



# Bay Mills Indian Community's COVID-19 elimination strategy: *An overview*

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## Executive summary

This working paper presents an overview of Bay Mills Indian Community's COVID-19 elimination strategy.

BMIC is implementing a strategy of elimination for COVID-19. The aims of this strategy are:

- to eliminate transmission chains within the BMIC reservation boundaries
- to prevent the emergence of new transmission chains originating from cases that originate from outside the community.

Successful achievement of these aims requires multiple and comprehensive control measures, implemented at high intensity. The control measures support three main strategy objectives:

- to identify and stop each transmission chain
- to prevent undetected transmission
- to prevent seeding of new clusters into Bay Mills Indian Community, using boundary control measures along the confines of the reservation

An elimination strategy has strong potential to:

- avoid COVID-19-specific health inequities for those living in socioeconomic deprivation
- prevent high rates of COVID-19-related permanent disability and death
- allow earlier de-escalation of control measures and quicker resumption of normal activities including return to work and provision of comprehensive primary, secondary and preventative health care
- extract maximum benefit from necessary control measures.

Elimination will not be easy to achieve and there are important associated risks. If the strategy is successful very few people will acquire the infection; however, the population will remain susceptible until a vaccine is developed and delivered.

In this document we propose indicators of success and failure to identify and mitigate these risks.

Subsequent work will examine specific control measures needed to deliver the strategy. We note however that control measures have the heaviest impact on populations and households who already experience disadvantage, such as inequitable access to the health system and health determinants. This risk further underlines the need for a strong focus at all levels throughout the COVID-19 response.



## Document purpose

BMIC is aiming to eliminate COVID-19. In this document we describe the overarching components of an elimination strategy, whether it is consistent with core principles for public health action in a pandemic, and indicators of success.

*Document authors:*

*This document is an adaptation of one of a number of papers prepared by the COVID-19 Public Health Response Strategy Team (a group of epidemiologists and public health medicine specialists seconded temporarily to the Ministry of Health, part of the New Zealand government).*

## Note

In this document we refer to pandemic strategies and control measures.

- Strategies are the high level approaches to managing the pandemic. Elimination is one of these strategies.
- Control measures are the specific interventions (eg, case finding, contact tracing, quarantine, school closures) that are needed to deliver on all the strategies. They are needed in different combinations and intensities and at different times for each strategy.



## Part 1: Decision-making principles for the COVID-19 response

Planning and coordination of the COVID-19 response must begin by recognizing the roles and responsibilities of the health system and the Executive Council, for and with tribal members.

Wellbeing principle: The wellbeing principle considers the opportunity to maximize health benefits (the protection of population health and wellbeing) and minimize health risks. These are the core principles of the BMIC Plan:

- 1. Every Bay Mills resident survives this pandemic.**
- 2. Protection of the public health in our community.**
- 3. Protection of the physical and financial well-being of our tribal employees.**
- 4. Protection of the Tribe's long-term economic well being.**

## Part 2: Describing the strategy

### Strategy Aims

Elimination of COVID-19 (or any disease) means reducing new cases in a defined geographical area, in this case Bay Mills Indian Community boundaries, to zero (or a very low defined target rate). Elimination is distinct from eradication.

Eradication refers to the complete and permanent worldwide reduction to zero new cases of the disease through deliberate efforts (eg, smallpox). Eradication of COVID-19 is not possible at this stage (and may not ever be possible).

The two primary aims of a COVID-19 elimination strategy are:

- to eliminate transmission chains in BMIC
- to prevent the emergence of new transmission chains originating from cases that originate from outside reservation boundaries.

Note: while COVID-19 elimination control measures are presumed to act nationally there is the ability to have local variation. For example, restricting access to isolated areas with no cases such as small communities or islands during the initial phase or after a measure of success has been achieved. Local variation may also be appropriate where there are regions with very low rates of COVID-19, noting the risk of transmission.

### Strategy Rationale

Motivating reasons for elimination in BMIC have several benefits and risks.

There is early evidence that intensive control measures have been effective in achieving COVID-19 elimination-level containment in other countries - particularly China, as described in the appendix of this document.

1. Elimination is possible in BMIC because of the early entry into a system of alert levels.
2. Elimination is a high-effort strategy, but it gives BMIC the potential to avoid additional health inequities from COVID-19 specific health impacts for Native peoples, and those living in socioeconomic deprivation.



