

For Information Only

Ontario's Emergency Health Services - Sector Overview

Presented To: Emergency Services Committee

Presented: Wednesday, Jun 27, 2018

Report Date: Friday, Jun 08, 2018

Type: Correspondence for Information Only

Resolution

For Information Only

Relationship to the Strategic Plan / Health Impact Assessment

This report refers to operational matters.

Report Summary

The Ministry of Health & Long Term Care has produced a report on data and information generated by the Health Analytics Branch in consultation with the Emergency Health Regulatory and Accountability Branch. The self defined goal of the report was to inform the Ministry and its partners the role of the Emergency Health Service sector in connection with the broader healthcare system. Generally, this report provides a highly data driven and informative overview of the Ambulance system within Ontario over a substantial period of time.

Financial Implications

There are no financial implications associated with this report.

Signed By

Report Prepared By

Michael MacIsaac
Executive Deputy Chief of Community Safety
Digitally Signed Jun 8, 18

Financial Implications

Jim Lister
Manager of Financial Planning and Budgeting
Digitally Signed Jun 10, 18

Recommended by the Department

Joseph Nicholls
Interim General Manager of Community Safety
Digitally Signed Jun 8, 18

Recommended by the C.A.O.

Ed Archer
Chief Administrative Officer
Digitally Signed Jun 12, 18

Ontario's Emergency Health Services Sector Overview

Purpose

To inform Council on a recent report received from the Ministry of Health & Long Term Care (MOHLTC) in relation to Emergency Health Services. The report provides an overview on data and information generated by the Health Analytics Branch in consultation with the Emergency Health Regulatory and Accountability Branch.

Background

According to the report itself, it was developed to inform ministry and partners about the role and scope of the Emergency Health Service sector as well as its connection to the broader health care system. It provides a high-level overview and analysis of the Ambulance system in Ontario. This is the first report of its kind that Administration has ever received. The report is highly data driven and relies on information from a wide variety of sources from many different time periods of up to 12 years ago. It contains information on funding, staffing, dispatch data for both air and land ambulance services and emergency department visits.

Analysis

The report contains eight separate sections in relation to the topics listed above. Additionally, there is a list of abbreviations and appendices with greater details and supplementary data. Where Figure numbers are referenced herein, they can be found within the attached MOHLTC report, Ontario's Emergency Health Services Sector Overview (March 2018). The eight sections are detailed below with high level insights as detailed on page 4 of the report Ontario's Emergency Health Services Sector Overview (March 2018):

Section 1: Overview

- Ontario has the largest ambulance system in Canada, employing over 8,000 land and air paramedics within 57 paramedic service providers and 1,000 ambulance communications officers in 22 land ambulance dispatch centres.
- The system is jointly managed by municipalities, the ministry, and Ornge, the non-profit organization responsible for all aspects of Ontario's air ambulance program.
- The MOHLTC regulates ambulance operations, certifies ambulance services and monitors operations through regular inspections and evaluations.

- The Ministry designates eight Base Hospitals who oversee paramedics' performance in relation to controlled acts.

Section 2: Emergency health services funding

- Ministry funding increased from \$712 million to \$916 million (28.6%) between fiscal years 2010/11 and 2016/17. During the same period, municipal funding increased from \$468 million to \$605 million (29.4%).
- Combined the MOHLTC and Municipalities spent \$1.52 billion in the Emergency Health Services sector in 2016/17 fiscal year.
- In the 2016/17 fiscal year, 79% of the money spent on EHS was for land ambulance services (Figure 2.2).
- The ministry funds up to half of each municipality's land ambulance service costs and covers 100% of all other ambulance service costs.

Section 3: Resources

- There were 8,469 paramedics working in Ontario in July 2017 (Table 3.2) in 1,753 vehicles (Table 3.5). Paramedic Services has a total of 135 Paramedics working in Greater Sudbury.
- There are three levels of paramedic designations in Ontario: Primary Care Paramedic (PCP), Advanced Care Paramedic (ACP), and Critical Care Paramedic (CCP). They account for 79%, 20% and 1% of Ontario paramedics, respectively (calculated from data in Figure 3.2). In Greater Sudbury the overall breakdown is PCP 41.5% and ACP 58.5%. CCP's typically work in the province for Ornge.
- Staffing requirements for each region are established by municipal council and the paramedic services chief based on the individual needs of the municipality.
- 67% of Ontario's paramedics worked full-time in July 2017 (Figure 3.2). In Greater Sudbury the number is 63.7%.

Section 4: Regulation and oversight

- The ministry is responsible for oversight of ambulance service certification and investigation of complaints.
- On average, 12% of ambulance service reviews required a re-visit due to unmet certification criteria (calculated from data in Table 4.1). Since inception Greater Sudbury Paramedic Services has never experienced a re-visit.
- The most common complaint type received between 2007 and 2016 was about the quality of patient care (Table 4.4).

Section 5: Patient characteristics

- North West (116 per 1,000 population) and North East (93 per 1,000 population) LHINs had the highest rates of ambulance utilization in the 2016/17 fiscal year. Central LHIN had the highest percent increase in ambulance utilization over the past ten years (Figure 5.2).
- The rate of ambulance use for patients aged 65+ is over four times higher than the rates for those under the age of 65 (Figure 5.4). In Greater Sudbury patients aged 65 and greater make up over 48% of our call volume over the last three years.
- Patients who arrived at the Emergency Department via ambulance were assigned, on average, a higher CTAS level than non-ambulance arrivals. Approximately 91% of arrivals by ambulance were triaged to CTAS levels I-III in 2016/17 (Figure 5.6).
- There were 2,025 Ontarians who made 12 or more trips to the Emergency Department via ambulance in 2016/17. The most common diagnoses among these users were related to mental health and addictions (Figure 5.10).

Section 6: Land ambulance dispatch and patient transport

- The number of 911 ambulance calls increased by 30.6% between 2007 and 2016 (Figure 6.2). Sudbury CACC (dispatches primarily Greater Sudbury and Manitoulin-Sudbury) has experienced a 9.6% increase in calls over the same period.
- There were approximately 1.75 million ambulance dispatches in 2016 (Figure 6.3).
- The number of ambulance transports increased by 243,272 between 2007 and 2016 (Figure 6.4).
- City of Greater Sudbury Paramedic Service has an average response time for the highest priority calls (Code 4's) of 5 min 49 sec. This represents the fourth best in the province only after Weeneebayko First Nation, Chippewas of Rama First Nation, and Sault Ste. Marie.

Section 7: Emergency department utilization

- In 2016/17, 16.5% of Emergency Department visits arrived at the hospital by ambulance (Table 7.1).
- From 2007/08 to 2016/17, the number of Emergency Department visits arriving by ambulance increased from 626,523 to 965,896, or 54.2% (Figure 7.1).
- The 90th percentile ambulance offload time has decreased from 61 minutes in 2008/09 to 42 minutes in 2016/17 (Figure 7.3).

Section 8: Air ambulance utilization

- Ornge operates Ontario's air ambulance program out of nine air bases and three land bases across the province.

- In fiscal year 2016/17, Ornge completed 20,830 transports. Approximately 97% were patient transports, and the rest were organ transports between facilities (Table 8.2).
- Approximately half of Ornge transports were deemed “emergency”, the highest priority level, from fiscal year 2012/13 to 2016/17. Over a quarter were considered “non-urgent” during the same period (Figure 8.1).
- Over 60% of Ornge transports originated in northern Ontario (calculated from data in Figure 8.4), with 808 transports originating from the Sudbury base which is a rotor wing base.

Conclusion/Next Steps

This high level report provides a great resource for review of the health and function of the ambulance system in Ontario. We will provide comment to the MOHLTC that these types of reports have value and that we would welcome future editions.

Resources Cited

Ontario Ministry of Health & Long Term Care. (March 2018). Ontario's Emergency Health Services Sector Overview.

Ontario's Emergency Health Services

Sector Overview

Health Analytics Branch
Health System Information Management Division
Ministry of Health and Long-Term Care

March 2018



About the Health Analytics Branch

The **Health Analytics Branch (HAB)**, in the Ministry of Health and Long-Term Care, provides high quality information, analyses, and methodological support to enhance evidence-based decision making in the health system. As part of the Health System Information Management (HSIM) Division, HAB manages health analytics requests, identifies methods, and creates reports and tools to meet ministry, LHIN, and other client needs for accurate, timely, and useful information.

Health Analytics Branch: Evidence you can count on.

About the Emergency Health Regulatory and Accountability Branch

The **Emergency Health Regulatory and Accountability Branch (EHRAB)**, in the Ministry of Health and Long-Term Care, sets standards, measures performance, and oversees key functions of Ontario's land and air emergency ambulance services. In cooperation with its partners, EHRAB continuously reviews and improves standards and practices to ensure Ontario's paramedics and ambulance services are equipped with the education, training and tools required to provide patients the best and most appropriate care in alignment with Ontario's *Patients First* agenda.

For more information, please contact:
ehssectorreport@ontario.ca

Report Contents

Introduction	3
Abbreviations	3
Report highlights	4
Section 1: Overview	5
Section 2: Emergency health services funding	7
Section 3: Resources	10
Section 4: Regulation and oversight	17
Section 5: Patient characteristics	21
Section 6: Land ambulance dispatch and patient transport	27
Section 7: Emergency department utilization	33
Section 8: Air ambulance utilization	38
Appendix A: Methodological notes and data sources	43
Appendix B: Key terms and abbreviations	45
Appendix C: Supplementary tables and figures	49

Introduction

This report provides a high-level overview and analysis of the emergency health system. The report includes information on funding, staffing, land and air ambulance dispatch data, and emergency department visits.

Background

Ontario's Emergency Health Services Sector Overview report was developed to inform the ministry and its partners about the role and scope of the emergency health services (EHS) sector as well as its connection to the broader health care system. The Health Analytics Branch developed this report in consultation with the ministry's Emergency Health Regulatory and Accountability Branch.

Report format

This report begins with a summary of key findings ordered by topic, followed by eight sections containing detailed analyses and supplementary information on key areas of the EHS sector. Quantitative results from EHS data are summarized in tables and figures to help illustrate the report's findings. Data sources are indicated in the footnote at the bottom of each page.

A list of the abbreviations used in this report is shown to the right. All abbreviations are defined the first time they appear in the report text.

Appendices at the end of the report contain information on the data sources and methodology, a glossary of key terms, and supplementary tables and figures.

Abbreviations

ACO: Ambulance communications officer

ACP: Advanced care paramedic

ADRS: Ambulance Dispatch Reporting System

AOT: Ambulance offload time

CACC: Central ambulance communications centre

CCLA: Critical care land ambulance

CCP: Critical care paramedic

CTAS: Canadian Triage and Acuity Scale

DDA: Designated delivery agent

ED: Emergency department

EHRAB: Emergency Health Regulatory and Accountability Branch
(Ministry of Health and Long-Term Care)

EHS: Emergency health services

ERV: Emergency response vehicle

HAB: Health Analytics Branch (Ministry of Health and Long-Term Care)

LHIN: Local Health Integration Network

MOHLTC: Ministry of Health and Long-Term Care

OCC: Ornge Communication Centre

PCP: Primary care paramedic

PTAC: Provincial Transfer Authorization Centre

SA: Standing agreement carriers

TPS: Toronto Paramedic Services

UTM: Upper-tier municipality

Section 1: Overview

- Ontario has the largest ambulance system in Canada, employing over 8,000 land and air paramedics and 1,000 ambulance communications officers.
- The system is jointly managed by municipalities, the ministry, and Ornge, the non-profit organization responsible for all aspects of Ontario's air ambulance program.

Section 2: Emergency health services funding

- Ministry funding increased from \$712 million to \$916 million (28.6 percent) between fiscal years 2010/11 and 2016/17. During the same period, municipal funding increased from \$468 million to \$605 million (29.4 percent).
- The ministry spent \$916 million on the EHS sector in the 2016/17 fiscal year (excluding one-time funding and ministry IT costs). During the same period the municipalities spent \$604 million (Table 2.1 and Figure 2.1).
- In the 2016/17 fiscal year, 79 percent of the money spent on EHS was for land ambulance services (Figure 2.2).
- The ministry funds up to half of each municipality's land ambulance service costs and covers 100 percent of all other ambulance service costs.

Section 3: Resources

- There were 8,469 paramedics working in Ontario in July 2017 (Table 3.2).
- There are three levels of paramedic designations in Ontario: Primary Care Paramedic, Advanced Care Paramedic, and Critical Care Paramedic. They account for 79 percent, 20 percent and 1 percent of Ontario paramedics, respectively (calculated from data in Figure 3.2).

- Staffing requirements for each region are established by municipal council and the paramedic services chief based on the individual needs of the municipality.
- 67 percent of Ontario's paramedics worked full-time in July 2017 (Figure 3.2).

Section 4: Regulation and oversight

- The ministry is responsible for oversight of ambulance service certification and investigation of complaints.
- On average, 12 percent of ambulance service reviews required a re-visit due to unmet certification criteria (calculated from data in Table 4.1).
- The most common complaint type received between 2007 and 2016 was about the quality of patient care (Table 4.4).

Section 5: Patient characteristics

- North West and North East LHINs had the highest per population rates of ambulance utilization in the 2016/17 fiscal year. Central LHIN had the highest percent increase in ambulance utilization over the past ten years (Figure 5.2).
- The rate of ambulance use for patients aged 65+ is over four times higher than the rates for those under the age of 65 (Figure 5.4).
- Patients who arrived at the ED via ambulance were assigned, on average, a higher CTAS level than non-ambulance arrivals. Approximately 91 percent of arrivals by ambulance were triaged to CTAS levels I-III in 2016/17 (Figure 5.6).
- There were 2,025 Ontarians who made 12 or more trips to the ED via ambulance in 2016/17. The most common diagnoses among these users were related to mental health and addictions (Figure 5.10).

Section 6: Land ambulance dispatch and patient transport

- The number of 911 ambulance calls increased by 30.6 percent between 2007 and 2016 (Figure 6.2).
- There were approximately 1.75 million ambulance dispatches in 2016 (Figure 6.3).
- The number of ambulance transports increased by 243,272 between 2007 and 2016 (Figure 6.4).

Section 7: Emergency department utilization

- In 2016/17, 16.5 percent of ED visits arrived at the hospital by ambulance (Table 7.1).
- From 2007/08 to 2016/17, the number of ED visits arriving by ambulance increased from 626,523 to 965,896, or 54.2 percent (Figure 7.1).
- The 90th percentile ambulance offload time has decreased from 61 minutes in 2008/09 to 42 minutes in 2016/17 (Figure 7.3).

Section 8: Air ambulance utilization

- Ornge operates Ontario's air ambulance program out of nine air bases and three land bases across the province.
- In fiscal year 2016/17, Ornge completed 20,830 transports. Approximately 97 percent were patient transports, and the rest were organ transports between facilities (Table 8.2).
- Approximately half of Ornge transports were deemed "emergency", the highest priority level, from fiscal year 2012/13 to 2016/17. Over a quarter were considered "non-urgent" during the same period (Figure 8.1).
- Over 60 percent of Ornge transports originated in northern Ontario (calculated from data in Figure 8.4).

Section 1: Overview

This section provides a summary of Ontario's ambulance services, management, and delivery model.

An Introduction: Ambulance Services in Ontario

Ambulance service delivery

Ontario's emergency health services (EHS) system is a series of interrelated land and air emergency medical services and programs designed to provide timely medical response and pre-hospital care. Ontario has the largest ambulance system in Canada, employing over 8,000 land and air paramedics and 1,000 ambulance communications officers.

Ontario's 22 land ambulance dispatch centres serve as communication hubs for receiving emergency calls and dispatching paramedics. Dispatchers use computer-aided technology to assign each call to the closest available and most appropriate ambulance in service through one of the 65 paramedic service providers. In 2016, dispatchers and paramedics responded to over 1.4 million emergency calls, dispatched ambulances over 1.7 million times, and transported over one million patients to emergency departments (EDs).

Ornge is a non-profit organization responsible for all aspects of Ontario's air ambulance program.

Ontario's air ambulance services are managed by **Ornge**. Air paramedics operate out of nine air and three land bases with a fleet of 19 aircrafts and 13 land vehicles. Ornge paramedics work across the province, performing over 18,000 patient and 450 organ transports each year.

Ontario's *Ambulance Act* governs all certification of land and air ambulance operators, as well as due process for investigating complaints and inspecting ambulance bases to ensure compliance with relevant legislation.

System oversight and regulation

The dispatch and emergency response system is jointly managed by the municipalities, the ministry, and Ornge.

Municipalities are responsible for operating and maintaining land ambulance services including establishing levels of service, developing ambulance deployment strategies and operational policies, and identifying staff and ambulance resource requirements. They work locally to develop emergency plans and ensure that the regulations and standards of Ontario's *Ambulance Act* are followed.

Base hospitals train and oversee land paramedics by quality monitoring their patient care, providing medical direction, and continuing their medical education.

The ministry oversees the land ambulance system by regulating ambulance operations, certifying ambulance services, and ensuring paramedics have the proper qualifications. Ambulance services are monitored, inspected, and evaluated by the ministry which also investigates related complaints. The ministry also designates Ontario's eight **base hospitals** to oversee paramedics' performance of controlled medical acts.

