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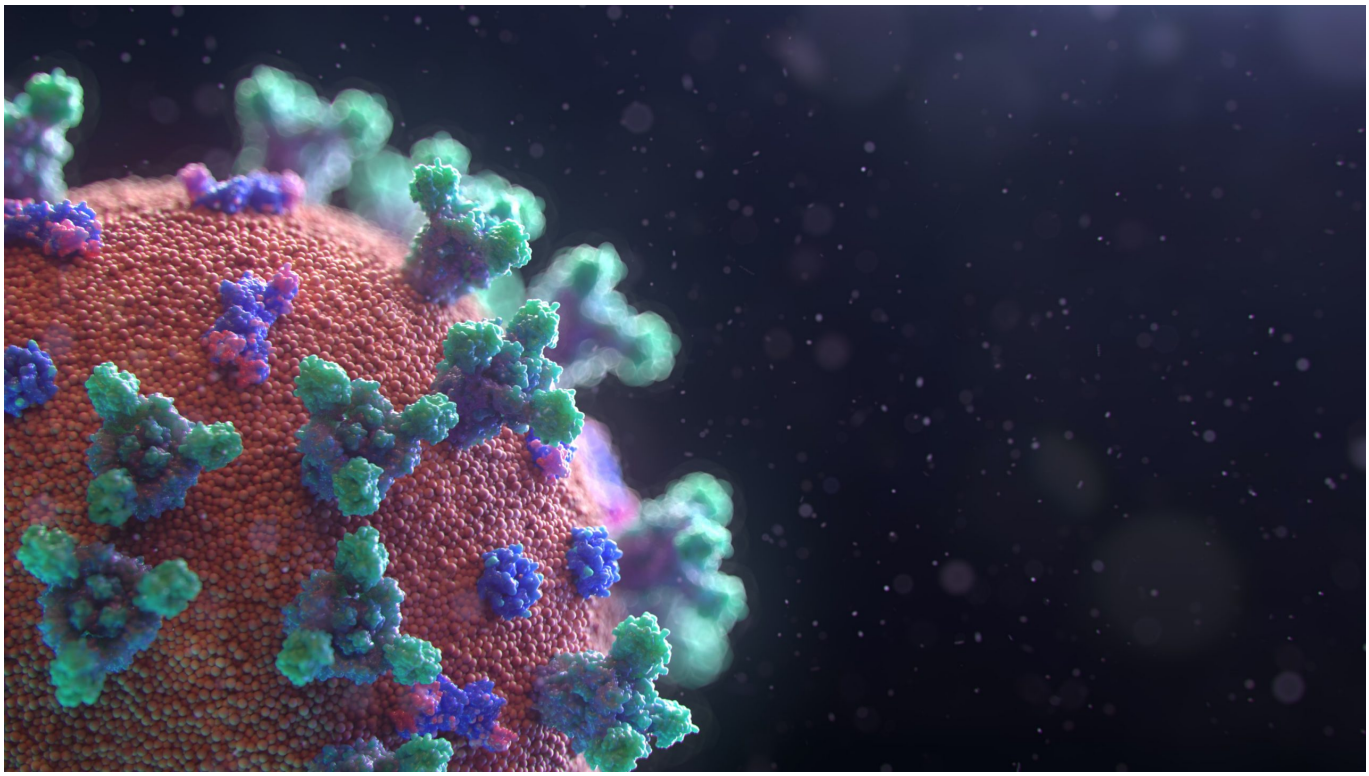

Pandemic terminology: getting it right matters for effective risk communication and management

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Compared with other OECD countries NZ is a stand-out success story by ending community transmission of COVID-19. While there have been some well-publicised recent deficiencies (eg, quarantine organisation), there has still been no evidence of community transmission for many weeks. Nevertheless, further improvements in NZ's response are possible and in this blog we detail how pandemic terminology could be upgraded. Consistent, accurate terminology could assist effective communication between political leaders, officials, scientists, international collaborators and the NZ public on key COVID-19 risk management issues.

Clear communication with the public is critical for managing the COVID-19 pandemic. Indeed, it appears to have been a major strength to date by NZ political leaders and officials (eg, Prime Minister Jacinda Ardern and Director General Ashley Bloomfield).

Nevertheless, there is further scope for improvement. In this blog, we focus on a set of key terms where consistent, accurate use is important:

Alert Levels: NZ has a 4-level Alert Level system that specifies measures to be taken to control the COVID-19 pandemic at each level (see here for further details). These Alert Levels have been a very successful communication tool in the NZ context, but they need to be revised now that more information on pandemic transmission is available. Such revisions would improve the response if border control failures resulted in outbreaks in the community. For example, mass mask use needs to be built into the various Alert Levels (see below). There might also be additional intermediate levels added to account for limitations with contact tracing capacity. Eg, at Alert Level 2 there is an event size limit of 100 and at Alert Level 1 it is allowable to fill a sports stadium with 40,000 people. There also needs to be further clarity around applying Alert Levels in specific regions to respond to a well-defined outbreak (see also “lockdown”).

