Opioids in Peel:

A Profile of Opioid Use and Related Harms

2017

Region of Peel
working with you

Peel Health Status Report Objectives

Peel Region's Health Status Reports provide relevant, high quality information about Peel health matters and trends.

This report describes trends in opioid use, opioid-related emergency department visits, hospital admissions, and opioid-related deaths in Peel region. As the opioid epidemic evolves, local data are needed to inform policies and programs aimed at preventing and reducing opioid-related harms in Peel. The audience for this report includes Region of Peel staff, health-care practitioners, and community agencies.

Acknowledgments

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Message from the Medical Officer of Health

Jessica Hopkins, MD MHSc CCFP FRCPC

Across Canada we are faced with the challenging and critical public health issue of opioid use. Opioid use is associated with serious harms like addiction, overdose and death. The high number of avoidable deaths is having tragic consequences for individuals, families and communities.

An effective response requires an understanding of the issue. Peel Public Health is pleased to present this report, Opioids in Peel: A Profile of Opioid Use and Related Harms, 2017, which combines data from various sources to describe trends in opioid use, opioid-related emergency department visits, hospital admissions, and opioid-related deaths in Peel region. This report presents important data needed to understand the specific issues we are faced with in Peel region and inform potential actions to protect people from harms associated with opioid use.

Prescribing rates for opioids in Peel are high, consistent with provincial prescribing rates. This represents a large number of people who are at risk of harms related to opioid use, throughout the range of appropriate use, inappropriate use, and misuse.

Similar to other Ontario jurisdictions, Peel has seen an increase in opioid-related harms over the past two decades as measured by emergency room visits, hospitalizations and deaths, with a more rapid increase in the previous three years, particularly among males aged 25 to 44 years.

There is limited data on the use of illicit drugs. We know that 11% of Grade 7 to 12 Peel students reported having used opioids that were not prescribed for them. And we know that fentanyl, generally associated with illicit use, has been detected in a high proportion of opioid overdose deaths in Peel (39% of 2016 overdose deaths).

These findings, along with additional monitoring and data analysis, and the experience of our community partners, will help ensure that we are considering and implementing the most appropriate interventions to prevent opioid misuse and harms in Peel.

Peel Public Health is committed to providing leadership, guidance and coordination to our collective efforts in Peel region. While the opioid issue is complex, I strongly believe that by working together we will advance our common objectives of preventing and reducing harms related to opioid use in Peel.

Background

What are opioids?

Opioids are a family of related drugs. Some, such as morphine and codeine, occur naturally and are extracted from the opium poppy plant. Other opioids are artificially-created (synthetic) like fentanyl, or are derived from morphine, such as oxycodone, hydromorphone and heroin. Opioids vary in strength. Fentanyl, for example, is approximately 50 to 100 times stronger than morphine **(Table 1)**.[1]

Prescription opioids are primarily used to control pain. They can be beneficial for easing suffering in individuals near the end of life or managing cancer-related pain, as well as those dealing with short-term pain from injuries or after surgery. Opioids can also have negative effects, ranging from constipation and drowsiness to unconsciousness, respiratory depression (reduced breathing), and death.[1]

Table 1: Relative Strength of Opioids

Opioid	Strength (approximate morphine-equivalent)†
Fentanyl	50-100x
Hydromorphone	5x
Oxycodone	1.5x
Morphine	1
Codeine	0.15x

† Strength is not adjusted for dose or length of prescription.
Source: Health Quality Ontario. 9 Million Prescriptions: What we know about the growing use of prescription opioids in Ontario. Toronto: Queen's Printer for Ontario; 2017.

What is opioid addiction?

Anyone who takes opioids regularly will develop opioid tolerance and physical dependence. Regular use of opioids leads to changes in the nerves and brain that result in opioid tolerance (the need to take higher doses of opioids to achieve the same effect) as well as physical dependence (susceptibility to withdrawal symptoms because the body is unable to re-adapt to the absence of the drug). Withdrawal symptoms, which can include sweating, chills, nausea, vomiting, and insomnia, occur in individuals who have developed physical dependence when they reduce or stop taking opioids too quickly.[2]

Addiction is a chronic, relapsing disease. It occurs when a person cannot control the urge to use substances, such as opioids, despite negative consequences. Clinically, it is referred to as substance misuse disorder, and has symptoms that fall into four major categories: impaired control, social impairment, risky use, and pharmacological criteria (tolerance and withdrawal).[2]

Treatment options for opioid addiction include self-help, peer support, counselling and opioid maintenance therapy. Most of the time treatments from two or more of these categories are combined. Opioid maintenance therapy is used to treat opioid dependence and involves replacing an opioid such as heroin with a regular dose of a long-acting opioid (e.g., methadone or buprenorphine) to reduce cravings and withdrawal symptoms and improve function.[2]

Why all the attention now?

The number of deaths from opioid overdoses in Ontario has now surpassed deaths from motor vehicle accidents.[3, 4] Many of the opioid-related deaths involve younger adults, resulting in many potential years of life lost.[5] Prescription opioids, along with the illicit use of opioids, have culminated in a public health crisis in Canada with epidemic numbers of overdose deaths. Most importantly, all of these deaths are preventable.

In the late 1990s, opioids began to be used more aggressively to treat individuals with non-cancer-related chronic pain, including back pain, joint pain, and nerve pain. By 2015, Canada and the United States had the highest rates of opioid consumption in the world.[6] There has been growing concern about the safety of opioid medications, particularly when used to manage chronic non-cancer pain, and greater evidence suggesting that the risk of addiction to opioid medication is higher than previously thought.

Over the last two decades, as the number of prescriptions for opioids has steadily increased, there has been a parallel increase in the number of opioid-related deaths. Prior to 2012, oxycodone was the most common drug involved in opioid-related deaths in Ontario. In recent years, other opioids such as hydromorphone and heroin have also been increasingly implicated in fatal overdoses.[7] This situation is further compounded by the emergence of highly potent opioids like fentanyl and carfentanil in the illegal drug market.