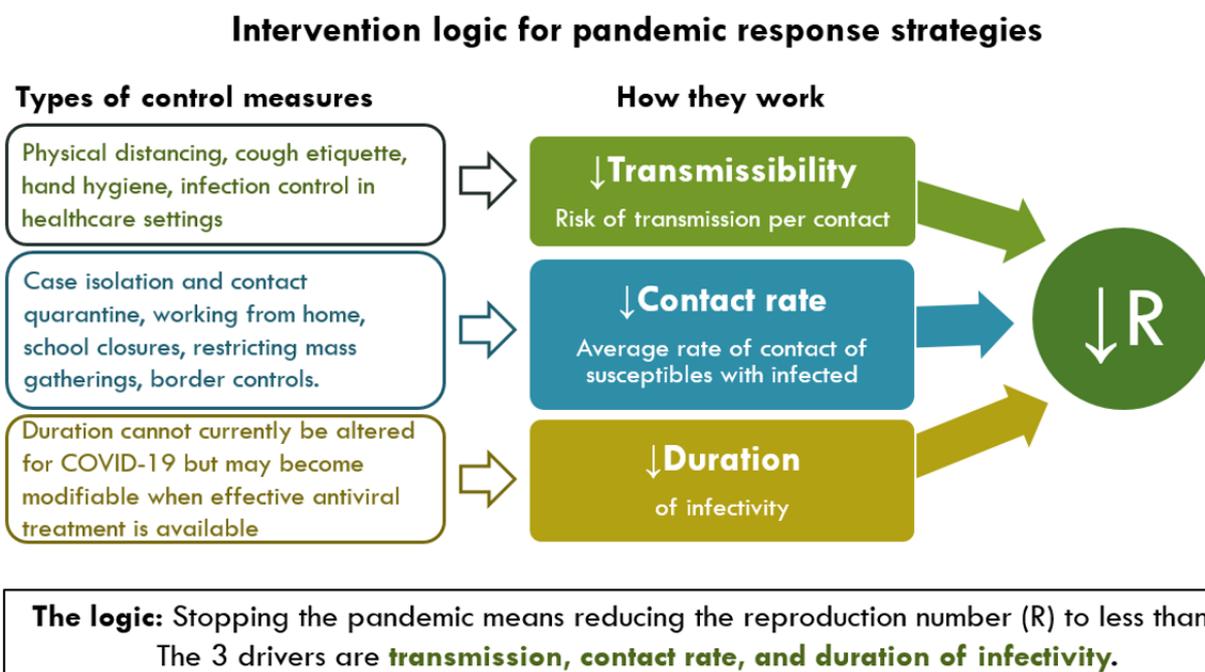
3. The consequences of uncontrolled spread of COVID-19 are severe, with potential deaths in the tens of thousands. <sup>1</sup> Elimination (at this stage of the BMIC response) has the potential to prevent substantial permanent COVID-19 related disability and death. It can also protect those that support and deliver our health care system and allow other health care activities to resume.
4. Elimination (if successful) has the potential for strict transmission control measures within BMIC to be lifted earlier. This means health care and access to the broader determinants of health can resume, leading to enhanced wellbeing.
5. Most components of an elimination strategy are needed in other COVID-19 strategies. Some, such as surveillance and contact tracing, are universal. The elimination strategy has the potential for substantial health benefits for wellbeing gained by implementing all strategy components early.

## Intervention Logic for Elimination of COVID-19

To stop the COVID-19 pandemic, the reproduction number (the number of secondary cases per case) must be reduced throughout the country to  $<1$ , or down as near to 1 as possible. (In practice, pandemic spread may be halted once the reproduction number (R) is just above 1.<sup>2</sup>)

Figure 1 illustrates the three drivers of the reproduction number, and the control measures relevant to COVID-19 that attenuate these drivers. When a vaccine becomes available and a sufficient proportion of the population has been vaccinated, transmissibility will be greatly reduced because contacts of a case are more likely to be immune: socially disruptive control measures aimed at reducing contact rates can then be relaxed.

Figure 1: Reproduction number drivers and attenuation measures



Another challenging feature of COVID-19 is that patients may be infectious for up to three days before they show any symptoms.<sup>3</sup> Thus, there is a high risk of extremely rapid and inequitable spread.

## Elimination strategy objectives

Based on the above aims, principles and intervention logic, the elimination strategy has four key objectives. These reflect activities which will need to be implemented and evaluated in three different settings (the health system, populations, and boundaries).

