TITLE	Update Note: Behavioural science and insights to combat COVID 19
Document reference	*Behavioural Insights 001*
Date and time	07 May 2020
Produced by/location	Joint Insights Group (JIG)

This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group. This report is assessed to be of MODERATE confidence. **Note:** *Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

Evidence overview
• Due to the constraints of COVID-19 much of the research has used self-report survey methods. These methods provide timely information on attitudes but may not accurately reflect actual behaviour.
• Other research has included meta-reviews and practical guidance provided by expert groups. These sources provide well supported guidance based on previous behavioural studies and pandemics but may not have been tested in the current context.
• Most of the research so far comes from Europe and the United States and may have limited generalisability to the New Zealand context.
• To date there are few available studies that have tested behavioural based interventions using experimental designs.

Domain	Insights
Health	
Adherence to protective health behaviours	• A UK study found that younger people, especially men, are comparatively bad at recalling public health guidance from communications. This group was also the least likely to report they would follow guidance on handwashing, physical distancing, and isolation. • Another UK survey found that people's internal motivation (i.e. their belief that it was an effective thing for them to do) was the most important factor for self-reported handwashing and hygiene practices.
Mental health impacts and response	• A meta-review of historic disease outbreaks has emphasised the likelihood of an increase in mental health conditions during, and immediately after, the COVID-19 outbreak. However, amongst the general population this will likely subside after lockdown measures are lifted. • The authors recommended that efforts should be taken to reduce COVID-related stigma – for those who have contracted the virus and for healthcare workers mental health screening should be used, initially targeted at groups thought to be at greater risk, to determine the tier of support required. • The New Zealand Attitude and Values Survey (NZAVS) has reported since the beginning of lockdown there has been a small increase in anxiety and depressive symptoms.
Contact tracing and communications.	• The majority of people in a UK survey supported linking COVID-19 tests to people's identity and medical records in order to protect lives and livelihoods. • 85% of people were also happy to receive SMS messages from the NHS and 65% were happy to receive them every other day.

Social	
Social cohesion and trust in public institutions.	• New draft findings from the NZAVS indicate that since the beginning of lockdown there has been a large increase in people's trust in public institutions and satisfaction with government. They also found a small increase in people's sense of community and trust in science.
Economic	
Economic and business satisfaction	• The NZAVS also reported that they found no differences in people's satisfaction with the economy and with business in New Zealand before and during the lockdown.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document collates and summarises relevant behavioural science findings focused on contributing to the COVID-19 response. It is broadly organised under Health, Economic, and Social domains (where available) and provides a descriptive overview of practical applications and theory. It is not an exhaustive review of the material and is intended to surface relevant findings that may be relevant to decision-makers.

Health - Research on compliance with health behaviours highlights a variety of important factors, including perceived risk, belief in the effectiveness of the behaviour, social norms and moral engagement.

Protective health behaviours, communications & compliance

2. The Behavioural Insights Team (BIT) in the UK have run several online trials[1] and surveys helping to improve communications to increase people's recall of public health guidelines. The key findings to date are:

   - **Younger people, especially men, are comparatively bad at recalling public health guidance from communications** – which may be a result of a lack of attention and shorter reading times.

   - **This group is also the least likely to report they would follow recommended practices about handwashing, physical distancing and self-isolation.**

   - **People who are the least *and* most worried about COVID-19 remembered fewer details of guidance they were shown.** This was true even when taking their gender, age, income, education, and where they lived into account.

3. A UK survey of 2025 people investigating the role of key factors in handwashing behaviour change found that people's **internal motivation (i.e. their belief that it was an effective thing for them to do) was the most important factor for self-reported handwashing and hygiene practices.**[2]

4. A longitudinal study in Switzerland[3] using a cohort of 786 young adults examined 'Who Complies with Physical distancing?'. The key findings were that:

   - Overall levels of non-compliance differed depending on the specific behaviour and by gender, but not by education level, social class or migration background.

---

[1] Behavioural Insight Team. (31 March 2020). Young men are hardest to engage on coronavirus guidance. Accessed online: https://www.bi.team/blogs/young-men-are-hardest-to-engage-on-coronavirus-guidance/

[2] Miller, G.J. et al. (2020). Capability, opportunity and motivation to enact hygienic practices in early stages of the COVID-19 outbreak in the UK. [Pre-print]. April 2020.

[3] Nivette, A. Eisner, M., Ribeaud, D. (2020). Who complies with Social Distancing? First results from a longitudinal study. [Webinar]. Retrieved from: https://www.vrc.crim.cam.ac.uk/sites/www.vrc.crim.cam.ac.uk/files/me_and_an_compliance_slides.pdf

- **Males had significantly higher levels of non-compliance for staying at home (18% vs 7%), not shaking hands (16% vs 7%), and avoiding being in groups (14% vs 5%). Both males and females had equal levels of non-compliance for physical distancing (18%).**

- **The most important predictor for non-compliance with physical distancing was moral disengagement** (i.e. people finding an excuse to not follow a moral rule, for example "why should I comply with the rules, others don't either"). Therefore, credible communication of moral reasons to comply will be critical to maintaining compliance with physical distancing rules.

- **Trusted and credible communication is an important basis for willingness to follow physical distancing rules.** It is more difficult to achieve voluntary compliance in groups with a low level of trust in government.

- **Maintaining compliance beyond the lock-down period will be challenging and widespread non-compliance will undermine the perception of a social norm** (i.e. if a person does not see most people complying, they won't either). This means that communicating compliance amongst higher risk social groups (i.e. credible norm-enforcement) is important to maintain compliance.

5. A US based survey[4], of 1591 people over a 5-day period in March 2020, found that:

   - **Self-reported physical distancing and handwashing was most strongly predicted by the perceived risk of being infected.** Over the 5-day period, as levels of perceived risk increased so did reported compliance with protective behaviours. However, people's perception of their own risk was much lower than their perceived risk for the average person, perhaps indicating an optimism bias.

   - There was a clear sub-group of people who were disengaged from public health messaging, had low levels of perceived risk and low reported levels of protective health behaviours. *The study did not report other demographics for this group.*

   - The authors recommended clear communication of risk, targeting disengaged populations (e.g. through emergency SMS messages), and emphasis on the beneficial effects of such protective behaviours for others.

6. A Norwegian survey[5] of 8676 people over a 15-day period in March 2020 found that:

   - Adherence to protective health behaviours was predicted by people **perceiving control measures as effective, increased media exposure, larger household sizes, having more children, and perceiving the outbreak as serious.**

   - Contrary to previous studies **there was little evidence that individual perceived risk was a key motivator of protective behaviours.** The conclusion suggests that emphasising that protective behaviours are effective at combating the spread of COVID is more important than exaggerating the risks of not doing it.

---

[4] Wise, T., Zbozinek, T. D., Michelini, G., Hagan, C. C., & Mobbs, D. (2020). Changes in risk perception and protective behavior during the first week of the COVID-19 pandemic in the United States. PsyArXiv [Working Paper], 1–13.

[5] Zickfeld, J., Schubert, T. W., Herting, A. K., Grahe, J. E., & Faasse, K. (2020, April 16). Predictors of Health-Protective Behavior and Changes Over Time During the Outbreak of the COVID-19 Pandemic in Norway. [Pre-print].

7. The British Psychological Society has released simple guidance on how to optimise policies and communications[6], including:

   - Minimise the 'I' and emphasise the 'we'. Create a collective viewpoint. Use messaging that highlights how we can look after each other, rather than how you can look after yourself.

   - Deliver messages from a credible source in relatable terms to the target audience.

   - Communicate the need for worry but be conscious that generating high levels of anxiety or fear could lead to avoidance.

   - Clearly specify behaviour changes required and their effectiveness.

   - Create clear channels of access for health literacy.

Contact tracing, communications and privacy

8. Initial findings from a survey run by BIT in the UK looking at acceptability of tracing apps with regard to privacy trade-offs found that the **majority of people supported linking COVID-19 tests to people's identity and medical records in order to protect lives and livelihoods.**

Finding - 12th April	Somewhat / Very much support	Not at all support
Record people's coronavirus test results on their NHS patient records	77%	7%
Require people to show ID or proof of identity to get a coronavirus test, so gov can record who has been tested	76%	9%

9. Another BIT survey of over 600 people in the UK found that over **85 percent of people were happy to receive a text from the National Health Service and 60 percent were happy to get messages at least once every other day.**[7]

Mental health impact and responses

10. A meta-review of historic infectious disease outbreaks and the potential mental health impacts[8] published in April 2020 highlighted that:

    - an increase in mental health conditions is likely during, and immediately after, the COVID-19 outbreak. **However, amongst the general population, this will likely subside after lockdown measures are lifted.**

    - **Frontline healthcare workers are at greater risk of adverse mental health outcomes.** Other potential at risk groups include; those with chronic physical and mental health conditions, children

---

[6] BPS Behavioural Science and Disease Prevention Taskforce. 2020. Behavioural science and prevention: Psychological guidance. Accessed online: https://www.bps.org.uk/sites/www.bps.org.uk/files/Policy/Policy%20-%20Files/Behavioural%20science%20and%20disease%20prevention%20-%20Psychological%20guidance%20for%20optimising%20policies%20and%20communication.pdf

[7] Using behavioural insights to create a Covid-19 text service for the NHS. Behavioural Insights Team. Accessed online: https://www.bi.team/blogs/using-behavioural-insights-to-create-a-covid-19-text-service-for-the-nhs/

[8] Nobles, J., Martin, F., Dawson, S., Moran, P. and Savovic, J. (2020) The potential impact of COVID-19 on mental health outcomes and the implications for service solutions. Available from: https://arc-w.nihr.ac.uk/research-and-implementation/covid-19-response/potential-impact-of-covid-19-on-mental-health-outcomes-and-the-implications-for-service-solutions/

and parents, people who have lost a family member, those with lower levels of education, those with high levels of perceived risk, and those who live in outbreak hotspots.

- Based on the review the authors recommended that:
  - efforts should be taken to reduce COVID-related stigma – for those who have contracted the virus and for healthcare workers.
  - mental health screening should be used, initially targeted at groups thought to be at greater risk, to determine the tier of support required. This could be through the use of online or remote services (e.g. hotlines, apps, accurate and up-to-date information).

11. Researchers in the UK have developed and rolled out **an evidence-based digital package to support Psychological Wellbeing for Healthcare Workers.**[9]

- The package outlines the actions that team leaders can take to provide psychologically safe spaces for staff, as well as guidance on communication and reducing social stigma, peer and family support, signposting others through psychological first aid (PFA), self-care strategies (e.g., rest, work breaks, sleep, shift work, fatigue, healthy lifestyle behaviours), and managing emotions.

- Initial qualitative evaluation shows that frontline workers found it useful, meaningful and appropriate.[10] The most important messages identified were normalisation of psychological responses during a crisis, and encouragement of self-care and help-seeking. The package was accessed 17,633 times within 7 days of release.

Social – New Zealand appears to be in a good position for a number of important compliance factors such as trust in government

12. New findings from the New Zealand Attitude and Values Survey[11], which interviewed 1003 people before (December 2019) and after the introduction of Alert Level 4 (March to April 2020), indicate that since the beginning of lockdown there has been:

- a large increase in people's trust in public institutions (e.g. politicians and NZ Police) as well as increased satisfaction with government.
- a small increase in people's:
  - sense of community
  - trust in science
  - anxiety and depressive symptoms.
- no major changes to people's overall subjective wellbeing.

Economic – Attitudes towards business and the economy do not appear to have been impacted during the initial lockdown

13. The New Zealand Attitude and Values Survey also reported that they found no differences in people's level of satisfaction with the economy and with business in New Zealand before and during the Alert Level 4 lockdown.

---

[9] Blake, H. & Bermingham. F. Psychological wellbeing for healthcare workers: mitigating the impact of covid-19. The University of Nottingham. Version 1.0, April 2020. https://www.nottingham.ac.uk/toolkits/play_22794

[10] Blake, H.,& Bermingham. F. (2020). **Mitigating the Psychological Impact of COVID-19 on 3 Healthcare Workers: A Digital Learning Package.** *International Journal of Environmental Research and Public Health.* 17.

[11] Sibley, C. et al. (2020). Short-term effects of the COVID-19 pandemic and nationwide lockdown on institutional trust, attitudes to government, health and wellbeing. [Pre-print].

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

APPENDIX I

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

TITLE	Update Note: Behavioural science and insights to combat COVID 19
Document reference	*Behavioural Insights 002*
Date and time	14 May 2020
Produced by/location	Joint Insights Group (JIG)

This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group. This report is assessed to be of MODERATE confidence. **Note:** *Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

Evidence overview	
• Due to the constraints of COVID-19 much of the research has used self-report survey methods. These methods provide timely information on attitudes and self-reported behaviour but may not accurately reflect actual behaviour. • There remains little empirical testing of interventions to change behaviour in response related to the COVID-19 response.	

Domain	Insights
Adherence with protective health behaviours	• An international survey has found that the most important factors in people's levels of risk perception towards COVID are: **the extent to which they hold individualistic or prosocial worldviews, personal experience of the virus, and social amplification** (i.e. if they were provided with information about the virus from a family member or friend).
Communications	• An online experiment in Ireland that tested different social distancing messages on posters found that **using simple messaging and diagrams was perceived as significantly more effective and memorable. However, messaging that emphasised the impacts of an individual's behaviour on an identifiable vulnerable person, or groups of other people, led to people being more cautious of other people's behaviours and influenced how acceptable they found other people's behaviours.**
Mental health and wellbeing	• A UK survey of young people (13-24) has found that a large proportion of young people feel significantly more anxious, and worried about their parents and family. This was even greater if the young people's parents/caregivers are key workers (e.g. health professionals). • Overall, young people did not perceive themselves as being at risk of catching the virus or as a risk to others. Men had lower levels of perceived risk compared to women of the same age. Likewise, older young men (19-24) had the lowest self-reported adherence with protective health behaviour guidelines.
Safety, trust and social connections	• An international survey, including 380 New Zealanders, has found that adherence to physical distancing and hygiene behaviours has been high across all countries, and New Zealanders were the least likely to think their Government had not been truthful about COVID. New Zealanders also had a high level of trust that the Government would keep them safe.

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document collates and summarises relevant behavioural science findings focused on contributing to the COVID-19 response. It is broadly organised under Health, Social and Economic domains (where possible) and provides a descriptive overview of practical applications and theory. It is not an exhaustive review of the material and is intended to surface findings that may be relevant to decision-makers. In some cases, additional analysis is provided and implications for New Zealand are discussed.

Adherence with protective health behaviours

2. Risk perception of COVID-19 has been consistently cited a key predictor for adherence with protective health behaviours. An international survey[1] conducted between March and April 2020 examined levels of risk perception as well as the factors that contribute to higher levels of risk perception. The survey included 6,991 people across 10 countries (UK, USA, Australia, Germany, Spain, Italy, Sweden, Mexico, Japan, and South Korea). The study highlighted that:

   - Levels of risk perception were relatively high globally and significantly correlated with reported levels of adherence to preventative health behaviours (e.g. washing hands, use of PPE, physical distancing).

   - Overall, the most important factors for perceived risk of COVID were:

     - **The extent to which people hold individualistic or more prosocial worldviews.** People who think it is important to do things for the benefit of others/society tended to perceive more risk than people with more individualistic worldviews.

     - **Personal experience with the virus.** Across most countries having personal experience with the virus had higher levels of perceived risk, although this appeared less important in the Australian sample.

     - **Hearing about the virus from family and friends (social amplification).** Having messages about COVID amplified by close friends and family also tended to lead to higher levels of perceived risk.

   - Other important variables included trust in government, science and medical professionals, personal knowledge of government strategy, and personal and collective efficacy (i.e. the belief in yourself or a group to be able to complete a task/achieve a goal).