As the opioid epidemic evolves, local data are needed to inform policies and programs aimed at preventing and reducing opioid-related harms in Peel. This report describes trends in opioid use, opioid-related emergency department visits, hospital admissions, and opioid-related deaths in Peel region.

An **opioid overdose** occurs when excessive amounts of opioids are taken. Opioids in high doses can result in slowed or stopped breathing (respiratory depression), decreased level of consciousness, and sometimes death.

Findings

Canada's opioid problem involves use of both prescription and non-prescription (including illicit) forms of the potent drugs. In a 2015 survey, 23% of adults in Ontario reported using prescription pain relievers in the past 12 months; 4% of adults reported using opioid pain relievers for non-medicinal purposes in the past 12 months.[8]

Since there are currently limited data on the use of illicit opioids in Peel region, this section focuses primarily on prescription opioid use.

Peel Students and Opioid Use

In 2015, 12% of Peel students (grades 7–12) reported having used opioid pain pills without a prescription in their lifetime and 11% reported use in the last 12 months.[9] These proportions were similar for Ontario. Family members were the most common source (52%) of opioid pain relief pills among Peel students who reported use in the last 12 months (Ontario: 56%).

One in five Peel students (20%) believed it is "fairly easy" or "very easy" to access non-medical opioid pain relief pills without a prescription (Ontario: 18%).[9] Approximately half of Peel students (48%) believed there is a "great risk" of harm associated with taking pain relief pills without a prescription.

Prescription Opioid Use

In 2014/15, nearly two million people in Ontario were dispensed an opioid, with a total of nine million dispense events.[10] Fifty-six percent of people dispensed an opioid had only a single dispense event.[10] Between 2012/13 and 2014/15, oxycodone and oxycodone compounds along with codeine and codeine compounds were the most commonly dispensed opioids in Ontario. During this time, the dispensing rates for these drugs remained stable while the number of prescriptions for hydromorphone, a stronger opioid, increased steadily.[10]

The geographic boundaries of Peel region are included in two Ontario Local Health Integration Networks (LHINs): Central West LHIN and Mississauga Halton LHIN. In 2014/15, Central West LHIN and Mississauga Halton LHIN had dispensing rates of 1,559 and 1,245 people dispensed an opioid per 10,000 population, respectively, which was similar to the provincial dispensing rate of 1,431 people per 10,000 population **(Table 2)**. The dispensing rate for hydromorphone and fentanyl patches (a form of prescribed fentanyl that releases a consistent dose of the drug over a long period of time) in both Central West LHIN and Mississauga Halton LHIN were well below the provincial rate. The overall opioid dispensing rate in Brampton was higher than in both Caledon and Mississauga.

In 2014/15, 41% of opioid recipients in Ontario had coverage under the Ontario Drug Benefit (ODB) program.[10] The ODB is a publicly-funded program that covers prescription drugs for Ontario residents over the age of 65, people on social assistance, people living in homes for special care and long-term care homes, people receiving professional home care

Table 2: Prescription Opioid Use by Type of Opioid and Local Health Intergration Network, Fiscal Year 2014/15

Type of Opioid	Dispensing Rate (number of individuals dispensed an opioid per 10,000 population)		
	Central West LHIN	Mississauga Halton LHIN	Ontario
All opioids†	1,559	1,245	1,431
Codeine and codeine compounds	683	574	691
Oxycodone and oxycodone compounds	359	336	381
Hydromorphone	94	81	168
Morphine	52	46	73
Fentanyl patches	14	12	24
Opioid maintenance therapy‡	19 (MMT) 4 (Suboxone®)	12 (MMT) 4 (Suboxone®)	31 (MMT) 8 (Suboxone®)

† Excludes opioid maintenance therapy.
‡ MMT: methadone maintenance therapy; Suboxone®: buprenorphine combined with naloxone
Source: Ministry of Health and Long-Term Care. Ontario Narcotics Atlas. Toronto, Ontario: Ontario Ministry of Health and Long-Term Care; December 2016.

services, and registrants in the Trillium Drug Program.[11] Among ODB recipients in 2015, the rate of people prescribed opioids, percent of high strength opioid recipients, and rate of people prescribed opioid maintenance therapy was lower in Peel than in Ontario as a whole.[12] Peel ranked 43rd, 48th, and 44th out of 49 counties in Ontario on these three measures, respectively.[12] Although there was not large differences in the rates of opioid recipients between the 25–44, 45–64, and 65+ age groups in Peel, the rate of people prescribed opioid maintenance therapy was highest among 25–44 year-olds compared to other age groups **(Table 3)**.

Table 3: Opioid Use among Ontario Drug Benefit Recipients by Age Group, Peel, 2015

Age Group (Years)	Rate of Opioid Recipients (recipients per 10,000 ODB eligible)	Rate of Opioid Maintenance Therapy Recipients (recipients per 10,000 ODB eligible)
0-24	473	32
25-44	1,595	284
45-64	2,047	79
65+	2,082	3

Source: The Ontario Drug Policy Research Network. Opioid Use and Related Adverse Events in Ontario. Toronto, Ontario: The Ontario Drug Policy Research Network; November 2016.

