

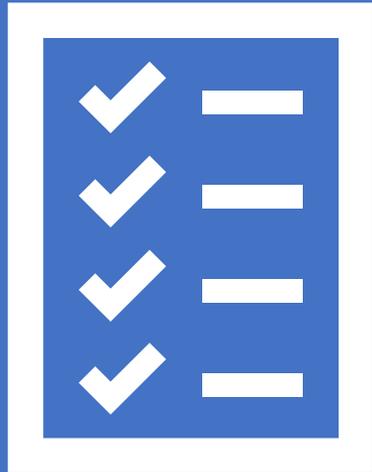
Public health system evaluation and lessons from the first peak of COVID-19

A report on behalf of
the Council of Ontario
Medical Officers of
Health

August 2020

The **Council of Ontario Medical Officers of Health**, a section of the Association of Local Public Health Agencies, is committed to improving the health of Ontarians and increasing health equity by strengthening Ontario's public health system. This report and supporting appendix are presented on behalf of the Council in an effort to achieve its mission through system leadership and coordination in collaboration with the provincial government and other organizations, and through evidence-informed advocacy on public health policy.

Context



- Local public health units have spent months **leading the response to the COVID-19 pandemic across sectors** in their communities
- Public health is evaluating its actions and **sharing lessons learned** from the first peak and resurgences
- These findings can be used to protect Ontario's communities by:
 - Building on aspects of the public health system response that should continue or be enhanced during resurgence and future peaks
 - Informing health system planning and preparedness for resurgence of COVID-19 and the upcoming influenza season
 - Leveraging the strengths of the local public health system connections with community to ensure cross sector interventions
 - Enhancing collaborative efforts with the public health system and health system partners in the Ministry of Health, Ontario Health, Ministry of Long-Term Care, and Primary Care

Impact of public health



- Contained COVID-19 and **prevented our health system from being overwhelmed**, despite seeing jurisdictions that demonstrated early control now facing significant resurgence^{1,2}
- Implemented widespread and timely public health measures and local public health responses that **prevented an estimated 220,000 cases and 4,400 deaths**³
- Local public health units kept **cases contained** by tackling challenges faced with re-opening and by tracing growing numbers of contacts for every case

1. Public Health Agency of Canada. Update on COVID-19 in Canada: Epidemiology and Modelling (August 14, 2020).

2. Government of Ontario. COVID-19 case data (August 14, 2020).

3. Office of the Premier of Ontario. Ontario provides full transparency by releasing COVID-19 modelling [press release] (2020 April 3).

Methods



- The Council of Ontario Medical Officers of Health (COMOH) initiated a sector-wide evaluation to:
 1. Capture what happened during public health's prevention, preparedness, and response efforts in the first six months of the COVID-19 pandemic
 2. Identify and learn from aspects of the public health system response that should continue or be enhanced during resurgences and future peaks
 3. Apply lessons learned to prepare for resurgences of COVID-19, the upcoming influenza season, and future pandemics
- Evaluations and continuous quality improvement processes have been carried out by local public health units through reviews, surveys, and interviews with their teams, the public, community partners, and stakeholders across sectors, which have been incorporated into this report.

Methods

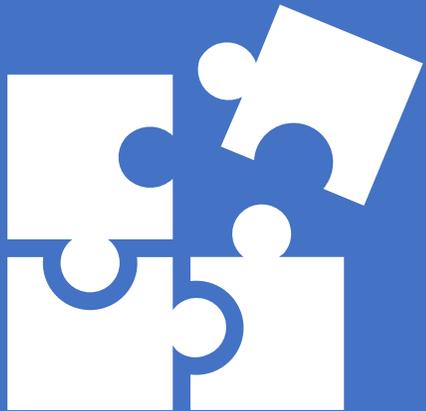


- All Medical Officers of Health invited to participate in the evaluation via email from COMOH on July 24, 2020
- 17/34 (50%) local public health units participated (60% rural, 40% urban), sharing insights on >100 local initiatives
- Working group members collated responses and used qualitative methods (thematic analysis) to synthesize findings
- Further input received from all COMOH membership at two meetings
- Appendix outlining local public health initiatives, partner feedback, and collaborative efforts accompanies this report

Key questions:

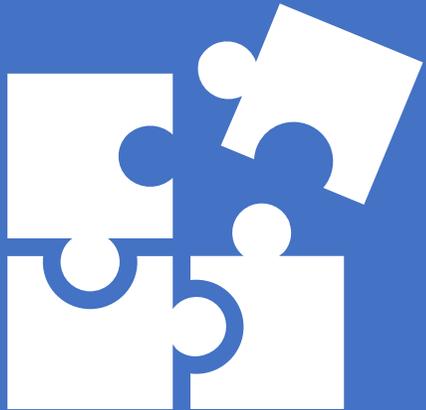
1. What **worked well** during the first peak?
2. What could be **improved**?
3. What should **continue** or be **enhanced**?
4. What else should we consider for **future COVID-19 planning** and **influenza** in the coming months?

Key components of local public health response



- **Protecting our communities** using public health measures to protect people from the virus, by minimizing transmission and deaths
- **Supporting sustainability of our health care system** by preventing cases and transmission
- **Protecting and supporting** those most adversely impacted by the pandemic due to poverty, social circumstance, or other discrimination
- **Leading and supporting recovery across our communities** to mitigate against the health, social, and economic harms of the virus, isolation, and restrictive measures
- **Partnering and collaborating to support** municipal, education, social service, health care, business, and community sectors
- **Communicating timely evidence-based information and data** to the public and partners

Key components of local public health response



- Using **surveillance and epidemiological analysis** to target public health action and inform local health partners
- **Synthesizing new scientific evidence, research and evaluation** to apply the most effective and up-to-date public health interventions locally
- Conducting **intensive and meticulous case management and contact tracing** while supporting isolation requirements
- **Preventing and rapidly responding to outbreaks** in community, workplace, congregate, and institutional settings
- Identifying key priorities and populations for **focused testing strategies**
- **Preparing for safe re-opening** of local schools, workplaces, daycares, personal service settings, restaurants, and other spaces
- **Planning and preparing** our health system and communities for resurgences, future peaks, and influenza

Sustaining the local public health response



- **Local public health leadership** has been critical to protecting health and **tailoring responses** to meet the needs of our communities during the first peak
 - **Experience** and **technical training** in public health emergencies and health protection prepared local public health to respond and built on existing pandemic preparedness and business continuity plans
 - **Public health measures** prevented illnesses and deaths that would have **overwhelmed our health care system** and continue to threaten to do so as seen in other jurisdictions
 - Public health leadership **brought communities together** to flatten the epidemic curve using preventive measures that continue to be a mainstay of the response
 - The most effective system in a public health emergency relies on **independent local public health authorities** that can leverage strong partnerships and community knowledge to adapt direction that is coordinated at the provincial level
- Public health holds a unique, **established, and trusted position that allows collaboration** with municipalities, schools, childcare settings, businesses, social services including congregated settings, health care and institutions, media, and community organizations **to effectively shape local response**
 - **Provincial and regional coordination** is critical to supporting the strong leadership and response undertaken by local public health units and boards of health
 - Pandemic response required rapid mobilization and scaling up of a **skilled public health workforce that will need ongoing investment** to respond to resurgence and increasing complexity of case management and contact tracing
 - Public health innovation and adoption of new **digital solutions** to improve effectiveness and efficiency have been vital to enhancing widespread detection and containment efforts

Themes identified in the public health system evaluation

Public health's effective response relied on



Early upstream interventions to **prevent** illness and **prepare** our communities



An approach to improving health of the whole population with a focus on **health equity**



Leveraging **local partnerships** to translate provincial direction into effective local action



Provincial and regional **coordination** to support local implementation



A highly skilled and agile **workforce** that will require ongoing investment



Digital solutions to optimize efficiency and support data sharing

Prevention and preparedness

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"Keep up the good work! We depend on you to keep us safe by keeping an eye on the important things that may affect our health while we do what we need to do."

