



Impact of COVID-19

Theoretical modelling of how the health system can respond



Purpose of modelling

(COVID-19)

Coronavirus

- Theoretical scenarios to help plan our responses
- Working with University of Melbourne (Doherty Institute) pandemic modelling team linked with international experts
- Uses international data, not Australian data

What we are showing today

- Not predictions of what will actually occur in Australia
- Some early work to be published on health system capacity modelling with a focus on ICU capacity
- Capacity modelling proof that we have tools that work to manage a pandemic
- Also publishing regional risk assessment modelling

Where we are now

Coronavirus (COVID-19)

We are flattening the curve

Daily percentage change in confirmed COVID-19 cases by notification date in rolling 3 day averages As at 1600 6 April 2020 (updated once per day)



% change 3 day rolling average (LHS) and New Cases (RHS)

Cumulative cases ignores deaths and recoveries Country doubles in Australia - Canada Spain 100,000 - China United Kingdom - Germany - Iran /Canada - Italy Korea, South 10,000 --- Japan -Australia - Korea South - New Zealand Singapore - Singapore Vew Zealer 1,000 õ - Spain - Taiwan* Taiwan - United Kingdom Data downloaded at 2020-04-07 06 10:44 - US 100 20 40 60 Days since 100th confirmed case Source: Johns Hopkins University

Cumulative cases count - log scale (post-100 cases): as at 0700hrs 7 April 2020

Source: Data provided by Department of Health, Date annotations done by PM&C.

Note: Changes in social practices could take a number of days to flow through to reduced case numbers, given the WHO estimate the COVID-19 incubation period to range between 1 to 14 days.

Cumulative COVID-19 cases by country

Modelled uncontrolled pandemic

Scenario - widespread outbreak at the same time



- Artificial not a prediction
- Doesn't reflect current state in Australia

Coronavirus (COVID-19)

- Assumes diffuse infection of 89% (>23 million)
- Impossible to meet ICU capacity



Modelled measures to flatten the curve*



*Not based on Australian case data.

Measures to flatten the curvemodelling comparison



	Scenario 1: no mitigation	Scenario 2: quarantine and isolation	Scenario 3: quarantine, isolation and social distancing (25%)	Scenario 4: quarantine, isolation and social distancing (33%)
Infection rate	89.1%	67.5%	37.7%	11.6%
Hospitalisation rate	5.4%	4%	2.2%	0.8%
Proportion who can access ICU beds	15%	30%	80%	100%

More realistic models and plans

- Focus of future modelling is based on real world Australian data
- Focal outbreaks, early indications that we are gaining control.
- Current case rate <0.025%, low ICU utilisation, death rate 0.7%, but ongoing community transmission

Coronavirus (COVID-19)

- Consideration of other variables:
 - Continued fall in returned travellers
 - Testing and public health capacity to quarantine and isolate
 - Impact of distancing and general hygiene measures
- We know we have tools that work and can scale them as needed *models help*