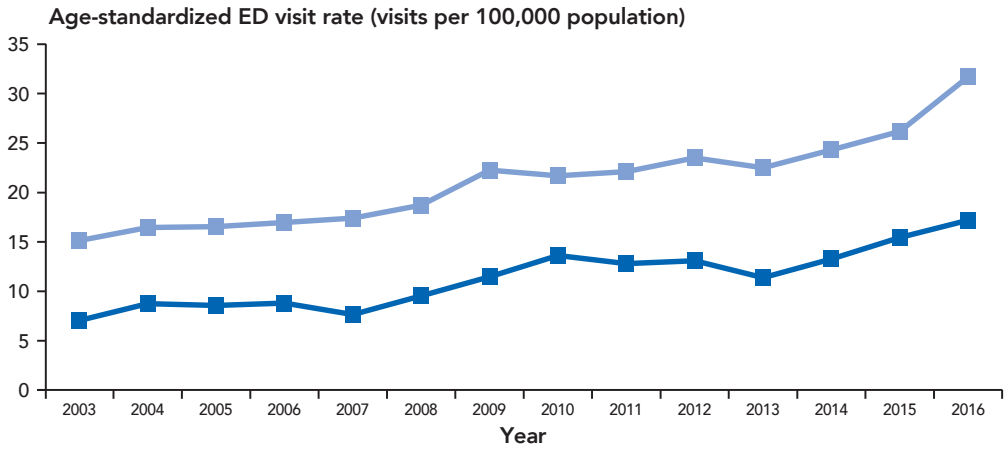
Opioid-Related Emergency Department Visits

Individuals visit the emergency department (ED) for a number of reasons related to using opioids, including poisoning (overdose), drug dependence, and withdrawal symptoms.

Since 2003, the rate of ED visits related to an opioid overdose has increased in Peel and in Ontario as a whole **(Figure 1)**. In 2016, there were 253 ED visits among Peel residents related to opioid overdoses for a rate of 17 ED visits per 100,000 population – this was just over half of Ontario's rate. The ED visit rates for opioid overdoses were similar across Brampton, Caledon, and Mississauga.

Figure 1

Emergency Department Visits related to Opioid Overdoses, Peel and Ontario, 2003-2016



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Peel	7.1	8.8	8.6	8.8	7.7	9.5	11.5	13.6	12.8	13.1	11.4	13.3	15.4	17.2
Ontario	15.1	16.5	16.5	17.0	17.4	18.7	25.3	21.7	22.1	23.5	22.5	24.3	26.2	31.7

Source: National Ambulatory Care Reporting System 2003-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
Population Estimates 2003-2015 and Projections 2016, Statistics Canada. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

In 2016, Peel's crude rate of ED visits related to opioid overdoses (17 ED visits per 100,000) was lower than public health units in Hamilton (53 ED visits per 100,000), Durham (41 per 100,000), Ottawa (25 per 100,000), Toronto (25 per 100,000) and Halton (22 per 100,000). However, over the past five years, Peel's ED visit rate has increased by 35%.

There were several important differences in the ED visit rate by age group and sex. Between 2014 and 2016, the median age of Peel residents visiting the ED related to an opioid overdose was 36 years, and males accounted for a larger proportion of visits than females **(Table 4)**. During this time, the ED visit rate among males aged 25 to 34 was higher than any other group and had increased by 31% **(Figure 2)**. The number of visits by municipality of residence closely reflects the population distribution in Peel region **(Table 4)**.

Between 2014 and 2016, nearly half of Peel's ED visits for opioid overdoses had an undetermined or unknown intent **(Table 4)**. Accidental overdoses accounted for 37% of Peel's ED visits for opioid overdoses which was similar to Ontario (40%).

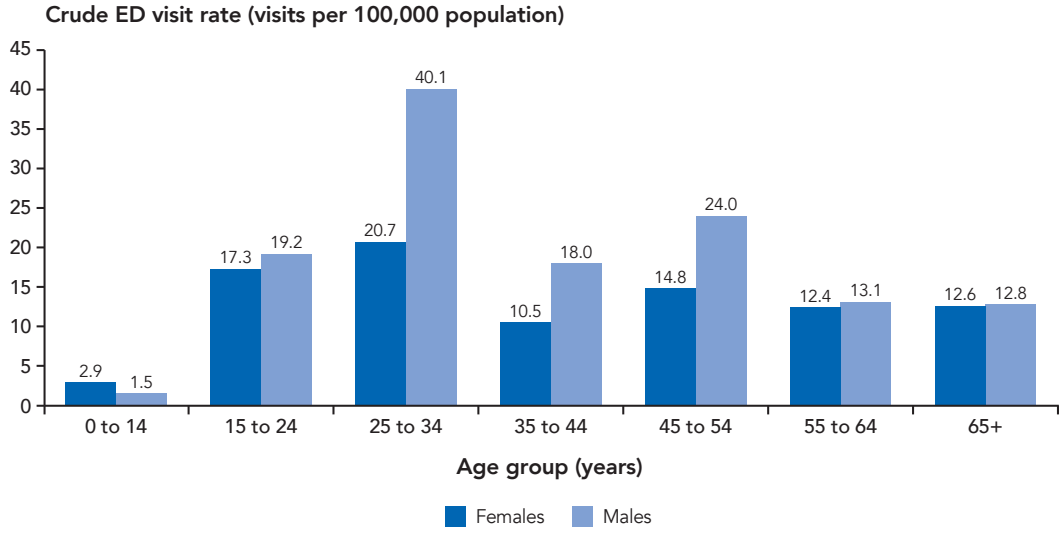
Table 4: Characteristics of Peel Residents Visiting the Emergency Department related to an Opioid Overdose, 2014-2016 Combined

Characteristic	Number of ED Visits (N=659)
Age (Median)	36 years
Male	381 (57.8%)
Residence	
Brampton	277 (42.0%)
Caledon	26 (4.0%)
Mississauga	356 (54.0%)
Intention to Overdose	
Accidental†	246 (37.3%)
Intentional (Suicide)	122 (18.5%)
Undetermined/ Unknown	291 (44.2%)

† Includes visits categorized as 'Accidental' or 'Therapeutic'
Source: National Ambulatory Care Reporting System 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Figure 2

Emergency Department Visits related to Opioid Overdoses by Age Group and Sex, Peel, 2014-2016 Combined



Source: National Ambulatory Care Reporting System 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
Population Estimates 2014-2015 and Projections 2016, Statistics Canada. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Among opioid overdose ED visits in Peel between 2014 and 2016, the most commonly reported drug was in the category of "other opioids" **(Table 5)**. This category includes drugs such as codeine, hydromorphone, morphine, and oxycodone. This information is collected through a combination of self-report and blood testing. A greater proportion of ED visits for overdoses in Peel involved heroin (19%) compared to Ontario (13%).

