

Lessons Learned from the First Wave of COVID-19 in NL

Objective

To prepare for the second wave of COVID-19 by examining the epidemiology of the first wave.

Practice Points

1. COVID-19 was first diagnosed in NL on March 14, 2020. A super spreader event occurred at a funeral home in St. John's from 13–15 Mar 2020.
2. The Coronavirus is spread by respiratory transmission. Management of clusters depends on social isolation, physical distancing, masks, and contact tracing.
3. Importation of cases can be ameliorated by banning travel, 14-day isolation on arrival, and testing for the virus at the border, with a second test done 5–10 days before or after arrival.
4. Physical distancing to more than 2 meters can be enhanced by a combination of working from home, limiting workplaces to essential services, closing restaurants and bars, closing schools, and limiting the number and size of gatherings.
5. Mortality from COVID-19 can be prevented by shielding the vulnerable, especially long-term care residents, and having hospital and ICU beds available during community transmission.

Methods

1. Incidence of new cases was obtained from media presentations by Public Health from 14 Mar to 30 Aug 2020 (5.5 months). We defined (a) flattening of the curve as <1 case/100,000/day for 1 week, which for the population of Eastern Health (EH), 317,250, was ≤ 3 cases/day, and (b) eradication of the virus as no new cases for >14 days (excluding travel related cases).
2. Daily use of beds was obtained from the Department of Health. Average daily use of beds before COVID-19 from 6 Jan to 15 Mar 2020 was compared to average daily use in the first 12 weeks of COVID-19 from 16 Mar – 7 Jun 2020.

Results

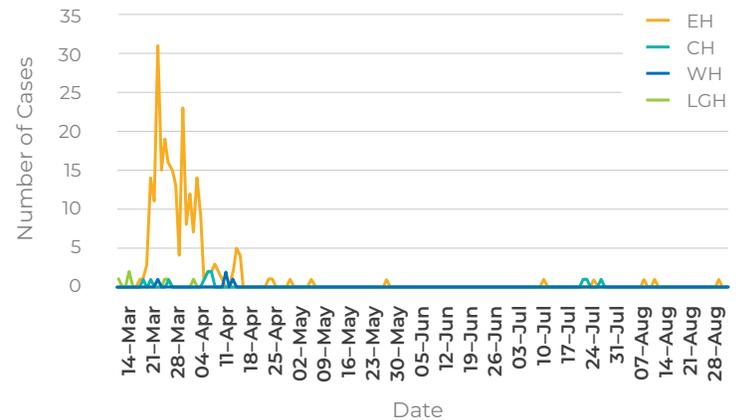


Figure 1. Incidence of New Cases by Regional Health Authority (RHA)

- The first cases identified in EH were like the tip of the iceberg in that they predicted exponential growth in numbers.
- The peak of the curve in EH occurred quickly within 5 days of onset, reflecting the effect of adherence to physical distancing interventions and good contact tracing.
- Flattening of the curve occurred within 25 days of onset.
- Eradication of the virus occurred within 42 days of onset.
- There were few cases in Central Health (CH), Western Health (WH), and Labrador-Grenfell Health (LGH) with little community transmission.
- Mortality was 1.1%, with 1 of 3 deaths occurring in a resident of a long-term care facility. Social isolation of residents protected them from the virus but at the expense of no social interactions with their families as they came to the end of their lives.
- Initial models predicted greater need for hospital and ICU beds and higher incidence of new cases around holidays than actually occurred.

This was the result of not having local data to populate models, dependence on data derived from populations with higher population density, and assumptions for the adherence to restrictions that were worse than what actually occurred.