1. Identify and stop each transmission chain. Highly active case detection is required, including active case finding in high-risk populations, with the isolation of cases and rapid tracing, testing, and quarantine of contacts (ie, public health measures).
2. Prevent undetected transmission. It is difficult to detect all transmission chains, so additional control measures outside of the public health system are needed to prevent undetected transmission (ie, population-level control measures to reduce transmissibility and contact rates, as in Figure 1).
3. Prevent the introduction of new transmission chains into BMIC, using boundary control measures for the reservation, including travel restriction and/or quarantine of incoming travelers.
4. Ensure all actions taken are designed and implemented to reduce the burden of both the disease and the control measures on disadvantaged populations



## Additional Considerations for Elimination of COVID-19 in Bay Mills Indian Community

Elimination is different from other strategies. Not because of the specific control measures used, but in the timing and intensity of these measures. There are further considerations for implementing the elimination strategy.

- This strategy requires multiple and comprehensive control measures implemented at high intensity, as no single control measure can be completely effective.
- An advantage of this comprehensive approach is that control measures have the potential to amplify one another when used in combination: for example, prohibition of mass gatherings enhances the feasibility of tracing all contacts of a case.
- An unusual feature of this strategy is that maximal control measure intensity is initiated at a time when there are still very few cases. Other strategies such as mitigation have maximal control measure intensity during the time period with the most cases. This is because of the different aims of each strategy.
- After the initial phase, these control measures may not need to be applied uniformly across the reservation. However, travel restrictions will need to continue for an extended period to prevent cases coming into BMIC.

## Disease Elimination Success and Failure Indicators

Criteria for assessing the elimination of infectious disease outbreaks are organism-specific. They are largely determined by transmission dynamics, types of surveillance used, and the availability of a suitable vaccine.

Elimination progress, success and maintenance can be assessed using common measures of viral spread such as:

- the size and duration of outbreak clusters
- the source of clusters (eg, the proportion of cases originating from international arrivals)
- whole genome sequencing
- estimates of  $R$ .<sup>4,5</sup>

Commonly used measures of population susceptibility, such as seropositivity or vaccination-based estimates, are still in development for COVID-19.

As noted by Kelly et al., "It is clear that disease elimination cannot be declared in the absence of high-quality laboratory-enhanced surveillance."<sup>4</sup> In order to ascertain elimination success, we need high-quality outbreak data to be collected from multiple sources and analyzed. Bias and error in this data should be minimal. Specific surveillance criteria for COVID-19, epidemiological criteria and thresholds must be established.

# COVID-19



Sustained epidemiological elimination (ie, no transmission) is difficult to achieve without an effective vaccine. However, as the first stage of elimination, we can aim to achieve containment of the disease (ie, identifying and extinguishing transmission chains as they occur) in the near future. Potential indicators of containment are proposed in Table 1 below. We have not yet proposed time frames as these will be dependent on the emerging epidemiological picture in BMIC and developing international evidence.

**Table 1: Indicators of successful containment of COVID-19 in Bay Mills Indian Community**

Strategy aim	Indicators of success	Comment
<p>Aim 1: To eliminate transmission chains in Bay Mills Indian Community.</p>	<p>Community-level surveillance identifies no transmission at the county level for a defined time period. Surveillance will need to demonstrate appropriate coverage of the general population and active case finding in high-risk and priority populations.</p> <p>The majority (proportion to be defined) of cases presenting to health services are from outside Chippewa County.</p> <p>Health service capacity is not exceeded due to COVID-19 not picked up by surveillance or case finding.</p>	<p><b>Epidemiological evidence of lack of transmission.</b> This requires ongoing collection of high-quality data that allows the assessment of the distribution of testing, cases, health system interactions and deaths (noting the potential importance of presymptomatic transmission).</p> <p><b>Clinical evidence of lack of transmission.</b> Further statistical work is needed to calculate how many people, from which population, would need to be sampled to be sufficiently confident that the absence of positive tests indicated a true absence of infection.</p>
<p>Aim 2: To prevent the emergence of new transmission chains originating from cases that arrive from outside the reservation.</p>	<p>No new instances of ongoing local transmission related to arrivals from outside of Chippewa County.</p> <p>Cases from outside Chippewa County and their close contacts are all detected and quarantined.</p>	<p>Indicates that the reservation is secure.</p>

*Note: Evidence on asymptomatic and pre-symptomatic transmission continues to be monitored. If high levels of asymptomatic transmission are considered likely, this finding will indicate a need to adjust any previously defined time periods.*

# COVID-19



Measures of failure are also important as they prompt consideration of how to improve the strategy or whether we should transition to other strategies. Potential indicators of failure are outlined in Table 2 below. It is important to clarify, however, that identification of cases may reflect effective case finding, rather than failure of control. Case numbers will need to be evaluated in context to assess whether transmission is increasing or decreasing.

