Briefing

Options for improving respiratory protection against aerosolised viral particles for MIQF workers and returnees

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To:	Hon Chris Hipkins, Minister for COVID-19 Response		
Copy to:	Hon Dr Ayesha Verrall, Associate Minister of Health		

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Minister's office to complete:

☐ Approved ☐ Decline ☐ Noted

☐ Needs change ☐ Seen ☐ Overtaken by events

☐ See Minister's Notes ☐ Withdrawn

Comment:

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

Purpose of report

1. This briefing provides advice on options for providing the wider managed isolation and quarantine facility (MIQF) workforce, and returnees, with an increased level of respiratory protection. As part of a precautionary approach and within the context of a range of other risk mitigations in place, this is intended to reduce the risk of aerosol transmission within MIQFs to both staff and returnees.

Summary

2. Our understanding of the risk of aerosol transmission of SARS-CoV-2 has changed over the course of the pandemic. We now understand that SARS-CoV-2 can be transmitted via infectious aerosols, and that this risk is increased in confined, poorly ventilated indoor spaces. A precautionary approach is also warranted by increasing evidence about the increased transmissibility of emerging variants of concern (e.g. the delta variant).

3. There is a range of work underway to reduce the risk of aerosol transmission within MIQFs, particularly with respect to assessing ventilation systems across the MIQ system and undertaking remedial actions. The installation of air filtration units in shared indoor spaces also provide an additional layer of risk mitigation.

4. However, given the time required to complete the remediation work programme, as well as the limited scope to improve the MIQF ventilation systems to the ideal conditions for viral isolation/containment without significant infrastructural changes, some risk to both staff and returnees associated with unpredictable air flow and poor ventilation within MIQFs will remain.

5. Accordingly, providing the wider MIQF workforce and returnees with a higher level of respiratory protection is an additional opportunity to reduce the risk of in-MIF transmission to both staff and returnees.

Providing a higher level of respiratory protection to the wider MIQF workforce

6. There are range of P2/N95 particulate respirators available that would be suitable for use by the non-health MIQF workforce, and which would provide a significantly higher level of respiratory protection to the wearer than the ear loop medical masks currently used by the non-health MIQF workforce.

7. According to *AS/NZS 1715:2009* and *AS/NZS 1716:2012,* workers must be fit tested prior to wearing P2/N95 particulate respirators. The available evidence suggests that fit checking (manually checking the fit and seal of the particulate respirator) is **not** a substitute for fit testing with respect to finding the best size and shape of a P2/N95 particulate respirator for each individual. However, even non-fit tested P2/N95 particulate respirators are likely to offer a greater level of respiratory protection than the ear loop medical masks currently in use among the non-health MIQF workforce.

8. Whilst Portacount fit testing machines can be procured for the MIQ system to facilitate rapid on-site fit testing, there are a range of operational and logistical challenges with implementing fit testing across the entire MIQF workforce. This includes:

    a. Management of workers that cannot pass a fit test for any of the available P2/N95 particulate respirators, or who cannot wear a P2/N95 particulate respirator for other reasons (e.g. because of reactivity to materials, and/or those who cannot or choose not to be clean shaven e.g. for cultural reasons).

    b. Supply constraints and challenges that may arise (i.e. the need to secure an ongoing supply of a wider range of P2/N95 particulate respirators than would be required if workers only performed fit checks).

    c. Operational and logistical barriers to implementing fit testing across the entire MIQF workforce, particularly with respect to the rotational nature of the New Zealand Defence Force (NZDF) MIQF workforce.

    d. The nature of the work completed by contractors may create barriers and complications for this work with respect to facilitating fit testing prior to engaging in on-site work.

9. Further work is required to confirm the operational guidance for the use of P2/N95 particulate respirators among the wider MIQF workforce (summarised in paragraphs 52 - 54).