Table 5: Emergency Department Visits related to Opioid Overdoses by Drug, Peel and Ontario, 2014-2016 Combined

Suspected Drug	Peel		Ontario	
	Visits	%	Visits	%
Other opioids	330	50.1	6,300	55.6
Heroin	125	19.0	1,453	12.8
Other synthetic narcotics	79	12.0	1,345	11.9
Other and unspecified narcotics	69	10.5	1,374	12.1
Methadone	64	9.7	1,108	9.8
Opium	4	0.6	50	0.4

Notes: Multiple drugs can be included in a single visit - percent columns will not add up to 100.
Source: National Ambulatory Care Reporting System 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Not all opioid-related ED visits are for overdoses. Prolonged opioid use can cause physical dependence and withdrawal if use is discontinued. Between 2014 and 2016, in addition to 659 ED visits related to opioid overdoses, there were 874 ED visits for mental and behavioural disorders related to opioid use. ED visits for issues of withdrawal were the most common in both Peel and Ontario **(Table 6)**.

Table 6: Emergency Department Visits for Mental and Behavioural Disorders related to the Use of Opioids, Peel and Ontario, 2014-2016 Combined

Issue	Peel		Ontario	
	Visits	%	Visits	%
Withdrawal state	322	36.8	8,075	41.6
Harmful use	228	26.1	5,784	29.8
Dependence syndrome	201	23.0	4,117	21.2
Acute Intoxication	104	11.9	1,171	6.0
Other†	39	4.5	589	3.0

Notes: Multiple issues can be included in a single visit - percent columns will not add up to 100.
† 'Other' includes withdrawal with delirium, psychotic disorder, amnesic syndrome, residual and late-onset psychotic disorder, other mental and behavioural disorders, and unspecified mental and behavioural disorder.
Source: National Ambulatory Care Reporting System 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Quick Facts on Naloxone Distribution

The Peel Works Needle Exchange Program Mobile Van distributes naloxone (Narcan®), a safe and easy-to-use medication that blocks the effects of opioids and reverses an overdose. Data collected from March 2017 to September 2017 indicate that:

- **44% of 73 new clients use both prescription and illicit opioids, 38% use only illicit opioids, and 18% use only prescription opioids.**
- **Among clients who reported using illicit opioids, 85% reported using heroin, 35% reported using fentanyl, and 6% reported using oxycodone. 24% reported using both heroin and fentanyl.**
- **68% of clients inject their drugs.**
- **41% of clients experienced an overdose in the past year.**
- **63% of clients who returned for a naloxone re-fill reported that 911 was not called during the overdose where naloxone was administered.**

Narcan® is also available free of charge to the public through Peel pharmacies participating in the Ontario Naloxone Program for Pharmacies. Between June 2016 to June 2017, 1,205 naloxone kits were distributed by Peel pharmacies.

"Good Samaritan Act" Enacted to Protect Overdose Victims

In May 2017, Canada's Parliament passed the *Good Samaritan Drug Overdose Act*, which protects people from charges related to simple possession when they call 911, or remain at the scene after an overdose.

Opioid-Related Hospitalizations

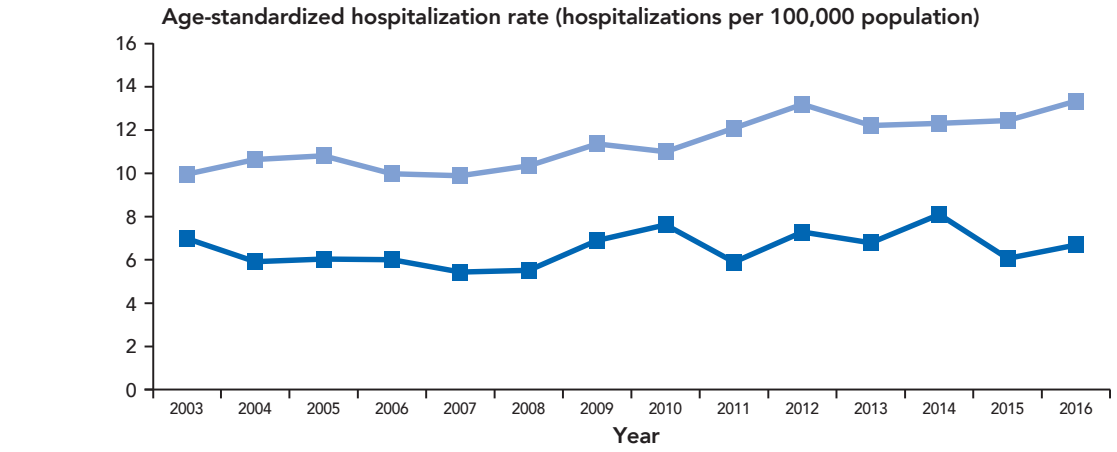
Hospital admissions may reflect more severe opioid-related harms compared to individuals who visit the ED and are treated without admission. While the rate of ED visits for opioid overdoses in Peel has increased since 2003, the opioid overdose hospitalization rate has remained stable **(Figure 3)**. In comparison, the Ontario opioid overdose hospitalization rate increased by 41%. In 2016, there were 96 hospitalizations among Peel residents related to opioid overdoses for a rate of seven hospitalizations per 100,000. This was approximately half of the provincial rate.

In 2016, the crude hospitalization rate in Peel for opioid overdoses (7 hospitalizations per 100,000) was lower than public health units in Hamilton (23 hospitalizations per 100,000), Durham (12 per 100,000), Halton (12 per 100,000), Ottawa (11 per 100,000), and Toronto (8 per 100,000). Over the past five years, the hospitalization rate among most health units has remained stable.

The hospitalization rate related to opioid overdoses was similar between Brampton, Caledon, and Mississauga. The median length of hospital stay for opioid overdose admissions in Peel was two days (range: 1 to 108 days).