   > **Evidence analysis:** While this study did recruit a large and diverse sample globally this was not necessarily representative of each country. However, the survey was robust and explored important factors for a key driver of adherence with protective health behaviours.
   >
   > **Implications:** New Zealand has a relatively low number of cases so like Australia personal experience will likely not have a large impact on levels of perceived risk here. However, in Australia, 'social amplification' (hearing about the virus from friends and family) was a significant determinant of whether COVID-19 was a real risk. Therefore, asking people to tell their social circle about important updates (e.g. changes to lockdown restrictions) is a simple behaviour that is likely to increase how seriously they are received.

---

[1] Dryhurst, S., Schneider, C.R., Kerr, J., et al. (2020): Risk perceptions of COVID-19 around the world, Journal of Risk Research. Accessed online: https://www.tandfonline.com/doi/pdf/10.1080/13669877.2020.1758193?needAccess=true

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

Communications

3. An Irish online experiment[2], of 500 participants, tested different communication strategies on posters and measured people's perceived effectiveness as well as the impact on behavioural intentions and beliefs in the acceptability of other people's behaviours. Theses messages were either simple messaging and diagrams (A) or messaging that emphasised the impact of individual action on other people (B) and (C).

(A) Simple (Control)
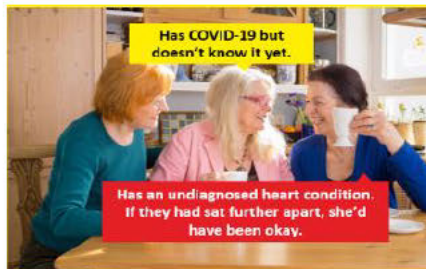
(B) Likelihood of infecting identifiable vulnerable person

(C) Likelihood of impacting a large number of others

The researchers found that:

- Posters using simple messaging and diagrams (A) were perceived as significantly more effective and memorable than the other versions. However, posters that emphasised that either an individual who contracts COVID could infect an identifiable vulnerable person (B) or a substantial number of other people (C), both led to higher levels of caution towards people's own behaviour (e.g. visiting friends) and the acceptability of other people doing the same.

- The authors concluded that people's judgement of effectiveness and actual effectiveness may not always align. There is evidence that communications should not just inform people of the recommended behaviour, but also emphasise the impact of non-adherence on identifiable people and the potential number of infections.

> **Evidence analysis:** This study has a relatively small sample size and while it did find significant differences it is not clear how big these effects were overall. As with other surveys this measured people's attitudes and intentions to act rather than actual behaviour.
>
> **Implications**: Some of the poster's in New Zealand's communications have used similar messages as the simple options (A) in this study. The evidence in this study is not strong enough to warrant not using this approach – but could provide an alternative option for future variations.

Wellbeing and mental health

4. A UK based survey[3] of 2,002 young people between 21 and 29 April 2020 looked at the wellbeing and behaviour of adolescents in response to COVID-19. Some key findings include:

- A large proportion of young people felt significantly more anxious, and worried about their parents and family. In addition, young people whose parents/caregivers are key workers (e.g. health professionals) had significantly greater levels of anxiety and lower levels of general well-being compared to those whose parents/caregivers were not key workers.

---

[2] Lunn, P.D., Timmons, S., Barjaková, M., Belton, C.A, Julienne, H. and Lavin, C. (2020). Motivating social distancing during the Covid-19 pandemic: An online experiment. *ESRI Working Paper No. 658.* Accessed online: https://www.esri.ie/system/files/publications/wp658.pdf

[3] Levita, L. (2020). Initial research findings on the impact of COVID-19 on the well-being of young people aged 13 to 24 in the UK. *COVID-19 PSYCHOLOGICAL RESEARCH CONSORTIUM (C19PRC).*

- Overall, young people did not perceive themselves as being at risk of catching the virus or as a risk to others. Young men had lower levels of perceived risk compared to women of the same age. Likewise, older young men (19-24) had the lowest self-reported adherence with protective health behaviour guidelines.

- Higher levels of anxiety predicted closer adherence to the rules, while conversely higher levels of depression predicted lower adherence.

Evidence Analysis: The survey asked participants how they felt now compared to before COVID which relies on people's memories of how they felt rather than their current state. There was no way to accurately measure how participants level of worry or feelings of anxiety have changed over the course of COVID.

Implications: The results provide a positive picture for New Zealand so far. Having high levels of trust in the government response is likely a positive predictor for adherence to protective health behaviours. Having a strong response from government likely provided New Zealanders with a sense of security which may have been positive for mental health initially.

5. A UK survey[4] of 1,000 respondents asked people how they felt about financial security and financial wellbeing in the future. The survey finds:

- Almost 29% believed that the economic situation of their household will be a lot worse in the future, though twice as many believed that the national and global economic situation would be a lot worse

- People reporting changes in their household's situation to be less bad compared to changes in the country suggests a financial "better-than-average" effect where people are likely to believe the economic downturn will affect others more severely than themselves.

Evidence Analysis: The survey includes many self-reported measures, such as income, alongside deduced measures, such as financial literacy. There may be measurement error, particularly in self-reporting. Further, it is not clear whether all participants are from the UK, or recruited from elsewhere.

Implications: Since we tend to compare ourselves socially, people overall considering themselves to be better off than others is positive for wellbeing. However, the generalisability for New Zealand is dubious, since New Zealanders may feel in very different financial situations and have different outlooks to others overseas.

Safety, trust and social connections

6. A large-scale survey[5] covering 58 countries (total 107,565 responses, including 380 from New Zealand) between late March and early April 2020 investigated people's adherence to government recommendations, perceptions of the response by government and other people, and how people's mental health was affected by government measures to respond to COVID-19. Key findings include:

- Levels of adherence to physical distancing and hygiene behaviours were high across all countries and most people agreed that strong policy measures (e.g. shop closures, curfews) were necessary.

---

[4] Barrafrem, K., Västfjäll, D., & Tinghög, G. (2020, April 30). Financial well-being, COVID-19, and the financial better-than-average-effect. Accessed online: https://psyarxiv.com/tkuaf/

[5] Fetzer, T., Witte, M., & Hensel, L. et al. (2020). Global Behaviours and Perceptions at the Onset of the Covid-19 Pandemic. *NBER Working Paper: 27082.* Accessed online: https://www.nber.org/papers/w27082.pdf

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

- People held strong beliefs about the importance of protective behaviours, but greatly underestimated the extent to which other people would (for example, 97% believed that social gatherings should be cancelled but only thought that 67% of other people would feel the same).

- New Zealanders were the least likely to think their Government had not been truthful about COVID (4%) and had a high level of trust that the Government would keep them safe (27% somewhat trusting and 68% strongly trusting).

- Most New Zealanders surveyed thought the government reaction was appropriate (82%), with only 17% finding the reaction insufficient. However, 50% of people surveyed thought the public reaction was insufficient.

- While 57% of New Zealanders surveyed indicated they would need to leave home within the next 5 days, only 10% listed meeting friends or relatives, exercising freedom, getting bored or tired of being at home as a reason for doing so.

- As a country imposes more stringent restrictions, both the participants perception that the government and public response is adequate and their trust that governments keep people safe increases, while depression measures decrease. For example, they showed that when the UK announced their nationwide lockdown there was an increase in trust in the government and a decrease in worry and depression.

> **Evidence analysis:** The inclusion of a New Zealand sample in this survey increases its relevance although it is likely that this was not representative of the population.
>
> **Implications:** The results provide a positive picture for New Zealand so far. Having high levels of trust in the government response is likely a positive predictor for adherence to protective health behaviours. Having a strong response from government likely provided New Zealanders with a sense of security which may have been positive for mental health initially.

7. The Ministry of Justice's COVID-19 Justice Sector Survey[6], a telephone survey conducted weekly on people's social connections, perceptions of safety, experience of crime and reporting to police, and understanding of the COVID-19 rules, has published results from the earlier levels of the lockdown (between 12-20 April and 21-27 April). Findings from the second week show that:

- 99% of people said the Alert Level 4 rules were clear to understand and they knew where they could go and what they could do, and 97% of people indicated it was easy for them to follow the rules.

- Most people were connecting socially, with 98% having communicated with family, whanau, or friends outside their house and 82% doing so on at least four days in a week. With only 4% of people feeling lonely most or all of the time.

- Most people reported low psychological distress with 6% of people reporting moderate or high levels of psychological distress.

- Most people feel very safe, but 1.8% feel very unsafe at home.

- 27% of people noticed a problem in their neighbourhood, most commonly dangerous driving and noisy neighbours.

---

[6] https://www.justice.govt.nz/justice-sector-policy/research-data/covid-19-justice-sector-survey/

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

- 89% of people don't worry about being a victim of crime, and only 1% worry most or all of the time. There was a noticeable 12 percentage point increase in the proportion of people who don't worry about being a victim of crime between the first and second week.

- 95% of people say they have easy access to someone to talk to if they are feeling unsafe. But 2% of people feel it is hard to find someone to talk to.

- People reported they would feel safer if:
    - There is more certainty about the future
    - COVID-19 is eliminated
    - A vaccine against COVID-19 is developed
    - They have work security and a stable income
    - Alert Level 4 is extended for a longer time
    - They can return to a normal life
    - There is greater visibility/greater presence of police to stop unreasonable behaviour

> **Evidence analysis:** Being a New Zealand sample makes these results particularly relevant, however this survey primarily focused on measures of attitudes and perceptions rather than reported behaviour.
>
> **Implications:** The high levels of understanding of the rules, good levels of social connection, and high levels of personal safety are all positive indicators from a behavioural perspective for on-going adherence. While moving down through AL3 and AL2 will increase the complexity of some of the rules, these results indicate that messaging to date has likely been effective for comprehension and other important social measures around safety and social connection have not been negatively impacted to a large extent by control measures.

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

APPENDIX I

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

TITLE	Behavioural factors associated with a return to AL 3 or 4
Document reference	*Behavioural Insights 005*
Date and time	04 June 2020
Produced by/location	Joint Insights Group (JIG)

*This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group. This report is assessed to be of MODERATE confidence. **Note:** Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

- The risk of widespread non-compliance in a return to AL 3 and 4 is low, as the perceived threat of COVID-19 is likely to increase. However, compliance will rely on the government continuing to communicate expectations early on.
- People will underestimate the possibility of a second wave and associated restrictions. So, this risk needs to be clearly communicated, including when, why and how it might happen to maintain perceptions of legitimacy and reduce shock.
- It will be more difficult for some to comply due to the economic and social costs, which if they become great enough will also outweigh the health threat of COVID-19.
- People's perceptions of COVID-19 could shift (i.e. people see infection as useful for herd immunity) and people no longer see the disease as a much of a threat, which would undermine the government strategy.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document collates and summarises relevant behavioural science theory on risks to compliance with protective health behaviours[1] during a second wave of COVID-19 and associated returns to AL3 or 4. It is not an exhaustive review of the material and is intended to identify key factors that may be relevant to decision-makers.

Behavioural risks to compliance under a second wave and a return to AL3 or AL4

2. New Zealand is continuing to see low levels of COVID-19 cases, and while the response to COVID-19 relies on widespread voluntary compliance with protective health behaviours, compliance with many of these behaviours will likely continue to reduce over time as[2] compliance becomes more difficult to prioritise and remember, social norms continue shift, perceptions of risk and threat continue to decrease, and the purpose and effectiveness of behaviours (e.g. contact tracing) becomes less clear. However, there remains a risk of a repeat waves of COVID-19 cases, as observed internationally (e.g. Iran[3] and South Korea[4]). This may require a return to AL 3 or 4 restrictions and the need for compliance with stricter protective health behaviours (e.g. self-isolation, lockdowns).

3. There does not appear to be any specific behavioural research available on the implications of a return to restrictions on compliance in a pandemic. Therefore, it is difficult to assess how adherence to protective health

---

[1] This includes a wide range including physical distancing in public, self-isolating, hygiene practices, monitoring and reporting symptoms, and participating in contact tracing.

[2] https://www.health.govt.nz/system/files/documents/pages/covid-19-health-and-wellbeing-survey-eighth-week-results-as-of-2020-05-27.pdf

[3] https://www.nytimes.com/2020/05/18/world/middleeast/iran-coronavirus-surge.html

[4] https://www.aljazeera.com/news/2020/05/south-korea-coronavirus-fight-trouble-surge-cases-200528041458518.html

behaviours would change in the current context. Based on behavioural theory, previous pandemic research and the approach in New Zealand to date, **it is overall unlikely there would be widespread non-compliance in response to restrictions with a new wave of COVID-19**[5]. Compliance with health behaviours will still rely on the same factors, if people have the capability, opportunity and motivation[6] they will be likely to comply.[7] Based on this model some of the key factors are outlined below.

4. **Capability – Do people still have the knowledge and skills?**

- Provided that the rules for AL 3 and 4 do not vary greatly people will already have the necessary knowledge, understanding and experience to comply.

- It will be important however that **the possibility of a return is communicated as part of ongoing risk communications**. People are likely to discount the actual risk[8] of a second wave and a return to AL 3 or 4, therefore this needs to be communicated to the public to avoid surprise, misinformation, and ensure people understand why, when, and how restrictions could return.[9] This may require reinforcing that COVID-19 remains uncontrolled internationally, and with no vaccine available, that behavioural restrictions are vital for New Zealand's long term strategy.

- An additional risk is that messaging from government becomes increasingly ineffective as things return to normal and saturation of COVID information means people do not pay attention to new messaging.[10]

5. **Opportunity – Do people have the physical opportunity and social permission?**

- **Physical:** It will be more difficult for some people to comply (e.g. self-isolate) as the economic and social costs will be harder to avoid. Some people may not have the physical resources (e.g. money and access to food) to allow an easy return to AL 3 and 4. However, for others it may be simpler as they have already set up arrangements and have changed habits (e.g. working remotely).

- **Social:** As with the initial AL 3 and 4, people will be more likely to comply if there is widespread adoption and social norms supporting the restrictions. New Zealand has high levels of prosocial attitudes[11] and based on the collective unity[12] and support seen in response during the initial lockdown it could be expected that this will be maintained. However, given the increased economic and social pressure from a second wave it will be less likely for some to receive permission from employers and social influences (e.g. family and whānau).

---

[5] It is difficult to provide overall quantitative measures of compliance as different behaviours are easier to measure and will depend on different factors. Based on surveys and google trend data New Zealand appeared to be overall compliant during the initial AL 3 and 4.

[6] West, R., Michie, S., Rubin, G.J. *et al.* Applying principles of behaviour change to reduce SARS-CoV-2 transmission. *Nat Hum Behav* **4**, 451–459 (2020). https://doi.org/10.1038/s41562-020-0887-9

[7] For some behaviours (e.g contracting tracing, hygiene, physical distancing) a return to AL 3 or 4 likely would not change these factors drastically, and in fact may increase motivation and therefore improve compliance

[8] Soofi M, Najafi F, Karami-Matin B. Using Insights from Behavioral Economics to Mitigate the Spread of COVID-19. Appl Health Econ Health Policy. 2020;18(3):345-350.

[9] BPS Behavioural Science and Disease Prevention Taskforce. 2020. Behavioural science and prevention: Psychological guidance. Accessed online: https://www.bps.org.uk/sites/www.bps.org.uk/files/Policy/Policy%20-%20Files/Behavioural%20science%20and%20disease%20prevention%20-%20Psychological%20guidance%20for%20optimising%20policies%20and%20communication.pdf

[10] Favero, N., & Pedersen, M. J. (2020). How to encourage "Togetherness by Keeping Apart" amid COVID-19? The ineffectiveness of prosocial and empathy appeals. *Journal of Behavioral Public Administration*, 3(2). https://doi.org/10.30636/jbpa 32.167

[11] https://worldhappiness.report/ed/2020/cities-and-happiness-a-global-ranking-and-analysis/

[12] Sibley, CG., Greaves, LG., Satherley, N, Wilson, M.S., Overall, N.C., Lee, C.H.J., Milojev, P., Bulbulia, J., Osborne, D., Milfont, T.L., Houkamau, C.A., Duck., I.M., Vickers-Jones, R., & Barlow, F.K. (in press). Effects of the COVID-19 pandemic and nationwide lockdown on trust, attitudes towards government, and wellbeing. *American Psychologist*. 10.1037/amp0000662

6. **Motivation – Do people still see COVID as a threat and believe in the government response?**

- **Perceptions of risk and threat:** assuming that a return to AL 3 and 4 is based on a sufficient increase in COVID-19 cases (i.e. actual risk) then it is likely people's perception of risk (for themselves, and others) will also increase. Perceived threat is a fundamental component of behaviour change in a pandemic, so any increases will likely help compliance.[13] There is a **risk is that people no longer see the need to avoid the disease** for themselves and may even believe that contracting the disease is inevitable and in fact better for herd immunity, reducing the incentive for them to stay indoors and isolate.[14] Likewise, there is a risk that fear of uncertainty and the associated worsening economic costs[15] mean people are less willing to comply, and support others to comply, as the economic costs outweigh the social costs.

