CANCER INCIDENCE DATA REVIEW
2000-2018

CITY OF FLINT, MICHIGAN

Michigan Department of Health and Human Services
Division of Environmental Health

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The Michigan Department of Health and Human Services will not exclude from participation in, deny benefits of, or discriminate against any individual or group because of race, sex, religion, age, national origin, color, height, weight, marital status, partisan considerations, or a disability or genetic information that is unrelated to the person's eligibility.

Cancer Incidence Data Review,
City of Flint, Michigan, 2000-2018

Summary

This cancer data review was initiated as a result of citizen concerns for the City of Flint, and not as a result of any documented cluster of cancer cases. This report provides cancer incidence for the City of Flint compared to Genesee County and Michigan, 2000-2018, for a subset of cancer sites that have been shown in peer-reviewed scientific literature to be associated with lead, per- and polyfluoroalkyl substances (PFAS), and/or total trihalomethanes (TTHM). A cancer site is the place of origin in the body where the cancer arose.

- Annual cancer incidence rates for most of the selected cancer sites could not be calculated for the City of Flint due to the low numbers of cases. Comparing these year-to-year incidence rates for colon, lung and bronchus, and prostate gland cancer in the City of Flint was not significantly different than Genesee County for nearly all years compared. This pattern was similarly observed when comparing the City of Flint to the state of Michigan, except for lung and bronchus cancer where the City of Flint had significantly higher annual rates than the state of Michigan for eight out of the 19 years compared.
- However, the 19-year combined cancer incidence rate (2000-2018) for lung and bronchus cancer and larynx cancer for the City of Flint was significantly higher than Genesee County and the state of Michigan; additionally, the cancer rate for stomach and prostate gland cancer for the City of Flint is significantly higher than the state of Michigan. The 19-year City of Flint cancer incidence rates for ovary, testes, urinary bladder, and brain and other central nervous system (CNS) cancer was significantly lower than the rate for Genesee County and the state of Michigan.
- For most cancer sites, the 19-year combined cancer incidence rate (2000-2018) for white residents of the City of Flint was not significantly different than for Black residents. Black residents had a significantly higher rate than white residents for stomach and prostate gland cancer; white residents had a significantly higher rate than Black residents for urinary bladder cancer.
- Compared to Genesee County or the state of Michigan, the frequency of cancers in the City of Flint was higher than expected for some cancer sites and lower than expected for others. This was also observed when the analysis was stratified by race or time period. There is no discernible, definitive increasing or decreasing trend in the comparison of the number of cancer cases observed in the City of Flint to what would be expected based on the cancer incidence for Genesee County and for the state of Michigan.

- This data review cannot determine whether cancer rates are associated with environmental exposures. This data review is descriptive, only identifying if there is a difference in cancer incidence in the City of Flint compared to county- and state-level cancer incidence.

Background

The Michigan Department of Health and Human Services' (MDHHS) Cancer Registry Program and Division of Environmental Health has conducted a review of cancer incidence data for diagnosis years 2000-2018, as collected by the Michigan Cancer Registry, for the combined 41 census tracts that make up the City of Flint, Michigan. We have prepared this report in response to a request from citizens to provide analysis specific to the City of Flint using all recent data available for cancers that have been shown in the scientific literature to be associated with chemical exposures to lead, per- and polyfluoroalkyl substances (PFAS), and/or total trihalomethanes (TTHM). There is community concern about the possibility of hazardous chemical exposure from the public water supply during the time the water supply was connected to the Flint River.

The City of Flint switched from water supplied by the Detroit Water and Sewerage Department (DWSD) to Flint River water as a drinking water source in April 2014.[1] In December 2014, The Michigan Department of Environmental Quality, now the Michigan Department of Environment, Great Lakes, and Energy (EGLE), notified the City of Flint of a violation for TTHM levels.[1,2] TTHM are disinfection byproducts regulated by the U.S. EPA (nationally) and EGLE (in Michigan) in community drinking water supplies as a group of chemicals.[3] The four chemicals measured for TTHM are chloroform, bromodichloromethane, dibromochloromethane, and bromoform. These chemicals are formed when chlorine, added to disinfect the water, reacts with other chemicals that could be in the water, such as total organic carbon. TTHM levels measured in the City of Flint water distribution system varied in 2014.[4] After the switch to the Flint River water, lead leached from plumbing, pipes, and fixtures due to the different characteristic of the water and the lack of corrosion control chemicals.[5] Elevated levels of lead were found in tap water samples from City of Flint homes.[6] In October 2015, the City of Flint switched back to water supplied by the DWSD.[1] Varying levels of lead continued to be found in drinking water in City of Flint homes.[7] Variability in water quality parameters, including chlorine, was reduced after the switch back to water supplied by the DWSD in 2015.[2]

During the time that the Flint River was used for drinking water, PFAS were not regulated chemicals in public water supplies. However, water samples from various areas of the Flint River were tested for PFAS both

before and after the river was used as a source of drinking water. In 2013, samples taken downstream of the City of Flint's drinking water intakes had detectable levels of PFOS and PFOA below the human health screening levels used at the time.[8,9] Additional Flint River water samples taken in 2016 upstream of where the City of Flint drinking water intakes were located showed PFOS levels below human health screening levels used at the time.[9]

This report is a follow-up to the report we published in 2020 that described cancer incidence rates for Genesee County compared to the state of Michigan and to two other urban counties that are sociodemographically similar to Genesee County (Saginaw and Calhoun counties) for four cancer sites.[10] It also compared cancer incidence rates for each ZIP code of Genesee County to the county as a whole for 22 cancer sites. The findings from the earlier report are the following:

- Genesee County's total cancer incidence rate was higher than the state of Michigan for most years during 1985 to 2015. However, rates of breast, colorectal, lung, and prostate cancer were not higher than the state of Michigan for most years during 1985 to 2015.
- Urban counties that are sociodemographically similar to Genesee County have rates of lung, female breast, and colorectal cancer that are not statistically different than Genesee County for most years during 1985 to 2015.
- Compared to the county, the frequency of cancers was higher than expected for some cancer sites and in some ZIP codes and lower than expected in others.
- ZIP code 48505 stood out as having more statistical elevations in cancer incidence than expected compared to other ZIP codes (11 cancer sites) but had cancer incidence that was statistically lower than expected for eight cancer sites.

A higher frequency of cancer than expected for a geographic area can be due to:[11]

- Chance or coincidence;
- Underestimating the expected number of cancer cases (e.g., not considering a risk factor within the population at risk);
- Higher frequency of medical testing for cancer;
- Higher frequency of known causes of cancer (e.g., smoking) and/or;
- Higher frequency of unknown cause(s) of cancer, yet to be determined.

Therefore, this report should be considered a descriptive review of cancer incidence for the City of Flint compared to Genesee County and the state of Michigan. It should not be considered evidence that potential exposure to any environmental contaminant has resulted in higher or lower cancer risk.

Methods

A cancer case is defined as a person with newly diagnosed cancer where the cancer site is reported to be malignant and primary. A cancer site is the place of origin in the body where the cancer arose. The data source for cancer cases in this report is the Michigan Resident Cancer Incidence File managed by the Michigan Cancer Surveillance Program (MCSP) in the Division for Vital Records & Health Statistics (DVRHS), Michigan Department of Health & Human Services. As required by MCL 333.2619 and Administrative Rules R. 325.9050 *et seq*., all newly diagnosed cases of invasive cancer in Michigan are routinely reported to the MCSP by reporting facilities such as hospitals and independent laboratories. This registry collects the patients' age, gender, race, cancer site and type, and residential address at the time of diagnosis. The registry does not record the cause of an individual's cancer nor does it collect sufficient information to determine the cause. Population data used in this report include annual population estimates, total and by race group, for the state of Michigan, Genesee County, and the 41 census tracts that comprise the City of Flint that originate from the U.S. Census.

For the purposes of the residential address at the time of cancer diagnosis as well as population data for analyses included in this report, the City of Flint was defined by the combination of the following 41 census tracts: 26049000100, 26049000200, 26049000300, 26049000400, 26049000500, 26049000600, 26049000700, 26049000800, 26049000900, 26049001000, 26049001100, 26049001200, 26049001300, 26049001400, 26049001500, 26049001600, 26049001700, 26049001800, 26049001900, 26049002000, 26049002200, 26049002300, 26049002400, 26049002600, 26049002700, 26049002800, 26049002900, 26049003000, 26049003100, 26049003200, 26049003300, 26049003400, 26049003500, 26049003600, 26049003700, 26049003800, 26049004000, 26049013500, 26049013600, 26049980000, 26049980100. The use of census tracts provided the best representation of the City of Flint and allowed for accurate population data from the U.S. Census. The Michigan Resident Cancer Incidence File has the attributed residential census tract for cancer cases diagnosed since 2000; therefore, analyses in this report include cancer cases diagnosed from 2000 to 2018, the most recent data years available. See Appendix, Figure 21 for a map of these census tracts.

Part 1 – Comparing Cancer Incidence Rates for the City of Flint to that of Genesee County and the State of Michigan

We compared annual and 19-year combined, age-adjusted cancer incidence rates between 2000 and 2018 for the City of Flint to those for the state of Michigan for the following cancer sites: colon, rectum, stomach, lung and bronchus, larynx, prostate gland, ovary, testes, urinary bladder, kidney and renal pelvis, brain and other central nervous system (CNS), meningioma. These cancer sites were chosen based on evidence of their association with lead, PFAS, or TTHM in the peer-reviewed scientific literature.[12-24] We also compared these cancer incidence rates for the City of Flint to those for Genesee County as a whole. Lastly, to evaluate disparities by race, we calculated cancer incidence rates for the City of Flint, Genesee County, and the state of Michigan separately for the two race groups, white and Black.

Cancer incidence rates are calculated as the number of new cancer cases during a given year in a geographic area divided by the population of the geographic area for that year.

Populations often differ in their distribution of age, which may in turn affect the overall rate of cancer cases in that population. For example, if one population has a larger number of elderly adults than another, it could demonstrate a higher cancer incidence rate simply due to its age structure. Therefore, when comparing cancer incidence rates between populations of different age distributions, it is important to account for those differences. In this report, age structure differences are accounted for in calculating cancer incidence rates using direct standardization methodology to compute age-adjusted rates using the 2000 United States Standard Population.[25]

Cancer incidence rates that are based on fewer than 20 cases are considered statistically unstable. This results in wide confidence intervals negating any usefulness for making comparisons between geographic areas or groups. Therefore, cancer incidence rates based on fewer than 20 cases are suppressed (not reported) in this report. To protect the identity of persons diagnosed with cancer, counts between one and five are also suppressed. Other counts are not reported if they can be used to calculate the suppressed counts - this is called complementary (or secondary) suppression.

To demonstrate time trends, age-adjusted cancer incidence rates for the City of Flint, Genesee County, and the state of Michigan are presented in line graphs where at least 10 annual rates are not suppressed due to

low counts of cases. To determine if these geographic regions have experienced an overall trend in cancer incidence over the 19-year period (2000-2018), the Spearman Correlation Coefficient and its accompanying statistical Rank Correlation Test were utilized where a rate could be reported for all 19 years. This test assesses whether there is a statistically significant monotonic relationship between two variables, in this case year and cancer incidence rate.

The Spearman Correlation Coefficient (rho, ρ) ranges from –1.0 to 1.0. If the coefficient equals –1.0, it indicates a perfect negative correlation, where each year has a lower cancer incidence rate than the previous year. If the coefficient equals 1.0, it indicates a perfect positive correlation, where each year has a higher cancer incidence rate than the previous year. As the correlation coefficient approaches 0.0, from either direction, the relationship between the two variables weakens. For example, a correlation coefficient of 0.90 indicates a stronger positive relationship between two variables than a coefficient of 0.50.

The p-value of the Rank Correlation test ranges from 0.0 to 1.0 and gives the probability of finding a significant overall monotonic trend in the cancer incidence rate data when, in reality, no trend exists. The standard used to assess the significance of a statistical test is p-value = 0.05. A p-value less than 0.05 indicates that there is less than a 5 percent chance of observing a trend, if in reality, rates are stable. In this case, the result is considered statistically significant. If the p-value is greater than or equal to 0.05, chance cannot be excluded as a likely explanation for the observed trend, so the result is not considered statistically significant. From this, it follows that:

- If there is a statistically significant increase in cancer incidence rates over time, the Spearman Correlation Coefficient will be positive and the p-value for the test will be less than 0.05.
- If there is a statistically significant decrease in cancer incidence rates over time, the Spearman Correlation Coefficient will be negative and the p-value for the test will be less than 0.05.

The 95-percent confidence interval for each annual rate and 19-year combined rate is also presented. It represents the range we would expect the rate fall within 95-percent of the time. When the 95-percent confidence interval for the rate is wide, it indicates that the rate is imprecise; rates that are based on small numbers of cancer cases will have wide confidence intervals. Confidence intervals can also be used to test whether the rate for the City of Flint is statistically different than the rates for the Genesee County or for the state of Michigan as a whole. If the 95-percent confidence interval for the Genesee County rate or the state of

Michigan rate overlaps with the 95-percent confidence interval for the City of Flint rate, it means that there is not a statistical difference between the city rate and the comparison geographies.

Part 2 – Identifying the Occurrence of Excess Cancer Incidence in the City of Flint

For the City of Flint, we determined whether the cancer incidence that was observed during the time period 2000 through 2018 exceeded what would be expected based on the cancer incidence for Genesee County and for the state of Michigan, for the following cancer sites: colon, rectum, stomach, lung and bronchus, larynx, prostate gland, ovary, testes, urinary bladder, kidney and renal pelvis, brain and other central nervous system (CNS), meningioma. For this, we calculated Standardized Incidence Ratios (SIRs). The SIR is calculated by dividing the number of cases of cancer that occurred among City of Flint residents (called observed cases) by the number of cases that would be expected if the City of Flint had the same cancer rate as Genesee County or the state of Michigan. We also calculated SIRs separately for the four-year time period 2000-2003 and the five-year time periods 2004-2008, 2009-2013, and 2014-2018 to assess whether there is an increasing or decreasing trend in the comparison of the number of cancer cases observed in the City of Flint to what would be expected based on the cancer incidence for Genesee County and for the state of Michigan. All of these analyses were conducted for the total population and then separately for the two race groups, white and Black.

- When the **SIR equals 1.00**, it means that the number of cases of cancer observed in the City of Flint **is the same** as would be expected if that area has the same cancer rate as the comparison population (county or state).
- When the **SIR is less than 1.00**, it means that the City of Flint **has fewer** cancer cases than expected based on the county or state rates.
- When the **SIR is greater than 1.00**, it means that the City of Flint **has more** cancer cases observed than would be expected based on the county or state rates. For example, an SIR of 1.5 would mean that the number of cases in the area was 50 percent higher than would be expected if the area had the same cancer rate as the comparison population.
- The degree to which the SIR is different than 1.0 (further away from 1.0 in either direction) indicates the strength of evidence for a difference between the expected and observed number of cases, i.e., that the City of Flint has higher or lower cancer incidence than the comparison population (county or state). As the SIR approaches 1.0, the evidence for higher or lower cancer incidence in the City of Flint

(versus the comparison population) gets weaker. The SIR is interpreted using the following framework.[26]

SIR Value	Strength of Evidence that the City of Flint Has Higher or Lower Cancer Incidence than the Comparison Population
Less than 0.4	Strong evidence of decreased cancer incidence
0.4 to less than 0.7	Moderate evidence of decreased cancer incidence
0.7 to less than 0.9	Weak evidence of decreased cancer incidence
0.9 to less than 1.2	No evidence of a difference in cancer incidence
1.2 to less than 1.5	Weak evidence of increased cancer incidence
1.5 to less than 3.0	Moderate evidence of increased cancer incidence
3.0 or greater	Strong evidence of increased cancer incidence

Similar to the age-adjustment process explained in Part 1, SIR calculations for Part 2 account for both differences in the age structure and the sex distribution between the City of Flint and Genesee County or the state of Michigan populations using indirect standardization methodology. SIRs were tested for evidence of a statistical difference in cancer rates by calculating 95-percent confidence intervals for each SIR. The 95-percent confidence interval represents the range in which we would expect the SIR to fall 95-percent of the time. When the 95-percent confidence interval is wide for an SIR, it indicates that the SIR is imprecise; SIRs that are based on small numbers of cancer cases will have wide confidence intervals. Confidence intervals can be used as a way to test whether the SIR shows evidence of a statistical difference in cancer rates. If the 95-percent confidence interval does not include the value 1.0 in its range, then the SIR is statistically different. It is important to note that when the number of cancer cases is small, such as for rare cancer sites or in smaller geographic areas, the report of only a few extra cancer cases can result in large SIRs, making interpretation of the confidence intervals particularly important. As long as the value 1.00 is contained within the SIR's 95-percent confidence interval, the SIR is within the range of expected values and is not evidence of a statistical difference in cancer incidence.

To protect the identity of persons diagnosed with cancer, counts (observed and expected) between one and five are suppressed. Other counts are not reported if they can be used to calculate the suppressed counts - complementary suppression.

Limitations

- Results of this investigation are based on surveillance data and not an epidemiologic research study of the relationship between any risk factors and cancer incidence. Therefore, these results cannot indicate whether any cancer occurrence is related to or caused by environmental contaminant exposures. Michigan Central Cancer Registry records do not include the data necessary to make such an evaluation. If a statistical increase (or decrease) is observed among the results of these analyses, it does not necessarily mean that the difference is due to an environmental exposure.
- This review cannot determine which individuals (with or without cancer) residing within the geographic area have been exposed to any environmental contaminant.
- The latency period is the time that passes between being exposed to something that can cause cancer (such as an environmental contaminant) and having symptoms or being diagnosed. Latency periods vary by cancer site and type. Cancer observed during a specific period could be related to an exposure that occurred a long time ago.
- Migration of people into and out of an area of analysis limits the interpretation of this data. The Michigan Cancer Surveillance Program records a person's address at time of cancer diagnosis, which may not reflect where they spent the majority of their life or the period of time when exposure to a cancer-causing agent occurred. For example, cancer cases included in the analysis of the investigation period could be related to exposures they had when they lived in another state.
- Multiple cancer data years have been combined due to the small number of cancer cases for the selected geographic area.
- The Michigan Central Cancer Registry data has residential census tract data starting from the year 2000. Since the City of Flint was defined by the combination of 41 census tracts, analyses of cancer incidence for the City of Flint before 2000 are not available.
- Analyses in this report are stratified by two race groups, white and Black. Due to low numbers of cancer cases in the City of Flint for other race groups, analyses for other race groups are not reported.

Results

Part 1 – Comparing Cancer Incidence Rates for the City of Flint to that of the Genesee County and the State of Michigan

Figures 1 through 3 provide the annual trend in cancer incidence rates for the City of Flint (2000-2018) compared to Genesee County and the state of Michigan for the three cancer sites where there were 10 or more unsuppressed annual incidence rates: colon, lung and bronchus, and prostate gland.