**Table 2: Indicators of unsuccessful containment of COVID-19 in Bay Mills Indian Community**

Aim		Failure indicator	Comment
<p>Aim 1: To eliminate transmission chains in Bay Mills Indian Community.</p>	<p>Complete failure</p>	<p>Increasing proportions of positive tests in community surveillance systems in multiple DHBs, mirrored by increasing hospital and /or ICU admissions.</p> <p>Viral sequencing indicating ongoing transmission.</p> <p>Demand for health care resources (eg, ICU beds or ventilators) exceeds capacity (note: the late sign of failure).</p> <p>Prioritization protocols and processes of available healthcare resources are inequitable.</p> <p>Mortality rates measured in severe acute respiratory infection (SARI) surveillance systems or the national collections, suggesting significant excess mortality from respiratory infections or significant excess all-cause mortality – for the total population, or within population subgroups (note: the late sign of failure).</p> <p>High-risk populations not successfully protected and exacerbation of existing inequities.</p> <p>Inability to deliver health care equitably and effectively for non-COVID-19 related illness (and prevention/promotion).</p>	<p>It will be essential to define and monitor a set of indicators that can give timely warnings of an impending health service failure for operational as well as pandemic control reasons.</p> <p>It will also be essential to ensure that the quality of the data collected and recorded can confidently assess the extent and impacts of COVID-19 related health, and non-COVID-19 related health by population sociodemographic s.</p>

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	Partial failure (Chippewa County)	Increasing proportions of positive tests in community surveillance system in geographically isolated areas/single DHBs while other regions have achieved the measures of success outlined above.	Important implications for data needs, quality assurance and accountability.
	Partial failure (quantum – eg, continuing to get above a defined threshold of cases per day)	Reduction of new cases to a more manageable level, but not to a level that could be called elimination or could justify the lifting of all control measures.	For example, South Korea has said 50 cases per day is about what their health system can cope with. The level for the BMIC health system would need to be defined.
	Partial failure (boundaries)	Clusters of local transmission (size to be defined) related to outside of BMIC are being detected.  Cases outside of BMIC are being detected after their quarantine period has ended.	



## Transitions

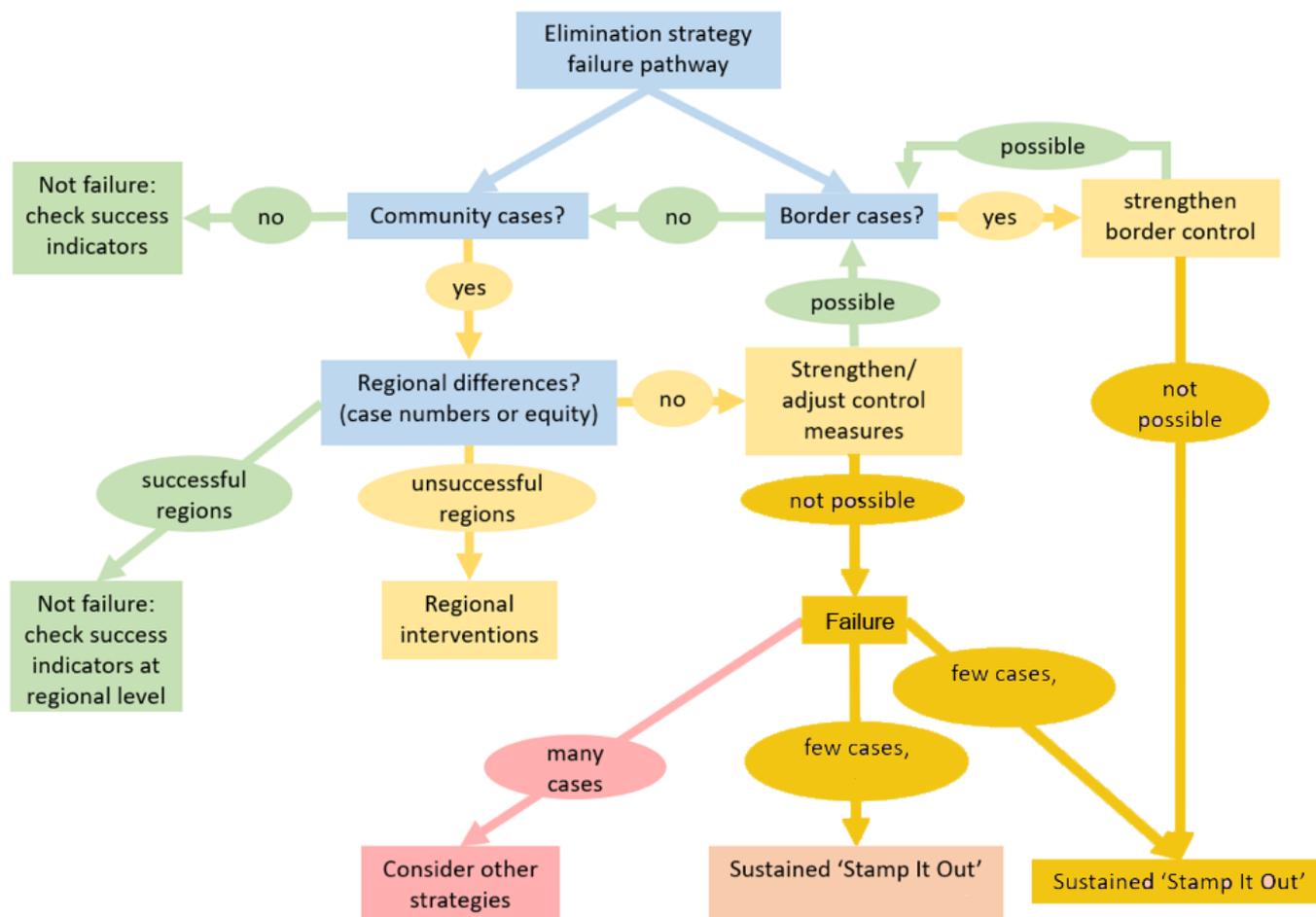
There are a number of potential pathways out of elimination depending on the success or otherwise of the strategy.