- **Public trust and confidence and perceptions of legitimacy.** Evidence from procedural justice demonstrates that perceived legitimacy of the rules is an important factor for compliance.[16] People need to not only believe that the change in rules is legitimate given available information (e.g. they may perceive an increase in cases to be a legitimate reason), but also believe that *other* people believe the rules are legitimate. If there is a return to AL 3 or 4 without clearly communicated reasons, there is a danger that people will not comply. The rules also need to be seen as applied equally and to be fair. However, to date New Zealand has shown high levels of trust and confidence in the approach taken by the government[17] and decisive actions to address the threat of COVID-19 has been highlighted as a key factor in increasing and maintain trust and compliance.[18]

- **Perceptions of government strategy.** The government has maintained high levels of trust in its actions throughout the pandemic[19], by communicating clearly and utilising subject matter experts. However, **multiple waves and a return to AL 3 or 4 may call into question the use of evidence and guidance, which could reduce trust in future decisions and the wider government strategy.**

- **Moral reasoning, prosocial attitudes and collective action.** New Zealand's approach to date has relied heavily on collective action and unity, as well as moral and empathy-based messaging (e.g. protect others). Research suggests that in pandemics prosocial attitudes increase and leveraging collective action is effective.[20] It is unlikely that prosocial attitudes and behaviour will decrease if the health threat returns and may in fact increase if there is wide spread economic impacts.[21] However, it is likely that moral disengagement, (i.e. finding an excuse to a moral standard) will increase for people who are hardest hit by the large economic and social costs of a return to AL 3 or 4 which would increase the

[13] Taylor, S. (2019). *The psychology of pandemics: Preparing for the next global outbreak of infectious disease.* UK : Cambridge Scholars Publishing.

[14] Rao, P. Behavioral economics in the time of coronavirus: rebellion or "willful ignorance" in the face of "grand challenges". *Rev Evol Polit Econ* (2020). https://doi.org/10.1007/s43253-020-00015-2

[15] Greasley, D., Madsen, J.B., & Oxley, L. (2001). Income Uncertainty and Consumer Spending during the Great Depression. *Explorations in Economic History.* 38.2. Accessed online: https://www.sciencedirect.com/science/article/abs/pii/S0014498300907514

[16] Hough, M., Jackson, J., Bradford, B., Myhill, A., & Quinton, P. (2010). Procedural justice, trust, and institutional legitimacy. *Policing: a Journal of Policy and Practice, 4,* 203-210.

[17] Sibley, CG., Greaves, LG., Satherley, N, Wilson, M.S., Overall, N.C., Lee, C.H.J., Milojev, P., Bulbulia, J., Osborne, D., Milfont, T.L., Houkamau, C.A., Duck, I.M., Vickers-Jones, R., & Barlow, F.K. (in press). Effects of the COVID-19 pandemic and nationwide lockdown on trust, attitudes towards government, and wellbeing. *American Psychologist.* 10.1037/amp0000662

[18] Fetzer, T., Witte, M., & Hensel, L. et al. (2020). Global Behaviours and Perceptions at the Onset of the Covid-19 Pandemic. *NBER Working Paper: 27082.* Accessed online: https://www.nber.org/papers/w27082.pdf

[19] https://static.colmarbrunton.co.nz/wp-content/uploads/2019/05/COVID-Times-24-April-2020.pdf

[20] Bavel, J.J.V., Baicker, K., Boggio, P.S. *et al.* Using social and behavioural science to support COVID-19 pandemic response. *Nat Hum Behav* **4,** 460–471 (2020). https://doi.org/10.1038/s41562-020-0884-z

[21] Alonso-Ferres, M., Navarro-Carrillo, G., Garrido-Macías, M., Moreno-Bella, E., & Valor-Segura, I. (2020). Connecting perceived economic threat and prosocial tendencies: The explanatory role of empathic concern. PLoS ONE 15(5): e0232608.

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

likelihood of non-compliance (e.g. "I need to open my business to provide income so therefore its okay for me not to isolate").[22]

7. These factors are not mutually exclusive and influence each other. For example, people's trust in the government response to a threat is dependent on them perceiving the threat as high enough to warrant a response in the first place. These factors will also compound to support compliance, for instance the more people comply with a return to AL 3 or 4 the more legitimate the decision will appear. Likewise, if certain groups do not comply or are not required to, and the reasons are not well understood, this will reduce perceptions of legitimacy and likewise compliance.

---

[22] Nivette, A., Ribeaud, D., Murray, A. L., Steinhoff, A., Bechtiger, L., Hepp, U., ... Eisner, M. (2020, May 2). Non-compliance with COVID-19-related public health measures among young adults: Insights from a longitudinal cohort study. https://doi.org/10.31235/osf.io/8edbj

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

APPENDIX I

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

TITLE	Behavioural Science Update
Document reference	*Behavioural Insights 007*
Date and time	19 June 2020
Produced by/location	Joint Insights Group (JIG)

*This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group. This report is assessed to be of MODERATE confidence. **Note:** Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document collates and summarises relevant behavioural science findings relating to the COVID-19 response. This update covers:

    -   A rapid review of behavioural research on factors and risks associated with adherence to quarantine, managed-isolation, and self-isolation.
    -   Recent examples of relevant behavioural science literature related to COVID-19.

    This document is not an exhaustive review and is intended to surface findings that may be relevant to decision-makers.

Key Insights

-   Compliance with isolation requirements will rely on providing people with the resources needed to ensure they have the physical capability and opportunity, managing the psychological impacts of isolation, and maintaining motivation.
-   New research finds that people are more likely to recognise the need to self-isolate when given detailed decision aids.
-   A worldwide survey demonstrates that messages from health experts are perceived as more 'shareable' than messages directly from government or celebrities.

Self-isolation, managed isolation, and quarantine

2. Border restrictions and the effective isolation of any new COVID-19 cases are key components of New Zealand's current strategy. Under Alert level 1 people entering New Zealand are required to stay in managed isolation or quarantine for at least 14 days. In addition, self-isolation is required for people who have been in close contact with a probable case or have recently returned overseas but have been granted an exemption to self-isolate.

3. These three measures rely on similar behavioural factors but differ in key areas particularly with regard to the amount of oversight and external monitoring of compliance. People in managed isolation and quarantine are less reliant on their own voluntary compliance, as they have support and external monitoring which reduce the likelihood of many reasons for breaches.[1] While currently New Zealand's strategy does not rely heavily on self-isolation, this is likely to be important if cases increase again, and if more travellers return to New Zealand, increasing the strain on managed isolation and quarantine facilities.

---

[1] West, R., Michie, S., Rubin, G.J. & Amlot, R. (2020). Applying principles of behaviour change to reduce SARS-CoV-2 transmission. *Nature Human Behaviour* pp. 1-9.

4. Research from previous pandemics and from the current crises have highlighted the following as key factors related to compliance within isolation:

- **Physical capability and opportunity**. People need to know when, why and how they need to go into isolation, and be provided with straightforward information with clear guidelines. For example, what are the symptoms that would require self-isolation? What contact can they have with other people? How do they get supplies? Research has highlighted that one way to support confidence and compliance is to **help people to make time-specific plans for isolation**, including how they are going to manage daily tasks, identify potential barriers to compliance as well as strategies to overcome them.[2,3] It is also critical that the cues, support and guidelines provided in the environment (e.g. by government officials and health care workers) is consistent to reduce confusion and maintain confidence. At Alert Level 1, there is a risk that the more obvious contrast between the level of freedom and activities for those in isolation and the wider public may increase perceptions of 'missing out'.[4] This would reduce the influence of the wider social norm, when most people are required to do the same thing. One solution is to reinforce social norms based on other people in isolation (e.g. 'there are many others like you who are also successfully self-isolating right now').

- **Managing psychological impacts of isolation**. A substantial amount of research has emphasised the impacts of isolation and quarantine on psychological health[5] which in turn makes it harder for people to maintain motivation and reduces psychological capability to comply. Overall, a number of key stressors have been identified including:

  o **Loneliness, frustration and boredom**, which can be exacerbated by a loss of routine and a lack of sleep[6] and/or exercise.

  o **Length of time**, since the longer people are required to isolate the worse the impacts can be. Likewise, clearly communicating the length of isolation, and the exact circumstances for any extension are important as surprise extensions can reduce motivation and willingness to comply[7]

  o **Inadequate information** (e.g. lack of clarity about the different levels of risk), and the associated stress created by the perceived difficulty in complying with protocols, as well as the broader fear of catching the illness from others, or fear of infecting others.

People must feel a need to maintain isolation in the face of cognitive and emotional barriers, develop new habits to sustain the behaviour and be motivated to find ways to overcome specific challenges that occur during the period. Having resources to support mental health and allow people to maintain healthy habits (e.g. exercise) without risking their own health or those of others, and any associated stress or feeling of guilt and shame is important.

---

[2] Lunn, P. D., Timmons, S., Julienne, H., Belton, C., Barjaková, M., Lavin, C., & McGowan, F. P. (2020, May 29). Using Decision Aids to Support Self-Isolation During the COVID-19 Pandemic. https://psyarxiv.com/fngx5/

[3] Lunn, P. et al. (2020). Using behavioural science to help fight the coronavirus. ESRI Working Paper No. 656. http://aei.pitt.edu/102644/ (2020).

[4] Przybylski AK, Murayama K, DeHaan CR, Gladwell V. Motivational, emotional, and behavioral correlates of fear of missing out. Comput Hum Behav. 2013;29:1841–8.

[5] Brooks, S. K. et al. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet 395, 912–920.

[6] Zheng, M. X., Yao, J., & Narayanan, J. (2020, March 20). Mindfulness Buffers the Impact of COVID-19 Outbreak Information on Sleep Duration. https://doi.org/10.31234/osf.io/wuh94

[7] Briscese, G., Lacetera, N., Macis, M., & Tonin, M. (2020). Compliance with Covid-19 Social-Distancing Measures in Italy: the Role of Expectations and Duration. NBER Working Paper No. w26916. Available at SSRN: https://ssrn.com/abstract=3563984

- **Maintaining motivation and perceptions of effectiveness and legitimacy.** Research into compliance with rules emphasises the need for legitimacy as a key motivator.[8] Perceptions of legitimacy rely on people understanding who makes the rules and why those rules exist and their equal application across people. There is a risk that **deviations or breaches (e.g. people not isolating properly, or external people mixing with isolated populations) will undermine the legitimacy of other people's efforts, decreasing their motivation to comply or increasing the likelihood that they rationalise exempting themselves from the rules.**[9] Another component is the perception that the rules are effective. Past research has highlighted that people express unwillingness to isolate themselves when they have doubts about the chances of infecting others (i.e. low belief in the effectiveness of isolation), but report greater willingness when they consider the possible effect on the most vulnerable in society.[10] Therefore, continuing to reinforce that isolation is helping to keep others safe and that health authorities are genuinely grateful to them will help to reduce the psychological impact and support compliance.

Overview of new behavioural literature

5. Self-isolation is vital to containing COVID-19 and will be increasingly important in AL 1. Researchers in Ireland tested behaviourally informed interventions to support self-isolation using an online experiment of 437 people.[11] One part of this experiment compared how people's decisions on the need for self-isolation changed when presented with simple (A) and complex (B) decision aid designs, compared to common public health advice (C). The researchers asked people to make decisions based on scenarios that varied in the relevant symptoms for COVID, the cold and flu viruses, as well as contexts (e.g. international travel).

A)   B)   C)

The researchers found that:

- people systematically underestimated the need to self-isolate in the scenarios that involved less obvious or 'secondary' COVID-19 symptoms (e.g. sore throat, fatigue), despite widely published public health guidance suggesting they should.
- in scenarios that involved primary symptoms (e.g. fever, dry cough) the majority of people decided self-isolation was required.

---

[8] Hough, M., Jackson, J., Bradford, B., Myhill, A., & Quinton, P. (2010). Procedural justice, trust, and institutional legitimacy. *Policing: a Journal of Policy and Practice, 4*, 203-210.

[9] Nivette, A., Ribeaud, D., Murray, A. L., Steinhoff, A., Bechtiger, L., Hepp, U., Shanahan, L., & Eisner, M. (2020). Noncompliance with COVID-19-related public health measures among young adults: Insights from a longitudinal cohort study. https://doi.org/10.31235/osf.io/8edbj

[10] Kappes, A., Nussberger, A.-M., Faber, N. S., Kahane, G., Savulescu, J., & Crockett, M. J. (2018). Uncertainty about the impact of social decisions increases prosocial behaviour. *Nature Human Behaviour, 2*(8), 573–580.

[11] Lunn, P. D., Timmons, S., Julienne, H., Belton, C., Barjaková, M., Lavin, C., & McGowan, F. P. (2020, May 29). Using Decision Aids to Support Self-Isolation During the COVID-19 Pandemic. https://psyarxiv.com/fngx5/

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

- relative to the common advice, **viewing the complex decision aid significantly increased the likelihood that participants decided that self-isolation was required**, even when controlling for multiple background characteristics (gender, age, educational attainment).
- when focusing on self-isolation decisions based on scenarios describing primary symptoms (e.g. fever, dry cough), there was a large difference between educational attainment, with the decision aids leading to better decisions for people with a degree compared to those without.

A second part of the study looked at attitudes towards the presentation of self-isolation guidelines. The researchers compared standard guidelines for managing self-isolation (A) to guidelines that were themed into related areas and used infographics (B) and measured how easy people found it to understand the guidelines (i.e. their confidence in their understanding), how well they could recall information from the guidelines, and how well they comprehended the guidelines based on a multiple-choice scenarios.

A key finding was that while **people did not feel that the infographics were any easier to follow**, the **infographics led to consistently higher scores on people's recall and comprehension of the guidelines.**

Evidence review: This research provides a good example of experimental methods to pre-test communication interventions. However, it is important to note that the methods involved people making decisions based on hypothetical scenarios. While the results show improvements in important variables such as memory retention, comprehension and confidence, these may not correlate with actual changes in behaviour. In addition, the effect size of the improvement was small, particularly in the second study.

New Zealand context: As New Zealand is now in AL 1 and faces a long period of uncertainty around the return of COVID-19 self-monitoring, reporting and self-isolating behaviours will be critical for effective management of any further outbreaks. This research shows promising ways to increase people's mental capability and opportunity to complete these behaviours, and shows how pre-testing interventions could be done in the New Zealand context to improve communications.

---

6. A lot of research has focused on how to send messages to the public about health behaviours in response to COVID-19. However, who sends that message is important as well. An experimental survey study[12] of people in six countries (Brazil, Italy, South Korea, Spain, Switzerland, US) looked at who were the most effective spokespersons for promoting social distancing by comparing a range of expert public health officials (e.g.