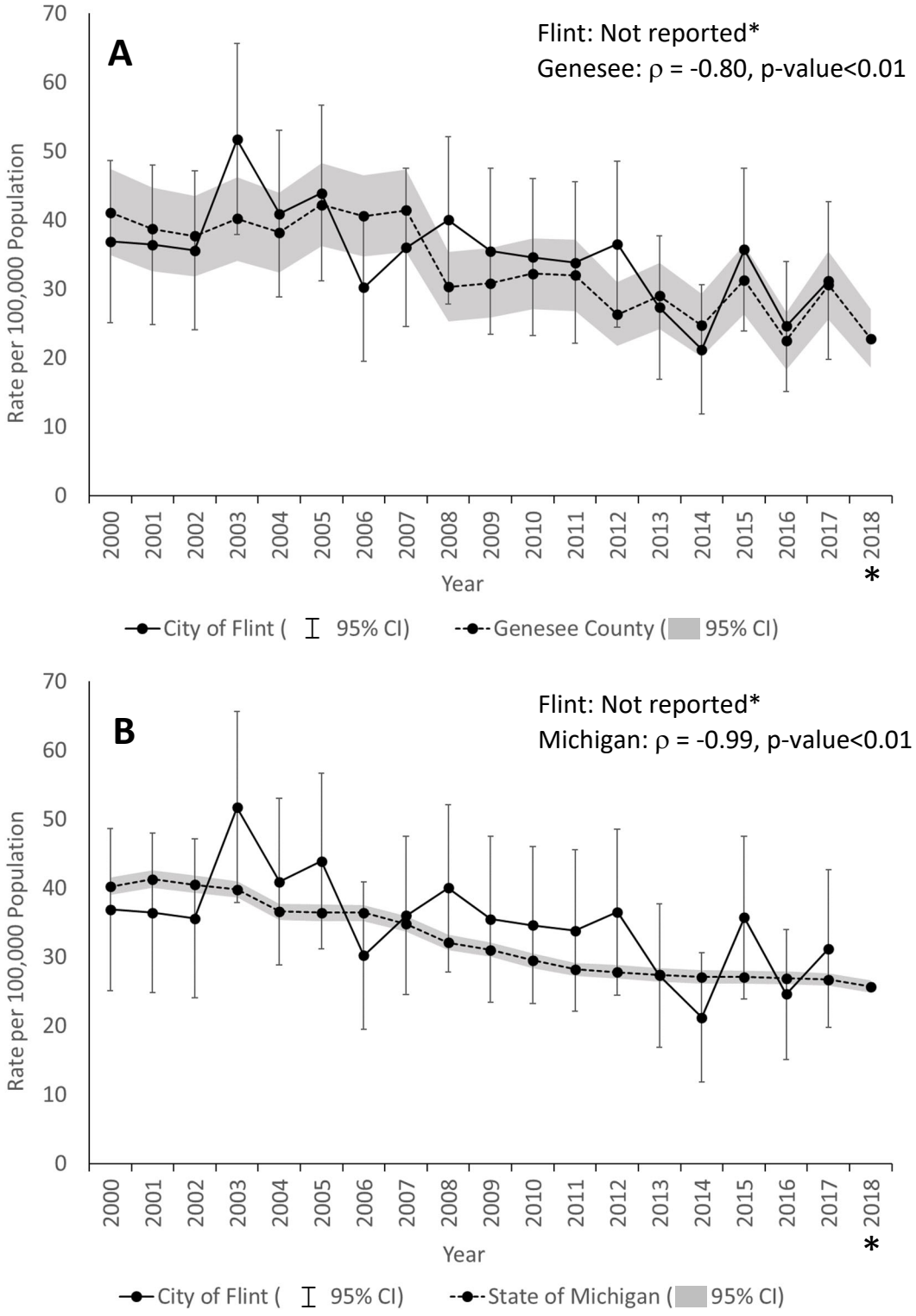
Table 1 provides the 19-year cancer incidence rates for the City of Flint (2000-2018) compared to Genesee County and the state of Michigan for all selected cancer sites.

Figures 4 and 5 provide the annual trend in cancer incidence rates for the City of Flint (2000-2018) for the race groups white and Black for two cancer sites where there were 10 or more unsuppressed annual incidence rates: lung and bronchus and prostate gland.

Table 2 provides the 19-year cancer incidence rates for the race groups white and Black for the City of Flint (2000-2018) for all selected cancer sites.

See Appendix, Tables 3-14, for all reportable counts and rates for Part 1 analyses.

Figure 1. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year for Colon Cancer[2], City of Flint, (A) Genesee County, and (B) State of Michigan, 2000-2018



[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Colon cancer cases were defined by new malignant cancer diagnoses where colon was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

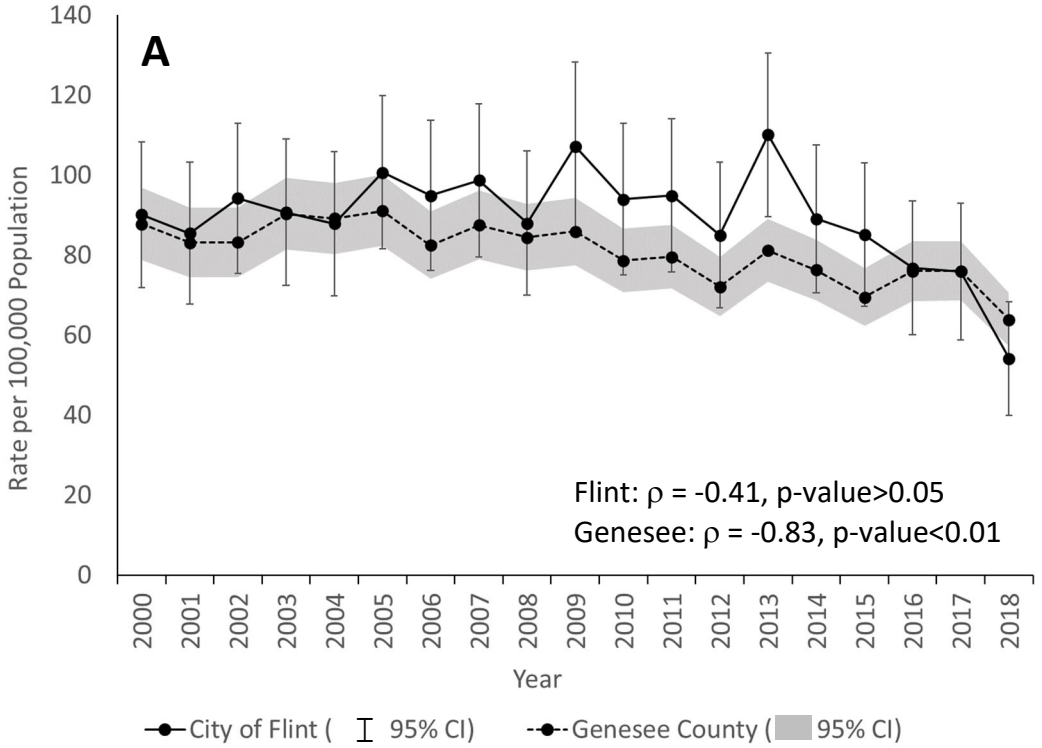
* City of Flint cancer incidence rate suppressed (rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero); Spearman Correlation Coefficient and its accompanying statistical Rank Correlation Test for the City of Flint not conducted due to suppressed data.

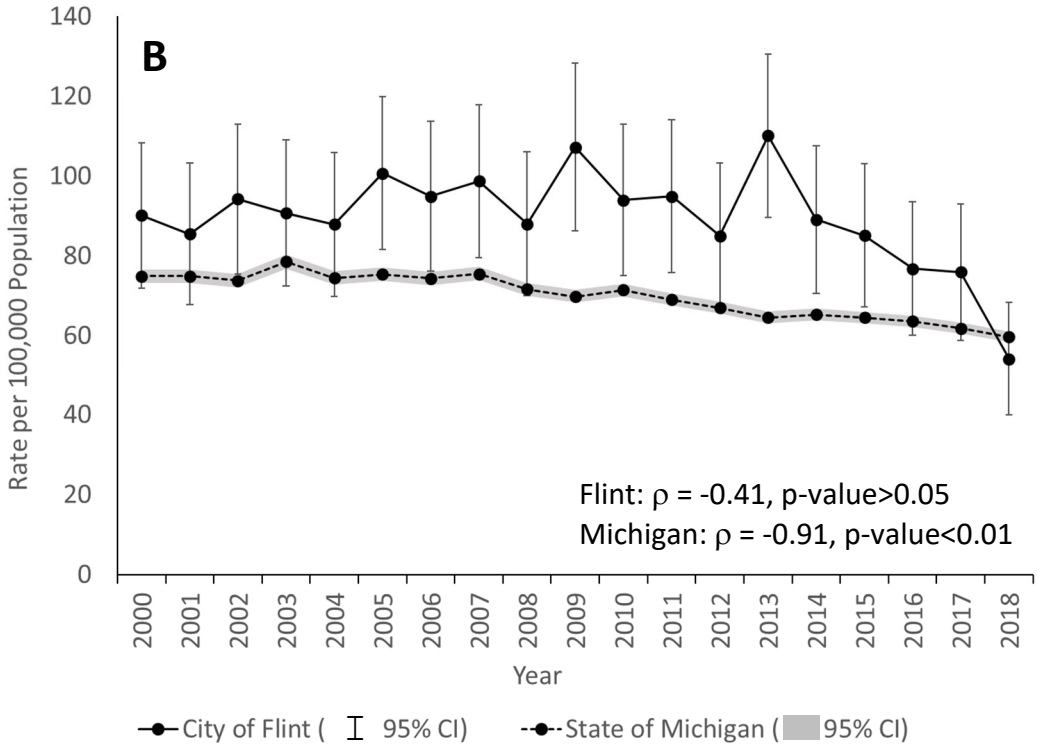
- The City of Flint's colon cancer incidence rate was not statistically different than Genesee County for any of the years during 2000 through 2017. (The rate for City of Flint 2018 was suppressed due to low counts.)

- The City of Flint's colon cancer incidence rate was not statistically different than the state of Michigan for any of the years during 2000 through 2017. (The rate for City of Flint 2018 was suppressed due to low counts.)

- Colon cancer incidence rates demonstrated a statistically decreasing trend over this time period for Genesee County and the state of Michigan ($p<0.05$).

Figure 2. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year for Lung and Bronchus Cancer[2], City of Flint, (A) Genesee County, and (B) State of Michigan, 2000-2018





[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

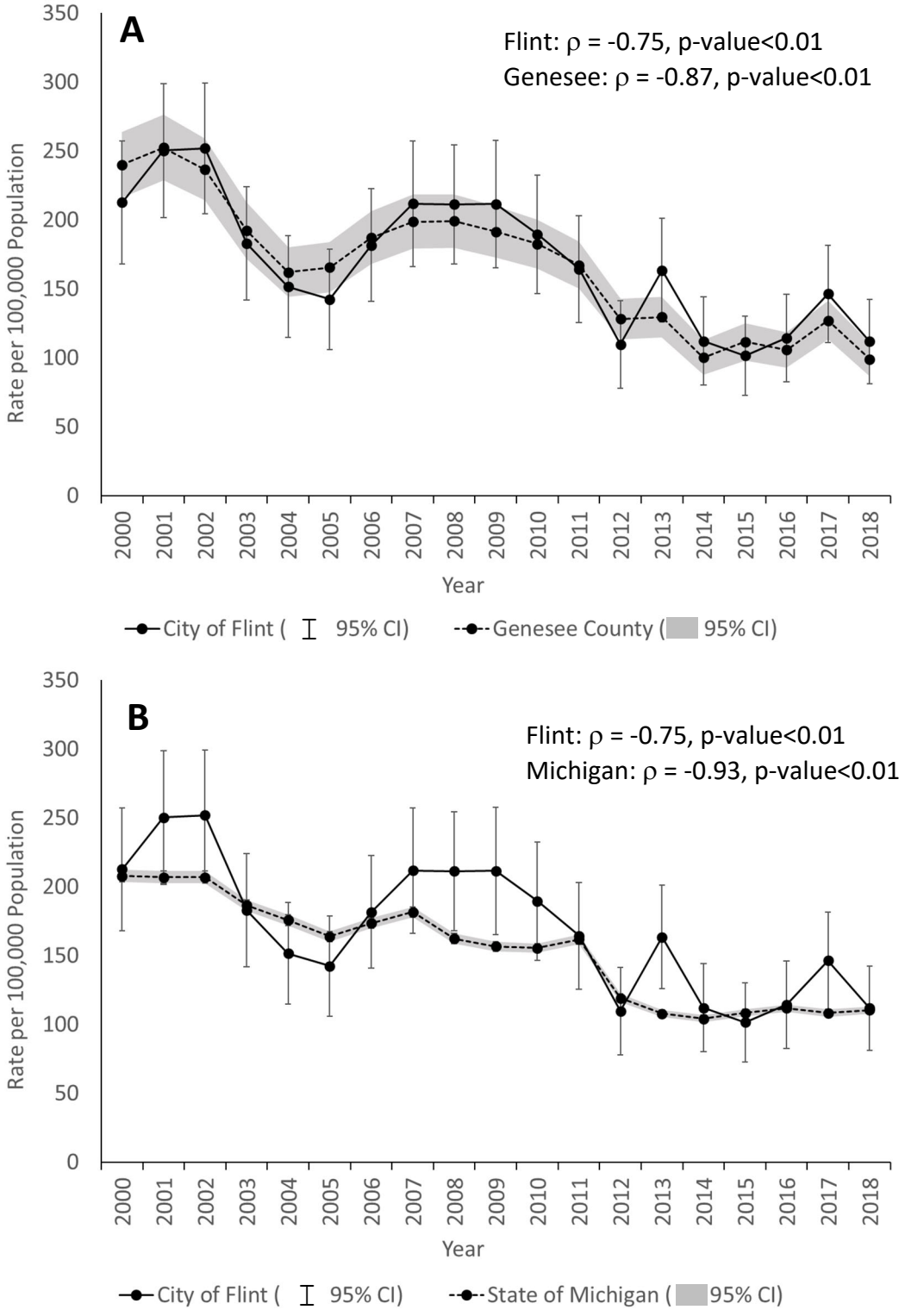
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Lung and bronchus cancer cases were defined by new malignant cancer diagnoses where lung or bronchus was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

- The City of Flint's lung and bronchus cancer incidence rate was not statistically different than Genesee County for 18 out of the 19 years during 2000 through 2018. In 2013, the City of Flint's lung and bronchus cancer incidence rate was statistically higher than Genesee County.

- The City of Flint's lung and bronchus cancer incidence rate was not statistically different than the state of Michigan for 11 out of the 19 years during 2000 to 2018. For the other eight years, the City of Flint had lung and bronchus cancer incidence rates that were statistically higher than the state of Michigan.

- Lung and bronchus cancer incidence rates demonstrated a statistically decreasing trend over this time period for Genesee County and the state of Michigan ($p<0.05$). There was a non-significant decreasing trend in lung and bronchus cancer incidence rates for the City of Flint during this time period.

Figure 3. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year for Prostate Gland Cancer[2], City of Flint, (A) Genesee County, and (B) State of Michigan, 2000-2018



[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Prostate gland cancer cases were defined by new malignant cancer diagnoses where prostate gland was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

- The City of Flint's prostate gland cancer incidence rate was not statistically different than Genesee County for any years during 2000 through 2018.

- The City of Flint's prostate gland cancer incidence rate was not statistically different than the state of Michigan for 17 out of the 19 years during 2000 to 2018.

- Prostate gland cancer incidence rates demonstrated a statistically decreasing trend over this time period for the City of Flint, Genesee County and the state of Michigan ($p<0.05$).

Table 1. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Site[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Cancer Site	City of Flint Rate per 100,000 (95% CI) [Count]	Genesee County Rate per 100,000 (95% CI) [Count]	State of Michigan Rate per 100,000 (95% CI) [Count]
Colon	34.1 (31.5, 36.7) [662]	32.7 (31.5, 33.9) [2,909]	31.8 (31.5, 32.0) [67,360]
Rectum	13.8 (12.2, 15.4) [273]	13.3 (12.6, 14.1) [1,189]	13.7 (13.5, 13.9) [29,178]
Stomach	8.3 (7.0, 9.5) [160]	6.7 (6.1, 7.2) [603]	6.5 (6.4, 6.6) [13,880]
Lung and Bronchus	89.5 (85.3, 93.7) [1,771]	80.6 (78.7, 82.4) [7,374]	69.4 (69.1, 69.8) [149,641]
Larynx	7.5 (6.3, 8.6) [155]	4.6 (4.2, 5.1) [436]	4.0 (3.9, 4.1) [8,775]
Prostate Gland	167.5 (158.6, 176.4) [1,427]	162.0 (158.1, 166.0) [6,743]	148.9 (148.2, 149.7) [149,718]
Ovary	10.4 (8.5, 12.3) [116]	13.4 (12.4, 14.5) [653]	12.6 (12.4, 12.8) [14,197]
Testes	2.9 (1.8, 4.0) [29]	5.2 (4.5, 6.0) [191]	5.8 (5.7, 6.0) [5,211]
Urinary Bladder	18.7 (16.7, 20.6) [358]	23.5 (22.5, 24.5) [2,120]	23.2 (23.0, 23.4) [49,466]
Kidney and Renal Pelvis	16.0 (14.3, 17.8) [322]	17.4 (16.5, 18.2) [1,570]	15.9 (15.7, 16.1) [33,879]
Brain and Other CNS	4.9 (4.0, 5.9) [106]	6.8 (6.3, 7.4) [587]	6.9 (6.8, 7.1) [14,064]
Meningioma	^ (^, ^) [*]	^ (^, ^) [10]	0.1 (0.1, 0.2) [302]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Shading indicates that the cancer incidence rate for the comparison population was statistically higher or lower than the rate for the City of Flint. (95-percent confidence intervals for the two rates do not overlap)

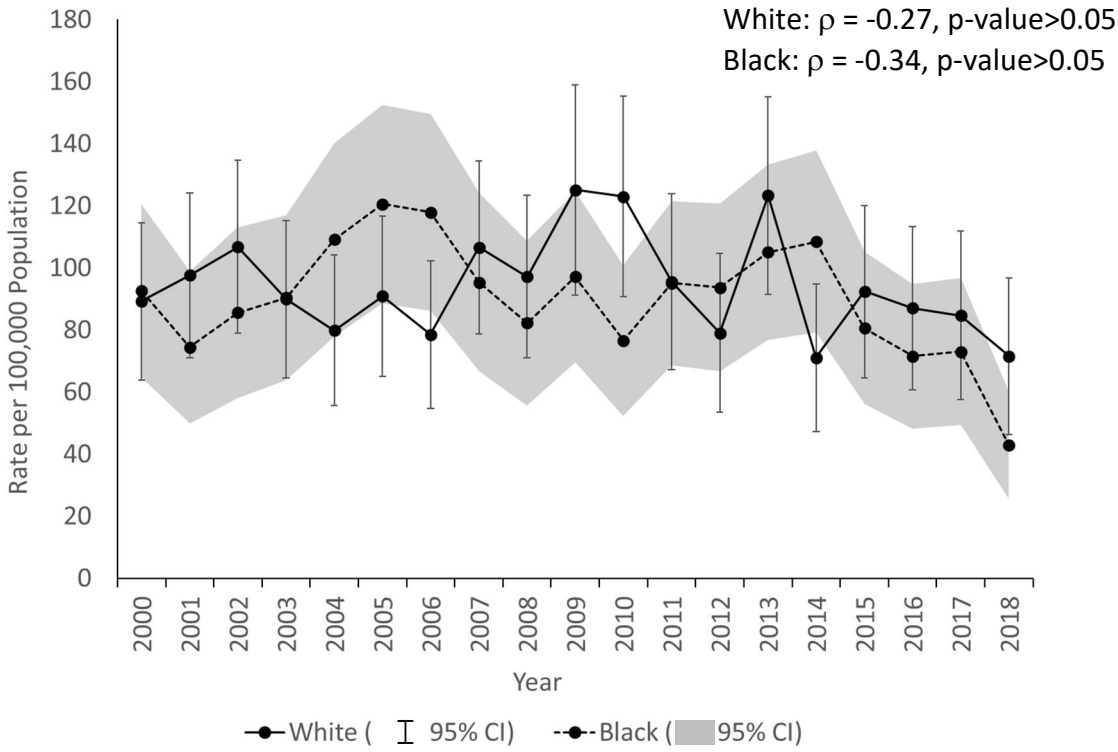
- The City of Flint cancer incidence rate for the 19-year period 2000-2018 was significantly higher than the rate for Genesee County for lung and bronchus cancer and larynx cancer.

- The City of Flint cancer incidence rate for the 19-year period 2000-2018 was significantly lower than the rate for Genesee County for ovary, testes, urinary bladder, and brain and other CNS cancer.

- The City of Flint cancer incidence rate for the 19-year period 2000-2018 was significantly higher than the rate for the state of Michigan for stomach, lung and bronchus cancer, larynx, and prostate gland cancer.

- The City of Flint cancer incidence rate for the 19-year period 2000-2018 was significantly lower than the rate for the state of Michigan for ovary, testes, urinary bladder, and brain and other CNS cancer.