Providing a higher level of respiratory protection to returnees

10. Providing returnees with better fitting masks is another opportunity to reduce the risk of in-MIF transmission to other returnees and to staff, by improving both source control and respiratory protection for the wearer.

11. The Ministry of Health (the Ministry) has assessed the available options for providing returnees with a better fitting mask than the ear loop medical masks currently used by returnees. The level 3 head loop mask has been assessed as a suitable potential option for returnees.

12. Prior to providing returnees with level 3 head loop masks, further operational work is required to understand the operational challenges and implications prior to implementing the change, as these masks are donned and doffed differently to the masks currently used by returnees. This further work includes updating returnee-facing collateral and briefings/instructions to returnees (refer to paragraphs 69 - 72).

13. Additionally, greater understanding of the human factors influencing returnee adherence to basic infection prevention and control (IPC) measures, such as correct donning and doffing of masks, will inform targeted efforts to improve compliance and efficacy of the

IPC measures in place in MIQFs. The Ministry is scoping a programme of work in this area and will provide you with further detail on 2 August 2021.

Recommendations

We recommend you:

a) **Agree** that the non-health MIQF workers be provided with P2/N95 particulate respirators in returnee facing zones by the end of July 2021. **Yes/No**

b) **Note** that further work is required to clarify the operational guidance and preparation for the use of P2/N95 particulate respirators among the wider MIQF workforce. **Yes/No**

c) **Note** that providing non-health MIQF workers with P2/N95 particulate respirators when they are in returnee zones will cost an estimated s 9(2)(b)(ii) more annually than is currently spent on medical masks for the non-health MIQF workforce, and that there is currently no forecasted supply constraints with extending P2/N95 particulate respirators to this group. **Yes/No**

d) **Note** that fit testing is the 'gold standard' and is required in under *AS/NZS 1715:2009* and *AS/NZS 1716:2012,* however, there are operational implications and challenges with fit testing the entire MIQF workforce, including: **Yes/No**

- The rotational nature of the MIQF workforce (particularly NZDF workers), which presents significant operational challenges in obtaining and maintaining 100% fit testing coverage of the wider workforce;
- The need to clarity the guidance for managing workers that cannot pass a fit test for any of the available P2/N95 particulate respirators, or who cannot wear a P2/N95 particulate respirator for other reasons, with consideration of equity implications; and
- The supply constraints and challenges that could arise as a result of the fit testing requirement, noting that if supply were constrained, allocation of available P2/N95 particulate respirators would necessarily be stratified by risk (i.e. based on risk of exposure while undertaking different tasks/activities).

e) **Agree** that fit testing of the wider MIQF workforce will commence by early August 2021 (pending arrival of Portacount fit testing machines), however, given the differential levels of risk faced by different groups of MIQF workers, fit testing will be prioritised to those at greater risk (i.e. at higher risk of exposure, and for greater lengths of time, due to the nature of their work). **Yes/No**

f) **Note** that following commencement by early August 2021, fit testing the MIQF workforce will be phased in over an extended period of time, and 100% fit testing coverage of the workforce will be challenging to achieve and/or maintained due to the rotational nature of parts of the MIQF workforce (particularly NZDF workers). **Yes/No**

g) **Agree** that supply and use of P2/N95 particulate respirators to the wider MIQF workforce will not be delayed while waiting for fit testing to become available, noting the significant risk reduction provided by a non-fit tested P2/N95 particulate respirator compared to the ear loop medical masks currently used by the non-health MIQF workforce. **Yes/No**

h) **Agree** that 30 TSi Portacount machines be procured to support the roll-out of fit testing of the entire MIQF workforce at a cost of s 9(2)(b)(ii) including consumables for one year. **Yes/No**

i) **Note** that the Portacount machines will continue to be utilised outside of current intent and purpose by the wider health system in the future if they are no longer required in MIQF settings. **Yes/No**

j) **Agree** that a brief trial be undertaken at select site(s) to test the acceptability and usability of the level 3 head loop masks among returnees, prior to a wider roll out across the MIQ system. Further work to understand the acceptability of modifications to the type 2 ear loop medical masks will simultaneously be undertaken, and a final recommendation for implementation will be provided in a briefing on 2 August 2021. **Yes/No**

k) **Agree** that further work is undertaken to understand and address the human factors and influencing returnee adherence to IPC measures, with further detail on this work programme provided to you in a briefing on 2 August 2021. **Yes/No**

