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**Subject:** COVID-19 Impact on Niagara Emergency Medical Services

**Report to:** Public Health & Social Services Committee

**Report date:** Tuesday, July 14, 2020

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## Recommendations

1. That Regional Council **RECEIVE** this report for information.

## Key Facts

- Niagara Emergency Medical Services (NEMS) has continued uninterrupted provision of core 911 Mobile Integrated Health (MIH) services, including land ambulance services, for the duration of the COVID-19 pandemic
- As a key component of the broader health care system, NEMS has been called upon to play various unconventional roles in response to the pandemic
- During the period of January 1–May 31, 911 call volume for NEMS decreased by 9.2% compared to YTD 2019
- For the same time period there was a decrease in the number of patients transported to the hospital of 16.8%
- Reductions in calls, patient transports and overall hospital utilization resulted in a decrease of ambulance offload delays by 81%
- The recovery of emergency ambulance resources otherwise spent in offload delay has normalized system performance, demonstrating that response time performance targets can be achieved.

## Financial Considerations

There are no financial considerations directly associated with this report. The recovery of lost productivity from the reduction of hospital offload delay time is represented in 'hours' of restored service which has an associated cost value but does not represent actual cost savings.

Lost productivity due to offload delay at hospitals for the first 12 weeks of 2020 was reduced from 3944 hours (an average of 404 hrs/week) to 909 hours (an average of 83 hrs/week) in the latter 11 weeks. This represents a total recovery of the equivalent of 3944 hours of available service that was no longer diverted away from their intended

function; to respond to community emergencies. The value of this previous loss of productivity is the equivalent of \$366,607 in resources over these 12 weeks.

## **Analysis**

COVID-19 has significantly affected all areas of service delivery by the Niagara Region, including essential services such as Niagara EMS. As a key component of the broader health care system including emergency care, primary care and public health, Niagara EMS has been called upon to play various unconventional roles in the response to the pandemic. This includes:

**Community COVID-19 Assessment and Testing (CCAT):** a team of paramedics that provide community specimen collection (swabbing) for people who are homebound and unable to attend an Assessment Centre or their own physician - over 500 tests completed.

**Infection Prevention and Control (IPAC) Coaching and Support:** a team of paramedics providing training and education on appropriate personal protective equipment (PPE) usage procedures to long term care (LTC) facilities, retirement homes, Public Health Inspectors and local area municipality employees - over 1300 people trained to date. This team was created after Public Health's observation that some long term care home and retirement home outbreaks were being exacerbated by improper PPE usage.

**Pandemic Response Plan:** a modification to the allocation of EMS resources in preparation for a possible response to 911 call volume increases and/or hospital overcapacity challenges. This included the use of NEMS Emergency Call Nurses (ECN) to provide enhanced telephone triage for 911 callers under a specific Pandemic Protocol. This also resulted in a reduction of tiered response calls for municipal fire services from approximately 10% of all EMS calls to 3%. This reduced risk of exposure for fire service employees, risk of disease transmission to patients and families, preserved scarce PPE, and ensured fire resources were available for fire-specific calls as required. There have been no identifiable adverse impacts to patient outcomes as a result.