Figure 4. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Lung and Bronchus Cancer[2], City of Flint, 2000-2018

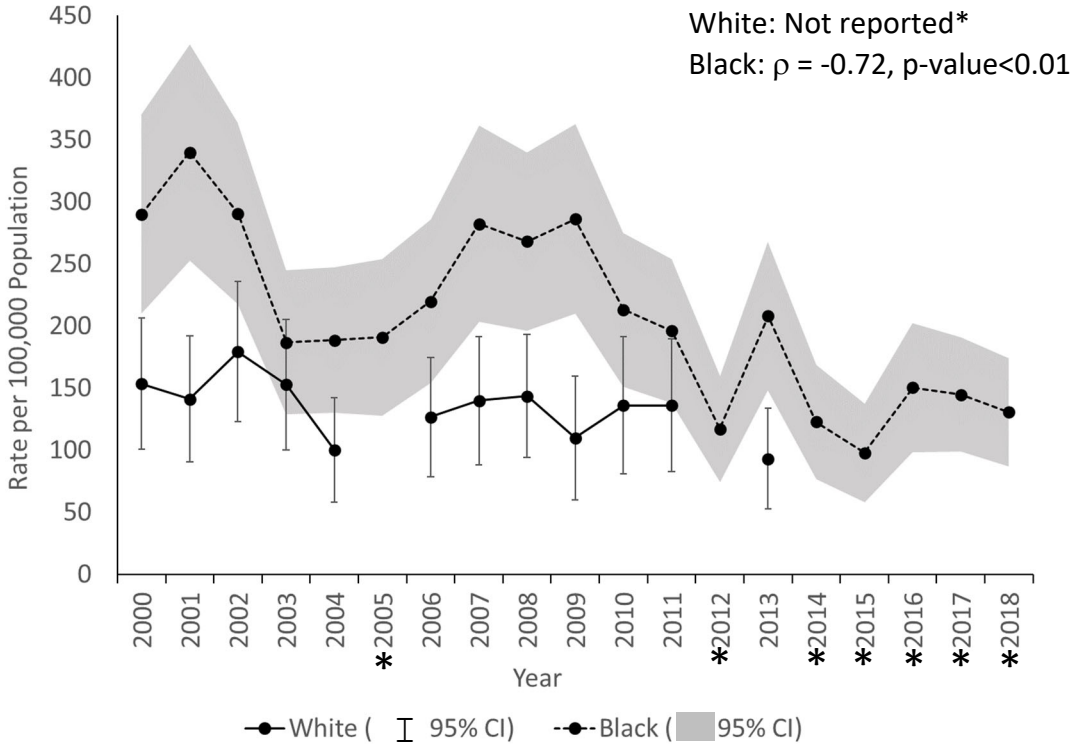


[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Lung and bronchus cancer cases were defined by new malignant cancer diagnoses where lung or bronchus was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

- The City of Flint's lung and bronchus cancer incidence rate among white residents was not statistically different than that among Black residents for any years during 2000 through 2018.

- There was a non-significant decreasing trend in lung and bronchus cancer incidence rates for white and Black residents of the City of Flint during this time period.

Figure 5. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Prostate Gland Cancer[2], City of Flint, 2000-2018



[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Prostate gland cancer cases were defined by new malignant cancer diagnoses where prostate gland was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.
* White cancer incidence rate suppressed (rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero); Spearman Correlation Coefficient and its accompanying statistical Rank Correlation Test for rates among white residents not conducted due to suppressed data.

- For the 12 years where a comparison was possible, the City of Flint's prostate gland cancer incidence rate among white residents was statistically lower than that among Black residents for six of the years.

- Prostate gland cancer incidence rates demonstrated a statistically decreasing trend over this time period for Black residents of the City of Flint ($p<0.05$).

Table 2. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Site[2] and Race, City of Flint, 2000-2018

Cancer Site	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]
Colon	30.9 (27.3, 34.4) [291]	38.3 (34.3, 42.4) [361]
Rectum	14.0 (11.6, 16.4) [131]	14.3 (11.9, 16.7) [138]
Stomach	5.1 (3.7, 6.6) [49]	12.1 (9.8, 14.5) [110]
Lung and Bronchus	94.0 (87.8, 100.2) [893]	89.8 (83.7, 96.0) [861]
Larynx	8.1 (6.3, 9.9) [77]	7.1 (5.5, 8.8) [76]
Prostate Gland	113.2 (102.6, 123.8) [451]	202.7 (188.8, 216.6) [862]
Ovary	10.7 (7.8, 13.6) [54]	10.9 (8.0, 13.7) [58]
Testes	4.9 (2.9, 6.9) [23]	^ (^, ^) [6]
Urinary Bladder	21.8 (18.8, 24.7) [208]	15.4 (12.8, 18.0) [138]
Kidney and Renal Pelvis	14.4 (11.9, 16.8) [134]	18.1 (15.4, 20.8) [181]
Brain and Other CNS	6.1 (4.5, 7.7) [57]	4.1 (2.9, 5.3) [48]
Meningioma	0 (0, 0) [0]	^ (^, ^) [*]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Shading indicates that the cancer incidence rate for white residents of the City of Flint was statistically higher or lower than the rate for Black residents of the City of Flint. (95-percent confidence intervals for the two rates do not overlap)

- In the City of Flint, the incidence rate for urinary bladder cancer for the 19-year period 2000-2018 was significantly higher among white residents compared to Black residents.

- In the City of Flint, the incidence rate for stomach and prostate gland cancer for the 19-year period 2000-2018 was significantly higher among Black residents compared to white residents.

- Cancer incidence rates for the 19-year period 2000-2018 were not significantly different between white and Black residents of the City of Flint for the following cancer sites: colon, rectum, lung and bronchus, larynx, ovary, testes, kidney and renal pelvis, brain and other CNS, meningioma.

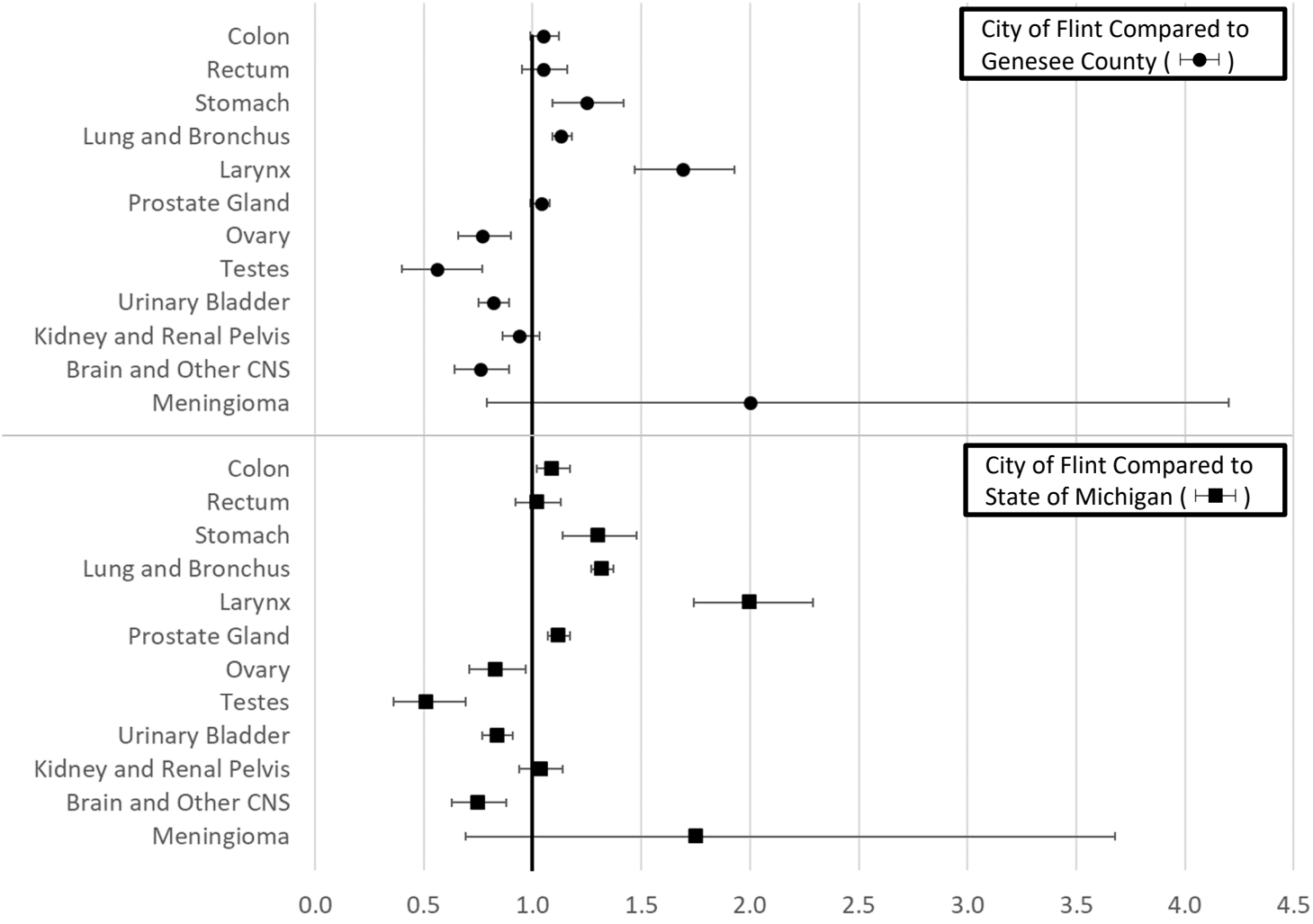
Part 2 – Identifying the Occurrence of Excess Cancer Incidence in the City of Flint

Figures 6 through 8 provide SIRs and their accompanying 95-percent confidence intervals for the cancer incidence by site of cancer for the City of Flint compared to (1) Genesee County and (2) the state of Michigan. They are presented first for the total population and then separately for white residents and Black residents.

Figures 9 through 20 show SIRs and their accompanying 95-percent confidence intervals for cancer incidence by time period and site of cancer for the City of Flint compared to (1) Genesee County and (2) the state of Michigan.

See Appendix, Tables 15 and 16, for all reportable counts and SIR values for Part 2 analyses.

Figure 6. Standardized Incidence Ratio (SIR)[1] for Invasive Cancers by Site, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000–2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the horizontal bar (95-percent confidence interval) touches or crosses the vertical line at 1.0 on the x-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

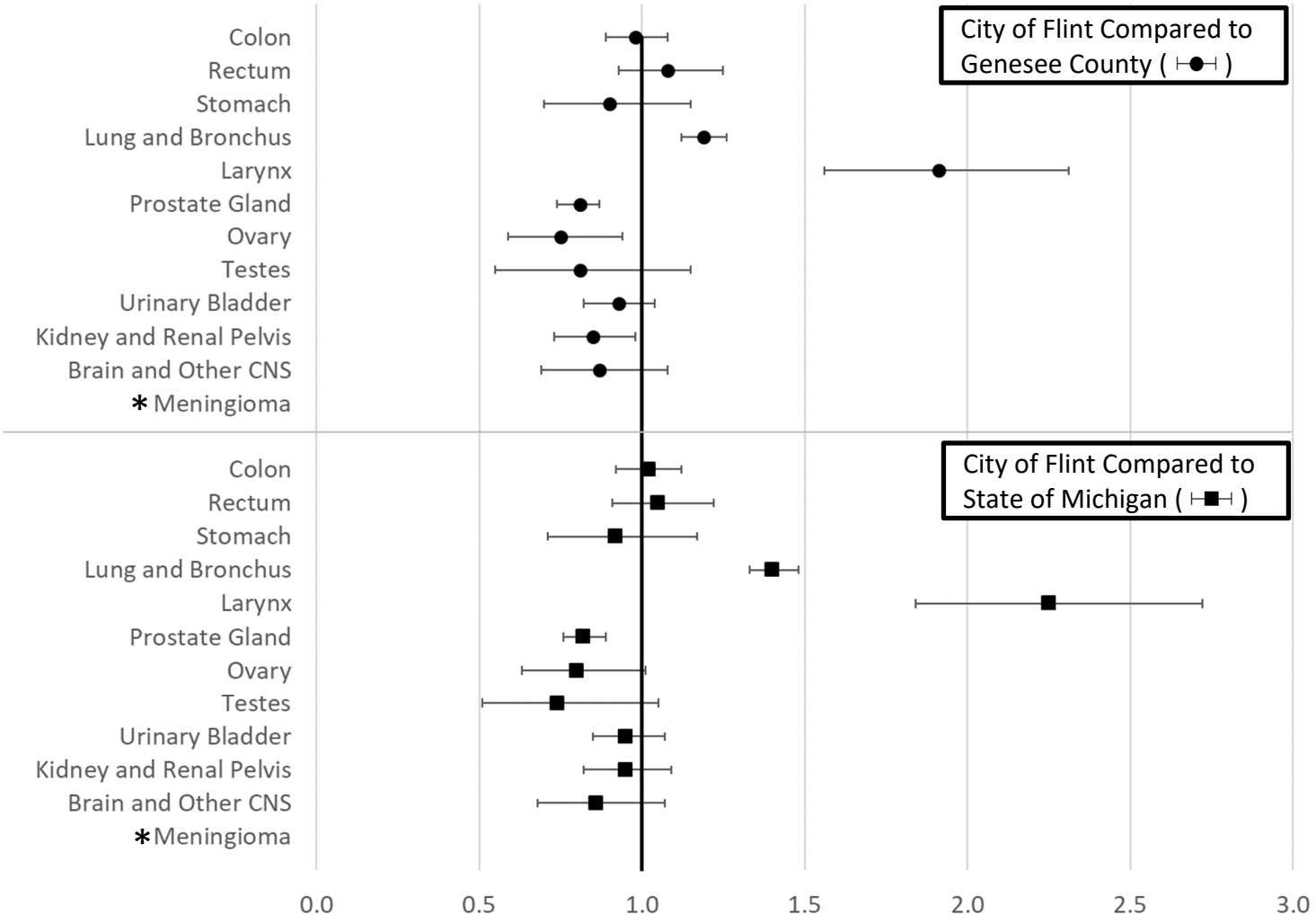
Compared to Genesee County

- The City of Flint had statistically higher than expected stomach, lung and bronchus, and larynx cancer cases. Of these, only larynx cancer showed moderate evidence of an increased number of cancer cases in the City of Flint compared to Genesee County according to the interpretation framework (SIR value of 1.5 to less than 3.0).[26] None of these associations showed strong evidence of increased cancer incidence.
- The City of Flint had statistically lower than expected ovary, testes, urinary bladder, and brain and other CNS cancer cases. Of these, only testicular cancer showed moderate evidence of a decreased number of cancer cases in the City of Flint compared to Genesee County according to the interpretation framework (SIR value of 0.4 to less than 0.7).[26] None of these associations showed strong evidence of decreased cancer incidence.
- The City of Flint did not have statistically different incidence of colon, rectum, prostate gland, kidney and renal pelvis, and meningioma cancer.

Compared to the State of Michigan

- The City of Flint had statistically higher than expected colon, stomach, lung and bronchus, larynx, and prostate cancer cases. Of these, only larynx cancer showed moderate evidence of an increased number of cancer cases in the City of Flint compared to Michigan according to the interpretation framework (SIR value of 1.5 to less than 3.0).[26] None of these associations showed strong evidence of increased cancer incidence.
- The City of Flint had statistically lower than expected ovary, testes, urinary bladder, and brain and other CNS cancer cases. Of these, only testicular cancer showed moderate evidence of a decreased number of cancer cases in the City of Flint compared to Michigan according to the interpretation framework (SIR value of 0.4 to less than 0.7).[26] None of these associations showed strong evidence of decreased cancer incidence.
- The City of Flint did not have statistically different incidence of rectum, kidney and renal pelvis, and meningioma cancer.

Figure 7. Standardized Incidence Ratio (SIR)[1] for Invasive Cancers by Site for White Residents, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the horizontal bar (95-percent confidence interval) touches or crosses the vertical line at 1.0 on the x-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

* The values for the SIR for meningioma comparing the City of Flint to both Genesee County and the state of Michigan were both 0.0 and are therefore not presented on the graph. This is due to very low numbers of meningioma cases.

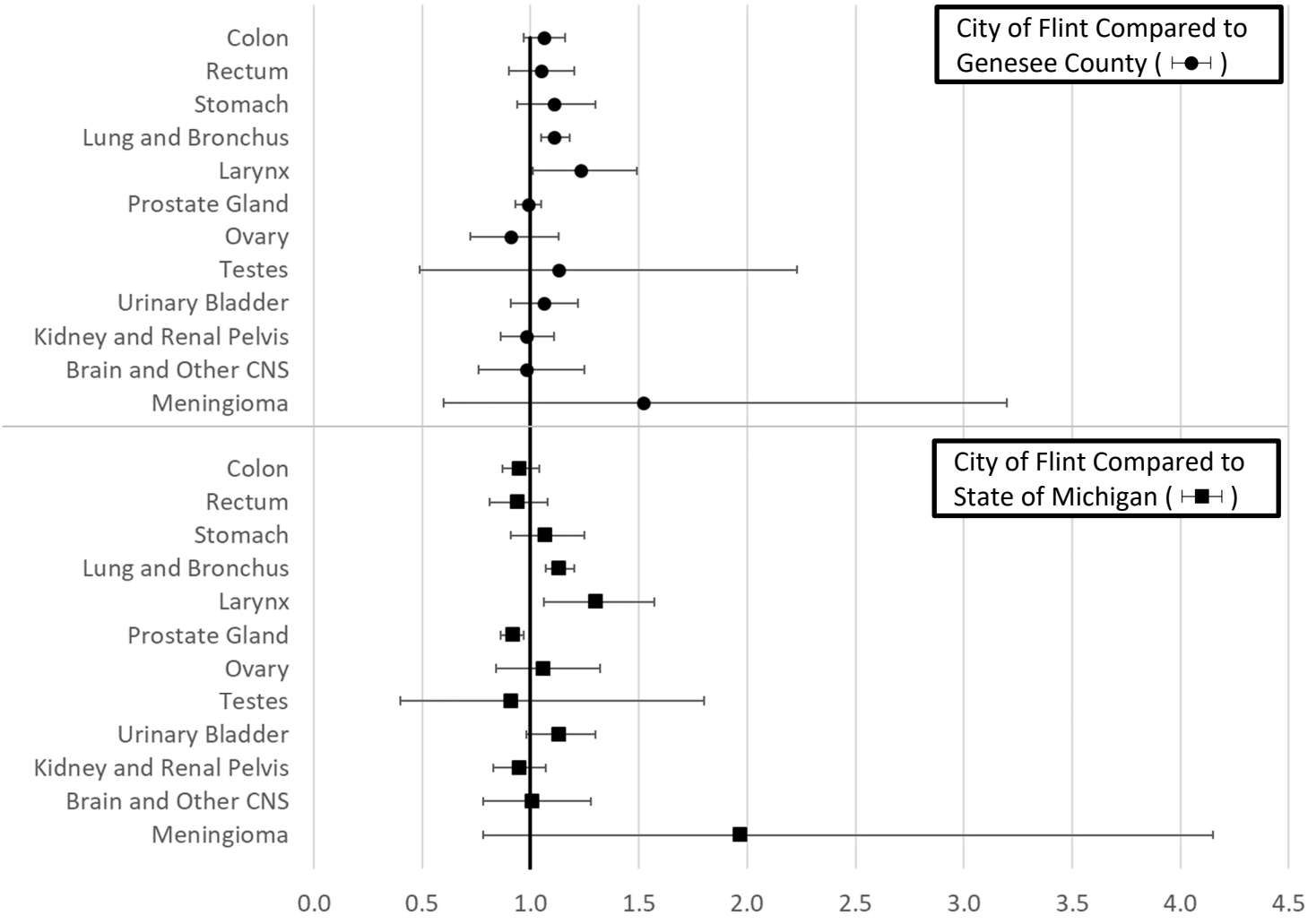
Compared to Genesee County for White Residents

- The City of Flint had statistically higher than expected lung and bronchus and larynx cancer cases. Of these, only larynx cancer showed moderate evidence of an increased number of cancer cases in the City of Flint compared to Genesee County according to the interpretation framework (SIR value of 1.5 to less than 3.0).[26] Neither of these associations showed strong evidence of increased cancer incidence.
- The City of Flint had statistically lower than expected prostate gland, ovary, and kidney and renal pelvis cancer cases. None of these associations showed moderate or strong evidence of decreased cancer incidence.
- The City of Flint did not have statistically different incidence of colon, rectum, stomach, testes, urinary bladder, brain and other CNS, and meningioma cancer.

Compared to the State of Michigan for White Residents

- The City of Flint had statistically higher than expected lung and bronchus and larynx cancer cases. Of these, only larynx cancer showed moderate evidence of an increased number of cancer cases in the City of Flint compared to Michigan according to the interpretation framework (SIR value of 1.5 to less than 3.0).[26] Neither of these associations showed strong evidence of increased cancer incidence.
- The City of Flint had statistically lower than expected prostate gland cancer cases. However, this association did not show moderate or strong evidence of decreased cancer incidence.
- The City of Flint did not have statistically different incidence of colon, rectum, stomach, ovary, testes, urinary bladder, kidney and renal pelvis, brain and other CNS, or meningioma cancer.

