Australian Government

Coronavirus (COVID-19)

Modelling the current impact of COVID-19 in Australia

16 April 2020

Next phase of modelling

Coronavirus (COVID-19)

- University of Melbourne (Doherty Institute) pandemic modelling team with international experts now working on next phase of modelling using Australian data to establish current state of the epidemic, known as "**nowcasting**"

What this means

- Modelling is based on real Australian data
- Better understand present state of epidemic
- Model 'forecasts' can be projected to estimate the next fortnight
- We will be able to review effectiveness of current measures and be better prepared to define future response strategies

Where we are now

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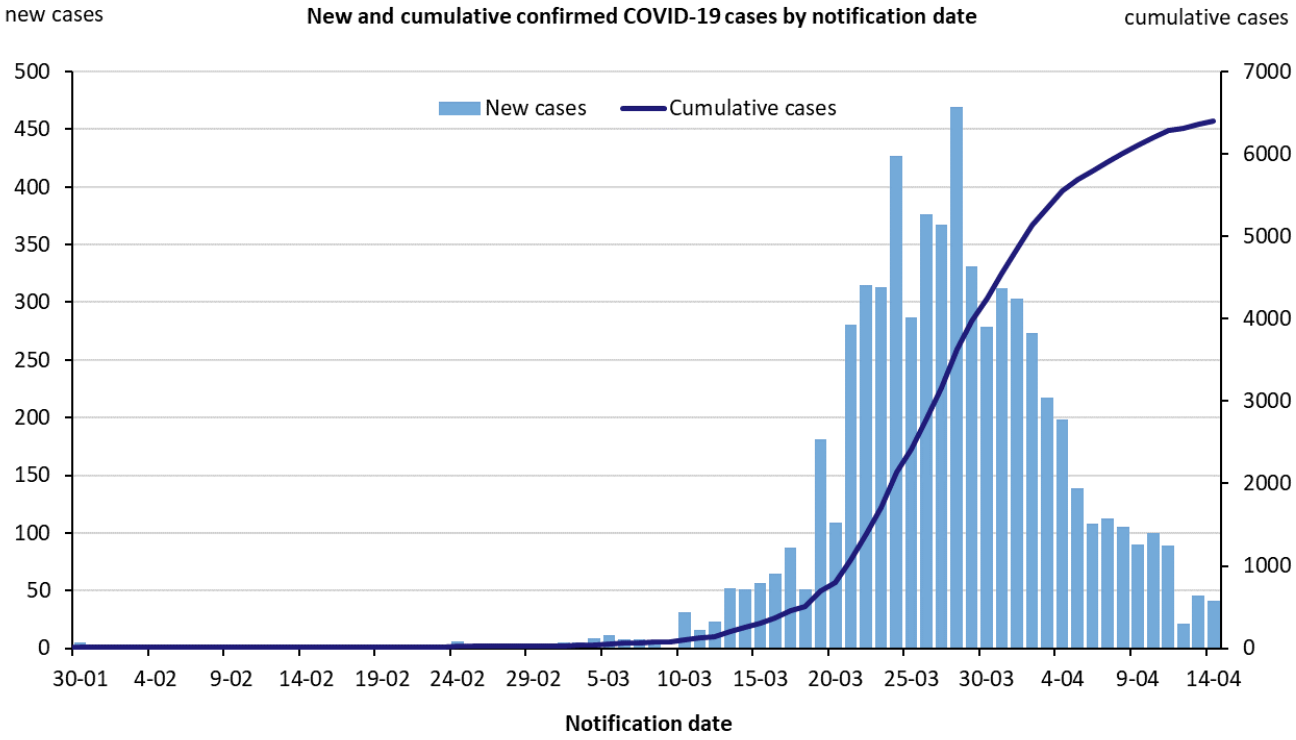

Number of new cases each day are reduced

Total number of cases are flattening

Coronavirus (COVID-19)

How do we know if strategies are effective?

- How well are our public health measures detecting cases?
  - London School of Hygiene and Tropical Medicine has developed a method that assesses the symptomatic case detection rate, based on a comparison between observed hospitalisations today and cases detected in earlier weeks
- Further analyses of known cases to estimate the effective reproductive numbers (R*eff*)
  - R_0 (basic reproductive number) = the number of people a single case infects on average (assuming whole population is susceptible and no strategies in place), estimated about 2.5 for COVID-19
  - Effective COVID-19 control strategies reduce this number so R*eff* <1