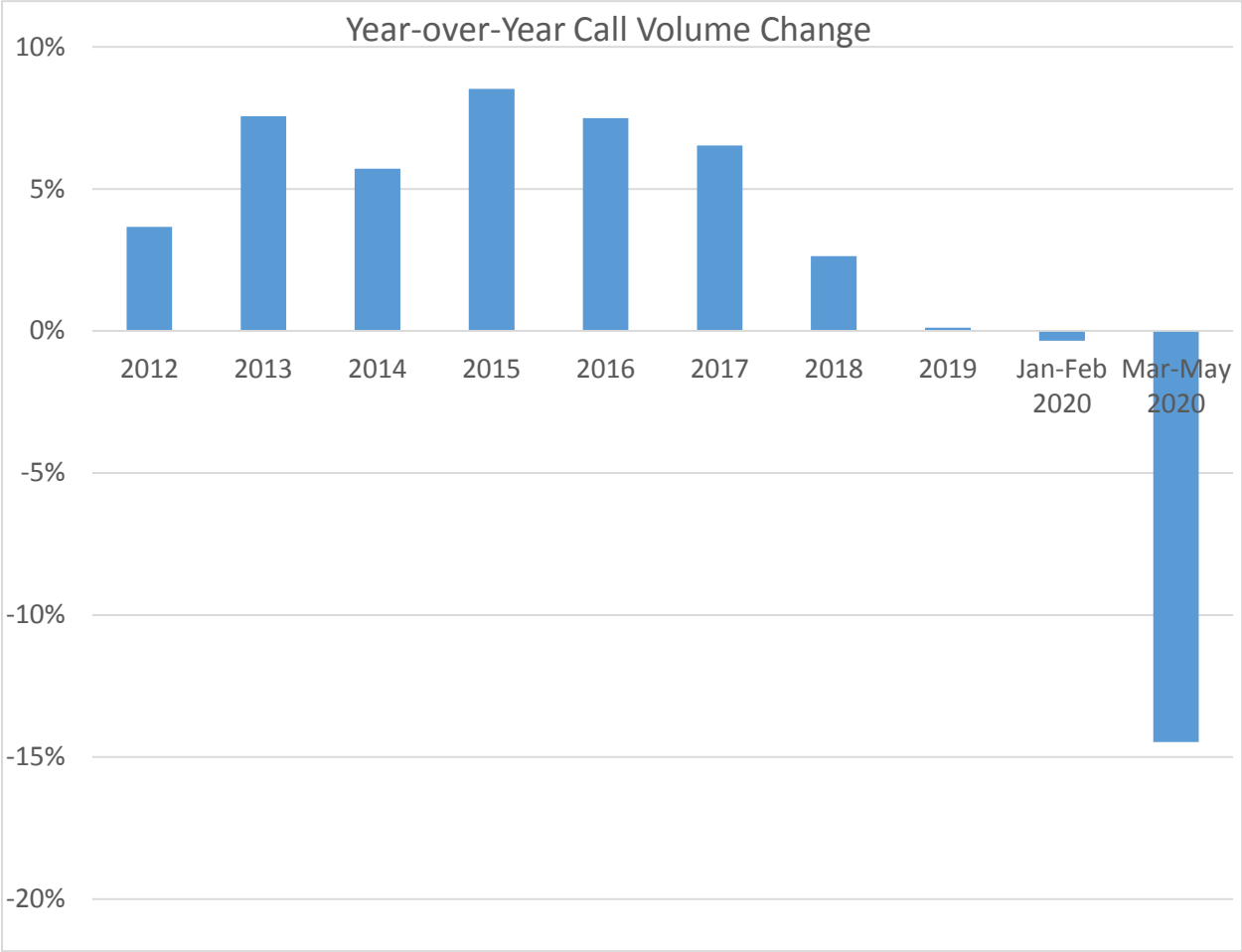
NEMS has continued to deliver its core service of responding to 911 calls. Prior to the outbreak of COVID-19 in Niagara, the service had just completed a major system transformation to a service delivery model of Mobile Integrated Health. A more fulsome

update on these changes will be provided in a future report. For the purpose of this report, it is important to note that the transformation to MIH has proven advantageous as the service was better positioned to adjust to changes brought on by the pandemic and was able to quickly provide the enhanced services and alterations as noted above. The MIH model allows for optimal access to appropriate health resources to meet the needs of people calling 911. This has resulted in fewer ambulance responses, decreasing risk of exposure to paramedics as well as elimination of many unnecessary transports to an emergency department.

