HAMILTON'S
COMMUNITY HEALTH
STATUS REPORT | 2024

Hamilton | hamilton.ca

LAND ACKNOWLEDGMENT FOR THE CITY OF HAMILTON

The City of Hamilton is situated upon the traditional territories of the Erie, Neutral, Huron-Wendat, Haudenosaunee and Mississaugas. This land is covered by the Dish With One Spoon Wampum Belt Covenant, which was an agreement between the Haudenosaunee and Anishinaabek to share and care for the resources around the Great Lakes. We further acknowledge that this land is covered by the Between the Lakes Purchase, 1792, between the Crown and the Mississaugas of the Credit First Nation.

Today, the City of Hamilton is home to many Indigenous people from across Turtle Island (North America) and we recognize that we must do more to learn about the rich history of this land so that we can better understand our roles as residents, neighbours, partners and caretakers.

MESSAGE FROM THE CITY OF HAMILTON'S MEDICAL OFFICER OF HEALTH

How healthy is our community? Where do we need to improve? Who is most impacted by poor health outcomes?

These are critical questions which we aim to answer in *Hamilton's Community Health Status Report.*

On behalf of Hamilton Public Health Services, I am proud to present this report, which raises awareness of current and evolving community health issues. The information in this report will help guide our work and inform broader discussions and decision-making across the community. It can help our community to prioritize resources, develop the most effective policies, advocate for funding, and measure our collective impact.

This report also serves as a call to action, urging us to collectively tackle the pressing health concerns it highlights.

Many of the health challenges our community faces are complex. They require innovation, collaboration, and action on multiple levels to address the factors that affect Hamiltonians' health. We need approaches that balance data and best practices with unique perspectives and expertise from across our community. That's an all-of-society approach. I am hopeful that this report will support that work.

This report was strengthened by consulting with local organizations that serve communities experiencing marginalization and disproportionate health outcomes. We listened to their voices to better understand the health information and how to share it in a meaningful way. I'm grateful to those who participated, for their valuable insights, their willingness to engage in difficult conversations, and their guidance on our journey toward using data to advance health equity.

You may notice that data about First Nations, Métis, and Inuit people in Hamilton are not included in this report. I want to acknowledge that this is because our organization did not engage with these communities early enough in our process to develop the report. We are working with Indigenous community partners to review the health status information available, and to ensure that any information used in Hamilton Public Health Services' work reflects their unique knowledge, experiences, and histories.

This engagement is essential when reporting on data about Indigenous communities and honours the principles of respect and self-determination. It is only after this engagement that Hamilton Public Health Services can proceed with any reporting as directed by and co-developed with Indigenous partners. I encourage you to review Hamilton Public Health Services' Indigenous Health Strategy[1], which recommends how we and other community organizations can better meet the needs of Indigenous people in Hamilton. The Strategy was developed based on results from a survey for community members and interviews with leaders of Indigenous organizations. We are grateful to those who contributed to the Strategy's development and review which will continue to guide Hamilton Public Health Services' work.

I extend my thanks to the staff involved in this process, from planning, through extensive analysis, to community engagement and beyond. Your contributions are deeply appreciated.

I hope that this report will help us better understand the health of our community and inspire us to work together to improve the health of Hamilton residents and promote health equity for all.

Sincerely,

Dr. Elizabeth Richardson
Medical Officer of Health, City of Hamilton Public Health Services

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

TABLE OF CONTENTS Continued

TABLE OF CONTENTS Continued

SUMMARY

Hamilton Public Health Services works to improve and protect the health and well-being of the whole population, in all their diversity. We focus on efforts to promote health, prevent disease and reduce the health differences between groups.

This report is part of our commitment to provide information so that as a community we can better understand the health of Hamiltonians. That includes the underlying social circumstances that influence health, such as education, housing, income, racism and social exclusion. By being better informed, and working together, we can improve health for all.

The following 10 themes highlight key findings from the report, including population health improvements, health inequities, changes in underlying population structure and continuing issues of public health concern for Hamilton residents.

1. OVER THE PAST DECADE, SPECIFIC POPULATION HEALTH IMPROVEMENTS HAVE OCCURRED FOR HAMILTONIANS.

Tobacco smoking continued to decrease in Hamiltonians. The percentage of current adult smokers decreased, more youth abstained from smoking and there was a substantial decline in smoking during pregnancy.

The Air Quality Health Index improved from 2015 to 2021. Fine particulate matter, which poses considerable health risks, declined from 2012 to 2021. However, fine particulate matter in Hamilton still exceeded levels where residents would be considered protected against chronic effects, and further improvements in air quality are needed to lower impacts on community health.

Chronic respiratory diseases showed positive improvements. New cases of chronic obstructive pulmonary disease declined substantially between 2011 to 2020. Further, new cases of lung cancer declined from 2010 to 2018, and premature deaths due to lung cancer declined from 2012 to 2021.

Hypertension improved in Hamilton due to a decline in new cases between 2011 to 2020. Historically, Hamilton has had higher rates of hypertension than Ontario as a whole, but this gap has now closed.

Teen pregnancy is linked to greater health and socioeconomic risks. Between 2009 to 2022, pregnancies among youth living in Hamilton declined by over 80% from 34.9 to 5.8 pregnancies per 1,000 female teens.

2. INEQUITIES PERSIST IN OUR COMMUNITY AS A MAJOR CONTRIBUTOR TO POOR HEALTH.

Some people in our community carry a heavier health burden than others. That is not due to choices or being unlucky, but due to unfair and unjust systems and social structures. Inequalities persist across many areas of health. They can be linked back to inequities in social circumstances involving education, gender, housing status, income, race, sexual orientation, and social supports.

Health inequities were observed for almost all topics. Some of the greatest inequities were found for substance use, self-harm, assault, and diabetes-related indicators. Income and housing needs were strongly associated with the inequities observed for these health outcomes. As an example, Hamiltonians living in areas with the lowest household incomes were nearly three times more likely to die from diabetes, nearly five times more likely to self-harm and nearly six times more likely to be assaulted.

3. HAMILTON'S POPULATION IS GROWING, BECOMING MORE DIVERSE AND AGING.

Hamilton has the fifth-largest population of all municipalities in Ontario. Our population of 605,842 in 2023 is projected to grow to an estimated 809,661 residents by 2046. One in four (25.1%) Hamilton residents identified as belonging to a racialized group in 2021, not including First Nations, Métis and Inuit. The proportion of racialized Hamiltonians has increased substantially since 2011 (15.7%). Seniors (age 65 and older) made up a larger proportion of the population in 2021 (18.3%) than children and youth under 15 years-old (16.0%); the senior population is the fastest growing age group in Hamilton.

4. MORE HAMILTONIANS ARE DYING PREMATURELY AND MANY OF THESE DEATHS ARE PREVENTABLE.

More than 1,900 Hamilton residents died prematurely (before age 75) in 2021, and nearly half of these deaths are considered preventable. Premature deaths lowered life expectancy at birth for Hamiltonians (81.3 years) compared to Ontarians overall (82.6 years) for those born between 2015-2017.

The top five causes of premature deaths for Hamiltonians in 2021 were ischemic heart disease, lung cancer, unintentional poisoning, colorectal cancer and chronic lower respiratory diseases. More Hamilton residents are dying prematurely compared to a decade ago, driven largely by the opioid drug crisis.

5. SUBSTANCE USE IS A MAJOR DRIVER OF PREVENTABLE DEATHS AMONG HAMILTONIANS.

Over 1,000 deaths are caused each year by tobacco (783 deaths), alcohol (208 deaths), and opioids (168 deaths) among Hamilton residents.

Although tobacco use is declining, it is still common throughout Hamilton with 1 in 6 adults being current tobacco smokers (over 75,000 adults). With the emergence and substantial rise in youth vaping rates, there is concern that the progress made to reduce tobacco smoking rates may stall or reverse.

Emergency department visits related to alcohol use among Hamiltonians (717.3 visits per 100,000 in 2018) increased prior to the COVID-19 pandemic and remains consistently greater than the Ontario average (604.6 visits per 100,000 in 2018).

Opioids have emerged as a major population health burden and leading cause of preventable deaths, particularly for younger adults. Opioid-related deaths increased by over 400% in Hamilton from 2005 to 2022 (5.0 to 27.3 deaths per 100,000) and are consistently greater than the provincial rate (16.7 deaths per 100,000 in 2022).

6. NOT ALL CHILDREN IN HAMILTON ARE GETTING THE BEST START IN LIFE.

Low birth weight is linked to poorer health outcomes in early life. The rate of babies born with low birth weights has increased in Hamilton and is much greater for babies from lower socioeconomic areas.

For babies, breastfeeding provides additional protection from infection and illness. Recent local data indicates that rates of exclusive breastfeeding have decreased, while formula feeding initiation rates in hospital settings have increased.

As they reach kindergarten, nearly one in three Hamilton students are vulnerable in at least one domain of early development. Specifically, there is rising vulnerability in the developmental areas of emotional maturity and physical health and well-being.

Uptake of childhood immunizations is another area of concern. Over one in three students born in 2015 do not have an up-to-date vaccination record with Hamilton Public Health Services for routine immunizations.

7. PHYSICAL HARM IS A GROWING CONCERN AND AN AREA OF SUBSTANTIAL INEQUITY.

There are concerning trends in Hamilton, including rates of self-harm and suicide, and harm to others through assault and homicide.

Rates of emergency department visits for self-harm injuries have increased by 55% over the past decade in Hamilton, disproportionately impacting female youth and those from low socioeconomic areas.

Suicide and homicide are both a leading cause of death for young adults in Hamilton. Homicide rates have increased in Hamilton with a record high in 2021.

Compared to the Ontario average (192.8 visits per 100,000 in 2021), Hamilton had a greater rate of emergency department visits for assault injuries (250.6 visits per 100,000 in 2021). These injuries show considerable inequities by socioeconomic conditions.

Since 2020, Hamilton has also experienced a 175% rise in police-reported hate and bias occurrences, primarily targeting the Black community, as well as the Jewish, Muslim, and LGBTIQ+ communities (lesbian, gay, bisexual, transgender, intersex, queer or questioning).

8. CLIMATE IMPACTS ARE AN AREA OF PUBLIC HEALTH SIGNIFICANCE IN OUR COMMUNITY.

Changes in average weather patterns resulting from the release of greenhouse gases already impact the health of the community, and extreme weather is projected to increase profoundly into the future.

The annual number of heat warning days for Hamilton increased overall from 2011 to 2023 and is projected to continue to rise. The five-year average was close to nine days from 2011 to 2015 and increased to 14 days from 2019-2023. In the decade from 2012 to 2021, residents of Hamilton visited the emergency department over 1,200 times with concerns specifically related to heat.

Climate change can affect ecosystems and support the spread of infectious diseases, such as insect-borne diseases, into new geographic regions. For example, most of the City of Hamilton and surrounding region has become a provincially designated risk area for Lyme disease. From 2021 to 2023, the rate of Lyme disease increased over 60%. The 81 confirmed cases in 2023 were the highest seen to date among Hamiltonians.

9. CHRONIC DISEASES REPRESENT A CONSIDERABLE PREVENTABLE HEALTH BURDEN ON HAMILTON RESIDENTS.

Chronic diseases and conditions are among the leading causes of death and disability in Hamiltonians.

For example, over the past decade both the rate of new cases and prevalence overall for diabetes has increased for Hamiltonians even after the changes in age structure are taken into consideration. Approximately 13% of Hamilton residents aged 20 and older were living with diabetes in 2020.

Newly diagnosed cases of chronic respiratory diseases among Hamiltonians including asthma, chronic obstructive pulmonary disease and lung cancer also continue to be higher than for Ontario overall.

10. NEW AND KNOWN INFECTIOUS DISEASES CONTINUE TO IMPACT OUR COMMUNITY'S HEALTH.

Coronavirus disease 2019 (COVID-19) emerged as the newest burden to our population's health in 2020 and continues to impact our community's health alongside the on-going burden of influenza and other respiratory diseases during the fall and winter seasons. Hamilton had 321 respiratory outbreaks in 2023 with the majority (75.7%) being COVID-19.

Over the past decade, syphilis rates have increased by more than 300% and gonorrhea rates have increased by more than 100% in Hamilton.

Invasive Group A Streptococcal infections, which can be fatal in 10-15% of cases, have increased by more than 250% in the past decade and Hamilton's rate (13.4 cases per 100,000 in 2022) has remained above the Ontario average (6.1 cases per 100,000 in 2022) over the past five years.

As a community we all have a role in amplifying the findings in this report. The City of Hamilton and all our community partners can use this information to support planning, delivery and monitoring of health services.

These findings represent a snapshot in time. Our community and its health status are constantly evolving, along with our understanding of the available information. We encourage you to consider the report as one tool to support our collective journey - to improve and protect the health and well-being of our community and reduce socioeconomic disparities and the resulting health inequities.

ABOUT THIS REPORT

PURPOSE OF THIS REPORT

Hamilton Public Health Services relies on meaningful data and information. With it, we can better guide public health planning and service delivery.

That's the primary goal of *Hamilton's Community Health Status Report*. This document provides insights into the health status of Hamilton residents, social determinants of health and health inequities.

In releasing the report, we hope it will also be of interest to community partners and the public to:
- increase awareness of local health issues
- inform community planning, decisions and development of healthy local public policy
- foster a common understanding of the breadth of issues that impact our community's well-being

Hamilton Public Health Services is mandated by the Ministry of Health, through the Ontario Public Health Standards, to assess the health status of our community. There are many approaches to do so.

Historically, we have produced tailored data and information products, such as the *Child and Youth Health Atlas* and the *Community Alcohol Report*, in addition to ongoing surveillance of public health issues that require more timely action like infectious diseases and opioid use. We paused most health status reporting during the response to the COVID-19 pandemic. Now, *Hamilton's Community Health Status Report* represents the beginning of a journey to enhance our approach to population health assessment.

We are pleased to share this information with the public, community partners and other healthcare providers. All play roles in improving health outcomes in Hamilton.

SCOPE

Hamilton's Community Health Status Report provides an overview of 13 topics:

1. Geography and Population
2. Social Circumstances Influencing Health
3. General Health
4. Healthy Pregnancy and Births
5. Child and Youth Health
6. Immunization
7. Infectious Disease
8. Environments and Health
9. Mental Health
10. Substance Use
11. Injury and Violence
12. Healthy Living
13. Chronic Disease

Health is broad, and this report does not include all its aspects. For planning and decision-making, we may need deeper analyses of these topics to better understand their issues and complexities. This report lays out community health status information from available data sources. It should be combined with other sources of evidence to gain insights into Hamilton's community health needs and determine recommendations and strategies. This information may be used to generate discussion amongst the many organizations, partners, and the public that have roles to play in improving health outcomes in Hamilton.

⚙ PROCESS

Emerging from the COVID-19 pandemic, Hamilton Public Health Services began plans to resume assessing the local health status in Hamilton. The process primarily relied on using existing mandates and frameworks to construct the content areas of this report. That included the Ontario Public Health Standards, the core indicators from the Association of Public Health Epidemiologists in Ontario and work completed by peer public health units.

To complete this report, Hamilton Public Health Services leveraged available data, mostly from secondary sources, meaning data was collected and made available to Hamilton Public Health Services by other organizations. These secondary data sources include Canada's population census, hospital-based databases, and national or provincial health surveys (e.g., Canadian Community Health Survey, Ontario Student Drug Use and Health Survey). There are some exceptions where we played a primary role in data collection, such as our *Infant Feeding Survey*.

When using data from multiple sources to describe Hamilton's health status, we might miss important community context and meaning.

We consulted with community organizations to ensure the data was grounded in local context, including local organizations that serve: Black communities, other racialized communities, LGBTIQ+ (lesbian, gay, bisexual, transgender, intersex, queer or questioning and other sexually or gender diverse people), and people with other lived experience of marginalization such as homelessness. We also consulted with Hamilton healthcare organizations.

We conducted community engagement for this report at the "consult" level according to the International Association of Public Participation's engagement spectrum. That means the project team received feedback on the report and was committed to listening to and addressing it.

Specific analysis related to First Nations, Métis, and Inuit people in Hamilton is not included in this report, as we did not involve Indigenous community partners early enough in the process to meaningfully engage on content. Building off one of the recommendations in Hamilton Public Health Services' Indigenous Health Strategy[1], "Explore how Public Health Services resources could help support Indigenous organizations (e.g., data or epidemiology support)", we are committed to continuing to engage with Indigenous community partners about how we can work together to support community health status reporting. Any reporting of available data about

First Nations, Métis, and Inuit people in Hamilton will only be published upon completion of fulsome engagement with Indigenous community partners.

When developing the content for this report, we kept in mind several considerations:

- transparency in providing available information
- quality of information
- protecting privacy of individuals within the data
- mitigating risks in releasing information that may cause unintentional harm or stigma to marginalized communities

In addition, we considered the statistical significance of differences when comparing local data over time, between groups of people, or with the province. This means we reported differences that were unlikely due to chance. Throughout the report, we used language such as 'similar to' or 'no difference' to describe data where no statistical differences were found. This approach relies on several factors to be able to identify statistically significant differences, including the quality and amount of data we available to work with.

Hamilton Public Health Services will continue to engage with community partners, including on data and information products. We are committed to applying what we have learned through the experience with the *Community Health Status Report* to our future work.

❗ LIMITATIONS

The data available to inform this report is far from perfect. There may be limited or no data on certain topics. With secondary data sources, we have limited control on the questions asked, the frequency of data collection, how soon we have access to data, or the level of detail for analysis.

In some cases, agreements between Hamilton Public Health Services and the organization collecting these data affect whether and how we can release the information.

We understand that the numbers on the page may not tell the complete story, accurately represent everyone or reflect the lived experience of our communities. These limitations highlight the importance of community engagement.

Some of the limitations are discussed below and further throughout the report.

Data Gaps

There is limited or no data on certain topics, and data quality can vary across sources and over time.

Throughout the report, we use proxy measures – such as data on emergency department visits and hospitalizations – to estimate the level of illness and disease in the population when better metrics are unavailable. These proxy measures may not tell the whole story.

For example, we know that health care data underestimates illness and disease in the population. We also know that certain populations may be underrepresented in the health care data. This may be due to social determinants of health, including racism and colonialism, which affect whether someone has access to care, will seek care, and the quality of care they receive.

In addition, throughout the COVID-19 pandemic people may not have accessed health care as they typically would. That affects the quality of these measures during this period. The pandemic had other impacts on data quality, including pauses in data collection and lower responsiveness to surveys.

Health inequities may exist when people experiencing different sociodemographic levels do not have the same health outcomes. Data sources used to measure health outcomes in this report may not consistently include sociodemographic information or may not have enough data to conduct robust analysis. Either can limit the scope of equity analysis throughout the report. Where feasible, we used an alternate approach to assess health inequities at the geographic level, considering differences in defined areas rather than in individuals.

Data Categorization

This report references language and categories developed and determined by the data sources used in this report. In some cases, these may be considered outdated and harmful. Where feasible, we have used language that mitigates harm and stigma.

We know that language can be used to affirm or dismiss people's identities and lived experiences. Categorization of people has historically been used to exclude, discriminate, and oppress equity-deserving groups.

Through our community engagement, we have worked to reduce harms related to categorizing people, and explicitly note limitations related to grouping people. We recognize that these groupings and presentations may not reflect people's perspectives or lived experiences. Hamilton Public Health Services is committed to finding opportunities to improve these approaches in future work.

One example of data categorization used in this report is race.

Race is a social construct created to categorize people into different groups. Through community engagement, we heard about how racism in all forms – such as interpersonal, systemic and Anti-Black – impacts the health of Hamiltonians who are Black and racialized.

Community engagement validated the limitations of grouping people into one "racialized" category, which may mask differences between racialized people within the category. To address this limitation, where possible, we disaggregated racialized groups and identified areas where grouping may cause unintentional harm.

Another example of data categorization used in this report is gender and sex.

While some data sources have begun collecting gender identity information, terminology and categorization is not consistent. There are still limitations in how data is collected or can be reported on the local level to protect privacy. For many data systems included in this report, only sex categorizations are available. These usually are limited to male and female and often collected as the sex assigned at birth.

We heard through community engagement about how gender identity is not routinely collected in data systems, and that existing data systems underrepresent gender- diverse populations. We acknowledge the limitations of gender identity and sex categorization available in these data systems, and that this report may have missed important health differences experienced by gender-diverse populations.

Data Timeliness

For the best decision-making, having the most up-to-date information is critical. The data sources used in this report vary in timeliness. While data in this report may be from several months or years ago, it demonstrates important trends and comparisons that inform our work.

Some data in administrative databases are collected on an ongoing basis, but with delays before it is made available. For example, death data has historically lagged by several years but are now available within a couple of years. Other administrative data sources, such as hospitalization and emergency department visits, are typically accessible within a year.

Still other data sources, such as the Census of Population and health surveys, are only conducted at certain points and represent a snapshot in time. We recognize that the sociodemographic context of the population at the time of the last Census (2021) may not reflect the current context among Hamilton residents. However, the Census continues to be a unique and broad source of information about Hamilton's population.

WE WANT YOUR FEEDBACK

Hamilton Public Health Services is committed to enhancing our approach to produce meaningful community health status information.

We welcome comments and feedback at **epiandeval@hamilton.ca**

GEOGRAPHY AND POPULATION

HIGHLIGHTS

- City of Hamilton Public Health Services covers an area of 1118.3 km² that wraps around the western part of Lake Ontario on the traditional territories of the Erie, Neutral, Huron-Wendat, Haudenosaunee and Mississaugas.

- The City of Hamilton is the fifth-largest population of all municipalities in Ontario, with 605,842 residents in 2023.

- Hamilton's population is projected to continue to grow and reach 809,661 residents overall by 2046.

- As the overall population grows, we'll see a demographic shift. Those of working age (15-64) will decrease and those age 65 and older will increase. So, the ratio of people who are generally not in the labour force to those in the workforce will rise.

GEOGRAPHY AND POPULATION

GEOGRAPHIC AREA

The geographic boundaries of the City of Hamilton and of Hamilton Public Health Services are the same. This area covers 1118.3 km² in Southern Ontario on the western end of the Niagara Peninsula and wraps around the western part of Lake Ontario (Figure 1.1). Hamilton sits on the traditional First Nations territories of the Erie, Neutral, Huron-Wendat, Haudenosaunee and Mississaugas.

Hamilton Public Health Services is responsible for delivering local public health programs and services to residents that live within this area. It is in the Ontario Health West region, which is responsible for planning, funding and monitoring the health care system (not including public health units) from Waterloo to Windsor, and from Tobermory to Niagara Falls.

Figure 1.1: Map of City of Hamilton Public Health Services and Surrounding Area, 2023.
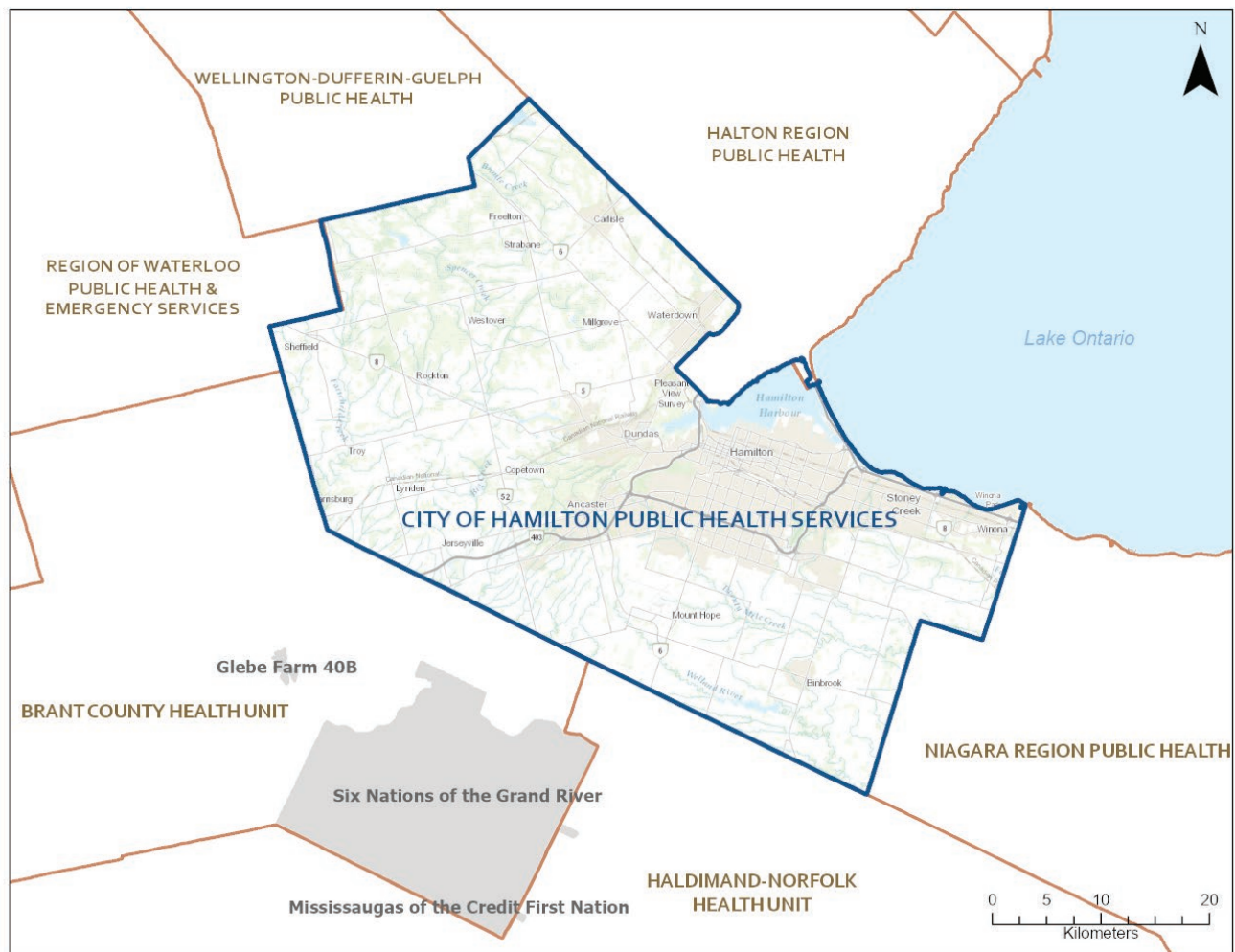
Sources: Public Health Units – Government of Ontario – Open Data – Geohub - Land Information Ontario, 2020-05-15T13:00:05-05:00 [1 October 2022]; First Nations Reserves – Government of Ontario – Open Data – Geohub - Land Information Ontario, 2020-01-02 [1 October 2022].

POPULATION SIZE AND DENSITY

In 2023, about 605,842 people lived in the City of Hamilton.[2]

The City of Hamilton was the fifth-most populous municipality in Ontario according to the 2021 Census.[3]

The population increased by 32,436 Hamiltonians from 536,917 in 2016 to 569,353 in 2021. This 6% population growth was similar to the Ontario average of 5.8% during this same period.

Hamilton's population density was 509.1 residents per square kilometre in 2021, compared to the Ontario average of 15.9 residents.[4]

AGE AND POPULATION DEPENDENCY RATIO

According to the 2021 Census, the most sizeable age group among Hamilton residents was those aged 30-34 (7.3%), followed by residents aged 55-59 (7.2%). This was similar to the overall Ontario figures, where 6.9% of the population is aged 30-34 and 7.3% was aged 55-59 (Figure 1.2; Appendix A Table 1.1).

For every 100 working-aged people In Hamilton (aged 15-64), there were just over 52 "dependents" (aged 0-14 or aged 65 and older). Many older adults of course continue to work past age 65.

Figure 1.2: Population distribution by age group, percent, Hamilton and Ontario residents, 2021
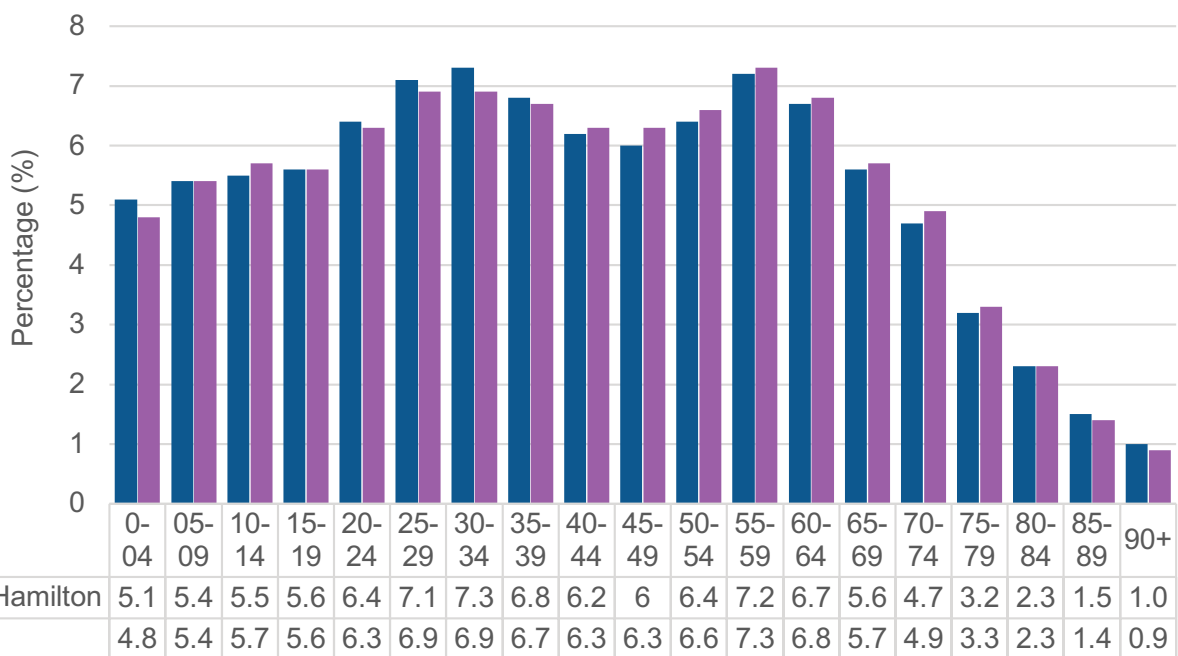
	0-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
City of Hamilton	5.1	5.4	5.5	5.6	6.4	7.1	7.3	6.8	6.2	6	6.4	7.2	6.7	5.6	4.7	3.2	2.3	1.5	1.0
Ontario	4.8	5.4	5.7	5.6	6.3	6.9	6.9	6.7	6.3	6.3	6.6	7.3	6.8	5.7	4.9	3.3	2.3	1.4	0.9

Source: Statistics Canada. 2023. Census Profile. 2021 Census. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released February 8, 2023.

The dependency ratio is an important measure, as it indicates the proportion of adults of working age who support and provide for healthcare systems. Generally, a lower dependency ratio is more desirable.

Hamilton's dependency ratio of 52.3 was the same as for Ontario overall (52.4) and has increased over the past five years. Those aged 65 years and older comprised 18.4% of the population in 2022 (up from 17.3% in 2018), while the percentage of those under age 15 decreased slightly (from 15.8% in 2018 to 15.4% in 2022).[5]

PROJECTED POPULATION

The City of Hamilton's total population is projected to grow to 809,661 by 2046 according to Ontario's projections. The population aged 80 and older will more than double by then. Residents aged 30-34 will form the largest age group (Figure 1.3; Appendix A Table 1.2).

Based on population projections, the dependency ratio is estimated to increase to 56.9 by 2046 from 52.2 in 2021 (Appendix A Table 1.3).

Figure 1.3: Population distribution by age group for men+ and women+, counts, Hamilton residents, Census (2021) and Population Projections (2046)
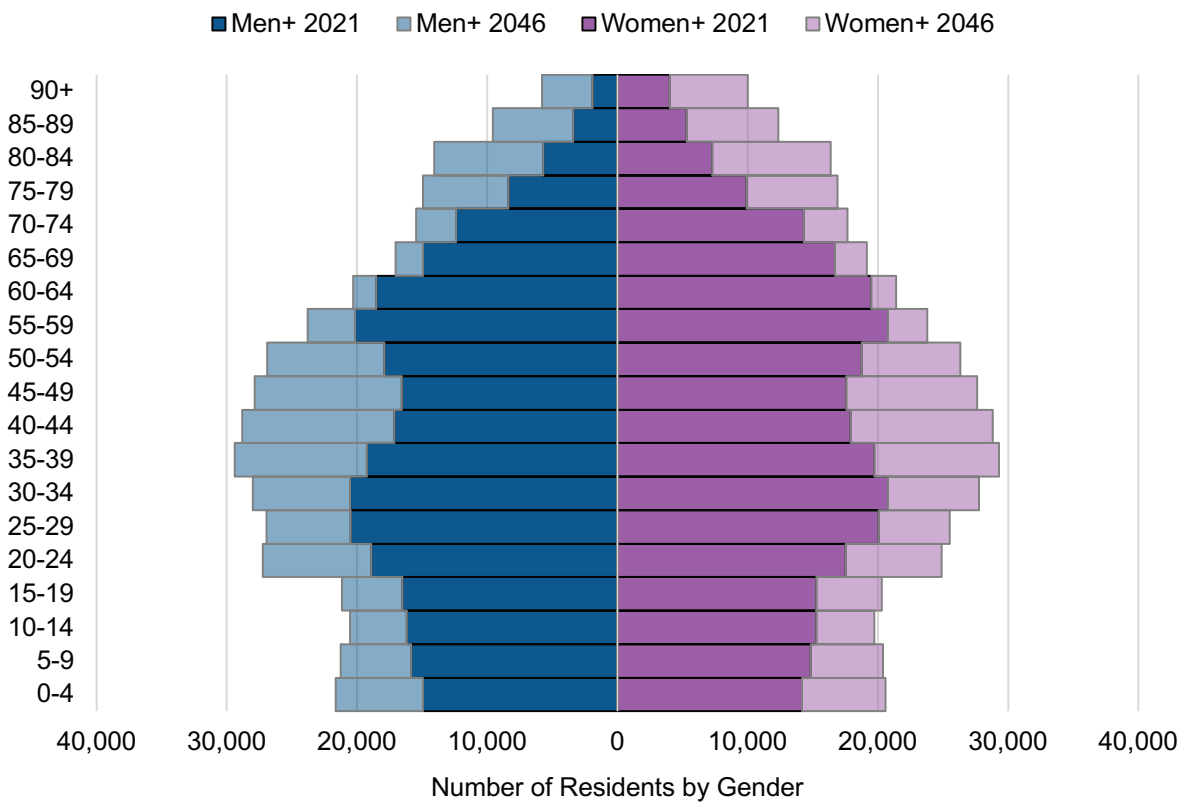
Sources: Statistics Canada. 2023. Census Profile. 2021 Census.
Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released February 8, 2023;
Population Projections. Hamilton. Ontario Ministry of Health, IntelliHEALTH ONTARIO. Extracted January 18, 2023.

Notes: Gender categories are those provided within the data source and the limitations of these binary categories are acknowledged. The category of women+ includes women and girls, as well as some persons who are non-binary persons, and men+ as men and boys, as well as some persons who are non-binary.

SOCIAL CIRCUMSTANCES INFLUENCING HEALTH

HIGHLIGHTS

- One-quarter of Hamilton residents self-identified as belonging to a racialized group in 2021, up from 16% in 2011. South Asian, Black, and Arab were the largest self-reported racialized groups.

- From 2016-2021, the top three places of birth of newcomers in Hamilton were India, Syria and the Philippines. That shows a shifting pattern, as the United Kingdom, India and Italy remain as the top three places of birth for all immigrants currently living in Hamilton.

- Approximately 8% of Hamilton residents were living in poverty in 2020. The rate was higher for young adults aged 18-24 years old (14%). Almost one in five households in Hamilton reported having some level of food insecurity in 2020-2021.

- Over one in five households in Hamilton lived in unaffordable housing in 2021. Homelessness increased in Hamilton between 2020 and 2023, with over 1,400 individuals identified as homeless in each month in 2023.

- Post-secondary graduates comprised 65% of Hamilton residents in 2021, which was lower than the Ontario average 67.8%. Racialized residents had a higher level of education than non-racialized (white) Hamiltonians, yet also had higher levels of poverty.

- Seven out of ten Hamilton residents aged 12 and older described their sense of belonging to their local community from 2015 to 2020 as strong. Community belonging is higher for youth aged 12-19 and those aged 65-74.

SOCIAL CIRCUMSTANCES INFLUENCING HEALTH

SOCIAL CIRCUMSTANCES

Social circumstances broadly include the conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life. That includes various forms of oppression resulting from a range of discrimination, such as (but not limited to) ableism, ageism, classism, colonialism, genderism, sexism and racism.

These social circumstances both oppress and privilege, intersect and mutually reinforce one another (the "intersectionality" of circumstances) in complex ways. That also uniquely affects a person's health.

A constraint of this report is the limited ability to explore the impact of intersectionality on the health of Hamilton residents.

GENDER

Gender influences health. For example, gender norms, or the ideas about how women and men should be and act, can affect health behaviours. Moreover, gender discrimination deters access to health services.[6]

Statistics Canada defines gender as an individual's personal and social identity as a man, woman or non-binary person (a person who is not exclusively a man or a woman).[7] The World Health Organization describes gender as a characteristic that is socially constructed.[6]

Peoples' gender identities are diverse and do not always correspond with binary notions of male and female. Gender identity is based on one's innermost concept of self as male, female, a blend of both or neither.

In 2021, the Canadian Census of Population included the concept of gender for the first time and made the distinction between gender and sex assigned at birth.

Sex is typically assigned at birth based on a person's reproductive system and other physical characteristics. For many people, their gender corresponds to their sex at birth (cisgender men and cisgender women). For some, these do not align (transgender men and transgender women), or their gender does not fall into one of the two "binary" categories of male and female (e.g., non-binary and gender fluid people). In 2021 all individuals were able to report their gender on the Census.

At the smaller geographic levels (such as the City of Hamilton), the Census provides limited gender detail. Statistics Canada collapsed categories into two genders to ensure privacy and provide stable estimates:

- "women+", defined as women and girls, as well as some persons who are non-binary
- "men+", defined as men and boys, as well as some persons who are non-binary[8]

For 2023, approximately half of Hamilton residents were grouped into the women+ category (305,477; 50.4%) and half into the men+ category (300,365; 49.6%).[2]

However, this approach maintains the historical gender binary categories. Reducing gender to two categories may mask the unique experience of different gender groups. For example, local research conducted in 2018[9] identified that some members of the LGBTIQ+ community in Hamilton, despite

greater acceptance, continued to face discrimination in the health care sector. Many reported not being respected and affirmed by knowledgeable and LGBTIQ+ competent health care providers.

It is possible to separate the 2021 Census data into more detailed groupings[10] including residents that are transgender or non-binary for the broader combined urban area of Hamilton, Burlington, and Grimsby. For this broader metropolitan area:

- approximately 0.23% of people aged 15 and older identified as transgender
- 0.15% identified as non-binary[11]

If this proportion was applied to the City of Hamilton population in 2021, it means approximately 1,081 persons aged 15 and older might have identified as transgender, and 738 might have identified as non-binary.

Within the urban area of Hamilton, Burlington and Grimsby (as within Canada generally[12]), the proportion of people identifying as transgender or non-binary was higher for younger age groups. For those aged 15-34, 0.41% identified as transgender and 0.40% identified as non-binary. For those 35 years and older, 0.15% identified as transgender and 0.05% identified as non-binary.

Other local research similarly found that self-identification as transgender or non-binary among Hamilton residents varied by age group.[9] There are likely several reasons, such as younger generations feeling more supported to explore and assert their gender identity than older generations.

LANGUAGE

Language affects individuals' and families' access to health services and health information. Limited English skills is a barrier to navigating the health system in Hamilton.[13] Furthermore, language barriers can lead to misdiagnoses and/or inaccurate treatment due to miscommunications with healthcare providers.[14]

Most residents of Hamilton (98.1%) reported that they could conduct a conversation in English on the 2021 Census (92.3% in English only and an additional 5.8% in English and French). Less than one percent (0.1%) spoke French only. And 1.9% spoke neither English nor French; that's approximately 10,435 residents (Appendix A Table 2.1).

The proportion able to conduct a conversation in English or English and French has not changed in the past decade (98.1% in 2021 and 98.2% in 2011) and is similar to Ontario overall in 2021 (97.3%) (Appendix A Table 2.1).

For the 2021 Census, almost one quarter (23.9%) of Hamilton residents have a mother tongue (first language learned and still understood) other than English or French. This is similar to the rate of 23.1% in the 2011 Census.[15]

Just over 14% of Hamilton residents (81,140) indicated one of these 10 languages as their single mother tongue on the 2021 Census: Arabic; Italian; Serbo-Croatian; Spanish; Portuguese; Polish; Punjabi (Panjabi); Mandarin; Urdu; and Tagalog (Pilipino, Filipino).

RACIALIZED POPULATIONS

One quarter (25.1%) of Hamiltonians, or about 140,950 people, self-identified with one or more racialized groups in 2021. That's lower than the 34.3% rate for Ontario overall. The percentage of Hamiltonians that self-identified with one or more racialized groups was similar for men+ (25.4%) and women+ (24.8%).

The terms "racialized population" or "racialized groups" are used in this report as defined by the Census 2021 concept of "visible minority" from the Employment Equity Act. This definition does not include First Nations, Métis and Inuit peoples as a "visible minority".

There are limitations to using this terminology and categorization. People who self-identify in multiple racial identities are aggregated into one category. Furthermore, the concept of race is a social construct. That means race was created based on the perception of physical attributes and culture differences and is not backed by scientific reason.

Within Hamilton, South Asians were the largest racialized group (the same as for Ontario). The 10 most populous racialized groups are the same for Hamilton as for Ontario residents. However, Hamilton residents are a slightly different mix of racialized groups than Ontario overall (Figure 2.1). One percent of Hamiltonians self-identified with more than one racialized group.

The three largest racialized groups among Hamilton residents were South Asian (6.2%), Black (5.1%) and Arab (2.8%). For Ontario, it was South Asian (10.8%), Chinese (5.8%) and Black (5.5%)[16]

The proportion of Hamilton residents self-identifying with one or more racialized groups increased from 15.7% (79,970 out of 509,635)

in 2011[17] to 19.0% (100,055 out of 527,930) in 2016[18] and 25.1% in 2021 (Appendix A Table 2.2) and differs by age group. While just over a quarter of Hamiltonians self-identified with one or more racialized groups on the 2021 Census (25.1%), the proportion was much higher among younger age groups aged 0-14 (33.3%) and highest among those aged 15-24 (36.2%) (Figure 2.2).
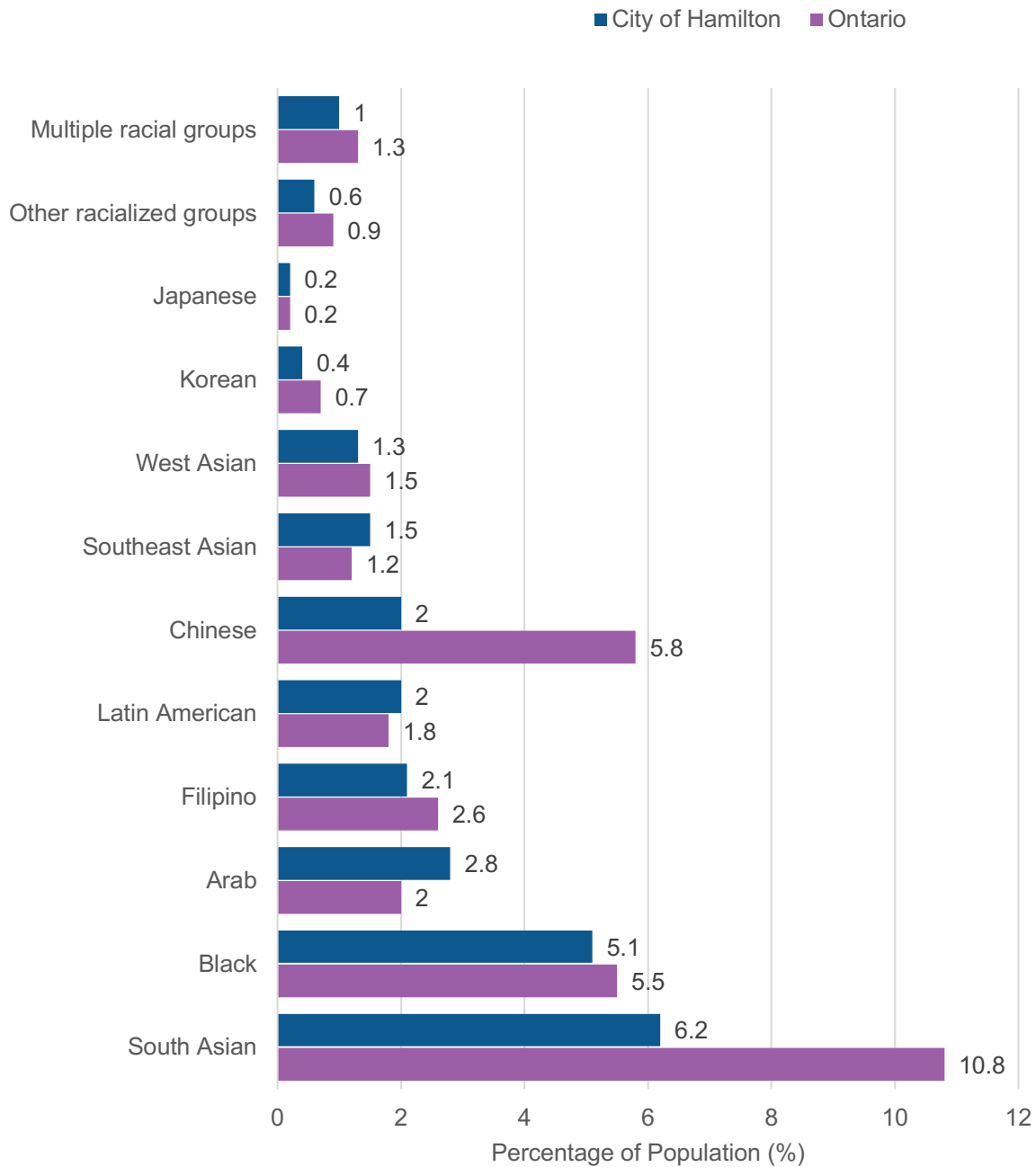
Similarly, the proportion of Hamiltonians identifying with each racialized group also differs by age. South Asian was the largest racialized group overall and among most age groups. Among the youngest age group, 0 to 14, Black was the largest racialized group.

Racism is pervasive. It adversely affects the treatment and opportunities of racialized people across every facet of society. That includes opportunities to be healthy. Racism is at the root of racial health inequities, as it intersects with other determinants of health, while discrimination and systematic barriers in healthcare settings can further deter racialized people's ability to be healthy.

Using racial categories in health data can increase our understanding of how racism impacts health. Yet different racialized groups have different experiences. Aggregating all racialized groups into one category may mask important differences.

This report provides analysis for racialized groups in social circumstances, risk factors and health outcomes. It does not include direct measures on people's experiences of systemic racism, and this is acknowledged as a limitation. However, experiences of racism are evident in the racial inequities seen throughout the report.

Figure 2.1: Top 10 most populous racialized groups, multiple racial groups and other racialized groups, percent of total population, Hamilton and Ontario residents, 2021

■ City of Hamilton ■ Ontario

Group	City of Hamilton	Ontario
Multiple racial groups	1	1.3
Other racialized groups	0.6	0.9
Japanese	0.2	0.2
Korean	0.4	0.7
West Asian	1.3	1.5
Southeast Asian	1.5	1.2
Chinese	2	5.8
Latin American	2	1.8
Filipino	2.1	2.6
Arab	2.8	2
Black	5.1	5.5
South Asian	6.2	10.8

Percentage of Population (%)

Figure 2.2: Racialized groups by age group, percent of age group's racialized population, Hamilton residents, 2021

Total - Age
- Chinese: 2.0
- Latin American: 2.0
- Filipino: 2.1
- Arab: 2.8
- Black: 5.1
- South Asian: 6.2
- Total Racialized: 25.1

65 years and over
- Arab: 0.9
- Latin American: 1.1
- Filipino: 1.1
- Chinese: 1.3
- Black: 2.0
- South Asian: 3.4
- Total Racialized: 12.3

25 to 64 years
- Chinese: 1.8
- Filipino: 2.1
- Latin American: 2.3
- Arab: 2.4
- Black: 4.5
- South Asian: 6.3
- Total Racialized: 24.6

15 to 24 years
- Latin American: 2.2
- Filipino: 2.6
- Chinese: 3.8
- Arab: 4.3
- Black: 7.0
- South Asian: 8.7
- Total Racialized: 35.2

0 to 14 years
- Chinese: 1.6
- Latin American: 1.7
- Filipino: 2.6
- Arab: 4.7
- South Asian: 7.0
- Black: 8.8
- Total Racialized: 33.3

Percentage (%)

Source: Statistics Canada, 2021 Census of Population Statistics Canada. Table 98-10-0352-02. Visible minority by gender and age: Census divisions by province or territory.

IMMIGRANT POPULATIONS

Immigrants often arrive to Canada with stronger health than their Canadian-born counterparts. However, many can experience a steep decline over time after migration to reach the Canadian-born population's health levels or lower.[19]

Being new to Canada may influence one's health due to factors such as language barriers, cultural differences and social isolation. Immigrants may confront challenges navigating the health system and receiving culturally safe care, which can lead to unmet healthcare needs. Additionally, they can face stresses adapting to new environments, which may contribute to poorer mental health outcomes.[20]

Over a quarter (25.9%) of the 2021 population living in the City of Hamilton self-identified as immigrants (Appendix A Table 2.3). Their top three places of birth were:

- United Kingdom (8.4% of immigrants)
- India (7.5%)
- Italy (6.1%)

The proportion of Hamilton residents that were immigrants was slighter higher in 2021 than a decade ago in 2016 at 24.7%.[18] That's lower than for Ontario at 30%.

Hamilton has a higher proportion of the immigrant population that report coming to Canada prior to 1980 (27.5%) compared to Ontario as a whole (20.5%) (Appendix A Table 2.3).

Similar to Ontario as a whole, almost a quarter of immigrants (23.8%) living in the City of Hamilton reported coming to Canada in the past 10 years. Newcomers are a sub-category of all immigrants, defined as those who arrived between 2016 to 2021. They formed 3.6% of the population or 13.8% of all immigrants. That's similar to Ontario as a whole (4.2% of population; 13.9% of all immigrants).

The top three places of birth of newcomers to Hamilton were:

- India (15.9% of recent immigrants)
- Syria (13.1%)
- Philippines (8.9%)

That was notably different than the newcomer profile for Ontario as a whole (Appendix A Table 2.4). The top three places of birth among recent immigrants for Ontario were:

- India (23.9% of recent immigrants)
- China (9.3%)
- Philippines (7.7%)

The mix of newcomer populations within Hamilton is dynamic and ever-changing because of global events. The 2021 Census provides a reliable snapshot in time, although more recent global events have already affected the makeup of Hamilton's newcomer populations.

Temporary residents who request refugee protection upon or after arrival in Canada (also known as asylum claimants) may be included in the "non-permanent resident" category. Statistics Canada defines "non-permanent resident" as people from another country with a usual place of residence in Canada, and who have a work or study permit, or who have claimed refugee status (asylum claimants). In 2021, Hamilton had 12,650 non-permanent residents, or 2.3% of the total population. This was similar to Ontario overall at 2.8% (Appendix A Table 2.3).

INCOME

Income is one of the strongest predictors of health status. It shapes access to resources that are fundamental to health, like healthy foods, safe housing, educational opportunities, recreation and other positive aspects of healthy living. Low income is linked with higher levels of stress, food insecurity and unhealthy environments. Living with incomes that constitute poverty is known to jeopardize health.[21]

Poverty

The Market Basket Measure is Canada's official measure of poverty. It's based on the cost of a specific basket of goods and services, representing a modest, basic standard of living. The Market Basket Measure threshold for a reference family of two adults and two children living in an urban area the size of Hamilton in 2020 was $46,306.

In 2020, 43,325 Hamiltonians, or 7.7% of residents, lived in poverty and did not have enough money to meet their basic needs. This is according to the Market Basket Measure and 2020 income reported on the 2021 Census (Figure 2.3, Appendix A Table 2.5).

The poverty rate for Hamilton residents (7.7%) was lower than for Ontario overall (8.3%). Poverty rates decreased significantly from 2015 (14.8%) for Hamilton residents, and income inequality improved among residents of Hamilton in 2020 compared to 2015. Income inequality in Hamilton was smaller overall compared with Ontario.[22]

The improvement in income inequality across Ontario is largely attributed to increases in government transfers during the pandemic, including the enhanced Canada Child Benefit and temporary COVID-19 pandemic relief benefits.[23]

Poverty rates were higher in 2020 for male residents of Hamilton (8.0%) than female residents (7.5%). Young adults aged 18-24 experienced the highest rates of poverty in 2020 (13.7%) compared to other age groups.

Other age groups with higher poverty rates included children aged five and younger (9.1%) and adults aged 55-64 (9.4%). Seniors aged 65 and older experienced the lowest rates of poverty at 4.2%.

Higher poverty rates (Figure 2.3, Appendix A Table 2.6) were also experienced by Hamiltonians that:

- lived alone or not with immediate family
- recently immigrated to Canada (between 2016 to 2020)
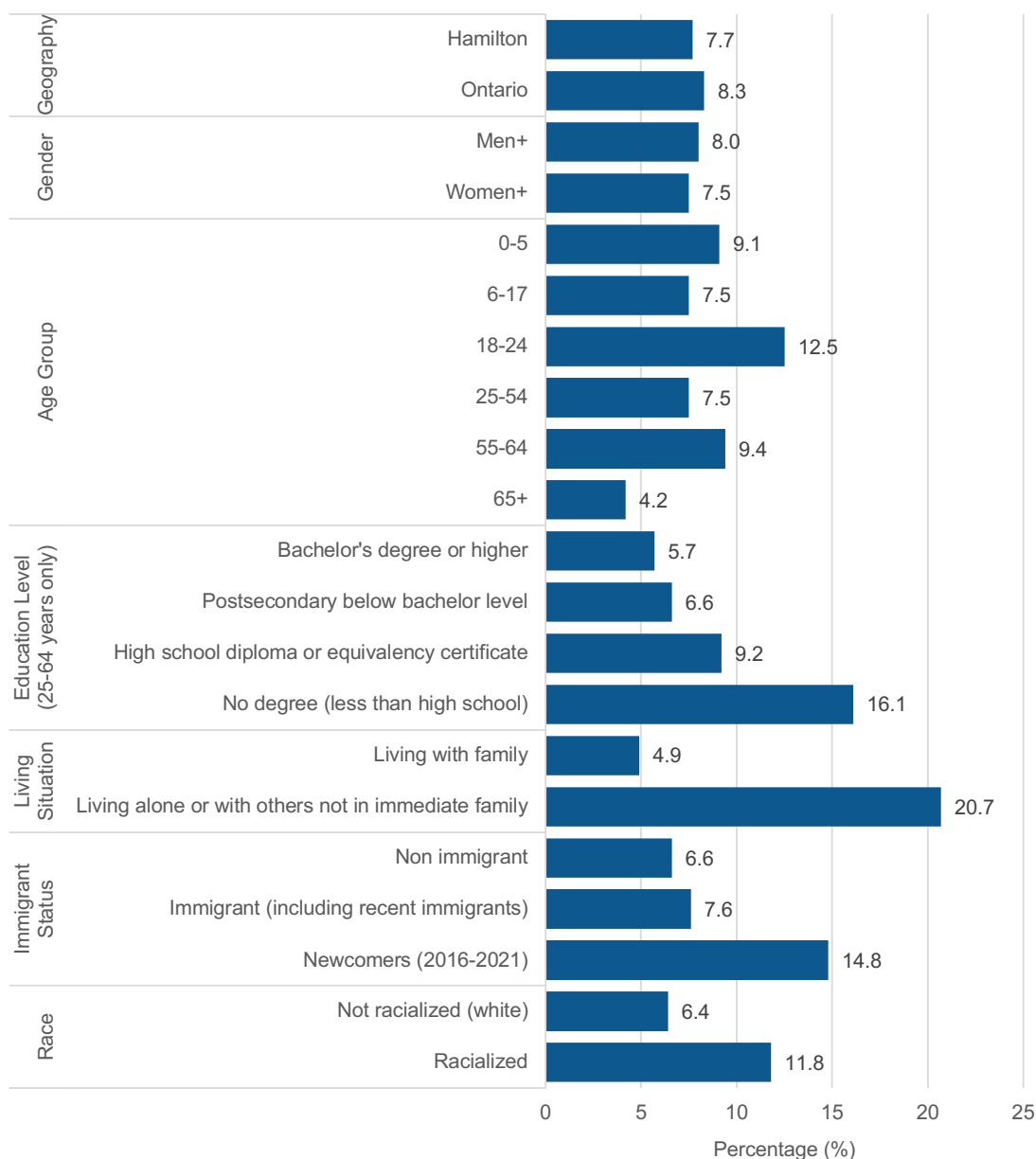- self-identified as racialized

In 2020, Hamilton residents who immigrated to Canada before 1980 faced a 4.8% poverty rate. This is substantially lower than the 7.6% for all immigrants and the 7.7% for all residents.

Poverty rates were also higher for racialized Hamiltonians (11.8%) in 2020 as compared to non-racialized Hamiltonians (6.4%).

Experiences of racism may have contributed to this inequity. The available summary data does not provide additional analysis by individual racialized groups, or overlapping intersections for individual Hamilton residents that may belong to multiple groups. This can lead to an incomplete understanding of poverty, as many of the most vulnerable Hamilton residents are those who face intersecting barriers.

The Employment Equity Task Force's recommended reforms include measures to address systemic racism and discrimination in hiring, promotion and retention practices,

Figure 2.3: Poverty rate (percent individuals below Market Basket Measure) by different groups of Hamilton residents and compared to Ontario, 2020

Category	Group	Percentage (%)
Geography	Hamilton	7.7
	Ontario	8.3
Gender	Men+	8.0
	Women+	7.5
Age Group	0-5	9.1
	6-17	7.5
	18-24	12.5
	25-54	7.5
	55-64	9.4
	65+	4.2
Education Level (25-64 years only)	Bachelor's degree or higher	5.7
	Postsecondary below bachelor level	6.6
	High school diploma or equivalency certificate	9.2
	No degree (less than high school)	16.1
Living Situation	Living with family	4.9
	Living alone or with others not in immediate family	20.7
Immigrant Status	Non immigrant	6.6
	Immigrant (including recent immigrants)	7.6
	Newcomers (2016-2021)	14.8
Race	Not racialized (white)	6.4
	Racialized	11.8

Source: Target group profile of the low-income population (Market Basket Measure), Census, 2021. Community Data Program - Custom data order from Statistics Canada

Note: The term "racialized" is used in this report as defined by the Census 2021 concept of "visible minority" from the Employment Equity Act. This definition uses specific groups and does not include First Nations, Métis and Inuit peoples as a "visible minority".

all of which may impact poverty levels.[24] For example, it is notable that higher poverty rates in racialized Hamilton residents are not likely due to education levels; a greater percentage (42.8%) had completed a bachelor's degree compared to non-racialized residents (27.1%) (Figure 2.5).

Poverty rates for Hamilton residents after the pandemic are not yet available. After 2020 the average rate of poverty increased for Canada as the temporary pandemic benefits were discontinued but continued to be lower in 2021 than in 2015.[25]

Living Wage

The living wage rate was estimated to be $20.80 per hour in 2023 for Hamilton residents, which reflects what they need to earn to cover the actual costs of living here.[26] This is higher than the general provincial minimum wage throughout Ontario, which was $16.55 as of October 1, 2023.[27] The living wage for Hamilton has increased from $16.45 in 2019 to $17.20 in 2021 to $19.05 in 2022.[28]

HOUSING

Access to safe, affordable housing is essential for optimal health. Unstable housing situations – such as homelessness, staying with friends or family, and/or frequently moving – induces stress and hinders access to healthcare services and social supports.

Housing Tenure

Just over one-third (34.3%) of private households in Hamilton were rented (tenant households) while the remainder were owned (65.7%) according to the 2021 Census. There were slightly more tenant households in Hamilton as compared to Ontario households in 2021 (31.4%) (Appendix A Table 2.7).

Affordable Housing

Unaffordable housing is defined as spending 30% or more of your pre-tax household income on shelter. By this measure, over 1 in 5 Hamilton households (23.2%) lived in unaffordable housing in 2021, similar to Ontario as a whole at 24.2% (Appendix A Table 2.7).

Compared to owner households, a higher percentage (37.5%) of renter households lived in unaffordable housing and an additional 13.7% of renter households lived in subsidized housing.

Core Housing Need

More than 1 in 10 Hamilton households (13.0%) – 28,055 of them – lived in an unsuitable, inadequate or unaffordable dwelling and could not afford alternative housing in their community in 2021. This was similar to the 12.1% for Ontario (Appendix A Table 2.7).

The rate of households with core housing need in Hamilton was similar to a decade ago (13.4% in 2011) and has improved since the previous Census (15.1% in 2016, representing 30,760 households) (Appendix A Table 2.8).[29]
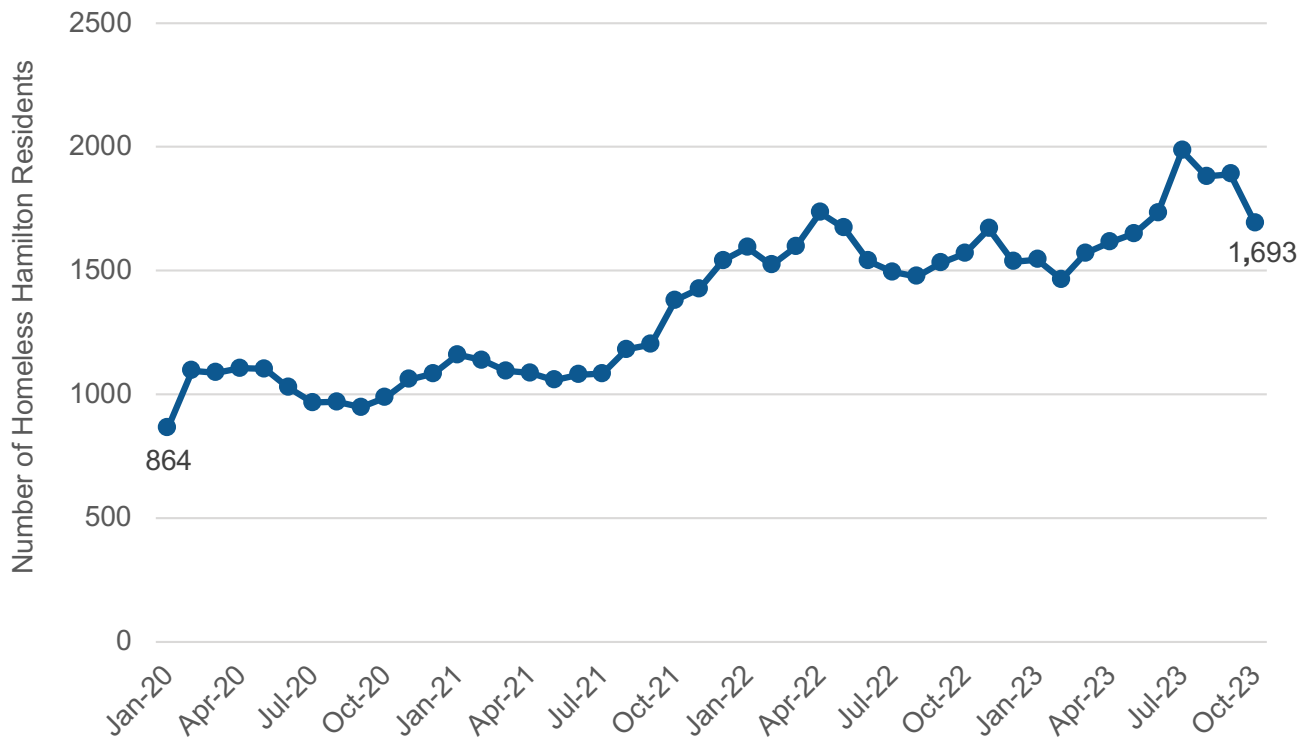
Homelessness

An estimated 1,693 Hamilton residents experienced homelessness in October 2023.[30] That year, homelessness ranged from 1,465 to 1,985 individuals per month (as of October 2023). This was up sharply from 2020, which had a monthly range from 864 to 1,105 individuals (Figure 2.4).

The number of residents in precarious housing situations may be even higher. For example, those staying with friends or family due to lack of housing likely aren't included in these homelessness figures.

Figure 2.4: Homeless Hamilton residents, count, January 2020 to October 2023

864

1,693

Source: City of Hamilton, Open Data, Scale of Homelessness, Accessed December 1, 2023, from Open Data Hamilton.

FOOD SECURITY

Adequate access to nutritious foods is vital to optimal health. Inadequate access is linked to poorer outcomes for early childhood growth and development, as well as mental health, and contribute to the development of chronic disease.[31]

Food insecurity is the inadequate or unstable access to food due to financial constraints. This indicator is Canada's primary measure and covers a range of metrics, from worrying about running out of food, to children not eating for a whole day.[32] The responses are designed to measure household food insecurity (including marginal, moderate and severe[33]) resulting from limited financial resources over the previous 12 months. This can also be used to estimate population-level food insecurity.

Approximately 18.0% of Hamilton households were food insecure in 2021-2022 (Appendix A Table 2.9). This was similar to 2019-2020 (19.1%) and to Ontario overall (17.4%).

That translates into an estimated 89,968 food insecure Hamiltonians in 2021-2022, or 15.8% of all residents.

EDUCATION

The level of education obtained by an individual influences their knowledge, behaviours, skills and opportunities. Education increases people's ability to make informed decisions about their health and can help them navigate complex health systems. People with higher levels of education have better health outcomes as they typically have more access to resources such as employment.

Across Hamilton residents aged 25-64: 65.0% of held a post-secondary education certificate, diploma or degree

- 24.7% had a high school diploma or equivalent as the highest education level achieved

- 10.4% had not completed high school or any other certificate, diploma or degree (Appendix A Table 2.10)

Looking more closely at post-secondary education for residents aged 25-64:

- 31.0% held a bachelor's degree or higher (34.3% women+ and 27.5% of men) (Figure 2.5, Appendix A Table 2.11)
- 34.0% held a post-secondary certificate or diploma below the bachelor level, including 5.6% that had an apprenticeship

The proportion of Hamiltonians with a bachelor's degree or higher was below the Ontario average (36.8%) but has increased since 2016 when 25.0% held a bachelor's degree or higher.[18]

Table 2.1: Bachelor's degree or higher, population aged 25-64 by selected racialized groups of City of Hamilton residents, 2021

Bachelor's degree or higher (age 25-64)	City of Hamilton	
	Count	Percent (%)
Racialized groups (Total)	31,950	42.8
South Asian	11,455	59.6
Chinese	3,325	59.3
Arab	3,115	42.3
Black	4,175	30.6

Sources: Statistics Canada. Table 98-10-0432-01. Highest level of education by visible minority and immigrant status: Canada, provinces and territories, census divisions and census subdivisions with a population 5,000 or more, DOI: https://doi.org/10.25318/9810043201-eng (accessed December 12, 2023) and Statistics Canada. Table 98-10-0415-01. Highest level of education by major field of study (summary)

Note: The term "racialized" is used in this report as defined by the Census 2021 concept of "visible minority" from the Employment Equity Act. This definition uses specific groups and does not include First Nations, Métis and Inuit peoples as a "visible minority".

Two out of every five Hamilton residents aged 25-34 held a bachelor's degree or higher (40.3%). This proportion decreased by age group; 1 in 5 Hamilton residents aged 55-64 had a bachelor's degree or higher (20.7%)

Higher rates were also found among Hamiltonians that self-reported as racialized (42.8%) (Table 2.1). Almost 6 in 10 Hamilton residents belonging to certain racialized groups – such as South Asian (59.6%) and Chinese (59.3%) – had a bachelor's degree or higher.[34] A higher percentage of immigrants also held a bachelor's degree or higher (35.9%) compared to non-immigrants (27.9%).

Figure 2.5: Bachelor's degree or higher level of education (percent individuals aged 25-64 in private households) by different groups of Hamilton residents and compared to Ontario, 2021
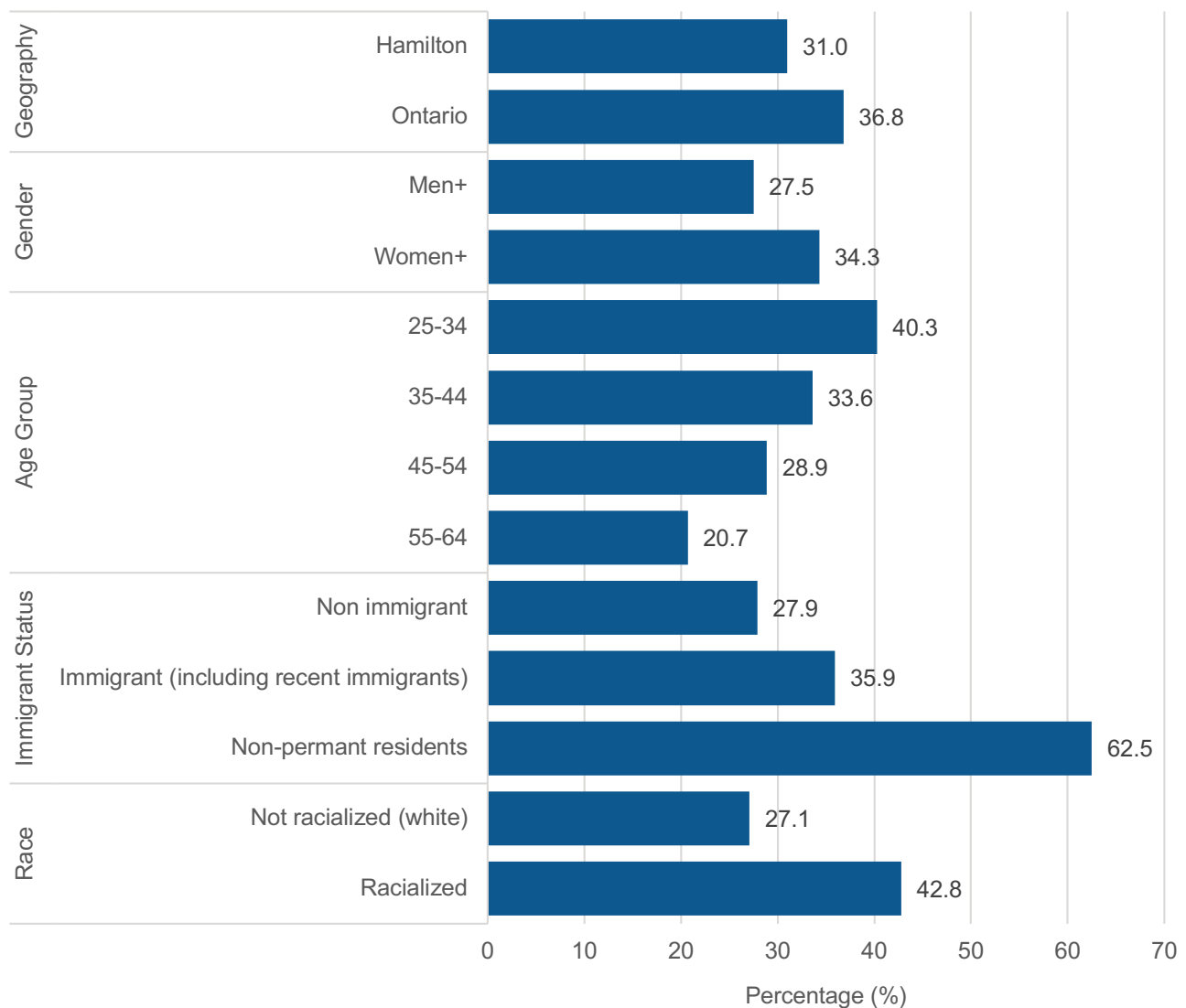
Category	Group	Percentage (%)
Geography	Hamilton	31.0
	Ontario	36.8
Gender	Men+	27.5
	Women+	34.3
Age Group	25-34	40.3
	35-44	33.6
	45-54	28.9
	55-64	20.7
Immigrant Status	Non immigrant	27.9
	Immigrant (including recent immigrants)	35.9
	Non-permant residents	62.5
Race	Not racialized (white)	27.1
	Racialized	42.8

Source: Statistics Canada. Table 98-10-0432-01. Highest level of education by visible minority and immigrant status: Canada, provinces and territories, census divisions and census subdivisions with a population 5,000 or more.

Note: The term "racialized" is used in this report as defined by the Census 2021 concept of "visible minority" from the Employment Equity Act. This definition uses specific groups and does not include First Nations, Métis and Inuit peoples as a "visible minority".

FAMILY STRUCTURE

A stable and supportive family structure can influence better health outcomes as it may contribute to a sense of security and belonging. Conversely, family instability (such as strained familial relationships) can lead to stress and adversely impact health.

There were 157,125 families in the City of Hamilton in 2021. Statistics Canada defines a family on the census as:

- a married couple (including opposite or same sex) and the children (if any) of either one or both spouses
- a common-law couple (including opposite or same sex) with or without children of either one or both partners
- one parent of any marital status with at least one child living in the same dwelling, and that child or those children
- grandchildren living with their grandparent(s) but with no parents present

The average size of census families in Hamilton was 2.9 people, and the average number of children in census families with children was 1.8. Almost half of all census families in Hamilton were two-person families (48.5%), while 22.3% are three-person families, 20.0% were four-person families and 9.3% have five or more persons.

This report uses the term "one-parent family" for consistency and to align with Statistic Canada's 2021 Census terminology. Families are complex and this grouping includes different family arrangements. There are many other recognized terms in use (e.g., single parent, independent parent, autonomous parent).

Two out of every 10 census families in

Hamilton (19.2% or 30,135) were one-parent families in 2021. The percentage was the same as in 2016 (19.2%) with an overall increase in the number of one-parent families (28,635 families)[18], due to population growth in general.

The percent of one-parent families was higher in Hamilton than for Ontario overall in 2021 (17.1%). Most one-parent families were led by people who identify as female (23,985; 79.6%) (Appendix A Table 2.12).

While 82.3% of Hamilton residents in private households lived in census families in 2021, 11.1% lived alone (62,110 residents), 4.0% lived with a non-relative only and an additional 2.7% lived with other relatives.

Looking at household type:

- 60.3% of households are one-census-family households without additional persons
- 27.9% are one-person households
- 4.3% (9,535) are two-or-more-person non-census-family households
- 3.7% (8,140) are multi-generational households
- 3.2% (7,030) are one-census-family households with additional persons
- less than 1% (0.7%, 1, 570 households) are multi-census-family households, where the dwelling is shared by two or more families, excluding multi-generational households

Some family structures, living arrangements and relationship dynamics may not align with the Statistic Canada's 2021 Census terminology. Other local research illustrates this and recognizes more complex possibilities for relationships, specifically for the Two Spirit and LGBTIQ+ population.[9]

COMMUNITY BELONGING

Having a sense of community belonging can contribute to better physical and mental health. That includes strong social support networks feeling connected to the community. Both can reduce feelings of isolation and loneliness. In contrast, experiences of discrimination in any form can erode the sense of community belonging for marginalized communities, influencing their health.

For the period of 2015 to 2020, 71.2% of Hamilton residents aged 12 and older described their sense of belonging to their local community as somewhat or very strong. This was similar to the Ontario average (70.9%) (Figure 2.6 and Appendix A Table 2.13).

Community belonging was greatest among those Hamiltonians aged 12-19 (83.2%) and 65-74 (82.2%). The lowest levels of community belonging were reported by those aged 20-44 (63.6%). There were no other differences among groups of Hamilton residents.

DISABILITY

Having a disability can intersect with various aspects of health and well-being. People with disabilities may encounter discrimination and the built environment can be a barrier to people with disabilities in accessing health and social services. That can lead to health inequities and negative health outcomes that are not associated with the disability itself.

Among Hamilton residents aged 15 and older in 2017, 29.0% had one or more disabilities that limited them in their daily activities (Appendix A Table 2.14). This was higher than for Ontario overall (24.1%).

The definition of disability was determined by the data source and includes:

- anyone who reported being "sometimes," "often" or "always" limited in their daily activities due to a long-term condition or health problem
- anyone who reported being "rarely" limited, if they were also unable to do certain tasks or could only do them with a lot of difficulty

The definition includes a broad range of limitations, including hearing, vision, mobility, pain, learning, mental health, memory and developmental disabilities.[35]

Males (27.6%) and females (30.7) had similar rates of disability. The rates increased with age; among those aged 15-64, 25.9% had a disability (higher than the 19.8% for this age group in Ontario overall), while 45.4% did in the 65-plus age group.

Figure 2.6: Community belonging, percent (%) of Hamilton residents aged 12 and older by different groups of Hamilton residents and compared to Ontario, 2015-2020 combined
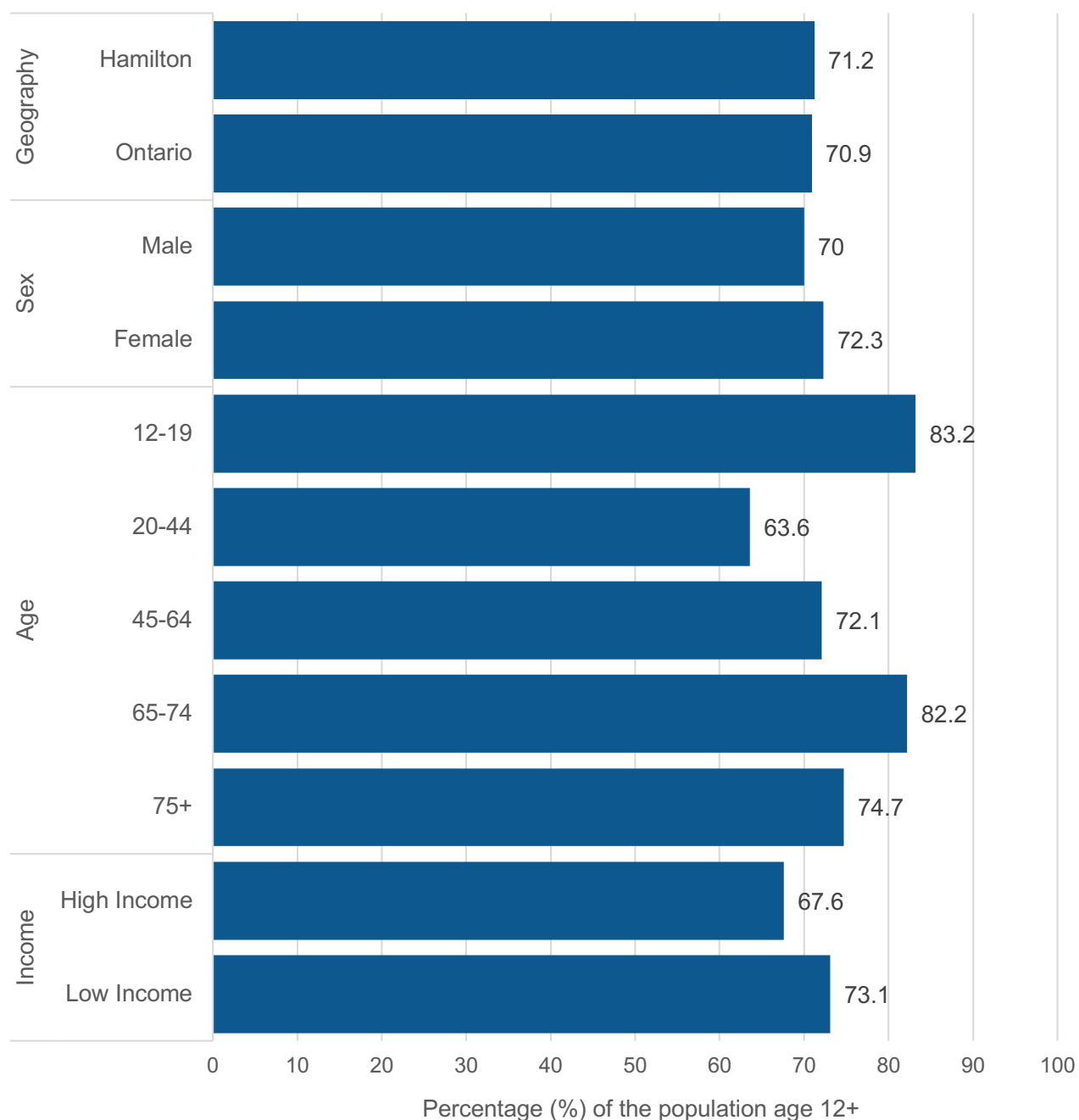
Group		Percentage
Geography	Hamilton	71.2
	Ontario	70.9
Sex	Male	70
	Female	72.3
Age	12-19	83.2
	20-44	63.6
	45-64	72.1
	65-74	82.2
	75+	74.7
Income	High Income	67.6
	Low Income	73.1

Percentage (%) of the population age 12+

Source: Canadian Community Health Survey [2015-2016 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health

Notes: Additional equity analysis (e.g., for racialized groups) was not available for reporting.
Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

GENERAL HEALTH

HIGHLIGHTS

- Hamilton residents are expected to live to be 81.3 years, below the Ontario average for life expectancy (82.6 years) based on 2015-2017 estimates.

- The rate of premature death increased for Hamilton residents between 2012 and 2021. This increase is far greater in neighbourhoods with more low-income households, which represents a widening inequality.

- Nearly half of premature deaths among Hamilton residents could potentially be avoided through population health and primary prevention efforts.

- Unintentional poisonings (primarily drug overdoses) are driving substantial increases in premature mortality and potential years of life lost among Hamilton residents.

- The top five leading causes of premature death for Hamilton residents in 2021: (1) ischemic heart disease; (2) cancer of the lung and bronchus; (3) unintentional poisoning; (4) cancer of the colon, rectum and anus; and (5) chronic lower respiratory diseases.

GENERAL HEALTH

SELF-RATED HEALTH

On average, 61.2% of Hamilton residents aged 12 and older rated their general health as very good or excellent for the combined years from 2015 to 2020 (Figure 3.1). That was similar to the Ontario average (61.1%).

Positive self-rated general health of Hamiltonians was similar across time periods: 58.7% for 2015-2016, 61.2% for 2017-2018, and 63.5% for 2019-2020.

Self-rated positive general health was greatest among residents aged 12-19, and decreased with each subsequent age group. Hamiltonians in the highest household income group (top 20% of income earners) rated their general health higher compared to those in the lowest income group (bottom 20% of income earners).

Figure 3.1: Self-rated general health as very good to excellent by different groups of Hamilton residents aged 12 and older, 2015-2020 combined

Group	Percentage (%)
Hamilton	61.2
Sex — Male	61.2
Sex — Female	61.1
Age — 12-19	75.4
Age — 20-44	66.4
Age — 45-64	59.1
Age — 65-74	53.1
Age — 75+	36.5
Income — High Income	75.9
Income — Low Income	43.2

Percentage (%) of the population age 12+
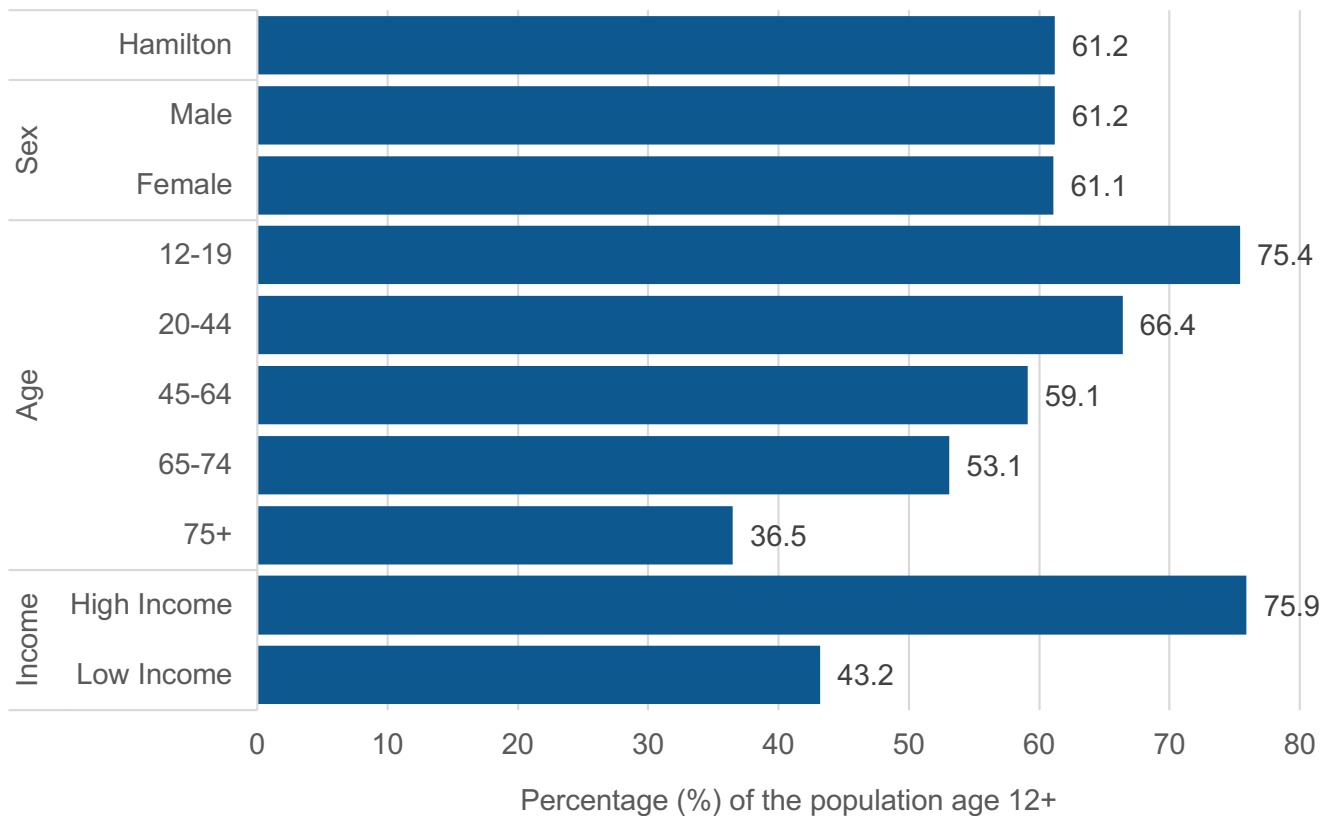
Source: Canadian Community Health Survey [2015-2016 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health.

Notes: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

LIFE EXPECTANCY

Life expectancy is estimated as either a person's entire life span (life expectancy at birth) or the number of years left to live once a person reaches a certain age (such as life expectancy at age 65). A higher life expectancy is considered an indicator of better overall health of the population and is sensitive to socioeconomic changes.

Hamilton residents born between 2015-2017 can expect, on average, to live to be 81.3 years old (Table 3.1). That's lower than for Ontarians overall (82.6 years) born in that period, but 0.7 years greater than the life expectancy for those born from 2006-2008.

