

1 **World's-Best Statistical Practice Saves Lives**

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8 **Executive Summary**

9 As three senior members of the Statistics profession, we are concerned that statistical methods
10 are not being used, or not being used appropriately, in formulating responses to the continuing
11 challenges facing Australia, including pandemics.

12 Whilst our focus is largely on the future, we shall highlight some key aspects of the response to
13 the COVID-19 pandemic (hereafter COVID) as context for the importance of addressing the
14 issues we identify. Elaboration of each of these aspects is available in Attachment 1, *Details*
15 *Relating to the Submission*.

16 We are scientists who believe that collaboration from all relevant disciplines is critical when the
17 next pandemic comes. From a statistical perspective, we think there are five critical issues to
18 managing a pandemic. These are given below, followed by actionable recommendations
19 stemming from them.

- 20 1. There is need for national, expert oversight of all scientific aspects, among them
21 epidemiological and statistical. However, during COVID, statistical aspects (apart from the
22 ABS surveys) were largely ignored.
- 23 2. The timely capture and analysis of diverse informative data streams is critical to informing
24 wise decision-making and ongoing communication with the community about the current
25 state of a pandemic. There needs to be a pandemic information plan that can be activated at
26 short notice. The plan should include a rolling national, scientifically designed monitoring
27 survey. [An outline for such a plan is provided on page 3 of Attachment 2, *Pandemic*
28 *Information Management Plan*. An earlier version was submitted to the Office of the Prime
29 Minister and Cabinet in August 2020, who referred it to the Department of Health, but there
30 is no evidence it was considered.]

- 31 3. There is a need to understand the potential impacts of uncertainty in the assumptions and
32 models used for predictions. Had this been adopted appropriately during COVID, the timing
33 for reducing the public-health impacts would have changed and the impacts of the Omicron
34 variant (including fatalities) significantly reduced. [See Attachment 1, *Details Relating to the*
35 *Submission.*]
- 36 4. Australia needs to follow best international practice in developing, updating, and using
37 epidemiological models that include an accounting of uncertainty and ongoing synthesis of
38 competitive predictions. For example, our national weather forecasting at BOM applies this
39 world's-best-practice approach. However, during the COVID pandemic, the government
40 relied almost exclusively on the modelling from the Doherty Institute, so dramatically
41 underutilizing the available national expertise.
- 42 5. It is essential to allow for socio-economic heterogeneity: policy and practice may need to
43 vary from sub-population to sub-population. In fact, ignoring heterogeneity led to biases in
44 predictions (including an upward bias in estimates of the effectiveness of the vaccination
45 program).

46 RECOMMENDATION 1. Professional statisticians should be appointed to the various advisory
47 groups to government that involve working with data, to advise on world's-best statistical
48 practice.

49 RECOMMENDATION 2. There should be a professional statistician on the Advisory Group of
50 ATAGI.

51 RECOMMENDATION 3. A Pandemic Information Plan should be developed as a matter of
52 urgency. Furthermore, we strongly recommend that a multi-disciplinary Task Force be
53 established now, to determine the data/information requirements for managing a pandemic
54 and how they might be met. The membership should include a senior statistician with statistical
55 modelling and analysis expertise, an official (government) statistician, an epidemiologist, a
56 medical researcher, an economist, a social psychologist, and a public-health official.

57 RECOMMENDATION 4. A rolling national, scientifically designed monitoring survey should be
58 instituted at the first sign of an emerging pandemic, preferably with the involvement of the ABS.

59 RECOMMENDATION 5: Because of the ubiquitous need throughout government for high-level
60 data-scientific oversight of actual or potential decision-making based on complex data, and the
61 need for an independent source of advice, we recommend the position of Chief Data Scientist
62 be established with strong parallels to that of Chief Scientist. Such an appointment would have

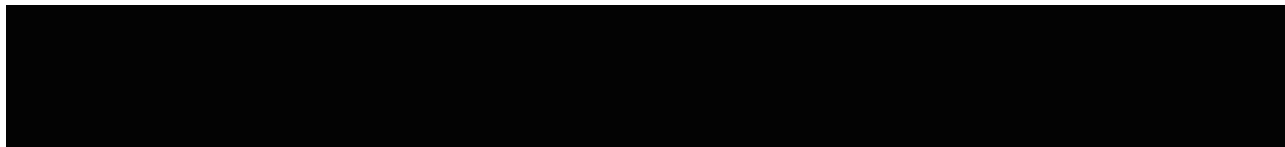
63 enhanced policy development in many other areas. [See Attachment 3, *Proposal for a Chief*
64 *Data Scientist.*]

65 RECOMMENDATION 6. We urge that transparency of data sources and modelling be
66 implemented in Australia, consistent with the approaches being used in the USA
67 (<https://covid19forecasthub.org/>), in collaboration with the CDC; and those used in Europe
68 (<https://covid19forecasthub.eu>), coordinated by the European Centre for Disease Prevention
69 and Control.

70 RECOMMENDATION 7. As part of the development of the Pandemic Information Plan
71 (Recommendation 3 above), identify the most important sources of heterogeneity that will
72 impact the pandemic, and include them as part of the relevant data streams.

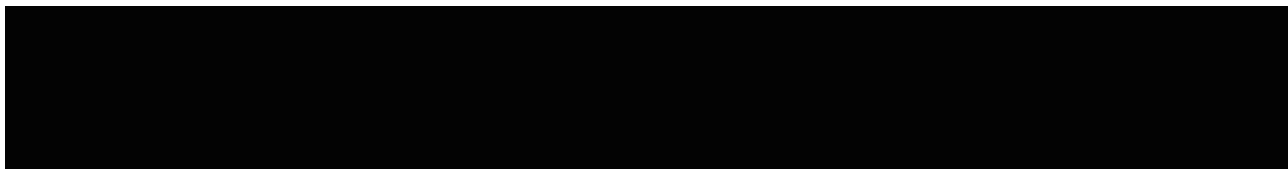
73 Finally, we draw attention to the following international commentary on these matters.

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77 Copyright considerations prevent us reproducing the entire contents that justify the title.
78 However, the final paragraph is very compelling:

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