PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA

What we would like to see on the Ministry of Health's website to better inform progress on COVID-19 elimination

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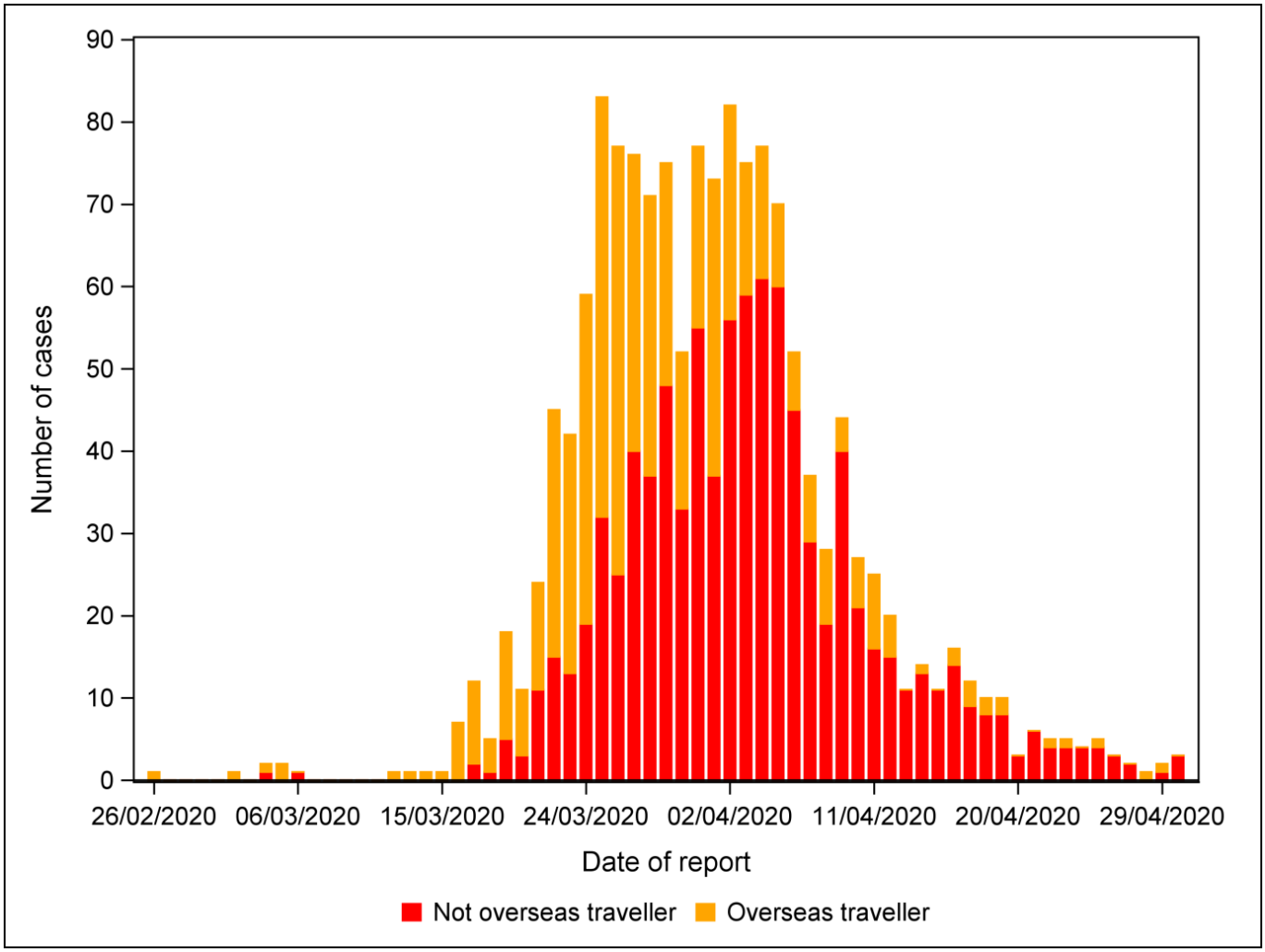
In this blog we analyse data from the Ministry of Health's COVID-19 website and display a key graph that we think should be routinely on that website. We also detail a potentially more useful way to categorise case data so that the public and research community can better track progress on the path to COVID-19 elimination. Both the graphical and tabular presentation of case data need to emphasise the critical distinction between imported cases (who should be safely isolated in supervised quarantine facilities) and transmission within NZ that would threaten elimination status.