In Hamilton, females have life expectancy that's nearly five years greater than for males.

Hamilton residents who reached age 65 in 2015-17 could expect, on average, to live another 20.6 years. Life expectancy at age 65 in 2015-17 was 22.1 years for females, three years higher than for males. Life expectancy at age 65 in 2015-17 was lower in Hamilton compared to the Ontario average.

Table 3.1: Life expectancy, Hamilton and Ontario residents, 2015-2017 combined

Life Expectancy	Groups	City of Hamilton	Ontario
Life Expectancy at Birth (years)	Males	78.8	80.5
	Females	83.6	84.6
	Total	81.3	82.6
Life Expectancy at Age 65 (years)	Males	19.0	19.8
	Females	22.1	22.6
	Total	20.6	21.3

Source: Statistics Canada. Table 13-10-0389-01 Life expectancy, at birth and at age 65, by sex, three-year average, Canada, provinces, territories, health regions and peer groups.

DEATH FROM ALL CAUSES

In 2021, 5,327 Hamilton residents died (Figure 3.2). Overall, the number and rate of deaths steadily increased in Hamilton since 2012. These rates do not account for changes over time in the age structure or socioeconomic conditions which are not accounted for in these rates and are known to influence health.

Figure 3.2: Total deaths and crude mortality rate, Hamilton residents, 2012-2021
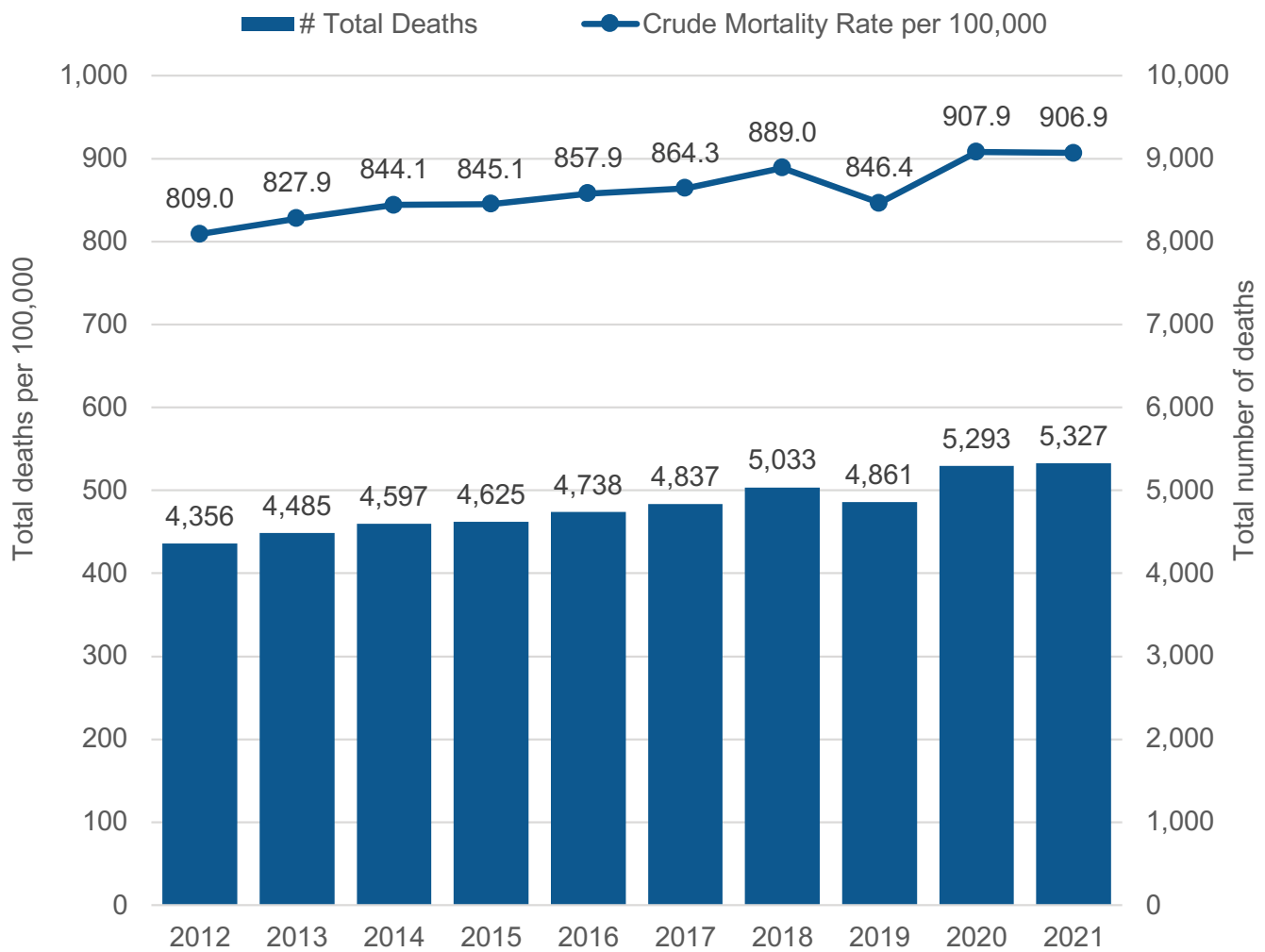
Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Notes: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

LEADING CAUSES OF DEATH

The 15 leading causes of death for Hamilton residents are shown in Table 3.2 for the years 2021 and 2012. The ranking of the top five did not change between 2012 and 2021. In 2021 the top five causes accounted for 35.3% of all deaths, down from 39.0% in 2012 for the same top five causes.

There were two major changes to the leading causes of death for Hamilton residents over this period. One was the emergence of coronavirus disease 2019 (COVID-19).

The other was the substantial increase in unintentional poisoning, which ranked 28th in 2012 (28 deaths) and seventh in 2021 (148 deaths).

Unintentional poisoning includes harm from swallowing, inhaling, absorbing, or injecting any substance (e.g., medicines, drugs, cleaning chemicals, alcohol, carbon monoxide). This report covers unintentional poisoning in Chapter 10: Substance Use.

The 15 leading causes of premature death (death before age 75) for Hamilton residents

Table 3.2: Leading causes of death, Hamilton residents, 2021 and 2012

Cause of Death	Rank in 2021	Deaths in 2021	Rank in 2012	Deaths in 2012
Ischemic heart disease	1	610	1	627
Dementia and Alzheimer disease	2	569	2	360
Cancer of the lung and bronchus	3	316	3	343
Cerebrovascular diseases	4	209	4	192
Chronic lower respiratory diseases	5	179	5	175
Cancer of the colon, rectum, and anus	6	158	7	131
Unintentional poisoning	7	148	28	34
Falls	8	140	9	123
Cancer of the lymph and blood	9	123	8	125
Coronavirus disease 2019	10	118	n/a	0
Diseases of the urinary system	11	115	13	80
Diabetes	12	111	6	147
Heart failure and complications	13	99	12	92
Cancer of the prostate	14	98	14	77
Cirrhosis and other liver diseases	15	91	15	75

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.
Note: Chronic lower respiratory diseases include chronic obstructive pulmonary disease (COPD) and asthma.

are shown in Table 3.3 for 2021 and 2012. The top five causes of premature deaths in 2021 differed from 2012, with unintentional poisonings rising to third from eleventh, and diabetes falling from third to ninth. These five leading causes accounted for 33.9% of all premature deaths in Hamilton in 2021.

There are notable differences among age groups (Table 3.4).

- Aged 19 and younger: The leading causes of death are perinatal conditions and congenital malformation, deformations and chromosomal conditions. Together, they account for 60.9% of deaths in that age group.
- Aged 20-44: Unintentional poisoning and intentional self-harm are the primary causes of death, accounting for 39.3% and 11.1% of deaths in that age group, respectively.
- Aged 45-64 and 65-74: Ischemic heart disease and cancer of the lung and bronchus are the leading causes of death.
- Aged 75 and older: While dementia and Alzheimer disease are the top cause of death, older populations in Canada tend to have multiple chronic conditions that may contribute to decline and death; only one condition may be listed as the primary cause of death.

Table 3.3: Leading causes of premature death (death before age 75), Hamilton residents, 2021 and 2012

Cause of Death	Rank in 2021	Deaths in 2021	Rank in 2012	Deaths in 2012
Ischemic heart disease	1	219	1	208
Cancer of the lung and bronchus	2	163	2	184
Unintentional poisoning	3	147	11	34
Cancer of the colon, rectum, and anus	4	74	4	62
Chronic lower respiratory diseases	5	72	5	58
Cirrhosis and other liver diseases	6	60	6	56
Cerebrovascular diseases	7	56	10	42
Coronavirus disease 2019	8	53	n/a	0
Diabetes	9	49	3	69
Cancer of the breast	10	47	8	47
Intentional self-harm	11	44	9	47
Cancer of the liver and intrahepatic bile ducts	12	43	13	27
Cancer of the pancreas	13	41	12	34
Cancer of the lymph and blood	14	40	7	53
Dementia and Alzheimer disease	15	32	15	19

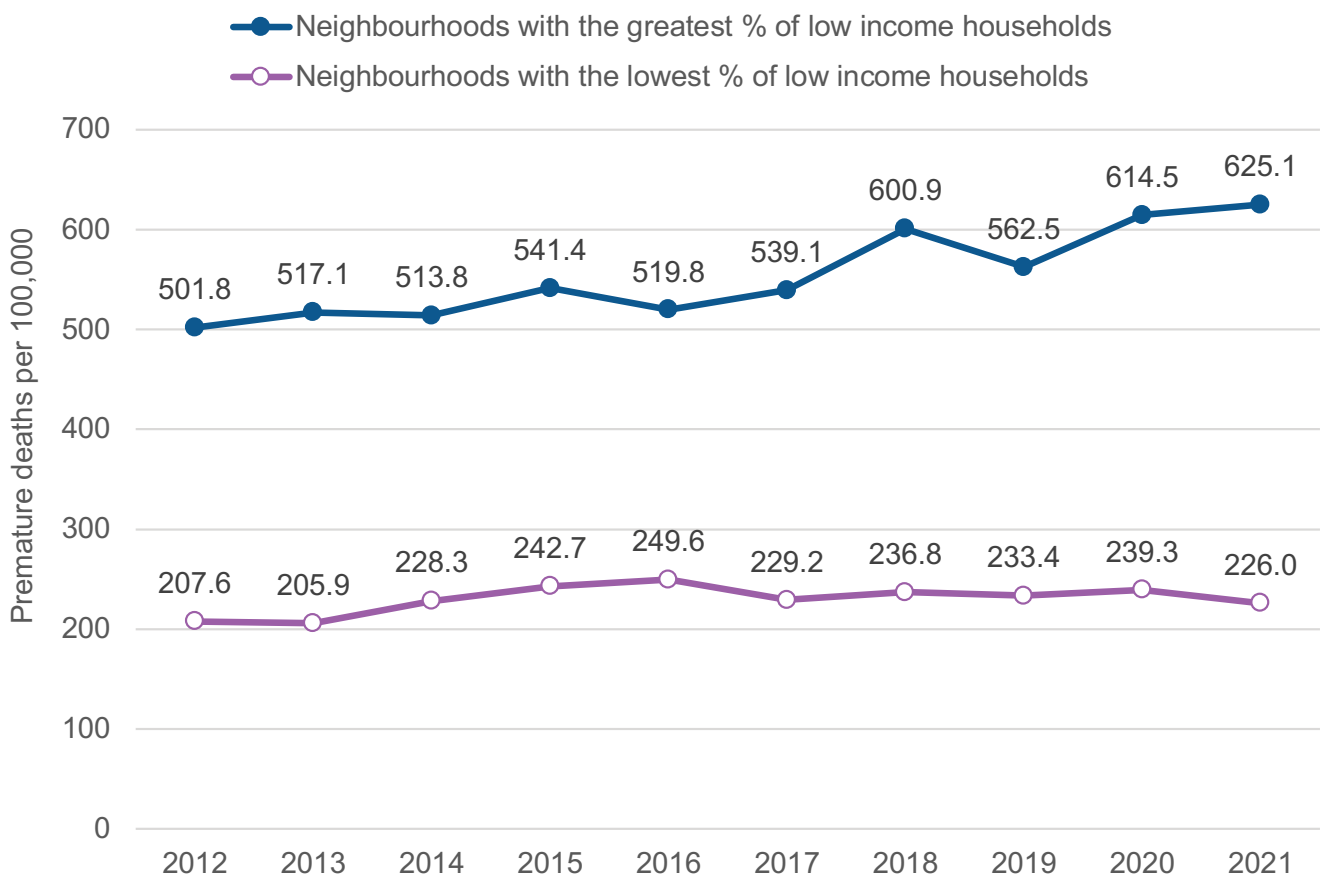**Source:** Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.
Note: Chronic lower respiratory diseases include chronic obstructive pulmonary disease (COPD) and asthma.

Table 3.4: Top five leading causes of death by age groups, Hamilton residents, 2021

Age Group (Total deaths)	Top 5 leading causes of death (number of deaths in 2021)				
	1	2	3	4	5
0 – 19 (46 deaths)	Perinatal conditions (20)	Congenital malformation, deformations, and chromosomal conditions (8)	Unintentional poisoning (2) Assault (2) Intestinal infection (2)	Intentional self-harm (1) Transport accidents (1) Cardio-myopathy (1)	Not available
20 – 44 (234 deaths)	Unintentional poisoning (92)	Intentional self-harm (26)	Assault (8)	Cirrhosis and liver diseases (7)	Transport accidents (5) Cerebro-vascular diseases (5)
45 – 64 (747 deaths)	Ischemic heart disease (91)	Cancer of the lung and bronchus (64)	Unintentional poisoning (46)	Cirrhosis and other liver diseases (32)	Cancer of the colon, rectum, and anus (27)
65 – 74 (964 deaths)	Ischemic heart disease (126)	Cancer of the lung and bronchus (99)	Chronic lower respiratory diseases (53)	Cancer of the colon, rectum, and anus (43)	Cerebro-vascular diseases (33)
75+ (3,336)	Dementia and Alzheimer disease (537)	Ischemic heart disease (391)	Cancer of the lung and bronchus (153) Cerebro-vascular diseases (153)	Falls (115)	Chronic lower respiratory diseases (107)

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

PREMATURE DEATH

Any death before age 75 is considered premature. For the three-year period of 2018 to 2020, 15,187 Hamilton residents died, and 5,863 (38.6%) of those deaths were premature. The rate of premature deaths increased by 11.4% in Hamilton between 2012 and 2021. That translates to an estimated 203 additional premature deaths in 2021 (Figure 3.3).

Premature deaths can be further examined to determine whether they could potentially have been avoided. Of the 5,863 premature deaths between 2018 and 2020, Statistics Canada estimates that 4,165 (71.0%) were potentially avoidable through prevention (2,800 deaths) or treatment (1,365 deaths).

Nearly half (47.8%) of premature deaths among Hamilton residents could potentially be prevented through population health and primary prevention efforts. They include changes to modifiable factors, population interventions and addressing underlying systemic factors that influence health.

There is substantial inequality, which has been widening, in Hamilton's rate of premature deaths (Figure 3.4). For example, consider the proportion of low-income households in a neighbourhood. Hamilton neighbourhoods with the greatest proportion of such households experience a premature death rate that's 176.6% greater than neighbourhoods with the lowest proportion of these households.

Figure 3.3: Premature deaths, Hamilton residents, 2012-2021
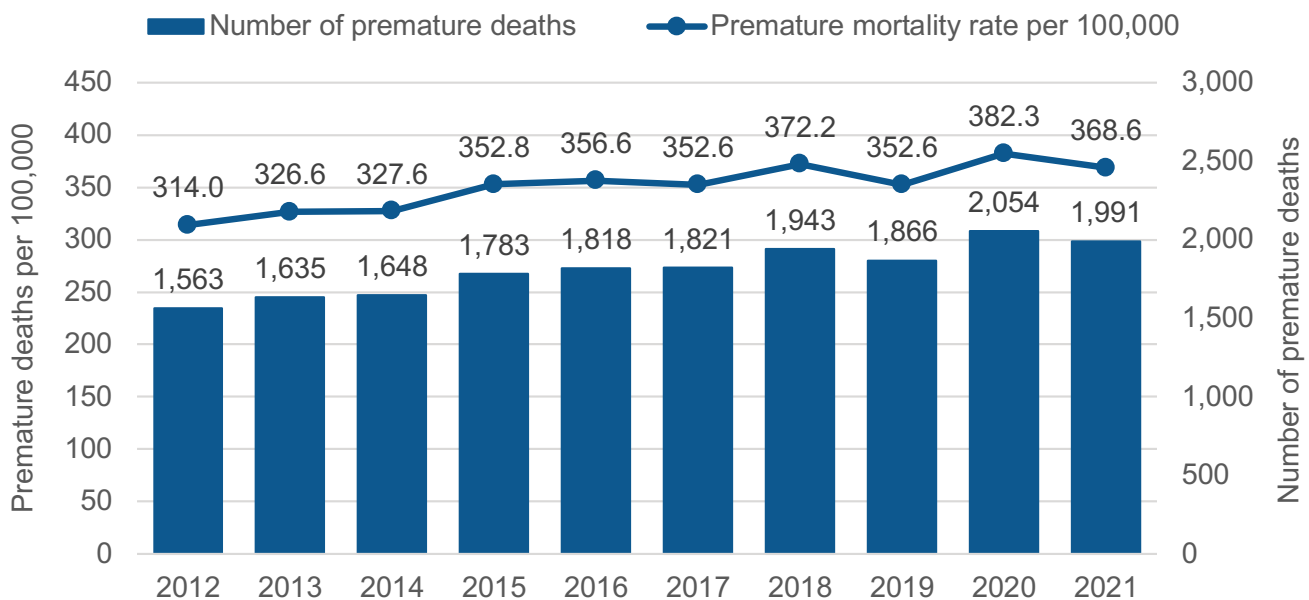
Legend: Number of premature deaths (bars); Premature mortality rate per 100,000 (line)

Year	Number of premature deaths	Premature mortality rate per 100,000
2012	1,563	314.0
2013	1,635	326.6
2014	1,648	327.6
2015	1,783	352.8
2016	1,818	356.6
2017	1,821	352.6
2018	1,943	372.2
2019	1,866	352.6
2020	2,054	382.3
2021	1,991	368.6

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.
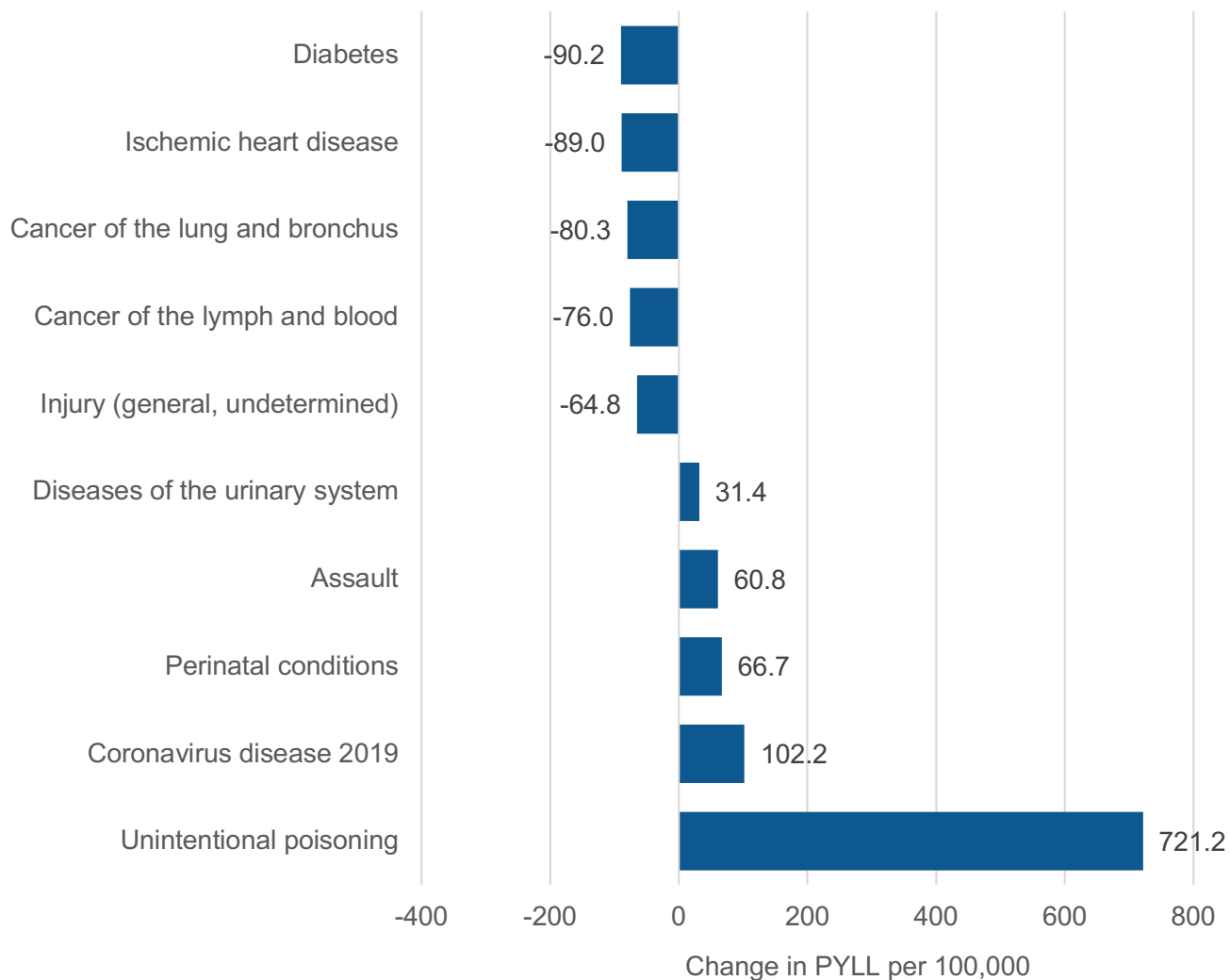
Notes: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Between 2012 and 2021, Hamilton neighbourhoods with the most low-income households also experienced a greater increase in premature deaths compared to neighbourhoods with the least low-income households. This has contributed to a widening inequality.

Between 2012 and 2021, there were changes in the different causes of premature death. Figure 3.5 shows the top five causes of increasing and decreasing premature deaths. The overall outcome is a net increase, largely driven by premature deaths due to unintentional poisoning and COVID-19.

Figure 3.4: Premature deaths by neighbourhood household income, Hamilton residents, 2012-2021

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 3.5: Change in premature deaths by selected cause of death from 2012 to 2021, Hamilton residents
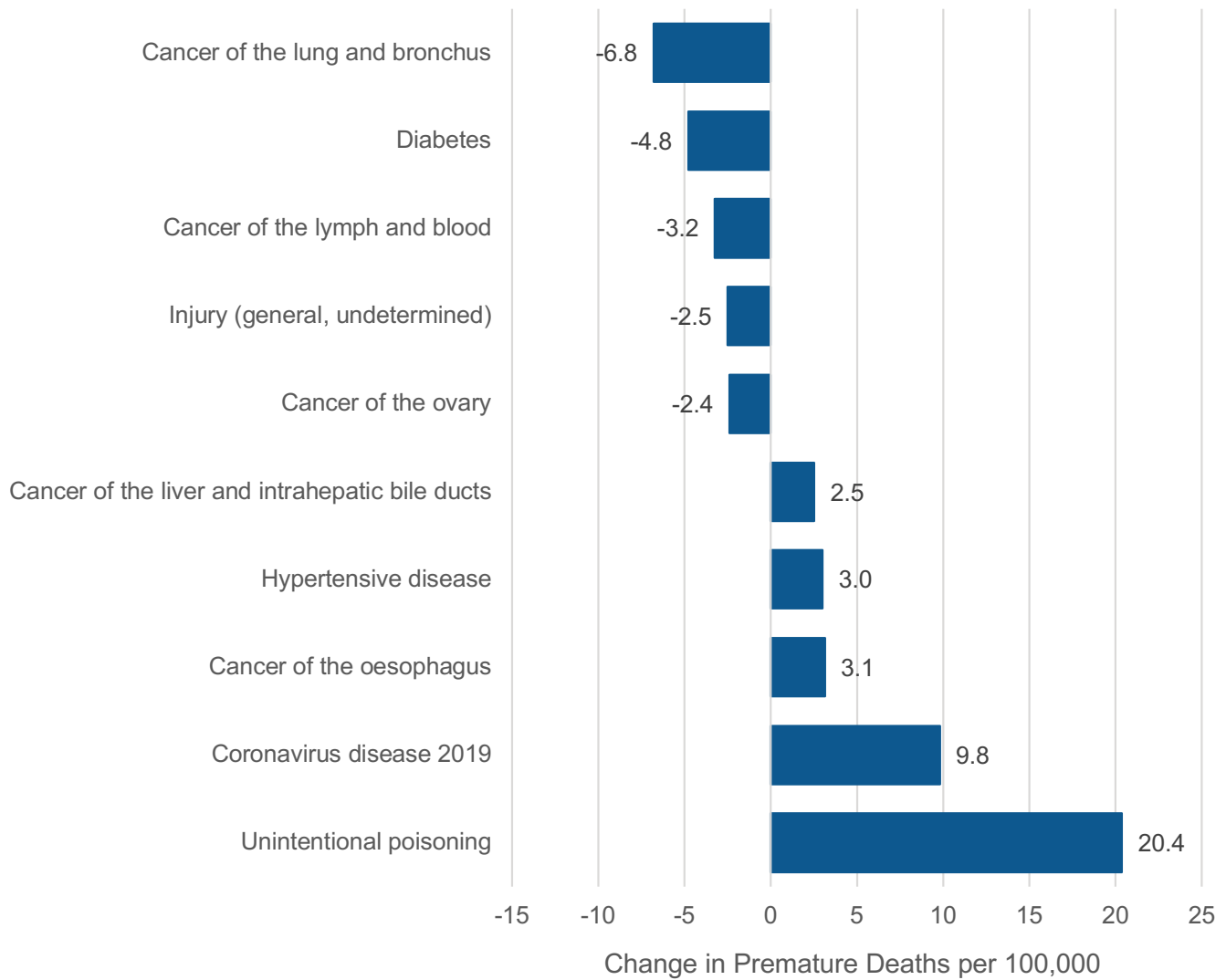
Cause of death	Change in Premature Deaths per 100,000
Cancer of the lung and bronchus	-6.8
Diabetes	-4.8
Cancer of the lymph and blood	-3.2
Injury (general, undetermined)	-2.5
Cancer of the ovary	-2.4
Cancer of the liver and intrahepatic bile ducts	2.5
Hypertensive disease	3.0
Cancer of the oesophagus	3.1
Coronavirus disease 2019	9.8
Unintentional poisoning	20.4

Change in Premature Deaths per 100,000

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

POTENTIAL YEARS OF LIFE LOST

[Potential years of life lost](#) is a measure of how many years of life a person could have lived if they did not die prematurely (before age 75). These potential years can be summed to provide a population level total and rate (Figure 3.6).

In 2021, there were 30,857 potential years of life lost across the population of Hamilton.

Unintended poisoning caused 4,989 years of lost life in 2021 (the leading cause). This is a substantial increase from 2012, when unintentional poisonings ranked sixth with 1,007 years of lost life (Table 3.5).

The overall rate of potential years of life lost for Hamilton residents increased between 2012 and 2021. Unintentional poisoning contributed the most years to this net increase (Figure 3.7).

Figure 3.6: Potential years of life lost (PYLL), Hamilton residents, 2012-2021
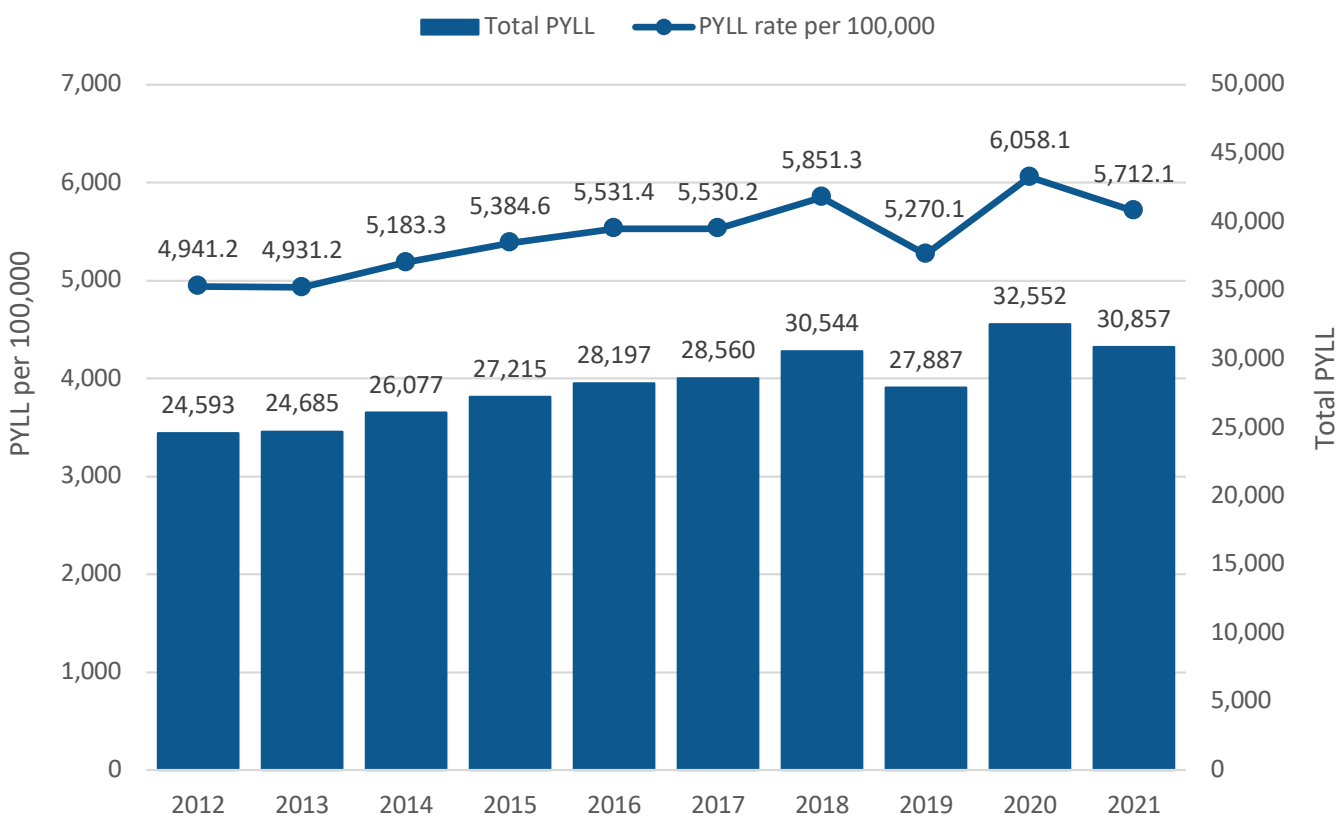
Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Table 3.5: Potential years of life lost (PYLL) by cause of death, Hamilton residents, 2021 and 2012

Cause of Death	Rank in 2021	PYLL in 2021	Rank in 2012	PYLL in 2012
Unintentional poisoning	1	4,989	6	1,007
Ischemic heart disease	2	2,222	1	2,490
Intentional self-harm	3	1,549	3	1,556
Perinatal conditions	4	1,500	4	1,050
Cancer of the lung and bronchus	5	1,495	2	1,777
Cirrhosis and other liver diseases	6	977	7	908
Cancer of the colon, rectum, and anus	7	809	10	702
Congenital malformation, deformation, and chromosol conditions	8	734	11	658
Cancer of the breast	9	687	8	792
Cerebrovascular diseases	10	652	14	567
Diabetes	11	608	5	1,009
Chronic lower respiratory diseases	12	572	13	568
Assault	13	566	23	219
Coronavirus disease 2019	14	552	n/a	0
Cancer of the pancreas	15	483	16	401

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Figure 3.7: Change in potential years of life lost (PYLL) by selected cause of death from 2012 to 2021, Hamilton residents

Cause of death	Change in PYLL per 100,000
Diabetes	-90.2
Ischemic heart disease	-89.0
Cancer of the lung and bronchus	-80.3
Cancer of the lymph and blood	-76.0
Injury (general, undetermined)	-64.8
Diseases of the urinary system	31.4
Assault	60.8
Perinatal conditions	66.7
Coronavirus disease 2019	102.2
Unintentional poisoning	721.2

Change in PYLL per 100,000

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

HEALTHY PREGNANCIES AND BIRTHS

HIGHLIGHTS

- Peripartum health risks related to mental health and weight gain have worsened for Hamilton residents who gave birth.

- Pregnancy and fertility rates are decreasing for residents of Hamilton but remain greater than those for Ontario residents.

- The rate of infants born with a low birth weight has increased in recent years, particularly for full-term infants.

- Rates of preterm births and low birth weights are higher among residents with lower incomes and lower education.

- Exclusive breastfeeding rates have decreased in recent years, while formula feeding in hospital has increased.

HEALTHY PREGNANCIES AND BIRTHS

PRECONCEPTION AND PERIPARTUM HEALTH

Taking a multivitamin with folic acid prior to and during pregnancy supports the normal growth of the baby's spine, brain and skull. This is particularly important for preventing neural tube defects.[36]

In 2021, 42.9% of Hamilton residents who gave birth used folic acid prior to pregnancy, and 42.0% used folic acid prior to and

during pregnancy (Figure 4.1). Both of these rates have increased since 2016, and are consistently greater than Ontario's rates since 2013.

Among Hamilton residents who gave birth, 2.2% have no designated primary care provider for themselves or their infant (Figure 4.2). This rate has fluctuated between 1.3% and 2.3% since 2015. Hamilton's rate remains lower than the Ontario rate for all years from 2015-2022.

Figure 4.1: Folic acid use prior to and during pregnancy, Hamilton residents who gave birth, 2013-2021
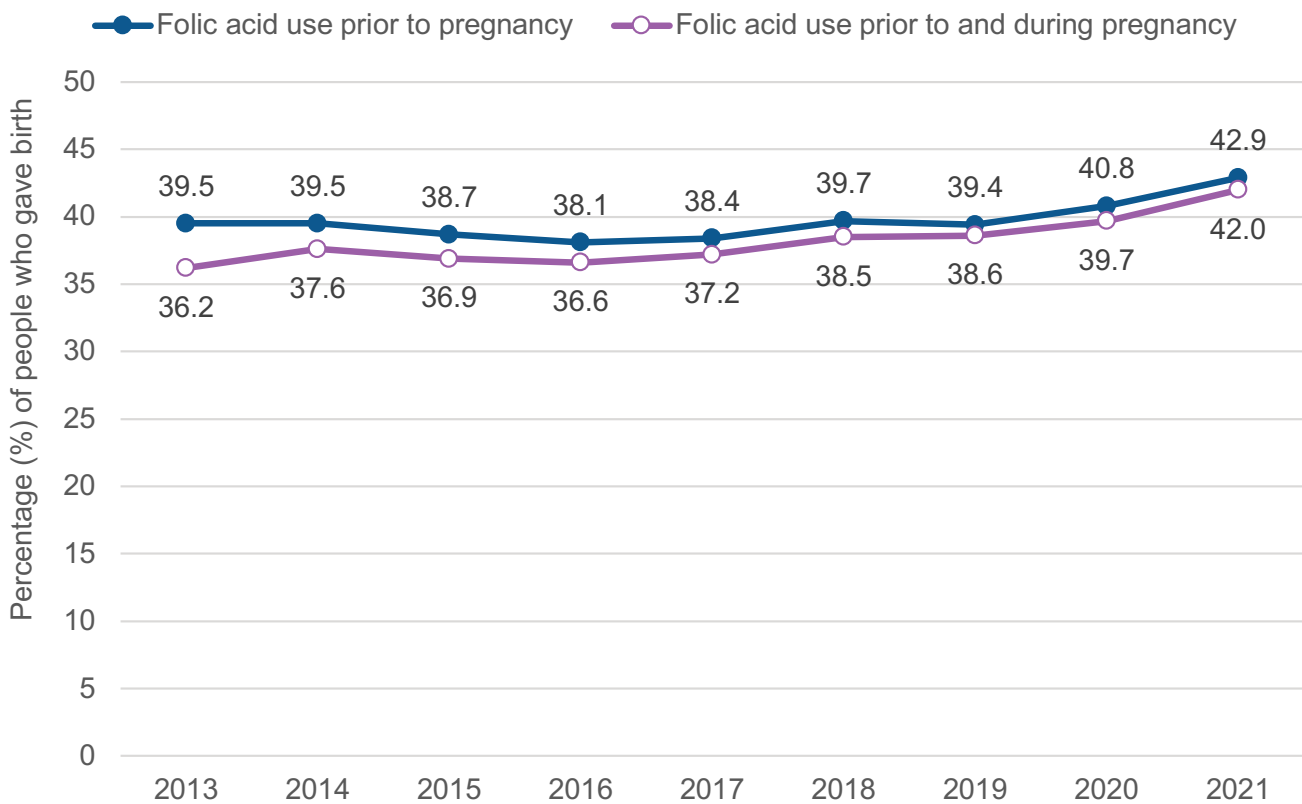
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: maternal health snapshot. Toronto, ON: King's Printer for Ontario.

Notes: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 4.2: No designated primary care provider, Hamilton residents who gave birth and/or their infants, 2015-2022
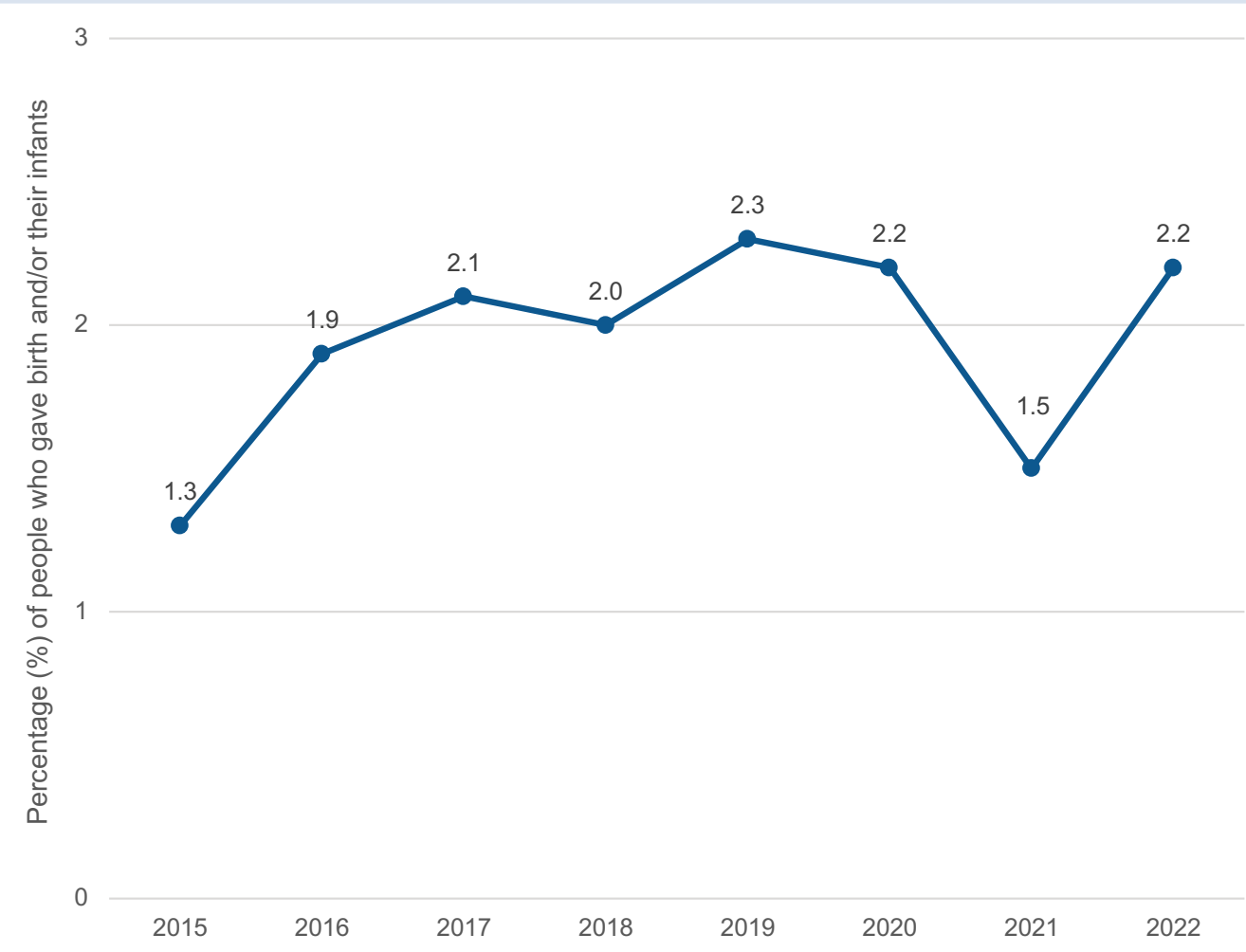
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: risk factors for healthy child development snapshot. Toronto, ON: King's Printer for Ontario.

Notes: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

For Hamilton residents who gave birth in 2021, 28.0% had concerns about their mental health during their pregnancy (Figure 4.3). This was greater than the Ontario rate (22.9%) and has been trending upwards since 2018.

This rate has coincided with a rise in anxiety and depression during pregnancy. Among Hamilton residents who gave birth in 2021:

- 22.1% reported anxiety during pregnancy, which is greater than the Ontario rate (17.9%)
- 12.2% reported depression during pregnancy, which was also greater than the Ontario rate (10.3%)

Rates of reported post-partum depression has remained relatively stable among Hamilton residents who gave birth, and is similar to the Ontario rate.

Measures of weight gain during pregnancy are shown in Figure 4.4 for Hamilton residents who gave birth.

The percentage of Hamilton residents who gained more weight than recommended increased from 47.1% in 2018 to 51.3% in 2021, greater than the Ontario rate. In contrast, the percentage of Hamilton residents who gained less weight than recommended decreased from 21.5% in 2018 to 18.6% in 2021, which was lower than the Ontario rate.

Figure 4.3: Mental health concerns, Hamilton residents who gave birth, 2013-2021
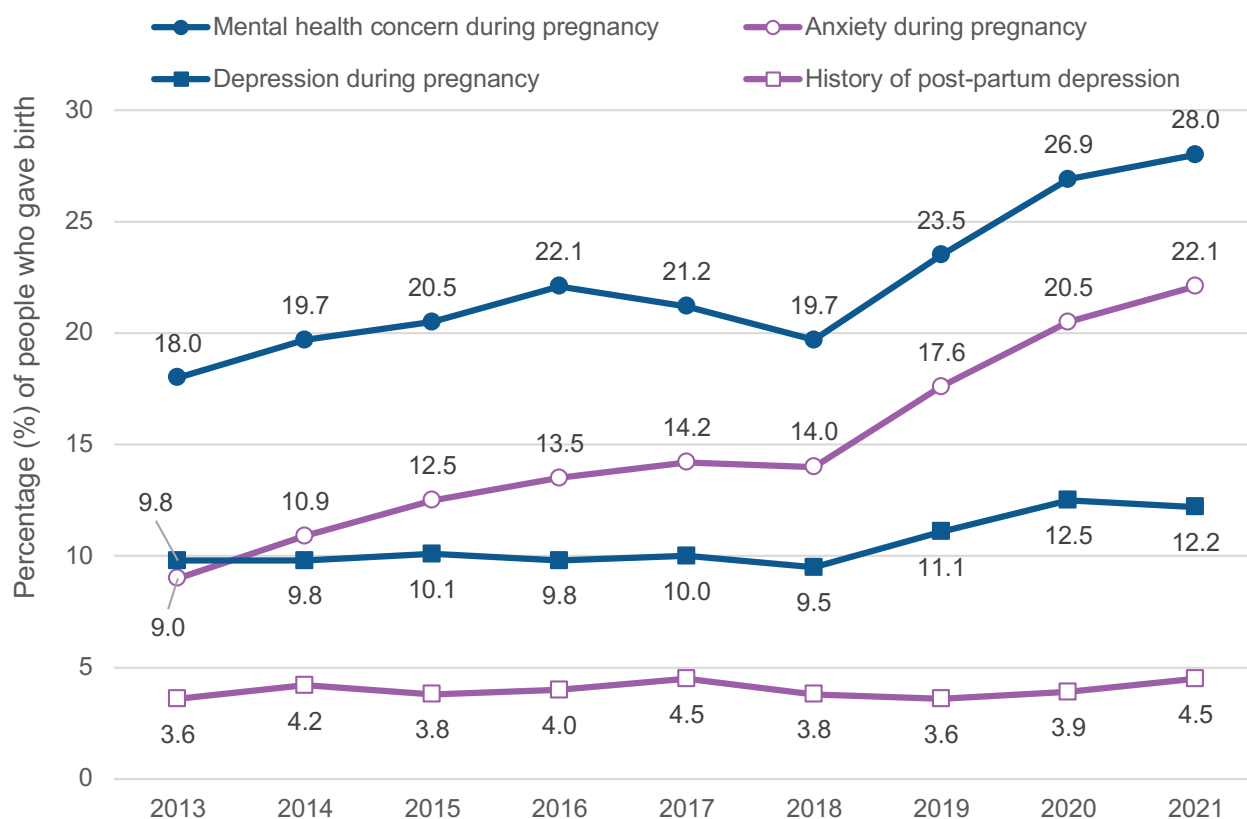
Legend: Mental health concern during pregnancy; Anxiety during pregnancy; Depression during pregnancy; History of post-partum depression

Y-axis: Percentage (%) of people who gave birth

Mental health concern during pregnancy: 2013: 18.0, 2014: 19.7, 2015: 20.5, 2016: 22.1, 2017: 21.2, 2018: 19.7, 2019: 23.5, 2020: 26.9, 2021: 28.0

Anxiety during pregnancy: 2013: 9.0, 2014: 10.9, 2015: 12.5, 2016: 13.5, 2017: 14.2, 2018: 14.0, 2019: 17.6, 2020: 20.5, 2021: 22.1

Depression during pregnancy: 2013: 9.8, 2014: 9.8, 2015: 10.1, 2016: 9.8, 2017: 10.0, 2018: 9.5, 2019: 11.1, 2020: 12.5, 2021: 12.2

History of post-partum depression: 2013: 3.6, 2014: 4.2, 2015: 3.8, 2016: 4.0, 2017: 4.5, 2018: 3.8, 2019: 3.6, 2020: 3.9, 2021: 4.5

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: maternal health snapshot. Toronto, ON: King's Printer for Ontario.

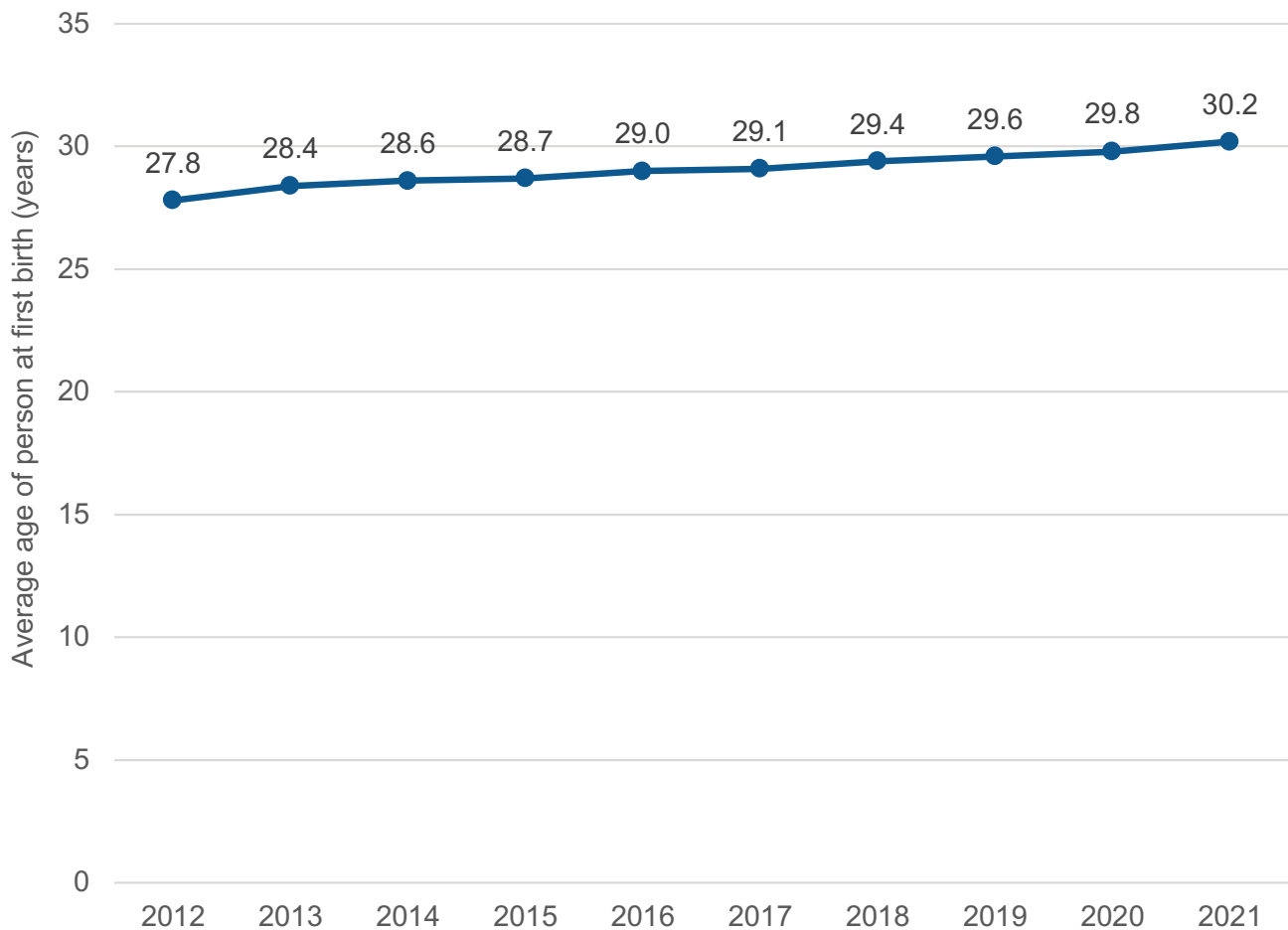**Note:** Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 4.4: Weight gain during pregnancy, Hamilton residents who gave birth, 2013-2021
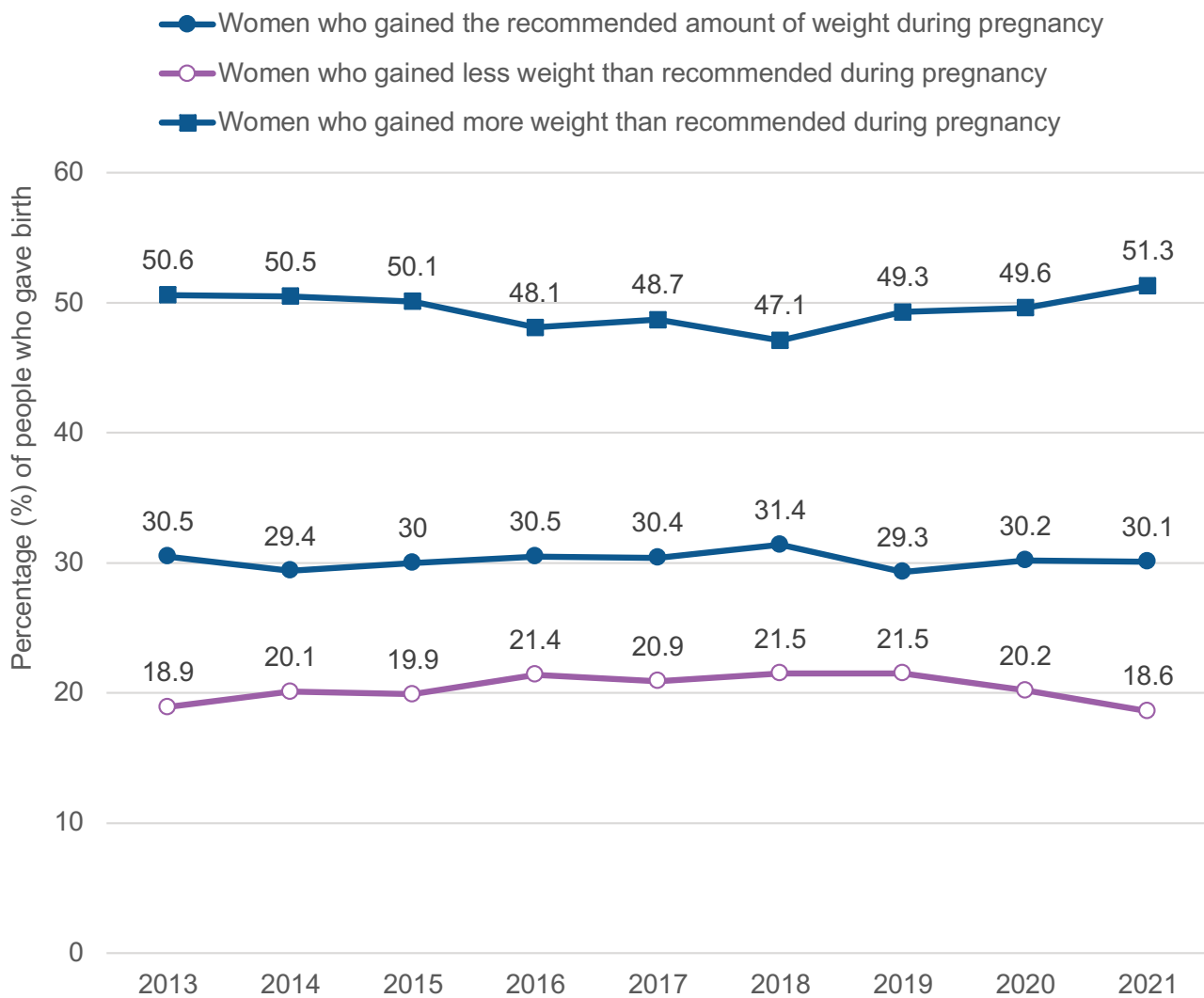
Legend:
- Women who gained the recommended amount of weight during pregnancy
- Women who gained less weight than recommended during pregnancy
- Women who gained more weight than recommended during pregnancy

Y-axis: Percentage (%) of people who gave birth

Women who gained more weight than recommended during pregnancy:
2013	2014	2015	2016	2017	2018	2019	2020	2021
50.6	50.5	50.1	48.1	48.7	47.1	49.3	49.6	51.3

Women who gained the recommended amount of weight during pregnancy:
2013	2014	2015	2016	2017	2018	2019	2020	2021
30.5	29.4	30	30.5	30.4	31.4	29.3	30.2	30.1

Women who gained less weight than recommended during pregnancy:
2013	2014	2015	2016	2017	2018	2019	2020	2021
18.9	20.1	19.9	21.4	20.9	21.5	21.5	20.2	18.6

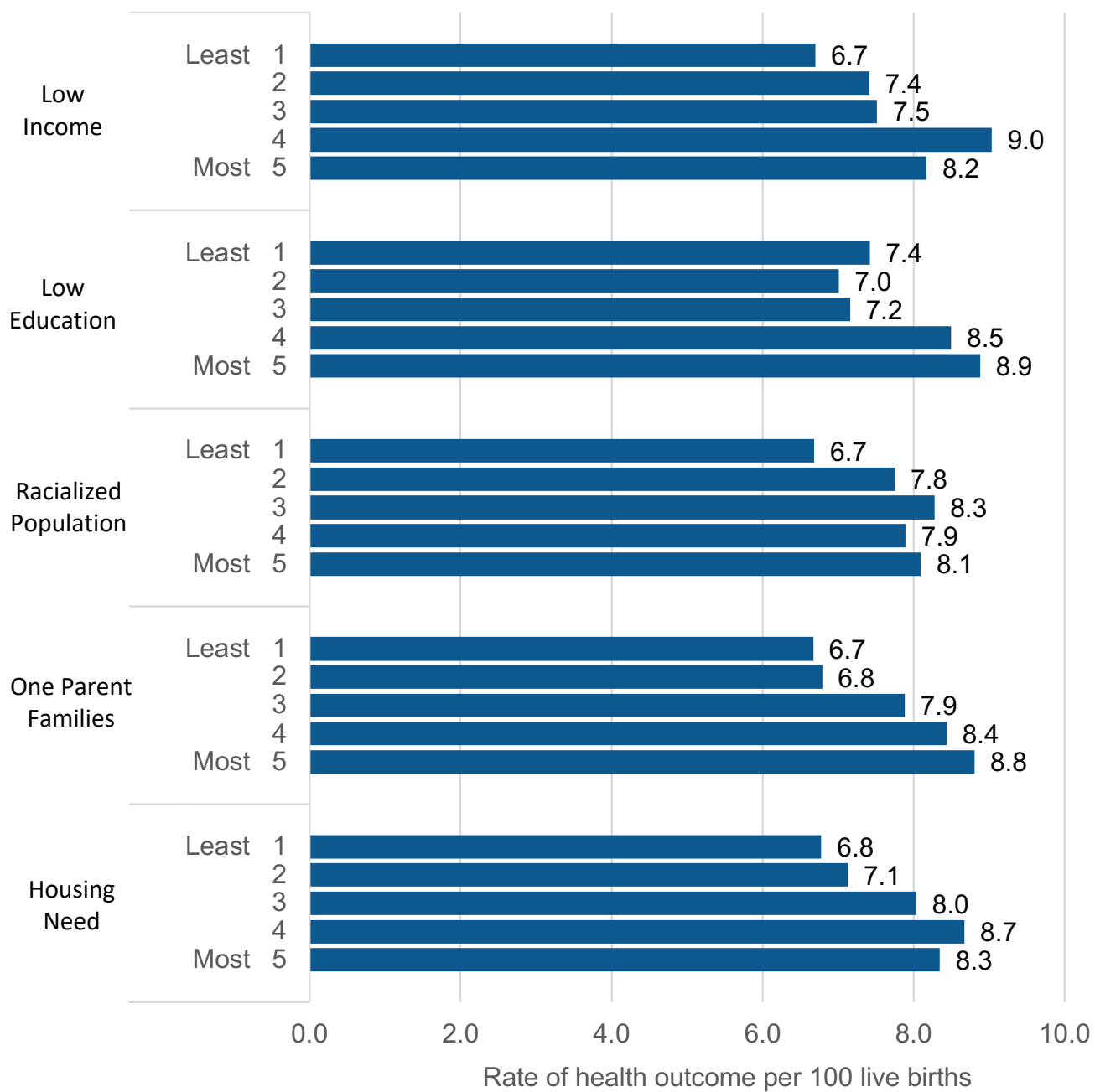**Source:** Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: maternal health snapshot. Toronto, ON: King's Printer for Ontario.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

PREGNANCY AND FERTILITY

Pregnancy and fertility rates are important for monitoring our population's reproductive status and demographics. Both measures focus on the female population age 15-49.

The pregnancy rate is a measure of all pregnancies, including those that result in live births, stillbirths or abortion. Among Hamilton females, there were 6,234 pregnancies and 5,385 live births in 2020. The pregnancy rate has decreased by 20.2% from 2016 to 2020, which translates to over 1,000 fewer pregnancies per year (Figure 4.5). But Hamilton's pregnancy rate has remained greater than the Ontario rate since 2013.

The fertility rate is a measure of pregnancies that result in live births, and has decreased by 8.1% from 2016 to 2020 (Figure 4.5). Hamilton's rate has remained greater than the Ontario rate since 2014.

The average age of Hamilton residents at the time of their first birth has increased from

Figure 4.5: Pregnancy and fertility rates, Hamilton females (age 15-49), 2012-2020
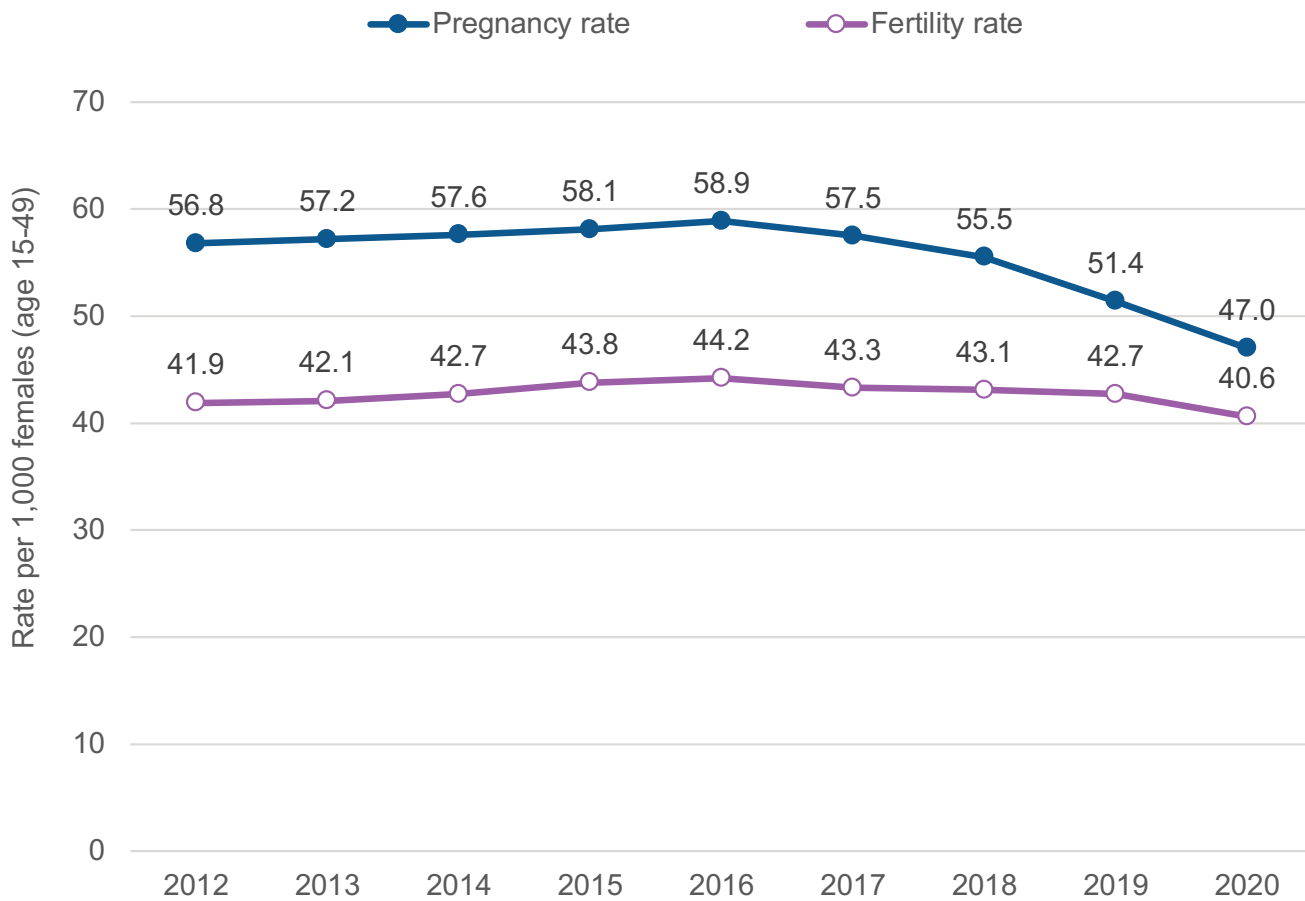
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: reproductive health snapshot. Toronto, ON: King's Printer for Ontario.

27.8 years to 30.2 years (Figure 4.6), same as the Ontario average in 2021 (30.2 years). Chapter 5 on Child and Youth Health includes a more focused section on teen pregnancy.

Substance use during pregnancy can harm the unborn baby. In 2021, Hamilton had:

- greater rates of tobacco use (5.5%) and cannabis use (4.8%) during pregnancy compared to Ontario (4.8% tobacco use and 4.2% cannabis use); and
- lower rates of alcohol use during pregnancy (1.4%) compared to Ontario (1.8%) in 2021.

For Hamilton, all types of substance use during pregnancy has decreased in recent years (Figure 4.7).

Figure 4.6: Average age of person who gave birth at first birth, Hamilton residents who gave birth, 2012-2021

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: reproductive health snapshot. Toronto, ON: King's Printer for Ontario.

Figure 4.7: Substance use during pregnancy, Hamilton residents who gave birth, 2015-2022
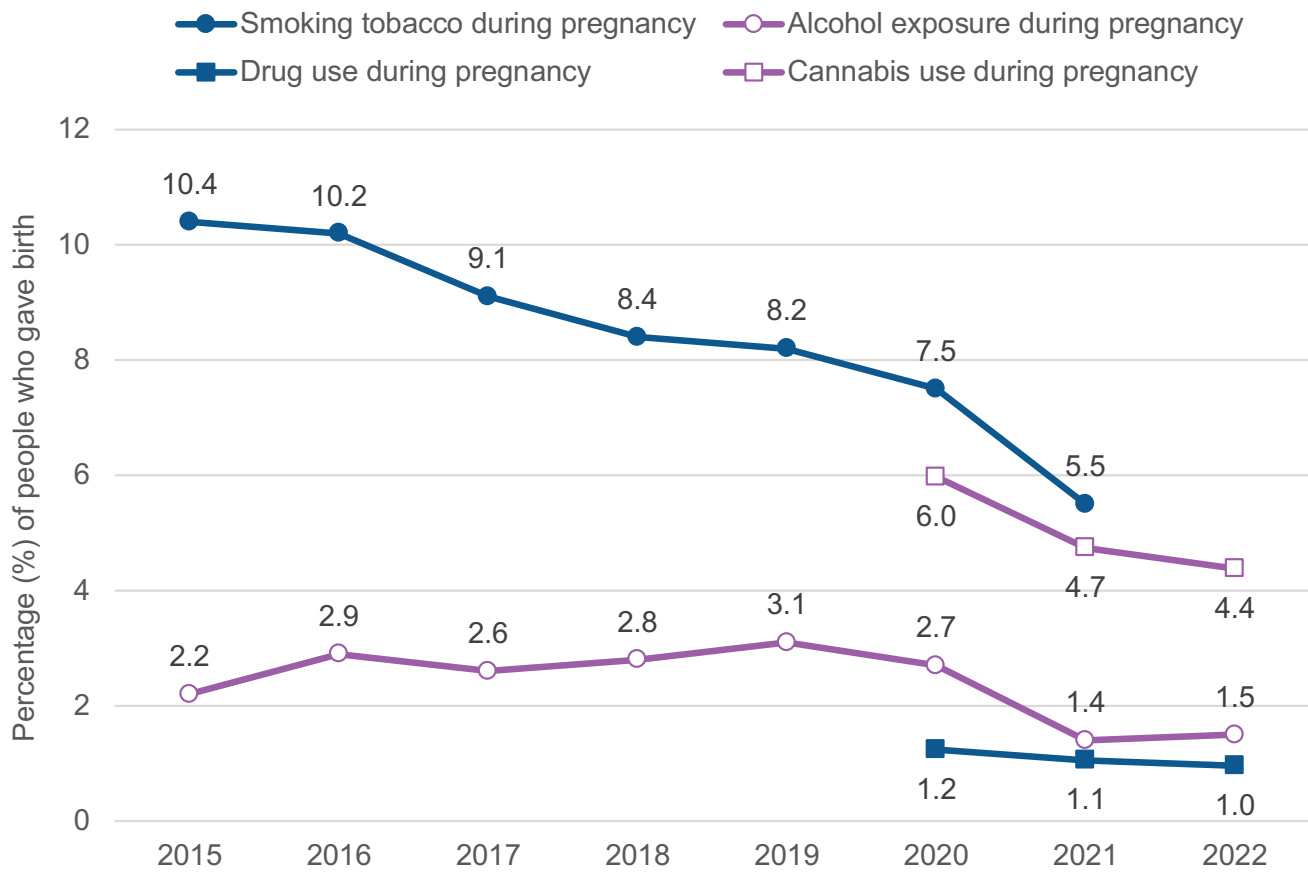
Legend: Smoking tobacco during pregnancy, Alcohol exposure during pregnancy, Drug use during pregnancy, Cannabis use during pregnancy

Smoking tobacco during pregnancy: 2015: 10.4, 2016: 10.2, 2017: 9.1, 2018: 8.4, 2019: 8.2, 2020: 7.5, 2021: 5.5

Alcohol exposure during pregnancy: 2015: 2.2, 2016: 2.9, 2017: 2.6, 2018: 2.8, 2019: 3.1, 2020: 2.7, 2021: 1.4, 2022: 1.5

Cannabis use during pregnancy: 2020: 6.0, 2021: 4.7, 2022: 4.4

Drug use during pregnancy: 2020: 1.2, 2021: 1.1, 2022: 1.0

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: maternal health snapshot. Toronto, ON: King's Printer for Ontario; Better Outcomes Registry and Network, 2020-2022.

Notes:
- Drug use excludes tobacco, alcohol, and cannabis use.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

BIRTHS

The live birth rate (a measure of the number of infants born alive among the total population) has remained relatively stable in Hamilton from 2012 to 2021 (Figure 4.8). There was one notable decrease in 2020 (approximately 290 fewer births than expected). Hamilton's live birth rate has been greater than Ontario's rate since 2016.

Preterm birth describes a baby born alive after less than 37 weeks of pregnancy. There were 436 preterm births among Hamilton residents in 2021 (Figure 4.9). The preterm birth rate for Hamilton tends to fluctuate, and there are no apparent trends over 2012-2021. Hamilton's preterm birth rate was similar to the Ontario rate for most of that period.

Figure 4.8: Live births, number and rate (crude) per 1,000 Hamilton residents, Hamilton residents, 2012-2021
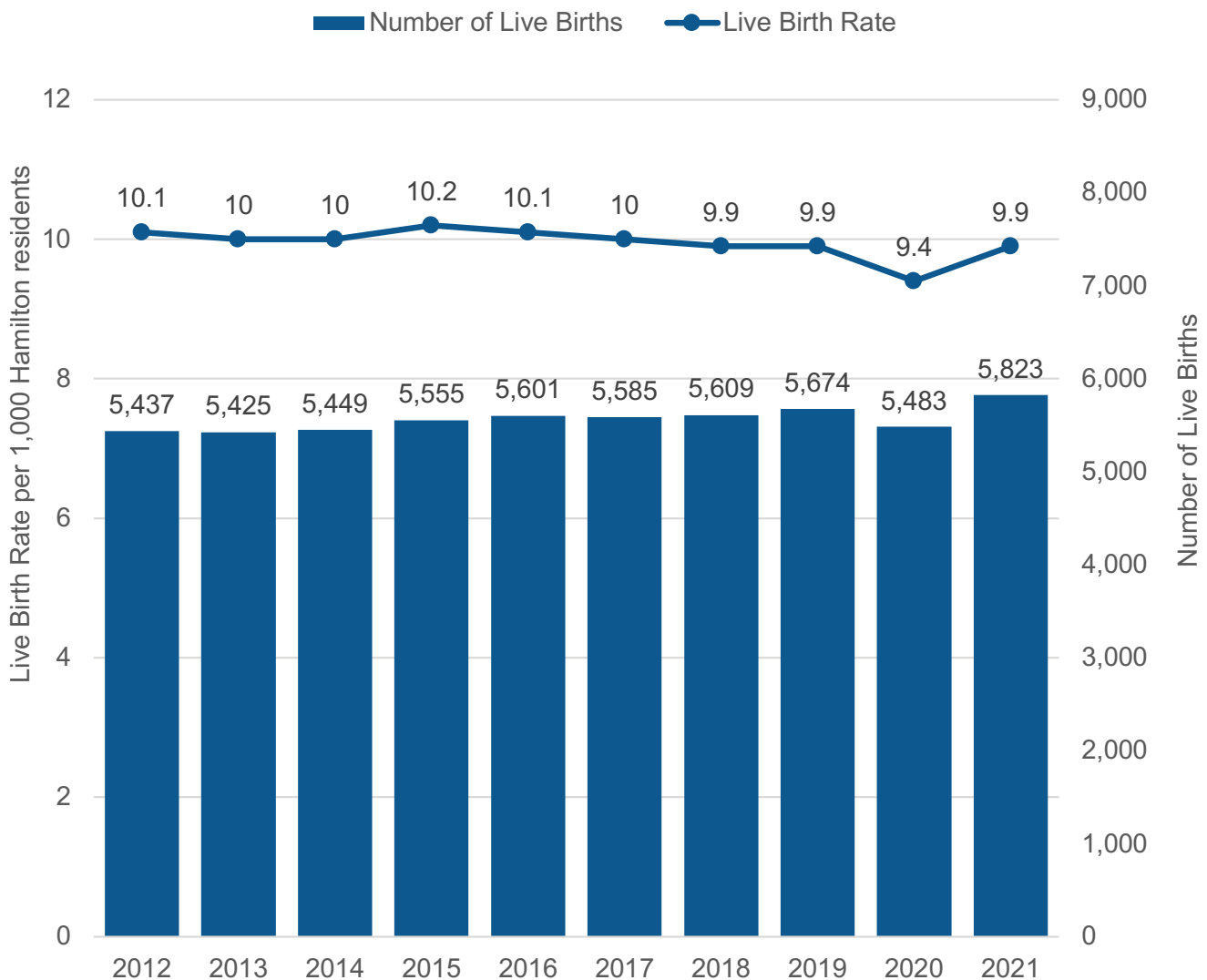
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: reproductive health snapshot. Toronto, ON: King's Printer for Ontario.

Figure 4.9: Preterm births, number and rate per 100 live births, Hamilton residents, 2012-2021
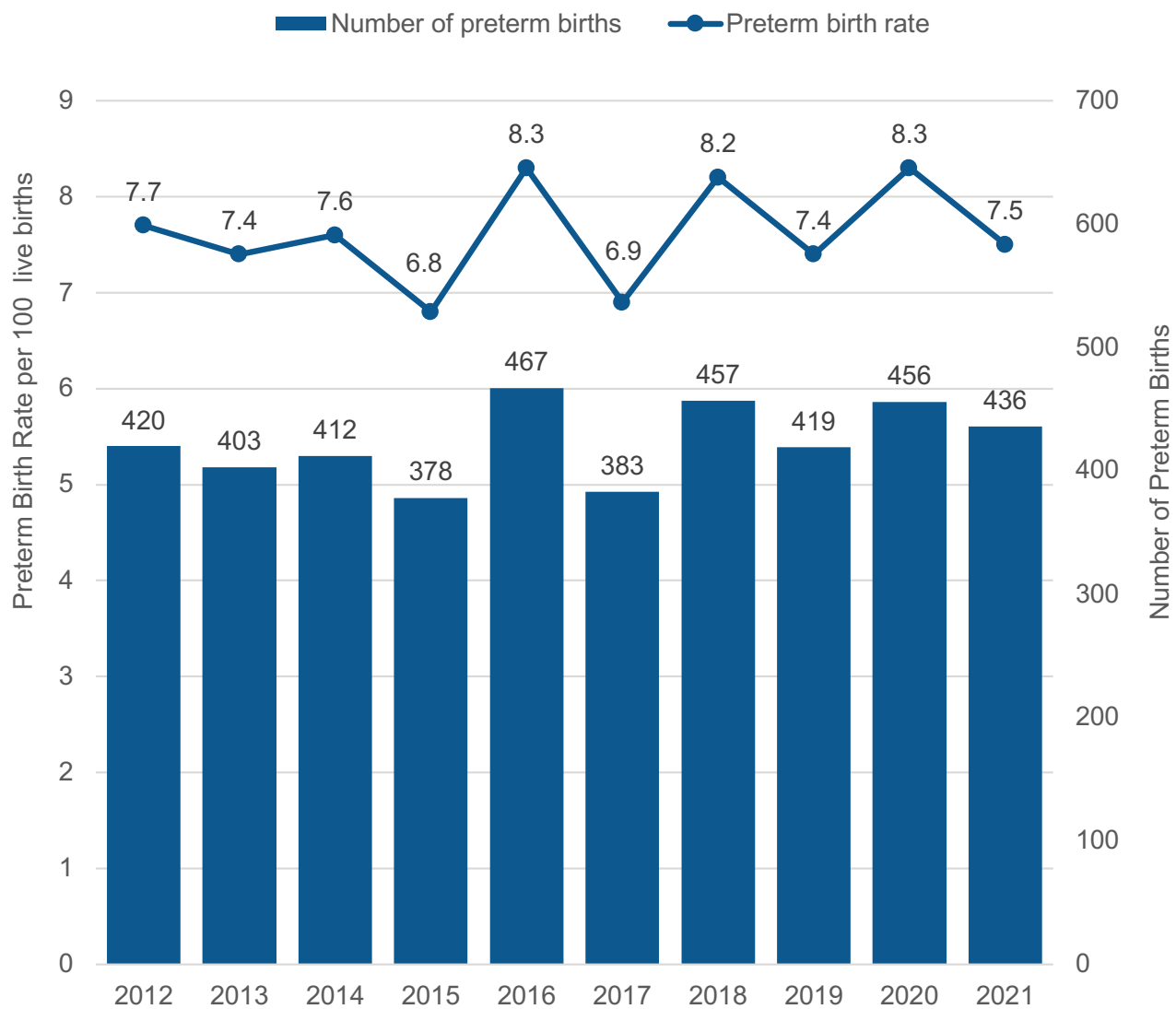
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: reproductive health snapshot. Toronto, ON: King's Printer for Ontario.

For 2017-2022, Hamilton saw 7.8 preterm births per 100 live births. Preterm births vary among different groups of Hamilton residents
(Figure 4.10). Compared to Hamilton's overall rate of preterm births, rates were higher in:

- areas with a greater percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent
- areas with the greatest percentage of individuals who self-identified as a race other than white or Indigenous
- areas with the greatest percentage of families with one-parent
- areas with the greatest percentage of households that have a core housing need

Figure 4.10: Preterm births by area-based socioeconomic quintiles, rate per 100 live births, Hamilton residents, 2017-2022 combined

Low Income
- Least 1: 6.7
- 2: 7.4
- 3: 7.5
- 4: 9.0
- Most 5: 8.2

Low Education
- Least 1: 7.4
- 2: 7.0
- 3: 7.2
- 4: 8.5
- Most 5: 8.9

Racialized Population
- Least 1: 6.7
- 2: 7.8
- 3: 8.3
- 4: 7.9
- Most 5: 8.1

One Parent Families
- Least 1: 6.7
- 2: 6.8
- 3: 7.9
- 4: 8.4
- Most 5: 8.8

Housing Need
- Least 1: 6.8
- 2: 7.1
- 3: 8.0
- 4: 8.7
- Most 5: 8.3

Rate of health outcome per 100 live births

Source: BORN Information System (2017-2022).

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Low birth weight is defined as an infant born alive at less than 2.5 kilograms (5.5 pounds). In 2021, 351 infants were born in Hamilton with low birth weights (Figure 4.11). Most were born preterm (<37 weeks gestation), but 27.6% were full-term.

Hamilton experienced a greater rate of low birth weights (all births) for 2018-2020 compared to the previous five-year average (2013-2017), although this rate appears to have decreased in 2021.

Similarly, the rate for low birth weights among full-term infants was 26.0% greater in 2018-

2021 compared to the previous five-year average (2013-2017). This resulted in an additional 85 full-term infants with low birth weights over 2018-2021.

This rate should be monitored closely for an emerging trend that could be elevating the overall low birth weight rate. Hamilton's rates of low birth weights tend to be similar or lower than the equivalent Ontario rates.

For 2017-2022, Hamilton saw 6.5 low birth weight infants per 100 live births. Low birth weights vary among groups of Hamilton residents (Figure 4.12).

Figure 4.11: Low birth weights, number and rate per 100 live births, Hamilton residents, 2012-2021
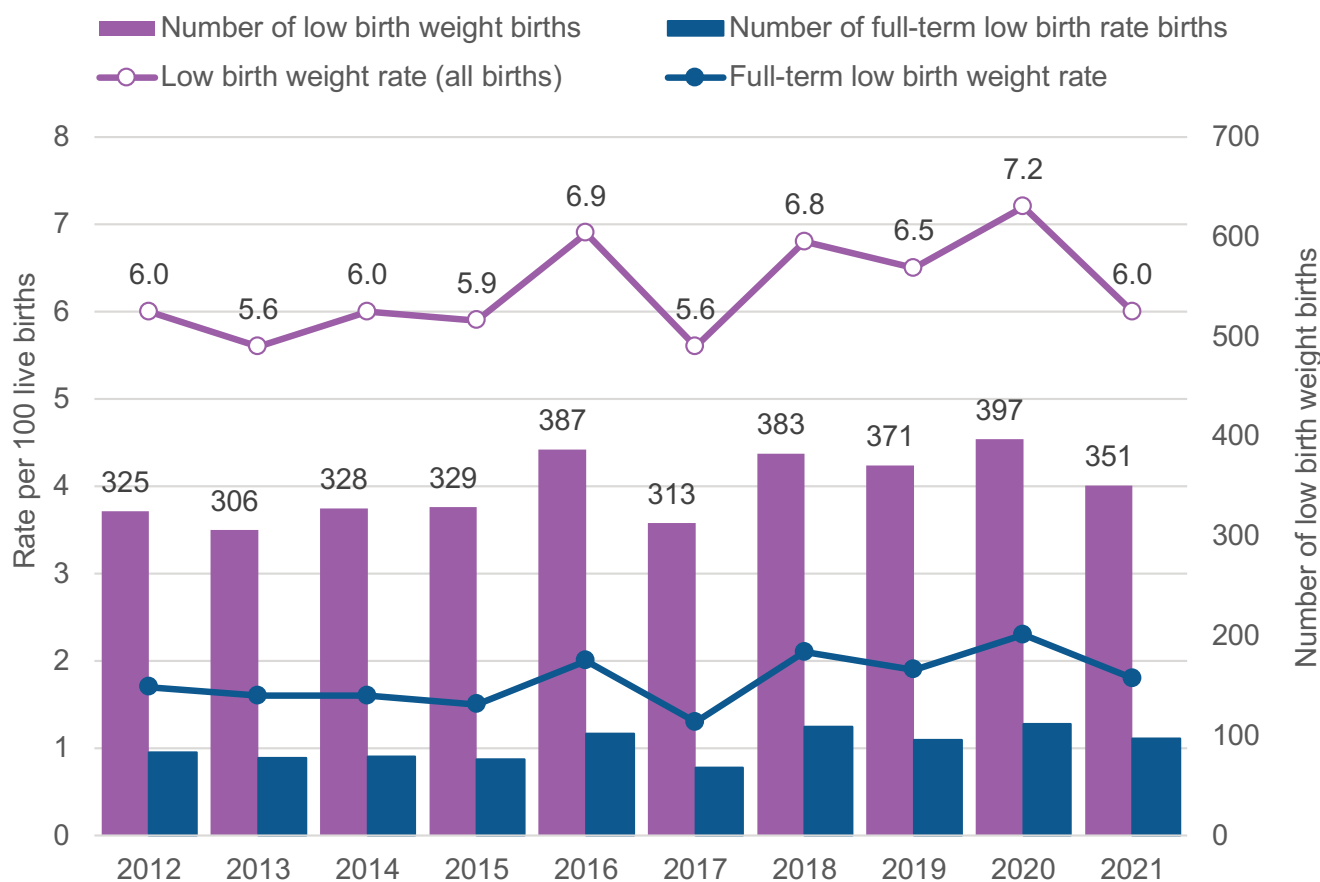
Legend:
- Number of low birth weight births
- Number of full-term low birth rate births
- Low birth weight rate (all births)
- Full-term low birth weight rate

Low birth weight rate (all births): 2012: 6.0, 2013: 5.6, 2014: 6.0, 2015: 5.9, 2016: 6.9, 2017: 5.6, 2018: 6.8, 2019: 6.5, 2020: 7.2, 2021: 6.0

Number of low birth weight births: 2012: 325, 2013: 306, 2014: 328, 2015: 329, 2016: 387, 2017: 313, 2018: 383, 2019: 371, 2020: 397, 2021: 351

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: reproductive health snapshot. Toronto, ON: King's Printer for Ontario.

Figure 4.12: Low birth weights by area-based socioeconomic quintiles, rate per 100 live births, Hamilton residents, 2017-2022 combined

Rate of health outcome per 100 live births

Low Income
- Least 1: 5.3
- 2: 5.8
- 3: 6.4
- 4: 7.4
- Most 5: 7.5

Low Education
- Least 1: 5.6
- 2: 5.8
- 3: 6.1
- 4: 7.7
- Most 5: 7.4

Racialized Population
- Least 1: 5.0
- 2: 6.2
- 3: 6.7
- 4: 7.0
- Most 5: 7.2

One Parent Families
- Least 1: 5.1
- 2: 5.7
- 3: 6.6
- 4: 7.3
- Most 5: 7.5

Housing Need
- Least 1: 5.1
- 2: 5.9
- 3: 6.7
- 4: 7.2
- Most 5: 7.6

Source: BORN Information System (2017-2022).

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Compared to Hamilton's overall rate of low birth weights, rates were higher in:

- areas with the greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent
- areas with the greatest percentage of individuals who self-identified as a race other than white or Indigenous
- areas with the greatest percentage of families with one parent
- areas with the greatest percentage of households that have a core housing need

INFANT FEEDING

Infants feeding can take different forms, including variations of breastfeeding and formula feeding.

Any breastfeeding refers to infants who receive human milk with or without formula or other liquids and solids. For Hamilton infants in 2021, 96.0% initiated any breastfeeding, declining to 84.5% at two months of age, 73.0% at four months and 67.7% at six months (Figure 4.13). All these rates have remained relatively stable between 2018 and 2021.

Exclusive breastfeeding refers to infants who receive only human milk and never formula or other liquids and solids (excluding vitamins and medicine). These rates were lower for 2021: 23.9% of Hamilton infants were exclusively breastfed at two months, followed by 19.5% at four months and 13.7% at six months.

These exclusive breastfeeding rates for 2021 were lower compared to the equivalent rates in 2018. Over the same period, the rate of infants receiving formula in hospital increased from 49.2% in 2018 to 63.3% in 2021.

Infant feeding rates vary among different groups of Hamilton residents who gave birth (Table 4.1). The highest rates of exclusive breastfeeding at two months, and the lowest rates of any formula use in hospital, were among caregivers:

- with college or university educations
- incomes of $150,000 or more
- in a married or common law relationship
- who identified as white

Figure 4.13: Infant feeding rates, Hamilton infants, 2018-2021

Legend: 2018, 2019, 2020, 2021

Any Breastfeeding

Breastfeeding Initiation
- 2018: 98.3
- 2019: 98.2
- 2020: 97.7
- 2021: 96.0

Up to 2 months
- 2018: 82.8
- 2019: 83.8
- 2020: 83.3
- 2021: 84.5

Up to 4 months
- 2018: 71.0
- 2019: 73.0
- 2020: 72.0
- 2021: 73.0

Up to 6 months
- 2018: 66.0
- 2019: 68.9
- 2020: 67.2
- 2021: 67.7

Exclusive Breastfeeding

Up to 2 months
- 2018: 38.2
- 2019: 29.8
- 2020: 24.0
- 2021: 23.9

Up to 4 months
- 2018: 29.8
- 2019: 24.1
- 2020: 19.2
- 2021: 19.5

Up to 6 months
- 2018: 21.9
- 2019: 14.7
- 2020: 11.9
- 2021: 13.7

Formula

Any formula in hospital
- 2018: 49.2
- 2019: 55.0
- 2020: 61.6
- 2021: 63.3

Percent (%) of infants

Source: Infant Feeding Survey (2018-2021), City of Hamilton Public Health Services.