Figure 8. Standardized Incidence Ratio (SIR)[1] for Invasive Cancers by Site for Black Residents, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the horizontal bar (95-percent confidence interval) touches or crosses the vertical line at 1.0 on the x-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

Compared to Genesee County for Black Residents

- The City of Flint had statistically higher than expected lung and bronchus and larynx cancer cases. Neither of these associations showed moderate or strong evidence of increased cancer incidence.
- The City of Flint did not have statistically different incidence of colon, rectum, stomach, prostate gland, ovary, testes, urinary bladder, kidney and renal pelvis, brain and other CNS, and meningioma cancer.

Compared to the State of Michigan for Black Residents

- The City of Flint had statistically higher than expected lung and bronchus and larynx cancer cases. Neither of these associations showed moderate or strong evidence of increased cancer incidence.
- The City of Flint had statistically lower than expected prostate gland cancer cases. This association did not show moderate or strong evidence of increased cancer incidence.
- The City of Flint did not have statistically different incidence of colon, rectum, stomach, ovary, testes, urinary bladder, kidney and renal pelvis, brain and other CNS, and meningioma cancer.

The next series of figures provide SIRs separately for the four-year time period 2000-2003 and the five-year time periods 2004-2008, 2009-2013, and 2014-2018 to assess whether there is an increasing or decreasing trend in the comparison of the number of cancer cases observed in the City of Flint to what would be expected based on the cancer incidence for Genesee County and for the state of Michigan.

There are some special limitations in these analyses that should be considered. First, the ability to observe patterns in these analyses is limited due to the few SIRs over time that can be calculated for comparison. Second, if SIRs comparing the City of Flint to comparison populations show an increasing pattern over time, it could be that either the City of Flint has increasing cancer incidence rates or it could be that the comparison community has decreasing cancer incidence rates and there is no change to City of Flint rates. Lastly, it is important to again note that when the number of cancer cases is small, such as for rare cancer sites or in smaller geographic areas, the report of only a few extra cancer cases can result in large SIRs. To identify differences over time in the SIR, the 95-percent confidence intervals should be compared; if the 95-percent confidence intervals overlap, there is not a statistically significant difference between the SIRs.

In observing the findings of these analyses, there is not a discernible, definitive increasing or decreasing trend in the comparison of the number of cancer cases observed in the City of Flint to what would be expected based on the cancer incidence for Genesee County and for the state of Michigan. There is fluctuation in the SIRs over time, with some time periods showing higher and some lower SIRs and the confidence intervals for the majority of SIRs overlap when comparing time periods. Also, in most cases the confidence intervals overlap with the value 1.0, indicating that, for those time periods, the cancer incidence in the City of Flint is not statistically different than the cancer incidence for the comparison community.

See Appendix, Table 16, for these analyses for the total population and by race group.

Figure 9. Standardized Incidence Ratio (SIR)[1] for Colon Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

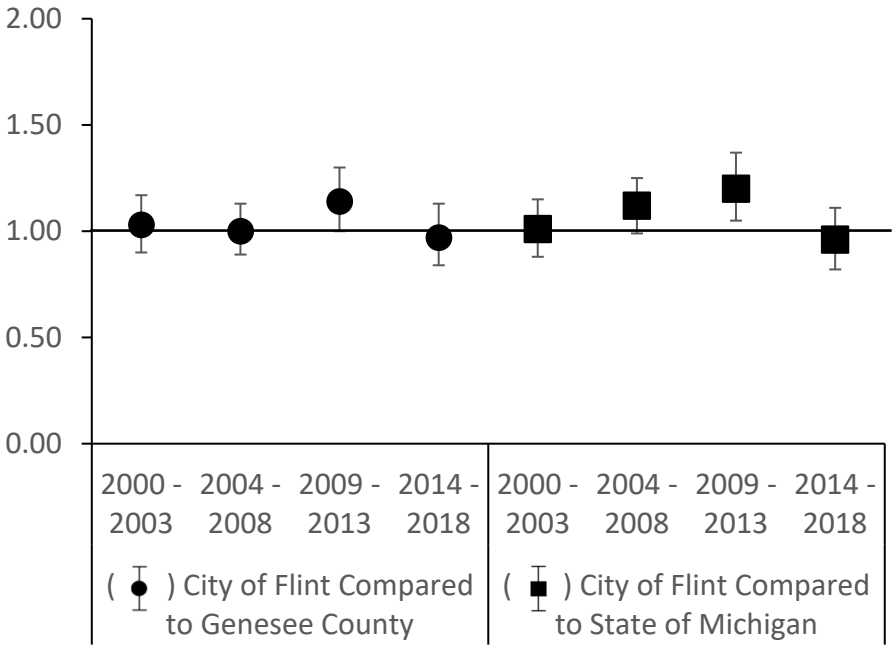
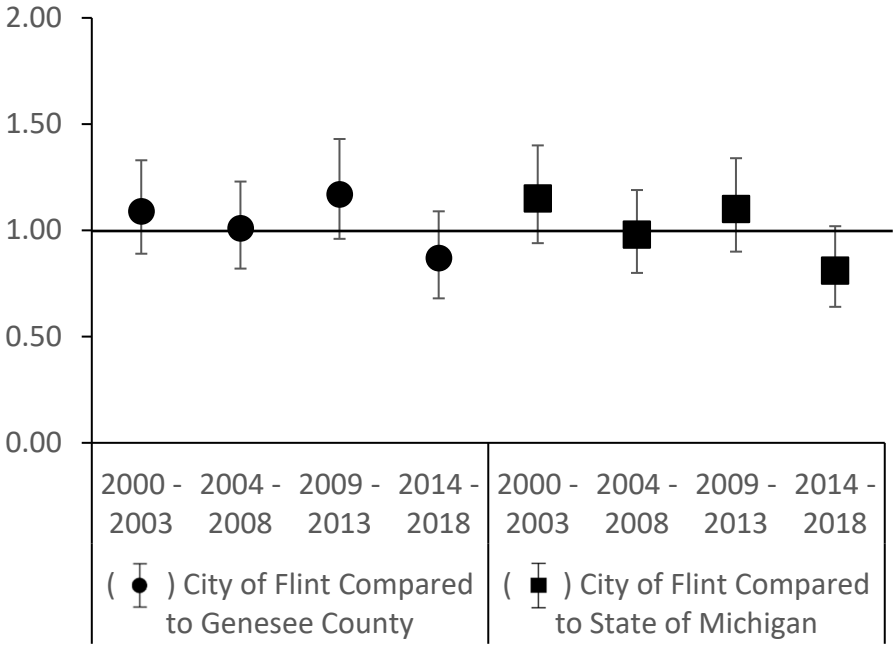


Figure 10. Standardized Incidence Ratio (SIR)[1] for Rectum Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the vertical bar (95-percent confidence interval) touches or crosses the horizontal line at 1.0 on the y-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

Figure 11. Standardized Incidence Ratio (SIR)[1] for Stomach Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

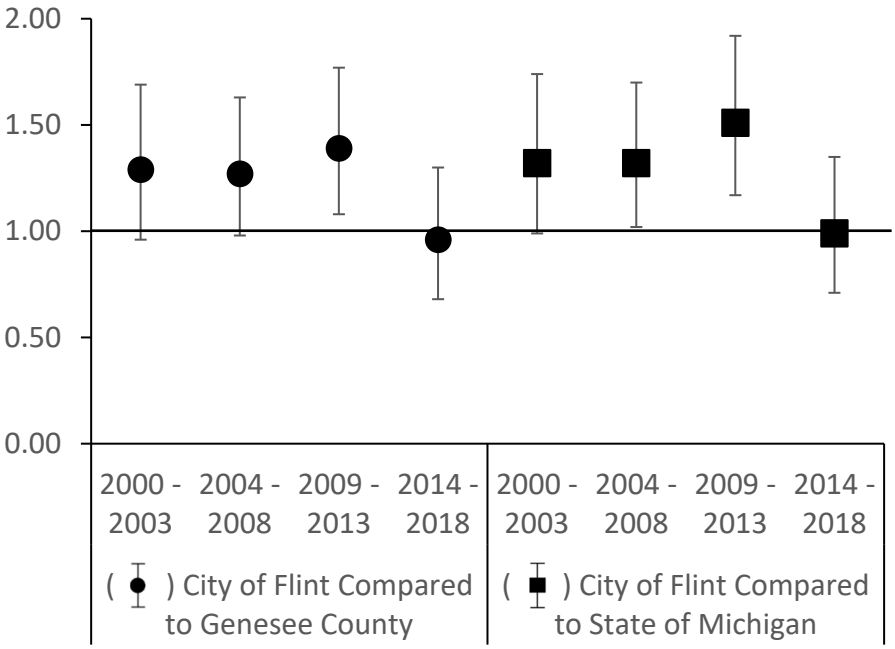
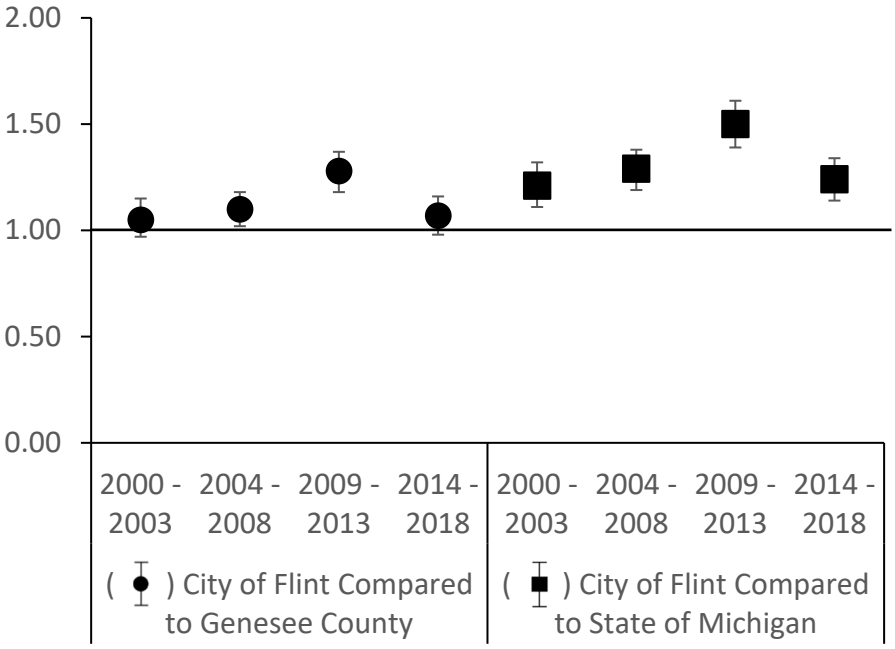


Figure 12. Standardized Incidence Ratio (SIR)[1] for Lung and Bronchus Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the vertical bar (95-percent confidence interval) touches or crosses the horizontal line at 1.0 on the y-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

Figure 13. Standardized Incidence Ratio (SIR)[1] for Larynx Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

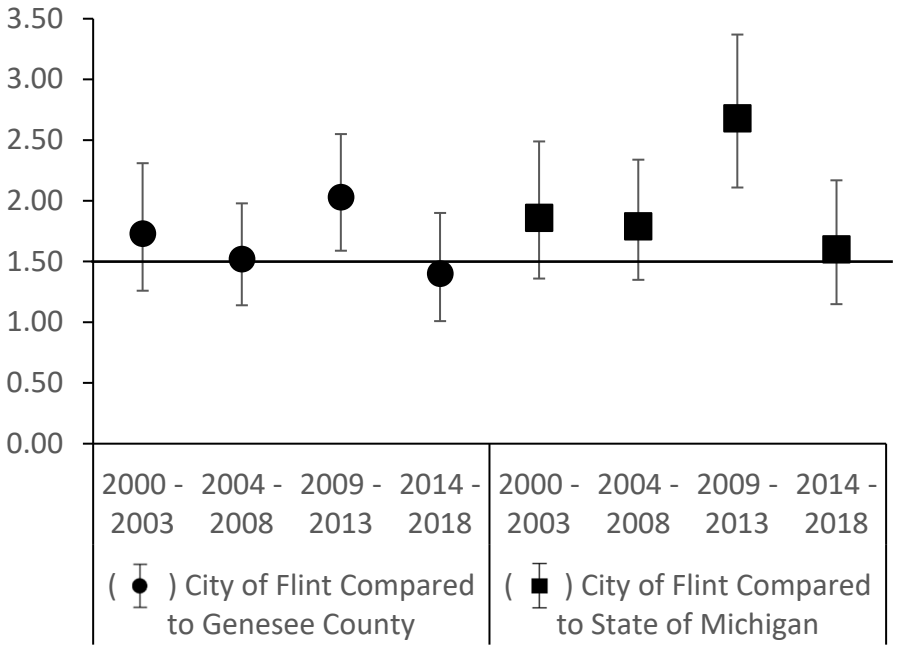
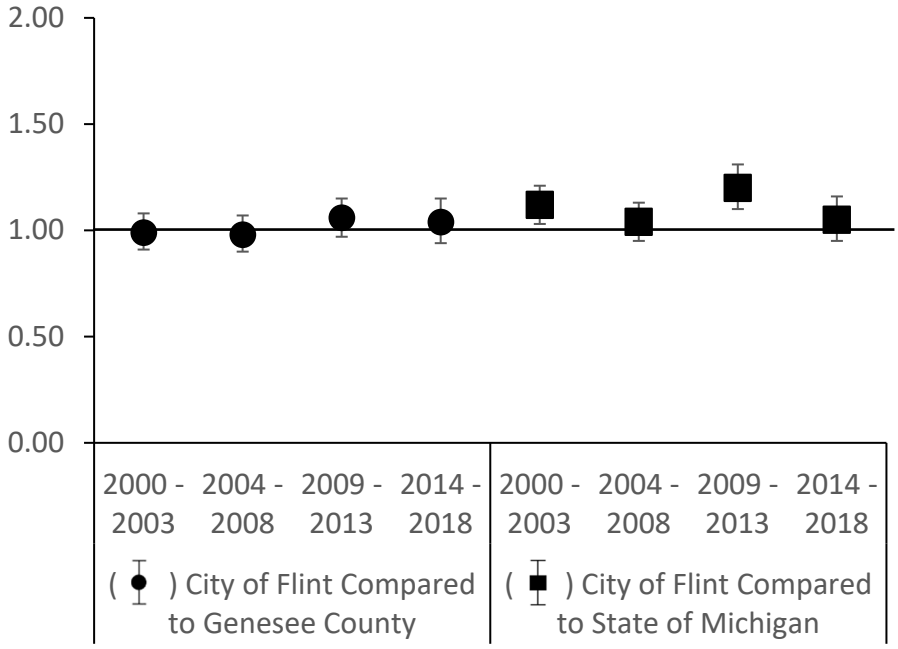


Figure 14. Standardized Incidence Ratio (SIR)[1] for Prostate Gland Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the vertical bar (95-percent confidence interval) touches or crosses the horizontal line at 1.0 on the y-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

Figure 15. Standardized Incidence Ratio (SIR)[1] for Ovary Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

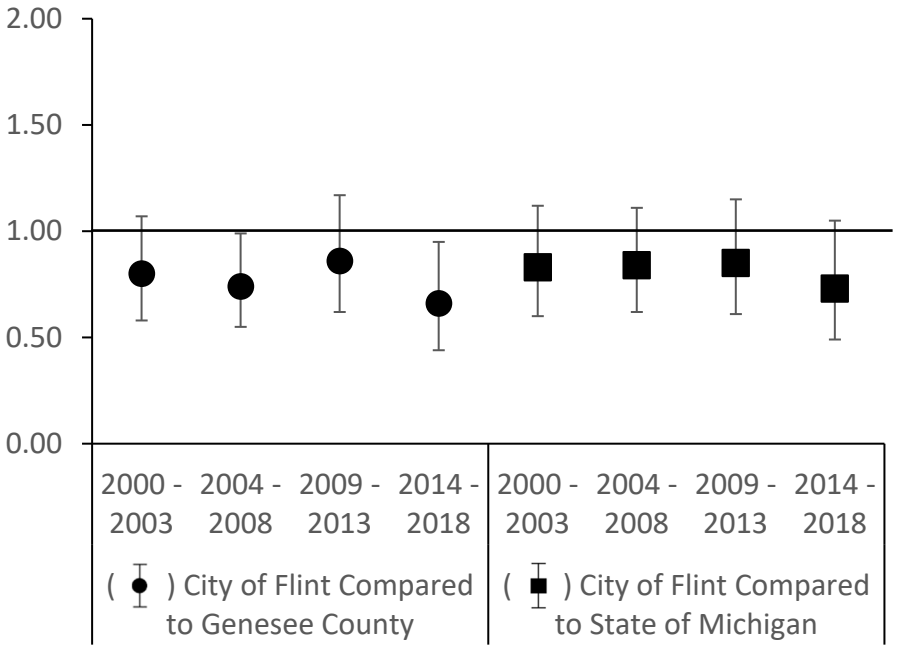
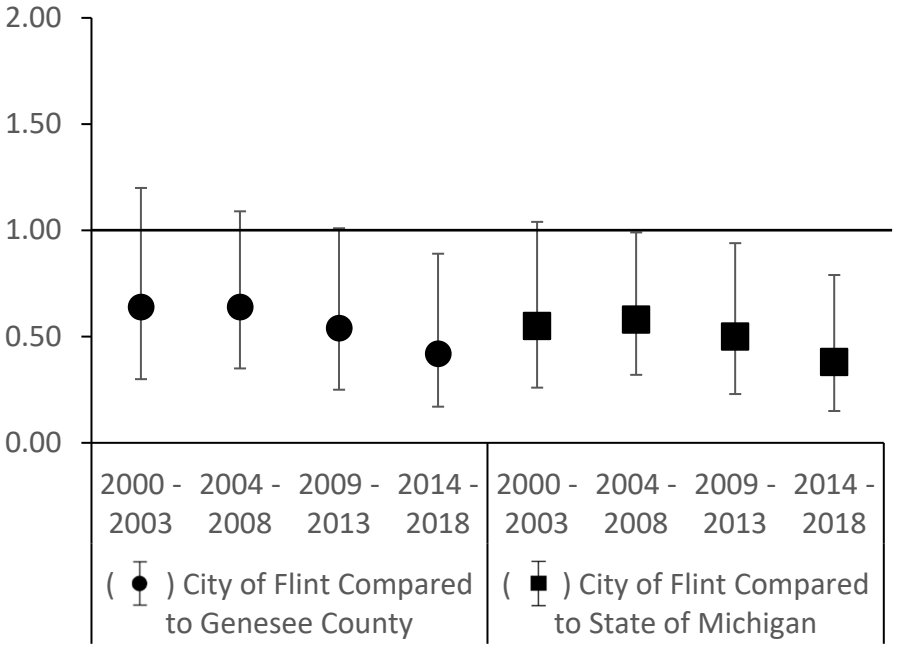


Figure 16. Standardized Incidence Ratio (SIR)[1] for Testes Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the vertical bar (95-percent confidence interval) touches or crosses the horizontal line at 1.0 on the y-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

Figure 17. Standardized Incidence Ratio (SIR)[1] for Urinary Bladder Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