Sue Gordon
Deputy Chief-Executive
COVID-19 Health System Response
Date: 28 June 2021

Hon Chris Hipkins
Minister for COVID-19 Response
Date: 1/7/21

Options for improving respiratory protection against aerosolised viral particles for MIQF workers and returnees

Background and context

We have continually adapted in response to emerging evidence of the role of aerosol transmission of SARS-CoV-2 and the increased transmissibility of emerging variants of concern

14. Over the course of the pandemic there has been a change in understanding about the mode of transmission of SARS-CoV-2, with an increasing recognition of the role that aerosol transmission plays in the spread of the virus. It is now widely understood that SARS-CoV-2 can be transmitted via infectious aerosols, and that this risk is increased in confined, poorly ventilated indoor spaces.

15. Continued adherence to basic infection prevention and control (IPC) precautions (e.g. hand hygiene, physical distancing, correct donning and doffing of personal protective equipment (PPE)) remains critical to preventing transmission within MIQFs.

The ventilation systems of MIQFs perform variably and have limited capability to be upgraded to the ideal conditions for mitigating the risk posed by infectious aerosols

16. Adequate ventilation and control of the flow of air that may contain live virus is critical to reducing the risk of aerosol transmission. The hotels we use as MIQFs were not designed for viral containment/isolation and have extremely limited capability to be upgraded to the ventilation specifications needed in hospital-level isolation settings.

17. The ventilation work programme that is underway across the MIQ system has identified considerable variation in the performance of the ventilation systems. In particular, many facilities are not achieving negative pressure conditions in hotel rooms, which is a key risk mitigation measure to manage airborne infections.

18. Air filtration units are currently being installed across the MIQ system in shared spaces where there is poor ventilation (namely corridors and lifts). This is due to be complete by the end of June 2021. While these units will decrease the concentration of airborne particles containing live virus, they cannot be relied upon in isolation to address the risks associated with aerosol exposure in shared indoor spaces.

19. Remediation work will be undertaken to ensure each facility meets their original ventilation design requirements, and (as far as possible) some air handling improvements towards the preferred conditions of MIQFs. However, this remediation work programme will need to be staggered to meet the operational and capacity requirements of the wider system and will take several months to complete and verify.

20. Additionally, while some gains will be achieved by the remediation work, there remains limited scope to improve the ventilation systems in the facilities to the ideal conditions for viral isolation/containment without significant and impracticable infrastructural

changes. Accordingly, some risk to both staff and returnees associated with unpredictable air flow and poor ventilation within MIQFs will remain.

We have observed a number of instances of potential aerosol transmission within our MIQFs

21. Within our MIQFs there have been MIQF worker infections attributed to potential aerosol transmission[1]. Note that the IPC guidance at the time of these events did not recommend the use of P2/N95 particulate respirators. There have also been returnee-to-returnee transmission events within MIFs attributed to potential aerosol transmission[2].

22. While few to date, these instances of potential aerosol transmission within our MIQF environments – particularly when coupled with our growing understanding of aerosol transmission of emerging SARS-CoV-2 variants of concern, the variable performance of MIQF ventilation systems, and challenges in achieving favourable ventilation conditions in MIQFs – support consideration of whether the personal protective equipment (PPE) provided to non-health MIQF workers should be reviewed to maximise their level of respiratory protection.