Symptomatic Case Detection Rate

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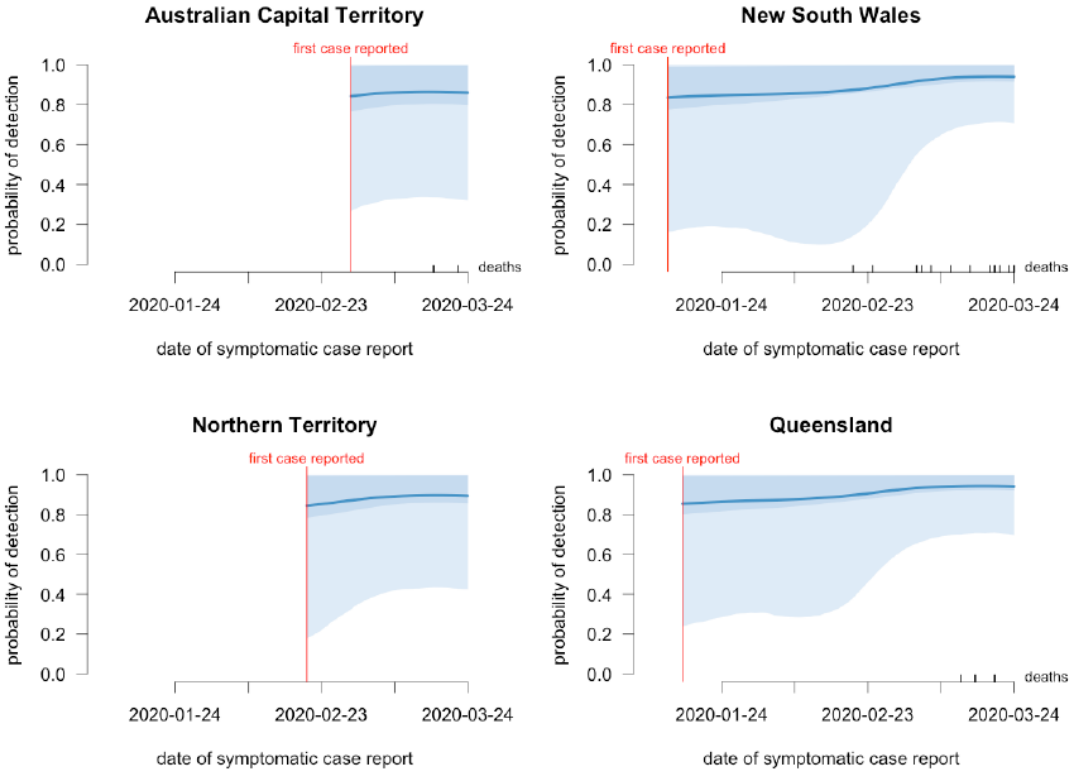

- Australia is estimated to be currently detecting approximately 92% of all symptomatic cases
- Each state and territory individually estimated to be detecting over 80%

Red vertical line = Date of the first reported case
Black ticks on x-axis = Deaths
Dark blue line = Mean Case Detection Rate
Shaded ribbons = 50% and 95% CI

Figure: Time series estimates of the symptomatic case detection rate for each jurisdiction using publicly available data up to 24 March

Symptomatic Case Detection Rate

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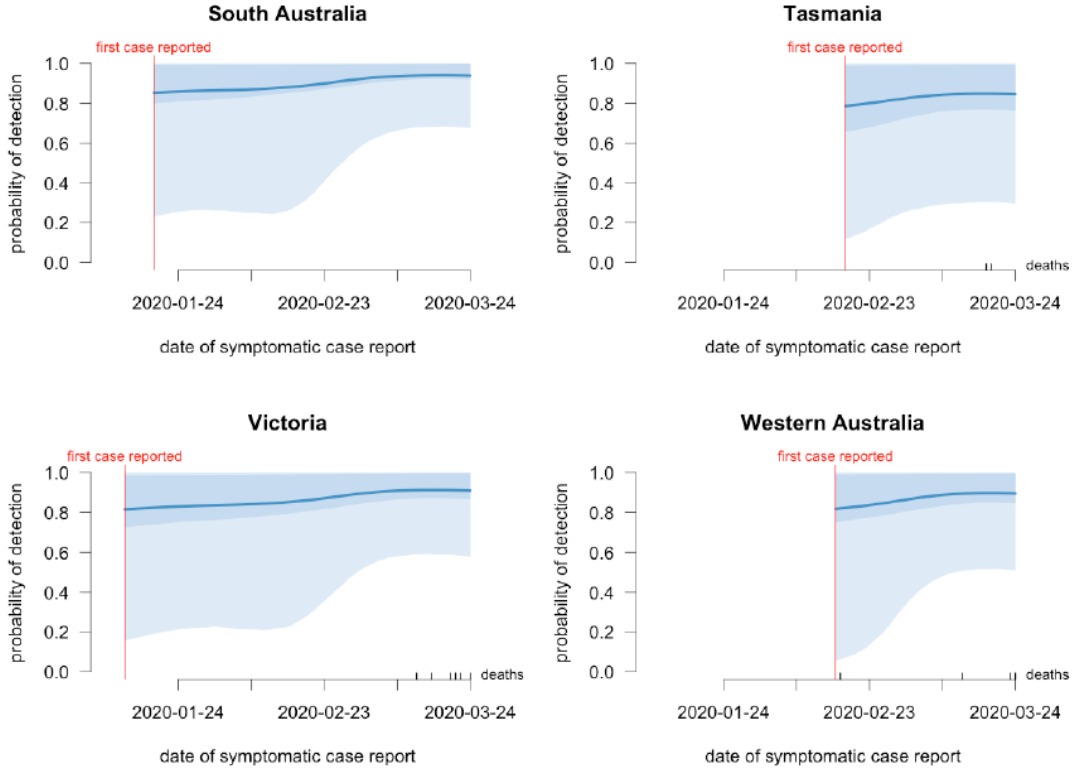