Ornge is responsible for all air ambulance operations, medical oversight of air paramedics, air dispatch, and authorizing air and land ambulance transfers.

The ministry holds Ornge accountable under a regulatory framework and performance agreements.

EHS funding is shared between the ministry and municipalities. The ministry grants each municipality up to 50 percent of its land ambulance service costs, and provides full funding for the operation of air ambulance services, dispatch centres, base hospitals, and service provision to First Nations and territories without municipal organization.

Section 2: Emergency health services funding

This section describes how ambulance services in Ontario are funded. It includes the total amount spent on emergency health services by the Ministry of Health and Long-Term Care and municipalities, and a breakdown of the total amount spent by activity.

SECTION 2: EMERGENCY HEALTH SERVICES FUNDING

Ontario's EHS funding is governed by the *Ambulance Act*, which divides responsibility between the province and individual municipalities — upper-tier municipalities (UTMs) and designated delivery agents. The province pays for the land ambulance dispatch system, service provision to First Nations, and service provision to territories without municipal organization. Ontario also funds the air ambulance program and base hospitals.

Municipalities are responsible for the cost and provision of land ambulance services within their boundaries. To assist the municipalities, the province provides a grant of 50 percent of the costs based on the municipality's previous year council-approved budget plus an incremental increase.

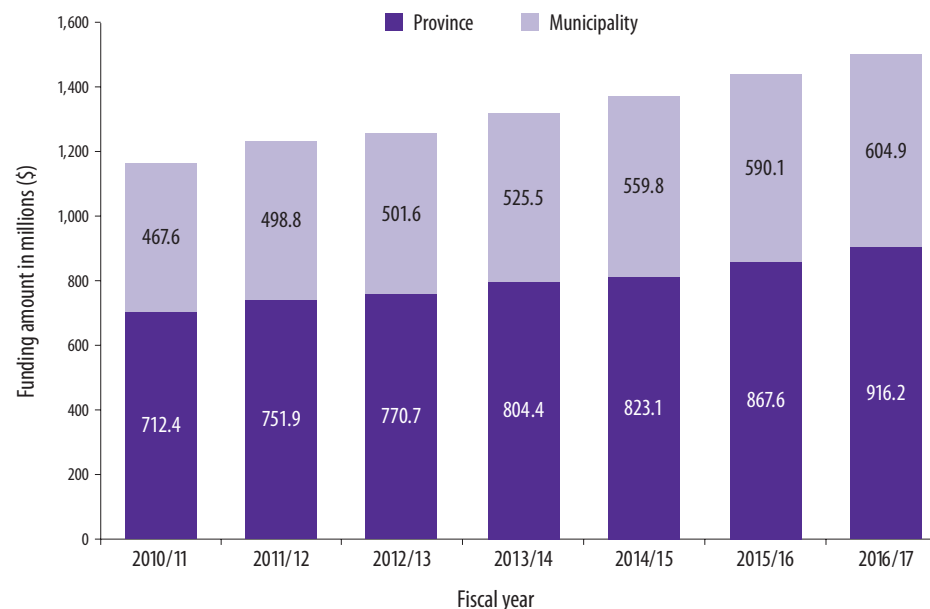
Key findings

- Ministry funding increased from \$712 million to \$916 million (28.6 percent) between fiscal years 2010/11 and 2016/17. During the same period, municipal funding increased from \$468 million to \$605 million (29.4 percent).
- The ministry spent \$916 million on the EHS sector in the 2016/17 fiscal year (excluding one-time funding and ministry IT costs). During the same period the municipalities spent \$605 million (Table 2.1 and Figure 2.1).
- In the 2016/17 fiscal year, 79 percent of the money spent on EHS was for land ambulance services (Figure 2.2).
- The ministry funds up to half of each municipality's land ambulance service costs and covers 100 percent of all other ambulance service costs.

Table 2.1: Total funding and year-over-year change, fiscal years 2010/11 to 2016/17

Year	Province		Municipalities	
	Funding (\$, millions)	Year-over-year change (%)	Funding (\$, millions)	Year-over-year change (%)
2010/11	712.4	—	467.6	—
2011/12	751.0	5.4%	498.8	6.7%
2012/13	770.7	2.6%	501.6	0.6%
2013/14	804.4	4.4%	525.5	4.8%
2014/15	823.1	2.3%	559.8	6.5%
2015/16	867.6	5.4%	590.1	5.4%
2016/17	916.2	5.6%	604.9	2.5%

Figure 2.1: EHS allocated funding, fiscal years 2010/11 to 2016/17



Data source: Emergency health service financial data records. Table excludes one-time funding and Ministry IT costs.

SECTION 2: EMERGENCY HEALTH SERVICES FUNDING

Combined, the province and municipalities spent \$1.52 billion on the EHS sector in the 2016/17 fiscal year. Table 2.2 and Figure 2.2 provide a breakdown of the funding by five major activities. Descriptions of the five activities are provided below.

LAND AMBULANCE

Ministry and municipality funding for the provision of land ambulance services.

AIR AMBULANCE + CRITICAL CARE LAND AMBULANCE (CCLA)

Ministry funding provided to Ornge for the provision of air ambulance and CCLA services.

DISPATCH

Ministry funding for the operation and staffing of 22 land ambulance communications centres.

MINISTRY SYSTEM OVERSIGHT

Salaries, wages and benefits for ministry employees and funding for transportation, communications, services and supplies, and equipment for the ministry.

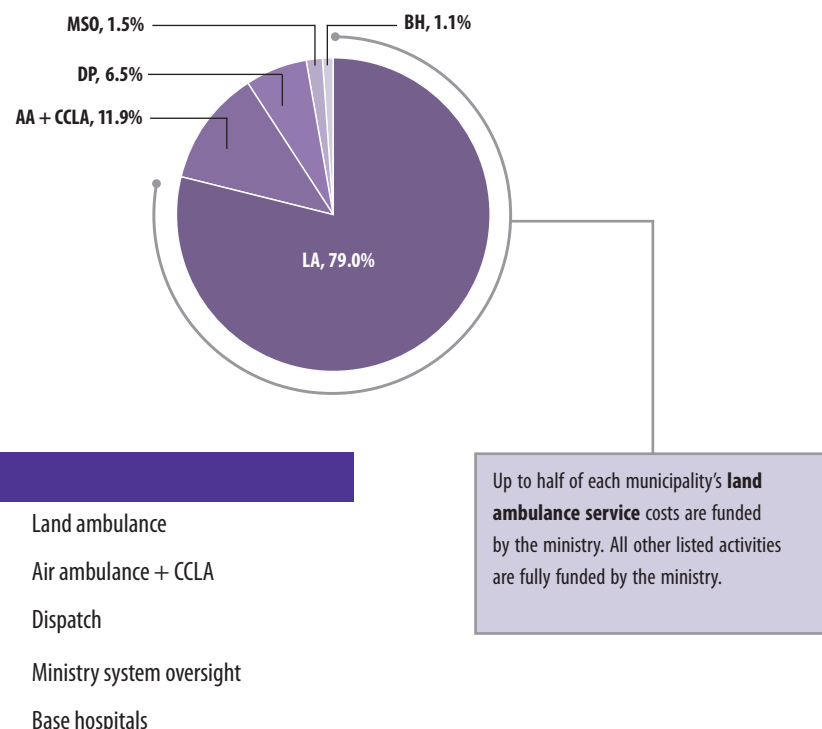
BASE HOSPITALS

Ministry funding to support paramedic certification, quality assurance, paramedic continuing medical education, and controlled medical act delegation.

Table 2.2: EHS funding breakdown by activity, fiscal year 2016/17

Activity	Funding (\$ millions)
Land ambulance	1,201.6
Air ambulance + CCLA	181.4
Dispatch	98.5
Ministry system oversight	23.1
Base hospitals	16.4
Total	1,521.1

Figure 2.2: Distribution of EHS funding by activity, fiscal year 2016/17



Data source: Emergency health services financial data records. Table excludes one-time funding and Ministry IT costs.

Section 3: Resources

This section provides information on Ontario's paramedic staffing, designations, and resources.

SECTION 3: RESOURCES

Ontario's EHS rely on the coordination of a complex system of land and air resources through effective communication, transportation, and medical training. 911 calls are received and actioned through centralized communication centres by Ambulance Communications Officers (ACOs) and their supervisors. Paramedics serve as the field operatives, tasked with patient transportation and providing medical assistance. This section explores the roles, demographics, and employment types of EHS employees, as well as the physical resources they use to conduct their work.

Paramedic designations

Paramedics are employed by UTMs, designated delivery agents (DDAs) and First Nations ambulance service operators to provide medical care for emergency patients and safe transportation for patients travelling between hospitals. There are three levels of paramedic designations in Ontario:

- **Primary Care Paramedic (PCP)**
- **Advanced Care Paramedic (ACP)**
- **Critical Care Paramedic (CCP)**

Paramedics provide basic life support, such as wound management, and are authorized to perform controlled acts and advanced medical procedures according to their role. Table 3.1 outlines differences in the scope of each role.

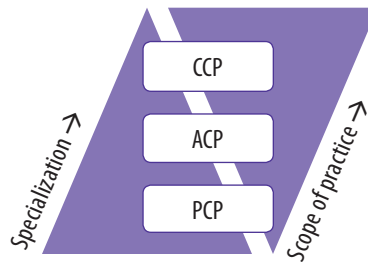


Table 3.1: Breakdown of paramedic responsibilities, by designation

PCP	<ul style="list-style-type: none"> • Medication administration (e.g., naloxone, nitroglycerin, etc.) • Electrocardiograms (12-lead) • Blood glucometry • Non-automated external cardiac defibrillation • Termination of resuscitation • Additional controlled acts and advanced medical procedures
ACP	Includes all of the above, as well as: <ul style="list-style-type: none"> • Additional medication administration • Endotracheal intubation • Intravenous therapy • Intraosseous therapy • Additional controlled acts and advanced medical procedures
CCP	Includes all of the above, as well as: <ul style="list-style-type: none"> • Additional medication administration • Chest x-ray interpretation • Urinary catheter insertion • Intravenous blood product administration • Additional controlled acts and advanced medical procedures

Key findings

- There were 8,469 paramedics working in Ontario in July 2017 (Table 3.2).
- There are three levels of paramedic designations in Ontario: Primary Care Paramedic, Advanced Care Paramedic, and Critical Care Paramedic. They account for 79 percent, 20 percent, and one percent of Ontario paramedics, respectively (calculated from data in Figure 3.2).
- Staffing requirements for each region are established by municipal council and the paramedic services chief based on the individual needs of the municipality.
- 67 percent of Ontario's paramedics worked full-time in July 2017 (Figure 3.2).

Paramedic qualification and training

All paramedics must complete a PCP diploma program (or equivalent) and pass the provincial MOHLTC Advanced Emergency Medical Care Assistant (AEMCA) theory exam. Successful candidates can then seek employment and complete base hospital testing to become authorized to perform delegated acts.

PCPs may supplement their qualifications with the ACP and CCP designations through additional training, testing, and certification. Paramedic training is primarily offered at Colleges of Applied Arts and Technologies, although some approved programs are offered through private career colleges and other institutions.

SECTION 3: RESOURCES

A paramedic may also undergo aeromedical training to qualify for practicing onboard an air ambulance. Currently, Ornge is the designated provider of air ambulance services and is responsible for the provision of CCLA services in Ontario.

Alternatively, paramedics may enter the Ontario workforce through equivalency processes which recognize paramedics licensed in other Canadian provinces/territories or jurisdictions. Other healthcare professionals with experience and qualifications equivalent to an Ontario paramedic graduate may also qualify. Table 3.2 categorizes paramedics working in Ontario in July 2017 by service type, designation, and full-time vs. part-time employment.

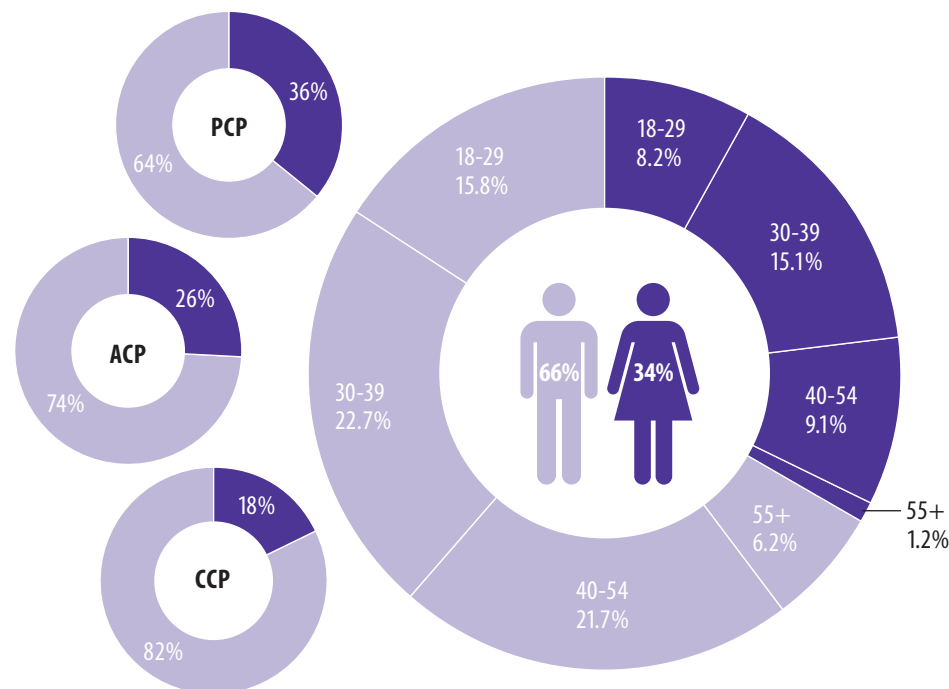
Table 3.2: Total number* of land and air paramedics in Ontario, by designation, July 2017

Service	Designation	Part-Time	Full-Time	Total
Land	PCP	2,668	3,920	6,588
	ACP	110	1,522	1,632
	CCP†	0	36	36
	Total	2,778	5,478	8,256
Air	PCP	16	86	102
	ACP	4	42	46
	CCP	3	62	65
	Total	23	190	213
Total	PCP	2,684	4,006	6,690
	ACP	114	1,564	1,678
	CCP	3	98	101
	Total	2,801	5,668	8,469

* Paramedics working for two or more ambulance service providers are only included once in this table.

† CCLA operated under Ornge.

Figure 3.1: Paramedic demographics by age, sex, and designation, July 2017



The majority of paramedics are male PCPs working in land ambulance services. Full-time employees outnumber their part-time coworkers roughly two-to-one, with a higher ratio among air paramedics than land paramedics.

Air ambulance services account for little more than three percent of the paramedic workforce, as of 2017. This reflects the lower call volume for air emergency services, as shown in Section 6: Land ambulance dispatch and patient transport and Section 8: Air ambulance utilization.

The largest age cohort for paramedics is 30–39 for both men and women. However, men aged 40–54 also have substantial representation at just over one fifth of all paramedics, while the number of female paramedics significantly drops over the age of 40.

Data source: Ambulance Service Identification Card Program, July 2017. Paramedics working for two or more ambulance service providers are included only once in this report.

SECTION 3: RESOURCES

Paramedic staffing

Paramedic staffing requirements for each region are established by municipal council and the ambulance services chief based on the individual needs of the municipality¹. Paramedic staffing is largely dependent on the size and population of an ambulance services' catchment area.

Approximately 67 percent of all Ontario paramedics are full-time employees. Ambulance services' dependence on part-time labour varies across service areas. Figure 3.2 shows the percentage of part-time and full-time paramedics in Ontario in 2017.

The percent of land ambulance paramedics that worked full-time in 2017 ranged between 15 and 100 percent. Figure 3.3 illustrates the percentage of land ambulance paramedics working full-time in each service area in 2017.

