

COVID-19 Update:

Why we must be cautious reopening businesses.

Gordon S. Doig PhD (Epidemiology and Biostatistics)
Head, Northern Clinical School Intensive Care Research Unit,
University of Sydney, Sydney, Australia

www.EvidenceBased.net

gdoig@med.usyd.edu.au

18 May 2020

© 2020, University of Sydney, Not for reproduction or distribution.





www.EvidenceBased.net

Evidence-based Decision Making x Evidence-based Decision Making x What am I doing about novel c x

https://www.evidencebased.net

RNSH **Evidence Based** **USyd**
DECISION MAKING

An Evidence Based reference site for healthcare decision makers

Journal Club
 EBRs
 Online Education

Talks
 Research
 Solutions

CHSR *f* **CRSS**

Developed with the assistance of a grant from CHSRF.

Chief Editor: **Gordon S. Doig**

Selected in the Top 5 "Best of the Web" Evidence-based Medicine resources by the American Thoracic Society.

All contents copyright © 2019 Gordon S. Doig, except where noted.
 Design, layout and images by John Soer and Gordon Doig. All rights reserved.

Web Browser name: Firefox
 Full version: 74.0
 Major version: 74
 JavaScript Version: 1.5



www.EvidenceBased.net

RNSH **Evidence Based** **USyd**
DECISION MAKING

An Evidence Based reference site for healthcare decision makers

Journal Club
 EBRs
 Online Education

Talks
 Research
 Solutions

CHSR f CRSS

Developed with the assistance of a grant from CHSRF.
 Chief Editor: **Gordon S. Doig**

Selected in the Top 5 "Best of the Web" Evidence-based Medicine resources by the American Thoracic Society.

All contents copyright © 2019 Gordon S. Doig, except where noted.
 Design, layout and images by John Soer and Gordon Doig. All rights reserved.
 Web Browser name: Firefox
 Full version: 74.0
 Major version: 74
 JavaScript Version: 1.5

'Talks' for pdf of this talk.



www.EvidenceBased.net

RNSH **Evidence Based** **USyd**
DECISION MAKING

An Evidence Based reference site for healthcare decision makers

Journal Club
EBRs
Online Education

Talks
Research
Solutions
COVID-19 Public Education

CHSR f CRSS

Developed with the assistance of a grant from CHSRF.
Chief Editor: **Gordon S. Doig**
Selected in the Top 5 "Best of the Web" Evidence-based Medicine resources by the American Thoracic Society.

All contents copyright © 2019 Gordon S. Doig, except where noted.
Design, layout and images by John Soer and Gordon Doig. All rights reserved.
Web Browser name: Firefox
Full version: 74.0
Major version: 74
JavaScript Version: 1.5

'Talks' for pdf of this talk.

'Solutions' for more COVID-19 public health information.



www.WHO.int

WHO | World Health Organization | Evidence-based Decision Making | What am I doing about novel coronavirus

https://www.who.int

Global Regions ▾ العربية 中文 English Français Русский Español

World Health Organization

COVID-19 Response Fund [Donate](#)

Home Health Topics ▾ Countries ▾ Newsroom ▾ Emergencies ▾ About Us ▾

EMERGENCY

Coronavirus disease (COVID-19) pandemic

[All info here →](#)

COVID-19 quick links >

- [Advice for the public](#) +
- [Advice for health workers](#) +
- [Country & Technical Guidance](#) +
- [Situation updates](#) +
- [Research and Development](#) +
- [Media resources](#) +

Novel Coronavirus (COVID-19) Situation dashboard

This interactive dashboard/map provides the latest global numbers and numbers by country of COVID-19 cases on a daily basis.

Have questions about COVID-19? We have answers

Click this link and **text hi to** the whatsapp number

WHO Health Alert brings COVID-19 facts to billions via WhatsApp

Or WhatsApp 'hi' to +41 79 893 18 92 to start the conversation.