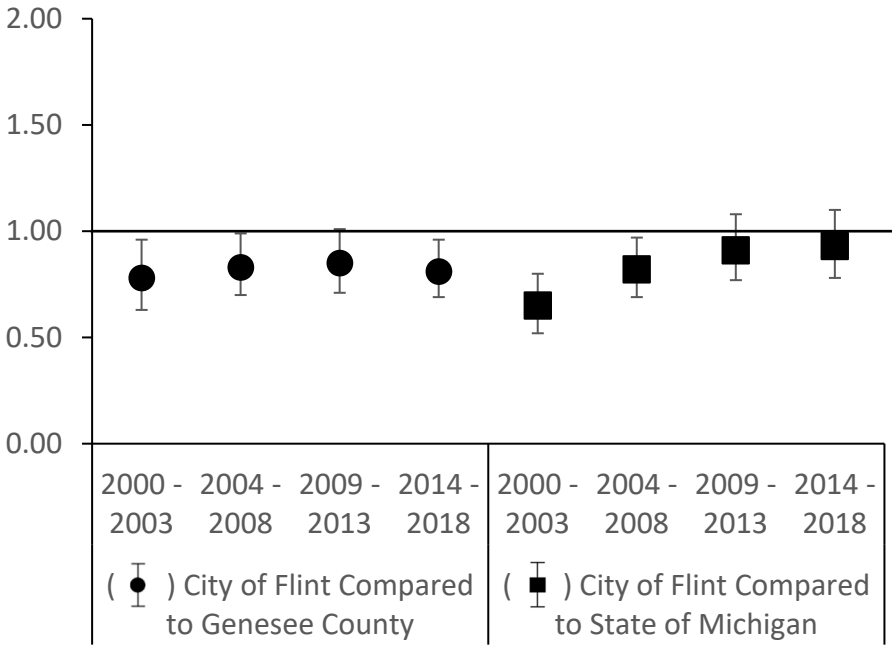
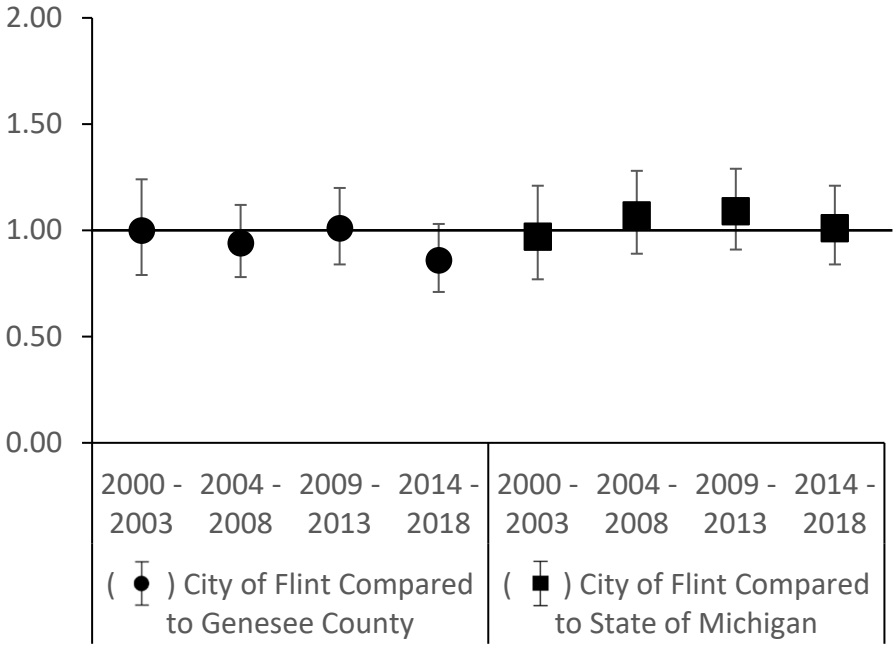


Figure 18. Standardized Incidence Ratio (SIR)[1] for Kidney and Renal Pelvis Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the vertical bar (95-percent confidence interval) touches or crosses the horizontal line at 1.0 on the y-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.
[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

Figure 19. Standardized Incidence Ratio (SIR)[1] for Brain and Other CNS Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

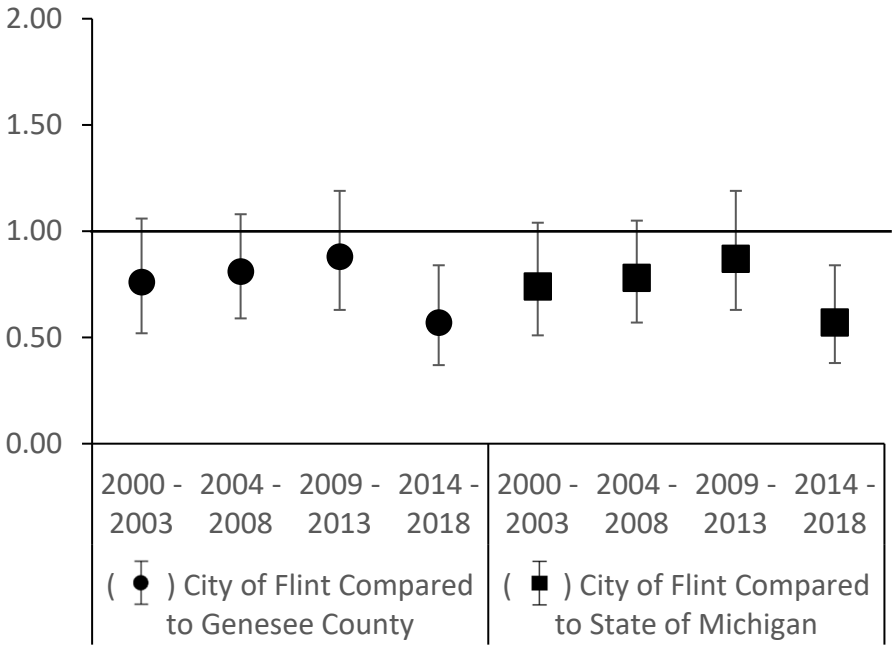
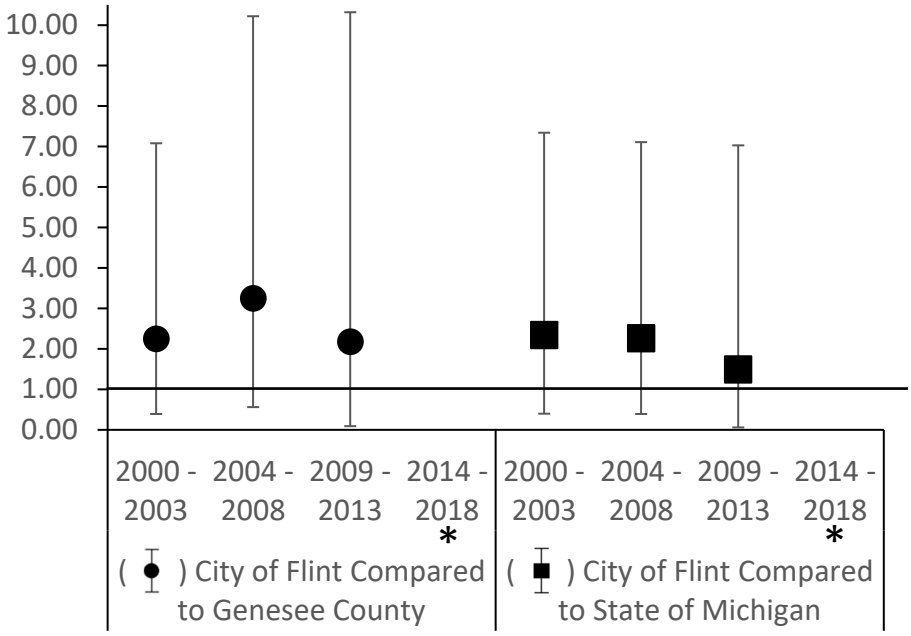


Figure 20. Standardized Incidence Ratio (SIR)[1] for Meningioma Cancer by Year Groups, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]



[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint. Where the vertical bar (95-percent confidence interval) touches or crosses the horizontal line at 1. 0 on the y-axis, it indicates that the cancer incidence in the City of Flint is not statistically different from the comparison population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

* The values for the SIR for meningioma comparing the City of Flint to both Genesee County and the state of Michigan (2014-2018) were both 0.0 and are therefore not presented on the graph. This is due to very low numbers of meningioma cases.

Conclusion

This cancer incidence review provides descriptive results of trends in cancer incidence rates for the City of Flint 2000 through 2018 compared to Genesee County and the state of Michigan and standardized incidence ratio analysis for the combined years 2000 to 2018 compared to Genesee County and the state of Michigan as well as by time period. All analyses were completed for selected cancer sites for the total population as well as for the two race groups, white and Black.

The main findings of these analyses are:

- Annual cancer incidence rates for most of the selected cancer sites could not be calculated for the City of Flint due to the low numbers of cases. Comparing these year-to-year incidence rates for colon, lung and bronchus, and prostate gland cancer in the City of Flint were not significantly different than Genesee County for nearly all years compared. This pattern was similarly observed when comparing the City of Flint to the state of Michigan, except for lung and bronchus cancer where the City of Flint had significantly higher annual rates than the state of Michigan for eight out of the 19 years compared.
- However, the 19-year combined cancer incidence rate (2000-2018) for lung and bronchus cancer and larynx cancer for the City of Flint was significantly higher than Genesee County and the state of Michigan; additionally, the cancer rate for stomach and prostate gland cancer for the City of Flint is significantly higher than the state of Michigan. The 19-year City of Flint cancer incidence rates for ovary, testes, urinary bladder, and brain and other central nervous system (CNS) cancer was significantly lower than the rate for Genesee County and the state of Michigan.
- For most cancer sites, the 19-year combined cancer incidence rate (2000-2018) for white residents of the City of Flint was not significantly different than for Black residents. Black residents had a significantly higher rate than white residents for stomach and prostate gland cancer; white residents had a significantly higher rate than Black residents for urinary bladder cancer.
- Compared to Genesee County or the state of Michigan, the frequency of cancers in the City of Flint was higher than expected for some cancer sites and lower than expected for others. This was also observed when the analysis was stratified by race or time period. There is no discernible, definitive increasing or decreasing trend in the comparison of the number of cancer cases observed in the City of Flint to what would be expected based on the cancer incidence for Genesee County and for the state of Michigan.

- This data review cannot determine whether cancer rates are associated with environmental exposures. This data review is descriptive, only identifying if there is a difference in cancer incidence in the City of Flint compared to county- and state-level cancer incidence.

Limitations that are particularly important are that (1) data from the Michigan Central Cancer Registry does not contain the information necessary to determine that cancer incidence is related to any environmental contamination, (2) given the long period of investigation, it is possible that the migration of people into and out of the analysis area is a mitigating factor in interpreting the findings.

This investigation should be considered a descriptive review of cancer incidence for the City of Flint and not as evidence that potential exposure to any environmental contaminant has resulted in higher or lower cancer risk. When reviewing multiple cancer sites over multiple geographic areas, such as was done for this report, patterns of increased incidence in some geographic areas and decreased incidence in others is common. It must also be considered that increased or decreased cancer incidence in an area during a time period can occur by chance alone. In its ongoing surveillance efforts, MDHHS will continue to publish annual cancer incidence rates on the MDHHS website for the Michigan Cancer Surveillance Program.

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Appendix

Figure 21. Map of Census Tracts Comprising the City of Flint

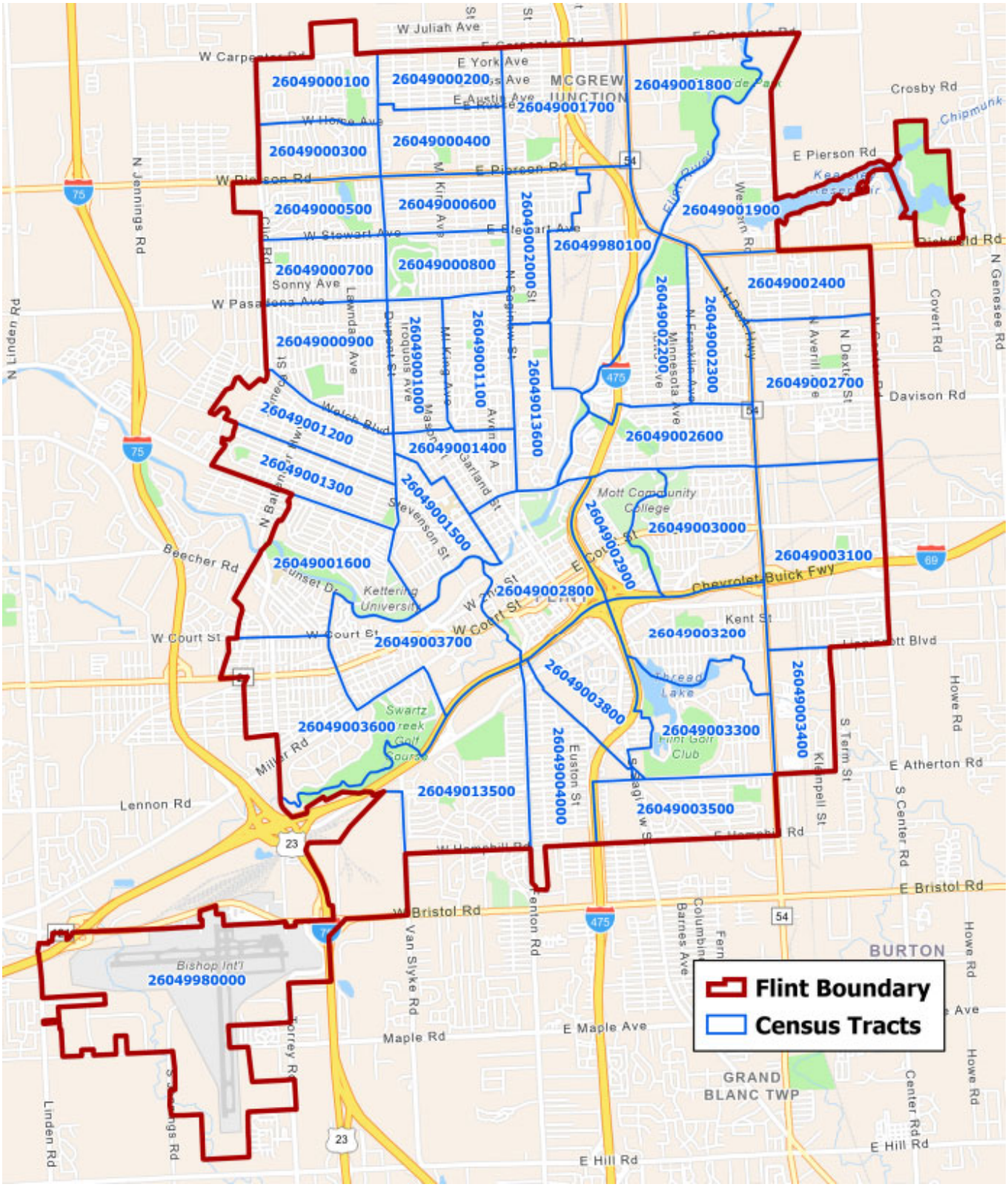

Table 3. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Colon Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [19]	^ (^, ^) [19]	36.9 (25.1, 48.6) [38]	40.1 (33.4, 46.8) [138]	46.4 (28.9, 63.9) [29]	41.1 (34.9, 47.4) [169]	38.5 (37.2, 39.8) [3,314]	53.7 (49.1, 58.2) [551]	40.2 (39.0, 41.5) [3,915]
2001	^ (^, ^) [18]	41.6 (23.0, 60.2) [20]	36.4 (24.8, 48.0) [38]	38.9 (32.3, 45.5) [134]	36.2 (21.3, 51.1) [24]	38.7 (32.6, 44.7) [159]	40 (38.6, 41.3) [3,470]	52.2 (47.8, 56.7) [537]	41.3 (40.0, 42.6) [4,065]
2002	^ (^, ^) [18]	^ (^, ^) [19]	35.6 (24.1, 47.1) [37]	38.1 (31.7, 44.6) [134]	33.6 (19.3, 47.9) [23]	37.7 (31.8, 43.5) [158]	38.7 (37.4, 40.0) [3,405]	54.9 (50.3, 59.4) [575]	40.5 (39.3, 41.8) [4,044]
2003	^ (^, ^) [17]	75.5 (49.8, 101.1) [35]	51.7 (37.9, 65.6) [54]	35.4 (29.2, 41.6) [126]	61.2 (42.0, 80.3) [42]	40.2 (34.1, 46.2) [172]	37.6 (36.3, 38.9) [3,357]	54.9 (50.4, 59.4) [591]	39.8 (38.6, 41.0) [4,037]
2004	37.4 (20.9, 53.8) [20]	48.4 (28.7, 68.2) [24]	40.9 (28.8, 53.0) [44]	35.7 (29.5, 41.8) [130]	51.2 (33.9, 68.5) [36]	38.2 (32.4, 44.0) [168]	35.1 (33.9, 36.4) [3,175]	47.8 (43.6, 51.9) [524]	36.6 (35.4, 37.7) [3,760]
2005	^ (^, ^) [16]	67.4 (42.3, 92.4) [30]	43.9 (31.2, 56.7) [46]	39.4 (33, 45.9) [145]	58.0 (39.2, 76.7) [40]	42.2 (36.2, 48.3) [188]	35.1 (33.8, 36.3) [3,216]	45.9 (41.9, 49.9) [523]	36.4 (35.2, 37.6) [3,811]

2006	^ (^, ^) [15]	^ (^, ^) [15]	30.2 (19.5, 40.9) [31]	41.3 (34.8, 47.9) [154]	36.3 (22.3, 50.3) [27]	40.6 (34.7, 46.5) [182]	35.1 (33.9, 36.4) [3,254]	45.1 (41.2, 49.0) [522]	36.4 (35.2, 37.5) [3,848]
2007	^ (^, ^) [15]	47.7 (27.8, 67.6) [23]	36.0 (24.5, 47.5) [38]	39.7 (33.3, 46.1) [150]	43.0 (28.1, 57.9) [33]	41.4 (35.4, 47.3) [188]	33.5 (32.3, 34.7) [3,163]	43.1 (39.3, 46.9) [509]	34.8 (33.7, 35.9) [3,753]
2008	^ (^, ^) [18]	48.6 (28.6, 68.6) [24]	40.0 (27.8, 52.1) [42]	26.2 (21.0, 31.4) [99]	48.3 (32.6, 64.0) [38]	30.3 (25.3, 35.4) [139]	31.1 (30.0, 32.2) [2,956]	38.9 (35.3, 42.5) [458]	32.1 (31.0, 33.2) [3,490]
2009	^ (^, ^) [15]	^ (^, ^) [18]	35.5 (23.4, 47.5) [34]	28.6 (23.3, 34.0) [112]	37.8 (23.4, 52.2) [28]	30.8 (25.8, 35.9) [145]	29.2 (28.2, 30.3) [2,823]	39.8 (36.2, 43.4) [489]	31.0 (30.0, 32.1) [3,436]
2010	43.7 (24.4, 63) [20]	^ (^, ^) [16]	34.6 (23.2, 46.0) [36]	32.3 (26.7, 37.9) [130]	32.5 (19.9, 45.1) [27]	32.2 (27.1, 37.3) [158]	27.9 (26.8, 29.0) [2,728]	38.4 (34.9, 41.9) [483]	29.5 (28.4, 30.5) [3,312]
2011	^ (^, ^) [15]	^ (^, ^) [17]	33.8 (22.1, 45.6) [33]	31.5 (25.8, 37.1) [124]	28.7 (16.8, 40.6) [23]	32.0 (26.8, 37.1) [152]	26.8 (25.8, 27.9) [2,634]	35.2 (31.9, 38.5) [460]	28.2 (27.2, 29.1) [3,193]
2012	^ (^, ^) [13]	46.5 (27.2, 65.9) [23]	36.5 (24.4, 48.5) [36]	24.3 (19.4, 29.2) [97]	36.7 (23.1, 50.3) [29]	26.3 (21.7, 31.0) [127]	26.6 (25.6, 27.6) [2,662]	34.9 (31.6, 38.2) [452]	27.8 (26.9, 28.8) [3,215]
2013	^ (^, ^) [11]	^ (^, ^) [14]	27.3 (16.9, 37.7) [27]	29.1 (23.8, 34.5) [116]	25.2 (14.4, 36.0) [22]	29.0 (24.2, 33.8) [143]	26.0 (25.0, 27.0) [2,631]	37.2 (33.9, 40.6) [493]	27.4 (26.4, 28.4) [3,213]
2014	^ (^, ^) [14]	^ (^, ^) [*]	21.2 (11.8, 30.6) [20]	27 (21.6, 32.4) [102]	^ (^, ^) [12]	24.7 (20.1, 29.3) [116]	25.8 (24.7, 26.8) [2,632]	35.7 (32.5, 39.0) [490]	27.1 (26.1, 28.1) [3,208]