Figure 3.2: Part-time and full-time paramedic staffing in Ontario, 2017

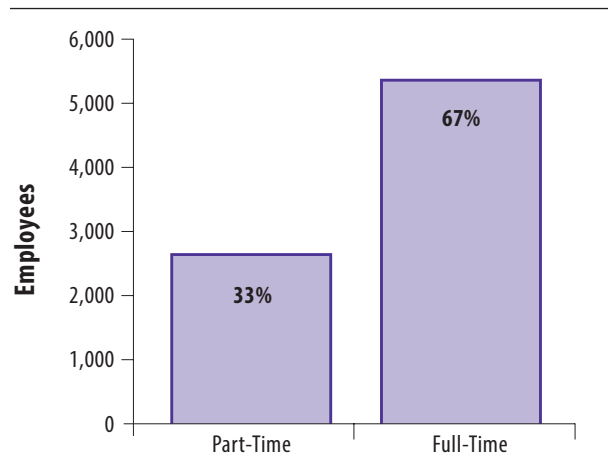
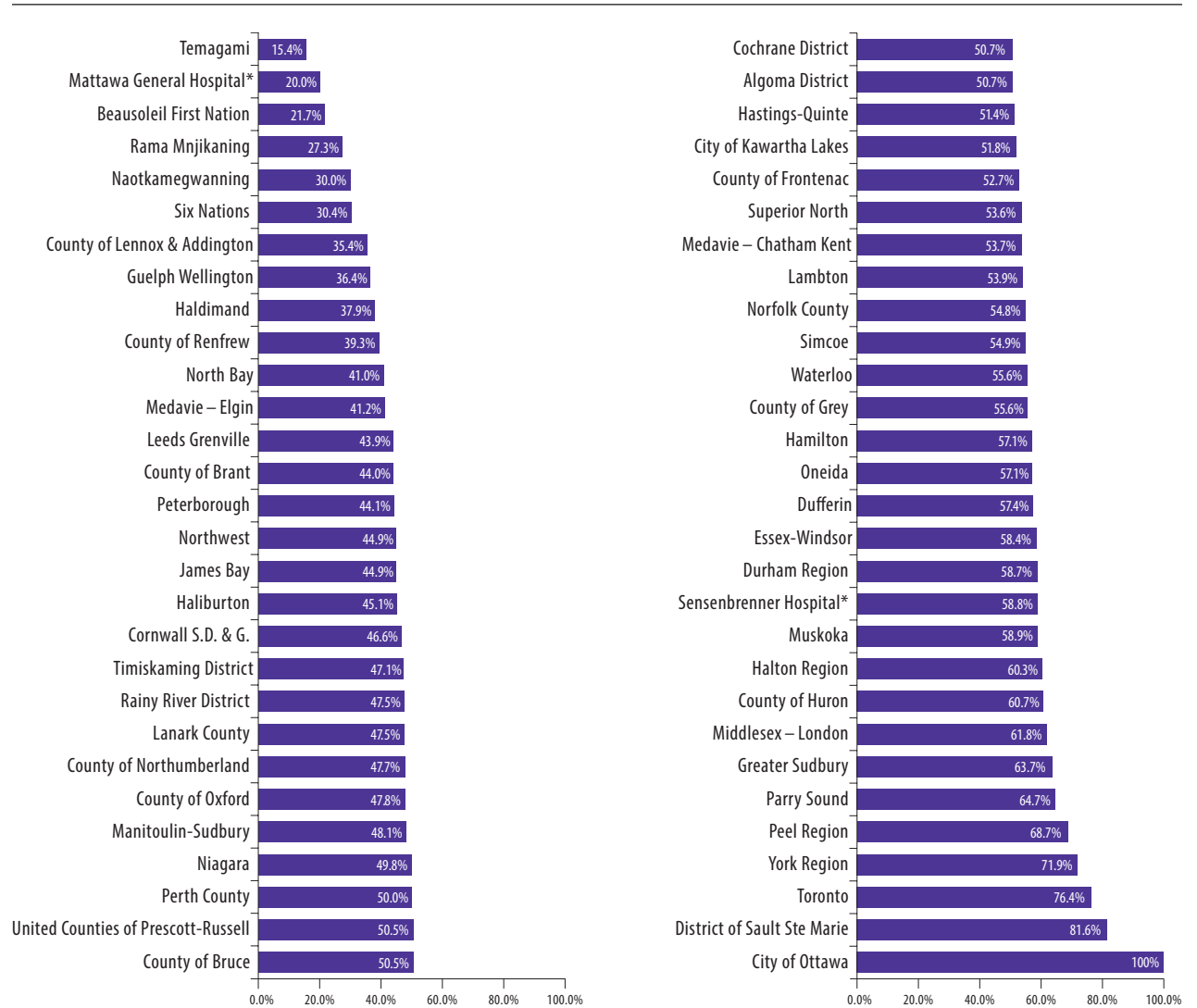


Figure 3.3: Percent of land ambulance paramedics working full-time, by ambulance service, 2017



*Mattawa General Hospital is subcontracted to provide ambulance services by the District of Nipissing. Sensenbrenner Hospital is subcontracted to provide ambulance services by the District of Cochrane.

Data source: Ambulance Service Identification Card Program, July 2017. Paramedics working for two or more ambulance service providers are included only once in this report. ¹ Ontario's Ambulance Act, subsection 6(1)(b).

SECTION 3: RESOURCES

Table 3.3 below assigns each ambulance service to a Local Health Integration Network (LHIN). Four ambulance services (highlighted in the table below) provide services in more than one LHIN. They are Peel Region, Halton Region, Toronto, and Lanark County. A table showing the inverse (LHINs by ambulance service) can be found in Appendix C – Supplementary Tables and Figures.

Table 3.3: Ambulance services by LHIN

LHIN	Ambulance service
Erie St.Clair	Essex-Windsor Lambton Medavie – Chatham Kent
South West	County of Bruce County of Grey County of Huron Medavie – Elgin Middlesex-London Norfolk Oneida County of Oxford Perth County
Waterloo Wellington	Guelph-Wellington Waterloo
Hamilton Niagara Haldimand Brant	County of Brant Haldimand Halton Region Hamilton Niagara Norfolk County Six Nations
Central West	Dufferin City of Toronto Peel Region
Mississauga Halton	Halton Region City of Toronto Peel Region
Toronto Central	City of Toronto
Central	City of Toronto York Region
Central East	City of Kawartha Lakes County of Northumberland Durham Region City of Toronto Peterborough Haliburton

LHIN	Ambulance service
South East	County of Frontenac Hastings-Quinte Lanark County Leeds Grenville County of Lennox and Addington
Champlain	City Of Ottawa Cornwall S. D. & G. Lanark County United Counties of Prescott-Russell County of Renfrew
North Simcoe Muskoka	Beausoleil First Nation Simcoe Muskoka Rama Mnjikaning
North East	Algoma District Greater Sudbury Cochrane District James Bay Manitoulin-Sudbury Mattawa General Hospital Naotkamegwanning North Bay Parry Sound District of Sault Ste. Marie Sensenbrenner Hospital Temagami Timiskaming
North West	Northwest Rainy River Superior North

* Mattawa General Hospital is subcontracted to provide ambulance services by the District of Nipissing. Sensenbrenner Hospital is subcontracted to provide ambulance services by the District of Cochrane.

SECTION 3: RESOURCES

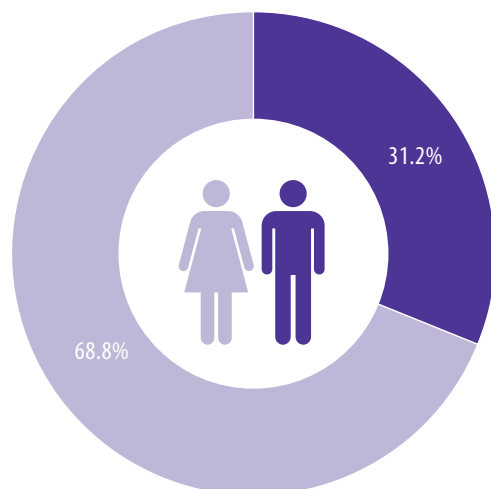
ACO responsibilities and training

ACOs work in ambulance communications centres and receive and process 911 emergency and non-emergency requests for ambulance services. ACOs are responsible for prioritizing incoming calls, collecting patient information, providing pre-arrival instructions to patients, deploying ambulance resources, and communicating patient updates to paramedics.

All ACOs are required to attend a seven week training program in land ambulance dispatching at a ministry-operated dispatch training centre. Upon completion of this program, ACOs are required to pass an examination and return to their home dispatch centre for further coaching and training. ACOs must also hold valid first aid and targeted responder CPR certification and obtain a Restricted Radio Operator Certificate.

Table 3.4 and Figure 3.4 present the number of communications officers working at the 22 land ambulance Central Ambulance Communications Centres (CACCs) and Ornge's air ambulance communications centre.

Figure 3.4: Communications officers* by sex, July 2017



*Demographic data are not available for Communication supervisors, so they are excluded from this analysis.

Data source: Ambulance Service Identification Card Program, July 2017.

Table 3.4: Number of communications officers by communications centre, July 2017

Centre name	Communications officer		Communications supervisor		Total
	Part-time	Full-time	Part-time	Full-time	
Mississauga	44	34	0	1	79
London	19	31	0	5	55
Wallaceburg	11	12	0	3	26
Windsor	20	15	0	4	39
Hamilton	23	33	0	6	62
Cambridge	19	26	0	4	49
Niagara	16	23	0	7	46
Georgian	36	36	0	3	75
Oshawa	18	19	0	3	40
Toronto	25	133	0	14	172
Lindsay	17	14	0	3	34
Ottawa	3	75	0	8	86
Renfrew	10	9	0	4	23
Kingston	18	18	0	4	40
Sudbury	17	17	0	5	39
Sault Ste. Marie	8	8	0	5	21
Timmins	5	16	0	4	25
North Bay	9	9	0	4	22
Muskoka	5	7	0	4	16
Parry Sound	5	10	0	2	17
Thunder Bay	13	9	0	2	24
Kenora	10	8	0	5	23
Ornge Communications Centre	5	51	0	0	56
Total	356	613	0	100	1,069

SECTION 3: RESOURCES

Land paramedic vehicles

Land paramedic services operate a fleet of 1,753 vehicles for patient transport. A variety of vehicles are available for use, depending on the emergency. Ambulances are used to transport patients who suffer acute illness with risk to their life and patients who require a stretcher or medical attention during transport.

An emergency response vehicle (ERV) is a vehicle other than an ambulance that can respond to a medical emergency and address the patient on site. These vehicles include emergency response units which address emergency medical incidents on a regular basis, and emergency support units which assist in event of a major emergency medical incident.

Special purpose ambulances are equipped with specific functionality to address a number of specific non-standard medical emergencies. Finally, administrative vehicles are used for efficient transport of EHS personnel to and from emergency locations or hospitals. Table 3.5 below displays the number of each vehicle type within the land services fleet.

Table 3.5: Total number of land emergency vehicles, 2014

Vehicle	# of units
Ambulances	1,171
Emergency response units	331
Emergency support units	59
Special purpose ambulance	62
Administrative vehicles	130
Total paramedic service fleet	1,753

Data source: Municipality Annual Service Plans. There is a three-year certification cycle and these numbers are updated at that time.

Air paramedic vehicles

The Ornge fleet consists of 19 aircraft and 13 land vehicles, including:

8 Airplanes



Pilatus Next Generation
PC-12

11 Helicopters



Leonardo AW-139

13 Ambulances



Crestline Commander

All aircraft are positioned to deliver services based on operational requirements. There are nine air bases and three land bases which have designated CCLA and Paediatric teams on standby. The map below shows the location of Ornge's bases. More information about air ambulance services can be found in Section 8: Air ambulance utilization.



Base	Location
1	Ottawa
2	Toronto
	Mississauga
	Toronto Paramedic Services (Ornge sub-contract)
3	Peterborough
4	London
5	Sudbury
6	Timmins
7	Moosonee
8	Thunder Bay
9	Sioux Lookout
10	Kenora

Section 4: Regulation and oversight

This section provides information on regulatory operations that ensure ambulance service providers comply with the applicable legislation. Data are presented summarizing results from inspections and investigations for Ontario's ambulance service providers.

SECTION 4: REGULATION AND OVERSIGHT

Oversight

Ontario's *Ambulance Act* stipulates that municipalities and DDAs are responsible for the direct delivery of land ambulance services. Enforcement and administration of the legislation governing the provision of ambulance services is the responsibility of the ministry. The ministry's core regulatory responsibilities include certification of ambulance services and investigation of complaints. This section describes these processes in detail and provides a summary of the data collected for fiscal year 2016/17.

Certification

The ministry establishes standards for ambulance services and is responsible for ensuring compliance with those standards. The ministry's Emergency Health Regulatory and Accountability Branch (EHRAB) evaluates candidate ambulance service operators to ensure compliance with the Land and Air Ambulance Certification Standards. Only land and air ambulance providers that have been certified by the ministry can operate an ambulance service in Ontario.

Compliance with legislated standards is determined through a formal inspection process called an Ambulance Service Review, which focuses on three main areas:

- **Patient care**
- **Quality assurance**
- **Administration**

A renewed certificate is issued to service providers that successfully meet the following two criteria:

1 A score of 90% or more for patient care (which represents 70% of the overall inspection)

2 An overall score of 90% or more (weighted 70% patient care, 20% quality assurance, and 10% administration)

Key findings

- The ministry is responsible for oversight of ambulance service certification and investigation of complaints.
- On average, 12 percent of ambulance service reviews required a re-visit due to unmet certification criteria (calculated from data in Table 4.1).
- The most common complaint type received between 2007 and 2016 was about the quality of patient care (Table 4.4).

In addition to the Ambulance Service Review inspection, three other types of inspections are conducted:

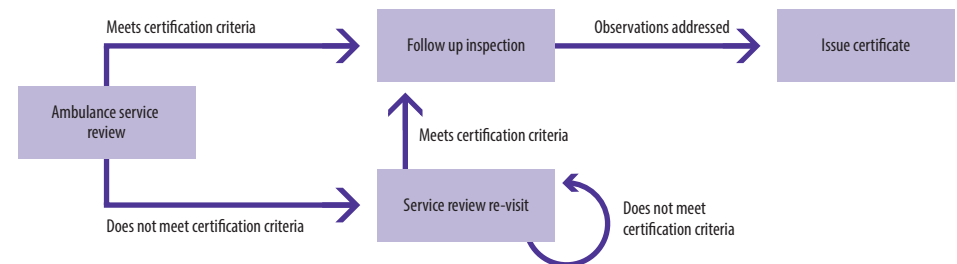
Service review re-visit: Conducted if a service does not meet the certification standards during an Ambulance Service Review.

Follow up inspection: Conducted after a service has met the certification standards, but with observations, to confirm that planned actions to address the observations from the Ambulance Service Review have been completed.

Unannounced inspection: Conducted without prior notice, on certified services throughout the three year certificate period.

The diagram below illustrates the certification process.

Figure 4.1: Certification process flow chart



SECTION 4: REGULATION AND OVERSIGHT

On average, 12 percent of ambulance service reviews resulted in a mandatory re-visit due to unmet certification criteria. Figure 4.2 shows the number of service reviews and re-visits over the past five years, while Table 4.1 shows the five-year totals, including number of observations and the percentage of reviews requiring a re-visit.

Figure 4.2: Number of service reviews and re-visits, by service type, fiscal year 2012/13 to 2016/17

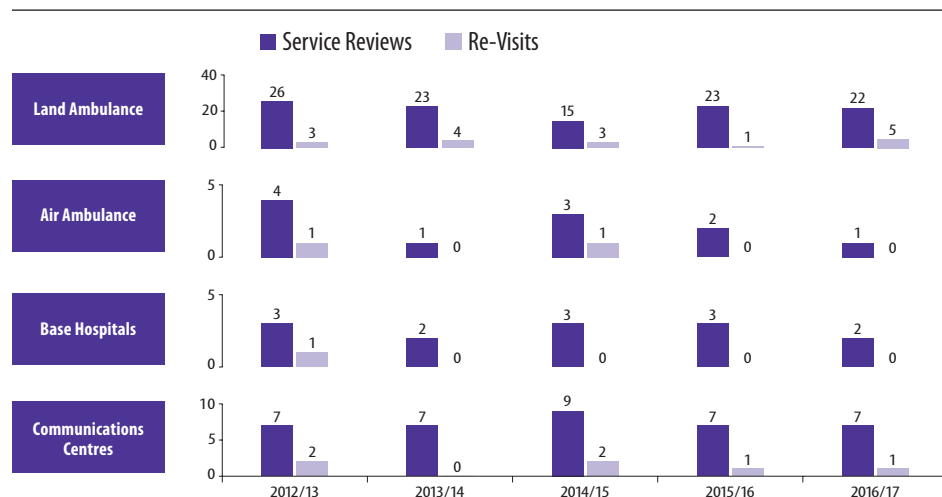


Table 4.1: Total number of inspections, observations and re-visits, by service type, fiscal year 2012/13 to 2016/17

Service type	Service reviews	Re-visits	% service reviews requiring a re-visit	Observations	
				Review	Re-visits
Land	109	13	12%	883	91
Air	11	2	18%	100	15
Base	13	1	8%	80	2
Communication centres	37	5	14%	463	47

Data source: Ambulance Service Review (ASR) log and Ambulance Service Review Program.

Investigations

The ministry conducts investigations to determine if there were any contraventions of the *Act*, its regulations, or legislated standards. It does not conduct investigations into matters covered under any other provincial or federal legislation, such as the cause of injury or death, or the actions of other allied agencies (e.g., fire, police).

Any citizen may inform Investigation Services of any incident related to land or air ambulance services or ambulance communications services in Ontario, where they have reason to believe that the activities of paramedics, ambulance communications officers or other ambulance or communication service staff may be in contravention of the *Act*, regulations, or standards.

After an investigation is conducted it is classified as one of the following:

SUBSTANTIATED

Investigations that can be validated and supported by evidence based on the complaint received.

UNSUBSTANTIATED

Investigations where no evidence can be found to support the complaint received.

OTHER

The complaint was previously investigated and no new concerns were raised.

A substantiated complaint often results in an operational or procedural change to mitigate further incidents. A copy of the investigation report is provided to the service operator and, if necessary, the presiding Coroner. A copy is also provided to the affected patient or his/her family member upon request.

SECTION 4: REGULATION AND OVERSIGHT

As shown in Table 4.2, the number of investigations opened per year has shown a general decline since 2012. Just under one third of investigations over the same time period were determined to be unsubstantiated. Note that some investigations were completed the year after they were opened.