---

[12] Abu-Akel, A., Spitz, A., & West, R. (2020, June 12). THE FAUCI EFFECT: PUBLIC HEALTH MESSAGING DURING THE COVID-19 PANDEMIC. https://doi.org/10.31234/osf.io/naxf3

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

immunology expert Dr. Anthony Fauci), celebrities (Kim Kardashian and Tom Hanks), or other government officials (specific to the country the participant was from). The researchers found:

- Across countries and demographics, Dr. Anthony Fauci achieved the highest level of respondents' willingness to reshare a call to social distancing, followed by the local government spokesperson.
- Celebrity spokespersons were least effective.
- The likelihood of message resharing increased with age, and increased when respondents expressed positive sentiments towards the spokesperson.

Evidence analysis: This is good experimental research with a large sample size of 12,000 people. However, it is unclear whether the messengers, particularly celebrities, are comparable for all six countries. Further, the sample is recruited via social media, which may introduce a self-selection bias. The researchers are only able to identify willingness to share a message, not actual behaviour.

Implications: This research demonstrates that the identity of the messenger can affect behavioural outcomes. In particular, it is important to note that messages from health experts are more likely to be shared than those directly from government. This is supported by the previous research that in times of crisis advice from experts is particularly important.[13] In New Zealand, many experts have had relatively high profiles during the crisis response and this has likely been an important factor in the positive public response.

7. The perception of the risk and threat posed by COVID-19 is a core underlying motivator for behavioural responses. However, the portrayal of risk must be balanced, as perceiving the risk as either too low or too high can result in non-compliance. Researchers in the US conducted a survey study[14] in March 2020 looking at behavioural intentions to comply with preventative behaviours and predictive factors including attitudes and socio-demographic variables. The researchers found that:

- associating COVID-19 with death has a negative correlation with intentions to perform preventative behaviours.
- further, associating COVID-19 with death/dying was correlated with a number of sociodemographic factors including:
  - age – counterintuitively, younger people were more likely to associate COVID-19 with death
  - ethnicity – in this case African American individuals were more likely to associate COVID-19 with death
  - availability of sick leave – people with less ability to take sick leave were more likely to associate COVID-19 with death.

Evidence review: As this is a cross sectional survey identifying correlations between association of COVID-19 with death and preventative behaviour it cannot be used to make causal conclusions. As with many COVID-19 studies it only measures intention to behave, which may not directly translate into real world action. However, this is an interesting finding as it highlights the nuance of threat and behaviour, and demonstrates that simply increasing threat won't necessarily increase behavioural responses.

---

[13] Bavel, J.J.V., Baicker, K., Boggio, P.S. *et al.* (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nat Hum Behav* **4**, 460–471. Accessed online: https://doi.org/10.1038/s41562-020-0884-z

[14] Jimenez, T., Restar, A., Helm, P.J. Cross, R.I, Barath, D. & Arndt, J. (2020). Fatalism in the context of COVID-19: Perceiving coronavirus as a death sentence predicts reluctance to perform recommended preventative behaviours. *SSM – Population Health*. Accessed online: https://www.sciencedirect.com/science/article/pii/S2352827320302524

NCMC
New Zealand Government
COVID-19 OPERATIONS COMMAND CENTRE

> **Implications:** As previous research has highlighted messaging should promote worry but not fear[15], and in particular should refrain from overstating the threat of COVID-19 to mortality. While in New Zealand we are currently facing the opposite issue of lower levels of perceived risk, it is important to note that attempts to communicate this risk should be considerate of possible backfire effects associated with communicating mortality.

8. A survey[16] of 704 people from a global sample (although 60% were from the UK and US) explored the relationship between people's collectivist vs. individualist tendencies; feelings of power (i.e. ability to make change); belief in conspiracy theories, and intentions to perform behaviours that slow the spread of COVID-19. The results showed that:

   - Higher levels of collectivism predicted higher intentions to participate in social distancing and hygiene behaviours.
   - Higher levels of powerlessness (i.e. ability to impact change) negatively predicted social distancing intentions. Beliefs in conspiracy theories positively predicted higher levels of powerlessness while higher levels of collectivism negatively predicted powerlessness.
   - Higher levels of individualism and low perceptions of power negatively predicted social distancing intentions and predicted beliefs in conspiracy theories, which was an additional predictor of lower compliance.

> **Evidence review:** While the researchers found a significant differences in factors, the size of these differences was small, indicating there are other important aspects influencing intentions. Likewise, measuring intentions rather than behaviour means it is unlikely this would directly translate completely to real world behaviour. Further, this is purely correlational research, so causation cannot be established.
>
> **Implications:** This research supports New Zealand's messaging around collective effort and unity. It is likely that NZ has seen an increase in collective sentiment in response to COVID-19. However, looking forward many parts of NZ, overall, have 'looser' (i.e. individualist) rather than 'tight' (i.e. collectivist) cultures – so it is possible that collectivism fades as COVID-19 becomes less prominent.

---

[15] BPS Behavioural Science and Disease Prevention Taskforce. 2020. Behavioural science and prevention: Psychological guidance. Accessed online: https://www.bps.org.uk/sites/www.bps.org.uk/files/Policy/Policy%20-%20Files/Behavioural%20science%20and%20disease%20prevention%20-%20Psychological%20guidance%20for%20optimising%20policies%20and%20communication.pdf

[16] Biddlestone, M., Green, R., & Douglas, K. (2020). Cultural orientation, powerlessness, belief in conspiracy theories, and intentions to reduce the spread of COVID-19. *British Journal of Social Psychology*. (In Press).

APPENDIX I

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences poss bly developed through few analytic techniques or methodologies.

COVID-19
ALL-OF-GOVERNMENT RESPONSE

TITLE	Behavioural Science Update
Document reference	*Behavioural Insights 009*
Date and time	3 July 2020
Produced by/location	Joint Insights Group (JIG)

This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group. This report is assessed to be of MODERATE confidence. **Note:** *Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

- Research into behavioural factors related to return migration is limited. However, the decision to return to New Zealand is likely impacted by the relative costs (e.g. risk of illness, financial loss, loss of social ties) and benefits (e.g. avoiding illness and welfare support) of doing so.
- Certain demographic factors such as age, and length of time overseas, provide useful proxies for a number of other risk factors and are comparatively easier to quantify.
- New research covered this week:
    - In Singapore, the government policy of **sharing precise, daily information detailing travel behaviour and residences of active cases** increases the physical distancing behaviours of other residents.
    - A survey study from a Chinese population indicates that rural populations are less likely to follow protective health measures and less likely to see them as effective. The researchers suggest that this is linked to lower levels of information appraisal in rural populations (i.e. the extent to which they can evaluate information relevance and importance).
    - Results from the New Zealand Attitudes and Values survey has shown that Alert Level 4 had a mixed impact on people's mental health, with substantial increases in feelings of worthlessness, but also increases in feelings of relief.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document summarises relevant behavioural science findings relating to the COVID-19 response. This update covers:

    - A rapid review of research on factors that influence the decision of New Zealanders to return home.
    - Recent examples of relevant behavioural science literature related to COVID-19.

This document is not an exhaustive review and is intended to surface findings that may be relevant to decision-makers.

Factors that contribute to decisions for New Zealanders to return

2. Pre-COVID-19 there were between 600,000 and 1 million New Zealanders living overseas, of which 100,000 – 110,000 were New Zealand residents considered to be travelling.[1] There is a risk that a large number of people (both New Zealanders that have migrated, or those considered to be travelling) returning home in a short time-frame will overwhelm the country's managed-isolation and quarantine capacity. This section provides an

---

[1] https://www.stats.govt.nz/news/about-100000-new-zealand-residents-travelling-overseas

overview of a rapid review of literature on factors that will influence the decision of New Zealanders living overseas to return home.

3. Given the unique circumstances, research on this topic is limited. Literature on return migration (i.e. people who have migrated overseas and then decide to return home) has not historically covered large external shocks such as a pandemic[2]. Past research has suggested that despite the potentially high levels of emotions involved in similar situations, such as disasters, people tend to treat the decisions to move as rational process (i.e. weighing up the costs and benefits involved)[3]. Based on this, we have summarised some of the potential factors for this decision below:

- **COVID-19 may act as a temporal trigger.** A cited reason for return migration is specific life-course events, such as starting a family or a career change[4]. For those who may have been contemplating return migration to New Zealand, the disruption from COVID-19 may have provided the necessary catalyst to do so – either by direct impact (e.g. on careers), or as a temporal landmark that leads to re-evaluation of life goals.[5]

- **Practical reasons related to their ability to stay in their current nation of residence.** People who are having financial difficulties, due to job loss or loss of accommodation, and do not have access to welfare support abroad, though do in New Zealand, will likely be forced to return. Likewise, people who are unable to find new work, either because they cannot renew temporary/work visas or there are few jobs available, may also choose to return home. Age and visa type are important factors in this decision, those working abroad on temporary visas in low skilled jobs may perceive a lack of job or social opportunities as sufficient to justify returning (though having additional entry costs may also be a bigger deterrent for this cohort).

- **Reason for being overseas, length of time abroad and integration within current country.** People who went abroad just prior to COVID-19 for plans that are no longer possible, such as working holidays, international travel or international study are the most likely to return, or already have done so. One factor is this decision is strength of social ties[6] in the place of residence (e.g. homeownership, having local networks of friends). Those people with strong social ties and who have faced less disruption from COVID-19, are less likely to decide to return to New Zealand. Likewise, the ability for people to remove these ties (e.g. selling their house) will likely also impact the decision to return.

- **The opportunity to return may vary.** For instance, the number of flights into New Zealand may influence people's decisions, as more flights are made available, more people may take up the opportunity. However this may also be subject to scarcity effects, whereby flights decrease in response to a second wave, potentially increasing demand and motivating a decision to return[7].

- **Changing costs of travel.** Increasing or decreasing the costs of travel will likely impact the choice of people to migrate. For instance, if there are additional costs imposed (e.g. paying for own managed-isolation) this may deter some - although this depends on the relative size of the additional cost of accommodation compared to the total cost of migration (e.g. it may only be a small additional cost on

[1] Stark, O. (2019). Behavior in reverse: Reasons for return migration. *Behavioural Public Policy, 3*(1), 104-126.

[3] Henry J. Return or relocate? An inductive analysis of decision-making in a disaster. *Disasters*. 2013;37(2):293-316.

[4] Stefanie Kley (2017) Facilitators and constraints at each stage of the migration decision process, Population Studies, 71:sup1, 35-49, DOI: 10.1080/00324728.2017.1359328

[5] Dai, Hengchen & Milkman, Katherine & Riis, Jason. (2014). The Fresh Start Effect: Temporal Landmarks Motivate Aspirational Behavior. Management Science. 60. 2563-2582. 10.1287/mnsc.2014.1901.

[6] Stefanie Kley (2017) Facilitators and constraints at each stage of the migration decision process, Population Studies, 71:sup1, 35-49, DOI: 10.1080/00324728.2017.1359328

[7] Mittone, L. & Savadori, L. (2009). "The Scarcity Bias". Applied Psychology. 58 (3): 453–468.

top of flights and the effort of selling assets, therefore may not be a large deterrent). Another consequence may be a surge in people returning due to the perceived limited opportunity as people attempt to avoid the implementation of costs[8]. A related risk is that the possibility that adding additional costs increases dishonest behaviour (e.g. attempts to get out of managed isolation) in order to try and avoid the loss this would cause[9].

- **The risk of staying in the current country.** As with many COVID-19 related behaviours, people's perception of risk from the threat of COVID-19 to themselves or loved ones is a key motivator. If there is a perception there is a genuine threat to their own (or loved ones) health, they will be greatly motivated to try and reduce that threat. In countries like the UK, perception of risk has tended to be higher, likely reflecting a more informed pubic experiencing the serious impacts of COVID-19[10]. Related to this are factors within a nation that may reduce people's perception of risk. For instance, if people generally feel that the government of the country they live in is handling the pandemic well, they will likely have lower perceived levels of threat and therefore may be less motivated to return to New Zealand. Certain populations more susceptible to the health impacts of COVID-19 (e.g. because of health conditions or older age) will likely have higher perceptions of risk from COVID-19, may see returning to New Zealand as a safer option – due to the lack of cases and greater access to public healthcare.

Implications

- There are a multitude of factors that will determine if people will decide to return. Many of these factors are out of people's control (e.g. job loss) and will relate to the relative costs and benefits of remaining in their current country versus returning to New Zealand.
- People with fewer social-ties to their current country are more likely to return, however this also likely depends on the relative threat from COVID-19 in that country, and the potential opportunities available in New Zealand.
- If the global situation deteriorates, both in terms of threat to health and economic opportunities, New Zealanders will almost certainly view returning home as the better option.

Overview of new behavioural literature

4. Transparent and targeted communication has consistently been highlighted as important factors for effective behavioural responses to protective health guidance from governments. Research [11] from Singapore has examined how, during the first wave of COVID-19 cases, the Ministry of Health attempted to adjust people's behaviour by sharing precise, daily information detailing travel behaviour and residences of active cases. The aim was to help people identify if they possibly had been in contact with an active case and reduce their own travel. Researchers used this transparency approach combined with cellphone data to quantify how local (within a person's district) and national COVID-19 case announcements trigger behavioural changes. Results showed that:

---

[8] Mittone, L. & Savadori, L. (2009). "The Scarcity Bias". Applied Psychology. 58 (3): 453–468.

[9] Schindler, S., & Pfattheicher, S. (2017). The frame of the game: Loss-framing increases dishonest behavior. *Journal of Experimental Social Psychology, 69,* 172-177.

[10] Sarah Dryhurst, Claudia R. Schneider, John Kerr, Alexandra L. J. Freeman, Gabriel Recchia, Anne Marthe van der Bles, David Spiegelhalter & Sander van der Linden (2020) Risk perceptions of COVID-19 around the world, Journal of Risk Research, DOI: 10.1080/13669877.2020.1758193

[11] Janssen, A. & Shapiro, M. H., (2020). Does Precise Case Information Limit Precautionary Behavior? Evidence from COVID-19 in Singapore (June 18, 2020). Available at SSRN: https://ssrn.com/abstract=3630173

- **one additional COVID-19 case in a person's home census area decreased their daily travel distance on the following day by an average of 89 metres**, while a non-local case reduces travel by 28 metres.

- a local case increases the probability of staying home on the following day by 0.14 percentage points.

- local cases also reduce inflow travel, with an additional case reducing the probability of someone entering that area by 0.34 percentage points.

> **Evidence review:** This is high quality research which makes use of detailed individual level data and exploits the plausibly exogenous variation in new COVID-19 cases day-to-day. The use of mobile phone data to trace people allows for an accurate record of actual behaviour, meaning it does not need to rely on less accurate self-reported behaviour. However, it is also worth noting that the effect sizes are relatively small.
>
> **Implications:** This research provides evidence to suggest that people can effectively reduce their travel in response to information about local COVID-19 cases. This supports the practice of transparency in government communications and how more targeted information can be more relevant and therefore more likely to impact behaviour. However, it should be noted that Singapore proceeded with lockdown following a second wave, suggesting it may only be appropriate in specific situations.

5. Accounting for demographic variation in policies and communications is critical to ensuring they are relevant and legitimate for different groups. A survey study[12] of 1591 people in China (87% living in urban settings) examined differences between rural and urban populations and their likelihood of adhering to a range of protective health behaviours in reaction to COVID-19 (e.g. wearing a mask, physical distancing, washing hands, etc.). The results showed that:
   - compared with urban residents, rural residents were overall less likely to perform preventive behaviours, and more likely to hold a negative attitude toward the effectiveness of performing preventive behaviours;
   - overall there was no difference in the direct impact of factors such as behavioural intentions, perceptions of subjective norms, or use of/variety of media sources between rural and urban populations;
   - however, the authors conclude that lower levels of information appraisal (i.e. ability to evaluate information relevance and importance) in rural populations was likely the key factor. This variable both directly impacted behavioural measures, as well as indirectly through behavioural intentions, perceptions of subjective norms, and intentions to behave.

