

# Briefing

## Second-Order contact tracing

<b>Date due to MO:</b> 3 December 2020	<b>Action required by:</b> N/A
<b>Security level:</b> IN CONFIDENCE	<b>Health Report number:</b> 20202106
<b>To:</b> Hon Chris Hipkins, Minister for COVID-19 Response	

## Contact for telephone discussion

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## Minister's office to complete:

- |                                               |                                    |                                              |
|-----------------------------------------------|------------------------------------|----------------------------------------------|
| <input type="checkbox"/> Approved             | <input type="checkbox"/> Decline   | <input type="checkbox"/> Noted               |
| <input type="checkbox"/> Needs change         | <input type="checkbox"/> Seen      | <input type="checkbox"/> Overtaken by events |
| <input type="checkbox"/> See Minister's Notes | <input type="checkbox"/> Withdrawn |                                              |

Comment:

PROACTIVELY RELEASED

# Second-order contact tracing

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**Security level:** IN CONFIDENCE      **Date:** 3 December 2020

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**To:** Hon Chris Hipkins, Minister for COVID-19 Response

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## Purpose of report

1. The purpose of this report is to provide you with the analysis of second-order contact tracing further to the advice provided to you in a recent report (HR 20201923).

## Summary

2. Second-order contact tracing is the tracing and isolating of close contacts of close contacts until the first-order contact has returned a negative test.
3. Contact tracing for second-order household members is now routinely part of 'business as usual' practice for contact tracing and has been successfully used in recent outbreaks.
4. Our current case investigation and contact tracing practices have proven effective to date, and will continue to be developed to support our national response.
5. The implementation of second-order contact tracing beyond the household has significant technology, workforce capacity and contact tracing service delivery implications which have been outlined in this report.
6. Our current case investigation and contact tracing capability and capacity will continue to be developed and a risk-based assessment will continue to be used routinely to support any wider deployment of second-order contact tracing on a case-by-case basis, in addition to its routine use for household contacts.

## Recommendations

We recommend you:

- a) **Note** that we will continue to develop our systems and processes including the use of digital technologies
- b) **Note** that we are planning further developments to our contact tracing system, namely developing our national response model, enhancing the technology platform, working with public health units and key central agencies to improve the timeliness of our response.

- c) **Agree** that we continue to routinely apply second-order contact tracing to second-order household contacts, and on a risk-based basis beyond that. **Yes/No**
- d) **Agree** that we provide a report back to you in March 2021, updating you on further contact tracing developments that have been implemented. **Yes/No**



Sue Gordon  
Deputy Chief Executive  
**COVID-19 Health System Response**  
Date:

Hon Chris Hipkins  
**Minister for COVID-19 Response**  
Date:

PROACTIVELY RELEASED

# Second-order contact tracing

## Background

7. New Zealand is in the **keep it out, stamp it out** phase of the COVID-19 response. The Government's overall public health strategy for COVID-19 is elimination.
8. The Government's response for dealing with new cases of COVID-19 in the community follows the Rapid Response Plan.<sup>1</sup> The purpose of the high-level plan is to guide the response immediately following confirmation of new cases in the community and establish governance arrangements [MIN-20-CAB-0387 refers]. Effective contact tracing is one of the four key pillars of the Rapid Response Plan and is the focus of any initial response.
9. Second-order contact tracing is the tracing of the close contacts of close contacts of a case. For the purposes of this discussion the following definitions are used:
  - Case = confirmed or probable case of COVID-19
  - First-order contact = close contact of case
  - Second-order contact = close contact of first-order contact of case
10. This report provides follow-up to our earlier advice (HR 20201923) regarding the implementation of second-order contact tracing in New Zealand.