Table 4.2: Total number of investigations opened and completed, average time to complete, and classification, 2012 to 2016.

Year	Investigations opened	Investigations completed	Average time to complete (days)	Percentage substantiated	Percentage unsubstantiated	Percentage other
2012	267	243	47.0	60.5%	32.9%	6.6%
2013	256	267	34.0	64.8%	28.8%	6.4%
2014	130	185	41.9	62.2%	34.6%	3.2%
2015	137	114	31.5	58.8%	33.3%	7.9%
2016	123	135	46.3	48.1%	28.1%	23.7%

For each complaint submitted, Investigation Services records the source and assigns a type based on the cause of the complaint. Tables 4.3 and 4.4 show the ten most common complaint sources and types over the past ten years.

Table 4.3: Ten most common complaint sources, 2007 to 2016

Rank	Complaint source	Number received
1	Field office	556
2	EMS service	393
3	Headquarters	396
4	Investigation services unit	254
5	3rd party/non-family/by-stander	216
6	CACC	79
7	Paramedic	66
8	Ornge	51
9	Coroner	38
10	Other	21

Table 4.4: Ten most common complaint types, 2007 to 2016

Rank	Complaint type	Number received
1	Quality of patient care	542
2	<i>Ambulance Act</i> contravention	303
3	Quality of ambulance service	281
4	Quality of ambulance dispatch	234
5	Quality of ambulance response	179
6	Quality of air ambulance response	126
7	Quality of air ambulance service	85
8	Quality of air ambulance dispatch	74
9	Request for information	66
10	Possible Criminal Code of Canada contravention	51

Data source: Ambulance Service Review (ASR) log.

Section 5: Patient characteristics

This section describes the patients that use Ontario's ambulance services, including their age, sex, number of visits, and reason for visit.

SECTION 5: PATIENT CHARACTERISTICS

In fiscal year 2016/17, 617,818 unique patients used ambulance services for care and transportation to the ED (Table 5.1). This represents a 40 percent increase in the number of unique patients over the past ten years (Figure 5.1). Central LHIN has the lowest rate of ED visits where the patient arrived by ambulance, and North West LHIN has the highest rate for both fiscal years 2007/08 and 2016/17 (Figure 5.2).

Key findings

- North West and North East LHINs had the highest per population rates of ambulance utilization in 2016/17, while Central LHIN had the highest percent increase in ambulance utilization over the past ten years (Figure 5.2).
- The rate of ambulance use for patients aged 65+ is over four times higher than the rates for those under the age of 65 (Figure 5.4).
- Patients who arrived at the ED via ambulance were assigned, on average, a higher CTAS level than non-ambulance arrivals. Approximately 91 percent of arrivals by ambulance were triaged to CTAS levels I-III in 2016/17 (Figure 5.6).
- There were 2,025 Ontarians who made 12 or more trips to the ED via ambulance in 2016/17. The most common diagnoses among these users were related to mental health and addictions (Figure 5.10).

Table 5.1: Unique patients who arrived at the ED by ambulance, 2007/08 to 2016/17

Fiscal year	Number of patients who arrived at ED via ambulance	Average number of trips per person
2007/08	441,393	1.38
2008/09	462,987	1.40
2009/10	482,281	1.40
2010/11	504,938	1.42
2011/12	519,564	1.44
2012/13	539,119	1.45
2013/14	553,506	1.47
2014/15	573,551	1.49
2015/16	589,082	1.51
2016/17	617,818	1.52

Figure 5.1: Key facts about patients who arrived by ambulance

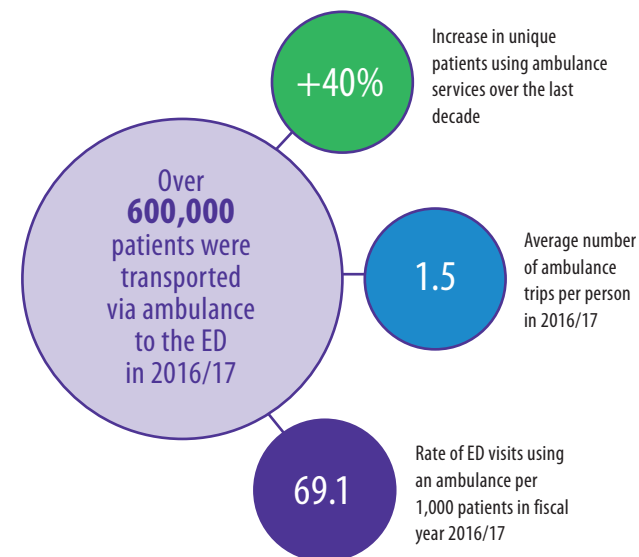
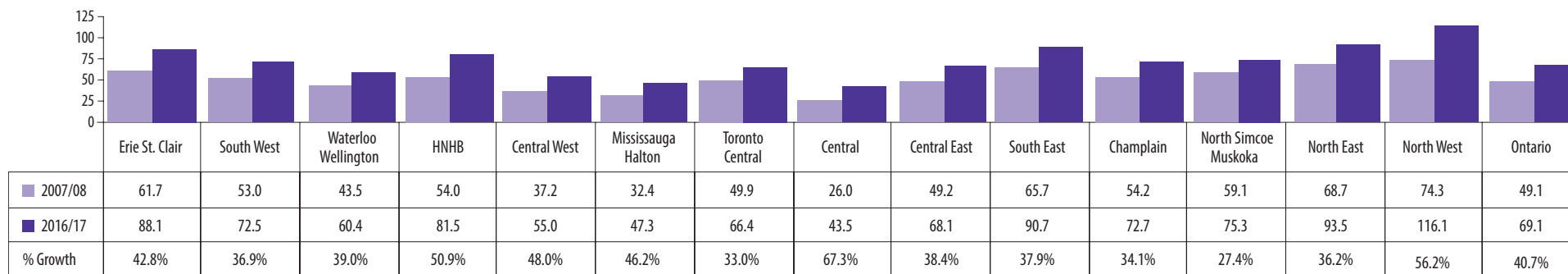


Figure 5.2: Number of ED visits where the patient arrived by ambulance per 1,000 population, by LHIN, fiscal year 2007/08 compared to fiscal year 2016/17



Per population rate: In this report, “rate” refers to the number of ED visits where the patient arrived by ambulance divided by the total population (LHIN or province) then multiplied by 1,000. Rates can be interpreted as X number of ED visits where the patient arrived by ambulance for every 1,000 people. A per population rate allows for objective comparisons across geographies. **Data Source:** National Ambulatory Care Reporting System (NACRS).

SECTION 5: PATIENT CHARACTERISTICS

Patient age and presenting complaints

In fiscal year 2016/17, nearly 50 percent of visits where the patient arrived by ambulance were made by patients aged 65+ (Figure 5.3). This percentage was over four times higher than the percentage for any other age group (Figure 5.4).

Table 5.2 below shows the top five reasons for patients seeking emergency medical care, by age group. Mental health and substance abuse were among the most common complaints for patients aged five to 64 years.

Table 5.2: Top five presenting complaints among ED visits where patient arrived by ambulance, by age group, fiscal year 2016/17

0 to 4 years	5 to 18 years	19 to 44 years
1. Seizure	1. Seizure	1. Abdominal pain
2. Fever	2. Head injury	2. Substance misuse/intoxication
3. Shortness of breath	3. Lower extremity injury	3. Seizure
4. Head injury	4. Abdominal pain	4. Depression/suicidal/self-harm
5. Cough/congestion	5. Depression/suicidal/self-harm	5. Overdose ingestion
45 to 64 years	65 to 74 years	75+ years
1. Chest pain — cardiac features	1. Shortness of breath	1. Shortness of breath
2. Abdominal pain	2. General weakness	2. General weakness
3. Shortness of breath	3. Chest pain — cardiac features	3. Abdominal pain
4. General weakness	4. Abdominal pain	4. Chest pain — cardiac features
5. Substance misuse/intoxication	5. Syncope/pre-syncope	5. Lower extremity injury

Figure 5.3: Distribution of ED visits where patient arrived by ambulance, by patient age and sex, 2016/17

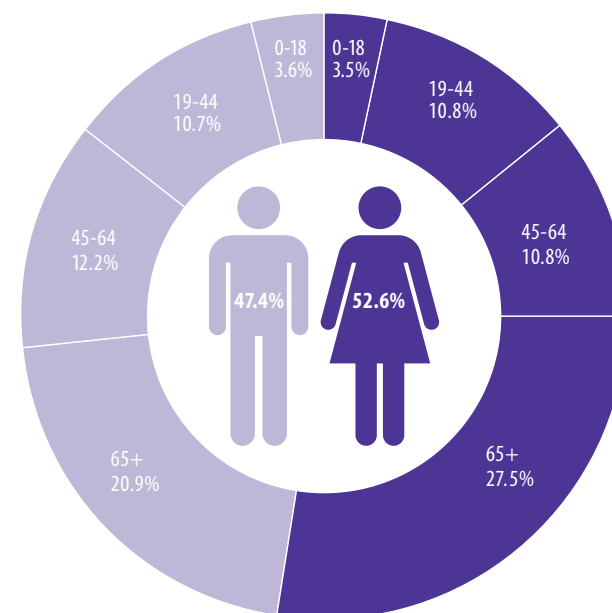
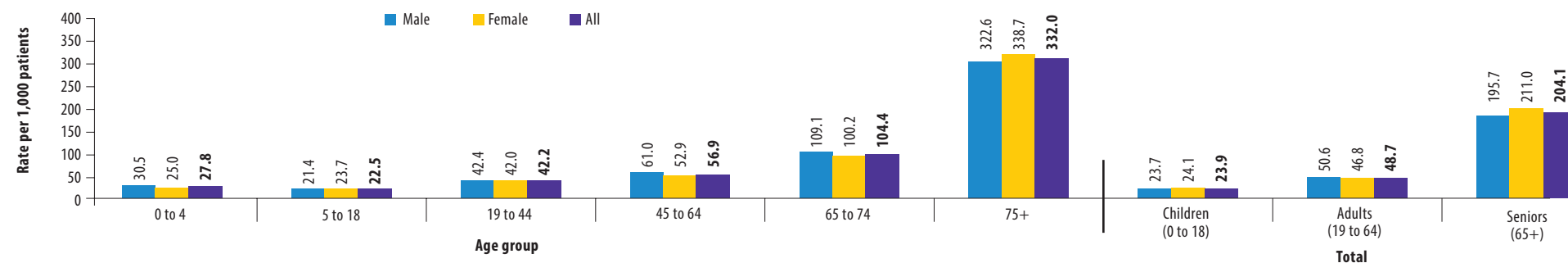


Figure 5.4: Number of ED visits where the patient arrived by ambulance per 1,000 population, by age group, 2016/17



Per population rate: In this report, “rate” refers to the number of ED visits where the patient arrived by ambulance divided by the total population (LHIN or province) then multiplied by 1,000. Rates can be interpreted as X number of ED visits where the patient arrived by ambulance for every 1,000 people. A per population rate allows for objective comparisons across geographies and age groups. **Data Source:** National Ambulatory Care Reporting System (NACRS).

SECTION 5: PATIENT CHARACTERISTICS

The Canadian Triage & Acuity Scale (CTAS) is a tool used to prioritize the urgency of an ED patient's required care (Figure 5.5). Patients are triaged according to the type and severity of their presenting symptoms. A higher percentage of patients who arrived at the ED by ambulance were classified as requiring urgent care (CTAS I-III) compared to those who did not arrive by ambulance (Figure 5.6). Over the past ten years, the percentage of patients who arrived at the ED by ambulance classified as less urgent (CTAS IV-V) decreased from 15.5 percent to 8.7 percent (Figure 5.7).

Figure 5.5: CTAS classifications

CTAS I	Resuscitation — conditions that are threats to life or imminent risk of deterioration, requiring immediate aggressive interventions.
CTAS II	Emergent care — conditions that are a potential threat to life or limb function requiring rapid medical intervention or delegated acts.
CTAS III	Urgent care — conditions that could potentially progress to a serious problem requiring emergency intervention.
CTAS IV	Less-urgent care — conditions related to patient age, distress, or potential for deterioration or complications that would benefit from intervention or reassurance within 1-2 hr.
CTAS V	Non-urgent care — conditions in which investigations or interventions could be delayed or referred to other areas of the hospital or health care system.

Table 5.3: Percentage of ED visits where patient arrived by ambulance, by CTAS and age group, fiscal year 2016/17

Age Group	CTAS I	CTAS II	CTAS III	CTAS IV	CTAS V	Total
0 to 4	5.8%	42.8%	41.2%	9.6%	0.7%	100.0%
5 to 18	3.7%	36.2%	47.9%	11.6%	0.6%	100.0%
19 to 44	3.8%	36.5%	49.4%	9.6%	0.7%	100.0%
45 to 64	4.6%	39.0%	47.9%	7.9%	0.7%	100.0%
65 to 74	5.0%	38.2%	49.6%	6.7%	0.5%	100.0%
75+	3.7%	33.7%	54.7%	7.4%	0.5%	100.0%

Data Source: National Ambulatory Care Reporting System (NACRS).

Figure 5.6: CTAS distributions for ED visits where patient arrived by ambulance compared to patients who did not arrive by ambulance, fiscal year 2016/17

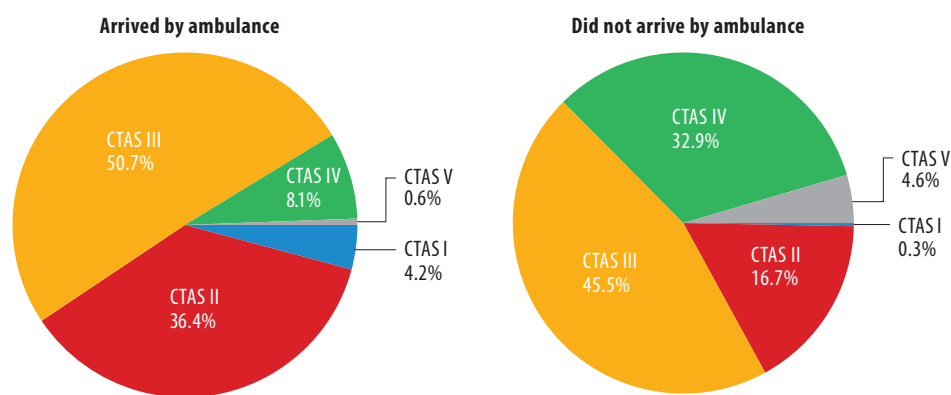
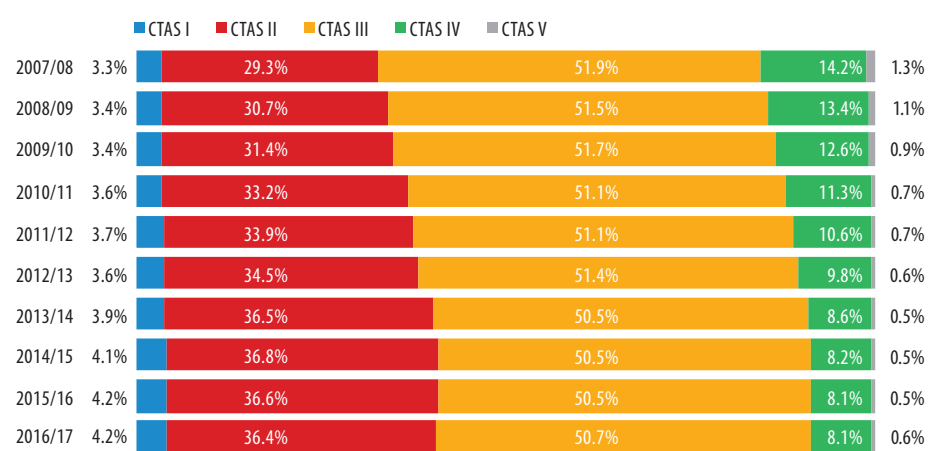


Figure 5.7: CTAS distributions for ED visits where patient arrived by ambulance, fiscal year 2007/08 to 2016/17



SECTION 5: PATIENT CHARACTERISTICS

Referral source and discharge disposition

In most cases, patients who arrived at the ED by ambulance chose to go to the hospital or were referred by their family members. For 4.5 percent of ED arrivals by ambulance, the patient was referred by another hospital or residential care setting, such as a long-term care home (Figure 5.8). While the homeless accounted for less than one percent of all ED visits where the patient arrived by ambulance, the percentage among hospitals reached a maximum of 16.1 percent in 2016/17 (Table 5.4). In 2016/17, the percentage of ED patients admitted to the hospital was higher among patients who arrived by ambulance (30.8 percent) compared to patients who arrived by other means (6.3 percent) (Figure 5.9).