Border restriction/closure/opening: These terms are often used very loosely in the NZ context. NZ’s borders are not “closed” but rather open to well-defined groups (eg, NZ citizens, essential workers) albeit with quarantine requirements. Even if NZ was to be part of a “travel bubble” (see below), this arrangement would likely involve ongoing border control measures including exit and entry screening.

Image by Luke Pilkinton-Ching, University of Otago Wellington.

Community transmission (of COVID-19): This term should clearly mean the situation where there is pandemic virus transmission within the country, but outside of a controlled border facility for isolation or quarantine. If such community transmission occurs, then NZ would lose its "COVID-19 elimination status". Such status would then need to be achieved again by identifying an absence of cases in the community over a specified time period (see "elimination" below). It would help if the Ministry of Health updated its website to clearly differentiate active cases in managed isolation/quarantine from cases associated with community transmission (as argued previously [1]).

Elimination (of COVID-19): We have proposed that the elimination definition includes three elements [2]:

(a) The absence of COVID-19 cases for a specified period of time, as estimated by modelling studies [3]. For example, no cases detected in the community for a period of 40 days since the last infected case was in the community (ie, from the day they went into isolation) would indicate a <1% probability of undetected community transmission;

(b) Ongoing testing and contact tracing at a sufficient level to demonstrate absence of cases [3], and if this level is not achieved then a longer period of time with no cases would be required;

(c) The exclusion of imported cases held in isolation/quarantine facilities (who are not released until they are proven to be non-infectious).

The Ministry of Health has similar definitions relating to eliminating chains of transmission in our community [4] and clusters being considered closed [5]. Both of these definitions are problematic in our view since they are not linked to adequacy of the surveillance process to provide evidence of success (which is a standard feature of elimination definitions used for other infectious diseases such as measles [6]).

Elimination status can be lost and regained if the criteria are met. It should be distinguished from "eradication", which is reducing disease incidence to zero at the global level.

Elimination strategy: This is the official strategy NZ is using to control COVID-19 [4, 7], ie, control measures to achieve zero community transmission of the pandemic virus within NZ. This approach contrasts with the "Exclusion", "Suppression" or "Mitigation" strategies detailed in the Appendix [7]. Nevertheless, once NZ is considered COVID-19 free (ie, no community transmission and all active cases are in managed isolation/quarantine facilities), it will probably shift to an "exclusion" strategy (see the Appendix). The elimination strategy seems to be the one being used by China, Taiwan, Hong Kong and possibly several other Asian jurisdictions. It was also the strategy successfully used for the SARS pandemic. It is sometimes referred to as "containment" though this term is not well defined in the infectious disease control literature.

Isolation: This term has been widely misused in the NZ context as it specifically relates to infected people and not to those who are in quarantine (and who are not known to be infected; see the definition of "quarantine" below). The *Dictionary of Epidemiology* [8] defines isolation as:

> "Separation, for the period of communicability, of infected

> persons or animals from others under such conditions as to prevent or limit the transmission of the infectious agent from those infected to those who are susceptible or who may spread the agent to others."

This distinction is important because more stringent management is required for isolation than for quarantine settings.

Lockdown: This less than ideal term has come to mean a combination of mass-quarantining, physical distancing and movement restrictions used by countries to reduce COVID-19 transmission (see "Alert Levels"). The term has its origins in protocols used to manage disruptions in prisons and has been extended to cover management of a range of disaster situations including mass shootings and terrorist attacks. Alternative terms used internationally for population measures to control COVID-19 transmission include "circuit-breaker", "stay-at-home" or "shelter-in-place" orders.

Image by Luke Pilkinton-Ching, University of Otago Wellington.

Mass masking / universal masking: Mass masking is a key pandemic control measure which involves widespread use of masks (commercial and home-made) by the public in communal settings. We have detailed the arguments for mass masking elsewhere [9,10]. While this measure is now required on flights coming into NZ and in quarantine, there is a need for it to be built into the Alert Level system for Alert Level 2 and higher (as we have detailed [10]). Communications about mask use need to make a clear distinction between

“mass masking” (wearing a face covering in public spaces to protect others) and “medical masking” (using “personal protective equipment” [PPE] to prevent cross transmission in healthcare settings).

