

Improving maritime border workers' adherence to the Required Testing Order

Project Final Report
November 2021



Contents

Executive summary	3
Target: Introduction and overview of the project	7
Project background	7
Ways of working	9
The gap this project addresses	9
Explore: Research Findings	10
Interviews with maritime border workers and PCBUs	10
Method	10
Design	10
Recruitment	11
Data collection	11
Participants	11
Results	12
Testing landscape	12
Main barriers and enablers to regular testing	12
Motivations for getting tested	14
Thoughts on saliva testing	14
KAP survey with maritime border workers	15
Method	15
Design	15
Recruitment	15
Data collection	16
Participants	16
Results	17
Knowledge	17
Attitudes	18
Practices	21
Focus groups with stevedores	23
Method	23
Design	23
Recruitment	23
Data collection	23
Participants	24
Results	24
Nasopharyngeal swabs are preferred over saliva testing, but not by much	24
A common barrier to testing is concerns about testing positive	25

A common motivation to get tested is responsibility to whānau	26
Most border workers know where and when to get tested	27
Solution: Co-designed behavioural solutions and recommendations	28
A. Solutions that apply to both nasopharyngeal and saliva testing	30
B. Increasing the uptake of saliva testing	36
Appendices	40
Appendix 1: Literature scan: Overview of factors that influence adherence to COVID-19 testing	40
Barriers and enablers to COVID-19 testing	40
Barriers	40
Enablers	41
Increasing adherence to COVID-19 testing	41
Place equity at the heart of actions	41
Improve ease of access	43
Address concerns about consequences	43
Devise appropriate incentives	43
Increasing adherence to health screening behaviours	44
Vaccine uptake	44
Health screening behaviours	46
Appendix 2: Interview guide for border workers	51
Appendix 3: KAP survey	58
Appendix 4: Focus group conversation guide for stevedores	65

Executive summary

Mandatory testing of all border workers continues to play an important role in preventing the transmission of COVID-19 as the country focuses on increasing its vaccination rates. However, not all maritime border workers adhere to the COVID-19 Public Health Response (Required Testing) Order 2020 (RTO), and adherence is lower amongst stevedores.

For this project, the Behavioural Insights Team (BIT) partnered with Dr Maria Baker (CEO, Te Rau Ora), and Gavin Faeamani (Tongan public health researcher), alongside the Ministry of Health's COVID-19 Behavioural Insights and Testing Operations Teams within the COVID-19 Directorate, to investigate the key barriers and enablers to regular COVID-19 testing for maritime border workers. The project was underpinned by collaborative design and a strong equity lens.

Objective

The overarching objective of this project was to identify the factors that most influence maritime border workers' COVID-19 testing behaviour, and make suggestions to increase adherence to the RTO.

Methods

To meet this objective, we conducted a range of research activities. These included:

- A rapid scan of the international research to understand the factors that influence adherence to COVID-19 testing;
- Consultations with Ministry of Health (the Ministry) and other key stakeholders to understand the maritime border worker landscape;
- Interviews with stevedores and Persons Conducting a Business or Undertaking (PCBUs) to understand the range of barriers and enablers to adhering to the RTO
- A Knowledge, Attitudes, and Practices (KAP) survey with maritime border workers to quantify the barriers and enablers to adhering to the RTO
- Focus group discussions with stevedores to unpack the findings from the KAP survey and explore solutions to the most common barriers
- A Solutions workshop with the Ministry and other key stakeholders to bring the findings together and develop solutions

Findings

Barriers and enablers to adhering to the RTO

The most frequently mentioned enablers supporting maritime border workers' adherence to the RTO were:

- The convenience of having the testing stations available at the ports; and
- Receiving text message reminders when they were due (or overdue) to be tested.

The most common barriers to adhering to the RTO were:

- Not being at work when testing falls due;
- The distance from testing venues (when at home);
- The discomfort of testing; and
- Needing to remember to get tested.

Motivations for adhering to the RTO

The strongest motivation to get tested regularly was a sense of responsibility to family, whānau, and community. This remained consistent even as the nature of stevedores' motivations to get tested changed. We found that stevedores' motivation to get tested changed depending on their perception of the risk of COVID-19 being transmitted in the community. When there is low risk of transmission (no community outbreak), stevedores get tested simply because they are required to (compliance), in other words to keep providing for their families and whānau. However, when there is a community outbreak, they make an active choice to get tested (adherence), or to prevent their families and whānau from being infected.













Nasopharyngeal versus saliva testing

We found that nasopharyngeal swabs were preferred slightly more by stevedores than saliva testing. This was primarily because stevedores have established a habit of nasopharyngeal testing once a fortnight, and it is relatively easy for them to maintain, since the testing stations are based at the ports. On the downside, nasopharyngeal testing can take up to 20-30 minutes to complete if there is a line at the testing station and this uses up most of stevedores' break time.

The main barrier to saliva testing was its increased frequency relative to nasopharyngeal swabs. Many stevedores felt having to get a saliva test twice a week was more intrusive than the fortnightly nasopharyngeal swabs. At the same time, the benefits of saliva testing, such as the convenience of not having to line up at a testing station or use up precious nursing resources, were not well understood by stevedores.

Solutions

We developed a range of solutions, some that apply to both nasopharyngeal and saliva testing and some that apply specifically to increasing the uptake of saliva testing. These are summarised below, along with our assessment of their feasibility and impact (low, medium, or high).

A. Solutions that apply to both nasopharyngeal and saliva testing	Feasibility & Impact
 <p>A1: Increase the convenience of testing for border workers and their knowledge of testing locations</p>	
 <p>A2: Provide operational transparency surrounding the COVID-19 testing process and what workers can expect if they test positive</p>	
 <p>A3: Publicly acknowledge the contributions that maritime border workers are making to keep New Zealand safe</p>	
 <p>A4: Facilitate competitions and leaderboards within and across PCBUs to make testing more attractive and social</p>	
B. Solutions that apply to specifically to increasing the uptake of saliva testing	Feasibility & Impact
 <p>B1: Clearly communicate the benefits of saliva testing and provide a rationale for the desired behaviour</p>	
 <p>B2: Reduce the required frequency for saliva testing</p>	

Structure of report

We have structured the report to follow the different phases of the project:

- **Target:** In the Target section of the report we describe the project background and key objectives, and ways of working with our project partners.
- **Explore:** In the Explore section we describe the key methods we used to explore the barriers and enablers to regular COVID-19 testing, and the results we obtained for each method.
- **Solutions:** In the Solutions section we recommend several evidence-based behavioural solutions to increase adherence to the RTO, via either nasopharyngeal or saliva testing, along with implementation considerations.
- **Appendices:** The Appendices contain a literature review that provides an overview of the factors that have been found to influence adherence to COVID-19 testing or other health screening behaviours. We have also included copies of: our interview guide for stevedores; the KAP survey; and focus group conversation guide for stevedores.

Target: Introduction and overview of the project

Project background

A cornerstone of New Zealand's successful policy to eliminate COVID-19 has been strict border control, and mandatory testing of all border workers continues to play an important role in preventing the rapid transmission of the COVID-19 Delta variant as the country focuses on increasing its vaccination rates.

The COVID-19 Public Health Response (Required Testing) Order 2020 (RTO) requires routine testing of border workers for COVID-19 at managed isolation and quarantine facilities, airports and seaports. Border workers can choose between three different forms of testing: nasopharyngeal testing (often referred to as nasal swabs), oropharyngeal testing (also referred to as throat swabs), or saliva testing:

- **Nasopharyngeal testing** - involves border workers visiting a testing station where a trained health worker, often a nurse, inserts a small, soft-tipped swab into one or both nostrils, twirls it a few times to collect secretions, and then removes it. The swab is inserted 2-3cm into the nasal passage to give the best result. It may be uncomfortable but should not be painful.¹ The procedure itself takes only a few minutes, but border workers may need to wait in line to be tested.
- **Oropharyngeal testing** - also requires border workers to visit a testing station, is also conducted by a trained health professional, but instead of the soft-tipped swab being inserted deeply into the nasal passage, it is instead inserted into the back of the throat/mouth. If this type of test is used, then a bilateral anterior nares swab must also be collected at the same time, albeit not as far into the nasal passage as for nasopharyngeal testing, to ensure an adequate amount of the virus is obtained.² Throat swabs are not the preferred method of COVID-19 testing because they are less likely to find the virus and are generally only an option for those unable to tolerate the nasopharyngeal swabs.³
- **Saliva testing** - this method requires border workers to register for the Saliva Testing Programme delivered by Asia Pacific Healthcare Group (APHG) and to download the COVID-19 Saliva Testing App. Once registered, border workers must pick up a testing kit, which should be available at their work. The test itself involves depositing a saliva sample (dribbling) into a tube, using the app to scan the barcode on the tube, sealing the tube into a biohazard bag, and depositing the sample in a drop-off box, which

¹<https://www.healthnavigator.org.nz/health-a-z/n/nasal-swab-test/>

²<https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-information-health-professionals/case-definition-and-clinical-testing-guidelines-covid-19/questions-and-answers-community-testing>

³<https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-health-advice-public/assessment-and-testing-covid-19/how-covid-19-testing-works#types>

should also be available at work. For a description of all the steps involved in COVID-19 saliva testing, see APHG instructions.⁴

Following collection of the sample any of the above methods, polymerase chain reaction (PCR) testing is undertaken to determine if the border worker is currently infected with the virus. Results are texted to border workers, usually within a couple of days.

Embedded within the RTO are several important *behaviours*, namely:

- Border workers need to be tested regularly for COVID-19
- Persons Conducting a Business or Undertaking (PCBUs) need to support the testing initiative as part of their health and safety responsibilities
- PCBUs need to maintain records to show their staff are being tested regularly in order to comply with the RTO

The RTO also sets out the relevant requirements regarding the frequency of testing for all border workers.⁵ Maritime border workers, the key focus for this study, must get tested either once every 7 or 14 days, depending on the nature of their role. Stevedores, who are the maritime border workers responsible for loading and unloading the ships, are required to be tested once every 14 days.

Border workers who have chosen saliva testing must provide samples more frequently - 2 samples every 7 days - because saliva testing is currently only accredited as a 'surveillance' (as opposed to a diagnostic) test.⁶

At any one time, a different percentage of border workers are overdue to be tested, meaning that not all border workers are adhering to the RTO. To address this problem, we investigated the key barriers and enablers to regular COVID-19 testing. The focus was on maritime border workers, particularly stevedores.

The Ministry of Health is also interested in increasing the uptake of saliva testing due to some of its advantages over nasopharyngeal testing: (1) saliva samples can be self-collected without supervision, avoiding possible exposure for healthcare professionals and the need for, and cost of, personal protective equipment (PPE); (2) it is less invasive than the nasopharyngeal swab; and (3) More frequent testing provides more effective surveillance for a vaccinated workforce.⁷

The overarching objective of this project was to identify the factors that most influence maritime border workers' COVID-19 testing behaviour, and make suggestions to increase adherence to the RTO.

⁴ MedLab Central. Saliva Testing for Permitted Workers. Accessed at:

<https://www.medlabcentral.co.nz/media/13788/covid-saliva-testing-for-permitted-workers-aphg-instructions.pdf>

⁵ Parliamentary Counsel Office. COVID-19 Public Health Response (Required Testing) Order 2020. Accessed at: <https://www.legislation.govt.nz/regulation/public/2020/0230/latest/LMS400353.html>

⁶ COVID-19 Saliva Testing - General FAQs. Accessed at:

https://www.health.govt.nz/system/files/documents/pages/saliva-testing-general-faqs-7_9.docx

⁷ New Zealand Ministry of Health. Saliva Testing for COVID-19. Accessed at:

https://www.health.govt.nz/system/files/documents/pages/saliva_testing_for_covid-19_-_factsheet_final_17_sept_2021.docx

There were three sub-objectives:

1. To determine if there are any behavioural constraints and/or limitations in the current infrastructure designed to enable adherence/compliance with the Border Worker Testing Register (BWTR), which might impact timely and effective monitoring/compliance.
2. To explore how to increase the uptake of saliva testing. It should be noted that saliva testing was introduced as an option for maritime border workers part of the way through the project.
3. To examine whether stevedores see themselves as *adhering* to the RTO (i.e. they have positive attitudes to undertaking testing behaviours, do so proactively and likely believe in the legitimacy of the RTO) or *complying* with the RTO (i.e. they view this as a negative behaviour they have to do and may not believe in the legitimacy of the RTO).

Ways of working

Two of our underpinning principles for this project were collaborative design and culturally skilled engagement. We met with the Ministry of Health's Working Group once a fortnight throughout the project to share any insights gathered so far and to seek input into the design of subsequent research activities.

We knew from the beginning how important cultural connection and engagement with Māori and Pacific respondents would be to support meaningful qualitative data. For this reason, we partnered with Dr Maria Baker, the CEO of Te Rau Ora, which is a kaupapa Māori organisation that aims to strengthen Māori health and wellbeing. We also partnered with Gavin Faeamani, a Tongan researcher, who is currently doing his PhD in Public Health.

Maria and Gavin's involvement was built into all phases of the research. They, or their representatives, were directly involved in: co-conducting the interviews with key stakeholders and stevedores; providing input on interview guides and the KAP survey; preparing for and participating in focus groups with stevedores; co-facilitating our Solutions workshop; and the final synthesis and quality assurance (QA) of results. We designed the research so that Maria and Gavin would be equally as involved in front end data collection as the rest of the BIT team. We also met with Maria and Gavin weekly to get their perspectives on key themes and what we were learning so far.

The gap this project addresses

While earlier work has identified barriers and enablers to COVID-19 testing, and provided some clues for strategies to increase adherence to the RTO, it is based on overseas research, and is not specific to maritime border workers (see Appendix 1 for literature scan). The current project directly investigates barriers and enablers to COVID-19 testing amongst New Zealand's maritime border workers and explores promising solutions, tailored to our unique New Zealand context. The next section outlines our methods and key findings.

Explore: Research Findings

To ensure our research methods were appropriately grounded in the current New Zealand testing landscape, we began the project by conducting preliminary interviews with key stakeholders. Key stakeholders included senior staff from: the Ministry of Health's Testing Operations Team and Saliva Testing Team; port-based PCBUs; The Bay of Plenty DHB; Ngati Ranginui (who employ testers at Tauranga port); and the Pacific Island Community Trust.

The interviews informed the three pieces of research we undertook to investigate maritime border workers' and PCBUs' thoughts and experiences of RTO-mandated COVID-19 testing:

- **Conducted interviews with stevedores and PCBUs.** The purpose of the interviews with stevedores and PCBUs was to understand the testing landscape and the key barriers and enablers to regular testing, and to explore what could be done to increase adherence to the RTO. Answers to interview questions informed the design of the KAP survey.
- **Ran a KAP survey with maritime border workers.** The purpose of the survey was to understand maritime border workers' knowledge, attitudes and practices, and to develop a more nuanced understanding of their experiences and behaviours, and any behavioural barriers they encounter when getting tested for COVID-19 as a part of the RTO.
- **Facilitated focus groups with stevedores.** These focus groups were conducted to share and unpack key findings from the KAP survey, and to develop further insights regarding stevedores' experiences specifically. We also used the focus groups as an opportunity to engage stevedores and ask them how we can solve the challenges they experience when getting tested for COVID-19.

Further information regarding the methods, participants, and results of each research activity is detailed in turn below.

Interviews with maritime border workers and PCBUs

Method

Design

We designed interview guides and consent forms for maritime border workers and PCBUs in consultation with key stakeholders. The interviews were designed to collect qualitative information on the COVID-19 testing landscape; the capability, opportunity, and motivational

barriers and enablers to adhering to the RTO; optimal communication channels for maritime border workers; and ideas for the KAP survey.

Recruitment

To recruit maritime border workers, we used purposeful sampling to ensure our interviews covered a diverse range of stevedores, from different ethnic backgrounds and gender, who were based at either Wellington or Tauranga ports.⁸ Two stevedoring companies based at those ports, C3 and Independent Stevedoring, respectively, assisted with the recruitment by asking for volunteers to be interviewed.

To recruit PCBUs, the Ministry of Health supplied us with a list of companies at Wellington and Tauranga ports and key contacts based at either Wellington or Tauranga ports.

All interview participants were offered a \$40 koha (grocery voucher) to thank them for their time and input.

Data collection

The interviews were conducted virtually or over the telephone. Sixty percent of the interviews were conducted by either Maria or Gavin and a member of the BIT team, with the remaining interviews conducted solely by a member of the BIT team. Informed consent was obtained from all participants prior to interviews. Participants were informed about the purpose of the interview, the reasons their views were being sought, how the information gathered would be used, and how the confidentiality of the information they provided during the interview would be protected. Each interview was recorded.

The cultural expertise and perspective brought by Maria and Gavin proved invaluable in interviews. For example, in an interview with two key stakeholders, the GM Māori Health at Bay of Plenty DHB, Marama Tauranga, and the CEO of Ngāti Ranginui, Mel Tata, Maria already had rapport with Marama and had a good understanding of the issues that Mel was raising with respect to their iwi providing a sustainable testing service for port workers. Having Gavin present in interviews meant that we were able to home in on specific cultural questions about who stevedores are most likely to listen to when they are given information about COVID-19.