> **Evidence review:** As this is a correlational study, these findings cannot infer causality. This was also not a representative sample as the online methods excluded those without internet access (which may be a reason for the low number of rural participants). This study relies on self-reported behaviour and did not include any other validation measures (e.g. movement data) that other studies have included. However many of these other studies have not reported large differences between reported behaviour and objective data.
>
> **Implications:** This study highlights the rural/urban differences in preventive behaviours against COVID-19. This is likely also a reality in New Zealand as the threat of COVID-19 is probably lower in rural communities given the lower population density. It also highlights efforts should be made to tailor COVID-19 information to rural populations.

---

[12] Chen, X. & Chen, H. (2020). Differences in Preventive Behaviors of COVID-19 between Urban and Rural Residents: Lessons Learned from A Cross-Sectional Study in China. *Int. J. Environ. Res. Public Health*, 17, 4437.

6. The New Zealand Attitudes and Values Survey (NZAVS) records social attitudes, personality and health in a nationally representative sample of adults in New Zealand, each year. Researchers[13] compared responses relating to psychological distress for participants during lockdown, compared to responses a year ago. They also compared responses to those given following the 2011 Christchurch earthquake. The results show that during Alert Level 4, **there were small increases in hopelessness, restlessness, and nervousness, and substantial increases in worthlessness.** However, there was relief from feelings of effort during Alert Level 4 fostered by social belonging. By contrast, the Christchurch earthquakes increased all distress indicators.

> **Evidence review**: This research uses a longitudinal survey, meaning it can compare each person's response to the same person's response in a previous time period. This allows for better identification of changes in wellbeing over time, compared to cross-sectional surveys as there is much great internal consistency.
>
> **Implications**: This is a useful indication of the real impacts COVID-19 has had on the New Zealand population in terms of mental health and follows on from previous publications from the New Zealand Attitudes and Values Survey. New Zealand faced some of the most restrictive measures globally during lock-down yet based on this research there were both negative and positive implications on mental health and overall it appears that New Zealanders have not been as heavily impacted as other countries.

7. The British Psychological Society has released a number of reviews on a number of key topics related to behaviour and the impact of COVID-19. These include:

   - **How shared identities can be used to promote community-level support, safe normative behaviour and increase compliance with guidance[14].** Creating a shared identity (e.g. "we are all in this together") is beneficial for responses during a crisis, but needs to be maintained during recovery, by engaging with impacted communities and recognising established inequalities and disadvantages to prevent further breakdowns in collective identities and perceptions of inequitable treatment.

   - **How values and the extent to which they are shared help to drive compliance with guidance as well as promote prosocial behaviour[15].** Key insights are that:
     - Individuals who attach higher importance to values related to self-transcendence (e.g., responsibility) and conservation (e.g., security) are likely to be more compliant with COVID-19 behavioural guidelines and to help others.
     - Believing that fellow citizens share the same values has been found to elicit a sense of connectedness that may be crucial in promoting collective effort.
     - Finding ways to correct misperceptions about differing values between people can help promote social connectedness (e.g. reporting compliance with guidelines, not just the minority of people breaching). Or promoting exchanges across society may also be beneficial for correcting such biases (e.g. mycountrytalks.org).

---

[13] Bulbulia, J., Barlow, F., Davis, D. E., Greaves, L., Highland, B., Houkamau, C., … Sibley, C. G. (2020, June 26). The Bittersweet Dynamics of Psychological Distress and Relief During New Zealand's COVID-19 Lockdown Clarify Avoidable Mental Health Burdens. Accessed online: https://doi.org/10.31234/osf.io/2m7re

[14] Templeton A, Guven ST, Hoerst C, et al. (2020). Inequalities and identity processes in crises: Recommendations for facilitating safe response to the COVID-19 pandemic. *Br J Soc Psychol*.10.1111/bjso.12400. Accessed online: https://onlinelibrary.wiley.com/doi/pdf/10.1111/bjso.12400

[15] Wolf, L.J., Haddock, G., Manstead, A.S.R., & Maio, G.R. (2020). The importance of (shared) human values for containing the COVID-19 pandemic. *Br J Soc Psychol*. 10.1111/bjso.12400. Accessed online: https://onlinelibrary.wiley.com/doi/pdf/10.1111/bjso.12401

- **How to maintain an effective social response and maintain collective resilience beyond lockdown[16].** Some of the key insights derived from previous research include:

  o Perceived social norms will continue to influence behaviours, therefore it is important that constructive behaviour is also highlighted in coverage and communications, not just negatives.

  o Regulations need to be practical. If a required behaviour is impractical it is unlikely to be acted upon and can further reduce compliance in other areas by reducing other people's perceptions of norms.

  o The search for a sense of collective unity is a powerful source of social motivation, and the shared identity that helped to overcome previous challenges during the pandemic can be reinforced by recalling and celebrating past achievements.

  o Preserve information and communication channels to allow people to share alternative viewpoints and constructive criticism. By sharing available information as much as possible, communicate the limits of current knowledge, and accept that people are better equipped to manage difficult but shared truths – instead of sheltering them which could cause feelings of isolation and confusion.

> **Evidence review:** These reviews provide useful overviews of how key theoretical concepts from social psychology can contribute to both managing the COVID-19 pandemic and the recovery. However, these papers do not provide any new data and the conclusions made need to be tested or research further in applied contexts.
>
> **Implications:** Many of the recommendations from these reviews align well with New Zealand's approach to post-lockdown measures and approach to recovery. In fact, the first article uses New Zealand as an example of an approach that, to date, has been effective at supporting a positive group identity amongst the public to help respond to the pandemic. However, these articles also highlight the challenge of maintaining social cohesion as the balance of preventing a return of the health threat of COVID-19 is replaced with complicated debates about managing the economic recovery. It will be critical to communicate with transparency, engage with impacted communities especially those already disadvantaged, as well as maintaining channels for debate and constructive criticism to avoid this collective social identity breaking down.

16

APPENDIX I

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

DEPARTMENT OF THE
PRIME MINISTER AND **CABINET**
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

TITLE	**Behavioural Science Update**
Document reference	*Behavioural Insights 010*
Date and time	17 July 2020
Produced by/location	Insights & Reporting Team

This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group.
This report is assessed to be of MODERATE confidence. **Note:** *Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

- Perceived legitimacy, social comparisons and displacement effects are likely to be key determinants of compliance with local lockdowns.
- Evidence suggests that pro-social messaging, reminders of previous behaviour, and seeing others following the rules can increase compliance.
- New research:
  - An experimental survey shows that communicating the non-compliance of a minority can increase support for government mandated COVID-19 tracing apps
  - By combining Google mobility data with a survey, researchers show that confidence in healthcare systems is correlated with mobility and compliance.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document summarises relevant behavioural science findings relating to the COVID-19 response. This update covers:

- A deep dive into behavioural responses to a localised lockdown in New Zealand.
- Recent examples of relevant behavioural science literature related to COVID-19.

This document is not an exhaustive review and is intended to surface findings that may be relevant to decision-makers.

Behavioural response to localised lockdown

2. Internationally, governments have used local lockdowns to limit the spread of COVID-19. Local lockdowns restrict movement for those living within an area with COVID-19 cases, to prevent further spread. The size of local lockdowns can vary, ranging from specific buildings to an entire city. A well-managed local lockdown is important for reducing the risk of COVID-19, by stopping the spread, minimising anxiety, and increasing confidence in the government response.[1]

Determinants of local lockdown compliance

3. We anticipate many determinants of compliance with local lockdown are likely to echo those for general lockdown compliance e.g. understanding the rules, perception of threat, and social norms. Below highlights factors that are likely to be particularly important for local lockdown compliance.

---

[1] Here, we specifically focus on local lockdowns, and not other localised restrictions or measures.

New Zealand Government

- **Perceived legitimacy:** research highlights the importance of legitimacy in maintaining compliance with rules[2]. Factors contributing to perceived legitimacy include:
  - **Fairness:** To date, messaging in New Zealand has emphasised that we are 'all in this together', with phrases like "team of 5 million" used to unite the population. A local lockdown runs a risk of **perceived unfairness, which evidence shows may reduce compliance**[3].
  - **Trust:** The government has maintained high levels of trust through transparent communication and by clearly outlining expectations. Acting fast to respond to a new risk is likely to consolidate this sentiment.
  - **Self and collective-efficacy:** People are more likely to comply if they believe their behaviour will effectively reduce the spread of the virus. Specifically, people will need to believe their individual actions, and those of their community, will be able to achieve this goal[4]. In local contexts, people are more likely to comply if they believe their actions will have an impact, and will not be undermined by the actions of others.
- **Social comparisons:** how we compare ourselves to others, and in- and out-group mentality, are determinants of compliance. Social comparison consists of:
  - **Out-group mentality:** In a crisis, it is common for people to view one another as belonging to groups, and categorise groups as 'deserving' or 'undeserving' of support[5]. Prejudice against those within the local lockdown area may occur if the group is seen as an external threat, to be blamed for further spread. This may reduce social cohesion, and further exacerbate a social divide.
  - **Consistency vs social proof:** Evidence shows that people living in individualistic societies respond best to reminders of their previous behaviours. In collectivistic societies, messaging which focuses on the behaviour of peers is more effective.[6] There are opportunities to message previous personal behaviours, displayed during lockdown, to enhance compliance.
  - **Competition:** One novel approach to support local compliance would be to incentivise behaviour with competition or 'gamification'[7]. If those experiencing local lockdown see their area as 'competing' with another area, there is added incentive to comply to be the first area to have restrictions lifted .
  - **Pro-social motivation:** Evidence suggests that communicating the pro-social benefits of compliance can increase uptake of preventative behaviours in a COVID-19 context[8].

---

[2] Hartley and Jarvis (2020) Policymaking in a low-trust state: legitimacy, state capacity, and responses to COVID-19 in Hong Kong, Policy and Society, 39:3, 403-423, DOI: 10.1080/14494035.2020.1783791

[3] Lind and Arndt (2016), "Perceived Fairness and Regulatory Policy: A Behavioural Science Perspective on Government-Citizen Interactions", OECD Regulatory Policy Working Papers, No. 6, OECD Publishing, Paris, https://doi.org/10.1787/1629d397-en.

[4] Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215.

[5] Roberto, Johnson and Rauhaus (2020) Stigmatization and prejudice during the COVID-19 pandemic, Administrative Theory & Praxis, DOI: 10.1080/10841806.2020.1782128

[6] Cialdini, Wosinska, Barrett, Butner, Gornik-Durose, (1999). Compliance with a Request in Two Cultures: The Differential Influence of Social Proof and Commitment/Consistency on Collectivists and Individualists. *Personality and Social Psychology Bulletin*, *25*(10), 1242–1253. https://doi.org/10.1177/0146167299258006

[7] Hamari, Juho & Koivisto, Jonna & Sarsa, Harri. (2014). Does Gamification Work? — A Literature Review of Empirical Studies on Gamification. Proceedings of the Annual Hawaii International Conference on System Sciences. 10.1109/HICSS.2014.377.

[8] Jordan, Yoeli, and Rand. (2020). Don't get it or don't spread it? Comparing self-interested versus prosocially framed COVID-19 prevention messaging. https://doi.org/10.31234/osf.io/yuq7x

New Zealand Government

- **Displacement effects:** evidence from criminology suggests that localised policing can both displace crime, and diffuse the benefits to other areas.[9]
  - In a local lockdown, this means there is a risk of people moving outside of the area, increasing the risk of spreading the virus to other regions. Setting 'deadlines' for those in affected areas to prepare for lockdown can create a scarcity mindset [10], where people want to seize an opportunity to leave the area before it is no longer possible.

Recommendations

- **Communication**
  - Messaging should demonstrate the legitimacy of a local lockdown, by **stating the risk present in the area**, and the risk of it spreading further.
  - Reminders that people, both themselves and others, have previously complied with a lockdown.
  - Pro-social messaging, including the benefits to other New Zealanders of complying.
- **Time frame**
  - Communication in advance of any lockdown, informing the public as to why and how such a process would occur – including the reasons why prior warning is unlikely if the immediate health impacts are to be effectively mitigated – is likely to mitigate the risk of panic buying or leaving the area. In addition, a swift response is likely to increase perceived legitimacy of a local lockdown.

Overview of new behavioural literature

4. **Explaining support for COVID-19 cell phone contact tracing[11]**

Researchers carried out an experimental survey to identify how messaging affects support for app-based contact tracing. In the experiment, 1,200 Canadian participants were assigned to one of three groups. Group 1 read a news article describing people who do not abide by physical distancing rules ("non-compliers"). Group 2 read a news article in which the Canadian health minister states that most of the population may become infected with COVID-19 ("high risk"). Group 3 serves as a control group, and is not assigned any news articles. The groups subsequently answered a question around support for an effective government driven contact tracing app.

The results show:

- The Group 1 "non-compliers" framing increases support for mandatory contact tracing apps by 9 percentage points, compared to the control group.
- Surprisingly, there is no statistically significant effect for the Group 2 "high risk" treatment group.

Evidence review: This experimental survey robustly demonstrates the effect of media communication on attitudes towards contact tracing apps, by randomly assigning participants into treatment groups.

Implications: Any strategy to increase support for a compulsory contact tracing app is unlikely to be effective if it relies on the threat having already manifested, with observed community transmission. However, early

---

[9] Bowers, Johnson, Guerette, *et al.* Spatial displacement and diffusion of benefits among geographically focused policing initiatives: a meta-analytical review. *J Exp Criminol* **7,** 347–374 (2011). https://doi.org/10.1007/s11292-011-9134-8

[10] Sugden, Wang and Zizzo (2019), Take it or leave it: Experimental evidence on the effect of time-limited offers on consumer behaviour, Journal of Economic Behavior & Organization, Volume 168, Pages 1-23, https://doi.org/10.1016/j.jebo.2019.09.008.

[11] Rheault, Ludovic, and Andreea Musulan. 2020. "Explaining Support for COVID-19 Cell Phone Contact Tracing." SocArXiv. July 6. doi:10.31235/osf.io/8wcgz.

and transparent messaging about how voluntary compliance with protective health behaviours will reduce over time is likely to generate more public support for a government controlled, contact tracing app.

5. **How confidence in health care systems affects mobility and compliance during the COVID-19 pandemic[12]**

Researchers explore the relationship between confidence in health care systems, and behavioural reactions to COVID-19. They use Google mobility data across 38 countries paired with a survey, and compare this to a broad range of contextual factors like deaths or policy implementations.

The results show:
- Societies with low levels of health care confidence initially respond faster to staying at home. However, this reaction plateaus sooner, and after the plateau it declines with greater magnitude than the response from societies with high health care confidence.
- Regions with higher confidence in the health care system are more likely to reduce mobility once the government mandates lockdown, compared to those with lower health care system confidence.
- Regions with high trust in the government but low confidence in the health care system dramatically reduce their mobility, suggesting a correlation for trust in the state with respect to behavioral responses during a crisis.

Evidence review: In using Google mobility data, this research has the benefit of recording actual movement behaviour, which is better quality than self-reported movement behaviour. However, the measurement of confidence in the health care system relies on asking people about their confidence in health care organisations. This question is ambiguous.

Implications: This research suggests that monitoring confidence in the healthcare system in New Zealand may help predict how people respond to new rules around compliance.

6. **Determinants of willingness to comply with health behaviours: A European COVID-19 study[13]**

This study uses UK (n=502) and Dutch (n=520) surveys to investigate how attitudes, social norms, trust and health relate to willingness to undertake preventative health behaviours, focusing on the interaction between factors.

The results show:
- Factors with the strongest positive link with reported preventative behaviors were: support for recommended measures; perceiving them to be effective; and perceived norm of friends and family.
- Social norms of family and friends were more strongly linked to preventative behaviours than wider societal norms.

Evidence review: This study uses representative samples from both countries. By investigating multiple factors at the same time, it improves existing knowledge about which factors have the strongest associations

---

[12] Chan, Ho Fai, Benno Torgler, Martin Brumpton, Alison Macintyre, Jefferson Arapoc, David A. Savage, Ahmed Skali, et al. 2020. "How Confidence in Health Care Systems Affects Mobility and Compliance During the COVID-19 Pandemic." PsyArXiv. July 3. doi:10.31234/osf.io/86qxu.

