening began on 1 May.

Cases per day

Lockdown	31 March 2020	325 cases per day
Re-opening	1 May 2020	785 cases per day
	10 June 2020	1,575 cases per day
	20 June 2020	3,309 cases per day
Restrictions re-introduced	29 June 2020	5,501 cases per day

Texas: Seven day rolling average of new confirmed cases: Houston Chronicle



RE-INTRODUCTION OF RESTRICTIONS

Due to the rapid increase of daily cases, on 26 June Governor Abbott re-introduced certain restrictions:

- Bars closed
- Restaurants capacity reduced from 75% to 50%
- Social activities such as water parks and river-rafting closed

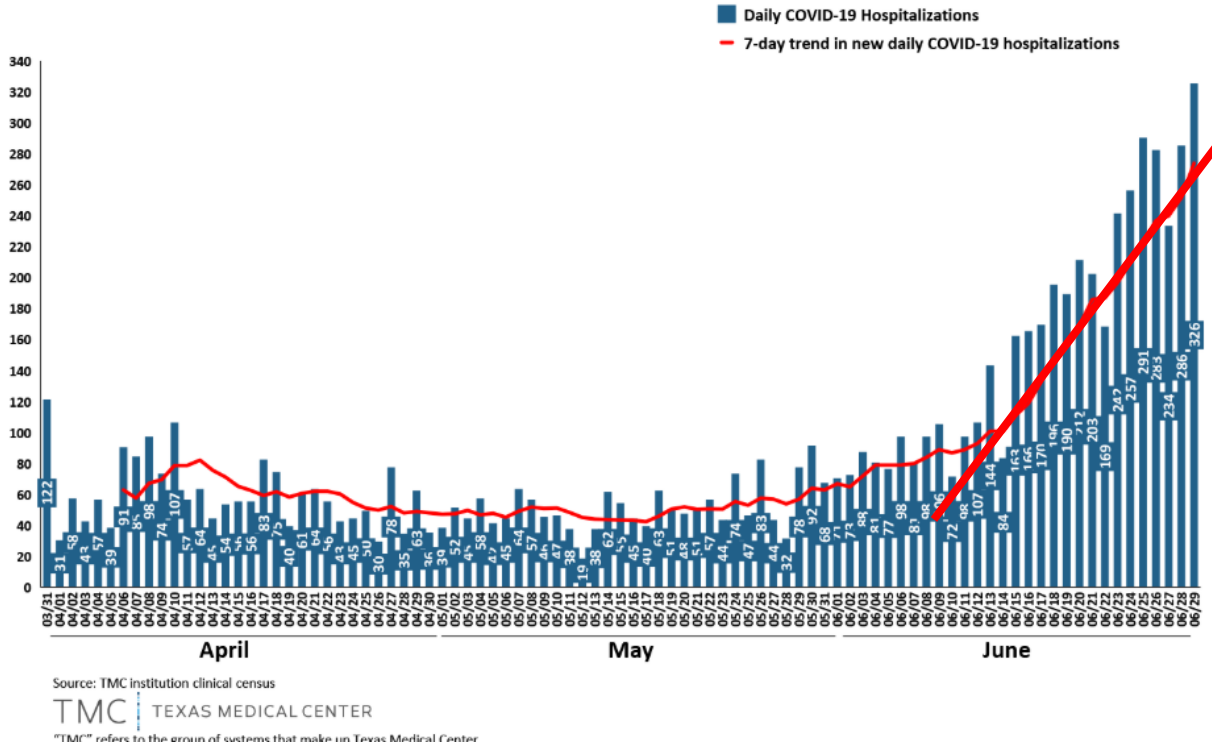
HOSPITALIZATIONS IN TEXAS

The State of Texas does not report daily state-level hospitalizations, however Texas Medical Centre (Houston) does. The graph shows a continued increase in new COVID hospitalizations in recent weeks.

