

ENVIRONMENTAL SCAN

(ARCHIVED) 'Lockdown' Public Health Measures during the COVID-19 Pandemic

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Key Points

- Lockdowns were effective and proved essential in decreasing the burden of Coronavirus Disease 2019 (COVID-19) in the first wave of the pandemic. The most effective lockdowns were those that were initiated rapidly. There is mixed evidence with regards to the required stringency of lockdowns. Discrepancies might be explained by differences in the overall adherence and speed of uptake of public health measures by the general population, which vary from jurisdiction to table jurisdiction as demonstrated by phone mobility data.
- To address recent resurgence, many countries have implemented lockdown measures similar to those employed in the first wave of the pandemic. Some jurisdictions have approached school settings differently during resurgence lockdowns, closing them for short durations, or aligning closure with planned school breaks.
- While the implementation of strict public health measures is an essential element of COVID-19 pandemic response, other interventions, such as enhancing testing, tracing, isolation, and support initiatives with an equity prioritization lens are at the core of an effective response.

Purpose and Scope

This document summarizes evidence and contextual information on restrictive community-based public health measures to inform public health action in second and subsequent waves of COVID-19 resurgence in the Province of Ontario. The focus of the evidence review component is on the effectiveness of strict physical distancing interventions, such as 'lockdowns' from the first wave. The contextual information component is from a targeted grey literature scan and details strict measures

implemented in response to COVID-19 resurgences globally. Countries and regions included in the scan are: Spain, France, Italy, Belgium, England, Wales, Northern Ireland, Israel and Australia. This document can be used by public health decision-makers to inform understanding of effectiveness of first wave lockdown interventions as well as to understand the types of measures implemented in select jurisdictions in the context of COVID-19 resurgence.

Background

Since early 2020, many countries have implemented strict measures to reduce the spread of the COVID-19 pandemic. Examples include school closures, restricting mass gatherings, imposing curfews and ‘stay-at-home’ orders.¹ Physical distancing has been a widely used strategy due to the evolving understanding of asymptomatic and pre-symptomatic individuals in transmission. Specific measures intended to increase physical distancing vary across countries and time points, and there is variability in how a lockdown is defined. Lockdowns entail stay-at-home recommendations or orders, but the level of restriction accompanying those orders varies. The Oxford COVID-19 Government Response Tracker group has developed the [Stringency Index](#),² which relies on a set of indicators quantifying how restrictive governments have been in their containment measures.³ Indicators include school closure, workplace closure, cancellation of public events, restrictions on gathering size, closure of public transit, stay at home requirements, restrictions on internal movement, and restrictions on international travel.³

When and how a jurisdiction should ease restrictions or reinstate lockdown measures are some of the common challenges faced—to balance health, social, and economic considerations (e.g., Fadallah et al.).⁴ The World Health Organization (WHO) warned in April, 2020 that a premature lifting of lockdowns and public health measures could spark a resurgence of infections.⁵

Recently, Han et al. (2020) examined the lessons learned from easing of restrictions in eastern Asia and Europe, highlighting four important lessons. Jurisdictions should:

1. Be transparent about which epidemiological and other factors are being used to assess easing or implementation of restrictive community-based measures. This includes explicit threshold and indicator details for when to transition between phases;
2. Have capacity to track the effective reproduction number (R_e), with appropriate interpretation at various geographical scales;
3. Continue with measures to reduce transmission (e.g., face mask wearing, creating social bubbles), and where possible, empower and enable all members of society to participate in tailoring solutions;
4. “Have an effective find, test, trace, isolate, and support system in place” to facilitate identifying mild and asymptomatic cases.⁶

In recent months, ‘lockdown’ measures have been used in various countries to manage the resurgence of COVID-19 infections.¹ This document summarizes evidence on the effectiveness of restrictive ‘lockdown’ measures implemented for the first COVID-19 wave, as well as reporting examples of recent resurgence ‘lockdown’ measures from selected jurisdictions to inform decision-making for the Ontario context.

Methods

The methods comprised of two components: an evidence review focused on the effectiveness of 'lockdown' measures; and a targeted grey literature scan of examples of resurgence 'lockdown' measures implemented in selected jurisdictions.

Focused Evidence Review

A rapid review of peer-reviewed literature was conducted to synthesize research evidence about the effectiveness of lockdowns and related measures on COVID-19 transmission and related outcomes. An electronic database search in MEDLINE on November 13, 2020 was conducted. A separate search for preprint articles was also conducted on November 16, 2020. Search terms included but were not limited to: lockdown, shutdown, circuit breaker, restrictions, COVID-19, ban, closure. The full search strategy is available upon request. Handsearching for relevant articles was also conducted.