News [All →](#)



 World Health Organization

Health Topics ▾

Countries ▾

Newsroom ▾

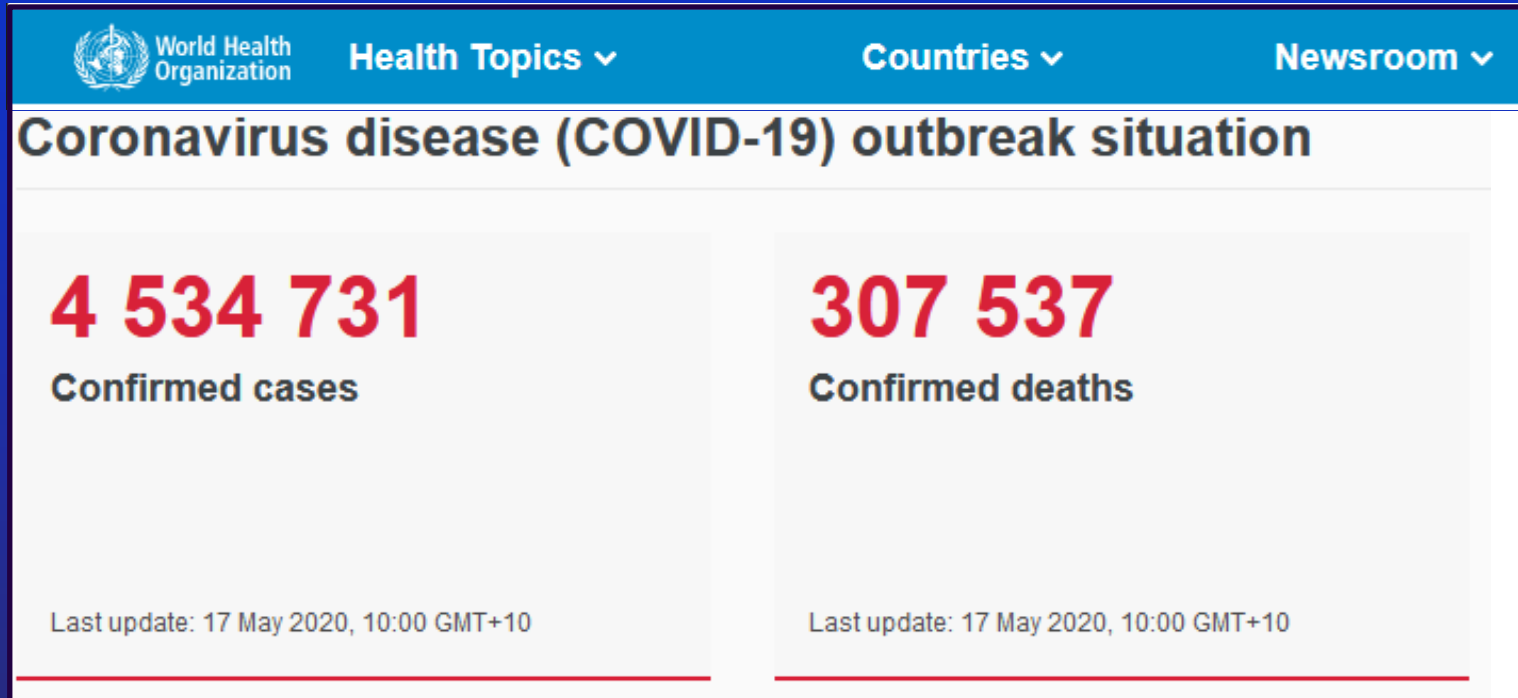
Coronavirus disease (COVID-19) outbreak situation