23. Note that vaccination will provide an additional layer of protection for staff against infection but does not completely prevent the risk of transmission/infection. Therefore, although all staff within MIQFs are now required to be vaccinated, maximising respiratory protection for MIQF staff is still likely to be of some additional benefit in preventing transmission to the MIQF workforce.

24. Within the context of our elimination strategy, we take a precautionary approach that layers a range of risk mitigations in order to prevent onward transmission from MIQFs to the community.

25. We continually review the evidence in alignment with the elimination strategy. As our understanding of the transmission mechanisms of SARS-CoV-2 has evolved, we have made ongoing improvements to minimise the risk of in-MIF transmission, including progressively strengthening the circumstances in which PPE is required in MIQF settings. However, despite these improvements, sporadic occurrences of in-MIF transmission may still continue to occur.

Options for improving respiratory protection for MIQF staff

Providing MIQF staff with a P2/N95 particulate respirator is an opportunity to reduce the risk of aerosol transmission within the MIQF environment

26. P2/N95 particulate respirators are used by healthcare workers when caring for patients with COVID-19 and are designed to filter at least 94-95% of aerosols. However, this level of protection will only be achieved if there is a good fit to the person's face that provides a tight facial seal. The evidence suggests that correct mask fit is likely more important

[1] **These cases include a Jet Park Auckland registered nurse (RN) in August 2020, two Sudima Christchurch RNs connected to tranche one of the international mariners in October 2020, and a cleaner at the Grand Millennium Auckland in March 2021.**

[2] **This includes at the Crowne Plaza in Christchurch in September 2020, the Pullman in January 2020, and the Grand Mercure Auckland in March 2021.**

with respect to aerosol protection than the filtration ability of the material used for the respirator.

27. P2/N95 particulate respirators were first introduced into the Ministry's MIQF IPC guidance for the MIQF workforce in December 2020 for when close interactions (≤ 2 metres) with a confirmed (or probable) case of COVID-19 were required. In practice, this primarily concerned the health workforce. In February 2021, the guidance was reviewed and subsequently expanded to include close interactions with **any** returnee, irrespective of their COVID-19 status.

28. In response to our growing understanding of the risks of aerosol transmission (see paragraphs 14 - 25), there have been recent discussions between the Ministry's IPC sub-technical advisory group (TAG) and IPC experts working in MIQFs about expanding the use of P2/N95 particulate respirators to include all MIQF workers when they are in confined, poorly ventilated, indoor spaces in MIQFs.

Equivalent border facilities in Victoria have moved towards providing P2/N95 particulate respirators for the non-health workforce

29. Given the unique nature of our MIQFs, there are few comparable international contexts. In particular, there are few countries or jurisdictions have border quarantine facilities of a standard comparable to our own, where there is similar degree of returnee movement throughout the facility, and where there is sustained elimination of the virus within the community as has been achieved in Aotearoa New Zealand.

30. Border quarantine facilities in Australia offer one of the most directly applicable comparisons. We understand that in Victoria, P2/N95 particulate respirators are being implemented across the entire quarantine hotel workforce as one of many steps to address the risk of aerosol transmission within their facilities[3].

We can provide P2/N95 particulate respirators to the entire MIQF workforce

31. As a precautionary approach, there is the opportunity to provide a higher level of respiratory protection to the non-health MIQF workforce than is offered by the medical masks currently in use by this workforce. A summary of alternative particulate respirators is provided below in paragraph 35.

32. Note that if we were to require expansion of the use of P2/N95 particulate respirators for the non-health MIQF workforce, there is a need to distinguish use of certain particulate respirators across health care workers and non-health care workers in MIQFs. As the MIQF health workforce are at greater risk of aerosol exposure than the non-health MIQF workforce due to the nature of their work, the supply of the highest specification P2/N95 particulate respirators must be reserved for the health workforce.