Peer-reviewed and pre-print articles were eligible for inclusion if they examined the effectiveness of lockdown measures for COVID-19 and were English language. Articles were excluded if they were modelling studies, did not have outcome data, or were editorials, letters, and commentaries. We focused on certain countries with relevance to Canada; thus, articles examining data from jurisdictions such as India, Africa, China or Brazil were excluded. Articles that had methodological concerns (e.g., poorly reported regression methodology) were also excluded. Titles, abstracts, and full-text versions of all papers were screened for inclusion by a single PHO staff member. Relevant data was extracted and summarized by one PHO staff member. Content was reviewed by senior members of the team. Quality appraisal was not conducted due to time limitations.

Grey Literature Review

Based on expert input, we conducted a rapid scan of restrictive community-based public health/ 'lockdown' measures documentation from selected countries and jurisdictions relevant to Ontario. These were obtained through online searches conducted on November 17, 2020 of recent policies, articles, government websites, official press and reports from the United Kingdom (UK) and Europe, as well as Australia and Israel. In the UK, Wales, England and Northern Ireland were examined; in Europe, the scan focused on Spain, Belgium, Italy and France. These jurisdictions were selected due to relevance in terms of health system context, as well as having experienced pandemic control after the first wave, followed by resurgence requiring community-based public health measures.

We described each jurisdiction in terms of: brief context, lockdown measures, lockdown duration, and impact on epidemiology when available (e.g., case direction, number of cases before and after the lockdown).

Due to time constraints, we were not able to complete a systematic search. However, the purpose of this scan was not to provide an exhaustive list of community-based public health measures nor all outcomes; the focus was to document 'lockdown' measures from relevant jurisdictions to inform decision-making for the Ontario context.

Findings

Focused Evidence Review

CHARACTERISTICS OF INCLUDED STUDIES

The library search identified 291 articles. Of those, 15 met inclusion criteria and were included in this review. The greatest proportion of studies examined data from multiple countries, while others examined data from Spain, Italy, the United States (US), the UK, Australia and Israel. The included studies focused on the timing of lockdowns, stringency of lockdown measures, as well as population mobility.

IMPACT OF LOCKDOWN MEASURES ON COVID-19 DISEASE BURDEN

Overall, lockdowns appeared effective at reducing the spread of COVID-19 during the first wave of the pandemic. All studies included in this rapid review show a significant decrease in the COVID-19 reproduction number,⁷ COVID-19 related hospitalization rates, COVID-19 related deaths, as well as other indicators of COVID-19 burden including community point prevalence⁸ and self-reported influenza-like symptoms,⁹ following implementation of lockdown measures.

Based on the evidence reviewed, timing of the lockdown appears to be a key factor in effectiveness. There was consensus across studies that earlier initiation of a lockdown and accompanying stay-at-home measures was associated with an overall decreased burden of COVID-19,¹⁰⁻¹⁴ with one study showing that a 7 day delay was associated with a doubling in deaths.¹² While early government action is crucial, it must not only involve declaration of lockdown measures. In Italy, for example, lockdowns were declared relatively early in the pandemic, but population adherence to lockdown measures was significantly delayed relative to other countries, as demonstrated through mobile phone data.¹²

The effect of lockdown measures on disease transmission likely begins rapidly, occurring within 7 days or less,^{15,16} but manifestations of the impact are delayed in time. In Italy, cases peaked 14 days following lockdown, and 9 to 10 days later in more heavily affected regions,¹⁵ which is consistent with what is known about median incubation period and testing delays. Data from the US and Spain showed that reductions in hospital admission rates were detectable approximately 2 weeks post-lockdown,^{10,17} whereas decreases in COVID-19-related mortality were noted 3 weeks post-lockdown.^{10,17}

A study by De Salazar et al¹⁸ suggested that more stringent lockdowns might have a differential effect on different age groups, with more stringent lockdowns shifting the burden of illness to younger demographics, but this was only a trend without statistical significance, and did not account for differential patterns in COVID-19 transmission in different phases of the pandemic.