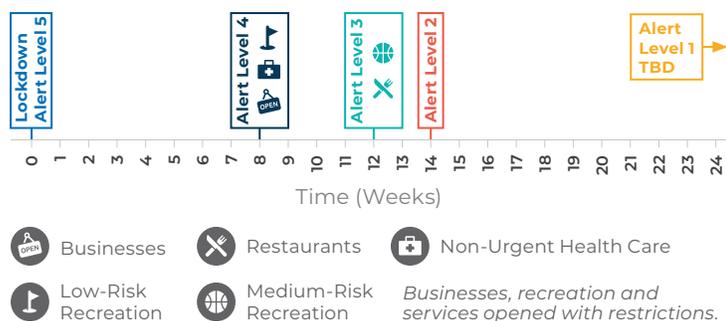


Figure 2. Timeline for Loosening of Restrictions in NL

- On 18 Mar 2020, NL declared a Public Health State of Emergency (SOE) (Level 5 of NL's COVID-19 Alert Level System). Non-essential businesses, schools, restaurants, public venues & recreational activities were all closed. Restaurants were closed for in-person dining. Private clinics were closed and non-urgent health care was postponed.
- On 11 May 2020, 54 days after SOE declared, NL moved to Alert Level 4 with some select businesses (eg. law firms), health care services and low-risk outdoor recreational activities (eg. golf) permitted to reopen/resume with restrictions.
- On 8 Jun 2020, 82 days after SOE, NL moved to Alert Level 3 allowing more businesses to reopen (eg. retail) with restrictions, medium-risk outdoor recreational activities (eg. sports such as baseball) to resume, private clinics to reopen, and restaurants to reopen at reduced occupancy.
- On 25 Jun 2020, 99 days after SOE, NL moved to Alert Level 2. More recreational activities, such as gyms & indoor pools were reopened with restrictions, and businesses, such as bars & lounges, were reopened with reduced occupancy.
- NL currently remains at Alert Level 2 with no date set for a move to Alert level 1.

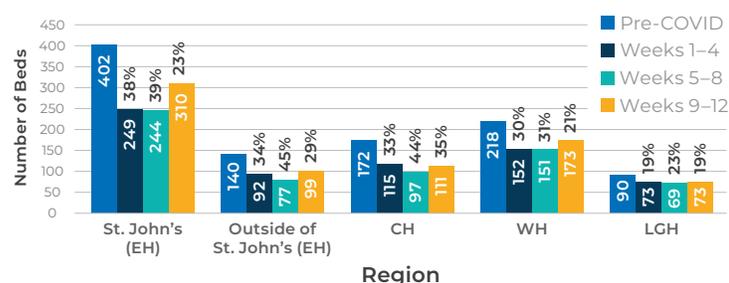


Figure 3. Reduction of Acute Hospital Beds in Use During the Initial 12 Weeks of COVID-19 Compared to the Average Number in Use for the 9 Weeks Preceding the Epidemic, by RHA

- Despite flattening the curve within 4 weeks of the start of the epidemic in EH, and eradication of the virus within 6 weeks, hospital bed use in weeks 9–12 of the epidemic was reduced by 23% in the three St. John's hospitals, and by 29% in the three rural hospitals of EH.
- Despite no community transmission of COVID-19 in regions outside EH, reduction in bed use for weeks 9-12 of the epidemic continued: 35% in CH, 21% in WH, and 19% in LGH.

Lessons Learned

- Rapid introduction of society lockdown, adherence to restrictions and good contact tracing lead to early peaking of new cases and flattening of the curve within 25 days.
- Eradication of the virus is possible and is a feasible goal should a second wave occur. Importation of new cases will be necessary for a second wave to occur and can be prevented by good border control together with either double testing over 7 days for the virus in people travelling to the province or 14 days isolation in the province.
- Community transmission was restricted to regions facilitated by a travel ban within the province. Restrictions to manage a cluster do not need to be province wide but can be restricted to localities with new cases.
- The relatively rapid flattening of the curve and eradication of the virus, but later loosening of restrictions in the first wave, supports earlier start to loosening of restrictions when these epidemiological events occur with a second wave.
- Prediction modelling using local data and assumptions based on local behaviour should improve the accuracy of predictions.
- Protection of the vulnerable is critical, but time is now available to create policies for social isolation that facilitate family interactions.
- Bed occupancy was lower than necessary during the epidemic, with attendant diminished access to necessary hospital care. Rapid introduction of lockdown in regions who have new cases plus effective contact tracing should prevent growth of clusters large enough to stress hospitals.
- Once cluster control is obtained, normalization of hospital bed use should be possible soon after flattening the curve.