All of the interviewees were most comfortable speaking English, but having Maria or Gavin present also helped to forge a cultural connection, especially when the interviewees were Māori or Pacific, respectively (40% of interviewees).

Participants

We conducted a total of 10 interviews with stevedores, and four interviews with six managerial staff from PCBUs at the ports of Wellington and Tauranga.⁹ Of the 10 stevedores,

⁸ Wellington port was selected for convenience, while Tauranga port was selected for its relatively large size. In addition, neither of these ports was in a geographical area subject to COVID-19 lockdown. At the time of the interviews, Auckland was in Level 3 lockdown, so was excluded for this reason.

⁹ Two of the PCBU interviews were with two staff each.

two were Māori women, two were Māori men, three were NZ European women and three were NZ European men. Two of the Māori participants also identified as Pasifika. Of the 6 PCBU managers, two were Māori women and four were NZ European men.

Results

Qualitative data from the interviews were thematically analysed, and grouped into four themes: (1) the testing landscape; (2) the key barriers and enablers to adhering to the RTO; (3) motivations for adhering to the RTO; and (4) thoughts on saliva testing.

Testing landscape

According to the RTO, all stevedores need to get tested once a fortnight. In what is essentially a 'stick' approach, if border workers refuse to get tested, their employer feels obligated to end their employment. Indeed, we heard about several stevedores losing their jobs when regular testing first became mandatory. Stevedores are technically allowed to get tested during work time, but the PCBUs (who employ the stevedores) are under huge time pressure to load and unload the ships, and this results in pressure on the stevedores to get tested during their breaks. The requirement to get tested does not change if stevedores are on leave or not at work.

We found that nasopharyngeal testing stations (for nasopharyngeal testing) are located at both Wellington and Tauranga ports. However, the ports are large locations and stevedores at both ports are often driven in a van to the testing station. In addition, the opening hours of the testing stations vary. In Wellington, the testing stations are open at different times on different days of the week. In Tauranga, the testing stations are open the same times each day (12:00 - 5:00 PM), but alternate each week between being open on the Point Sulphur side of the port and the Mt Maunganui side of the port.

At the time of interviewing, saliva testing was just starting to be introduced at the ports. Most stevedores knew about the option of saliva testing, but most had not taken it up.

Main barriers and enablers to regular testing

The most frequently mentioned barrier that emerged to regular COVID-19 testing was related to convenience, specifically stevedores not being at work (either due to being on leave or not rostered on) when their testing falls due. Because stevedores are in the habit of being tested at work, some travel back into the testing station at work to get tested, even though it might be much further away from where they live than another testing station. Another frequently mentioned barrier related to convenience was the testing station not being open when stevedores are at work (a particular issue for stevedores on night shift). Other barriers were as follows:

- **Waiting at the testing station to get the test since testing must be conducted during their break times.** Stevedores often work 12 hour shifts with two 30-minute breaks. Waiting at a testing station to have a nasopharyngeal test can take most of their break time.

“Yes it might stop production, but let’s do that - let’s not make it harder for workers. We could have an accident - if we are tired or hungry. The company should think about that.”

- Border worker interview participant

- **The length of time it takes to get a result.** Test results often take up to 2 days to come through, and can sometimes be delayed for longer. Some stevedores found the delays in receiving the testing results demotivating, as they could be positive without knowing it and potentially put their whānau and communities unnecessarily at risk.
- **The discomfort of getting (nasopharyngeal) test.** At the Wellington port, the discomfort of getting a nasopharyngeal test was exacerbated by one particularly rough nurse. All Wellington based stevedores mentioned this as a barrier. Several reported waiting longer until the gentler nurse was on shift in order to get their test.

“When you are walking out with tears coming out of your eyes with the man doing it compared with the woman doing it...”

“It was very uncomfortable anyway; with him, it is 10 times more uncomfortable.”

- Border worker interview participant

- **Integrating the testing schedule into one’s normal routine.** Stevedores noted the additional burden of remembering to get tested and the logistics of juggling childcare to get tested, especially when testing fell due when they were not at work.
- **Fear of testing positive.** Testing positive to COVID-19 would mean that stevedores would not be able to attend work and would need to make arrangements to quarantine. Stevedores noted that this would significantly impact not only their income and their personal health, but could also put their family/whānau at risk.
- **Resentment of mandatory testing.** Several stevedores reported feelings of annoyance and resentment that the government had made regular and frequent testing a condition of their employment.
- **Concern about catching COVID-19 from nurses at the testing station.** One stevedore indicated that he was concerned about having to wait in line, close to other people, and potentially catch COVID-19 from a nurse at the testing station. His reasoning was that nurses are at higher risk of having COVID-19 because they are exposed to a continuous stream of border workers wanting to be tested.

These barriers are largely consistent with the findings from a survey conducted by Colmar Brunton on the barriers to getting tested for COVID-19 amongst Pacific peoples in South Auckland.¹⁰

¹⁰ Colmar Brunton. (2021). *Impact of COVID-19 on Pacific peoples living in South Auckland*. Report prepared for the Ministry of Health by Colmar Brunton. Accessed at: https://www.health.govt.nz/system/files/documents/pages/impact_of_covid-19_on_pacific_peoples_living_in_south_auckland.pdf

Consistent with behavioural science evidence that behaviours are more likely to occur if they are easy to undertake, or are promoted at opportune times,¹¹ the most frequently mentioned enablers for regular testing were that (1) testing stations are based at the ports; and (2) stevedores receive text message reminders from the Ministry of Health and their PCBU when they are due to be tested, and again if they become overdue for testing.

Motivations for getting tested

Interviews with stevedores suggested that most were just meeting the requirements of the RTO because they had to (compliance).

“If I had a choice, I wouldn’t do it; but it’s just a thing I have to do.”
- Border worker interview participant

Relatedly, a commonly mentioned motivation for regular testing, particularly when the RTO was first enacted, was to avoid the consequences of a fine.

“Yes cos \$300 is a lot of money for a lot of people. People are not too happy about it, but sometimes that is what you have to do to get people more motivated about it.”
- Border worker interview participant

However, as time went on and no stevedores received a fine, it became less of a deterrent.

In contrast, many interviewees mentioned that they were motivated to get tested regularly to protect themselves, their whānau and the wider community (proactive adherence).

“My family and kids; they are my motivation every day.”
- Border worker interview participant

Thoughts on saliva testing

The main finding with respect to saliva testing is that the requirement for more frequent saliva tests (twice a week) is a major barrier to its uptake amongst stevedores.

“If you have the saliva one done, they are coming into your self bubble too often.”
“Everyone is happy with the nose swab every couple of weeks instead of saliva testing every couple of days”
- Border worker interview participant

In general, there was a lot of confusion about saliva testing. This confusion encompassed a lack of understanding amongst stevedores of why the saliva testing needed to be more frequent than the nasopharyngeal testing and the relative benefits of saliva versus nasopharyngeal testing (e.g. that saliva testing does not require lining up at a testing station). This is relatively unsurprising, since saliva testing had not been fully implemented at either Wellington or Tauranga ports at the time the interviews were conducted. The very small number of stevedores who had already selected saliva testing had done so because they

¹¹ Service, O., Hallsworth, M., Halpern, D. et al. (2014). EAST: Four simple ways to apply behavioural insights. Cabinet Office and Nesta: London.

perceived it to be easier and far less invasive or unpleasant compared with nasopharyngeal testing.

“Recipe for disaster - lining up behind everyone else at a testing station; it is a no go for me; I am happy doing twice weekly saliva tests.”

- Border worker interview participant

KAP survey with maritime border workers

Method

Design

The KAP survey was designed to identify maritime border workers’ knowledge, attitudes and practices surrounding COVID-19 testing. This was designed to inform solutions to support maritime border workers to undertake COVID-19 testing, as required by the RTO. To do this, we included three distinct sections of the survey, where we asked about:

- **Knowledge:** This section examined respondents’ knowledge about the need to get tested for COVID-19 (despite vaccination status), and whether respondents knew where, when, and why they should get tested.
- **Attitudes:** In this section we explored respondents’ attitudes to COVID-19 testing and the RTO, including whether respondents were simply getting tested under the RTO because they have to (compliance), perceptions of employer communications regarding testing, preferences for testing methods, and attitudes toward saliva testing specifically.
- **Practices:** To understand maritime border worker behaviour, we asked about how frequently respondents had been overdue for a COVID-19 test, perceived barriers to getting tested regularly, and what factors could make it easier to get tested more regularly.

For more detailed information about the KAP survey, including the exact wording of the questions, see Appendix 2.

Recruitment

The KAP survey was sent out to PCBUs at ports via email, and these PCBUs distributed a link to the survey to their employees via email and/or text message. We also sent an additional email to PCBUs prior to the survey closing, to prompt them to remind their employees to complete the survey. In addition, BIT visited the Wellington and Tauranga ports in person to encourage stevedores to complete the survey, and provided kai (muffins and

grapes) as a reciprocity prompt¹² to those stevedores who had not yet completed the survey, and to thank those stevedores who had already completed the survey.

Workers were eligible to complete the survey if they were able to state (to the best of their knowledge) that they are subject to the RTO, and they held a role in the maritime border force. Respondents who answered that they were not subject to the RTO (or didn't know if they were subject to the RTO), and respondents who indicated that they "don't work in the maritime border workforce" for their role were screened out of the survey.

Maritime border workers who completed the survey were entered into a prize draw to win one \$200 koha (grocery voucher). This prize draw was unlinked to the survey responses, meaning that we were unable to link anything a border worker told us with the personal contact information they provided for the prize draw.

Data collection

The KAP survey was open to respondents between 6 and 15 October 2021. The survey was hosted on an online survey platform (SurveyMonkey) and all data were downloaded off the platform once the KAP survey was closed.

Participants were informed about the purpose of the survey, why we were conducting the research, and how the information would be collected and used. They were also informed that the research was being conducted by an independent research organisation, and that their participation was voluntary and confidential. Respondents were also provided with a link to download and save the Information Statement in the online survey, if they wished to (see Appendix 2 for the information statement). Participants provided informed consent to complete the KAP survey.

Participants

A total of 624 responses were collected for the KAP survey, of which 78% were fully complete. A small portion of respondents completed some of the initial questions, but failed to complete the survey; their results are included in analyses where available. There were 116 respondents (12%) who were screened out of the survey as they did not meet the eligibility criteria. A total of 509 participants provided a response for at least one of the questions following the screening criteria.

We allowed respondents the choice to withhold a response to any question within the KAP survey to allay concerns of the respondents feeling pressured to provide their thoughts on COVID-19 testing. As a result, many questions from the KAP survey were not completed by all respondents, and the sample sizes differ across the questions.

The final sample of respondents comprised:¹³

¹² Reciprocity, or the social norm obliging repayment of favours or gifts etc, is a powerful behavioural motivator. See Fehr, E., & Gächter, S. (1998). Reciprocity and economics: The economic implication of Homo Reciprocans. *European Economic Review*, 42(3-5), 845-859.

¹³ Note that respondents were not obliged to answer the questions collecting demographic information, so there may be some missing responses.

Gender	Percentage of sample
Female	21%
Male	73%
Prefer not to say	6%

Ethnicity	Percentage of sample
Maori	27%
Pacific	5%
Asian	5%
NZ European	50%
Unknown	13%

Border role	Percentage of sample
Stevedore	39%
Non-stevedore	61%

Age	Percentage of sample
18-49	54%
Over 50	41%
Unknown	5%

Results

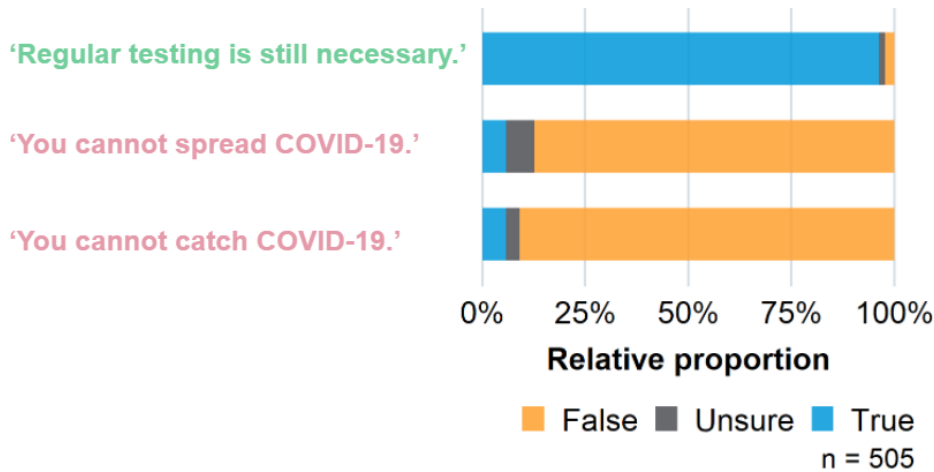
Knowledge

The vast majority of respondents understood the need for testing even if they are fully vaccinated

Most survey respondents had good knowledge of the need for COVID-19 testing and how it spreads. A majority of respondents were able to state that even if they were fully vaccinated, they still required regular testing, and could both spread and catch COVID-19. However, there was a small proportion of respondents who still reported misperceptions about the

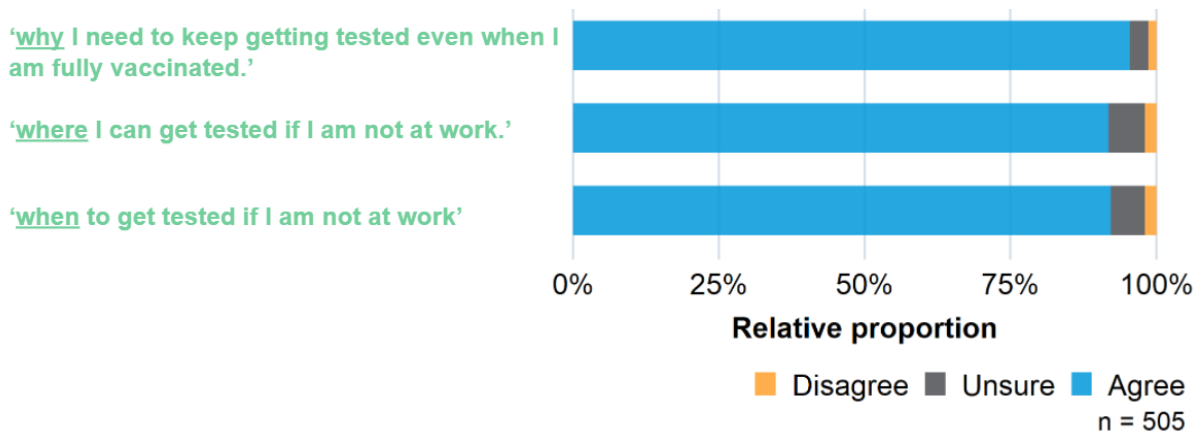
need for testing, and whether COVID-19 can be spread and caught by vaccinated individuals.

Although stevedores and Māori respondents reported lower knowledge about how COVID-19 spreads among the vaccinated, they still understood that they should get tested regularly, regardless of vaccination status.



Most respondents understood why, where, and when to get tested

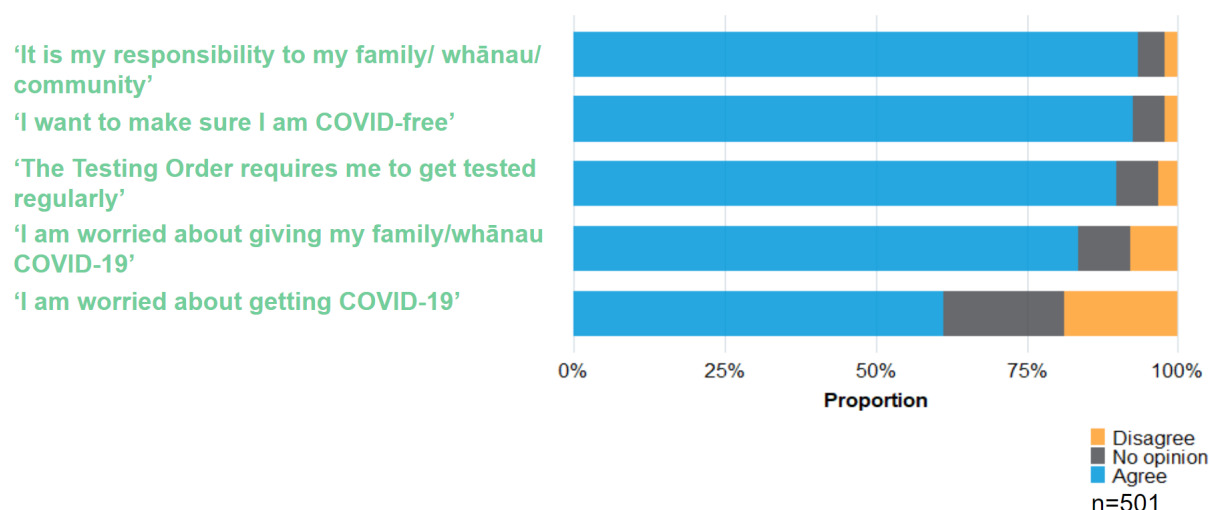
A majority of respondents indicated that they knew where and when they could get tested while not at work. However, there was a small number of survey respondents who indicated that they were unsure where or when to get tested outside of work, or did not know why they needed to keep getting tested when they were fully vaccinated. Although this is a small group of respondents, this is still problematic given the requirement for maritime border workers to stick with their testing schedule, even while not at work.