Table 4.1: Infant feeding rates by different socioeconomic groupings, Hamilton residents, 2018-2021 combined

Social Determinant	Characteristic	Breastfeeding Initiation (%)	Any Breastfeeding at 2 Months (%)	Exclusive Breastfeeding at 2 Months (%)	Any Formula in Hospital (%)
Education	High school or less	92.6	73.8	18.0	73.0
	Some post-secondary	98.2	82.1	25.0	57.1
	College/ university	98.3	84.9	30.1	55.4
Income	Less than $30,000	94.8	73.9	15.7	74.8
	$150,000 or more	99.5	91.5	36.2	49.8
Marital Status	Married/ common law	98.0	84.9	30.0	55.7
	Single, divorced, separated, other	93.9	72.8	16.7	72.6
Race	White	97.4	82.7	31.1	52.9
	Racialized	98.6	85.7	23.0	67.9

Source: Infant Feeding Survey (2018-2021), City of Hamilton Public Health Services.

Notes:
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

CHILD AND YOUTH HEALTH
HIGHLIGHTS

- 30% of kindergarten children are vulnerable in at least one domain of early development. Some of these domains have been changing over time, including rising vulnerability in emotional maturity and physical health and well-being.

- 43% of infants have at least one potential risk for experiencing an adverse childhood event; however, some of the most common risks have decreased in recent years.

- Teen pregnancy has decreased substantially in the past decade.

- Oral health status among children has remained relatively stable.

CHILD AND YOUTH HEALTH

Note that data on children and youth (aged 0-19) can be found throughout this report, presented alongside other age categories within the particular health chapters. This chapter contains some unique data and measures for children and youth that may not fit elsewhere in the report.

EARLY DEVELOPMENT

The early childhood period spans birth to six years. In Ontario, educators measure vulnerabilities for senior kindergarten students (aged 5-6) using the Offord Centre's Early Development Instrument (EDI). This population-based measure assesses children's developmental health, upon entry into school, across five domains:

- physical health and well-being
- social competence
- emotional maturity
- language and cognitive development
- communication skills and general knowledge

Vulnerability during early development is defined in relation to the population's EDI score (i.e., the bottom 10%) and these are the children who would most benefit from programs and services.[37]

Six EDI cycles have been completed in Hamilton, starting in 2002. Figure 5.1 shows the 2002-2018 EDI results for Hamilton senior kindergarten (SK) students.

In the most recent cycle, 2018, 30.3% of SK students in Hamilton were vulnerable in one or more domains of early development. This percentage has been relatively consistent since 2002 and is similar to the provincial average (30%).

The physical health and well-being domain shows the greatest level of vulnerabilities (17%), and this has been trending up over time.

The emotional maturity domain demonstrated an increased level of vulnerability in 2015 and 2018 compared to previous years.

The language and cognitive development domain, as well as the communication skills and general knowledge domain, had lower levels of vulnerability for 2015 and 2018 when compared to previous years.

Figure 5.1: Vulnerability in the domains of the early child development, senior kindergarten students (age 5-6) in Hamilton, 2002-2018

Legend: ■ 2002 ■ 2005 ▨ 2008 ▨ 2010 ■ 2015 ▨ 2018

Vulnerable in 1 or more domains
- 29.2
- 29.4
- 30.6
- 30.2
- 30.7
- 30.3

Communication Skills & General Knowledge
- 12.7
- 13.3
- 13.5
- 14.1
- 9.4
- 10.5

Language & Cognitive Development
- 12.7
- 10.1
- 10.0
- 9.2
- 6.4
- 8.2

Emotional Maturity
- 11.4
- 10.9
- 9.9
- 9.4
- 12.3
- 12.3

Social Competence
- 10.4
- 10.1
- 9.8
- 10.0
- 10.9
- 10.6

Physical Health & Well-Being
- 12.6
- 14.6
- 16.9
- 16.9
- 18.4
- 17.0

Percentage (%) of senior kindergarten students

Source: Early Development Instrument (2002-2018), City of Hamilton.

ADVERSE CHILDHOOD EXPERIENCES

Adverse childhood experiences are potentially traumatic events that can have negative, lasting effects on health and well-being. These experiences range from physical, emotional or sexual abuse to neglect or other household challenges.

The likelihood of an adverse childhood experience can be predicted by a combination of individual, relational, community and societal risk factors. That includes:

- children with special needs
- parental history of abuse
- substance use and mental health issues in the family
- social isolation
- family dynamics
- poor social conditions

As the number of risk factors increases, so does the likelihood of an adverse childhood experience. In 2018, an estimated 43.0% of Hamilton infants had at least one risk factor for adverse childhood experiences, and this estimate has been relatively stable since 2014.

The number of risk factors for Hamilton infants (age <1 year) is shown in Figure 5.2. Each year, about 100 infants (2.0%) fall into the highest risk group (4+ risk factors) for adverse childhood experiences. Among the highest risk group, the most common risks were involvement of child protection services, household mental illness, and substance use during pregnancy.

Figure 5.2: Infants with one or more risk factors for adverse childhood experiences, Hamilton infants (age <1 year), 2018

- 3 Risk Factors, 4%
- 4+ Risk Factors, 2%
- 2 Risk Factors, 10%
- 1 Risk Factor, 27%
- 0 Risk Factors, 57%
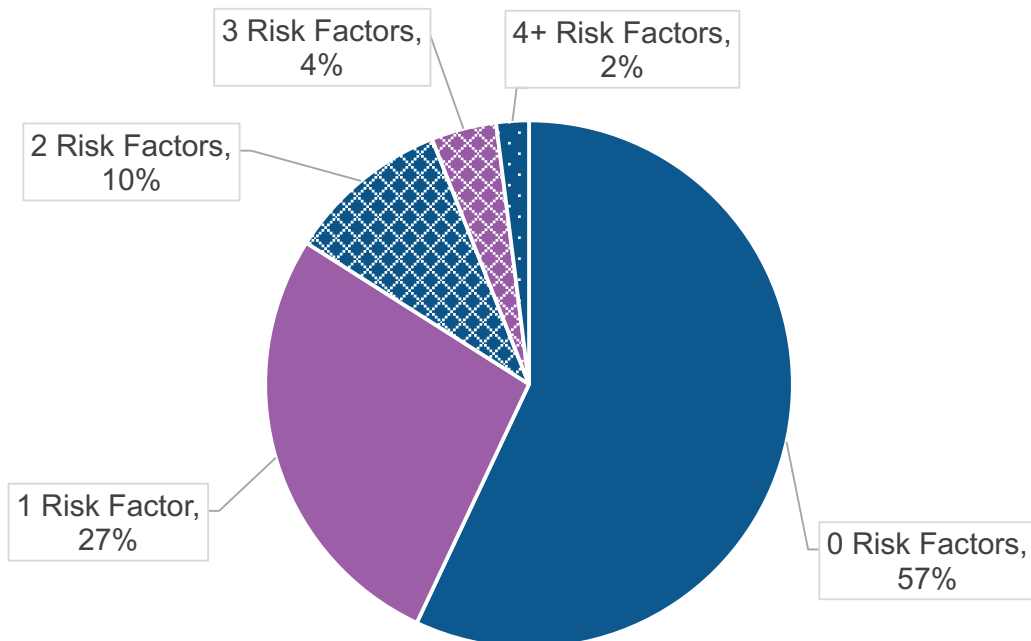
Source: Integrated Services for Children Information System [2018].

TEEN PREGNANCY

Teen pregnancy can increase the health risks for the baby and the person who gave birth. A teen pregnancy is any planned or unplanned pregnancy among a female aged 15-19 years which may result in a birth or termination of pregnancy. From 2009-2022, Hamilton's teen pregnancy rate decreased from 34.9 to 5.8 pregnancies per 1,000 female teens (Figure 5.3). There were 89 teen pregnancies among Hamilton residents in 2022.

The falling rate likely has several factors, but increased access to contraceptives is proposed as the primary cause.[38] The teen pregnancy rate was greater in Hamilton than the Ontario average from 2012-2019, but was similar in 2020.[39]

Figure 5.3: Teen pregnancy rate, female Hamilton residents aged 15-19, 2009-2022
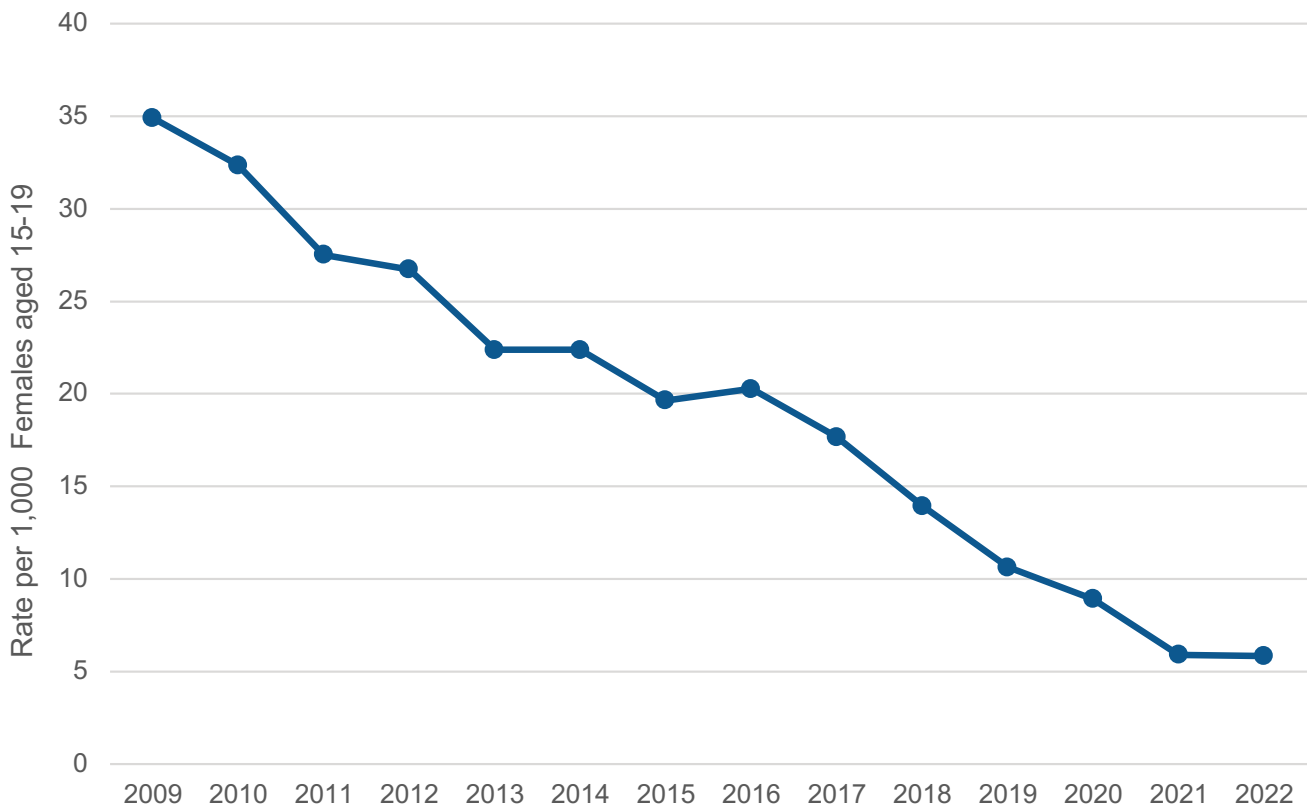
Source: Inpatient Discharges and External Cause Table, IntelliHEALTH ONTARIO, Ontario Ministry of Health [July 6, 2023].

Notes:
- Information on sex is sourced from the health record associated with the Ontario Health Card.
- This data does not include miscarriages or pregnancies terminated using pharmacological medicine.

ORAL HEALTH

Hamilton Public Health Services conducts oral health screenings on kindergarten (age 4-6) and grade two students (age 7-8). This includes identifying children who require urgent dental care, such as open obvious decay, pain, infection, trauma or irreversible periodontal condition.

In the 2022-2023 school year, 8.0% of screened kindergarten students and 9.5% of screened grade two students required urgent dental care (Figure 5.4). This has remained relatively consistent from 2012-2013 to 2022-2023 (though data is missing or incomplete for the 2019-2020, 2020-2021 and 2021-2022 school years).

Accessing dental care from emergency departments is another measure that can be monitored as a proxy for dental care access. Each year, an average of 135 of Hamilton's children and youth visit an emergency department for dental care. That rate has remained relatively stable between 2012 and 2021 (Figure 5.5).

Figure 5.4: Urgent dental care needs among screened kindergarten (junior and senior kindergarten) and grade two students attending publicly-funded schools in Hamilton, 2012-2023
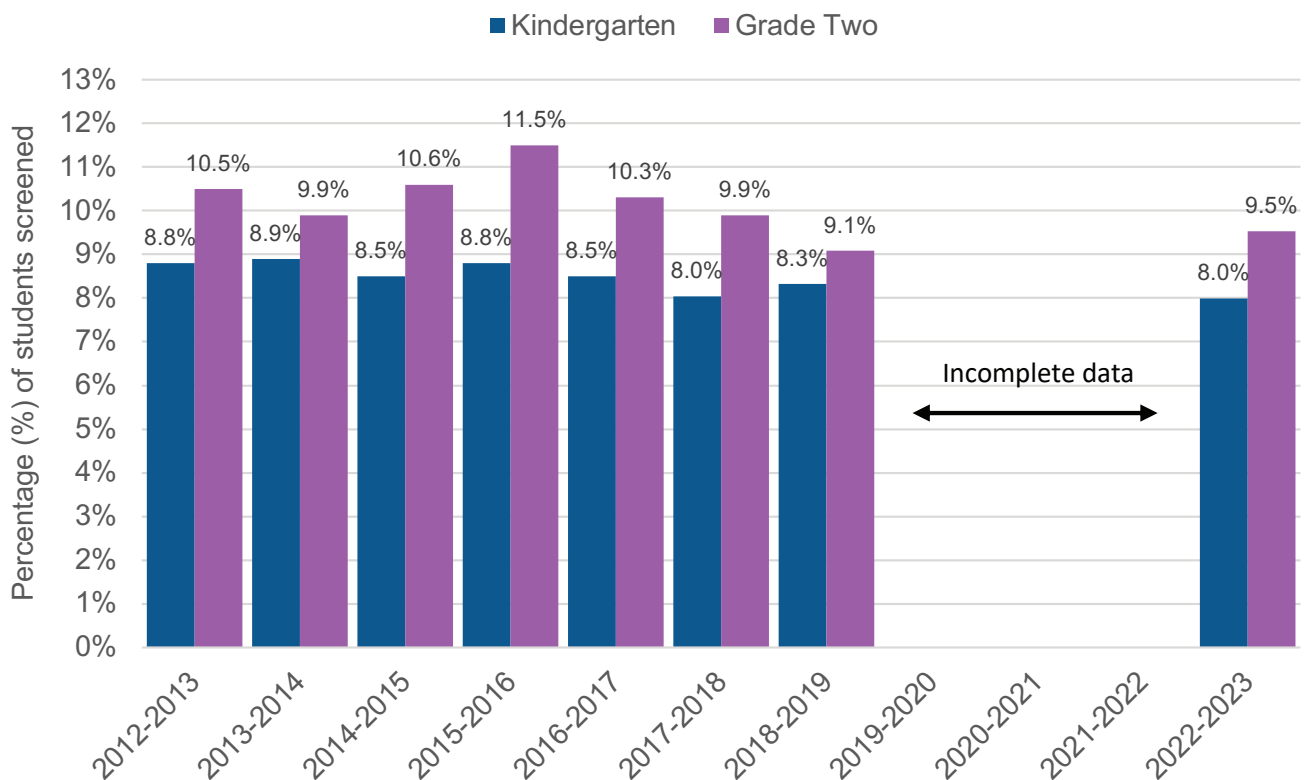
Source: Hamilton Public Health Services, Dental Program [30 Oct 2023].

Notes:
- Data from 2019-2020, 2020-2021, and 2021-2022 is missing or incomplete due to service disruptions caused by the COVID-19 pandemic.
- These data do not include children who are in private school or home school.

Figure 5.5: Oral health-related emergency department visits, rate per 100,000 children and youth (age 0-19), Hamilton residents, 2012-2021
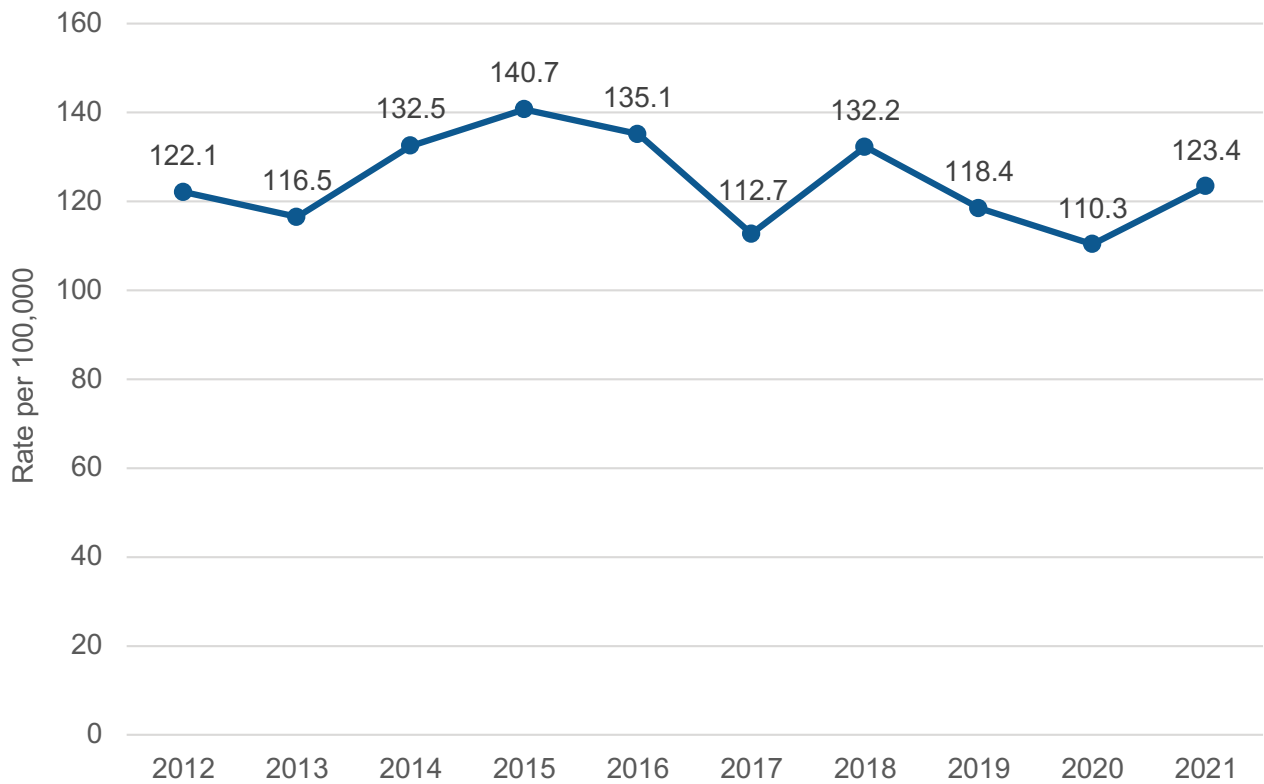
Source: Inpatient Discharges [2012-2021], IntelliHEALTH ONTARIO, Ontario Ministry of Health; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].

INFANT MORTALITY

[Infant](#) mortality is a key population health indicator, one that is closely associated with overall well-being and socioeconomic conditions of a community. On average, there are 26 deaths among Hamilton infants (age <1 year) each year. Hamilton's infant mortality rate has remained relatively consistent (Figure 5.6) and is similar to the Ontario average. From 2012 to 2021, the primary causes of death for Hamilton infants were:

- short [gestation](#) and [low birth weight](#) (32 deaths)
- ill-defined and unspecified causes (24 deaths)
- sudden death with unknown cause (21 deaths)
- complications of placenta, cord, and membranes (19 deaths)
- maternal complications of pregnancy (17 deaths)

Figure 5.6: Infant mortality, Hamilton residents age <1 year, 2012-2021
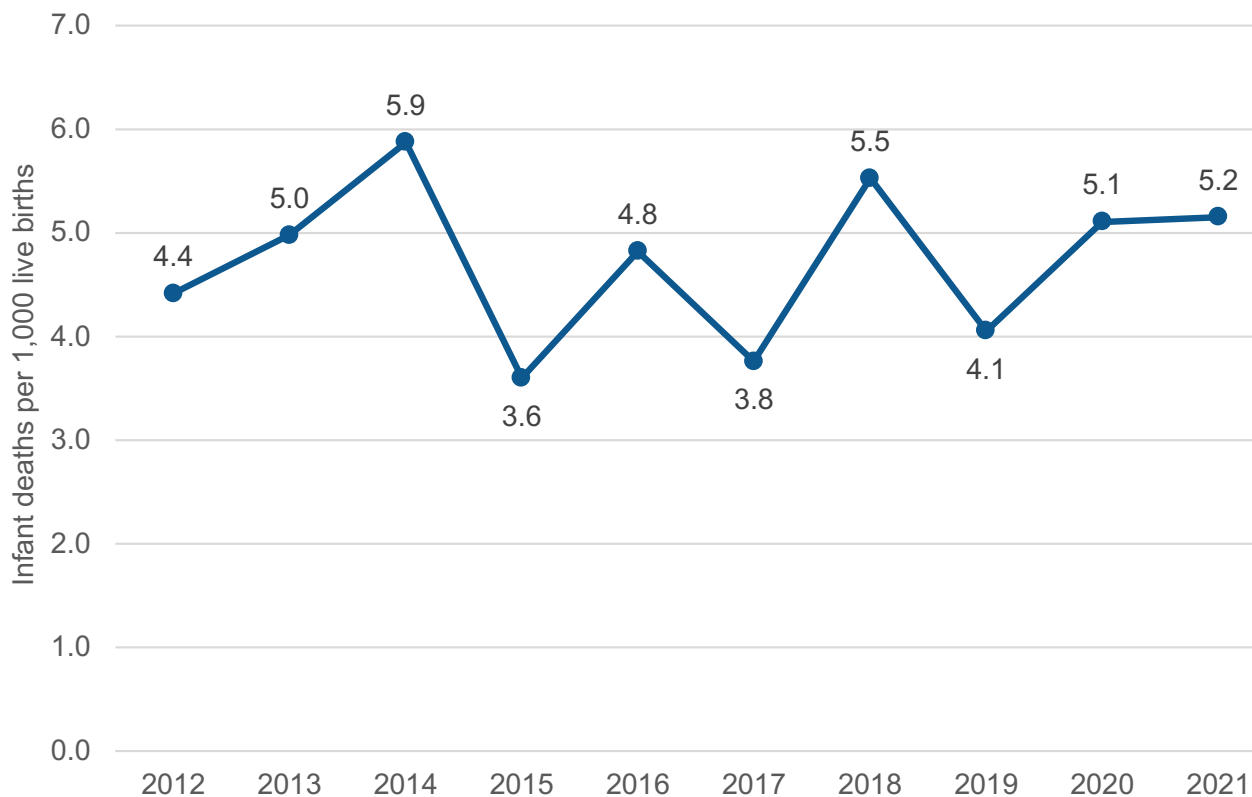
Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

IMMUNIZATION

HIGHLIGHTS

- More than 1 in 3 students born in 2015 do not have an up-to-date vaccination record with Hamilton Public Health for most diseases listed under Ontario's Immunization of School Pupils Act.

- Most Hamilton residents have not received a vaccine for Coronavirus disease 2019 (COVID-19) in the past 6 months.

IMMUNIZATION

VACCINATION OF SCHOOL STUDENTS

Apart from COVID-19 vaccinations, Ontario does not have a universal population-based registry that captures vaccinations administered at point of care. Students attending school must submit certain vaccination records to their local public health unit as stipulated by Ontario's *Immunization of School Pupils Act* (ISPA). In most cases, that responsibility falls to the student's parent or guardian. Self-reported vaccination records to public health may not be fully complete or accurate even for students who are up to date on their vaccinations. Using these records may result in an underestimation of vaccine coverage amongst students.

Table 6.1 shows the percentages of Hamilton students born in either 2015 (aged 7-8 years in the 2022-2023 school year) or 2006 (aged 16-17 years in 2022-2023 school year) who have an up-to-date vaccination record with Hamilton Public Health Services. The vaccination status of students without an up-to-date record with Hamilton Public Health Services is unknown.

The percentage of Hamilton students with an up-to-date vaccination record varied by birth cohort and disease. For all diseases (except rubella), approximately 2,300-2,500 (36.1-39.6%) students born in 2015 do not have an up-to-date vaccination record with Hamilton Public Health Services.

Approximately 2,500 (36.3-36.8%) students born in 2006 do not have an up-to-date vaccination record for diphtheria, pertussis and tetanus. The percentage of students with an exemption record (for medical or philosophical/conscience belief reasons) averaged 2.3%, with some slight variation between birth cohorts and disease.

Vaccination for Human Papilloma Virus (HPV) and Hepatitis B are publicly funded by the province but are not listed under ISPA. These vaccinations are typically offered through public health clinics.

The percentage of Hamilton students born 2005-2010 with up-to-date vaccination records for HPV and Hepatitis B vaccines are shown in Table 6.2. The percentage of students with up-to-date vaccination records for HPV and Hepatitis B vaccines is substantially lower for those born in 2007 and 2008 when compared to other birth cohorts.

Table 6.1: Vaccination record status by disease and student birth cohort, Hamilton students born in 2015 (aged 7-8 years in the 2022-2023 school year) and 2006 (aged 16-17 years in 2022-2023 school year), as of January 8, 2024

Disease	Birth Year	% with up-to-date vaccination record	% with no up-to-date vaccination record or exemption record	% with exemption record
Diphtheria	2015	60.6%	37.5%	1.9%
	2006	61.2%	36.5%	2.3%
Measles	2015	61.6%	36.1%	2.3%
	2006	90.9%	6.4%	2.7%
Mumps	2015	61.3%	36.3%	2.4%
	2006	90.7%	6.6%	2.7%
Pertussis	2015	60.5%	37.6%	1.9%
	2006	60.9%	36.8%	2.3%
Poliomyelitis	2015	60.9%	37.2%	1.9%
	2006	89.5%	8.3%	2.3%
Rubella	2015	87.9%	9.8%	2.3%
	2006	92.4%	5.0%	2.7%
Tetanus	2015	60.7%	37.4%	1.9%
	2006	61.4%	36.3%	2.3%
Varicella*	2015	58.3%	39.6%	2.1%
	2006	37.4%	60.3%	2.3%
Meningococcal	2006	85.9%	11.7%	2.4%

Source: Panorama, Hamilton Public Health Services [extracted 8 January 2024].

Notes:
- Diseases in this table are listed under Ontario's Immunization of School Pupils Act.
- (*) Varicella vaccine record only required for students born after 2010.

Table 6.2: Vaccination record status by disease and student birth cohort, Hamilton students born 2005-2010, as of January 8, 2024

Disease	Birth Year	% with up-to-date vaccination record	% with no up-to-date vaccination record or exemption record
Hepatitis B Virus	2010	65.8%	34.1%
	2009	58.5%	41.5%
	2008	28.4%	71.5%
	2007	39.4%	60.6%
	2006	71.1%	28.9%
	2005	74.1%	25.9%
Human Papilloma Virus	2010	58.6%	41.4%
	2009	54.7%	45.3%
	2008	22.6%	77.4%
	2007	34.9%	65.1%
	2006	63.0%	36.9%
	2005	66.4%	33.6%

Source: Panorama, Hamilton Public Health Services [extracted 8 January 2024].

Notes:
- Diseases in this table are not listed under Ontario's Immunization of School Pupils Act (ISPA) but are publicly funded by the province of Ontario.
- Exemptions were not included as a unique category because these immunizations are not required under ISPA and there is no requirement to submit an exemption.

CORONAVIRUS DISEASE 2019 VACCINATION

As of January 9, 2024:

- 13.5% of the Hamilton residents had received a vaccine for Coronavirus disease 2019 (COVID-19) in the previous six months'
- 1.9% of residents were vaccinated 6-12 months ago
- 65.2% of residents were vaccinated 12 or more months ago

Recency of vaccination varied substantially by age group. Over the previous six months, less than 5% of youth and young adults but more than 30% of seniors (aged 65 and older) have been vaccinated (Table 6.3).

Table 6.3: Recency of receiving a vaccine for Coronavirus disease 2019 (COVID-19) by age group, Hamilton residents, as of January 9, 2024

Age Group	Previously vaccinated	Previously vaccinated 12+ months ago	Previously vaccinated 6 to less than 12 months ago	Previously vaccinated less than 6 months ago
0 to 4 Years	7.9%	4.0%	1.1%	2.7%
5 to 11 Years	41.1%	36.9%	1.1%	3.1%
12 to 17 Years	76.5%	72.4%	0.9%	3.2%
18 to 24 Years	82.1%	78.0%	1.1%	3.1%
25 to 29 Years	86.9%	81.1%	1.2%	4.6%
30 to 34 Years	84.4%	77.0%	1.3%	6.1%
35 to 39 Years	85.3%	76.6%	1.4%	7.3%
40 to 44 Years	86.7%	78.0%	1.4%	7.3%
45 to 49 Years	88.6%	79.4%	1.4%	7.8%
50 to 54 Years	91.4%	79.8%	1.5%	10.0%
55 to 59 Years	90.0%	74.0%	1.8%	14.2%
60 to 64 Years	91.7%	68.2%	2.2%	21.3%
65 to 69 Years	92.4%	57.3%	3.4%	31.7%
70 to 74 Years	93.8%	49.3%	4.1%	40.4%
75 to 79 Years	96.4%	46.6%	4.6%	45.2%
80 to 84 Years	96.0%	46.2%	4.3%	45.4%
85+ Years	95.9%	46.2%	5.2%	44.6%

Source: IntelliHEALTH ONTARIO, COVAXon Data Load [extracted 9 January 2024].

INFECTIOUS DISEASE

HIGHLIGHTS

- In 2023, the five most common reportable infectious diseases in Hamilton were COVID-19 (6,821 cases), Chlamydial infections (1,750 cases), Influenza (579 cases), Gonorrhea (479 cases) and latent Tuberculosis (402 cases).

- Respiratory virus season is a continuing burden for our community. Hamilton had 321 respiratory outbreaks in 2023, with the majority (75.7%) being COVID-19.

- In the last 10 years (2014 to 2023), the rate of Invasive Group A Streptococcal (iGAS) infections has increased by more than 250%. Hamilton's rate has remained consistently above the Ontario average since 2019. Approximately 10-15% of these cases are fatal.

- Syphilis rates have increased by more than 300% in Hamilton during the last 10 years (2014 to 2023). While syphilis continues to disproportionately impact males, local data shows an increasing trend emerging among females.

- The rate of Lyme disease increased by more than 1,300% between 2014 (0.9 cases per 100,000) and 2023 (13.4 cases per 100,000).

INFECTIOUS DISEASE

Germs such as bacteria, viruses, parasites and fungus can enter the human body and multiply. This can lead to infections and pose a serious health risk to the population.[40]

The typical ways infectious (or communicable) diseases can spread include:

- from person to person through direct contact
- by germs carried in air, water, food or soil
- through animals and insects to humans[40]

In Ontario, public health units work to prevent and control the spread of infectious diseases in their communities. Under the *Health Protection and Promotion Act* (HPPA), diseases of public health significance must be reported to the local Medical Officer of Health (see Table 7.1 for a list of 2023 case count and incidence rate data).

Many of the reportable diseases are rare in Canada. That's due to effective control through immunization, drinking water treatment, safe food regulations, pasteurization, improved sanitation, public education, and other infection prevention practices.

This chapter highlights the diseases with significant trends in the past 10 years and significant differences when compared to Ontario. We've grouped them into five categories:

1. **Enteric diseases**: acquired through consuming contaminated food or water; or spread through direct person-to-person contact, fecal-oral contact, or indirect transmission through contact with contaminated surfaces.

2. **Respiratory diseases**: transmitted from person to person through air droplets (such as coughing or sneezing); by direct contact with an infected person; or by indirect transmission through contact with contaminated surfaces.

3. **Sexually-transmitted and blood-borne infections:** transmitted through sexual contact and bodily fluids.

4. **Vaccine-preventable diseases**: caused by viruses or bacteria that can be prevented by immunization through vaccination.

5. **Vector-borne diseases**: caused by parasites, bacteria and viruses that are transmitted by infected insects or ticks, also known as vectors.

6. **Antimicrobial-resistant infections**: have gained resistance to antimicrobial treatments.

The number of infectious disease cases reported to public health may not represent the full number of cases in the community.

For example, an Ontario study found that for every one case of enteric illness reported to public health, there could be several hundred unreported cases in the community.[41]

Usually, cases are only reported to public health if the infected person seeks care from a healthcare provider and diagnostic testing is completed. Depending on the disease, many cases go undetected. People with reportable infections may recover independently without seeking care, and diagnostic testing may not be warranted for everyone.

Table 7.1: Case counts and incidence rate of diseases of public health significance, Hamilton and Ontario, 2023

Disease of Public Health Significance	Hamilton		Ontario	
	Number of cases	Rate per 100,000	Number of cases	Rate per 100,000
Acquired Immunodeficiency Syndrome (AIDS)	4	0.7	67	0.4
Amebiasis	6	1.0	79	0.5
Brucellosis	2	0.3	5	0.0
Campylobacter Enteritis	58	9.6	2,516	16.4
Carbapenemase-producing Enterobacteriaceae (CPE)	71	11.7	767	5.0
Chlamydial Infections	1,750	288.9	42,688	277.8
Cryptosporidiosis	21	3.5	531	3.5
Cyclosporiasis	27	4.5	662	4.3
COVID-19	6,821	1,125.9	140,978	917.5
Encephalitis/Meningitis	11	1.8	155	1.0
Giardiasis	32	5.3	1,033	6.7
Gonorrhea (All Types)	479	79.1	14,151	92.1
Group A Streptococcal Disease, Invasive	95	15.7	1,993	13.0
Group B Streptococcal Disease, Neonatal	4	0.7	46	0.3
Haemophilus Influenzae Disease (All Types, Invasive)	19	3.1	346	2.3
Hepatitis A	8	1.3	154	1.0
Hepatitis B (acute)	2	0.3	139	0.9
Hepatitis B (chronic)	61	10.1	1,560	10.2
Hepatitis C	156	25.7	3,394	22.1
Human Immunodeficiency Virus (HIV)	44	7.3	1,373	8.9
Influenza	579	95.6	10,326	67.2
Legionellosis	19	3.1	339	2.2
Listeriosis	2	0.3	68	0.4
Lyme Disease	81	13.4	1,791	11.7
Meningitis	3	0.5	155	1.0
Meningococcal Disease, Invasive	2	0.3	30	0.2
Paratyphoid Fever	3	0.5	85	0.6
Pertussis (Whooping Cough)	1	0.2	288	1.9
Salmonellosis	84	13.9	2,366	15.4
Shigellosis	6	1.0	263	1.7

Disease of Public Health Significance	Hamilton		Ontario	
	Number of cases	Rate per 100,000	Number of cases	Rate per 100,000
Streptococcus Pneumoniae (Invasive)	66	10.9	1,576	10.3
Syphilis, Early Congenital	1	0.2	13	0.1
Syphilis, Infectious	146	24.1	3,222	21.0
Syphilis, Latent	100	16.5	1,964	12.8
Syphilis, Other	8	1.3	404	2.6
Tuberculosis	23	3.8	881	5.7
Tuberculosis infection, Latent	402	66.4	7,060	45.9
Typhoid Fever	2	0.3	137	0.9
Varicella (Chickenpox)	21	3.5	613	4.0
Verotoxin Producing *E.coli* (VTEC)*	5	0.8	135	0.9
West Nile Virus Illness	6	1.0	48	0.3
Yersiniosis	4	0.7	224	1.5

Source: Integrated Public Health Information System (iPHIS) and Case and Contact Management System (CCM) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Notes:
- Case counts include confirmed cases only. Cases are pulled based on "episode date" (estimate of the onset date of disease), except for CPE, HIV, AIDS and TB.
- Population estimates and projections are used to calculate rate per 100,000 population.
- Diseases with a count of 0 in Hamilton were excluded from the table: Acute Flaccid Paralysis; Anaplasmosis; Anthrax; Babesiosis; Blastomycosis; Botulism; Chancroid; Cholera; Creutzfeldt-Jakob Disease, All Types; Diphtheria; Echinococccus Multilocularis Infection; Encephalitis; Food Poisoning, All Causes; Hantavirus Pulmonary Syndrome; Hemorrhagic Fevers; Lassa Fever; Leprosy; Measles; Mpox; Mumps; Ophthalmia Neonatorum; Paralytic Shellfish Poisoning; Plague; Poliomyelitis, Acute; Powassan virus; Psittacosis/Ornithosis; Q Fever; Severe Acute Respiratory Syndrome (SARS); Smallpox; Rabies; Rubella; Rubella (congenital syndrome); Tetanus; Trichinosis; Tularemia.
- Sex and gender are not clearly defined in the Integrated Public Health Information System (iPHIS) and could include a combination of sex assigned at birth or gender identity. Sex from Case and Contact Management (CCM) refers to sex assigned at birth.
- (*) Includes hemolytic uremic syndrome (HUS).
- Data for rubella (congenital syndrome) were last updated on 31 July 2024.

ENTERIC DISEASES

Campylobacter enteritis

Campylobacter enteritis is a bacterial disease that can cause diarrhea, abdominal pain, nausea and vomiting.[42] Infection can occur from:

- eating contaminated food including raw or undercooked chicken, pork
- drinking contaminated water or raw milk
- handling infected animals such as puppies, kittens and farm animals

In 2023, there were 58 confirmed cases of Campylobacter enteritis in Hamilton. In the past 10 years (2014-2023), the rate of this disease has decreased significantly and dropped in half in Hamilton, from 22 cases per 100,000 population in 2014 to 9.6 cases per 100,000 population in 2023 (Figure 7.1). When compared to Ontario (16.4 cases per 100,000 population), Hamilton's rate was 1.7 times lower.

Figure 7.1 Campylobacter enteritis confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
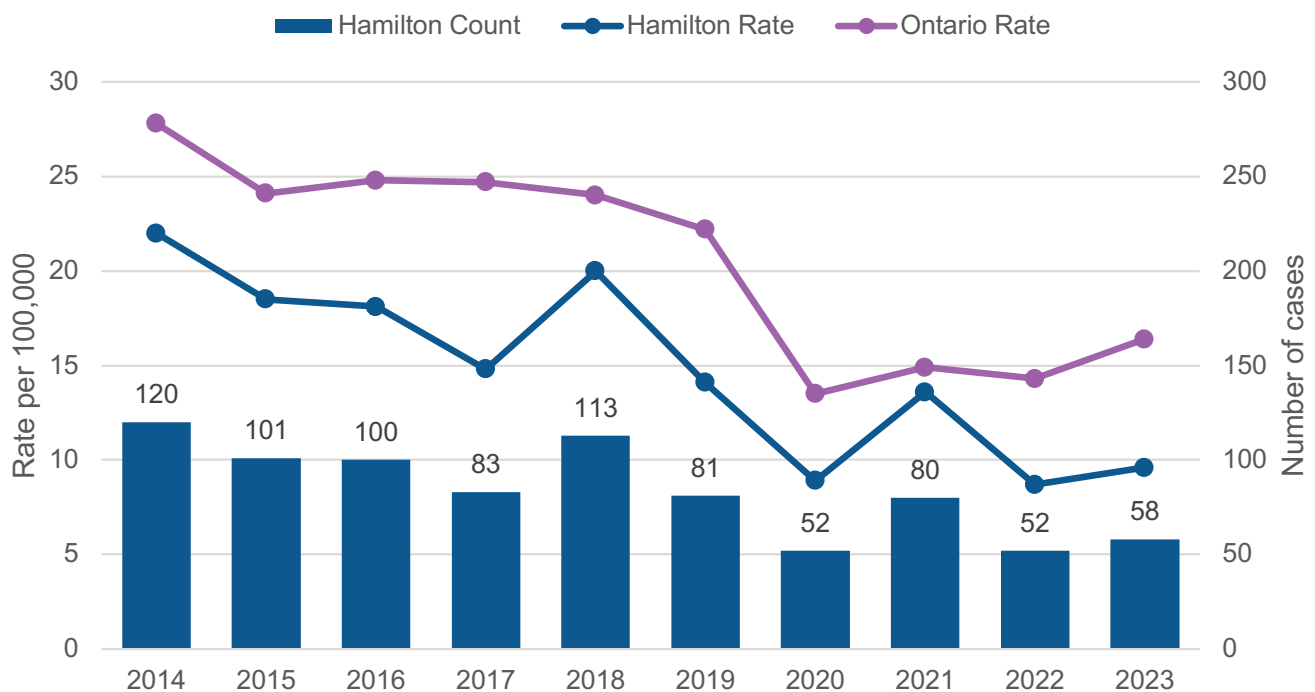
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Salmonellosis

Salmonellosis is a food-borne infection caused by the bacteria Salmonella. It is commonly spread through consuming contaminated food or water.[43] Most people develop diarrhea, abdominal cramping and fever.[43]

The rate of Salmonellosis has decreased by 42.4% in the past 10 years (2014-2023), with 84 confirmed cases in Hamilton for 2023 (Figure 7.2). The lowest rates were seen during the COVID-19 pandemic in 2020 and 2021.

Figure 7.2 Salmonellosis confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
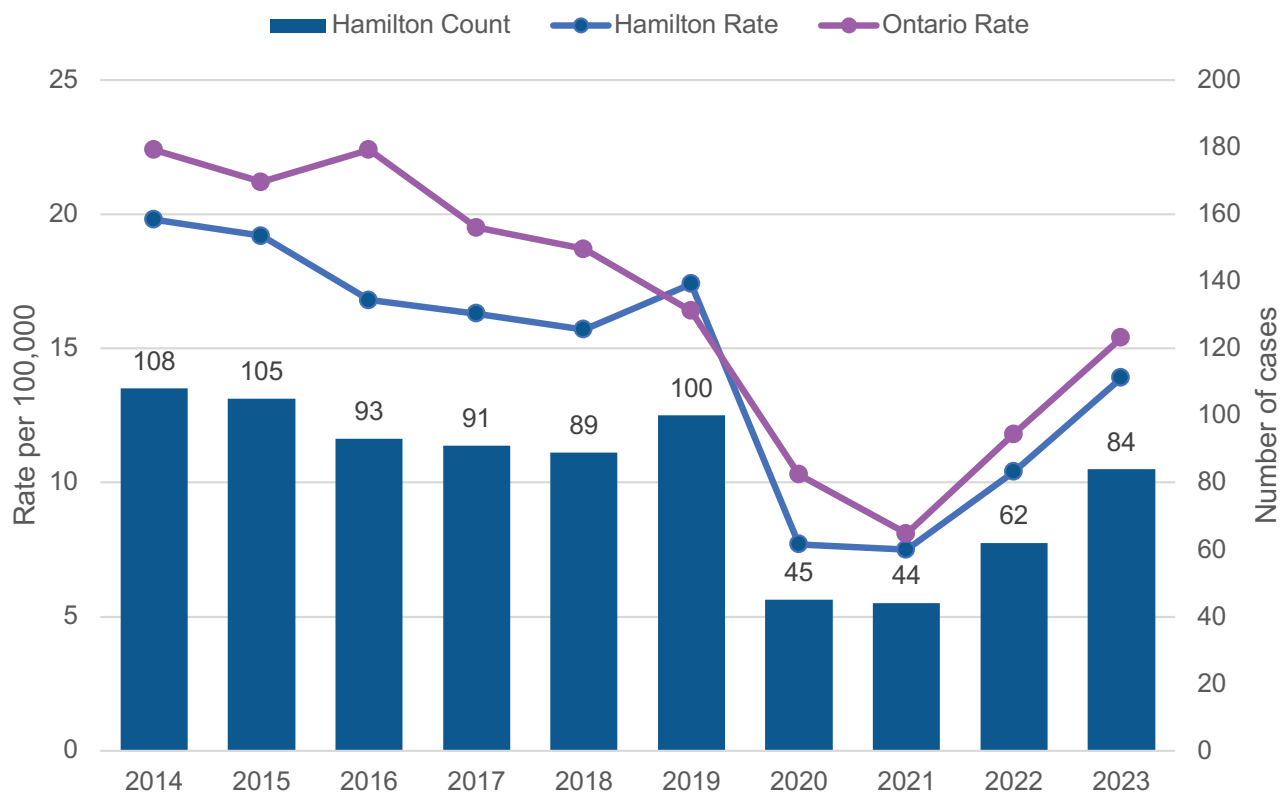
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Verotoxin-producing E.Coli including HUS (VTEC)

Verotoxin-producing Escherichia coli (VTEC) is a group of bacteria that causes gastrointestinal illness. Transmission includes direct or indirect contact with humans infected with VTEC, animals or waste.[44] The transmission route may include the consumption of contaminated food, fecal-oral, and person-to-person contact.

In 2023, there were five confirmed VTEC cases in Hamilton. The rate has significantly increased between 2014 (0.2 cases per 100,000 population) to 2023 (0.8 cases per 100,000 population) (Figure 7.3).

Figure 7.3 Verotoxin-producing E. coli (VTEC) confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
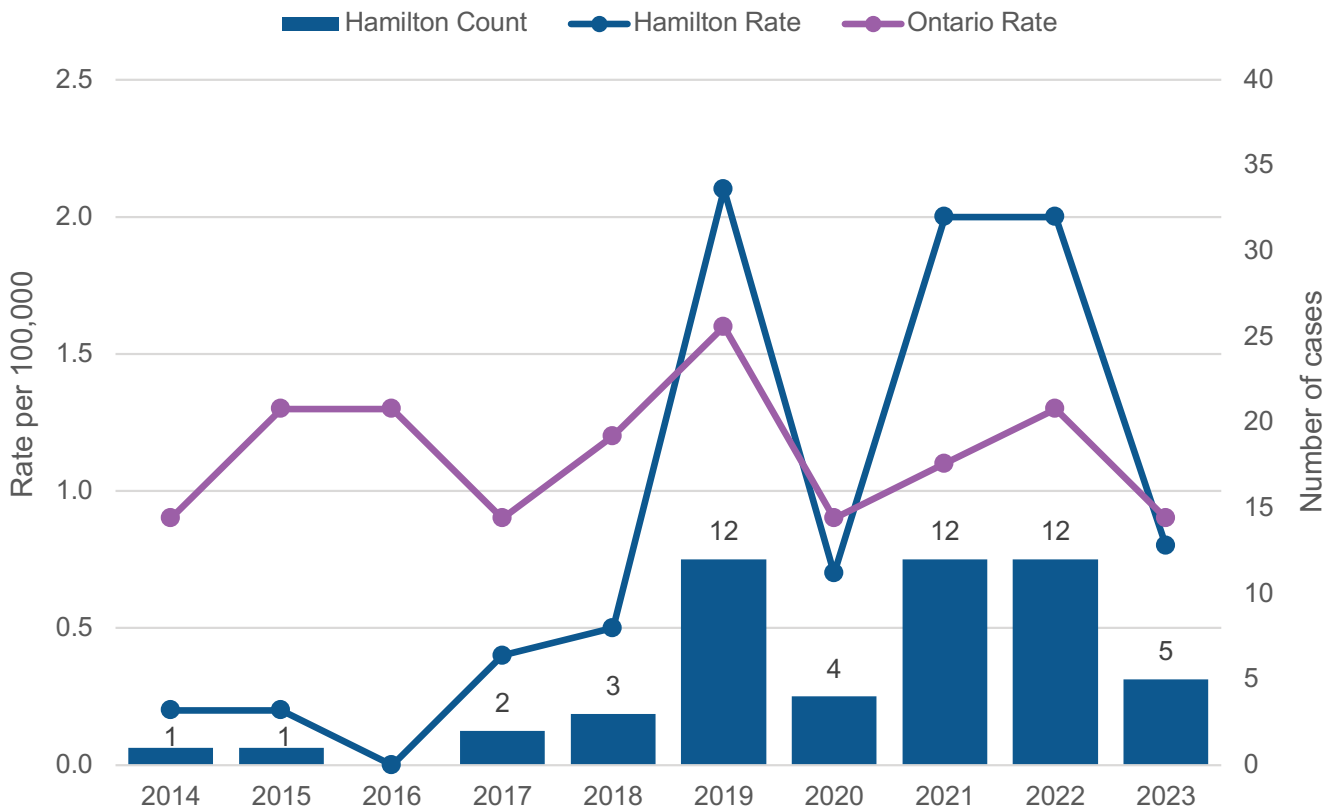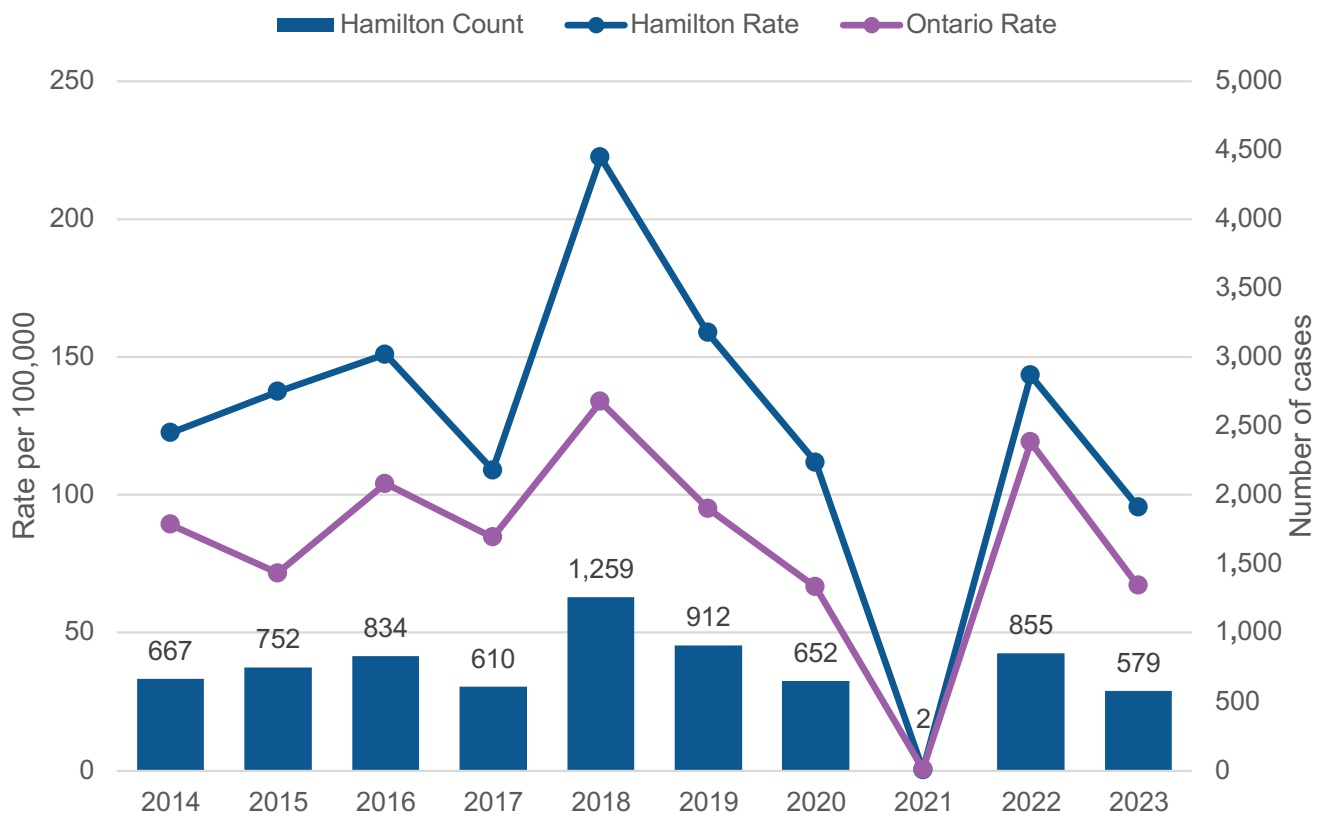
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Note: VTEC cases includes those with hemolytic uremic syndrome (HUS)

RESPIRATORY DISEASES

COVID-19

Coronavirus disease 2019 (COVID-19) is a respiratory disease caused by SARS-CoV-2 virus. COVID-19 became a global pandemic in 2020. It can be highly contagious and spread quickly through respiratory droplets when a person with COVID-19 breathes, coughs, sneezes or talks. Transmission can also occur by touching contaminated surfaces.

Symptoms of COVID-19 ranges from mild (like flu or cold) to severe (such as pneumonia or multi-organ failure).[45] People with COVID-19 that do not have symptoms can also spread COVID-19.

Figure 7.4 COVID-19 confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
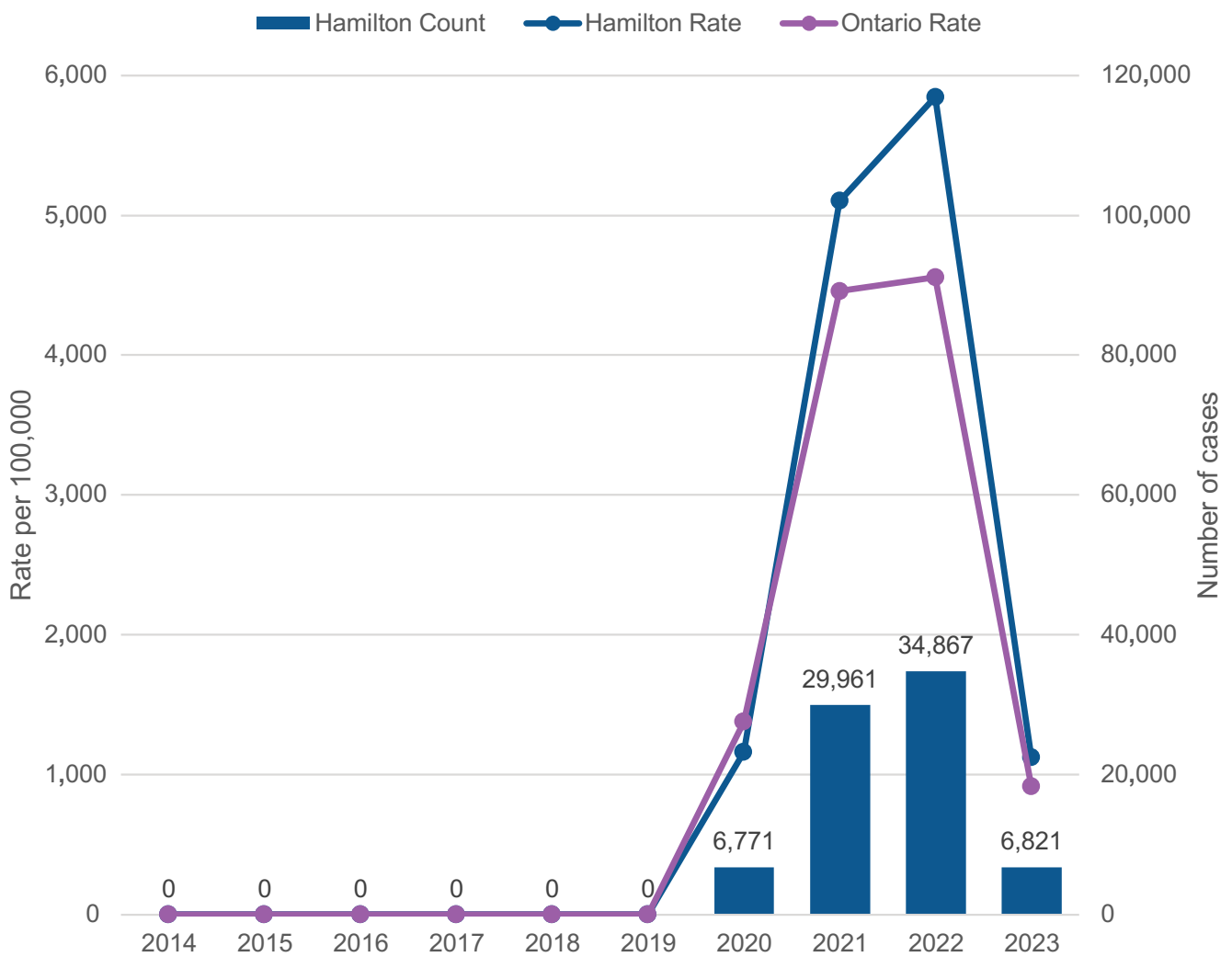
Source: Case and Contact Management System (CCM) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

In Hamilton, the COVID-19 rate peaked in 2022 with 5,847.4 cases per 100,000 population (Figure 7.4). As access to testing has changed to focus on those at highest risk, the number of confirmed cases are likely an undercount. The true rate of infections in the community could be much higher.

In 2023, Hamilton had 6,821 confirmed COVID-19 cases, representing 1,125.9 cases per 100,000 population (Figure 7.4). The local rate was significantly higher than the provincial rate of 917.5 cases per 100,000 population (22.7% higher). Females were more likely to have a reported COVID-19 infection, accounting for 63% of total cases in 2023.

There were 321 respiratory outbreaks in Hamilton in 2023. The majority (243 outbreaks, 75.7%) were caused by COVID-19.

Rates of COVID-19 in 2023 were highest among seniors aged 75 years and older, who accounted for 40% of all cases in Hamilton (Figure 7.5).

Figure 7.5 COVID-19 confirmed cases by age group, Hamilton, 2023
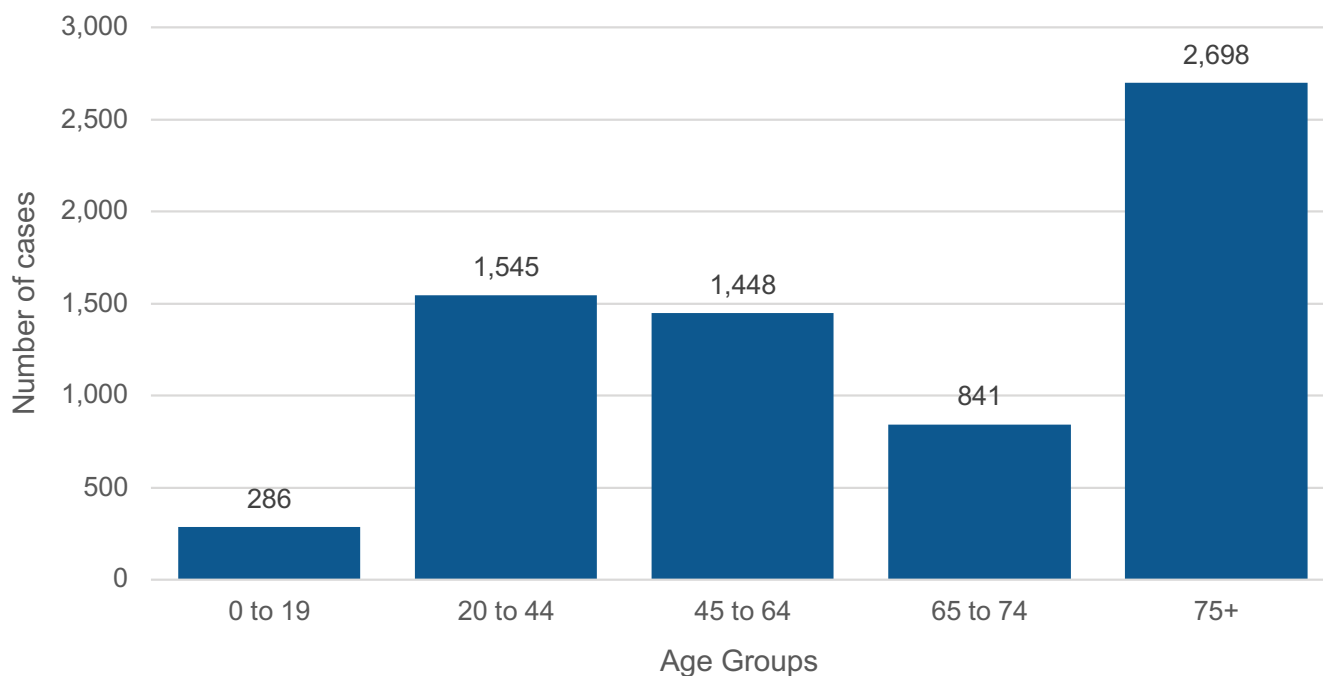
Source: Case and Contact Management System (CCM) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Group A Streptococcus, Invasive (iGAS)

Group A streptococcus (GAS) are bacteria naturally found in the throat. It can cause non-invasive infections such as strep throat and impetigo, but it can become an invasive disease when the bacteria enter the blood or deep tissue.[46]

iGAS can spread from direct contact with mucus from the nose or throat of an infected person, or from contact with infected wounds or sores on the skin. This disease is of particular concern because approximately 10-15% of cases in Ontario are fatal.

In Hamilton, the rate of iGAS increased 3.5 times in the past 10 years, from 4.4 cases per 100,000 population in 2014 to 2023 (15.7 cases per 100,000 population), with 2023 having the highest rate to date (Figure 7.6).

Those 65 years and older had the most iGAS cases (32 confirmed cases), accounting for 33.7% of all cases, followed by the 45-64 age group (29 confirmed cases) (Figure 7.7).

Compared to 2022, the largest increases in 2023 were seen in children aged 1-4 (from one case in 2022 to five in 2023) and aged 5-9 (from no cases in 2022 to six in 2023).

Figure 7.6 Group A Streptococcus, Invasive (iGAS) confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
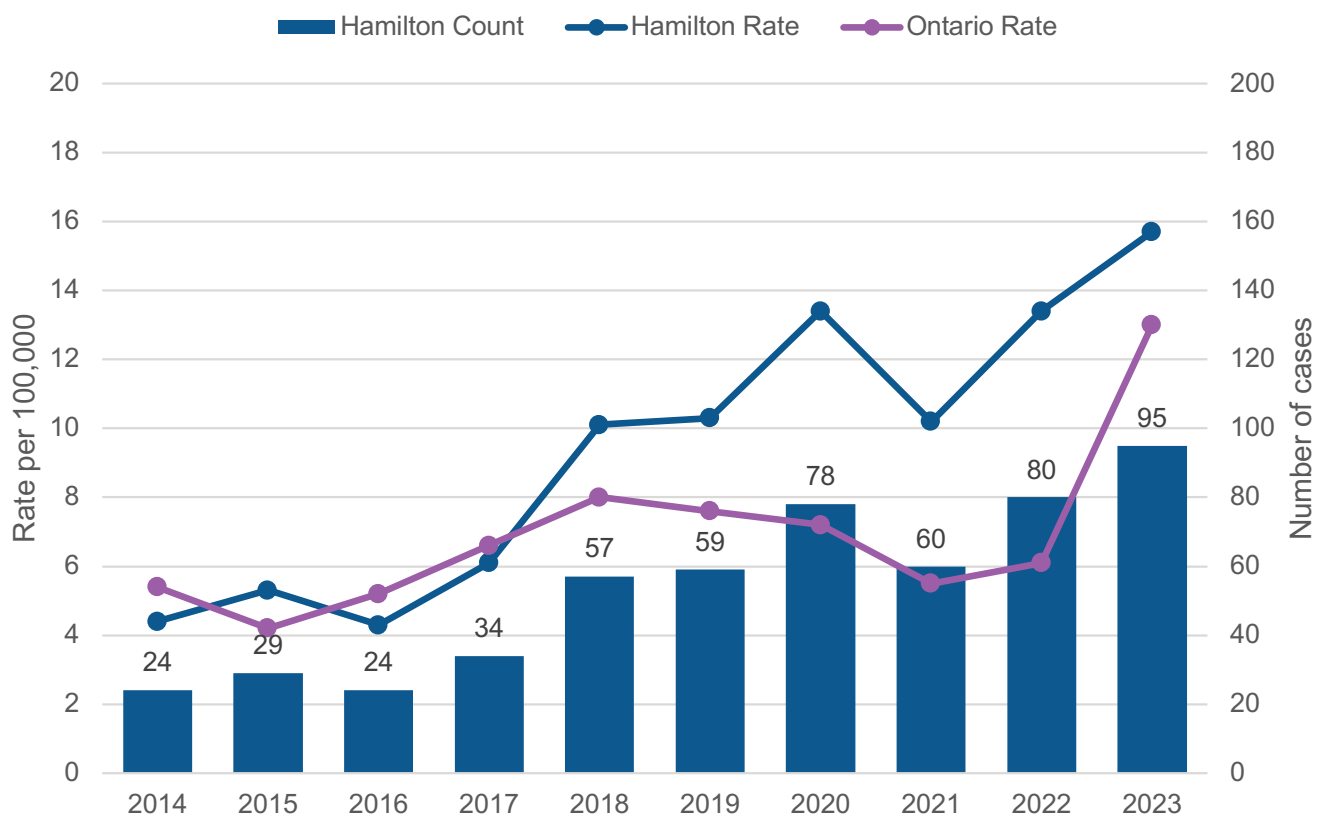
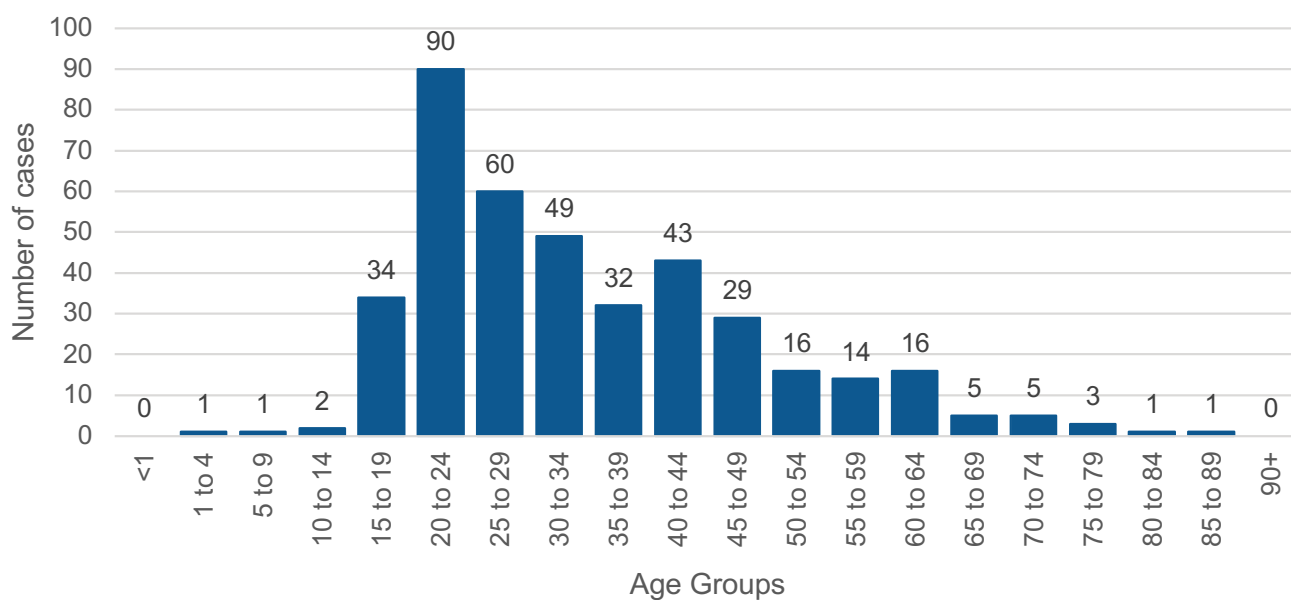

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Figure 7.7 Group A Streptococcus, Invasive (iGAS) confirmed cases by age group, Hamilton, 2023
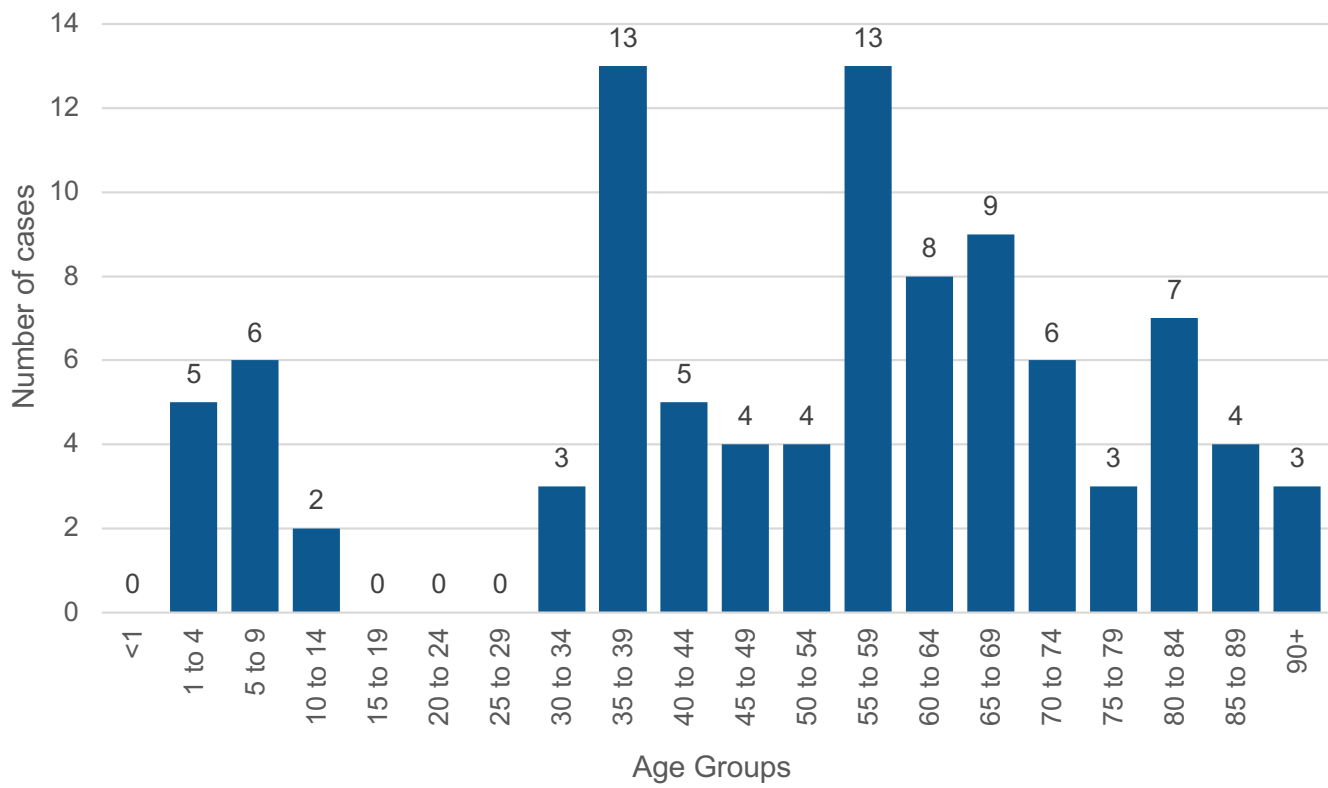
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Influenza

Influenza or flu is a viral respiratory infection that usually circulates during the fall and winter season. It can easily spread from person to person by coughing or sneezing.[47]

In 2023, the rate of Influenza in Hamilton (95.6 cases per 100,000 population) was 42.3% higher than Ontario (67.2 cases per 100,000 population) (Figure 7.8). Local rates were highest among females (53.8% of total Influenza cases), and those between 0 to 19 years (233 cases or 40.2% of total Influenza cases) (Figure 7.9). In the chart below, note that due to the COVID-19 pandemic lockdown, there were only 2 reported cases of influenza in 2021.
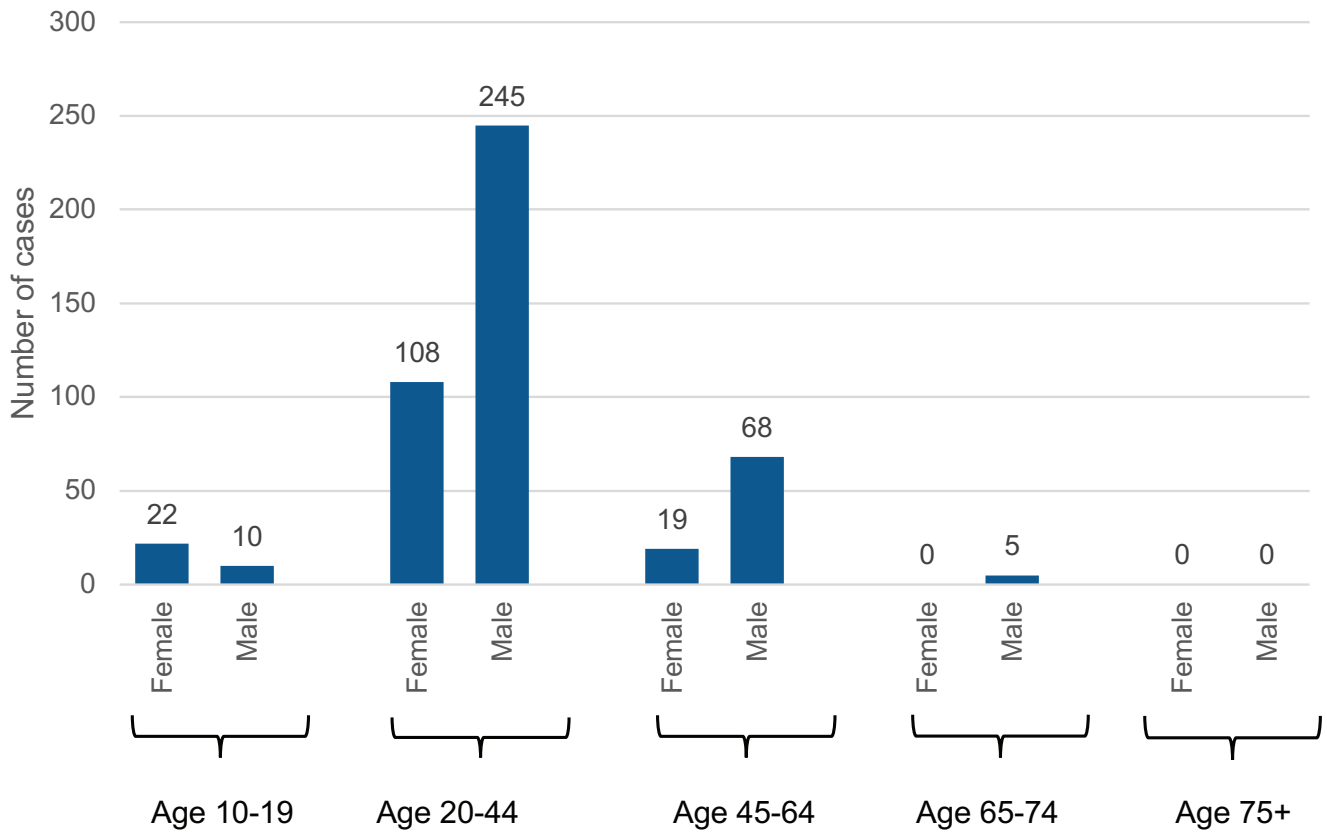
Figure 7.8 Influenza confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]
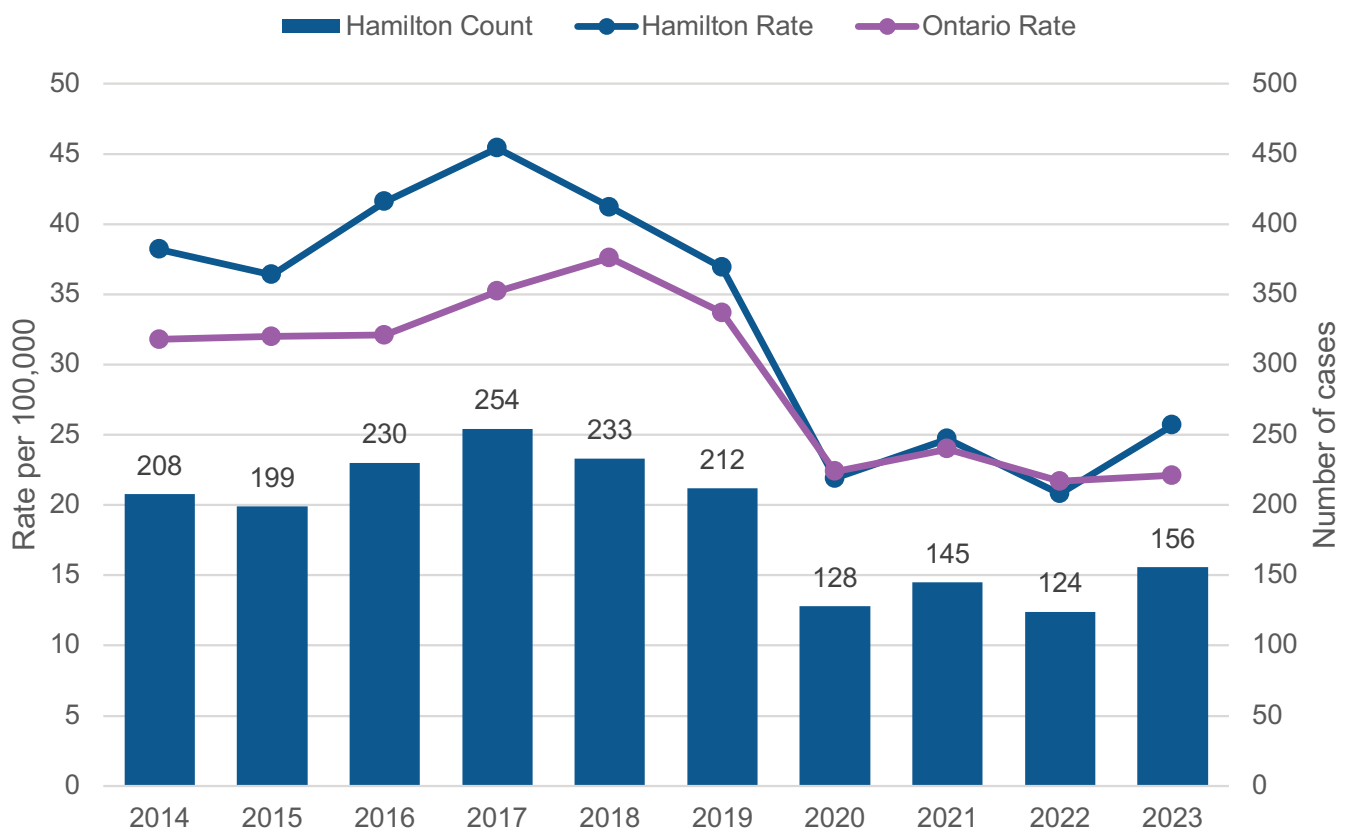
Figure 7.9 Influenza confirmed cases by age group and sex, Hamilton, 2023
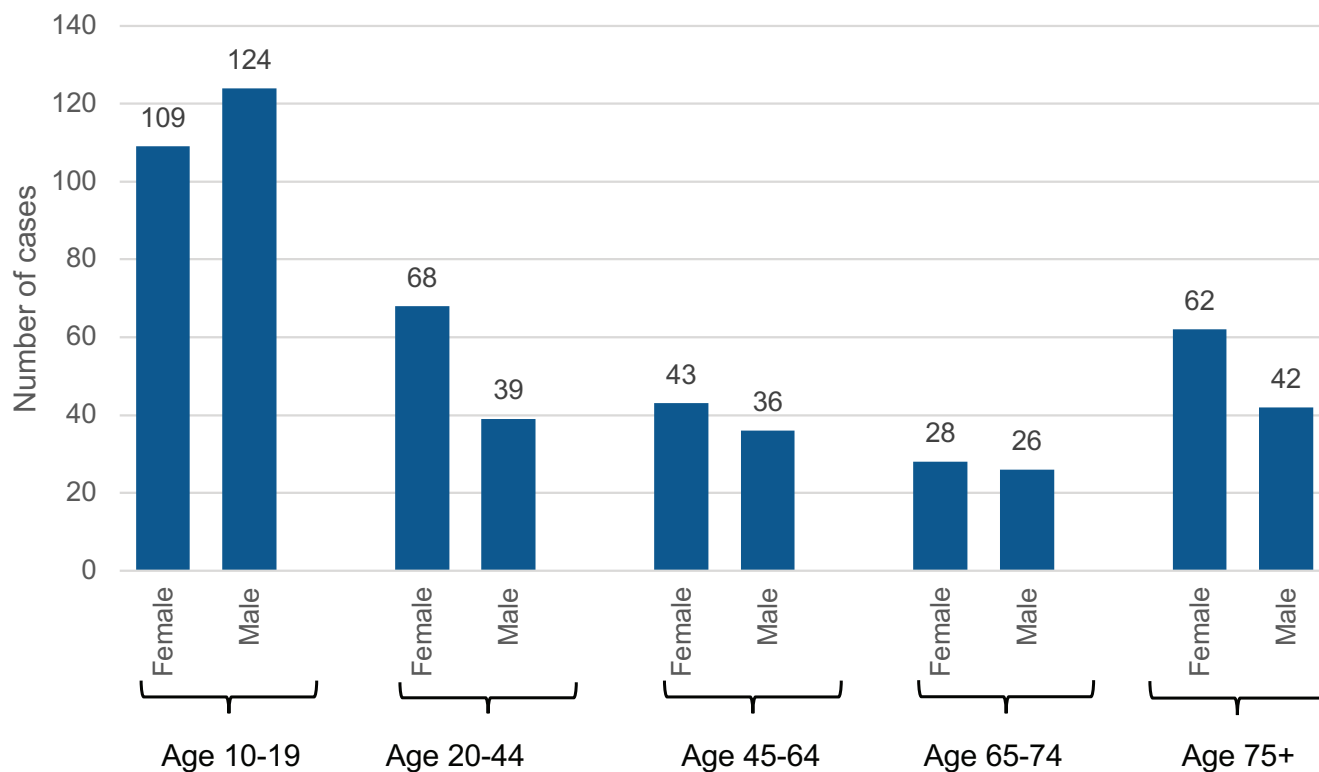
Y-axis: Number of cases

Age group	Female	Male
Age 10-19	109	124
Age 20-44	68	39
Age 45-64	43	36
Age 65-74	28	26
Age 75+	62	42

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Tuberculosis

Tuberculosis or TB is caused by breathing in a bacteria called Mycobacterium tuberculosis from someone with active TB disease in their lungs or airways. Latent TB infections occur when a person's immune system can fight the bacteria and keep it from growing. They have no symptoms, don't feel sick and are unable to spread this respiratory disease to others.[48]

In 2023, the rate of active TB in Hamilton (3.8 cases per 100,000 population) was 1.5 times lower when compared to Ontario (5.7 cases per 100,000 population) (Figure 7.10).

In 2023, the rate of latent TB cases in Hamilton (66.4 cases per 100,000 population) was significantly higher than Ontario (45.9 cases per 100,000 population) (Figure 7.11). The highest rates were seen among people in their 20s (Figure 7.12). Females were disproportionately affected by latent TB, accounting for 70.1% of total cases.

Figure 7.10 Active tuberculosis confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
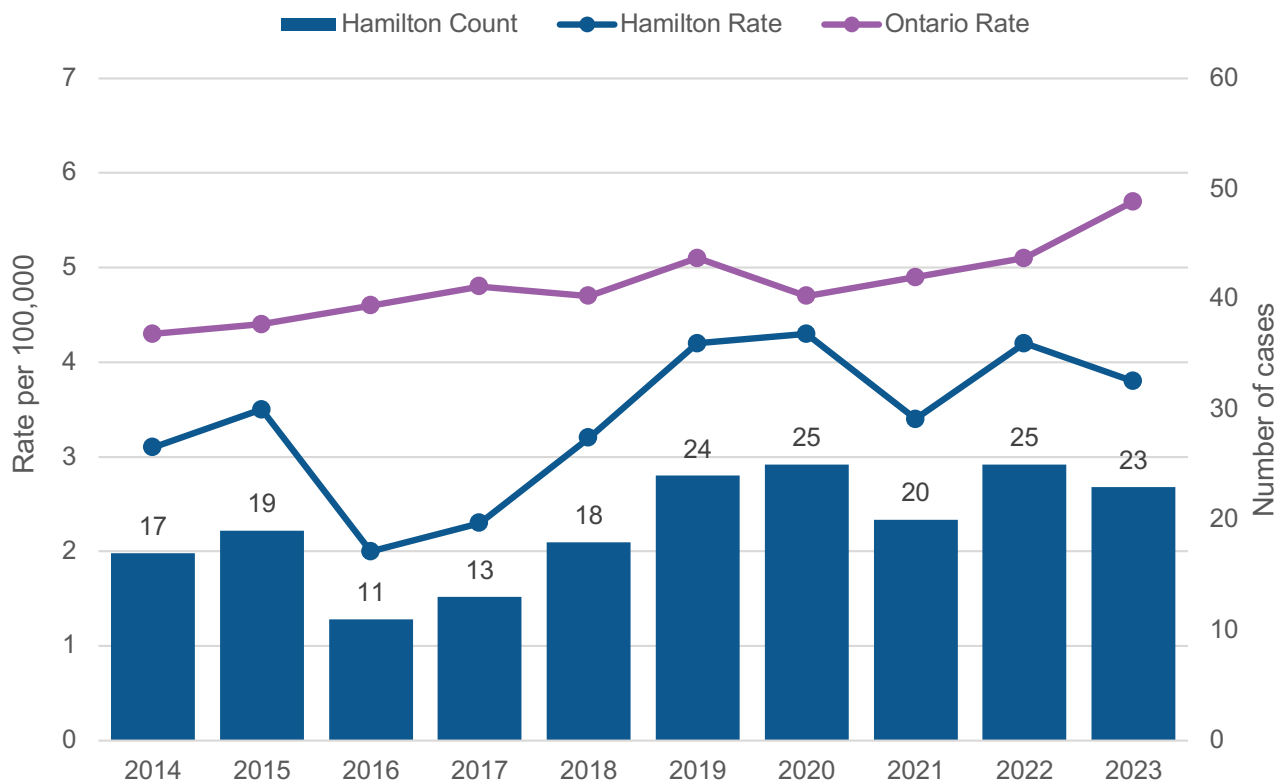
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Figure 7.11 Latent tuberculosis confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
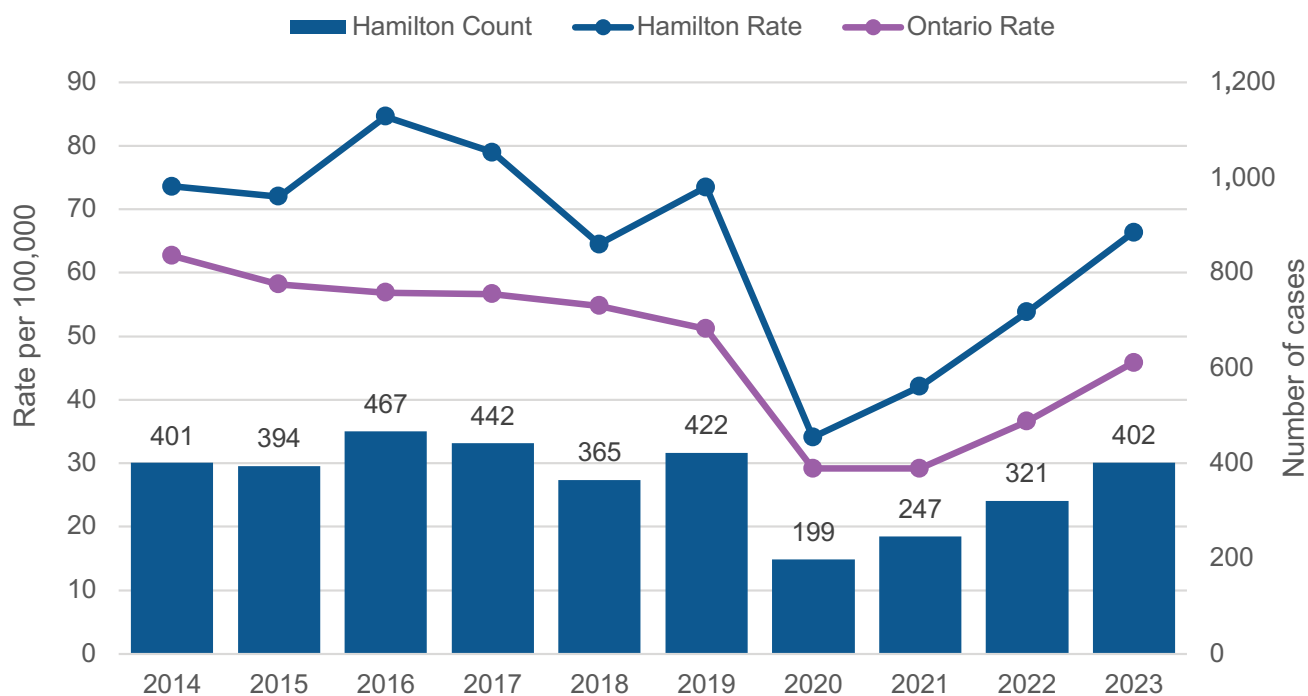
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Figure 7.12 Latent tuberculosis confirmed cases by age group, Hamilton, 2023

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

SEXUALLY-TRANSMITTED AND BLOOD-BORNE INFECTIONS

Gonorrhea

Gonorrhea is transmitted through unprotected oral, vaginal or anal sex; if left untreated, it can be passed on from mother to child during childbirth or can lead to infertility.[49]

Gonorrhea cases in Hamilton increased 2.2 times across the 10 years from 2014 (35.6 cases per 100,000 population) and to 2023 (79.1 cases per 100,000 population). However, when compared to the 2023 provincial rate (92.1 cases per 100,000 population), the local rate was significantly lower (Figure 7.13).