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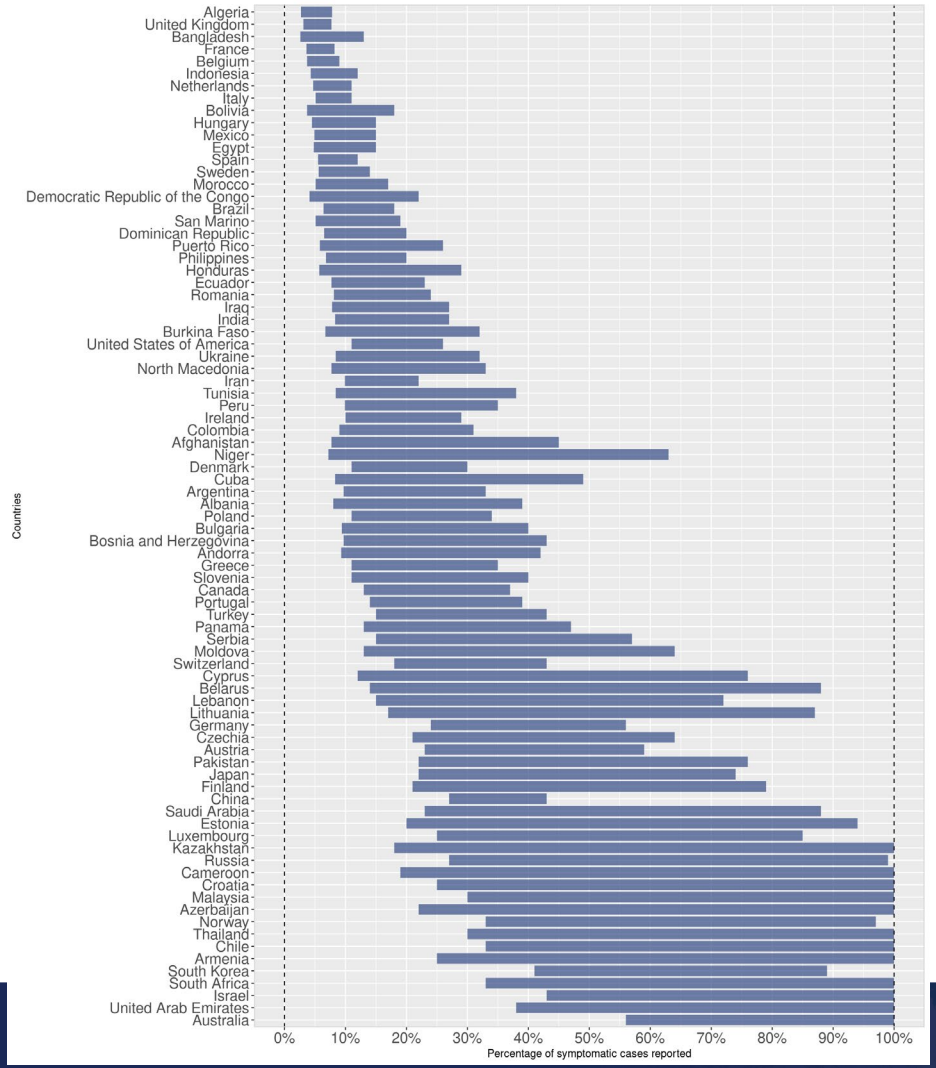

How do we compare internationally?

International comparisons from LSHTM show that Australia has one of the highest reported detection rates globally (point estimate 84%)

CMMID Repository. 2020. Using A Delay-Adjusted Case Fatality Ratio To Estimate Under-Reporting. [online] Available at: https://cmmid.github.io/topics/covid19/severity/global_cfr_estimates.html.

