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Why a “mouth and nose” lockdown with masks might help avoid a “full body” lockdown at home

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The concepts of an Alert Level system, household “bubbles”, and social event size limits are all valuable pandemic control measures. Nevertheless, better “source control” of COVID-19 at various Alert Levels by requiring masks in public indoor spaces could reduce the risk of outbreaks (should there be border control failures) and reduce the likelihood that we would need to move back to tighter restrictions and lockdowns with the associated adverse economic, social and

mental health effects.

Typical street/shopping scene in Hong Kong with everyone wearing a mask (photo from author [LC] personal collection)

The spread of the SARS-CoV-2 virus appears to be mainly through conversational contact, at home and at social events. Both internationally and in New Zealand, large clusters are usually initiated by “super-spreader” events. New Zealand examples include weddings, a conference, a hospitality venue and a “private function” amongst others (see the Ministry of Health’s website on clusters). At the Bluff wedding cluster the transmission from one infected individual eventually resulted in 98 infected cases. One particular outbreak at a choir in Seattle involved 52 out of 61 people being infected from a single case [1]. Air currents have also been implicated in a restaurant outbreak, as per this informative blog, which also details outbreaks in various workplaces.

A study looking at clusters in Hubei Province (China) noted only one outbreak in an outdoor environment (and this involved only two people at 0.3% of outbreaks) [2]. One author has described common settings of the superspreading events: “*These parties, funerals, religious meet-ups and business networking sessions all seem to have involved the same type of behaviour: extended, close-range, face-to-face conversation—typically in crowded, socially animated spaces…Wherever and whenever people are up in each other’s faces, laughing, shouting, cheering, sobbing, singing, greeting, and praying*” [3].

Studies of outbreaks in Hong Kong have shown increase likelihood of outbreaks in “mask

off" settings (social events) compared with "mask on" settings (workplace environments) [4]. A high mask-wearing jurisdiction (96% of the population), Hong Kong has had a low Re for weeks without the strict lockdown we have faced in New Zealand.

Disease modelling suggests that early adoption of face masks by 80% of the population can stop the pandemic without the need for a lockdown. Without mass masking, if lockdown is lifted after 9 weeks and social distancing alone is employed, countries face the risk of a second wave of infections 4-5 months later [5]. When looking at empirical data from mask-wearing cultures, results from the modelling described above shows a "near perfect correlation between early universal masking and successful suppression of daily case growth rates and/or reduction from peak daily case growth rates". The authors of this study state: "Combined with other NPIs [non-pharmaceutical interventions] including social distancing and mass contact tracing, a "mouth-and-nose lockdown" is far more sustainable than a "full body lockdown", from economic, social, and mental health standpoints" [5].

In New Zealand, the concept of Alert Levels has been a useful approach to pandemic control. But as the country moved into Alert Level 2, the bubbles have "burst" and we now rely on social event size limits, restrictions at hospitality venues, and an emphasis on keeping at least 1-2 metres apart, depending on the setting. In this blog we consider that there is scope to further revise the Alert Level system to improve its effectiveness in preventing future pandemic spread if there is a second spike of cases from silent transmissions or border control failure. We considered improvements in light of the following key points:

- The growing body of evidence favouring mask use for source control (as discussed above). Alert Level 2 still poses risks of transmission from asymptomatic infected individuals in different settings such as school, shopping, work and public transport. It is within this Level that additional measures such as mass masking are highly desirable (see previous PHE blogs here and here).
- Until we have improved technologies for contact tracing, we need to be extra cautious around permitting large social events for which contact tracing by health workers might be extremely difficult.
- Optimal gathering sizes balance well-being from social contact with the ability to maintain progress on COVID-19 elimination (reduced risk of transmission and contact tracing).
- The setting of the gathering (indoor vs outdoor) should be taken into account, along with the potential for loud speech, singing, and up-close face-to-face proximity.
- There is a particular need to protect older people from COVID-19 and already some New Zealand aged residential care facilities require all visitors to wear masks at Alert Level 2 (eg, these ones).

Potential improvements to bubbles, social event sizes and mask requirements at different Alert Levels

Our proposals are listed in the table below. In the absence of controlled trials, these recommendations are largely based on informed judgement around the basic biology of SARS-CoV-2 and the emerging literature on COVID-19 outbreaks. Further refinements should be made as transmission mechanisms are better understood through New Zealand based and international studies. The practicality of these ideas should ideally be refined after a rapid process of community consultation, eg, a government-run process involving submissions, hui, and focus groups in coming weeks.