CHARACTERISTICS OF LOCKDOWN MEASURES

In an analysis of 149 countries having implemented at least one physical distancing measure in the first wave of the pandemic, the authors found that the combination of school closure, workplace closure, restrictions on mass gatherings and restrictions on population movement was associated with a 13% decrease in the incidence of COVID-19, when implemented within a seven day time frame.¹⁴ Closure of public transit conferred no additional benefit.¹⁴ The combination of school closure, workplace closure and restrictions on mass gatherings without lockdown was also effective in decreasing the COVID-19 incidence rate.¹⁴

Findings regarding the required stringency of and/or adherence to lockdown measures are mixed. Use of mobile phone mobility data has emerged as a method by which researchers aim to assess the degree to which a population may be 'staying at home'; thus, potentially reflecting both adherence to and stringency of the measures imposed. Several studies conclude that only strict lockdowns were effective in decreasing the burden of COVID-19. Vinceti et al. found that the "mild" lockdown first imposed in Italy on February 20, 2020, which included closure of all educational institutions, closure of non-essential industrial and commercial activities, as well as limits on social gatherings, was not effective in reducing transmission rates, as evidenced by minimal changes in mobility.¹⁵ Only the stricter lockdown subsequently imposed on March 8, 2020, which prohibited any kind of activities beyond certain health or professional needs, was effective at decreasing both SARS-CoV-2 positivity rates and mobility, respectively assessed using publicly reported national SARS-CoV-2 daily case numbers and data from mobile phones from 27 million subscriber identification module cards.¹⁵ These findings are supported by an international comparison of COVID-19-related death rates across 125 countries, which was found to be negatively associated with stringency index scores.¹¹

In contrast, several groups concluded that there appeared to be no additional benefit of more stringent lockdowns. Santamaria et al report a significant drop in the effective reproductive number (R_e) in Spain following implementation of a national lockdown on March 15, 2020 to levels under 1, and additional measures imposed on March 31, 2020 appeared to have no further effect on R_e .⁷ Another study examined Google Global mobility data from 34 Organization of Economic Cooperation and Development (OECD) countries, as well as Singapore and Taiwan, and found an association between decreased COVID-19 incidence rates and moderate levels of decreased mobility (20-40%).¹⁹ Beyond a 40% decrease in mobility; however, the effect levelled off, suggesting further restrictions in mobility did not further reduce COVID-19 transmission during the first wave of the pandemic.¹⁹

To add further nuance, the association between mobility and COVID-19 cases might be limited in time, and stronger at the outset of a lockdown. Google GPS mobility data from eight Australian states demonstrated a strong correlation between decreasing COVID-19 growth rate, increasing doubling time and decreasing community mobility in the 7 days following lockdown initiation.¹⁶ The association between community mobility and COVID-19 cases was weaker thereafter, and not found in the state of Victoria's second wave in August.¹⁶ The authors posit that other public health measures and their increased adoption (e.g., hand hygiene and social distancing across settings) might explain the lack of an association between mobility and COVID-19 case numbers after the early stages of lockdown.

Scan of Grey Literature

The findings below describe the lockdown/restriction measures that were implemented in various countries as well as the context, duration, and epidemiological impact of these measures.

ENGLAND

Context:

Restrictions were implemented nationally between November 5, 2020 and December 2, 2020. On November 5, 21,137 new cases were identified and the 7-day average in England was 22,443. As of November 13 (one week later), 24,540 new cases were identified and the 7-day average had risen to 25,331²⁰

Lockdown Measures, Duration and Impact on Epidemiology:

During the period of restriction, **schools** remained open and no **curfews** were implemented. However, restrictions encouraged individuals to avoid all non-essential travel by private or public transportation. Individuals were not permitted to leave home for holidays or stay overnight away from their main home unless permitted by law. **Working** outside of the home was allowed where it could not be done from home. Individuals were instructed to avoid meeting people they do not live with, outdoors and indoors, and could only **exercise** outdoors with people they live with, or those part of their 'support bubble', or with one other person. **Face coverings** were required in all indoor/enclosed public spaces. **Places of worship** were limited to independent prayer, funerals, broadcast, or to provide essential voluntary services. **Funerals** were capped at a maximum of 30 people and social distancing was required among those not living together. **Weddings** and civil partnership ceremonies were not permitted except where one of those getting married is seriously ill. These weddings were limited to 6 people. **Bars and restaurants** were closed, but were open for click and collect, drive through and delivery. **Leisure and sport facilities** as well as **retail** locations were also closed with the exception of essential businesses (e.g., food, gas, bank). Entertainment venues were also closed, including community centres, except to access Information Technology (IT) services for those with limited home access, and for click and collect.²¹

As of November 13 (one week following implementation of restrictions), the new daily rise in cases was 24,540, and the 7 day average (by specimens collected as of November 9) was 273.4 per 100,000.²⁰