4 534 731
Confirmed cases

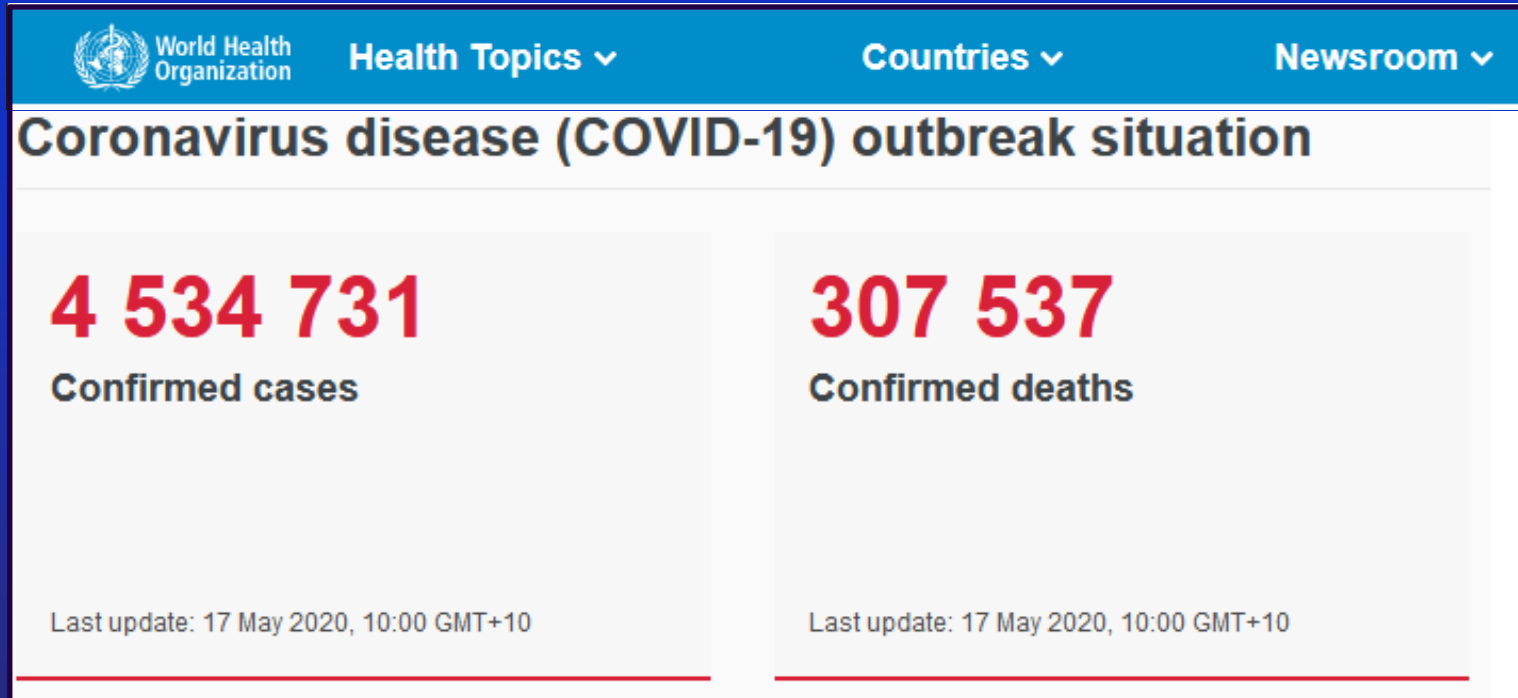
Last update: 17 May 2020, 10:00 GMT+10

307 537
Confirmed deaths

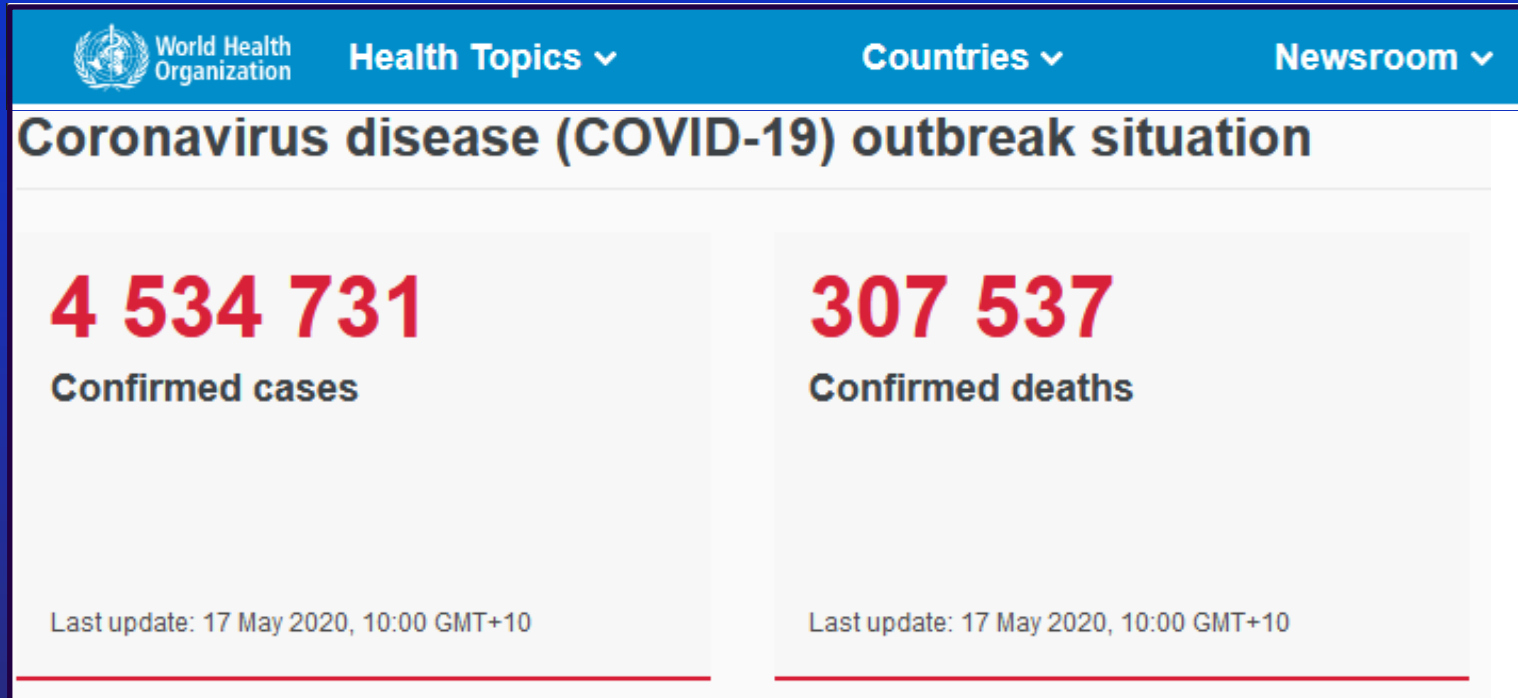
Last update: 17 May 2020, 10:00 GMT+10



- 6.8% case fatality rate (307,537/4,534,731).



- **6.8%** case fatality rate (307,537/4,534,731).
- **30.0%** case fatality rate for Ebola virus.



- 6.8% case fatality rate (307,537/4,534,731).
- 30.0% case fatality rate for Ebola virus.
- 0.2% case fatality rate for the (normal) flu.



Contents of this talk

- Effective treatments
- Immunity and vaccination
- The importance of re-opening businesses safely



Effective treatments for COVID-19

Some drugs show promise in observational studies or very small trials:

- hydroxychloroquine
- azithromycin
- remdesivir



Effective treatments for COVID-19

Some drugs show promise in observational studies or very small trials:

- hydroxychloroquine
- azithromycin
- remdesivir

However, they all still require safety and effectiveness demonstrated by adequately powered larger trials. These are ongoing.



Effective treatments for COVID-19

Some drugs show promise in observational studies or very small trials:

- hydroxychloroquine
- azithromycin
- remdesivir

However, they all still require safety and effectiveness demonstrated by adequately powered larger trials. These are ongoing.

There are currently no drugs licensed for the treatment or prevention of COVID-19 (WHO, 27 Apr 2020)



Immunity and vaccination



Immunity and vaccination

Development of immunity is a multi-step process:



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens
- *Cellular immunity* can also provide longer term protection against specific pathogens



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens