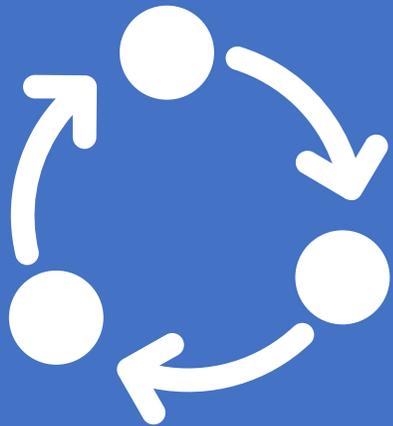
- Community partner feedback

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Local public health expertise focused on **community-wide pandemic preparedness** and **upstream prevention of illness and death**

- Worked with local partners to ensure health system capacity was not overwhelmed
- Rapidly moved to enhanced operations and IMS structures due to pandemic preparedness and continuity of operations planning
- Advocated for early interventions to address **personal protective equipment (PPE)** needs across sectors, **implementing testing** of all staff and residents within outbreak facilities, and for **universal masking** in hospitals, long term care and retirement homes, and community and primary care settings
- Conducted **proactive infection prevention and control (IPAC) assessments** with partners to prevent local outbreaks in congregate settings, essential workplaces, and institutional settings
- Shared **modelling projections** for transmission with the public and partners while tailoring surveillance and epidemiological analyses to support communication about local situation

Prevention and preparedness



Highlights from the field

- Due to concerns of community transmission, **Peel Public Health** along with other local health units across the province pre-emptively closed nightclubs, concert venues, theatres, and dine-in services at restaurants ahead of provincial direction.
- **Halton Region Public Health** worked closely with local hospitals and LHINs to lead a congregate setting strategy, which took a pro-active approach with all congregate and institutional settings in doing in-person IPAC visits and assisted these priority settings in ensuring appropriate IPAC measures were in place to reduce their risk level for COVID-19.
- **Simcoe Muskoka District Health Unit**, in partnership with primary care and hospitals, proactively established local assessment centres prior to provincial direction.
- **Hamilton Public Health Services** conducted proactive pre-opening inspections of all licensed childcare programs in the city, working with the Child System Services Manager to ensure the safe re-opening of all child care spaces.

Health Equity

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"Our shelters have had relatively low numbers, and we expected to have numbers like long term care facilities. We should think about what we are doing right."

- Community partner feedback

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- Public health applied **population-level interventions** that addressed **health equity** by considering the needs of settings that may be more vulnerable to COVID-19 and populations that would disproportionately experience the negative unintended consequences of public health measures
 - Identified and addressed needs of **people who may be more susceptible** to COVID-19 by providing IPAC and testing support to congregate settings such as **shelters and long term care homes**
 - Partnered to develop **isolation centres** for people experiencing homelessness, distributed non-medical masks to those with limited means, and mobilized volunteers to provide supports like **grocery or prescription delivery** to people in isolation or quarantine
 - Monitored and mitigated the **unintended consequences** of public health measures by providing PPE to **community agencies** serving priority populations, continued to distribute **naloxone kits** and other essential public health services, and partnered with local agencies to address rising **mental health and substance use** concerns
 - Developed new methods for engaging and collaborating with communities on the collection of local raced-based and socioeconomic data

Health Equity



Highlights from the field

- **Timiskaming Health Unit** convened a Community Support Collaborative to identify priority population needs arising from COVID-19, and partnered to access funds for cleaning supplies, PPE, and Plexiglas partitions for private transportation providers in rural communities without public transit.
- **York Region Public Health**, in collaboration with shelters, identified an increase in domestic violence rates and developed resources to support this population with guidance for individuals experiencing abuse during heightened times of isolation.
- **Public Health Sudbury & Districts** ensured local partners working with priority populations were trained in IPAC measures to continue to safely deliver services, supported the implementation of isolation shelter for people experiencing homelessness, and mobilized volunteers to provide supports to people in isolation.
- **North Bay Parry Sound District Health Unit** enhanced their community harm reduction work through promotion of new harm reduction messages within the context of COVID-19, redirecting clients when service disruptions occurred, and collaborated on a community alert when surges in adverse events related to drugs were detected in the community.

Partnerships



We as an organization depend on public health webpages, news releases, and phone calls for the advice we need to give the people we support a better quality of life.

- Community partner feedback



- Public health acted as a **bridge across health and social systems** to enhance **collective community action** for a strong and effective response
- **Leveraged existing local partnerships** with health care sector, municipalities, schools, and community organizations to facilitate:
 - Collaborative planning tables to ensure coordinated local responses and resources for **First Nations, Inuit, and Métis** community members
 - Provision of IPAC support to **hospitals, long term care and retirement homes, child care centres, and congregate settings like shelters, group homes, and detention centres**
 - Direct support for local implementation of public health measures including development of regulations and by-laws and **tailored guidance for schools, businesses, child care centres, and community organizations** in order to protect the health of **workers and their clients**

Partnerships



Highlights from the field

- **Public Health Sudbury & Districts** has a First Nations Community Partners Table to discuss community needs during the pandemic, share resources, and help make connections with other sectors (e.g., to support re-opening plans, surveillance testing, and community pandemic response plans).
- **Simcoe Muskoka District Health Unit's** past pandemic planning enabled a strong, collaborative relationship with municipalities when responding to COVID-19. Weekly teleconferences enabled a coordinated response to a number of challenges, including public crowding on beaches and use of face coverings in indoor public spaces.
- **North Bay Parry Sound District Health Unit** partnered with a local construction company to develop COVID-19 safety protocols well in advance of these being asked by the Ministry.
- **Hamilton Public Health Services** worked with local Indigenous service providers to launch an Indigenous peer-to-peer COVID-19 phone line to access public health information on COVID-19.
- **Ottawa Public Health's** relationship with the City of Ottawa enabled success in countless initiatives from redeploying city staff and infrastructure to the response, working rapidly to implement a bylaw for indoor masking, proactively building a safer approach for public transit and emergency child care centres, and working as a member of the city's Human Needs Task Force to plan for food security, housing, transportation, volunteer services, fundraising, and psychosocial supports.