Date	TMC average daily growth in hospitalizations
4 June	2.1% daily growth
11 June	3.5% daily growth
17 June	4.4% daily growth
29 June7.8%	7.8% daily growth

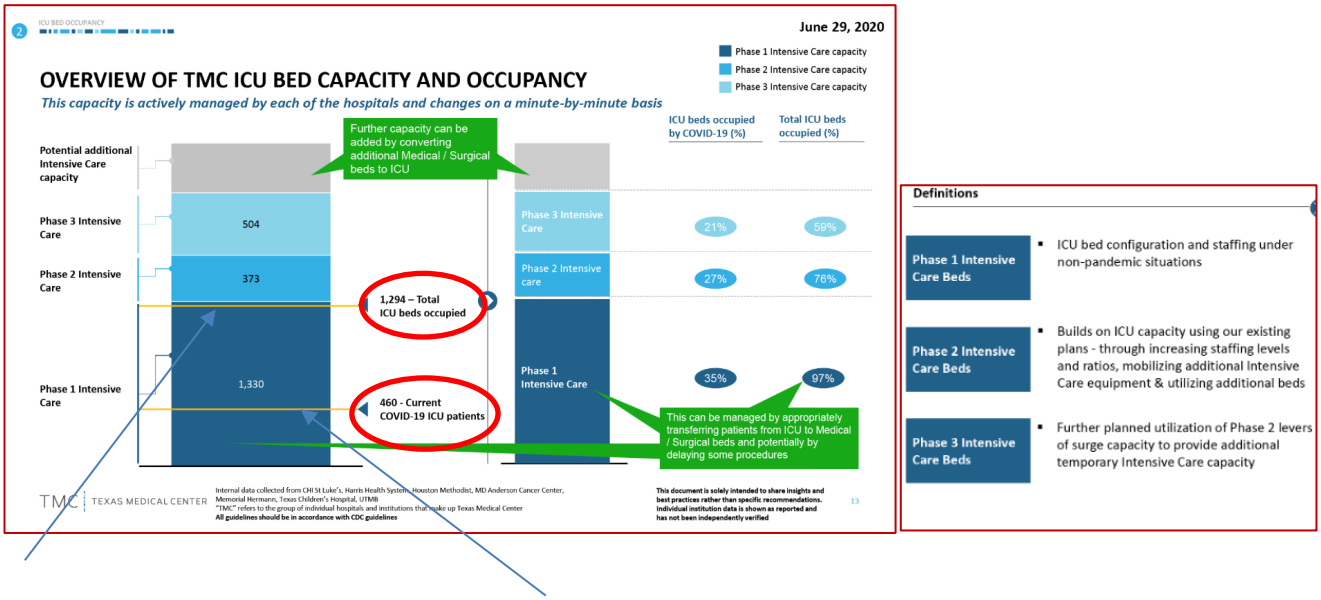
TMC DAILY NEW COVID-19 HOSPITALIZATIONS

ICU & Med Surg hospitalizations

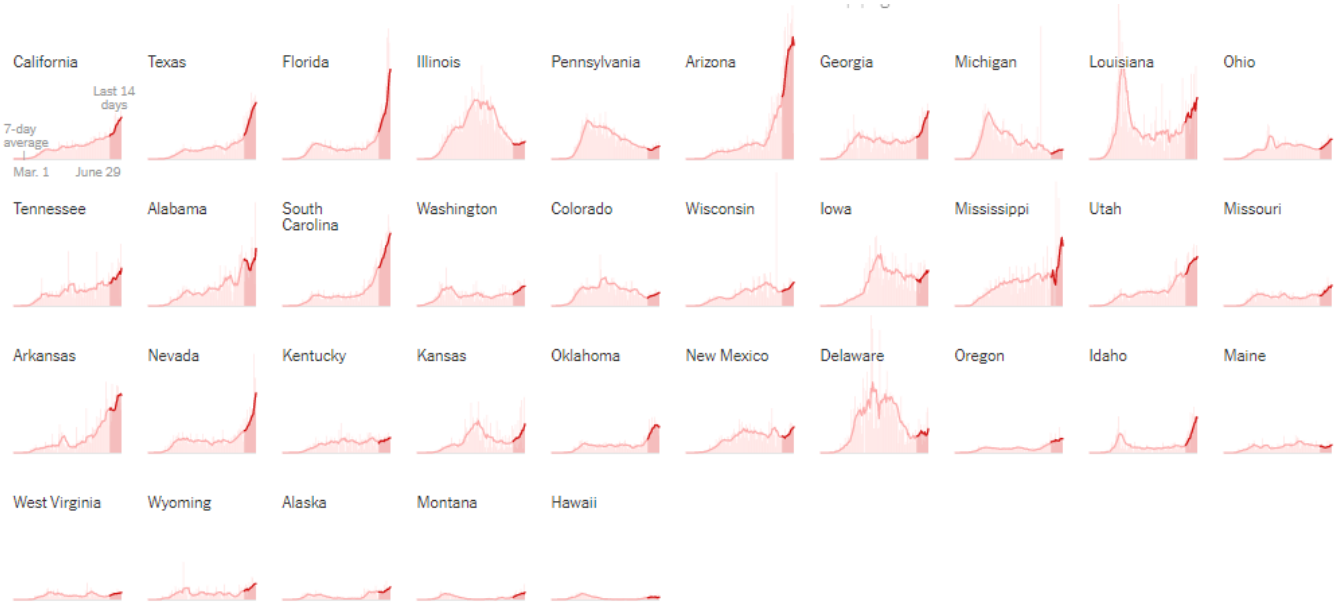


Graph: Texas Medical Centre

TMC ICU STATUS



WHERE CASES ARE INCREASING IN THE USA



Data: New York Times

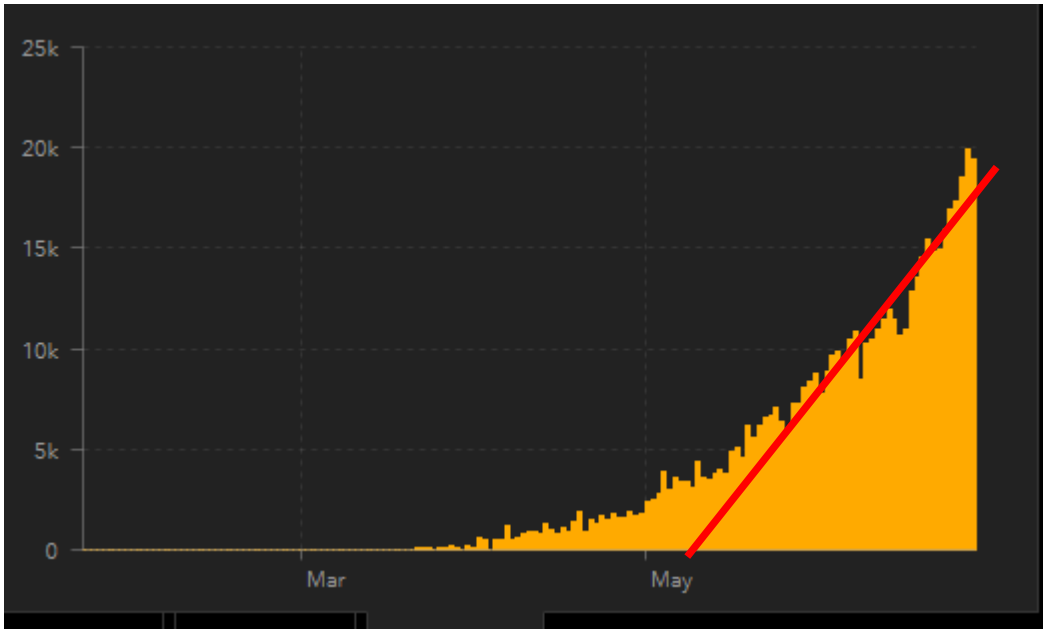
UPDATE ON INDIA

DAILY CASES IN INDIA

GRAPH: JOHNS HOPKINS UNIVERSITY

TOTAL CASES	**585,000**
TOTAL DEATHS	**17,400**
% DEATHS	**3%**

India has not passed its peak of daily confirmed cases.



CHALLENGE TO THE INDIAN MEDICAL SYSTEM

INTERNATIONAL SOS SPECIAL ADVISORY "COVID-19 OUTBREAK IMPACTING HEALTH CARE"

Cases of COVID-19 continue to increase cases across the country. Some major cities such as New Delhi and Mumbai have been significantly impacted, with the healthcare sector particularly affected. As a result of increased demand only limited care may be available in both private and public medical systems. Members should defer all travel until the situation improves.

Advice

Defer all travel due to the effects of the COVID-19 pandemic on the health care situation in the country. Follow the advice and requirements of local authorities.

For International Assignees

- Carefully consider whether it is best for you and your family to remain where you are now or to relocate. If you decide to relocate, this should be done as soon as possible.
    - Review the circumstances which influence your ability to remain in country (and work with the restrictions, directives and mitigation measures of the authorities)
    - Review your personal needs to be in an alternate location.