Figure 3

Hospitalizations related to Opioid Overdoses, Peel and Ontario, 2003-2016



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Peel	7.0	5.9	6.0	6.0	5.4	5.5	6.9	7.6	5.9	7.3	6.8	8.1	6.1	6.7
Ontario	10.0	10.6	10.8	10.0	9.9	10.4	11.4	11.0	12.1	13.2	12.2	12.3	12.4	13.3

Source: In-Patient Database 2003-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
Population Estimates 2003-2015 and Projections 2016, Statistics Canada. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Characteristics of people who were hospitalized for opioid overdoses were similar to those who visited the emergency department. Between 2014 and 2016, males accounted for a larger proportion of Peel's overdose hospitalizations than females **(Table 7)**. The median age of hospitalized individuals was older than for individuals visiting the ED (47 years vs. 36 years), however, similar to ED visits, the hospitalization rates among males aged 25 to 34 years and 45 to 54 years were higher

than any other age group **(Figure 4)**. The proportion of opioid overdose hospitalizations was larger in Brampton than expected based on its population **(Table 7)**. Accidental overdoses accounted for 30% of Peel's overdose hospitalizations which was similar to Ontario (31%).

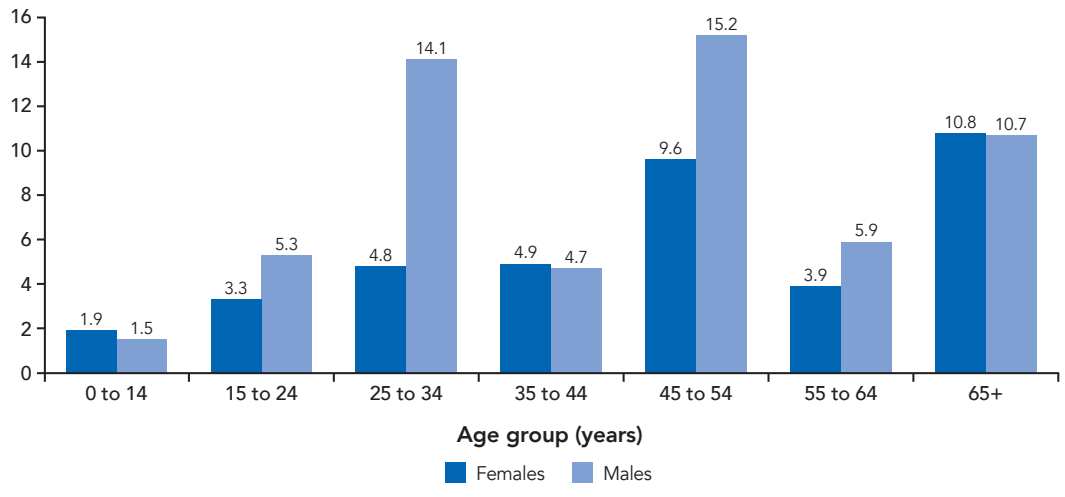
Table 7: Characteristics of Peel Residents Hospitalized related to an Opioid Overdose, Peel, 2014-2016 Combined

Characteristic	Number of Hospitalizations (N=289)
Age (Median)	47 years
Male	169 (58.3%)
Residence	
Brampton	146 (50.3%)
Caledon	7 (2.4%)
Mississauga	137 (47.2%)
Intention to Overdose	
Accidental†	88 (30.3%)
Intentional (Suicide)	40 (13.8%)
Undetermined/ Unknown	162 (55.9%)

† 'Accidental' includes hospitalizations categorized as 'Accidental' or 'Therapeutic'
Source: In-Patient Database 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Figure 4

Hospitalizations related to Opioid Overdoses by Age Group and Sex, Peel, 2014-2016 Combined



Source: In-Patient Database 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
Population Estimates 2014-2015 and Projections 2016, Statistics Canada. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Among Peel's hospitalizations related to opioid overdoses between 2014 and 2016, the most commonly reported drug was "other opioids" **(Table 8)**. Like ED visits, a greater proportion of Peel's hospitalizations involved heroin compared to Ontario as a whole.

Table 8: Hospitalizations related to Opioid Overdoses by Drug, Peel and Ontario, 2014-2016 Combined

Suspected Drug	Peel		Ontario	
	Hospitalizations	%	Hospitalizations	%
Other opioids	156	53.8	3,222	60.4
Other and unspecified narcotics	54	18.6	991	18.6
Methadone	36	12.4	627	11.7
Heroin	34	11.7	276	5.2
Other synthetic narcotics	20	6.9	421	7.9
Opium	1	0.3	27	0.5

Notes: Multiple drugs can be included in a single hospitalization - percent columns will not add up to 100.
Source: In-Patient Database 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Between 2014 and 2016, in addition to 289 hospitalizations related to opioid overdoses, there were 396 hospitalizations for mental and behavioural disorders related to the use of opioids.

Hospitalizations for "dependence syndrome" were the most common in both Peel and Ontario; however, Ontario had a larger proportion of hospitalizations for opioid dependence than Peel **(Table 9)**.

Table 9: Hospitalizations for Mental and Behavioural Disorders related to the Use of Opioids, Peel and Ontario, 2014-2016 combined

Issue	Peel		Ontario	
	Hospitalizations	%	Hospitalizations	%
Dependence syndrome	131	33.1	3,595	42.3
Harmful use	95	24.0	2,460	28.9
Acute Intoxication	85	21.5	865	10.2
Withdrawal state	84	21.2	1,520	17.9
Other†	33	8.3	344	4.0

Notes: Multiple issues can be included in a single hospitalization - percent columns will not add up to 100.
† 'Other' includes withdrawal with delirium, psychotic disorder, amnesic syndrome, residual and late-onset psychotic disorder, other mental and behavioural disorders, and unspecified mental and behavioural disorder.
Source: In-Patient Database 2014-2016, Canadian Institute for Health Information. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care