Coordination



From the hospital perspective, most decisions made by health service partners have an impact on our operations. The coordination by [a local public health unit] to many, if not all, players at the same table at the same time, hearing the same message, enhanced our understanding and response

- Hospital partner feedback



- **Coordination** between local public health units helped strengthen the pandemic response, improve efficiency, and share work loads:
 - Public health units **shared human and digital resources, technical expertise and new methods, and collaborated** to promote regional consistency during times of uncertainty from the earliest phases of the pandemic
 - Increasing proportion of public health workforce **working remotely** while **embracing new technological platforms** for engagement has allowed greater coordination and collaboration across jurisdictions
 - Public health **implemented provincial strategies**, while allowing for local variation and adaptation due to different **local contexts** on issues such as community transmission, cross-border travel, masking, testing, and laboratory capacity
- **Provincial and regional information sharing** through channels such as Ministry Emergency Operations Committee calls, updates from Public Health Ontario, calls with Medical Officers of Health, and Ontario Health regional planning tables

Coordination



Highlights from the field

- **Eastern Ontario Health Unit, Leeds, Grenville and Lanark District Health Unit, Renfrew County and District Health, and Ottawa Public Health** coordinated to develop a mandatory masking policy to ensure consistency across the region and avoid duplication of efforts, with each public health unit then moving forward to adapt within their own local context.
- Since January 2020, the **Ontario Public Health Emergency Managers Network** shared updates, resources, consultations, and professional development information amongst its members to support local responses.
- Medical Officers of Health in the **Greater Toronto and Hamilton area** worked together during the pandemic to share information and where possible, coordinate their responses given the mobility of individuals within their geographic area.
- **Porcupine Health Unit** and **Timiskaming Health Unit** formed a working group to provide timely and consistent responses and support to School Boards that span their districts. The group also aims to reduce duplication of effort related to ongoing COVID-19 supports for schools.

Workforce



The ability of the IMS structure to be flexible and responsive to the emerging needs was extremely helpful. Training by the Rapid Response Team helped to ready people. I think we did amazing work, and I am very proud to have been part of it.

- Local public health unit staff



- **Local public health leadership** rapidly responded to COVID-19 by applying **years of experience in public health emergencies** and working with community partners on IPAC and outbreak management
- When redeployed to the COVID-19 response, public health's highly skilled workforce has **adapted quickly to new roles and technologies, demonstrating resilience**
- **Key public health skills and roles** highlighted in the response include epidemiology, emergency preparedness, IPAC, case management and contact tracing, health communications, community engagement, and focus on health equity implications of pandemic
- **Critical core services that protect the health of our communities**, such as public health inspections and responding to other infectious diseases, continued to be offered during the pandemic and must continue in order to prevent increased pressures on the health care system

Workforce



Highlights from the field

- *"From the time I received the call that I was positive to COVID-19, I ALWAYS felt like I had the support of **Algoma Public Health**... Having gone through the experience, the community should have complete faith in the process - I have never answered so many questions in my life and to say that your case management was thorough is an understatement. The nurses on your front line were remarkable... I truly felt like they cared about my physical and mental wellbeing."* – Community member feedback
- While many health system partners were scaling back and experiencing lower volumes, **Huron Perth Public Health and Brant County Health Unit** rapidly scaled up from a Monday to Friday 8:30 - 4:30 and 24/7 on-call operation to Monday to Friday two shifts with evenings, weekend shifts, and 24/7 on-call in order to respond to the need for support to the public, partners, and stakeholders.
- *"They received a call, they responded immediately. They gave accurate information and they followed up on each situation that I was involved in."* – Community partner feedback to **Public Health Sudbury & Districts**

Digital solutions

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Excellent media and social media presence with clear, succinct, and recent evidence-based principles.

- Community partner feedback

”

- Local public health units adopted new **digital solutions** that were critical to **optimize the function, efficiency, and effectiveness** of case management, contact tracing, and outbreak investigation and management
- Dashboards were developed to **visualize data** while allowing for **real-time transparency** of public health efforts and health system pressures, including indicators for local monitoring and informing re-opening decisions
- Public health workforce rapidly adapted to new platforms for working remotely and continued supporting case and contact management efforts virtually

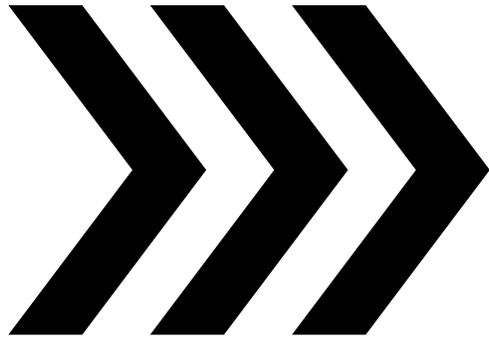
Digital solutions



Highlights from the field

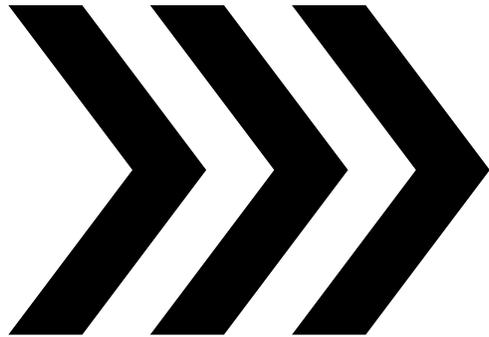
- **Ottawa Public Health** developed a dynamic disease reporting system. The COVID-19 Ottawa Database (known as “The COD”), adapted from a system used in Newfoundland and Labrador, supports local case management and contact tracing. Building from this database has led to development of novel epidemiological methods and technology to detect potential clusters earlier and mobilize resources to investigate.
- **KFL&A Public Health**, working with the Office of the CMOH, enabled the real-time capture of suspected COVID-19 emergency department visits across the province in the Acute Care Enhanced Surveillance (ACES) system and built the Pandemic Tracker as a public tool (<https://www.kflaphi.ca/aces-pandemic-tracker/>).
- Machine learning was developed by **York Region Public Health** to optimize the utility and interpretation of OLIS lab results data to support the automation of reporting and timely case follow up.
- **Hamilton Public Health Services** adapted existing technology used for routine inspections of food premises. Inspectors record COVID-19 IPAC observations and education data into the existing Hedgehog Inspection System to ensure all information is stored together.
- **Middlesex-London Health Unit** developed Azure software and several other local public health units were able to use this platform to facilitate the COVID-19 response.