Outbreak: If a border control failure occurs in NZ there is a risk of an outbreak of community transmission – which could range from one to hundreds of cases. Most likely such an outbreak in NZ will be controlled via established measures eg, contact tracing and use of isolation (of infected cases) and quarantine (for contacts who have been exposed to infected cases). For a large outbreak that is taking some time to control, it is possible that the Alert Level system (see above) would be re-activated at a local, regional or even national level. The term “outbreak” is much more useful in the NZ context than discussions about “second waves” or “surges” (see below). An “outbreak” is an epidemic increase that is localised in time and place. If outbreaks persist and multiply they could be described as an “epidemic” of community transmission. A “pandemic” is an epidemic affecting multiple countries.

Physical distancing: Physical distancing is a strategy to reduce the risk of COVID-19 transmission between an infected person and other people. It is achieved at the individual level (eg, the 2 metre distance requirement), and also for populations, with progressive restrictions on physical gathering at higher alert levels. Physical distancing is the preferred term to social distancing (which until recently had been the standard term used to describe this non-pharmaceutical intervention for pandemic control) as it more accurately reflects the behaviour intended and avoids connotations of social isolation.

Quarantine: This term has also been widely misused in the NZ context by being used instead of “isolation” – with this latter term being the one used for people who are known to be infected. The formal definition is as follows:

> “Restriction of the activities of well persons or animals who have been exposed to a case of communicable disease during its period of communicability (i.e., contacts) to prevent disease transmission during the incubation period if infection should occur.” [8]

Second wave: The world is still experiencing the first wave of COVID-19 infection and there is no certainty that this pandemic will cause additional waves. The concept of waves of infection arose from the 1918 influenza pandemic which had three distinct waves over more than a year (the first started in March 1918, the second and most deadly spread globally from September to November 1918, and a third followed in early 1919 [11]. Countries with poorly controlled COVID-19 spread and where the “suppression” or “mitigation” strategies are being attempted (rather than the “elimination” strategy as in NZ) will inevitably experience a “surge” or “spike” in cases if controls are relaxed.

Travel bubble: This term is being explored by NZ policymakers and many different interpretations are possible. It could involve a “trans-Tasman bubble” between NZ and COVID-19 free Australian states or with Australia as a whole (even with a low level of on-going pandemic virus transmission in Australia, as we have modelled in one study [12,13]).

Or it could be limited to COVID-19 free jurisdictions eg, various Pacific island nations (eg, Cook Islands, Samoa, Tonga) or Taiwan (which appears to have no community transmission of COVID-19 for over 2 months [14]). Analogous terms used internationally include “travel/air bridges”, and “travel/tourist/corona corridors” between “green zones”.

Concluding comments

NZ is in a favourable position with no evidence of community transmission of the pandemic virus causing COVID-19 for many weeks. As such it has the opportunity to fine-tune all aspects of its pandemic response. This means it should ideally tighten its terminology and ensure that political leaders and officials consistently use the correct terms when communicating with the science community, international agencies, and the NZ public.

A review of terminology could also contribute to a broader official inquiry into the NZ pandemic response. A Royal Commission would seem appropriate given the scale of the pandemic response and its impact on NZ [15]. Such an inquiry could identify lessons for the near future (eg, for pandemic control if border control failures occur) but also identify lessons for the organisation and resourcing of public health more broadly. We consider there is a strong case for creating a specialised national public health agency to manage the ongoing response to this pandemic and other major public health threats.

Appendix: Terms covering alternative strategies, in addition to elimination

Term	Explanation
Exclusion strategy	This is the strategy being taken towards the COVID-19 pandemic in various island jurisdictions (eg, Cook Islands, Samoa, Tonga, and Vanuatu). These jurisdictions have maintained tight border controls (sometimes ending all incoming passenger aircraft flights) and so have never had community transmission of COVID-19 (as of the time of writing in June 2020). Once NZ has declared success with its Elimination strategy, it will probably transition to an Exclusion strategy.
Mitigation strategy	This strategy is the one that is traditionally used for influenza pandemics ie, to use control measures to reduce the size and peak of the health burden but not at a level that aims to achieve elimination or suppression ie, “flatten the curve”. Pandemic spread then ceases when herd immunity is achieved naturally (or a vaccine becomes available). This strategy was proposed by some countries at the start of their COVID-19 epidemics (eg, Sweden, Netherlands and UK), but these countries appear to have adopted more of a suppression strategy at the time of writing. Indeed, since herd immunity is building fairly slowly in such countries – it is likely that these countries will persist with suppression as opposed to switching back to mitigation.
Suppression strategy	This strategy is used by most high-income countries in response to COVID-19. It involves the use of control measures to decrease pandemic spread so that the health system is not overloaded (eg, hospitals and intensive care facilities are not overloaded) until a vaccine becomes available. This is the strategy that NZ is most likely to adopt if its elimination strategy fails (ie, if there are border control failures that result in uncontrollable outbreaks where the prospect of returning to elimination becomes unachievable).

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