[13] Chambon, Dalege, Elberse, and van Harreveld. 2020. "A Psychological Network Approach to Factors Related to Preventive Behaviors During Pandemics: A European COVID-19 Study." PsyArXiv. July 1. doi:10.31234/osf.io/es45v.

New Zealand Government

with preventative behaviour. However, the research design means that we can only observe a correlation, meaning that we cannot say if one causes the other.

Implications: This study highlights the importance of the behaviour of family and close associates friends and family has, as well as the importance of the public perceiving a given behaviour or measure is effective. In New Zealand, it will be important to maintain public perception surrounding the efficacy of preventative measures.

7. **Trust in government and its associations with health behaviour and prosocial behaviour during the COVID-19 pandemic**[14]

Researchers use data from a global survey of 23,733 people across 23 countries to examine the associations between trust in government and adoption of health and prosocial behaviours. They also explore factors in the COVID-19 context that influence trust in government.

The results show:
- Factors positively associated with trust in government include: perceptions of governments as well organised; using clear messages; with good knowledge on COVID-19; and acting fairly.
- Higher levels of trust in government is associated with higher self-reported handwashing, avoiding crowded spaces, physical distancing, and prosocial behaviour.
- Trust in government action to combat the economic impacts of COVID-19 has a stronger association with willingness to engage in prosocial behaviour than trust in government actions on disease control.

Evidence review: This study uses large and representative samples from a range of countries. However, almost half of the 23 countries are European, limiting the generalisability of the research. In addition, it is correlational research and therefore does not make causal conclusions.

Implications: This research reiterates previous findings that trust in government is associated with higher compliance. In addition, it demonstrates that focusing on initiatives to reduce the economic impact of COVID-19 is likely to encourage pro-social behaviours.

---

[14] Han, Qing et al., (2020). Trust in government and its associations with health behaviour and prosocial behaviour during the COVID-19 pandemic. https://psyarxiv.com/p5gns/

New Zealand Government

APPENDIX I

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

New Zealand Government

DEPARTMENT OF THE PRIME MINISTER AND CABINET
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

TITLE	Behavioural Science Update
Document reference	*Behavioural Insights 011*
Date and time	31 July 2020
Produced by/location	Insights and Reporting Team (IRT)

*This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group. This report is assessed to be of MODERATE confidence. **Note:** Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

- The lack of new experimental evidence currently available as well as differences between the COVID-19 contexts in New Zealand and globally means that new relevant behavioural insights are limited.
- New research included in this updated includes:
  - Attitudes to contact tracing app uptake in Ireland.
  - Intention to behaviour gaps for protective health behaviours.
  - The impact of fake news, and misinformation warnings, on behavioural intentions.
  - The psychological impact of lockdowns and mitigating factors.
  - Principles that explain why some people choose not to follow rules even when they understand them.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document summarises relevant behavioural science findings relating to the COVID-19 response. This update covers recent examples of relevant behavioural science literature related to COVID-19. This document is not an exhaustive review and is intended to surface findings that may be relevant to decision-makers.

2. **Attitudes towards digital contact tracing in Republic of Ireland[1]**

   An Irish online survey of 8088 people aimed to examine the barriers and facilitators to the use of a COVID-19 contact tracing mobile App. The key findings were that:
   - 54% of respondents said they would definitely download a contact tracing App, while 30% said they would probably download an App.
   - 95% of respondents identified at least one reason for them to download the App, with the most common reasons being the potential for the App to help family members and friends (79%) and a sense of responsibility to the wider community (78%). Other motivations included that it would let people know if they were infected (71%) and it would help protect them (65%).
   - 59% identified at least **one reason not to download the App**, with the most common reasons being fear that technology companies (41%) or the government (33%) might use the App technology for greater surveillance after the pandemic.
   - there was some evidence for an association between gender and unwillingness to install the App, with males more likely to respond that they probably or definitely wouldn't install the app (11% vs 6%).

---

[1] O'Callaghan, M.E., Buckley, J. & Fitzgerald, B. et al. (2020) A National Survey of attitudes to COVID-19 Digital Contact Tracing in the Republic of Ireland, PREPRINT (Version 1) available at Research Square. Accessed online: https://www.researchsquare.com/article/rs-40778/v1

> **Evidence review:** The self-selection methodology resulted in a sample with disproportionately more females and higher levels of education. However, given the sample size they were able to weight their analysis and no differences were found. It is worth noting that the well documented 'intention-behaviour gap' likely means that the results in this survey greatly overestimate the actual behaviour. Initial news reports from Ireland suggest that uptake of the App has been comparatively good, with 37 % of the adult population downloading the app within a week.[2]
>
> **Implications:** Contact tracing Apps have been developed all over the world with limited success. This research supports the notion of leveraging individuals' worry for family as a means to motivate uptake. It is worth noting that the actual and perceived risk from COVID-19 is likely higher in Ireland due to the higher number of cases.

3. **Large differences between intentions and behaviours to stay home and get tested in Dutch study[3]**

   Researchers from the Dutch National Institute for Public Health and the Environment conducted two surveys in May and June including 50,291 people, to examine intentions to adhere to stay home and get tested for COVID-19 if they have symptoms. These were supplemented further with in-depth interviews. Researchers measured people's intention to do these behaviours as well as their self-reported behaviour in the previous week. The key results show:

   - **A large gap between participants intentions versus their behaviour for getting tested.** For people who did not have symptoms at time 1 (May), 68% of people stated that they would get tested if they developed symptoms (such as cough, runny nose and fever). However, for those who developed symptoms by time 2, only 15 % reported getting tested. For those who did have symptoms at time 1, 23% of people intended to get tested, but only 18% of the total had done so by time 2.
   - Many people with symptoms continued daily activities:
     - only 20% of people with symptoms stated that they stayed home in the past 7 days (which is the official advice).
     - 87% did groceries (compared to 93% of people without symptoms)
     - 45% went to work (compared with 50% of people without symptoms)
     - 58% visited someone (compared with 71% of those without symptoms)
     - 33% went outside with their dog or children (same as without symptoms)
     - 30% went to a cafe, bar or restaurant (compared to 39% without symptoms)
   - Factors that predicted people not getting tested or staying at home included:
     - Having another health condition that could explain the symptoms like hay fever or assuming it's just a cold;
     - Wanted to monitor their symptoms for another week before testing
     - Assumptions that testing or staying at home would be difficult.
   - Factors that increased their likelihood to test or stay at home included:
     - the severity of the symptoms (particularly fever and shortness of breath)
     - feeling a need to protect others - especially if they know at risk people
     - wanting certainty
     - believing that testing and staying at home would help fight COVID-19
     - having higher perceptions of risk (i.e. believed they had a high chance of catching COVID-19 and that COVID-19 would be bad for them).

   > **Evidence review:** This was a large survey study that investigated a key behaviour that will continue to be relevant to efforts to managed COVID-19. The large gap between intentions and behaviour is consistent with

---

[2] https://www.businessinsider.com.au/nearform-ireland-covid-19-contact-tracing-app-approached-us-states-2020-7?r=US&IR=T
[3] https://www.rivm.nl/en/news/gap-between-intention-and-behaviour-in-staying-home-and-testing-for-covid-19
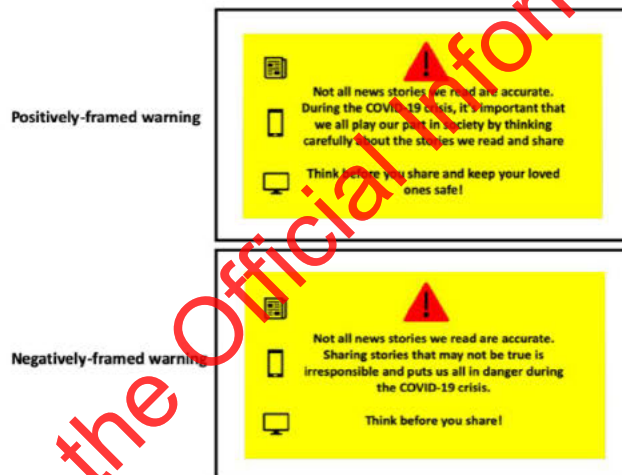
previous research and could even be larger as self-reported measures of behaviour can suffer from social desirability bias. It is worth noting that many of the reported barriers/enabling factors related to intentions and not behaviour.

Implications: Testing and staying at home will continue to be relevant for New Zealand. Some of the recommendations from this report emphasise the need to make testing easy for people and highlight that usefulness and importance of getting tested.

4. **The impact of fake news and misinformation on behavioural intentions[4]**

In an online experiment of 3746 people, researchers in Ireland experimentally tested the impact of exposure to fake news stories related to COVID-19 and misinformation warnings on people's intention to perform a related behaviour to what was mentioned in the new story (e.g. vaccination adherence, App uptake).

Participants first saw one of four misinformation warning messages (positively framed, negatively framed, general information, no message – see examples below). Participants then read one of six news stories (four real, two fake). The fake stories included misinformation about either unproven remedies (spicy food or caffeine), possible complications with COVID-19 vaccinations, or data privacy issues with contact tracing apps.

Positively-framed warning

Not all news stories we read are accurate. During the COVID-19 crisis, it's important that we all play our part in society by thinking carefully about the stories we read and share

Think before you share and keep your loved ones safe!

Negatively-framed warning

Not all news stories we read are accurate. Sharing stories that may not be true is irresponsible and puts us all in danger during the COVID-19 crisis.

Think before you share!

- **The results for the impacts of the fake news stories were mixed.**
  - In some conditions, the exposure to fake news stories had a small significant impact on behavioural intentions:
    - Participants who read the story about privacy concerns relating to a contact-tracing app reported being less willing to download the app
    - Participants who read the story about vaccination complications reported being less willing to accept a vaccination
  - Whereas the stories relating to unproven remedies showed no significant impacts on behavioural intentions to consume more of those remedies.
- **None of the fake news warnings had any impact on people's susceptibility to fake news and their subsequent behavioural intentions.** However, this may be due to already heightened levels of suspicion due to the current COVID-19 crisis.

---

[4] Greene, C., & Murphy, G. (2020, July 24). Can fake news really change behaviour? Evidence from a study of COVID-19 misinformation. https://doi.org/10.31234/osf.io/qfnm3

New Zealand Government

**DEPARTMENT OF THE
PRIME MINISTER AND CABINET**
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

> **Evidence review:** The impact of misinformation on behaviour is critical in the COVID-19 context. This study is still in pre-print, but is a novel study of a previously under researched area using experimental methods and therefore provides interesting insights into the impact of misinformation and the effectiveness of methods to combat it. However, this was also a laboratory-based study, with a sample that had disproportionately high levels of education – which may influence susceptibility to fake news. In addition the study only dealt with one-time exposure to fake news. Likewise, it measured behavioural intention which is typically unreliable.
>
> **Implications:** Fake news and misinformation will continue to be an issue for New Zealand in combating COVID-19, particularly for behaviours such as vaccination and contact tracing. Based on these findings, we might expect that one off instances of fake news are unlikely to be particularly damaging to behavioural intent in the COVID-19 context. However, this studies also highlights (and recommends) the importance of testing and trialling interventions.

5. **International survey evidence highlights ways to mitigate the psychological impact of lockdowns[5]**
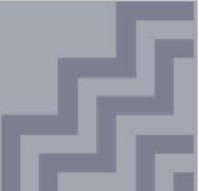
   A global survey of 8,229 people from 79 countries, including participants from New Zealand, aimed to understand the psychological impact of the COVID-19 pandemic on mental health and identify mitigating and exacerbating effects of lockdowns. Results indicated:

   - Overall there were elevated levels of anxiety and depression (especially in the USA, UK, and Brazil), associated with feelings of low control and social isolation.
   - Although social isolation increased with the duration of lockdown/quarantine, it was mitigated by frequent communication with close personal contacts (e.g. family and friends). Other mitigating factors include adaptive coping (e.g. making plans, seeking advice) but not maladaptive coping (e.g. denial or substance use), and the perception and trust that one's government is dealing with the outbreak.
   - New Zealanders reported the highest levels of institutional trust and perceptions of government actions, which correlated with infection and death rates, and overall was correlated with lower levels of anxiety.
   - The more local diagnosed infections in the environment of participants, the higher the perceived risk of contracting COVID-19. This in turn predicts a higher perceived threat of the effects of COVID-19 on one's personal life, and threat predicts higher levels of anxiety and depression.
   - Avoidance behaviours (e.g. wearing a mask, washing hands, etc.) predicted higher levels of anxiety.

> **Evidence review:** This study is still in pre-print and only reports correlational findings. However, it is important to understand in more detail how lock-downs can impact the psychological wellbeing of people and the ways this might be mitigated.
>
> **Implications:** It is important to stay aware of the impact that lockdowns/quarantine cans have psychologically as this will continue to be a reality for a number of people in New Zealand. And critically what might limit the impact, which based on this research includes the importance of facilitating social connections and .

---

[5] van Mulukom, V., Muzzulini, B., Rutjens, B. T., Van Lissa, C. J., & Farias, M. (2020, July 22). The Psychological Impact of Lockdown During the COVID-19 Pandemic_PREPRINT. https://doi.org/10.31234/osf.io/c8weq

New Zealand Government

Released under the Official Information Act 1982

DEPARTMENT OF THE
PRIME MINISTER AND **CABINET**
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

APPENDIX I

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

New Zealand Government

DEPARTMENT OF THE
PRIME MINISTER AND **CABINET**
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

TITLE	Behavioural Science Update
Document reference	*Behavioural Insights Update 013*
Date and time	28 August 2020
Produced by/location	Insights and Reporting Team (IRT)

*This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Joint Insights Group. This report is assessed to be of MODERATE confidence. **Note:** Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

- One experimental study finds that a message emphasizing civic responsibility is most effective for improving intention to engage with preventative behaviour. However, this effect reduces as the pandemic progresses over time.
- Another experimental study finds that altruistic messaging can increase compliance with preventative behaviour, but also reduces quality of sleep and healthy eating.
- Engaging with recommendations to physically distance is most likely among those who believe their close social circle also physically distance.
- In the USA, rural residents exposed to local news which includes coverage of large cities affected by COVID-19 are more likely to practice distancing behaviour than rural residents whose news coverage does not include such cities.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document summarises behavioural science findings relating to the COVID-19 response. This document is not an exhaustive review and is intended to surface findings that may be relevant to decision-makers.

Overview of new behavioural literature

2. **Five experiments find mixed results for the effectiveness of short messages on compliance with COVID-19 public health guidelines**[1]

Between March and July 2020, researchers carried out five online studies in the US, evaluating the effectiveness of 56 short messages, which aim to increase compliance with COVID-19 public health guidelines. The studies build on each other to identify the most effective messaging.

- Study 1: 998 participants rated ten out of a possible 24 messages on how persuasive they find them. All messages were two to four sentences long and advocated for staying home to prevent the spread of COVID-19. All messages were designed using behavioural insights, for example using social norms, reciprocity, empathy, and formal authority.
- Study 2: This study builds on Study 1, only including 998 new participants who self-reported as not highly compliant with public health behaviours, and adds additional messages including those crowdsourced from participants in Study 1.
    - o The researchers combined the results of the first two studies to rank the most effective messages. The highest-ranking message emphasised responsibility to reciprocate sacrifices made by

---
[1] Pink, S., Stagnaro, M., Chu, J., Mernyk, J., Voelkel, J. G., & Willer, R. (2020). Five Experimental Tests of the Effects of Short Messages on Compliance with COVID-19 Public Health Guidelines.

healthcare workers: "Doctors, nurses, and other health care workers are working around the clock, risking their lives to care for patients with the coronavirus. Working long hours in highly infectious environments, many of them are falling ill. As our health care workers put their lives on the line, we can do our part simply by staying home and limiting physical contact with others."