Opportunities to sustain the public health response



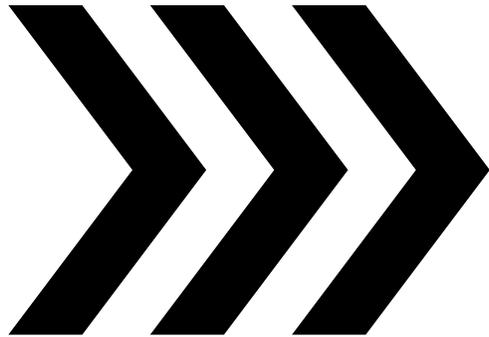
- Local public health must provide ongoing **leadership and guidance in all essential public health functions** to support sectors and tailor responses that meet the needs and strengths of our communities
 - Continue to lead planning and preparedness efforts in our communities using data-driven projections and evidence-informed interventions founded in public health expertise
 - Lead clear, concise, and engaging public health communications across traditional and social media platforms that enable the public to reduce their risk
- Local public health must build on **partnerships and collaboration** across sectors to **address new and complex community challenges** such as return to school, increased demand for health services, increase in visitors to long term care homes, re-opening of businesses, and larger social gatherings
 - Build well-resourced school health teams led by local public health to prepare and respond to new cases while supporting students and families with mental health and other health concerns

Opportunities to sustain the public health response



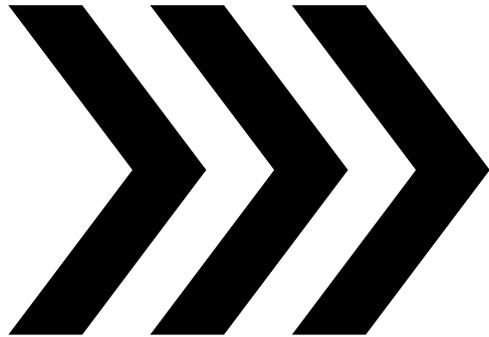
- There must be investment in **local public health workforce** to allow for surge capacity needed for increasing complexity of pandemic response and maintaining critical core public health services
 - Support collaboration between local public health units through new or existing public health “hubs” where resources can be shared and broader actions coordinated without reducing workforce
 - Enhance surge capacity for contact tracing and outbreak management by enabling rapid movement of workforce from one jurisdiction to another, based on local epidemiology
 - Enhance sharing of expert technical guidance, standards of practice, communications products, data analysis
 - Explore strategies to ensure and promote workforce resilience, while protecting mental and physical health

Opportunities to sustain the public health response



- There must be **increased resources for IPAC and outbreak management** in higher-risk settings and priority populations to minimize severe illness that would strain the health care system
 - Health system support and ongoing collaboration with Ontario Health for targeted and mobile testing strategies as part of early community cluster response
 - Proactive IPAC through audits and consultation with higher risk congregate and institutional settings in partnership with the broader health system
 - Review effective strategies to increase population uptake of influenza vaccine as added protection during resurgence and reduce potential strain of respiratory illness on the healthcare system

Opportunities to sustain the public health response



- **Local public health expertise and connections with community** must be capitalized on at regional and provincial tables
- Roles of **key health system players** must be clarified and mutually respected for maximum health gains
 - Clarify and align roles across Ontario pandemic response structure for public health and health system partners including local public health, Ministry of Health, Chief Medical Officer of Health, Public Health Ontario, Ontario Health, and Ministry of Long-Term Care
 - Ensure public health and acute care expertise are informing each other's separate but complimentary actions through partnerships at the five regional Ontario Health pandemic response tables, with clear lines of communication with local and provincial planning tables
 - Streamline reporting and coordination on pandemic response for medical officers of health with Chief Medical Officer of Health while maintaining local independence and accountability to boards of health
- **New technologies** must be developed and adapted to support case management, contact tracing, and outbreak investigations so local public health units can enhance effectiveness despite growing complexity
- Innovative technologies must be explored to help with **advanced planning, forecasting, and operational response** in dealing with resurgence and other respiratory illnesses

Community
partner
feedback

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Thank you for the long hours and tireless work to try to get us through the pandemic. I know we have smart and innovative people who work for us to come up with solutions for us to live during this pandemic. We can get through this together.

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Public health
system
evaluation and
lessons from the
first peak of
COVID-19

Appendix of local public health
initiatives and feedback

A report on behalf of
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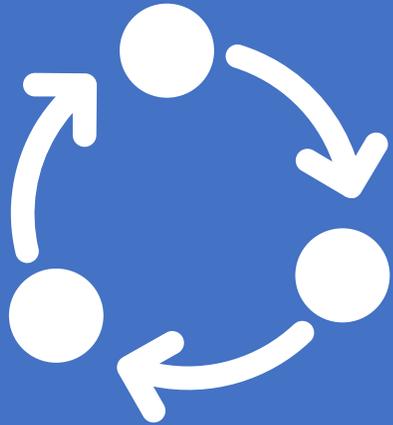
August 2020

Public health's effective response relied on



This document is provided as an Appendix to the '*Public health system evaluation and lessons from the first peak of COVID-19*' report and captures feedback provided by members of the Council of Ontario Medical Officers of Health on local public health unit initiatives, partner perspectives, and collaborative efforts across the public health system. The highlights received from the field are categorized across the six themes identified in the evaluation, though in many cases are cross-cutting.

Prevention and preparedness



Halton Region Public Health worked closely with local hospitals and LHINs to lead a congregate setting strategy, which took a pro-active approach with all congregate and institutional settings in doing in-person IPAC visits and assisted these priority settings in ensuring appropriate IPAC measures were in place to reduce their risk level for COVID-19.

Hamilton Public Health Services conducted proactive pre-opening inspections of all licensed childcare programs in the city, working with the Child System Services Manager to ensure the safe re-opening of all child care spaces.

KFL&A Public Health has worked to complete an After-Action Review using key informant interviews, focus groups, and a survey, to identify strengths and enhance agency's response moving forward.

KFL&A Public Health piloted mass testing surveillance activities.

Hospital partners highlighted they valued the "visibility, accessibility, and expertise" of **Ottawa Public Health** and its "outstanding" support for their

organizations. Relayed they appreciated the team "daily huddles" and an approach to infection prevention and control that recognized their own expertise as well.
- Hospital partner feedback

Ottawa Public Health's skilled team of epidemiologists collaborated with hospital and university partners to use modelling to project the impact of public health interventions on the local epidemic curve. This supported the health care system in planning for hospital admissions and use of intensive care unit resources like ventilators.

Due to concerns of community transmission, **Peel Public Health** along with other local health units across the province pre-emptively closed nightclubs, concert venues, theatres, and dine-in services at restaurants ahead of provincial direction.

Public Health Sudbury & Districts

supported hospitals, schools, daycares, and local businesses to help with informed decisions and safe practices:

- *"Public health proved very helpful!"*
"Keep up the good work! We depend on you to keep us safe by keeping an eye on the important things that may affect

our health while we do what we need to do." - Community partner feedback

Simcoe Muskoka District Health Unit, in partnership with primary care and hospitals, proactively established local assessment centres prior to provincial direction.

York Region Public Health provided direct support to long term care and congregate living settings through onsite infection prevention and control (IPAC) preparedness and outbreak assessment visits, IPAC educational support to staff in these settings, and the provision of emergency personal protective kits for interim supply while additional resources were acquired.

Health Equity



Halton Region Public Health partnered with paramedics to set up a community paramedic team for the purpose of testing people in the community who were unable to attend a community COVID-19 assessment centre due to physical mobility challenges.