Attitudes

Compliance with the testing order and responsibility to family/whānau are strong motivators for regular COVID-19 testing

When we asked survey respondents about *why* they get tested regularly for COVID-19, the two most frequently endorsed statements related to wanting to protect one's family/whānau/community, and making sure that the worker is COVID-free themselves. Surprisingly, while workers noted that wanting to make sure they were COVID-free was a motivator for being tested regularly, only 61% of workers agreed that they were worried about getting COVID-19. Twenty percent of maritime border workers disagreed that they were worried about getting COVID-19, and 19% did not state their opinion.



Saliva tests are perceived as a convenient testing option, but there are barriers to access

While there was a slight preference in nasopharyngeal swabs as a method for COVID-19 testing, there is no clear preferred testing method. This suggests that there is an opportunity for saliva testing to become a preferred method of COVID-19 testing for the border workforce in the future. That is because saliva tests are perceived as convenient, given the flexibility in when and where a worker completes the test. For example, approximately one in four survey respondents agreed that they prefer to use saliva testing methods because they do not have to wait in line to be tested.

"Currently the saliva testing programme has been by far the most convenient way of ensuring I keep up with regular testing. As a shift worker, the nasal swab via testing stations was difficult at times to adhere to whilst maintaining my work commitments."

- KAP survey respondent

However, respondents did note that there are some barriers to doing saliva tests. Respondents noted that the number and location of saliva testing drop-off boxes made it more difficult for them to do saliva testing.

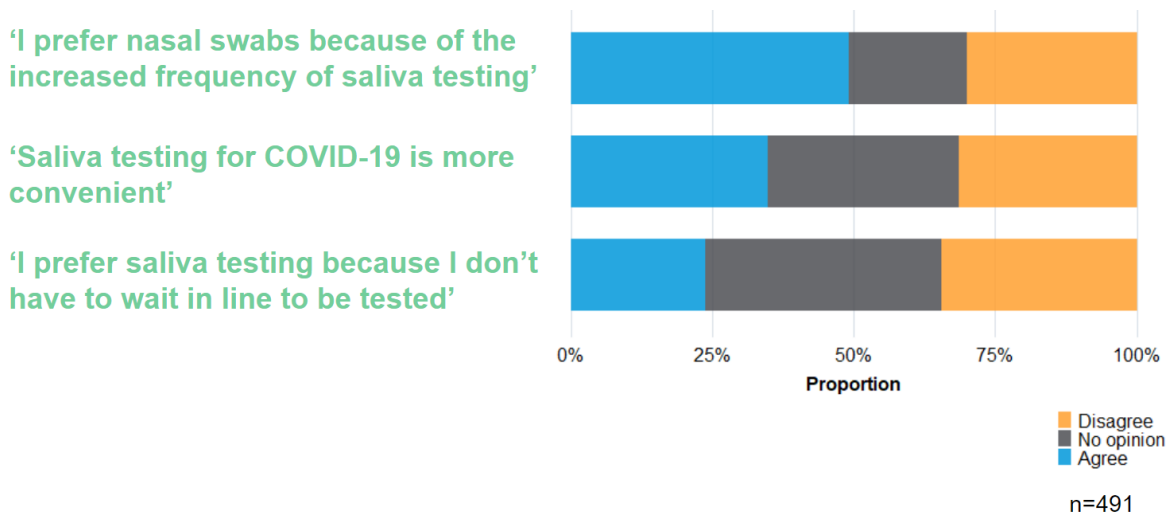
"I guess I would get saliva tested but I don't know where all the drop off points are."

"Lack of saliva testing facilities if I'm away on holiday in a remote area."

- KAP survey respondents

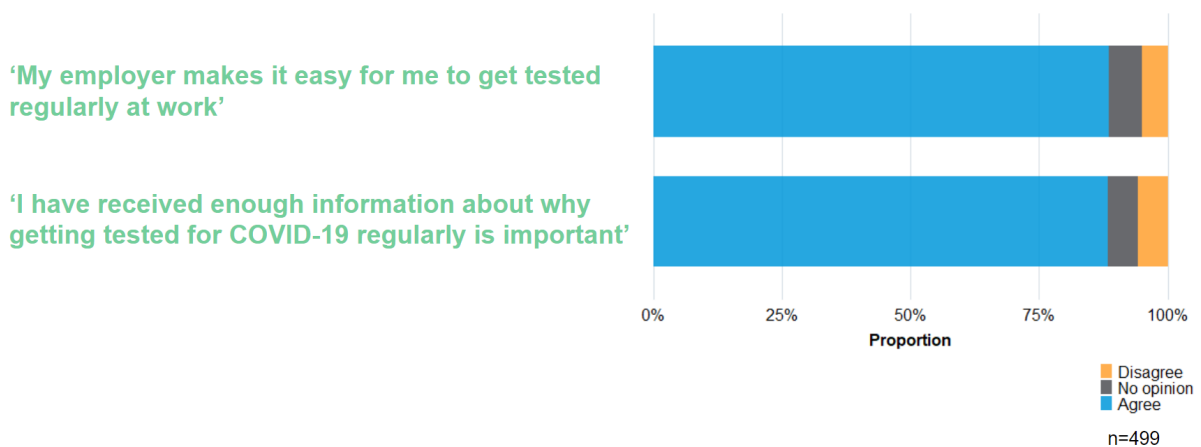
In addition, approximately half of the survey respondents noted that the increased frequency of saliva testing (relative to nasopharyngeal testing) made it a less attractive option for them to choose. This is because respondents noted that the frequency of the saliva tests is multiple times per week, compared to less frequent testing using the nasopharyngeal method.

*“Saliva that had same frequency as nasal swab”
 “If saliva testing was available for regular fortnightly tests.”
 - KAP survey respondents*



Sentiment towards employer communications regarding COVID-19 testing is good

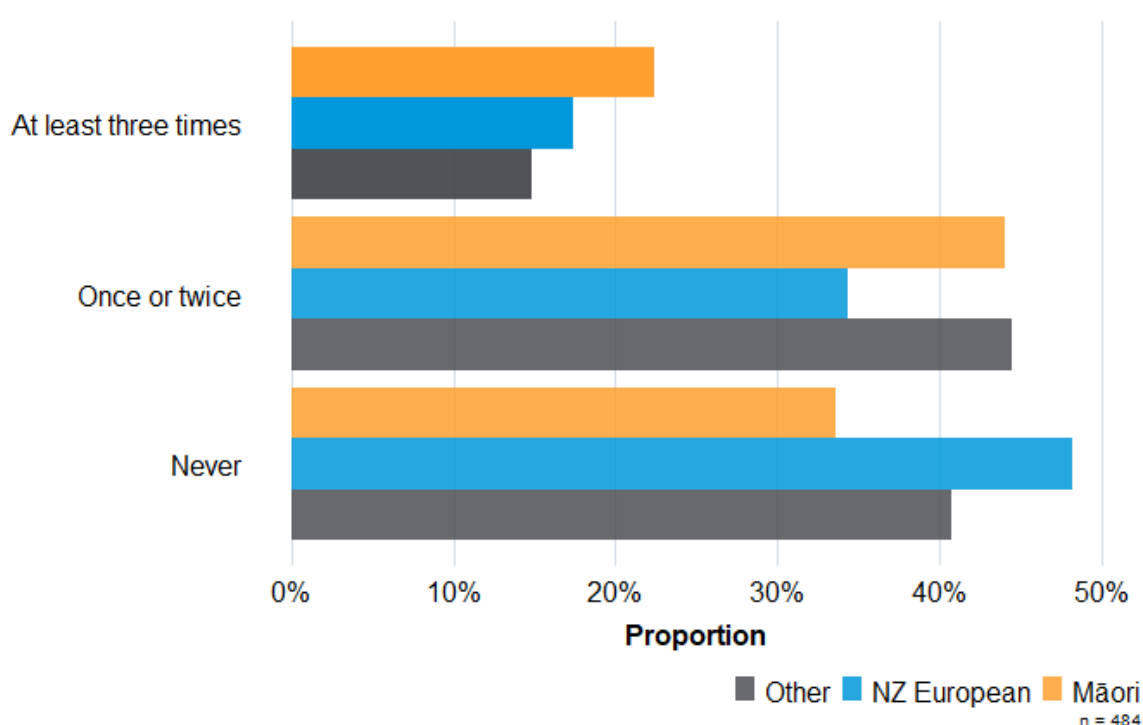
The vast majority of survey respondents agreed that their employer makes it easy for them to get tested regularly (89% agree), and that they have received adequate information about why getting tested is important (88% agree). This suggests that while there are some maritime border workers who may want more information, for the most part workers are satisfied with the level of information their employers have provided about why getting tested regularly is important.



Practices

Over half of respondents have been late for regular COVID-19 testing at least once, and Māori respondents are more likely to report having been late than NZ Europeans

Slightly fewer than half of the respondents told us that they have never been late for their regular COVID-19 test. However, there were differential rates of self-reported lateness for COVID-19 testing, dependent on respondent ethnicity. Survey respondents who identified as Māori were more likely to self-report that they had been late for COVID-19 testing at least once, relative to NZ European-identifying respondents. Thirty four percent of Māori respondents self-reported never having been late for a COVID-19 test, compared to 48% of NZ European respondents. This suggests that Māori maritime border workers may face unique challenges in getting tested for COVID-19 on time, relative to other border workers.



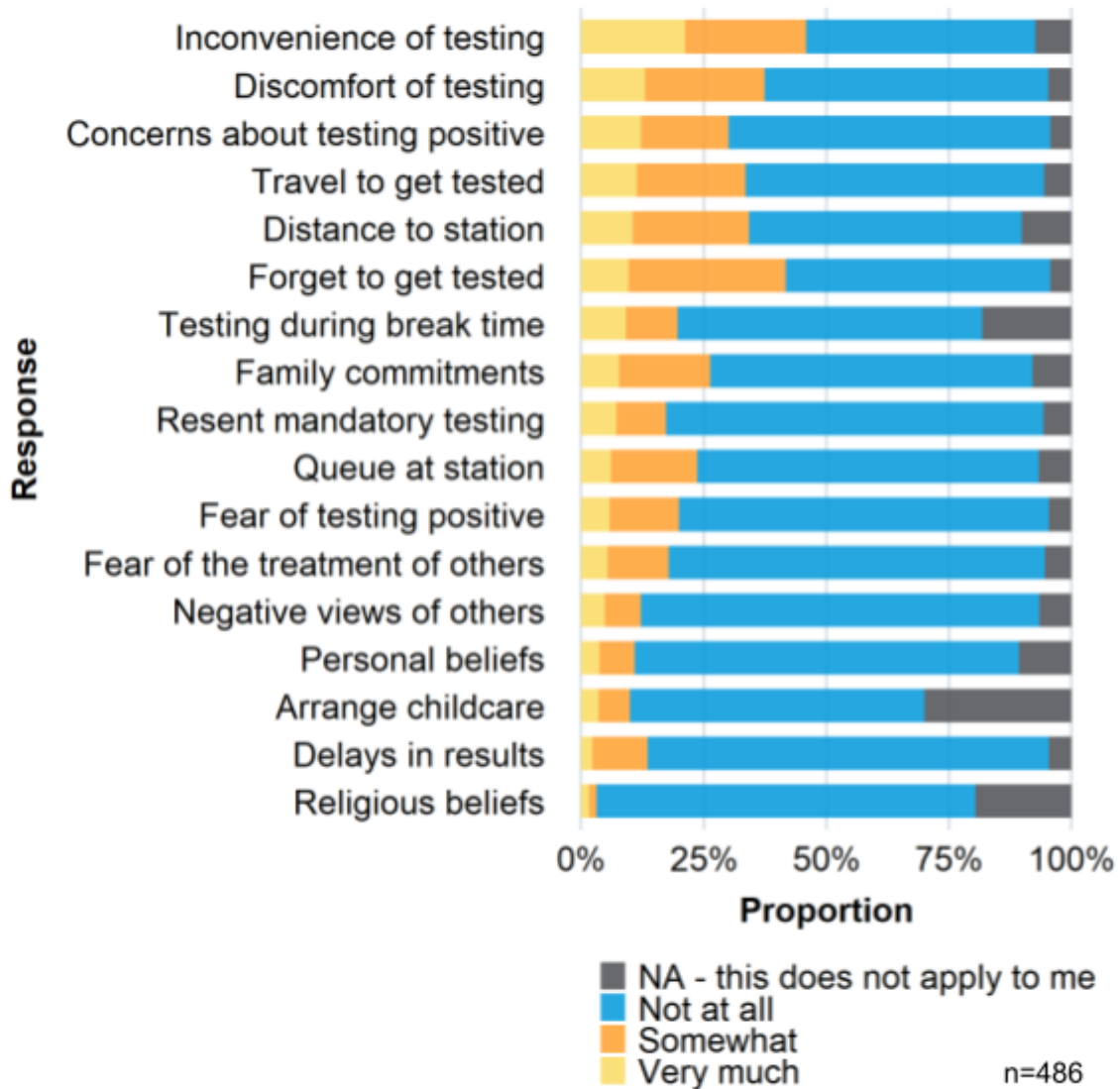
The most common barriers to regular testing are difficulty getting tested outside of work, needing to remember, test discomfort, and distance from testing venues

To understand the barriers that maritime border workers face getting tested regularly for COVID-19, we asked about whether specific factors have stopped, or could stop, survey respondents from getting tested. These factors were included in the survey based on previous literature, and our interviews with stakeholders.

For many of the barriers we asked about, many respondents indicated that the factor was “not at all” a barrier to getting tested regularly for COVID-19 testing (shown in blue on the chart below). However, approximately half of the survey respondents indicated that “The inconvenience of having to get tested outside of work (i.e., while rostered off, or on leave)” can make getting tested regularly for COVID-19 at least somewhat difficult. Forty percent of

respondents also indicated that forgetting to get tested has stopped them, or could stop them, from getting tested regularly.

Interestingly, the need to get tested during break time and delays in receiving results came up frequently during interviews as something that makes it difficult for maritime border workers to get tested for COVID-19 regularly, but this was not consistently reflected in the survey responses. Only 13% of survey respondents indicated that delays in results could stop them, or has stopped them, from getting tested regularly, and 20% of respondents told us that getting tested during their breaks was a barrier to getting tested.



Focus groups with stevedores

Method

Design

The two focus groups were designed to test some of the key themes that emerged from the KAP survey and to discuss with border workers the solutions they thought would work best for them to increase their adherence to the RTO. The focus groups were designed to unpack four key findings from the KAP survey:

1. Nasopharyngeal swabs are preferred over saliva testing, but not by much
2. A common barrier to testing is concerns about testing positive
3. Motivations to get tested is responsibility to whānau
4. Most border workers know where and when to get tested

Recruitment

To recruit stevedores for the two focus groups, we asked for assistance from two PCBUs, based at Wellington and Tauranga ports, respectively, to recruit 5-6 stevedores with diverse characteristics. We requested that the participants be different from those whom we interviewed in the Explore phase to maximise the heterogeneity of input and to robustly test the key themes that had emerged.

The Wellington PCBU asked for volunteers to participate at a certain time and day, while for the Tauranga port, participants were whoever happened to be at the port on the day we visited and agreed to participate.

All focus group participants were offered a \$40 koha (grocery voucher) to thank them for their time and input.

Data collection

The focus groups were conducted face-to-face, each with two facilitators, one cultural expert and one member of the BIT research team. Because Maria and Gavin were in lockdown at the time of the focus groups, they nominated two representatives, Kirimatao Paipa and Veisia Pulu, respectively, to participate on their behalf. Kirimatao co-facilitated the focus group at Wellington port, while Veisia co-facilitated the focus group at Tauranga port.

Each focus group was approximately 30 minutes, to accommodate the time pressure stevedores are under to load and unload the ships. In each focus group, we explored three of the four topics. In Wellington, we unpacked topics 1, 2, and 3. In Tauranga, we unpacked topics 1, 2, and 4.

Informed consent was sought from all participants prior to the focus groups. Participants were informed about the purpose of the interview, the reasons their views were being sought,

how the information gathered would be used, and how the confidentiality of the information they provided during the focus group would be protected. Each focus group was recorded.

Participants

A total of 11 stevedores participated in the two focus groups, six in Wellington and five in Tauranga. Of the Wellington stevedores, one was a Māori woman, three were Māori men, and two were NZ European men. Of the Tauranga stevedores, there was one Māori man, one Māori woman, and three NZ European men.

Results

For each of the four selected topics, we unpacked their meaning further and discussed possible solutions with stevedores. Below we describe the outcomes of the focus groups, and in the subsequent Solutions section, discuss the solutions generated by focus group members.

Nasopharyngeal swabs are preferred over saliva testing, but not by much

The main reason for nasopharyngeal swabs being preferred by stevedores over saliva testing is that stevedores are in the habit of nasopharyngeal testing once a fortnight and it is relatively easy for them, since the testing stations are based at the ports. Nevertheless, nasopharyngeal testing can take up to 20-30 minutes to complete, especially if there is a line at the testing station, and there is some resentment that this can use up most of the stevedores' break time.

With respect to saliva testing, focus group participants suggested that the main barrier is its higher frequency (twice a week). This finding is consistent with what we found in the interviews.