Quick Facts on Neonatal Abstinence Syndrome

Maternal opioid use during pregnancy can impact the health of a newborn. Neonatal abstinence syndrome (NAS) refers to the presence of withdrawal symptoms in newborns resulting from the maternal use of drugs that cause physical dependence, including opioids. Health outcomes associated with NAS include increased risk of birth complications (e.g., low birth weight), admission to the neonatal intensive care unit, and prolonged hospitalization.[13] Although opioids are not the only cause of NAS, 55-94% of newborns whose mothers were addicted to, or treated with, opioids while pregnant will develop NAS.[13, 14]

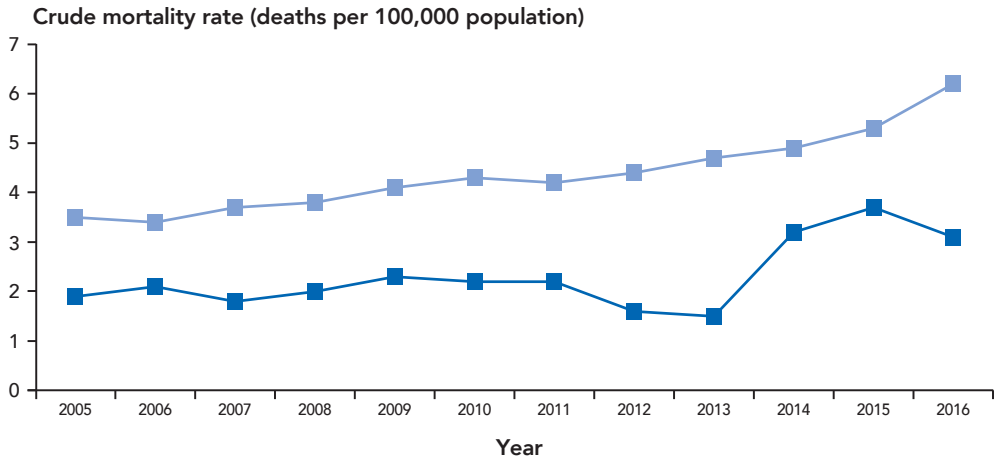
Between 2003 and 2016, the hospitalization rate due to NAS increased approximately three-fold in Peel and six-fold in Ontario. Peel's rate was consistently lower than Ontario's during that time period. In 2016, there were 31 hospitalizations due to NAS in Peel.

Opioid-Related Deaths

Peel's opioid-related mortality rate was stable between 2005 and 2013, but increased sharply in 2014 **(Figure 5)**. In 2016, there were 46 deaths in Peel involving opioids, alone or in combination with alcohol, compared to 21 deaths in 2013. In 2016, Peel's opioid-related mortality rate was lower than most surrounding public health units **(Table 10)**.

Figure 5

Opioid-Related Deaths, Peel and Ontario, 2005-2016



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Peel	1.9	2.1	1.8	2.0	2.3	2.2	2.2	1.6	1.5	3.2	3.7	3.1
Ontario	3.5	3.4	3.7	3.8	4.1	4.3	4.2	4.4	4.7	4.9	5.3	6.2

Notes: Data for 2016 are preliminary and subject to change.
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Interactive Opioid Tool. Toronto, ON: Queen's Printer for Ontario; 2017. Available from: http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/Opioid.aspx

Table 10: Opioid-Related Deaths and Mortality Rate by Public Health Unit, 2016

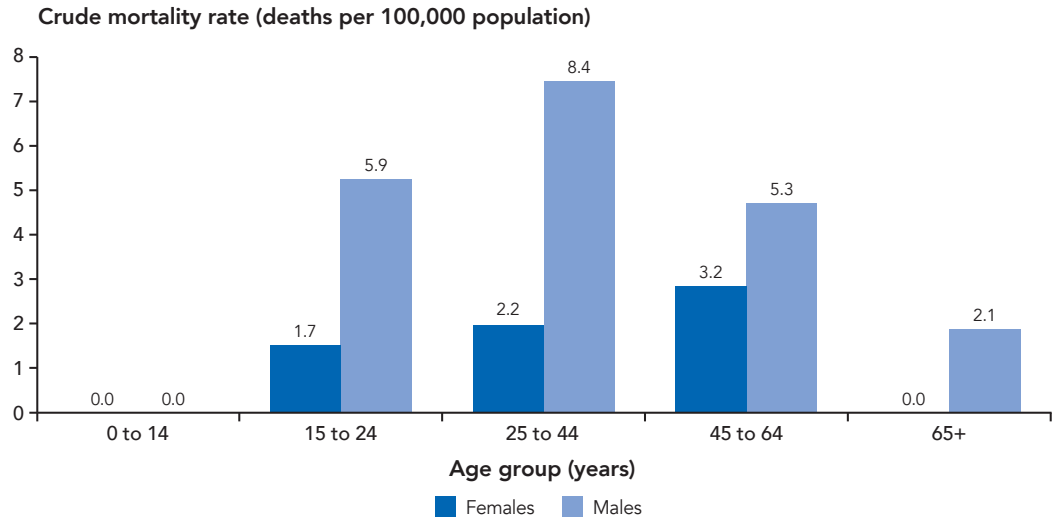
Public Health Unit	Number of deaths	Crude Mortality rate (deaths per 100,000 population)
Hamilton	52	9.2
Toronto	186	6.5
Durham	41	6.1
Halton	26	4.6
Ottawa	40	4.1
Peel	46	3.1
York	29	2.5

Notes: Data for 2016 are preliminary and subject to change.
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Interactive Opioid Tool. Toronto, ON: Queen's Printer for Ontario; 2017. Available from: http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/Opioid.aspx

Between 2007 and 2016, the opioid-related mortality rate in Peel was higher among males compared to females. This difference was especially pronounced from 2014 to 2016 when the overall mortality rate increased. Between 2014 and 2016, 73% of opioid-related deaths were male; the highest mortality rate was among males aged 25 to 44 years **(Figure 6)**. This is consistent with data from other jurisdictions, which raises questions about whether males are more likely than females to use drugs alone and not have someone present who can call 911 or seek care. The number of deaths in 25 to 44 year-old males increased from an average of eight per year between 2005 and 2013 to 16 deaths in 2014. In 2016, there were 13 deaths among males aged 25 to 44 years.