Figure 5.8: Referral source for ED visits where patient arrived by ambulance, fiscal year 2016/17

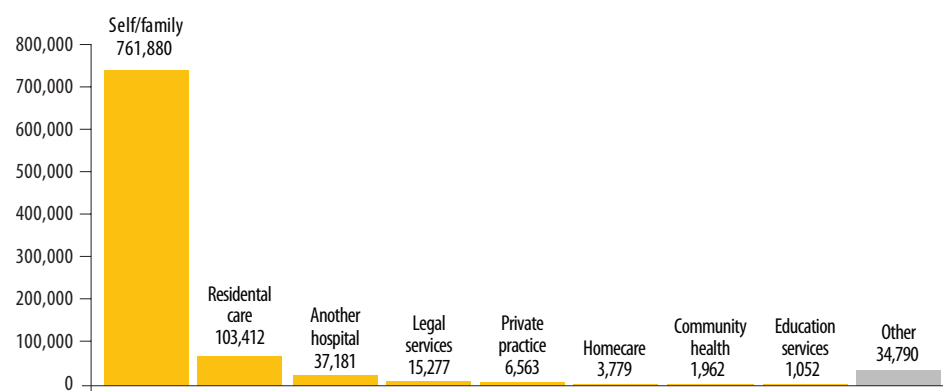


Figure 5.9: ED visit disposition for patients who arrived by ambulance compared to patients who did not arrive by ambulance, fiscal year 2016/17

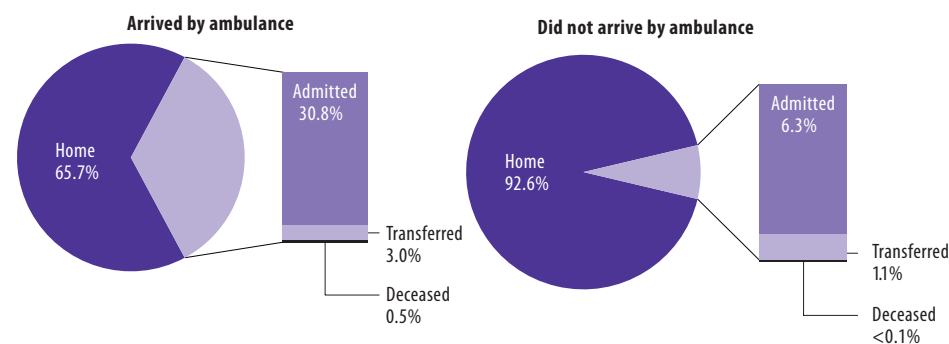


Table 5.4: Hospitals that provide care to a higher percentage of homeless patients, fiscal year 2016/17

City	Hospital	Hospital Type	Percent of all arrivals by ambulance where the patient is homeless
Toronto	St. Michael's Hospital	Teaching hospital	16.1%
Toronto	University Health Network – Toronto General	Teaching hospital	10.7%
Toronto	Sinai Health System – Mount Sinai	Teaching hospital	10.6%
Toronto	University Health Network – Toronto Western	Teaching hospital	5.8%
Red Lake	Red Lake Margaret Cochenour Memorial Hospital	Low-volume	4.3%
Toronto	St. Joseph's Health Centre	Very high-volume	2.7%
Ingersoll	Alexandra Hospital	Low-volume	2.6%
Hamilton	St. Joseph's Healthcare Hamilton – Charlton Campus	Very high-volume	2.6%
Kitchener	Grand River Hospital – Kitchener-Waterloo	Very high-volume	2.3%
Ottawa	Hopital Montfort	Teaching hospital	1.9%
London	London Health Sciences Centre – Victoria	Teaching hospital	1.9%
Windsor	Windsor Regional Hospital – Ouellette Campus	Very high-volume	1.9%
Barrie	Royal Victoria Regional Health Centre	Very high-volume	1.8%
St. Catharines	Niagara Health System – St. Catharines	Very high-volume	1.6%
Toronto	Toronto East Health Network	Very high-volume	1.6%

Data Source: National Ambulatory Care Reporting System (NACRS).

SECTION 5: PATIENT CHARACTERISTICS

Frequent users of ambulance services

Frequent user is defined in this report as a patient who made 12 or more trips to the ED using an ambulance within a 12 month period.

In fiscal year 2016/17, there were 2,025 frequent users in Ontario. The percentage of unique patients in each LHIN who were frequent users ranged from 0.16 percent in Mississauga Halton to 0.98 percent in North West (Table 5.6).

The most common diagnosis during ED visits by frequent users was “mental health due to substance use”. Figure 5.10 shows the ten most common diagnoses for frequent users, which account for over 50 percent of all frequent users’ diagnoses.

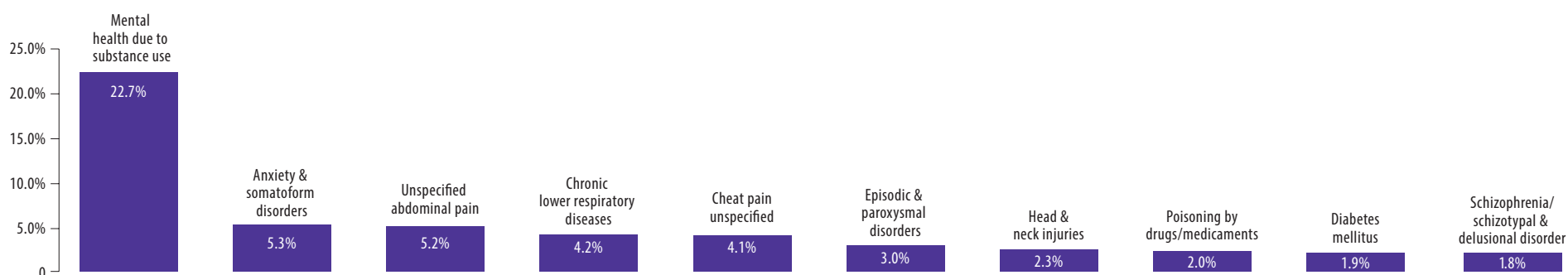
Table 5.5: Key facts about frequent ambulance users

In 2016/17, 2,025 unique patients were classified as frequent users	
Annual number of ambulance trips	43,773
Average number of ambulance trips	21.6 per patient
Percent female	45.9%
Average age	52.2 years
Average ED length of stay	7.1 hours

Table 5.6: Number and percentage of unique patients by LHIN and frequency of ED visits by ambulance, fiscal year 2016/17

Patient LHIN	Single visits		2 to 3 visits		4 to 11 visits		12+ visits (frequent users)		Total
	#	%	#	%	#	%	#	%	
Erie St. Clair	26,303	72.9%	7,604	21.1%	2,085	5.8%	98	0.27%	36,090
South West	34,213	74.2%	9,504	20.6%	2,264	4.9%	136	0.29%	46,117
Waterloo Wellington	24,478	76.8%	5,974	18.7%	1,354	4.2%	83	0.26%	31,889
HNHB	56,602	74.0%	15,771	20.6%	3,895	5.1%	252	0.33%	76,520
Central West	30,005	81.1%	5,798	15.7%	1,089	2.9%	86	0.23%	36,978
Mississauga Halton	33,406	79.2%	7,202	17.1%	1,506	3.6%	69	0.16%	42,183
Toronto Central	39,247	75.1%	10,014	19.2%	2,758	5.3%	265	0.51%	52,284
Central	44,987	79.0%	9,708	17.0%	2,177	3.8%	105	0.18%	56,977
Central East	54,647	75.4%	14,188	19.6%	3,391	4.7%	225	0.31%	72,451
South East	20,201	71.8%	6,286	22.3%	1,583	5.6%	84	0.30%	28,154
Champlain	43,980	72.4%	13,178	21.7%	3,466	5.7%	162	0.27%	60,786
North Simcoe Muskoka	17,452	73.9%	4,849	20.5%	1,231	5.2%	71	0.30%	23,603
North East	23,981	72.8%	6,892	20.9%	1,936	5.9%	120	0.36%	32,929
North West	10,481	70.1%	3,300	22.1%	1,017	6.8%	147	0.98%	14,945
Ontario	464,377	75.2%	121,272	19.6%	30,144	4.9%	2,025	0.33%	617,818

Figure 5.10: Top ten diagnoses for ED visits where the patient was identified as a frequent user, fiscal year 2016/17



Data Source: National Ambulatory Care Reporting System (NACRS).

Section 6: Land ambulance dispatch and patient transport

This section focuses on the number of 911 calls received, the number of ambulances dispatched, and the number of patients transported to the hospital.

SECTION 6: LAND AMBULANCE DISPATCH AND PATIENT TRANSPORT

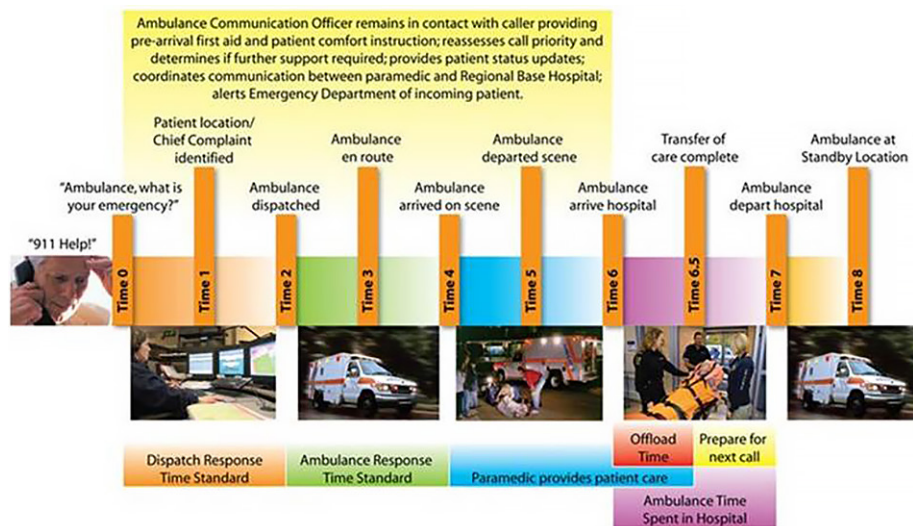
Key findings

- The number of 911 ambulance calls increased by 30.6 percent between 2007 and 2016 (Figure 6.2).
- There were approximately 1.75 million ambulance dispatches in 2016 (Figure 6.3).
- The number of ambulance transports increased by 243,272 between 2007 and 2016 (Figure 6.4).

Timeline of events

Response to a 911 call involves the coordinated actions of communications officers, paramedics, and hospital staff. The process can be broken down into ten steps, defined in the diagram below from Time 0 to Time 8. Monitored time intervals are colour coded and labelled below the timeline.

Figure 6.1: Chronology of an emergency call for an ambulance



More information on ambulance offload time (Time 6 to Time 6.5) can be found in Section 7: Emergency department utilization.

Dispatch priority codes

For most patients, first contact with an emergency health services provider is made by calling 911. At this point, calls are assigned a priority code, which may change while carrying out the call. Dispatch priority codes are listed below.

CODE 1: DEFERRABLE CALL

A non-emergency call which may be delayed without being physically detrimental to the patient.

CODE 2: SCHEDULED CALL

A non-emergency call performed at a specific time due to limited availability of special treatment or diagnostic/receiving facilities.

CODE 3: PROMPT CALL

May be responded to with moderate delay. The patient is stable or under professional care and not in immediate danger.

CODE 4: URGENT CALL

Immediate attention required; possible threat to life, limb, or function.

CODE 8: STANDBY CALL

Vehicle or crew needed for emergency coverage or in anticipation of a call.

Note: Codes 5-7 are not assigned.

SECTION 6: LAND AMBULANCE DISPATCH AND PATIENT TRANSPORT

Emergency call volume

In Ontario, the total number of 911 calls for an ambulance increased by 30.6 percent between 2007 and 2016 (Figure 6.2). Over the same period, the percent change in the number of calls at the CACC level ranged from a 6.7 percent decrease in Parry Sound to a 55.6 percent increase in Niagara (Table 6.2).

Figure 6.2: Total number of 911 calls received by Ontario CACCs, 2007 to 2016

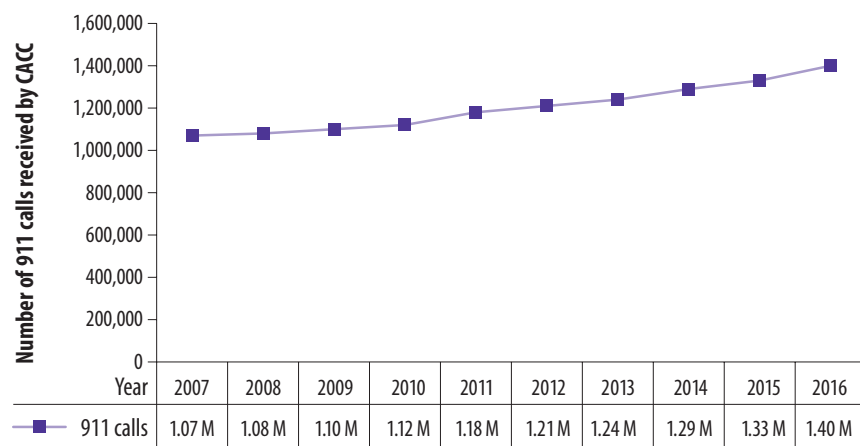


Table 6.1: Percentage of calls by priority code, 2007 to 2016

Year	Code 1	Code 2	Code 3	Code 4
2007	5.8%	6.9%	18.8%	68.5%
2008	5.2%	5.7%	20.4%	68.7%
2009	4.7%	4.8%	24.2%	66.3%
2010	4.3%	4.2%	25.0%	66.4%
2011	4.1%	3.9%	25.2%	66.8%
2012	3.9%	3.0%	25.3%	67.8%
2013	3.7%	2.8%	26.0%	67.5%
2014	3.3%	2.6%	26.5%	67.6%
2015	3.2%	2.4%	26.7%	67.7%
2016	3.0%	2.1%	26.8%	68.0%

Table 6.2: Percent change in the number of 911 calls received, by CACC, 2007 to 2016

CACC	911 Calls		Percent change
	2007	2016	
Parry Sound	3,701	3,453	-6.7%
Muskoka	7,166	9,323	30.1%
Renfrew	11,002	12,920	17.4%
Kenora	14,251	18,056	26.7%
Timmins	13,145	19,070	45.1%
North Bay	17,013	19,749	16.1%
Sault Ste. Marie	14,437	20,037	38.8%
Wallaceburg	18,979	24,350	28.3%
Thunder Bay	23,723	30,170	27.2%
Sudbury	30,817	33,775	9.6%
Lindsay	30,394	39,411	29.7%
Windsor	38,095	50,291	32.0%
Niagara	36,739	57,149	55.6%
Oshawa	49,777	58,551	17.6%
Kingston	49,657	63,536	27.9%
Cambridge	51,373	68,518	33.4%
Hamilton	69,088	93,711	35.6%
London	79,535	98,126	23.4%
Georgian	93,881	128,958	37.4%
Ottawa	90,968	132,326	45.5%
Mississauga	88,686	133,486	50.5%
Toronto	232,270	280,208	20.6%

In some cases a 911 call for an ambulance triggers a notification for fire and/or police assistance on the scene. Police are notified whenever an ambulance is dispatched to the scene of a crime or in the event of a possible hazard, such as a violent person. In 2016, police were notified for 13.3 percent of all calls.

Emergencies are reported to fire services if the event is included under municipally-approved tiered response agreements. These events include cardiac arrest, structural hazards, reports of multi-vehicle collisions, and environmental emergencies (e.g., nuclear, chemical, or biological releases). In 2016, fire services were notified for 20.2 percent of all calls. Half of the CACCs also dispatch fire trucks directly. In 2016, fire trucks were dispatched for 2.9 percent of calls received by these CACCs.

Data Source: Ambulance Dispatch Reporting System (ADRS).

SECTION 6: LAND AMBULANCE DISPATCH AND PATIENT TRANSPORT

Ambulance dispatch

In 2016, the average dispatch response time—the time between when a 911 call was placed and when an ambulance was dispatched (T0 and T2 in Figure 6.1)—for the highest priority calls (Code 4–Urgent), ranged between roughly one and a half minutes and three minutes. Table 6.3 below presents the average dispatch response time for emergency calls for all 22 CACCs.

Table 6.3: Average dispatch response time for emergency calls, 2016

CACC	Average dispatch response time
Muskoka	1 min 38 sec
North Bay	1 min 46 sec
Thunder Bay	1 min 49 sec
Wallaceburg	1 min 53 sec
Oshawa	1 min 56 sec
Timmins	1 min 57 sec
Parry Sound	1 min 57 sec
Kingston	1 min 59 sec
Windsor	2 min 4 sec
Niagara	2 min 4 sec
Renfrew	2 min 6 sec
Lindsay	2 min 8 sec
Sudbury	2 min 9 sec
London	2 min 12 sec
Hamilton	2 min 14 sec
Sault Ste. Marie	2 min 17 sec
Ottawa	2 min 22 sec
Georgian	2 min 26 sec
Kenora	2 min 27 sec
Mississauga	2 min 31 sec
Cambridge	2 min 35 sec
Toronto	3 min 1 sec

The total number of ambulance dispatches in Ontario increased 33.6 percent between 2007 and 2016 (Figure 6.3). At the CACC level, the percent change in the number of ambulance dispatches ranged from a decrease of 6.7 percent in Parry Sound to an increase of 62 percent in Mississauga (Table 6.5). Table 6.4 below describes the percentage of dispatches by priority code.