*“The frequency of saliva testing is hoha, but not if they make it easier.”
- Focus group participant*

Two new insights emerged from the focus groups about saliva testing. First many of the focus group participants did not know where the drop-boxes were for saliva testing. They did not know where the nearest drop-box was to their home and some did not even know where the drop-box at work was.

Second, ‘IT stuff’ was identified as a barrier to saliva testing. ‘IT stuff’ referred to the requirement to download an App, and scan barcodes and QR codes on their phone. This was perceived to be challenging, especially for those not in the habit of using their phone for scanning purposes or familiar with mobile phone technology.

Those choosing the saliva method had done so to avoid the discomfort of nasopharyngeal or throat swabs and to avoid having to wait in line.

*“I don’t enjoy gagging.”
- Focus group participant*

A common barrier to testing is concerns about testing positive

We knew from the interviews that fear of testing positive was a barrier to testing. The KAP survey confirmed that concerns about testing positive were fairly common amongst maritime border workers. When we explored this further with stevedores in the focus groups, several different types of concerns emerged about testing positive. These included:

- **Stigma, or worrying about what others will think.** Stevedores in Tauranga reported that they would be worried that others would think negatively about them if they received a positive test.

*“... being **that** person with COVID.”*

- Focus group participant

Interestingly, the Wellington stevedores said they did not worry about what others would think if they received a positive test. It is not clear why the Wellington stevedores differed from the Tauranga stevedores in this respect. At the same time, stevedores recognised that stigma could decrease as more people test positive for COVID-19.

- **Health concerns for self and vulnerable whānau members.** Stevedores also worried about the health implications if they test positive. They did not want to get COVID-19 themselves and did not want to pass it on, especially to vulnerable whānau or community members.

“You might die...”

“I think COVID will hurt. I have trouble enough with the normal cold.”

- Focus group participants

- **Not knowing what to expect if they receive a positive COVID-19 test.** There was a lack of understanding of what happens following a positive COVID-19 test. For example, stevedores did not know whether they would have to isolate at home or go into a MIQF. Stevedores reported that the different stories and changing messages in the media contributed to the confusion.
- **Negative connotations about MIQFs.** Stevedores reported that they thought of MIQFs like a ‘remand’ centres. This is likely due to media coverage portraying people stuck or locked up inside hotels. They associated MIQFs with being a ‘police state’, where citizens’ activities are monitored and scrutinised, even suggesting that MIQFs should be given a more friendly name to counteract the negative connotations.
- **Going into isolation and potentially being away from whānau.** One of the biggest concerns about testing positive was literally being in isolation, separated from whānau.

“...put in a hotel and separated from whānau.”

“For me, it would be grandkids; not seeing them.”

- Focus group participants

This concern is not surprising, as humans need emotional connection for their wellbeing. Many stevedores did not understand that whānau could join them in quarantine if they wanted to.

- **Losing money because you can't work.** Many stevedores come from relatively disadvantaged backgrounds and stevedoring is not a highly paid role. Exacerbating matters, a relatively large proportion of stevedores are on casual contracts, so only get paid when they are called into work when the boats arrive. Receiving a positive COVID-19 test means not being able to go to work and that means not being able to provide for the whānau.

A common motivation to get tested is responsibility to whānau

The KAP survey revealed that one of the most common motivations to get tested regularly was a sense of responsibility to whānau, to keep them safe from COVID-19. Stevedores report being more worried about giving their whānau COVID-19 than catching it themselves.

The sense of responsibility to whānau remained consistent, even as the nature of the motivations to get tested varied. We explored whether stevedores get tested regularly only because they are required to (compliance) or whether they make an active choice (adherence).

We found that stevedores' motivation changed depending on their perception of the risk of COVID-19 being transmitted in the community. They told us that in the absence of a major outbreak, they get tested mostly because it is a requirement for work, and they need to provide for their families and whānau.

"You just gotta do what you have to do."

- Focus group participant

However, in the event of a significant outbreak, stevedores said they would make more of an active choice to get tested regularly in order to prevent their whānau and others from being infected. Thus, regardless of whether stevedores are complying with or adhering to the RTO, they are doing so for their whānau.

In exploring motivators to get tested, several new factors emerged in the focus groups that reduce stevedores motivation to get tested regularly:

- **Lack of acknowledgement of stevedores as a workforce protecting the border.** Stevedores reported that they were under-appreciated for continuing to work hard during all the COVID-19 lockdowns and for the sacrifices they were having to make, such as regular testing, to continue doing their job. They perceived that other frontline workers had been acknowledged for their role in keeping things going during the lockdowns, but felt left out of this acknowledgement.
- **Inconsistent messaging from management and misinformation on social media.** Stevedores reported that they felt some confusion about why they needed to keep

getting tested regularly, partly as a result of changing messages from management and misinformation they received from social media.

- **Lack of understanding regarding why they need to keep getting tested when fully vaccinated.** Several stevedores in the focus groups reported that they did not understand why they need to keep getting tested even when fully vaccinated. Not having a clear rationale for continuing to get tested regularly reduced their motivation to adhere to the RTO.

Most border workers know where and when to get tested

As shown in the KAP survey results, most maritime border workers reported knowing where and when to get tested, even outside of work. We wanted to see if this was really the case for stevedores or whether they felt pressure to respond in a certain way in the survey.

Similar to what we heard in the interviews, stevedores in the focus groups generally knew where and when to get tested at work, but they found it difficult to remember exactly when the next test was due.

*“We forget when we had the last test because we have had so many.”
- Focus group participant*

In addition, not all focus group participants knew where the closest testing station or drop-off box was to their home. Some of them did know, however, to ‘google it’ or ring Healthline or their GP to find out.

Solution: Co-designed behavioural solutions and recommendations

Testing remains a central pillar of New Zealand's clinical and public health response to the COVID-19 pandemic. The infrastructure put in place to enable compliance with the RTO, namely communications to PCBUs, the BWTR, testing stations based at the ports, and text message reminders, has largely been successful. The compliance of maritime border workers with the RTO is now relatively high.

Adherence is a different matter. Focus group participants told us that adherence increases when there is more community transmission, as border workers make a more active choice to protect themselves and their families and whānau. It is likely that further enhancing adherence to the RTO will require more nuanced communications, in which the rationale for the desired ongoing behaviour is clearly explained, and where the messenger/s are carefully chosen.

However, a single approach to encouraging COVID-19 testing amongst maritime border workers is unlikely to work.^{14,15,16} The maritime border workforce is made up of a high percentage of casual Māori and Pacific workers. We found that Māori respondents to our KAP survey were more likely to report being late once or twice with their testing, suggesting that a culturally tailored approach is required to address inequities and ensure adherence to the RTO. An equity lens recognises that different resourcing is required in order for different groups to reach similar levels of adherence to the RTO.¹⁷ It would therefore not be appropriate to assume that a single strategy, such as a given information campaign, would suffice when it comes to improving adherence to the RTO.

It would also be unsuitable for the Ministry to focus all of its resources on enhancing adherence to the RTO via just nasopharyngeal testing at the expense of saliva testing. As noted above, saliva testing offers several key advantages over nasopharyngeal testing, including self-collection, lower invasiveness, and more effective surveillance as a result of more frequent testing.

We conducted a 2-hour online solutions workshop to generate solutions to increase maritime border worker testing. These solutions were generated based on the findings from the Explore research, and evidence from the behavioural sciences literature more broadly. In the

¹⁴ Mina, M. J., & Andersen, K. G. (2021). COVID-19 testing: One size does not fit all. *Science*, 371(6525), 126-127.

¹⁵ King, P., Cormack, D., McLeod, M., Harris, R., & Gurney, J. (2020). COVID-19 and Māori health—when equity is more than a word. *Public Health Expert*. Accessed at: <https://blogs.otago.ac.nz/pubhealthexpert/covid-19-and-maori-health-when-equity-is-more-than-a-word/>

¹⁶ Loane, J., Percival, T., Laban, W., Lambie, I. (2021). All-of-community by all-of-government: Reaching Pacific people in Aotearoa New Zealand during the COVID-19 pandemic. *NZMJ*, 134(1533): 96-103.

¹⁷ Robson, B., & Harris, R. (2007). *Hauora: Māori Standards of Health IV. A study of the years 2000–2005. Wellington: Te Ropu Rangahau Hauora a Eru Pomare.*

workshop, BIT provided participants a brief overview of the findings of the Explore research and behavioural insights principles. Participants then split into two breakout rooms, with one focusing on increasing the uptake of saliva testing, and the other focusing on increasing the uptake of nasopharyngeal testing.

In these breakout rooms, groups brainstormed and discussed possible solutions, including those that were suggested by border workers in interviews and focus groups, and prioritised a solution (consisting of one idea or multiple ideas) to take forward. For the remainder of the workshop, participants then discussed in their breakout rooms how the solution could be implemented, and how behavioural insights principles could be applied to enhance the solution implementation. In the main group, participants then shared back their solution ideas, and the group provided feedback and suggestions on how the solution could be improved, and additional considerations to be made.

The solutions workshop participants were representatives from: the Ministry of Health; the Ministry of Business, Innovation and Employment (MBIE); Maritime New Zealand; the Ministry for Primary Industries; the Ministry of Transport; and Customs. The workshop was delivered by the Behavioural Insights Team, Dr Maria Baker, and Gavin Faeamani.

Below, we describe the ideas that emerged from the workshop, as well as our Explore research, for improving maritime border workers' adherence to the RTO via both nasopharyngeal and saliva testing, and the unique implementation considerations that should be taken into account to ensure the success of different solutions, particularly from an equity point of view. We have also rated the feasibility and likely impact of different solutions. We have grouped our solutions under two categories:

- A. Solutions that apply to both nasopharyngeal and saliva testing:** These are overarching solutions that can be implemented to increase the uptake of either nasopharyngeal testing, saliva testing, or both. They operate at a greater, whole-of-system level, compared to our solutions that are specific to saliva testing.
- B. Solutions that apply specifically to increasing the uptake of saliva testing:** Given the Ministry's ongoing interest in promoting saliva testing, these solutions relate to how the Ministry can increase the uptake of saliva testing within the current testing regime. The solutions also address how the saliva testing process can be tailored and improved to promote greater uptake of saliva testing methods among maritime border workers.

A. Solutions that apply to both nasopharyngeal and saliva testing

Solution A1



Increase the convenience of testing for border workers and their knowledge of testing locations

Recommendation: Increase the ease and convenience of testing for border workers and ensure that all border workers know where the closest testing station or drop-off box is to their home. This could be achieved via a number of steps:

- Make the port-based testing stations mobile. Rather than border workers having to visit the port-based testing station, which is often a long walk or a short drive, the testing station could be taken to convenient locations to catch workers during their breaks or upon arrival at work.
- Provide more drop-off boxes for saliva testing in convenient locations and make sure border workers are told where they are
- Tell all border workers where the nearest drop-off box or testing station is to their home.

Implementation considerations:

- **Consider the best temporary locations for the mobile testing station** - Mobile testing stations, where the nurses go to the border workers (rather than the border workers having to drive or walk to the port-based testing station) could be made available at all large ports. For example, having a mobile station temporarily based near border workers' break rooms or in areas where workers enter or exit the port could make it much easier for border workers to regularly get tested on time.
- **Provide safe environments for nursing staff and border workers** - In our Explore research, one border worker indicated that he was concerned about potentially catching COVID-19 from nurses at the testing station. Equal care should be taken with setting up temporary mobile stations as has been taken with setting up the more permanent port-based testing stations, for example continuing to ensure that nurses are equipped with personal protective equipment (PPE) and providing enough space so that workers waiting to be tested can maintain physical distancing from each other.
- **Ensure border workers know where the saliva drop-off boxes are** - The current saliva drop-boxes are reasonably salient, although given the size of many ports, convenience could be improved by increasing the number of drop-boxes. However, no matter how many drop-boxes there are, border workers are less likely to select saliva testing if they don't know where they are.
- **Consider the optimal way to inform border workers of the closest testing station or drop-off box to their home** - border workers could access a texting platform (via text messages, not an app) that they can text their current location or home address to, and the texting platform would provide an auto-reply that indicates where the closest testing station or drop-off box is to that location.



Feasibility - Low Medium High



Impact - Low Medium High

Supporting evidence from the Explore research:

- In the survey, we found that stevedores knew where to get tested when at work, but were less certain of where the closest testing station was to their home.
- In the interviews and focus groups, we were also told that this is a challenge for casual workers, because their testing day can fall due on a day they are not at work.
- The KAP survey revealed that the inconvenience of getting tested outside of work is the largest barrier to adhering to the RTO.
- Most maritime border workers go to a testing station at their port, which can require driving to a testing station, waiting for the test, and then driving back; This process can take 20-30 minutes, and often occurs on stevedores' lunch or smoke break. In our interviews and focus groups, border workers told us that getting tested can often be quite demanding on their time, and that they are already under significant pressure to perform their roles at the port.

Behavioural Insights Principles:

- One of the most fundamental principles of behavioural science is that if you want to encourage a behaviour, make it easier.¹⁸
- Nudges involving simplification (i.e., making a communication or process easier) demonstrate above average effect sizes, relative to nudges involving other mechanisms.¹⁹

Solution A2

Provide operational transparency surrounding the COVID-19 testing process and what workers can expect if they test positive

Recommendation: Provide maritime border workers with greater information and operational transparency surrounding:

- **The testing process and what they can expect on each testing occasion:**²⁰ If possible, border workers should be given information about how long their test results should take to arrive, on each testing occasion. The Ministry could also consider expediting testing for border workers and letting workers know when their tests will be expedited. We note, however, that any prioritisation would need to occur within the operating constraints and priorities of a local outbreak.²¹

¹⁸ Service, O., Hallsworth, M., Halpern, D. et al. (2014). *EAST: Four simple ways to apply behavioural insights*. Cabinet Office and Nesta: London.

¹⁹ DellaVigna, S., & Linos, E. (2020). RCTs to Scale: Comprehensive Evidence from Two Nudge Units. NBER Working Paper Series.

²⁰ Note that this solution can also apply to other essential workers, and individuals for whom a test is a priority and/or expedited, such as individuals living with a disability.

²¹ We recognise that there are limitations surrounding which test results are prioritised for processing, depending on the context. For example, as noted in the Solutions workshop, if there is a local outbreak, then tests from those who have attended high risk and/or exposure sites should be prioritised. However, in the event of an outbreak of the Omicron variant, the focus may shift back to the border.



Feasibility - Low Medium High



Impact - Low Medium High

- **The reason for delays in the receipt of results (if there are any):** Given the fast-evolving nature of the pandemic and the requirement for responsiveness in the testing system, we recommend that where there are delays to the receipt of results for maritime border workers, they are told when and why this is the case. For example, workers could receive a generic holding text from the Ministry that the testing system in their local area is operating at a “surge” capacity, due to a local outbreak, or that the Ministry is currently prioritising processing tests from workers from other industries or priority groups.
- **What they can expect if they test positive to COVID-19:** Border workers should be provided with greater clarity about what happens if a worker tests positive. For example, workers should explicitly be told that their whānau can stay with them in a MIQ facility, if desired, and that they will be eligible for additional financial support from MSD.

Implementation considerations:

- **Ensure Māori and Pacific partnership in the design of the messages -** Operational transparency and related information campaigns may work well among some groups of people and be less effective for others. Māori and Pacific involvement will ensure an equity lens is taken and that culturally nuanced messages are implemented for Māori and Pacific peoples.
- **Provide accurate information to workers -** Operational transparency can be a powerful method of increasing engagement with a particular service, however care needs to be taken to provide accurate estimates of wait time, for example. If border workers perceive that the estimates of wait time are inaccurate, or that the estimates do not reflect their experience, there is the potential that the solution could lead to an unexpected backfire in worker engagement.
- **Framing of messages -** Consider framing messages about adhering to the RTO in the context of protecting whānau and jobs.
- **Consider how a smaller-scale or pilot version of this solution could be implemented -** Solution A2 would require a whole-of-system approach to testing, which we understand that the Ministry is currently working on. However, there are smaller-scale versions of this solution that could be implemented in the interim, such as sending text messages to PCBUs notifying them of, and explaining the reasons for, any expected delays in testing.

Supporting evidence from the Explore research:

- Maritime border workers told us that they were concerned about the delay in receiving test results, and testing positive for COVID-19 and what happens to themselves, their whānau, and their income (and this was particularly true for Māori respondents).
- A significant motivator for maritime border workers to get tested regularly was their sense of responsibility to family, whānau and community.