A VIEW FROM THE LABORATORY: PROFESSOR JOHN OXFORD

Inactivation of Coronaviruses by solar irradiation

I wondered when a paper like this would appear and here it is! I was slightly disappointed that it was entirely theoretical. After all, it is quite easy to grow COVID-19 in the laboratory on Vero E6 cells in a Category IIII safety laboratory. There the virus could be subject to a dose of UV light and killing effects quantified. Also, before we begin, I have had good personal experience of the killing power of UV light on viruses. As a post-doctoral scientist, I inactivated influenza virus quite easily. Even a few minutes of irradiation would reduce infectivity 10,000-fold. COVID-19 is, like influenza, a lipid enveloped RNA virus. It is twice as large as influenza with a genome twice the size. But the latter property could make it an even better target.

The authors in the peer reviewed but not yet published paper (J.L. Sagripanti and C.T. Lyle), developed a theoretical model and equated geography of several cities in the world. They indicated that an aerosol of COVID-19 could remain active on surfaces in the winter in temperate-zone cities and could even be "re-aerosolised". In contrast, sunlight should have a role, in occurrence, spread, rate and duration of the pandemic. On a further personal note, I would say that this is a well investigated ground for influenza, but there is no firm conviction, although we know by observation that influenza is seasonal. We also know that it is spread in equatorial regions all year round. So, to put it mildly, we can start with theory but acknowledge that it may be very difficult to move to practicalities.

With influenza survival not correlated to relative humidity nor temperature, there is an emphasis UV inactivation! The authors have experience in "biodefence" viruses, so this remit has been to measure UV irradiation in cities around the world. But already we see the problems and the potential weaknesses. The authors had to assume no atmospheric influence by haze, clouds and pollution and/or elevation of cities. One issue is that we all know that pollution levels in cities in China, seen by satellite, have dropped very considerably during COVID.

Their calculations showed, compared to actual data for other coronaviruses and flu, that at the winter solstice at the beginning of the COVID-19, **pandemic virus exposure to solar sun sunlight would reduce the virus infectivity by 50% in 22 mins in Mexico City, 99 mins in Shanghai and 86 mins in Cairo. In European cities nearly 100% virus survival would be common at this time.** The authors point to prolonged survival of smallpox in the dark and treatment of Spanish influenza in the open sunlight.

Training of dogs to identify COVID-19 infected persons on arrival in the UK?

We all know of England's love for dogs, the Queen with her Corgi's, and the supposed bulldog nature of Prime Ministers from W. Churchill to the present occupant.

An article in The Observer describes Dr Claire Guest and her work at a dog rescue centre she co-founded "Medical Detection Dogs". Dr Guest works with Spaniels and Labradors. She can identify a so-called bio-technician dog that was then trained to detect odours. Their ability to detect odours is 10-100,000 times greater than a human, as noted by Prof James Logan at the London School of Hygiene and Tropical Medicine. For malaria, a risk for half the world's population, a problem is infectious people who show no symptoms. However, mosquitoes can recognise them and can hence spread disease. But could dogs? At present bio-detection dogs at airports screen for drugs and explosives at a rate of 250 people per hour. The centre has been awarded a grant of £500,000 together with the University of Durham. They are collecting samples from used face masks from 3,000 NHS staff both uninfected and infected. **The dogs could be used for a rapid pre-screen as passengers disembark.**

COVID-19 in children and adolescents in Europe: multinational, multicentric cohort study (Gotzinger F. *et al,* 2020)

The data and the paper take advantage of an already established network of 304 clinicians and researchers in the TB network in Europe. They noted that little clinical data had been published in China for children. The authors note that this is the first study of children with COVID-19 (diagnosed by PCR) to include data from centres and multiple (31) EU countries. Even Australia was given honorary EU status! From a personal viewpoint, I was especially interested in children with COVID-19 plus additional viruses such as influenza and the common cold. These children were more likely to be admitted to ICU. The case fatality was low at 0.69% or 4/582. The study was carried out over three weeks from 1 - 24 April. Symptoms were fever (65%) with 54% having signs of URTI. A quarter had pneumonia. Only 25 children needed mechanical ventilation.

The overall conclusion was that COVID-19 was generally a mild disease for children, including infants. Given our (the UK's) semi-detached status in the EU at the moment, I was pleased to see two UK institutions involved, including Great Ormond Street.

The study was conducted in a hospital and so is selecting the most severe of the clinical spectrum. The strength of the study (complementary work at the CDC and the Australian HPA) is a focus on clinical details. As the current study was closing there were reports of a hyper-inflammatory syndrome in children (PIMS-TS and MIGS). Therefore, long term outcomes remain to be established. **For children in the ICU, the time of ventilation was not very different from cases of RSV and/or influenza. They warn of problems in the next winter if there is co-circulation of influenza and COVID-19.** The authors want to see "robust data on antivirals and immmuno modulatory drugs".

