Author’s response to reviews

Title: Perspectives of Australian Policymakers on the Potential Benefits and Risks of Technologically Enhanced Communicable Disease Surveillance - A Modified Delphi-Survey

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Author’s response to reviews:

We thank the editor for the opportunity to revise and resubmit this manuscript, and the reviewers for their comments which we have addressed in the following manner:

REV #1

1. There are no page numbers on my version, which explains some imprecisions.

We apologise for this inconvenience. Examination during submission processes led us to believe that the editorial management program worked to introduced page and line numbers to the article sent out for review – we have now embedded page numbers in the Word.doc to facilitate your examination of the paper.

2. This is kind of a frustrating article. At any given point it is well written, fluent, informative, provocative, and very easy to critique. I suggest review and resubmit so that the authors can have an opportunity to join their intelligent writing and useful research with a better explanation of what everybody can get out of it.

We have redrafted and greatly the expanded the abstract (to the limit of 350 words) and introduced new sections at key points in the main paper to highlight how the introduction of
event-based social media monitoring and WGS technologies to enhance communicable disease surveillance systems will create new ethical and legal concerns. We hope that the key issues explored and the major take home findings for readers are now clearer.

3. I just do not understand the logic that binds together the new technologies in question. Is it just that we can't run unlimited Delphi processes, so we might as well lump together quite different things? That strikes me as an honest if unglamorous justification for the juxtaposition of issues that from many perspectives look quite different, such that they wouldn't benefit from being part of the same Delphi process.

We acknowledge that the logic linking these two different technologies to the enhancement of communicable disease surveillance systems will not necessarily be clear to people who are not experts in the relevant fields or operate in related domains of practice. We have introduced the following text to the introduction on Pages 4 and 5 to make this clear to readers:

Methods for differentiating types of microbe have become increasingly sophisticated over the last 20 years. Whole genome sequencing (WGS) technologies can provide rapid and accurate information about which microbe is causing the outbreak and the timing and direction of transmission between patients. Incorporating this information into surveillance systems will permit more accurate biological risk prediction and faster outbreak identification and tracking,[6, 7] but also creates information about individuals that many people would consider to be private.[8]

Concurrent to with these developments in microbiological analysis, there has been a similar rate of innovation and technology change in data management. Using the tools provided by ‘Big Data’, syndromic surveillance systems can also now track and integrate online data collected for unrelated purposes that potentially reflect disease activity in the community, such as social media posts and internet searches.[9-13] Integrating either or both of these new sources of information into communicable surveillance practices has the potential to greatly enhance current systems. If linked electronically and scanned systematically, pathogen WGS data and user-generated online information could be mined to uncover new epidemiological patterns and associations much faster than traditional public health approaches.[14-16] Incorporating these new technologies and novel sources of information into established communicable disease surveillance systems should improve our understanding of the rate and direction of disease transmission between individuals.
and within populations, provide earlier warning and more accurate monitoring of outbreaks, and
reduce uncertainty and public fear during their early stages.[8, 17]

4. Why Delphi?

In our original submission we noted in the limitations section on page 18

the method is particularly useful for technological forecasting and the evaluation of complex
problems where: (i) the rate of socio-technical change exceeds that which can be managed by
technocratic styles of governance; and/or (ii) objective data (and models and relations dependent
on this data) are insufficient to explain or predict social actions.

This text now appears in the introduction.

5. What is this "increasingly influential network?" Seems important but I don't understand.

By using the phrase ‘increasingly influential network’ we mean to indicate that this group of
related academic scholars and knowledge users are beginning to exercise greater influence over
legislative and policy processes by being called on to provide advice or act as experts on relevant
government and judicial reviews and statutory bodies. But because this is confusing we have
moved this part of our description into the definition supplied in the subsequent paragraph

6. What is "framework analysis"- can we at least have a citation if we want to find out what it is
and does?

We provide a brief description of framework analysis on page 7 accompanied by a reference to
Gale and colleagues 2013 methodological review in BMC Res Method (REF 25 in original
submitted version). Noting that some readers may not be familiar with this long-established
qualitative research method we have added some further detail and another reference so the
section now reads:
Responses were analysed qualitatively and coded thematically by two authors (CD and JJ) using framework analysis, a deductive matrix-based qualitative research method for ordering and synthesizing textual data. Developed by the National Centre for Social Research (UK), framework analysis methods are especially well suited to conducting applied and policy relevant research.[33, 34]


7. Limitations/ external validity questions. Now we know what a carefully interrogated set of Australian elites think. What does this tells about how Australians think, and what does this suggest about how non-Australians would think?

We agree that we do not elaborate in this paper what the general public think about these issues - whether they live in Australia or elsewhere. But this is not a specific limitation to this study as our objective was to identify the key concerns of practitioners and relevant experts who work with these technologies in Australia. Nevertheless, we have added the following text to the limitation section of page 19 to make this clear:

This Delphi survey has captured the perspectives of representatives of expert groups in relevant to enhancing communicable disease surveillance systems in Australia. Because of differences in cultural norms and the surrounding social, legal and public health systems, a similar group brought together in another jurisdiction may come to different conclusions.

8. The bigger limitation is probably the mass-elite divide rather than the Australian/non-Australian: do elite (informed, engaged) Australians understand non-elite (uninformed, unengaged) Australians?
We agree that we do not elaborate in this paper what the general public think about these issues. But this is not a specific limitation to this study as our objective was to identify the key concerns of practitioners and relevant experts who work with these technologies – rather than the public who are the subjects of surveillance. With regard to this we are currently conducting a series of citizens’ juries with members so we have added the following text:

Perspectives of the Australian public are currently being sought through a series of citizens’ juries, to explore what they believe to be acceptable and legitimate use of Big Data and pathogen WGS for the purposes of communicable disease surveillance.[51, 52]


REV #2

1. A very important article reflecting the key gaps in being able to progress the use of newer technologies to enhance surveillance of communicable diseases.

We thank the reviewer for this comment and agree that this is an emerging area of concern that needs to be addressed – in particular in light of the social and political controversy surrounding the use of new technologies in other areas including marketing, political campaigning and social engineering.

2. Well written and extremely insightful.

Thank you
3. The methods section is well described, my one comment refers to the sentence on page 8 - line 29-31: "The final stage of analysis during preparation of this report drew on the knowledge and professional experience of the research team."

For readers who are not familiar with the research team, this may not be clear. Can this be clarified?

We thank the review for noting that our backgrounds will be opaque to the reader. We have introduced the following text to Page 8 to provide some information as to the professional background and expertise of the research team:

The final stage of analysis during preparation of this report drew on the knowledge and professional experience of the research team which includes expertise in health social science, bioethics, Australian health law, infectious disease, microbiological laboratory and data sciences and health protection.