Halton Region Public Health continued to deliver critical services to families and individuals throughout the pandemic (e.g. harm reduction services, Healthy Babies Healthy Children, telephone parenting supports).

Hamilton Public Health Services developed enhanced surveillance indicators for priority populations to monitor the societal impacts of COVID-19 and the response. Through a partnership with local hospitals and police, indicators are provided in as close to real-time as possible, and jointly monitored by the Public Health Emergency Control Group and Hamilton's EOC to enable a timely and collaborative response.

Huron Perth Public Health accessed United Way and private donor funding pots to provide grocery store cards to

families at increased risk and those self-isolating, as well as computer access to those living with low incomes in rural areas.

KFL&A Public Health maintained key programming (e.g., HBHC and Child and BabyTalk) to support families during the COVID-19 crisis and worked with municipalities, health, and social service partners to establish a self-isolation centre for individuals experiencing homelessness.

KFL&A Public Health coordinated IPAC activities with local partners working with priority populations (shelters) and higher-risk settings (correctional institutions).

KFL&A Public Health worked with Frontenac Paramedics to implement an outreach COVID-19 swabbing program to support rural populations, people with mobility issues and populations at higher risk.

Ottawa Public Health used their relationships with community organizations to support the work of collecting, analyzing and reporting on

race-based COVID-19 data, recognizing the critical importance of understanding how the health of certain communities has been disproportionately affected by the pandemic.

"Our shelters have had relatively low numbers, and we expected to have numbers like long term care facilities. We should think about what we are doing right." - Community partner feedback to **Ottawa Public Health**

Public Health Sudbury & Districts provided guidance to agencies working with priority populations on safe best practices, access to harm reduction equipment, and daily visits to support homeless populations.

Public Health Sudbury & Districts ensured local partners working with priority populations were trained in IPAC measures to continue to safely deliver services, supported the implementation of an isolation shelter for people experiencing homelessness, and mobilized volunteers to provide supports to people in isolation.

Health Equity



North Bay Parry Sound District Health Unit enhanced their community harm reduction work through promotion of new harm reduction messages within the context of COVID-19, redirecting clients when service disruptions occurred, and collaborated on a community alert when surges in adverse events related to drugs were detected in the community.

Simcoe Muskoka District Health Unit (SMDHU) employed locally specific strategies for engaging or staying in touch with priority populations.

Communications were distributed to different priority population groups (e.g. guidance to shelters, congregate settings). SMDHU worked with social services, priority population planning committees, and individuals on a one-on-one basis to ensure:

- Mandatory requirements were met re: case and contact management
- Heat planning for priority populations and assessment of existing infrastructure
- Established testing options for priority populations (e.g. lower income), assessment centre outreach options, and worked with District of Muskoka to help with promotion of testing
- Communication strategy for priority

population notification system

- Funeral homes included in listserv
- Worked with primary care and hospitals to establish local assessment centres prior to provincial direction and the Central Region Ontario Health

Timiskaming Health Unit convened a Community Support Collaborative for the purpose of identifying priority population needs arising from COVID-19, and partnered to access funds that provided cleaning supplies, PPE, and Plexiglas partitions for private transportation providers in rural communities without public transit.

Facilitated by **Timiskaming Health Unit**, the Community Support Collaborative meets weekly to identify and address priority population needs arising from COVID-19 and related public health measures. Initiatives linked to this collaborative include:

- Timiskaming Connections Initiative, including a phone line to link volunteers with those in need of support related to COVID-19 and public health measures.
- Partnered to access funds and provide masks/face coverings to those with barriers to access. Includes a wide

range of community partners serving as depots across the district including small, rural areas.

- Sourced funding and coordinated masks/face coverings for distribution to passengers with all transportation providers.
- Partnered to access funds to address the digital divide; a pre-existing equity issue exacerbated by COVID-19. This initiative will provide technology, Internet, and digital health literacy skills to individuals in need.

York Region Public Health, in collaboration with shelters, identified an increase of domestic violence rates and developed resources to support this population with guidance for individuals experiencing abuse during heightened times of isolation.

York Region Public Health supported local shelters via the provision of 6600 surgical masks as well as provided guidance and recommendations for the establishment of both transitional housing and an isolation shelter for priority populations along with emergency personal protective equipment kits

Partnerships



Hamilton Public Health Services worked with local Indigenous service providers to support the safe opening of various community-based supports; including a Friendship Centre, licensed child care and health care centre, as well as launch an Indigenous peer-to-peer COVID-19 phone line to access public health information on COVID.

Hamilton's Health Sector Emergency Management Committee is responsible for a collaborative multi-agency response and is chaired by **Hamilton Public Health's** MOH. This group developed a novel approach to assessment centres in the city – the collaborative model is a partnership between hospitals, primary care, public health and the City of Hamilton.

"Planning moved quickly, and there was a high level of trust between [organizations] despite uncertain times and at times uncertain funding resources. We just made it happen." - **Hamilton Health Sector Emergency Management Committee/Hamilton Health Team** debrief

Hamilton Public Health Services collaborated with partner hospitals to

complete virtual COVID-19 IPAC audits with all long term care facilities and retirement homes in the city. This work assessed COVID-19 preparedness in these facilities and prepared partner hospitals for rapid response should outbreak assistance be needed.

Hamilton Public Health Services provided extensive IPAC support to community partners, including staff educational webinars and IPAC assessments for the Ministry of Children, Community and Social Services, bi-weekly calls with Hamilton-Wentworth Detention Centre, consultation and IPAC assessments for the housing and shelter sector and congregate settings, proactive inspections of all licensed childcare settings, and consultations with workplaces for safe re-opening.

KFL&A Public Health initiated and coordinated the emergency response to ensure access to COVID-19 testing with health sector and municipal partners (e.g., primary care, paramedics, acute care and municipalities)

City partners have shared a strong support of the way public health has been working with the municipality and

encouraged **Ottawa Public Health** to "keep doing great things" with in local collaboration with city partners--this has been highlighted as a key theme of the "successes achieved together." – City of Ottawa feedback

Ottawa Public Health's relationship with the City of Ottawa has enabled success in countless initiatives with its municipal partners, from redeploying city staff and infrastructure to the response, working rapidly to implement a bylaw for indoor masking, proactively building a safer approach for public transit and emergency child care centres, and working as a member of the city's Human Needs Task Force to plan for food security, housing, transportation, volunteer services, fundraising, and psychosocial supports.

Partnerships



Public Health Sudbury & Districts

provided reliable information that local businesses, community organizations, and partners used to make best decisions for staff and the community:

- *"We as an organization depend on public health webpages, news releases and phone calls for the advice we need to give the people we support a better quality of life."*
- *"Collaboration with senior leaders to help make informed decisions related to staffing, procedure, etc."*

North Bay Parry Sound District Health Unit partnered with a local construction company to develop COVID-19 safety protocols well in advance of these being asked for by the Ministry.

North Bay Parry Sound District Health Unit provided enhanced surveillance data to local hospital partners, who were provided with weekly, customized syndromic surveillance reports that alerted hospitals when surges in specific syndromes were detected through the Emergency Department. Reports also included testing rates, outbreaks, and cases for their specific catchment area.