Behavioural Insights Principles:

- Operational transparency is an effective method for increasing trust and engagement with government, in part via increasing citizen perceptions of



Feasibility - Low Medium High



Impact - Low Medium High

government effort toward fixing problems, and via increasing citizen perceptions that engaging with government is impactful.²²

- Operational transparency has been shown to increase perceptions of effort and trust in other non-government contexts.²³

Solution A3



Publicly acknowledge the contributions that maritime border workers are making to keep New Zealand safe

Recommendation: Explicitly and frequently acknowledge the role that maritime border workers play in providing critical services to the New Zealand community, and keeping New Zealand safe. This acknowledgement could be provided via several sources:

- **Weekly newsletters disseminated to the PCBUs:** The important and crucial role that maritime border workers play in protecting the border of New Zealand should be acknowledged frequently within the weekly PCBU newsletters. This aims to provide ongoing assurance that the work border workers are doing is valued, and is targeted towards PCBUs and maritime border workers.
- **Ministry of Health communications:** Ministry communications could be used to provide acknowledgement for the role that maritime border workers play in keeping New Zealand safe to a broader audience. For example, the Ministry could use diverse platforms including digital and print media, specific webpages, or social media content to publicly recognise the role that border workers have fulfilled in the COVID-19 pandemic.
- **Press conferences:** In addition to the two primary methods (above), New Zealand government briefings or press conferences could be used to provide recognition of the tough role that border workers have undertaken in the pandemic, and their active role in keeping all New Zealanders safe through regular testing. We recommend that this is a supplementary method of acknowledging maritime border workers, and should be deployed less frequently compared to the other two methods because it is a more crucial channel for information provision to the general public, and has the potential to become “bloated” with non-crucial information that may seem ingenuine.

Implementation considerations:

- **Ensure Māori and Pacific partnership in the design of the communications** - This will ensure Māori specific health messaging, which has been a key feature

²² Buell, R.W., Porter, E. & Norton, M. I., Surfacing the Submerged State: Operational Transparency Increases Trust in and Engagement with Government (January 26, 2020). Harvard Business School Marketing Unit Working Paper No. 14-034, Harvard Business School Technology & Operations Mgt. Unit Working Paper No. 14-034,

²³ Mejia, J., Urrea, G. and Pedraza-Martinez, A.J. (2019), Operational Transparency on Crowdfunding Platforms: Effect on Donations for Emergency Response. *Prod Oper Manag*, 28: 1773-1791. <https://doi.org/10.1111/poms.13014>



Feasibility - Low Medium High



Impact - Low Medium High

in the successful Māori response to COVID-19.²⁴ For example, the ‘Protect your whakapapa’ campaign could work for increasing adherence to testing as well.

- **Learn from previous successful Māori health promotional campaigns -** Critical success factors from previous Māori health promotional campaigns include:
 - Kaupapa Māori solutions
 - A holistic approach
 - Māori messaging and messengers
 - Narratives and messages that are careful not to take a deficit approach or victim blame Māori
 - Multi-dimensional strategies that focus on the social determinants of health
- **Test communications to make sure they are perceived as genuine -** The Ministry should workshop the communications to ensure that they feel and are perceived as genuine. This mitigates the potential risk that workers do not find the communications as genuine, or that workers find the communications forced.
- **Avoid publicly identifying border workers -** Care should be taken not to publicly identify any individual who is employed at the maritime border. There is a risk that workers could be excluded from public or family life due to the perception that they are a “COVID risk”, or could be carrying COVID unknowingly.
- **Frame the messages carefully -** Care should be taken to avoid inadvertently communicating that maritime border workers are not compliant with the RTO, or that they are at significant risk of contracting COVID-19 and therefore passing it onto the community.

Supporting evidence from the Explore research:

- Maritime border workers undertake essential work, even outside of a pandemic. However, during the COVID-19 pandemic, the pressures of their job have increased due to the increased precautions necessary, including regular COVID-19 testing.
- Feedback from maritime border workers suggested that workers feel underappreciated for the work they are doing and the sacrifices that they make, particularly in contrast to other essential workers (e.g., grocery store workers), who have received public acknowledgement.

Behavioural Insights Principles:

- Evidence from the behavioural sciences and therapy literature suggests that acknowledgement of effort builds rapport. Rapport is a connection or relationship with someone else, which is important for influencing behaviour change.^{25,26}

²⁴ One, A.T. & Clifford, C. (2021). Tino rangatiratanga and well-being: Māori self determination in the face of COVID-19. *Frontiers in Sociology*, 6: 613340. doi: 10.3389/fsoc.2021.613340

²⁵ Bundy, C. (2004). Changing behaviour: Using motivational interviewing techniques. *Journal of the Royal Society of Medicine*, 97(44): 43-47. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1308798/pdf/15239293.pdf>

²⁶ Dombrowski, S.U., O’Carroll, R.E., & Williams, B. (2016). Form of delivery as a key ‘active ingredient’ in behaviour change interventions. *British Journal of Health Psychology*, 21: 733-740.



Feasibility - Low Medium High



Impact - Low Medium High

- When an employee feels that their efforts are recognised, this can increase productivity, engagement, and motivation.^{27,28}

Solution A4



Facilitate competitions and leaderboards within and across PCBUs to make testing more attractive and social

Recommendation: Use friendly competitions among PCBUs, and small incentives for winning these competitions, to facilitate testing among maritime border workers. The competition should be across PCBUs, be visible to all maritime border workers, provide comparisons with other PCBUs, and provide rewards that are attractive to border workers as an incentive for participation in the competition.

Implementation considerations:

- **Balance the mandatory aspect of the RTO and the competition** - Care should be taken to balance the implementation of the competition/leaderboard with communicating about the RTO. It is crucial that maritime border workers do not inadvertently come to believe that, because there is a competition or leaderboard surrounding testing, that the testing itself is no longer mandatory. While this is not a significant risk, this possibility was raised within the Solutions workshop as an implementation consideration.
- **Consider the level of competition** - The granularity of the competition and/or leaderboard will need to be workshopped with PCBUs. For example, the Ministry could either administer the competition/leaderboard centrally, or provide comprehensive materials for the PCBUs to do so. This would mean that PCBUs would be competing against one another, or that teams within PCBUs would compete against one another, respectively.
- **Avoid unnecessary burden for PCBUs** - The Ministry should ensure that PCBUs do not experience unnecessary burden due to participating in such a competition/leaderboard. Should the Ministry choose not to administer the competitions centrally, the Ministry should create and disseminate materials that the PCBUs can simply take forward, rather than putting the onus of creating materials on the PCBUs themselves.
- **Offer incentives** - Incentives could be offered for high-performing or particularly engaged PCBUs, such as funding for BBQs or other social events. However care will need to be taken to avoid inadvertently communicating that the compliance with the RTO is not mandatory, and that the incentives themselves are COVID-safe.

²⁷ Bradler, C., Dur, R., Neckermann, S., & Non, A. (2013). Employee Recognition and Performance: A Field Experiment. Accessed at: <https://madoc.bib.uni-mannheim.de/33289/1/dp13017.pdf>

²⁸ Dobre, O.I. (2013). Employee motivation and organizational performance. Review of Applied Socio- Economic Research. 5(1), 53-189.



Feasibility - Low Medium High



Impact - Low Medium High

Supporting evidence from the Explore research:

- Workers told us that they were particularly motivated to get tested by the provision of incentives, including the provision of kai. One way to do this would be to implement these incentives via a leaderboard or competition.

Behavioural Insights Principles:

- There is significant evidence in the behavioural sciences literature that suggests that competitions and leaderboards are an effective method to promote behaviour change. This is because they reinforce social norms surrounding the behaviour - that is, people see what others like themselves are doing. These norms can be effective even when the individuals themselves are not aware of the influence of the norm on their behaviour.²⁹

B. Increasing the uptake of saliva testing

Solution B1



Clearly communicate the benefits of saliva testing and provide a rationale for the desired behaviour

Recommendation: Communicate the benefits of saliva testing to maritime border workers. For example, saliva testing overcomes many of the barriers associated with nasopharyngeal testing - workers don't have to lose their break time waiting in line to get tested and it takes the burden off nurses.

- **Provide a rationale for the desired behaviour** - Let border workers know why more frequent saliva testing is required or why they need to keep getting tested, even when fully vaccinated; make sure their key concerns are addressed.
- **Consider developing a mnemonic** - This could help border workers remember the key steps involved in saliva testing, for example 'Salivate, Seal, Scan'.

Implementation considerations:

- **Ensure Māori and Pacific partnership in the design of the communications** - This is vital to ensure tinorangatiratanga and that benefits are communicated in a culturally nuanced way.
- **Use Māori and Pacific models of health when communicating the benefits of saliva testing** - These articulate important aspects of hauora and provide a holistic, strengths-based language that is likely to be important when communicating any benefits of testing.
- **Consider the timing and broader context** - It may be prudent to hold off on increasing the uptake of saliva testing until any other major changes at the ports

²⁹ Cialdini R. Influence: Science and Practice. Boston: Pearson; 2009; Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, 34(7), 913-923.



Feasibility - Low Medium High



Impact - Low Medium High

have been completed. For example, we were told by a Tauranga-based PCBU that they were introducing a system that required all visitors to the port to be tested upon entrance.

- **Craft clear communications** - The Ministry would need to provide clear communications to PCBUs on the benefits of saliva testing and ask that PCBUs pass this onto their border workers.
- **Use BI principles**, including social norms, reciprocity, and a trusted messenger (see below section on Behavioural Insights Principles for examples).

Supporting evidence from the Explore research:

- Barriers to saliva testing in our Explore research were related to its implementation, including communicating the rationale for more frequent testing.
- Many border workers did not understand why they needed to keep getting tested when fully vaccinated.

Behavioural Insights Principles:

- We have limited cognitive capacity. Our capacity to perform mental work is a limited resource that can be taken up by planning, remembering, worrying, self-control, etc.³⁰ When under stress, for example associated with having to introduce large-scale changes into the port, there is even less capacity to focus on achieving a new goal, such as increasing the uptake of saliva testing.³¹
- Social norms and reciprocity are powerful behavioural motivators:³²
 - *Social norms* refers to evidence that we are likely to change our behaviour in line with others' behaviour if we know how others are behaving. If border workers know that many of their peers are taking up saliva testing, this is likely to influence them. An example message using social norms is: *"More and more stevedores at your port are opting in to saliva testing because they don't have to wait in line to be tested."*
 - *Reciprocity* refers to the social norm obliging repayment of gifts or favours, and the shunning of those who "freeload".³³ Receiving a message that frontline nurses are working to keep border workers safe is likely to encourage a behavioural response in return. A message using reciprocity might be: *"Frontline nurses have been working tirelessly to keep you safe; you can help free up their time by choosing saliva testing."*
- Evidence suggests there are two types of effective messenger: (1) We are more likely to act on a message delivered by a source we perceive as credible or an expert; and (2) We are more likely to listen to a messenger we relate to, or who is demographically and behaviourally similar to us.³⁴ Border workers should receive information on saliva testing from trusted colleagues or community leaders.

³⁰ Fiske, S.T. & Taylor, S.E. (1991) *Social Cognition* (2nd ed.). New York: McGraw-Hill.

³¹ Mullainathan, S., & Shafir, E. (2014). *Scarcity: The true cost of not having enough*. Penguin Books: London.

³² Fehr, E., & Gächter, S. (1998). Reciprocity and economics: The economic implication of Homo Reciprocans. *European Economic Review*, 42(3-5): 845-859.

³³ Cabinet Office & Institute for Government (2010). *MINDSPACE: Influencing behaviour through public policy*.

³⁴ Durantini, Albarracín, Mitchell, Earl and Gillette (2006) Conceptualizing the influence of social agents of behavior change: A meta-analysis of the effectiveness of HIV-prevention interventionists for different groups. *Psychological Bulletin*, 132: 212-248.



Feasibility - Low Medium High



Impact - Low Medium High

Solution B2



Reduce the required frequency for saliva testing

Recommendation: Reduce the frequency necessary for saliva testing (policy change required).

Implementation considerations:

- **Consider the timing and broader context** - reducing the frequency of saliva testing is likely to make it a more attractive, easier option to border workers. However, similar to the previous solution (C1), we need to consider the shifting landscape at the maritime borders. Any larger scale shift from nasopharyngeal to saliva testing potentially puts the ports under further pressure to support the change. This would be on top of a new requirement for ports to implement a regime whereby everyone needs to get tested before entering the ports.
- **Alignment with National Testing Strategy** - Any change in the required frequency of saliva testing should be aligned with the new national Testing Strategy when it is available.

Supporting evidence from the Explore research:

- Workers perceived saliva tests as convenient, however the increased frequency of saliva tests (relative to nasopharyngeal testing) was a significant barrier to saliva testing.

Behavioural Insights Principles:

- Reducing the burden of an alternative option and making it easier to perform is an effective method for behaviour change.³⁵
- Overseas studies have shown that saliva testing is as effective and sensitive as nasopharyngeal testing.^{36, 37}

Conclusion

This project has identified the factors that most influence maritime border workers' adherence to the RTO, and made recommendations to increase adherence to the RTO. We found that many of the most common barriers and enablers are related to the convenience of COVID-19 testing. Even though the Ministry has already done a lot to make testing as easy as possible, gaps remain in the current infrastructure designed to enable adherence.

³⁵ Service, O., Hallsworth, M., Halpern, D. et al. (2014). *EAST: Four simple ways to apply behavioural insights*. Cabinet Office and Nesta: London.

³⁶ Butler-Laporte, G., et al. (2021). Comparison of saliva and nasopharyngeal swab nucleic acid amplification testing for detection of SARS-CoV-2: A systematic review and meta-analysis. *JAMA Internal Medicine*, 181(3), 353-360, <https://doi.org/10.1001/jamainternmed.2020.8876>.

³⁷ Teo, A.K.J., et al. (2021). Saliva is more sensitive than nasopharyngeal or nasal swabs for diagnosis of asymptomatic and mild COVID-19 infection, *Scientific Reports: Nature portfolio*, 11: 3134.



Feasibility - Low Medium High



Impact - Low Medium High

One of the main gaps relates to the need to take a stronger equity lens and to partner with Māori and Pacific community leaders to develop more culturally tailored responses. Improving adherence to the RTO is definitely a case of 'one size does not fit all'.

With respect to nasopharyngeal testing, the testing stations could become mobile, going to where the border workers are, and steps could be taken to make sure all border workers know where the closest testing station is to their home.

With respect to saliva testing, more could be done to highlight the benefits of saliva testing to maritime border workers and to further increase convenience by increasing the number of drop-off boxes for saliva samples.

It is likely that adherence could be further improved via a communications campaign that provided clear rationales for the need to keep being tested regularly and outlined what to expect in the event of receiving a positive COVID-19 test. Such a campaign should also aim to activate border workers' strongest motivation to adhere to regular testing - to protect family and whānau.

Appendices

Appendix 1: Literature scan: Overview of factors that influence adherence to COVID-19 testing

In this literature scan we review the international research focusing on the barriers and enablers to COVID-19 testing and what has worked to increase adherence to COVID-19 testing. Since existing research is limited, we have also drawn on research into interventions that have successfully enhanced other COVID-19 related or health screening behaviours.

Barriers and enablers to COVID-19 testing

In this section we detail some general barriers and enablers to getting tested for COVID-19, particularly as found in the evidence from countries outside of New Zealand. However, given the unique New Zealand context and cultural considerations, we used this work as a foundation to prepare our Explore work to understand the barriers and enablers to COVID-19 testing for New Zealand maritime border workers specifically.

Barriers

There has been limited work to date on barriers to getting tested for COVID-19 in a workplace context. However, one study in long-term care facilities found that concerns surrounding additional workload associated with testing were barriers to COVID-19 testing. In addition, staff expressed concerns about the test timing; similarly to the maritime border worker context, staff were required to get tested regularly, and staff found that it was impractical to attend their workplace on their days off without compensation, or to attend their workplace prior to the start of their shift for testing, without receiving additional pay or other incentives.³⁸

In addition, concerns surrounding the implications of a positive test on personal income and the resulting impact on workplace staff resourcing were major barriers to testing. Staff reported being particularly concerned about the risk of false positives, and as a result having fewer staff available to work due to workers self-isolating at home.³⁹

This concern about the impact of testing positive on others and on one's own mental health is also reflected in a student sample.⁴⁰ In addition, the absence of COVID-19 symptoms, and

³⁸ Kierkegaard, P., Micocci, M., McLister, A., Tulloch, J., Parvulescu, P., Gordon, A., & Buckle, P. (2021). Implementing Lateral Flow Devices in Long-Term Care Facilities: Experiences from the Liverpool COVID-19 Community Testing Pilot in Care Homes - A Qualitative Study. Available at: <http://dx.doi.org/10.2139/ssrn.3825945>

³⁹ Ibid (Kierkegaard, et al).

⁴⁰ Blake H, Knight H, Jia R, Corner J, Morling JR, Denning C, et al. (2021). Students' Views towards Sars-Cov-2 Mass Asymptomatic Testing, Social Distancing and Self-Isolation in a University Setting during the COVID-19 Pandemic: A Qualitative Study. *International Journal of Environmental Research and Public Health*. 18(8):4182.

therefore identifying the need for testing, was noted as a barrier to testing in a community sample in the UK.⁴¹

Enablers

A major enabler to COVID-19 testing is a desire to protect others from contracting COVID-19.^{42,43} Additionally, in a sample of asymptomatic close contacts of confirmed cases in the UK, a desire to protect vulnerable individuals or those one lives with was noted as a key enabler for regular COVID-19 testing, and this did not differ by ethnicity. However, those from ethnic minority communities also indicated that they accepted daily testing to allay concerns that they themselves could have COVID-19.⁴⁴

Most importantly for the current project, the ease of access to testing was noted as a key enabler to regular testing for a cohort of university students and staff who were required to undergo testing; this was particularly the case when more frequent testing was required.⁴⁵ This suggests that targeting ease of access for maritime border workers may be a key route to promoting adherence to the RTO.