UNITED KINGDOM (WALES)

Context:

On October 23, 2020, Wales entered a 'fire break' or short-term lockdown.²² On October 19, 2020, the incidence was 126.8 cases per 100,000 over 7 days. At that time, the percent positivity in Wales was 11.9%, 19% in the city of Cardiff.²³

Wales monitors several so-called 'circuit-breaker' indicators over a 7 day period, which if exceeded, triggers a fire break or an even more restrictive stay-at-home order/full lockdown.²³ The following are indicators and thresholds used in Wales (as of October 19, 2020):

- Incidence: >40/100,000 (126.8/100,000)
- Reproduction number: $R \geq 1.5$ (1.2; 95% CI: 1.17–1.23)
- Positivity rate: >5% (11.9%)
- Hospital bed occupancy with COVID-19 patients: >500 beds occupied (488)
- Critical care bed occupancy with COVID-19 patients: >70 beds occupied (40)

Lockdown Measures, Duration and Impact on Epidemiology:

During the fire break, residents were ordered to **stay home** (except for exercise); **work** from home if possible; avoid **social gatherings** indoors or outdoors with people outside of your household (except for support bubbles); non-essential businesses were closed (except food markets); and **places of worship** were closed. Childcare remained open. The fire break in Wales occurred during a break in **school** (half-term break or mid-term break). Primary and special schools re-opened after half-term break (4 to 11 year-olds). Secondary schools re-opened after the half-term for children in years seven and eight (11 to

12 year-olds). Pupils were able to take exams but other pupils continued learning from home for an extra week.²²

The Welsh government has acknowledged there must be a balance of harms. Both intervening and not intervening will cause harm: long and short-term harms, direct and indirect harms, economic harms, social and psychological harms, and health harms. The fire break was initiated alongside communications stating that if action was not taken at the time, further, more expensive and longer action in the future would be required to achieve a similar reduction. There was evidence for concern that cases and hospital admissions in Wales was leading to a deterioration in the capacity to treat non-COVID-19-related physical and mental health issues.²³

The fire break in Wales was 17 days long, and lasted until November 9, 2020.²⁴ As of November 14, 2020 (7 day rolling average for November 6 to 12, 2020), incidence was 164.5/100,000 (October 19: 126.8/100,000) and percent positivity was 13.6% (October 19: 11.9%).²⁵ For the week ending November 8, 2020, there were 58 patients in critical care (October 19: 40) and total patients in all hospital wards was 1,171 (October 19: 488). After November 9, 2020, there was relaxation of restrictions, including allowing bubbles with two households; gatherings of four people in bars and restaurants (no alcohol after 10 p.m.); and 15 people able to participate in indoor exercise activities (30 outside).

NORTHERN IRELAND

Context:

Restrictions were implemented on October 16th and were intended to be in place for a period of four weeks. However, media has reported that this has since been extended.²⁶ On October 16th, Northern Ireland reported an increase of 4,984 cases over the previous days and a doubling rate of 15.7 days.²⁷

Lockdown Measures, Duration and Impact on Epidemiology:

Restrictions included **limiting social bubbles** to a maximum of 10 people from two households and no overnight stays in a private home were permitted unless in a bubble. Individuals were encouraged to **work** from home unless unable to do so, and no unnecessary travel was permitted. **Bars and restaurants** were closed except for deliveries and takeaways for food, with the existing closing time of 11.00 p.m. remaining. The **retail** sector was permitted to stay open at this time with the exception of close contact services such as hairdressers and beauticians. Off-licenses and supermarkets were not permitted to sell alcohol after 8.00 p.m. No indoor **sport** of any kind or organised contact sport involving household mixing other than at the elite level was permitted. However, gyms remained open but for individual training. No mass events involving more than 15 people (except for allowed outdoor sporting events where the relevant number for that will continue to apply) were permitted. **Places of worship** remained open with a mandatory requirement to wear face coverings when entering and exiting. **Funerals** were limited to 25 people with no pre- or post-funeral gatherings and wedding ceremonies and civil partnerships to be limited to 25 people with no receptions (this was implemented on October 19). **Universities** and further education delivered distance learning to the maximum extent possible. Essential face-to-face learning was permitted where was necessary and unavoidable.²⁸

As of November 16, 2020 the number of confirmed cases in Northern Ireland is doubling at a slower rate (57.3 days) over the last 5 days compared with the doubling rate in the 5 days before that (50.2 days). The growth of new cases also appears to be slowing reporting 3,831 cases over the past 5 days.²⁹