- o The other four top performing messages used an identifiable victim, compassion and empathy, information about breaking the transmission chain, and expert statements.

- Study 3: The researchers tested whether the top four messages from Studies 1 and 2 cause people who are not fully compliant to change their behaviours. After reading a message, 1,627 participants indicated how often they intended to engage in health behaviours (e.g. staying at home, or wearing a mask) in the upcoming days.
  - o Results from Study 3 show that participants who read any message reported significantly greater increases in intentions to engage in preventative behaviours than those who receive no message. However, no messages were significantly more persuasive than the active control message ("Coronavirus is a respiratory illness that can spread from person to person. The virus is thought to spread mainly between people who are in close contact with one another. You can help prevent the spread of COVID-19. Stay home and avoid contact with others when you must go out.)

- Study 4: This study adapts four treatment messages to call for new behaviours, instead of asking people to stay home (e.g. physically distancing from others, or wearing a mask). 1,531 participants with self-reported low compliance indicated how often they intended to engage with the health behaviours.
  - o Similar to Studies 1 and 2, the civic duty message was most effective. The researchers find that most of the effect is driven by those low in scepticism. None of the messages had any effect on people with high scepticism.

- Study 5: Given that study 3 and 4 find different effects, the researchers replicated Study 4 using only the civic duty message and the active control, with 568 low-compliance participants.
  - o The researchers found that in this replication, the civic duty message was not significantly more persuasive than the control.

Overall results:

- A message emphasizing civic responsibility to reciprocate healthcare workers' sacrifices performed best in three of five studies.
- Short messages are most effective for people with low scepticism towards COVID-19.
- However, the authors note that short messages may be ineffective in increasing compliance with public health guidelines during advanced stages of the pandemic.

Evidence review: This is good quality experimental research, which uses an iterative approach and replication to ensure robustness. It is worth noting the researchers specifically select a sample of low-compliance people, which is likely to give results of a larger magnitude compared to a general population sample. In addition, they rely on self-reported behaviour, which may not reflect actual behaviour.

Implications: Messaging based on civic reciprocity may be effective at increasing compliance. The authors note that the reduction in effect they see may be a consequence of timing, as the pandemic progresses and more information becomes available. In New Zealand, new messages may be less likely to affect compliance behaviour, since the pandemic has been contained relative to other countries that are facing high rates of infection.

DEPARTMENT OF THE
PRIME MINISTER AND **CABINET**
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

3. **Altruistic messaging can increase compliance with preventative behaviour, but can negatively affect quality of life**[2]

In this online experiment, 5,225 residents in Japan were asked about their intention to avoid contact with others and take preventive actions after seeing one of five behaviourally informed messages. Participants also responded to a follow-up survey a week later, to determine whether the behaviour had been enacted. The five messages were:

- Altruistic: By avoiding contact with others and taking action to prevent infection, you can protect the lives of people close to you;
- Loss-framed altruistic: If you do not take such measures, you will expose people close to you to danger;
- Selfish: By taking such measures, you can protect your own life;
- Altruistic and selfish: By taking such measures, you can protect the lives of yourself and people close to you;
- Simple: Stay home.

In the initial survey, the researchers found:

- The altruistic message was the only one to increase intention to avoid going out, although this is only statistically significant at the 10% level.
- The altruistic and loss-framed altruistic messages were both effective at increasing intention to take other preventative actions (e.g. avoiding shaking hands).

In the follow-up survey, the researchers found:

- Reduced frequency of going out for only those exposed to the altruistic message, although again this is only statistically significant at the 10% level.
- No messages showed a promotional effect of increasing preventative behaviours, and some showed opposite effects. In particular, those who received the selfish message were less likely to report having taken preventative action. However, those who received the altruistic message also reported decreases in behaviours affecting quality of life, including sleep quality and healthy eating.
- Compared to the control group, the intervention group receiving the altruistic message showed a decrease in life satisfaction regarding leisure time and friendships. The authors suggest this may be because the messages cause them to go out less, and spend less time with others.

> **Evidence review:** This experimental research goes some way to reduce the problems of reporting intention to engage in a behaviour, with a follow-up survey about actual behaviour. However, both these measures are still self-reported and may not accurately reflect actual behaviour.
>
> **Implications:** This is novel research in that it identifies not just the impact of messaging on behaviour, but also on life satisfaction and factors affecting quality of life. These dimensions are worth considering when choosing messaging, as factors affecting quality of life, like sleep and healthy eating, may outweigh the promotional effects, and actually increase the risk of COVID-19.

---

[2] Sasaki, S., Kurokawa, H., and Ohtake, F. (2020) Short-term responses to nudge-based messages for preventing the spread of COVID-19 infection: Intention, behavior, and life satisfaction, No 20-11, Discussion Papers in Economics and Business, Osaka University, Graduate School of Economics.

4. We distance most when we think our social circle does[3]

Researchers used an online survey covering 6,674 people from 114 countries to investigate how social influence predicts people's adherence to distancing. In particular, the researchers measured the impact of social influence at three different scales: one's close social circle, one's fellow citizens, and the entire world. Respondents were asked questions including the size of their close social circle, how much they adhered to and approved of distancing measures, and how much they thought that others adhered to and approved of distancing measures.

The researchers found:

- Perceived adherence of one's close circle had the strongest association with adherence to distancing rules, followed by own approval of the measures.
- Others' perceived adherence was a better predictor of self-adherence than others' perceived approval.
- Perceived vulnerability of self and others were both predictors of adherence.

Evidence review: This research only identifies a correlation between social circles and distancing behaviour, and cannot identify a causal relationship. However, it can robustly identify the greatest predictors of adherence to distancing, using a large sample size covering many countries.

Implications: These findings demonstrate that beyond convincing people about the threat of COVID-19 or the necessity of adherence to rules, the influences of close social circles need to be considered. In particular, this suggests that messages should endorse a sense of community and togetherness by emphasising empathy, collective values and widespread adherence by others within the community.

5. Exposure to news from large cities affected by COVID-19 can increase distancing behaviour in rural areas[4]

In the USA, many rural residents have lived experiences of the COVID-19 pandemic which are very different from their "local" news coverage, if their local coverage includes major cities which may be greatly affected. In this study, the authors explore the impact of different news coverage in rural areas. To determine whether urban-centric news coverage affects distancing behaviour, the researchers use county-level cell phone data. In addition, they collect survey responses from residents of the counties to ensure differences can be attributed to the local media. The authors find:

- Rural residents are more likely to practice social distancing if they live in a media market that is more impacted by COVID-19.
- This is despite rural residents receiving high COVID-19 media coverage reporting being less approving of local news compared to their counterparts who are less exposed to COVID-19 coverage.
- The effects attributable to local news coverage (3 percentage points) were smaller than partisan (7 percentage points) and gender differences (8 percentage points).

Evidence review: This research takes a novel approach to identify a causal effect of COVID-19 media coverage on distancing behaviour. In addition, by using mobile phone data, it does not rely on self-reported behaviour.

Implications: The USA is in a unique position with a specific urban/rural divide, a very large population, and with a different COVID-19 context compared to New Zealand. However, with Auckland dominating the news
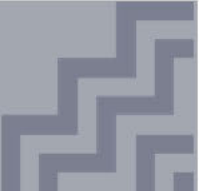
[3] Tuncgenc, B., El Zein, M., Sulik, J., Newson, M., Zhao, Y., Dezecache, G., & Deroy, O. (2020). We distance most when we believe our social circle does. PsyArXiv. https://doi.org/10.31234/osf.io/u74wc
[4] Kim E, Shepherd ME, Clinton JD. 2020. The effect of big-city news on rural America during the COVID-19 pandemic. *Proc Natl Acad Sci U S A*. 2020;202009384. doi:10.1073/pnas.2009384117

New Zealand Government

throughout New Zealand, some regions may experience similar sentiments of under-representation. This research suggests that news coverage emphasising the threat can increase distancing behaviour, even in the presence of this sentiment.

DEPARTMENT OF THE
PRIME MINISTER AND CABINET
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

APPENDIX I

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

New Zealand Government

TITLE	Behavioural Science Update
Document reference	*Behavioural Insights Update 014*
Date and time	11 September 2020
Produced by/location	Insights and Reporting Team (IRT)

This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Insights and Reporting Team (IRT). This report is assessed to be of MODERATE confidence. **Note:** *Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

s6(b)(i)

- Survey data from Massey University shows **most New Zealanders (74%) report they would get vaccinated when a vaccine is available.** Key barriers to vaccination include concerns around the need for safety testing (18%) and potential side effects (16%). Key motivators for vaccination were to protect family (62%) and protect themselves (62%). It is important to note however that this research is based on intentions and it will be important to ensure this is translated into actual behaviour.

- Experimental research looking at a range of novel behaviourally designed interventions has found that providing information to address people's misconceptions can increase social distancing behaviour (e.g. keeping safe distance, staying at home). However, this only had significant improvements for people who weren't, or had only recently started, complying and could even backfire and reduce compliance for those who had been complying for a while already.

- Survey data from the Netherlands has reported that while rates of compliance for social distancing decreased in June, they have seen an increase in July. Certain key drivers for compliance that remained consistent across May, June and July include practical capacity to comply, perceptions of threat, and general support for mitigation measures. Interestingly, deterrence (e.g. fear of punishment) was not a significant predictor of compliance.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document summarises behavioural science findings relating to the COVID-19 response. This document is not an exhaustive review and is intended to surface findings that may be relevant to decision-makers.

Overview of new behavioural literature

s6(b)(i)

Released under the Official Information Act 1982

3. **People in New Zealand, Australia and the UK share relatively high levels of intentions to use a COVID-19 vaccine when available.** A Massey University survey[1] of 1040 people between June 26 and July 13 reported that:

   - 74% of New Zealanders will get vaccinated when a COVID-19 vaccine is available.
   - Older people (66 years and older) were more likely to get vaccinated (81%) than people 18-25 years, 72%, and 26-35 years (70%).
   - Māori respondents reported lower intentions to get vaccinated (36% saying they were not willing to get a vaccine) compared to NZ/European respondents (24%), Pasifika (30%), and Asian or other ethnicities (19%).
   - Half of New Zealanders agreed that they would get vaccinated even if they had to pay for it (52%), and 56% were willing to put their names on a waiting list to get vaccinated.
   - Overall, the two biggest motivators for vaccination were to protect family (62%) and protect themselves (62%). The biggest barriers to vaccination were concerns around the need for safety testing (18%) and potential side effects (16%).
   - People also showed support for some restrictions against people who refuse vaccination with 61% supporting an international travel ban, 57% supporting restricted access to public places, but less support 50% for restrictions on sending children to school, and financial restrictions such as reduced pay (30%) and higher tax (28%).

   > **Evidence review:** The Massey survey provides a picture of New Zealanders attitudes towards COVID-19 vaccination. The researchers weighted demographics to get a representative reflection of the population. However, it is always important to remember the general limitations about measures based on intention which tend not to translate fully into actual behaviour. Further research is needed to test the barriers identified in this research as well as those highlighted in the existing literature.[2]
   >
   > **Implications:** Vaccination uptake will be a crucial strategic behaviour for COVID-19 response and it is encouraging that this research suggests there are high rates of intention to vaccinate in line with estimates for herd immunity thresholds.[3] Likewise, the numbers in the UK and Australia[4], show similar attitudes internationally which contrast with research from the US that found at least 35% of Americans would not get a vaccine.[5] In New Zealand it will be critical to begin planning and testing interventions to address barriers to vaccination uptake in the New Zealand context and generally ensure intention becomes action.

4. **Online experiments testing behaviourally informed communication interventions on people's self-reported protective health behaviours found benefits for people inexperienced with these behaviours, but also potential for backfire effects[6]**

   A sample of 2,637 people (from the US and UK) were randomised to one of the following four behaviourally designed interventions (or a control condition who received no intervention) that aimed to increase key health behaviours (e.g. social distancing):

[1] Menon, V. & Thaker, J (2020). *Aotearoa New Zealand Public Attitudes to COVID-19 Vaccine.* Wellington, New Zealand: Massey University. Accessed online:
https://mro.massey.ac.nz/bitstream/handle/10179/15567/Aotearoa%20New%20Zealand%20Public%20Attitudes%20to%20COVID-19%20Vaccine.pdf?sequence=1

[2] Xiao X, Wong RM. Vaccine hesitancy and perceived behavioral control: A meta-analysis. *Vaccine.* 2020;38(33):5131-5138.

[3] https://www.nytimes.com/interactive/2020/05/28/upshot/coronavirus-herd-immunity.html

[4] https://covidsurvey.mit.edu/dashboard.html

[5] https://news.gallup.com/poll/317018/one-three-americans-not-covid-vaccine.aspx

[6] Krpan, D., Makki, F., Saleh, N., Brink, S., & Klauznicer, H. (2020). When Behavioural Science Can Make a Difference in Times of COVID-19. *Behavioural Public Policy,* 1-45

New Zealand Government

- A 'letter' condition that aimed to leverage empathy by asking people to write a letter to a vulnerable person who meant a lot to them, explaining that they would do everything necessary to prevent the spread of COVID-19.
- A 'meaningful activity' condition where people identified an activity that they enjoyed and could do while staying at home to reduce temptation to leave home. They were also asked to consider the barriers to this activity and how they would overcome them in line with restrictions.
- An 'economy' condition where people read messages that argued how strict adherence to social distancing would protect the economy in the long run and be better for everyone.
- An 'information' condition that presented people with hypothetical scenarios in which people could violate COVID-19 restrictions due to various misconceptions (e.g. socialising with neighbours in the same building). They were then asked if they thought the actions in the scenarios were appropriate, and received immediate feedback confirming if their answer was accurate or correcting them if not.

People's self-reported behaviour (social distancing and staying at home) was then measured one day later. Results showed that:

- Baseline levels of compliance behaviour were relatively high, with 76% indicating very high compliance with general social distancing, 96% indicating they did not leave their house to meet family or friends, and 97% did not allow visitors for social gatherings.
- Overall, **none of the interventions had a statistically significantly impact on self-reported behaviours when compared to the control condition.**
- However, for people who had recently begun practicing social distancing (within the past 14 days), the "information based" intervention led to:
  - an increase in people's general levels of social distancing;
  - a decrease in the number of times people went outside;
  - a decrease in the amount of time people spent outside.
- **For people who had begun practicing social distancing earlier (at least 32 days ago), the intervention did not improve behaviour, and in some cases backfired and reduced compliance.**
- The researchers suggest that this may reflect either an example of 'psychological reactance', where people who were already practicing social distancing reacted negatively to being told to comply even more. Alternatively, this group was likely the people who were taking the COVID-19 situation very seriously already and the information intervention may have corrected some of their beliefs and reduced their perceptions of risk. However, these conclusions require further investigation.

Evidence review: This is experimental research that investigated new interventions to increase behaviour, as well as a range of moderating variables (e.g. previous social distancing experience). However, the use of a short measurement window (1-day) means it is hard to know if impacts will last. Likewise, the researchers were unable to identify any significant relationships between the mediator variables they tested and therefore can only hypothesise why the information condition worked for people with low levels of social distancing experience.

Implications: The results highlight the need to consider the previous experience of audiences as the COVID-19 situation continues. Critically, a blanket approach to implementing behaviour interventions in a situation where many people already comply will likely have limited value (i.e. a 'ceiling effect'). However, the baseline compliance in this sample (76%) also appears to be quite high – which limits the generalisability to the New Zealand context where social distancing compliance is unlikely to be that high. Acknowledging that people already have experience with protective health behaviours and know how to respond to restrictions will likely

> be important when/if restrictions are re-introduced. In addition, this research suggests that information-based interventions that aim to correct misconceptions can be effective – although in this case the intervention is relatively intensive requiring presentation of information, questioning and correcting as necessary.