Effective Reproduction Number (R*eff*)

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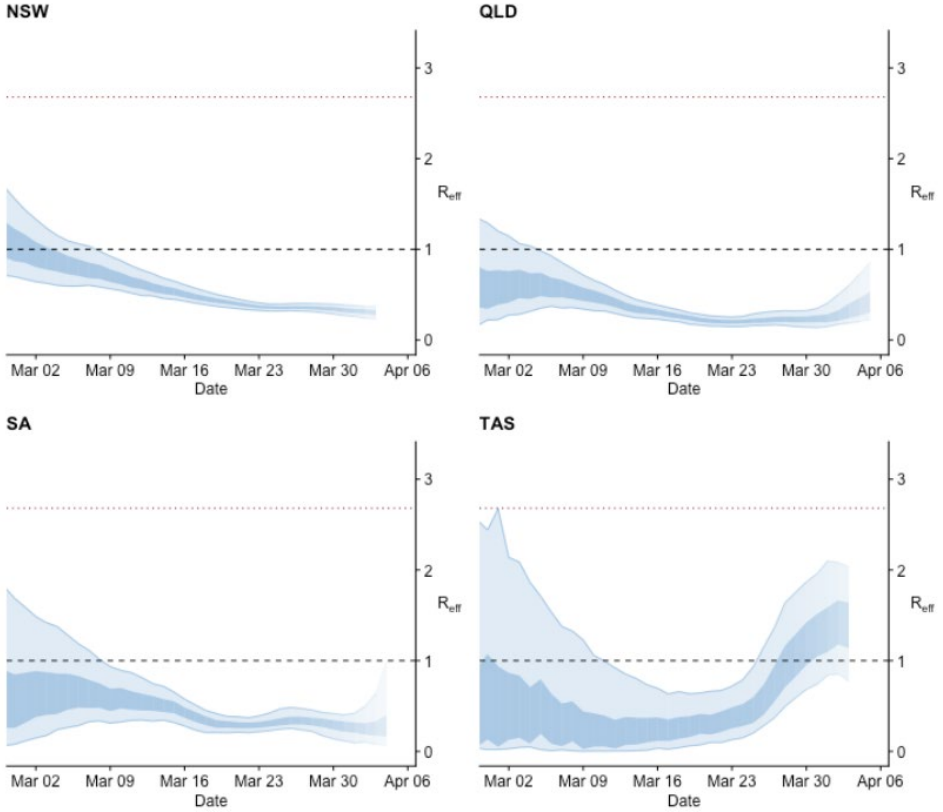

Figure: Time-varying estimate of the Reff of COVID-19 up to 5 April based on data up to and including 13 April, for each Australian state and territory with sufficient local transmission (excludes ACT and NT)

Black dotted line in middle = 1
(target value for the R*eff* required for control)

Red dotted line at top = 2.68
(R*eff* estimated for early epidemic phase in Wuhan in the absence of public health interventions and assuming that the population was completely susceptible to infection)

Light blue ribbon: R*eff* = 90% credible interval
Dark blue ribbon: R*eff* = 50% credible interval

Effective Reproduction Number (R*eff*)

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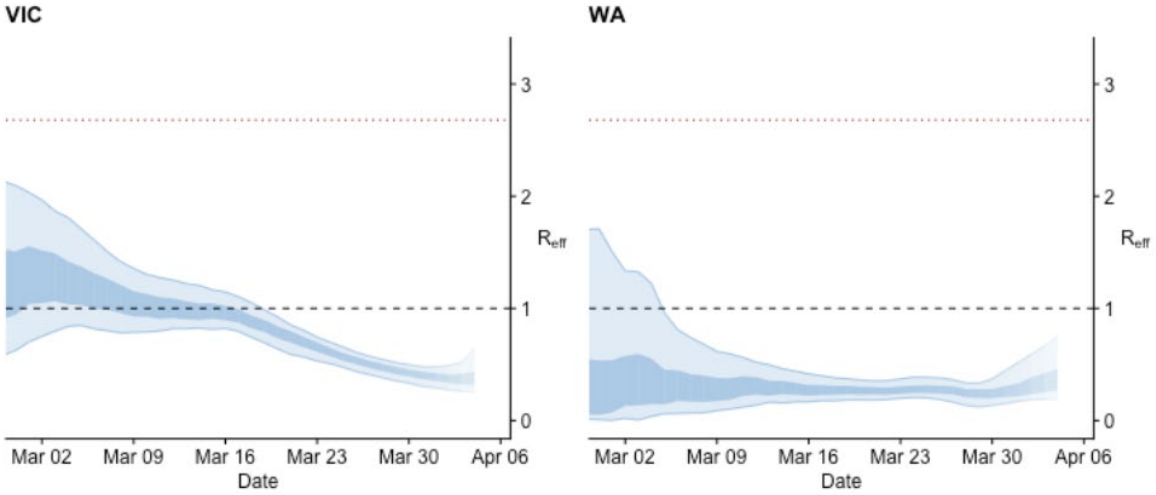

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