2015	^ (^, ^) [15]	42.1 (24.0, 60.2) [21]	35.7 (23.9, 47.5) [36]	28.5 (23.2, 33.8) [118]	43.5 (29.0, 58.0) [36]	31.3 (26.3, 36.4) [156]	25.8 (24.8, 26.8) [2,674]	36.7 (33.5, 40.0) [513]	27.1 (26.1, 28.0) [3,258]
2016	^ (^, ^) [9]	^ (^, ^) [17]	24.6 (15.1, 34.0) [27]	20.5 (16.1, 24.9) [87]	29.4 (17.8, 40.9) [26]	22.5 (18.3, 26.6) [117]	25.9 (24.9, 26.9) [2,709]	34.3 (31.2, 37.5) [485]	26.9 (26.0, 27.9) [3,281]
2017	^ (^, ^) [13]	^ (^, ^) [15]	31.2 (19.8, 42.7) [30]	30.2 (24.7, 35.6) [124]	29.7 (18.0, 41.4) [26]	30.6 (25.6, 35.5) [154]	26.3 (25.2, 27.3) [2,783]	30.2 (27.3, 33.1) [433]	26.7 (25.8, 27.6) [3,300]
2018	^ (^, ^) [10]	^ (^, ^) [*]	^ (^, ^) [15]	25.2 (20.2, 30.1) [106]	^ (^, ^) [10]	22.8 (18.6, 27.1) [118]	25.0 (24.0, 26.0) [2,678]	30.1 (27.2, 33.0) [438]	25.7 (24.8, 26.6) [3,221]
2000 - 2018	30.9 (27.3, 34.4) [291]	38.3 (34.3, 42.4) [361]	34.1 (31.5, 36.7) [662]	31.7 (30.4, 33.0) [2,326]	35.9 (32.8, 39.1) [531]	32.7 (31.5, 33.9) [2,909]	30.5 (30.2, 30.8) [56,264]	40.6 (39.8, 41.4) [9526]	31.8 (31.5, 32.0) [67,360]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Colon cancer cases were defined by new malignant cancer diagnoses where colon was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 4. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Rectum Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [8]	^ (^, ^) [8]	^ (^, ^) [17]	17.1 (12.8, 21.5) [59]	^ (^, ^) [10]	17.0 (13.0, 21.0) [70]	15.4 (14.6, 16.3) [1327]	16.3 (13.9, 18.8) [178]	15.6 (14.8, 16.4) [1,529]
2001	^ (^, ^) [10]	^ (^, ^) [7]	^ (^, ^) [17]	13.7 (9.8, 17.5) [48]	^ (^, ^) [11]	14.1 (10.5, 17.7) [60]	14.7 (13.9, 15.5) [1277]	17.2 (14.7, 19.7) [188]	15.0 (14.3, 15.8) [1,493]
2002	^ (^, ^) [9]	^ (^, ^) [6]	^ (^, ^) [15]	16.5 (12.2, 20.7) [58]	^ (^, ^) [6]	15.1 (11.4, 18.8) [64]	15.6 (14.8, 16.4) [1375]	17.6 (15.1, 20.1) [200]	15.9 (15.1, 16.7) [1,602]
2003	^ (^, ^) [11]	^ (^, ^) [14]	23.4 (14.2, 32.6) [25]	17.9 (13.5, 22.3) [65]	^ (^, ^) [16]	18.7 (14.7, 22.8) [82]	15.1 (14.2, 15.9) [1345]	17.5 (15.0, 20.0) [198]	15.5 (14.8, 16.3) [1,589]
2004	^ (^, ^) [7]	^ (^, ^) [7]	^ (^, ^) [14]	13.8 (10.0, 17.7) [51]	^ (^, ^) [11]	14.1 (10.6, 17.6) [63]	14.9 (14.1, 15.7) [1343]	16.2 (13.8, 18.6) [185]	15.0 (14.3, 15.8) [1,559]
2005	^ (^, ^) [6]	^ (^, ^) [*]	^ (^, ^) [12]	11.1 (7.7, 14.5) [41]	^ (^, ^) [10]	11.4 (8.3, 14.6) [52]	14.9 (14.1, 15.7) [1362]	16.0 (13.7, 18.2) [196]	15.1 (14.3, 15.8) [1,591]

2006	^ (^, ^) [8]	^ (^, ^) [6]	^ (^, ^) [14]	16.4 (12.2, 20.5) [61]	^ (^, ^) [7]	15.5 (11.8, 19.1) [70]	14.1 (13.3, 14.9) [1316]	15.7 (13.5, 18.0) [190]	14.4 (13.7, 15.1) [1,540]
2007	^ (^, ^) [9]	^ (^, ^) [10]	18.5 (10.4, 26.6) [20]	14.0 (10.2, 17.8) [53]	^ (^, ^) [15]	15.1 (11.5, 18.6) [70]	14.0 (13.3, 14.8) [1319]	17.7 (15.4, 20.1) [219]	14.5 (13.7, 15.2) [1,570]
2008	^ (^, ^) [8]	^ (^, ^) [6]	^ (^, ^) [14]	13.3 (9.7, 17.0) [52]	^ (^, ^) [8]	13.2 (9.9, 16.5) [62]	13.7 (12.9, 14.4) [1303]	14.4 (12.2, 16.5) [176]	13.9 (13.2, 14.6) [1,528]
2009	^ (^, ^) [8]	^ (^, ^) [10]	^ (^, ^) [18]	14.8 (10.9, 18.7) [57]	^ (^, ^) [12]	15.3 (11.7, 18.9) [72]	13.3 (12.6, 14.1) [1287]	16.1 (13.8, 18.3) [209]	13.9 (13.2, 14.6) [1,555]
2010	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [12]	13.4 (9.6, 17.2) [50]	^ (^, ^) [12]	13.8 (10.4, 17.3) [63]	13.1 (12.4, 13.8) [1270]	15.8 (13.6, 18.0) [207]	13.6 (12.9, 14.3) [1,532]
2011	^ (^, ^) [8]	^ (^, ^) [8]	^ (^, ^) [16]	10.8 (7.6, 14.1) [44]	^ (^, ^) [14]	11.9 (8.8, 15.0) [59]	12.9 (12.2, 13.6) [1269]	14.1 (12.0, 16.2) [190]	13.2 (12.5, 13.8) [1,511]
2012	^ (^, ^) [*]	^ (^, ^) [10]	^ (^, ^) [12]	8.1 (5.2, 10.9) [32]	^ (^, ^) [13]	9.2 (6.5, 11.8) [46]	12.6 (11.8, 13.3) [1246]	14.7 (12.6, 16.8) [201]	12.9 (12.3, 13.6) [1,498]
2013	^ (^, ^) [10]	^ (^, ^) [*]	^ (^, ^) [14]	12.3 (8.8, 15.8) [49]	^ (^, ^) [7]	11.9 (8.8, 15) [59]	11.8 (11.1, 12.5) [1199]	12.9 (11.0, 14.9) [179]	12.0 (11.4, 12.7) [1,426]
2014	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [12]	10.7 (7.3, 14.0) [41]	^ (^, ^) [14]	11.5 (8.4, 14.6) [55]	12.7 (12.0, 13.4) [1302]	12.4 (10.6, 14.3) [179]	12.8 (12.2, 13.5) [1,532]

2015	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [10]	11.7 (8.3, 15.0) [50]	^ (^, ^) [8]	11.1 (8.2, 14.1) [58]	12.1 (11.4, 12.8) [1241]	13.7 (11.7, 15.7) [192]	12.3 (11.6, 12.9) [1,477]
2016	^ (^, ^) [6]	^ (^, ^) [9]	^ (^, ^) [16]	14.1 (10.3, 18.0) [56]	^ (^, ^) [15]	15.0 (11.5, 18.6) [73]	13.1 (12.4, 13.8) [1358]	14.4 (12.4, 16.4) [212]	13.3 (12.7, 14) [1,626]
2017	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [9]	10.8 (7.4, 14.2) [43]	^ (^, ^) [11]	11.0 (8.0, 14.0) [56]	12.6 (11.9, 13.3) [1288]	15.3 (13.3, 17.3) [230]	13.0 (12.3, 13.7) [1,574]
2018	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	11.9 (8.4, 15.3) [48]	^ (^, ^) [7]	11.3 (8.2, 14.4) [55]	11.5 (10.8, 12.2) [1217]	12.9 (11.1, 14.8) [192]	11.7 (11.0, 12.3) [1,446]
2000 - 2018	14.0 (11.6, 16.4) [131]	14.3 (11.9, 16.7) [138]	13.8 (12.2, 15.4) [273]	13.1 (12.3, 14.0) [958]	13.7 (11.8, 15.6) [207]	13.3 (12.6, 14.1) [1,189]	13.4 (13.2, 13.6) [24644]	15.1 (14.7, 15.6) [3721]	13.7 (13.5, 13.9) [29,178]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Rectum cancer cases were defined by new malignant cancer diagnoses where rectum was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 5. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Stomach Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [8]	^ (^, ^) [17]	^ (^, ^) [12]	7.2 (4.6, 9.9) [29]	6.1 (5.6, 6.6) [526]	13.3 (11.1, 15.6) [138]	6.9 (6.4, 7.4) [676]
2001	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [17]	^ (^, ^) [11]	6.5 (4.1, 8.9) [28]	6.2 (5.7, 6.8) [543]	13.0 (10.8, 15.2) [133]	7.0 (6.5, 7.5) [689]
2002	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [10]	6.8 (4.1, 9.6) [24]	^ (^, ^) [7]	7.5 (4.9, 10.1) [31]	6.4 (5.9, 6.9) [566]	14.6 (12.3, 17.0) [156]	7.4 (6.9, 7.9) [742]
2003	^ (^, ^) [*]	^ (^, ^) [10]	^ (^, ^) [14]	5.5 (3.1, 7.9) [20]	^ (^, ^) [11]	7.3 (4.8, 9.9) [32]	6.3 (5.8, 6.8) [561]	14.2 (11.9, 16.6) [146]	7.2 (6.6, 7.7) [725]
2004	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	6.2 (3.7, 8.7) [23]	^ (^, ^) [6]	6.8 (4.4, 9.3) [30]	6.3 (5.8, 6.8) [570]	11.4 (9.3, 13.4) [124]	6.9 (6.4, 7.5) [716]
2005	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	7.1 (4.4, 9.8) [27]	^ (^, ^) [7]	7.3 (4.9, 9.8) [34]	6.1 (5.6, 6.6) [561]	12.4 (10.3, 14.5) [139]	6.9 (6.4, 7.4) [725]

2006	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [12]	^ (^, ^) [*]	^ (^, ^) [19]	5.8 (5.3, 6.3) [537]	11.9 (9.9, 14.0) [134]	6.5 (6.0, 7.0) [693]
2007	^ (^, ^) [*]	^ (^, ^) [9]	^ (^, ^) [14]	7.7 (4.9, 10.5) [29]	^ (^, ^) [10]	8.7 (5.9, 11.4) [39]	6.3 (5.8, 6.8) [592]	12.8 (10.7, 14.9) [151]	7.1 (6.6, 7.6) [772]
2008	0 (0, 0) [0]	^ (^, ^) [12]	^ (^, ^) [12]	^ (^, ^) [18]	^ (^, ^) [16]	7.3 (4.9, 9.8) [34]	5.5 (5.1, 6.0) [531]	11.6 (9.6, 13.5) [135]	6.3 (5.8, 6.7) [688]
2009	^ (^, ^) [7]	^ (^, ^) [*]	^ (^, ^) [11]	6.7 (4.1, 9.3) [26]	^ (^, ^) [*]	6.4 (4.1, 8.7) [31]	5.8 (5.3, 6.3) [560]	11.7 (9.7, 13.7) [141]	6.5 (6.0, 7.0) [726]
2010	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [10]	7.3 (4.5, 10.0) [28]	^ (^, ^) [9]	7.9 (5.4, 10.5) [38]	6.4 (5.9, 7.0) [638]	10.8 (8.9, 12.7) [135]	7.0 (6.5, 7.5) [794]
2011	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	5.5 (3.3, 7.8) [23]	^ (^, ^) [6]	5.8 (3.7, 7.9) [29]	6.1 (5.6, 6.5) [601]	11.3 (9.4, 13.2) [142]	6.7 (6.3, 7.2) [771]
2012	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [8]	7.1 (4.5, 9.7) [29]	^ (^, ^) [8]	7.8 (5.3, 10.2) [38]	6.2 (5.7, 6.7) [626]	9.6 (7.9, 11.3) [126]	6.7 (6.2, 7.2) [785]
2013	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [12]	6.8 (4.2, 9.4) [27]	^ (^, ^) [10]	7.6 (5.1, 10.1) [37]	5.9 (5.4, 6.4) [601]	10.6 (8.8, 12.4) [136]	6.5 (6.0, 6.9) [765]
2014	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	7.5 (4.9, 10.1) [32]	^ (^, ^) [*]	7.0 (4.7, 9.3) [37]	5.0 (4.6, 5.5) [525]	9.3 (7.6, 10.9) [128]	5.7 (5.3, 6.1) [686]

2015	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [19]	^ (^, ^) [6]	5.1 (3.1, 7.2) [25]	5.4 (4.9, 5.8) [570]	10.0 (8.2, 11.7) [130]	6.1 (5.6, 6.5) [739]
2016	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [16]	^ (^, ^) [9]	4.4 (2.7, 6.2) [25]	5.2 (4.8, 5.6) [556]	10.4 (8.7, 12.2) [145]	5.9 (5.5, 6.4) [726]
2017	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [9]	5.1 (3.0, 7.2) [23]	^ (^, ^) [11]	6.9 (4.7, 9.2) [38]	5.0 (4.5, 5.4) [531]	9.7 (8.1, 11.4) [137]	5.7 (5.3, 6.1) [705]
2018	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	5.8 (3.5, 8.1) [26]	^ (^, ^) [*]	5.3 (3.3, 7.2) [29]	5.4 (4.9, 5.8) [592]	7.9 (6.4, 9.3) [119]	5.9 (5.5, 6.3) [757]
2000 - 2018	5.1 (3.7, 6.6) [49]	12.1 (9.8, 14.5) [110]	8.3 (7.0, 9.5) [160]	5.8 (5.3, 6.4) [436]	10.9 (9.1, 12.6) [155]	6.7 (6.1, 7.2) [603]	5.8 (5.7, 5.9) [10,787]	11.2 (10.8, 11.6) [2,595]	6.5 (6.4, 6.6) [13,880]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Stomach cancer cases were defined by new malignant cancer diagnoses where stomach was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 6. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Lung and Bronchus Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	89.3 (63.9, 114.6) [48]	92.6 (64.8, 120.4) [45]	90.1 (71.8, 108.3) [94]	88.1 (78.2, 97.9) [305]	87.7 (64.1, 111.4) [57]	87.8 (78.8, 96.9) [364]	73.4 (71.6, 75.2) [6,327]	87 (81.3, 92.7) [924]	74.9 (73.2, 76.6) [7,336]
2001	97.6 (70.9, 124.2) [52]	74.4 (49.9, 99.0) [37]	85.5 (67.8, 103.2) [90]	84.4 (74.8, 94.1) [297]	74.8 (53.8, 95.7) [52]	83.1 (74.4, 91.8) [351]	73.4 (71.6, 75.2) [6,373]	91 (85.2, 96.7) [976]	74.9 (73.2, 76.6) [7,406]
2002	106.8 (79.0, 134.7) [57]	85.6 (58.1, 113.0) [40]	94.2 (75.5, 112.9) [98]	83.4 (74.0, 92.9) [298]	83.6 (61.0, 106.2) [57]	83.2 (74.5, 91.8) [357]	71.8 (70.1, 73.6) [6,334]	90.6 (84.9, 96.4) [974]	73.8 (72.1, 75.5) [7,404]
2003	89.9 (64.6, 115.2) [49]	90.4 (63.8, 117.0) [46]	90.7 (72.4, 109.0) [95]	92.1 (82.2, 102) [332]	82.0 (60.8, 103.2) [60]	90.3 (81.4, 99.3) [392]	76.3 (74.5, 78.1) [6,815]	97.0 (91.1, 102.9) [1,074]	78.5 (76.8, 80.2) [7,993]
2004	79.9 (55.7, 104.2) [42]	109.2 (78.1, 140.3) [50]	87.9 (69.9, 105.9) [92]	89.3 (79.6, 99.0) [328]	92.1 (68.5, 115.6) [63]	89.2 (80.3, 98.0) [393]	73.0 (71.3, 74.8) [6,604]	87.6 (82.1, 93.2) [992]	74.4 (72.8, 76.1) [7,681]
2005	90.9 (65.0, 116.7) [48]	120.6 (88.6, 152.5) [58]	100.7 (81.5, 119.9) [106]	90.1 (80.5, 99.8) [335]	98.3 (74.8, 121.7) [72]	91.1 (82.3, 100) [408]	74.3 (72.5, 76.0) [6,782]	87.0 (81.5, 92.5) [1,002]	75.4 (73.8, 77.1) [7,878]

2006	78.5 (54.6, 102.3) [42]	117.9 (86.2, 149.6) [56]	94.9 (76.2, 113.7) [99]	79.3 (70.2, 88.3) [298]	98.9 (75.5, 122.2) [73]	82.5 (74.1, 90.9) [375]	72.5 (70.7, 74.2) [6,728]	90.1 (84.6, 95.7) [1,055]	74.3 (72.6, 75.9) [7,889]
2007	106.6 (78.8, 134.4) [57]	95.3 (66.7, 124.0) [45]	98.7 (79.6, 117.8) [103]	87.1 (77.7, 96.5) [333]	83.6 (62.4, 104.8) [63]	87.5 (78.9, 96.1) [404]	74.4 (72.6, 76.1) [7,015]	87.1 (81.6, 92.5) [1,033]	75.5 (73.9, 77.2) [8,156]
2008	97.1 (70.9, 123.3) [53]	82.2 (55.6, 108.8) [39]	88.0 (70.0, 106.0) [92]	85.7 (76.4, 94.9) [333]	72.6 (53.3, 91.9) [57]	84.4 (76.1, 92.8) [398]	70.5 (68.8, 72.2) [6,772]	82.2 (76.9, 87.4) [983]	71.6 (70.0, 73.2) [7,876]
2009	125.1 (91.1, 159.0) [53]	97.1 (69.5, 124.7) [49]	107.2 (86.3, 128.2) [103]	85.8 (76.6, 95.1) [335]	85.9 (65.2, 106.5) [70]	85.9 (77.5, 94.3) [408]	68.4 (66.7, 70.1) [6,655]	78.8 (73.7, 83.8) [970]	69.8 (68.3, 71.4) [7,795]
2010	123.0 (90.6, 155.3) [56]	76.6 (52.3, 100.9) [40]	94.0 (75.0, 112.9) [96]	80.2 (71.4, 89.1) [322]	70.1 (51.4, 88.8) [57]	78.6 (70.7, 86.6) [384]	70.3 (68.7, 72.0) [6,948]	77.4 (72.4, 82.3) [982]	71.4 (69.8, 72.9) [8,102]
2011	95.5 (67.1, 123.8) [44]	95.1 (68.7, 121.5) [52]	94.9 (75.7, 114.0) [97]	77.5 (68.9, 86.2) [316]	84.4 (64.4, 104.5) [72]	79.6 (71.7, 87.5) [396]	67.4 (65.8, 69.0) [6,760]	80.4 (75.4, 85.4) [1,037]	69.0 (67.5, 70.6) [7,970]
2012	79.0 (53.4, 104.6) [37]	93.7 (66.6, 120.8) [48]	85.0 (66.8, 103.2) [86]	70.4 (62.3, 78.5) [294]	82.8 (62.7, 102.9) [68]	72.1 (64.7, 79.6) [366]	65.7 (64.1, 67.2) [6,752]	78.3 (73.4, 83.3) [1,014]	67.0 (65.5, 68.5) [7,920]
2013	123.3 (91.5, 155.1) [59]	105.1 (76.9, 133.3) [56]	110.1 (89.7, 130.6) [115]	78.0 (69.4, 86.5) [328]	98.4 (76.8, 119.9) [84]	81.2 (73.3, 89.1) [419]	63.3 (61.7, 64.8) [6,619]	74.8 (70.1, 79.6) [1,009]	64.5 (63.1, 66.0) [7,800]
2014	71.1 (47.3, 94.9) [35]	108.4 (79.1, 137.7) [55]	89.1 (70.6, 107.5) [92]	73.7 (65.4, 81.9) [314]	89.1 (68.9, 109.3) [78]	76.3 (68.7, 83.9) [399]	64.3 (62.8, 65.9) [6,868]	72.6 (68.0, 77.2) [1,012]	65.3 (63.9, 66.8) [8,063]