33. Note that while the use of P2/N95 particulate respirators will reduce the risk of aerosol transmission to MIQF workers, ongoing IPC education, training, and monitoring of the non-health workforce is critical to maintain compliance. Increasing the specifications of PPE may also result in reduced adherence to basic IPC measures due to complacency,

[3] **The Victorian border quarantine system is also undertaking ventilation assessments and remedial actions to achieve negative pressure in hotel rooms, similar to the ventilation work programme underway in our own MIQ system.**

and/or discomfort in wearing this type of mask. These risks must be monitored and countered.

34. Education and training requirements to ensure that maximum benefit from wearing a P2/N95 particulate respirator will be required to ensure the benefits outweigh the risks of incorrect usage.

There are alternative particulate respirators to those used by the MIQF health workforce, which provide a high level of aerosol protection to the wearer

35. Our health care workers are currently accessing 3M9320A+, 1870+,1860 and 1860S P2/N95 particulate respirators. However, there are range of alternatives that would be suitable for the non-health MIQF workforce, including:

    a. Drägar X-Plore 1720 FFP2 (87,000 stock on hand with further orders arriving);

    b. 3M 8210 P2 (529,000 stock on hand with further orders arriving); and

    c. 3M 9210 N95 (292,000 stock on hand).

36. We have received enquiries specifically about the use of the 'Airpop' mask. Note that the Ministry does not consider the 'Airpop' mask to be suitable for use in MIQF settings as the Ministry has not been in a position to verify and authenticate all of the appropriate technical documentation and certification. Therefore, its efficacy in ensuring adequate protection to the wearer cannot be sufficiently assured.

Supply and cost considerations (of the above)

37. Global supply of P2/N95 particulate respirators remains constrained for a variety of reasons, including the increasing incidence of COVID-19 cases in the Northern Hemisphere, trade and export measures internationally, and the reduction in emergency-use authorisation initiatives.

38. The Ministry currently holds 9,187,455 P2/N95 particulate respirators, with a further 18 million on order. Current average per week use across health and disability settings, alongside border and MIQF use, equates to 15,000 per week.

39. The following supply model has been created on the assumption that the workforce requirements equates to 2,700 personnel working an average of 6 shifts or interactions per week, utilising four P2/N95 particulate respirators per shift or engagement, and at an average cost of s 9(2)(b)(ii) (mask + freight).

40. Note that this supply model is on top of the current utilisation and budget estimations for the healthcare workers currently accessing and utilising P2 particulate respirators within MIQFs.

MIQF additional P2 supply requirements for non-health MIQF workers per week (approximate)	Cost per week	Impact of decision on budget (from 30 June 2021 to 30 June 2022)
64,800	s 9(2)(b)(ii)	s 9(2)(b)(ii)

41. Supply is available within the currently centrally managed supply from the Ministry. MIQFs are already set up to order directly from the Ministry's portal, however, clear considerations will be applied to differentiate supply for health versus non-health MIQF workers in MIQFs. Supply will be reviewed and monitored every week.

The efficacy of fit tested versus fit checked P2/N95 particulate respirators

42. The Australian/New Zealand Standards *AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment* and *AS/NZS 1716:2012 Respiratory protective devices* require an individual to be fit tested prior to initial use and then annually, or whenever there is a change in facial features and/or a change in the 'model' of respirator. Note that the Standards are not legally enforceable.

43. ***Fit testing*** is a process to identify whether the shape and size of a respirator fits the face of the wearer. There are a range of physiological factors that affect the fit of P2/N95 particulate respirators, and the presence of facial hair also interferes with the seal. Initial fit test pass rates vary considerably with lower rates in women and people of Asian ethnicity.

44. ***Fit checking*** (as opposed to fit testing) is a process where the wearer assures the correct wear and good seal of their P2/N95 particulate respirator and is the minimum safety standard to ensure respiratory protection. Most health agencies recommend that healthcare workers carry out fit checking every time they wear an P2/N95 particulate respirator.

45. With respect to the efficacy of fit checking versus fit testing in assessing *mask fit*, the evidence suggests that fit checking is **not** a substitute for fit testing to find the best size and shape of a P2/N95 particulate respirator for an individual.