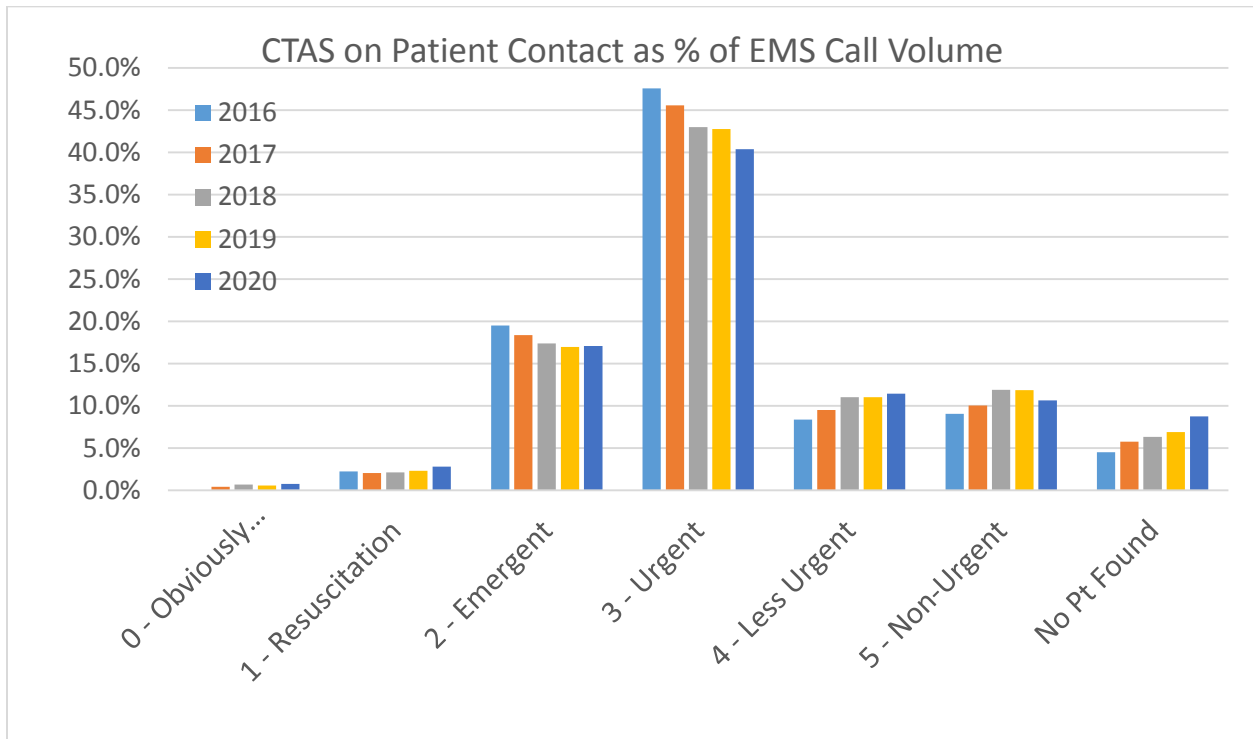
### **Impact on Call Volume and Patient Acuity**

During the period of January 1 - May 31, 2020, 911 call volume for NEMS decreased by 9.2% compared to YTD 2019 (Figure 1). It should be noted that some portion of this decrease is likely consistent with system transformation activities already undertaken by NEMS. The majority of the decrease was seen in low acuity (less severe) types of patient presentations, with a slight increase in patients triaged on the Canadian Triage and Acuity Scale (CTAS) as a level 1, requiring immediate resuscitation (Figure 2). Changes in specific types of patient presentations as assessed upon phone triage is shown in Table 1 below.

Figure 1 Call Volume Change Year over Year to May 31 2020. Jan-Feb and March-May are shown separately.



**Figure 2** EMS Acuity (CTAS) on Initial Patient Contact as % of Call Volume, Jan 1-May 31, by Year.



**Table 1** Call volumes by Medical Priority Dispatch System (MPDS) protocol classification. January 1, 2020-May 31, 2020. Note: 'Pandemic Protocol' is a newly added protocol activated April 30, designed to manage low acuity calls for breathing problems, chest pain and 'sick person'. Therefore, these protocols will appear slightly lower.

EMS Call Type (MPDS)	EMS Calls 2019 n(%)	EMS Calls 2020 n(%)	Change 2020	2020 compared to previous 4 year average
Assault/ Sexual Assault	629 (2.58)	682 (3.07)	8.4%	0.85%
Cardiac Arrest	336 (1.38)	385 (1.73)	14.6%	20.22%
Chest Pain	2007 (8.22)	1790 (8.06)	-10.8%	-6.36%
Overdose/ Poisoning	865 (3.54)	928 (4.18)	7.3%	59.18%
Psychiatric/ Abnormal Behaviour	1588 (6.50)	1426 (6.42)	-10.2%	-2.79%
Stab/Gunshot	36 (0.15)	42 (0.19)	16.7%	35.48%