## Our contact tracing system is robust

11. Since the August Auckland outbreak we have had eight further incidents of people, including border workers and flight crew, in the community who were infected at the border or managed isolation or quarantine facilities. In response to the cases in the community since then, the approach outlined in the Rapid Response Plan has been utilised, we have contact traced immediately and this has served us well.
12. The August Auckland outbreak was large and took several weeks to get under control. The recent outbreaks have been managed and contained much more quickly. This is because index cases were identified early, and our contact tracing system then allowed us to identify any new cases and subsequent close contacts quickly which in turn allowed them to be managed through testing and isolation that involved minimal further spread.
13. Our focus in contact tracing is to quickly identify those individuals that are at most risk of having contracted the virus and to test and isolate them. Where additional cases are identified, we need to be able to act quickly to identify their close contacts as well.
14. Ensuring we have sufficient resource available to respond to additional cases is a key requirement to the success of the case investigation and contact tracing service.
15. During the eight incidents we contact traced 3,055 close contacts in the community.

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<sup>1</sup> On 6 July 2020 Cabinet noted that the COVID-19 All-of-Government Response Group had developed a 'Stamp it Out' plan for responding to new cases of COVID-19 in the community, which outlined the principles, objectives and key pillars of a response, a range of potential scenarios, and some of the actions that would be taken to stop the spread of COVID-19 in the community [CAB-20-MIN-0330 Minute refers].

16. In its current state, it is expected that public health units (PHUs) collectively have capacity to manage up to 350 new cases per day with the ability to surge to an additional 150 cases per day within 3 – 4 days if required. This estimate is based on a series of assumptions, including the number of close contacts per case, the level of complexity of cases, local policy settings and the availability of a wider workforce (predominantly from DHBs).
17. With each outbreak, the actual number of cases that can be managed will vary. The Auckland August outbreak is an example of this as there was a high number of close contacts for each case in the early stages of the outbreak before the alert level changes took effect. The outbreak primarily affected the Pacific community who are widely involved in their local communities meaning that there were a number of large 'exposure' events to assess and identify close contacts. It was also important that the PHU established a strong rapport with local community leaders to ensure public health advice was trusted and understood. Successfully managing a local outbreak of this nature takes time and resources which means that there is less capacity in terms of the number of cases per day that can be managed.

### **We are continuing to develop our systems and processes**

18. We have been learning and gaining experience from each event and have increased preparedness and capability since March 2020. However, we cannot be complacent and are continuously improving the contact tracing system.
19. Since August 2020 we have implemented the following improvements:
  - a. Updated the national delegation framework to enable task-sharing across all 12 PHUs and the National Investigation and Tracing Centre.
  - b. Enhanced use of digital technologies to support contact tracing, including the use of push notifications via the NZ COVID Tracer App for casual contacts.
  - c. Facilitated a debrief with public health units (PHUs) to identify and share learnings from the outbreak.
  - d. Trained PHU super-users to enhance utilisation of the NCTS.
  - e. Development of provisional guidance for COVID-19 contact categories.
20. During the August resurgence and subsequent positive cases, we have included second-order contact tracing of household contacts. This means that where we identified a close contact of a case, we undertook a second level of contact tracing for those individuals in their household. This ensured that during the early stages of the community outbreak we were focussed on where there was the greatest risk of transmission.

### **We are planning further developments**

21. We are continuing to improve our contact tracing system and have a detailed development plan for the next six months. This includes further enhancements in technology and operational processes.
22. Over the next six months our top priorities are to:
  - a. Strengthen our use of digital technologies to support contact tracing, including the use of Bluetooth technology.

- b. Implement one-off health checks for those departing from MIQF into the community.
  - c. Develop and deliver a national response model for case investigation and contact tracing.
  - d. Coordinate a national workforce with specialist public health skills that can be activated to support local outbreaks either virtually or through a 'Flying Squad'.
  - e. Implement a quality framework to overarch our national case investigation and contact tracing practices.
  - f. Further enhance the National Contact Tracing Solution (NCTS) to support second-order contact tracing and the overall operational environment.
  - g. Working with PHUs and contracted providers to ensure they have the appropriate workforce to support equitable health outcomes for those affected by COVID-19.
  - h. Collaborate with key central agencies to enhance the timeliness of identifying, contacting, and supporting the isolation of cases and contacts.
23. As our operational capabilities and technology develop, it opens further opportunities to improve our contact tracing. We will continue to update you on these opportunities as they arise. It is important however that we continue to build on the current robust model in a way that is sustainable and does not impact the integrity of our response.