North Bay Parry Sound District Health Unit

Public Health Inspectors offered training, education, and recommendations for infection prevention and control to management at Nipissing Mental Health Housing and Support Services, and others supporting the local temporary homeless shelter.

Peel Public Health, in bringing public health expertise to a Regional integrated response table, was able to quickly initiate surveillance screening in Long-Term Care (LTC) homes and complete screening of all residents and staff at 28 LTCs one week ahead of the provincially mandated deadline. This response table was then able to quickly pivot into directing expanded community testing in workplaces and areas of high incidence.

Public Health Sudbury & Districts has a First Nations Community Partners Table to discuss community needs during the pandemic, share resources, and help make connections with other sectors (e.g., to support re-opening plans, surveillance testing, and community pandemic response plans).

Simcoe Muskoka District Health Unit's

past pandemic planning enabled a strong, collaborative relationship with municipalities when responding to COVID-19. Weekly teleconferences enabled a coordinated response to a number of challenges, including public crowding on beaches and use of face coverings in indoor public spaces.

Simcoe Muskoka District Health Unit documented many examples of strong working relationships with community partners (e.g. hospitals, City of Barrie, Indigenous groups) including teleconferences with local municipal and health care system partners, partnerships with assessment centres, homeless shelter operations in hotels, local PPE donation management strategy, and strong relationships developed with Family Health Teams.

Simcoe Muskoka District Health Unit's MOH acted as co-chair with the Central Region of Ontario Health to liaise with the MOHs of the public health units in the region in order to inform the Region and its health care leader of local public health responses, and to help coordinate actions among the players.

Partnerships



Simcoe Muskoka District Health Unit's MOH sat at the provincial Public Health Measures Table and liaised between the CMOH office and local MOHs in Central East Region on the changes in the provincially lead control measures.

Southwestern Public Health Units

collaborated together with local Ontario Health partners to create epidemiology summaries for the region to inform local Health Care System Planning.

A Testing Policy Advisory Council was established early in the pandemic in the Southwest. Made of partners from **Southwestern Public Health Units and Ontario Health**, the Council developed testing guidance to ensure that testing was implemented in a fair and consistent manner across the southwest, taking into consideration local/regional capacity.

Timiskaming Health Unit convened health system partners weekly to provide situation updates and provide clarification on guidance and directives:

- *"From the Hospital perspective, most decisions made by health service*

partners have an impact on our operations. The coordination by THU to many, if not all, players at the same table at the same time, hearing the same message, enhanced our understanding and response" – Health system partner

As part of the structure of the Regional Municipality of York, **York Region Public Health** (YRPH) has been able to leverage many partnerships embedded within the regional structure like social services, paramedic, and seniors' services; enabling a collaborative and coordinated approach to the response from all service delivery areas. Pre-existing relationships with key partners in each municipality (i.e. Community Emergency Management Coordinators) allowed for close collaboration. YRPH collaborated rapidly with Ontario Health/LHIN and local hospitals to support the IPAC extender program to provide timely assessments and education. Partnership was also in place between YRPH, LHIN and the Ministry of Children, Community and Social Services to establish a coordinated approach to personal protective requirements.

Coordination



Algoma Public Health coordinated weekly teleconferences with the Community Emergency Management Coordinators of Algoma's 21 municipalities. Partners identified major sources of community health risk and worked together to communicate and mitigate risk. Early groundwork in emergency preparedness meant that days before Canada issued mandatory quarantine orders, Algoma returning travellers were already receiving and following local public health advice to stay home for 14 days, and they were well-supported to do this thanks to delivery services of groceries and essentials which were rapidly set up by Algoma municipalities.

Eastern Ontario Health Unit, Leeds, Grenville and Lanark District Health Unit, Renfrew County and District Health, and Ottawa Public Health coordinated to develop a mandatory masking policy to ensure consistency across the region and avoid duplication of efforts, with each public health unit then moving forward to adapt within their own local context.

Medical Officers of Health in the **Greater Toronto and Hamilton area** have worked together during the pandemic to share information and where possible, coordinate their responses given the mobility of individuals within their geographic area.

KFL&A Public Health has coordinated many initiatives over the course of the pandemic:

- Held weekly meetings with Medical Directors of all LTC and RH as well as weekly meetings with municipal partners.
- Ran an educational session for all area primary care physicians and conducted two continuing professional development webinars for area physicians.
- Coordinated enforcement activities in their region by bringing together Kingston Police, OPP and City of Kingston Bylaw Officers to reduce duplication of enforcement activities.
- Planned to conduct table top exercises with large institutions in their region: Queen's University, municipalities and other community services.

KFL&A Public Health worked with municipal partners, including mayors, wardens and CAOs to implement and enforce the Section 22 mask order.

Since January 2020, the **Ontario Public Health Emergency Managers Network** shared updates, resources, consultations, and professional development information amongst its members to support local responses.

The community and partners relied on public health statistics to keep them informed on the status of cases. Also, public health provided consistent messaging coordinated across the **North East:**

- *"The epidemiological statistics were very helpful. The collaboration between APH, PPH and PHSD so that we may have a consistent message in our schools is also helpful."* – Northeastern community partner speaking of the coordination between **Algoma Public Health, Porcupine Health Unit, and Public Health Sudbury & Districts.**

Coordination



Public Health Units in the North East worked together to share frameworks and templates for detailed epidemiological reports.

Simcoe Muskoka District Health Unit coordinated and supported other public health units in conducting rapid reviews of literature regarding the harms to physical, mental, and social wellbeing resulting from public health measures, both population-wide and from a health equity perspective. Findings will be used to inform enhanced efforts to help mitigate these harms, where possible, for the remainder of the pandemic.

Simcoe Muskoka District Health Unit played a lead role in planning coordination, liaison work and collaborative work with assessment centres, homeless shelters, Ontario Health Teams, and hospitals.

York Region Public Health (YRPH) provided ongoing infection prevention and control support to congregate settings in partnerships with York Region Social Services, Ministry of Health, and other stakeholders. YRPH has also

coordinated with private sector businesses such as corporate food operators to relay messaging, ensure policy compliance, and garner support in preventing further spread. In addition, ongoing coordination between the Regional Environmental Services Department and external stakeholders was led by YRPH to participate in pilot research and testing for COVID-19 in wastewater.

York Region Public Health (YRPH) partnered with local community partners (i.e. municipality), paramedic services and Ontario Health to host a mobile testing day in Georgina. In addition, YRPH coordinated a Customer Experience journey mapping with local assessment centre which has ensured open communication channels with hospitals and public health and allowed for quick implementation of changes in practice such as changing screening criteria. YRPH and the hospitals continue to work together to improve the customer experience of accessing testing to ensure York Region residents access testing when and where needed.

York Region Public Health (YRPH) coordinated weekly joint meetings with

the Public and Catholic School Boards to support school reopening strategies. Similarly, YRPH and Social Services partnered with childcare settings to ensure preparedness support is provided to these stakeholders to assist in the safe reopening of these facilities.