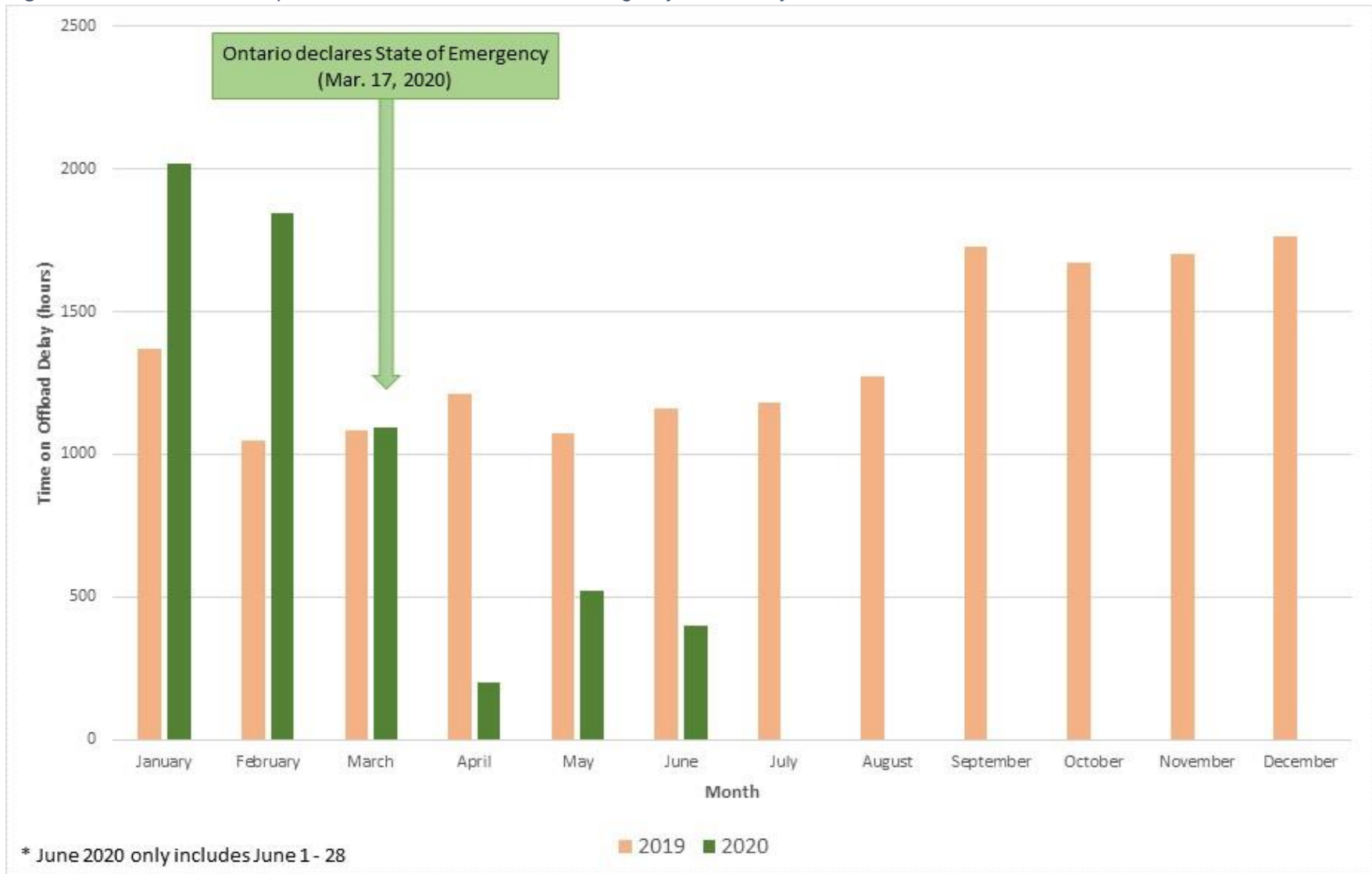
EMS Call Type (MPDS)	EMS Calls 2019 n(%)	EMS Calls 2020 n(%)	Change 2020	2020 compared to previous 4 year average
Stroke	690 (2.83)	717 (3.23)	3.9%	8.19%
Total	24,424	22,212	-9.1%	-3.73%

