# Actuarial modelling says COVID-19 more widespread in Australia than headlines suggest

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- **Modelling suggests as many as 20,000 COVID-19 carriers (as at April 9), far higher than 3,000+ active cases reported.**
- **Actuary urges better understanding of risks before restrictions are relaxed.**
- **Higher community infection rates suggest greater vigilance required than media reports might suggest.**

A simple reductive approach to modelling and estimating community infection points to much higher numbers of COVID-19 carriers in Australia than there are confirmed active cases.

In an article prepared for the Actuaries Institute's COVID-19 Working Group, Douglas Isles said modelling suggests that at April 9 there may have been around 20,000 carriers of COVID-19 in Australia, a much higher number than the 3,000 or so active cases reported.

"A straightforward analysis of data available suggests that confirmed active cases hugely under-report community infection," Mr Isles said. "The focus in the media has been on three key data points around COVID-19:  deaths, confirmed and active cases.

"We need to talk more about estimates and monitoring of community infection," he said. "Those risks need to be better understood before authorities decide when and how to relax current restrictions, an issue looming large for policymakers.

"Noting there are a lot more people with COVID-19 than there are confirmed cases, the public needs to be aware of the need for greater vigilance."

Actuaries Institute Chief Executive Elayne Grace said: "The Institute established a working group to help advise its professional members, industry and policymakers, who are seeking to understand the impact of the virus on our society and our economy.

"We are looking at community health aspects, but also how the virus impacts business sectors as diverse as health, insurance and superannuation, and how policy changes may impact individuals, businesses and communities.

"The Actuaries Institute working group will also undertake assessments and approaches that can help governments and other groups manage Australia's eventual end to this lockdown period and ensure the impacts are as limited as possible."

Mr Isles said while the modelling is simple, "the key point is that the reported data is an order of magnitude less than the actual data".

Mr Isles, an actuary who has a Master of Arts in mathematics from Cambridge University in the UK, said his model is based on a number of authoritative sources including the Australian government's Department of Health and the World Health Organization (WHO).

Australian Department of Health data showed 330,000 people had been tested for COVID-19 at April 9, 2020. At that time, there were 6,103 confirmed cases, 51 deaths and 2,987 recoveries.

The median age of death was 79, the median age of cases was 47, and most cases were acquired overseas.

Mr Isles also used WHO data that tracked time lapses from the onset to recovery in various scenarios, including mild and severe cases. He used Australia-wide data covering April 9 statistics, plus rate of population testing, number of positive results, and recovery and fatality rates.

Using a constant carrier mortality rate and a constant time frame from infection to death allows modellers to infer new carriers at a point in time. Applying a carrier mortality rate estimate of 0.5% to the data on Australian COVID-19 deaths suggests there may have been around 400 new carriers per day in the week to March 12, and 800 per day in the week to March 19. This means it is likely there were around 10,000 carriers by March 19, and by April 9, more likely 20,000 carriers.

Mr Isles' modelling can be accessed **here**.

"With access to more granular data, particularly around the demographics of those tested and the dynamics of viral transmission, these estimates could be improved," he said.

"For COVID-19 we have a sample of 330,000 people tested, which is over 1% of the population. It is reasonable for the public to expect to be provided with health experts' estimates of community infection rather than focusing purely on confirmed cases."

Actuaries apply math, statistics, economics and financial analysis to a wide range of business and public policy issues. They use complex data sets to evaluate risk.

The Actuaries Institute's COVID-19 Working Group involves a core group of 13 actuaries, supported by a further 50 actuaries working on a wide range of issues, advising business leaders, regulators and policymakers.

**Douglas Isles is available for interview.**

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