I liked the paper with 32 authors representing the whole group, and congratulate them for their effort to bring the data for publication so quickly!

Why COVID-19 was not created in a Wuhan lab?

Peter Daszale, President of Eco Health Alliance wrote an unusual piece for the Guardian with the title above. What comes out of the piece is how much time and expertise “non-profit companies” are putting into genetics and virology. He noted that Eco Health Alliance had spent 15 years working in China sampling more than 16,000 bats. He deduces, and I would agree with him that such experience gives confidence in his deductions about the origin of COVID-19.

He does not think that “SARS originated in outer-space or that HIV was man made”. He estimates that there are 1.7 million undiscovered viruses in wildlife and that SE Asia is a hot spot. He proposes that we should not be chasing conspiracies but focussing on science and prevention in these regions of the world.

His group found that 3% of the community in Yunnan had antibodies to bat coronaviruses estimating that between 1-7 million people are infected with bat coronavirus each year. A naturally emerging virus is less exciting than germ warfare labs and outer space, but more realistic and likely!

There was no single “patient zero” to start the UK epidemic

The genomics consortium (Cog UK) has sequenced COVID-19 viruses at the start of the outbreak and found that “viruses from China had a negligible impact in the UK”. Most of the viruses causing the initial cases came from the EU. The consortium has analysed the genetic code from 20,000 viruses.

They found 1356 “origins” in the UK from visitors from abroad. Eighty percent of the initial cases arrived in the UK before 28 Feb- 29 March. (But at that point the UK was trying to decide whether or not to lockdown). A football match between Liverpool and Madrid on 11 March probably had little impact. Three thousand Spanish fans had come for the match. Each of the 1,356 viruses initiated a chain of infection and the social distancing is now pushing them to extinction.

Their data showed that origins were Spain 33.6% (of the cases), France (28.3%), Italy (14.4%), Ireland 3.1%, and China (0.1%). The study to my mind shows the power of sequencing on a large scale, but the data can raise as many questions as it answers.

Hard decisions will have to be made: a retrospective view from intensive care in 2006

With all the descriptions of ICU’s and COVID-19 I had a “retro look” at the time (2006) we were all concentrating on the UK influenza pandemic plan. In a short article from the BMJ (31 March 2006), Richard Marsh a Consultant in anaesthetic and critical care, noted that bird flu (H5N1) was causing deaths, although very limited in geography, and not having spread outside SE Asia, caused by respiratory failure leading to multisystem failure. He noted that the ICU’s with mechanical ventilation and organ support symptoms had not been around in the previous influenza pandemics of 1957 and 1968.

The HPA in its pandemic planning was assuming a mortality of 0.37% and a relatively low hospital admission rate of 0.55%. Between 44% and 100% of patients in SE Asia with avian influenza developed respiratory failure. He concluded that a large district hospital serving a population of 330,000 in the UK would expect more than 10 extra requests from ICU per day for several weeks. Accruing a stay of ten days, he concluded that 30 additional ICU beds would be needed, which is between 4-5 times the number in most general hospitals in the UK.

He predicted that 24-50% of the population would be infected.

Recent experience in SARS in 2006 had shown that critical care staff were at high-risk of infection. Numbers of experienced staff would be depleted, and agency staff would not be able to make up the gap in trained staff. A triage system would be necessary perhaps differing from the UK normal but “intensive care specialists, other doctors, nursing staff and administrators need to have discussions in advance.”

Hopefully this would be transparent and ensure that the limited resources are used equitably and to greatest effect”.

Theoretical analysis of drying times to destroy COVID-19 virus correlated with different outbreaks

This highly theoretical paper has some very important implications for public health. There have been a lot of publications on climate and virus transmission and none, to my knowledge, have been able to pin down similar seasonal variation shown by influenza.

This paper concentrates on COVID-19 and is published in “Physics of Fluids”. How long does the virus “stay alive in cough and sneezes”? The authors studied the drying time and used a mathematical model. Higher ambient temperatures helped to dry out the virus droplets faster and so reduced the chances of survival. With greater humidity the virus particles survived longer. This is not particularly new, but the novelty is an analysis of rate of spread of the virus in cities such as New York, Los Angeles, Miami, Sydney, Chicago, and Singapore. In cities with the larger growth rate of the pandemic the drying time was longer.

The authors concluded that “outdoor weather matters in the growth of this infection”. Personally, I believe that this explanation is overall too simplebut should be factored into calculations and predictions.

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