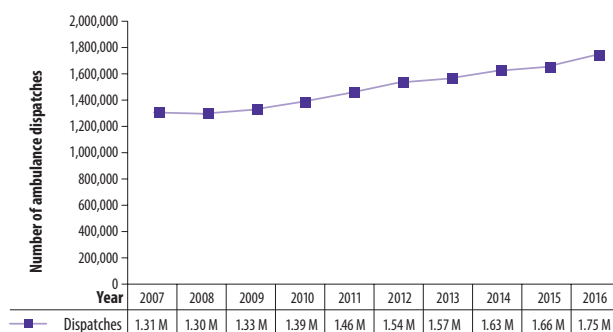
Table 6.4: Percentage of ambulance dispatches by priority code, 2007 to 2016

Year	Code 1	Code 2	Code 3	Code 4
2007	5.5%	6.4%	18.0%	70.0%
2008	4.8%	5.2%	19.8%	70.2%
2009	4.4%	4.4%	23.4%	67.8%
2010	3.9%	3.8%	23.9%	68.4%
2011	3.7%	3.5%	24.1%	68.8%
2012	3.4%	2.7%	24.3%	69.6%
2013	3.2%	2.5%	25.0%	69.3%
2014	3.0%	2.3%	25.6%	69.1%
2015	2.9%	2.1%	25.9%	69.1%
2016	2.7%	1.9%	26.1%	69.3%

Table 6.5: Percent change in the number of ambulance dispatches, by CACC, 2007 to 2016

CACC	Ambulance dispatches		Percent change
	2007	2016	
Parry Sound	4,243	3,963	-6.6%
Muskoka	8,957	10,363	15.7%
Renfrew	13,619	16,871	23.9%
Timmins	14,406	20,296	40.9%
Kenora	15,853	20,963	32.2%
North Bay	18,970	22,280	17.4%
Sault Ste. Marie	15,670	23,834	52.1%
Wallaceburg	21,712	27,275	25.6%
Thunder Bay	28,792	34,521	19.9%
Sudbury	40,098	40,840	1.9%
Lindsay	34,100	46,660	36.8%
Windsor	47,662	61,291	28.6%
Niagara	51,994	65,736	26.4%
Oshawa	53,134	71,533	34.6%
Kingston	56,744	71,955	26.8%
Cambridge	59,139	82,337	39.2%
London	90,846	112,019	23.3%
Hamilton	86,637	118,145	36.4%
Georgian	115,593	169,838	46.9%
Mississauga	108,509	175,787	62.0%
Ottawa	115,120	179,335	55.8%
Toronto	302,773	371,768	22.8%

Figure 6.3: Number of ambulance dispatches in Ontario, 2007 to 2016



Data Source: Ambulance Dispatch Reporting System (ADRS).

SECTION 6: LAND AMBULANCE DISPATCH AND PATIENT TRANSPORT

Ambulance service response time

In 2016, the average length of time between when an ambulance was on route and when it arrived on scene (T3 and T4 in Figure 6.1), for the highest priority calls (Code 4 – Urgent), ranged between roughly four minutes and just over 12 minutes. Table 6.4 presents the average response times for all municipalities in 2016.

Table 6.6: Average response time from ‘on route’ to ‘on scene,’ by municipality, 2016

Municipality	Average response time	Municipality	Average response time	Municipality	Average response time
Weeneebayko First Nation	3 min 54 sec	County of Elgin	6 min 32 sec	County of Prescott and Russell	7 min 51 sec
Chippewas of Rama First Nation	4 min 31 sec	Region of Waterloo	6 min 35 sec	Six Nations of the Grand River First Nation	7 min 55 sec
Sault Ste. Marie	5 min 35 sec	County of Perth	6 min 40 sec	Wikwemikong First Nation	7 min 59 sec
City of Greater Sudbury	5 min 49 sec	District of Thunder Bay	6 min 43 sec	County of Hastings	8 min 1 sec
County of Middlesex	5 min 52 sec	County of Wellington	6 min 45 sec	County of Northumberland	8 min 7 sec
Naotkamegwaning First Nation	5 min 54 sec	Region of York	6 min 50 sec	County of Huron	8 min 11 sec
District of Cochrane	5 min 58 sec	Chatham-Kent	6 min 54 sec	City of Kawartha Lakes	8 min 13 sec
Region of Durham	6 min 1 sec	Region of Peel	6 min 58 sec	District of Timiskaming	8 min 27 sec
County of Dufferin	6 min 2 sec	County of Frontenac	7 min 0 sec	District of Muskoka	8 min 41 sec
County of Lambton	6 min 4 sec	District of Nipissing	7 min 0 sec	County of Renfrew	8 min 53 sec
Region of Niagara	6 min 10 sec	County of Brant	7 min 2 sec	County of Leeds & Grenville	9 min 16 sec
County of Essex	6 min 12 sec	County of Grey	7 min 3 sec	County of Lennox and Addington	9 min 40 sec
Beausoleil First Nation	6 min 14 sec	City of Toronto	7 min 11 sec	District of Rainy River	10 min 3 sec
County of Norfolk	6 min 18 sec	County of Peterborough	7 min 13 sec	County of Bruce	10 min 9 sec
County of Oxford	6 min 20 sec	County of Haldimand	7 min 23 sec	County of Prince Edward	10 min 25 sec
City of Hamilton	6 min 23 sec	County of Simcoe	7 min 27 sec	District of Kenora	11 min 5 sec
Region of Halton	6 min 26 sec	District of Algoma	7 min 41 sec	Town of Parry Sound	11 min 7 sec
City of Ottawa	6 min 26 sec	City of Cornwall	7 min 47 sec	Manitoulin/Sudbury District	11 min 46 sec
Oneida Nation of Thames First Nations	6 min 31 sec	County of Lanark	7 min 47 sec	County of Haliburton	12 min 17 sec

Data Source: Ambulance Dispatch Reporting System (ADRS).

SECTION 6: LAND AMBULANCE DISPATCH AND PATIENT TRANSPORT

Patient transport

In Ontario, the total number of patients transported to a hospital increased 28.3 percent between 2007 and 2016 (Figure 6.4). Over the same time period the percent change in the number of patients transported at the CACC level ranged from a 19.1 percent decrease in Parry Sound to a 51.4 percent increase in Niagara (Table 6.8).

Figure 6.4: Number of patients transported to hospital, 2007 to 2016

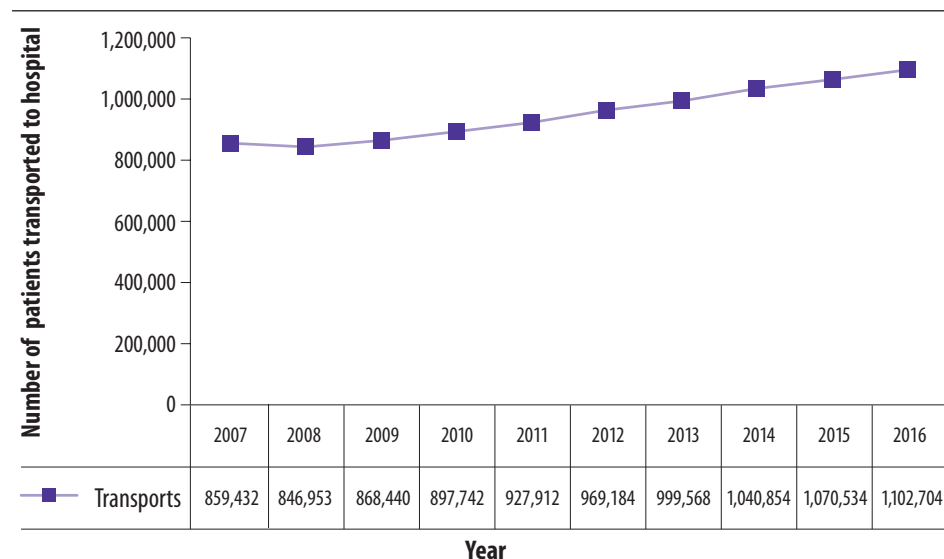


Table 6.7: Percentage of patients transported to hospital, by priority code, 2007 to 2016

Year	Code 1	Code 2	Code 3	Code 4
2007	7.3%	8.5%	20.6%	63.6%
2008	6.1%	6.8%	21.5%	65.6%
2009	5.4%	5.8%	24.4%	64.3%
2010	4.9%	5.1%	24.9%	65.2%
2011	4.6%	4.6%	25.2%	65.6%
2012	4.3%	3.6%	25.2%	66.9%
2013	4.0%	3.2%	26.0%	66.8%
2014	3.6%	3.1%	26.2%	67.2%
2015	3.5%	2.9%	26.1%	67.5%
2016	3.3%	2.6%	26.1%	68.1%

Data Source: Ambulance Dispatch Reporting System (ADRS).

Table 6.8: Percent change in the number of patients transported, by CACC, 2007 to 2016

CACC	2007 patient transports	2016 patient transports	Percent change
Parry Sound	3,369	2,724	-19.1%
Muskoka	7,432	7,622	2.6%
Renfrew	8,423	9,366	11.2%
Kenora	12,619	13,205	4.6%
Sault Ste. Marie	12,546	16,404	30.8%
North Bay	15,801	16,707	5.7%
Timmins	12,598	17,254	37.0%
Wallaceburg	15,323	18,964	23.8%
Thunder Bay	18,915	22,742	20.2%
Sudbury	28,559	27,741	-2.9%
Lindsay	26,193	33,064	26.2%
Windsor	31,492	39,842	26.5%
Niagara	28,668	43,391	51.4%
Oshawa	31,173	45,158	44.9%
Kingston	43,486	53,741	23.6%
Cambridge	42,400	54,713	29.0%
Hamilton	55,582	73,294	31.9%
London	71,160	83,545	17.4%
Ottawa	73,524	100,288	36.4%
Mississauga	67,261	101,574	51.0%
Georgian	71,407	102,383	43.4%
Toronto	177,627	218,982	23.3%

Section 7: Emergency department utilization

This section describes emergency department utilization in Ontario with a focus on visits where the patient arrived at the hospital by ambulance.

SECTION 7: EMERGENCY DEPARTMENT UTILIZATION

Emergency department arrivals by ambulance

From 2007/08 to 2016/17, the volume of visits to Ontario ED increased from 4.8 million to almost 5.9 million annual visits, an increase of 21.6 percent. During the same period, the percentage of ED visits where the patient arrived by ambulance increased 54.2 percent, from 626,523 visits in fiscal year 2007/2008 to 965,896 visits in 2016/17 (Figure 7.1).

The percentage of ED visits where the patient arrived by ambulance varied by LHIN. In fiscal year 2016/17, the Hamilton Niagara Haldimand Brant (HNHB) and Central West LHINs had the highest percentages of visits where the patient arrived by ambulance, with 21.7 percent and 20.1 percent, respectively. Conversely, the lowest percentages were seen in South West (12.5 percent) and North East (11.4 percent) LHINs (Table 7.1).

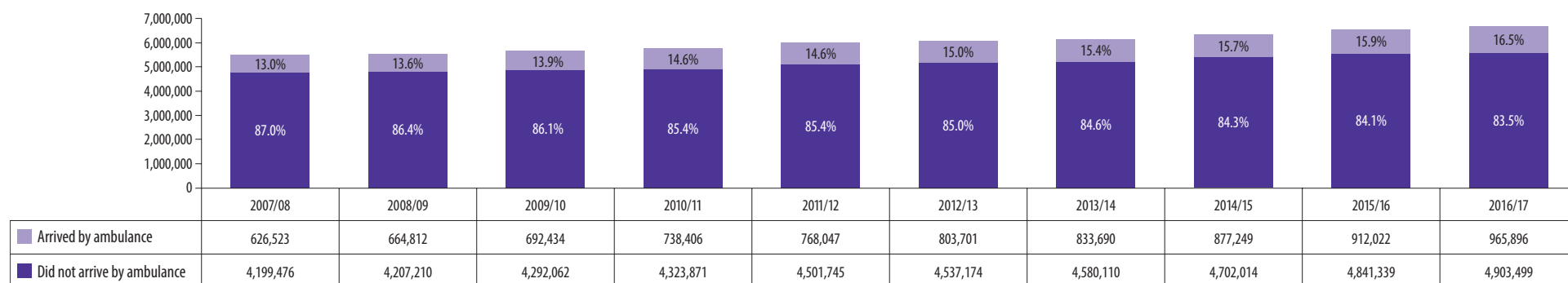
Table 7.1: Percentage of ED visits where the patient arrived by ambulance, by LHIN, fiscal year 2016/17

LHIN of hospital	Total number of ED visits	Percentage of visits arriving by ambulance		
		Initial ED visit	ED to ED transfers	All arrivals by ambulance
Erie St. Clair	288,075	18.9%	0.1%	19.0%
South West	593,097	12.1%	0.4%	12.5%
Waterloo Wellington	283,246	16.2%	0.1%	16.3%
HNHB	550,393	21.0%	0.6%	21.7%
Central West	262,415	20.1%	0.0%	20.1%
Mississauga Halton	354,590	16.0%	0.2%	16.2%
Toronto Central	576,030	19.1%	0.6%	19.7%
Central	465,763	16.3%	0.1%	16.4%
Central East	624,789	17.0%	0.2%	17.1%
South East	259,266	16.0%	1.3%	17.3%
Champlain	681,329	14.4%	0.5%	14.9%
North Simcoe Muskoka	259,420	14.5%	0.1%	14.6%
North East	454,717	11.3%	0.2%	11.4%
North West	216,265	12.7%	0.1%	12.8%
Ontario	5,869,395	16.1%	0.4%	16.5%

Key findings

- In 2016/17, 16.5 percent of ED visits arrived at the hospital by ambulance (Table 7.1).
- From 2007/08 to 2016/17 the number of ED visits arriving by ambulance increased from 626,523 to 965,896, or 54.2 percent (Figure 7.1).
- The 90th percentile ambulance offload time has decreased from 61 minutes in 2008/09 to 42 minutes in 2016/17 (Figure 7.3).

Figure 7.1: Proportion of ED visits where the patient arrived by ambulance, fiscal year 2007/08 to 2016/17



Data Source: National Ambulatory Care Reporting System (NACRS).

SECTION 7: EMERGENCY DEPARTMENT UTILIZATION

Ambulance arrivals by hospital type

Hospitals were categorized into five main types to assess differences in the proportion of ED visits where the patient arrived by ambulance. Four categories are based on annual total ED visit volume and the fifth distinguishes teaching hospitals, which are high-volume hospitals involved in academic research.

TEACHING HOSPITALS

Provide training for medical interns and residents in affiliation with a medical or health sciences school. They perform acute and complex patient care and have membership in the Council of Academic Hospitals of Ontario.

VERY HIGH-VOLUME COMMUNITY HOSPITALS

Treat over 50,000 annual ED visits.

HIGH-VOLUME COMMUNITY HOSPITALS

Treat between 30,000 to less than 50,000 annual ED visits.

MEDIUM-VOLUME COMMUNITY HOSPITALS

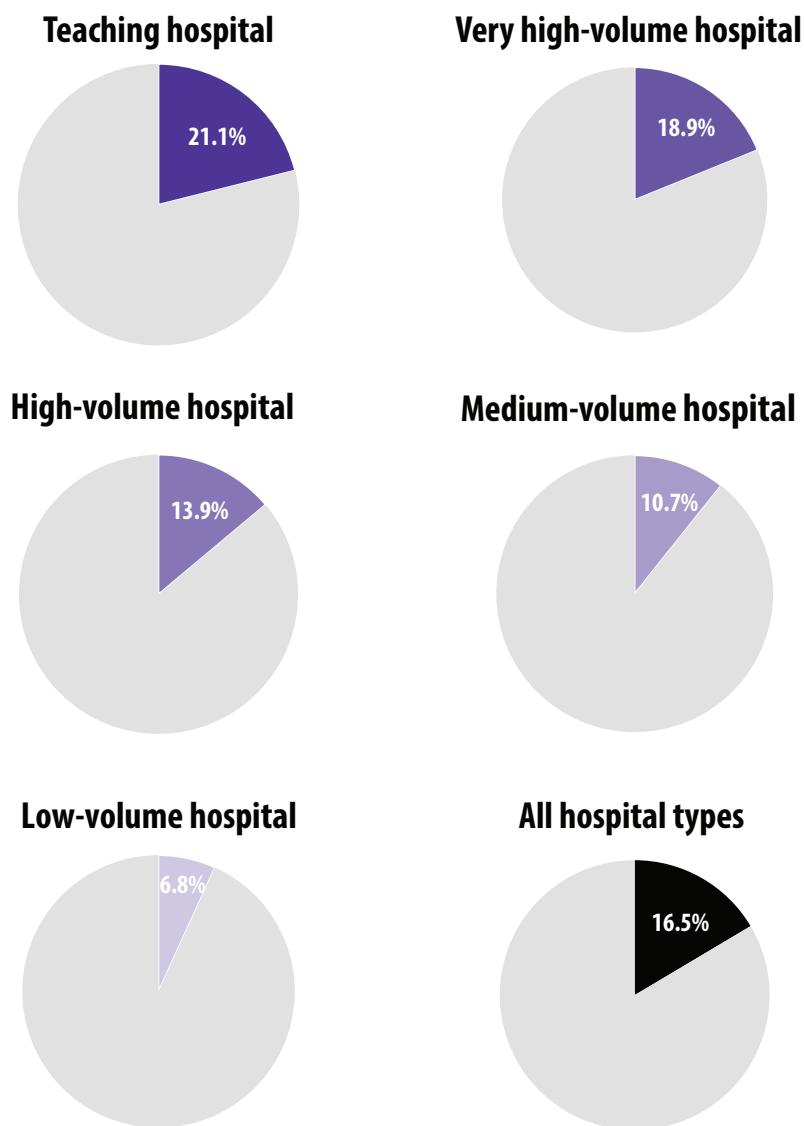
Treat between 20,000 to less than 30,000 annual ED visits.