There has been speculation in various media reports that the health of people may have suffered due to delays in accessing health care out of fear of COVID-19. Our data indicates that this is possible. Incidents of stroke have risen by 8.2%, which could be indicative of delayed care. More significantly, cardiac arrest calls have increased 14.6% (20% against the previous four-year average), potentially indicating delayed attempts to access care. It is possible that the reduction in responses to ‘chest pain’ may reflect fewer people seeking care for cardiac issues that then progress to cardiac arrest and stroke. However, it is difficult to say what the true impact on responses for ‘chest pain’ may be due to changes in how some calls were processed as part of pandemic planning. While incidents processed for psychiatric/abnormal behaviour (including attempted suicide) have decreased slightly, a considerable increase of 7.3% in overdose responses (59.18% against the 4-year average) was observed. It is also possible that some overdose responses were processed as cardiac arrests and are reflected in those numbers. Responses for assault/sexual assault and stab/gunshot have notable increases as well. What is evident is that more analysis is required on this data to best understand the full impact COVID-19 has had on the acute health of our communities as it relates to the use of 911.

### **Impact on System Performance**

With a decrease in call volume of 9.2%, there was a subsequent decrease in the number of patients transported to the hospital of 16.8%. These decreases, combined with hospital efforts to realign resources as part of pandemic planning and fewer people self-presenting at local emergency departments, led to greater hospital capacity to manage patients. This resulted in the reduction of ambulance offload delays by 81% (Figure 3).

Figure 3 EMS Offload Hours per Month, 2019-2020. State of Emergency declared by Province March 17.



In the 12 week period prior to the declaration of COVID-19, the time paramedics were required to wait to transfer care of a patient to the hospital (offload delay) was 4853 hours. In the approximately 11 weeks since the onset of the pandemic, this lost time had been reduced to 909 hours. The recovery of these resources otherwise lost to hospital turn around time represent an additional 3944 hours that were no longer diverted away from their intended function to respond to emergencies in our community. While no actual cost savings arise from this recovery, the cost value is equivalent to \$366,607 worth of frontline resources not being lost over these 12 weeks.

With the significant reduction in offload delays and the recovery of these emergency resources, for the first time since the implementation of the system transformation in the Q3 of 2019, response time performance targets are being achieved (Table 2). It is apparent that if not for the loss of these resources to hospital wait times as a key contributor to resource availability, Niagara EMS would meet the performance metrics on an ongoing basis.

**Table 2** Response time comparison for the time period pre COVID-19 and current. Measures are reported as average (AVG) and the 90<sup>th</sup> percentile (90<sup>th</sup>).

CTAS	Jan 1-Mar 15	Mar 15-May 31	Change	Jan 1-Mar 15	Mar 15-May 31	Change	Response Time Target
	(pre COVID-19) <b>AVG</b>	<b>AVG</b>		(pre COVID-19) <b>90th</b>	<b>90th</b>		
<b>Sudden Cardiac Arrest</b>	6:36	6:05	-0:31	10:55	9:16	-1:39	6:00 <b>55<sup>th</sup></b>
<b>1</b>	6:56	6:10	-0:46	11:45	9:31	-2:14	8:00 <b>80<sup>th</sup></b>
<b>2</b>	8:57	8:31	-0:26	14:47	13:54	-0:53	15:00
<b>3</b>	17:43	15:32	-2:11	33:06	27:18	-5:48	30:00



CTAS	Jan 1-Mar 15	Mar 15- May 31	Change	Jan 1-Mar 15	Mar 15- May 31	Change	Response Time Target  90 <sup>th</sup> except as shown
	(pre COVID- 19)  AVG	AVG		(pre COVID- 19)  90 <sup>th</sup>	90 <sup>th</sup>		
4	22:31	18:28	-4:03	45:52	33:53	-7:59	60:00
5	24:20	18:58	-5:22	49:19	35:41	-13:38	120:00

## Alternatives Reviewed

This report provides initial confirmation of the positive effects the transformation to a Mobile Integrated Health model of care has had on the system, specifically in response to the COVID-19 pandemic. Of most significance is the evidence that clearly demonstrates the optimal system performance when offload delay stressors are minimized. Given this knowledge, the alternative option of resuming previous practices associated with hospital offload delay must be avoided at all costs. Niagara EMS is working closely with Niagara Health to take the lessons learned from the pandemic experience, specific to overcrowding and flow at the local emergency departments, and ensure priority measures are implemented to refrain from returning to the pre COVID-19 status of significant offload delays and reduced system performance.

## Other Pertinent Reports

PHD 20-2019 Niagara EMS System Transformation Update 2

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