## **Second-order contact tracing**

24. As noted above, we have been conducting second-order contact tracing of household contacts as part of our Rapid Response Plan. We have considered whether second-order contact tracing could be further extended to those beyond household contacts.

### **Second-order contact tracing can be beneficial**

25. Second-order contact tracing can be beneficial in the early stages of an outbreak however there are instances in which it would not be recommended:
- a. If the index case was detected early, close to symptom onset, with very little risk of onwards transmission.
  - b. Where there are multiple cases identified at the beginning of an outbreak, and capacity is best exerted in completing fast and efficient first-order contact tracing.
26. There may be scenarios where, as per our current Rapid Response Plan, the Ministry's Office of the Director of Public Health in partnership with the relevant Medical Officer of Health will determine the risks associated with transmission and undertake second-order contact tracing as deemed appropriate.
27. Second-order contact tracing is most effective at a household contact level due to the degree and timing of exposure required for second-order contacts to be at risk. This has been implemented since October and has been effective at containing the risk appropriately.
28. Tracing and quarantining second-order contacts is dependent on the development of and significant uptake of digital technologies. Even then, this additional level of tracing may only provide a relatively small additional benefit and modelling by Professor Shaun

Hendy and colleagues confirmed that effective management of first-order contacts should be the priority.<sup>2</sup>

## Second-order contact tracing requires significant trade-offs

29. Contact tracing for second-order household members has been implemented by relevant public health units (PHUs) during recent clusters and is now routinely part of 'business as usual' practice for contact tracing. This is a sustainable approach that can be undertaken with current contact tracing capacity, however it still requires operational and technological enhancements which we are currently developing.
30. The implementation of second-order contact tracing beyond the household, even if limited to 'known' second-order contacts, has significant technology, workforce capacity and contact tracing service delivery implications which would require trade-offs with first-order contact tracing.
31. As noted above, our current capacity for case investigation and contact tracing is estimated at 350 cases nationally per day. Our current planning assumption is that each individual has an average of 30 close contacts.
32. Our case investigation and contact tracing resources are concentrated on identifying those at the highest risk of infection, which means focusing on first-order close contacts and household contacts.
33. Any second-order contact tracing would utilise the same resources. This means that there would necessarily be a trade-off between our ability to undertake case investigation and contact tracing for additional cases, and second-order contact tracing of already identified cases.
34. Table One calculates the number of hours needed to investigate and communicate with first-order contacts, up to the estimated maximum capacity of 350 cases. Given the notional estimates of 4 hours for the initial case investigation and 45 minutes for close contact calls this equates to 9,275 hours. The equivalent number of hours could be used to investigate and contact trace a maximum of only 4 cases (8,506 hours) to a second-order contact level<sup>3</sup>. It would also inhibit our ability to effectively respond to the unknown variables that we have seen arise, such as unanticipated numbers of first- and second-order contacts or case complexity.
35. As noted above, the resource requirements will vary for each cluster and as experienced in the August Auckland outbreak, some clusters will be far more intensive to manage.

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<sup>2</sup> Plank M, James A, Lustig A Steyn N, Binny R, Hendy S. 26 August 2020. Potential reduction in transmission of COVID-19 by digital contact tracing systems. <https://www.tepunahamatatini.ac.nz/2020/08/28/potential-reduction-in-transmission-of-covid-19-by-digital-contact-tracing-systems/>

<sup>3</sup> Based on the following assumptions: 4 hours interview time for initial case, 45 minutes for first order contact calls, 2 hours interview time with each first order contact and 30 minutes phone call with each second order contact. This is only the time taken to complete the direct communications with contacts. Additional work is still required ie, use of Finding Services to identify contact details, any necessary escalations and workflow management.

**Table One: Modelled number of contacts under first and second-order contact tracing<sup>4</sup>**

Number of Positive Cases	Notional hours needed to contact trace first-order contacts	Notional hours needed to contact trace first- and known second-order contacts
1	27	2,127
2	53	4,253
3	80	6,380
<b>4</b>	106	<b>8,506</b>
5	133	10,633
<b>350</b>	<b>9,275</b>	744,275

36. Our current model ensures that we utilise a risk-based approach to assess when second-order contact tracing is necessary. This allows us to have flexibility to further investigate second-order contacts in high risk scenarios, while maintaining the integrity of our contact tracing response.