In addition to resource sharing and coordination, **York Region Public Health**, along with other public health units, combined efforts to implement a coordinated approach to responding to workplace-related investigations to identify effective public health measures for these unique investigations and to enable timely information sharing for impacted public health units.

Workforce



*"I've been meaning to reach out to you and say a big thanks and tell you how wonderful your staff are at APH. The support for reopening [child care centre location] as a whole and previous to that for emergency child care was beyond excellent! A special shout out to [APH employees] who are our Inspectors and have answered all of our many, many questions!" – Child care centre operator feedback to **Algoma Public Health**.*

*"From the time I received the call that I was positive for COVID-19, I ALWAYS felt like I had the support of **Algoma Public Health**...Having gone through the experience, the community should have complete faith in the process - I have never answered so many questions in my life and to say that your case management was thorough is an understatement. The nurses on your front line were remarkable...I truly felt like they cared about my physical and mental wellbeing." – Feedback from community member*

While many health system partners were scaling back and experiencing lower volumes, **Huron Perth Public Health and Brantford County Public Health** rapidly

scaled up from a Monday to Friday 8:30 - 4:30 and 24/7 on-call operation to Monday to Friday two shifts with evenings, weekend shifts, and 24/7 on-call in order to respond to the need for support to the public, partners, and stakeholders.

"Camaraderie - in these trying times, [Public Health Nurses] have come together, problem solved, encouraged, and helped one another. It's been very inspiring and makes me proud to be a part of the COVID-19 response" - **Hamilton Public Health** employee

KFL&A Public Health staff were cross-trained and deployed to implement work of the newly established COVID-19 functional units, including an Assessment Centre, Call Centre, Case and Contact Management, IPAC, and Enforcement.

KFL&A Public Health created nurse and public health inspector teams to provide sector specific IPAC guidance to high risk congregate settings, e.g., LTC/RH, childcare, and correctional institutions.

KFL&A Public Health has implemented CCM using a combination of nurse and non-nurse staff.

Ottawa Public Health has been in enhanced operations since January 28, 2020. By early June, >75% of staff were deployed to the response and many new team members were hired to address the pandemic. The team responded to >2000 cases, traced >7000 contacts, managed >30 outbreaks, collaborated on testing >20,000 individuals in long term care homes and congregate settings, fielded >24,000 inquiries from the community, and had >250,000 likes, comments, and shares on social media.

"The ability of the IMS structure to be flexible and responsive to the emerging needs was extremely helpful. Training by the Rapid Response Team helped to ready people. I think we did amazing work, and I am very proud to have been part of it."
- **Ottawa Public Health** employee

Ottawa Public Health recruited nurses via a Registered Nurses Association of Ontario call-out, hired 4th year Nursing Students, and retired Public Health Nurses.

Workforce



The ability to adjust and scale the call centre processes, tools, and workforce, along with the various modes on media interaction highlighted the flexibility of the **North Bay Parry Sound District Health Unit**. This was necessary when comparing the challenges and addressing gaps of decisions made provincially vs. local interpretation and implementation. For example, 99% of staff members have been consistently using Microsoft Teams, which has enabled the workforce to work remotely, efficiently communicate and share information, and collaborate internally and externally with health care services in their district.

For the **North Bay Parry Sound District Health Unit**, a local connection to the communities helped inform the COVID-19 topics that resulted in the most inquiries, which directly informed the work of the Communications Department. Having locally informed data allowed for strategic messaging in specific pockets of the district.

At **Public Health Sudbury & Districts**, over ¾ of staff members have been redeployed to support the pandemic response. Public health nurses,

inspectors, dietitians, nutritionists, dental hygienists, health promoters, and support staff refocused their efforts to pandemic response or adapted essential public health programs and services.

Community partner feedback about the professionalism of **Public Health Sudbury & Districts** staff, their immediate responses, provision of accurate information, and following-up on each situation:

- *"Public health Sudbury comes with professional staff who have many resources for organizations and people alike."*
- *"I have been really impressed with how helpful, thorough, and friendly every member of the public health team has been!"*
- *"Thank you for the long hours and tireless work to try to get us through the pandemic. I know we have smart and innovative people who work for us to come up with solutions for us to live during this pandemic. We can get through this together."*
- *"Great job!! Each and every one is to be commended!! Keep up the great work...and thank you all for your service to our community."*
- *"Personally, their response team. They*

received a call, they responded immediately. They gave accurate information and they followed up on each situation that I was involved in."
- Community partner feedback

Simcoe Muskoka District Health Unit formally activated the agency's Incidence Management System on January 24, 2020, and the agency began to implement the Infectious Diseases Emergency Response Plan. With the changes in the agency's operations and modifications in work, staff were redeployed to the Infectious Disease (ID) and Health Connection programs along with the provision of training, support, working at home, and staff recruitment.

Simcoe Muskoka District Health Unit developed a COVID-19 Business Continuity Plan (BCP) to manage the redeployment, recruitment, training, and repatriation (of staff back to their base programs). The BCP was not designed for the scope and scale of the COVID-19 pandemic, and thus had to be remade during the pandemic for this application. The BCP informed the subsequent development of a modified 2020 budget.

Workforce



Timiskaming Health Unit's diverse workforce was able to tap into affiliate networks for timely sharing of information, tools, and processes. This supported agile response and reduced duplication of effort during peak response time. OPHEN, ODPH, APHEO, Business Administrators. This included assisting in areas to which they were redeployed.

York Region Public Health (YRPH) created a workgroup focusing on children and youth to ensure parents, caregivers, schools, and health care professionals had information and resources focused on the health and wellbeing of this population. In addition, YRPH has invested in developing a highly skilled infection prevention and control team. This has proved to be extremely valuable in quickly mobilizing these resources in providing rapid support to many stakeholders during the COVID-19 pandemic response. YRPH provided support to their workforce via the activation of the Public Health Emergency Support Group providing peer to peer support for mental health support.

Operating within an Incident Management Structure (IMS), **York Region Public Health** has been in active

response structure since January 23, 2020 with enhanced monitoring and surveillance in place prior. Throughout the duration of the response, YRPH has gradually redeployed public health staff to meet the operational requirements of the response with over 70% of staff redeployed at the peak. Efforts were made to ensure continuity of critical core services while balancing the response.

York Region Public Health has also greatly benefited from their position within the Regional Municipality of York, where an additional 67 staff were redeployed to directly support the response (many with unique skill sets such as Data Analytics and Visualization Services) as well as additional non-direct support from other areas (i.e. Human Resources, Property Services, Information Technology Services, Access York).

Digital solutions



Halton Region Public Health worked with other departments at Halton Region to look for technology to support case and contact management for COVID-19 so that staff could begin working from home. Selection and the first phase of implementation of a new electronic record had occurred when the province began to review different systems. The province chose the same platform that Halton staff had already vetted and Halton staff have provided much support to the province on the planning and implementation of the provincial CCM tool that has been launched this summer.