2015	92.4 (64.6, 120.1) [44]	80.6 (56.1, 105.1) [43]	85.1 (67.2, 103.0) [89]	69.0 (61.1, 76.8) [303]	72.4 (54.1, 90.7) [63]	69.5 (62.3, 76.7) [372]	64.0 (62.5, 65.5) [6,937]	70.3 (65.8, 74.8) [983]	64.5 (63.0, 65.9) [8,079]
2016	87.0 (60.7, 113.3) [44]	71.5 (48.3, 94.8) [38]	76.8 (60.1, 93.5) [85]	76.1 (67.9, 84.4) [337]	75.2 (56.7, 93.8) [66]	76.0 (68.5, 83.5) [410]	63.2 (61.7, 64.7) [7,008]	68.3 (63.9, 72.6) [987]	63.6 (62.2, 65.0) [8,171]
2017	84.7 (57.6, 111.9) [40]	73.0 (49.5, 96.6) [39]	75.9 (58.8, 92.9) [80]	78.4 (70.1, 86.8) [353]	66.3 (48.9, 83.6) [59]	76.0 (68.6, 83.4) [418]	61.9 (60.4, 63.3) [6,997]	61.8 (57.6, 65.9) [898]	61.8 (60.4, 63.2) [8,086]
2018	71.5 (46.3, 96.8) [33]	42.9 (25.6, 60.2) [25]	54.2 (39.9, 68.4) [59]	66.0 (58.4, 73.5) [304]	53.7 (38.4, 68.9) [50]	63.9 (57.2, 70.6) [360]	59.4 (58.0, 60.9) [6,901]	65.3 (61.1, 69.6) [975]	59.7 (58.4, 61.1) [8,036]
2000 - 2018	94.0 (87.8, 100.2) [893]	89.8 (83.7, 96.0) [861]	89.5 (85.3, 93.7) [1,771]	80.3 (78.3, 82.4) [6,065]	81.7 (77.0, 86.4) [1221]	80.6 (78.7, 82.4) [7,374]	68.3 (67.9, 68.7) [128,195]	79.5 (78.4, 80.7) [18,880]	69.4 (69.1, 69.8) [149,641]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Lung and bronchus cancer cases were defined by new malignant cancer diagnoses where lung and bronchus was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

Table 7. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Larynx Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [16]	^ (^, ^) [*]	^ (^, ^) [19]	4.6 (4.2, 5.1) [399]	6.7 (5.1, 8.2) [73]	4.9 (4.4, 5.3) [480]
2001	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [13]	^ (^, ^) [*]	^ (^, ^) [17]	4.0 (3.6, 4.4) [350]	7.1 (5.6, 8.7) [81]	4.4 (4.0, 4.8) [437]
2002	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [10]	^ (^, ^) [17]	^ (^, ^) [7]	5.4 (3.2, 7.6) [24]	3.9 (3.5, 4.3) [344]	7.1 (5.5, 8.6) [81]	4.2 (3.8, 4.6) [429]
2003	^ (^, ^) [6]	^ (^, ^) [6]	^ (^, ^) [12]	^ (^, ^) [13]	^ (^, ^) [8]	4.6 (2.6, 6.6) [21]	3.9 (3.5, 4.3) [349]	5.4 (4.1, 6.7) [64]	4.0 (3.6, 4.4) [418]
2004	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [15]	^ (^, ^) [*]	^ (^, ^) [17]	4.3 (3.8, 4.7) [390]	6.3 (4.8, 7.7) [73]	4.5 (4.1, 4.9) [471]
2005	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	6.6 (4.0, 9.2) [25]	^ (^, ^) [*]	6.1 (3.9, 8.4) [28]	4.1 (3.6, 4.5) [377]	6.4 (5.0, 7.9) [78]	4.3 (3.9, 4.7) [461]

2006	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [9]	^ (^, ^) [12]	^ (^, ^) [9]	4.4 (2.5, 6.2) [21]	4.1 (3.7, 4.5) [389]	7.5 (5.9, 9.0) [92]	4.5 (4.1, 4.9) [488]
2007	^ (^, ^) [7]	^ (^, ^) [6]	^ (^, ^) [13]	6.0 (3.6, 8.4) [24]	^ (^, ^) [8]	6.4 (4.2, 8.7) [32]	4.1 (3.7, 4.5) [396]	7.7 (6.1, 9.2) [98]	4.5 (4.1, 4.9) [499]
2008	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [16]	^ (^, ^) [*]	4.3 (2.5, 6.2) [21]	3.8 (3.4, 4.2) [371]	5.2 (3.9, 6.4) [67]	3.9 (3.5, 4.3) [443]
2009	^ (^, ^) [6]	^ (^, ^) [*]	^ (^, ^) [8]	5.6 (3.3, 7.9) [23]	^ (^, ^) [*]	5.6 (3.5, 7.7) [28]	4.0 (3.6, 4.4) [389]	4.7 (3.5, 5.9) [62]	4.1 (3.7, 4.5) [461]
2010	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [9]	^ (^, ^) [15]	^ (^, ^) [6]	4.2 (2.4, 6.0) [21]	4.0 (3.6, 4.4) [401]	6.3 (5.0, 7.6) [89]	4.4 (4.0, 4.7) [508]
2011	^ (^, ^) [8]	^ (^, ^) [8]	^ (^, ^) [17]	5.8 (3.5, 8.2) [24]	^ (^, ^) [8]	6.5 (4.2, 8.7) [33]	3.7 (3.3, 4.1) [377]	5.7 (4.4, 7.0) [78]	3.9 (3.5, 4.3) [462]
2012	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [11]	^ (^, ^) [18]	^ (^, ^) [8]	4.9 (3.0, 6.8) [27]	3.6 (3.2, 3.9) [381]	5.9 (4.6, 7.3) [82]	3.8 (3.5, 4.2) [472]
2013	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [8]	^ (^, ^) [16]	^ (^, ^) [*]	4.0 (2.3, 5.8) [21]	3.7 (3.3, 4.0) [390]	4.4 (3.3, 5.5) [64]	3.7 (3.4, 4.1) [460]
2014	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [8]	^ (^, ^) [18]	^ (^, ^) [7]	4.7 (2.8, 6.6) [25]	3.3 (2.9, 3.6) [360]	5.6 (4.4, 6.9) [81]	3.5 (3.2, 3.9) [454]

2015	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [18]	^ (^, ^) [*]	3.9 (2.3, 5.6) [22]	3.7 (3.4, 4.1) [415]	5.7 (4.4, 6.9) [82]	3.9 (3.6, 4.3) [507]
2016	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [11]	^ (^, ^) [*]	^ (^, ^) [15]	3.3 (3.0, 3.7) [377]	4.7 (3.6, 5.8) [73]	3.5 (3.2, 3.8) [463]
2017	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [18]	^ (^, ^) [*]	4.2 (2.5, 6.0) [23]	2.9 (2.6, 3.3) [332]	4.8 (3.6, 5.9) [72]	3.1 (2.8, 3.4) [416]
2018	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [19]	^ (^, ^) [*]	3.4 (2.0, 4.9) [21]	3.1 (2.8, 3.4) [363]	4.7 (3.6, 5.9) [72]	3.3 (3.0, 3.6) [446]
2000 - 2018	8.1 (6.3, 9.9) [77]	7.1 (5.5, 8.8) [76]	7.5 (6.3, 8.6) [155]	4.4 (3.9, 4.8) [331]	5.9 (4.7, 7.1) [100]	4.6 (4.2, 5.1) [436]	3.8 (3.7, 3.9) [7,150]	5.8 (5.5, 6.1) [1462]	4.0 (3.9, 4.1) [8,775]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Larynx cancer cases were defined by new malignant cancer diagnoses where larynx was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 8. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Prostate Gland Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	153.4 (100.7, 206.1) [33]	290.1 (209.8, 370.3) [58]	212.7 (167.9, 257.4) [91]	230.1 (204.8, 255.4) [334]	293.6 (222.7, 364.4) [79]	240.1 (216.3, 263.9) [417]	194.2 (189.7, 198.7) [7296]	323.3 (305.8, 340.7) [1393]	207.9 (203.5, 212.3) [8,832]
2001	141.0 (90.2, 191.9) [30]	339.8 (252.9, 426.6) [67]	250.2 (201.6, 298.8) [106]	218.1 (194.0, 242.1) [328]	336.7 (263.9, 409.6) [97]	252.5 (228.6, 276.5) [452]	195.3 (190.8, 199.8) [7462]	295.2 (278.7, 311.7) [1307]	206.9 (202.6, 211.2) [8,948]
2002	179.2 (122.8, 235.7) [39]	290.7 (217.5, 364.0) [63]	251.9 (204.5, 299.3) [111]	207.9 (185.0, 230.9) [326]	284.3 (222.1, 346.5) [88]	236.6 (214.2, 259.0) [445]	191.6 (187.2, 196.0) [7521]	320.8 (303.6, 338.0) [1427]	206.9 (202.6, 211.2) [9,188]
2003	152.8 (100.3, 205.3) [33]	186.7 (128.6, 244.7) [41]	182.8 (141.7, 223.8) [79]	169.7 (148.6, 190.7) [261]	213.5 (155.5, 271.6) [64]	192.1 (171.5, 212.7) [354]	171.5 (167.4, 175.6) [6813]	292.3 (276.1, 308.5) [1344]	186.5 (182.4, 190.5) [8,408]
2004	100.1 (58.3, 142.0) [22]	188.6 (129.8, 247.4) [41]	151.6 (114.9, 188.3) [67]	143.3 (124.7, 161.9) [234]	210.6 (158.0, 263.2) [68]	162.1 (144.0, 180.3) [319]	160.7 (156.8, 164.6) [6555]	259.7 (244.6, 274.8) [1230]	175.8 (171.9, 179.6) [8,150]
2005	^ (^, ^) [18]	190.8 (127.8, 253.7) [39]	142.3 (106.0, 178.6) [61]	149.1 (130.1, 168.1) [244]	202.0 (151.4, 252.7) [67]	165.6 (147.4, 183.8) [329]	150.2 (146.4, 154.0) [6242]	235.6 (221.5, 249.7) [1156]	163.9 (160.2, 167.6) [7,757]
2006	126.5 (78.4, 174.5) [27]	219.8 (154.1, 285.6) [45]	181.5 (140.7, 222.4) [78]	165.8 (145.9, 185.8) [275]	221.5 (170.5, 272.5) [76]	187.0 (167.8, 206.3) [377]	158.4 (154.6, 162.3) [6739]	246.4 (232.1, 260.6) [1245]	173.5 (169.7, 177.2) [8,421]

2007	139.9 (88.3, 191.5) [29]	282.1 (203.1, 361.2) [55]	211.8 (166.3, 257.2) [88]	170.0 (150.0, 190.0) [287]	266.2 (207.3, 325.1) [87]	198.8 (179.0, 218.6) [405]	165.9 (162.0, 169.8) [7249]	253.9 (239.6, 268.2) [1307]	181.6 (177.7, 185.4) [9,040]
2008	143.6 (93.8, 193.4) [32]	268.1 (196.3, 339.9) [56]	211.2 (167.8, 254.5) [93]	175.2 (155.4, 195.1) [307]	240.4 (187.6, 293.2) [85]	199.1 (179.8, 218.4) [423]	150.5 (146.9, 154.2) [6748]	227.7 (214.3, 241.2) [1203]	162.3 (158.8, 165.9) [8,296]
2009	109.7 (60.1, 159.4) [20]	286.2 (209.8, 362.5) [60]	211.6 (165.3, 257.8) [86]	164.4 (145.4, 183.5) [295]	281.4 (223.3, 339.4) [98]	191.4 (172.7, 210.1) [416]	143.9 (140.4, 147.5) [6644]	231.7 (218.4, 245.0) [1273]	156.7 (153.2, 160.1) [8,258]
2010	136.1 (80.6, 191.6) [25]	213.0 (151.3, 274.8) [49]	189.5 (146.5, 232.4) [81]	156.8 (138.5, 175.1) [291]	231.0 (180.0, 282.0) [84]	182.5 (164.5, 200.4) [409]	142.8 (139.4, 146.3) [6740]	235.1 (221.9, 248.3) [1331]	155.4 (152, 158.8) [8,385]
2011	136.1 (82.8, 189.4) [27]	196.1 (138.1, 254.0) [45]	164.3 (125.7, 202.8) [73]	157.8 (139.6, 176.0) [296]	203.4 (157.0, 249.8) [77]	167.1 (150.1, 184.2) [382]	148.4 (144.9, 151.9) [7161]	251.1 (237.7, 264.6) [1464]	161.8 (158.4, 165.3) [8,937]
2012	^ (^, ^) [13]	117.0 (74.4, 159.6) [30]	109.7 (78.0, 141.4) [50]	109.1 (94.3, 124.0) [214]	138.6 (102.4, 174.7) [59]	128.1 (113.5, 142.7) [306]	108.2 (105.3, 111.2) [5428]	185.7 (174.5, 197.0) [1139]	119.1 (116.2, 122) [6,841]
2013	93.1 (52.5, 133.7) [21]	207.9 (148.0, 267.7) [49]	163.5 (126.0, 201.0) [78]	104.0 (89.6, 118.5) [205]	188.7 (145.5, 231.9) [77]	129.5 (114.9, 144.2) [312]	97.3 (94.5, 100.0) [4962]	175.9 (165.0, 186.8) [1087]	107.9 (105.2, 110.6) [6,315]
2014	^ (^, ^) [13]	122.7 (76.9, 168.5) [29]	112.0 (80.0, 144.0) [51]	79.0 (66.7, 91.3) [164]	120.1 (85.5, 154.6) [49]	100.1 (87.5, 112.8) [250]	94.9 (92.2, 97.6) [4953]	149.4 (139.6, 159.3) [959]	104.1 (101.5, 106.7) [6,239]
2015	^ (^, ^) [19]	97.7 (58.1, 137.4) [24]	101.5 (72.7, 130.3) [50]	97.9 (84.1, 111.6) [202]	109.6 (77.1, 142.1) [46]	111.5 (98.1, 124.9) [279]	100.3 (97.6, 103.1) [5322]	163.1 (152.9, 173.2) [1068]	108.4 (105.7, 111.1) [6,606]
2016	^ (^, ^) [19]	150.3 (98.5, 202.1) [35]	114.3 (82.7, 145.8) [58]	85 (72.3, 97.6) [181]	140.3 (102.7, 177.8) [57]	105.7 (92.8, 118.6) [271]	101.0 (98.2, 103.7) [5492]	165.4 (155.1, 175.6) [1081]	111.7 (109, 114.4) [6,971]

2017	^ (^, ^) [17]	144.8 (98.7, 190.9) [40]	146.3 (110.8, 181.7) [71]	92.2 (78.9, 105.4) [194]	165 (126.5, 203.6) [74]	127.1 (113.1, 141.2) [330]	96.7 (94.1, 99.4) [5375]	163.1 (153.1, 173.1) [1105]	108.3 (105.6, 110.9) [6,914]
2018	^ (^, ^) [14]	130.5 (87.1, 173.8) [36]	111.7 (81.1, 142.2) [55]	82.6 (70.6, 94.7) [186]	158.1 (119.5, 196.8) [68]	98.9 (86.9, 111.0) [267]	100.4 (97.7, 103.0) [5714]	162.4 (152.4, 172.3) [1102]	110.4 (107.8, 113) [7,212]
2000 - 2018	113.2 (102.6, 123.8) [451]	202.7 (188.8, 216.6) [862]	167.5 (158.6, 176.4) [1,427]	140.2 (136.2, 144.2) [4,824]	204.3 (193.3, 215.4) [1400]	162 (158.1, 166.0) [6,743]	136.8 (136.1, 137.6) [120416]	222.1 (219.1, 225.0) [23221]	148.9 (148.2, 149.7) [149,718]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Prostate gland cancer cases were defined by new malignant cancer diagnoses where prostate gland was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 9. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Ovary Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	19.8 (13.5, 26.2) [38]	^ (^, ^) [*]	17.5 (12.2, 22.9) [41]	18.4 (17.2, 19.7) [846]	11.7 (9.0, 14.4) [74]	17.4 (16.3, 18.6) [931]
2001	^ (^, ^) [6]	^ (^, ^) [*]	^ (^, ^) [7]	17.8 (11.8, 23.8) [34]	^ (^, ^) [*]	15.2 (10.2, 20.2) [36]	15.3 (14.1, 16.4) [715]	9.1 (6.7, 11.4) [58]	14.5 (13.5, 15.5) [789]
2002	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [9]	15.8 (10.1, 21.5) [30]	^ (^, ^) [8]	16 (10.9, 21.1) [38]	14.6 (13.5, 15.7) [695]	11.9 (9.2, 14.6) [76]	14.2 (13.2, 15.2) [785]
2003	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [8]	15.2 (9.8, 20.7) [30]	^ (^, ^) [*]	14.5 (9.7, 19.3) [35]	14.6 (13.5, 15.7) [698]	13.4 (10.6, 16.3) [87]	14.5 (13.5, 15.5) [804]
2004	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	19.0 (12.7, 25.2) [36]	^ (^, ^) [7]	18 (12.6, 23.4) [43]	13.9 (12.8, 14.9) [677]	12.3 (9.6, 14.9) [84]	13.6 (12.6, 14.6) [771]
2005	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	13.1 (8.1, 18.0) [27]	^ (^, ^) [*]	12.8 (8.3, 17.2) [32]	13.3 (12.2, 14.3) [645]	8.9 (6.7, 11.2) [62]	12.7 (11.8, 13.7) [722]

2006	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	11.0 (6.2, 15.7) [21]	^ (^, ^) [7]	12.1 (7.7, 16.5) [29]	13.8 (12.8, 14.9) [685]	8.7 (6.5, 10.9) [61]	13.3 (12.4, 14.3) [766]
2007	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [9]	15.5 (10, 20.9) [32]	^ (^, ^) [6]	15.4 (10.5, 20.3) [39]	14.1 (13.0, 15.1) [697]	12.2 (9.6, 14.8) [87]	13.7 (12.8, 14.7) [795]
2008	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	13.8 (8.8, 18.7) [30]	^ (^, ^) [9]	15.6 (10.8, 20.4) [41]	13.1 (12.1, 14.2) [658]	9.6 (7.3, 11.9) [68]	12.9 (12, 13.8) [754]
2009	^ (^, ^) [*]	^ (^, ^) [9]	^ (^, ^) [12]	14.1 (8.8, 19.4) [29]	^ (^, ^) [10]	15.4 (10.5, 20.3) [40]	12.8 (11.8, 13.8) [650]	10.7 (8.3, 13.1) [79]	12.7 (11.7, 13.6) [753]
2010	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	9.2 (5.1, 13.3) [20]	^ (^, ^) [*]	9.7 (5.8, 13.5) [25]	13.1 (12.0, 14.1) [669]	10.9 (8.5, 13.3) [79]	12.9 (12.0, 13.8) [777]
2011	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	13.6 (8.5, 18.8) [29]	^ (^, ^) [*]	11.7 (7.5, 15.9) [31]	13.0 (12.0, 14.0) [671]	8.4 (6.3, 10.5) [64]	12.4 (11.5, 13.3) [754]
2012	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	12.2 (7.5, 16.8) [27]	^ (^, ^) [6]	11.7 (7.7, 15.8) [33]	13.0 (11.9, 14.0) [661]	11.8 (9.4, 14.2) [94]	12.8 (11.9, 13.7) [778]
2013	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	13.5 (8.4, 18.7) [28]	^ (^, ^) [6]	13.5 (8.9, 18.1) [35]	12.7 (11.7, 13.7) [662]	7.4 (5.5, 9.4) [59]	11.9 (11.1, 12.8) [742]
2014	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	13.1 (8.0, 18.1) [28]	^ (^, ^) [6]	13.4 (8.8, 17.9) [35]	11.7 (10.7, 12.7) [610]	9.7 (7.5, 12.0) [76]	11.5 (10.6, 12.4) [710]