BELGIUM

Context:

In Belgium, strict measures were enacted on October 26, 2020 followed by 'reinforced' country-wide lockdown starting November 2, 2020. The tightened restrictions resulted from increased numbers of infections, hospitalizations, ICU admissions and deaths having exponentially grown since early September, 2020.³⁰

Lockdown Measures, Duration and Impact on Epidemiology:

Reinforced lockdown will last until December 13, 2020, with decisions to modify **non-essential business** restrictions occurring on December 1.³¹ The goal is that **schools** remain 'open' (albeit virtually for those beyond first year secondary school), the economy remains active (closure of business except deliveries), and **non-essential travel** remains possible (no travel restrictions within Belgium). Starting November 15, 2020, some relaxation measures may be applied related to schools and testing protocols (allowing more than just high-risk individuals to be tested).

There may be additional variations to measures (generally more strict) within each region of Belgium and even within municipalities.³² However, the broad national rules include the following:^{31,33} **visits to the homes of family and friends** were not permitted (with the exception of individuals who live alone). Teleworking was mandatory. If it was not possible to **work** from home, wearing a face mask in the workplace was mandatory and ventilation must be guaranteed. **Masks** were mandatory in all public places. Group **gatherings** outside were limited to four people. In Wallonia and Brussels, there were nightly curfews from 10 p.m. to 6 a.m., with exceptions for essential trips. All **bars, cafés and restaurants** were closed. Take-out was permitted until 10 p.m. Night shops had to close at 10 p.m. and alcohol sales were prohibited after 8 p.m. Restaurants and bars in hotels were also closed; however meals could be served in rooms.

There were additional measures in place in Brussels. These included closure of **stores** by 8 p.m., no **consumption of alcohol** in public, **masks** worn at all times in all places, except private homes, and an enforced **curfew**.

Epidemiological data from consolidated estimates suggests that since a peak of cases on October 27, 2020, new cases are steadily declining (22,188 cases October 27, 2020 versus 7,489 cases November 10, 2020).³⁰ Positivity rates have drastically increased; however, testing has been restricted to high-risk individuals. The time lag between new cases versus deaths and hospital admission has not yet demonstrated appreciable change of 7- and 14-day averages; however, data visually indicates a declining trend of the latter measures since lockdown measures were applied.

FRANCE (METROPOLITAN FRANCE AND MARTINIQUE)

Context:

On Monday, October 5, 2020, maximum alert was initiated for Paris and the surrounding suburbs.³⁴ The cities of Marseille, Aix-en-Provence and surrounding areas, and Guadeloupe had been under maximum alert several weeks prior. Maximum alert thresholds include community rate of infection in exceedance of 250 per 100,000, or 100 per 100,000 in people aged over 65, or when at least 30% of the intensive care unit (ICU) beds are occupied by COVID-19 patients.³⁴ Subsequently, national lockdown was initiated Friday, October 30, 2020, affecting metropolitan France and Martinique.^{35,36}

Lockdown Measures, Duration, and Impact on Epidemiology

Lockdown measures will remain in place until December 1, 2020.^{36,37} Easing of restrictions, if at all, on December 1 will be limited to certain businesses. Details of public health measures in place during lockdown include the following;^{36,38-41} During restriction periods, individuals were not permitted to **travel** between different parts of France. Individuals were only permitted to **leave their residence** for: commuting to and from work, school or training place; carrying out essential business trips that cannot be postponed; sitting exams; purchase basic commodities, or collecting an order; medical appointments that cannot be carried out remotely or postponed; to exercise outdoors and essential family reasons. Individuals were required to **work** from home if it was possible to do so. All **schools** from kindergarten to high school remained open, and face masks were compulsory in schools for all children above the age of 6 years. All **university** lectures were provided by videoconference and libraries were accessible only with an appointment. **Non-essential shops and bars, restaurants** and other venues remained closed. Take-away, **grocery stores and supermarkets**, pharmacies, tobacconists, petrol stations and other essential stores remained open. **Places of worship** remained open for weddings (with a maximum of six people) and funerals (with a maximum of 30 people). **Masks** were required in all open venues and on public transit.

Since late July, 2020, the 7-day average of new COVID-19 cases in France had steadily risen with exponential growth occurring starting in October and peaking November 9, 2020.⁴² The growth period from late July to October saw 7-day average new cases rise from approximately 500-1,000 to 11,000-12,000. Within one month, the 7-day average of new cases exponentially rose to nearly 55,000. As of November 15, 2020, the week following the peak (the date of this review) or two weeks since national lockdown, cases have dramatically decreased to just under 30,000 for the 7-day average new cases reported.