- *Cellular immunity* can also provide longer term protection against specific pathogens
 - Killer T-cells (CD8) attack host cells infected with a specific pathogen



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens
- *Cellular immunity* can also provide longer term protection against specific pathogens
 - Killer T-cells (CD8) attack host cells infected with a specific pathogen

The good news is, SARS-CoV-2 specific antibodies can be detected in people who have recovered from COVID-19.



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens
- *Cellular immunity* can also provide longer term protection against specific pathogens
 - Killer T-cells (CD8) attack host cells infected with a specific pathogen

The good news is, SARS-CoV-2 specific antibodies can be detected in people who have recovered from COVID-19.

- However, some people have very low levels of neutralizing antibodies.



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens
- *Cellular immunity* can also provide longer term protection against specific pathogens
 - Killer T-cells (CD8) attack host cells infected with a specific pathogen

The good news is, SARS-CoV-2 specific antibodies can be detected in people who have recovered from COVID-19.

- However, some people have very low levels of neutralizing antibodies.
- This suggests *cellular immunity* **may** also be critical to recovery.



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens
- *Cellular immunity* can also provide longer term protection against specific pathogens
 - Killer T-cells (CD8) attack host cells infected with a specific pathogen

The good news is, SARS-CoV-2 specific antibodies can be detected in people who have recovered from COVID-19.

- However, some people have very low levels of neutralizing antibodies.
- This suggests *cellular immunity* may also be critical to recovery.