Figure 6

Opioid-Related Deaths by Age Group and Sex, Peel, 2014-2016 Combined



Notes: Data for 2016 are preliminary and subject to change.
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Interactive Opioid Tool. Toronto, ON: Queen's Printer for Ontario; 2017. Available from: http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/Opioid.aspx

Multiple drugs can be identified in a single overdose death. In 2015, 41% of opioid-related deaths in Ontario involved multiple opioid types.[5] Additionally, opioid-related deaths in Ontario involved other non-opioid drugs including benzodiazepine (51%), antidepressants (38%), and cocaine (32%).[5]

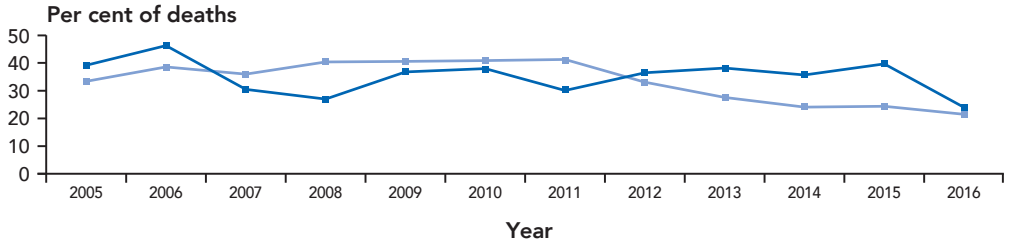
Among opioid-related deaths in Peel in 2016, fentanyl was the type of opioid most commonly detected following a toxicology screen; however, 61% of deaths involved other opioids **(Figure 7)**. In 2016, fentanyl was detected in 18 (39%) overdose deaths in Peel, 18 (34%) deaths in 2015, and in 14 (31%) deaths in 2014. Between 2005 and 2013, Peel averaged three deaths per year where fentanyl was detected.

The proportion of deaths involving oxycodone in Peel declined in 2016 after remaining stable for the previous 10 years. This is in comparison to provincial data where the proportion of deaths involving oxycodone in Ontario has steadily declined since 2011. Heroin has been detected in a higher proportion of Peel opioid-related deaths than in Ontario overall. In 2016, heroin was detected in 26% of overdose deaths in Peel compared to nine per cent in all Ontario overdose deaths.

Figure 7

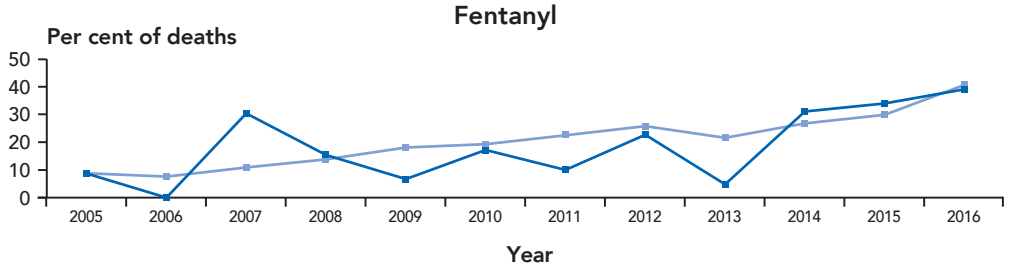
Proportion of Opioid-Related Deaths by Drug, Peel and Ontario, 2005-2016

Oxycodone



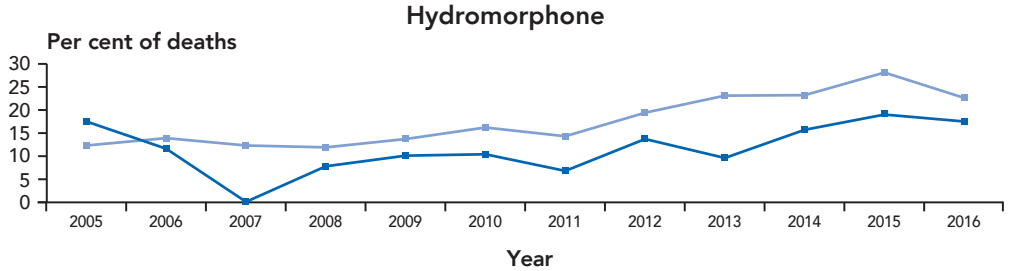
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Peel	39.1	46.2	30.4	26.9	36.7	37.9	30.0	36.4	38.1	35.6	39.6	23.9
Ontario	33.3	38.5	35.9	40.3	40.5	40.8	41.2	33.0	27.5	24.0	24.3	21.7

Fentanyl



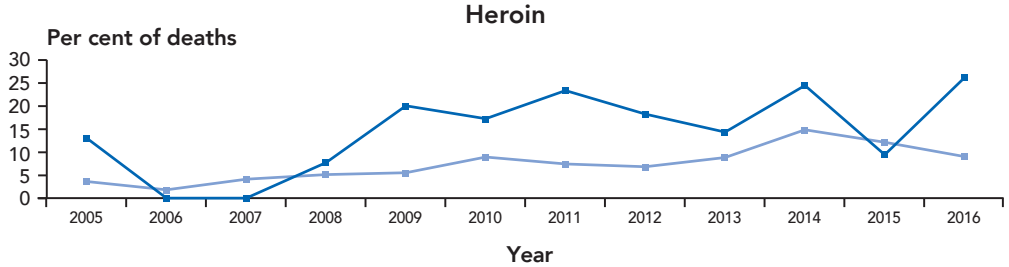
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Peel	8.7	0.0	30.4	15.4	6.7	17.2	10.0	22.7	4.8	31.1	34.0	39.1
Ontario	8.8	7.6	10.9	13.8	18.1	19.3	22.5	25.8	21.6	26.8	29.9	40.7