Hamilton Public Health Services adapted existing technology used for routine inspections of food premises. Inspectors record COVID-19 IPAC observations and education data into the existing Hedgehog Inspection System to ensure all information is stored together.

KFL&A Public Health created a public facing dashboard to communicate COVID-19 case identification, assessment and testing updates to the community.

KFL&A Public Health has worked to create an internal capacity prediction dashboard to inform staff allocation during surge response.

KFL&A Public Health, with other health units, has contributed toward the development and implementation of the provincial CCM tool

KFL&A Public Health, working with the Office of the CMOH, enabled the real-time capture of suspected COVID-19 emergency department visits across the province in the Acute Care Enhanced Surveillance (ACES) system and built the Pandemic Tracker as a public tool (<https://www.kflaphi.ca/aces-pandemic-tracker/>).

KFL&A Public Health's community COVID-19 dashboard (<https://www.kflaph.ca/en/healthy-living/status-of-cases-in-kfla.aspx>), has received an average of 6000 hits per day, and provides timely data on the status of cases, assessment, and testing.

Middlesex-London Health Unit developed Azure software and several other local public health units were able

to use this platform to facilitate the COVID response.

Ottawa Public Health developed a dynamic disease reporting system (the COVID-19 Ottawa Database known as "The COD"), adapted from a system used in Newfoundland and Labrador that supports local case management and contact tracing Building from this database has led to development of novel epidemiological methods and technology to detect potential clusters earlier and mobilize resources to investigate.

Ottawa Public Health's information technology team built a digital platform for daily screening of symptoms of COVID-19 in employees to help protect the health and safety of their workforce.

"Evidence based information, great graphics, informative without being preachy, and a wicked sense of humour. It's everything a public health organization should be!" - Community member feedback on **Ottawa Public Health's** social media presence

Digital solutions



Public Health Sudbury & Districts has been proactive, active, and responsive on social media. Video and evidence based information is valued and trusted:

- *"Appreciate the health unit's presence on social media and the quick communication re: new cases in our area."*
- *"Excellent media and social media presence with clear, succinct, and recent evidence-based principles."*

Simcoe Muskoka District Health Unit was well prepared with a pre-existing database to capture contact management and for surveillance reporting. IT already had technology for virtual conferencing (Skype for Business) to enable staff working from home; moved to VPN for all staff.

Simcoe Muskoka District Health Unit's website supported the distribution of information, guidance, and direction to communities, as well as received communication from community members (in addition to the community Health Connection line).

Simcoe Muskoka District Health Unit had frequent media events (5 times weekly in April), where the MOH held press conferences via Facebook Live from his home office, then posted content on YouTube.

York Region Public Health adopted many digital solutions to allow for the automation of data visualization where various datasets (i.e. iPHIS, OLIS, assessment centre data) are linked to provide the final publicly accessible dashboards.

York Region Public Health (YRPH) implemented an outbreak investigation system to better navigate the complexities of outbreak investigations and allow for linkages amongst cases. This has allowed for the provision of evidence based public health measures to settings in active outbreak. YRPH has collaborated with a local company specialized in big data analysis to support in evidence based local forecasting for anticipated spread/transmission of COVID-19.

York Region Public Health adopted a crowdsourcing approach through the implementation of an online client survey linked to an educational video on contact tracing. The aim of this approach was support local health unit in conducting a timely and efficient investigation for individuals testing positive.

Machine learning was developed by **York Region Public Health** to optimize the utility and interpretation of OLIS lab results data to support the automation of reporting and timely case follow up.

Public health system evaluation and lessons from the first peak of COVID-19

A report on behalf of the Council of Ontario Medical Officers of Health | August 2020

SUMMARY OF KEY FINDINGS

Local public health units have spent months leading the response to the COVID-19 pandemic across sectors in their communities

Findings from this evaluation can be used to **protect Ontario's communities** by:

- Building on public health system response that should continue or be enhanced during resurgence and future peaks
- Informing health system planning and preparedness for resurgence of COVID-19 and the upcoming influenza season
- Leveraging the strengths of the local public health system connections with community to ensure cross sector interventions

METHODS

- All Medical Officers of Health were invited to participate in the evaluation via email
- Further input received from all COMO membership at two meetings

Key questions:

What **worked well** during the first peak?
What could be **improved**?
What should **continue** or be enhanced?
What else should we consider for **future COVID-19 planning** and **influenza** in the coming months?

- 17/34 (50%) local public health units participated (60% rural, 40% urban), sharing insights on >100 local initiatives
- Evaluations and continuous quality improvement processes carried out by local public health units through reviews, surveys, and interviews with their teams, the public, community partners, and stakeholders across sectors were incorporated into this report

SUSTAINING THE PUBLIC HEALTH RESPONSE

Local public health leadership has been critical to protecting health and tailoring responses to meet the needs of our communities during the first peak

SIX THEMES IDENTIFIED



- **Public health measures** prevented illnesses and deaths that would have **overwhelmed our health care system** and remain a threat as seen in other jurisdictions
- Public health leadership **brought communities together** to flatten the epidemic curve using preventive measures that continue to be a mainstay of the response
- **Experience** and **technical training** in public health emergencies and health protection prepared local public health to respond and built on existing pandemic preparedness plans
- The most effective system in a public health emergency relies on **independent local public health authorities** that can leverage strong partnerships and community knowledge to adapt direction coordinated at the provincial level
- Public health holds a unique, **established, and trusted position that allows collaboration** with municipalities, schools, childcare settings, businesses, social services including congregate settings, health care and institutions, media, and community organizations **to effectively shape local response**
- **Provincial and regional coordination** is critical to supporting the strong leadership and response undertaken by local public health units and boards of health
- Pandemic response required rapid mobilization and scaling up of a **skilled public health workforce that will need ongoing investment** to respond to resurgence and increasing complexity of case management and contact tracing
- Public health innovation and adoption of new **digital solutions** to improve effectiveness and efficiency have been vital to enhancing widespread detection and containment efforts

“ *Thank you for the long hours and tireless work to try to get us through the pandemic. I know we have smart and innovative people who work for us to come up with solutions for us to live during this pandemic. We can get through this together.* ”

- Community partner feedback

OPPORTUNITIES

Local public health must provide ongoing leadership and guidance in all essential public health functions

- Local public health must build on **partnerships and collaboration** across sectors to **address new and complex community challenges** such as return to school, increased demand for health services, increase in visitors to long term care homes, re-opening of businesses, and larger social gatherings
- There must be investment in **local public health workforce** to allow for surge capacity needed for increasing complexity of pandemic response and maintaining critical core public health services
- There must be **increased resources for IPAC and outbreak management in higher-risk settings and priority populations** to minimize severe illness that would strain the health care system
- **Local public health expertise and connections with community** must be capitalized on at regional and provincial tables
- Roles of **key health system players** must be clarified and mutually respected for maximum health gains
- **New technologies** must be developed and adapted to support case management, contact tracing, and outbreak investigations so local public health units can enhance effectiveness despite growing complexity
- Innovative technologies must be explored to help with **advanced planning, forecasting, and operational response** in dealing with resurgence and other respiratory illnesses