LOW-VOLUME COMMUNITY HOSPITALS

Treat less than 20,000 annual ED visits. In general, these hospitals are the only hospitals available in a given community.

The percentage of ED visits where the patient arrived by ambulance varies by hospital type, and shows a positive correlation with the hospitals' volumes. In 2016/17, teaching hospitals had the highest percentage of visits where the patient arrived by ambulance followed by high-, medium- and low-volume hospitals (Figure 7.2).

Figure 7.2: Percentage of ED visits where the patient arrived by ambulance, by hospital type, fiscal year 2016/17



Data Source: National Ambulatory Care Reporting System (NACRS). Hospital descriptions referenced from <http://www.ontariowaittimes.com/er/En/Definitions.aspx?view=1>.

SECTION 7: EMERGENCY DEPARTMENT UTILIZATION

Ontario hospitals were ranked according to the percentage of ED visits where the patient arrived by ambulance in 2016/17. Table 7.2 shows the ten highest and lowest ranking hospitals, as well as their rank in terms of total ED visit volume. The top ten hospitals account for nearly 20 percent of all ED visits that arrived by ambulance in 2016/17. Seven of the top ten are teaching hospitals and the remaining three are very high-volume. The ten lowest ranking hospitals are all classified as low-volume, meaning they receive fewer than 20,000 ED visits per year.

Table 7.2: Top and bottom ten hospitals for percentage of ED visits where patient arrived by ambulance, fiscal year 2016/17

Rank		City	Hospital	Hospital Type	Total ED visits	Arrivals by Ambulance	
By % Arrival by ambulance	By Overall ED volume					#	%
1	59	Hamilton	Hamilton Health Sciences – Juravinski	Teaching	41,707	13,621	32.7%
2	51	Hamilton	Hamilton Health Sciences – General	Teaching	48,556	15,073	31.0%
3	41	London	London Health Sciences Centre – University	Teaching	55,047	16,947	30.8%
4	34	Kingston	Kingston Health Sciences Centre – Kingston General	Teaching	59,739	18,103	30.3%
5	63	Windsor	Windsor Regional Hospital – Ouellette Campus	Very high-volume	55,064	16,560	30.1%
6	15	Ottawa	The Ottawa Hospital – Civic Campus	Teaching	82,240	22,347	27.2%
7	35	Windsor	Windsor Regional Hospital – Metropolitan	Very high-volume	59,718	16,075	26.9%
8	28	Hamilton	St. Joseph's Healthcare Hamilton – Charlton Campus	Very high-volume	64,999	17,441	26.8%
9	30	Toronto	University Health Network – Toronto Western	Teaching	63,105	16,483	26.1%
10	11	Ottawa	The Ottawa Hospital – General Campus	Teaching	86,981	22,001	25.3%
155	144	Chesley	South Bruce Grey Health Centre – Chesley	Low-volume	6,848	261	3.8%
156	113	Minden	Haliburton Highlands Health Services – Minden	Low-volume	15,352	577	3.8%
157	93	Petrolia	Bluewater Health – Petrolia	Low-volume	19,732	678	3.4%
158	107	Almonte	Almonte General Hospital	Low-volume	16,123	551	3.4%
159	129	Seaforth	Seaforth Community Hospital	Low-volume	10,989	364	3.3%
160	137	Blind River	North Shore Health Network – Pavillon	Low-volume	10,312	338	3.3%
161	157	Richards Landing	North Shore Health Network – Richard's Landing	Low-volume	3,332	104	3.1%
162	131	Cochrane	Lady Minto Hospital	Low-volume	10,789	317	2.9%
163	164	Hornepayne	Hornepayne Community Hospital	Low-volume	1,591	36	2.3%
164	111	Deep River	Deep River and District Hospital	Low-volume	15,552	318	2.0%



Top ten



Bottom ten

Data Source: National Ambulatory Care Reporting System (NACRS).

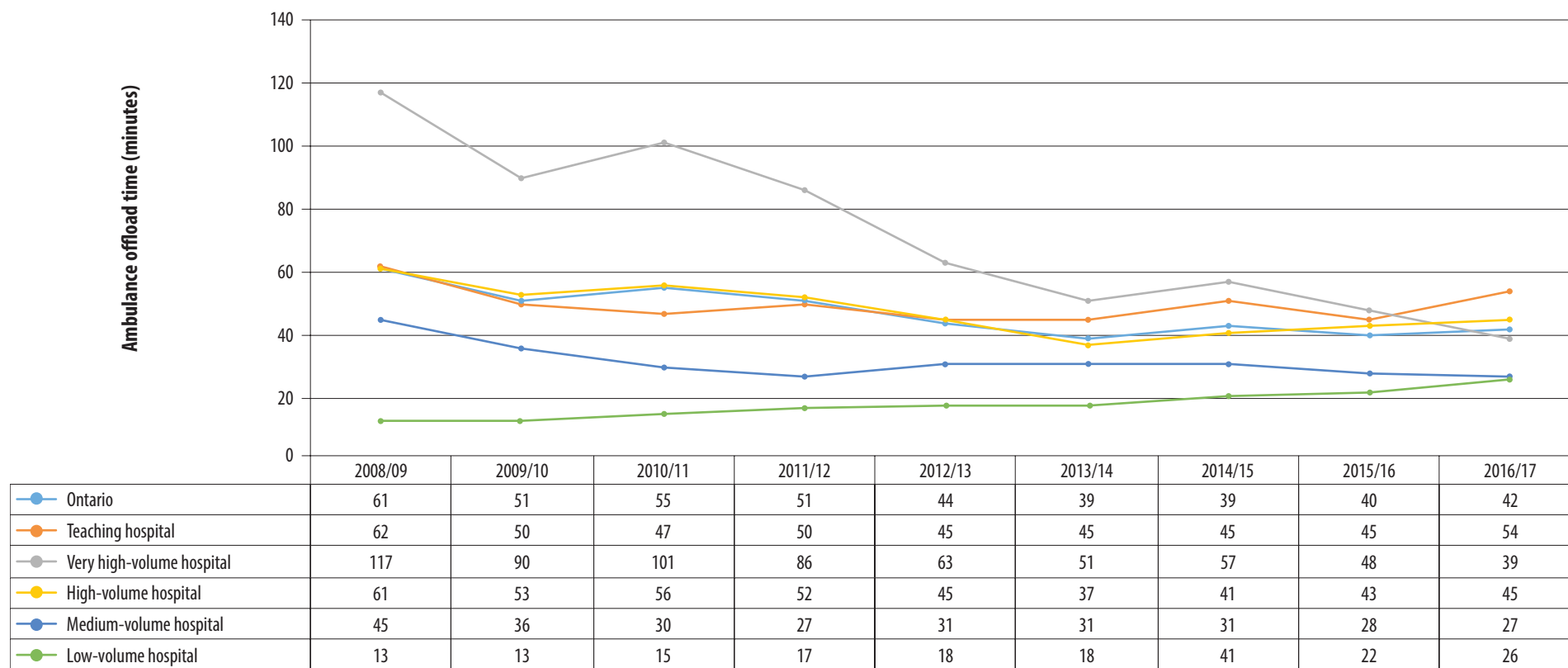
SECTION 7: EMERGENCY DEPARTMENT UTILIZATION

Ambulance offload time

Ambulance offload time (AOT) is the time it takes from when an ambulance arrives at the hospital to when patient care is transferred from paramedics to hospital staff. AOT is calculated as the time between T6 and T6.5 in Figure 6.1 in this report. Figure 7.3 below shows the 90th percentile AOT for all of Ontario and for select, previously described hospital types between fiscal years 2008/09 and 2016/17. The 90th percentile AOT in Ontario decreased from 61 minutes in 2008/09 to 42 minutes in 2016/17. This means that in 2016/17, the transfer of care between an ambulance and the hospital was completed in 42 minutes or less for 90 percent of visits.

The 90th percentile AOT decreased for all hospital types, with the exception of low-volume hospitals. The largest decrease in AOT was observed for very high-volume hospitals.

Figure 7.3: 90th percentile ambulance offload time, fiscal year 2008/09 to 2016/17



Data Source: Access to Care, Cancer Care Ontario.

Section 8: Air ambulance utilization

This section provides information on Ontario's air ambulance program including responsibilities, service locations, and analysis of transport volumes by fiscal year.

SECTION 8: AIR AMBULANCE UTILIZATION

The ministry provides funding to Ornge, a corporation governed by an independent board of directors, to operate Ontario's air ambulance program. Ornge is responsible for all air ambulance operations including contracting flight service providers, medical oversight of air paramedics, air dispatch, and authorizing air and land ambulance transfers. Under Ornge's performance agreement, it must uphold the aviation requirements established by Transport Canada and the Ontario government's standards and requirements for air operators, as enforced by the Ministry of Natural Resources and Forestry.

Ontario's air ambulance program provides the following services:

AIR AMBULANCE FLIGHTS

Ornge and a pool of five certified air ambulance Standing Agreement (SA) carriers provide scene calls and inter-facility transports across Ontario.

CCLA

Ornge performs CCLA transports and provides funding to the Toronto Paramedic Services (TPS) to operate a companion program called the Critical Care Transport Unit (CCTU).

ORNGE COMMUNICATIONS CENTRE (OCC)

This centre coordinates all requests for transports that require an asset from Ornge, or one of the SA carriers.

BASE HOSPITAL FUNCTION

Provides medical direction and advice, paramedic aero-medical certification and training, air quality assurance, continuing education, and patient care guidance to air ambulance paramedics.

ORGAN RECOVERY SERVICES

Ornge is contracted through the Ontario Trillium Gift of Life Network to recover organs from hospitals for transplants, and to transport physicians who assist with organ recovery.

PROVINCIAL TRANSFER AUTHORIZATION CENTRE (PTAC)

Operated by Ornge, the PTAC screens and authorizes inter-facility patient transfers in the province to help control the spread of infectious diseases.

Key findings

- Ornge operates Ontario's air ambulance program out of nine air bases and three land bases across the province.
- In fiscal year 2016/17, Ornge completed 20,830 transports. Approximately 97 percent were patient transports, and the rest were organ transports between facilities (Table 8.2).
- Approximately half of Ornge transports were deemed "emergency", the highest priority level, from fiscal year 2012/13 to 2016/17. Over a quarter were considered "non-urgent" during the same period (Figure 8.1).
- Over 60 percent of Ornge transports originated in northern Ontario (calculated from data in Figure 8.4).

Service delivery model

Ornge delivers air ambulance services through the combined resources of its own aviation fleet and a pool of contracted SA carriers. Currently, Ornge has contracts with five SA carriers that perform fixed-wing patient transports on a fee-for-service basis. All contracted SA carriers are certified air ambulance operators capable of performing fixed-wing transport services with primary and/or advanced level care. SA carriers perform both non-urgent and urgent/emergent transfers with access to 16 aircrafts across six locations, including Northern Ontario.

Service locations

Ornge service teams operate out of nine air bases and three land bases across Ontario. Table 8.1 shows the locations of Ornge's air, **CCLA** and **paediatric** service teams as well as the level of care they are qualified to provide.

Ornge's CCLA program provides inter-facility transfers for critically ill, but stable, patients where the level of care required is greater than that available through municipal ambulance services.

Ornge's Paediatric Transport Team consists of paramedics and nurses specially trained to take care of patients under the age of 18.

SECTION 8: AIR AMBULANCE UTILIZATION

Table 8.1: Ornge base locations, services and designated levels of care

Bases	Service teams	Designated level of care
Ottawa	Rotor-wing	CCP
Ottawa	CCLA	CCP
Toronto	Rotor-wing	CCP
Mississauga	CCLA and paediatric	CCP
TPS (Ornge sub-contract)	CCLA	CCP
Peterborough	CCLA	CCP
London	Rotor-wing	CCP
Sudbury	Rotor-wing	CCP
Timmins	Fixed-wing	CCP
Moosonee	Rotor-wing	PCP
Thunder Bay	Fixed-wing and rotor-wing	CCP
Sioux Lookout	Fixed-wing	CCP
Kenora	Rotor-wing	ACP

Air ambulance transports

In the 2016/17 fiscal year, Ornge completed 20,830 transports. The bulk of these requests (96.9 percent) were to transport a patient, and the remaining 3.1 percent were to transport organs between facilities. The total number of transports Ornge completed increased 14.9 percent between fiscal year 2012/13 and 2016/17 (Table 8.2).

Table 8.2: Number of transports, fiscal year 2012/13 to 2016/17

Fiscal year	Patients	Organs	Total
2012/13	17,832	302	18,134
2013/14	17,603	324	17,927
2014/15	18,035	447	18,482
2015/16	18,330	408	18,738
2016/17	20,181	649	20,830

Data Source: Ornge Computer Aided Dispatch System (Flight Vector)

Transports by priority level

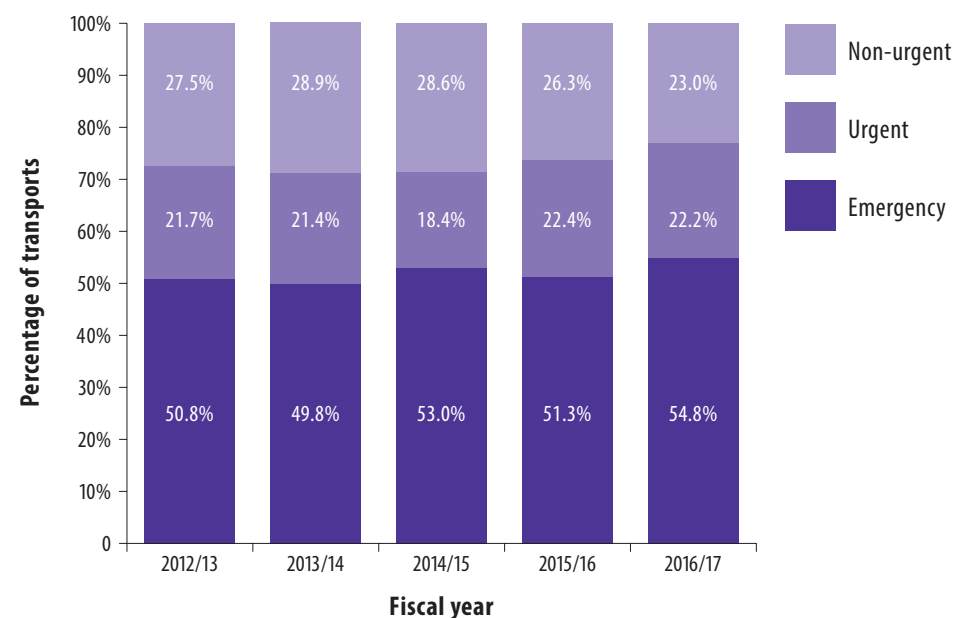
Transports are prioritized as either non-urgent, urgent, or emergency. Figure 8.1 illustrates the transport volume by level of urgency. Approximately 50 percent of all transports were classified as “emergency” from fiscal year 2012/13 to 2016/17.

Non-urgent: Scheduled or routine transports

Urgent: Non-life threatening, but prompt transport required

Emergency: Life or limb-threatening condition or a medically unstable patient

Figure 8.1: Transport volume by urgency, fiscal year 2012/13 to 2016/17



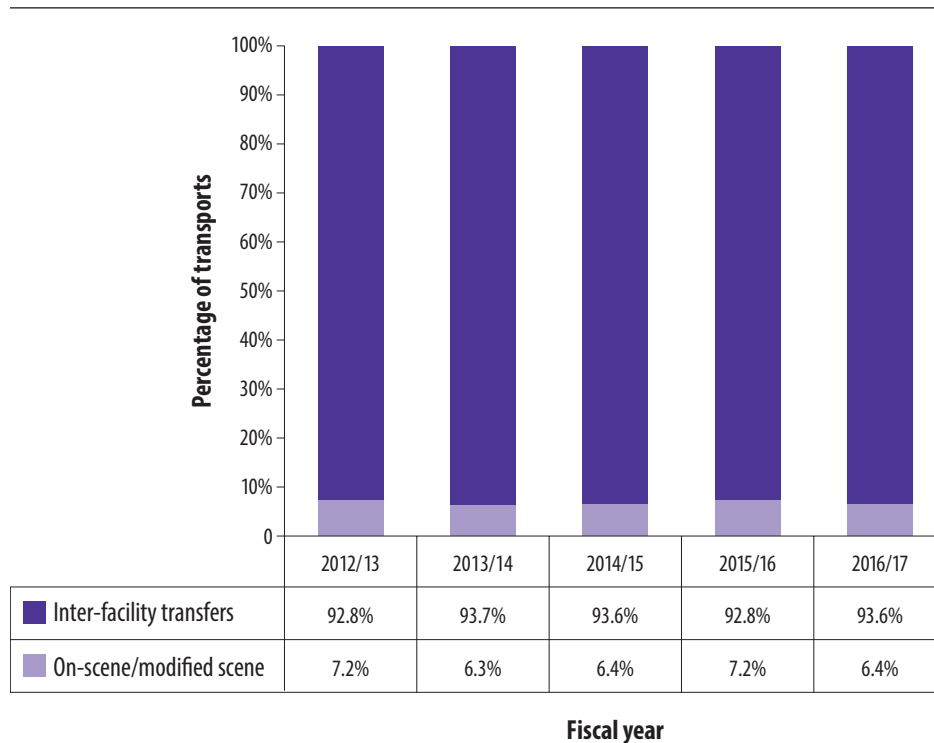
SECTION 8: AIR AMBULANCE UTILIZATION

Transports by type

The majority of all transports are inter-facility transfers, meaning a patient is transported between two healthcare facilities. The remaining transports are classified as on-scene or modified scene. On-scene response occurs when Ornge is dispatched directly to a scene in order to transport a patient to a provincial trauma centre as quickly as possible.