Males had a higher rate of Gonorrhea in Hamilton, accounting for 68.5% of total cases for 2023. Gonorrhea cases were highest among those in their 20s and 30s, and 355 confirmed cases (74.1% of total cases) were seen in those between 20-44 (Figure 7.14).

Figure 7.13 Gonorrhea confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
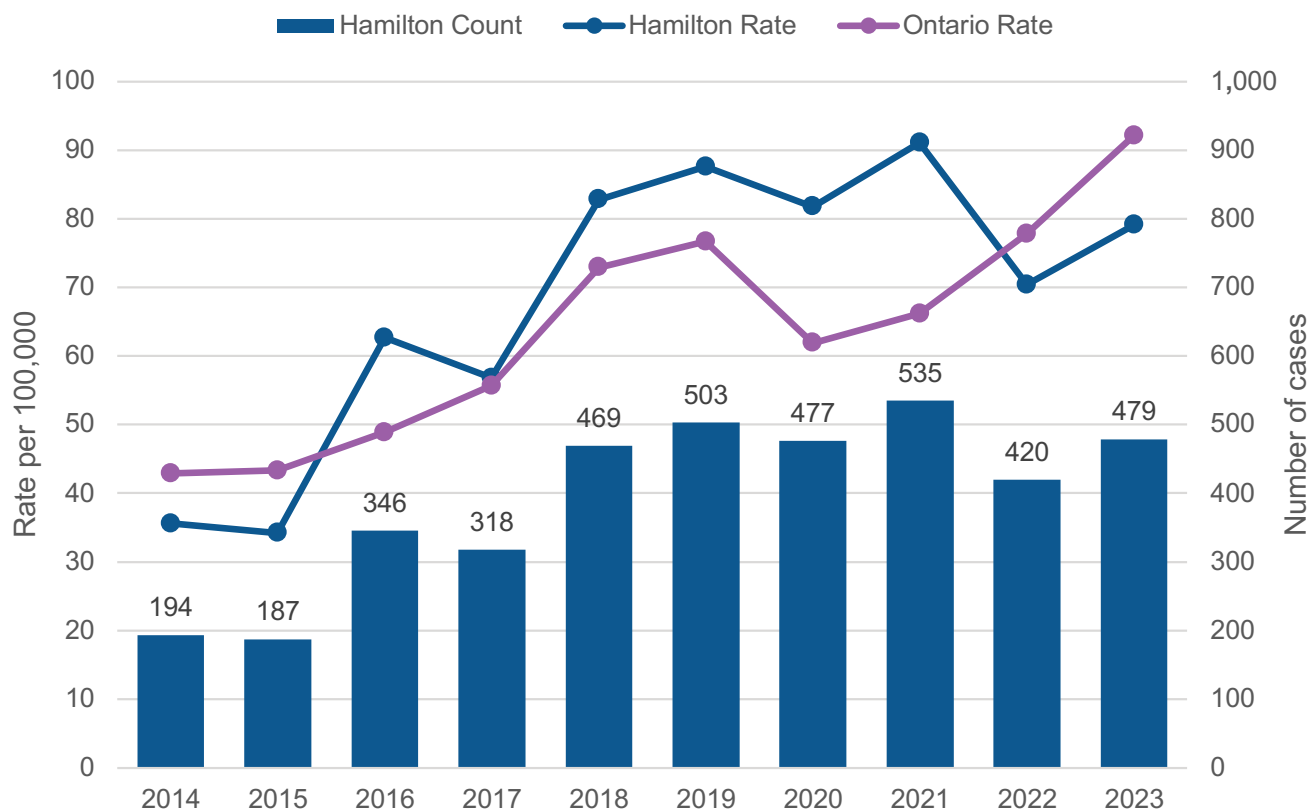
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Figure 7.14 Gonorrhea confirmed cases by age group and sex, Hamilton, 2023

Number of cases

	Age 10-19	Age 20-44	Age 45-64	Age 65-74	Age 75+
Female	22	108	19	0	0
Male	10	245	68	5	0

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Hepatitis C

Hepatitis C is a liver infection caused by a virus. Infection can come:

- from blood contact, including sexual activity
- by sharing needles, razors, scissors, nail clippers or toothbrushes
- through mother-to-child during childbirth

Between 2014 to 2023, Hepatitis C infections in Hamilton decreased by 48.6% from 38.2 cases per 100,000 population to 25.7 cases per 100,000 population (Figure 7.15).

Three-fifths (60.3%) of Hepatitis C infections diagnosed in 2023 were among males. The highest rate was among those in the 20-44 group, which accounted for half (53.8%) of all cases in 2023 (Figure 7.16).

Figure 7.15 Hepatitis C confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]
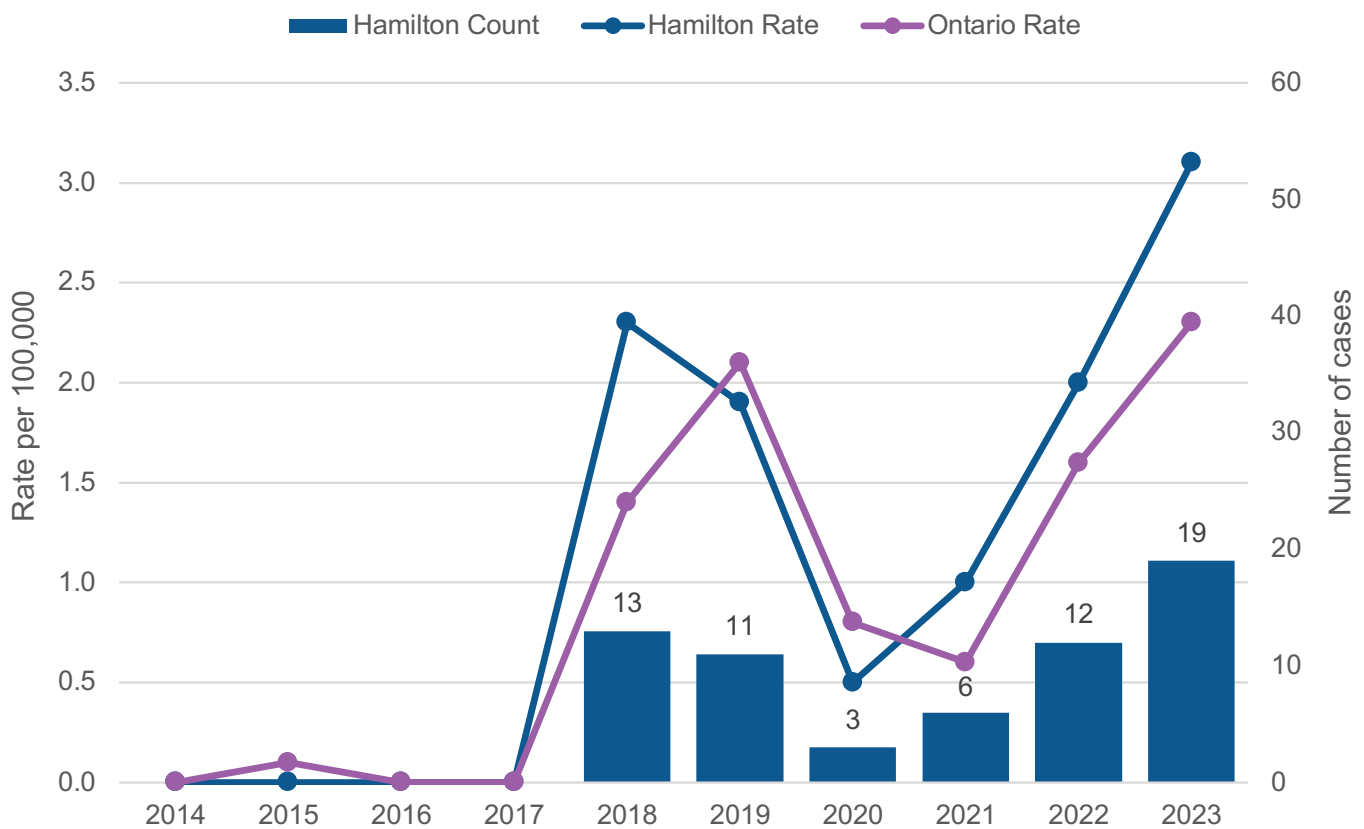
Figure 7.16 Hepatitis C confirmed cases by age group, Hamilton, 2023
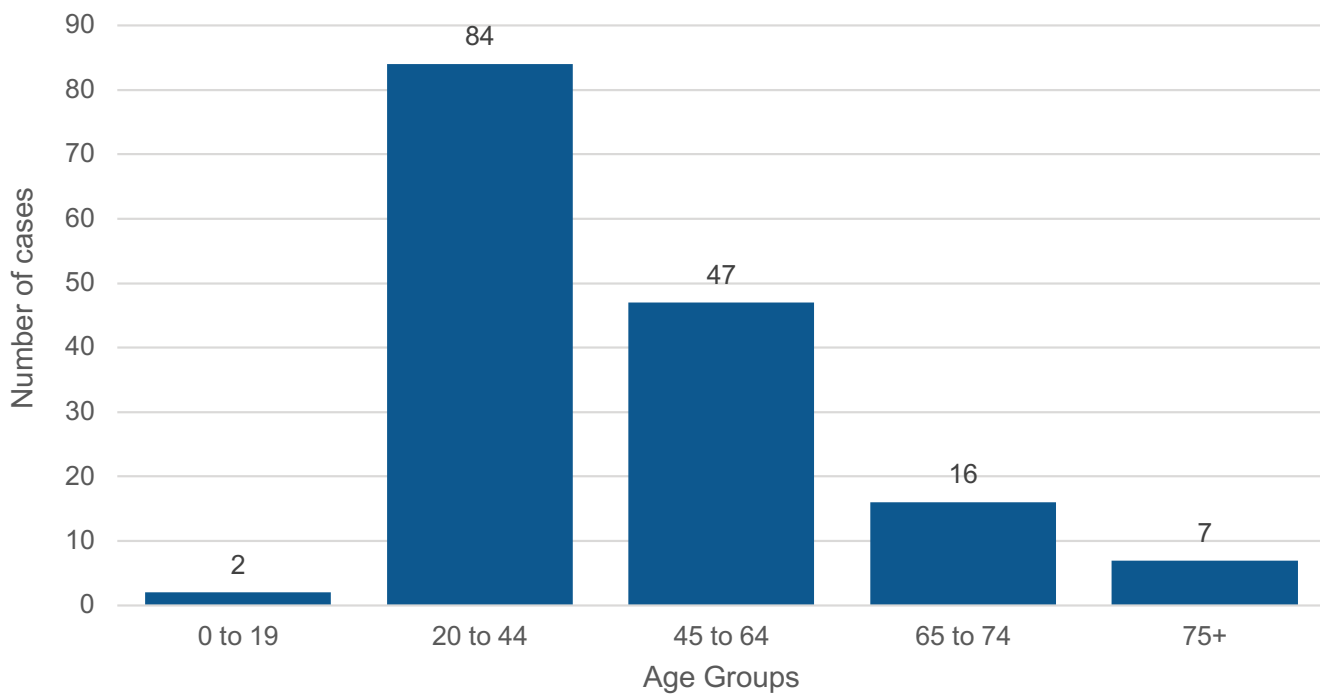
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Syphilis

Syphilis is caused by bacteria that are transmitted through direct contact (oral, genital, or anal). It can also be passed on from mother-to-child during pregnancy or childbirth.

Early congenital syphilis occurs when a mother with syphilis pass on the infection to her baby during pregnancy, which can cause lifelong health impacts, miscarriage or stillbirth.[50]

Infectious syphilis includes early latent, primary and secondary stages. Late latent syphilis is non-infectious and does not show any symptoms.

In Hamilton, the rate of infectious syphilis increased significantly from 2014-2023, rising four-fold (Figure 7.17). The greatest increase was seen during the COVID-19 pandemic; the rate more than doubled from 2019 to 2020, and continued to rise in 2021 and 2022. There were 146 confirmed infectious syphilis cases in 2023, representing 24.1 cases per 100,000 population.

Figure 7.17 Infectious syphilis confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
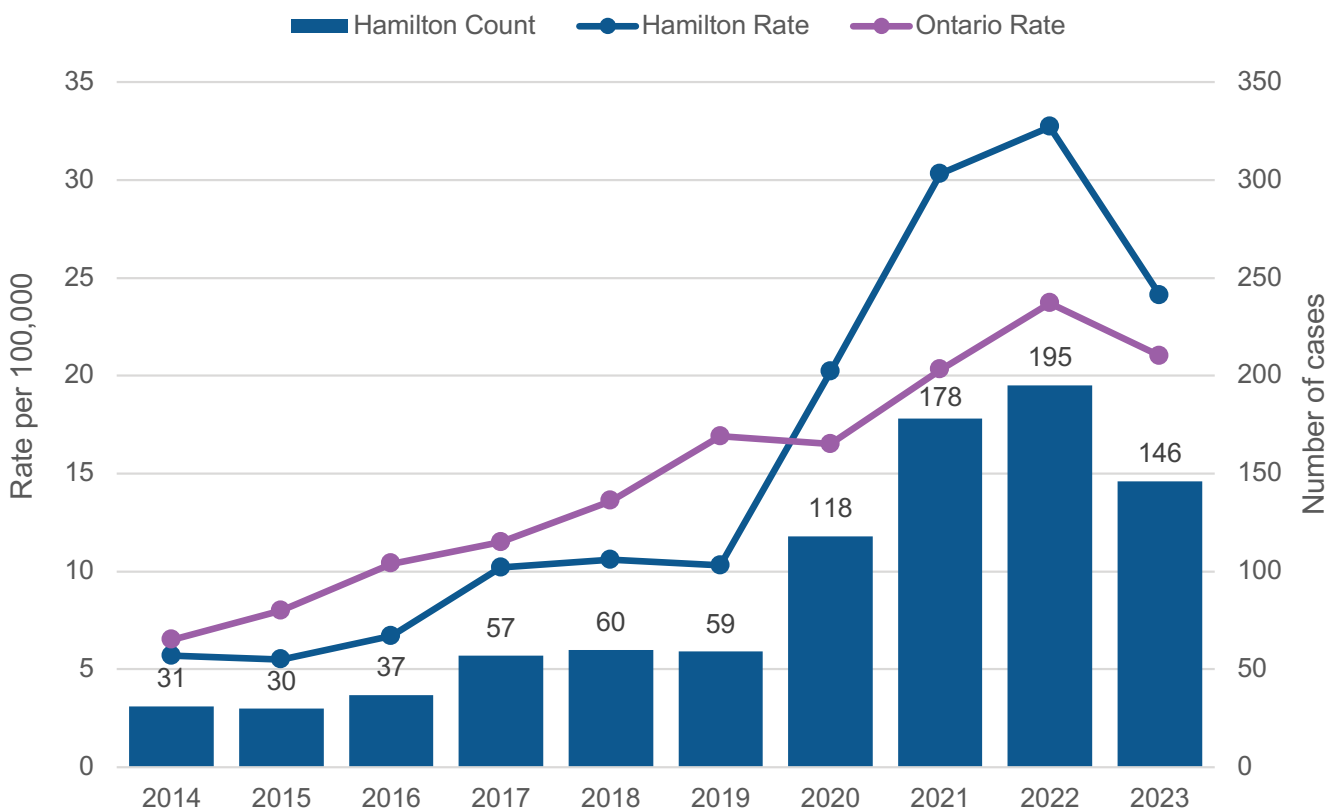
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Note: Infectious syphilis includes (1) early latent syphilis; (2) infectious neurosyphilis; (3) primary anal, genital or other sites syphilis; and (4) syphilis, secondary of skin and mucous membranes or other sites.

The majority (82.9%) of infectious syphilis cases were among men in 2023, affecting 40.3 males per 100,000 population. The rates of infectious syphilis were highest among those aged 20-44, followed by 45–64-year-olds (Figure 7.18).

For latent syphilis, Hamilton has seen a four-fold increase in confirmed cases from 2014 (4.2 cases per 100,000 population) to 2023 (16.5 cases per 100,000 population) (Figure 7.19).

In 2023, the local rate of latent syphilis was 28.9% higher than the provincial comparison (12.8 cases per 100,000 population).

Most of the latent syphilis cases (62%) were among males. The highest rates of were among those in aged 20-44, accounting for 64% of total latent syphilis cases in Hamilton for 2023.

Prior to 2018, Hamilton saw no confirmed cases of early congenital syphilis. In the last six years, however, confirmed cases have re-emerged, and two were reported in Hamilton in 2020.

Figure 7.18 Infectious syphilis confirmed cases by age group and sex, Hamilton, 2023
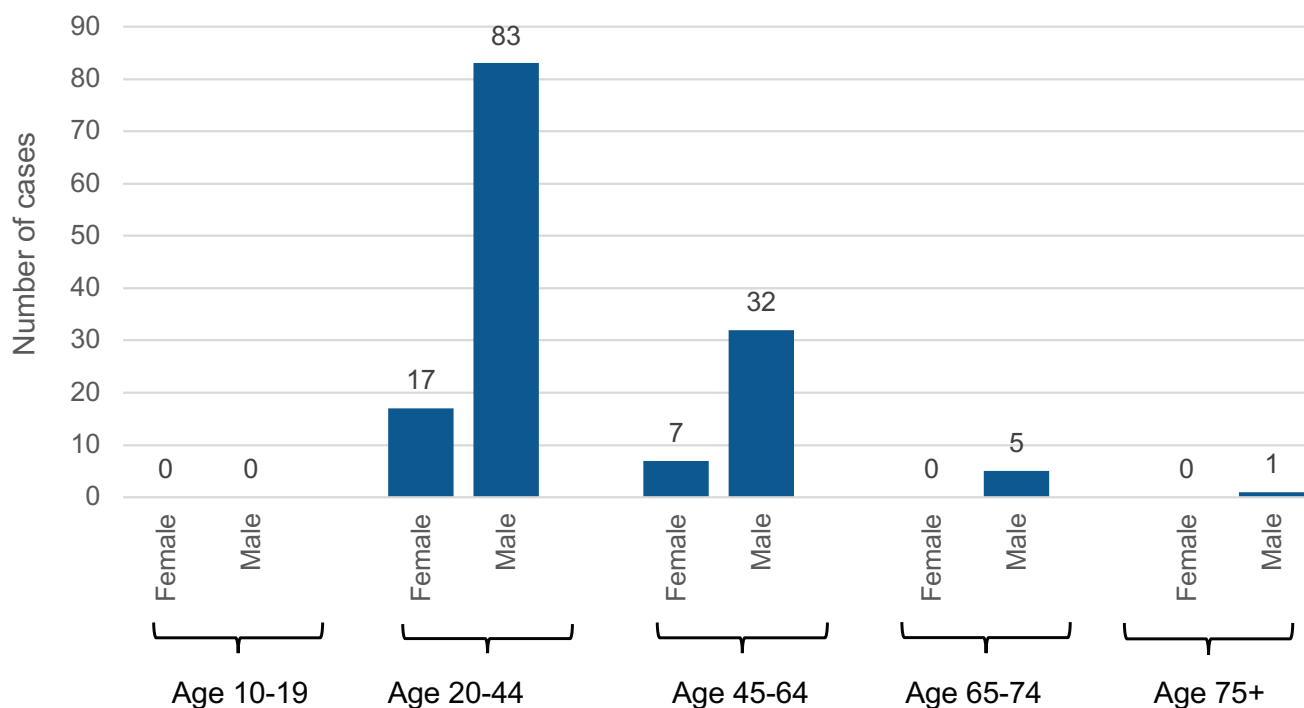
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Figure 7.19 Latent syphilis confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023

Legend: Hamilton Count, Hamilton Rate, Ontario Rate

Data labels (Hamilton Count): 2014: 23, 2015: 34, 2016: 24, 2017: 32, 2018: 32, 2019: 42, 2020: 35, 2021: 58, 2022: 61, 2023: 100
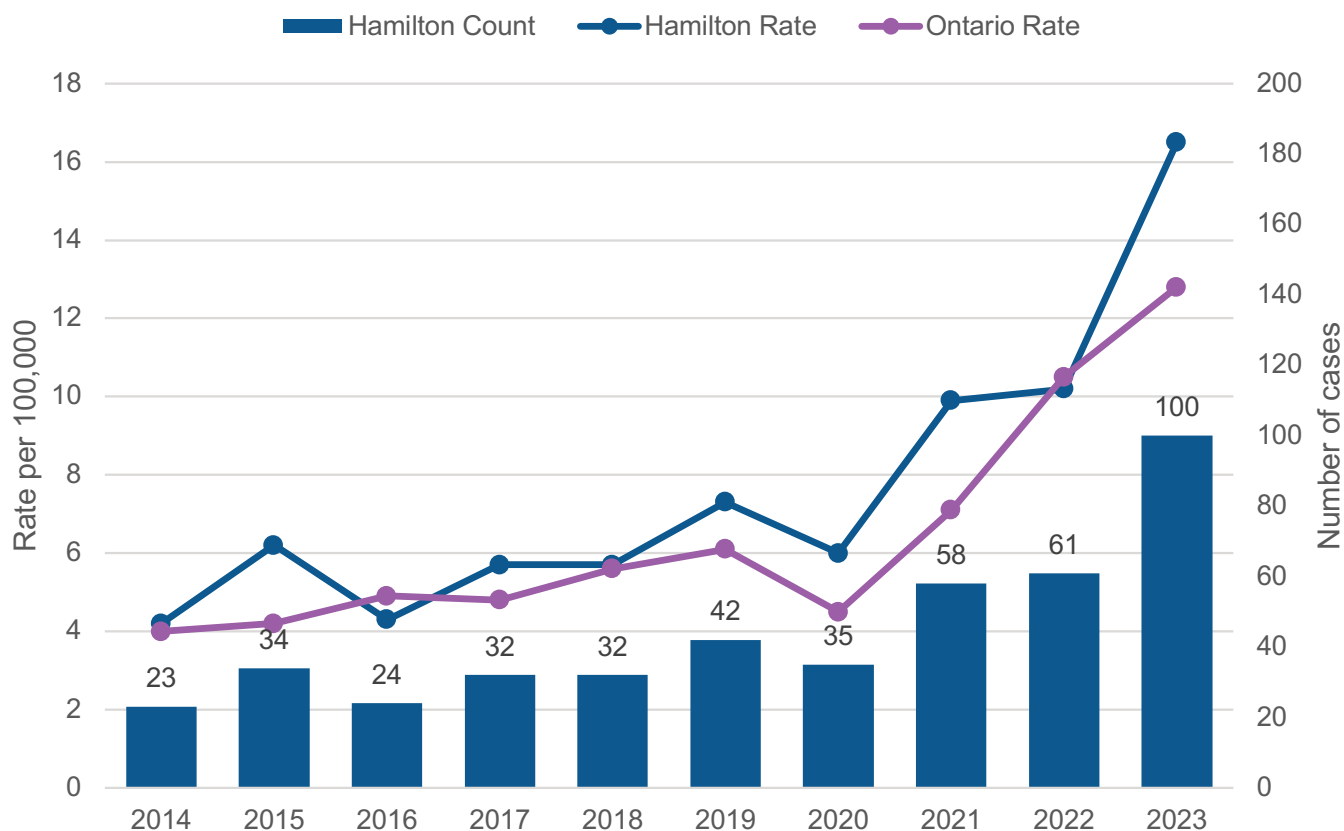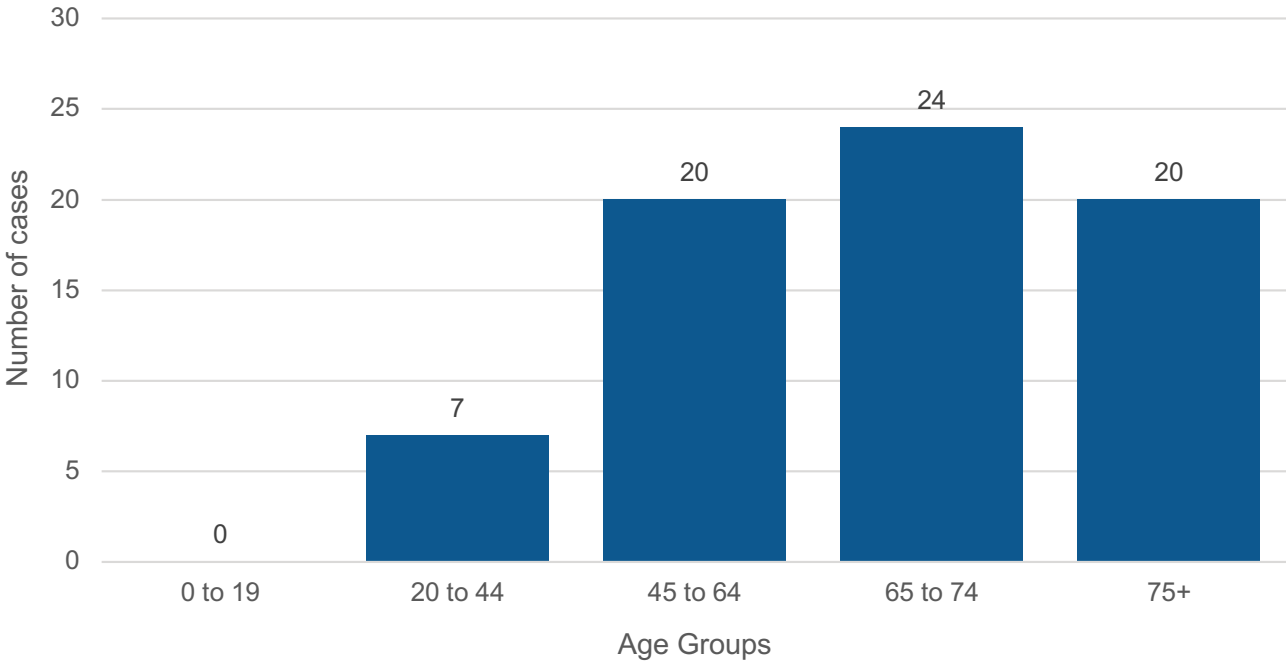
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

VACCINE-PREVENTABLE DISEASES

Haemophilus influenzae disease, all types, invasive

Haemophilus influenzae (*H. influenzae*) is a bacteria that can be spread from person to person through respiratory droplets by sneezing and/or coughing.

In Hamilton, the rate of *H. influenzae* disease increased three-fold from 2021-2023. In 2023, there were 3.1 cases per 100,000 population, the highest rate to date (Figure 7.20).

Figure 7.20 Haemophilus influenzae disease, all types, invasive confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

VECTOR-BORNE DISEASES

Lyme Disease

Lyme disease can be spread to humans through the bite of an infected blacklegged tick. Hamilton and much of the surrounding region is deemed a risk area for Lyme disease.

The past 10 years has seen a significant increase in confirmed Lyme disease cases in Hamilton. In just three years, the rate of Lyme disease increased 63.4% (13.4 cases per 100,000 population in 2023 compared to 8.2 cases per 100,000 population in 2021) (Figure 7.21).

In 2023, Hamilton had the highest number of reported confirmed cases to date with 81.

Figure 7.21 Lyme disease, confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
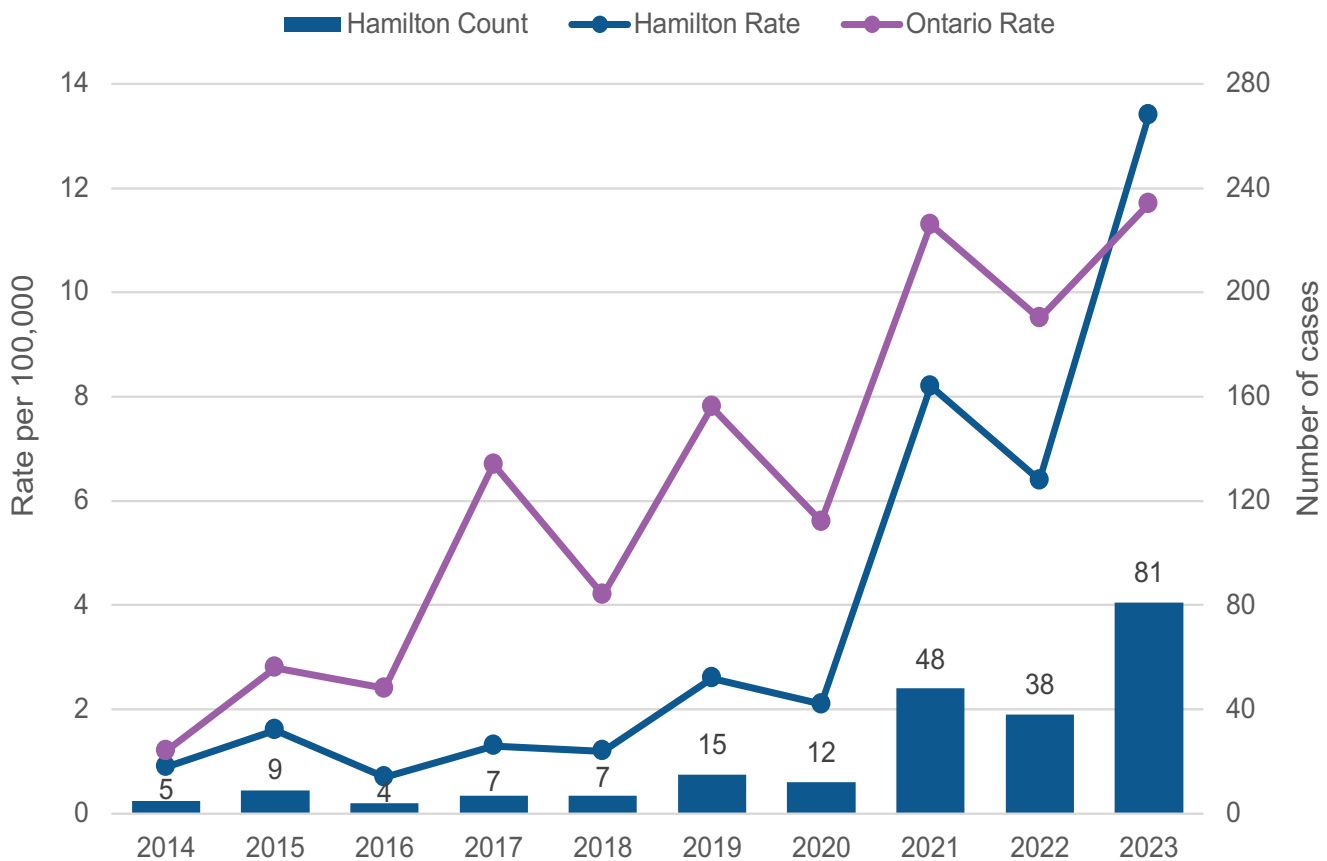
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

West Nile Virus

West Nile virus is spread to humans from the bite of an infected mosquito.

In 2023, Hamilton had six confirmed cases of West Nile virus, a significantly higher rate (1 case per 100,000 population) than for Ontario as a whole (0.3 case per 100,000 population) (Figure 7.22).

Figure 7.22 West Nile virus, confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
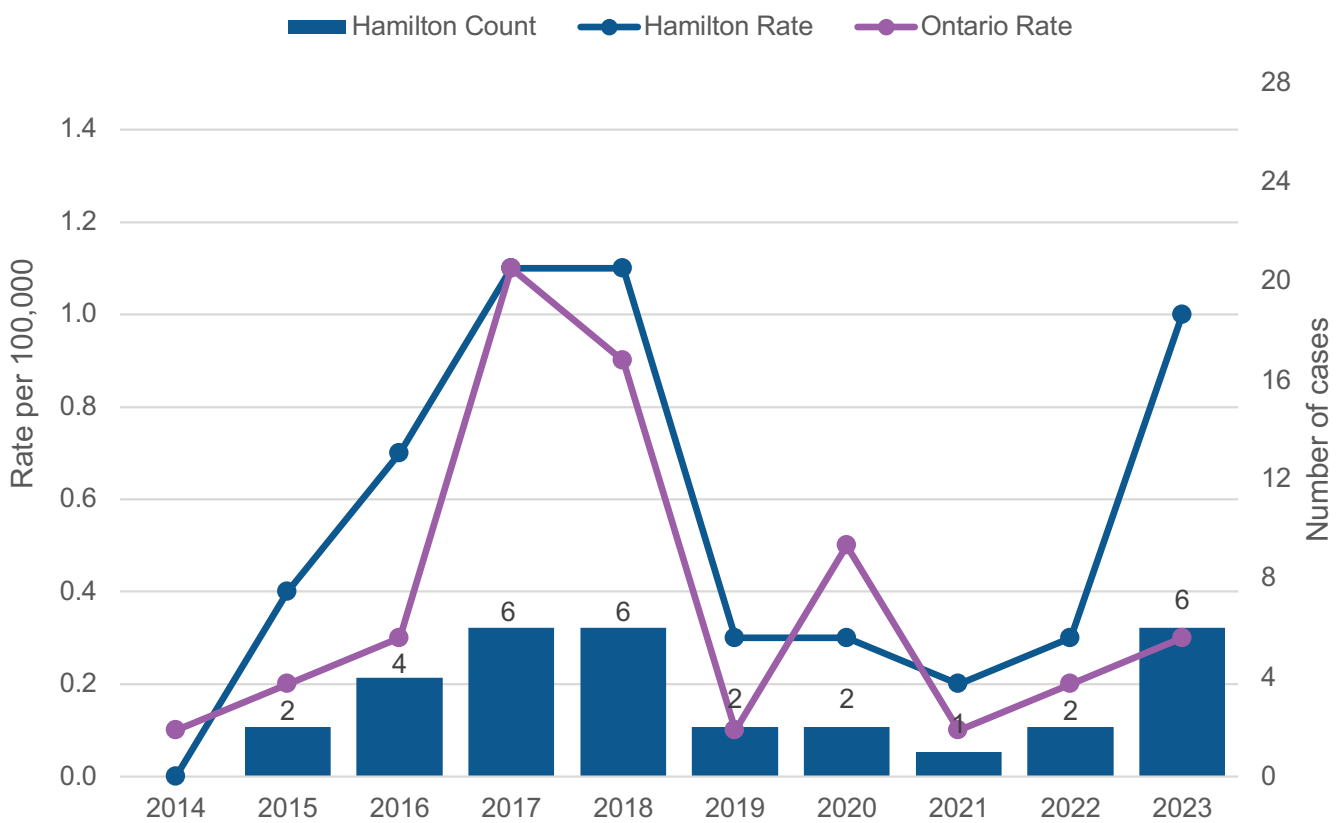
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

ANTIMICROBIAL-RESISTANT INFECTIONS

Carbapenemase-producing Enterobacteriaceae (CPE)

Enterobacteriaceae are a family of bacteria. Carbapenamase-producing Enterobacteriaceae (CPE) are resistant to carbapenem antimicrobials.

CPE can spread through direct or indirect contact, and can cause pneumonia, or infections of the gastrointestinal tract, urinary tract and skin. One risk factor for infection is receiving healthcare in settings that have CPE.

In Hamilton, the rate of CPE increased significantly in the past 10 years (2014-2023). The greatest increases occurred from 2022 to 2023 when the CPE rate more than doubled.

There were 71 confirmed CPE cases in 2023, representing 11.7 cases per 100,000 population (Figure 7.23). This rate increased almost 12-fold from 2018 (0.4 cases per 100,000 population) to 2023.

Compared to Ontario (5 cases per 100,000 population), Hamilton had more than twice as high a rate of CPE in 2023. Some or most of this increase is likely attributed to changes in reporting requirements and surveillance practices. Reporting of this disease became mandatory in 2018, and ever since there have been increased efforts to screen and test for this disease in healthcare settings.

Figure 7.23 Carbapenemase-producing Enterobacteriaceae (CPE) confirmed cases (count and incidence rate per 100,000 population), Hamilton and Ontario, 2014-2023
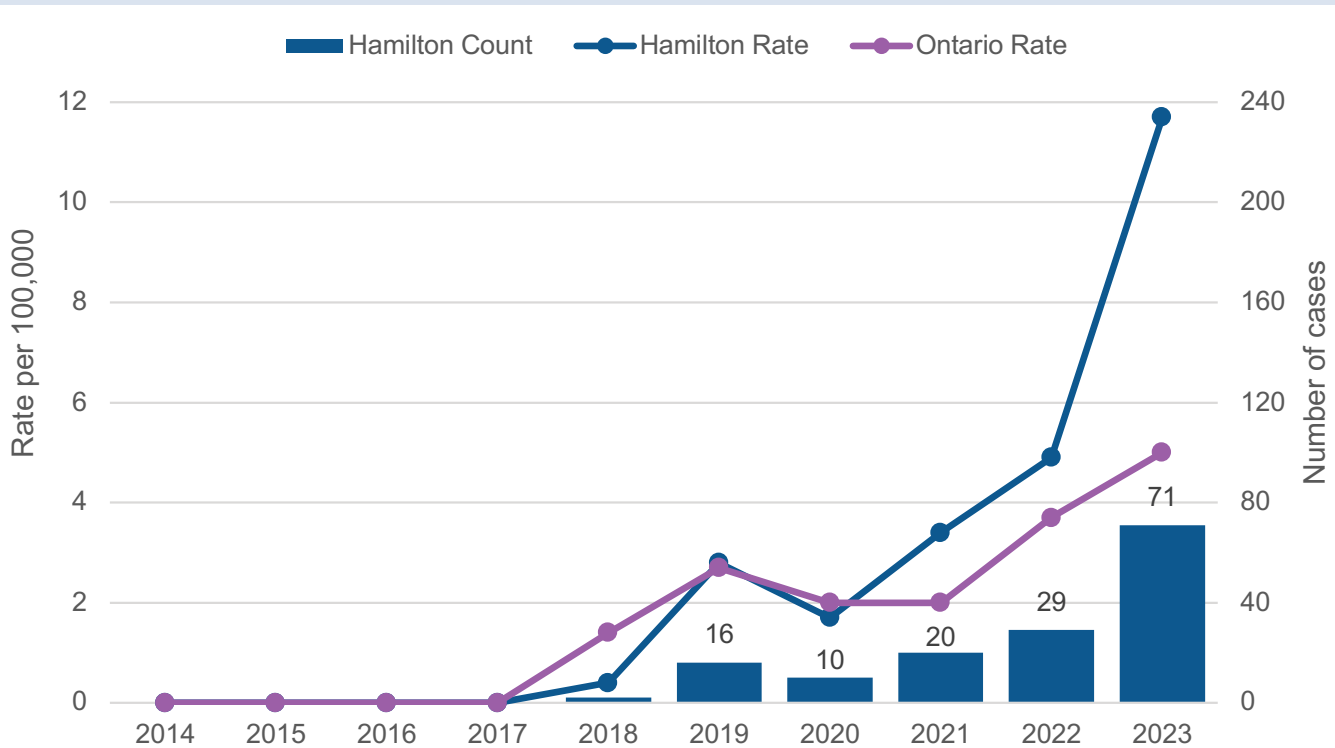
Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

Males are disproportionately affected by CPE, accounting for 63.4% of cases in 2023 (5 males compared to 8.5 females per 100,000 population).

CPE cases were most frequently seen in older population, specifically in 65- to 74-year-olds, which accounted for 33.8% of all CPE cases in 2023. This is followed by the 45–65-year-olds and 75+ age groups (Figure 7.24).

Figure 7.24 Carbapenemase-producing Enterobacteriaceae (CPE) confirmed cases by age group, Hamilton, 2023

Source: Integrated Public Health Information System (iPHIS) accessed through Public Health Ontario Infectious Disease Query [5 April 2024]

ENVIRONMENTS AND HEALTH

HIGHLIGHTS

- Outdoor air quality in Hamilton has improved over the past decade, however some specific air pollutants continue to reach levels that are a risk to human health.

- Five Special Air Quality Statements were issued for Hamilton in 2023, the highest number since warnings began in 2015.

- Fine particulate matter levels in Hamilton improved overall between 2012 and 2021. But in 2021 they exceeded the point where residents would be considered protected against chronic effects.

- Air pollution accounted for an estimated 55 deaths of Hamilton residents in 2018.

- The number of heat warning days in Hamilton generally increased from 2011 to 2023, and the city's annual average temperature is projected to rise.

- From 2012 to 2021, Hamilton residents visited the emergency department more often for heat-related illness (1,291 visits) than for cold-related illness (791 times). While no deaths were attributed to heat-related illness in that period, there were 17 deaths due to cold-related illness.

- Some residents live in areas with greater potential risks to their health due to overall exposure to heat and heat vulnerability (sensitivity to heat combined with fewer options to seek relief).

- Inequalities exist in heat- and cold-related illness, particularly in areas with the greatest percentage of households below the low-income cut-off after tax and areas with the greatest percentage of households that have a core housing need.

ENVIRONMENTS AND HEALTH

PHYSICAL OUTDOOR AIR QUALITY

Air Quality Health Index

Poor air quality comes from a number of factors, including emissions from various natural and man-made sources (e.g., vehicles, forest fires, power plants, industrial processes and residences), and is influenced by atmospheric and weather conditions.

The Air Quality Health Index (AQHI) is based on the combined health effects of three common air pollutants that are known to harm human health: ozone (O_3) at ground level; particulate matter ($PM_{2.5}/PM_{10}$); and nitrogen dioxide (NO_2).

The AQHI was implemented across Ontario in 2015, and uses a scale ranging from 1-10+ to cover four health risk categories:

- low health risk: 1-3
- moderate health risk: 4-6
- high health risk: 7-10
- very high health risk: 10+

Ontario issues air quality alerts in partnership with Environment and Climate Change Canada. There are two levels of alerts: Special Air Quality Statement (SAQS) and Smog and Air Health Advisory (SAHA).

SAQS inform the public of the potential for degrading air quality. It's issued if an AQHI of 7 or greater and is expected to last for 1-2 hours, or for areas where forest fire smoke is expected to cause deteriorating air quality. SAHA is issued when AQHI levels of 7 or greater are expected to continue for three hours or more.

The SAQS is meant to notify the residents – especially those at risk due to age, underlying illnesses or sensitivities – to pay attention to air quality and adjust their activities if they observe adverse health effects. In 2023, five SAQS were issued for Hamilton, primarily due to forest fire smoke, up from two in 2022 and the highest number since implementation in 2015 (Figure 8.1).

No SAHAs have been issued for Hamilton since reporting began in 2015.

In 2021, the Hamilton Downtown monitoring station reported low risk air quality about 85.6% of the time, based on the annual reported hours and moderate risk or above 14.5% of the time based on the AQHI. For that same year, the respective figures in Ontario were 93.1% and 6.8% (with high risk 0.03% of the time).[51]

AQHI results varied for the seven-year period that results were available and generally decreased over that time (Appendix A Table 8.1). In 2015, the AQHI was at or above a moderate health risk level 20.3% of the time. It fluctuated from 2016 through 2019 from 14.2% to 16.7%, then dipped in 2020 to 9.8% before increasing again in 2021 (Figure 8.2).

Measures put in place in 2020 due to the COVID-19 pandemic, such as the temporary stay-at-home order, reduced transportation and industrial activities across Ontario. Monitoring on the Highway 401 corridor indicated the pandemic measures reduced emission of nitrogen dioxide (NO_2), while road traffic reductions made little impact on fine particulate matter ($PM_{2.5}$) and ozone (O_3) levels.[52]

Figure 8.1: Special Air Quality Statements, City of Hamilton, 2015-2023
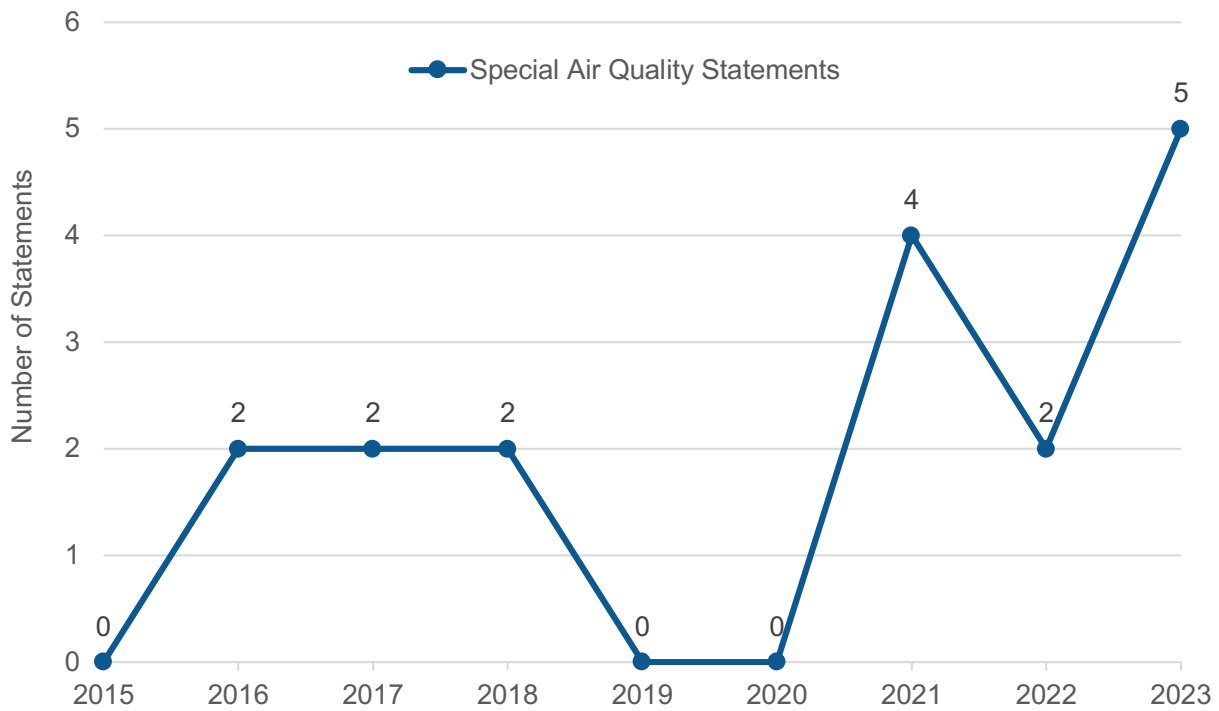
Source: Air Quality Ontario, Summary of Special Air Quality Statements and Smog and Air Health Advisories 2015-2023, accessed January 15, 2024, and available at: https://www.airqualityontario.com/aqhi/advisories_stats.php

Figure 8.2 Air Quality Health Index (AQHI), moderate risk or above, percent of annual valid hours, Hamilton Downtown monitoring station, 2015-2021
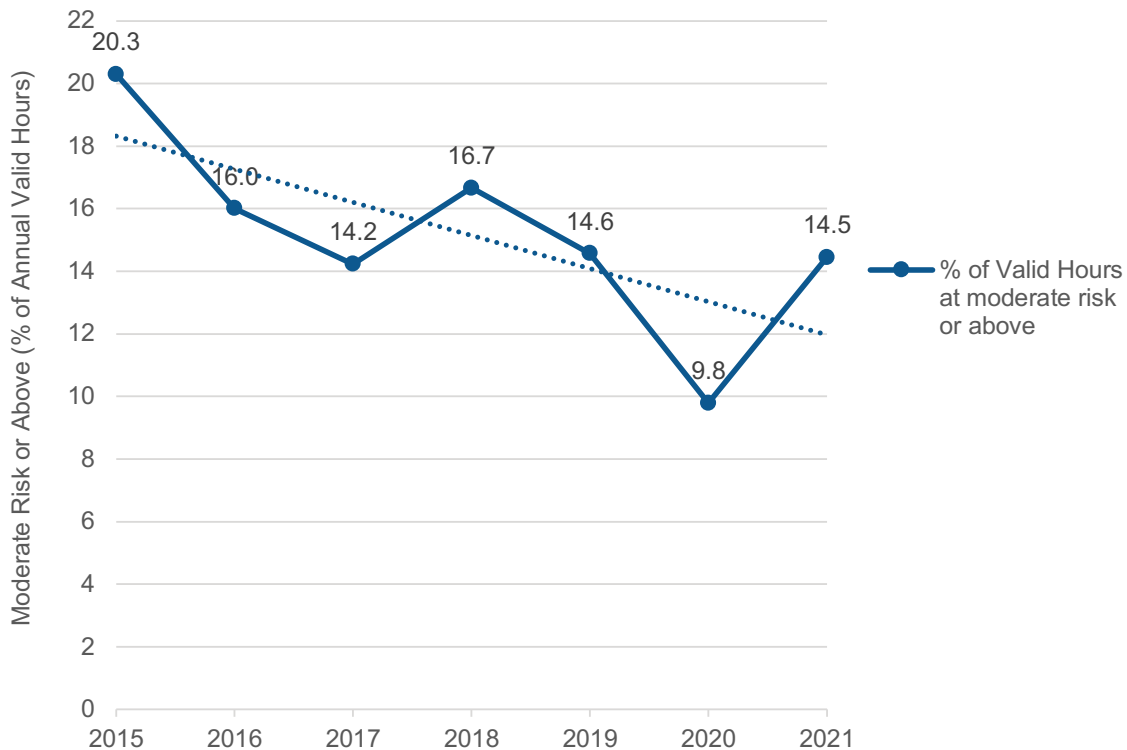
Source: Air Quality Ontario. Air Quality in Ontario Reports 2015-2021. Available from: www.airqualityontario.com/press/publications.php and https://www.ontario.ca/document/air-quality-ontario-2021-report

AIR POLLUTANTS

Outdoor air quality in Hamilton has improved over the past decade, however some specific air pollutants continue to reach levels that are a risk to human health.

Appendix A Table 8.2 provides the 10-year trends from 2012 to 2021 (the most recent comprehensive reporting year) for concentrations of 16 air contaminants at the Hamilton Downtown air monitoring station.

Hamilton has three air monitoring stations: Downtown, Hamilton Mountain and Hamilton West. Hamilton Downtown (located at Elgin/Kelly streets), typically has poorer outdoor air quality results and was therefore selected as the indicator station. This station is also classified as one of Ontario's roadside stations to better understand traffic-related air pollution in urbanized settings. Roadside air monitoring stations are typically located within approximately 100 metres of a major roadway with daily traffic volumes greater than 10,000 vehicles per day.[52]

In 2021, fine particulate matter ($PM_{2.5}$) exceeded the recommended provincial Ambient Air Quality Criteria (AAQC) for preventing chronic health effects. Sulphur dioxide (SO_2) levels also exceeded the AAQC criteria for acute health effects.

Fine particulate matter

Fine particulate matter, along with ozone (O_3), are the main components of smog. Breathing in unhealthy levels of $PM_{2.5}$ can increase the risk of health problems like heart disease and respiratory diseases including asthma. People living with heart or lung disease, children and older adults aged 65 and older are particularly sensitive to this pollutant.[52]

Health Canada identified that exposure to $PM_{2.5}$ contributed 65% of all premature mortality due to air pollution in Canada when the three main contributors to poor health are considered (i.e., $PM_{2.5}$, NO_2, and ozone).[53]

The annual mean concentration of $PM_{2.5}$ at the Hamilton Downtown ambient air monitoring station in 2021 was 8.9 µg/m³, higher than the 2020 level of 8.1 µg/m³ (Figure 8.3).

Overall, fine particulate matter levels at the Hamilton Downtown station decreased by 20.9% over a 10-year period, from 10.2 µg/m³ in 2012 to 8.9 µg/m³ in 2021. The levels in Ontario decreased by 18% for the same period.

An Annual Ambient Air Quality Criteria (AAQC) of 8.8 µg/m³ was introduced in 2020 for $PM_{2.5}$ It's the level that assesses whether residents are protected against chronic effects. The annual level, averaged over three years from 2019-2021, was within those criteria at 8.6 µg/m³. For levels above that, active management is advised to reduce pollutant levels.

Hamilton Downtown and Windsor West were the only two air monitoring stations in the province that recorded 2021 annual mean concentration of $PM_{2.5}$ levels above the Ontario AAQC.

In 2021, Ontario experienced several wildfire smoke events. That included one event that caused widespread elevated $PM_{2.5}$ concentrations and poor air quality across the province. It prompted the issuance of a SAQS for most of Southern Ontario, including Hamilton, on July 19, 2021.[51]

Figure 8.3: Fine particulate matter (PM₂.₅) annual mean (µg/m³), Hamilton downtown monitoring Station (#29000), 2012-2021
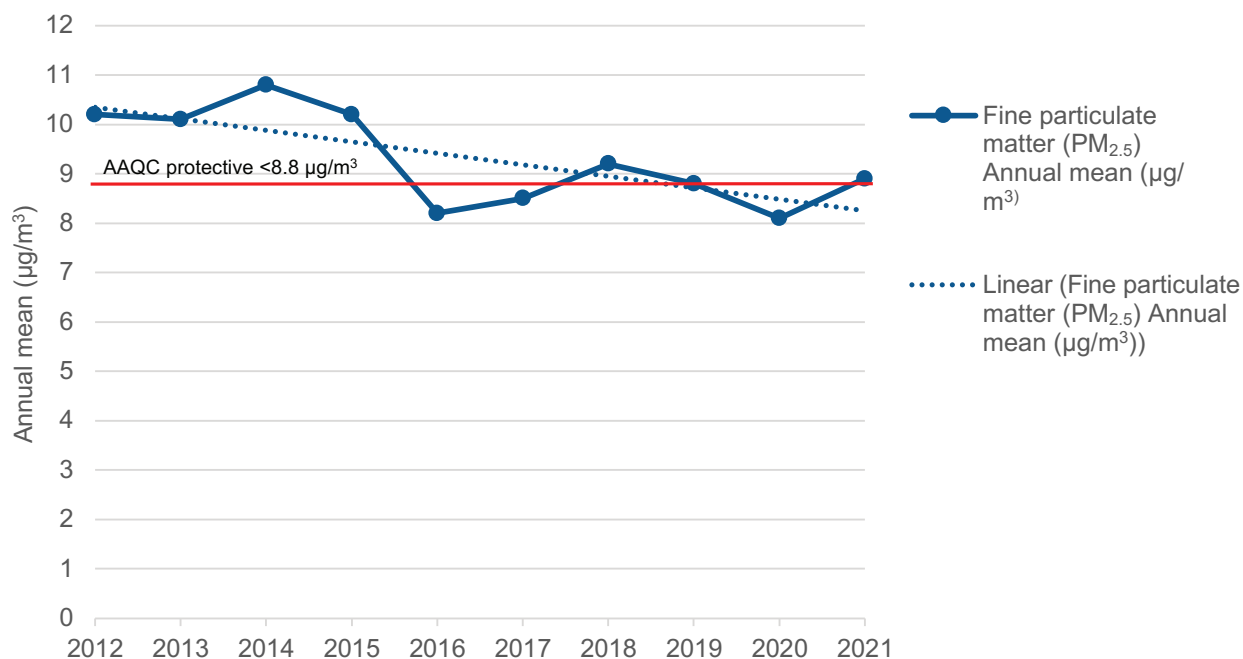
Source: Air Quality in Ontario 2021 Report, 10-year trend for fine particulate matter (PM₂.₅), annual mean (µg/m³) Available from: www.ontario.ca/document/air-quality-ontario-2021-report/appendix#section-6

Notes: To ensure trend comparability, a correction factor was applied to PM₂.₅ concentrations measured in 2012 to approximate the SHARP measurement approach used in Ontario from 2013 onward.

Sulphur dioxide

Exposure to high levels of sulphur dioxide (SO_2) can cause breathing problems and respiratory illness, and exacerbate respiratory and cardiovascular disease.

People with asthma, chronic lung disease or heart disease are particularly affected by short-term exposures to SO_2. Exposures can cause respiratory deaths in adults, particularly in those with asthma.[52]

The annual mean concentration of SO_2 at the Hamilton Downtown station in 2021 was 3.8 ppm, slightly higher than the 2020 level of 3.7 ppm (Figure 8.4).

Overall, SO_2 levels at the Hamilton Downtown station decreased by 14.2% over the 10-year period, from 4.8 ppm in 2012 to 3.8 ppm in

2021. Ontario decreased by 54% for the same period.

Hamilton Downtown's 2021 annual mean concentration of SO_2 was the highest recorded in Ontario that year. That was below the AAQC level of 4 ppm, indicating that Hamiltonians were generally protected against chronic effects.

However, the SO_2 level exceeded the AAQC standard in six of the 10 years between 2012-2021, most recently in 2019 (Appendix A Table 8.2). The one-hour SO_2 levels also assess protection against acute effects. In 2021, Hamilton Downtown exceeded the AAQC criteria of 40 ppb 169 times, the highest number for the reported monitoring stations in Ontario.[51]

Figure 8.4: Sulphur Dioxide (SO2) annual mean (ppm), Hamilton downtown monitoring station, 2012-2021

AAQC protective <4 ppm
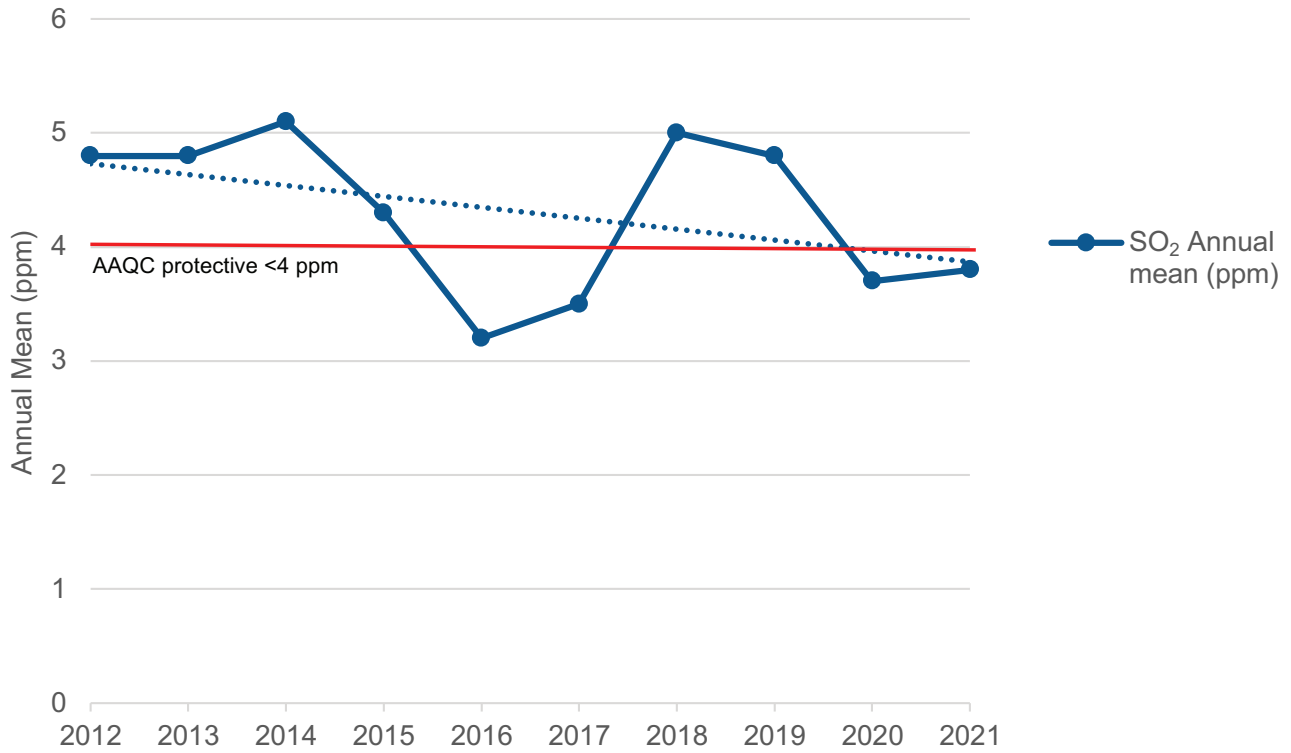
SO$_2$ Annual mean (ppm)

Source: Air Quality in Ontario 2021 Report, 10-year trend for sulphur dioxide (SO2) annual mean (ppm) Available from: www.ontario.ca/document/air-quality-ontario-2021-report/appendix#section-6

AIR QUALITY-RELATED ILLNESS AND DEATH

The Global Burden of Disease (GBD) Study is the largest systematic, data-driven project to quantify the loss of health from major diseases and risk factors such as air pollution.[54] It adds up the risk from pollutants – including ambient ozone and fine particulate matter – for health outcomes attributed to air pollution in Canada.

These outcomes include ischemic heart disease, stroke, lung cancer, chronic obstructive pulmonary disease (COPD), lower respiratory infections and type II diabetes. The estimates do not currently include the impact of air pollution on various mental or neurological health outcomes, such as dementia.

Using the GBD Study approach, air pollution was estimated to account for 55 deaths of Hamiltonians in 2018. That included approximately:

- 17 deaths due to ischemic heart disease
- 13 deaths due to COPD
- 11 deaths due to lung cancer
- 6 deaths to cerebrovascular disease
- 5 deaths to diabetes and kidney disease
- 3 deaths are from all other diseases combined

This total could be much higher, as Health Canada modelling indicated that approximately 378 premature deaths could be attributed to air pollution for Hamiltonians in 2016.[53] The 2018 estimate is lower than that from 2012 when 90 deaths of Hamiltonians were attributed to air pollution (Appendix A Table 8.3).[55]

Diseases that are linked to poor air quality are also among the five leading causes of premature deaths to Hamiltonians in 2021 (see Chapter 3: General Health, Table 3.3), including deaths due to ischemic heart disease (#1) lung cancer (#2) and COPD (#5).

Poor air quality can exacerbate symptoms of chronic disease, including COPD and asthma putting Hamiltonians living with chronic diseases at risk during poor air quality days.

The number of Hamiltonians of all ages living with asthma in 2020 was 80,416.[56] That's twice as many as the number of Hamiltonians aged 20 and older living with COPD in 2020 at 40,217. The prevalence rate for COPD, when age was taken into consideration, was higher for Hamiltonians (7,950 per 10,000 population) compared to Ontario (7,454 per 10,000 population).[57]

PHYSICAL HEAT

Hamilton's annual average outdoor temperature for all seasons is projected to increase from the baseline of 8.3°C (1976-2005) to 10.4°C (2021-2050) and then to 12.5°C (2051-2080).[58]

Heat Warning Days

Hamilton's Medical Officer of Health issues a heat warning when two or more consecutive day are expected with:

- daytime highs greater than or equal to 31°C and nighttime lows greater than or equal to 20°C, or
- it feels like 40°C or greater with the Humidex

In 2023, Hamilton had 11 heat warning days (Figure 8.5). The annual number of heat warning days increased overall from 2011-2023. The five-year average was 8.8 days from 2011-2015 and 14 days from 2019-2023.

Heat warning days peaked in 2020 at 24 days and were at their lowest in 2014 at three days (Appendix A Table 8.4).

The length of an average heatwave is expected to increase from 3.8 days to 8.4 days by 2080. The total annual number of days at or above 30°C is projected to increase from 16.1 days at baseline to 37.2 days by the 2050s and 63.3 days by the 2080s.[58]

Figure 8.5: Heat warning days, annual counts, City of Hamilton, 2011-2023
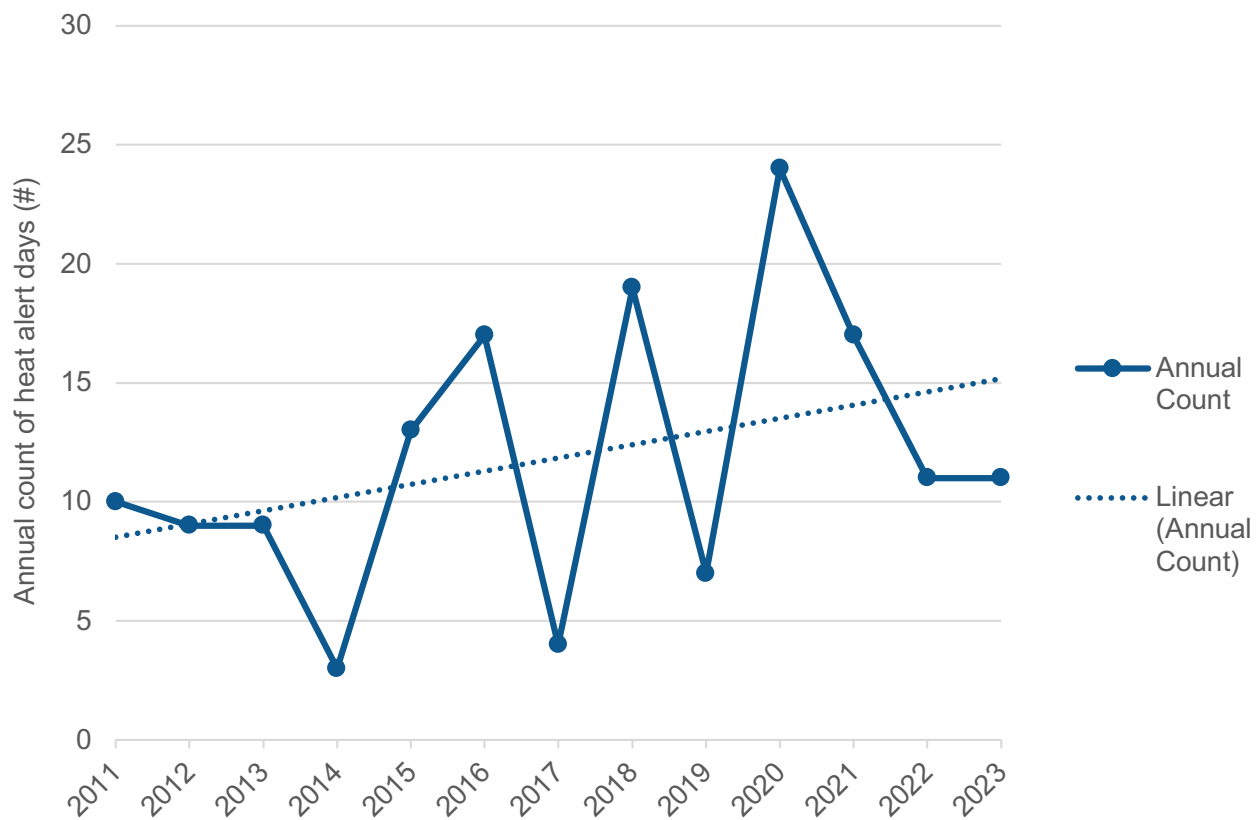
Source: City of Hamilton Public Health Services, Summary of Heat Warnings 2011 – present. Accessed October 25, 2023

EXTREME WEATHER: HEAT-RELATED ILLNESS

Over the 10-year period from 2012-2021 Hamilton recorded no deaths attributed to heat-related illness (there were two deaths in 2011)[59] and 28 heat-related hospitalizations. The peak number of hospitalizations was six in in 2020, a year when heat warnings also peaked at 24 days.[60]

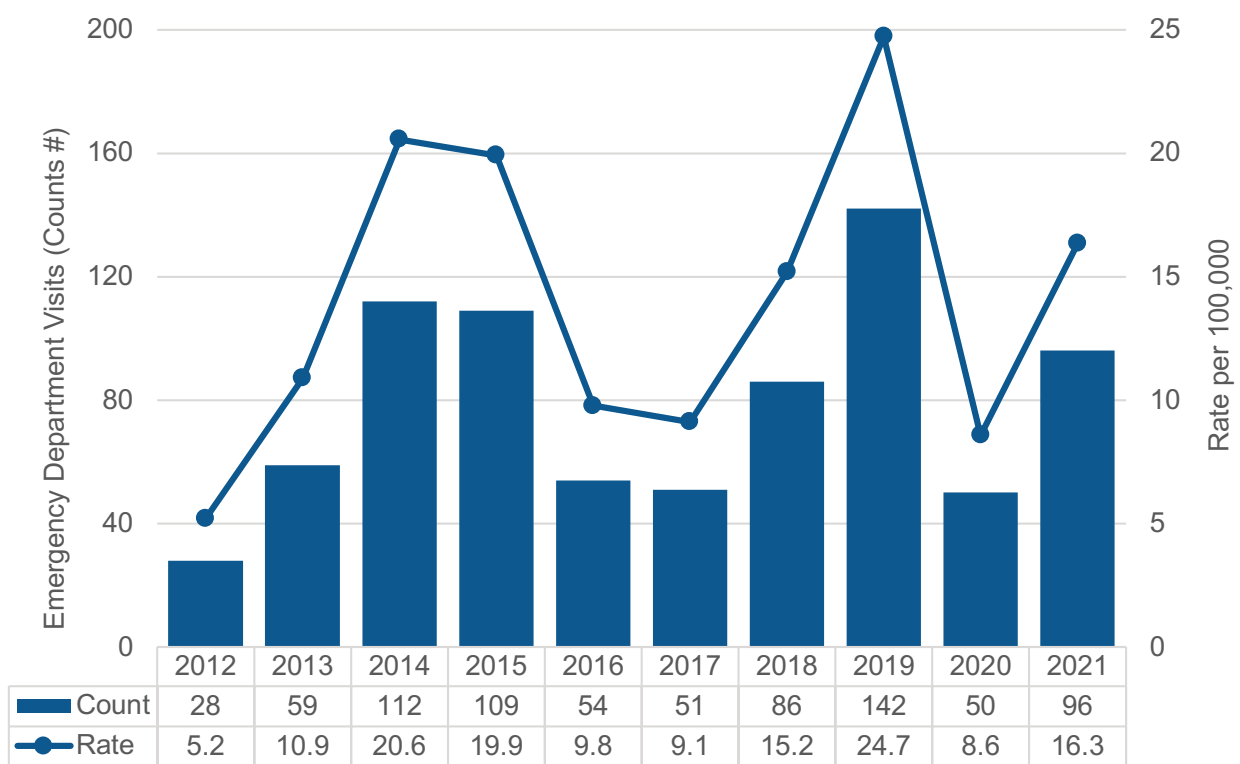Over the three-year period from 2019-2021, the average annual rate of emergency department visits for heat-related illness among Hamilton residents was 18.1 per 100,000 population, which was similar to the Ontario rate of 18.8 per 100,000 population.

Figure 8.6 illustrates trends over time of emergency department visits for heat-related illness among Hamiltonians. There were 96 such visits in 2021, the most recent year of data assessed, and 1,291 from 2012-2021. The peak number of visits was 204 in 2016 (coinciding with an observed increase in heat warning days); the lowest was 62 in 2014.[61]

Even when the number of heat warning days was up (19 days in 2018 and 24 days in 2020), Hamilton residents experienced fewer emergency department visits than in 2016.

Heat-related emergency department visits for Hamiltonians from 2017-2021 were not equally distributed (Figure 8.7). When assessing area-based inequality, higher rates of heat-related emergency department visits existed among

Figure 8.6: Heat-related emergency department visits, counts and rate, Hamiltonians, 2012-2021
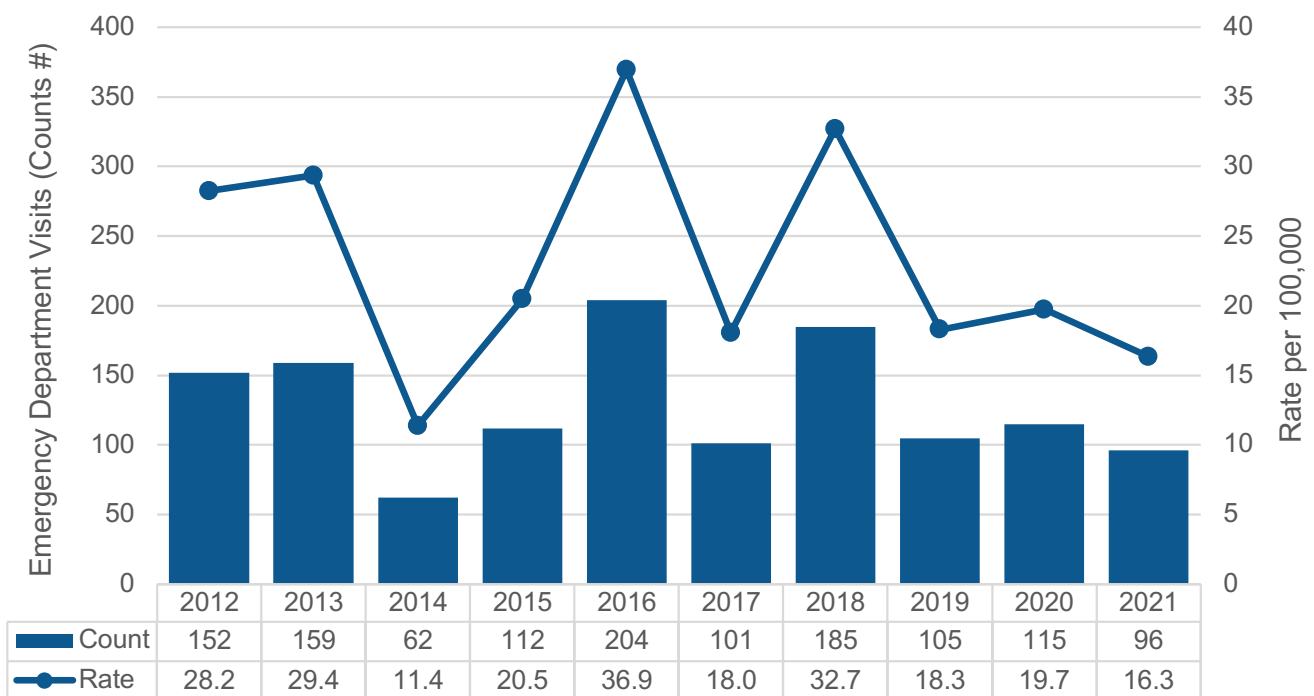
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Count	152	159	62	112	204	101	185	105	115	96
Rate	28.2	29.4	11.4	20.5	36.9	18.0	32.7	18.3	19.7	16.3

Sources: Ambulatory Emergency External Cause, Ontario Ministry of Health, IntelliHEALTH ONTARIO [Date Extracted 18 April 2022]; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [Data Effective 5 April 2023].

Notes:
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 8.7: Heat-related emergency department visits by area-based socioeconomic quintiles, average annual crude rate per 100,000 population, Hamilton residents, 2017-2021 combined

Low Income
- Least 1: 20.2
- 2: 24.9
- 3: 25.3
- 4: 38.8
- Most 5: 52.8

Low Education
- Least 1: 25.0
- 2: 25.1
- 3: 35.4
- 4: 27.4
- Most 5: 44.6

Racialized Population
- Least 1: 28.4
- 2: 31.7
- 3: 38.1
- 4: 28.7
- Most 5: 28.1

One Parent Families
- Least 1: 21.4
- 2: 28.2
- 3: 31.5
- 4: 37.3
- Most 5: 41.4

Housing Need
- Least 1: 21.0
- 2: 24.2
- 3: 26.7
- 4: 42.1
- Most 5: 48.0

Rate of health outcome per 100,000

Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Hamilton residents who lived in (Figure 8.7):

- areas with greatest percentage of households below the low-income cut-off after tax (more than double the rate seen in neighbourhoods with the lowest percentage of such households)
- areas with the greatest percentage of households that have a core housing need (more than double the rate of neighbourhoods with the lowest percentage of such households)
- areas with the greatest percentage of families with one-parent
- areas with the greatest percentage of individuals with no high school diploma or equivalent

Risks rise with both exposure and vulnerability.

An individual's exposure to extreme heat can be influenced by the environment (e.g., built environment, the presence or absence of beneficial conditions such as plant cover, water proximity and altitude).

Vulnerability to heat is influenced by the sensitivity or intensity with which heat waves are felt (e.g., population age, types of households, housing characteristics). In periods of heat, some areas also have fewer factors that could enhance an individual's ability to cope, such as access to shopping malls, other air-conditioned spaces and public cooling spaces.

Figure 8.8 identifies geographic areas in Hamilton with the highest potential risk due to extreme heat, and combines both risk of exposure and vulnerability.

Figure 8.8: Extreme heat potential risk areas (High Exposure Index and High Vulnerability Index), City of Hamilton, 2023
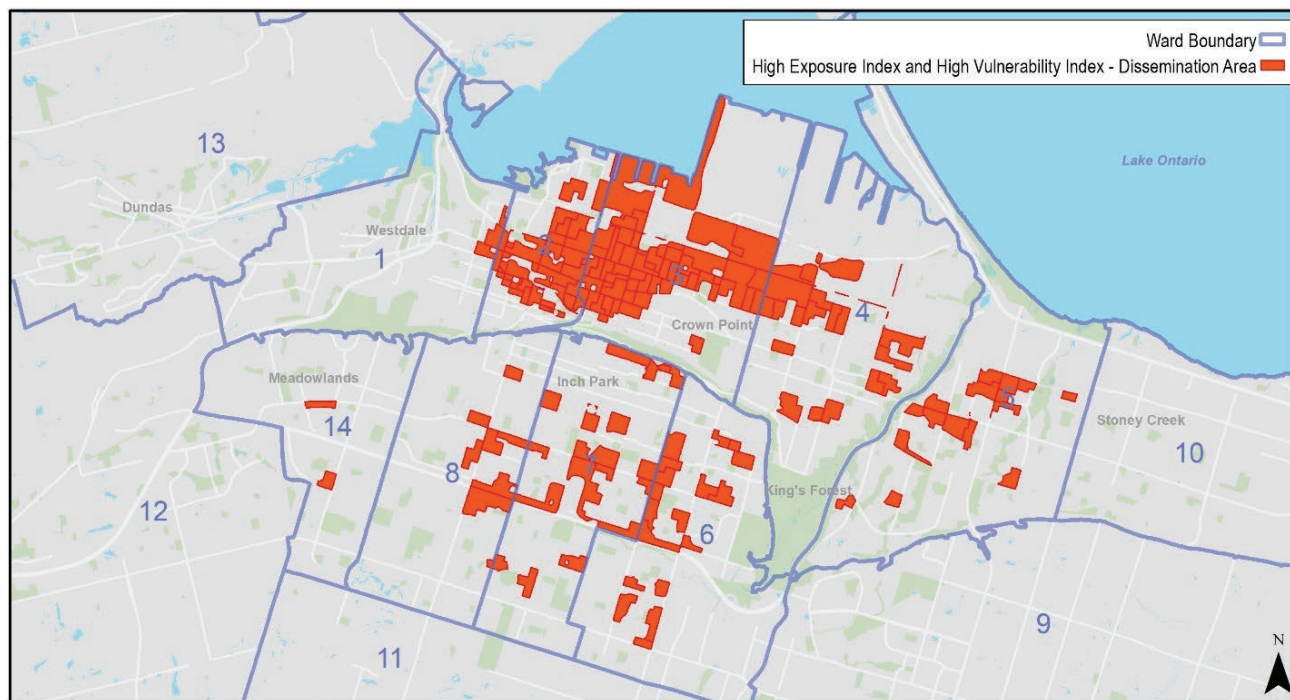
Source: Public Health Services, City of Hamilton, 2023, Adapted from: Department of Geography, Université Laval. (2023) Mapping the vulnerability and exposure to extreme heat waves of populations living in housing in Canadian Communities. Heatwaves.ffgg.ulaval.ca

PHYSICAL COLD

Cold Warning Days

Hamilton's Medical Officer of Health issues a cold warning when the temperature drops or is expected to drop below -15°C, or the temperature feels like -20°C with wind chill. In 2023 there were six cold warning days in Hamilton.

The annual number of cold warning days decreased from 2010-2023 with year-to-year fluctuations (Figure 8.9). The five-year averages were 31 days for 2011-2015 and 8.6 days for 2019-2023.

Cold warning days peaked in 2014 at 52 days and were at their lowest in 2020 at two days (Appendix A Table 8.4).

Figure 8.9: Cold warning days, annual counts, City of Hamilton, 2011-2023
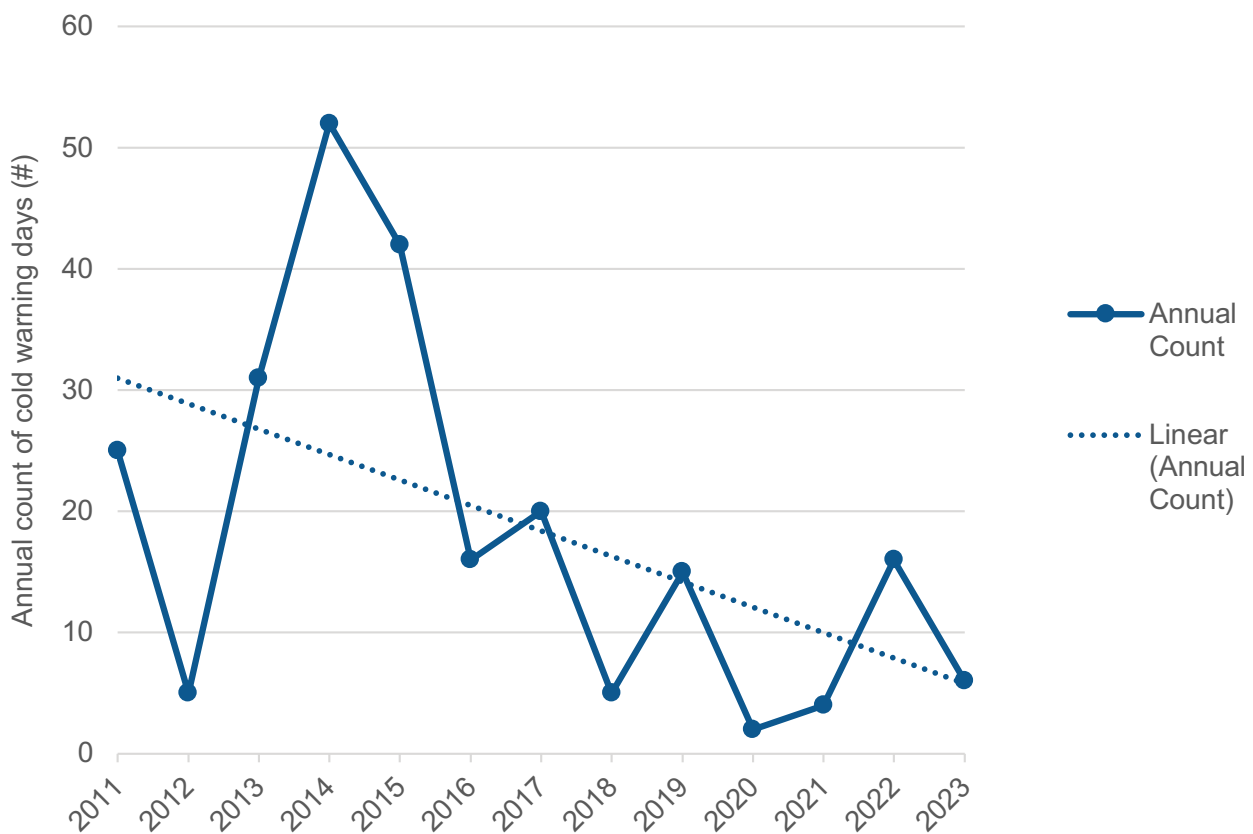
Source: City of Hamilton Public Health Services, Summary of Cold Warnings 2011 – present. Accessed January 22, 2024

EXTREME WEATHER: COLD-RELATED ILLNESS

Over the 10-year period from 2012-2021 there were 17 deaths among Hamilton residents attributed to cold-related illness, including two in 2021 (the most recent year where data is available).[59]

Figure 8.10 illustrates trends over time of emergency department visits for cold-related illness among residents. There were 96 such visits in 2021, for a rate of 16.3 per 100,000 population, and 787 from 2012-2021. The peak number of visits was 142 in 2019; the lowest was 28 in 2012.[61]

The greatest peak in the number of cold warning days, 52 in 2014, coincided with a peak in emergency department visits that year. However, the greatest peak for cold-related emergency department visits in the 10-year period from 2012 to 2021, occurred in 2019, and that coincided with only a small peak in cold warning days at 15 days.

Figure 8.10: Cold-related emergency department visits counts and rate, Hamiltonians, 2012-2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Count	28	59	112	109	54	51	86	142	50	96
Rate	5.2	10.9	20.6	19.9	9.8	9.1	15.2	24.7	8.6	16.3

Data Sources: Ambulatory Emergency External Cause, Ontario Ministry of Health, IntelliHEALTH ONTARIO [Date Extracted 18 April 2022]; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [Data Effective 5 April 2023].