### The impact of second-order contact tracing on people is significant

37. The public has to date proven very engaged and accepting of the approach to first-order contact tracing, the benefits of which can be and have been clearly articulated.

38. Evidence shows that the effectiveness of contact tracing is heavily reliant on public engagement, which is determined by clear communication about the approach as well as the individual and community benefits.<sup>5</sup>

39. The implementation of second-order contact tracing has the potential to undermine public confidence in the contact tracing system. The public health risk to second-order contacts cannot be as easily articulated which raises concern regarding public perception and continued compliance with self-isolation. If second-order contact tracing is applied without discretion, there will be people who are advised to self-isolate, individually carrying the associated financial and social burden, despite having limited or no exposure.

40. Compliance of second-order contacts with isolation/quarantine is dependent on public messaging and adherence may be variable. Further resourcing will be required to support the self or managed isolation of second-order contacts, as well as provide the necessary support to ensure compliance.

41. Any extension to the existing approach to second-order contact tracing also has the potential to increase existing inequities due to the number of people required to self-isolate.

42. Māori and Pacific populations are most likely to be adversely impacted by the requirement that individuals are needed to self-isolate as second-order contacts. This is

<sup>4</sup> Note – ‘Known’ second-order contacts are those easily identified by the close contacts. It is assumed that 66% of contacts are known to an individual, equally 20 second-order contact for every first-order contact.

<sup>5</sup> Megnin-Viggars O, Carter P, Melendez-Torres GJ, Weston D, Rubin GJ (2020) Facilitators and barriers to engagement with contact tracing during infectious disease outbreaks: A rapid review of the evidence. PLOS ONE 15(10): e0241473. <https://doi.org/10.1371/journal.pone.0241473>

impacted by higher likelihood for Māori and Pacific people working in higher risk environments, the greater number of people living in households and the degree of social connection within their community.

43. The enforceability of isolation requirements for second-order contacts has also been raised as a concern by Medical Officers of Health (MOsH). As there is minimal, or at times no, public health risk to these individuals it raises the questions regarding the use of statutory tools. This would therefore be entirely voluntary.
44. The current ability to use discretion in the application of second-order contact tracing based on our risk assessment approach allows us to consider these further impacts and how any equity considerations can be managed.

### **Further operational and technology changes would be needed**

45. Second-order contact tracing of households is not yet supported by the technology that underpins the system, the National Contact Tracing Solution (NCTS), therefore involves a number of manual processes to ensure data is recorded for these second-order contacts. Due to these existing limitations in NCTS capability, there is risk in undertaking second-order contact tracing which must be carefully managed.
46. Reporting on second-order household contacts cannot currently be provided but it is expected that enhancement to the NCTS in early 2021 will enable reporting on the total number of identified second-order contacts only.
47. Future NCTS re-design will enable records to be created for second-order contacts outside of household members. Even with the re-design, anticipated from March 2021, there will be significant system and reporting limitations for the management of second-order contacts.
48. Second-order contact tracing will significantly increase the volume of contacts. There are operational risk associated with the work-flow management of this increased volume, particularly as this will require national delegation across PHUs.
49. In addition to the resource to complete the necessary operational processes, any extension to the existing practice for second-order contact tracing will require significant updates to supporting training and procedural documentation.

### **Next steps**

50. The Ministry will continue to enhance our contact tracing system, focusing on our top priorities to ensure a coordinated and sustainable national response and strengthening our use of digital technologies which have the potential to support contact tracing.
51. We will utilise our existing approach to second-order contact tracing to respond to the identified public health need, and a risk-based assessment will be utilised to establish where second-order contact tracing beyond household contacts may be undertaken on a case-by-case basis.
52. We will provide a report-back in March 2021 providing an update on further contact tracing developments that have been implemented.

**ENDS.**