Increasing adherence to COVID-19 testing

In this section we outline a number of actions or solutions that have increased adherence to COVID-19 testing regimes, and describe how they have been implemented in different contexts.

Place equity at the heart of actions

Given the higher proportion of casual Māori and Pacific maritime border workers, especially stevedores, and the differential impact on their communities in the event of an outbreak, equity should be at the heart of actions to increase adherence to testing.⁴⁶ Equity starts with the recognition that different resourcing is required in order for different groups to achieve similar outcomes.⁴⁷ Although Māori and Pacific peoples are more vulnerable with respect to health outcomes, they are also resilient, adaptive, self-reliant and innovative. Māori- and Pacific-led health promotion programmes have been very effective in keeping Māori and

⁴¹ Mowbray, F., Woodland, L., Smith, L.E., Amlot, R., & Rubin, G.J. (2021). Is My Cough a Cold or Covid? A Qualitative Study of COVID-19 Symptom Recognition and Attitudes Toward Testing in the UK. *Frontiers in Public Health*. 18.

⁴² University of Liverpool. Liverpool Covid-SMART pilot evaluation., 2020. Available: <https://www.liverpool.ac.uk/coronavirus/research-and-analysis/covid-smart-pilot/>

⁴³ Hirst, J., Logan, M., Fanshawe, T.R., Mwandigha, L., Wanat, M., Vicary, C., et al. (2021), Feasibility and Acceptability of Community COVID-19 Testing Strategies (FACTS) in a University Setting.

⁴⁴ Martin, A.F., Denford, S., Love, N. et al. (2021). Engagement with daily testing instead of self-isolating in contacts of confirmed cases of SARS-CoV-2. *BMC Public Health* 21, 1067.

⁴⁵ Wanat M, Logan M, Hirst JA, et al. (2021). Perceptions on undertaking regular asymptomatic self-testing for COVID-19 using lateral flow tests: a qualitative study of university students and staff. *BMJ Open*. 11.

⁴⁶ King, P., Cormack, D., McLeod, M., Harris, R., & Gurney, J. (2020). COVID-19 and Māori health—when equity is more than a word. *Public Health Expert*.

⁴⁷ Robson, B., & Harris, R. (2007). *Hauora: Māori Standards of Health IV. A study of the years 2000–2005. Wellington: Te Ropu Rangahau Hauora a Eru Pomare.*

others safe during the pandemic.^{48,49,50} Examples of effective Māori- and Pacific-led responses that could have promise in the COVID-19 testing space are as follows:

- **Use of community networks and social cohesion** - Existing Māori networks mean that Māori are uniquely positioned to provide bilateral channels between government and communities to disseminate information, gather insights into community needs, and distribute resources. Māori channels often have a higher level of trust and engagement with Māori communities than mainstream channels. This is demonstrated in Māori channels being able to reach those who may have been unreachable by other parties, thereby leading to more effective outcomes.⁵¹

Similarly, communications to Pacific peoples via trusted community leaders has been key in preventing the spread of COVID-19 in Pacific communities. One example of this has been the Ministry of Health working with church leaders to ensure that Pacific knowledge and protocols were used to disseminate information effectively.⁵²

- **Storytelling practices** - oral traditions and intergenerational storytelling, including remembering ancestors, have played an important role in Māori being acutely aware of the potentially devastating impacts of COVID-19 on their communities.⁵³
- **Online innovations** - online tools using a tikanga lens have enabled Māori to maintain whanaungatanga and share Māori knowledge and expertise. For example a community organisation started an online communication strategy and hashtag *#protectourwhakapapa* to ensure that health communication was effectively conveyed and relevant to Māori whānau and communities.⁵⁴

Similarly key members and leaders of the Pacific community have encouraged and educated Pacific communities via online initiatives. Following a second COVID-19 outbreak in Auckland that placed Pacific communities at risk, South Auckland Pacific church youth leaders held an online talanoa (discussion) to share ways to support one another in the community. A social media campaign was also launched with the tagline “We got your back Aotearoa”.⁵⁵

These Māori and Pacific responses to COVID-19 are multi-dimensional, holistic and strengths-based. The Māori responses are also characterised by the exercising of tinorangatiranga and the valuing of tikanga Māori. The approaches offer important insights and lessons into how adherence to the RTO could be further increased amongst Māori and Pacific border workers.

⁴⁸ One, A.T. & Clifford, C. (2021). Tino rangatiranga and well-being: Māori self determination in the face of COVID-19. *Frontiers in Sociology*, 6: 613340. doi: 10.3389/fsoc.2021.613340

⁴⁹ McMeeking, S., & Savage, C. (2020). Māori responses to COVID-19. *Policy Quarterly*, 16(3).

⁵⁰ Ioane, J. Percival, T., Laban, W., & Lambie, I. (2021). All-of-community by all-of-government: Reaching Pacific people in Aotearoa New Zealand during the COVID-19 pandemic. *NZMJ*, 134(1533): 96-103.

⁵¹ McMeeking, S., & Savage, C. (2020). Māori responses to COVID-19. *Policy Quarterly*, 16(3).

⁵² Ioane, J. Percival, T., Laban, W., & Lambie, I. (2021). All-of-community by all-of-government: Reaching Pacific people in Aotearoa New Zealand during the COVID-19 pandemic. *NZMJ*, 134(1533): 96-103.

⁵³ One, A.T. & Clifford, C. (2021). Tino rangatiranga and well-being: Māori self determination in the face of COVID-19. *Frontiers in Sociology*, 6: 613340. doi: 10.3389/fsoc.2021.613340

⁵⁴ Ibid (One & Clifford).

⁵⁵ Ioane, J. Percival, T., Laban, W., & Lambie, I. (2021). All-of-community by all-of-government: Reaching Pacific people in Aotearoa New Zealand during the COVID-19 pandemic. *NZMJ*, 134(1533): 96-103.

Improve ease of access

The convenience of the location of COVID-19 testing sites, and the distances that people need to travel to get to them, can play a large role in adherence to testing. A study in Liverpool (UK) found the location of testing sites was a major predictor of testing uptake.⁵⁶ For every one kilometre increase in distance to the nearest testing site there was an 11% reduction in the number of tests completed. A survey of key workers in the UK found 70% of participants were only willing to travel 30 minutes or less for regular testing.⁵⁷ Key workers who completed the survey identified testing at home or at their work location as their top 2 preferred testing locations.

Similarly, an unpublished online study by BIT on intentions to get tested in a mass population testing scheme found intentions were much higher when people were told tests would be available at a convenient location (instead of needing to travel to a test site). Participants in the online study were much less willing to get tested frequently than one-off when it required travel to a test site, but were just as willing when testing was available at a convenient location.

Address concerns about consequences

Beliefs about the consequences of testing positive for COVID-19 may act as a barrier to getting a test, and may need to be addressed in order to increase adherence to testing. A study in a maternity ward in the United States found pregnant women were hesitant to get tested as they were concerned they would be separated from their newborn or family if they tested positive.⁵⁸ Phase 3 of the study implemented an infographic and a clinical script that reassured women they would not be separated from their newborn in most circumstances. Uptake of COVID-19 testing significantly increased in this phase.

Similarly, a survey of key workers in the UK found 13% stated concern about ‘missing out financially’ if they tested positive as a reason not to get tested for COVID-19.⁵⁹ For those who would be badly financially impacted, entitlement to paid sick leave was one of the highest factors that would increase their likelihood to get tested.

Devise appropriate incentives

Incentives can be framed as either a “carrot” or a “stick” approach. That is, they can reward people for undertaking a behaviour or punish people for not undertaking a behaviour. In the context of COVID-19 testing, a “carrot” approach would allow people to participate in additional activities if they have received a negative COVID-19 test result, whereas a “stick”

⁵⁶ Green, M. A., García-Fiñana, M., Barr, B., Burnside, G., Cheyne, C. P., Hughes, D., ... & Buchan, I. E. (2021). Evaluating social and spatial inequalities of large scale rapid lateral flow SARS-CoV-2 antigen testing in COVID-19 management: An observational study of Liverpool, UK (November 2020 to January 2021). *The Lancet Regional Health-Europe*, 6, 100107.

⁵⁷ Primary Research Summary Findings: OC&C Learnings 18 August 2020.

⁵⁸ Kernberg, A., Kelly, J., Nazeer, S., Russell, S., Tuuli, M., Stout, M. J., ... & Carter, E. B. (2020). Universal Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2) Testing Uptake in the Labor and Delivery Unit: Implications for Health Equity. *Obstetrics & Gynecology*, 136(6), 1103-1108.

⁵⁹ Primary Research Summary Findings: OC&C Learnings 18 August 2020.

approach would prohibit people from participating in activities if they have not had a COVID-19 test.

Both approaches were recently implemented together in Slovakia. People who tested negative were able to exit lockdown and go to work, visit non-essential shops, eat outdoors at restaurants, meet with up to 6 people and travel around the country. Those who did not get a test were unable to work (even from home) and had to self-isolate without a right to sick leave. As a result, Slovakia tested 3.6 million people (95% of their eligible population aged between 10-65) for COVID-19 in a single weekend.⁶⁰ However, it is important to highlight a critical difference between the Slovakian context and New Zealand border workers: namely, that testing in Slovakia is voluntary, whereas for New Zealand border workers it is mandatory. This suggests that despite the positive outcome obtained in Slovakia through a combined “carrot” and “stick” strategy, these findings should not be considered generalisable in the absence of replication in populations that more closely resemble New Zealand border workers.

Increasing adherence to health screening behaviours

Given the paucity of research on increasing adherence to COVID-19 testing, we also reviewed literature on how to influence other COVID-related and health screening behaviours, and how cultural and equity considerations have been taken into account for these health behaviours.

Vaccine uptake

Many of the strategies or ideas that have successfully increased vaccination uptake, including COVID-19 vaccination uptake, are also likely to support regular COVID-19 testing. For example see: behavioural science ideas on ‘*What works to increase vaccination uptake*’;⁶¹ ways of improving access to adolescent immunisations;⁶² increasing COVID-19 vaccine uptake in Black Americans;⁶³ and the Centers for Disease Control and Prevention’s (CDC) 12 strategies for improving COVID-19 vaccination.⁶⁴

Of particular interest are solutions that have been designed specifically to increase vaccination uptake amongst disadvantaged or minority communities. These include:

⁶⁰ Behavioural Insights Team. Mass testing: What can Medway learn from Slovakia? (2020). Accessed at: <https://www.bi.team/blogs/mass-testing-what-can-medway-learn-from-slovakia/>

⁶¹ Brewer, N.T. (2021). What works to increase vaccination uptake, *Academic Pediatrics*, 21(4): S9-S16.

⁶² Das, J.K., Salam, R.A., Arshad, A., Lassi, Z.S., & Bhutta, Z.A. (2016). Systematic review and meta-analysis of interventions to improve access and coverage of adolescent immunizations, *Journal of Adolescent Health*, 59(4): S40-S48.

⁶³ Burki, T. (2021). Increasing COVID-19 vaccine uptake in Black Americans. *The Lancet Infectious Diseases*, 21(11): 1500-1501.

⁶⁴ Centers for Disease Control and Prevention. 12 COVID-19 Vaccination Strategies for Your Community. (2021). Accessed at: <https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence/community.html>

- **Eliminate key structural barriers** - Vaccine access can be increased by taking steps such as offering free transportation and increasing vaccination site hours.⁶⁵ Other interventions also reduce structural barriers, such as:
 - **Mobile vaccination units** - these involve bringing vaccinations to the people, for example, via bus, rather than requiring people to visit vaccination clinics.
 - **Home-delivered and workplace vaccination** - bringing vaccines to people's homes, work places, or schools are effective means to reach populations who are living in more disadvantaged circumstances.
- **Use vaccine ambassadors and social networks** - this involves lay health advisors, who are trusted members of the community, disseminating important health messages about vaccination. The strategy has increased vaccination rates in under-resourced, predominantly Latinx Mission District in San Francisco and communities of colour in Philadelphia. The social network component of the strategy was encouraging those who had been vaccinated to share their own vaccination experiences with their unvaccinated friends and family.⁶⁶
- **Use messages that highlight reciprocity** - BIT has tested a range of different messages in Latin America that have been shown to increase vaccination intentions there. Positive reciprocity is the impulse or the desire to be kind to those who have been kind to us.⁶⁷ It can be a powerful behavioural motivator. We found that a message that combined confidence in healthcare professionals with the concept of reciprocity was the most effective in increasing vaccination intentions for Latin Americans, compared with other behavioural messages.⁶⁸ The message read: "Healthcare staff will be the first to get the vaccine. To help them in the fight against COVID-19, they need you to get vaccinated when it's your turn."

Other strategies that have worked to increase vaccination uptake in the general population include:

- **Reminder messages** - In addition to communication strategies that aim to boost vaccination intentions (such as the reciprocity example above), other communications, such as reminder messages, have helped people to follow through on their vaccination intentions and overcome sources of friction, such as forgetfulness and procrastination.⁶⁹ Reminder text messages are low cost 'nudges' that have been

⁶⁵Vital Strategies. 15 Practices to Improve Vaccination Program Effectiveness by Reaching the People Most at Risk. Accessed at: https://cities4health.org/assets/library-assets/115_pe_15-practices-to-improve-vaccination-effectiveness_fact-sheet_0521_rev-a_v3.pdf

⁶⁶Centers for Disease Control and Prevention. 12 COVID-19 Vaccination Strategies for Your Community. (2021). Accessed at: <https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence/community.html>

⁶⁷Fehr, E., & Gächter, S. (1998). Reciprocity and economics: The economic implications of Homo Reciprocans. *European Economic Review*, 42(3-5): 845-859.

⁶⁸Behavioural Insights Team. How can we use behavioural science to promote vaccination against COVID-19 in Latin America? (2021). Accessed at: <https://www.bi.team/blogs/how-can-we-use-behavioural-science-to-promote-vaccination-against-covid-19-in-latin-america/>

⁶⁹Dai, H., Saccardo, S., Han, M.A. et al. (2021). Behavioural nudges increase COVID-19 vaccinations. *Nature*, 597: 404-409. <https://doi.org/10.1038/s41586-021-03843-2>

effectively applied to a number of health-related behaviours, including upcoming vaccination appointments. They can help to bridge the intention-action gap.⁷⁰

- **Implementation intention prompts** - planning exactly how we will perform a behaviour can make us more likely to follow through with it when the time comes. Implementation intentions are exercises that prompt us to link situational cues with actions which will help us to achieve our goals. For example, instead of 'I will eat more healthily', you might say: 'If I get hungry, I will have an apple.'⁷¹ The use of implementation intentions, where employees are prompted to write down the date and time they plan to be vaccinated, has enhanced influenza vaccination rates.⁷²
- **Vaccination requirements** - these are policy mandates that require certain groups, such as employees or students, to get vaccinated. The RTO represents a 'testing requirement'. There is evidence that requirements can shape behaviour, for example, school requirements have been shown to increase the uptake of most vaccines.⁷³ One downside of requirements is that they can create substantial work for immunisation programmes and prevent staff from working on other essential duties.⁷⁴ Other downsides are that they are perceived as more paternalistic and punitive, and might lead to some workers quitting or losing their jobs.⁷⁵
- **Trusted messengers** - The 'messenger effect' is the tendency for people to give different weight to information depending on who is communicating it to them.⁷⁶ We are more likely to act on a message delivered by a source we perceive as credible or an expert. We are also more likely to listen to a messenger we relate to, or who is demographically and behaviourally similar to us.⁷⁷ Studies have found that messages involving a personal physician or a scientist recommending vaccination are more effective than vaccination messages from politicians.

Health screening behaviours

Strategies that have worked to encourage other health screening behaviours, such as breast, cervical, or bowel screening, could also be useful for thinking about how to encourage adherence to regular COVID-19 testing. Similar to COVID-19 testing, screening for diseases such as cancer or other chronic health conditions is important because these programmes

⁷⁰ Ibid.

⁷¹ Gollwitzer, P.M. (1999). Implementation intentions: Strong effects of simple plans. *The American Psychologist*, 54(7): 493-503.

⁷² Milkman, K.L. Beshears, J., Choi, J.J., Laibson, D., & Madrian, B.C. (2011). Using implementation intentions prompts to enhance influenza vaccination rates. *PNAS*, 108(26): 10415-10420.

⁷³ Greyson, D. Vriesema-Magnuson, C., & Bettinger, J.A. (2019). Impact of school vaccination mandates on pediatric vaccination coverage: A systematic review. *CMAJ Open*, 7: E524

⁷⁴ Omer, S.B., Betsch, C., & Leask, J. (2019). Mandate vaccination with care. *Nature*, 571: 469-472.

⁷⁵ Khullar, D. (2021). The complex business of vaccine mandates. *The New Yorker Medical Dispatch*. Retrieved from: <https://www.newyorker.com/science/medical-dispatch/the-complex-business-of-vaccine-mandates>

⁷⁶ Dolan, P., Hallsworth, M., Halpern, D., King, D., & Vlaev, I. (2010). MINDSPACE: Influencing behaviour through public policy. Cabinet Office & Institute for Government: London. Accessed at: <https://www.instituteforgovernment.org.uk/sites/default/files/publications/MINDSPACE.pdf>

⁷⁷ Durantini, Albarracín, Mitchell, Earl and Gillette (2006) Conceptualizing the influence of social agents of behavior change: A meta-analysis of the effectiveness of HIV-prevention interventionists for different groups. *Psychological Bulletin*, 132: 212-248.

enable early identification and intervention with the ultimate aim of reducing morbidity and mortality from these causes.