People infected with the coronavirus SARS-CoV-2 that causes COVID-19, and detected in

NZ, belong to one of two broad groups: infected overseas or infected within NZ. The Ministry of Health (MoH) provides some data on confirmed and probable cases. We assume the cases in this database are mostly symptomatic cases. However, it is not necessarily all identified symptomatic cases in NZ because the dataset is not intended to include those who were diagnosed overseas and have been included in another country's count reported to WHO (Press conference by Director General of Health, 23/4/20).

Graphing the separate contribution of imported and locally acquired COVID-19 infections

To demonstrate the value of improving the graphical presentation of COVID-19 cases on the MoH's website, we graph below data from the MoH's tabulated line listings of cases that includes an overseas travel variable (coded as yes, no or blank). We assume those with 'yes' are those who are thought to have been infected overseas or in transit to NZ. The figure below shows the number of cases reported each day divided into those with overseas travel (yes) in orange and those not (overseas travel no or blank) in red.



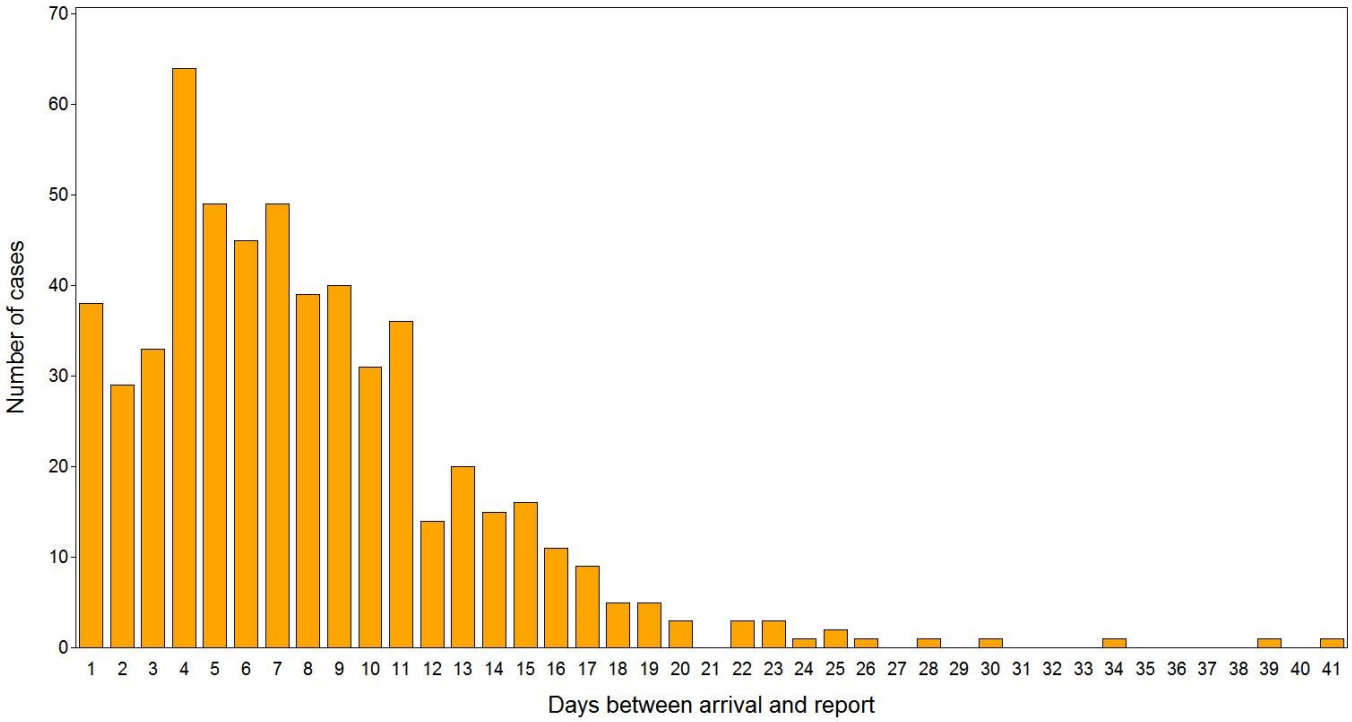
This figure shows that the proportion of reported cases associated with overseas travel has been decreasing, with an increasing proportion of cases being infected in NZ.

The overseas travel variable is 'yes' for 39% of cases, the same percentage that the MoH reports as imported cases (cases with a reported history of international travel within 14 days of symptom onset). The percentage of cases with overseas travel in the last two weeks is 16%. So there has been an increase in the proportion of all cases which are

identified infections that are transmissions in NZ. But this could also partly be a consequence of more overseas travellers arriving in NZ with their infection having been identified and reported by a country they have come from (but such data are not reported by the MoH). Those with the overseas travel variable blank (13) have a similar distribution of report dates to those with the overseas travel variable as ‘no’.