Hydromorphone



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Peel	17.4	11.5	0.0	7.7	10.0	10.3	6.7	13.6	9.5	15.6	18.9	17.4
Ontario	12.2	13.8	12.2	11.8	13.6	16.1	14.2	19.3	23.0	23.1	28.0	22.5

Heroin



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Peel	13.0	0.0	0.0	7.7	20.0	17.2	23.3	18.2	14.3	24.4	9.4	26.1
Ontario	3.6	1.8	4.1	5.1	5.5	8.9	7.4	6.8	8.8	14.8	12.1	9.0

Notes: 1) Data for 2016 are preliminary and subject to change. 2) Multiple drugs can be included in a single death.
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Interactive Opioid Tool. Toronto, ON: Queen's Printer for Ontario; 2017. Available from: http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/Opioid.aspx

Summary of Key Findings

- Opioid dispensing rates, which are one measure to indicate the potential for opioid dependence and related harms, are similar in Peel and Ontario. Dispensing of more potent opioids, hydromorphone and fentanyl patches, however, is low in Peel compared to provincial rates.
- Data on the use of illicit or other non-prescription opioids in Peel is limited, however, in 2015, 11% of Peel students in grades 7 to 12 reported having used opioid pain pills without a prescription in the previous 12 months. It is also known that fentanyl, generally associated with illicit use, has been detected in a much greater proportion of opioid overdose deaths in Peel beginning in 2014 – up to 39% (18 deaths) in 2016.
- Between 2014 and 2016, there were 1,533 emergency department (ED) visits in Peel for opioid-related overdoses or related mental/behavioural disorders such as withdrawal and dependence syndrome. Although measures of opioid-related harms (e.g., rates of ED visits, hospitalizations, and overdose deaths) are lower in Peel compared to Ontario, Peel has seen a marked increase in these measures since 2013, particularly among males aged 25 to 44 years.
- The rate of hospitalization for neonatal abstinence syndrome (newborn infants experiencing withdrawal from drugs, including opioids) in Peel increased three-fold between 2003 and 2016.
- From 2014 to 2016, 73% of opioid overdose deaths were in males, while males accounted for only 58% of patients visiting the emergency department for an opioid overdose. This is consistent with data from other jurisdictions, raising questions about whether males are more likely than females to use drugs alone and/or without someone present who can call 911 or seek care on their behalf.
- Additional monitoring is needed to further understand drug use and related harms in Peel region.
    - In 2012, there was an observed Canadian increase in the use of other more accessible drugs such as heroin. In Peel, the proportion of deaths involving oxycodone has remained relatively stable since 2012 compared to a marked decrease in oxycodone-related deaths in Ontario overall.
    - In Peel, a greater proportion of ED visits due to overdoses from 2014 to 2016 involved heroin (19%) compared to Ontario (13%).
- The emergent opioid problem is complex – it has linkages to public health, health care, human services, mental health, and criminal justice. Peel Public Health will continue to work with partners from across the region to develop a comprehensive opioid strategy for Peel aimed at maximizing health and minimizing harms for individuals and communities. The strategy will be based on federal and provincial frameworks[15,16] and encompass the four pillars of 1) prevention, 2) harm reduction, 3) treatment and 4) enforcement. Peel Public Health will also continue to participate in provincial and federal initiatives to ensure the needs of Peel residents are understood and addressed.

Data Sources and Limitations

Narcotics Monitoring System (NMS):

- Provides data on opioid dispensing (utilization)
- Data extracted from the Ontario Narcotics Atlas (2016)[10]
- Collects data for all monitored drugs, irrespective of whether the prescription is paid for through a publicly-funded program, private insurance, or out-of-pocket

Ontario Drug Benefit (ODB):

- Provides opioid dispensing (utilization) data for all individuals who are eligible for publicly-funded prescription drug coverage in Ontario
- Data extracted from the Opioid Use and Related Adverse Events in Ontario report (2016)[12]

National Ambulatory Care Reporting System (NACRS):

- Provides data for opioid-related emergency department (ED) visits
- Contains data on hospital-based and community-based ambulatory care including day surgery, outpatient and community-based clinics, and emergency departments
- ED visits for opioid poisonings (overdoses):
  - Includes unscheduled ED visits for opioid poisoning (all diagnosis types)
  - Includes ICD-10 codes T40.0 (poisoning by opium), T40.1 (poisoning by heroin), T40.2 (poisoning by other opioids), T40.3 (poisoning by methadone), T40.4 (poisoning by other synthetic narcotics), and T40.6 (poisoning by other and unspecified narcotics)
  - Excludes cases with a query/ suspected diagnosis (diagnosis prefix=Q)
- ED visits for mental and behavioural disorders related to the use of opioids:
  - Includes unscheduled ED visits for mental and behavioural disorders due to the use of opioids (all diagnoses)
  - Includes ICD-10 codes F11.0 (acute intoxication), F11.1 (harmful use), F11.2 (dependence syndrome), F11.3 (withdrawal state), F11.4 (withdrawal state with delirium), F11.5 (psychotic disorder), F11.6 (amnesic syndrome), F11.7 (residual and late-onset psychotic disorder), F11.8 (other mental and behavioural disorders), and F11.9 (unspecified mental and behavioural disorder)
  - Excludes cases with a query/ suspected diagnosis (diagnosis prefix=Q)
- Data include people who visit the ED and may not reflect the total burden in the population

Discharge Abstract Database (DAD):

- Provides opioid-related inpatient separation data (hospitalizations) from acute care hospitals
- Hospitalization data for opioid poisonings and mental and behavioural disorders due to the use of opioids are coded using the same ICD-10 codes that are used for ED visits
- Data include people who are hospitalized and may not reflect the total burden in the population

Public Health Ontario Interactive Opioid Tool:

- Provides data on deaths from opioid poisonings where opioid poisoning was considered as contributing to the cause of death
- Data are from the Ontario Opioid-Related Death database, Office of the Chief Coroner for Ontario

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