SPAIN

Context:

On October 25, 2020 a state of emergency was declared that enabled regional governments to implement restrictions in their regions. Restrictions were initially set for 15 days; however, they are extendable up to six months under the state of emergency declaration.⁴³ On October 25, 2020, 15,653 new cases were reported nationally and the R_e was 1.25.⁴⁴

The triggers for implementing restrictions in Spain were based on three criteria: (1) number of infections, (2) care and public health capacity; (3) the characteristics and vulnerability of the population. There were four **risk levels** (low, medium, high and extreme) identified.

Regarding number of infections, a bi-weekly incidence rate <25 cases per 100,000 inhabitants is classified as low risk, 25 to <150 per 100,000 is a medium risk, a rate of 150 to 250 cases per 100,000 as high risk and >250 cases per 100,000 inhabitants an extreme risk. The specific rate of cases among those over the age of 65 years (which is the group most vulnerable to COVID-19), the number of positive cases in the tests carried out in each region and the percentage of cases that are traced are also considered. Additionally, a very high risk situation exists if the number of beds occupied by COVID-19 patients exceeds 15% of global hospital admittances and 25% in the case of intensive care unit (ICU) beds.⁴⁵

Lockdown Measures, Duration and Impact on Epidemiology:

Starting on October 25, **movement between regions** was prohibited. This applied to the entire country except the Canary Islands (exceptions: purchasing medication, complying with labour obligations). A **curfew** was implemented between 11 p.m. – 6 a.m. (note: each regional government may modify the start from between 10 p.m. and midnight and the end from between 5 a.m. and 7 a.m.).⁴⁵

Since October 25 (when measures were implemented) cases steadily rose to a peak on November 5 (21, 129 new cases) at which point growth began to decline.⁴⁶ By November 16, newly identified cases were reduced to 15,520 and the Re was reduced to 0.91.⁴⁴

ITALY

Context:

On October 22, 2020, authorities in the Lombardy, Lazio, and Campania regions voluntarily imposed a curfew (11 p.m. to 5 a.m.) and restricted in-person attendance at all secondary schools. Subsequently on October 25, national measures were introduced and were further tightened on November 6, 2020. The nationwide measures implemented on November 6, 2020 are set to last until at least December 3, 2020.⁴⁷ On November 6, there were 35,505 new COVID-19 cases identified and 445 deaths were reported.⁴⁸

Lockdown Measures, Duration and Impact on Epidemiology:

On October 25, 2020, nationwide measures were implemented including a **curfew** (10 p.m. to 5 a.m.), the closure of **recreational spaces** (gyms and swimming pools) and a forced closure of **bars and restaurants** at 6 p.m. These nationwide measures were introduced three days after several regions (Lombardy, Lazio, Campania) imposed a **curfew** (11 p.m. to 5 a.m.) and closed all secondary **schools** to in-person attendance. The nationwide measures were further tightened on November 6, 2020, using a **tiered system** based on ICU capacity and reproduction number, which will last for a period of at least three weeks until December 3, 2020.⁴⁷

As of November 6, 2020, high-risk, “red zone” region restrictions required residents not to leave home unless for necessities (e.g., work, health, emergencies),⁴⁸ and all **bars, restaurants and non-essential retail** were ordered to close.⁴⁹ In medium risk, “orange zone” regions residents were ordered **not to leave their home, restaurants and bars** were closed except for delivery, and shops were allowed to open.⁴⁸ In yellow zones the only restriction remaining was the curfew from 10 p.m. to 5 a.m.⁴⁸

It is still early to identify whether these nationwide restrictions have been effective in controlling the spread of COVID-19. On November 13, Italy reported its highest daily incidence during the pandemic at 40,092 newly identified infections. The national reproduction number is close to 2, with an average of 35,908 infections per day and 580 deaths per day.⁴⁷

ISRAEL

Context:

On September 18, 2020, restrictive measures were implemented nationally in Israel, through until October 11, 2020.⁵⁰ On October 21, 2020, the Ministry of Health and Prime Minister’s Office adopted the “Lockdown Relaxation Roadmap” providing guidance for easing restrictions. The restrictions were set to be reassessed on November 14, 2020.⁵¹ As of November 15, 2020 the Cabinet had not approved the rollback of any lockdown measures.⁵²

Lockdown Measures, Duration and Impact on Epidemiology:

The restrictive measures in place from September 18, 2020 to October 11 2020 ordered residents to **stay within 500 metres of their home** with exceptions (e.g., work, buying medications, medical treatment, funeral, prayer). **Schools** were ordered to close during this period, and **social gatherings** were restricted to an individual's household.⁵⁰ Initially, **workplaces** were allowed to stay open but were subsequently ordered to close on September 24, 2020.⁵³ The number of passengers allowed on **public transportation** was restricted, **recreation facilities** were closed, and **businesses** open to the public were closed.⁵⁰

Places of worship were closed with exceptions for Rosh Hashanah and Yom Kippur. Exceptions included permission to attend prayer within 500 metres of an individual's home, with the restriction that the number of worshippers present shall not exceed 1 person per 4 square meters of space in places designated for prayer.⁵⁰

The "Lockdown Relaxation Roadmap," provides guidance on relaxing restrictions which will be based on health indices, require a waiting period of no less than 14 days, and a situation assessment will be held to examine the situation prior to further relaxing restrictions.⁵⁴ Many restrictions were eased except for the closure of **non-essential businesses** (e.g., restaurants, gyms, pools, markets, commerce) and the prohibition on sporting events, conferences or festivals. The **education** sector opened to partial capacity, **social gatherings** allowed (limited to 10 inside, 20 outside), and places of worship open for prayer only (limited to 10 indoor, 20 outdoor). These restrictions were set to be reassessed on November 14, 2020,⁵¹ but the Cabinet had not yet approved the rollback of any lockdown measures.⁵²

Three areas that were not allowed to move into these relaxed restrictions included: Majdal Shams, Mas'ada, Buq'ata, and Hatzor HaGlilit. In these areas, there is a closure of grades one through four, residents cannot leave home unless for essential reasons, and entry into restricted areas is forbidden with exceptions (e.g., civilian rescue, residents, journalists, essential service, education, social workers, medical crews).⁵⁵

When restrictive measures were implemented nationwide on September 18, 2020, there were 4,341 new daily cases identified, and cases steadily increased to a peak on October 3, 2020 with 6,232 new daily infections were reported. However, daily cases have decreased consistently since the peak on October 3, 2020, with 653 new cases reported on November 16, 2020.⁵⁶

AUSTRALIA (METROPOLITAN MELBOURNE AND REGIONAL VICTORIA)

Context:

On August 2, 2020, the state of Victoria (Regional Victoria) entered stage 3 restrictions, but stage 4 (lockdown) restrictions for Metropolitan Melbourne.

The state of Victoria experienced a rise in cases from the end of June (30 cases per day among a population of 6.4 million [incidence calculated as 0.5/100,000]) to the end of July (nearly 700 cases reported daily [incidence calculated as 10.9/100,000]). On Aug 2, 2020, the 14-day average number of daily cases in Metropolitan Melbourne was approximately 386.5 (incidence calculated as 7.8/100,000).⁵⁷ Daily case counts in Victoria peaked with 687 new cases reported on August 4, 2020; by mid-August, fewer than 300 new cases were being reported daily.⁵⁸ Daily COVID case counts continued to decrease: on September 1, 87 new cases were reported in the state, and on September 13, 2020, the date when some restrictions began to ease, the 14-day rolling average was 56.9 new cases diagnosed per day for

Metropolitan Melbourne and 4.1 for regional Victoria.⁵⁹ Regional Victoria subsequently entered the Third Step of reopening on September 16, whereby additional restrictions were eased. By October 1, only 5 new cases were reported in the state.

On July 9, 2020, Metropolitan Melbourne was placed under stage 3 restrictions for a minimum of six weeks, when 191 cases were reported (incidence 0.04 cases per 100,000). Stage 4 restrictions were imposed in the context of increasingly widespread community transmission in the Metropolitan area.

Lockdown Measures, Duration and Impact on Epidemiology:

Melbourne was placed under lockdown (stage 4 restrictions) on August 2, 2020, with a **stay-at-home** order (with **curfew** between 8:00 p.m. and 5:00 a.m.); closure of **non-essential businesses, schools, community and athletic facilities** (including outdoor spaces such as playgrounds); banning of **gatherings** (public gatherings capped at 2, including members of one's own household); **restrictions on travel** in and out of the affected area, and **masking** in all public spaces (indoor and outdoor).⁶⁰

Beyond metropolitan Melbourne, stage 3 restrictions applied across the state of Victoria, which also included a **stay-at-home** order, albeit less strict (no **curfew** or restricted perimeter of travel), more lenient restrictions on businesses (e.g., hair salons allowed to operate), and allowance for select ceremonies.⁶¹ Of note, on June 22, 2020, restrictions on the maximum number of people attending **social gatherings** (5 indoors and 10 outdoors) and **restaurant** capacity (capped at 20 patrons) were put in place in the state of Victoria in response to a rise in locally-acquired cases. Of the 163 reported cases between June 8th and June 21, 49% were acquired locally with no known epidemiological link (or pending investigation at the time of report).