Delays with reporting of cases amongst travellers

The following figure shows the distribution of the days between an overseas traveller’s arrival in NZ and the date that their case status was officially reported.



This duration is recorded for most overseas travellers. For 11% the duration is longer than 14 days. Since these are cases with a reported history of international travel within 14 days of onset, these represent durations between onset and reporting of up to at least 27 days, which is a concern from a disease control perspective. Furthermore, the 11% with a duration between arrival and report date of greater than 14 days is an underestimate of this proportion because more recent arrivals that will have a long duration have not been reported yet (only those with a short duration could be reported).

The NZ Government introduced further border measures on entry to NZ for flights which depart from another country after 9 April. These travellers must go into supervised quarantine facilities for a minimum of 14 days. Since then (21 days ago at the time of writing), for infections that have been reported, the duration between arrival and report date has ranged from 2 to 6 days.

The current border controls may be effective. Whereas following earlier 14 day self-isolation measures, travellers may have left self-isolation after the onset of symptoms and before their case was reported.

Improving the transmission categories used to classify and tabulate COVID-19 cases

NZ appears to be making good progress towards the elimination of infection from SARS-CoV-2. The number of new cases of infection has been declining during April (down to only 2 new cases on 30 April), while the amount of testing has been steadily increasing. Nevertheless, it is still unclear from the MoH website as to the extent to which new cases of COVID-19 in the last 24 hours or last week are either epidemiologically linked to other known cases, or have no known source.

To clarify such issues we present below a table template that we consider shows case data in a way that supports the elimination goal and identifies categories where action would be needed if cases were detected. It would also be useful to see the MoH provide a second version of the table presented based on onset date, instead of report date, to provide a better indication of distribution of infectious cases over time.

The most important distinction is between imported cases detected in travellers arriving in NZ and cases where transmission has occurred within this country. While quarantine measures remain in place at our points of entry, cases detected in arriving travellers should not be a threat to any elimination status. Indeed, we can expect such cases to continue and potentially increase depending on numbers of arrivals, their source countries and the intensity and distribution of the global COVID-19 pandemic. By contrast, the other categories of cases all threaten the country's potential elimination status. Such cases should be carefully classified to help inform our containment efforts and identify improvements.

The term "community transmission" is ambiguous and probably not particularly helpful for defining elimination status. For a highly infectious virus like SARS-CoV-2, all transmission events in the susceptible NZ population would threaten elimination status. As noted in the table, some events would be of much greater concern than others, notably cases where the source of infection is unknown.

The categories presented here should ideally be used to also classify test data, including both test requests and results. That way it would be possible to calculate positivity proportions (%) in meaningful ways.

Sample table for categorising and presenting regularly updated COVID-19 case data in NZ

Case transmission category	Implications	Last 24h	Last 7 days	Last 28 days	Cumul-ative
Imported infections					
Travellers to NZ (with these being in isolation until recovery)	Does not impact on elimination status				
Cases linked to imported infections[1]					
Aircrew or airport staff, ship crews or seaport staff	Failure of border quarantine systems				

People who were infected as a household contact of a known infected traveller or airport/seaport worker	Failure of border quarantine systems[2]				
People who were infected as a contact of a known infected traveller (other than household contacts) or part of an outbreak linked to a traveller	Failure of border quarantine systems[2]				
Cases linked to spread within NZ[1]					
People whose source of infection is unknown (and investigations have been exhausted)	Potentially widespread transmission in NZ				
People who were infected as a household contact of a known case (but where this case was not a traveller to NZ)	Transmission within NZ[2]				
People who were infected from a known case in the community (ie, epidemiologically linked and not in the above categories) or part of an outbreak linked to such a case	Transmission within NZ[2] Indicator of the effectiveness of contact tracing				
People who were infected in a healthcare setting	Failure of infection control[2]				
People whose source of infection is unknown but investigations are still proceeding	Uncertain importance but potentially widespread transmission within NZ				
Potential cases linked to spread within NZ[1]					
People identified as infected during systematic testing of asymptomatic populations who are more likely to be exposed to COVID-19, eg, healthcare workers, staff in quarantine facilities	Implications depend on population, context, and test specificity.[3] Could indicate widespread transmission within NZ				

[1] Cases in these categories contribute to the ‘not-imported’ grouping and would have implications for maintenance of any elimination status, depending on how that is defined.

[2] The importance of these cases depends on whether these outbreaks are being successfully investigated and contained through rapid contract tracing and quarantine.

[3] Testing of asymptomatic people will inevitably identify false positives which need to be evaluated before deciding whether they are ‘true’ cases.

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