Notes:
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 8.11: Cold-related emergency department visits by area-based socioeconomic quintiles, average annual crude rate per 100,000 population, Hamilton residents, 2017-2021 combined

Low Income
- Least 1: 9.5
- 2: 12.3
- 3: 12.0
- 4: 16.0
- Most 5: 29.2

Low Education
- Least 1: 13.7
- 2: 10.5
- 3: 16.3
- 4: 16.8
- Most 5: 19.3

Racialized Population
- Least 1: 16.0
- 2: 16.6
- 3: 18.6
- 4: 10.2
- Most 5: 14.8

One Parent Families
- Least 1: 10.1
- 2: 12.8
- 3: 15.1
- 4: 20.2
- Most 5: 19.8

Housing Need
- Least 1: 10.7
- 2: 9.7
- 3: 13.2
- 4: 15.9
- Most 5: 29.3

Rate of health outcome per 100,000

Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
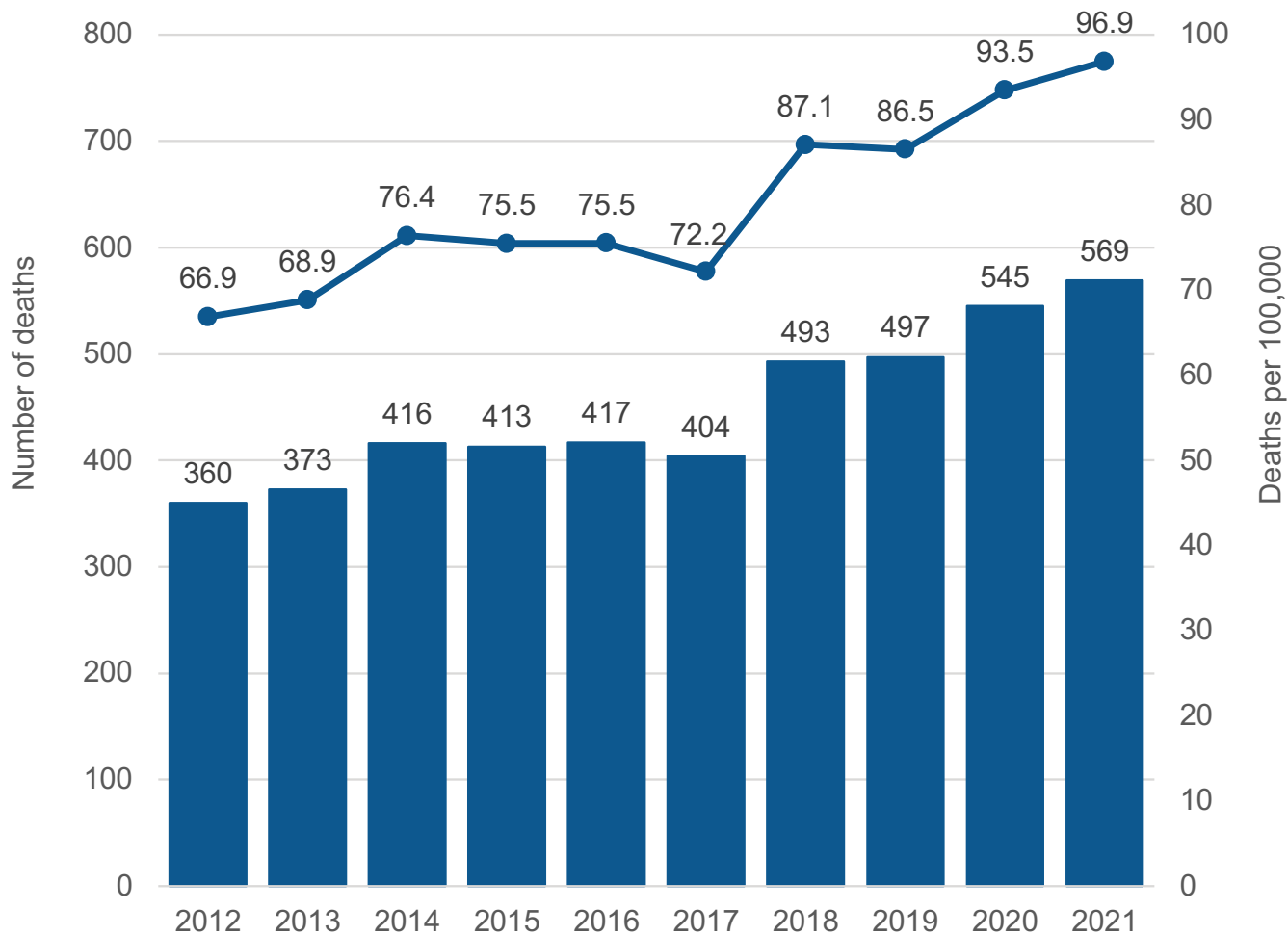- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Cold-related emergency department visits for Hamiltonians from 2017-2021 were not equally distributed by geographic area. When assessing area-based inequality, higher rates of cold-related emergency department visits existed among Hamilton residents who lived in (Figure 8.11):

- areas with greatest percentage of households below the low-income cut-off after tax (three times as high as the rate seen in neighbourhoods with the lowest percentage of such households)
- areas with the greatest percentage of households that have a core housing need (almost twice as high as the rate seen in neighbourhoods with the lowest percentage of such households)
- areas with the greatest percentage of families with one-parent
- areas with the greatest percentage of individuals with no high school diploma or equivalent

RADON

Radon is a colourless, odourless gas produced by the decay of natural uranium in the ground. It's quickly diluted outdoors but can accumulate to harmful levels indoors and can build up in lower levels of buildings. As radon is found naturally in the environment, most buildings have some level of radon. Radon gas is drawn into buildings when the air pressure inside the house is lower than in the ground beneath.

Indoors, radon gas can accumulate to harmful levels. People can inhale radioactive particles, and damage cells that can become cancerous. Radon, along with fine particulate matter ($PM_{2.5}$) and solar ultraviolet radiation, contribute over 90% of the environmental burden of cancer in Ontario according to Cancer Care Ontario and Public Health Ontario.[62]

While there is no safe level of radon, Health Canada's current guideline recommends remedial action to reduce levels greater than 200 Bq/m³. The Hamilton Household Radon Survey (2019-2020) found that 14.3% of participating homes had radon levels exceeding that guideline, three times greater than the Ontario provincial percentage of 4.6%.[63]

Higher levels may be due to the soil and rocks below a building. Drains, cracks in the foundation, gaps around pipes and other openings provide points of entry. Energy-efficient methods that make a building more airtight (e.g., sealing around windows and doors) also reduce passive ventilation. Without employing reduction strategies, that can lead to higher indoor radon concentrations .[64]

MENTAL HEALTH

HIGHLIGHTS

- Self-rated mental health is good or excellent for two-thirds of residents aged 12 and older, but is much higher for those in the highest income groups compared to the lowest income group.

- Hospitalizations for mood and anxiety disorders have decreased in recent years.

- Hospitalizations for schizophrenia, substance use related disorders and other adult personality disorders have increased over the past decade.

- Outpatient visits for mental health and substance use increased during the COVID-19 pandemic.

- While suicide deaths remained unchanged from 2018-2022, emergency department visits for self-harm have increased. Those visits are much higher for female youth and other groups such as lower income and racialized.

- The rate of deaths due to dementia and Alzheimer's disease increased among Hamilton residents over the past decade.

MENTAL HEALTH

SELF-RATED MENTAL HEALTH

On average, over two-thirds of Hamilton's residents aged 12 and older rated their mental health as very good or excellent (68.1%) for the combined years from 2015 to 2020 (Figure 9.1). This is similar to the Ontario average for the same time-period (68.5%).

Positive self-rated mental health of Hamiltonians was similar for 2015-2016 (70.6%), 2017-2018 (69.4%), and 2019-2020 (64.4%).

There were few differences across age groups, and a similar percent of females (67.9%) and males (68.4%) aged 12 and older rated their mental health as very good or excellent in Hamilton. One notable difference was Hamiltonians in the highest household income group rated their mental health much higher (75.6%) compared to Hamiltonians in the lowest income group (57.0%).

Figure 9.1: Self-rated mental health as very good-to-excellent by different groups of Hamilton residents age 12+, 2015-2020 combined
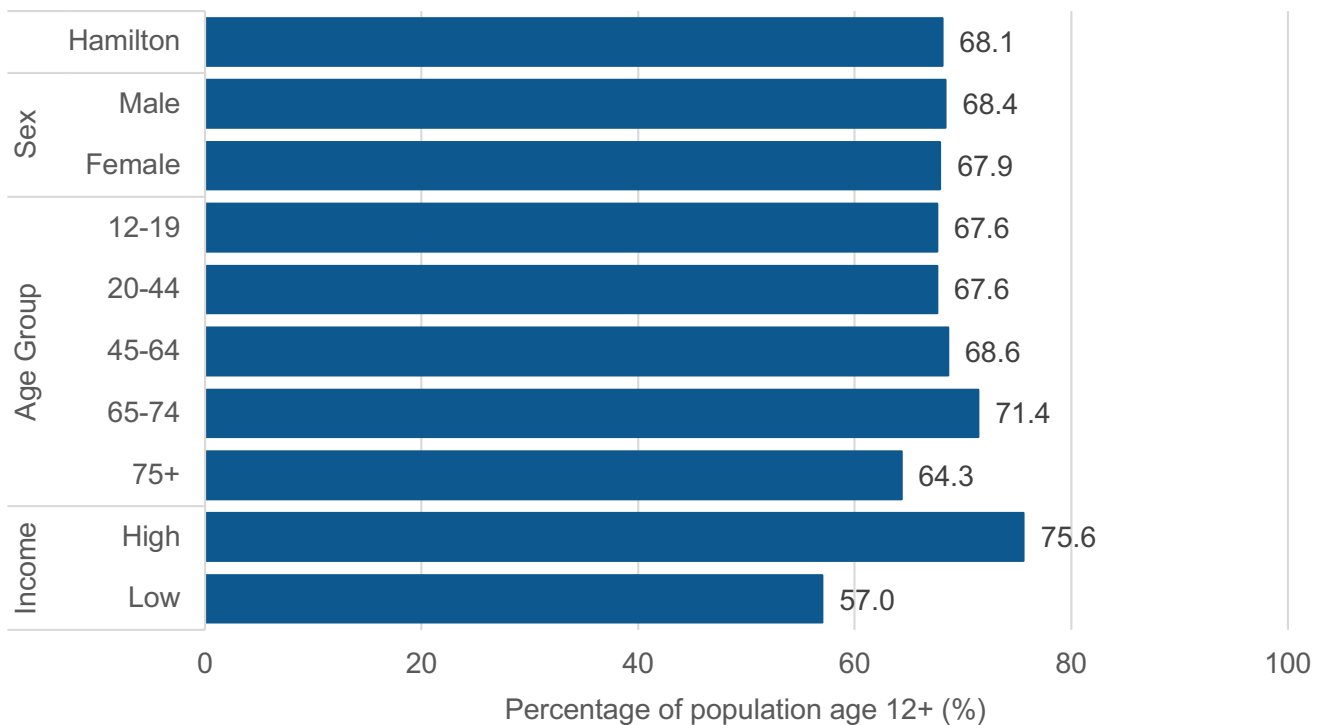
Group		Percentage
	Hamilton	68.1
Sex	Male	68.4
	Female	67.9
Age Group	12-19	67.6
	20-44	67.6
	45-64	68.6
	65-74	71.4
	75+	64.3
Income	High	75.6
	Low	57.0

Percentage of population age 12+ (%)

Source: Canadian Community Health Survey [2015-2016 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

MENTAL ILLNESS

This section assessed hospitalizations across five groups of mental illnesses (Figure 9.2):

- mood disorders (mood/affective disorders)
- schizophrenia (schizophrenia, delusional and non-organic psychotic disorders)
- substance-related disorders
- anxiety disorders
- other adult personality disorders (selected disorders of adult personality and behaviour)

For 2021, there were 2,955 hospitalizations for these conditions among Hamilton's residents. On average, eight Hamilton residents were hospitalized each day from 2019 to 2021 for one of those five groups of mental illness.

Compared to Ontario as a whole, Hamiltonians have a:

- lower rate of hospitalizations for mood disorders, substance-related disorders and anxiety disorders
- similar hospitalization rate for schizophrenia
- higher hospitalization rate for other adult personality disorders

Hospitalization rates increased over 2012-2021 for schizophrenia (37.7% increase), substance use-related disorders (46.1% increase), and other adult personality disorders (77.5% increase) (Figure 9.3).

During 2020-2021, the rate of hospitalizations decreased for mental health and substance use-related disorders among Hamilton's

---

Figure 9.2: Mental health and substance use related disorders, average annualized crude hospitalization rate, Hamilton and Ontario residents, 2019-2021

■ City of Hamilton   ■ Ontario

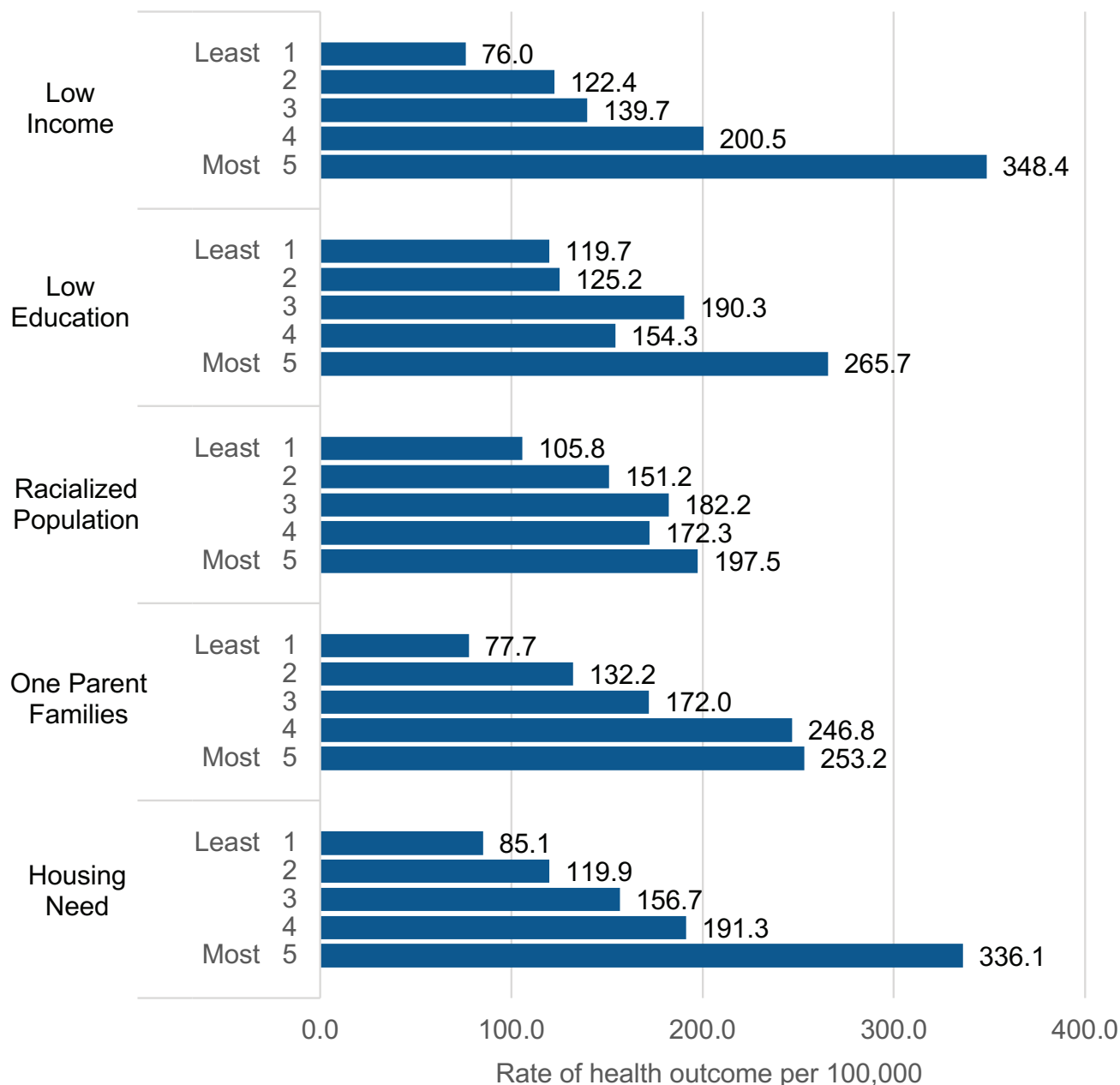| Disorder	City of Hamilton	Ontario
Mood disorders	166.9	175.4
Schizophrenia	142.4	139.7
Substance related disorders	108.6	116.7
Anxiety disorders	48.5	62.9
Other adult personality disorders	41.8	33.4

Rate per 100,000
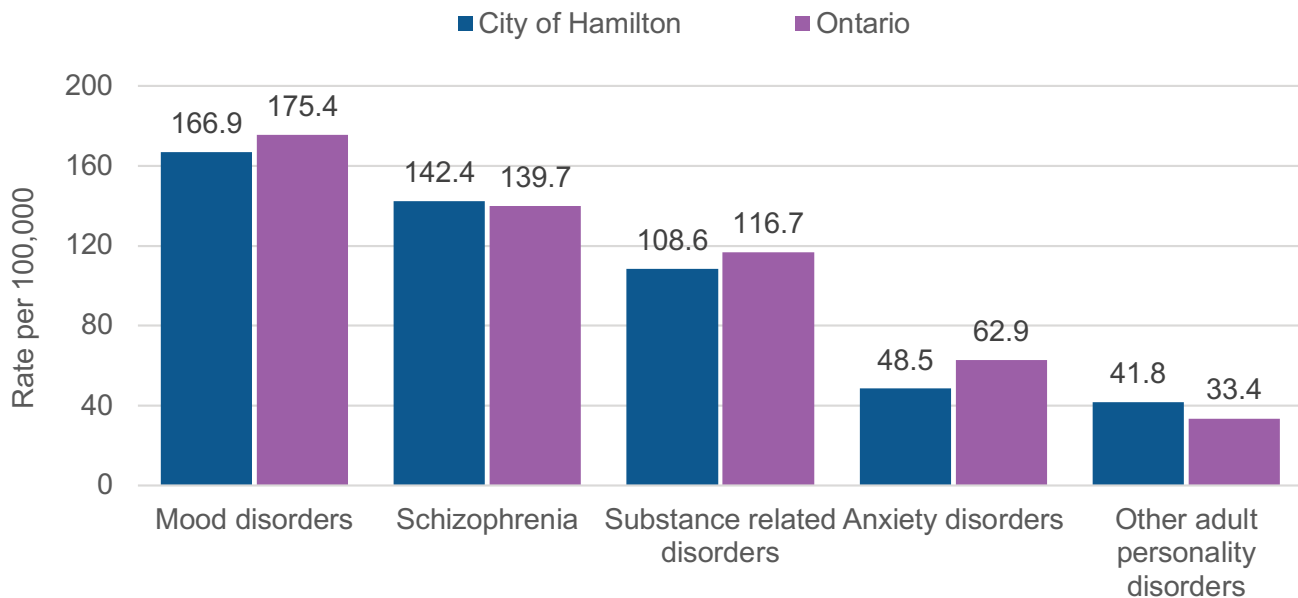
Sources: Inpatient Discharges [2019-2021], IntelliHEALTH ONTARIO, Ontario Ministry of Health; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 9.3: Trends in mental health and substance related disorders, crude hospitalization rate, Hamilton residents, 2012-2021
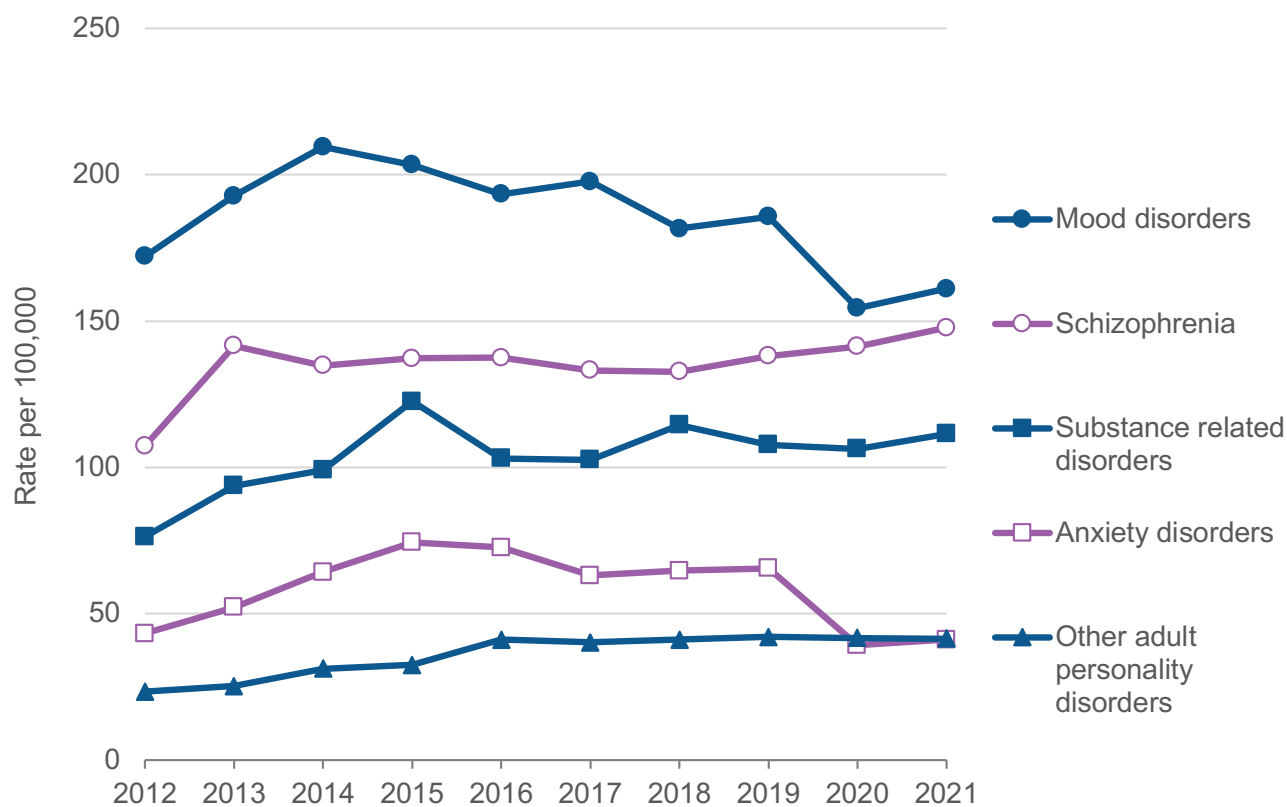
Sources: Inpatient Discharges [2012-2021], IntelliHEALTH ONTARIO, Ontario Ministry of Health; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].
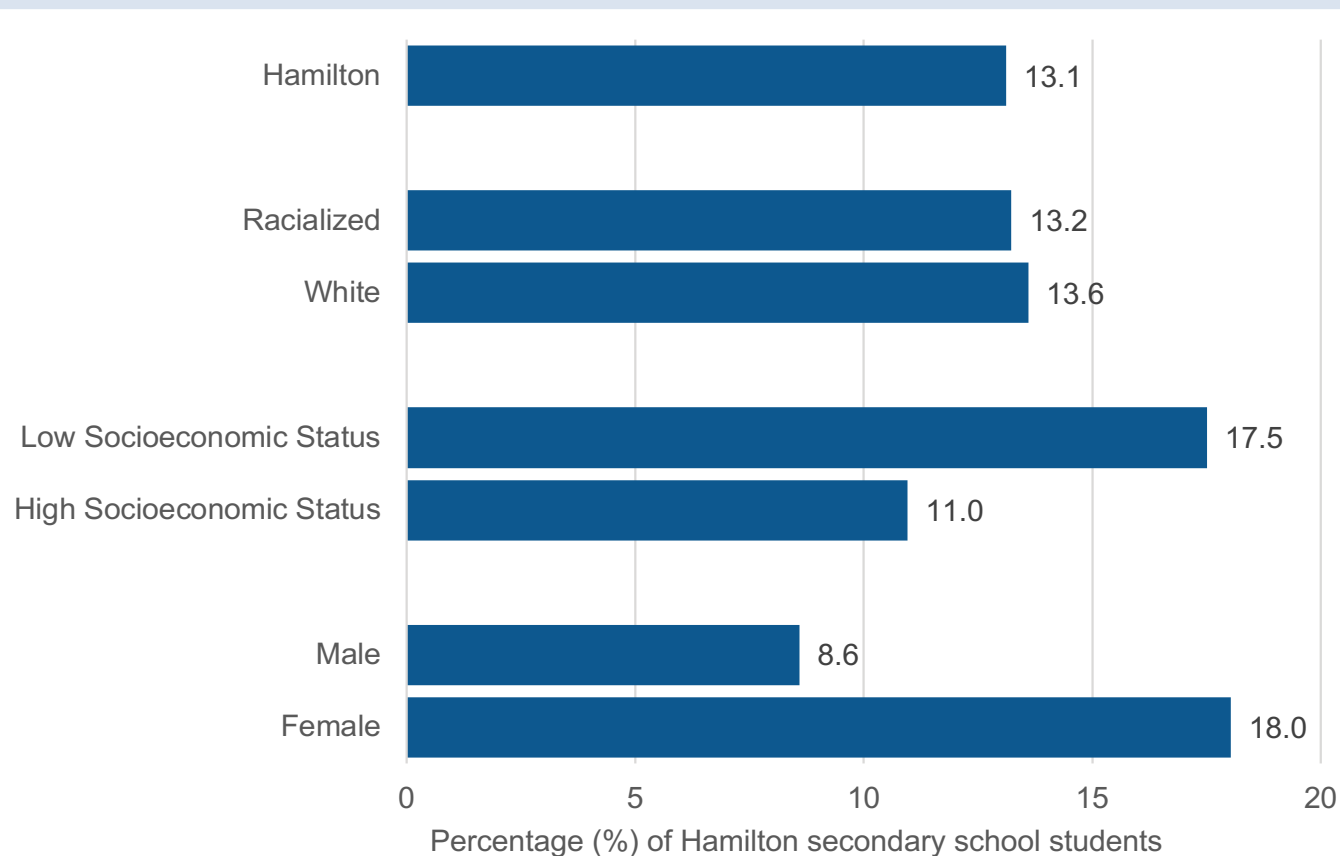
Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

residents. Per 100,000 population, the rate was 451.5 hospitalizations, compared to 495.5 in the pre-pandemic period of 2017-2019. This drop was primarily related to a decrease in hospitalizations for mood/affective disorders (declining since 2015) and anxiety disorders.

The rate of hospitalizations for all other mental health conditions remained stable or increased during 2012-2021.

Another mental health indicator that was assessed was deaths related to dementia and Alzheimer's disease. The number and rate of deaths for Hamiltonians due to dementia and Alzheimer's disease are shown in Figure 9.4. These figures increased between 2012 and 2021, but that doesn't account for changes in the age structure of the population over this period.

Figure 9.4: Deaths due to dementia and Alzheimer's disease, Hamilton residents, 2012-2021

Source: Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Many people seek and receive care for mental health concerns outside hospitals as outpatients. These data only represent individuals who seek and can access care. Many barriers may prevent someone from accessing care, including stigmatization and discrimination.

Outpatient mental health and substance use visits increased during the pandemic period for Hamilton's residents. There were 5.8 visits per 100 population per month from 2020-2021, compared to 5.1 visits in the pre-pandemic baseline period of 2017-2019.

Outpatient service visits for mental health and substance use varied among different groups. Rates of outpatient visits were greater among Hamilton residents from areas with the most low-income households, and with more racialized and newcomer populations (Table 9.1).

This inequality persisted during the pandemic, throughout which each of the groups experienced increasing rates.

Table 9.1: Comparison of mental health and substance use outpatient visits by different groups, Hamilton residents, pre-pandemic (2017-19) and pandemic periods (2020-21)

Grouping	Defined Groups	Pre-Pandemic (2017-2019): visits per 100 population per month	Pandemic (2020-2021): visits per 100 population per month
Income	Population residing in the lowest income quintile areas	7.2	8.0
	Population residing in the highest income quintile areas	4.0	4.5
Racialized & Newcomer	Population residing in the areas with the most racialized and newcomer populations	5.3	6.1
	Population residing in the areas with the least racialized and newcomer populations	4.8	5.6

Source: Institute for Clinical Evaluative Sciences, Project Number 2022 0950 133 000 [21 September 2022].

Notes:
- Outpatient visits include Hamilton residents who visit any physician specialty (e.g., family physician, psychiatrist, pediatrician) in Ontario for outpatient service for either a mental health or substance use.
- The racialized and newcomer population index is defined according to the Ontario Marginalization Index and these populations are combined into one domain of marginalization related to racism and discrimination; however, this does not allow for more granular analysis of inequities within unique racial or newcomer populations.
- An area-based approach was used to determine inequalities between equity populations

SELF-HARM AND SUICIDE

Self-harm encompasses intentional self-inflicted injury or poisoning, which includes attempted and completed suicide.

On average, Hamilton residents made 1,028 emergency department (ED) visits each year for self-harm from 2019-2021(176.8 ED visits per 100,000 population). This was higher than the Ontario average (125.6 ED visits per 100,000 population).

Self-harm ED visits for Hamilton's residents increased 55.4% between 2012 and 2021 – up to 172.3 ED visits per 100,000 population from 110.9 visits (Figure 9.5).

ED visits for self-harm vary among different groups of Hamilton residents. Females aged 10-19 years had the highest rate of ED visits for self-harm (784.9 ED visits per 100,000 population). In general, rates of self-harm decreased among females as age increased (Figure 9.6).

Figure 9.5: Self-harm emergency department visits (number and crude rate per 100,000 population), Hamilton residents, 2012-2021
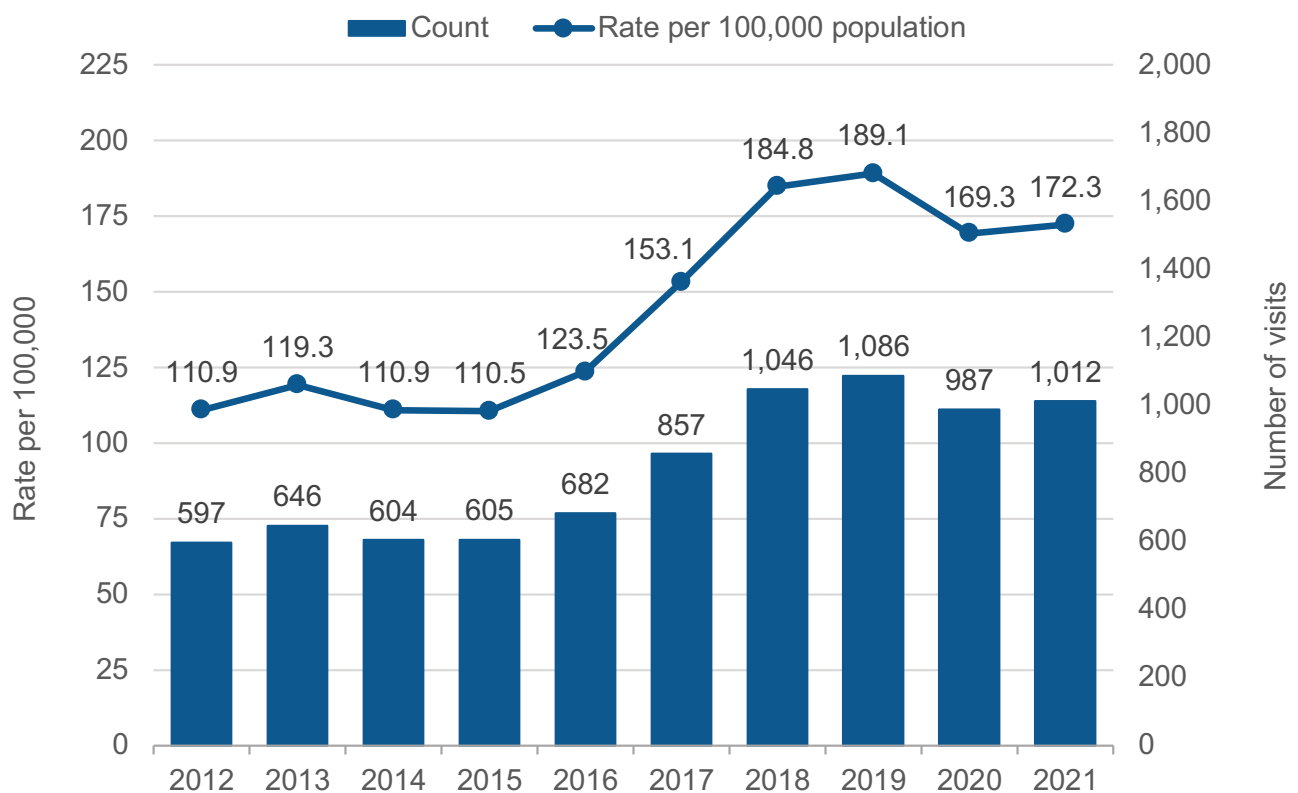
Sources: Ambulatory Emergency External Cause [2012-2021], IntelliHEALTH ONTARIO, Ontario Ministry of Health; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 9.6: Self-harm emergency department visits by age group and sex, group-specific rates per 100,000 population, Hamilton residents, 2021
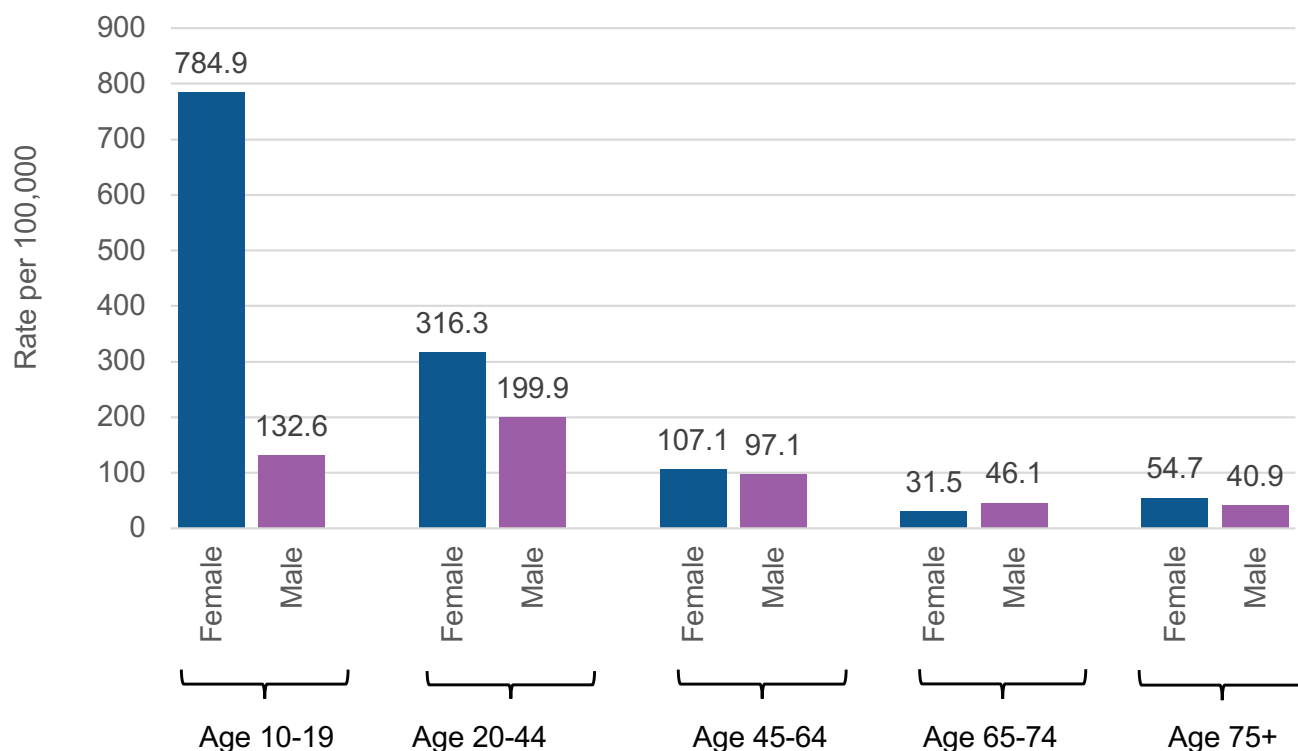
Sources: Ambulatory Emergency External Cause [2021], IntelliHEALTH ONTARIO, Ontario Ministry of Health; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

When assessing area-based inequality (Figure 9.7), higher rates of ED visits for self-harm existed among Hamilton residents who lived in:

- areas with the greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent
- areas with the greatest percentage of individuals who self-identified as a race other than white or Indigenous
- areas with a greater percentage of one-parent families
- areas with the greatest percentage of households that have a core housing need

Figure 9.7: Self-harm emergency department visits by area-based socioeconomic quintiles, crude rate per 100,000 population, Hamilton residents, 2017-2021 combined

Rate of health outcome per 100,000

Low Income
- Least 1: 76.0
- 2: 122.4
- 3: 139.7
- 4: 200.5
- Most 5: 348.4

Low Education
- Least 1: 119.7
- 2: 125.2
- 3: 190.3
- 4: 154.3
- Most 5: 265.7

Racialized Population
- Least 1: 105.8
- 2: 151.2
- 3: 182.2
- 4: 172.3
- Most 5: 197.5

One Parent Families
- Least 1: 77.7
- 2: 132.2
- 3: 172.0
- 4: 246.8
- Most 5: 253.2

Housing Need
- Least 1: 85.1
- 2: 119.9
- 3: 156.7
- 4: 191.3
- Most 5: 336.1

Sources: Ambulatory Emergency External Cause [2017-2021], IntelliHEALTH ONTARIO, Ontario Ministry of Health; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Among grade 9-12 students in Hamilton, 1 in 8 reported that they seriously contemplated attempting suicide in the past year (Figure 9.8). Students identifying as female and those from low socioeconomic status were more likely to contemplate a suicide attempt in the past year.

On average there were 62 suicide deaths each year for Hamilton's residents from 2018-2022, similar to Ontario's rate. The rate of suicide deaths for Hamilton's residents remained relatively stable between 2015 to 2022 (Figure 9.9).

Figure 9.8: Contemplation of attempting suicide in the past year, percentage of Hamilton secondary school students (grades 9-12), 2019

Category	Percentage
Hamilton	13.1
Racialized	13.2
White	13.6
Low Socioeconomic Status	17.5
High Socioeconomic Status	11.0
Male	8.6
Female	18.0

Percentage (%) of Hamilton secondary school students

Source: Ontario Student Drug Use and Health Survey, 2019.

Note: Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.

Figure 9.9: Suicide deaths, number and crude rate per 100,000 population of suicide deaths, Hamilton residents, 2015-2022
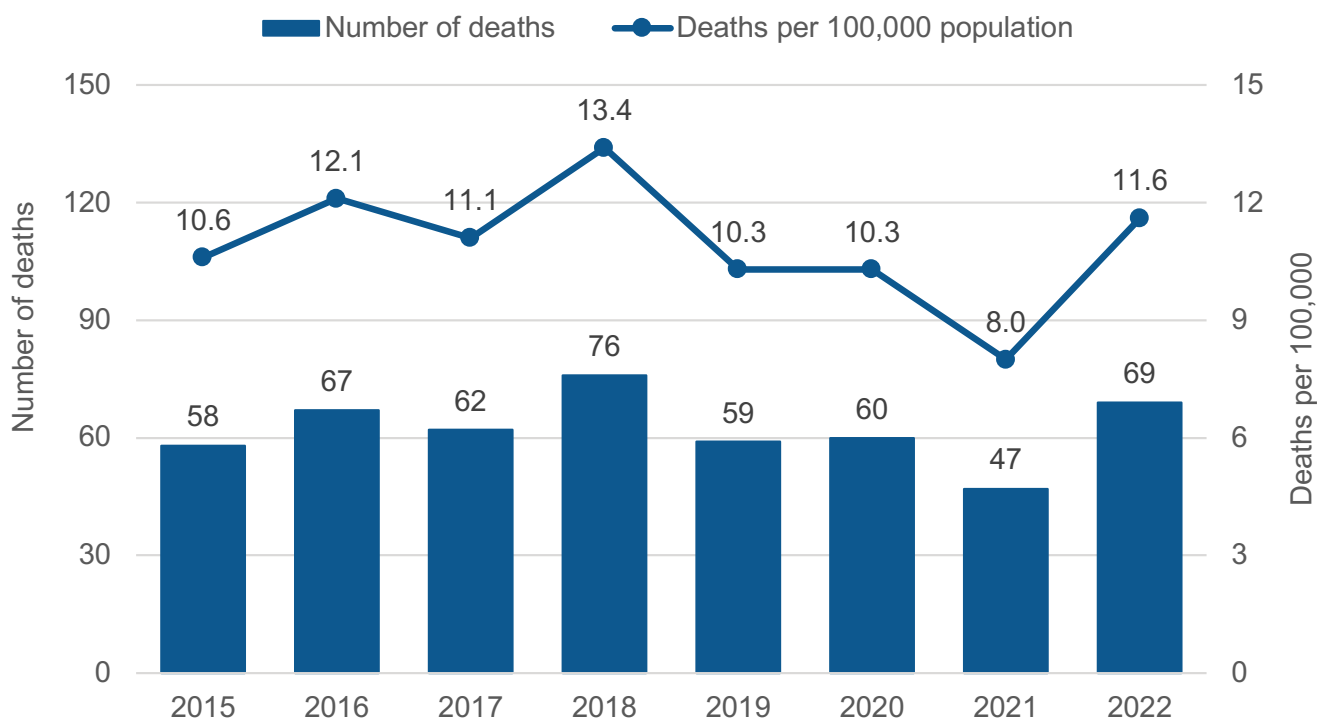
Sources: Office of the Chief Coroner of Ontario [April 2023]; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Suicide deaths vary among different groups of Hamilton residents (Figure 9.10). Compared to Hamilton's overall rate of suicide deaths for 2012-2021 (10.2 deaths per 100,000 population), there were higher rates among:

- areas with greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent
- areas with the greatest percentage of families with one-parent
- areas with the greatest percentage of households with a core housing need

Figure 9.10: Suicide deaths by area-based socioeconomic quintiles, crude rate per 100,000 population, Hamilton residents, 2009-2018 combined

Category	Quintile	Rate
Low Income	Least 1	6.5
	2	8.1
	3	9.1
	4	11.5
	Most 5	18.5
Low Education	Least 1	9.5
	2	8.6
	3	10.5
	4	9.6
	Most 5	13.5
Racialized Population	Least 1	9.0
	2	11.3
	3	11.5
	4	9.7
	Most 5	9.8
One Parent Families	Least 1	6.1
	2	10.4
	3	9.6
	4	13.7
	Most 5	13.3
Housing Need	Least 1	6.1
	2	8.5
	3	10.6
	4	10.8
	Most 5	18.1

Rate of health outcome per 100,000
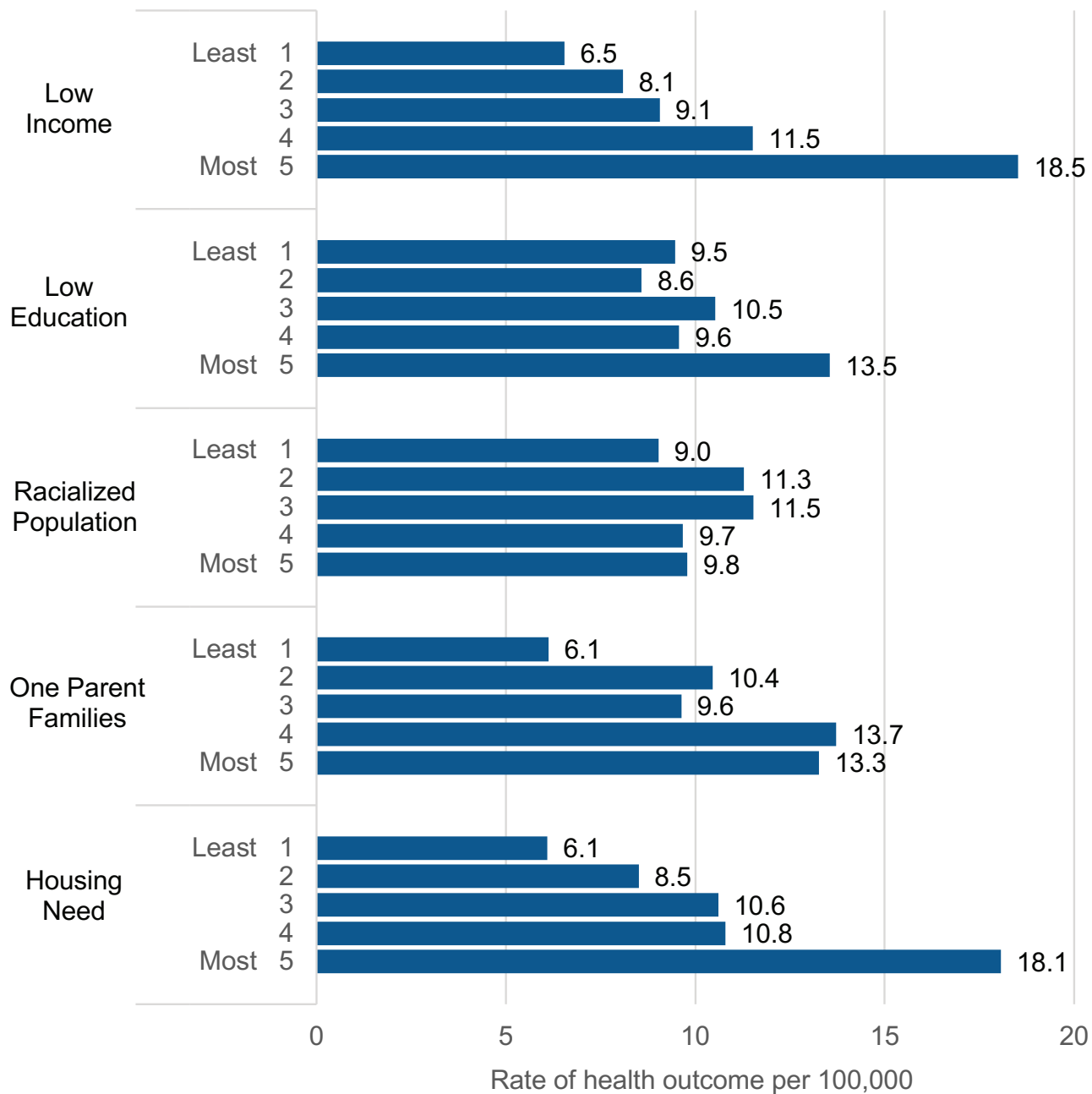
Sources: Ontario Mortality Data [2012-2021], IntelliHEALTH ONTARIO, Ontario Ministry of Health; Statistics Canada, Table 17-10-0142-01 Population Estimates by Census Division [5 April 2023].

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

LIFE STRESS

More than 1 in 5 Hamilton residents aged 12 and older indicated that most days are quite a bit or extremely stressful in the 12 months prior to the survey (22.9%). This was for 2015 to 2020 on average (Figure 9.11). This percentage was similar to Ontario overall for the same time-period (21.5%). There was no difference over time from 2015-16 (22.0%) through 2017-18 (24.6%) to 2019-20 (22.2%).

The highest rates of life stress were reported among those aged 20-44 (25.1%) and 45-64 (28.7%). There were no further differences among socioeconomic groupings of Hamilton residents.

Figure 9.11: Life stress by different groups, percent self-rated that most days are quite a bit or extremely stressful, Hamilton residents aged 12+, 2015-2020 combined
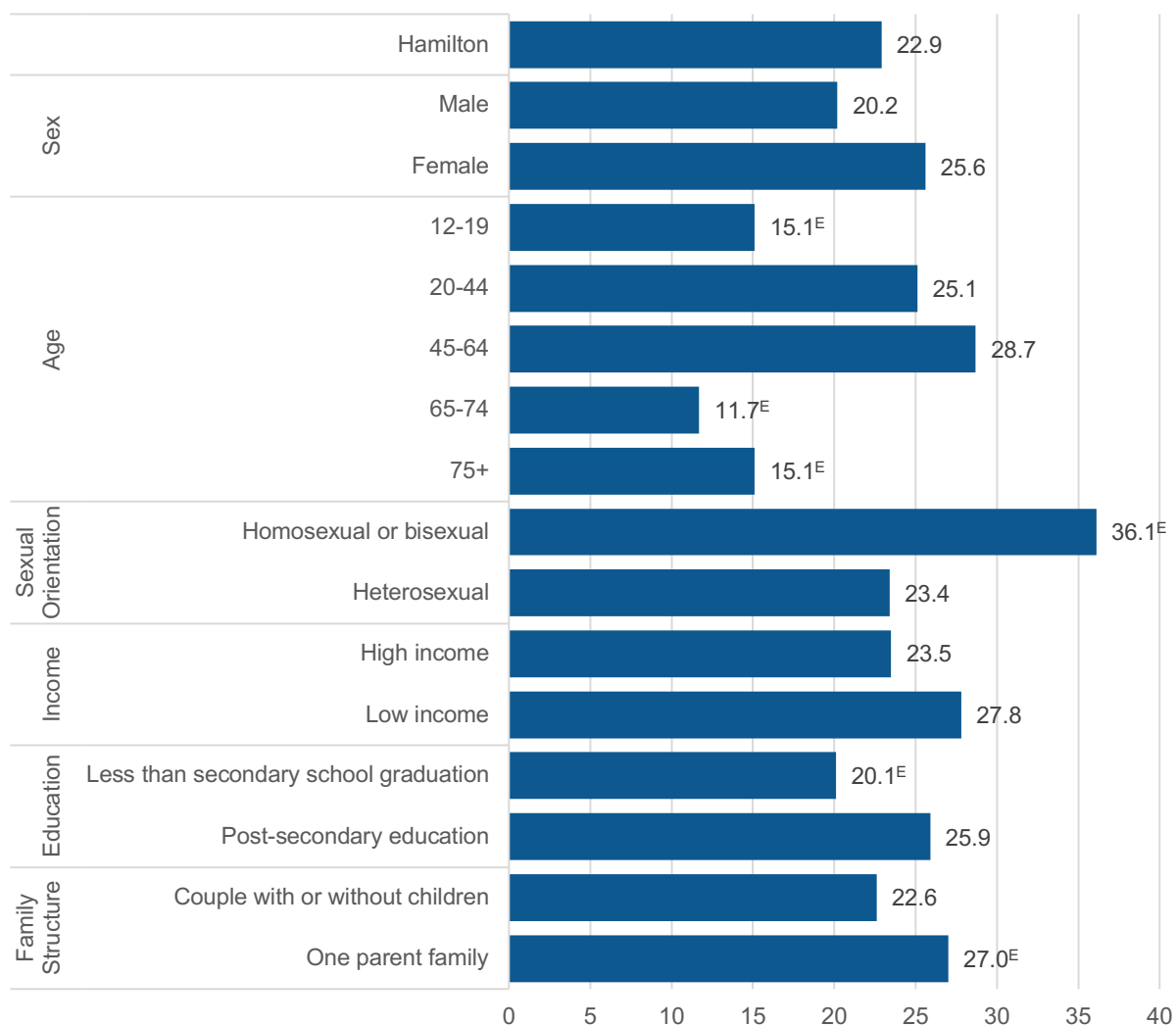
Category	Group	Value
	Hamilton	22.9
Sex	Male	20.2
	Female	25.6
Age	12-19	15.1^E
	20-44	25.1
	45-64	28.7
	65-74	11.7^E
	75+	15.1^E
Sexual Orientation	Homosexual or bisexual	36.1^E
	Heterosexual	23.4
Income	High income	23.5
	Low income	27.8
Education	Less than secondary school graduation	20.1^E
	Post-secondary education	25.9
Family Structure	Couple with or without children	22.6
	One parent family	27.0^E

Source: Canadian Community Health Survey [2015-2016 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health.

Notes:
- E – interpret estimate with caution due to high variability in responses.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

SUBSTANCE USE

HIGHLIGHTS

- Over 1,000 deaths are caused each year by tobacco (783), alcohol (208), and opioids (168) among Hamilton residents.

- Nearly 1 in 6 Hamilton adults smoke tobacco. Rates continue to decrease and fewer youth initiate smoking each year. But this trend is at risk of reversing or slowing with one-third of students using vapes or e-cigarettes in secondary schools.

- Over 1 in 3 Hamilton residents had three or more alcoholic drinks in the past week. This rate has increased, while the percentage who report no alcohol consumption in the past week is decreasing.

- The rate of emergency department visits for cannabis-related harms has doubled over the decade of 2012-2021 for Hamilton residents.

- Opioid-related deaths have increased substantially in Hamilton and are greater than the Ontario average. Males aged 25-64, people identified as homeless, and people identified racially as Black or white have a greater risk of death from opioids.

SUBSTANCE USE

UNINTENTIONAL POISONING

Unintentional poisoning is a broad categorization that includes any harm from swallowing, inhaling, absorbing or injecting any substance (e.g., medicines, drugs, cleaning chemicals, alcohol, carbon monoxide).

Hamilton's rate of deaths due to unintentional poisoning increased by 300% between 2012 and 2021. The death rate was greater for Hamilton residents (22.1 deaths per 100,000) when compared to the Ontario average (15.8 deaths per 100,000).

The primary driver of unintentional poisoning deaths is opioid overdoses. This has emerged as a major population health burden and leading cause of preventable deaths, particularly for younger adults. Opioid-related deaths increased by over 400% in Hamilton since 2005, and are consistently greater than the provincial rate. See more on opioids later in this chapter.

From 2012 to 2021, there were 750 deaths due to unintentional poisoning among Hamilton residents. A specific cause was noted in 64% of cases, and the top ones were:

- narcotics and psychodysleptics/hallucinogens (412 deaths)
- specified non-narcotic/hallucinogenic drugs (35 deaths)
- alcohol (28 deaths)

Similarly, Hamilton's rate of ED visits for unintentional poisoning doubled between 2012 and 2021, from 156.2 per 100,00 population to 312.9 (Figure 10.1). For 2019-2021, this rate was greater for Hamilton residents (274.7 visits per 100,000) when compared to the Ontario average (199.6 visits per 100,000).

Figure 10.1: Unintentional poisoning emergency department visits and deaths, Hamilton residents, 2012-2021
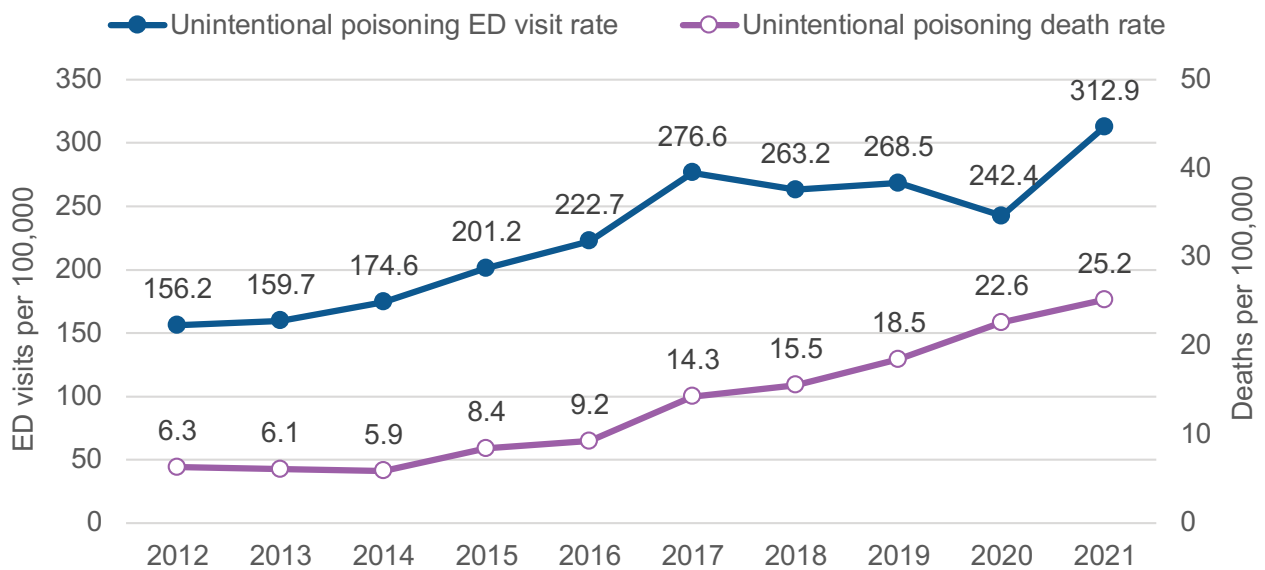
Sources: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO; Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

TOBACCO

One in six (16.7%) Hamilton adults (age 20+) currently smoke tobacco. When age is taken into consideration, the rate for Hamilton residents is similar to Ontario (Figure 10.2). Current tobacco smoking rates declined in Hamilton and provincially between 2015-16 and 2019-20.

Looking at different groups (Figure 10.3), Hamilton residents were more likely to be a current tobacco smoker if they identified as lesbian, gay or bisexual, were in one-parent families, or had not completed secondary school. Hamilton seniors (age 65+) were less likely to currently smoke tobacco.

In an average year in Hamilton, tobacco smoking causes an estimated 783 deaths, 3,113 hospitalizations and 4,972 emergency department visits (Table 10.1).[65] Among Hamilton residents age 35+, 1 in 6 deaths are attributed to tobacco smoking.

Over 9 in 10 Hamilton youth (age 12-19) report that they have never smoked tobacco (Figure 10.4), similar to the Ontario average. The percentage of Hamilton youth who have never smoked tobacco has increased year-over-year from 2015-16 to 2019-20.

Figure 10.2: Adults who currently smoke tobacco, Hamilton and Ontario residents aged 20+ (age-standardized), 2015-2020
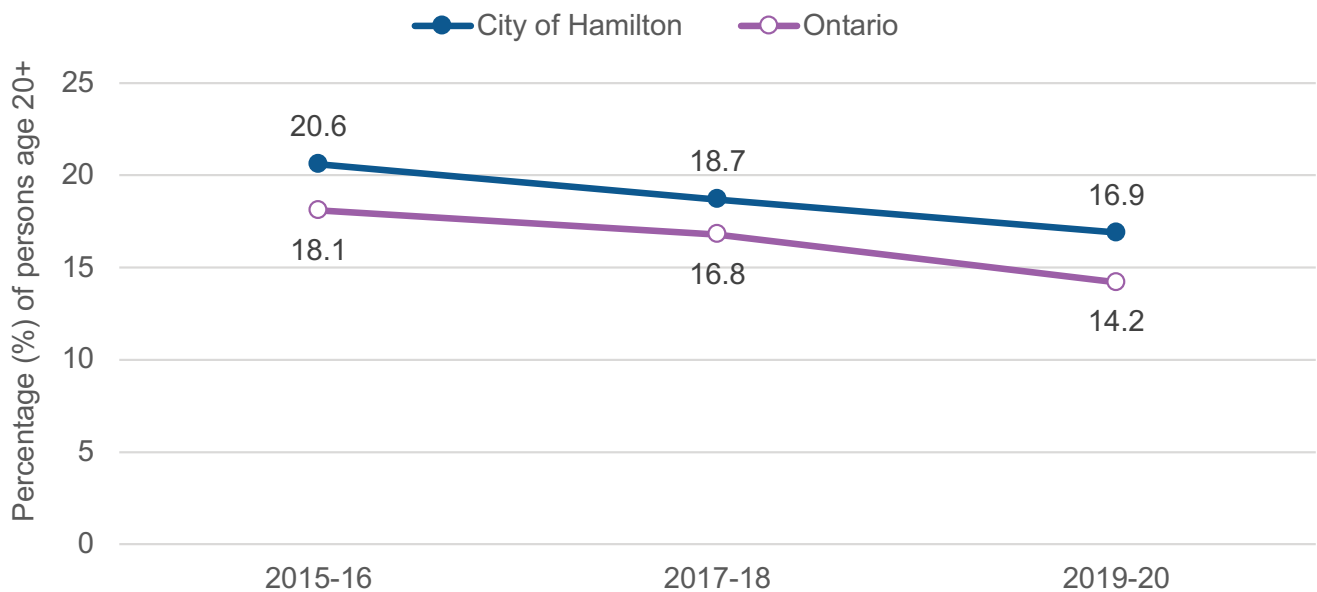
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: smoking snapshot. Toronto, ON: King's Printer for Ontario.

Figure 10.3: Current tobacco smoking prevalence by different groups, Hamilton residents aged 12+, 2015-2020 combined
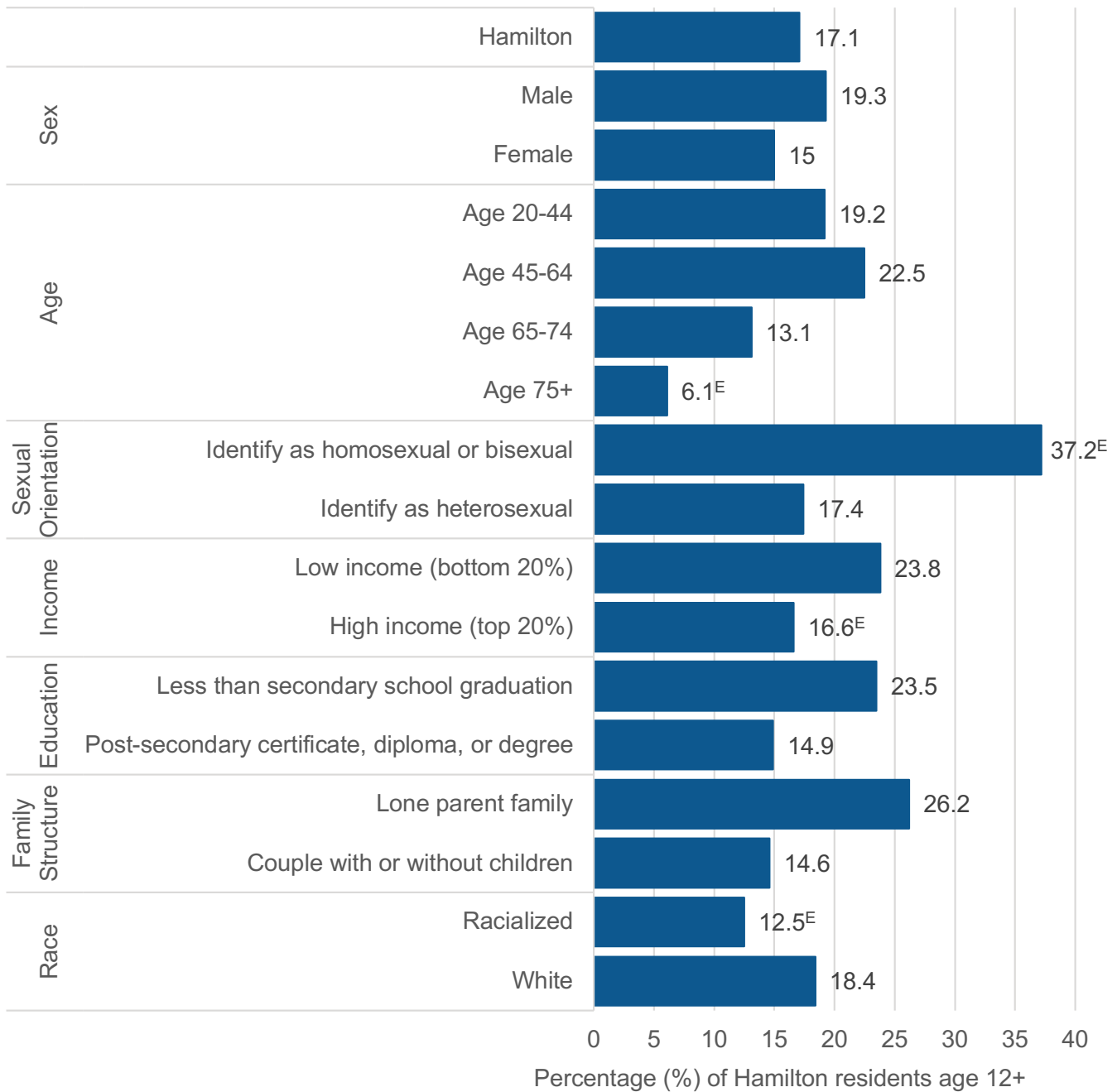
Category	Group	Percentage
	Hamilton	17.1
Sex	Male	19.3
Sex	Female	15
Age	Age 20-44	19.2
Age	Age 45-64	22.5
Age	Age 65-74	13.1
Age	Age 75+	6.1^E
Sexual Orientation	Identify as homosexual or bisexual	37.2^E
Sexual Orientation	Identify as heterosexual	17.4
Income	Low income (bottom 20%)	23.8
Income	High income (top 20%)	16.6^E
Education	Less than secondary school graduation	23.5
Education	Post-secondary certificate, diploma, or degree	14.9
Family Structure	Lone parent family	26.2
Family Structure	Couple with or without children	14.6
Race	Racialized	12.5^E
Race	White	18.4

Percentage (%) of Hamilton residents age 12+

Source: Canadian Community Health Survey [2015-2016 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health.

Notes:
- E – interpret estimate with caution due to high variability in responses.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Table 10.1: Estimates of the average annual deaths, hospitalizations, and emergency department visits from health conditions attributed to smoking tobacco, Hamilton resident age 35+

Outcome	Number of outcomes attributed to smoking tobacco				
	Total	Cancer	Cardiovascular	Diabetes	Respiratory
Deaths	783	352	240	8	182
Hospitalizations	3,113	369	1,339	27	1,377
Emergency Department Visits	4,972	93	1,349	52	3,478

Source: Ontario Health and Ontario Agency for Health Protection and Promotion (Public Health Ontario). Burden of Health Conditions Attributable to Smoking and Alcohol by Public Health Unit in Ontario. Toronto: King's Printer for Ontario; 2023.

Note: These estimates were generated using various data inputs from the years 2014 to 2019.

Figure 10.4: Youth who have never smoked tobacco, Hamilton and Ontario residents aged 12-19, 2015-2020
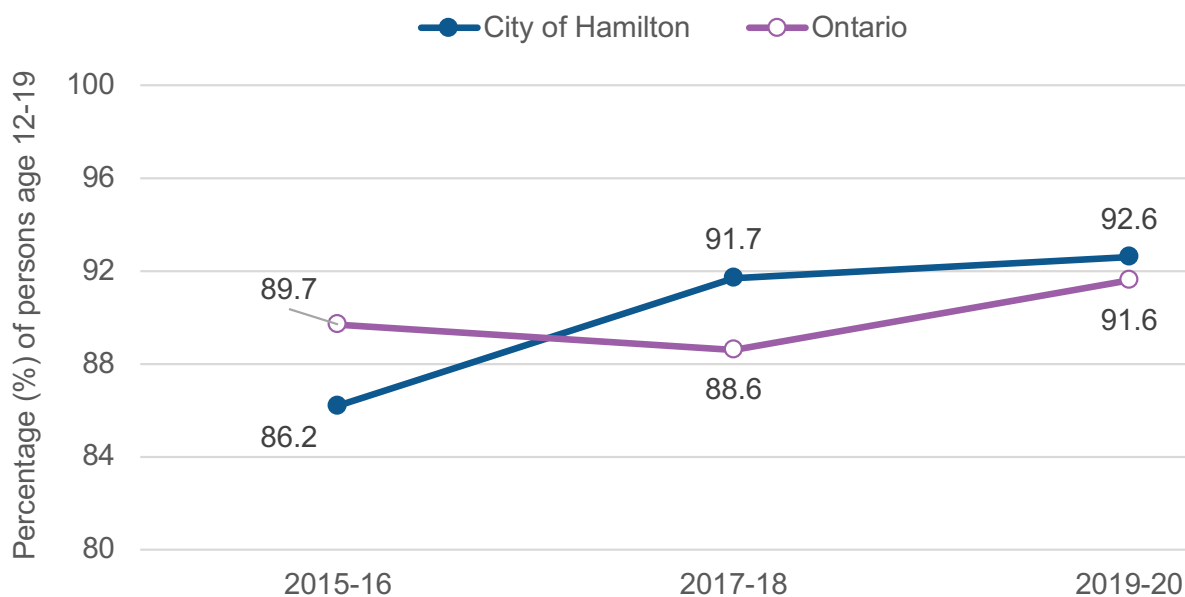
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: smoking snapshot. Toronto, ON: King's Printer for Ontario.

VAPING

In 2019, nearly 1 in 3 Hamilton secondary school students report using an e-cigarette or vaping in the previous year (Figure 10.5), similar to the Ontario average (28.4%). The most likely to try were students identifying as white. With the emergence and substantial rise in youth vaping rates, there is concern that the progress made to reduce tobacco smoking rates may stall or reverse. Research has found that for every 6 youth who start vaping, 1 of them will go on to start smoking tobacco.[66]

Figure 10.5: E-cigarette use or vaping in the past year, percentage of Hamilton secondary school students (grades 9-12), 2019
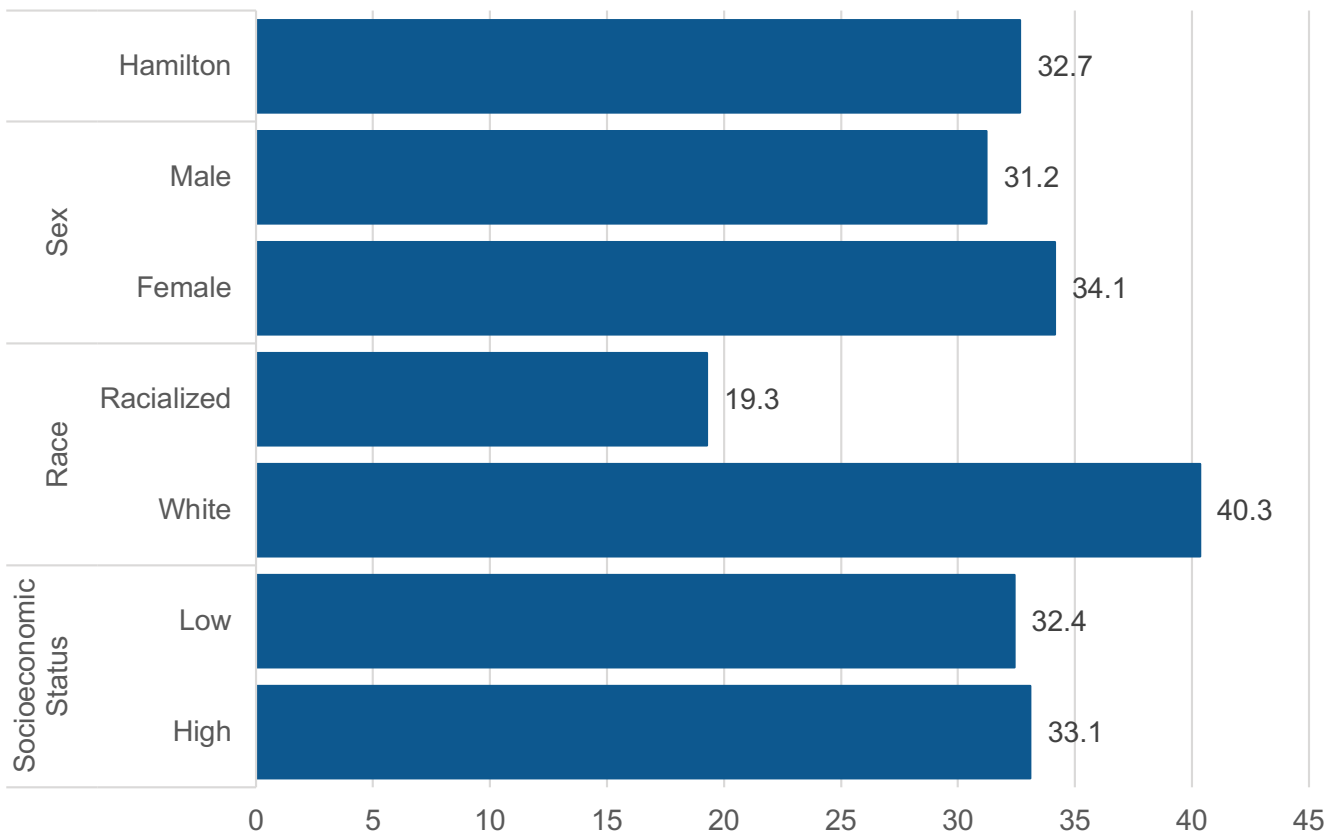
Category		Percentage
	Hamilton	32.7
Sex	Male	31.2
	Female	34.1
Race	Racialized	19.3
	White	40.3
Socioeconomic Status	Low	32.4
	High	33.1

Source: Ontario Student Drug Use and Health Survey, 2019.

Note: Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.

ALCOHOL

Over 1 in 3 (34.0%) Hamilton residents had three or more alcoholic drinks in the past week. When age is taken into consideration, the rate for Hamilton resident is similar to Ontario (Figure 10.6).

The age-standardized measure has increased year-over-year, from 29.9% in 2015-2016 to 34.5% in 2019-2020. Over the same period, the percentage of Hamilton residents who had no alcoholic drinks in the past week decreased year-over-year from 31.3% in 2015-2016 to 29.2% in 2019-2020.

Just over 1 in 6 (17.1%) Hamilton residents reported that they consumed seven or more alcoholic drinks in the previous week. When age is taken into consideration, Hamilton's rate has remained stable since 2015-2016 and is similar to Ontario.

Similarly, over 1 in 6 (18.0%) Hamilton residents report at least one heavy drinking episode per month. When age is taken into consideration, Hamilton's rate remained stable since 2015-2016 and is similar to Ontario.

Among Hamilton secondary school students, nearly 1 in 3 (31.4%) report drinking alcohol in the past four weeks, and 1 in 6 (16.1%) report

Figure 10.6: Standard alcoholic drinks consumed in the past week (seven days), City of Hamilton residents aged 12 and older (age-standardized), 2015-2020
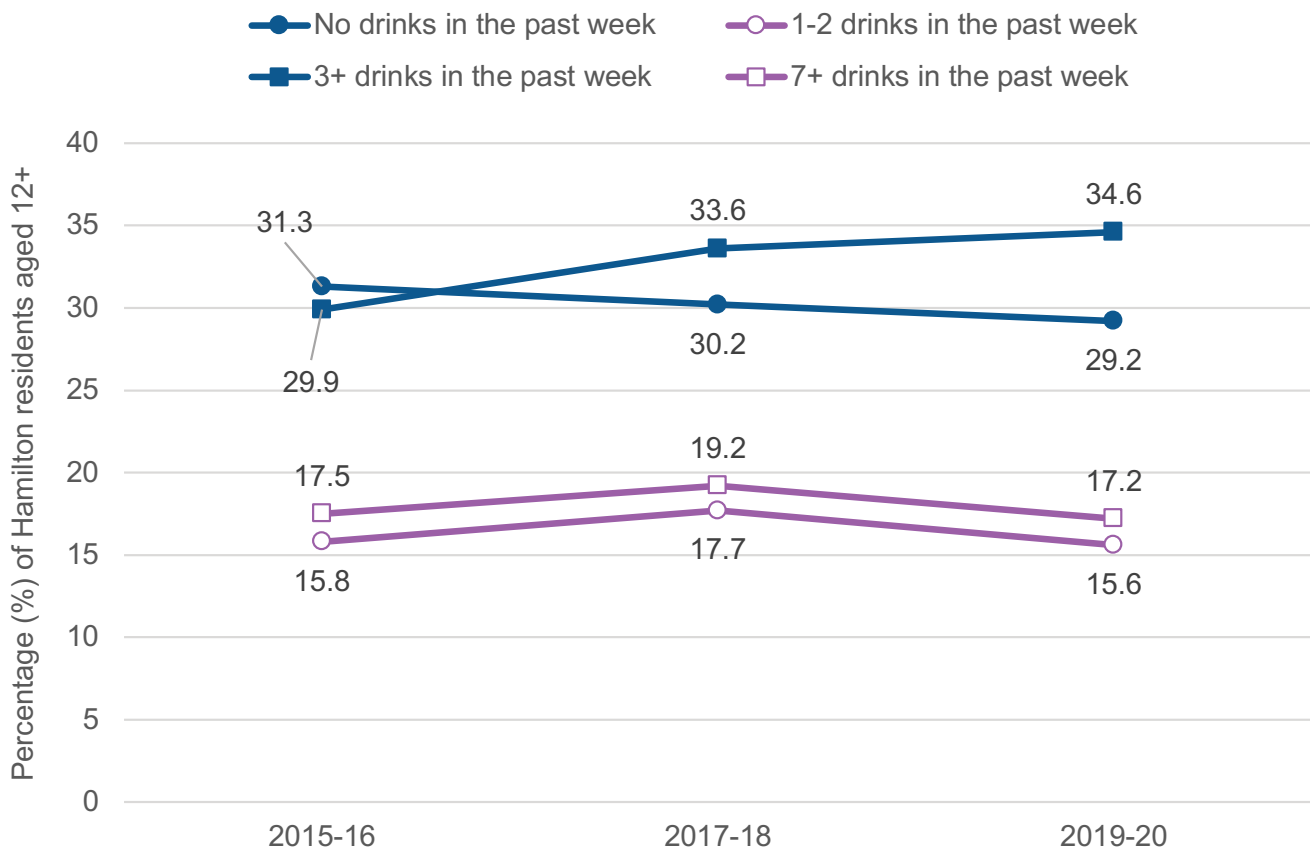
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: alcohol use snapshot. Toronto, ON: King's Printer for Ontario.

Figure 10.7: Alcohol consumption in the past four weeks and binge drinking in the past month, percentage of Hamilton secondary school students (grades 9-12), 2019

Legend: ■ Binge drinking in the past month ■ Drank alcohol in past 4 weeks

Hamilton
- Binge drinking in the past month: 16.1
- Drank alcohol in past 4 weeks: 31.4

Sex

Male
- Binge drinking in the past month: 16.7
- Drank alcohol in past 4 weeks: 31.2

Female
- Binge drinking in the past month: 15.4
- Drank alcohol in past 4 weeks: 31.5

Race

Racialized
- Binge drinking in the past month: 6.8
- Drank alcohol in past 4 weeks: 15.2

White
- Binge drinking in the past month: 21.7
- Drank alcohol in past 4 weeks: 41.5

Socioeconomic Status

Low
- Binge drinking in the past month: 14.0
- Drank alcohol in past 4 weeks: 28.8

High
- Binge drinking in the past month: 17.3
- Drank alcohol in past 4 weeks: 32.7

Percentage (%) of Hamilton secondary school students

Source: Ontario Student Drug Use and Health Survey, 2019.

Note: Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.

binge drinking in the past month (Figure 10.7). Both measures were similar to the Ontario average. Hamilton secondary school students identifying as white were more likely to drink alcohol in the past four weeks.

In an average year, it is estimated that alcohol causes 208 deaths, 1,073 hospitalizations and 9,123 emergency department visits among Hamilton residents (Table 10.2).[65] For Hamilton residents age 15+, nearly 1 in 20 deaths (4.4%) are attributed to alcohol consumption.

Looking at emergency department visits for health conditions caused by alcohol, Hamilton's rate increased from 2014 to 2018 but saw decreases especially in 2020 and 2021; it is possible that people avoided emergency departments during the COVID-19 pandemic. This rate is greater in Hamilton when compared to Ontario. So is the rate of hospitalizations for health conditions caused by alcohol that has remained relatively stable in Hamilton between 2012 and 2021 (Figure 10.8).

Table 10.2: Estimates of the average annual deaths, hospitalizations, and emergency department visits from health conditions attributed to alcohol, Hamilton resident age 15+

Outcome	Number of outcomes attributed to alcohol					
	Total	Cancer	Cardiovascular	Digestive Condition	Neuro-psychiatric	Unintentional Injury
Deaths	**208**	57	46	40	18	27
Hospitalizations	**1,073**	85	-82	221	399	302
Emergency Department Visits	**9,123**	18	85	222	2,710	4,953

Source: Ontario Health and Ontario Agency for Health Protection and Promotion (Public Health Ontario). Burden of Health Conditions Attributable to Smoking and Alcohol by Public Health Unit in Ontario. Toronto: King's Printer for Ontario; 2023.

Note: These estimates were generated using various data inputs from the years 2014 to 2019.

Figure 10.8: Emergency department visits and hospitalizations for health conditions entirely caused by alcohol, Hamilton and Ontario residents (age-standardized), 2012-2021

Legend:
- Emergency department visits (City of Hamilton)
- Hospitalizations (City of Hamilton)
- Emergency department visits (Ontario)
- Hospitalizations (Ontario)

Y-axis: Emergency department visits / hospitalizations per 100,000

Emergency department visits (City of Hamilton): 619.4, 594.5, 580, 638.7, 651.6, 657.7, 717.3, 635.9, 555.1, 579.7

Emergency department visits (Ontario): 504.9, 500.2, 513.3, 557.8, 576.4, 589, 604.6, 593.4, 514.6, 543.3

Hospitalizations (City of Hamilton): 254.7, 255.7, 237.1, 254.5, 236.4, 234.1, 253.3, 231.3, 222.5, 228.4

Hospitalizations (Ontario): 190.8, 192.5, 188.8, 194.7, 199.1, 200.5, 200.1, 196.8, 201.3, 210.9

X-axis years: 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: alcohol harms snapshot. Toronto, ON: King's Printer for Ontario.

CANNABIS

Nearly 1 in 6 (15.7%) Hamilton residents (aged 12 and older) used cannabis in the past year (Figure 10.9), higher than the Ontario rate (12.7%). Among Hamilton residents, cannabis use was greater among adults aged 20-44, males and those who identified as white.

In 2021, 606 Hamilton residents visited an emergency department due to cannabis-related harms. The rate of emergency department visits for cannabis-related harms doubled over 2012-2021 for Hamilton residents (Figure 10.10), which follows a similar trend for Ontario. However, in 2020 and 2021, Hamilton's rate of emergency department visits for cannabis-related harms was lower than the Ontario rate.

Figure 10.9: Cannabis use in the past year, Hamilton residents (aged 12 and older), 2015-2020 combined
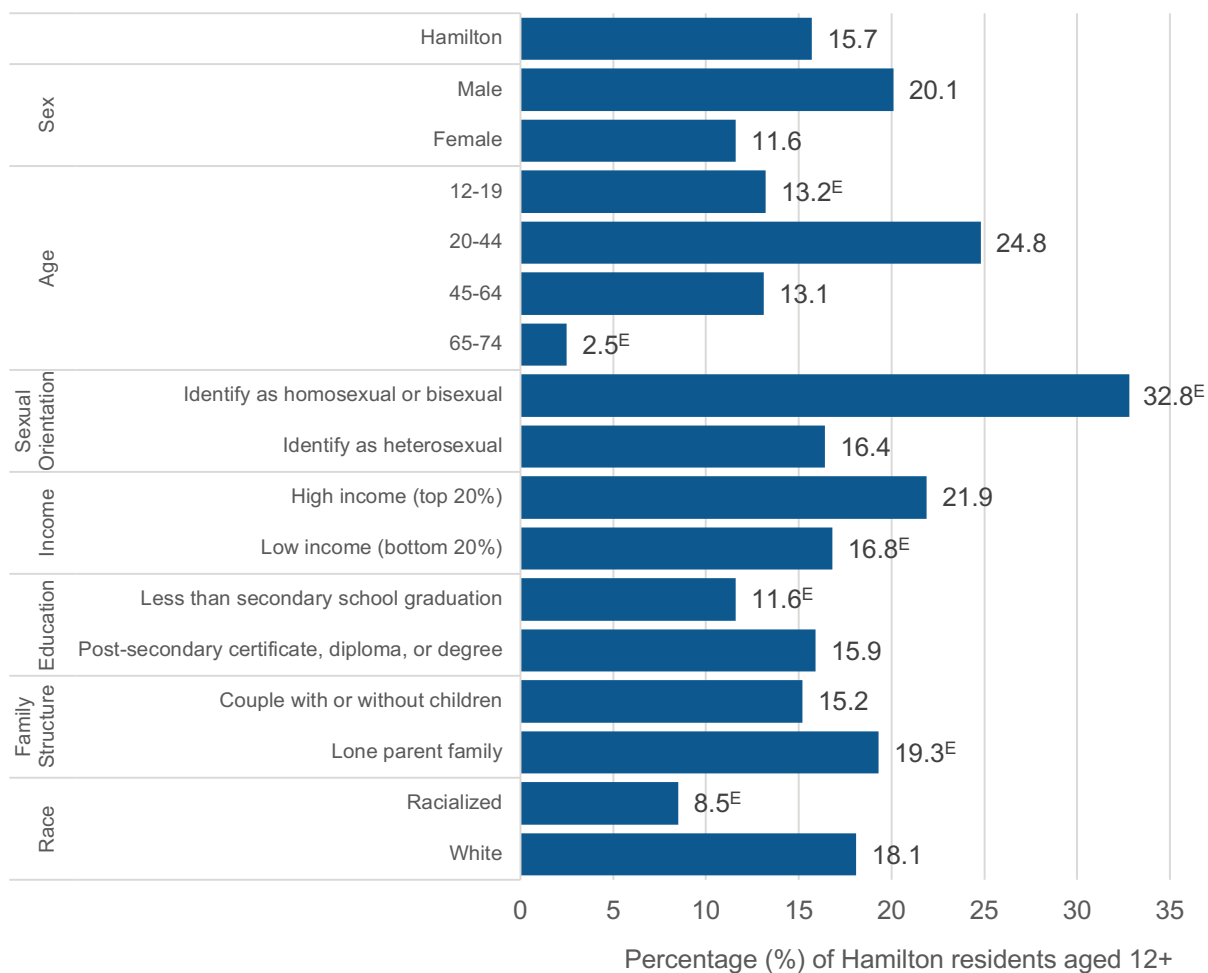
Source: Canadian Community Health Survey [2015-2016 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health.