Vaccines are usually designed to promote specific antibody production *or* stimulate cellular immunity.



Immunity and vaccination

Development of immunity is a multi-step process:

- *Non-specific immunity* (macrophages etc) defends against all pathogens
- *Adaptive immunity* (antibodies) provides longer term protection against specific pathogens
- *Cellular immunity* can also provide longer term protection against specific pathogens
 - Killer T-cells (CD8) attack host cells infected with a specific pathogen

The good news is, SARS-CoV-2 specific antibodies can be detected in people who have recovered from COVID-19.

- However, some people have very low levels of neutralizing antibodies.
- This suggests *cellular immunity* **may** also be critical to recovery.

Vaccines are usually designed to promote specific antibody production **or** stimulate cellular immunity.

Because we are not certain which process is most important, many vaccines will need to be tested before we find the 'right one'.



Current situation



Current situation

- 1) Case fatality rate is currently 6.8%.



Current situation

- 1) Case fatality rate is currently 6.8%.
- 2) We have no COVID-19 specific treatments.



Current situation

- 1) Case fatality rate is currently 6.8%.
- 2) We have no COVID-19 specific treatments.
- 3) Vaccine development will take at least 12 months. Maybe longer.



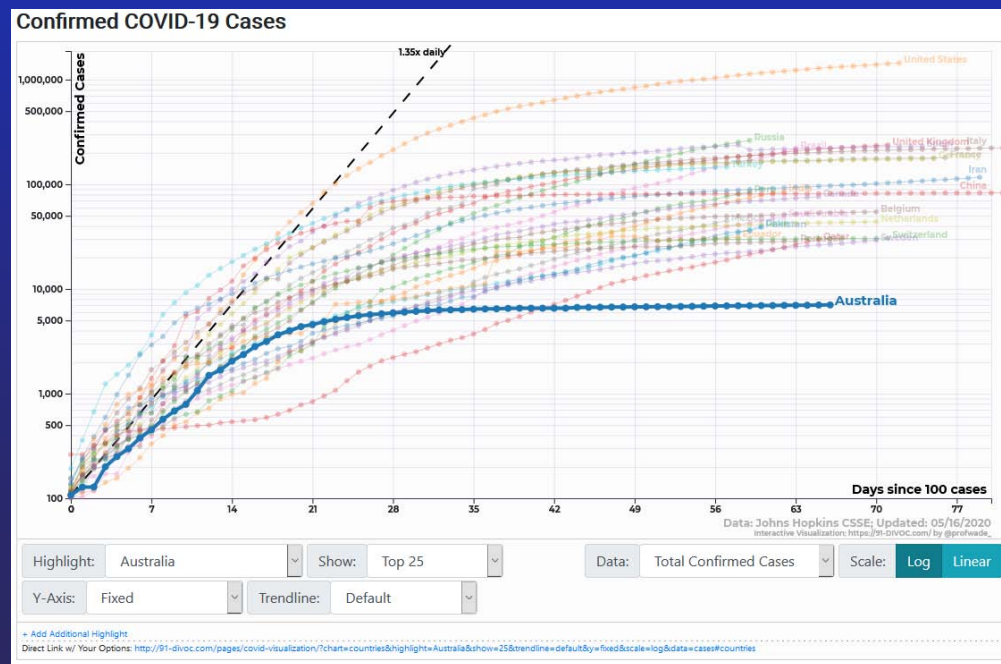
Current situation

- 1) Case fatality rate is currently 6.8%.
- 2) We have no COVID-19 specific treatments.
- 3) Vaccine development will take at least 12 months. Maybe longer.
- 4) Public health campaigns are **the only effective tools** for stopping COVID-19 transmission