46. However, even non-fit tested P2/N95 particulate respirators are likely to offer a greater level of respiratory protection than the ear loop medical masks currently in use among the non-health MIQF workforce.

47. Our legal advice is that if it is not reasonably practicable to fit test the non-health MIQF workforce, this is unlikely to be a breach of the Health and Safety at Work Act 2015.

There is an option to secure Portacount fit testing machines that enable real time fit testing capability

48. Portacount machines can be procured to facilitate rapid quantitative fit testing within MIQFs. 30 TSi Portacount machines can be sourced through Australia and are the same machines utilised within our District Health Boards (DHBs). The total up to maximum cost of the machines and consumables for 2,500 fit assessments equates to s 9(2)(b)(ii) exclusive GST.

49. Once these Portacounts are no longer required within the MIQ system, they can be utilised within DHBs or by Primary Health Organisations who currently support general practice and urgent care clinics with their fit testing. As fit testing is an annual requirement for healthcare workers, the machines will continue to be utilised outside of the current intent and purpose.

50. There is an approximate five-week lead time before the Portacounts will arrive within Aotearoa New Zealand.

There are operational challenges to implementing fit testing across the MIQ workforce

51. There are significant operational implications for fit testing the entire MIQF workforce even with the procurement of Portacount machines. These implications include:

    a. The need for clarity regarding the management of workers that cannot pass a fit test for any of the available P2/N95 particulate respirators, or who cannot wear a P2/N95 particulate respirator for other reasons (e.g. because of reactivity to materials, and/or those who cannot or choose not to be clean shaven e.g. for cultural/religious reasons);

    b. The supply constraints and challenges that may arise (i.e. the need to secure an ongoing supply of a wider range of P2/N95 particulate respirators than would be required if workers only performed fit checks). If supply is sufficiently constrained, there would be a need to risk stratify their usage (i.e. based on risk of exposure while undertaking different tasks/activities, and in different settings).

    c. Operational and logistical barriers to implementing fit testing across the entire MIQF workforce, particularly with respect to the rotational nature of the NZDF MIQF workforce. For contractors who may enter a MIQF one time, or for a brief amount of time, there are logistical challenges in ensuring they are appropriately fit tested prior to entering the site.

    d. The amount of time it takes for each individual to be fit tested needs to be taken into account. Training time for fit testing and fit checking should also be considered.

52. Note that during the approximate five-week lead time before the Portacount fit testing machines can be delivered, the Ministry of Business, Innovation and Employment (MBIE) will oversee and support the change management required to implement this work. This includes clarifying the roles and responsibilities relating to implementing fit testing at both a regional and facility level, communicating to persons conducting business or undertakings (PCBUs) and MIQF staff about the change, and confirming timeframes for the roll-out of fit testing.

53. Note that the Ministry of Health will revise and update the current PPE advice to provide the operational IPC guidance for the use of P2/N95 particulate respirators in returnee zones, and will support regional MIQF IPC teams to prepare for implementation. This work will be complete by late July 2021.

54. This will include:

    a. Clarifying zones, areas and activities that would meet requirements for any staff needing to wear P2/N95 particulate respirators, based on a site-by-site risk assessment;

    b. Reviewing current requirements than maintain and support IPC principles and hierarchal controls in relation to on-site activities and specific tasks undertaken by non-health staff to:

        i. Ensure efficient use of resources;

        ii. Support the appropriate scheduling and sequencing of events and activities to allow for an increase in the frequency of breaks from wearing P2/N95 particulate respirators (to around at least once every 2 hours), given the

discomfort that can be experienced when wearing P2/N95 particulate respirators for extended periods of time; and

c. Confirming risk prioritisation for the roll-out of fit testing.

55. Given significant risk reduction provided by a non-fit tested P2/N95 particulate respirator compared to an ear loop medical mask, the roll out of P2/N95 particulate respirators to the wider MIQF workforce will not be delayed while waiting for fit testing to become available.