Notes:
- E – interpret estimate with caution due to high variability in responses.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.
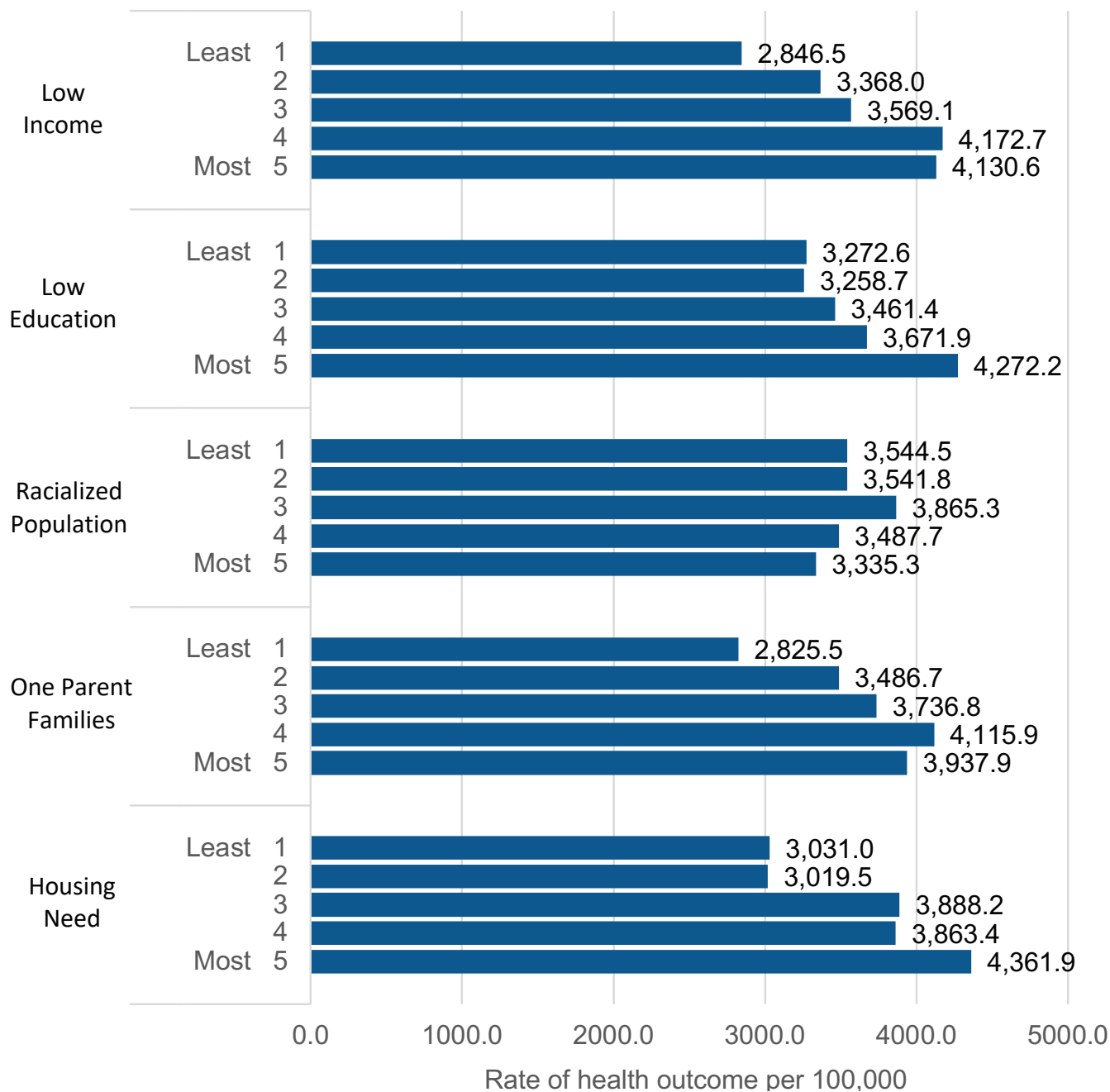
Figure 10.10: Emergency department visits for cannabis-related harms, Hamilton and Ontario residents (age-standardized), 2012-2021
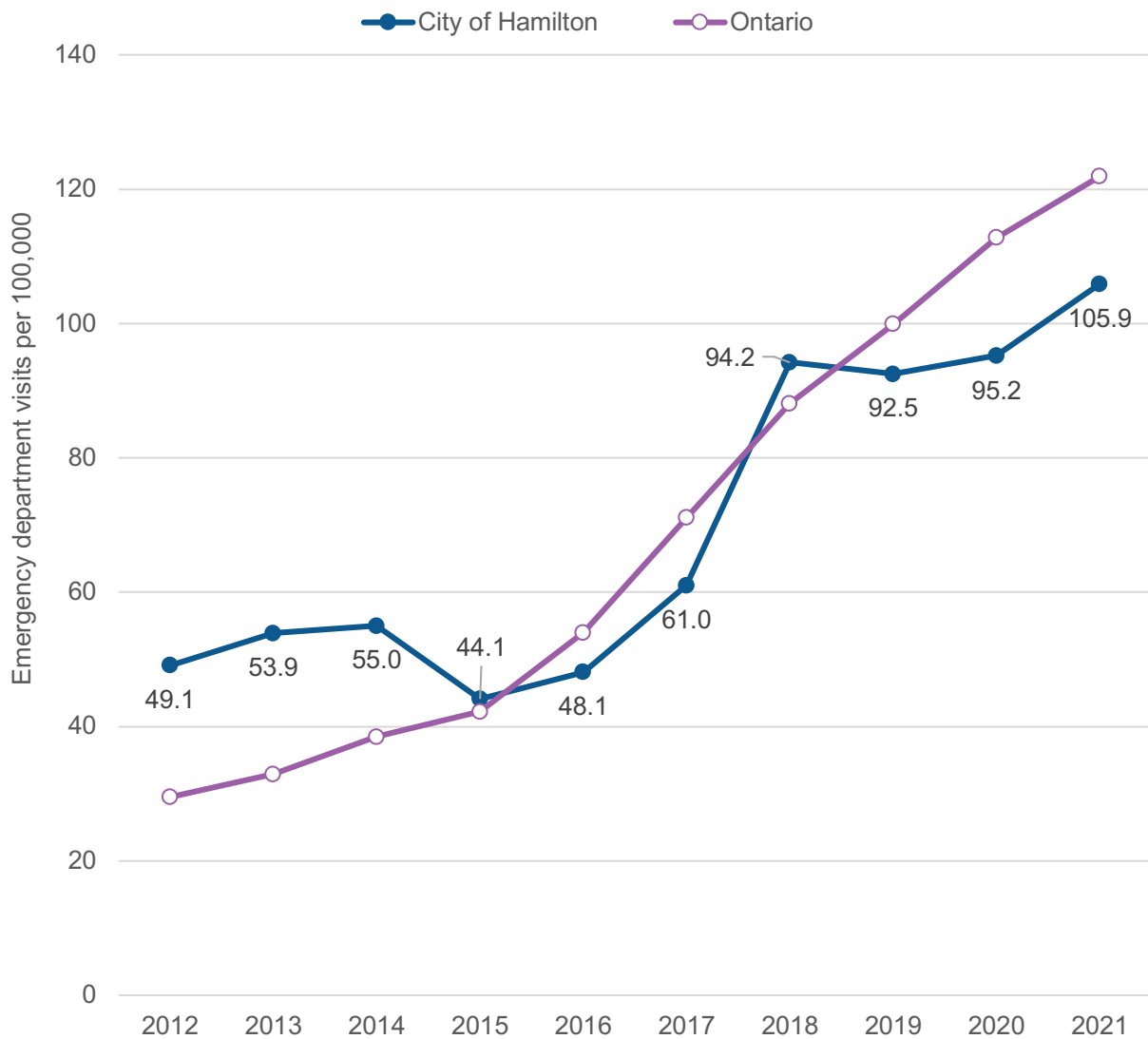
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: cannabis harms

OPIOIDS

The rate of opioid-related emergency department visits increased by 878.6% between 2005 and 2021 for residents of Hamilton (Figure 10.11). In 2022, this rate decreased to a level similar to the 2019 rate. Hamilton's rate has remained consistently greater than that of Ontario – 52.7% greater in 2022.

There were 168 opioid-related deaths in Hamilton in 2022 according to the most current data (Figure 10.12).

Hamilton's opioid-related death rate increased by 446% from 2005-2022. This rate has remained consistently greater than the Ontario rate, and was 63.5% higher in 2022.

Figure 10.11: Opioid-related emergency department visits, Hamilton and Ontario residents, 2005-2022
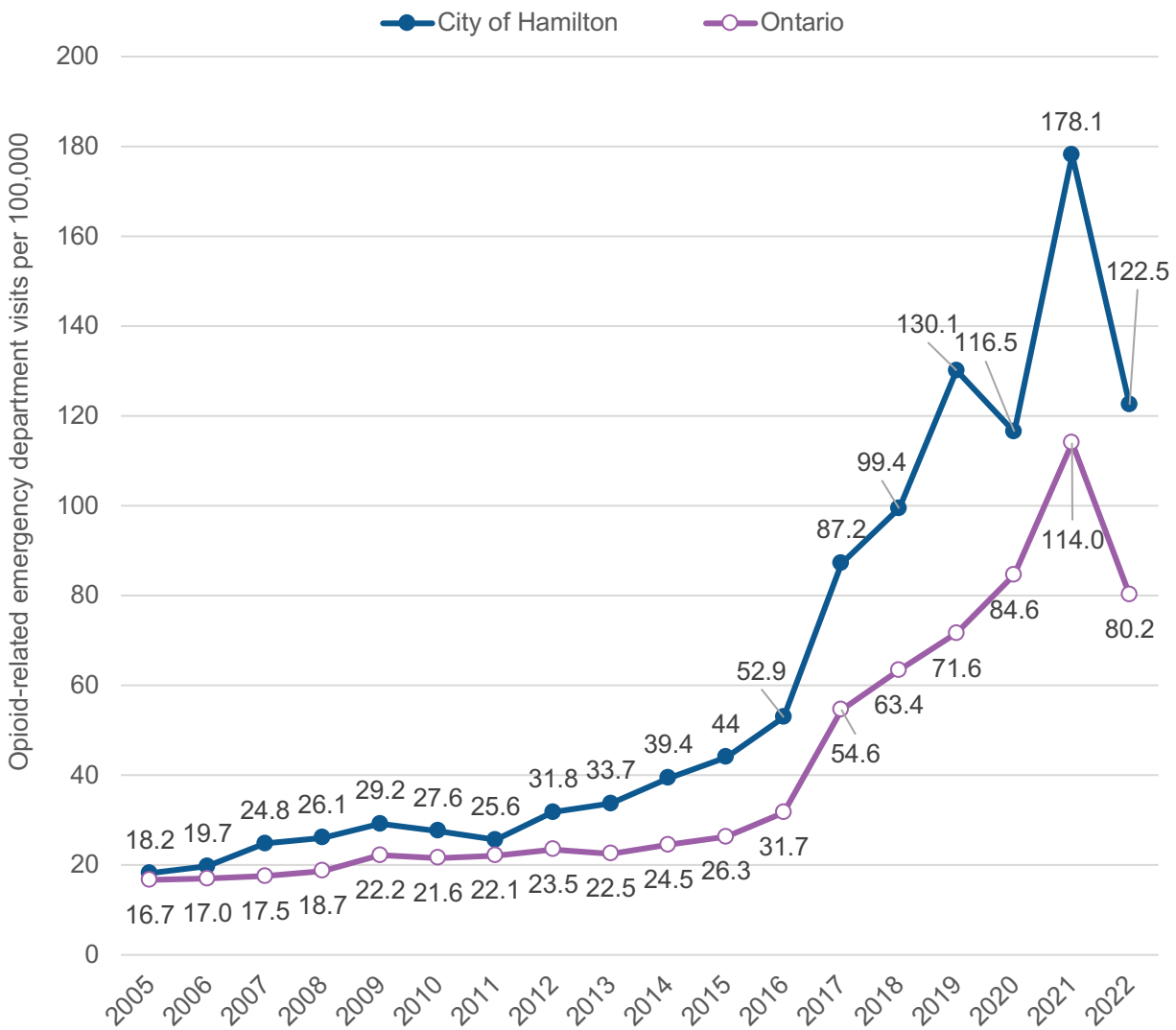
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Interactive opioid tool. Toronto, ON: King's Printer for Ontario; 2023.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.
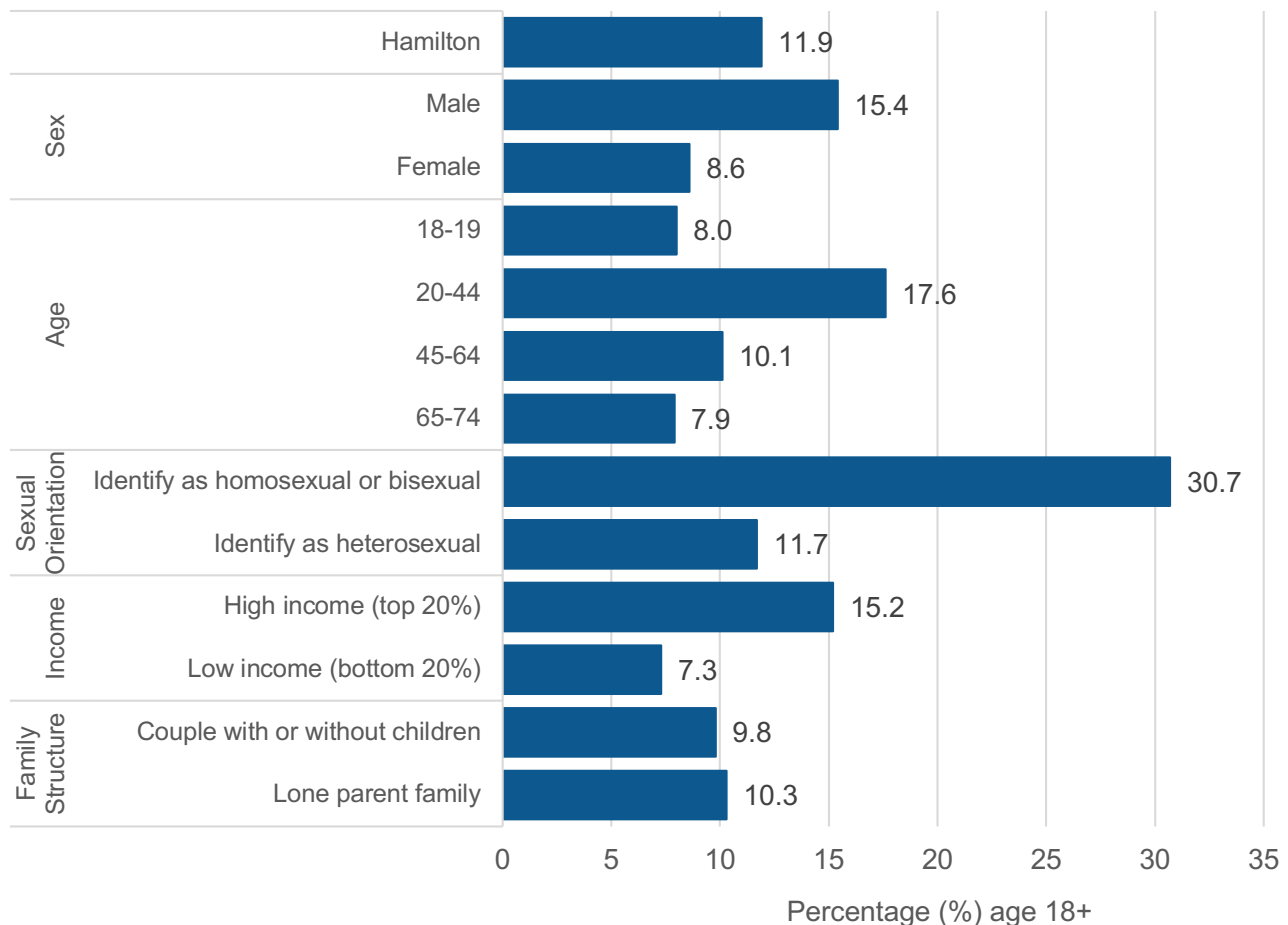
Figure 10.12: Opioid-related deaths in Hamilton and Ontario, 2005-2022
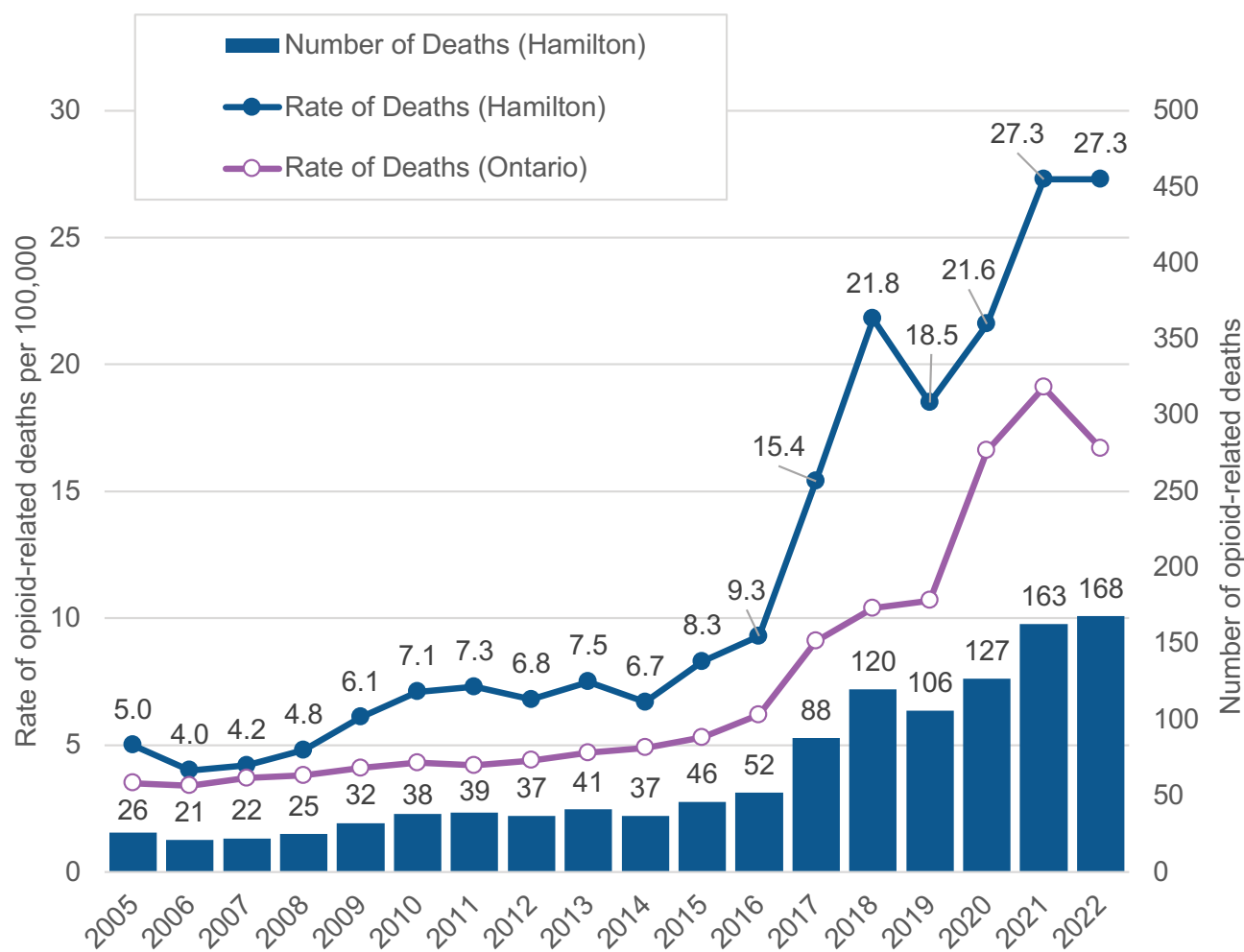
Source: Office of the Chief Coroner of Ontario.

Notes:
- Data includes probable and confirmed deaths. Data are subject to change as pending investigations are completed by the coroner's office.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

The rate of opioid-related deaths differs by sex and age groups in Hamilton (Figure 10.13). In 2022, 72.2% of opioid-related deaths were among males aged 25-64 years. This group is experiencing the most substantial and disproportionate increase in opioid-related deaths in Hamilton.

There are many types of opioids. Multiple ones may be connected to an opioid-related death. Based on the most available data from 2022, fentanyl (all types) was the most common linked to opioid-related deaths in Hamilton. It was present in 86.4% of all opioid-related deaths. This is a substantial increase from 2005, when only 3.8% of opioid-related deaths were connected to fentanyl (all types).

Oxycodone was present in 5.6% of Hamilton's opioid-related deaths in 2022, which is a substantial decrease from 42.3% in 2005.

Heroin, hydrocodone, hydromorphone, methadone, morphine and nitazenes were each present in less than 10% of Hamilton's opioid-related deaths in 2022.

The rate of unintentional opioid-related deaths in Hamilton differed by groupings based on housing status and racial identity (Table 10.3).

There were substantially higher rates among people whose living arrangement was identified as homeless (1,024.9 deaths per 100,000) compared to those identified as residing in a private dwelling (16.1 deaths per 100,000).

The rate of opioid-related deaths was greater among people who identified as white (22.4 deaths per 100,000) and Black (13.4 deaths per 100,000) when compared to people who identified as East or Southeast Asian, South Asian, Latin American or Middle Eastern (4.0 deaths per 100,000). These racial identities were grouped together for privacy considerations, as the number of deaths in each of these populations is low.

Figure 10.13: Opioid-related deaths by age group and sex, Hamilton, 2018-2022
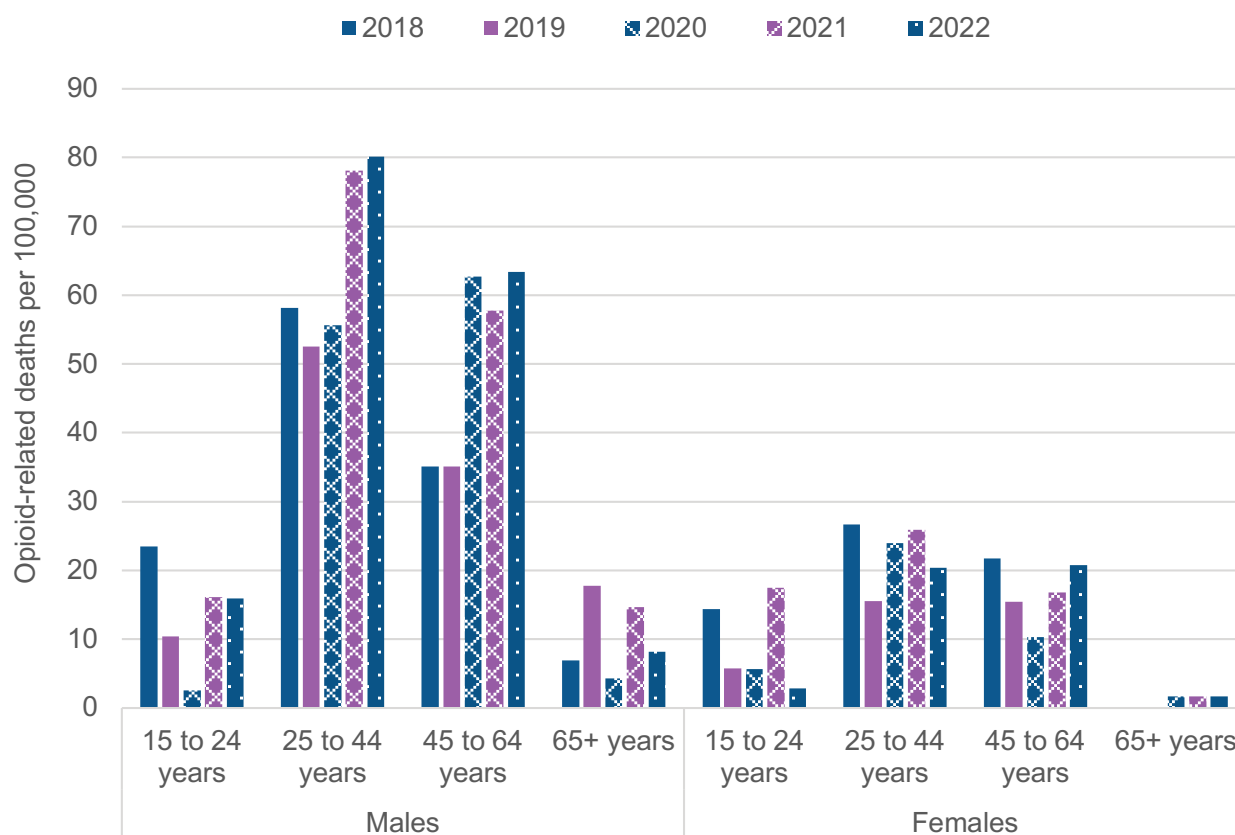
Source: Coroner's Opioid Investigative Aid, Office of the Chief Coroner for Ontario, extracted November 2, 2023.

Table 10.3: Unintentional opioid-related deaths by different groups, Hamilton, 2018-2022 combined

Grouping	Defined Groups	Number of opioid-related deaths	Opioid-related deaths per 100,000
Housing Status	People whose living arrangement was identified as homeless	53	1,024.9
	People whose living arrangement was identified as residing in a private dwelling	445	16.1
Racial Identity	People who were identified as Black	18	13.4
	People who were identified as white	458	22.4
	People who were identified as East or Southeast Asian, South Asian, Latin American or Middle Eastern	21	4.0

Source: Coroner's Opioid Investigative Aid, Office of the Chief Coroner for Ontario, extracted November 2, 2023 (prepared by Public Health Ontario).

Notes:
- Housing status and racial identity are determined by the Office of the Chief Coroner of Ontario during their investigation. Approximately 80-90% of deaths have this information available.
- These data only include unintentional deaths where there was no evidence of intentional self-harm (suicide).
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

INJURY AND VIOLENCE

HIGHLIGHTS

- Falls are a substantial cause of injuries for Hamilton residents, particularly older residents. Rates of fall injuries have remained relatively stable.

- Land transport injuries are decreasing, but distracted driving and injuries remain greater among Hamilton males and those aged 20-44.

- Hamilton has a greater rate of assault-related injuries compared to Ontario, particularly among males aged 20-44. The rate of homicides has increased in recent years.

- There are substantial socioeconomic inequalities related to injuries. Assault-related injuries are one of the most unequal health outcomes in Hamilton.

- Since 2020 there has been a 175% rise in police-reported hate and bias occurrences in Hamilton, primarily targeting Black, Jewish, Muslim and LGBTIQ+ (lesbian, gay, bisexual, transgender, intersex, queer or questioning) populations.

INJURY AND VIOLENCE

LEADING CAUSES OF INJURY

The leading causes of injury-related emergency department (ED) visits and deaths are shown in Table 11.1 for Hamilton residents. Annually, EDs see over 20,000 visits for fall-related injuries, almost as many as for all other injuries combined.

Falls, along with unintentional poisoning, were the top causes of injury-related deaths for Hamilton residents in 2021; collectively, they account for 76.4% of all injury-related deaths.

Unintentional poisoning is primarily driven by opioid overdoses, and is covered in further detail in Chapter 10: Substance Use. This category represented the largest total of potential years of life lost (PYLL) for Hamilton residents in 2021. Unintentional injuries accounted for 62.8% of all PYLL for all injuries. Self-harm ranked second, accounting for 20.2% of PYLL for all injuries.

Table 11.1: Leading causes of injury-related emergency department (ED) visits, deaths, and potential years of life lost (PYLL), Hamilton residents, 2021

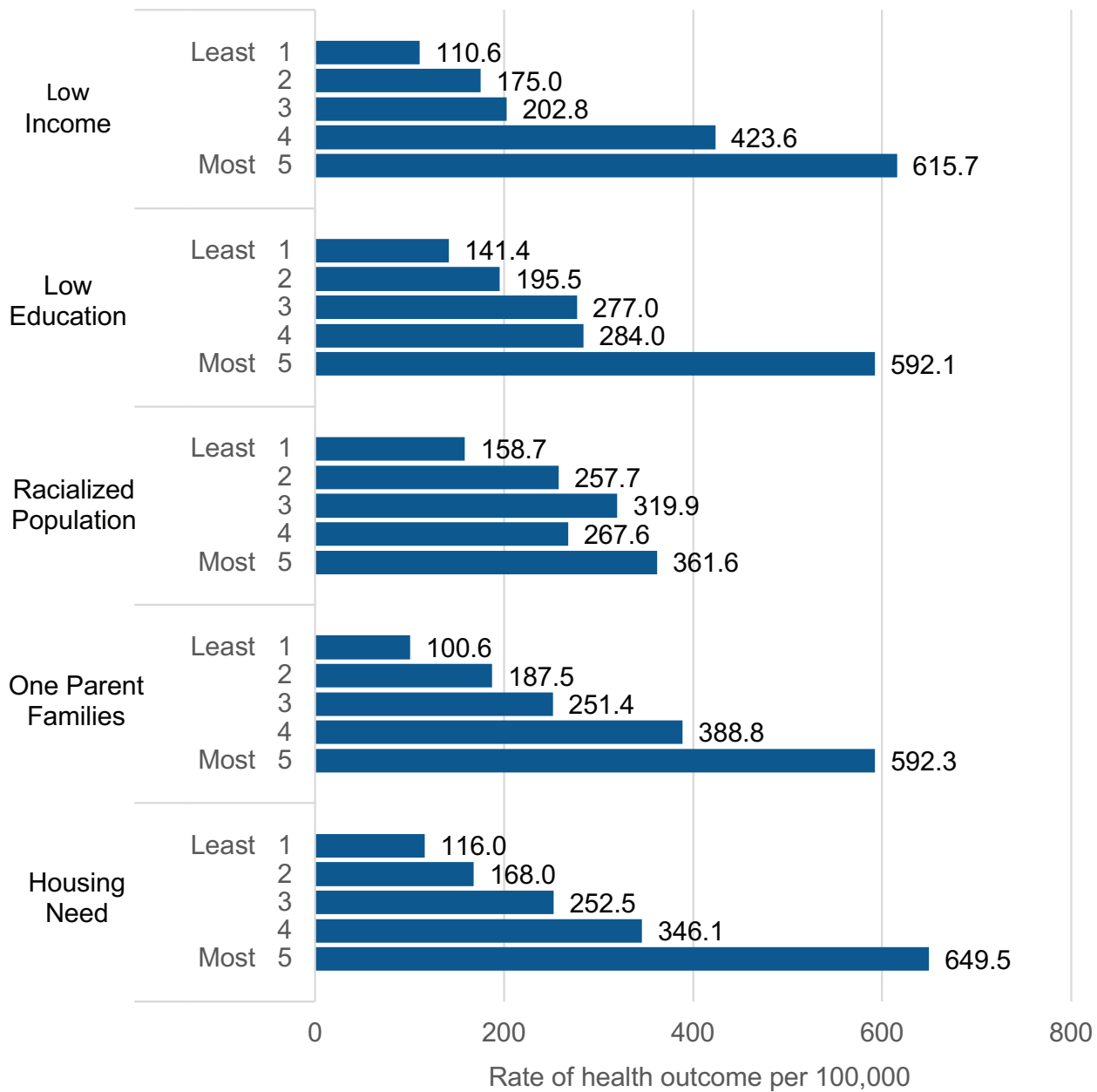| Injury Type	ED visits	Deaths	PYLL
Assault	1,472	15	566
Self-harm	1,012	47	1,603
Burns	708	3	67
Cut or pierce injury	5,434	0	0
Falls	20,278	140	224
Near-drowning or submersion	22	1	40
Neurotrauma	1,938	0	0
Struck by or against object	7,456	1	12
Land transport-related injuries	3,831	22	445
Unintentional poisoning	1,838	148	4,989
Overexertion	2,239	0	0

Sources: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO; Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

FALLS

The rate of fall-related ED visits and deaths are shown in Figure 11.1 for Hamilton residents from 2012 to 2021. Both rates have remained relatively stable during this period. The rate of ED visits for fall injuries is greater for Hamilton residents aged 75 and older, particularly females (Figure 11.2).

For 2019-2021, the rate of fall-related ED visits was greater in Hamilton (3,488.2 visits per 100,000) than for Ontario (2,929.3 visits per 100,000). Similarly, the rate of fall-related deaths was greater in Hamilton (22.9 deaths per 100,000) when compared to Ontario (20.4 deaths per 100,000).

Figure 11.1: Fall-related emergency department visits and deaths, Hamilton residents, 2012-2021
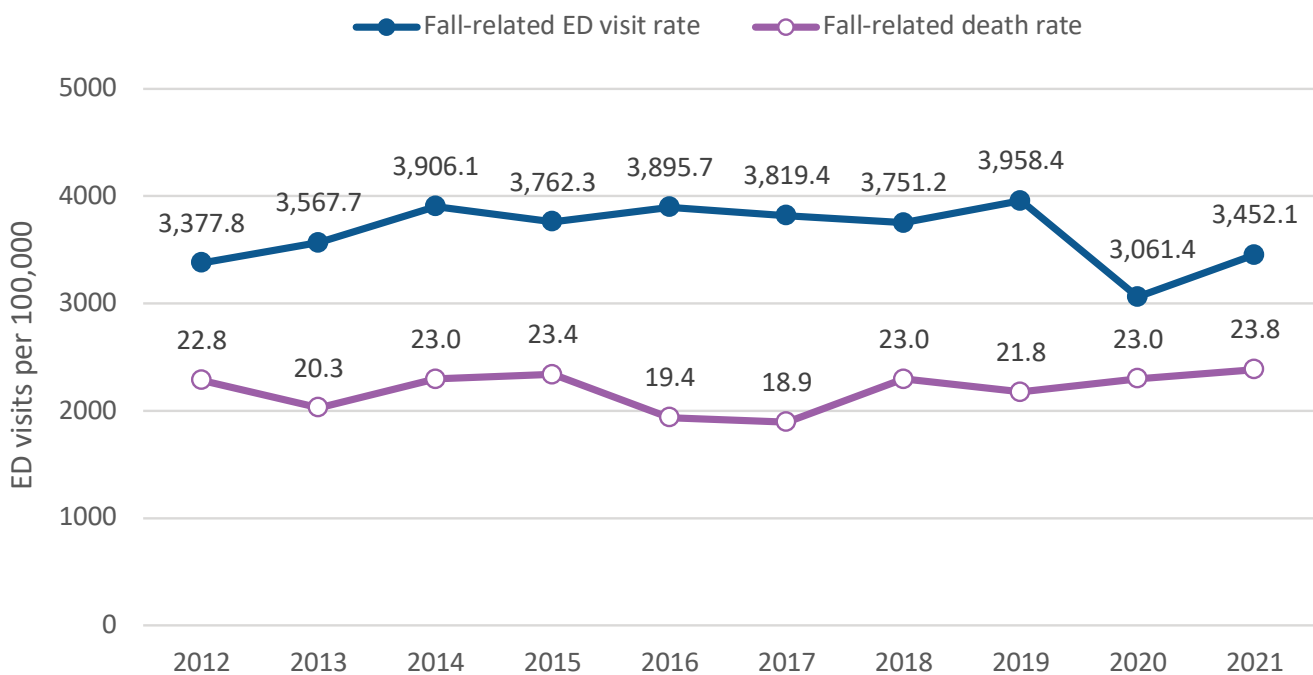
Legend: Fall-related ED visit rate; Fall-related death rate

ED visit rate values: 2012: 3,377.8; 2013: 3,567.7; 2014: 3,906.1; 2015: 3,762.3; 2016: 3,895.7; 2017: 3,819.4; 2018: 3,751.2; 2019: 3,958.4; 2020: 3,061.4; 2021: 3,452.1

Death rate values: 2012: 22.8; 2013: 20.3; 2014: 23.0; 2015: 23.4; 2016: 19.4; 2017: 18.9; 2018: 23.0; 2019: 21.8; 2020: 23.0; 2021: 23.8

Y-axis: ED visits per 100,000

Sources: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO; Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 11.2: Emergency department visits for fall injuries by age group and sex, Hamilton residents, 2021
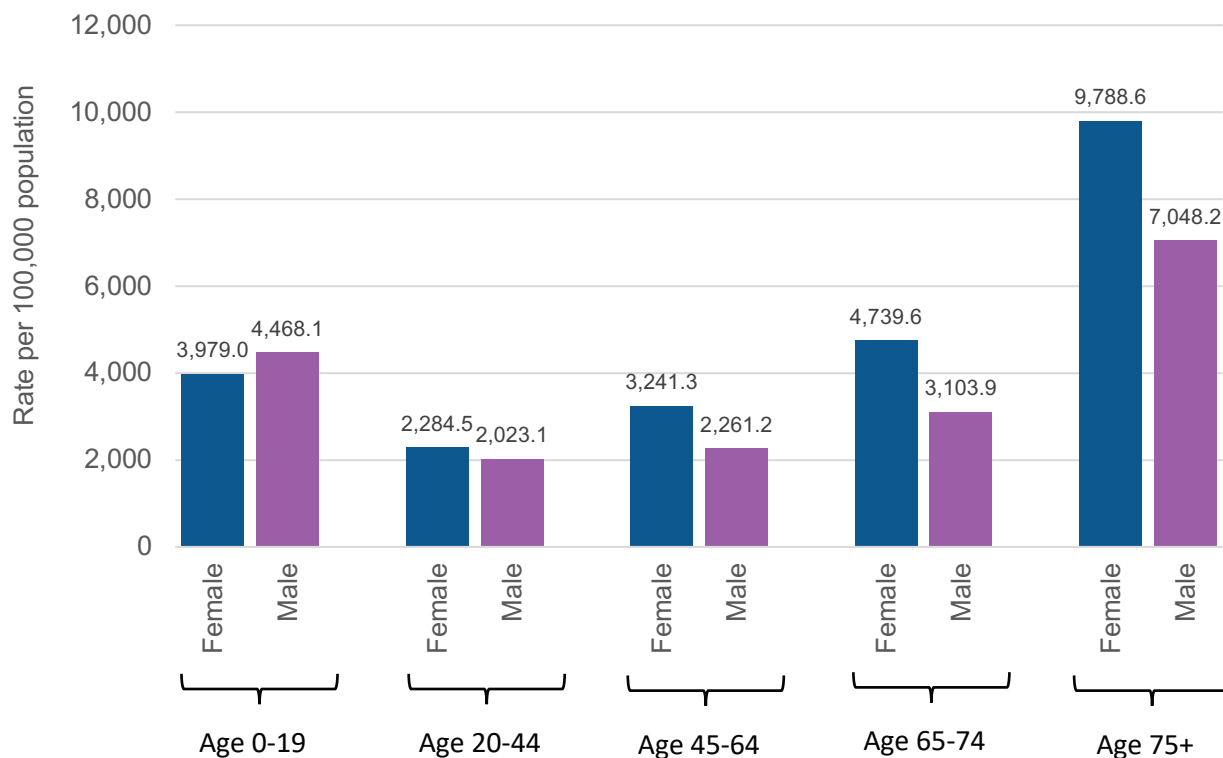
Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

There were 1,228 fall-related deaths among Hamilton residents from 2012 to 2021. In the 56% of cases where a specific cause is noted, the top causes were:

- falls on or from stairs and steps (108 deaths)
- falls involving a bed, chair or other furniture (96 deaths)
- slipping, tripping or stumbling on the same level without snow or ice (69 deaths)

When assessing area-based inequality, there are higher rates of ED visits for fall injuries among Hamilton residents living in (Figure 11.3):

- areas with a greater percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent
- areas with a greater percentage of families with one-parent
- areas with the greatest percentage of households with a core housing need

Figure 11.3: Emergency department visits for fall injuries by area-based socioeconomic quintiles, crude rate per 100,000 population, Hamilton residents, 2017-2021

			Rate
Low Income	Least	1	2,846.5
		2	3,368.0
		3	3,569.1
		4	4,172.7
	Most	5	4,130.6
Low Education	Least	1	3,272.6
		2	3,258.7
		3	3,461.4
		4	3,671.9
	Most	5	4,272.2
Racialized Population	Least	1	3,544.5
		2	3,541.8
		3	3,865.3
		4	3,487.7
	Most	5	3,335.3
One Parent Families	Least	1	2,825.5
		2	3,486.7
		3	3,736.8
		4	4,115.9
	Most	5	3,937.9
Housing Need	Least	1	3,031.0
		2	3,019.5
		3	3,888.2
		4	3,863.4
	Most	5	4,361.9

Rate of health outcome per 100,000

Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

LAND TRANSPORT INJURIES

Land transport injuries can involve cars, trucks, vans, motorcycles, all-terrain vehicles, and pedal cycles. Pedestrians who are injured by a land transport vehicle are also included within this category.

The risk of injury is increased when a land transport vehicle is operated while impaired or distracted. One in nine (11.9%) Hamilton adults report being impaired while driving, or being in a vehicle with an impaired driver, at least once in the past year (Figure 11.4); this risk was greater for Hamilton adults identifying as lesbian, gay or bisexual.

Nearly 30% of Hamilton drivers (aged 16 and older) report using a cell phone while driving in the past year (excludes hands-free use). This practice was greater among drivers aged 20-44 and male drivers (Figure 11.5). Measures of impaired and distracted driving were similar between Hamilton and Ontario residents.

Figure 11.4: Adults who report being impaired while driving or being in a vehicle with an impaired driver in the past year, Hamilton residents aged 18 and older, 2017-2020 combined

Category	Group	Percentage
	Hamilton	11.9
Sex	Male	15.4
Sex	Female	8.6
Age	18-19	8.0
Age	20-44	17.6
Age	45-64	10.1
Age	65-74	7.9
Sexual Orientation	Identify as homosexual or bisexual	30.7
Sexual Orientation	Identify as heterosexual	11.7
Income	High income (top 20%)	15.2
Income	Low income (bottom 20%)	7.3
Family Structure	Couple with or without children	9.8
Family Structure	Lone parent family	10.3

Percentage (%) age 18+

Source: Canadian Community Health Survey [2017-2018 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 11.5: Drivers who used a cell phone while driving in the past year (excludes hands-free use), Hamilton drivers aged 16 and older, 2017-2018

Category	Group	Percentage
	Hamilton	29.9
Sex	Male	36.1
Sex	Female	23.4
Age	20-44	41.7
Age	45-64	27.1
Age	65-74	9.2
Income	High income (top 20%)	45.0
Income	Low income (bottom 20%)	29.8
Family Structure	Couple with or without children	32.2
Family Structure	Lone parent family	18.6
Race	Racialized	29.6
Race	White	29.6

Percentage of drivers age 16+
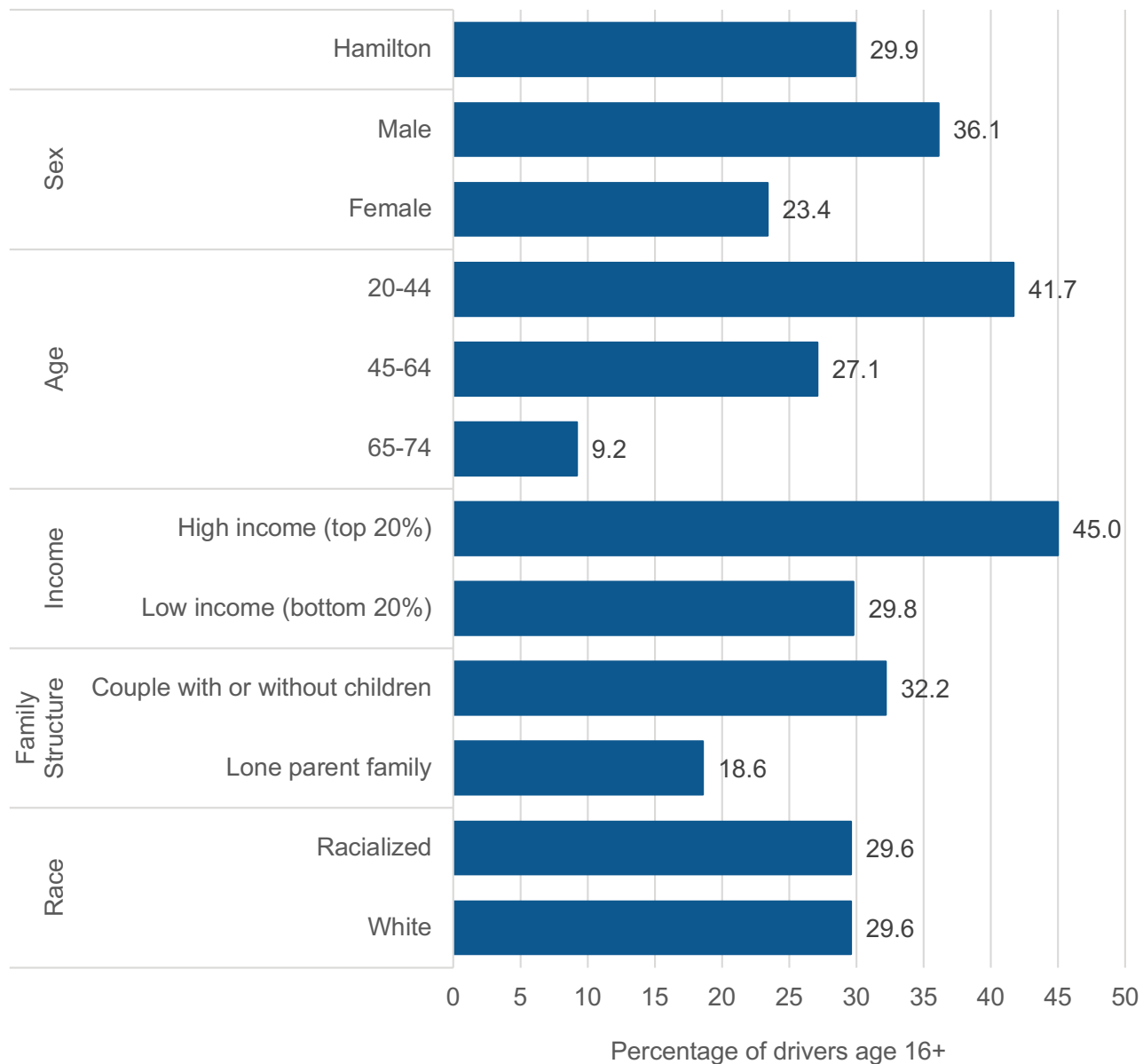
Source: Canadian Community Health Survey [2017-2018], Statistics Canada, Share File, Ontario Ministry of Health.

Notes:
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

For Hamilton residents from 2012 to 2021, Figure 11.6 shows the rate of ED visits and deaths due to land transport injuries. Both rates appear to be trending downwards with some year-to-year fluctuations, but these trends should be monitored closely to determine whether they're sustained.

Over 2019-2021, the rate of ED visits for land transport injuries was greater in Hamilton (714.0 visits per 100,000) compared to Ontario (656.8 visits per 100,000). More Hamilton males made ED visits for land transport injuries across all age groups, particularly those aged 20-44 (Figure 11.7).

The rate of deaths due to land transport injuries in Hamilton (3.7 deaths per 100,000) was similar to Ontario (4.1 deaths in Ontario per 100,000) during 2019-2021. For this period, there were 233 deaths due to land transport injuries among Hamilton residents.

While 27.9% of these deaths have a non-specific cause, the top causes include:

- pedestrian injured in land transport incident (70 deaths)
- car/truck/van occupant injured (43 deaths)
- motorcycle occupant injured (29 deaths)

When assessing area-based inequality, there were higher rates of ED visits for land transport injuries among Hamilton residents living in (Figure 11.8):

- areas with greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent
- areas with the greatest percentage of individuals who self-identified as a race other than white or Indigenous
- areas with the greatest percentage of families with one-parent
- areas with the greatest percentage of households that have a core housing need

Figure 11.6: Land transport injury-related emergency department visits and deaths, Hamilton residents, 2012-2021
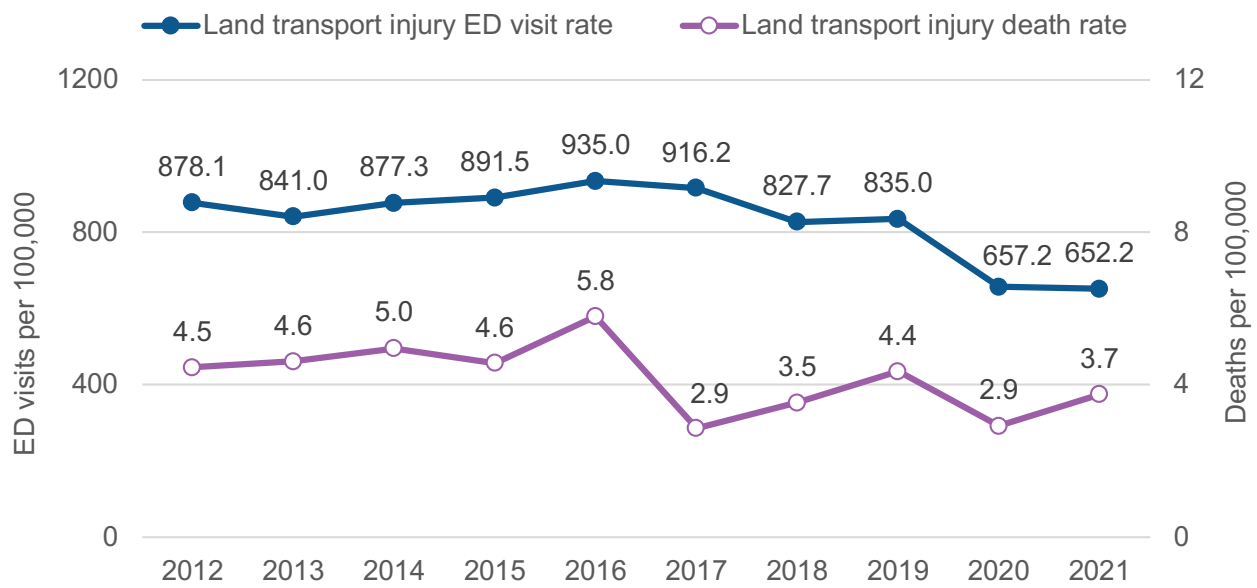
Sources: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO; Ontario Mortality Data, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 11.7: Emergency department visits for land transport injuries by age and sex, Hamilton residents, 2021
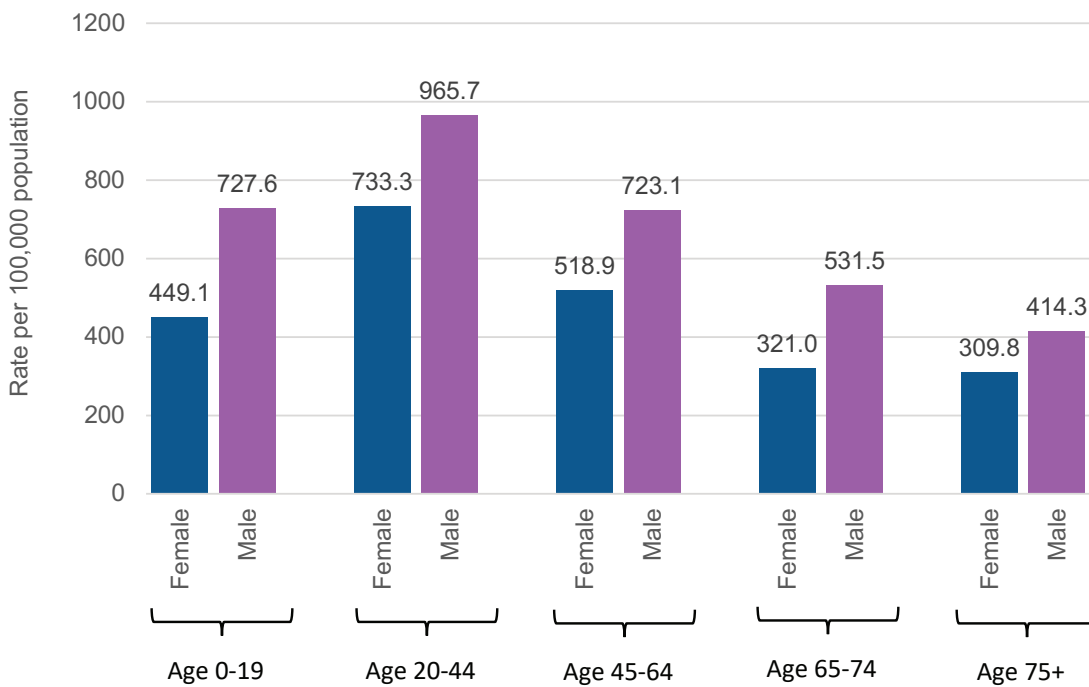
Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 11.8: Emergency department visits for land transport injuries by area-based socioeconomic quintiles, crude rate per 100,000 population, Hamilton residents, 2017-2021 combined

Low Income
- Least 1: 622.5
- 2: 691.4
- 3: 712.5
- 4: 901.2
- Most 5: 940.7

Low Education
- Least 1: 631.6
- 2: 692.3
- 3: 745.3
- 4: 755.7
- Most 5: 1028.3

Racialized Population
- Least 1: 703.3
- 2: 731.0
- 3: 786.6
- 4: 765.1
- Most 5: 775.1

One Parent Families
- Least 1: 596.2
- 2: 693.7
- 3: 713.8
- 4: 881.8
- Most 5: 993.1

Housing Need
- Least 1: 647.0
- 2: 665.0
- 3: 770.7
- 4: 807.2
- Most 5: 978.1

Rate of health outcome per 100,000

Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

ASSAULTS AND HOMICIDES

Hamilton's rate of emergency department visits for physical or sexual assaults was consistently greater than the Ontario rate for all years between 2012 and 2021 (Figure 11.9).

Overall, Hamilton males had a greater rate of ED visits for assault injuries compared to Hamilton females. These rates were greatest among those aged 20-44 (Figure 11.10).

In 2018, 1 in 25 Hamilton residents (3.9%) were victims of a self-reported physical or sexual assault. More than 1 in 4 (27%) experienced unwanted sexual behaviour in public.[67]

Figure 11.9: Assault-related emergency department visits, Hamilton and Ontario residents, 2012-2021
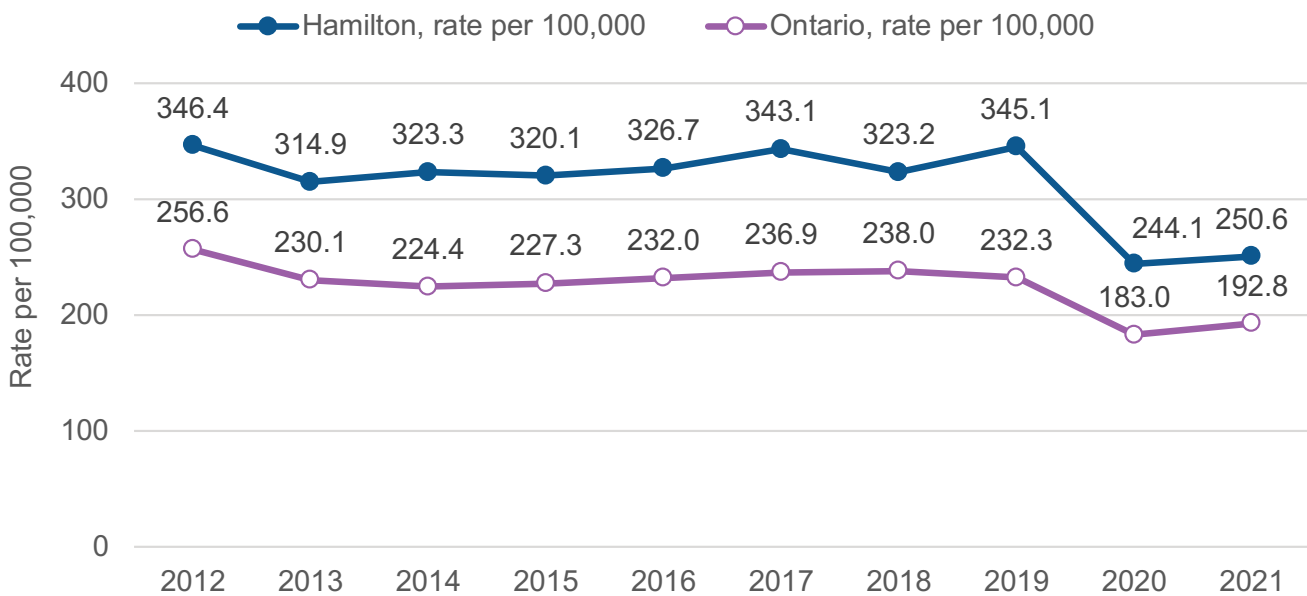
Legend: Hamilton, rate per 100,000; Ontario, rate per 100,000

Hamilton values: 2012: 346.4, 2013: 314.9, 2014: 323.3, 2015: 320.1, 2016: 326.7, 2017: 343.1, 2018: 323.2, 2019: 345.1, 2020: 244.1, 2021: 250.6

Ontario values: 2012: 256.6, 2013: 230.1, 2014: 224.4, 2015: 227.3, 2016: 232.0, 2017: 236.9, 2018: 238.0, 2019: 232.3, 2020: 183.0, 2021: 192.8

Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

Figure 11.10: Assault-related emergency department visits by age and sex, Hamilton residents, 2021
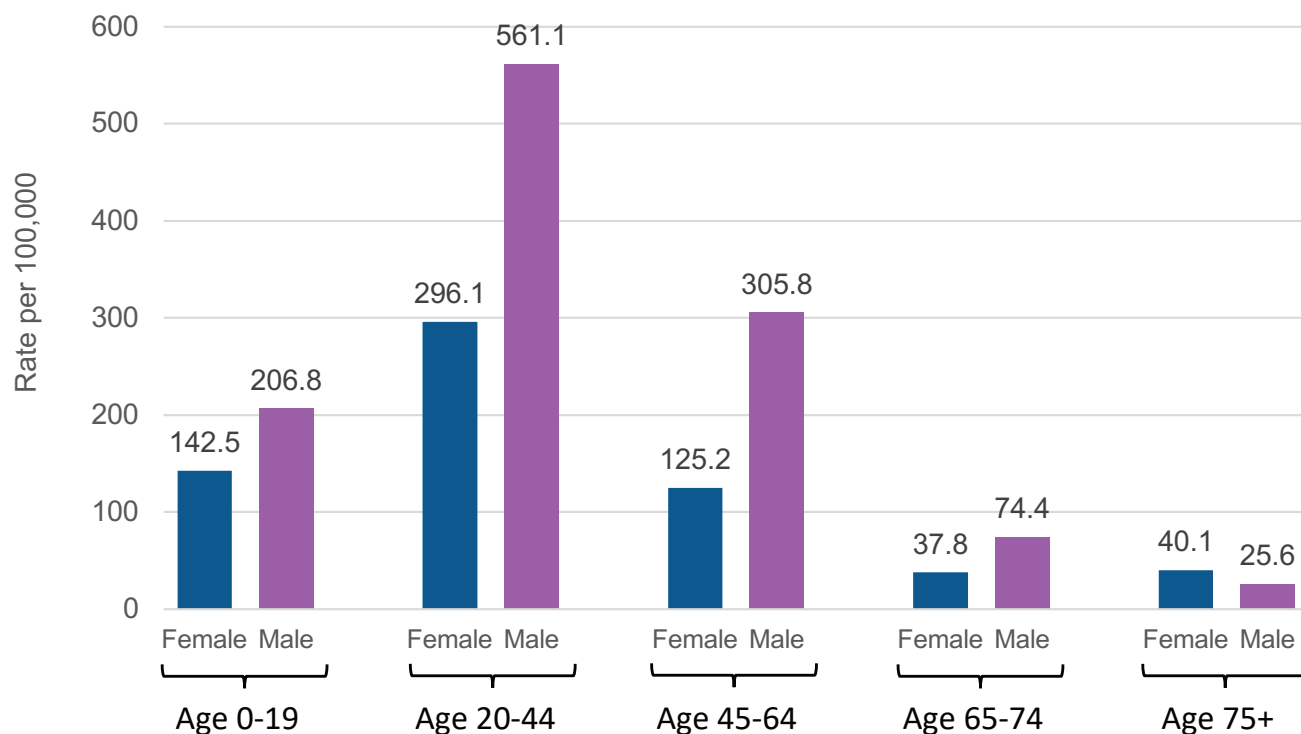
Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

When assessing area-based inequality, there were higher rates of assault-related ED visits among Hamilton residents living in (Figure 11.11):

- areas with greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent
- areas with the greatest percentage of individuals who self-identified as a race other than white or Indigenous
- areas with the greatest percentage of families with one-parent
- areas with the greatest percentage of households that have a core housing need

Figure 11.11: Assault-related emergency department visits by area-based socioeconomic quintiles, crude rate per 100,000 population, Hamilton residents, 2017-2021 combined

Low Income
- Least 1: 110.6
- 2: 175.0
- 3: 202.8
- 4: 423.6
- Most 5: 615.7

Low Education
- Least 1: 141.4
- 2: 195.5
- 3: 277.0
- 4: 284.0
- Most 5: 592.1

Racialized Population
- Least 1: 158.7
- 2: 257.7
- 3: 319.9
- 4: 267.6
- Most 5: 361.6

One Parent Families
- Least 1: 100.6
- 2: 187.5
- 3: 251.4
- 4: 388.8
- Most 5: 592.3

Housing Need
- Least 1: 116.0
- 2: 168.0
- 3: 252.5
- 4: 346.1
- Most 5: 649.5

Rate of health outcome per 100,000

Source: Ambulatory Emergency External Cause, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO.

Notes:
- For each socioeconomic metric, Hamilton's census neighbourhoods were sorted into five groups (quintiles) and the health outcome was measured in each group to determine inequalities. Refer to Quintile Graphs in the glossary for a further explanation.
- Different racialized groups have different health experiences. Aggregating all racialized groups into one category masks these differences.
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

The number and rate of homicides in Hamilton from 2005-2022 are shown in Figure 11.12. The rate of homicides increased substantially between 2016 and 2021, with an equally substantial decline in 2022. This should be monitored closely due to the rapid emergence and continued evolution of this trend.

Figure 11.12: Homicide rate (3-year moving average) and count in Hamilton, 2005-2022
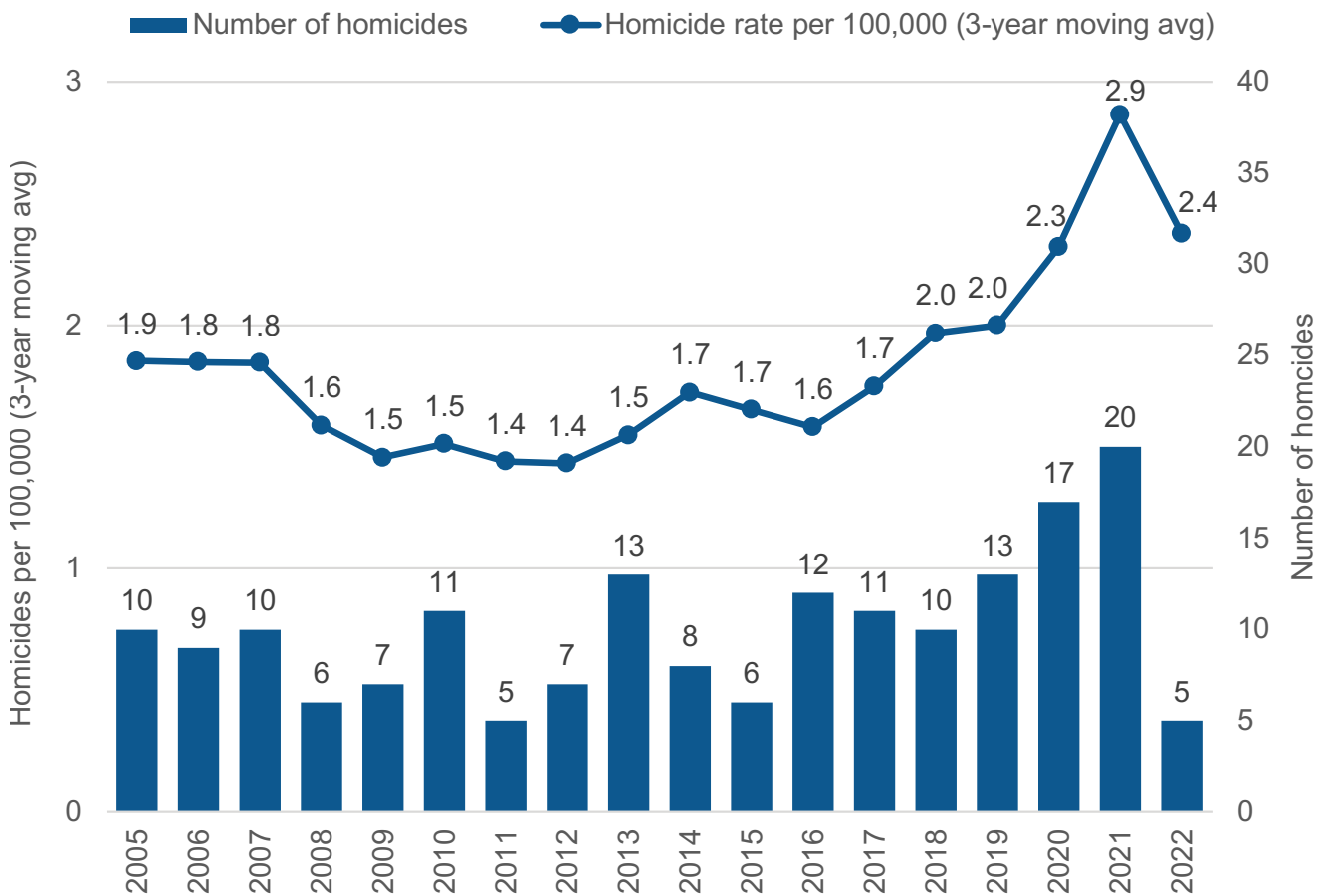
Source: Hamilton Police Services, January 2023.

HATE AND DISCRIMINATION

Reports of occurrences that are motivated by hate and discrimination are on the rise in Hamilton.

In 2023, there were 220 such occurrences reported to Hamilton Police Services in 2023 (Figure 11.13). That was the greatest number of reported occurrences over the past 10 years, and was up by 175% since 2020 (80 occurrences).

Some of this increase may be attributed to greater awareness or willingness to report hate or bias occurrences to police. But hate and bias occurrences are likely under-reported due to the mistrust between police and people from Black, LGBTIQ+, religious and other communities.[68]

The groups most targeted by occurrences of hate or bias reported to police (Figure 11.14) include:

- the Black community
- the Jewish community
- the Muslim community
- the LGBTIQ+ (lesbian, gay, bisexual, transgender, intersex, queer or questioning and other sexually or gender diverse people) community

Figure 11.13: Hate or bias occurrences reported to Hamilton Police Services, City of Hamilton, 2014-2023
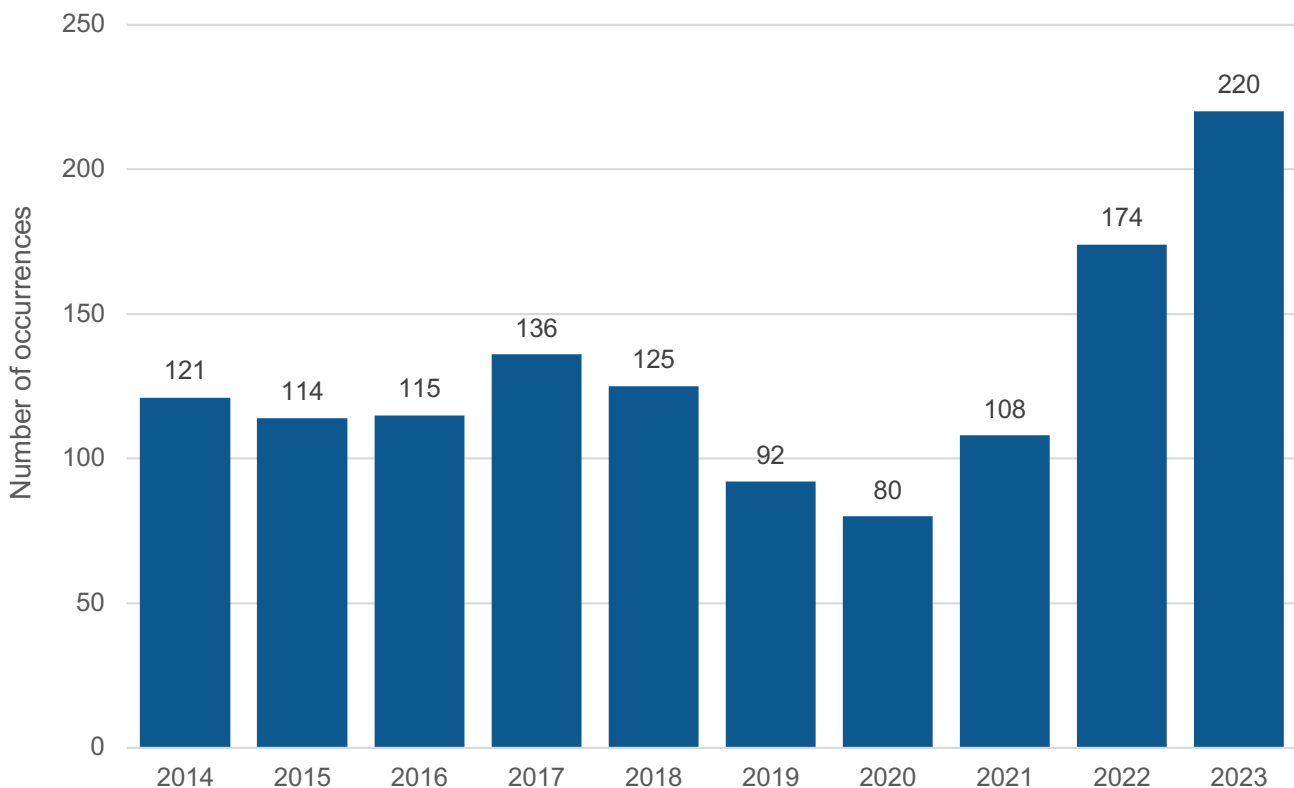
Source: Hamilton Police Services.

In Hamilton, 96 of the hate or bias occurrences reported were racially motivated; Black people were targeted in 71.8% (69 occurrences) of these occurrences in 2023, an increase of 102.9% since 2019 (34 occurrences). These findings continue to highlight the persistence of anti-Black racism; each year the Black community tops the list with the most incidences.

Fifty-nine hate or bias occurrences were motivated by religion, targeting members of the Jewish (44) and Muslim (15) communities,

experiencing a 51.7% and 87.5% increase respectively, in hate or bias occurrences in 2023 when compared to 2019.

Sexual orientation and gender identity were the focus of 64 hate or bias occurrences in 2023, primarily targeting the Two-Spirit and LGBTIQ+ community. This has increased by 433.3% since 2019 (12 occurrences). As previously stated, some of the increase across these groups may be attributed to greater awareness or willingness to report hate or bias occurrences to police.

Figure 11.14: Hate or bias occurrences reported to Hamilton Police Services by most targeted groups, City of Hamilton, 2019-2023
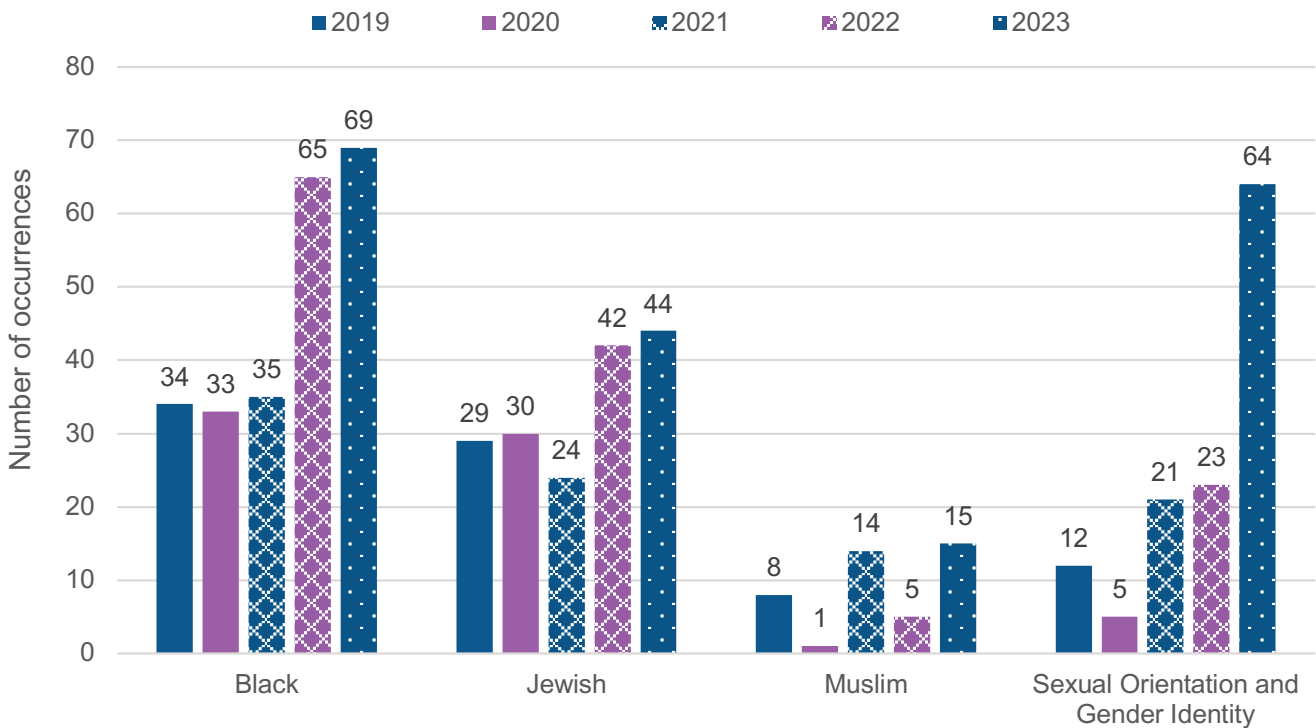
Source: Hamilton Police Services.

COMMUNITY SAFETY

We can glean feelings about community safety from the 2019 Rapid Risk Factor Surveillance Survey and 2019 Ontario Student Drug Use and Health Survey. These self-reported measures show that:

- 82.8% of Hamilton adults feel very or reasonably safe walking alone in their neighbourhood after dark.
- 87.8% of Hamilton adults think it is very or reasonably safe for children to play outside during the day in their neighbourhood.
- 23.7% of adult residents believed a lot of family violence occurred in the community in 2019, and 42.5% believed family violence has increased over the past five years in Hamilton.
- Bullying in schools is a major traumatic experience: 1 in 5 (19.5%) secondary school students reported being bullied at school since the start of the 2018-2019 school year, similar to the Ontario average.

HEALTHY LIVING

HIGHLIGHTS

- Just over half (51.7%) of Hamilton adults report meeting recommended physical activity levels, but this trend appears to be decreasing. Physical activity levels are lower for females and older age groups.

- Less than one in five (18.5%) Hamilton residents report eating vegetables and fruits five or more times per day. Frequency of vegetable and fruit consumption is low across all sex and age groups in Hamilton.

- Over one in three (35.4%) Hamilton adults were categorized having a body mass index of 30 or over in 2019-2020, which was considerably greater than the Ontario average. Since 2015-2016, females and adults aged 18-44 years in Hamilton appear to have experienced the greatest rise in body mass index.

- Around one in six (15.9%) Hamilton residents report having trouble going to sleep or staying asleep most of the time.

- Over 70% of Hamilton residents report appropriately protecting themselves from the sun during peak hours, but this is lower for males and those under 65 years old.

HEALTHY LIVING

PHYSICAL ACTIVITY

Physical activity is important to overall health. The Canadian Physical Activity Guidelines recommend that adults (age 18+) get at least 150 minutes (2.5 hours) of moderate- to vigorous-intensity aerobic physical activity per week.

Among Hamilton adults, 51.7% reported meeting this recommendation in 2020. When age is taken into consideration, Hamilton's rate appears to be decreasing over time and was similar to the Ontario average (Figure 12.1).

The percent of Hamilton adults who meet the recommended physical activity levels differs by sex and age (Figure 12.2). Females reported lower physical activity levels, and this activity decreased year-over-year from 2015-2020. Physical activity levels are also lower among older age groups. There is notable decline within all age groups from 2015-2020 in Hamilton.

Figure 12.1: Self-reported physical activity at or above recommended level from the Canadian Physical Activity Guidelines, Hamilton and Ontario adults age 18+ (age-standardized), 2015-16 – 2020
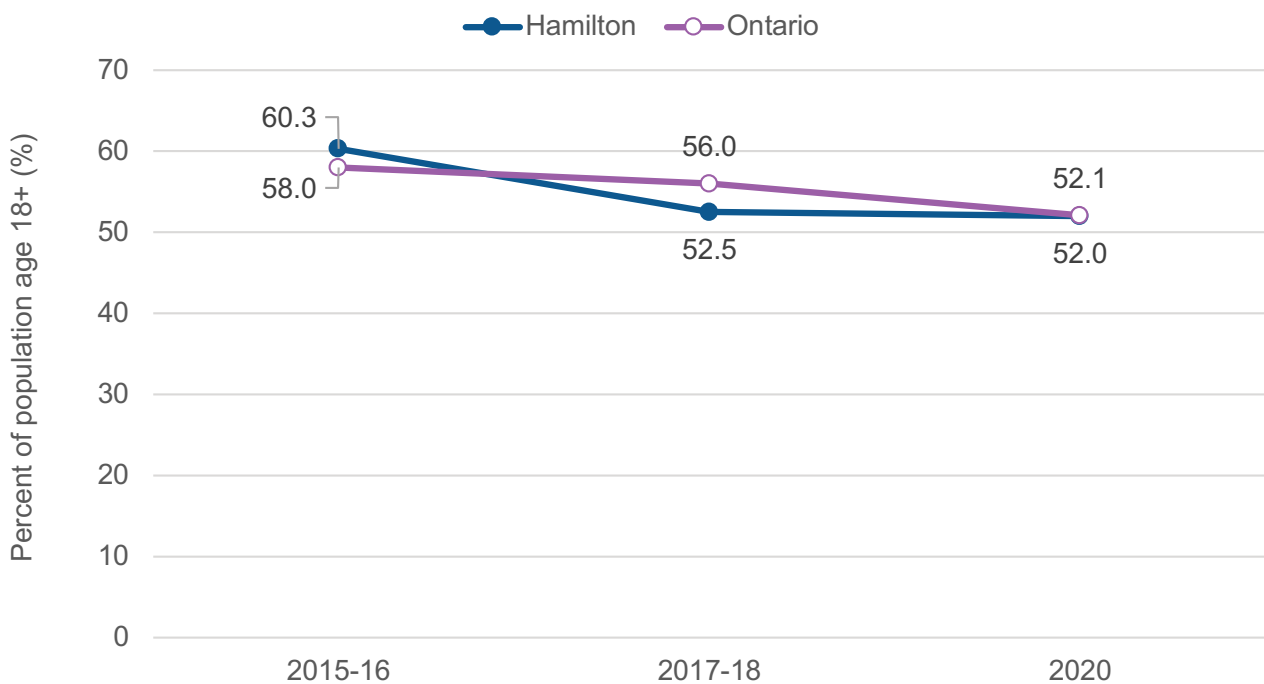
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: physical activity snapshot. Toronto, ON: King's Printer for Ontario.

Figure 12.2: Self-reported physical activity at or above recommended level from the Canadian Physical Activity Guidelines by age and sex, Hamilton adults age 18+ (age-standardized and age-specific), 2015-16 – 2020
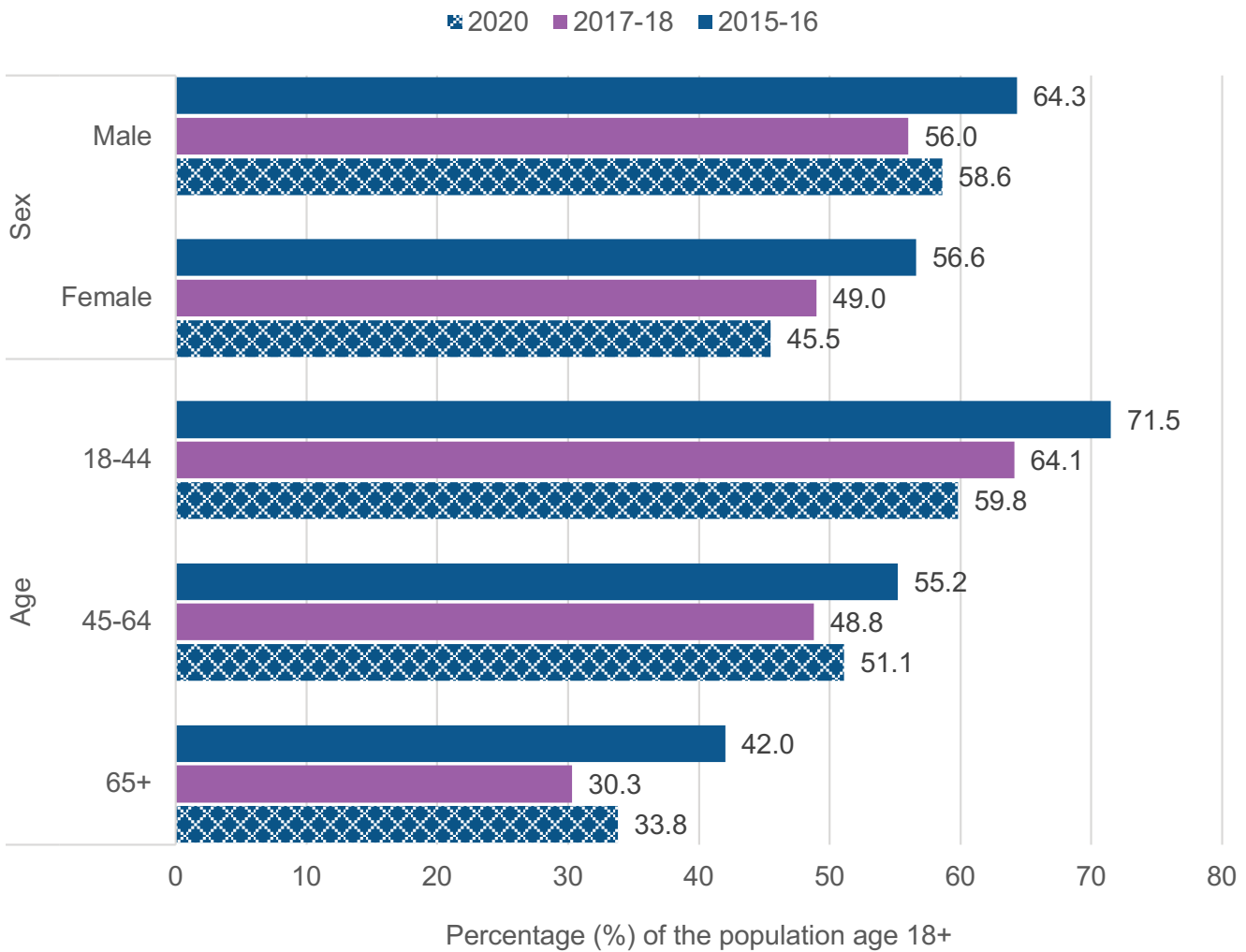
Legend: 2020 · 2017-18 · 2015-16

Sex

Male
- 2015-16: 64.3
- 2017-18: 56.0
- 2020: 58.6

Female
- 2015-16: 56.6
- 2017-18: 49.0
- 2020: 45.5

Age

18-44
- 2015-16: 71.5
- 2017-18: 64.1
- 2020: 59.8

45-64
- 2015-16: 55.2
- 2017-18: 48.8
- 2020: 51.1

65+
- 2015-16: 42.0
- 2017-18: 30.3
- 2020: 33.8

Percentage (%) of the population age 18+

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: physical activity snapshot. Toronto, ON: King's Printer for Ontario.

VEGETABLE AND FRUIT CONSUMPTION

Vegetables and fruits are a critical part of a healthy diet but measuring a community's food intake can be challenging. One simplified way is to survey people about how often they eat vegetables and fruits (see Figure 12.3) instead of the amount (servings) consumed.

Although frequency of vegetable and fruit consumption is linked to overall diet quality, this surveying approach does not provide the fuller picture of nutrient intake in the population. In 2020, about 1 in 5 (18.5%) Hamilton residents reported consuming vegetables and fruits five or more time per day. When age is taken into consideration, Hamilton's rate was similar to the Ontario rate and the frequency of vegetable and fruit consumption appears to have decreased across both Hamilton and Ontario from 2015-2020.

The percent of Hamilton residents who consumed vegetables and fruits five or more time per day was low across all groups, particularly for males (Figure 12.4).

Figure 12.3: Self-reported prevalence of consumption of vegetables and fruits five or more times per day, Hamilton and Ontario residents age 12+ (age-standardized), 2015–2020
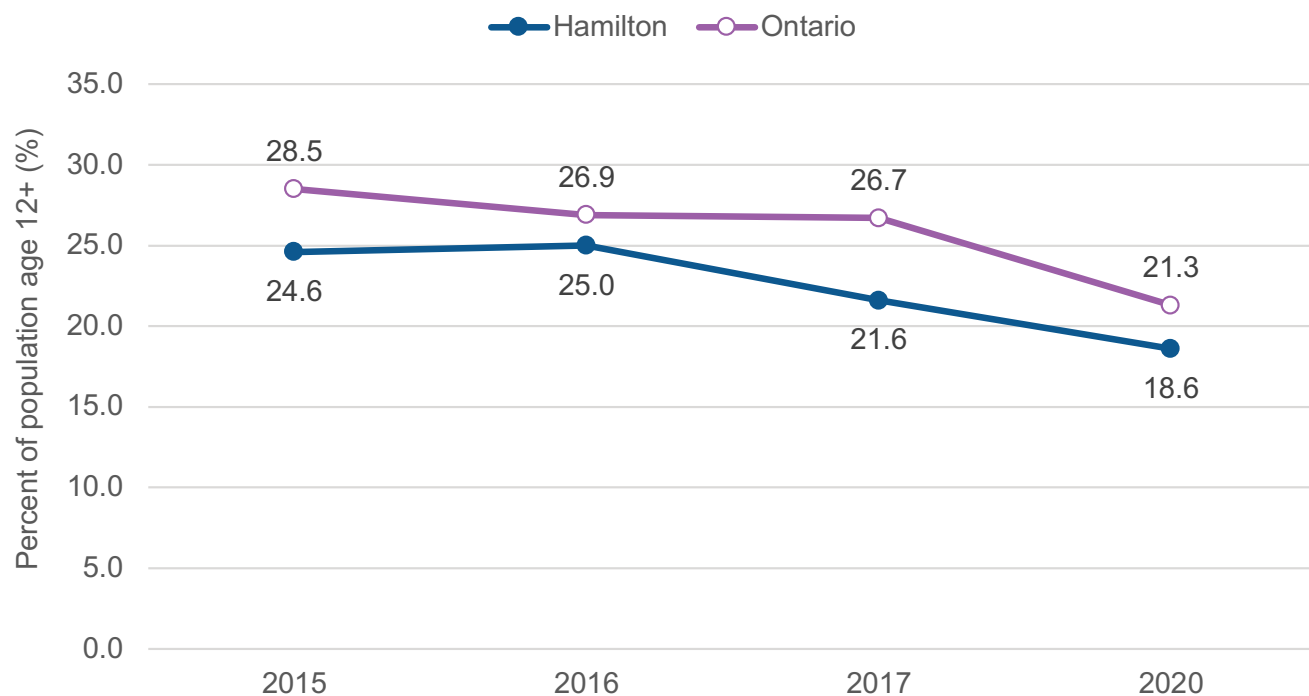
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: nutrition and healthy weights snapshot. Toronto, ON: King's Printer for Ontario.