Current situation

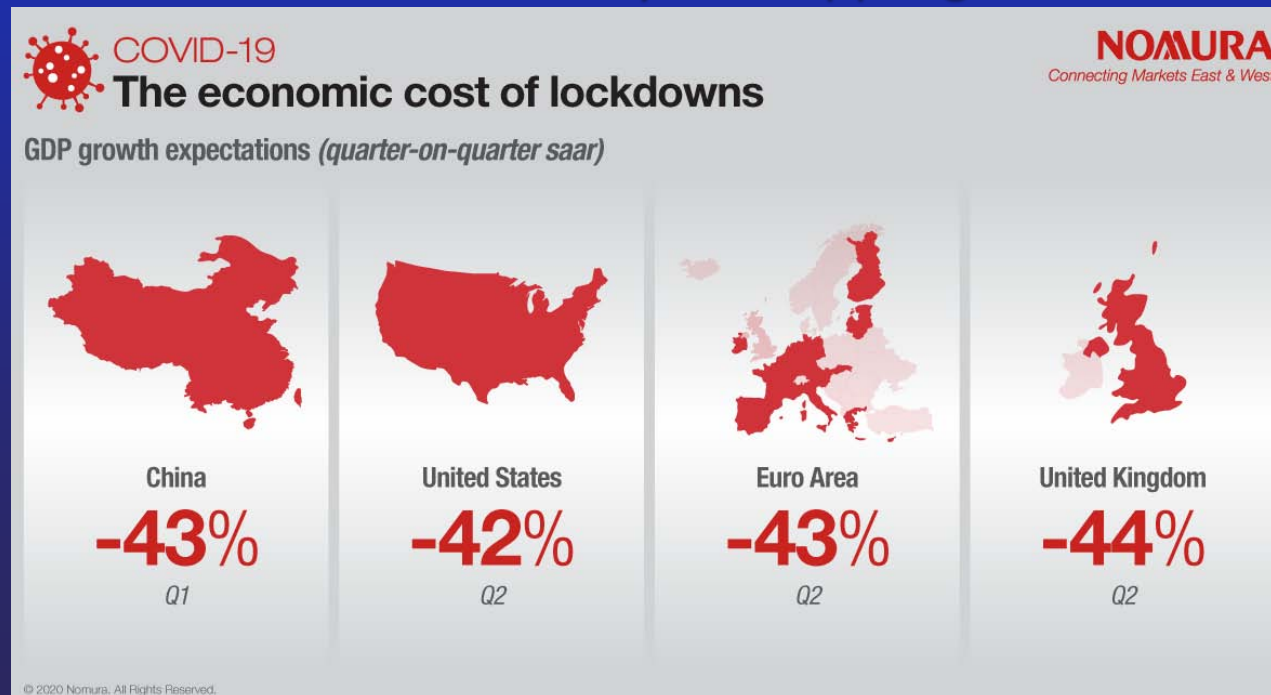
- 1) Case fatality rate is currently 6.8%.
- 2) We have no COVID-19 specific treatments.
- 3) Vaccine development will take at least 12 months. Maybe longer.
- 4) Public health campaigns are **the only effective tools** for stopping COVID-19 transmission





Current situation

- 1) Case fatality rate is currently **6.8%**.
- 2) We have no COVID-19 specific treatments.
- 3) Vaccine development will take at least 12 months. Maybe longer.
- 4) Public health campaigns are the only effective tools for stopping COVID-19 transmission **but they are crippling the economy.**



Lessons from the 1918 flu pandemic





Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.

- Each campaign was slightly different, but included core interventions such as **forced business closures**, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.

- Each campaign was slightly different, but included core interventions such as forced business closures, **isolation and quarantine**, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.

- Each campaign was slightly different, but included core interventions such as forced business closures, isolation and quarantine, **bans on public gatherings**, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.

- Each campaign was slightly different, but included core interventions such as forced business closures, isolation and quarantine, bans on public gatherings, **closure of gathering places, reducing crowding on public transport and individual-level personal behaviours** (mask use, hygiene etc).



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.

- Each campaign was slightly different, but included core interventions such as forced business closures, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).

When these campaigns were stopped, deaths from flu *always* increased again!



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.

- Each campaign was slightly different, but included core interventions such as forced business closures, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).

When these campaigns were stopped, deaths from flu *always* increased again!

- Furthermore, cities with the lowest death toll before their public health campaign started also had the highest second wave of deaths.



Lessons from the 1918 flu pandemic

Researchers from the NIH, VA and Harvard studied 17 US cities during the 1918 flu pandemic.

Each city was successful in reducing deaths using public health campaigns.

- Each campaign was slightly different, but included core interventions such as forced business closures, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).

When these campaigns were stopped, deaths from flu *always* increased again!

- Furthermore, cities with the lowest death toll before their public health campaign started also had the highest second wave of deaths.

In 1918, most cities keep their public health campaigns running for 2 to 8 weeks, *then stopped everything all at once!!*



Public health and reopening your business



Public health and reopening your business

Public health campaigns have been very successful in reducing the spread of COVID-19.