56. Because different workers within MIQFs are faced with different levels of risk due to the nature of their jobs, a risk stratification framework will be developed to prioritise groups of workers for fit testing based on the risk of different activities (i.e. length and degree of potential exposure).

57. Unions have been notified that work is underway to improve IPC measures and protections for workers as a result of our growing understanding of aerosol transmission risks in poorly ventilated, confined indoor spaces. MBIE will continue to engage with the Unions to ensure there is support for the improvements to health and safety for workers in MIQFs.

58. It is acknowledged that there may be questions about implications for workers who 'fail' fit testing (i.e. workers whose facial characteristics mean they are unable to properly fit any of the available P2/N95 particulate respirators). MBIE is continuing to explore this, including considering how these challenges are managed among other workforces (e.g. the health workforce).

Options for improving respiratory protection for returnees

59. Returnees currently wear 3 ply ASTM Level 2/Type IIR ear loop medical masks, which have an estimated 38.5% 'fitted filtration efficiency' (%FFE)[4] (e.g. compared to around 98% FFE for a P2/N95 particulate respirator). There are a range of modifications that can be made to ear loop medical masks to improve their fit and increase %FFE[5].

Providing with a better fitting mask is an opportunity to reduce the risk of in-MIF transmission via infectious aerosols

60. Providing returnees with better fitting medical masks when in the airports, en-route to MIQFs, and whenever they are outside their room, would reduce the risk of in-MIF transmission to other returnees and to staff by:

a. Improving source control (i.e. reduce the risk of the wearer exhaling infectious droplets into the environment, thereby reducing the risk to MIQF staff and to other returnees); and

b. Improving respiratory protection for the wearer.

[4] **FFE combines the intrinsic filtering efficiency of the mask material, as well as the efficacy of fit to the face, to give an indication of the level of respiratory protection provided to the wearer (i.e. higher %FFE indicates a greater level of protection).**

[5] **Including the use of aluminium nose bridges, tying ear loops and tucking side pleats, the use of ear guards or hair/mask clips, and double masking (placing a fabric mask over the medical mask).**

61. Note that while cohorting of returnees reduces the risk of undetected late in-MIF transmission, thereby reducing the risk of a returnee incubating the virus on exiting the facility into the community, current cohorting arrangements cannot completely eliminate the risk of a returnee departing the facility while incubating the virus.

62. Accordingly, the provision of better fitting masks as a precautionary approach would further reduce the risk of aerosol transmission to returnees throughout their time in MIQFs (and also in airports and while in transit to MIQFs), providing an additional layer of protection against in-MIF transmission.

63. In addition to modifications to the Type IIR/Level 2 ear loop medical masks[5], there are alternate masks available which provide a higher %FFE i.e. a higher level of respiratory protection to the wearer. This is primarily due to enhanced fit of the masks, which appears in the literature to be more important for respiratory protection than the filtering capacity of the material.

64. The Ministry has assessed the available options for providing returnees with a better fitting (therefore higher %FFE) mask. In consultation with the IPC sub-TAG and the MIQ TAG, we have identified the ASTM Level 3 head loop mask as a suitable potential option for returnees. This mask is expected to provide up to 71.5% FFE[6].

65. Note that a prototype FFP2 particulate respirator is expected to become available to the market in the coming months. There is limited information currently available about this prototype due to the commercial sensitivity of the information, however, if it passes accreditation it may be a suitable option for returnees and would provide a very high level of respiratory protection without impacting supply for the health or other workforces. The Ministry will continue to monitor the progress of this prototype and will provide further advice on its suitability and applicability in the MIQ system, if and when further information is available.