Successful population-based screening programmes require sufficient engagement to reduce morbidity and mortality from the condition/disease being screened for. A robust body of literature indicates that engagement with screening programmes is consistently lower among Māori vs non-Māori in New Zealand; and lower among First Nations Australians vs non-First Nations Australians.^{78, 79}

Addressing this challenge through an equity lens means addressing the impact of social determinants of health on screening engagement in these populations, as well as the structural barriers inherent in the design of screening programmes that give rise to health inequities.

Some methods for how this can be done effectively to lift screening engagement include:

- **Select trusted providers to make recommendations** - Health provider recommendations are one of the most powerful motivators of screening behaviour.⁸⁰ And yet, there is evidence that physicians are less likely to recommend screening for those who are more vulnerable due to lower income or education.⁸¹ A national indigenous bowel screening pilot in Australia supplied bowel screening kits to clients when they visited their trusted indigenous health care provider. The indigenous providers explained the purpose, importance and process of screening for bowel cancer. This alternative pathway to receiving the kits significantly boosted indigenous screening rates compared with the usual pathway of receiving the kits in the mail.
- **Develop social marketing campaigns or communications that:**
 - **Identify and use relevant motivators for screening** - New Zealand's National Cervical Screening Programme's (NCSP) "Don't Just SAY It Matters" campaign successfully improved rates of engagement with cervical screening by Māori and Pacific women. It achieved this by designing communications materials that focused on Māori and Pacific women's key motivators, for example staying well for the sake of others, especially whānau.⁸²
 - **Include members of the target audience in co-designing the messaging** - communications have the best chance of achieving the intended effect when they are co-designed with the intended target audience.⁸³ The "Don't Just SAY

⁷⁸ Olver, I., Marine, F., & Grogan, P. (2011). Disparities in cancer care in Australia and the Pacific. *Oncologist*, 16(7): 930-4.

⁷⁹ Seneviratne, S., Campbell, I., Scott, N., Shirley, R., & Lawrenson, R. (2015). Impact of mammographic screening on ethnic and socioeconomic inequities in breast cancer stage at diagnosis and survival in New Zealand: A cohort study. *BMC Public Health*, 15: 46.

⁸⁰ Brewer, N.T. (2021). What works to increase vaccination uptake, *Academic Pediatrics*, 21(4): S9-S16.

⁸¹ O'Malley, M.S., Earp, J.A., Hawley, S.T., Chell, M.I., Mathews, H.F., & Mitchell, J. (2001). The association of race/ethnicity, socioeconomic status, and physician recommendation for mammography: who gets the message about breast cancer screening? *Am J Public Health*, 91 (1):49.

⁸² The National Social Marketing Centre. Don't Just SAY It Matters. Accessed at: <https://thensmc.com/resources/showcase/don%E2%80%99t-just-say-it-matters>

⁸³ Victorian State Government (2019).How can we improve participation in breast, bowel and cervical cancer screening: Cancer screening quality improvement toolkit. Accessed at:

It Matters” campaign described above was designed with Māori and Pacific women. Several different concepts were also pre-tested with Māori and Pacific groups before the campaign started to ensure the key messages resonated.

- **Take health literacy into account** - Individual health literacy is the skills, knowledge, motivation and capacity of an individual to access, understand and act on health information. It should not be confused with intelligence - health systems are complex and even highly skilled people can find the health system too complex to understand, especially during periods of poor health or stress. For this reason, all communications should be as simple and easy to understand as possible for all people.⁸⁴
- **Ensure members of the target audience are represented in messaging** - ‘social norms’ refers to the insight that we take our behavioural cues from others. If we know how others are behaving, we are more likely to behave that way ourselves. We are even more likely to follow the example of people we perceive to be similar to us than members of groups we don’t identify with.⁸⁵ Representing the target audience in the messaging therefore enhances the power of social norms. Qualitative research on how to communicate effectively with young Māori, Pacific and Asian women about participating in the National Cervical Screening Programme revealed that all young women wanted to see themselves represented in promotional material.⁸⁶ The successful “Don’t Just SAY IT Matters” campaign took this approach in its promotional materials.
- **Use culturally relevant models of care** - The healthcare system in Aotearoa NZ, is informed primarily by an individualistic, problem-based, and biomedical approach.⁸⁷ Research confirms that Māori are more likely than other groups in New Zealand to encounter structural, cultural, and interpersonal forms of discrimination, marginalisation, and racism when accessing healthcare services. These negative experiences, such as being treated differently to others and deficit stereotypes, impact trust and the decisions Māori make about future access to healthcare services.⁸⁸

Māori prefer to use holistic models of health such as Te Whare Tapa Wha, which identifies the complex nature of wellbeing and provides guidance to respond to all

<https://www.murrayphn.org.au/wp-content/uploads/2019/06/Cancer-Screening-QI-Toolkit-52-Improving-Breast-Bowel-Cervical-screening.pdf>

⁸⁴Cancer Institute NSW. Step 3: Address health literacy as a barrier to screening. Accessed at:

<https://www.cancer.nsw.gov.au/what-we-do/working-with-primary-care/cancer-screening-and-primary-care-quality-improvement/module-4-care/step-3-address-health-literacy-as-a-barrier-to-screening>

⁸⁵ Clore, G. L., & Byrne, D. (1974). The reinforcement affect model of attraction. In T. L. Huston (Ed.), *Foundations of interpersonal attraction* (pp. 143–170). New York: Academic Press

⁸⁶ Allen & Clarke. (2019). *Cervical screening communications for young Māori, Pacific and Asian women: Key findings and implications*. Report prepared for the Ministry of Health.

https://www.nsu.govt.nz/system/files/resources/cervical_screening_communication_research_key_findings.pdf

⁸⁷ Health Quality & Safety Commission (HQSC). (2019). *A window on the quality of Aotearoa New Zealand health care 2019*. HQSC. Accessed at:

<https://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/publications-and-resources/publication/3721/>

⁸⁸ Wilson, D., Moloney, E., Parr, J.M., Aspinall, C., & Slark, J. (2021). Creating an indigenous Māori-centred model of relational health: A literature review of Māori models of health. *Journal of Clinical Nursing*, 30(23-24): 3539-3555.

determinants of health in a balanced way.⁸⁹ Screening programmes that embed indigenous values, concepts and practices have had more success in reducing health screening inequities. For example, culturally tailored methods used by BreastScreen WA have contributed to higher screening rates for indigenous women in Western Australia compared to indigenous women nationally.⁹⁰ Methods include having a dedicated Aboriginal Programme Officer, provision of transport and accommodation assistance, and four mobile vans. Interventions aimed at improving health practitioners' cultural competency have increased physician cancer screening recommendations and nurse practitioner screening rates for Māori.⁹¹

- **Address logistical obstacles** - a fundamental behavioural insight is that if you want to encourage a behaviour, make it Easy.⁹² There are a range of mental, physical and logistical challenges that must be attended to in order to achieve successful engagement with a health screening service. Addressing the most significant logistical challenges, such as cost and transport, has been shown to increase engagement rates in screening for ethnic minority women.^{93, 94} Several of the successful screening programmes already mentioned have aimed to meet people where they are at, for example via a mobile screening service.

Opportunistic reminders to get screened have also been found to increase screening rates.⁹⁵ They remove the mental barrier of having to remember the appointment.

- **Address intersectional factors, such as gender and socioeconomic status, that affect the likelihood of engaging with screening** - males are, on average, less likely than females to engage with health screening.⁹⁶ One study found that when men were told specific details about what to expect with a cancer screen (i.e. who conducts the screening and what one has to do during the screening), this increased their willingness to get screened.⁹⁷

Differences in socioeconomic status also influence engagement with health screening. For example, international studies have shown that more advantaged

⁸⁹ Rochford, T., & Signal, L. (2009). Using a framework of Māori models for health to promote the health of Māori. *Keeping up to date*, No. 29-30. http://hauora.co.nz/wp-content/uploads/2019/03/KUTD29_30.pdf

⁹⁰ Pilkington, L. Haigh, M.M., Durey, A., Katzenellenbogen, J.M., & Thompson, S.C. (2017). Perspectives of Aboriginal women on participation in mammographic screening: A step towards improving services. *BMC Public Health*, 17(697)

⁹¹ Cram, F. (2014). Improving Māori access to health care: Research report. Auckland: Katoa Ltd. Accessed at: [https://www.moh.govt.nz/notebook/nbbooks.nsf/0/211DA45C5EA63205CC257DD8007AE977/\\$file/Access_ResearchReport.pdf](https://www.moh.govt.nz/notebook/nbbooks.nsf/0/211DA45C5EA63205CC257DD8007AE977/$file/Access_ResearchReport.pdf)

⁹² Owain, S., Hallsworth, M., Halpern, D. et al. *EAST: Four simple ways to apply behavioural insights*. Cabinet Office & Nesta: London. https://www.bi.team/wp-content/uploads/2015/07/BIT-Publication-EAST_FA_WEB.pdf

⁹³ Allen & Clarke. (2019). *Cervical screening communications for young Māori, Pacific and Asian women: Key findings and implications*. Report prepared for the Ministry of Health.

⁹⁴ Masi, C.M., Blackman, D.J., Peek, M.E. (2007). Interventions to enhance breast cancer screening, diagnosis, and treatment among racial and ethnic minority women. *Med Care Res Rev*, 64(5): 195S-242S.

⁹⁵ Victorian State Government (2019). *How can we improve participation in breast, bowel and cervical cancer screening: Cancer screening quality improvement toolkit*. Accessed at: <https://www.murrayphn.org.au/wp-content/uploads/2019/06/Cancer-Screening-QI-Toolkit-52-Improving-Breast-Bowel-Cervical-screening.pdf>

⁹⁶ Davis, J.L., Buchanan, K.L., Katz, R.V., & Green, B.L. (2012). Gender differences in cancer screening beliefs, behaviors, and willingness to participate: Implications for health promotion. *Am J Mens Health*, 6(3): 211-217.

⁹⁷ Ibid.

women are more likely to engage with breast screening.⁹⁸ A number of interventions have been found to reduce inequities in screening rates between low and high socioeconomic groups. For example, providing resources that are developed to support people with low literacy and numeracy skills has the potential to improve rates of screening. Reducing logistical barriers and sending reminders have also been shown to reduce inequities in cancer screening attendance.⁹⁹ The challenge is to increase health screening rates for people living in disadvantaged circumstances whilst ensuring that screening rates do not drop for more advantaged populations.

In summary, the limited research available on effective strategies for increasing adherence to COVID-19 testing highlights the importance of making access easy, and suggests that equity considerations should be put at the heart of change efforts. Other clues for how to increase adherence to COVID-19 testing can be found in the literature summarising effective methods for increasing vaccine uptake and engagement with health screening behaviours. Solutions likely to work for Māori and Pacific peoples will be culturally tailored, use trusted messengers, be access enhancing, and address financial or logistical barriers. Effective communication campaigns will be designed in partnership with the target audience.

⁹⁸ Pruitt S.L., Shim, M.J., Mullen, P.D., Vernon, S.W., & Amick, B.C. (2009). Association of area socioeconomic status and breast, cervical, and colorectal cancer screening: a systematic review. *Cancer Epidemiol Biomark Prev*, 18:2579–99.

⁹⁹ Bygrave, A., Whittaker, K., & Aranda, S. (2020). The impact of interventions addressing socioeconomic inequalities in cancer-related outcomes in high income countries: A systematic review. *J Public Health Res*, 9(3): 1711.

Appendix 2: Interview guide for border workers

The COVID-19 Public Health Response (Required Testing) Order 2020 requires routine testing of border workers for COVID-19 at managed isolation and quarantine facilities, airports and seaports. Embedded within this Required Testing Order (RTO) are several important behaviours; namely:

- Border workers need to be tested regularly for COVID-19
- PCBUs need to support this initiative as part of their health and safety responsibilities
- PCBUs need to maintain records to show their staff are being swabbed regularly as per the Required Testing Order.

Understanding and supporting these behaviours is an imperative enabler to New Zealand maximising the strength of its borders.

The Behavioural Insights Teams (BIT) has been funded by the Ministry of Health to work collaborate with PCBUs and border workers to evaluate what factors most influence maritime border workers' COVID-19 testing behaviour, and how might behavioural insights inform changes to these factors and enable adherence to the RTO.

The study is anonymous and PCBUs and participants are expected to answer the survey questions with objectivity and candour. No individual responses will be identified. Alternatively, trends will be identified, measured, and reported.

Theme	Research questions
Introductions & warm-up	<ul style="list-style-type: none"> • Introduce the team and thank the person for their time • Explain the purpose of the project and stakeholder interview • Ask for participant's consent • Ask about participant's role and build rapport
Part 1: Understand testing landscape	<ul style="list-style-type: none"> • What is the current testing process and environment at the PCBU? • What are the main enablers to regular testing? • What are the main barriers to regular testing? • Has the introduction of saliva testing made a difference? • Has being vaccinated made a difference?
Part 2: Motivations	<ul style="list-style-type: none"> • What motivates participants to stay up-to-date with the RTO? • How do participants feel when they or others are overdue to be tested?
Part 3: Norms & patterns	<ul style="list-style-type: none"> • Perceptions of the size of RTO nonadherence • Patterns regarding which workers fall behind at this PCBU?
Part 4: Consequences for nonadherence	<ul style="list-style-type: none"> • What are the consequences for nonadherence to the RTO? • What escalation steps tend to be effective?
Part 5: Key COVID-19 comms channels	<ul style="list-style-type: none"> • What are the key channels which PCBUs communicate with maritime border workers, particularly stevedores?

	<ul style="list-style-type: none"> ● Explain KAP survey ● What would be the most effective platform for conducting a KAP survey with stevedores/ stevedores? ● What would be the most effective means of disseminating a KAP survey with stevedores?
Next steps	<ul style="list-style-type: none"> ● Magic wand Q ● Thank participant for their time ● Get home address to send supermarket voucher and email address to send final copy of report (store these in stakeholder outreach tracking and not the IV notes).

Introductions & warm up

1. Introduce the team and thank the border worker for their time

2. Explain the purpose of the project and border worker interview

Regular testing of border workers is one way to ensure that COVID-19 does not spread to the community, with subsequent health and economic consequences. But we know that some border workers, particularly stevedores, struggle to adhere to the Required Testing Order (RTO).

We are interested in the reasons for this and what could be done to enable better adherence to the RTO.

3. Ask for participant's consent

See guidelines on [border worker consent form](#).

Emphasise that we do not work for the Ministry of Health, and anything they say about non-adherence or any other topic will remain confidential within the immediate research team.

4. Role of participant, demographics, build rapport

4.1 Great, thanks. Before we dive in, can you tell me about you?

- What is your **age**?
- Which one of NZ's beautiful **ethnicities** do you belong to?
- How large is your family or whānau?

4.2 Now I'd like to know a bit more about your role at the port?

- Are you a shift worker? What hours do you work?
- Who else do you work with at the port, ie what is the size of your team?

Part 1: Understand testing landscape

5. What is the current testing process and environment where you work?

5.1. To start off with, can you tell me about how testing takes place at your work?

- How often do you need to get tested?
- How did you find out about the requirements to get tested, eg Manager at PCBU, pamphlet etc?
- What is the induction process for the RTO?
- Do you still need to get tested if you are on leave or holiday?
- Where is the testing site? If not at work, what alternative options for testing are available?
- How often is testing available?
- Are you able to get tested during work time?
- How does the timing of testing availability align with shifts? How does this influence you and your colleagues' adherence to testing?

6. What are the main *enablers* to regular testing for you, ie what makes regular testing possible and easy for you?

6.1. What has your company done to make regular testing easy for you?

- If you have been overdue for testing, what has helped to get back on track with regular testing?
- What else enables you to get tested regularly?

7. What are the main *barriers* you face in order to get tested regularly (according to the RTO)?

7.1. When you have fallen behind with your testing, what has been the reason?

7.2. What do your fellow stevedores think about the testing (or vaccinations)?

7.3. What does your community think about testing (or vaccinations)?

7.4. What non-work challenges do you have to getting tested regularly, eg family commitments, transport?

7.5. Is there any other reason you feel reluctant to get tested regularly, eg worry about getting a positive result?

7.6. Do you have any questions about testing that have not been answered?

8. How has the introduction of saliva testing made a difference?

8.1. Have you been told about the option to have a saliva test?

- Which option would you prefer - a saliva test or a nasal (nasopharyngeal) test? Why?
- Is anyone at your work using saliva testing? Why or why not?

8.2. What is the appeal or benefit of saliva testing, from your perspective?

8.3. What is the appeal or benefit of nasal testing, from your perspective?

9. Have you been vaccinated? Has this impacted on your adherence to the RTO? Why or why not?

9.1. Do you still have to get tested if you are fully vaccinated?

9.2. Has your sense of risk changed now that you are vaccinated?

Part 2: Motivations

10. What motivates you to stay up-to-date with your testing?

Probe if they say, 'it's required.'

- Do they want to avoid reprimand from MOH?
- Are they worried about catching COVID-19?
- Are they worried about what their peers or family think?