- Each country's campaign has been slightly different, but includes core interventions such as forced business closures, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).



Public health and reopening your business

Public health campaigns have been very successful in reducing the spread of COVID-19.

- Each country's campaign has been slightly different, but includes core interventions such as **forced business closures**, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).

Forced business closures have had the biggest impact on the economy.



Public health and reopening your business

Public health campaigns have been very successful in reducing the spread of COVID-19.

- Each country's campaign has been slightly different, but includes core interventions such as **forced business closures**, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).

Forced business closures have had the biggest impact on the economy.

WHO strongly recommends that public health campaigns must not be stopped all at once, otherwise we will have a second wave of deaths.

<https://www.who.int/publications-detail/covid-19-strategy-update---14-april-2020>

<http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/technical-guidance/2020/strengthening-and-adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-considerations-for-the-who-european-region,-24-april-2020>



Public health and reopening your business

Public health campaigns have been very successful in reducing the spread of COVID-19.

- Each country's campaign has been slightly different, but includes core interventions such as **forced business closures**, isolation and quarantine, bans on public gatherings, closure of gathering places, reducing crowding on public transport and individual-level personal behaviours (mask use, hygiene etc).

Forced business closures have had the biggest impact on the economy.

WHO strongly recommends that public health campaigns must not be stopped all at once, otherwise we will have a second wave of deaths.

*If we want to re-open businesses, we must
keep all other public health interventions in place.*

<https://www.who.int/publications-detail/covid-19-strategy-update---14-april-2020>

<http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/technical-guidance/2020/strengthening-and-adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-considerations-for-the-who-european-region,-24-april-2020>



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.
- Summarised at <https://Solutions.EvidenceBased.net/COVID2019/>



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.
- Summarised at <https://Solutions.EvidenceBased.net/COVID2019/>
- For optometry specific measures, see the first CCLSA COVID-19 webinar (<https://vimeo.com/402804867>).



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.
- Summarised at <https://Solutions.EvidenceBased.net/COVID2019/>
- For optometry specific measures, see the first CCLSA COVID-19 webinar (<https://vimeo.com/402804867>).

A second wave of deaths may lead to a second wave of business closures.



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.
- Summarised at <https://Solutions.EvidenceBased.net/COVID2019/>
- For optometry specific measures, see the first CCLSA COVID-19 webinar (<https://vimeo.com/402804867>).

A second wave of deaths may lead to a second wave of business closures. Be aware of the WHO advice for getting your workplace ready for COVID-19.



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.
- Summarised at <https://Solutions.EvidenceBased.net/COVID2019/>
- For optometry specific measures, see the first CCLSA COVID-19 webinar (<https://vimeo.com/402804867>).

A second wave of deaths may lead to a second wave of business closures.

Be aware of the WHO advice for getting your workplace ready for COVID-19. There are also useful country and state specific resources.

<https://apps.who.int/iris/handle/10665/331584>

<https://www.safeworkaustralia.gov.au/collection/workplace-checklists-covid-19>



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.
- Summarised at <https://Solutions.EvidenceBased.net/COVID2019/>
- For optometry specific measures, see the first CCLSA COVID-19 webinar (<https://vimeo.com/402804867>).

A second wave of deaths may lead to a second wave of business closures.

Be aware of the WHO advice for getting your workplace ready for COVID-19. There are also useful country and state specific resources.

Use these resources and measures to protect your employees, patients and community.

<https://apps.who.int/iris/handle/10665/331584>

<https://www.safeworkaustralia.gov.au/collection/workplace-checklists-covid-19>



Public health and reopening your business

Because your community may have sporadic cases or clusters of cases, you *must* continue preventive health measures in your business.

- These measures include social distancing, proper disinfecting of equipment and premises, hand washing and respiratory hygiene.
- Summarised at <https://Solutions.EvidenceBased.net/COVID2019/>
- For optometry specific measures, see the first CCLSA COVID-19 webinar (<https://vimeo.com/402804867>).

A second wave of deaths may lead to a second wave of business closures.

Be aware of the WHO advice for getting your workplace ready for COVID-19. There are also useful country and state specific resources.

Use these resources and measures to protect your employees, patients and community.

Thank you for your time and good luck!!

<https://apps.who.int/iris/handle/10665/331584>

<https://www.safeworkaustralia.gov.au/collection/workplace-checklists-covid-19>