Modified scene response occurs when Ornge is dispatched to a scene where the local land ambulance has already begun transporting the patient to a hospital. The air ambulance may then follow the land ambulance to a nearby landing site to transport the patient, if needed. Figure 8.2 illustrates air ambulance transport volume by type.

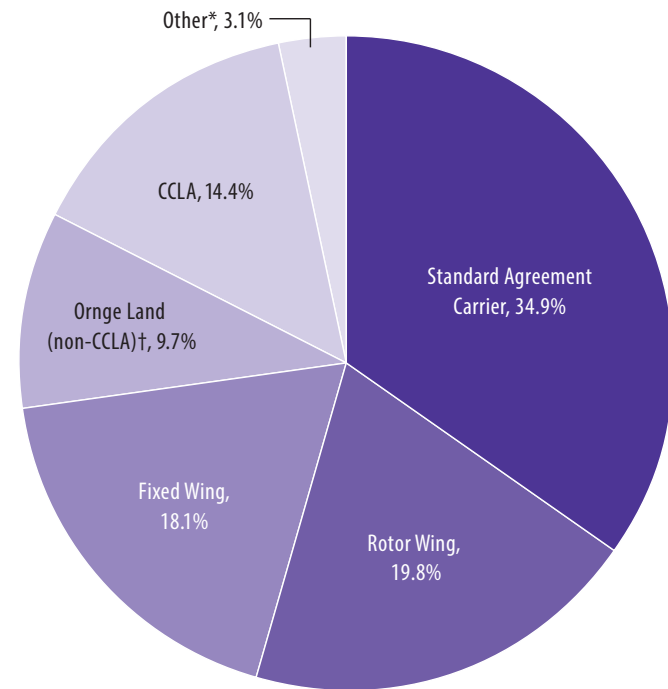
Figure 8.2: Transport volume by type, fiscal year 2012/13 to 2016/17



Transports by method

Over one third of Ornge dispatched transports were performed by SA carriers in fiscal year 2016/17. Approximately 23 percent of the transports were on land and conducted by Ornge's CCLA program and non-CCLA land vehicles¹. Figure 8.3 shows the methods used to transport organs and patients during the 2016/17 fiscal year.

Figure 8.3: Ornge transports by method, fiscal year 2016/17



† Seven vehicles are used for a variety of circumstances in a backup or supplementary capacity at existing air ambulance bases in Toronto, London, Sudbury, Sioux Lookout, and Thunder Bay.

* Other methods include transports by contract organ carriers (2.2%), scheduled flights (<0.1%), local land paramedic service with Ornge medics (0.8%), and Manitoba Life flights (0.1%)

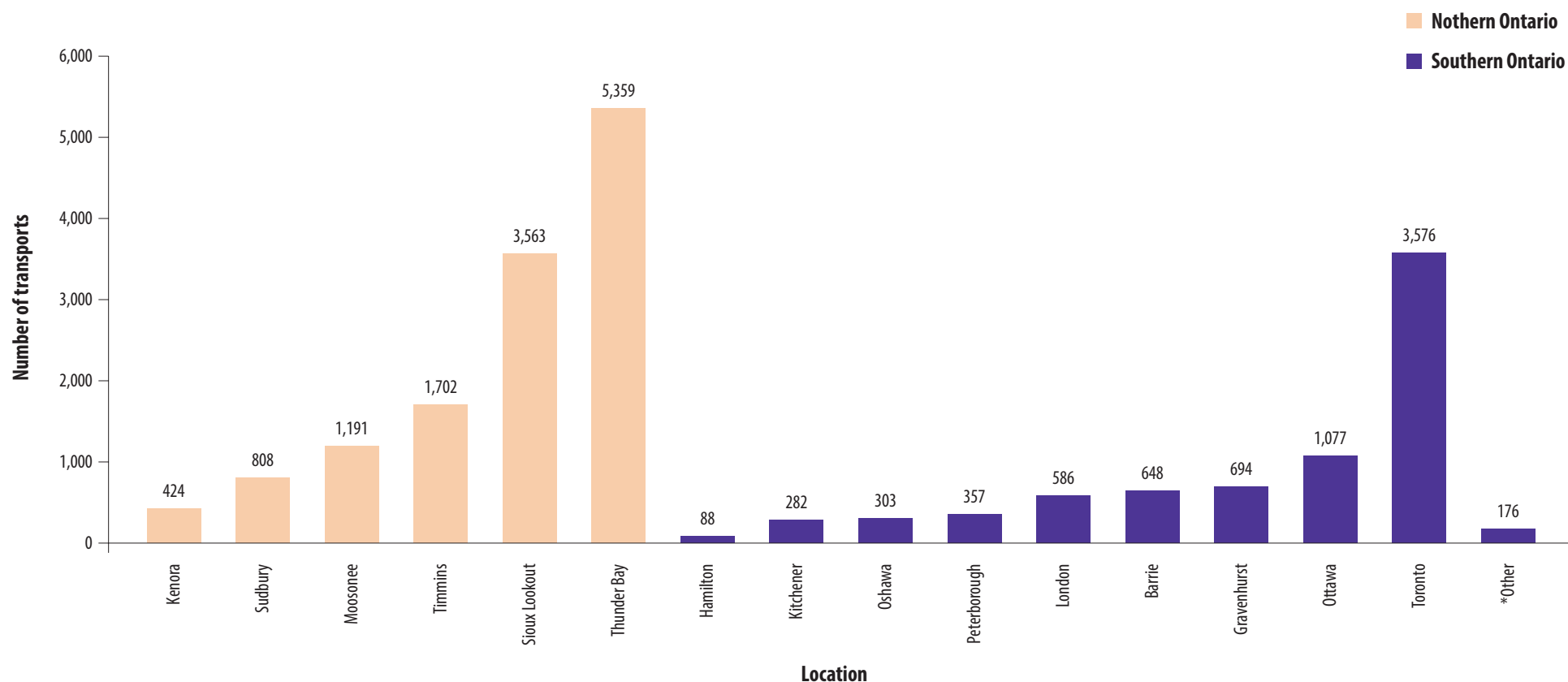
Data Source: Ornge Computer Aided Dispatch System (Flight Vector). **1.** Ornge has seven vehicles in a backup or supplementary capacity at existing air ambulance bases in Toronto, London, Sudbury, Sioux Lookout, and Thunder Bay.

SECTION 8: AIR AMBULANCE UTILIZATION

Transports by region

Air ambulance transports were analyzed by the region of origin. In 2016/17, nearly 63 percent of Ornge's transports originated from a base in northern Ontario. Figure 8.4 shows the number of transports Ornge conducted from each region. The orange and purple bars represent Ornge bases in northern and southern Ontario, respectively.

Figure 8.4: Transport volume (land and air) by region, fiscal year 2016/17



*Other includes Local EMS (167), Scheduled flights on commercial carriers (6), Out of province (3).

Data Source: Ornge Computer Aided Dispatch System (Flight Vector).

Appendix A: Methodological notes and data sources

Methodological notes

This report uses data from multiple sources, as described below. As land and air ambulance dispatch data do not capture patient health card number, it is not possible to track patients throughout their journey from 911 call to treatment in an ED.

Data sources

Described below are some of the key data sources used in this report, by section

Section 2: Emergency health services funding

Integrated Financial Information System (IFIS)

IFIS is an enterprise-wide financial system used to obtain year-end/year-to-date actuals, financial commitments and obligations, procurements, and allocations.

Section 3: Resources

Ambulance Service Identification Card Program

This source includes information on each emergency medical attendant, paramedic, and ambulance communications officer in Ontario. These data were used to identify the number of paramedics and communications officers in addition to their type of employment (part-time, full-time), age and sex.

Annual Service Plans

Information on patient demographics, number of paramedics and paramedic fleet type submitted by municipalities and designated delivery agents to the ministry.

Ornge Computer Aided Dispatch System (Flight Vector)

Flight Vector includes administrative, clinical, demographic and transport data such as destination, asset used and level of care provided by the flight paramedic.

Section 4: Regulation and oversight

Ambulance Service Review Program (ASR)

ASR is a web-based tool that captures inspection and certification data for land ambulance services.

Section 5: Patient characteristics

National Ambulatory Care Reporting System (NACRS)

NACRS contains administrative, clinical and demographic data for ambulatory care services (emergency departments, day procedures, outpatient clinics) in Ontario hospitals. The analyses in this report were limited to unscheduled emergency department visits.

Section 6: Land ambulance dispatch and patient transports

Ambulance Dispatch Reporting System (ADRS)

ADRS is a web-based application that houses administrative and demographic data on ambulance calls received by Ontario's CACCs.

Section 7: Emergency department utilization

National Ambulatory Care Reporting System (NACRS)

As described for Section 5.

Section 8: Air ambulance utilization

Ornge Computer Aided Dispatch System (Flight Vector)

As described for Section 3.

Appendix B:

Key terms and abbreviations

APPENDIX B: KEY TERMS AND ABBREVIATIONS

Key Terms

Advanced Care Paramedic (ACP): Paramedics who have completed additional education and training beyond that of a Primary Care Paramedic. They are certified under a base hospital medical director to perform additional controlled acts and advanced medical directives.

Ambulance Communications Officer (ACO): Ambulance Communications Officers work in ambulance communications centres and receive and process 911 emergency and non-emergency requests for ambulance services.

Ambulance offload time (AOT): The time it takes for patient care to be transferred from the ambulance to the hospital. Calculated as the time between when the ambulance arrives at the hospital (Time 6 in Figure 6.1) and the time when transfer of care is complete (Time 6.5 in Figure 6.1).

Ambulance service response time: The time it takes for an ambulance to arrive on scene. Calculated as the time between when the ambulance is on route (Time 3 in Figure 6.1) and when it arrives on scene (Time 4 in Figure 6.1).

Base hospital: Base hospitals train and oversee land paramedics by monitoring their patient care, providing medical direction, and continuing their medical education.

Canadian Triage and Acuity Scale (CTAS): The Canadian Triage and Acuity Scale is a tool used to prioritize the urgency of a patient's required care. Patients are triaged according to the type and severity of their presenting symptoms.

Critical care land ambulance (CCLA): Ornge's CCLA program provides responsive and safe inter-facility transfers for critically ill, but stable, patients where the level of care required is greater than that available through municipal ambulance services.

Critical Care Paramedic (CCP): Paramedics who have completed additional education and training beyond that of an Advanced Care Paramedic. They are certified under a base hospital medical director to perform additional controlled acts and advanced medical directives.

Dedicated offload nurses program: Dedicated nurses in hospital emergency departments responsible for offloading patients from ambulances to reduce ambulance offload time and allow paramedics to be available to respond to other calls.

Designated delivery agent (DDA): Agent responsible for providing land ambulance services in a given geographic area.

Dispatch standard response time: The time it takes for an ambulance to be dispatched. Calculated as the time between when a request for service is received (Time 0 in Figure 6.1) and an ambulance is dispatched (Time 2 in Figure 6.1).

Frequent users: Patients who made 12 or more visits to ED using an ambulance within a 12 month period.

APPENDIX B: KEY TERMS AND ABBREVIATIONS

Local Health Integration Network (LHIN): Agencies established by the MOHLTC in 2006 that plan, fund, and manage health services locally. Ontario's 14 LHINs are:

- 1 – Erie St. Clair (ESC)
- 2 – South West (SW)
- 3 – Waterloo Wellington (WW)
- 4 – Hamilton Niagara Haldimand Brant (HNHB)
- 5 – Central West (CW)
- 6 – Mississauga Halton (MH)
- 7 – Toronto Central (TC)
- 8 – Central (C)
- 9 – Central East (CE)
- 10 – South East (SE)
- 11 – Champlain (CH)
- 12 – North Simcoe Muskoka (NSM)
- 13 – North East (NE)
- 14 – North West (NW)

Ornge: Ornge is a non-profit body responsible for all air ambulance operations including the contracting of flight service providers, medical oversight of all air paramedics, air dispatch and authorizing air and land ambulance transfers.

Paediatric service team: Ornge's paediatric transport team, comprised of paramedics and nurses specially trained to take care of patients under the age of 18.

Per population rate: For the purpose of this report, the number of individuals who visited an emergency department divided by the total population (LHIN, or province) then multiplied by 1,000. Rates can be interpreted as X number of individuals visited an emergency department for every 1,000 people. A per population rate allows for objective comparisons across geographies.

Primary Care Paramedic (PCP): Paramedic who has completed a paramedic diploma program (or equivalent) and passed the provincial Advanced Emergency Medical Care Assistant theory exam. They are certified under a base hospital medical director to perform controlled acts.

Standing agreement (SA) carriers: Certified air ambulance operators capable of performing fixed-wing transport services with primary and/or advanced level of care.

Upper-tier municipality (UTM): A federation of local municipalities within a geographic border. Upper-tier municipalities provide services such as transit, policing and health and social services.

Abbreviations

ACO: Ambulance communications officer

ACP: Advanced care paramedic

ADRS: Ambulance Dispatch Reporting System

AOT: Ambulance offload time

CACC: Central ambulance communications centre

CCLA: Critical care land ambulance

CCP: Critical care paramedic

CTAS: Canadian Triage and Acuity Scale

DDA: Designated delivery agent

ED: Emergency department

EHRAB: Emergency Health Regulatory and Accountability Branch
(Ministry of Health and Long-Term Care)

EHS: Emergency health services

ERV: Emergency response vehicle

HAB: Health Analytics Branch (Ministry of Health and Long-Term Care)

LHIN: Local Health Integration Network

MOHLTC: Ministry of Health and Long-Term Care

OCC: Ornge Communication Centre

PCP: Primary care paramedic

PTAC: Provincial Transfer Authorization Centre

SA: Standing agreement carriers

TPS: Toronto Paramedic Services

UTM: Upper-tier municipality

Appendix C:

Supplementary tables and figures

APPENDIX C: SUPPLEMENTARY TABLES AND FIGURES

Table C.1 below assigns each LHIN to an ambulance service and is the inverse of Table 3.3. Rows highlighted in orange represent ambulance services that cross LHIN boundaries.

Table C.1: LHIN by ambulance services.

Ambulance service	LHIN	Ambulance service	LHIN	Ambulance service	LHIN
Algoma District	North East	Essex-Windsor	Erie-St.Clair	Norfolk	South West
Beausoleil First Nation	North Simcoe Muskoka	Greater Sudbury	North East	Norfolk County	Hamilton Niagara Haldimand Brant
City Of Ottawa	Champlain	Guelph-Wellington	Waterloo Wellington	North Bay	North East
City of Kawartha Lakes	Central East	Haldimand	Hamilton Niagara Haldimand Brant	Northwest	North West
City of Toronto	Central West Mississauga Halton Toronto Central Central Central East	Haliburton	Central East LHIN	Oneida	South West
Cochrane District	North East	Halton Region	Hamilton Niagara Haldimand Brant Mississauga Halton	Parry Sound	North East
Cornwall S.D. & G.	Champlain	Hamilton	Hamilton Niagara Haldimand Brant	Peel Region	Central West Mississauga Halton
County Of Northumberland	Central East	Hastings-Quinte	South East	Perth County	South West
County of Brant	Hamilton Niagara Haldimand Brant	James Bay	North East	Peterborough	Central East
County of Bruce	South West	Lambton	Erie-St.Clair	Rainy River	North West
County of Frontenac	South East	Lanark County	South East Champlain	Rama Mnjikaning	North Simcoe Muskoka
County of Grey	South West	Leeds Grenville	South East	Sensenbrenner Hospital	North East
County of Huron	South West	Manitoulin-Sudbury	North East	Simcoe	North Simcoe Muskoka
County of Lennox and Addington	South East	Mattawa General Hospital	North East	Six Nations	Hamilton Niagara Haldimand Brant
County of Oxford	South West	Medavie – Chatham Kent	Erie-St.Clair	Superior North	North West
County of Renfrew	Champlain	Medavie – Elgin	South West	Temagami	North East
District of Sault Ste. Marie	North East	Middlesex-London	South West	Timiskaming	North East
Dufferin	Central West	Muskoka	North Simcoe Muskoka	United Counties of Prescott-Russell	Champlain
Durham Region	Central East	Naotkamegwanning	North East	Waterloo	Waterloo Wellington
		Niagara	Hamilton Niagara Haldimand Brant	York Region	Central

*Mattawa General Hospital is subcontracted to provide ambulance services by the District of Nipissing. Sensenbrenner Hospital is subcontracted to provide ambulance services by the District of Cochrane.