The transition if COVID-19 containment is successful (defined in Table 1) is to a maintenance phase. This would involve:

- ongoing intensive surveillance and monitoring to detect any breaches, linked to capability and capacity to respond in a timely way that limits transmission
- staged lifting of control measures within BMIC - ideally from the least risky transitioning through to the most risky (this sequencing would need to be determined as part of further work)
- intense and sustained restrictions of BMIC reservation boundaries, as these would now be our primary defense
- the ultimate end of this strategy, allowing lifting of boundary controls, would be through population vaccination to obtain herd immunity.

If elimination does not appear to work the transitions are more complex, and context-specific. Some possible pathways are in Figure 2 below. These may change depending on specific circumstances.

**Figure 2: Elimination strategy failure pathways**



## Next steps

This document contains a high level view of an elimination strategy. The elimination strategy has been activated very rapidly, without the detailed policy and technical scrutiny that would normally precede such a major initiative. Further work is needed to:

- examine the specific control measures needed to deliver the strategy in detail including any evidence of effectiveness and the impacts of them. We need to plan a risk-based approach to lifting control measures assuming success, or allow for increased intensity of control measures if needed
- work up a detailed implementation plan including:
  - identifying and rectifying any operational gaps in the key public health building blocks needed to deliver elimination (eg, contact tracing strategy, surveillance strategy)
  - a detailed analysis for each control measure needed as part of an elimination strategy
  - a detailed risk analysis for each control measure needed as part of an elimination strategy
  - specific work further defining the parameters of acceptable bounds for the containment parameters (eg, further defining time frames etc.)

# COVID-19



## BMIC Plan of Action

2020

### Bay Mills Indian Community COVID-19 Response Plan

#### Level 5: Highest Restrictions

All restrictions the same as outlined in Resolution No. 20-03-23E, the first Shelter at Home Executive Order, passed on March 23, 2020 by the Bay Mills Indian Community Executive Council.

- Curfew is in place from 10 p.m. to 6 a.m.
- Your movements should be limited.
- Only essential travel outside the home is permitted.
- You should not gather with individuals outside of your household.
- Masks are required throughout the reservation.

*\*\*\*Full details on level 5 restrictions can be found online at baymills.org.*

#### Level 4: Many Restrictions

*All prior restrictions as Level 5, EXCEPT:*

- Curfew is lifted
- Non-essential workplaces will remain closed.
- Outdoor gatherings of up to 10 people permitted- you must adhere to social distancing.
- No indoor gatherings or residential visits indoors are permitted.
- No in-person education.
- Essential businesses will be open with limited capacity, masks are required.
- Outdoor recreation facilities remain closed, including campgrounds, parks and playgrounds.
- Outdoor construction is permitted, adhering to social distancing.
- Indoor construction is permitted in vacant or unoccupied dwellings.
- Telehealth is encouraged for non-urgent medical, dental, and behavioral health.
- Masks required in public facilities.