5. **A July update from series of surveys in the Netherlands[7],[8] (as well as from the UK, US and Israel), has emphasised some consistent factors for compliance across time and cultures.**

The surveys have focused on identifying levels of self-reported compliance with social distancing as well as a range of potential explanatory variables.[9] The most recent results from the Netherlands come in the context of loosening and removal of restrictions, as well as a resurgence in case numbers. These results were also compared to data collected in May and June.

- Overall, the researchers found that while compliance with social distancing had dropped from early May (48%) to early July (23.5%) through July, this had halted and potentially begun to reverse (up to 30.4%).
- Of the many explanatory variables that were tested, the most important factors have remained relatively consistent include:
    - Situational factors, such as having the practical capacity to comply (e.g. "am I able to keep a safe distance from other people outside my household?");
    - perceptions of threat from the virus generally (e.g. for society and other vulnerable people) and support for mitigation measures;
    - perceived social norms (i.e. what are other people doing?). The researchers note that in July the perception that other people were complying decreased, which could pose a risk to future compliance.
- Other variables that were highlighted in previous surveys over May and June included:
    - having more opportunities to violate mitigation measures;
    - individual moral beliefs in the obligation to obey the law.
- Across all surveys, deterrence (or fear of punishment) was not a significant predictor of compliance.

A similar pattern of factors was also found across US[10], UK[11] and Israeli[12] populations, which the same researchers surveyed in April. Some of the consistent findings reinforce that:

- situational factors in people's environment such as, having the capacity to comply and limited opportunities to break the rules were predictors for compliance;
- intrinsic motivation appears to be more important than extrinsic, such as people's moral beliefs (e.g. beliefs that people have a duty to obey the law);
- and need to protect elderly friends were important but that deterrence (e.g. perceptions of punishment severity and certainty) had a limited role.

---

[7] Reinders Folmer, C., Kuiper, M., Olthuis, E., Kooistra, E. B., de Bruijn, A. L., Brownlee, M., … van Rooij, B. (2020, August 28). Maintaining Compliance when the Virus Returns: Understanding Adherence to Social Distancing Measures in the Netherlands in July 2020. https://doi.org/10.31234/osf.io/vx3mn

[8] Previous publications have also been cited in reports by the All of Government Law Reform Team "Further Information on Academic Research Relating to the Policy Underlying the Act"

[9] For example, citizens' *capacity to obey rules*, their *opportunity to break rules*, their *support for the mitigation measures*, their *emotional state due to the measures*, and their *obligation to obey the law*; and factors that influence their perceptions of the *cost and benefits of compliance*, *deterrence*, *procedural justice*, and *social norms* regarding compliance.

[10] van Rooij, Benjamin, Anne Leonore de Bruijn, Christopher Reinders Folmer, Emmeke Kooistra, Malouke Esra Kuiper, Megan Brownlee, Elke Olthuis, and Adam Fine. 2020. "Compliance with COVID-19 Mitigation Measures in the United States." *Working paper on PsyArXiv*. doi: 10.31234/osf.io/qymu3.

[11] Kooistra, Emmeke, Christopher P. Reinders Folmer, Elke Olthuis, Megan Brownlee, Malouke Esra Kuiper, Adam Fine, and Benjamin Van Rooij. 2020. "Mitigating COVID-19 in a Nationally Representative UKSample: Personal Abilities and Obligation to Obey the Law Shape Compliance with Mitigation Measures." *Working Paper posted on PsyArXiv https://psyarxiv.com/zuc23/*.

[12] de Bruijn, A. L., Feldman, Y., Kuiper, M. E., Brownlee, M., Reinders Folmer, C., Kooistra, E. B., … van Rooij, B. (2020, August 28). Why did Israelis comply with COVID-19 Mitigation Measures during the initial first wave lockdown?. https://doi.org/10.31234/osf.io/vm8x9

Evidence review: These surveys provide self-reported data from a number of different contexts, so while purely correlational, the ability to compare across countries because of the similar methodology is valuable. The consistent patterns for important compliance factors help to point to more universal drivers. The researchers note that further analysis is yet to be done to investigate all of the variables impacts in a longitudinal study.

Implications: The Netherlands provides an interesting comparison for New Zealand, as they have taken a more lenient approach to date and have relied more on voluntary compliance. And over the survey period, the restrictions that were in place were being removed. Based on the findings from this research, interventions that increase people's capacity to comply, reduce their opportunities to violate, increase perceptions of the health threat of the virus, enhance support for mitigation measures, or strengthen social norms for compliance likely have favourable effects.

New Zealand Government

APPENDIX I

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

TITLE	Behavioural Science Update
Document reference	*Behavioural Insights Update 015*
Date and time	23 October 2020
Produced by/location	Insights and Reporting Team (IRT)

*This report was produced by Behavioural Science Aotearoa (Sector Group - Ministry of Justice) in support of the AoG Insights & Reporting Team (IRT).. This report is assessed to be of MODERATE confidence. **Note:** Due to the pace required to keep up with COVID-19 developments some of the research included has not been peer-reviewed.*

Key Insights

- Experimental and longitudinal surveys demonstrate how exposure to conspiracy theories decreases institutional trust and support for government regulation.

- Researchers thematically compare New Zealand to UK messaging from leaders, and suggest that communication focusing on social identity is a factor for compliance with health behaviours.

- Research spanning 67 countries finds a strong national identity is a reliable predictor of self-reported spatial distancing, physical hygiene, and policy support.

- The framing of questions in surveys can have large effects on self-reported compliance with health behaviours, by up to 17 percentage points.

Background

1. Behavioural science provides a way to understand and shift behaviours critical to the management of the COVID-19 pandemic. This document summarises behavioural science findings relating to the COVID-19 response. This document is not an exhaustive review and is intended to surface findings that may be relevant to decision-makers.

Overview of new behavioural literature

2. **Belief in conspiracy theories affects institutional trust and support for COVID-19 regulations**[1]

Researchers tested whether belief in conspiracy theories predicts institutional trust, support of government regulations and compliance. They conducted three complementary studies using a cross-sectional survey, an experimental study and a longitudinal survey.

- **Study 1: Cross-section survey.** 425 participants representative of the Danish adult population responded to a survey which captured attitudes around institutional trust, support of government regulations, physical distancing, hygiene measures, social engagement (e.g. helping elderly with shopping) and belief in political COVID-19 conspiracies.
  - On a 5-point scale from 1: Disagree to 5: Agree, participants ranked five statements (e.g. "Powerful people are using COVID-19 in order to crash the economy"). The mean score was 1.71.
  - Results show that people with stronger beliefs in conspiracies report lower institutional trust, lower support for government regulation, less adoption of physical distancing and social engagement. Conspiracy belief was unrelated to the adoption of hygiene measures.

---

[1] Pummerer, L., Böhm, R., Lilleholt, L., Winter, K., Zettler, I., & Sassenberg, K. (2020, April 14). Conspiracy theories and their societal effects during the COVID-19 pandemic. https://doi.org/10.31234/osf.io/y5grn

New Zealand Government

- **Study 2: Experimental study.** 242 participants were recruited via a German university. Participants were randomly assigned to a treatment group, which read a conspiracy theory in the format of a news report, and a control group which did not read any news report. Following these conditions, participants responded to a survey questions comparable to the cross-section survey.
  - Results from this study replicate those found in the cross-section survey. People in the treatment group exhibited less institutional trust and less support of governmental regulations shifting the mean response on the 5-point scale by 0.26 points and less reported adoption of physical distancing, by 4 percentage points.
- **Study 3: Longitudinal survey.** 546 participants recruited via a German university completed measures of the same attitudes as studies 1 and 2. Eight weeks later, 134 of the same participants took part in a second wave of the survey.
  - The results are the same as those in study 1 when analysed cross-sectionally, not accounting for the longitudinal nature of the survey.
  - By comparing time 1 to time 2 surveys, the researchers find evidence that belief in conspiracy theories decreases institutional trust and support of government regulations, and the effect is not driven the other way around.

Evidence review: This study benefits from having the experimental and longitudinal studies to back up the findings in the cross-section survey, which is only able to identify correlation. Note that the studies have fairly small sample sizes, but still estimate statistically significant effects.

Implications: This research suggests that simply being exposed to conspiracy theories reduces institutional trust and support for regulations. This demonstrates a need for mitigating the spread of conspiracy theories and improving resilience among target populations to reduce adverse impacts on trust; which previous research shows is important for adherence with protective health behaviours.

---

3. **Harnessing shared identities to mobilise resilient responses to the COVID-19 pandemic[2]**

   Researchers illustrate the potential for harnessing shared identities to mobilise the public's response to COVID-19. In the first study, they use qualitative analysis to compare Prime Minister Ardern's use of identity-based language to mobilise New Zealanders, with Prime Minister Johnson's use of individualistic appeals to the UK public. They analyse the first ten speeches on COVID-19 by each leader, investigating how the leaders positioned themselves and their audiences when requesting public adherence to health protection measures, and how they construct group identities.

   - The researchers found differences in how leaders position themselves in relation to the public when requesting protective actions, with Johnson constructing the audience in generic terms ('everyone', 'wider public', 'people'), whereas Ardern positions her audience simultaneously as an inclusive national category ('we as a nation', 'our older New Zealanders') and within smaller communities ('friends', 'family', 'neighbours').

   - Ardern framed decisions as moral imperatives, ('New Zealanders' public health comes first', 'The worst-case scenario is simply intolerable'), whereas Johnson frames decisions as technical

---

[2] Vignoles, V., Jaser, Z., Taylor, F., & Ntontis, E. (2020, September 29). Harnessing shared identities to mobilise resilient responses to the COVID-19 pandemic. https://doi.org/10.31234/osf.io/g9q5u

New Zealand Government

requirements ('we need to keep people apart', 'we need health workers who are also parents to continue to go to work').

- Both leaders constructed the pandemic as a collective problem that could only be overcome through collective agency.

In the second study, they explore which patterns of social identification predicted protective behaviours (personal hygiene, physical distancing), prosocial actions (helping close and distant others), and psychological wellbeing (mental wellbeing, depressive symptoms, anxiety), among 560 UK adults surveyed online during lockdown. They focus on four identity categories: family; local community; the nation; and humanity.

- Strong identification with a family unit uniquely predicted perceiving the pandemic as serious, more physical distancing, and marginally more hygiene behaviours. Local community identification uniquely predicted close and distant prosocial actions. Identifying strongly with humanity as a whole uniquely predicted more prosocial actions towards distant others, and better mental wellbeing.
- National identification did not significantly predict personal hygiene or physical distancing; moreover, national identification predicted more actions helping proximal others, but fewer actions helping distal others.

Evidence review: The design of these studies do not permit causal inference, but do suggest a pathway from leader rhetoric to public action via social identification. This mechanism is consistent with previous research into identity-based leadership. In addition, while study 1 explores the rhetoric of a New Zealand leader, study 2 does not use a New Zealand sample in the survey.

Implications: Those designing messages should consider how to appeal to different aspects of identity to motivate behaviour. This is context dependent, and would benefit from research specific to New Zealand.

4. **National identity predicts public health support during a global pandemic**[3]

Researchers collected data from representative samples across 67 countries (N=46,450, including participants from New Zealand). Participants were surveyed on their attitudes towards health behaviours, including physical distancing and personal hygiene, as well as their support for policy. The researchers analysed the data using multi-level models, which account for country-level variation in economic, political and health measures, to determine whether strong national identity predicts public health support. They find:

- National identification is a reliable predictor of self-reported spatial distancing, physical hygiene, and policy support.
- Citizens who identified more strongly with their nation reported greater support for critical public health measures, even after adjusting for national narcissism and political ideology (as well as the country-level Human Development Index and local rates of COVID-19 infections and mortality).
- Right-wing participants reported lower levels of support for protective measures than more left-wing participants. National narcissism was only weakly related to support for several of the measures.

---

[3] Van Bavel, J. J., Cichocka, A., Capraro, V., Sjåstad, H., Nezlek, J. B., Alfano, M., ... Longoni, C. (2020, September 2). National identity predicts public health support during a global pandemic. https://doi.org/10.31234/osf.io/ydt95

New Zealand Government

DEPARTMENT OF THE
PRIME MINISTER AND **CABINET**
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

> **Evidence review:** This research is correlational and was conducted during the early stages of the pandemic. Therefore, while it is likely that national identification is theoretically likely to influence public health behaviour, there is no evidence for the direction of the relationship. In addition, the survey measures self-reported behavioural intentions, not actual behaviour.
>
> **Implications:** Insights into how national identity plays a role in compliance with health behaviours is relevant for leaders and policy makers when designing programs and messages to promote public health initiatives. This is in line with the research reported above, which shows the effectiveness of shared identities in promoting health behaviour. However, note that the two studies find conflicting results on the role of national identity, highlighting the limitations for generalising from this research.

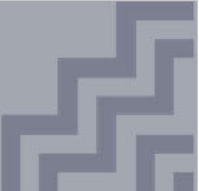5. **Question framing affects self-reported compliance with health behaviours[4]**

Researchers aimed to understand how question framing in surveys affects people's self-reported estimates of compliance with public health guidance (e.g. handwashing and physical distancing). The researchers tested two sources of bias; framing effects, to understand whether a positively or negatively framed question affects responses; and social desirability, to understand whether perceived desirability of reporting high compliance affects responses. They used two online experiments, with 1,800 participants from Ireland. In one experiment, they varied whether questions were framed positively or negatively (eg, 'I always wash my hands' vs 'I don't always wash my hands'). In the other experiment, all participants were presented with a list of behaviours, made up of 'target' behaviours (that indicate public health compliance, like handwashing) and 'non-target' behaviours that are unrelated to health outcomes (like 'I am watching less TV than usual'). Half the participants were asked to state *which* behaviours applied to them, and the other half were asked how *many* behaviours applied to them. The researchers compared the difference in these groups to determine whether social desirability of health behaviours affected self-reported compliance. They found:

-   Base-line rates of self-reported compliance were high, at 91%.
-   Effect sizes were large. Negatively framing questions reduced self-reported compliance with health behaviour by up to 17 percentage points, and taking away social desirability bias reduced self-reported compliance by up to 10 percentage points.

> **Evidence review:** This is strong experimental research demonstrating the causal effects of message framing on self-reported behaviour. However, it does not address whether self-reported behaviour effectively captures actual behaviour beyond these two biases.
>
> **Implications:** This research suggests that compliance may appear artificially high if surveys use direct, positively framed questions. Therefore, we should treat surveys which use this approach with caution, and seek further evidence to help us understand the reliability of survey questions.

---

[4] Timmons S, McGinnity F, Belton C, et al. It depends on how you ask: measuring bias in population surveys of compliance with COVID-19 public health guidance. J Epidemiol Community Health Published Online First: 16 October 2020. doi: 10.1136/jech-2020-215256

New Zealand Government

DEPARTMENT OF THE
PRIME MINISTER AND **CABINET**
TE TARI O TE PIRIMIA ME TE KOMITI MATUA

APPENDIX I

Qualitative Statement	Associated Probability Range
Almost Certain	>90%
Highly/Very Probable/Likely	75-85%
Probable/Likely	55-70%
Realistic Possibility	25-50%
Improbable/Unlikely	15-20%
Remote/Highly Unlikely	<10%

CONFIDENCE LEVEL	GENERAL CRITERIA
High Confidence	The underlying information is well corroborated from proven sources. A strong understanding of the issue exists. There is negligible risk of deception. There are minimal assumptions. There is a mix of strong logical inferences possibly developed through multiple analytic techniques or methodologies.
Moderate Confidence	The underlying information is well corroborated from good sources. A moderate understanding of the issue exists. There is some risk of deception. Several assumptions are made; some are critical to the analysis. There is a mix of strong and weak inferences possibly developed through a single analytic technique or methodology.
Low Confidence	The underlying information is well corroborated from good or marginal sources. There is limited understanding of the issue. There is considerable risk of deception. Many assumptions are made; some are critical to the analysis. The reasoning is dominated by weak inferences possibly developed through few analytic techniques or methodologies.

New Zealand Government