10.1. Do you make the decision to keep getting tested - by yourself or with your family or whānau?

10.2. What kind of incentives would motivate you to stay up-to-date with your testing?

11. How do you feel when you know that you or others are overdue to be tested?

- *Probe: does it worry you when you or others are behind on their testing?*
 - When you or others are behind, are you worried about reprimand or enforcement measures MOH might take?
 - When you or others are behind, are you worried that you or others might have COVID-19?
 - When you or others are behind, are you worried about what your peers or family or whānau might think?
 - When you or others are behind, are you worried about COVID-19 spreading through the workforce? Are you worried about being the source of a community outbreak?

Part 3: Norms and patterns

12. How big a problem do you perceive late testing to be amongst stevedores at your port?

12.1. At any given time, how many of your colleagues are overdue to be tested?

13. Are there patterns among which workers fall behind at your PCBU?

- 13.1. Are you aware whether there are some individuals who repeatedly come up as late or non-compliant with the RTO?
- *If yes: Why do you think this is?*
- 13.2. Have you noticed any patterns regarding which workers fall behind at your port?
- Are there particular work groups who are more often behind (e.g. stevedores, night shift workers, weekend workers, casuals, etc.)
 - Are there particular demographic groups who are more often behind (e.g., younger, older, gender, religion, non-native English speakers, etc.)?
 - Do you see any differences in adherence between new workers vs those who have been under the RTO for some time?

Part 4: Consequences for nonadherence

14. What are the consequences for when you are overdue to be tested?

- 14.1. Can you talk me through what happens when you get behind on your testing?
- How does your *PCBU* follow up with stevedores who are behind in their testing?
 - How soon would your PCBU know that you are behind?
 - *[Get step-by-step idea of escalation process]*
 - How does the *Ministry of Health* follow up with stevedores who are behind on their testing?
 - How do your PCBU's escalation actions & reminders overlap with those of the Ministry of Health, if at all?
 - Are there any consequences for you if you fall behind too often?

15. What escalation steps tend to be effective?

- 15.1. How effective are each of those steps in encouraging you or other stevedores to get tested?
- 15.2. Thinking about the last time you were behind, which step/ action nudged you to get tested again?

Part 5: Key COVID-19 comms channels

16. What are the key channels through which PCBUs communicate with maritime border workers, particularly stevedores?

16.1. What are the main ways [your employer] communicates information to you about COVID-19 testing?

[Prompt] - Employer, MoH web pages, Unite Against COVID-19, television, social media etc?

- Can you tell me about the last time you saw or received a message about testing?
- Besides your employer, who else communicates with you about COVID-19 testing? (MOH, Public Health staff?)

16.2. How well do you think your coworkers understand messages from [your employer]?

- Do any of your coworkers struggle because they do not speak English fluently?
- Do many of your coworkers struggle to read written instructions?

16.3. Are there any other barriers to outreach/ communication that we should be aware of?

17. What would be the most effective platform for conducting a KAP survey with stevedores/ PCBUs?

In the next step of this project, we will be conducting a survey to ask maritime border workers about their knowledge, attitudes and practices related to COVID-19 testing. This will help to inform intervention areas for improving RTO adherence. The survey should take no longer than 15 minutes to complete. I have a couple of questions to get your advice on how to do this as effectively as possible.

17.1. If we conduct the survey with **stevedores**, what type of survey do you think would generate the best response? *I.e., paper, online, phone, in-person, etc*

- How would you advise us to incentivise stevedores to complete the survey?
- If the survey is being completed by stevedores, what would be the most effective way to ensure that people who don't speak English fluently can participate?
- What languages would be most important to consider, among your stevedore cohort?

18. What would be the most effective means of disseminating a KAP survey with stevedores?

18.1. What channel do you think makes the most sense for sending the survey out, so that stevedores are aware of it?

Closing & next steps

19. **Magic wand Q** - if anything could be done to increase border workers' adherence to the RTO, what would be most effective?

20. Thank the participant for their time.

21. Ask for:

- The participant's home address so we can post a supermarket voucher
- The participant's email address so the final report can be sent to them

[Note: the personal contact details should be stored separately in the stakeholder outreach tracking sheet, not the interview notes].

Appendix 3: KAP survey

Survey methodology

Survey population, sampling plan and data collection

The population that we targeted with this survey was active maritime border workers, including stevedores, who are subject to the RTO. Participants were eligible to participate if they fell into this category (and were aware that they were subject to the RTO).

Participants were invited to participate in this survey via a link to the survey, distributed via text or email to PCBU contacts around New Zealand.

Given that this survey was invite-based and non-compulsory, there were inevitably some response biases in those who chose to respond. That is, it is possible that we only collected data from certain subgroups of maritime border workers - that is, those workers who were more likely to respond to a survey regarding the RTO were potentially more supportive of the RTO to begin with. We sought to overcome this by offering participation incentives (\$200 koha), however the likelihood of a biased sample was a limitation of the current survey.

Data collection took place on SurveyMonkey, an online survey platform. We also took paper/pen versions of the survey to ports when BIT visited those sites, to seek to specifically increase the uptake of the survey among those who do not wish to use their phones to participate.

Information statement and informed consent

All survey participants provided informed consent prior to providing their data in the survey. The information statement and informed consent appeared as the first questions in the survey (the copy can be seen below). If a participant did not provide consent, they were not able to participate in the survey.

Note that participants were incentivised to participate in the survey via the chance of winning a \$200 gift voucher for groceries, that was provided in the form of a gift voucher to a grocery store of their choice¹⁰⁰ (i.e., Countdown, New World, Pak n Save, etc). BIT conducted the prize draw and Sarah Hayward contacted the winning participant to advise them of their win, and determine the most suitable grocery store voucher for their location.

Survey validation methods

This survey was validated via interviews with two border workers from the population of interest. This validation took place to ensure that the survey questions were the most relevant, appropriate, and were comprehensible for the population of interest. Following the survey validation, we then iterated the survey based on the workers' feedback. For example, we rephrased some of the items to make them more unambiguous, removed some irrelevant

¹⁰⁰ We have chosen not to specify a particular grocery store due to equity considerations - some grocery stores may not be easily accessible across the country/

items, and cut down the length of the survey. We then distributed the survey after iteration via the methods outlined above.

Data analysis and dissemination of survey results

Data analysis plan

We analysed responses to quantitative questions descriptively, looking for trends that emerged in participants' knowledge, attitudes and practices. Where there was sufficient data available, we also broke down the analysis by demographic groups (i.e., Māori vs NZ European vs Other). However, we did not conduct or present any descriptive statistics on groups smaller than ten people, to avoid inadvertent identification of respondents and false inferences from small samples.

For qualitative data: We analysed responses thematically, drawing out themes and trends for qualitative responses.

All analyses on survey data were conducted by the Behavioural Insights Team, and quality assured by Dr. Elizabeth Convery.

Data management

All data was securely stored on a password protected drive that only members of the BIT's Research Team have access to. Data handling and management were governed by BIT's data management protocol, where data is only available to members of the BIT research team. Data was anonymised and stored on secure drives accessible only to BIT staff. Data was not and will not be transmitted to third parties not involved in this research, except where this is appropriate under the conditions of appropriate data sharing agreements.

The survey

Introductory page

Thanks for agreeing to help us understand how to help keep New Zealand safe from COVID-19.

Please read the points below, and if you are happy to participate please indicate this in the checkbox below to continue with the survey.

- This survey is for all NZ maritime border workers. It is about mandatory COVID-19 testing.
- It is being conducted by an independent research group, in collaboration with the Ministry of Health.
- It is voluntary and confidential. This means that the Ministry of Health will not be able to identify the answers you provide.
- For more information click [here](#).

I have read and understood the aims of this research, and want to take part in this research.
I do not want to take part in this research (note, you will not be able to participate in this survey or enter the prize draw).

Screeners

QS.1: To the best of your knowledge, are you required to undergo COVID-19 testing under the Required Testing Order, as a part of your employment? (i.e., is regular COVID-19 testing mandatory for you?)

- Yes
- No [*Screenout*]
- I don't know [*Screenout*]

QS.2: Which role in the maritime border workforce do you primarily work in?

- Stevedore
- Customs officer
- Linesman/woman
- Marine engineer
- Marine pilot
- Marine surveyor
- Port worker
- Technician
- Other: *Please specify*
- I don't work in the maritime border workforce [*Screenout*]

QS.3: Which regular testing method are you currently using?

- Nose swabs
- Throat swabs
- Saliva testing
- I don't know

QS.4: How often do you need to be tested, according to the Required Testing Order?

- Once a week
- Once a fortnight
- Twice a week
- I don't know

Knowledge

Q1.1 We are interested in what you know about getting tested for COVID-19.

Please select the option that best represents your knowledge.

[Randomise order.](#)

I need to get tested regularly for COVID-19 even if I am fully vaccinated against COVID-19.	<i>True</i>	<i>False</i>	<i>Not sure</i>
If I am fully vaccinated against COVID-19, I can't get COVID-19	<i>True</i>	<i>False</i>	<i>Not sure</i>
If I am fully vaccinated against COVID-19, I can't pass on COVID-19 to others	<i>True</i>	<i>False</i>	<i>Not sure</i>

Q1.2 *Thinking about your knowledge of COVID-19 testing, do you agree or disagree with the following statements?*

Please select one on each row.

[Randomise order.](#)

I know where I can get tested if I am not at work	<i>Disagree</i>	<i>Not sure</i>	<i>Agree</i>
I know when to get tested if I am not at work	<i>Disagree</i>	<i>Not sure</i>	<i>Agree</i>
I know why I need to keep getting tested even when I am fully vaccinated	<i>Disagree</i>	<i>Not sure</i>	<i>Agree</i>

Attitudes

Q2.1 Thinking about your attitudes towards COVID-19 testing, do you agree or disagree with the following statements?
Please select one on each row.

I get tested for COVID-19 regularly because:

[Randomise order.](#)

The Testing Order requires me to get tested regularly	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
I want to make sure I am COVID-free	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
It is my responsibility to my family/whānau/community	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
I am worried about getting COVID-19	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
I am worried about giving my family/whānau COVID-19	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>

Q2.2 Thinking about how your employer communicates with you about COVID-19 testing, do you agree or disagree with the following statements?

Please select one on each row.

[Randomise order.](#)

I have received enough information about why getting tested for COVID-19 regularly is important	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
My employer makes it easy for me to get tested regularly at work	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>

Q2.4 Thinking about the options you have for COVID-19 testing, please write your ranking of following in order of your preference

(i.e., write 1 next to your most preferred method of testing, 2 next to your next most preferred, and 3 next to your least preferred method of testing)
Write response next to item
Back of the nose swab
Throat swab
Saliva sample (performed twice as frequently as the swabs)

Q2.5 Have you been offered the option of saliva testing , instead of a nasal or throat swab?
Single response item
Yes, and I am currently doing saliva COVID-19 tests
Yes, but I am still getting nasal or throat swab COVID-19 tests
No, I have not been offered saliva COVID-19 tests
I don't know

Q2.6 Thinking about your attitude toward saliva testing for COVID-19 , to what extent do you agree or disagree with the following statements?			
Please select one on each row.			
Randomise order.			
Saliva testing for COVID-19 is more convenient than nasal swabs	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
I am interested in undertaking saliva testing for COVID-19	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
I prefer nasal swabs to saliva testing because of the increased frequency of saliva testing (twice a week).	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>
I prefer saliva testing to nasal swabs because I don't have to wait in line to be tested	<i>Disagree</i>	<i>No opinion</i>	<i>Agree</i>

Practices

Q3.1 Approximately how many times have you personally been late to get a COVID-19 test, as a part of the Required Testing Order?
<i>(It's important that you're honest with us here. Just a reminder that any information you give us will not be linked to you individually. That means the Ministry of Health won't know from this survey that you've ever been overdue for COVID-19 testing).</i>
Single response.
0 times - I have never been overdue for testing
1-2 times
3-4 times
5-6 times
7+ times

Q3.2 Listed below are some statements about things that might stop people from getting a COVID-19 test regularly. To what extent has each statement been something that has stopped you (or could stop you) from getting tested regularly for COVID-19?				
Please select one on each row				
Randomise order.				
	Not at all	Somewhat	Very much	NA- this does not apply to me
Having to travel to a testing station				
Needing to make childcare arrangements for when I get tested				
Having other family/whānau commitments				

Waiting at the testing station to get the test
Needing to remember to get tested
The inconvenience of having to get tested outside of work (i.e., while rostered off, or on leave)
Other people saying negative things about COVID-19 testing
The discomfort of getting tested
The length of time it takes to get a result
Annoyance or resentment that the Government made testing mandatory
My personal beliefs
My religious beliefs
A fear of testing positive to COVID-19
A fear of how others will treat me if I test positive to COVID-19
Worry about what will happen if I test positive to COVID-19 (i.e., being socially disconnected, not having enough money to make ends meet)
My workplace asking me to get tested during my break times (i.e., smoke break, lunch break)
Not being near an open testing station when I want to get tested
Other: Please specify

What would make it easier for you to get tested regularly?

Q3.4

You can write some dot-points here or short sentences here, if that's easier.

[Free response.](#) [Short response box.](#)

Demographic information

What is your **gender**?

[Single response]

- Female
- Male
- Another gender - please specify:
- I'd prefer not to say

What is your **age**?

[Single response]

- 18 - 24
- 25 - 29
- 30 - 34
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65+

At which port do you primarily conduct your business/**work**?

[Single response]

- Northland

- Auckland
- Tauranga
- Waikato (Taharoa)
- Gisborne
- Napier
- New Plymouth
- Wellington
- Picton
- Nelson
- Christchurch (Lyttelton)
- Timaru
- Dunedin (Port Chalmers)
- Invercargill (Bluff and Tiwai Point)
- *Other*

Please select the **ethnicity/ethnicities** that you identify as:

[Multiple responses; Checkbox]

- NZ European
- Māori
- Pacific
- Asian
- Middle Eastern/Latin American/African
- *Other Ethnicity*

Thank you - you've reached the end of the survey! Please click "Done" below, and you will see a link to a separate survey to enter your contact details for the \$200 prize draw.

[Note: Participants who complete the survey will be linked to another survey to collect their name, phone number and email in a separate survey, to conduct the prize draw. This will ensure that a respondent's details cannot be linked to their survey responses].

Appendix 4: Focus group conversation guide for stevedores

Central Question	Sub-questions
<p>Introductions, background & warm-up (5 mins)</p>	<ul style="list-style-type: none"> • Introduce ourselves and thank the stevedores for their time • Explain purpose of project and focus group - Regular testing of border workers is one way to ensure that COVID-19 does not spread to the community, with subsequent health and economic consequences. We recently ran a survey with all maritime border workers to help us understand the most common barriers to COVID-19 testing. In this focus group, we would like to unpack the findings a bit further and also hear your ideas for what could make COVID-19 testing easier • Build rapport
<p>Sharing high level findings from survey (5 mins)</p>	<ol style="list-style-type: none"> 1. Most common barriers - (a) Inconvenience of not getting tested while at work; (b) having to get tested during smoko break; (c) concerns about testing positive for COVID [slide 12] 2. Testing methods: We found that nose swabs are the preferred testing method, but not by much. Maritime border workers are also interested in saliva testing [slide 8] 3. Why, where and when to get tested: Most maritime border workers reported knowing why they need to keep getting tested even when fully vaccinated; where to get tested if not at work; and when to get tested if not at work [slide 5] 4. Motivations for getting tested: Most common motivation was responsibility to family/whānau, followed by wanting to make sure you are COVID-free. Also just simply because testing is a requirement [slide 6]
<p>Unpacking the findings - large group discussion (10 mins)</p>	<ol style="list-style-type: none"> 1. Concerns about testing positive: One of the barriers that emerged was concerns about testing positive. What would it mean to you and your whānau/family if you tested positive? What are your main worries about testing positive? (Prompt only if needed: being socially disconnected, not having enough money to make ends meet, fear of how others will treat you) 2. Saliva testing: Have you tried saliva testing? What made it easy or difficult? Where are the saliva test drop off points? 3. Why, where and when to get tested: Explore - do stevedores actually know where and when to get tested when they are not at

	<p>work OR they actually don't know but feel pressure to say they do know?</p> <p>4. Motivations for getting tested: What do stevedores think is the strongest motivation for getting tested? Why? Do stevedores just get tested because they have to (compliance) or is it an active choice (adherence)?</p>
<p>Solutions - brainstorm solutions on sticky notes, followed by large group discussion (10 mins)</p>	<p>1. Concerns about testing positive: Solutions to reduce worry about if you do test positive for COVID-19?</p> <p>2. Saliva testing: Solutions to increase the uptake of saliva testing; what would reduce the barriers to saliva testing?</p> <p>3. Where and when to get tested: Solutions to make it easier to get tested? Would it make a difference if stevedores were told where the closest testing station is to their home?</p> <p>4. Motivations for getting tested: What would increase motivation to get tested?</p>
<p>Wrap-up and close</p>	<ul style="list-style-type: none"> ● Do they have any other ideas for how to increase adherence to RTO? ● Thank the stevedores for their time ● Explain next steps

Dark red text = only if time.

Note: It will save time, by presenting the first finding, then unpacking it further, then brainstorming solutions, before moving to the second finding, unpacking it, discussing solutions etc.