#### Level 3: Moderate Restrictions

*All prior restrictions as Level 4, EXCEPT:*

- Indoor residential visits are permitted.
- Outdoor recreation facilities will be open for use. This is limited to 10 people at a time, including supervising adults.
- Non-essential businesses may open and operate at 50 % capacity, following customer and employee safety protocols are posted for public notice.
- Gatherings are limited to no more than 25 people. (This excludes businesses operating under capacity restrictions.)
- Executive Council may permit larger gatherings such as outdoor commencement ceremonies for OCS and BMCC with appropriate social distancing guidelines.
- Masks are required in indoor settings with public interaction.
- Campgrounds open (restrooms will remain closed).
- Medical, dental, and behavioral health in-person visits can increase with safety protocols and with provider approval.
- In-person education permitted with modifications to comply.
- Government offices will be open with limited services by appointment; telework permitted (in-person meetings are discouraged).

#### Level 2: Low Restrictions

*All prior restrictions as Level 3, EXCEPT:*

- Masks required in public spaces.
- Non-essential businesses allowed to open at 75% capacity (w/ employee & customer safety protocols for public notice).
- Outdoor recreation facilities and campgrounds open.
- With the exception of businesses operating under capacity restrictions, indoor gatherings of more than 25 people are prohibited.
- Government offices reopen; telework optional.
- In-person education is permitted.

#### Level: No Restrictions

- All prior restrictions are lifted.
- Masks are recommended in public spaces.
- Businesses encouraged to post employee and customer safety protocols for public notice.

*\*\*\* You can find the most current level of response by visiting baymills.org.  
The level will be posted at the top left side of the website.*

Please continue to practice social distancing at all times. Those age 60 and older, or members of a vulnerable population, should avoid social contact at all levels.



## Appendix 1

### Supporting Evidence

Elimination (or elimination-level containment) has only (to our knowledge) been largely successful in New Zealand. Other countries such as South Korea and Taiwan may be aiming for elimination, but have not yet achieved it.

### Strategy and Measures Used by Other Cities/States

The United States does not currently have a national approach to COVID-19; instead it has opted for a flexible (risk based) approach in different regions. States are managing their own plans with overall guidance and recommendations from the Centers for Disease Control.

Common measures that are being deployed:

- **Curfews:** In the U.S., states such as New York enacted a curfew and shut down public transportation in an effort to keep people at home. Several states including Ohio and Michigan followed that pattern.
- **Masks:** Face coverings are recommended by the CDC and now required in many states.
- **Boundary controls:** Texas, Delaware, Florida and Rhode Island began stopping drivers with out-of-state license plates (April 2020) and ordering them to quarantine for two weeks, if they intend to stay in the state. Those entering the state for “essential” business reasons, such as commercial traffic, appear to be exempt. <sup>6</sup>
- **Physical distancing strategies:** The CDC’s recommendation that a distance of 6 feet between non-household members has become the nationwide protocol.
- **Case identification:** Widespread testing measures were put in place. Temperature and health screening was carried out in airports and stations, including the use of thermal temperature scanners. Cases and suspected cases were isolated, and case households were quarantined.
- **Hygiene measures:** UV light systems for disinfection as well as wide spread use of hand sanitizer has been suggested.
- **Contact tracing:** Health Departments across the country are working with local health centers/hospitals to identify and trace potential clusters. Quarantine measures are implemented on an as-needed basis.

Many states are gradually, but not completely, lifting control measures. As control measures have been loosened, some cases have reappeared. This is the instance with Georgia, Texas, California, and Florida.

New case numbers are reported as manageable with strong contact tracing and case isolation most notably in the Northeastern states. <sup>7</sup> However, there is considerable concern about the risk of a second wave of COVID-19; only a very small proportion of people in the U.S. will actually now be immune to COVID-19.

It is important to note that in an elimination strategy, lifting/relaxing control measures follows, rather than coincides with, zero cases. The advantage BMIC has in being a ‘slightly later follower’ is that we will be able to observe whether cases in other areas remain low as control measures are lifted. Critical research is necessary for BMIC to assess whether similar criteria and timeframes would be applicable here.

Other successfully eliminated infectious diseases such as Ebola and SARS may also provide some useful precedents for elimination measures, but their different transmission dynamics mean that not all their control measures are applicable to the current pandemic.



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