Table: Existing current NZ Alert Level arrangements and our recommended revisions (in italics) for different settings and face mask use requirements

		Proposed changes:		
Alert level	**Family and social settings – current arrangements**	**Social settings**	**Healthcare settings**	**Public transport & border control settings**
4	Current: Bubbles of household members only. "All gatherings cancelled and all public venues closed."	*Up to two families can share child care.* *Face mask wearing required when indoors in supermarkets/ shops and healthcare facilities (GP surgeries, pharmacies, hospitals) and if a household member is a suspected or confirmed COVID-19 patient.*	*Bubbles for appropriate teams eg, in hospitals and aged residential care facilities. Masks required for all healthcare workers and all patients. N95 masks when interacting with suspected or confirmed COVID-19 patients.*	*Masks required for all travellers and essential workers (can be fabric/ home-made masks).* *Public transport occupancy to be limited to 50% capacity.*
3	Current: People "must stay within their immediate household bubble, but can expand this to reconnect with close family/whānau, or bring in caregivers, or support isolated people. This extended bubble should remain exclusive." "Gatherings of up to 10 people are allowed but only for wedding services, funerals and tangihanga."	*Up to three families can share child-care. Consider "contact clustering" of two families or 5 friends in a bubble.* *Face mask wearing required as above.*	*As above*	*Masks required, as above. Public transport normal occupancy.*

		Proposed changes:		
Alert level	**Family and social settings – current arrangements**	**Social settings**	**Healthcare settings**	**Public transport & border control settings**
2	Current: “People can reconnect with friends and family, and socialise in groups of up to 10, go shopping, or travel domestically, if following public health guidance.” “No more than 10 people at gatherings (to be reviewed 25 May), except funerals and tangihanga, which can have a maximum of 50 people if registered with Ministry of Health.” “Hospitality businesses must keep groups of customers separated, seated, and served by a single person. Until 21 May alcohol can only be served when purchasing a meal. Maximum of 100 people at a time.” “Event facilities, including cinemas, stadiums, concert venues and casinos have a limit of 100 customers in each workplace at any time, with 1 metre physical distancing and record keeping.”	*Groups of up to 50 indoors and 100 outdoors if wearing masks (but not required during eating/drinking and only for those over the age of 2 years and if physically able).* *Eating and drinking in an indoor environment can only occur if seated at separate tables.* *Patrons must be seated at separate tables 1.5m apart while eating/drinking.* *All hospitality venues closed by midnight (for both infection control and injury prevention [6] reasons given the increased intoxication and fatigue risks).* *No mask requirements (unless mandated by premise owners/employers).*	*No need for team bubbles. Masks required for all healthcare workers and patients. N95 masks when interacting with suspected or confirmed COVID-19 patients.*	*As above.*

		Proposed changes:		
Alert level	**Family and social settings – current arrangements**	**Social settings**	**Healthcare settings**	**Public transport & border control settings**
1*	Current: No restrictions	*No indoor or outdoor events over 200 people permitted until digital technologies for efficient contact tracing have over 50% uptake by the public.* *Hospitality venue hours (as above) for injury prevention reasons.* *No mask requirements.*	*No restrictions, normal infection control practices only*	*Masks only required for international flights and border control settings in NZ.*
0**	This level does not yet officially exist. *No restrictions*	*Hospitality venue hours (as above). No other restrictions.*	*No restrictions*	*No restrictions*

* We suggest that Alert Level 1 is re-defined to be where successful elimination of SARS-CoV-2 transmission in New Zealand has been achieved (eg, 28 days with no new cases from transmission within NZ), but there is still a small risk of a border control failure that could result in an outbreak.

** We suggest that this zero Alert Level is adopted and equates to either global eradication of COVID-19 or widespread protection via vaccination.

Conclusions

Making use of bubbles, limiting social event sizes and widespread use of face masks are all important pandemic control strategies. The current Alert Level system could be enhanced by using face masks to provide increased outbreak prevention while allowing greater gathering sizes at Alert Level 2 and more efficient use of public transport. If border control failures were to occur and an increase in the current Alert Level was needed, employing face masks could allow us to enter a “mouth and nose” lockdown rather than a “full body” lockdown at home.

Requirements for mask use for a McDonalds restaurant in Hong Kong (photo from author [LC] personal collection)

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