Figure 12.4: Self-reported prevalence of consumption of vegetables and fruits five or more times per day by age and sex, Hamilton residents age 12+ (age-standardized and age-specific), 2015–2020
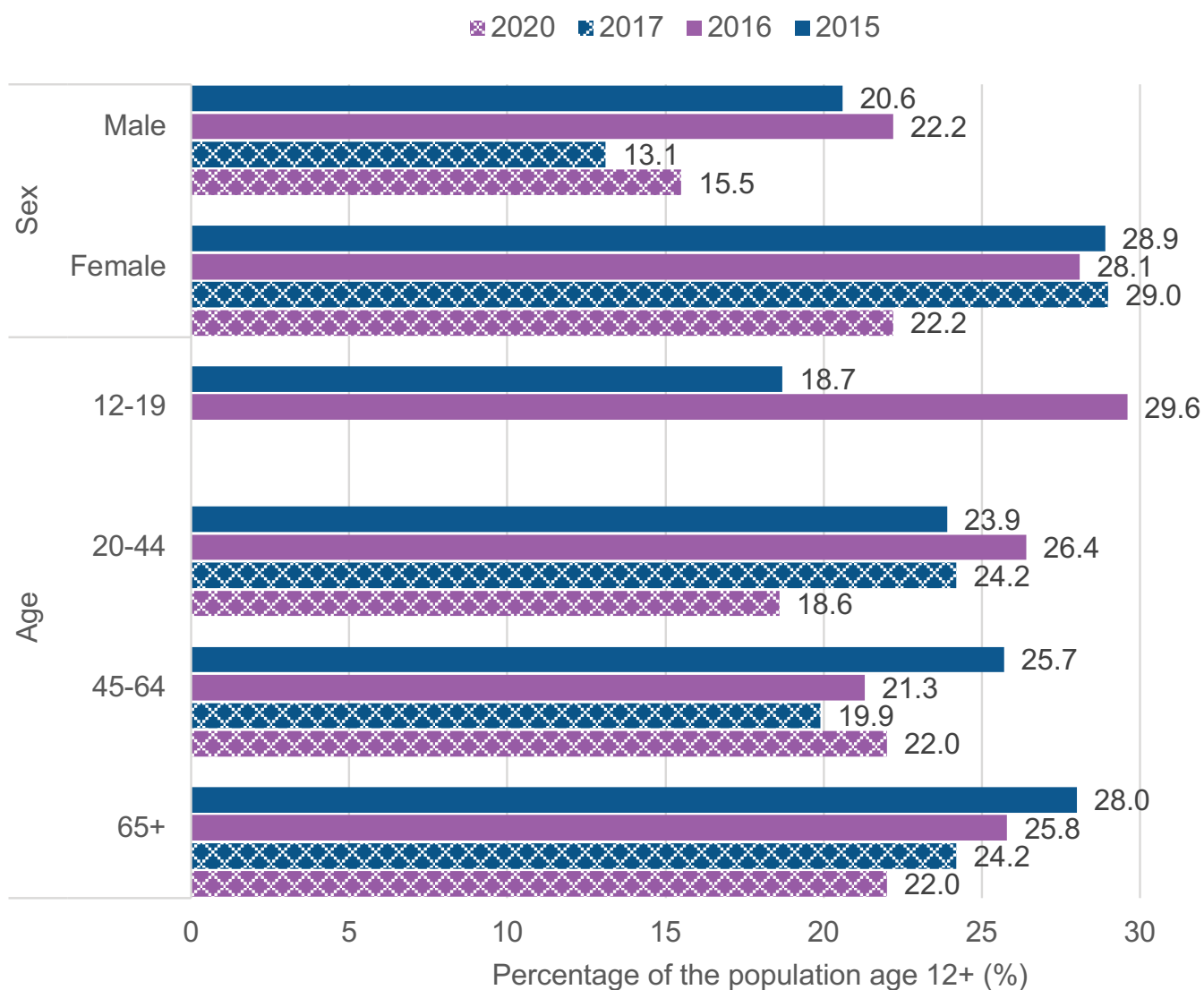
Legend: 2020 · 2017 · 2016 · 2015

Sex

Male
- 2015: 20.6
- 2016: 22.2
- 2017: 13.1
- 2020: 15.5

Female
- 2015: 28.9
- 2016: 28.1
- 2017: 29.0
- 2020: 22.2

Age

12-19
- 2015: 18.7
- 2016: 29.6

20-44
- 2015: 23.9
- 2016: 26.4
- 2017: 24.2
- 2020: 18.6

45-64
- 2015: 25.7
- 2016: 21.3
- 2017: 19.9
- 2020: 22.0

65+
- 2015: 28.0
- 2016: 25.8
- 2017: 24.2
- 2020: 22.0

X-axis: Percentage of the population age 12+ (%) — 0, 5, 10, 15, 20, 25, 30

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: nutrition and healthy weights snapshot. Toronto, ON: King's Printer for Ontario.

Note: Data for age group 12-19 was suppressed for 2017 and 2020 due to data quality issues.

BODY MASS INDEX

Body mass index (BMI) is a measure of a person's weight relative to their height. It is often used as an epidemiological measure to estimate population health risk.[69] At a population level, high BMI is correlated with body fat, metabolic conditions, disease outcomes and health risk.

BMI has been the preferred indirect measure of excess body fat for population-level surveillance. That is because it is an inexpensive and easy approach, where a person can self-report in a survey. However, the use of BMI has several limitations:

BMI is not a direct measure of body composition, nor does it allow us to distinguish between fat mass and muscle mass.

At the individual level, BMI does not conclusively determine a person's body composition or health. That can only happen through more direct measurement and diagnoses by a qualified health professional.

BMI was developed using the anthropometric data of white members of a population, mainly of European and American origin. It may not be suited for all ethnic groups, especially those who have higher risks at a lower BMI.[70]

BMI is reported using the following numerical categories[71]:

- BMI less than 18.5
- BMI range of 18.5 to 24.9
- BMI range of 25 to 29.9
- BMI 30 and over

Figure 12.5: Self-reported prevalence of body mass index ≥30, Hamilton and Ontario adults age 18+ (age-standardized), 2015-16 – 2019-20
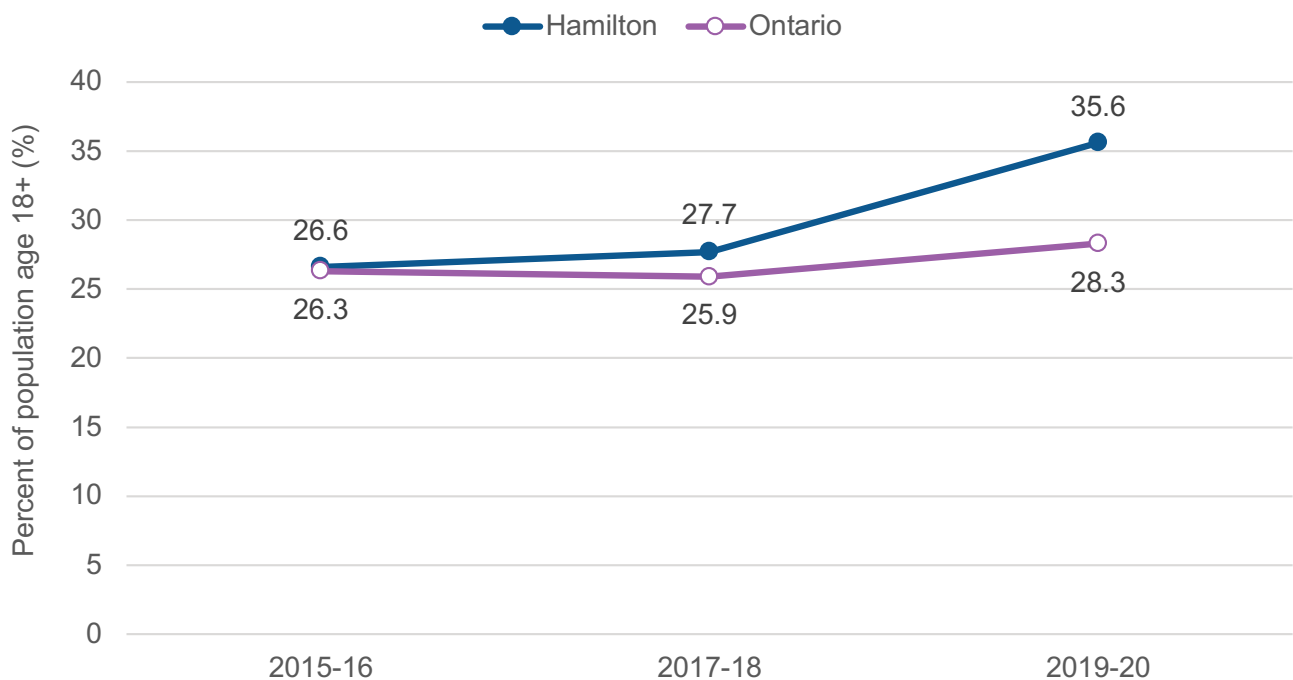
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: nutrition and healthy weights snapshot. Toronto, ON: King's Printer for Ontario.

Note: These results include an adjustment during analysis to correct for survey respondents who systematically overestimate or underestimate their height and weight.

This report focuses on the category of BMI of 30 and over. During analysis, a correction was applied for survey respondents who systematically overestimate or underestimate their height and weight.

Over one in three (35.4%) Hamilton adults were categorized as having a BMI of 30 or greater in 2019-2020. When age is taken into consideration, Hamilton's rate was greater than the Ontario average (Figure 12.5).

Compared to other large municipal areas in Ontario, Hamilton had one of the highest rates of adults with a BMI of 30 or greater in 2019-2020. The rate of Hamilton adults with a BMI of 30 or greater appears to have increased since 2015-2016.

Figure 12.6: Self-reported prevalence of body mass index ≥30 by age and sex, Hamilton adults aged 18 and older (age-standardized and age-specific), 2015-16 – 2019-20
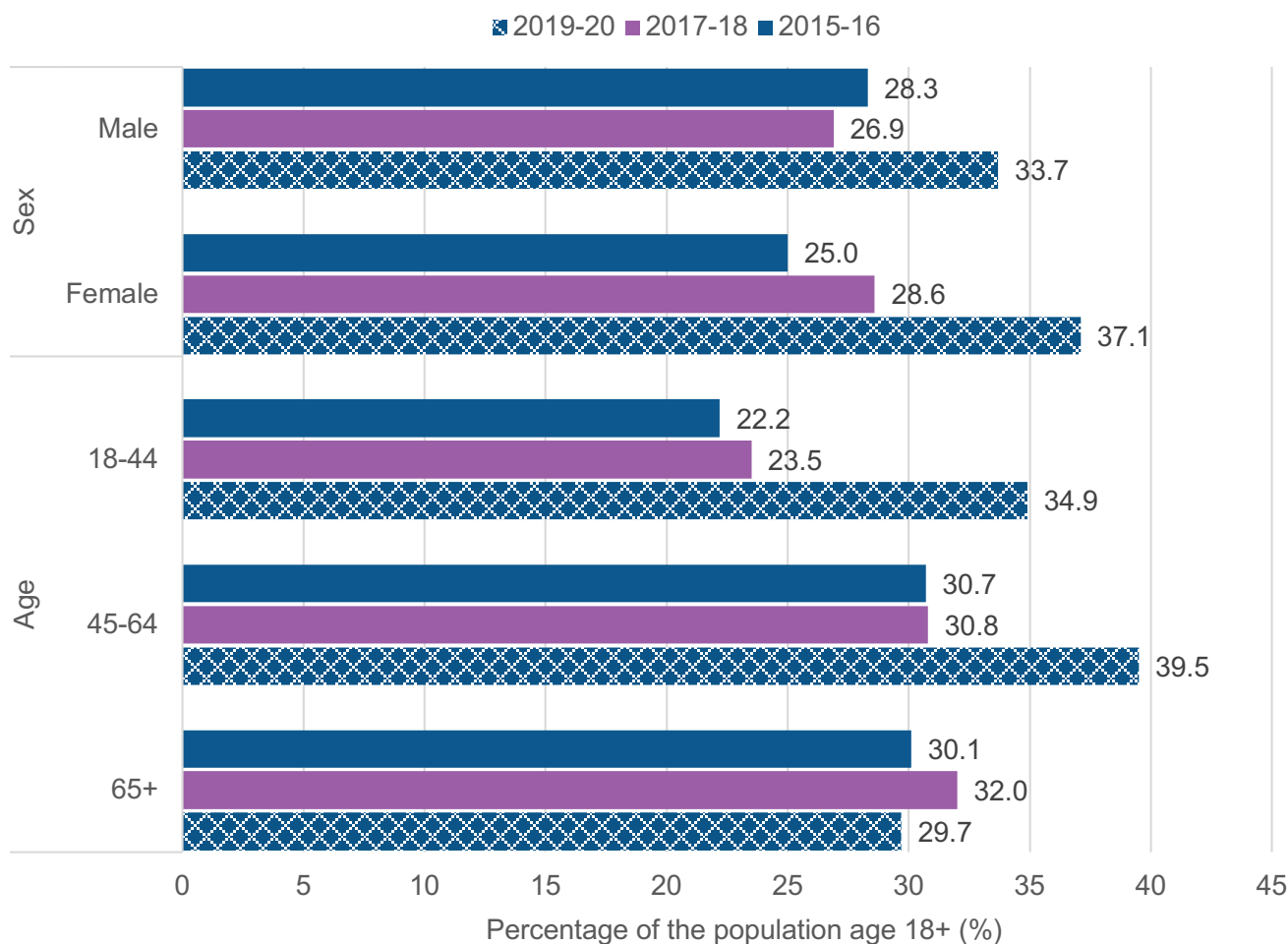
Legend: 2019-20, 2017-18, 2015-16

Sex
- Male: 2015-16 = 28.3; 2017-18 = 26.9; 2019-20 = 33.7
- Female: 2015-16 = 25.0; 2017-18 = 28.6; 2019-20 = 37.1

Age
- 18-44: 2015-16 = 22.2; 2017-18 = 23.5; 2019-20 = 34.9
- 45-64: 2015-16 = 30.7; 2017-18 = 30.8; 2019-20 = 39.5
- 65+: 2015-16 = 30.1; 2017-18 = 32.0; 2019-20 = 29.7

X-axis: Percentage of the population age 18+ (%)

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: nutrition and healthy weights snapshot. Toronto, ON: King's Printer for Ontario.

Note: These results include an adjustment during analysis to correct for survey respondents who systematically overestimate or underestimate their height and weight.

The rates of Hamilton adults with a self-reported BMI of 30 or greater are shown in Figure 12.6 by age and sex groupings. Rates have risen across most groups. However, the greatest increases were observed for Hamilton females and Hamilton residents aged 18-44 years; both of these groups were greater than their Ontario comparators in 2019-2020.

These rates warrant further consideration to better understand the factors that may drive health inequalities. Interpreting BMI data requires consideration of several complex intersections: weight, biological and environmental factors, weight-based stigma and discrimination, healthcare inequalities, systematic racism, inadequate income and other social determinants of health.

Many negative outcomes that previous research has associated with excess weight (e.g., heart disease, high hemoglobin A1C levels) may be partially attributed to the emotional, psychological, and behavioural effects of weight bias.[72] Notably, pursuing a healthy lifestyle can happen at all body weights.

Figure 12.7: People who report having trouble going to sleep or staying asleep most of the time, Hamilton and Ontario residents age 12+, 2015-16
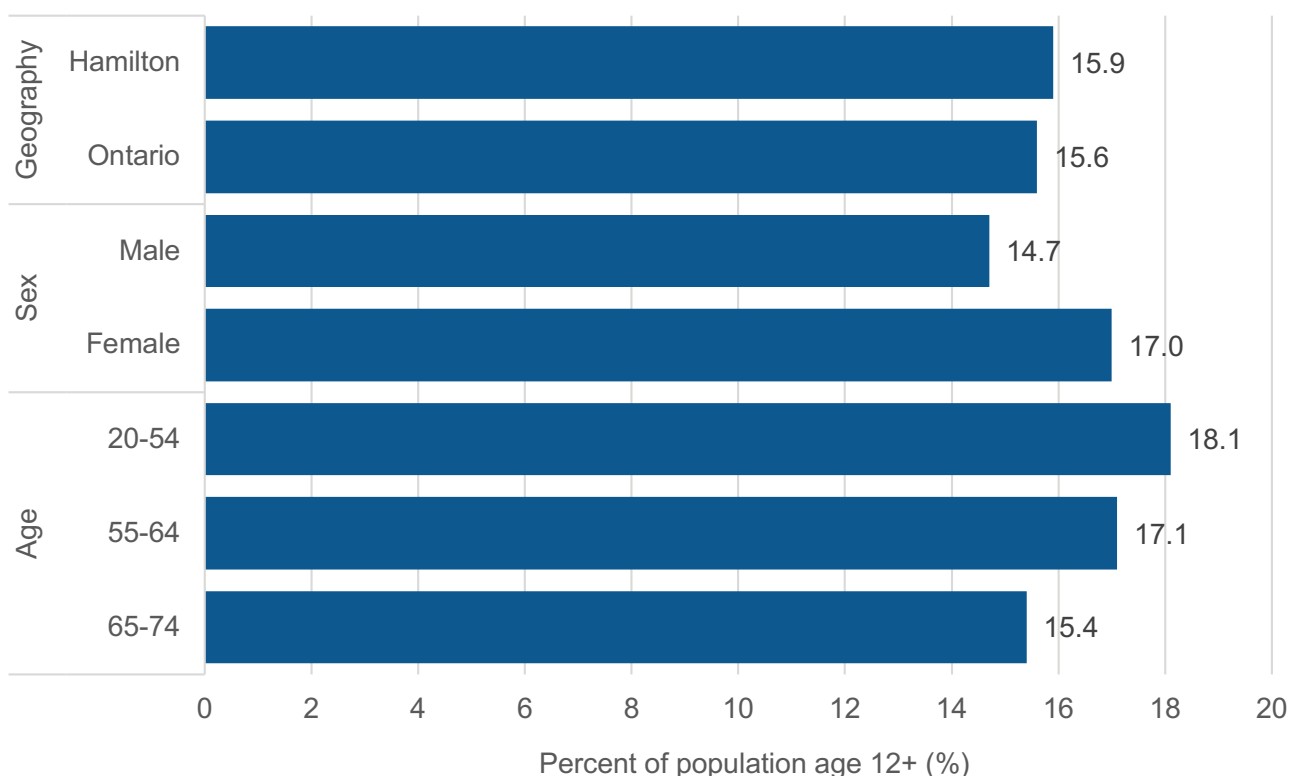
Source: Canadian Community Health Survey [2015-2016], Statistics Canada, Share File, Ontario Ministry of Health.

Notes:
- Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.
- Results for those aged 12-19 and aged 75 and older were not released because the estimates do not meet data accuracy standards.

SUN SAFETY

It is recommended to spend fewer than 30 minutes in the sun during peak hours, or to do at least one of the following: seek shade, wear protective clothing and a hat, or wear sunscreen SPF≥15 on your face and body.

Over 70% of Hamilton residents report appropriately protecting themselves from the sun during peak hours, as described above (Figure 12.8), similar to the Ontario average (72.0%). Among Hamilton residents, three groups were less likely to protect themselves: those who identified as male, youth aged 12-19 and adults aged 20-64.

SLEEP

Around one in six (15.9%) Hamilton residents report having trouble going to sleep or staying asleep most of the time (Figure 12.7), similar to the Ontario average (15.6%). This measure was relatively similar across age and sex groups in Hamilton.

Figure 12.8: People who report appropriately protecting themselves from the sun during peak hours, Hamilton and Ontario residents age 12+, 2015-16
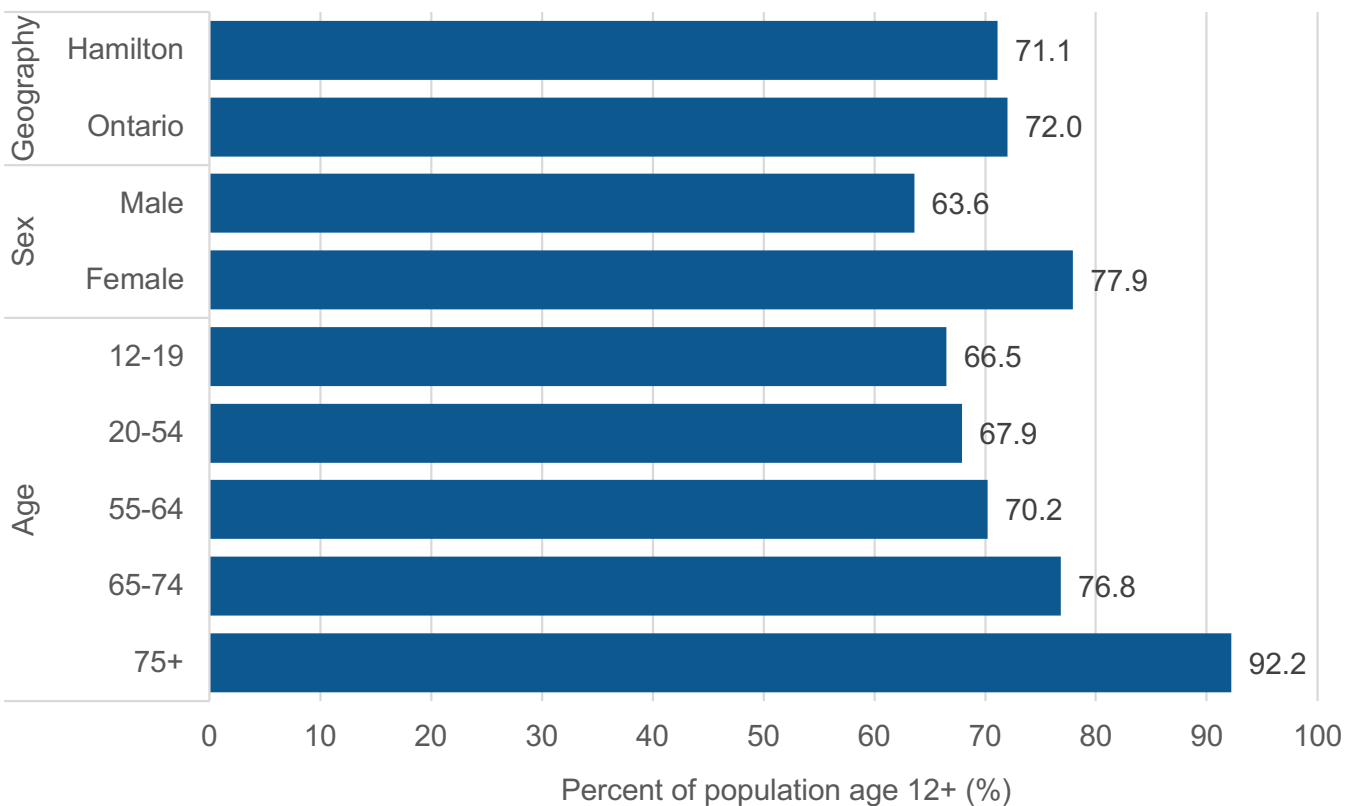
Source: Canadian Community Health Survey [2015-2016], Statistics Canada, Share File, Ontario Ministry of Health.

Note: Different age groups have different health experiences. These measures do not account for age differences within groups, over time, or compared to Ontario. These results may be due to underlying age structures and not risk or health outcomes.

CHAPTER 13

CHRONIC DISEASE

HIGHLIGHTS

- Chronic diseases represent a considerable preventable health burden on Hamilton residents.

- 129,578 Hamilton residents aged 20 and older had hypertension (high blood pressure) in 2020, a prevalence of 27%, putting them at risk for heart failure and ischemic heart disease.

- 61,954 Hamiltonians aged 20 and older had diabetes in 2020, with a prevalence of 13%, an increase since 2011. The rate of newly diagnosed cases among Hamiltonians in 2020 was higher than the Ontario rate.

- Deaths due to diabetes is nearly three times higher for Hamilton residents living in areas with the lowest income or the greatest core housing need.

- 40,217 Hamiltonians aged 20 and older were living with chronic obstructive pulmonary disease (COPD) in 2020. Incidence rates declined but continue to be higher than for Ontario overall.

- 26,700 Hamiltonians were living with some type of cancer in 2018 – a prevalence of 4.7%.

- Female breast cancer is the most common type of cancer. One out of every 50 female residents in Hamilton were living with breast cancer in 2018. Lung, colorectal and prostate cancer were the other three most common newly diagnosed cancers in 2018.

CHRONIC DISEASE

CHRONIC DISEASE OVERVIEW

Chronic diseases represent a considerable preventable health burden on Hamiltonians.

These are diseases that persist for a long time, generally progress slowly and can be treated but not cured.[73] Often, they require ongoing medical attention and may limit activities of daily living.

While there is variation in the use of the term[74], chronic diseases of public health importance include:

- cancer
- cardiovascular diseases
- diabetes
- intermediate health states such as metabolic syndrome and prediabetes
- hypertension
- respiratory diseases including chronic obstructive pulmonary disease (COPD) and asthma[75]

Dementia, mental illness and addictions are also considered chronic diseases of public health importance and are covered in Chapter 9.

Many factors contribute to chronic diseases. That includes several health behaviours (covered elsewhere in this report), and social circumstances (covered in Chapter 2).

For instance, evidence indicates that systematic discrimination and exclusion – due to colonialism, or an individual's race, gender, economic situation, sexual orientation or physical ability – affect the development of chronic diseases within specific groups. Social circumstances can also contribute to these groups' inequitable treatment within the health system.

Older adults generally have higher rates of preventable chronic diseases. This affects overall health for Hamiltonians and increases pressure on the health system. As Hamilton's population continues to age, it's important to maintain efforts in chronic disease prevention.

Among the ways of assessing the preventative portion of diseases: the number of premature deaths among those under 75 caused by a specific disease; and the total number of potential years of life lost (PYLL) attributed to those causes.

In 2021, the leading causes of premature death and PYLL among Hamilton residents under age 75 were:

- ischemic heart disease (219 premature deaths, 2,022 PYLL)
- cancer of the colon, rectum and anus (74 premature deaths, 809 PYLL)
- cerebrovascular diseases (56 premature deaths, 652 PYLL)
- diabetes (49 premature deaths, 608 PYLL)

Lung cancer and diabetes have had a reduction in premature deaths, while hypertensive disease showed an increase from 2012-2021 (Chapter 3: General Health, Figure 3.5). The remainder of this chapter outlines specific chronic diseases in order of their burden on Hamilton residents.

HYPERTENSION, HYPERTENSIVE DISEASE, AND ISCHEMIC HEART DISEASE

Hypertension, or high blood pressure, is one of the major risk factors for hypertensive disease. That includes heart failure and ischemic heart disease.

An estimated 129,579 Hamiltonians aged 20 and older were living with hypertension in 2020. That's a prevalence rate of 27,462.1 per 100,000 Hamiltonians, or approximately 27.5% of residents (Appendix Table 13.1). Prevalence rates were the same in males (27.5%) and females (27.5%).

Prevalence was much higher in older age groups. Over half of those 65-74 were living with hypertension (59.2%), as were 84.4% of those aged 75 and older (Appendix Table 13.1).

When age was taken into consideration, the prevalence rate in 2020 was higher for Hamilton residents (25,439.3 per 100,000), when compared to Ontario overall (25,165.9 per 100,000).

In 2020, there were 4,217 new cases (also known as incidence) of hypertension among Hamiltonians aged 20 and older, with a rate of 1,203.7 per 100,000 (Appendix Table 13.1). Males had a higher incidence rate (1,304.7 per

Figure 13.1: Hypertension incidence (new cases) by age groups and age-specific rate per 100,000, Hamilton residents, 2020
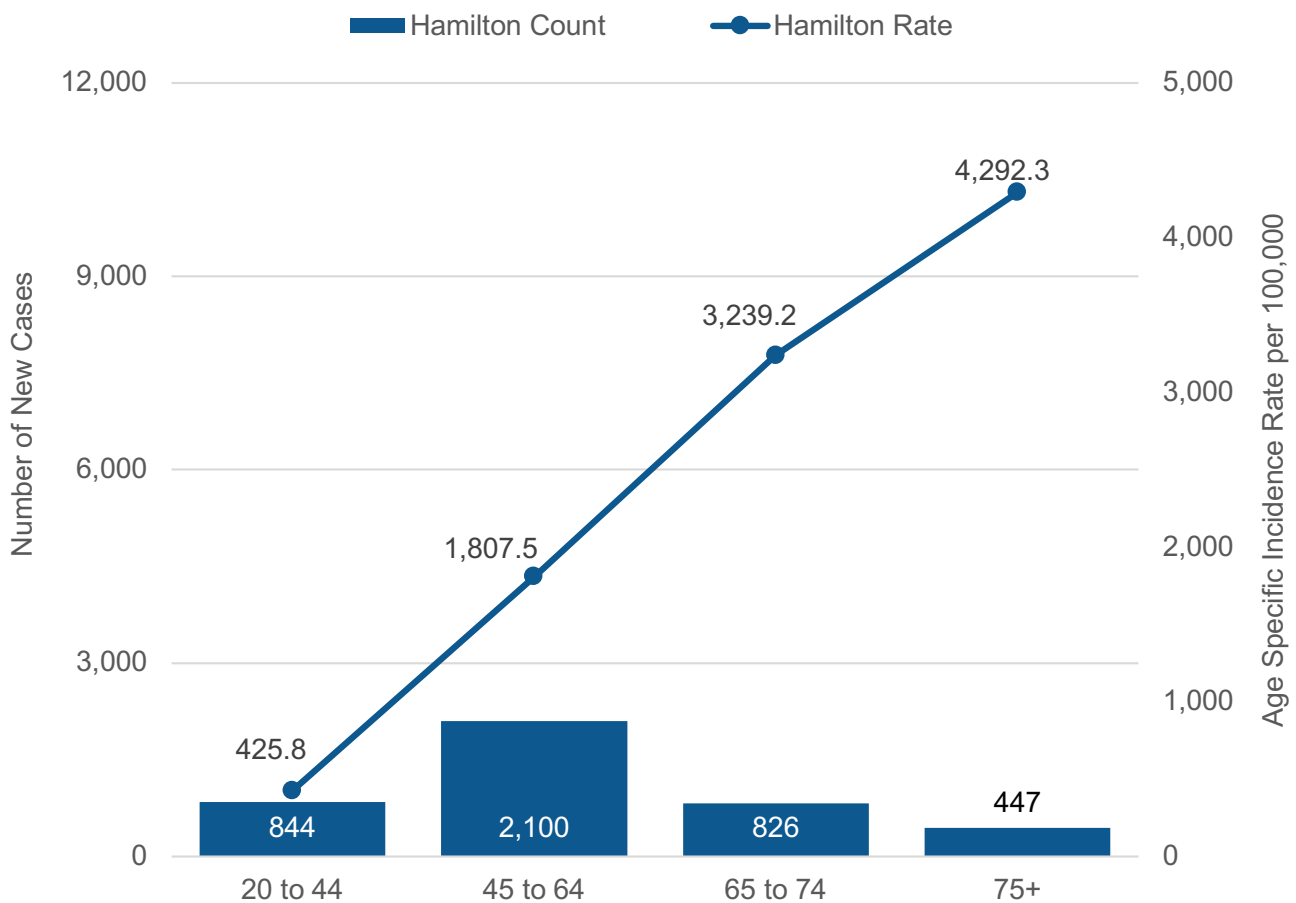
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot: incidence of hypertension, age specific rates 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16].
Available from: publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidence-prevalence

100,000) than females (1106.1 per 100,000) (Figure 13.1). Nearly half of all new cases were in those aged 45-64 (2,100 new cases). However, the highest rate was in residents aged 75 and older (4,292 per 100,000).

Incidence rates of hypertension declined overall among Hamilton residents aged 20 and older between 2011 (5,530 cases; 2,487.7 per 100,000) and 2020 (4,217 new cases; 1,565.7 per 100,000).

These rates were higher than Ontario overall from 2011-2016, then similar to Ontario from 2017-2020. We should interpret the 2020 results with caution due to changes in the availability of health care and health-seeking behaviour during the COVID-19 pandemic.

When assessing area-based inequality, Hamilton residents had higher rates of deaths due to hypertensive disease in 2018 that lived in (Appendix Table 13.2):

- areas with the greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of households that had a core housing need
- areas with a greater percentage of families with one-parent

Hamiltonians were almost two-and-a-half times more likely to die from hypertensive disease in the lowest-income quintile areas as compared to the highest-income areas.

Similarly, Hamiltonians from the areas with the highest core housing need were more than twice as likely to die from hypertensive disease as compared to the areas with the lowest core housing needs.

There were similar inequalities in deaths due to ischemic heart disease. Hamilton residents from the areas with the highest core housing need were more than twice as likely to die from

this disease compared to those from the areas with the lowest housing needs. And those in the lowest income areas were nearly twice as likely to die from ischemic heart disease. Inequalities also existed for family structure, i.e., being a family with one-parent.

DIABETES

Diabetes is one of the more burdensome health outcomes for Hamiltonians. An estimated 61,954 Hamiltonians aged 20 and older were living with diabetes in 2020, or approximately 13.1% of the population (Appendix Table 13.3).

Males have a higher overall prevalence (13.9%) of diabetes than females (12.4%). Prevalence was also higher in older age groups; in Hamilton over one-quarter (28.3%) of those aged 65-75 and over one-third (35.5%) of those 75 and older were living with diabetes.

When age was taken into consideration, the prevalence rate increased in Hamilton and Ontario from 2011-2020. For Hamiltonians it was 10,806.2 per 100,000 in 2011 and 12,295.1 per 100,000) in 2020 (similar to Ontario's prevalence rate of 12,273 per 100,000).

In 2020, there were 3,586 new cases of diabetes among residents in Hamilton. (Appendix Table 13.3). Males had a higher incidence rate in 2020 (916.1 per 100,000) than females (812.9 per 100,000).

There were also differences by age groups. The highest number of new cases of diabetes was among those aged 45-64 (1,580), while the highest incidence rates of diabetes overall was among those aged 65-75 (1,877 per 100,000) and 75 and older (1,558.3 per 100,000) (Figure 13.2).

Figure 13.2: Diabetes incidence (new cases) by age groups and age-specific rate per 100,000, Hamilton residents, 2020

Legend: Hamilton Count ▬ Hamilton Rate ●

Data points (Hamilton Rate):
- 20 to 44: 348.5
- 45 to 64: 1,131.8
- 65 to 74: 1,876.8
- 75+: 1,558.3

Hamilton Count:
- 20 to 44: 700
- 45 to 64: 1,580
- 65 to 74: 815
- 75+: 491

Y-axis left: Number of New Cases (0 to 8,000)
Y-axis right: Age Specific Incidence Rate per 100,000 (0 to 2,000)
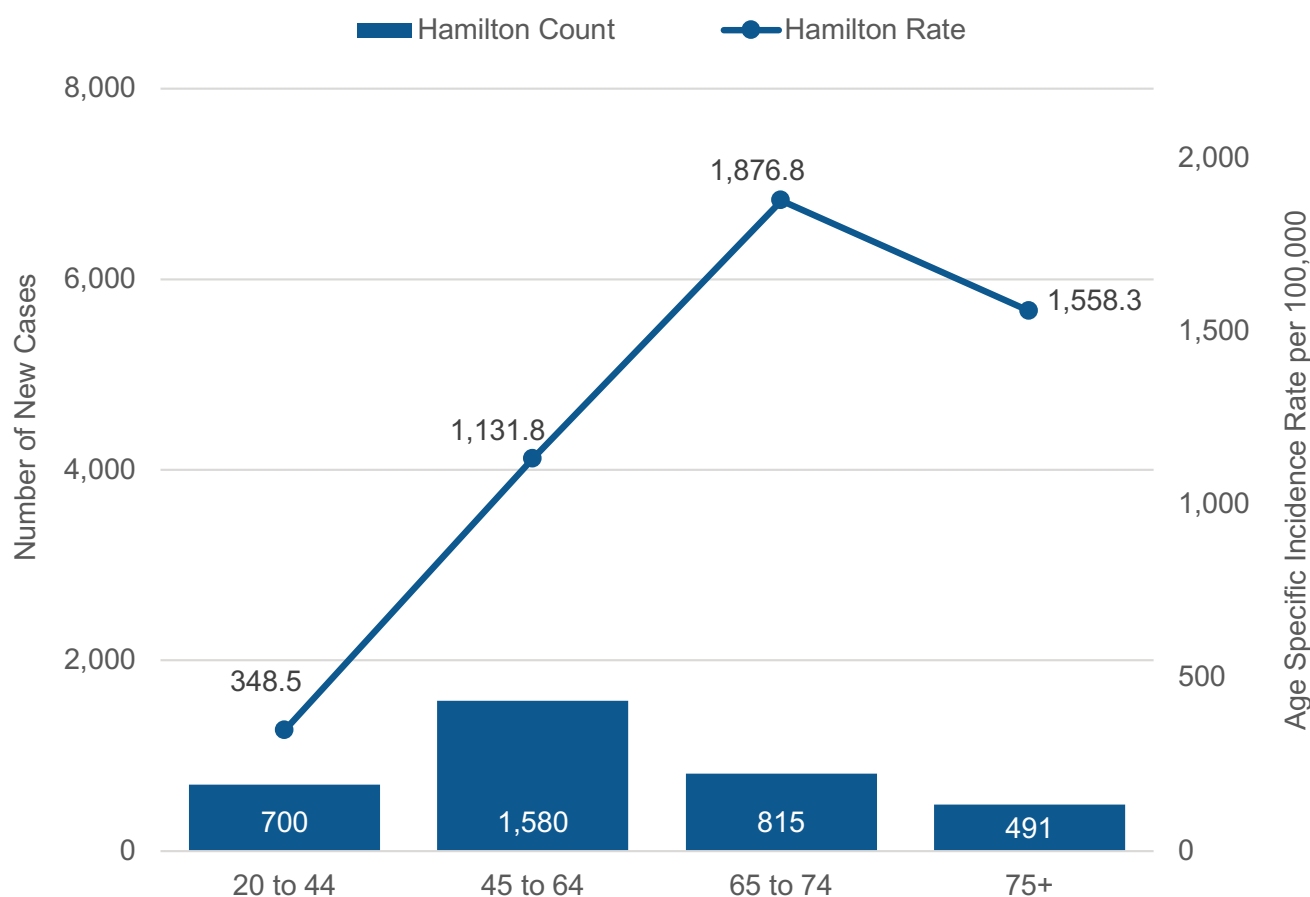
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot: incidence of diabetes, age specific rates 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16].
Available from: publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidenceprevalence

When age was taken into consideration, Hamilton residents aged 20 and older had a higher incidence rate of diabetes in 2020 (896.9 per 100,000) compared to the Ontario rate (794.1 per 100,000). That was up from 813.7 per 100,000 population in 2012 for Hamilton residents. Rates were likely influenced during the pandemic due to changes in the availability of health care and health-seeking behaviours.

When assessing area-based inequality for 2018, there were higher rates of deaths due to diabetes among Hamilton residents who lived in (Appendix Table 13.2):

- areas with the greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of households that had a core housing need
- areas with a greater percentage of families with one-parent
- areas with the greatest percentage of individuals with no high school diploma or equivalent

Hamilton residents were nearly three times more likely to die from diabetes in the lowest-income quintile areas compared to the highest-income quintile areas.

Similarly, people living in the areas of Hamilton with the highest housing need were nearly three times more likely to die from diabetes compared with the areas with the lowest housing need.

This area-level analysis did not find significant differences in deaths due to diabetes for self-identified racialized groups (which did not include Indigenous populations). This analysis is limited in its ability to assess the independent impact of belonging to specific racialized groups when other factors such as age structure or income are controlled. However, compelling research indicates that South Asian, and Black populations, when assessed on an individual level, have higher levels of diabetes[76-77].

Analysis of hospitalizations for diabetes from 2019-2021 also indicate that rates among Hamilton residents were higher than for Ontario as a whole. Those in the areas with the lowest-income quintile were also over three times more likely to be hospitalized for diabetes than those in the highest-income quintile areas.

Similarly, those living in the areas with the greatest level of core housing need were over three times more likely to be hospitalized for diabetes than those in areas with the lowest quintile of core housing needs (data not shown).

ASTHMA

An estimated 80,416 or 13.4% of Hamiltonians were living with asthma in 2020 (13,394.2 per 100,000) (Appendix Table 13.4). Females had a higher prevalence rate (13.9%) of asthma than males (12.9%). Prevalence was also higher in those aged 20-44 (16.8%) compared with other age groups (Figure 13.3).

When age was taken into consideration, the prevalence rate for asthma in 2020 was lower for Hamilton residents (13,430.3 per 100,000) compared to Ontario overall (14,975.1 per 100,000 population, not shown).

In 2020, 1,365 new cases of asthma were diagnosed among Hamilton residents. The rate of newly diagnosed cases of asthma was 254.4 per 100,000 (Appendix Table 13.4). Incidence rates were similar for males and females.

From 2011 (2,240 cases; 429.9 per 100,000) to 2020 (1,365 cases; 250.7 per 100,000) the incidence of asthma decreased overall among Hamilton residents when age is taken into consideration.

Each year from 2011-2016, Hamilton residents had lower incidence rates of asthma than Ontario, when age was considered. Then, in 2020, Hamiltonians had a higher rate (250.7 per 100,000) than Ontario (223.1 per 100,000). Interpret the 2020 results with some caution due to changes in the availability of health care and health- seeking behaviour during the COVID-19 pandemic. However, the difference between the rates of newly reported cases in Hamilton residents and Ontario residents had begun to change before the pandemic.

Figure 13.3: Asthma incidence (new cases) by age groups and age-specific rate per 100,000, Hamilton residents, 2020

Legend: Hamilton Count (bar), Hamilton Rate (line)

Number of New Cases / Age Specific Incidence Rate per 100,000

Age Group	Count	Rate
0 to 19	469	34.4
20 to 44	351	25.7
45 to 64	318	23.3
65 to 74	137	10.0
75+	90	6.6
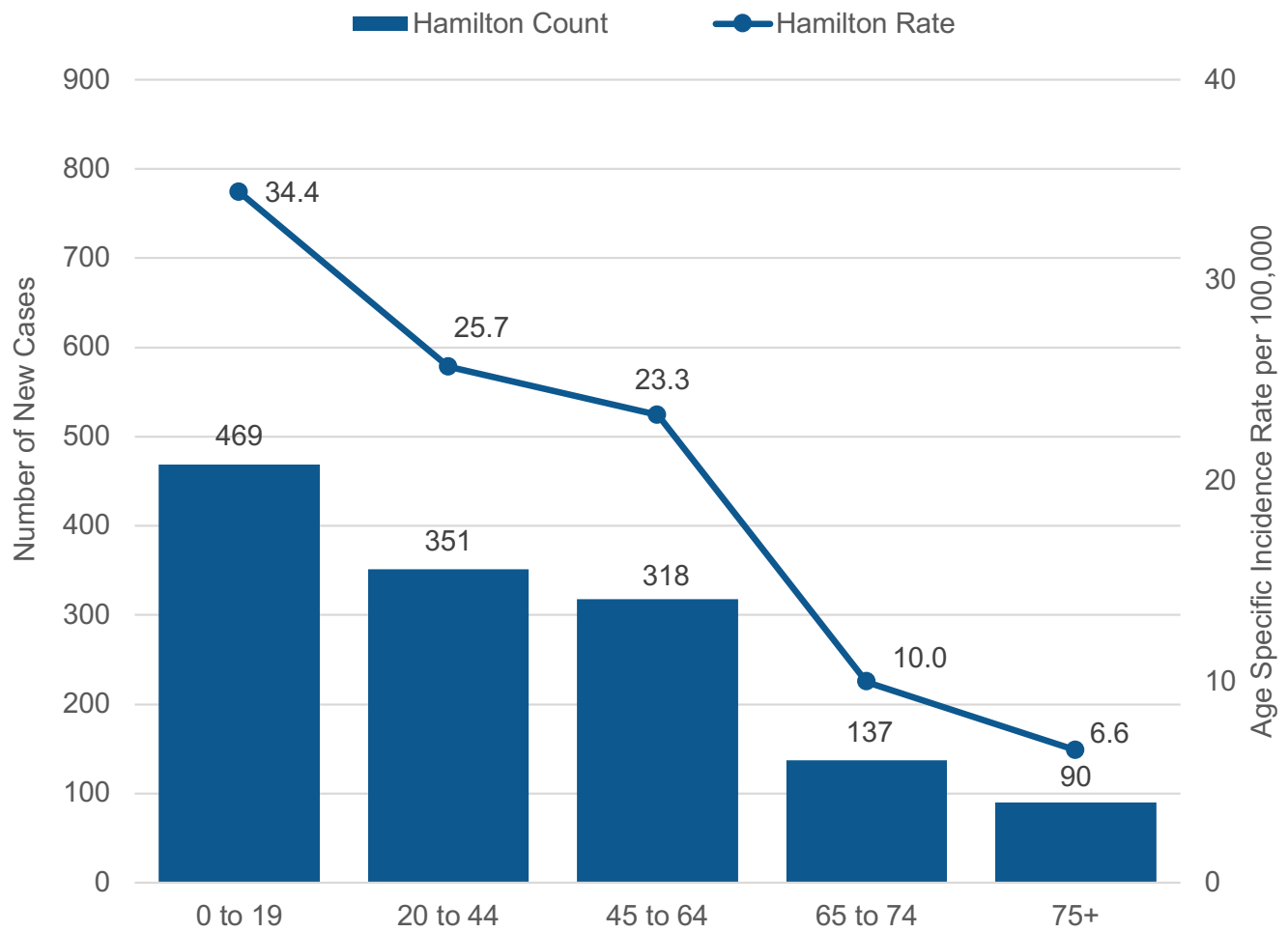
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot, incidence of asthma, age specific rates 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16].
Available from: publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidenceprevalence

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

An estimated 40,217 Hamilton residents aged 20 and older were living with chronic obstructive pulmonary disease (COPD) in 2020. That's a rate of 8,523.3 per 100,000 Hamiltonians, or approximately 8.5% of the population (Appendix Table 13.5).

Males have a higher prevalence rate of COPD than females. Prevalence was also higher in older age groups. Nearly a quarter of those aged 75 and older were living with COPD in 2020 (23,516.7 per 100,000 Hamilton residents).

When age was taken into consideration, the prevalence rate in 2020 was higher in Hamilton (7,950.4 per 100,000) when compared to Ontario overall (7,453.7 per 100,000 population).

Among residents aged 20 and older in 2020, the number of newly diagnosed cases (incidence of COPD) was 1,671 (Appendix Table 13.5). As with prevalence of COPD, males have a higher incidence rate than females (Figure 13.4).

When age is taken into consideration, incidence rates of COPD declined overall among Hamiltonians aged 20 and older between 2011 (2,930 cases; 752.6 per 100,000) and 2020 (1,671 cases; 384.2 per 100,000) (Appendix Table 13.5).

Interpret the 2020 results with some caution due to changes in the availability of health care and health-seeking behaviour during the COVID-19 pandemic. However, the decline began before the pandemic for both males and females, in Hamilton and for Ontario (Figure 13.4).

Despite these declines, Hamilton residents aged 20 and older continued to have higher incidence rates than Ontario in each year from 2011 to 2020 when age is considered.

Figure 13.4: Chronic obstructive pulmonary disease, new cases by sex, age- standardized rate per 100,000, Hamilton and Ontario Residents aged 20 and older, 2011-2020

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Hamilton males	851.8	756	780.4	748	695.7	726.7	643.8	644.4	559.9	452.9
Ontario males	756.8	720	716.7	690.3	670.1	637.2	624	572	525.2	378.8
Hamilton females	727	667.3	635.9	629.2	609	605.6	547.5	519.8	452.9	332
Ontario females	614.5	589.6	573.5	556.3	530.4	511.3	493.2	460.7	414.3	305

Source: ICES Chronic Disease Derived Cohorts, 2011 to 2020, Date received: August 31, 2022. Distributed by Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot: prevalence/incidence of COPD–crude and age specific rates (both sexes) 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16]. Available from: www.publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidenceprevalence

CANCER OVERVIEW

Almost 1 in 20 Hamiltonians (4.7%), or approximately 26,700 people, were living with some type of cancer in 2018. This percentage was the same as Ontario overall (4.7%).

The number of people living with cancer is known as cancer prevalence. It includes people who:

- are under active treatment for cancer
- recently completed their primary treatment
- are long-term survivors or "living free" of cancer

Prevalence is estimated on the number of people diagnosed with cancer in the previous 30 years and still alive on January 1, 2019.

Overall, an estimated 3,580 Hamiltonians were newly diagnosed with cancer in 2018.

The annual rate of newly diagnosed cases is known as incidence rate. Generally, this rate was similar among Hamilton and Ontario residents between 2010 and 2016 (after underlying age and sex differences in the populations were held constant, so that they could not influence the comparison). However, in 2017 the age- standardized cancer incidence rate among Hamilton residents was higher than the Ontario rate. It remained elevated in 2018, the most recent year where data is available (Figure 13.5)

Cancer incidence varied by sex. (Male and female counts and rates are based on the sex as provided by Ontario Health the data distributor rather than gender identity which was not available.) Figure 13.6 indicates the incidence rates within age groups for males and females.

- Overall cancer incidence counts were similar for males (1,790) and females (1,785) in 2018.
- There is a greater number of older female than male residents in Hamilton, which affects rates. Accounting for differences in the age structure of males and females in Hamilton, males had a higher age standardized cancer incidence rate (609.9 per 100,000) than females (542.9 per100,000).
- Males generally have higher rates than females in the older age groups (60 and older).
- Females have higher rates in the younger age groups (40-49 and 50-59) largely due to earlier diagnoses of breast cancer.

Figure 13.5: Cancer incidence, new cases and age-standardized rate per 100,000, Hamilton and Ontario residents, 2010-2018
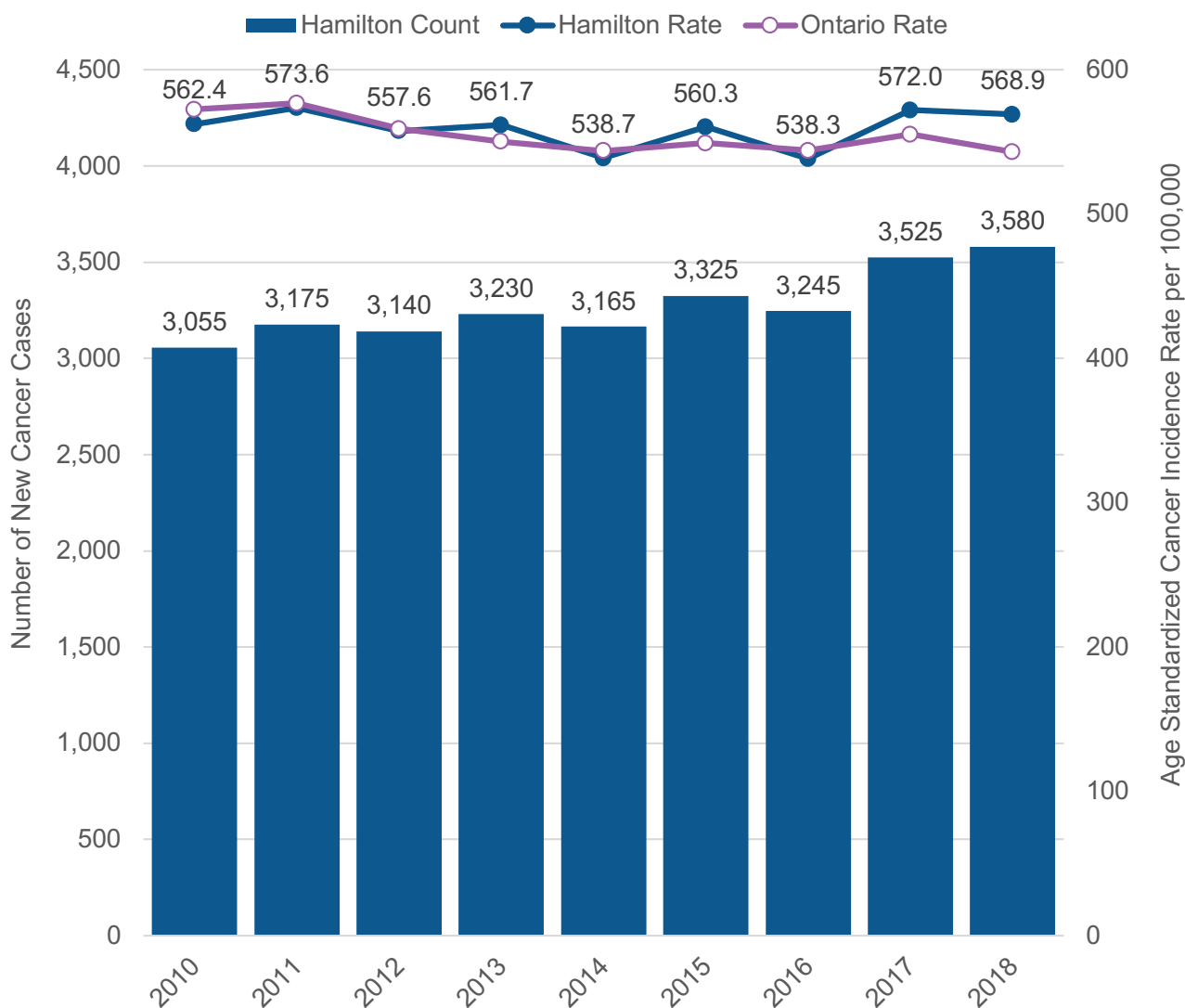
Legend: Hamilton Count, Hamilton Rate, Ontario Rate

Hamilton Rate values: 562.4, 573.6, 557.6, 561.7, 538.7, 560.3, 538.3, 572.0, 568.9

Hamilton Count values: 3,055 (2010), 3,175 (2011), 3,140 (2012), 3,230 (2013), 3,165 (2014), 3,325 (2015), 3,245 (2016), 3,525 (2017), 3,580 (2018)

Source: Cancer Incidence 2010-2018. Ontario Cancer Registry SEER*Stat Package - Release 12 - OCR (March 2021) Available from: https://www.cancercareontario.ca/en/data-research/view-data/cancer-statistics/ontario-cancer-profiles and Statistics Canada. Table 17-10-0005-01 Population estimates on July 1st, by age and sex [Internet]. Ottawa (CA): Government of Canada; 2020 Sept 29 [cited 2021-01-21]. Available from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501

Note: Counts of people newly diagnosed with cancer were randomly rounded at the source to multiples of 5 to protect personal health information. Due to this rounding, subgroup totals may not equal total counts.

Figure 13.6: Cancer incidence, age- and sex-specific rates, Hamilton residents aged 40 and older, 2018
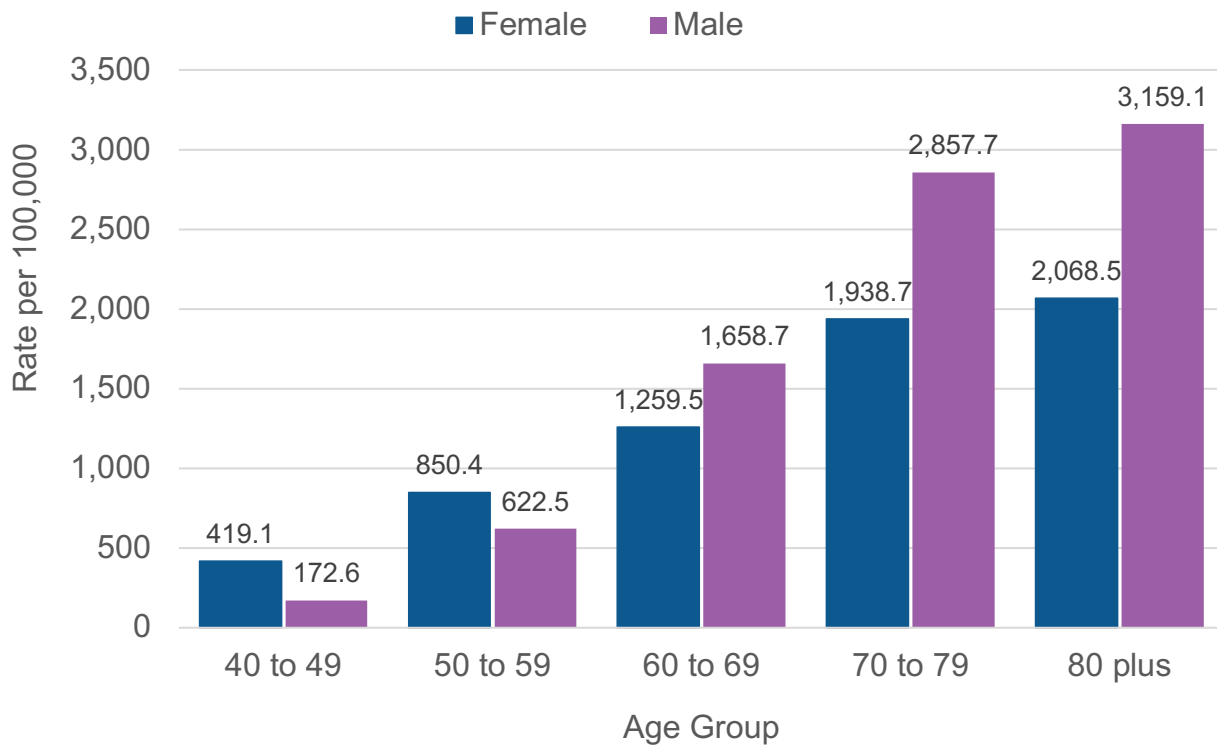
Source: Cancer Incidence 2018. Ontario Cancer Registry SEER*Stat Package - Release 12 - OCR (March 2021) Available from: https://www.cancercareontario.ca/en/data-research/view-data/cancer-statistics/ontario-cancer-profiles

Notes:
Female and male sex terms refer to the sex that is recorded in the Ontario Cancer Registry.
Incidence rates in those younger than 40 are not shown due to small counts by age group.

COMMON CANCER TYPES

Table 13.1 provides cancer prevalence by type for Hamiltonians. The greatest number of people were living with the following four cancers in 2018:

- breast cancer
- prostate cancer
- colorectal cancer
- melanoma

Table 13.2 provides the cancer incidence by type for Hamiltonians including comparisons to Ontario taking age structures into

consideration. Among newly diagnosed cancer in 2018, the four most common were:

- breast cancer (475 new cases)
- lung cancer (460 new cases)
- colorectal cancer (375 new cases)
- prostate cancer (365 new cases)

The difference between incidence (newly diagnosed cases) and prevalence (number of people living with cancer) is influenced by cancer survival rates. For example, lung cancer is the second-most common type of cancer newly diagnosed among Hamilton residents. The survival rate is poor, so the

number of people living with lung cancer over time is low. The opposite is true for prostate cancer; survival rates are generally good and therefore prevalence is high.

Figure 13.7 illustrates the rate of new cases for these four cancers among Hamiltonians, considering differences in underlying age structures in 2018 using age standardized incidence rate.

Over time, breast cancer rates have increased, while lung and prostate cancer have decreased slightly. Prostate cancer decreased from 2010-2014 in conjunction with changes to recommendations for prostate cancer screening, and then increased again from 2015-2018.

Table *13.1: Most prevalent cancers by type, Hamilton residents, 2018*

Cancer Type	Count	Population	% of Population (sex specific where indicated)
All cancer	**26,700**	**570,400**	**4.7**
Breast (female)	5,645	288,145	2.0
Prostate	4,655	282,250	1.6
Colorectal	3,140	570,400	0.6
Melanoma	1,820	570,395	0.3
Non-Hodgkin lymphoma	1,465	570,395	0.3
Lung	1,255	570,395	0.2
Thyroid	1,060	570,395	0.2
Kidney	990	570,400	0.2
Bladder	785	570,400	0.1
Leukemia	710	570,400	0.1
Oral cavity and pharynx	615	570,395	0.1
Cervix	395	288,145	0.1

Sources: Ontario Cancer Registry SEER*Stat Package - Release 12 - OCR (March 2021).
Available from: https://profiles.cancercare.on.ca/prevalence/
Statistics Canada. Table 17-10-0005-01 Population estimates on July 1st, by age and sex [Internet]. Ottawa (CA): Government of Canada; 2020 Sept 29 [cited 2021-01-21]. Available from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501.

Notes:
- Counts were randomly rounded to multiples of 5 to protect personal health information.
- Prevalence describes the number and percentage of people diagnosed with cancer within the past 30 years (between 1989 and 2018) and still alive on the index date of January 1, 2019. People with more than one cancer diagnosis are counted once for the first diagnosis. Only the first cancer of a given type in an individual is counted (for people who have multiple episodes of cancer).
- Table includes only those cancer where more than 350 Hamiltonians were reported to be living with that type in 2018.

Cancer Type	Hamilton		Ontario	
	Count	Annual Age-Standardized Rate	Annual Age-Standardized Rate	Significantly Different than Ontario ↑
All cancer	**3,580**	**568.9**	**543.0**	
Breast (female)	475	150.3	147.4	-
Lung	460	70.5	64.1	-
Colorectal	375	58.0	53.5	-
Prostate	365	121.6	128.9	-
Bladder	195	30.0	25.6	-
Melanoma	165	26.2	25.2	-
Non-Hodgkin lympho-ma	155	24.8	27.3	-
Kidney	120	19.0	16.9	-
Pancreas	105	15.9	12.8	-
Thyroid	105	18.4	21.4	-
Leukemia	85	13.3	15.6	-
Myeloma	75	11.2	9.2	-
Stomach	75	12.2	10.6	-
Oral cavity and phar-ynx	70	11.4	12.1	-
Cervix (female) Count is for 2016-2018, 3-years combined)	65*	8.2	8.4	-

Sources: Ontario Cancer Registry SEER*Stat Package - Release 12 - OCR (March 2021).
Available from: https://profiles.cancercare.on.ca/Incidence/atlas.html?date=2018

Statistics Canada. Table 17-10-0005-01 Population estimates on July 1st, by age and sex [Internet]. Ottawa (CA): Government of Canada; 2020 Sept 29 [cited 2021-01-21]. Available from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501.

Notes:
- Asterisk * denotes this is an estimate of newly diagnosed cases of cancer of the cervix in females based on a 3-year combined count from 2016-2018 of 65 cases. To compare to the counts in the rest of the table an annual count would be approximately a third of this number, but due to instability is not reported.
- Counts were randomly rounded to multiples of 5 to protect personal health information.
- All cancer types with insufficient counts to display in 2018 (e.g., brain and other nervous systems, larynx, esophagus) are not included in this table, with the exception of cervical cancer which is a cancer of preventive interest to public health and included as an aggregated rate over a three-year period.
- To be comparable with the PHU level statistics, Ontario statistics exclude cancer cases of unknown residence (PHU); therefore, provincial statistics may not match the true counts and rates published elsewhere.
- Age standardized rates are adjusted to the 2011 Canadian standard population.
- This refers to a person's sex as recorded on health records, rather than their gender identity.

Figure 13.7: Cancer incidence for common cancers, age-standardized rate, Hamilton residents, 2010-2018
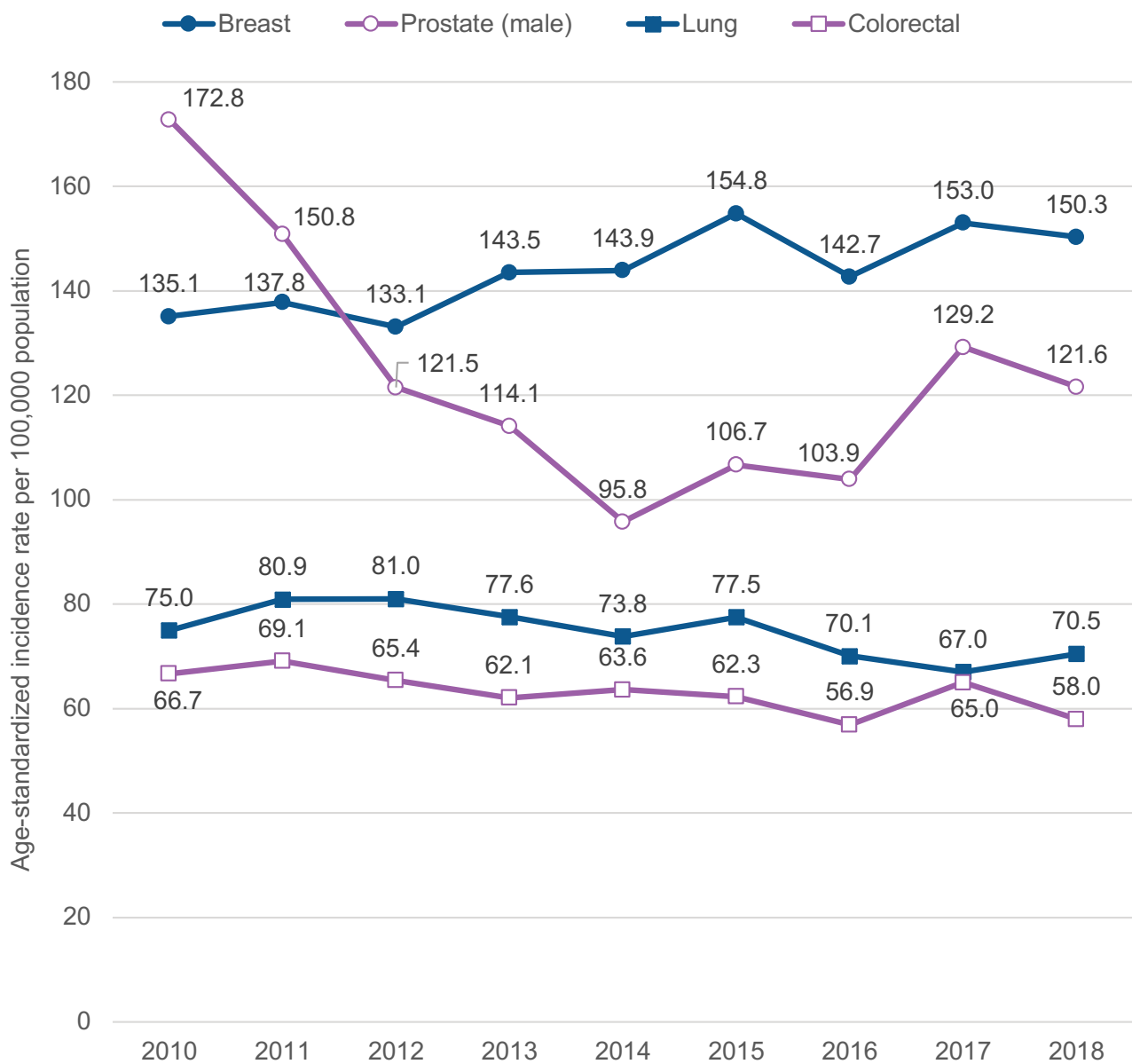
Source: Cancer Incidence 2010-2018. Ontario Cancer Registry SEER*Stat Package - Release 12 - OCR (March 2021)
Available from: https://www.cancercareontario.ca/en/data-research/view-data/cancer-statistics/ontario-cancer-profiles

Note: Incidence rates include "multiple primaries" where for example the same person may be newly diagnosed with two different cancers in the same year and therefore that person is counted twice in the incidence rates.

BREAST CANCER

Female breast cancer is the most common type of cancer. One in 50 female residents in Hamilton (5,645) were living with breast cancer in 2018.

This 2% is the prevalence of breast cancer among Hamiltonians whose sex is identified as female on their health records, as provided by Ontario Health the data distributor. Their gender identity was not available.

In 2018, female breast cancer was also the most commonly diagnosed cancer for Hamilton residents, with approximately 475 new cases.

Incidence rates were similar for females in Hamilton and Ontario overall. In 2018, the age-standardized incidence rate for Hamilton residents (the rate after age differences were taken into consideration) was 150.3 per 100,000 female residents. This was slightly higher than Ontario's age standardized rate (147.4 per 100,000). Figure 13.7 shows that the age standardized incidence of breast cancer for female residents increased from 2010-2018.

The incidence rate differs by age group (Figure 13.8):

- The greatest number of cases were diagnosed in those aged 60-69 for the combined years between 2014 to 2018.
- Age-specific incidence rates were highest in female residents in Hamilton aged 70-79 (438.8 per 100,000), followed by those aged 80 and older (414.9 per 100,000).
- Rates were incrementally lower for each younger age group: 357.4 per 100,000 for those aged 60-69; 264.9 per 100,000 for those aged 50-59; 157.3 per 100,000 for those aged 40-49; and 38.9 per 100,000 for those aged 30-39.

When assessing area-based inequality for 2009-2018, there were higher rates of deaths due to breast cancer among female residents who lived in (Appendix Table 13.2):

- areas with the greatest percentage of households that had a core housing need
- areas with the greatest percentage of households below the low-income cut-off after tax

Figure 13.8: Breast cancer incidence by age groups, new cases, age-specific rate per 100,000, Hamilton residents, 2014-2018 combined

Legend: Hamilton Count | Hamilton Rate

Age group	Hamilton Count	Hamilton Rate
30 to 39	70	38.6
40 to 49	285	157.3
50 to 59	550	264.9
60 to 69	590	357.4
70 to 79	450	438.8
80+	340	414.9

Source: Ontario Health (Cancer Care Ontario). Ontario Cancer Profiles [Internet]. 2021 [cited April 22, 2024]. Available from https://cancercareontario.ca/ontariocancerprofiles
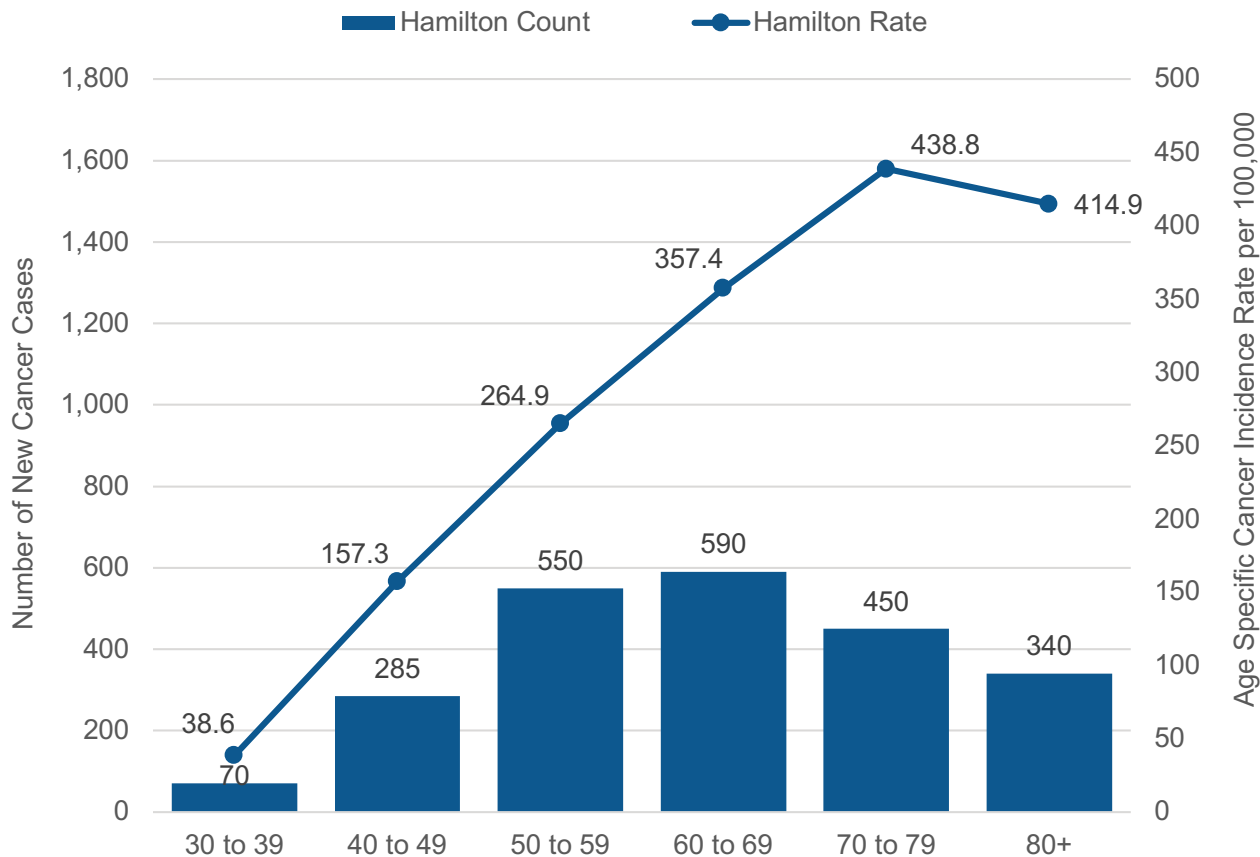
Notes: Younger age groups are not shown to protect personal health information or due to imprecise estimates. This includes breast cancer only in females as defined within the original data.

PROSTATE CANCER

Prostate cancer is the second most common type of cancer among Hamilton residents. Just over 1 in 60 male residents (approximately 4,655) were living with prostate cancer in 2018.

(This 1.6% is the prevalence of prostate cancer among Hamiltonians whose sex is identified as male on their health records, as provided by Ontario Health the data distributor. Their gender identity was not available.)

In 2018, prostate cancer in males was also the fourth-most diagnosed cancer for Hamilton residents with approximately 365 new cases diagnosed in 2018. Incidence rates were similar for male residents in Hamilton (121.6 per 100,000) compared to Ontario (128.9 per 100,000) after taking age structure into consideration (Table 13.2).

The age-standardized incidence rate of prostate cancer for male Hamilton residents decreased from 2010-2014 (Figure 13.7) in conjunction with changes to recommendations for prostate cancer screening. The Canadian Task Force on Preventive Health Care recommended against screening with a prostate-specific antigen (PSA) test in males younger than 55 years old and stated that those 70 years and older may have little to gain from testing. Incidence increased again from 2015 through to 2018.

Incidence rates for prostate cancer in males differ by age group (Figure 13.9):

- The greatest number of cases were diagnosed in those aged 60-69 for the combined years from 2014-2018.
- Age-specific incidence rates were highest in male Hamilton residents aged 70-79 (566.7 per 100,000), followed by those aged 80 and older (518.3 per 100,000).
- Rates were incrementally lower for each younger age group: 376.8 per 100,000 for 60-69; 118.3 per 100,000 for 50-59; and 8.5 per 100,000 for 40-49.

When assessing area-based inequality from 2009-2018, there were higher rates of deaths due to prostate cancer among male Hamilton residents who lived in (Appendix Table 13.2):

- areas with the greatest percentage of households that had a core housing need
- areas with the greatest percentage of households below the low-income cut-off after tax

Figure 13.9: Prostate cancer incidence by age groups, new cases, age-specific rate per 100,000, Hamilton residents, 2014-2018 combined

Source: Ontario Health (Cancer Care Ontario). Ontario Cancer Profiles [Internet]. 2021 [cited April 22, 2024]. Available from https://cancercareontario.ca/ontariocancerprofiles
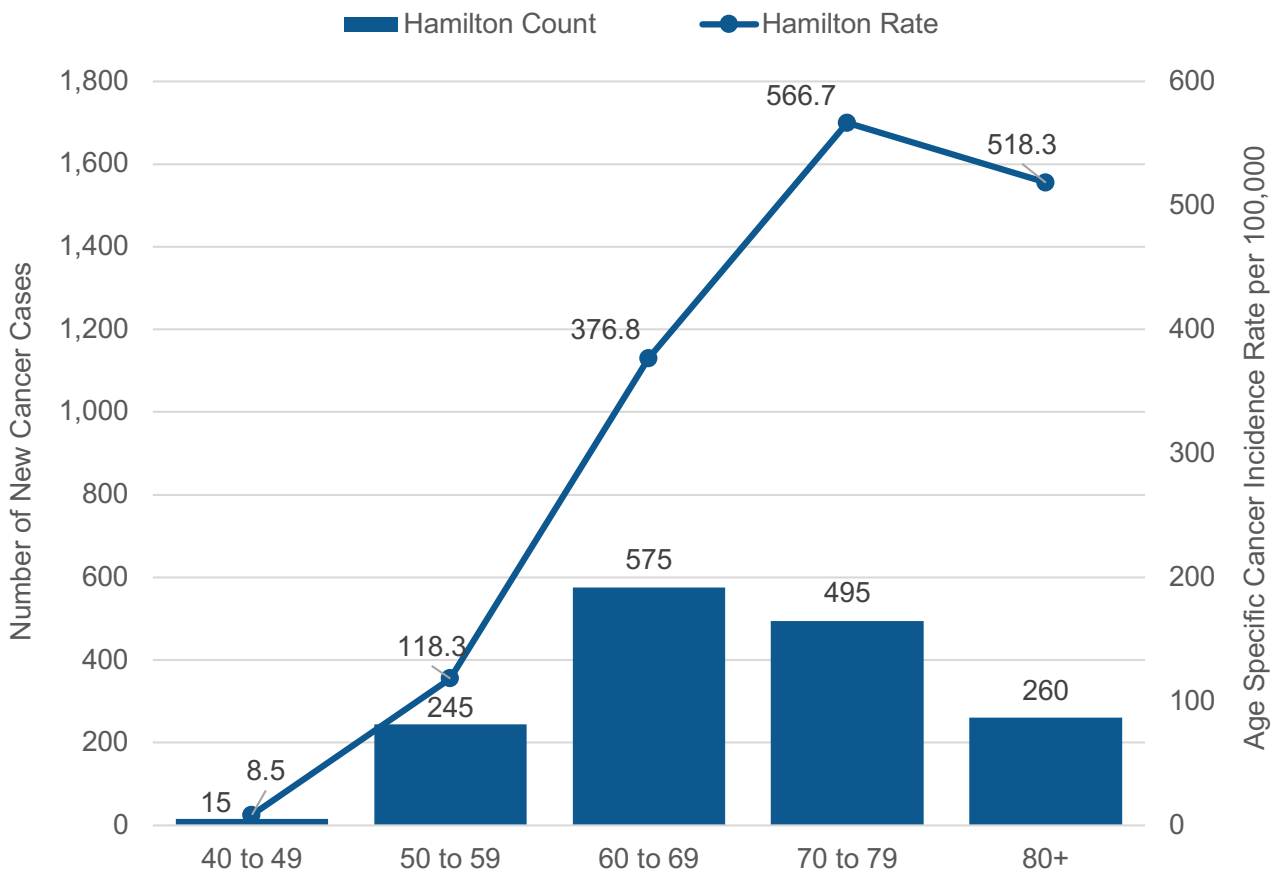
Note: Younger age groups are not shown to protect personal health information or due to imprecise estimates

COLORECTAL CANCER

Colorectal cancer is the third-most common type of cancer among Hamilton residents. Approximately 3,140 residents were living with it in 2018.

It was also the third-most diagnosed cancer for Hamilton residents in 2018 (approximately 375 new cases), after female breast cancer and lung cancer.

No difference in incidence rates could be detected in 2018 between Hamilton residents (58.0 per 100,000) and Ontario as a whole (53.5 per 100,000) after taking age structure into consideration. This was likely due to relatively small numbers in that single year (Table 13.2).

However, when the colorectal cancer incidence is combined for 2014-2018, Hamilton residents had a higher age-standardized incident rate (61.1 per 100,000) compared to Ontario (56.6 per 100,000). This was primarily due to the difference between male residents of Hamilton (73.9 per 100,000) and male Ontarians (67.6 per 100,000) overall. Female residents of Hamilton (50.5 per 100,000) had a similar incidence rate to female Ontarians overall (47.1 per 100,000) (not shown).

The age-standardized incidence of colorectal cancer among Hamilton residents generally decreased slightly from 2010 (66.7 per 100,000) to 2018 (58.0 per 100,000) (Figure 13.7)

Colorectal cancer incidence rates differ by age group and sex (Figure 13.10):

- The greatest number of cases (310) were diagnosed in male Hamilton residents aged 70-79 for the combined years between from 2014-2018.
- Age-specific incidence rates were highest in male residents aged 80 and older (448.5 per 100,000), followed by males aged 70-79 (354.9 per 100,000).

When assessing area-based inequality for 2009-2018, there were higher rates of deaths due to colorectal cancer among Hamilton residents who lived in (Appendix Table 13.2):

- areas with the greatest percentage of households that had a core housing need
- areas with a greater percentage of families with one-parent
- areas with the greatest percentage of households below the low-income cut-off after tax
- areas with the greatest percentage of individuals with no high school diploma or equivalent

Figure 13.10: Colorectal cancer incidence by sex and age groups, new cases, age-specific rate per 100,000, Hamilton residents, 2014-2018 combined

Source: Ontario Health (Cancer Care Ontario). Ontario Cancer Profiles [Internet]. 2021 [cited April 22, 2024]. Available from https://cancercareontario.ca/ontariocancerprofiles
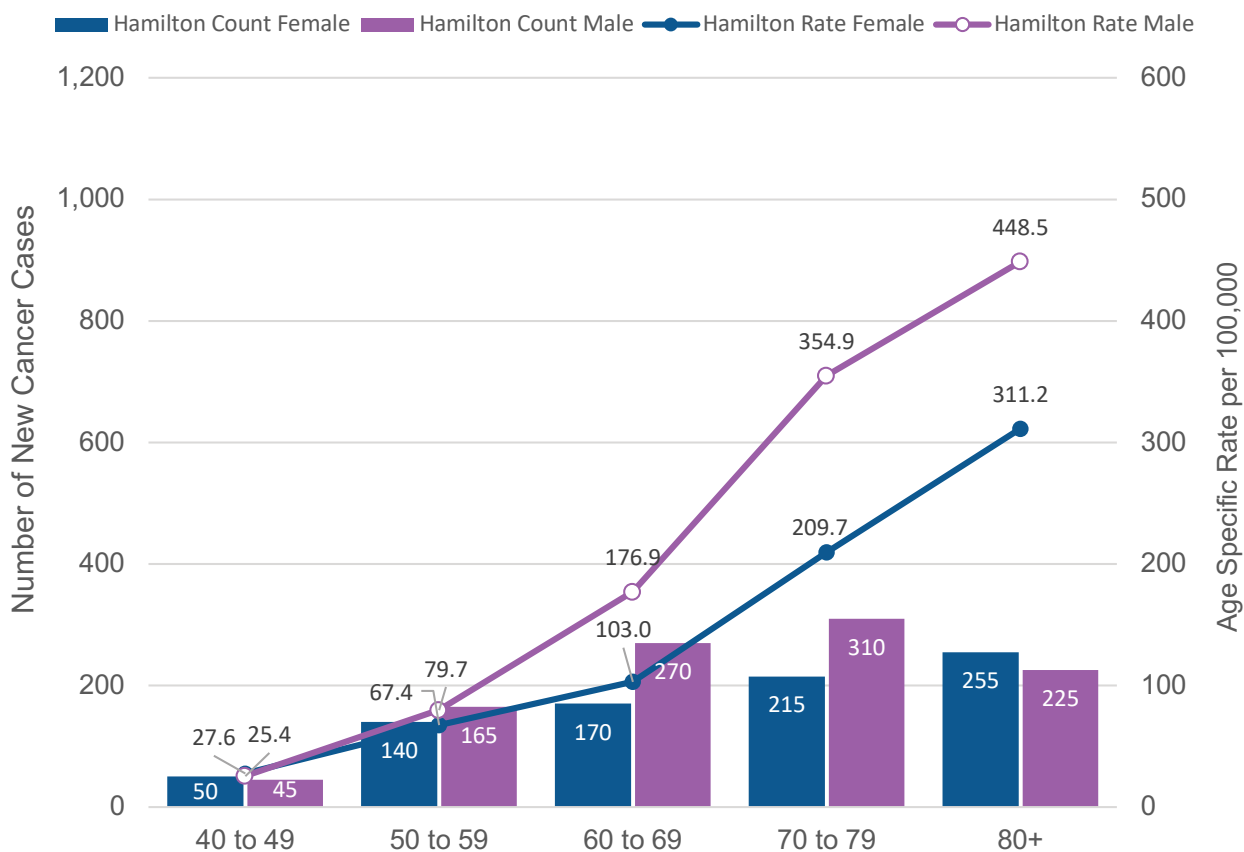
Note: Younger age groups are not shown to protect personal health information or due to imprecise estimates

LUNG CANCER

Lung cancer is the sixth-most common type of cancer in Hamilton residents. Approximately 1,255 residents were living with it in 2018.

That year, lung cancer was the second-most diagnosed cancer for Hamilton residents (approximately 460 new cases) after female breast cancer.

No difference in Incidence rates could be detected between Hamilton residents (70.5 per 100,000) and Ontario overall (64.1 per 100,000) after taking age structure into consideration (Table 13.2).

However, when the lung cancer incidence is combined for 2014-2018, Hamilton had a higher age-standardized incident rate (71.7 per 100,000) compared to Ontario (66.2 per 100,000). This was primarily due to the difference between male residents of Hamilton (81.7 per 100,000) and male Ontarians (72.6 per 100,000) overall. Female residents of Hamilton (64.2 per 100,000) had a similar incidence rate to female Ontarians (61.8 per 100,000) (not shown).

Figure 13.7 shows the age-standardized incidence of lung cancer among Hamilton residents generally decreased slightly from 2010 (75.0 per 100,000) to 2018 (70.5 per 100,000).

Lung cancer incidence rates differ by age group and sex (Figure 13.11):

- The greatest number of cases (365) were diagnosed in male residents of Hamilton aged 60-69, and in female residents aged 70-79 for the combined years between 2014-2018.
- Age-specific incidence rates were highest in males aged 80 and older at 538.3 per 100,000, followed by males aged 70-79 (400.7 per 100,000).