Supply considerations for provision of Level 3 head loop masks for returnees

66. The Ministry currently holds 5,800,000 Level 3 Head Loop surgical masks.

67. The following supply model has been created on the assumption that the returnee requirements equates to 5,943 returnees requiring 4 masks a day at an average per mask cost of s 9(2)(b)(ii) Note that this supply model is on top of the current utilisation and budget estimations for the healthcare workers s.

MIQF returnees Level 3 Surgical Head Loop supply requirements for returnees per week (approximate)	Cost per week	Impact of decision on budget (from 30 June 2021 to 30 June 2022)
166,404	s 9(2)(b)(ii)	s 9(2)(b)(ii)

[6] **Note: this is the %FFE of a level 3 mask with ties behind the head as data was not available about the %FFE of the level 3 head loop masks. However, as the mask's specifications themselves are identical, the %FFE are likely to be comparable.**

68. Supply is available within the currently centrally managed supply from the Ministry. MIQFs are already set up to order directly from the Ministry's portal.

Prior to implementing changes in the type of masks provided to returnees, we recommend undertaking a brief trial to test the acceptability of the proposed intervention

69. The proposed level 3 head loop masks are donned and doffed differently than the level 2 ear loop masks currently utilised by returnees. Given the operational (and potentially supply) challenges associated with changing returnee PPE, it is important to take time to understand the operational challenges and implications prior to implementing change in order to prevent unintended consequences (e.g. increase in non-compliance with PPE requirements among returnees).

70. This work includes updating returnee-facing collateral and briefings/instructions regarding the donning and doffing of these new masks, to ensure that returnees are well prepared to understand and respond to such changes.

71. Therefore, prior to distributing level 3 head loop masks across the MIQ system for returnees and subject to your agreement, a brief trial will be undertaken at select site(s) to test the acceptability and usability of the level 3 head loop masks among returnees.

72. During this time, further work to understand the acceptability of modifications to the type 2 ear loop medical masks will also be undertaken, with a view to review both options (level 3 head loop masks and modified level 2 ear loop medical masks) and make a final recommendation for implementation in a briefing on 2 August 2021.

There is a need to gain greater understanding of the human factors that influence returnee behaviours and compliance with IPC measures

73. In addition to providing returnees with better fitting masks, reducing the risk of transmission to returnees also requires further focus on the human factors influencing returnee adherence to basic IPC measures, such as correct donning and doffing of masks. This will inform targeted efforts to improve compliance and efficacy of IPC measures.

74. The Ministry is scoping a programme of work to gain a greater understanding of the human factors and challenges in achieving and maintaining returnee adherence to IPC measures. We will provide further detail on this programme of work on 2 August 2021.

75. Note that MBIE are exploring options to widen the use of CCTV to support health related objectives. An update on this work will be included in the briefing on 2 August 2021.

Equity considerations

76. Potential equity considerations for the implementation of P2/N95 particulate respirators among the wider MIQF workforce relate primarily to the challenges surrounding fit testing. In particular, in instances where workers 'fail' fit testing (see paragraph 58 above), and/or where the requirement to be clean shaven may have implications for freedom of expression/freedom from discrimination (e.g. for workers that maintain facial hair for cultural/religious reasons). As noted in paragraph 58, MBIE are continuing to explore this issue.

Next steps

77. Subject to your agreement, we will progress the operational work required to implement P2/N95 particulate respirators among the wider MIQF workforce in returnee zones, with a view to complete this by the end of July 2021.

78. Pending arrival of the Portacount fit testing machines, fit testing of the workforce will commence by early August 2021 and be progressively rolled out across the entire MIQF workforce using a risk prioritisation approach.

79. We will keep you informed of progress in our regular weekly updates.

80. Subject to your agreement, we will undertake a brief trial of the acceptability and usability of level 3 head loop masks among returnees, as well as explore options for utilising modified level 2 ear loop medical masks. We will provide you with a final recommendation for providing returnees with better fitting masks on 2 August 2021, alongside further detail of a programme of work to better understand the human factors influencing returnee adherence to IPC measures.

ENDS