A roadmap for reopening was developed, with four documents outlining the reopening process for general living and working.⁶² In early September 2020, the regional lockdown of Melbourne was extended until September 28, 2020, with the majority of stage 4 restrictions remaining in place.⁶³ However, a set of modifications took effect on September 14, 2020 (step 1 of the roadmap for reopening). Nightly **curfews** were expected to be changed from 8:00 p.m. to 9:00 p.m., and still ending at 5:00 a.m. Further, public gatherings of two people, or a household, were permitted for up to two hours daily. And, finally, **travel** limits of 5 km would be allowed for specific reasons (such as work or education if these could not be done at home). Other regions of Victoria would enter the third step of reopening on September 16, thus allowing increased reopening for **sport, recreation, ceremonies** and special occasions. Contact tracing measures would also be increased. Some restrictions were modified at the end of September 2020 as Metropolitan Melbourne moved to the second step of the reopening roadmap. As of November 8, 2020, regional Victoria and Metropolitan Melbourne were in the third step of the reopening roadmap, with loosening of restrictions.

As of November 15, 2020, there have been zero COVID-19 cases reported in Metropolitan Melbourne or regional Victoria for the last 16 days, with three active cases remaining.⁶⁴

Overall Findings and Discussion

Impact of Lockdowns during the First Wave of COVID-19

Effectiveness: The evidence reviewed in this document confirms that lockdowns were highly effective in decreasing the burden of COVID-19 in all jurisdictions in which they were implemented. Evidence regarding the necessary stringency level of lockdown measures was mixed.

Timing: Results from mobility studies suggest that early initiation of lockdowns is necessary, but governments must also act to ensure rapid adoption of such measures. The delay in adoption might explain the perceived lack of effectiveness of milder lockdown measures in certain jurisdictions such as Italy. Beyond a certain level of restriction, lockdown effectiveness might be dictated by when an *effective* decrease in mobility occurs at a population level. In some jurisdictions, stronger lockdown restrictions and accompanying enforcement and messaging might have been required to achieve even a moderate decrease in community mobility and subsequent adoption of other public health measures. Uptake of public health measures might be more rapid in second wave lockdowns because of the now widespread recognition of their importance in curbing the spread of the disease. These findings suggest an important role for ensuring that effective communication and public trust can be fostered to support public participation in these largely behavioural interventions.⁶⁵

Limitations: The studies from the peer-reviewed and pre-print literature report findings from the first wave of the pandemic, when testing capacity was notably limited in most jurisdictions. Therefore, the incidence data in these studies is likely of limited reliability. In addition, several studies included aggregate results from jurisdictions that were heterogeneous both in their approach to lockdown measure implementation, and in their capacity to test. Additional limitations inherent to pre-print studies also apply. Accordingly, these conclusions must be interpreted with caution.

Approaches to the Second Wave

Jurisdictions that have re-implemented restrictive ‘lockdowns’ are applying a range of measures across broad categories, which are similar to first wave lockdown interventions. The stringency of second wave lockdowns appears more varied, and some jurisdictions have chosen a less restrictive approach in specific settings. Schools, notably, have been closed for shorter durations, or their closure even aligned with a planned school break. This approach factors in the described [negative impacts](#) of pandemic interventions on childhood development.⁶⁶

An Equity-Informed Approach

- Most of the public health responses assessed in this document involved measures implemented at a national or sub-national (e.g., provincial or state) level. The narrative around equity relevant to the local level was not found in the literature reviewed for this document.
- In Canada, equity-seeking groups, which include racialized and Indigenous people, have been more severely affected by COVID-19.^{67,68} Numerous factors contribute to the disproportionate impact, many of them rooted in structural factors such as systemic discrimination and stigma. Uptake of public health measures, for instance, is known to be difficult in these communities because of work conditions (in-person, or essential workers) and residential arrangements (e.g., multi-generational crowded households).
- The centralized responses to the COVID-19 pandemic must be accompanied by local interventions that action equity and prioritize neighbourhoods and communities that are disproportionately affected (or at risk of being so) by the pandemic, providing adequate resources and support, through collaboration with community leaders.⁶⁷

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