Figure 13.11: Lung cancer incidence by sex and age groups, new cases, age-specific rate per 100,000, Hamilton residents, 2014-2018 combined

Legend: Hamilton Count Female | Hamilton Count Male | Hamilton Rate Female | Hamilton Rate Male

Age group	Count Female	Count Male	Rate Female	Rate Male
40 to 49	25	15	8.5	13.8
50 to 59	140	135	67.4	65.2
60 to 69	295	365	178.7	239.2
70 to 79	365	350	355.9	400.7
80+	255	270	311.2	538.3

Y-axis (left): Number of New Cancer Cases
Y-axis (right): Age Specific Rate per 100,000

Source: Ontario Health (Cancer Care Ontario). Ontario Cancer Profiles [Internet]. 2021 [cited April 22, 2024]. Available from https://cancercareontario.ca/ontariocancerprofiles
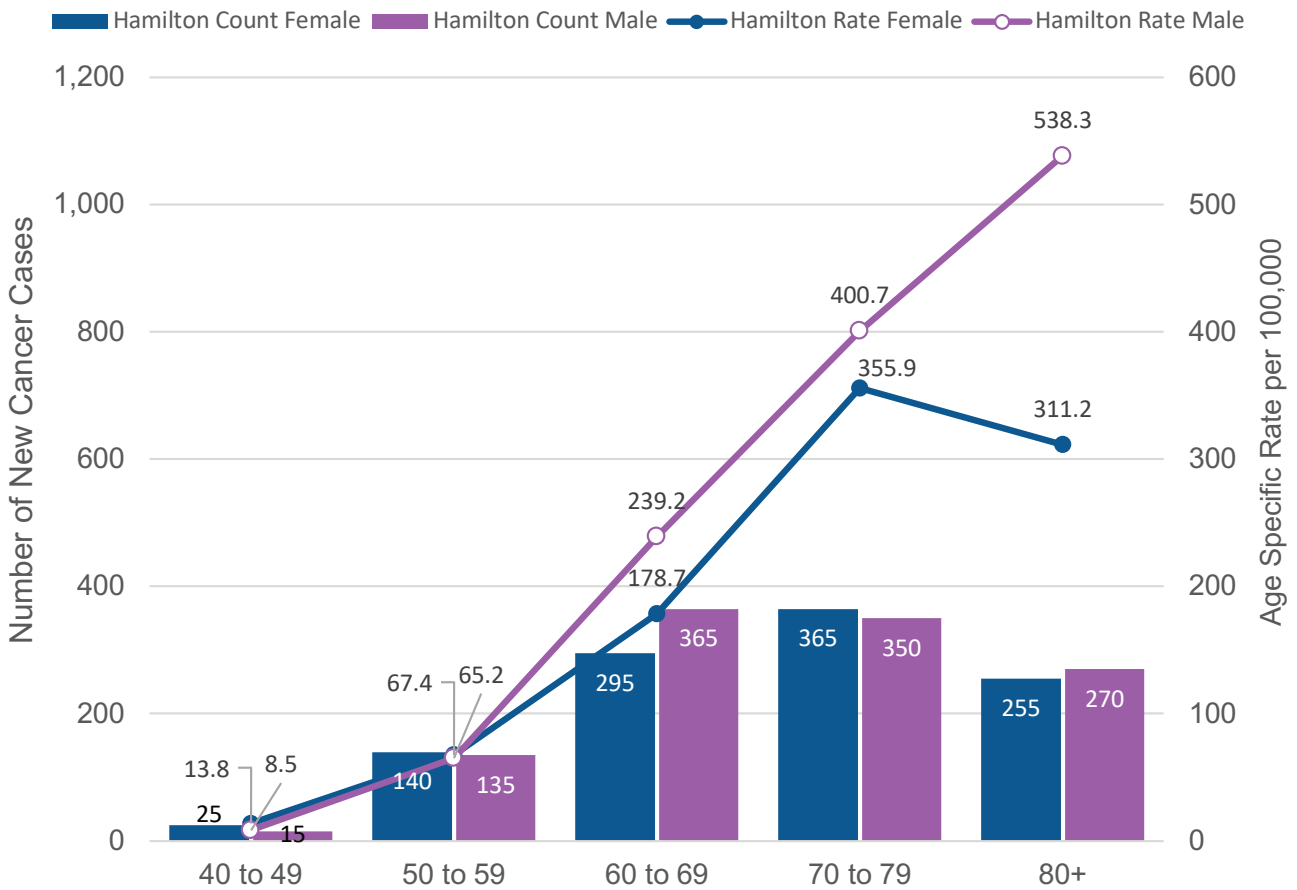
Note: Younger age groups are not shown to protect personal health information or due to imprecise estimates

References

1. City of Hamilton - Public Health Services. Public Health Services Indigenous health strategy: nothing for us, without us. Hamilton, ON: City of Hamilton. 2023. [cited 2024 n.d.]. Available from: https://web.archive.org/web/20240716155734/https://pub-hamilton.escribe-meetings.com/filestream.ashx?DocumentId=373198

2. Ontario. Ministry of Health. IntelliHEALTH Ontario. Population projections 2023. [data set]. Toronto, ON: King's Printer for Ontario; 2023. [extracted 2023 Jan 18]

3. Statistics Canada. Census in brief: Canada's fastest growing and decreasing municipalities from 2016 to 2021. Census of Population, 2021. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2022. [cited 2024, n.d.]. Available from: https://www12.statcan.gc.ca/census-recensement/2021/as-sa/98-200-x/2021001/98-200-x2021001-eng.pdf

4. Statistics Canada. Population and dwelling counts: Canada, provinces and territories, census divisions and census subdivisions (municipalities). Table 98-10-0002-03. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2022. [cited 2024, n.d.]. Available from: DOI: https://doi.org/10.25318/9810000201-eng

5. Statistics Canada. Demographic dependency ratio, July 1, by health region and peer group, 2018 boundaries. Table 17-10-0133-01. Ottawa, ON: His Majesty the King in Right of Canada, as represented by the Minister of Industry; 2023. [cited 2024, n.d.]. Available from: https://doi.org/10.25318/1710013301-eng

6. World Health Organization. Gender and Health Overview [Internet]. Geneva, CH: World Health Organization; n.d. [cited 2024 May 07]. Available from: https://www.who.int/health-topics/gender#tab=tab_1

7. Statistics Canada. Gender of person. [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2021. [updated 2024 Jun 13; cited 2024, n.d.]. Available from: https://www23.statcan.gc.ca/imdb/p3Var.pl?Function=-DEC&Id=410445

8. Statistics Canada. Age, sex at birth and gender. Reference guide census of population, 2021. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2022. [updated 2022 Apr 27; cited 2024, n.d.]. Available from: https://www12.statcan.gc.ca/census-recensement/2021/ref/98-500/014/98-500-x2021014-eng.cfm

9. Mills, S., Dion, M., Thompson-Blum, D., et al. Mapping the void: Two-spirit and LGBTIQ+ experiences in Hamilton. Hamilton, ON: McMaster University. 2019. [cited 2024, n.d.]. Available from: http://hdl.handle.net/11375/28172

10. Statistics Canada. Classification of cisgender, transgender and non-binary. [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2021. [updated 2021 Nov 02; cited 2024, n.d.]. Available from: https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=1326715&CVD=1326716&CLV=0&MLV=2&D=1

11. Statistics Canada. Broad age groups and gender: Canada and census metropolitan areas. Table 98-10-0037-01. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry, 2022. [updated 2024 Jul 15; cited 2024, n.d.] Available from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810003701

12. Statistics Canada. The Daily [Internet]. Canada is the first country to provide census data on transgender and non-binary people. Cat. no. 11-001-X. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2022. [updated 2023 May 31; cited 2023, n.d.] Accessed from: https://www150.statcan.gc.ca/n1/en/daily-quotidien/220427/dq220427b-eng.pdf?st=zJUdU5RY

13. Health Canada. Language barriers in access to health care. Prepared by Sarah Bowen. Cat. no. H39-578/ 2001E. Ottawa, ON: Her Majesty the Queen in Right of Canada, represented by the Minister of Public Works and Government Services Canada; 2001. [cited 2024, n.d.]. Available from: https://www.canada.ca/en/health-canada/services/health-care-system/reports-publications/health-care-accessibility/language-barriers.html#a0

14. Pandey, M., Maina, R.G., Amoyaw, J. et al. Impacts of English language proficiency on healthcare access, use, and outcomes among immigrants: a qualitative study. BMC Health Serv Res 21, 741 (2021). [cited 2024, n.d.].
Available from: https://doi.org/10.1186/s12913-021-06750-4

15. Statistics Canada. Hamilton, Ontario (Code 3525005) and Hamilton, Ontario (Code 3525) (table), Census Profile. 2011 Census. Cat. no. 98-316-XWE. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2012. [cited 2023 Aug 24]. Available from: http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E

16. Statistics Canada. Census profile, 2021 census of population. Cat no: 98-316-X2021001. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2022. [updated 2023 Nov 15; cited 2023 Aug 23] Available from: https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E

17. Statistics Canada. Hamilton, C, Ontario (Code 3525005) (table). National household survey (NHS) profile. 2011 National Household Survey. Cat no. 99-004-XWE. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2013. [cited 2023 Sep 7].
Available from: http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E

18. Statistics Canada. Census profile, 2016 Census. Hamilton, Census Division [Census division], Ontario and Ontario [Province] (table). Cat no. 98-316-X2016001. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2017. [cited 2023 Sep 07]. Available from: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E

19. De Maio, FG and Kemp, E. The deterioration of health status among immigrants to Canada. Glob Public Health. 2010;5(5):462–78. [cited 2023 Sep 7].
Available from: DOI https://doi.org/10.1080/17441690902942480

20. Ng, E and Zhang, H. The mental health of immigrants and refugees: Canadian evidence from a nationally linked database. Health Rep. 2020. 31(8):3-12. [cited 2023 Sep 7]. Available from: DOI https://doi.org/10.25318/82-003-x202000800001-eng

21. Raphael D., Bryant, T., Mikkonen, J. et al. Social determinants of health: the Canadian facts. Oshawa, ON: Ontario Tech University Faculty of Health Sciences; 2020. [cited 2024, n.d.]. Available from: https://thecanadianfacts.org/The_Canadian_Facts-2nd_ed.pdf

22. Statistics Canada. Income inequality statistics across Canada: Canada, provinces and territories, census divisions and census subdivisions. Table 98-10-0096-01. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2022 [cited 2023 Nov 22]. Available from: DOI https://doi.org/10.25318/9810009601-eng

23. Statistics Canada. Census in brief: Disaggregated trends in poverty from the 2021 census of population. Cat no. 98-200-X. Ottawa, ON: His Majesty the King in Right of Canada as represented by the Minister of Industry; 2022. [cited 2024, n.d.]. Available from: https://www12.statcan.gc.ca/census-recensement/2021/as-sa/98-200-x/2021009/98-200-x2021009-eng.pdf

24. Blackett, A. A transformative framework to achieve and sustain employment equity - report of the Employment Equity Act review task force. Cat no. Em8-81/1-2023E-PDF. Ottawa, ON: His Majesty the King in Right of Canada, as represented by the Minister of Employment, Workforce Development and Official Languages; 2023. [cited 2024, n.d.]. Available from: https://www.canada.ca/content/dam/esdc-edsc/documents/corporate/portfolio/labour/programs/employment-equity/reports/act-review-task-force/EEA-Review-Task-Force-Report-2023-v2.pdf

25. Statistics Canada. Low-income statistics by age, sex and economic family type. Table 11-10-0135-01. Ottawa, ON: His Majesty the King in Right of Canada, as represented by the Minister of Innovation, Science and Industry; 2024. [updated 2024 July 16; cited 2024, n.d.] Available from: DOI https://doi.org/10.25318/1110013501-eng

26. Coleman, A. Calculating Ontario's Living Wages – Ontario Living Wage Network. Toronto, ON: Ontario Living Wage Network; 2023. [cited 2024 May 31]. Accessed from: https://sprchamilton.ca/wp-content/uploads/2023/11/Calculating_Ontarios_Living_Wages_-_2023.pdf

27. Ontario Living Wage Network. 2023 Living Wage Rates. [Internet] Toronto, ON: Ontario Living Wage Network; 2023. [cited 2023 Nov 28].
Accessed from: https://www.ontariolivingwage.ca/2023_living_wage_rates

28. Ontario Living Wage Network. Living Wage Week 2022. [Internet] Toronto, ON: Ontario Living Wage Network; 2022. [cited 2023 Nov 28]
Accessed from: https://www.ontariolivingwage.ca/living_wage_week_2022

29. Statistics Canada. Core housing need, 2016 census. Cat no: 98-509-X2016001. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2017. [updated 2018 Aug 23; cited 2023 Nov 28]. Accessed from: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/chn-biml/index-eng.cfm

30. City of Hamilton - Housing Services Division. Housing and Homelessness Dashboard [Data set]. Hamilton, ON: City of Hamilton. [cited 2023 Dec 1]. Accessed from: https://housing-and-homelessness-dashboard-spatialsolutions.hub.arcgis.com/

31. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Household food insecurity in Ontario. [Internet]. Toronto, ON: King's Printer for Ontario, 2023. [cited 2024 May 08]. Accessed from: https://www.publichealthontario.ca/en/About/News/2023/04/Household-Food-Insecurity-Ontario

32. Statistics Canada. Food Security [Internet]. Ottawa, ON: His Majesty the King in Right of Canada, as represented by the Minister of Industry; 2023. [updated 2023-12-01; cited 2024 May 08]. Available from: https://www160.statcan.gc.ca/prosperity-prosperite/food-security-securite-alimentaire-eng.htm

33. Tarasuk V, Li T, Farfard St-Germain A-A. Household food insecurity in Canada 2021. Toronto, ON: PROOF Food Insecurity Policy Research. 2022. [updated 2022 Nov 16; cited 2023 n.d.]. Available from: https://proof.utoronto.ca/wp-content/uploads/2022/08/Household-Food-Insecurity-in-Canada-2021-PROOF.pdf

34. Statistics Canada. Highest level of education by visible minority and immigrant status: Canada, provinces and territories, census divisions and census subdivisions with a population 5,000 or more. Table 98-10-0432-01. Ottawa, ON: His Majesty the King in Right of Canada, as represented by the Minister of Innovation, Science and Industry; 2022. [updated 2024 July 16; cited 2024 n.d.] Available from: DOI https://doi.org/10.25318/9810043201-eng

35. Statistics Canada. Canadian survey on disability reports. The evolution of disability data in Canada: keeping in step with a more inclusive Canada. Cat no. 89-654-X2018003. Ottawa, ON. Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2018. [cited 2023, n.d.]. Available from: https://www150.statcan.gc.ca/n1/pub/89-654-x/89-654-x2018003-eng.htm

36. Public Health Agency of Canada. Folic acid and neural tube defects [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada, represented by the Minister of Health; 2018. [updated 2018 Jan 29; cited 2024, n.d.].
Available from: https://www.canada.ca/en/public-health/services/pregnancy/folic-acid.html

37. Offord Centre for Child Studies. How to interpret EDI (Early Development Instrument) results. Hamilton, ON: Offord Centre for Child Studies. N.d. [cited 2024, n.d.].
Available from: https://edi.offordcentre.com/researchers/how-to-interpret-edi-results/

38. Lindberg L, Santelli J and Desai S. Understanding the decline in adolescent fertility in the United States, 2007-2012. J Adolesc Health. 2016;59(5):577-83. [cited 2024, n.d.]. Available from: DOI www.doi.org/10.1016/j.jadohealth.2016.06.024

39. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Reproductive health snapshot: PHU/LHIN (2013 to 2022). [Data; Internet]. Toronto, ON: King's Printer for Ontario; 2024. [cited 2024, n.d.]. Available from: https://www.publichealthontario.ca/en/Data-and-Analysis/Reproductive-and-Child-Health/Reproductive-Health

40. Centers for Disease Control and Prevention (US). Who we are. [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2023 [updated 2022 Mar 9; cited 2024 Apr 18]. Available from: https://archive.cdc.gov/www_cdc_gov/ncezid/what-we-do/2021-highlights/who-we-are.html

41. Majowicz, SE, Edge, VL, Fazil, A, et al. Estimating the under-reporting rate for infectious gastrointestinal illness in Ontario. Can J Public Health. 2005;96 (3):178–81. [cited 2024 Apr 17]. Available from: DOI www.doi.org/10.1007/BF03403685

42. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Campylobacteriosis. [Internet]. Toronto, ON: King's Printer for Ontario. 2023. [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Enteric-Foodborne-Diseases/Campylobacteriosis

43. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Salmonellosis. [Internet]. Toronto, ON: King's Printer for Ontario. 2023 [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Enteric-Foodborne-Diseases/Salmonellosis

44. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Verotox-in-producing Escherichia coli (VTEC). [Internet]. Toronto, ON: King's Printer for Ontario. 2023. [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Enteric-Foodborne-Diseases/VTEC

45. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Coronavirus Disease 2019 (COVID-19). [Internet]. Toronto, ON: King's Printer for Ontario. 2024. [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Respiratory-Diseases/Novel-Coronavirus

46. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Group A Streptococcal Disease, Invasive (iGAS). [Internet]. Toronto, ON: King's Printer for Ontario. 2024. [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Respiratory-Diseases/iGAS

47. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Influenza (flu). [Internet]. Toronto, ON: King's Printer for Ontario. 2024. [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Respiratory-Diseases/Influenza

48. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Tuberculosis (TB) [Internet]. Toronto, ON: King's Printer for Ontario; 2024. [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Respiratory-Diseases/Tuberculosis

49. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Gonorrhea [Internet]. Toronto, ON: King's Printer for Ontario. 2023. [cited 2024 Apr 18]. Available from: https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Sexually-Transmitted-Infections/Gonorrhea

50. Centers for Disease Control and Prevention. Congenital syphilis – CDC fact sheet. [Internet]. Atlanta, GA: Centers for Disease Control and Prevention (US); n.d. [updated 2024 Jan 30; cited 2024 Apr 18]. Available from: https://web.archive.org/web/20240418114039/https://www.cdc.gov/std/syphilis/stdfact-congenital-syphilis.htm

51. Ontario. Ministry of the Environment, Conservation and Parks. Air quality in Ontario 2021 report. Toronto, ON: King's Printer for Ontario; 2023. [updated 2024 May 06; cited 2024, n.d.]. Available from: www.ontario.ca/document/air-quality-ontario-2021-report

52. Ontario. Ministry of the Environment, Conservation and Parks. Air quality in Ontario 2020 report. Toronto, ON: King's Printer for Ontario; 2022. [updated 2024 May 06; cited 2024, n.d.]. Available from: https://www.ontario.ca/document/air-quality-ontario-2020-report

53. Health Canada. Health impacts of air pollution in Canada - estimates of premature deaths and nonfatal outcomes, 2021 report. Cat no.: H144-51/2021E-PDF. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Health; 2021. [cited 2024, n.d.]. Available from: www.canada.ca/content/dam/hc-sc/documents/services/publications/healthy-living/2021-health-effects-indoor-air-pollution/hia-report-eng.pdf

54. Murray, CJL. The global burden of disease study at 30 years. Nat Med 28(10): 2019–26. 2022. Available from: www.doi.org/10.1038/s41591-022-01990-1

55. City of Hamilton - Public Health Services Department. Health check: assessing the local burden of disease in the City of Hamilton, 2nd ed. Hamilton, ON: City of Hamilton; 2018. Available from: https://web.archive.org/web/20240621143259/https://www.hamilton.ca/sites/default/files/2022-11/health-check-report-2018_0.pdf

56. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Chronic disease incidence and prevalence snapshot: prevalence of asthma. Age-standardized rate (both sexes) 2020. [Internet]. Toronto, ON: King's Printer for Ontario; 2022 [cited 2023 Nov 22]. Available from: www.publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidence-prevalence

57. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Chronic disease incidence and prevalence snapshot: prevalence of COPD (adults 20+). Age-standardized rate (both sexes) 2020. [Internet]. Toronto, ON: King's Printer for Ontario; 2022 [cited 2023 Nov 22]. Available from: www.publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidence-prevalence

58. ICLEI Canada - Local Governments for Sustainability. Climate science report for the City of Hamilton. Prepared by ICLEI Canada. Toronto, ON: ICLEI Canada; 2021. [cited 2023 Apr n.d.] Available from: https://web.archive.org/web/20231001004507/https://www.hamilton.ca/sites/default/files/2022-10/climate-change-impact-adapatation-plan-science-report.pdf

59. Ontario. Ministry of Health, IntelliHEALTH Ontario. Vital statistics. [data set]. Toronto, ON: King's Printer for Ontario; 2023. [extracted 2023 Apr n.d.]

60. Ontario. Ministry of Health, IntelliHEALTH Ontario. Discharge abstract database. [data set]. Toronto ON: King's Printer for Ontario; 2023. [extracted 2023 Oct 05].

61. Ontario. Ministry of Health, IntelliHEALTH Ontario. Ambulatory emergency external cause. [data set]. Toronto, ON: Queen's Printer for Ontario; 2022. [extracted 2022 Apr 18].

62. Cancer Care Ontario, Ontario Agency for Health Protection and Promotion (Public Health Ontario). Environmental Burden of Cancer in Ontario. Toronto: Queen's Printer for Ontario; 2016. [cited 2023 n.d.]. Available from: https://www.publichealthontario.ca/en/Data-and-Analysis/Chronic-Disease/Environmental-Burden-of-Cancer

63. City of Hamilton – Public Health Services. Radon prevalence in Hamilton (BOH20022). Presentation to the Board of Health on November 16, 2020. Hamilton, ON: City of Hamilton; 2020. [cited 2023 n.d.]. Available from: https://web.archive.org/web/20240612094542/https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=245276

64. City of Hamilton – Public Health Services. Information Report: Radon Prevalence in Hamilton (BOH20022). Presentation to the Board of Health on November 16, 2020. Hamilton, ON: City of Hamilton. [cited 2023 n.d.]. Available from: https://web.archive.org/web/20240716161455/https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=245275

65. Ontario Health and Ontario Agency for Health Protection and Promotion (Public Health Ontario). Burden of health conditions attributable to smoking and alcohol by public health unit in Ontario. Toronto: King's Printer for Ontario; 2023. [cited 2023 n.d.]. Available from: https://www.publichealthontario.ca/en/health-topics/health-promotion/tobacco/smoking-alcohol

66. Soneji, S., Barrington-Trimis, JL., Wills, TA., et al. Association between initial use of e-cigarettes and subsequent cigarette smoking among adolescents and young adults: a systematic review and meta-analysis. JAMA Pediatr. 2017;171(8): 788-97. [cited 2024 n.d.]. Available from: DOI www.doi.org/10.1001/jamapediatrics.2017.1488

67. Statistics Canada. Safe cities profile series: key indicators by census metropolitan area. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Industry; 2020. [updated 2020 May 15; cited 2024 n.d.]. Available from: https://www150. statcan.gc.ca/n1/pub/85-002-x/2020001/article/00001/hamilton-eng.htm

68. Hamilton Center for Civic Inclusion. Community online hate reporting. [Internet]. Hamilton, ON: Hamilton Center for Civic Inclusion; n.d. [cited 2024 n.d.].
Available from: https://hcci.ca/hate/

69. Centers for Disease Control and Prevention. About adult BMI. [Internet]. Atlanta, GA: Centers for Disease Control and Prevention (US). [updated 2022 Jun 03; cited 2024 n.d.].
Available from: https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html

70. National Health Service England. Obesity. [Internet]. London, UK.: National Health Service England. [updated 2023 Feb 15; cited 2024 n.d.].
Available from: https://www.nhs.uk/conditions/obesity/

71. Public Health Agency of Canada. Canadian guidelines for body weight classification in adults. Question and answers for the public. [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada, represented by the Minister of Health; 2003. [updated 2019 Nov 25; cited 2024 n.d.]. Available from: https://www.canada.ca/en/health-canada/services/food-nu-trition/healthy-eating/healthy-weights/canadian-guidelines-body-weight-classification-adults/questions-answers-public.html

72. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Synopsis. Review of "Weight bias: a narrative review of the evidence, assumptions, assessment, and recommendations for weight bias in health care." Toronto, ON: Public Health Ontario; 2024. [cited 2024 n.d.]. Available from: https://www.publichealthontario.ca/-/media/Docu-ments/W/24/weight-bias-narrative-review.pdf

73. Public Health Agency of Canada. Chronic Diseases [Internet - archived]. Canadian best practices portal. Ottawa, ON: Her Majesty the Queen in Right of Canada, represented by the Minister of Health; 2013. [updated 2013 Oct 21; cited 2024 n.d.].
Available from: http://web.archive.org/web/20240121061916/https://cbpp-pcpe.phac-aspc.gc.ca/chronic-diseases/

74. Bernell S and Howard SW. Use your words carefully: what is a chronic disease?
Front Public Health. 2016;4:159. [cited 2024 n.d.]
Available from: DOI www.doi.org/10.3389/fpubh.2016.00159

75. Ontario. Ministry of Health. Ontario public health standards: requirements for programs, services, and accountability, 2021. Toronto, ON: Queen's Printer for Ontario; 2021. [cited 2024 n.d.]. Available from: https://web.archive.org/web/20240711054442/https://files.ontar-io.ca/moh-ontario-public-health-standards-en-2021.pdf

76. Public Health Agency of Canada. Inequalities in health of racialized adults in Cana-da. [Infographic]. Ottawa, ON: His Majesty the King in Right of Canada, represented by the Minister of Health; 2022. [cited 2024 n.d.]. Available from: https://www.canada.ca/en/public-health/services/publications/science-research-data/inequalities-health-racial-ized-adults-18-plus-canada.html

77. Gagné T and Veenstra G. Inequalities in hypertension and diabetes in Canada: intersec-tions between racial identity, gender, and income. Ethn Dis. 2017;27(4):371-78. [cited 2024 n.d.]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5720946/

Glossary

Adverse childhood experiences are potentially traumatic events that occur during childhood and can have negative, lasting effects on health and well-being. These experiences range from physical, emotional or sexual abuse, to neglect or other household challenges. The likelihood of an adverse childhood experience can be predicted by a combination of individual, relational, community and societal risk factors. These include children with special needs; parental history of abuse; substance use and mental health issues in the family; social isolation; family disorganization; and poor social conditions.

Affordable housing is the proportion of household total income before tax that is spent on shelter costs. Unaffordable housing refers to spending more than 30% of pre-tax household income on shelter. It includes both owner- and renter-households. Farm households and on-reserve households are not included; they cannot be assessed for housing affordability because the concept is not applicable.

Air monitoring station: Hamilton's stations are located in Hamilton Downtown, Hamilton West and Hamilton Mount. The Downtown station at Elgin St./Kelly St. typically has higher levels of air pollutants than the other two other stations, and therefore is the one selected to monitor air quality.

Air Quality Health Index (AQHI) was developed by Health Canada and Environment Canada to measure air quality health risk and is based on hourly data for ozone, fine particulate matter and nitrogen dioxide. The Hamilton Downtown station collects hourly data on the three pollutants ($PM_{2.5}$, O_3, and NO_2) needed to calculate the AQHI.

Ambient Air Quality Criteria (AAQC) provide a maximum concentration level of a contaminant in air that is protective against adverse effects on health and/or the environment. It assesses protection against chronic effects (annual AAQC) and acute effects (one-hour AAQC).

Any breastfeeding refers to infants who receive human milk with or without formula or other liquids and solids.

Asylum claimant is a temporary resident who requests refugee protection upon or after arrival in Canada. We don't know whether a claimant is a refugee until their case has been decided. Asylum claimant is the term used in Canadian law and is roughly equivalent to "asylum seeker". (Service providers use "asylum seeker" for people who are planning to make a claim but haven't yet.) Asylum claimants may be included in Statistics Canada's "non-permanent resident" category.

Binge drinking is defined as a person having five or more standard alcoholic drinks on at least one occasion.

Census Family, as defined by Statistics Canada, includes: 1) a married couple; 2) a common-law couple, 3) a one-parent family living with at least one child who does not have their own spouse or child living in the household; or 4) grandchildren living with their grandparent(s) but with no parents present.

Cold warning days are the days when a cold alert has been declared by the City of Hamilton's Medical Officer of Health. A cold alert is issued when the temperature drops or is expected to drop below -15°C or the temperature feels like -20°C with wind chill.

Core housing need refers to whether a private household's housing falls below at least one of the indicator thresholds for housing adequacy, affordability or suitability, and would have to spend 30% or more of its total before-tax income to pay the median rent of alternative local housing that is acceptable (attains all three housing indicator thresholds). Housing indicator thresholds are defined as follows:

- Adequate housing is reported by their residents as not requiring any major repairs.
- Affordable housing has shelter costs equal to less than 30% of total before-tax household income.
- Suitable housing has enough bedrooms for the size and composition of resident households according to the National Occupancy Standard (NOS), conceived by the Canada Mortgage and Housing Corporation and provincial and territorial representatives.

Only private, non-farm, non-reserve and owner- or renter-households with incomes greater than zero and shelter-cost-to-income ratios less than 100% are assessed for "core housing need".

Non-family households with at least one maintainer aged 15-29 attending school are considered not to be in "core housing need: regardless of their housing circumstances. Attending school is considered a transitional phase, and low incomes earned by student households are viewed as being a temporary condition.

Dependency ratio: The ratio of people who are generally not in the labour force (the "dependents") to those that are in the workforce. The "dependent" part includes the population under 15 years old and people aged 65 and over. This ratio is an indicator of the potential pressure on those in the workforce by the dependent part of population.

Developmental vulnerability describes children who score below the 10th percentile cut-off of the Ontario baseline population on the Early Development Instrument.

Exclusive breastfeeding refers to infants who receive only human milk and had never received formula or other liquids and solids (excluding vitamins and medicine).

Fertility rate is a measure of pregnancies that result in live births among the population of females aged 15-49.

Fine particulate matter (PM$_{2.5}$) is an air contaminant that can be harmful to human health. It is 2.5 microns in diameter or less and can get further into the respiratory system than larger particles. The matter is primarily formed from chemical reactions in the atmosphere and burning fuel. In Ontario the particulate is mostly sulphate and nitrate particles, elemental and organic carbon and soil. Major sources include vehicle exhaust, burning wood, gas and other fuels and fires. Particulate pollution can travel long distances from its source, including wildfires from the north or cross-border pollution form the south.

Food insecurity is the inadequate or unstable access to food due to financial constraints. It includes marginal, moderate and severe food insecurity. Marginal food insecurity is defined as worrying about running out of food and/or limited food selection because of lack of money. Moderate food insecurity involves compromising the quality and/or quantity of food due to a lack of money. Severe food insecurity means missing meals, reducing food intake and, at the most extreme, going day(s) without food.

Gender categories used by Statistics Canada of women+ and men+: The 2021 Census marked the first use of the categorizations women+ and men+. For both, it includes individuals whose gender corresponds with sex assigned at birth (i.e., cisgender); whose gender does not correspond with sex assigned at birth (e.g., transgender); and some persons who are non-binary (e.g., agender, fluid, queer, or Two-Spirit). Data on non-binary persons are distributed randomly between the two other gender categories to protect confidentiality by Statistics Canada for smaller levels of geography (e.g., City of Hamilton). This categorization is carried through to the population projections. See also **Men+** and **Women+**.

General provincial minimum wage in Ontario is the hourly wage paid to most workers aged 18 and older. It does not apply to students under 18, homeworkers or hunting, fishing and wilderness guides. As of October 1, 2023, the general provincial minimum wage in Ontario was $16.55 per hour.

Gestation is the period between conception and birth when a fetus is developing in the womb.

Heat warning days are the days when a heat event has been declared by the City of Hamilton's Medical Officer of Health. A heat warning is issued when it is anticipated that there will be two or more consecutive days with daytime highs greater than or equal to 31°C and nighttime lows greater than or equal to 20°C, or when there's a Humidex of 40°C or greater.

Heavy drinking is defined as either five or more standard drinks for a male on at least one occasion per month; or four or more standard drinks for a female on at least one occasion per month.

Homelessness is the number individuals actively homeless in Hamilton (regardless of the length) and includes those who've stayed in a shelter in the previous 90 days. Data is collected by shelters through the Homeless Individuals and Families Information System (HIFIS).

Immigrant status refers to whether a person is a non-immigrant, immigrant or a non-permanent resident.

Immigrants includes persons who are, or who have ever been, landed immigrants or permanent residents. Such persons have been granted the right to live in Canada permanently by immigration authorities. Immigrants who have obtained Canadian citizenship by naturalization are included in this category. The 2021 Census includes immigrants who were admitted to Canada on or prior to May 11, 2021.

Incidence is the rate of new cases or events over a specified period for the population at risk for the event.

Infant is a person who is less than 365 days old.

Knowledge of official languages refers to whether the person can conduct a conversation in English only, French only, in both or in neither language. For a child who has not yet learned to speak, this includes languages that the child is learning to speak at home.

Land transport incidents or injuries are any unintentional incidents or injuries involving a device designed or used primarily for conveying persons or goods from one place to another place on land, such as pedal cycles, motorcycles, cars, trucks, vans, heavy transport trucks and all-terrain vehicles.

Life expectancy is the number of years a person would be expected to live. This could be estimated as a person's entire life span (life expectancy at birth) or life expectancy could be estimated as the number of years left to live once a person reaches a certain age (such as life expectancy at age 65).

Live birth rate is a measure of all live births among the total population.

Living wage is the hourly wage a worker needs to earn to cover their basic expenses and participate in their community. A living wage is not the same as the minimum wage, which the provincial government legislates for all employers. The living wage reflects what people need to earn to cover the actual costs of living in their community and draws on community-specific data to determine the expenses.

Low birth weight is when an infant is born alive and weighs less than 2.5kg.

Market Basket Measure (MBM) is Canada's official measure of poverty based on the cost of a basket of goods and services representing a basic standard of living, e.g., food, clothing, shelter, transportation and other necessities. This applies to a reference family of two adults and two children. When the disposable income for the MBM falls below a certain threshold, every member in the family is considered to be in poverty.

Men+ is a Statistics Canada term first used in analysis of the 2021 Census. It includes men and boys whose gender corresponds with sex assigned at birth (i.e., cisgender); men and boys whose gender does not correspond with sex assigned at birth (e.g., transgender); and some persons who are non-binary (e.g., agender, fluid, queer, or Two-Spirit). See also Gender categories used by Statistics Canada.

Mother tongue refers to the first language learned at home in childhood and still understood at the time the data was collected. If the person no longer understands the first language learned, the mother tongue is the second language learned. For a person who learned more than one language in early childhood, the mother tongue is the language they spoke most often at home before starting school. A person has more than one mother tongue only if they learned multiple languages at the same time and still understand them. For a child who has not yet learned to speak, the mother tongue is the language spoken most often to this child at home. A child who has not yet learned to speak has more than one mother tongue only if these languages are spoken to them equally, so that they learn these languages at the same time.

Newcomers includes persons who immigrated from 2016-2021. This is a sub-category of all immigrants residing in Hamilton.

Non-binary is one term used to describe genders that don't fall into one of the two "binary" categories of male and female. Individuals might self-identify with other terms such as agender, fluid, Two-Spirit, and gender-nonconforming.

Non-immigrants includes persons who are Canadian citizens by birth.

Non-permanent residents include persons from another country with a usual place of residence in Canada and who have a work or study permit, or who have claimed refugee status (asylum claimants). Family members living with work or study permit holders are also included, unless they are already Canadian citizens, landed immigrants or permanent residents.

Outpatient visit for mental health and substance use describes services provided by a psychiatrist, family physician/general practitioner or pediatrician, covered by the Ontario Health Insurance Plan, to a person who is not hospitalized.

Period of immigration (e.g., 2016-2021) refers to the period when the immigrant first obtained landed immigrant or permanent resident status.

Potential years of life lost is a measure of how many years of life a person could have lived if they did not die prematurely (before age 75). The potential years of life lost for each premature death can be summed to provide a population level total and rate.

Potentially avoidable death is a premature death, among people under age 75, that may potentially have been avoided through successful prevention or treatment. The avoidable conditions are those established in 2012 by the Canadian Institute for Health Information.

ppb: parts (of contaminant) per billion (parts of air), by volume.

Pregnancy rate is a measure of all pregnancies including those that result in live births, stillbirths, or abortion among the population of people with uteruses aged 15-49.

Prevalence is the proportion of a population who have a specific characteristic in a given time period.

Premature death is any death before the age of 75. Different regions of the world may use different age thresholds to define premature deaths within the context of those regions.

Preterm birth is when an infant is born alive after less than 37 weeks of gestation.

Quintile graphs were used in this report to display health inequalities. First, we looked at a socioeconomic measure (e.g., housing need) in each of Hamilton's census neighbourhoods. Based on this socioeconomic measure, Hamilton's census neighbourhoods were sorted into five groups, also known as quintiles. The groups are ordered from least to most based on the value of the socioeconomic measure. Quintile 1 includes areas where the socioeconomic characteristic is least common (e.g., areas with the lowest percentage of housing need). Quintile 5 includes areas where the socioeconomic characteristic is most common (e.g., areas with the greatest percentage of housing need). Next, health outcomes are analyzed for each quintile. How often the health outcome occurs in each quintile is reported as a rate per 100,000 people. Rates describe how frequent a particular health outcome is in a consistent way. Using this approach, we can describe the rate of the health outcome (e.g., fall injuries) relative to the area's socioeconomic characteristics (e.g., housing need). This allows comparing how the health outcome differs as the socioeconomic characteristic changes across census neighbourhoods. This provides an area-level overview of health inequalities but does not provide insight to individual experiences of health inequalities. It is important to note that different age groups have different health experiences, and this analysis does not account for age differences across these different groups.

Racialized population replaces the use of the term "visible minority" used prior to the 2021 Census. It refers to whether a person self-identifies as a visible minority, as defined by the *Employment Equity Act*: "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour". This population consists mainly of the following groups: South Asian, Chinese, Black, Filipino, Arab, Latin American, Southeast Asian, West Asian, Korean and Japanese.

Self-harm includes intentional self-inflicted injury or poisoning which may result in a fatal outcome (attempted or completed suicide).

SHARP PM$_{2.5}$ monitor can detect additional components of PM$_{2.5}$ especially during cold weather. It provides more accuracy than concentrations measured by the Tapered Element Oscillating MicroBalance (TEOM) method, which was used until 2012 in Ontario.

Special Air Quality Statements (SAQS) are the first of a two-level air quality alert system in Ontario issued in partnership with Environment and Climate Change Canada. SAQS inform the public of the potential for degrading air quality and are issued if an Air Quality Health Index of 7 or greater is expected to last for 1-2 hours. A SAQS is also issued for areas where forest fire smoke is expected to cause deteriorating air quality.

Standard drink is defined as one drink that contains 17.05 millilitres or 13.45 grams of pure alcohol. Examples of one standard drink include: a bottle of beer (341 ml or 12 oz, 5% alcohol), a glass of wine (142 ml or 5 oz, 12% alcohol), and a shot glass of spirits (43 ml or 1.5 oz, 40% alcohol).

Stillbirth is when an infant is born dead after 22 weeks of gestation or weighing >500 grams.

Sulphur dioxide (SO$_2$) is an air contaminant that can be harmful to human health. It is a colourless gas that smells like burnt matches. It can be oxidized in the atmosphere to form sulphuric acid aerosols. In addition, SO$_2$ is a precursor to sulphates, one of the main components of airborne secondary PM$_{2.5}$.

Unintentional poisoning is the accidental ingestion, injection, inhalation, or other exposure to a substance (e.g., drugs, medicine, solvents, vapours, biological substances) that causes harm to the body. Intentional poisoning incidents as a form of self-harm or harm to others is excluded.

Up-to-date vaccination record indicates that the person has received vaccinations according to the publicly funded immunization schedule in the province of Ontario and this vaccination record has either: (a) been reported to Hamilton Public Health Services by the person or parents/guardians of the person, or (b) entered into Panorama by Hamilton Public Health Services for vaccinations administered at its own vaccination clinics.

µg/m³: micrograms (of contaminant) per cubic metre (of air), by weight.

Women+ is a Statistics Canada term first used in analysis of the 2021 Census. It includes: women and girls whose gender corresponds with sex assigned at birth (i.e., cisgender); women and girls whose gender does not correspond with sex assigned at birth (e.g., transgender); and some persons who are non-binary (e.g., agender, fluid, queer, or Two-Spirit). See also **Gender categories used by Statistics Canada**.

Appendix A – Supplementary Data Tables

Appendix Table 1.1: Population distribution for men+ and women+ by age group, counts and percent, Hamilton and Ontario residents, 2021

Gender	City of Hamilton						Ontario
	Women+		Men+		Total		Total
Age Group	2021 Census Population	% Population	2021 Census Population	% Population	2021 Census Population	% Population	% Population
0-04	14,180	4.9	14,920	5.3	29,100	5.1	4.8
05-09	14,855	5.1	15,840	5.7	30,695	5.4	5.4
10-14	15,260	5.3	16,190	5.8	31,450	5.5	5.7
15-19	15,265	5.3	16,530	5.9	31,795	5.6	5.6
20-24	17,510	6	18,895	6.8	36,405	6.4	6.3
25-29	20,040	6.9	20,485	7.3	40,525	7.1	6.9
30-34	20,780	7.2	20,550	7.3	41,330	7.3	6.9
35-39	19,720	6.8	19,225	6.9	38,940	6.8	6.7
40-44	17,900	6.2	17,125	6.1	35,025	6.2	6.3
45-49	17,595	6.1	16,560	5.9	34,155	6	6.3
50-54	18,770	6.5	17,900	6.4	36,665	6.4	6.6
55-59	20,775	7.2	20,155	7.2	40,930	7.2	7.3
60-64	19,505	6.7	18,540	6.6	38,045	6.7	6.8
65-69	16,700	5.8	14,935	5.3	31,630	5.6	5.7
70-74	14,305	4.9	12,390	4.4	26,700	4.7	4.9
75-79	9,895	3.4	8,390	3	18,290	3.2	3.3
80-84	7,280	2.5	5,705	2	12,990	2.3	2.3
85-89	5,330	1.8	3,420	1.2	8,750	1.5	1.4
90+	4,040	1.4	1,895	0.7	5,930	1.0	0.9
Total	289,715	100	279,640	100	569,350	100	100

Sources: Statistics Canada. 2023. Census Profile. 2021 Census.

Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released February 8 2023

Notes: Individual age group counts in the Census 2021 were rounded to 0 or 5.

Appendix Table 1.2: Population distribution by age group for men+ and women+, counts and percent, Hamilton residents, Census (2021) and population projections (2046)

Gender	Age Group (years)	2021 Census Population	% Population	2046 Projections	% Population	Age Group Growth Rate
Women+	0-04	14,180	4.9	20,606	5.0	45.3
	5-09	14,855	5.1	20,389	5.0	37.3
	10-14	15,260	5.3	19,732	4.8	29.3
	15-19	15,265	5.3	20,297	5.0	33.0
	20-24	17,510	6.0	24,877	6.1	42.1
	25-29	20,040	6.9	25,513	6.2	27.3
	30-34	20,780	7.2	27,782	6.8	33.7
	35-39	19,720	6.8	29,323	7.2	48.7
	40-44	17,900	6.2	28,845	7.1	61.1
	45-49	17,595	6.1	27,626	6.8	57.0
	50-54	18,770	6.5	26,341	6.4	40.3
	55-59	20,775	7.2	23,815	5.8	14.6
	60-64	19,505	6.7	21,392	5.2	9.7
	65-69	16,700	5.8	19,154	4.7	14.7
	70-74	14,305	4.9	17,649	4.3	23.4
	75-79	9,895	3.4	16,888	4.1	70.7
	80-84	7,280	2.5	16,390	4.0	125.1
	85-89	5,330	1.8	12,370	3.0	132.1
	90+	4,040	1.4	10,005	2.4	147.6
	Total (Women+)	**289,715**	**100.0**	**408,994**	**100.0**	**41.2**

Men+						
	0-04	14,920	5.3	21,617	5.4	44.9
	5-09	15,840	5.7	21,256	5.3	34.2
	10-14	16,190	5.8	20,516	5.1	26.7
	15-19	16,530	5.9	21,169	5.3	28.1
	20-24	18,895	6.8	27,226	6.8	44.1
	25-29	20,485	7.3	26,944	6.7	31.5
	30-34	20,550	7.3	27,989	7.0	36.2
	35-39	19,225	6.9	29,407	7.3	53.0
	40-44	17,125	6.1	28,829	7.2	68.3
	45-49	16,560	5.9	27,843	6.9	68.1
	50-54	17,900	6.4	26,890	6.7	50.2
	55-59	20,155	7.2	23,782	5.9	18.0
	60-64	18,540	6.6	20,278	5.1	9.4
	65-69	14,935	5.3	17,023	4.2	14.0
	70-74	12,390	4.4	15,481	3.9	24.9
	75-79	8,390	3.0	14,924	3.7	77.9
	80-84	5,705	2.0	14,091	3.5	147.0
	85-89	3,420	1.2	9,595	2.4	180.6
	90+	1,895	0.7	5,807	1.4	206.4
	Total (Men+)	**279,640**	**100.0**	**400,667**	**100.0**	**43.3**
Total	**Total all ages**	**569,350**	**100**	**809,661**	**100**	**42.2**

Sources: Statistics Canada. 2023. Census Profile. 2021 Census.

Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released February 8 2023; Population Projections. Hamilton. Ontario Ministry of Health, IntelliHEALTH Ontario. Extracted January 18, 2023

Notes: Individual age group counts in the Census 2021 were rounded to the nearest 0 or 5. The category of women+ includes women and girls, as well as some persons who are non-binary persons. The category of men+ includes men and boys, as well as some persons who are non-binary persons.

Appendix Table 1.3: Age group composition of population and dependency ratio, Hamilton residents, 2021 Census and 2046 population projections

	2021 Census		2046 Population Projections	
	Population Counts	Percent of Total (%)	Population Counts	Percent of Total (%)
Age group composition				
0 to 14 years	91,240	16.0	124,116	15.3
15 to 64 years	373,820	65.7	516,168	63.8
65 years and over	104,290	18.3	169,377	20.9
Total	569,350	100	809,661	100
Dependency ratio (dependent age versus working age)				
Dependent population (0 to 14 years and 65+ years)	195,530		293,493	
Working age (15-64 years)	373,820		516,168	
Total dependency ratio	52.3		56.9	

Sources: Statistics Canada. 2023. Census Profile. 2021 Census.

Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released February 8, 2023; Population Projections. Hamilton. Ontario Ministry of Health, IntelliHEALTH ONTARIO. Extracted January 18, 2023.

Notes: Individual age group counts in the Census 2021 were rounded to 0 or 5.

Appendix Table 2.1: Knowledge of official languages, and mother tongue, 2021, City of Hamilton and Ontario

Characteristic	City of Hamilton		Ontario	
	Population Counts	Percent of Total (%)	Population Counts	Percent of Total (%)
Total population excluding institutional residents - 100% data	563,820	100.0	14,099,790	100.0
Knowledge of official languages				
English only	520,350	92.3	12,196,575	86.5
French only	410	0.1	39,310	0.3
English and French	32,630	5.8	1,519,365	10.8
Neither English nor French	10,435	1.9	344,545	2.4
Mother tongue				
Single responses	542,005	96.1	13,430,605	95.3
Official languages	408,935	72.5	9,642,770	68.4
English	402,740	71.4	9,179,655	65.1
French	6,195	1.1	463,120	3.3
Non-official languages	133,065	23.6	3,787,835	26.9
Arabic	12,560	2.2	214,230	1.5
Italian	12,490	2.2	194,125	1.4
Serbo-Croatian	10,350	1.8	77,145	0.5
Spanish	9,930	1.8	217,245	1.5
Portuguese	7,405	1.3	153,750	1.1

Characteristic	City of Hamilton		Ontario	
	Population Counts	Percent of Total (%)	Population Counts	Percent of Total (%)
Polish	6,665	1.2	106,275	0.8
Punjabi (Panjabi)	6,280	1.1	260,075	1.8
Mandarin	5,215	0.9	327,470	2.3
Urdu	5,150	0.9	170,955	1.2
Tagalog (Pilipino, Filipino)	5,095	0.9	168,845	1.2
Multiple responses	21,815	3.9	669,185	4.7
English and French	2,080	0.4	96,260	0.7
English and non-official language(s)	17,315	3.1	494,610	3.5
French and non-official language(s)	430	0.1	15,710	0.1
English, French and non-official language(s)	370	0.1	16,770	0.1
Multiple non-official languages	1,625	0.3	45,835	0.3

Source: Statistics Canada, 2021 Census of Population. Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released March 29, 2023 (accessed August 23, 2023).

Note: This table excludes knowledge of First Nations, Métis and Inuit languages.

Appendix Table 2.2: Racialized populations, 2021, City of Hamilton and Ontario

Characteristic	City of Hamilton		Ontario	
	Population Counts	Percent of Total (%)	Population Counts	Percent of Total (%)
Racialized population **(formerly "visible minority")**				
Total – Racialized population for the population in private households - 25% sample data	560,915	100.0	14,031,750	100.0
Total racialized population	140,950	25.1	4,817,360	34.3
South Asian	34,790	6.2	1,515,295	10.8
Black	28,415	5.1	768,740	5.5
Arab	15,490	2.8	284,215	2.0
Filipino	11,730	2.1	363,650	2.6
Latin American	11,145	2.0	249,190	1.8
Chinese	10,945	2.0	820,245	5.8
Southeast Asian	8,445	1.5	167,845	1.2
West Asian	7,365	1.3	212,185	1.5
Korean	2,365	0.4	99,425	0.7
Japanese	1,160	0.2	31,420	0.2
Racialized group, not included elsewhere	3,270	0.6	124,120	0.9
Multiple racialized groups	5,825	1.0	181,025	1.3
Not a racialized group – the rest of the population	419,965	74.9	9,214,395	65.7

Source: Statistics Canada, 2021 Census of Population. Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released March 29, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed August 23, 2023).

Appendix Table 2.3: Immigrant status, 2021, City of Hamilton and Ontario

Characteristic	City of Hamilton			Ontario		
	Population Counts	Percent of Total (%)	Percent of Immigrants (%)	Population Counts	Percent of Total (%)	Percent of Immi-grants (%)
Immigrant status and period of immigration						
Total - Immigrant status and period of immigration for the population in private households – 25% sample data	560,920	100.0	-	14,031,755	100.0	-
Non-immigrants	402,725	71.8	-	9,437,320	67.3	-
Immigrants	145,550	25.9	100.0	4,206,585	30.0	100.0
Before 1980 (Multiple years)	40,080	7.1	27.5	860,305	6.1	20.5
1980 to 1990 (11-year period)	17,010	3.0	11.7	506,195	3.6	12.0
1991 to 2000 (10-year period)	25,760	4.6	17.7	852,765	6.1	20.3
2001 to 2010 (10-year period)	28,030	5.0	19.3	941,630	6.7	22.4
2011 to 2021 (10-year period)	34,665	6.2	23.8	1,045,695	7.5	24.9
2016 to 2021 (last 5-year period)	20,145	3.6	13.8	584,680	4.2	13.9
Non-permanent residents	12,640	2.3	8.7	387,850	2.8	9.2

Source: Statistics Canada, 2021 Census of Population. Citation: Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released March 29, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed September 7, 2023).

Appendix Table 2.4: Top 10 places of birth of immigrants, 2021, City of Hamilton and Ontario

Characteristic	City of Hamilton			Ontario		
	Population Counts	Percent of Total (%)	Rank	Population Counts	Percent of Total (%)	Rank
Total immigrant Population	145,550	-	-	4,206,585	-	-
Birthplace of immigrant population						
United Kingdom	12,195	8.4	1	239,485	5.7	4
India	10,935	7.5	2	495,750	11.8	1
Italy	8,905	6.1	3	135,640	3.2	6
Philippines	8,255	5.7	4	268,575	6.4	3
Iraq	5,715	3.9	5	-	-	-
Portugal	5,475	3.8	6	-	-	-
Poland	5,400	3.7	7	-	-	-
Pakistan	5,300	3.6	8	165,530	3.9	5
China	4,100	2.8	9	355,955	8.5	2
United States of America	4,045	2.8	10	111,390	2.6	9
Jamaica	-	-	-	122,770	2.9	7
Sri Lanka	-	-	-	112,730	2.7	8
Hong Kong	-	-	-	108,480	2.6	10
Total recent immigrant population (2016-2021)	20,145	-	-	-	-	-
Birthplace of recent immigrant population						
India	3,205	15.9	1	139,655	23.9	1
Syria	2,640	13.1	2	30,180	5.2	4
Philippines	1,790	8.9	3	45,235	7.7	3
Nigeria	915	4.5	4	16,575	2.8	7

Appendix Table 2.4: Continued from page 213

Characteristic	City of Hamilton			Ontario		
	Population Counts	Percent of Total (%)	Rank	Population Counts	Percent of Total (%)	Rank
Iraq	905	4.5	5	12,940	2.2	9
Pakistan	665	3.3	6	23,970	4.1	5
United States of America	615	3.1	7	17,940	3.1	6
China	580	2.9	8	54,645	9.3	2
Jamaica	525	2.6	9	9,975	1.7	10
United Kingdom	340	1.7	10	-	-	-
Iran	-	-	-	13,215	2.3	8

Source: Statistics Canada, 2021 Census of Population. Statistics Canada. 2022. Focus on Geography Series. 2021 Census. Statistics Canada Catalogue no. 98-404-X2016001. Ottawa, Ontario. Release date: February 9, 2022. Updated on: November 30, 2022. http://www12.statcan.gc.ca/census-recensement/2021/as-sa/fogs-spg/index.cfm?Lang=E

Appendix Table 2.5: Individual poverty rate (market basket measure) for men+ and women+ by age group, counts and percent, Hamilton and Ontario residents, 2020

Gender	City of Hamilton							Ontario	
	Women+		Men+		Total			Total	
Age Group (Years)	Count	%	Count	%	Count	%	95% CI	%	95% CI
0-17	4,260	8.0	4,575	8.1	8,830	8.0	7.6-8.4	8.7	8.6-8.8
0-5	1,475	8.8	1,710	9.3	3,185	9.1	8.3-9.9	9.5	9.3-9.7
6-17	2,780	7.6	2,865	7.5	5,645	7.5	7.1-8.0	8.3	8.1-8.6
18-24	2,780	11.8	3,345	13.1	6,120	12.5	11.9-13.1	13.7	13.5-13.9
25-54	8,430	7.4	8,425	7.6	16,860	7.5	7.3-7.7	8.3	8.2-8.3
55-64	3,430	8.5	3,920	10.3	7,350	9.4	9.0-9.8	8.9	8.8-9.0
65+	2,370	4.4	1,795	4.0	4,160	4.2	4.0-4.5	4.8	4.7-4.8
Total	**21,265**	**7.5**	**22,060**	**8.0**	**43,325**	**7.7**	**7.5-7.9**	**8.3**	**8.3-8.3**

Source: Statistics Canada. Table 98-10-0113-01, Individual Market Basket Measure poverty status by economic family characteristics of persons: Canada, provinces and territories, census divisions and census subdivisions. Accessed November 24, 2023, from: http://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=981001130

Appendix Table 2.6: Individual poverty rate (market basket measure) by selected groups of Hamilton residents and compared to Ontario, counts and percent, 2020

Characteristic	City of Hamilton		
	Count	Total of Sub-Population	Percent of Total (%)
Individual poverty rate (Market Basket Measure)			
Hamilton	43,325	560,915	7.7
Ontario	1,158,845	13,977,130	8.3
Men+	22,060	275,900	8.0
Women+	21,265	285,020	7.5
0-5	3,185	35,095	9.1
6-17	5,645	74,875	7.5
18-24	6,120	48,960	12.5
25-54	16,860	225,165	7.5
55-64	7,350	78,240	9.4
65+	4,160	98,570	4.2
Bachelor's degree or higher	5,365	31,520	5.7
Postsecondary below bachelor level	6,850	103,130	6.6
High school diploma or equivalency certificate	6,905	74,815	9.2
No degree (less than high school)	5,080	31,520	16.1
Living with family	22,760	461,625	4.9
Living alone or with others not in immediate family	20,565	99,290	20.7
Not immigrant	26,670	402,730	6.6
Immigrant (including recent immigrants)	11,085	145,545	7.6
Recent immigrant (2016-2021)	2,990	20,150	14.8
Not racialized (white)	26,735	419,965	6.4
Racialized	16,590	140,950	11.8

Sources: Age group and gender subgroup estimates: Statistics Canada. Table 98-10-0113-01 Individual Market Basket Measure poverty status by economic family characteristics of persons: Canada, provinces and territories, census divisions and census subdivisions; Other subgroups: Numerator: Target group profile of the low-income population (Market Basket Measure), Census, 2021. Community Data Program - Custom data order from Statistics Canada. Denominator: Statistics Canada, 2021 Census of Population.

Appendix Table 2.7: Housing tenure, affordable housing and core housing need for households, counts and percents, City of Hamilton and Ontario

Characteristic	City of Hamilton		Ontario	
	Household Counts	Percent of Total (%)	Household Counts	Percent of Total (%)
Housing tenure (owner/renter)				
Total - Private households by tenure - 25% sample data	222,805	100	5,491,200	100
Owner	146,410	65.7	3,755,720	68.4
Renter	76,400	34.3	1,724,970	31.4
Affordable housing				
Total - Owner and tenant households with household total income greater than zero, in non-farm, non-reserve private dwellings by shelter-cost-to-income ratio - 25% sample data	221,115	100.0	5,415,420	100.0
Spending less than 30% of income on shelter costs	169,815	76.8	4,103,320	75.8
Spending 30% or more of income on shelter costs	51,305	23.2	1,312,095	24.2
Core housing need				
Total - Owner and tenant households with household total income greater than zero and shelter-cost-to-income ratio less than 100%, in non-farm, non-reserve private dwellings - 25% sample data	216,390	100.0	5,272,360	100.0
In core need	28,055	13.0	639,805	12.1
Not in core need	188,335	87.0	4,632,550	87.9

Source: Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released March 29, 2023.
https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed September 13, 2023).

Appendix Table 2.8: Time trends in core housing need for households, 2011 to 2021, City of Hamilton

Year	Total Households	Percent of Households in Core Housing Need (%)
2011	Not available	13.1
2016	30,760	15.4
2021	28,055	13.0

Source: Statistics Canada. Census Profiles, 2011, 2016 and 2021

Appendix Table 2.9: Household food insecurity, Hamilton households, 2019-2020 and 2021-2022

	Hamilton		Ontario	
	Percent (%)	Percent 95% CI (%)	Percent (%)	Percent 95% CI (%)
Food insecurity (household level)				
2019-2020	19.1	15.4-22.8	17.1	16.3-17.9
2021-2022	18.0	15.2-20.8	17.4	16.7-18.0

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Household food insecurity estimates from the Canadian Income Survey: Ontario 2019-2022. Toronto, ON: King's Printer for Ontario; 2024. [Modified 2024 Jul 5; cited 2024 Jul12]

Appendix Table 2.10: Highest education level attained for the population aged 25-64, City of Hamilton residents compared to Ontario, counts and percent, 2021

Characteristic	City of Hamilton		Ontario	
	Counts	Percent of Total (%)	Counts	Percent of Total (%)
Highest educational level (age 25-64)				
Total – Highest certificate, diploma or degree for the population aged 25-64 years in private households – 25% sample data	303,405	100.0	7,584,645	100.0
No certificate, diploma or degree	31,520	10.4	667,665	8.8
High (secondary) school diploma or equivalency certificate	74,815	24.7	1,770,810	23.3
Postsecondary certificate, diploma or degree	197,070	65.0	5,146,170	67.8
Postsecondary certificate or diploma below bachelor level (including apprenticeship or trades certificate)	103,130	34.0	2,356,375	31.1
Apprenticeship or trades certificate or diploma	16,895	5.6	384,770	5.1
College, CEGEP or other non-university certificate or diploma	79,495	26.2	1,787,580	23.6
University certificate or diploma below bachelor level	6,740	2.2	184,030	2.4
Bachelor's degree or higher	93,940	31.0	2,789,795	36.8
Bachelor's degree	61,395	20.2	1,798,010	23.7
University certificate or diploma above bachelor level	5,690	1.9	173,205	2.3
Degree in medicine, dentistry, veterinary medicine or optometry	2,970	1.0	71,055	0.9
Master's degree	20,065	6.6	658,060	8.7
Earned doctorate (excluding honorary doctorates)	3,820	1.3	89,470	1.2

Source: Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released March 29, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed September 13, 2023).

Appendix Table 2.11: Bachelor's degree or higher, population aged 25-64 by selected groups of City of Hamilton residents and compared to Ontario, 2021

Characteristic	City of Hamilton		
	Counts	Percent (%)	95% CI
Bachelor's degree or higher (age 25-64)			
Total – Highest certificate, diploma or degree for the population aged 25-64 in private households – 25% sample data	303,405	-	-
Hamilton	93,940	31.0	30.6-31.3
Ontario	3,528,600	36.8	36.7-36.9
Women+	52,980	34.3	33.8-34.8
Male+	40,965	27.5	27.1-28.0
25-34 years	32,800	40.3	39.5-41.1
35-44 years	24,675	33.6	32.9-34.3
45-54 years	20,295	28.9	28.0-29.7
55-64 years	16,175	20.7	20.1-21.3
Racialized (formerly visible minority)	31,950	42.8	42.0-43.6
South Asian	11,455	59.6	58.2-61.1
Chinese	3,325	59.3	56.2-62.3
Arab	3,115	42.3	39.4-45.1
Black	4,175	30.6	29.0-32.3
Not racialized (white)	61,990	27.1	26.7-27.5
Immigrant	31,415	35.9	35.3-36.6
Non-permanent residents	4,245	62.5	59.8-65.1
Not Immigrant	58,280	27.9	27.5-28.3

Sources: Statistics Canada. Table 98-10-0432-01. Highest level of education by visible minority and immigrant status: Canada, provinces and territories, census divisions and census subdivisions with a population 5,000 or more, DOI: https://doi.org/10.25318/9810043201-eng (accessed December 12, 2023)

Appendix Table 2.12: Family structure, census family type, individual resident's family type, City of Hamilton and Ontario

Characteristic	City of Hamilton		Ontario	
	Counts	Percent (%)	Counts	Percent (%)
Census family type				
Total number of census families in private households - 100% data	157,120	100.0	3,969,670	100.0
Total couple families	126,990	80.8	3,291,560	82.9
Married couples	104,915	66.8	2,776,165	69.9
With children (any age)	60,470	38.5	1,571,480	39.6
Without children	44,440	28.3	1,204,680	30.3
Common-law couples	22,070	14.0	515,395	13.0
With children (any age)	8,305	5.3	189,835	4.8
Without children	13,770	8.8	325,560	8.2
Total one-parent families	30,135	19.2	678,110	17.1
in which the parent is a woman+	23,985	15.3	538,450	13.6
in which the parent is a man+	6,150	3.9	139,660	3.5
Individual's family type				
Total - Persons in private households - 100% data	560,915	100.0	14,031,750	100.0
Total - Persons in census families	461,625	82.3	11,601,460	82.7
Married spouses or common-law partners	253,975	45.3	6,583,120	46.9
Parents in one-parent families	30,135	5.4	678,110	4.8
Children (any age)	177,510	31.6	4,340,235	30.9
In a two-parent family	130,110	23.2	3,281,460	23.4
In a one-parent family	47,405	8.5	1,058,775	7.5
Total - Persons not in census families in private households - 100% data	99,290	17.7	2,430,295	17.3
Living alone	62,110	11.1	1,452,540	10.4
Living with other relatives (including foster children)	14,895	2.7	388,780	2.8
Living with non-relatives only	22,285	4.0	588,970	4.2
Household type				
Total - Household type - 100% data	222,810	100.0	5,491,200	100.0
One-census-family households without additional persons	134,420	60.3	3,347,195	61.0
Couple-family households	111,410	50.0	2,841,660	51.7
With children (all ages)	60,525	27.2	1,517,365	27.6
Without children	50,880	22.8	1,324,295	24.1
One-parent-family households	23,015	10.3	505,535	9.2
Multigenerational households	8,140	3.7	221,120	4.0
Multiple-census-family households	1,570	0.7	45,215	0.8
One-census-family households with additional persons	7,030	3.2	184,430	3.4
Two-or-more-person non-census-family households	9,535	4.3	240,700	4.4
One-person households	62,110	27.9	1,452,540	26.5

Source: Statistics Canada, 2021 Census of Population. Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023.
https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed December 12, 2023).

Appendix Table 2.13: Community belonging, percent (%) of Hamilton residents aged 12 and older by selected groups of City of Hamilton residents and compared to Ontario, 2015-2020 (combined)

Percent of people who have a somewhat strong or very strong sense of belonging to their community[1]		Hamilton		Ontario	
		%	95% CI	%	95% CI
		71.2	(68.9, 73.4)	70.9	(70.3-71.5)
Sex	Male	70.0	(66.6, 73.3)		
	Female	72.3	(69.4, 75.0)		
Age	12-19	83.2	(76.7, 88.2)		
	20-44	63.6	(58.5, 68.5)		
	45-64	72.1	(67.8, 76.0)		
	65-74	82.2	(77.9, 85.8)		
	75+	74.7	(67.2, 81.0)		
Income	High income (top 20%)	67.6	(62.4, 72.4)		
	Low income (bottom 20%)	73.1	(67.3, 78.3)		

Source: Canadian Community Health Survey [2015-2016 to 2019-2020], Statistics Canada, Share File, Ontario Ministry of Health

Appendix Table 2.14: Disability prevalence by sex and age group Hamiltonian residents aged 15 and over, 2017

		Hamilton				Ontario	
		Count	Count 95% CI	% Total	Percent 95% CI (%)	% Total	Percent 95% CI (%)
Disability prevalence							
Total prevalence of disability		125,700	(97,387-153,963)	29.1	(24.3-34.4)	24.1	(23.4-24.8)
Sex	Male	58,450	-	27.6	(21.3-34.9)	22	(21.2-23.0)
	Female	67,250	-	30.7	(23.9-38.4)	26	(25.1-27.0)
Age group	15-64	93,600	-	25.9	(20.9-31.7)	19.8	(19.1-20.5)
	65 and over[E]	32,100	-	45.4	(34.3-57.1)	43.1	(41.4-44.8)
Males by age group	15-64[E]	45,000	-	25.1	(18.5-33.2)	18.1	(17.2-19.1)
	65 and over[E]	13,450	-	40.8	(25.2-58.5)	40.4	(37.8-43.0)
Females by age group	15-64[E]	48,600	-	26.8	(19.5-35.5)	21.3	(20.3-22.4)
	65 and over[E]	18,650	-	49.5	(34.9-64.1)	45.4	(43.1-47.7)

Source: Canadian Survey on Disability, 2017, Community Data Program - Custom data order from Statistics Canada

Notes:

- These data were acquired as a custom order from Statistics Canada. The data are not typically available at the geographic levels provided here, as the CSD is designed to report on Canada, the provinces and the territories. Much of the data are suppressed or should be used with caution (rating = E).

- E denotes the estimate has high sampling variability for Hamilton residents and should be interpreted with caution. The data predate Statistics Canada's improved collection of gender identity information in 2021.

Appendix Table 8.1: Annual Air Quality Health Index (AQHI) risk levels at Hamilton Downtown monitoring station, percent of valid hours, 2015-2021

2015		Year						
		2016	**2017**	**2018**	**2019**	**2020**	**2021**	
Number of annual valid hours		8733	8713	8667	8627	8585	8737	8571
Risk Level		Percent of Valid Hours						
Low risk	AQHI = 1	3.3	2.4	2.2	3.8	2.8	3.6	5.2
	AQHI = 2	34.1	36.3	37.8	38.8	38.3	46.2	43.0
	AQHI = 3	42.3	45.4	45.7	40.7	44.3	40.5	37.5
Moderate risk	AQHI = 4	16.1	13.2	12.2	13.5	11.9	8.5	11.0
	AQHI = 5	3.2	2.6	1.8	2.6	2.5	1.0	2.8
	AQHI = 6	0.9	0.3	0.1	0.6	0.2	0.3	0.4
High risk	AQHI = 7	0.1	0	0.1	0.1	0	0	0.2
	AQHI = 8	0	0	0	0	0	0	0
	AQHI = 9	0	0	0	0	0	0	0
	AQHI = 10	0	0	0	0	0	0	0
Very high risk	AQHI = 10+	NA	NA	NA	0	0	0	0
Percent of valid hours at moderate risk or above		20.3	16.0	14.2	16.7	14.6	9.8	14.5
Number of days at least 1 hour is high risk or more >6		4	0	1	2	0	0	2

Source: Air Quality Ontario. Air Quality in Ontario Reports 2015-2021.
Available from: www.airqualityontario.com/press/publications.php and www.ontario.ca/document/air-quality-ontario-2021-report

Appendix Table 8.2: Annual air contaminants at Hamilton Downtown monitoring station, 2011-2021

Contaminant	Year									
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Nitric oxide (NO) (Annual mean (ppb))	4.6	4.3	3.9	1.3	4.2	3.9	3.9	4.0	2.9	3.5
Nitrogen dioxide (NO2) (Annual mean (ppb))	11.9	12.4	12.4	12.2	11.9	11.9	11.6	12.5	9.9	10.2
Nitrogen oxides (NOx) (Annual mean (ppb))	16.6	16.8	16.3	7.7	16.1	15.8	15.5	16.5	12.8	13.7
Fine particulate matter (PM2.5) (Annual mean µg/m3)) **AAQC=8.8µg/m3**	10.2	10.1	10.8	10.2	8.2	8.5	9.2	8.8	8.1	8.9
Ground-level ozone (O3) 1h maximum 1h Maximum (ppb)O3 1h **AAQC: 80 ppb**	88.0	86.0	74.0	74.0	78.0	73.0	77.0	65.0	77.0	80
Ground-level ozone (O3) (Annual mean (ppb))	25.7	25	25.3	25.9	26.7	25.6	25.6	24.4	26.3	26.4
Ground-level ozone (O3) summer means (May - September) (Summer mean (ppb))	32.4	28.4	27.5	29.5	30.6	27.8	29.7	26.1	29.4	30.1
Ground-level ozone (O3) winter means (January-April, October-December) (Winter mean (ppb))	20.9	22.5	23.7	23.3	23.9	24.2	22.6	23.2	24.1	23.8
Sulphur dioxide (SO2) (Annual mean (ppb)) **SO2 1y AAQC: 4 ppb**	4.8	4.8	5.1	4.3	3.2	3.5	5.0	4.8	3.7	3.8
Carbon monoxide (CO) (1h maximum (ppm)) **CO 1h AAQC: 30 ppm**	1.7	2.0	2.9	1.3	1.4	2.1	1.7	1.9	1.2	1.5
Benzene (Annual mean (µg/m3)) **Benzene 1y AAQC: 0.45 µg/m3**	INS	0.977	INS	0.899	1.092	0.675	0.569	0.639	0.568	0.613
Toluene (Annual mean (µg/m3)	INS	2.067	INS	2.229	2.249	1.642	1.296	0.862	0.817	1.314
Ethylbenzene (Annual mean (µg/m3))	INS	0.193	INS	0.192	0.21	0.186	0.187	0.129	0.126	0.172
m- and p-xylene (Annual mean (µg/m3))	INS	0.603	INS	0.594	0.621	0.518	0.532	0.359	0.398	0.486
o-xylene (Annual mean (µg/m3))	INS	0.195	INS	0.206	0.216	0.189	0.198	0.131	0.145	0.183
1,3-butadiene (Annual mean (µg/m3))	INS	0.046	INS	0.032	0.037	0.025	0.039	0.028	0.028	0.036

Source: Air Quality in Ontario 2021 Report & Appendices, Available from: https://www.ontario.ca/document/air-quality-ontario-2021-report/appendix#section-6

Notes:

- INS indicates there was insufficient data to calculate a valid annual mean.
- The annual mean for 2018 for Hamilton Downtown is derived from data from March to June, August, and October to December in 2018 for the following contaminants: benzene, toluene, ethylbenzene, m- and p-xylene, o-xylene, 1,3-butadiene.

Appendix Table 8.3: Estimated deaths attributed to risk factors based on Global Burden of Disease Study, 2019, residents of Hamilton, 2012 and 2018

Risk Factor Category (Level 2 Risks)	2012	2018
Metabolic risks (Body Mass Index (BMI), blood pressure, cholesterol)	984	1050
Tobacco	553	518
Dietary risks	590	427
Extreme temperature (hot and cold)	N/A	196
Occupational risks (injuries, carcinogens)	154	113
Alcohol and drug use	52	74
Low physical activity	103	71
Air pollution	90	55
Other environmental risks (including radon)	8	20
Child and maternal malnutrition	19	15
Unsafe sex	19	7
Violence and sexual abuse	1	6
Unsafe water, sanitation and handwashing	2	1

Note: Estimates are calculated based on Population Attributable Fractions, Canada, Global Burden of Disease Study 2019 using deaths to Hamiltonians in 2018; deaths sourced through Ministry of Health, IntelliHEALTH ONTARIO.

Appendix Table 8.4: Annual heat and cold warning events and days, City of Hamilton 2011-2023

Year	Heat Warnings		Cold Warnings	
	# Events	# Days	# Events	# Days
2011	3	10	9	25
2012	8	9	3	5
2013	2	9	7	31
2014	3	3	10	52
2015	4	13	8	42
2016	7	17	8	16
2017	2	4	4	20
2018	6	19	4	5
2019	3	7	4	15
2020	7	24	1	2
2021	5	17	4	4
2022	4	11	11	16
2023	4	11	3	6

Sources: City of Hamilton Public Health Services, Summary of Heat Warnings 2011 – present. Accessed October 25, 2023, and Summary of Cold Warnings 2011 – present. Accessed January 22, 2024

Appendix Table 13.1: Hypertensive disease, prevalence and annual incidence, by sex and age group, Hamilton residents aged 20 and older, 2020

Hypertensive Disease		Count			Crude Rate
Prevalence		**Count**	**% Total Count**	**Percent (%)**	**95% Confidence Interval**
Total (Age 20+)		129,579	100	27.5	27.3-27.6
Sex	Male	63,641	49.1	27.5	27.3-27.6
	Female	65,938	50.9	27.5	27.2-27.7
Age group*	20-44	8,626	6.7	4.2	4.1-4.3
	45-64	47,119	36.4	29.3	29.0-29.6
	65-74	34,867	26.9	59.2	58.6-59.8
	75+	38,967	30.1	84.4	83.6-85.3
Incidence		**Count**	**% Total Count**	**Rate per 100,000**	**95% Confidence Interval**
Total (Age 20+)		4,217	100	1203.7	1,167.4-1,240.1
Sex*	Male	2,247	53.3	1304.7	1,250.7-1,358.6
	Female	1,970	46.7	1106.1	1,057.2-1,154.9
Age group*	20-44	844	20.0	425.8	397.0-454.5
	45-64	2,100	49.8	1807.5	1,730.2-1,884.8
	65-74	826	19.6	3239.2	3,018.3-3,460.1
	75+	447	10.6	4292.3	3,894.4-4,690.2

Data Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot: prevalence/incidence of hypertensive disease crude and age-specific rates (both sexes) 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16]. Available from: www.publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidenceprevalence

Note: Asterisk (*) denotes significant difference within group

Appendix Table 13.2: Selected chronic diseases in order of relative inequalities (rate ratios) of deaths by equity sub-populations, Hamilton residents, 2009-2018

Chronic Disease (In order of highest inequities)	Equity Sub-population (In order of highest inequities)	Relative Rate Difference	95% Confidence Interval	Equity Assessment ↓↑ Indicates significant differences between highest to lowest quintile
Diabetes (ICD-10 Codes E10-14 includes both Type 1 and Type 2)	Income	2.90	2.44-3.44	↑
	Core Housing Need	2.84	2.42-3.33	↑
	Family Structure (One-Parent)	2.09	1.75-2.49	↑
	Education	1.49	1.26-1.75	↑
	Racialization	1.08	0.09-1.29	-
Hypertensive disease (ICD-10 codes I10-I15)	Income	2.42	1.85-3.18	↑
	Core Housing Need	2.13	1.65-2.76	↑
	Family Structure (One-Parent)	1.48	1.12-1.95	↑
	Education	0.93	0.73-1.19	-
	Racialization	0.57	0.43-0.76	↓
Ischemic heart disease (ICD-10 codes I20-I25)	Core Housing Need	2.13	1.98-2.30	↑
	Income	1.92	1.77-2.08	↑
	Family Structure (One-Parent)	1.45	1.34-1.58	↑
	Education	1.19	1.11-1.29	↑
	Racialization	0.73	0.67-0.79	↓
Cerebrovascular disease (ICD-10 codes I60-I69)	Core Housing Need	1.52	1.33-1.73	↑
	Income	1.50	1.72-1.31	↑
	Family Structure (One-Parent)	1.11	0.97-1.28	-
	Education	0.92	1.04-0.81	↑
	Racialization	0.72	0.63-0.83	↓
Colorectal cancer (ICD-10 codes C18-C20, C26.0)	Core Housing Need	1.59	1.35-1.87	↑
	Family Structure (One-Parent)	1.44	1.22-1.70	↑
	Income	1.43	1.20-1.70	↑
	Education	1.18	1.00-1.39	↑
	Racialization	0.65	0.55-0.77	↓
Prostate cancer (ICD-10 codes C61)	Core Housing Need	1.75	1.37-2.23	↑
	Income	1.48	1.15-1.91	↑
	Family Structure (One-Parent)	1.27	0.98-1.64	-
	Education	0.82	0.64-1.05	-
	Racialization	0.61	0.47-0.79	↓
Breast cancer (ICD-10 codes C50 (female only))	Core Housing Need	1.40	1.15-1.70	↑
	Income	1.37	1.11-1.69	↑
	Family Structure (One-Parent)	1.11	0.90-1.36	-
	Education	0.93	0.76-1.13	-
	Racialization	0.54	0.44-0.67	↓

Appendix Table 13.2: Continued from page 228

Chronic Disease (In order of highest inequities)	Equity Sub-population (In order of highest inequities)	Relative Rate Difference	95% Confidence Interval	Equity Assessment ↓↑ Indicates significant differences between highest to lowest quintile
Malignant melanoma (ICD-10 codes C43)	Core Housing Need	1.02	0.66-1.02	-
	Income	0.77	0.49-1.20	-
	Education	0.72	0.46-1.11	-
	Family Structure (One-Parent)	0.83	0.54-1.27	-
	Racialization	0.45	0.28-0.73	↓

Data Source: Ministry of Health, IntelliHealth, Vital Statistics, 2009-2018

Appendix Table 13.3: Diabetes, prevalence and annual incidence, by sex and age group, Hamilton residents aged 20 and older, 2020

Diabetes		Count		Crude Rate	
Prevalence		**Count**	**% Total Count**	**Percent (%)**	**95% Confidence Interval**
Total (age 20+)		61,954	100	13.1	13.0-13.2
Sex*	Male	32,181	51.9	13.9	13.7-14.0
	Female	29,773	48.1	12.4	12.3-12.5
Age group*	20-44	5,827	9.4	2.8	2.8-2.9
	45-64	23,030	37.2	14.3	14.1-14.5
	65-74	16,704	27.0	28.3	28.0-28.8
	75+	16,393	26.5	35.5	35.0-36.0
Incidence		**Count**	**% Total Count**	**Rate per 100,000**	**95% Confidence Interval**
Total (age 20+)		61,954	100	863.2	835.0-891.5
Sex*	Male	1,855	51.7	916.1	874.4-957.8
	Female	1,731	48.3	812.9	774.6-851.2
Age group*	20-44	700	19.5	348.5	322.6-374.3
	45-64	1,580	44.1	1,131.8	1,076.0-1,187.6
	65-74	815	22.7	1,876.8	1,747.9-2,005.6
	75+	491	13.7	1,558.3	1,420.5-1,696.2

Data Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot: prevalence/incidence of diabetes crude and age- specific rates (both sexes) 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16]. Available from: www.publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidenceprevalence

Note: Asterisk (*) denotes significant difference within group

Appendix Table 13.4: Asthma, prevalence and annual incidence, by sex and age group,
Hamilton residents, all ages, 2020

Hypertensive Disease		Count			Crude Rate
Prevalence		**Count**	**% Total Count**	**Percent (%)**	**95% Confidence Interval**
Total (all ages)		80,416	100.0	13.4	13.3-13.5
Sex	Male	38,324	47.7	12.9	12.7-13.0
	Female	42,092	52.3	13.9	13.8-14.0
Age group*	0-19	14,831	18.4	11.5	11.4-11.7
	20-44	34,559	43.0	16.8	16.6-17.0
	45-64	18,034	22.4	11.2	11.1-11.4
	65-74	6,875	8.5	11.7	11.4-11.9
	75+	6,117	7.6	13.3	12.9-13.6
Incidence		**Count**	**% Total Count**	**Rate per 100,000**	**95% Confidence Interval**
Total (all ages)		1,365	100.0	254.4	240.9-267.9
Sex*	Male	640	46.9	237.9	219.5-256.4
	Female	725	53.1	271.1	251.3-290.8
Age group*	0-19	469	34.4	364.9	331.9-397.9
	20-44	351	25.7	204.3	182.9-225.7
	45-64	318	23.3	222.1	197.6-246.5
	65-74	137	10.0	261.9	218.0-305.7
	75+	90	6.6	221.7	175.9-267.6

Note: Asterisk (*) denotes significant difference within group

Appendix Table 13.5: Chronic obstructive pulmonary disease, prevalence and annual incidence, by sex and age group, counts and annual crude rate, Hamilton residents aged 20 and older, 2020

COPD		Count			Crude Rate
Prevalence		**Count**	**% Total Count**	**Rate per 100,000**	**95% Confidence Interval**
Total (age 20+)		40,217	100	8,523.3	8,440.0-8,606.6
Sex	Male	19,832	49.3	8,558.0	8,438.9-8,677.1
	Female	20,385	50.7	8,489.9	8,373.3-8606.4
Age group*	20-44	1,636	4.1	794.2	755.7-832.7
	45-64	16,884	42.0	10,501.0	10,342.6-10,659.4
	65-74	10,845	27.0	18,405.7	18,059.3-18,752.1
	75+	10,852	27.0	23,516.7	23,074.2-23,959.1
Incidence		**Count**	**% Total Count**	**Rate per 100,000**	**95% Confidence Interval**
Total (age 20+)		1,671	100	384.2	365.8-402.6
Sex*	Male	925	55.4	432.9	405.0-460.8
	Female	746	44.6	337.2	313.0-361.3
Age group*	20-44	244	14.6	119.3	104.3-134.2
	45-64	710	42.5	490.1	454.1-526.2
	65-74	386	23.1	790.9	712.0-869.8
	75+	331	19.8	902.5	805.3-999.7

Data Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot: prevalence/incidence of COPD–crude and age- specific rates (both sexes) 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16]. Available from: www.publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidenceprevalence

Note: Asterisk (*) denotes significant difference within group

Appendix Table 13.6: Chronic obstructive pulmonary disease, incidence counts and age standardized rate Hamilton and Ontario, residents aged 20 and older, 2011-2020

| Year | # New Cases | Hamiltonians Age-Standardized Incidence Rate | | Ontario Age-Standardized Incidence Rate | | Significantly Different |
		Rate	95% CI	Rate	95% CI	Hamilton compared to Ontario
2011	2,930	778.7	750.4-806.9	677.9	672.5-683.2	Higher
2012	2,694	705.9	679.2-732.6	648.5	643.4-653.7	Higher
2013	2,716	700.2	673.9-726.6	639.2	634.2-644.3	Higher
2014	2,677	680.8	654.9-706.6	617.3	612.4-622.2	Higher
2015	2,579	647.1	622.1-672.1	593.8	588.9-598.6	Higher
2016	2,674	659.7	634.6-684.7	568.8	564.1-573.4	Higher
2017	2,436	591.8	568.3-615.4	553.2	548.7-557.8	Higher
2018	2,428	578.7	555.6-601.8	512.2	507.9-516.5	Higher
2019	2,165	504.3	482.9-525.7	465.8	461.7-469.8	Higher
2020	1,671	390.6	371.7-409.4	339.1	335.7-342.6	Higher

Data Source: ICES Chronic Disease Derived Cohorts, 2011 to 2020, Date received: August 31, 2022. Distributed by Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: chronic disease incidence and prevalence Snapshot: prevalence/incidence of COPD–crude and age- specific rates (both sexes) 2020 [Internet]. Toronto, ON: King's Printer for Ontario; c2022 [2022 Dec 15; cited 2022 Dec 16]. Available from: www.publichealthontario.ca/en/data-and-analysis/chronic-disease/chronic-disease-incidenceprevalence

Appendix Table 13.7: Cancer prevalence by type, Hamilton residents, 2018

Cancer Type	Count	Population	% of Population (or sex specific where indicated)
All cancer	26,700	570,400	4.7
Breast (female)	5,645	288,145	2.0
Prostate (males)	4,655	282,250	1.6
Colorectal	3,140	570,400	0.6
Melanoma	1,820	570,395	0.3
Non-Hodgkin lymphoma	1,465	570,395	0.3
Lung	1,255	570,395	0.2
Thyroid	1,060	570,395	0.2
Kidney	990	570,400	0.2
Bladder	785	570,400	0.1
Leukemia	710	570,400	0.1
Oral cavity and pharynx	615	570,395	0.1
Cervix	395	288,145	0.1
Hodgkin lymphoma	330	570,395	0.06
Brain and other nervous system	305	570,395	0.05
Myeloma	290	570,400	0.05
Stomach	280	570,395	0.05
Larynx	170	570,395	0.03
Liver	160	570,400	0.03
Pancreas	155	570,400	0.02
Esophagus	105	570,400	0.02

Source Ontario Cancer Registry SEER*Stat Package - Release 12 - OCR (March 2021). Statistics Canada. Table 17-10-0005-01 Population estimates on July 1st, by age and sex [Internet]. Ottawa (CA): Government of Canada; 2020 Sept 29 [cited 2021-01-21]. Available from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501."

Notes:

- Counts were randomly rounded to multiples of 5 to protect personal health information.

- Prevalence describes the number and percentage of people diagnosed with cancer within the past 30 years and still alive on the index date of January 1, 2019 (i.e., diagnosed between 1989 and 2018). People with more than one cancer diagnosis are counted once for the first diagnosis.

- Only the first cancer of a given type in an individual is counted (for people who have multiple episodes of cancer).

Appendix Table 13.8: Cancer incidence by type, counts and age standardized rate, Hamilton residents and Ontario, 2018

Cancer Type	Count	Hamilton Age-Stand-ardized Rate	Hamilton 95% CI	Ontario Age-Stand-ardized Rate	Ontario 95% CI	Different than Ontario
All cancer	3,580	568.9	550.3-588.0	543.0	539.3-546.7	↑
Breast (female)	475	150.3	136.8-164.7	147.4	144.7-150.1	-
Lung	460	70.5	64.1-77.3	64.1	62.8-65.3	-
Colorectal	375	58.0	52.2-64.3	53.5	52.3-54.6	-
Prostate	365	121.6	109.3-134.8	128.9	126.4-131.5	-
Bladder	195	30.0	25.9-34.5	25.6	24.8-26.4	-
Melanoma	165	26.2	22.3-30.6	25.2	24.4-26.0	-
Non-Hodgkin lymphoma	155	24.8	21.1-29.1	27.3	26.5-28.2	-
Kidney	120	19.0	15.7-22.8	16.9	16.3-17.6	-
Pancreas	105	15.9	12.9-19.4	12.8	12.3-13.4	-
Thyroid	105	18.4	15.0-22.3	21.4	20.6-22.1	-
Leukemia	85	13.3	10.6-16.5	15.6	15.0-16.2	-
Myeloma	75	11.2	8.7-14.1	9.2	8.8-9.7	-
Stomach	75	12.2	9.6-15.3	10.6	10.1-11.1	-
Oral cavity and pharynx	70	11.4	8.9-14.5	12.1	11.6-12.7	-
Cervix 2016-2018 3-years combined)	65	8.2	6.3-10.4	8.4	8.0-8.8	-

Sources: Ontario Cancer Registry SEER*Stat Package - Release 12 - OCR (March 2021).
Statistics Canada. Table 17-10-0005-01 Population estimates on July 1st, by age and sex [Internet]. Ottawa (CA): Government of Canada; 2020 Sept 29 [cited 2021-01-21]. Available from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501.

Notes:
- Cancer of the cervix rate is provided for 3 years combined to permit reporting due to privacy and stability concerns.
- Counts were randomly rounded to multiples of 5 to protect personal health information.
- All cancer types with insufficient counts to display in 2018 (with the exception of cervix) (e.g., brain & other nervous systems, larynx, esophagus) are not included in this table.
- To be comparable with the PHU level statistics, Ontario statistics exclude cancer cases of unknown residence (PHU); therefore, provincial statistics may not match the true counts and rates published elsewhere. 95% Confidence Interval is an estimate of the potentially lower and higher value of the rate.
- 95% Confidence Interval is an estimate of the potentially lower and higher value of the rate.
- Age standardized rates are adjusted to the 2011 Canadian standard population.
- This refers to a person's sex as recorded on health records, rather than their gender identity.
- Incidence describes the number of new cases.