2015	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	11.9 (7.0, 16.9) [25]	^ (^, ^) [*]	10.1 (6.1, 14.1) [27]	10.9 (10.0, 11.9) [589]	9.7 (7.5, 11.9) [78]	10.8 (10.0, 11.7) [688]
2016	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	16.1 (10.7, 21.5) [37]	^ (^, ^) [*]	14.1 (9.6, 18.7) [40]	11.4 (10.5, 12.4) [605]	8.6 (6.5, 10.6) [70]	11.1 (10.2, 11.9) [698]
2017	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	12.2 (7.4, 17.0) [27]	^ (^, ^) [*]	10.6 (6.7, 14.5) [30]	10.0 (9.2, 10.9) [552]	6.8 (5.0, 8.7) [56]	9.6 (8.8, 10.4) [625]
2018	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [17]	^ (^, ^) [*]	8.8 (5.0, 12.5) [23]	8.8 (8.0, 9.6) [470]	7.0 (5.1, 8.9) [56]	8.8 (8.0, 9.6) [555]
2000 - 2018	10.7 (7.8, 13.6) [54]	10.9 (8.0, 13.7) [58]	10.4 (8.5, 12.3) [116]	13.9 (12.7, 15.1) [545]	11.8 (9.4, 14.1) [98]	13.4 (12.4, 14.5) [653]	13.0 (12.8, 13.2) [12,455]	9.8 (9.3, 10.3) [1,368]	12.6 (12.4, 12.8) [14,197]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Ovary cancer cases were defined by new malignant cancer diagnoses where ovary was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 10. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Testes Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [9]	^ (^, ^) [*]	^ (^, ^) [11]	6.1 (5.3, 6.8) [249]	^ (^, ^) [8]	5.4 (4.7, 6.0) [266]
2001	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	6.5 (5.7, 7.3) [266]	^ (^, ^) [11]	5.7 (5.1, 6.4) [282]
2002	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [10]	0 (0, 0) [0]	^ (^, ^) [10]	6.4 (5.6, 7.1) [258]	^ (^, ^) [10]	5.5 (4.8, 6.2) [270]
2003	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [12]	0 (0, 0) [0]	^ (^, ^) [12]	6.4 (5.6, 7.1) [256]	^ (^, ^) [7]	5.5 (4.9, 6.2) [270]
2004	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [10]	^ (^, ^) [*]	^ (^, ^) [11]	7.1 (6.2, 7.9) [282]	^ (^, ^) [7]	6.1 (5.4, 6.8) [297]
2005	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [12]	0 (0, 0) [0]	^ (^, ^) [12]	7.5 (6.6, 8.3) [296]	^ (^, ^) [*]	6.4 (5.7, 7.1) [309]

2006	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [9]	0 (0, 0) [0]	^ (^, ^) [9]	6.5 (5.7, 7.3) [254]	^ (^, ^) [9]	5.6 (5.0, 6.3) [269]
2007	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [10]	^ (^, ^) [*]	^ (^, ^) [11]	6.6 (5.8, 7.4) [259]	^ (^, ^) [15]	6.0 (5.3, 6.7) [287]
2008	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [11]	0 (0, 0) [0]	^ (^, ^) [12]	6.3 (5.5, 7.1) [240]	^ (^, ^) [7]	5.5 (4.9, 6.2) [259]
2009	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [7]	0 (0, 0) [0]	^ (^, ^) [7]	5.8 (5.0, 6.5) [214]	^ (^, ^) [12]	5.0 (4.4, 5.7) [230]
2010	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [*]	^ (^, ^) [9]	7.1 (6.3, 8.0) [264]	^ (^, ^) [12]	6.3 (5.5, 7.0) [288]
2011	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [10]	0 (0, 0) [0]	^ (^, ^) [11]	6.6 (5.7, 7.4) [248]	^ (^, ^) [*]	5.7 (5.0, 6.4) [264]
2012	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [10]	^ (^, ^) [*]	^ (^, ^) [12]	6.6 (5.8, 7.4) [248]	^ (^, ^) [11]	5.8 (5.1, 6.5) [267]
2013	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [10]	0 (0, 0) [0]	^ (^, ^) [10]	7.3 (6.4, 8.2) [266]	^ (^, ^) [14]	6.3 (5.5, 7.0) [283]
2014	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [9]	0 (0, 0) [0]	^ (^, ^) [9]	6.5 (5.7, 7.3) [238]	^ (^, ^) [15]	5.7 (5.0, 6.4) [260]

2015	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [8]	0 (0, 0) [0]	^ (^, ^) [8]	6.7 (5.9, 7.6) [249]	^ (^, ^) [9]	5.9 (5.2, 6.6) [270]
2016	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	6.5 (5.7, 7.3) [241]	^ (^, ^) [8]	5.6 (4.9, 6.3) [260]
2017	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [11]	0 (0, 0) [0]	^ (^, ^) [13]	7.3 (6.4, 8.2) [272]	^ (^, ^) [7]	6.3 (5.6, 7.0) [296]
2018	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [11]	0 (0, 0) [0]	^ (^, ^) [12]	7.0 (6.1, 7.9) [256]	^ (^, ^) [7]	6.1 (5.4, 6.9) [284]
2000 - 2018	4.9 (2.9, 6.9) [23]	^ (^, ^) [6]	2.9 (1.8, 4.0) [29]	6.1 (5.2, 7) [175]	^ (^, ^) [8]	5.2 (4.5, 6.0) [191]	6.7 (6.5, 6.9) [4,856]	1.4 (1.2, 1.6) [177]	5.8 (5.7, 6.0) [5,211]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Testes cancer cases were defined by new malignant cancer diagnoses where testes was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 11. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Urinary Bladder Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [9]	^ (^, ^) [*]	^ (^, ^) [13]	24.4 (19.2, 29.6) [84]	^ (^, ^) [*]	22.0 (17.4, 26.5) [90]	26.4 (25.3, 27.5) [2,274]	13.4 (11.2, 15.7) [138]	25.0 (24.0, 26.0) [2,440]
2001	^ (^, ^) [12]	^ (^, ^) [*]	^ (^, ^) [13]	19.0 (14.4, 23.6) [66]	^ (^, ^) [*]	16.5 (12.5, 20.4) [68]	26.0 (25.0, 27.1) [2,262]	11.3 (9.2, 13.4) [114]	24.4 (23.4, 25.3) [2,401]
2002	^ (^, ^) [7]	^ (^, ^) [*]	^ (^, ^) [13]	21.7 (16.8, 26.5) [77]	^ (^, ^) [9]	21.1 (16.7, 25.4) [89]	24.6 (23.6, 25.7) [2,173]	14.5 (12.2, 16.9) [151]	23.7 (22.7, 24.6) [2,370]
2003	^ (^, ^) [12]	^ (^, ^) [11]	23.5 (14.1, 32.9) [24]	19.6 (15.0, 24.2) [70]	^ (^, ^) [16]	20.6 (16.2, 24.9) [87]	24.9 (23.9, 25.9) [2,231]	14.9 (12.5, 17.2) [154]	24.1 (23.1, 25.0) [2,442]
2004	^ (^, ^) [11]	^ (^, ^) [7]	^ (^, ^) [18]	23.8 (18.8, 28.9) [87]	^ (^, ^) [10]	22.7 (18.2, 27.2) [98]	23.5 (22.5, 24.5) [2,129]	13.7 (11.4, 16.0) [145]	22.5 (21.6, 23.5) [2,318]
2005	^ (^, ^) [13]	^ (^, ^) [*]	^ (^, ^) [16]	26.3 (21.0, 31.5) [96]	^ (^, ^) [7]	23.8 (19.2, 28.4) [104]	27.0 (25.9, 28.0) [2,470]	14.2 (12.0, 16.5) [157]	26.0 (25.0, 26.9) [2,706]

2006	^ (^, ^) [13]	^ (^, ^) [*]	^ (^, ^) [18]	26.1 (20.9, 31.3) [98]	^ (^, ^) [7]	23.7 (19.2, 28.3) [107]	24.7 (23.7, 25.7) [2,298]	13.9 (11.7, 16.2) [157]	23.6 (22.7, 24.6) [2,503]
2007	^ (^, ^) [11]	^ (^, ^) [11]	22.2 (13.1, 31.3) [23]	22.6 (17.9, 27.4) [87]	^ (^, ^) [15]	23.3 (18.9, 27.8) [107]	25.8 (24.8, 26.9) [2,439]	15.5 (13.2, 17.9) [171]	24.7 (23.7, 25.6) [2,650]
2008	^ (^, ^) [12]	^ (^, ^) [10]	21.5 (12.5, 30.6) [22]	22.5 (17.8, 27.3) [88]	^ (^, ^) [16]	23.8 (19.4, 28.3) [111]	24.5 (23.5, 25.5) [2,344]	11.7 (9.7, 13.7) [133]	23.3 (22.4, 24.2) [2,538]
2009	^ (^, ^) [10]	^ (^, ^) [8]	^ (^, ^) [19]	25.3 (20.3, 30.3) [100]	^ (^, ^) [10]	24.2 (19.7, 28.6) [115]	24.5 (23.5, 25.4) [2,376]	13.7 (11.5, 15.8) [159]	23.6 (22.7, 24.5) [2,617]
2010	^ (^, ^) [8]	^ (^, ^) [13]	22.7 (13.3, 32.1) [23]	25.2 (20.3, 30.1) [101]	^ (^, ^) [17]	25.6 (21.0, 30.1) [124]	24.8 (23.8, 25.8) [2,430]	12.8 (10.7, 14.9) [152]	23.8 (22.9, 24.8) [2,675]
2011	^ (^, ^) [10]	^ (^, ^) [6]	^ (^, ^) [16]	26.9 (21.8, 31.9) [111]	^ (^, ^) [10]	24.8 (20.4, 29.2) [123]	24.8 (23.8, 25.7) [2,476]	13 .0 (11.0, 15.1) [160]	23.5 (22.6, 24.4) [2,696]
2012	^ (^, ^) [13]	^ (^, ^) [*]	^ (^, ^) [18]	27.7 (22.6, 32.9) [114]	^ (^, ^) [6]	25.4 (20.9, 29.9) [126]	24.4 (23.5, 25.4) [2,501]	13.3 (11.3, 15.4) [171]	23.2 (22.3, 24.1) [2,728]
2013	^ (^, ^) [14]	^ (^, ^) [*]	23.4 (13.5, 33.2) [22]	25.9 (21.0, 30.8) [110]	^ (^, ^) [7]	24.2 (19.9, 28.5) [123]	22.9 (22.0, 23.9) [2,392]	15.2 (13.0, 17.4) [190]	22.2 (21.4, 23.1) [2,653]
2014	^ (^, ^) [13]	^ (^, ^) [6]	19.8 (11, 28.6) [20]	28.2 (23.2, 33.3) [121]	^ (^, ^) [9]	25.9 (21.5, 30.3) [134]	23.9 (22.9, 24.8) [2,526]	13.2 (11.2, 15.1) [178]	22.8 (22.0, 23.7) [2,776]

2015	^ (^, ^) [13]	^ (^, ^) [12]	24.7 (14.9, 34.6) [25]	26.3 (21.4, 31.3) [112]	^ (^, ^) [15]	24.9 (20.5, 29.3) [129]	23.1 (22.2, 24.0) [2,490]	12.6 (10.7, 14.6) [169]	21.8 (2.0 1, 22.6) [2,706]
2016	^ (^, ^) [7]	^ (^, ^) [9]	^ (^, ^) [16]	22.0 (17.5, 26.5) [94]	^ (^, ^) [16]	21.2 (17.2, 25.3) [111]	24.3 (23.3, 25.2) [2,638]	12.7 (10.8, 14.7) [172]	22.8 (21.9, 23.6) [2,858]
2017	^ (^, ^) [12]	^ (^, ^) [9]	21.2 (12.2, 30.2) [22]	25.6 (20.8, 30.4) [112]	^ (^, ^) [17]	25.2 (20.9, 29.6) [135]	22.0 (21.1, 22.9) [2,456]	13.7 (11.7, 15.7) [192]	21.1 (20.3, 21.9) [2,713]
2018	^ (^, ^) [8]	^ (^, ^) [9]	^ (^, ^) [17]	27.9 (22.9, 33.0) [124]	^ (^, ^) [13]	25.7 (21.3, 30.0) [139]	21.4 (20.6, 22.3) [2,446]	11.8 (10.0, 13.6) [170]	20.3 (19.5, 21.1) [2,676]
2000 - 2018	21.8 (18.8, 24.7) [208]	15.4 (12.8, 18) [138]	18.7 (16.7, 20.6) [358]	24.7 (23.6, 25.8) [1,852]	14.8 (12.7, 16.8) [206]	23.5 (22.5, 24.5) [2,120]	24.3 (24.1, 24.5) [45,351]	13.4 (12.9, 13.9) [3,033]	23.2 (23.0, 23.4) [49,466]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Urninary bladder cancer cases were defined by new malignant cancer diagnoses where urinary bladder was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 12. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Kidney and Renal Pelvis Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [8]	^ (^, ^) [6]	^ (^, ^) [14]	15.9 (11.7, 20.1) [55]	^ (^, ^) [7]	15.2 (11.5, 19.0) [63]	13.3 (12.5, 14.1) [1,142]	15.6 (13.3, 18) [175]	13.6 (12.9, 14.3) [1,334]
2001	^ (^, ^) [8]	^ (^, ^) [*]	^ (^, ^) [12]	10.1 (6.7, 13.4) [35]	^ (^, ^) [6]	10.0 (7.0, 13.0) [42]	12.3 (11.6, 13.1) [1,070]	19.1 (16.5, 21.7) [213]	13.1 (12.4, 13.8) [1,301]
2002	^ (^, ^) [8]	^ (^, ^) [8]	^ (^, ^) [16]	14.5 (10.5, 18.4) [52]	^ (^, ^) [12]	14.8 (11.2, 18.4) [65]	13.8 (13.0, 14.5) [1,208]	18.7 (16.2, 21.2) [216]	14.4 (13.6, 15.1) [1,450]
2003	^ (^, ^) [*]	^ (^, ^) [11]	^ (^, ^) [15]	13.5 (9.7, 17.3) [49]	^ (^, ^) [15]	14.7 (11.1, 18.2) [65]	14.5 (13.7, 15.2) [1,288]	17.4 (15.0, 19.8) [203]	14.9 (14.2, 15.7) [1,532]
2004	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [13]	18.0 (13.6, 22.4) [66]	^ (^, ^) [11]	17.9 (13.9, 21.9) [79]	14.3 (13.5, 15.1) [1,293]	15.9 (13.5, 18.2) [186]	14.5 (13.8, 15.3) [1,510]
2005	^ (^, ^) [*]	^ (^, ^) [12]	^ (^, ^) [16]	17.0 (12.8, 21.2) [63]	^ (^, ^) [18]	18.4 (14.5, 22.4) [84]	14.7 (13.9, 15.5) [1,341]	16 (13.7, 18.3) [195]	15.0 (14.3, 15.8) [1,587]

2006	^ (^, ^) [9]	^ (^, ^) [7]	^ (^, ^) [16]	19.5 (15.0, 24.0) [73]	^ (^, ^) [12]	18.5 (14.6, 22.5) [85]	15.9 (15.1, 16.7) [1,467]	18.7 (16.3, 21.2) [228]	16.3 (15.5, 17.0) [1,732]
2007	^ (^, ^) [6]	^ (^, ^) [12]	^ (^, ^) [19]	17.2 (13.0, 21.5) [65]	^ (^, ^) [17]	18.0 (14.1, 21.9) [84]	16.0 (15.2, 16.8) [1,502]	21.8 (19.1, 24.4) [277]	16.8 (16.0, 17.6) [1,831]
2008	^ (^, ^) [10]	^ (^, ^) [14]	23.1 (13.8, 32.3) [24]	14.4 (10.6, 18.2) [56]	28.8 (16.3, 41.4) [22]	16.3 (12.6, 19.9) [78]	15.5 (14.7, 16.3) [1,465]	22.1 (19.4, 24.8) [270]	16.3 (15.5, 17.0) [1,785]
2009	^ (^, ^) [8]	^ (^, ^) [14]	21.3 (12.3, 30.3) [22]	17.6 (13.4, 21.8) [69]	^ (^, ^) [17]	17.6 (13.8, 21.3) [86]	16.3 (15.5, 17.2) [1,565]	19.8 (17.3, 22.3) [251]	16.8 (16.1, 17.6) [1,871]
2010	^ (^, ^) [11]	^ (^, ^) [11]	22.6 (13.2, 31.9) [23]	20.4 (15.8, 25.0) [79]	28.8 (16.3, 41.3) [21]	21.4 (17.2, 25.6) [101]	15.8 (15.0, 16.6) [1,523]	23.6 (20.9, 26.3) [307]	16.9 (16.2, 17.7) [1,899]
2011	^ (^, ^) [10]	^ (^, ^) [10]	20.0 (11.1, 28.9) [20]	17.6 (13.3, 21.9) [68]	^ (^, ^) [14]	17.3 (13.5, 21.1) [82]	16.6 (15.8, 17.4) [1,628]	20.9 (18.3, 23.4) [279]	17.2 (16.4, 17.9) [1,962]
2012	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [9]	16.5 (12.4, 20.5) [66]	^ (^, ^) [10]	15.4 (11.9, 18.9) [77]	16.3 (15.5, 17.1) [1,620]	20.4 (17.9, 22.8) [279]	16.8 (16.1, 17.6) [1,954]
2013	^ (^, ^) [8]	^ (^, ^) [8]	^ (^, ^) [17]	18.1 (13.8, 22.5) [71]	^ (^, ^) [16]	18.2 (14.3, 22.0) [89]	16 (15.2, 16.8) [1,620]	22.1 (19.5, 24.6) [305]	16.8 (16.0, 17.6) [1,981]
2014	^ (^, ^) [8]	^ (^, ^) [10]	^ (^, ^) [18]	20.6 (16.0, 25.1) [82]	^ (^, ^) [18]	20.1 (16.1, 24.1) [101]	16.2 (15.4, 17.0) [1,644]	21.0 (18.5, 23.4) [298]	16.7 (16.0, 17.5) [1,999]

2015	^ (^, ^) [*]	^ (^, ^) [11]	^ (^, ^) [15]	16.4 (12.5, 20.2) [72]	^ (^, ^) [17]	17.3 (13.7, 20.9) [92]	15.2 (14.4, 16.0) [1,566]	18.1 (15.8, 20.3) [261]	15.5 (14.8, 16.2) [1,873]
2016	^ (^, ^) [7]	^ (^, ^) [12]	^ (^, ^) [19]	16.4 (12.3, 20.6) [66]	^ (^, ^) [18]	17.3 (13.5, 21.0) [86]	17.1 (16.3, 17.9) [1,771]	18.5 (16.2, 20.7) [273]	17.2 (16.4, 18.0) [2,096]
2017	^ (^, ^) [10]	^ (^, ^) [13]	24.3 (14.4, 34.1) [24]	19.7 (15.3, 24.2) [82]	26.0 (15.1, 37.0) [23]	21.4 (17.3, 25.5) [109]	16.5 (15.7, 17.3) [1,755]	20.2 (17.9, 22.6) [294]	16.9 (16.1, 17.6) [2,101]
2018	^ (^, ^) [*]	^ (^, ^) [6]	^ (^, ^) [10]	20.3 (15.7, 24.8) [83]	^ (^, ^) [17]	20.1 (16.1, 24.2) [102]	16.4 (15.6, 17.2) [1,741]	18.5 (16.2, 20.7) [278]	16.6 (15.8, 17.3) [2,081]
2000 - 2018	14.4 (11.9, 16.8) [134]	18.1 (15.4, 20.8) [181]	16.0 (14.3, 17.8) [322]	17.0 (16.0, 17.9) [1252]	18.8 (16.6, 21.0) [291]	17.4 (16.5, 18.2) [1,570]	15.4 (15.2, 15.6) [28,209]	19.4 (18.9, 20.0) [4,788]	15.9 (15.7, 16.1) [33,879]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Kidney and renal pelvis cancer cases were defined by new malignant cancer diagnoses where kidney and renal pelvis was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 13. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Brain and Other Central Nervous System (CNS) Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	6.1 (3.5, 8.7) [21]	^ (^, ^) [*]	5.7 (3.5, 7.9) [25]	7.5 (6.9, 8.1) [632]	5.2 (3.9, 6.5) [67]	7.2 (6.6, 7.7) [708]
2001	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	8.5 (5.4, 11.6) [29]	^ (^, ^) [*]	7.8 (5.1, 10.4) [33]	7.6 (7.0, 8.2) [643]	4.5 (3.3, 5.7) [55]	7.1 (6.6, 7.7) [711]
2002	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	8.5 (5.4, 11.5) [30]	^ (^, ^) [*]	7.0 (4.5, 9.4) [31]	7.8 (7.2, 8.4) [669]	4.6 (3.4, 5.8) [57]	7.3 (6.8, 7.9) [739]
2003	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	7.0 (4.2, 9.8) [24]	^ (^, ^) [*]	6.8 (4.3, 9.3) [29]	7.3 (6.7, 7.8) [626]	5.3 (4.0, 6.6) [67]	7.0 (6.5, 7.5) [706]
2004	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [6]	6.6 (4.0, 9.3) [24]	^ (^, ^) [*]	6.5 (4.1, 8.9) [29]	7.8 (7.2, 8.4) [674]	5.4 (4.1, 6.7) [70]	7.4 (6.9, 8.0) [759]
2005	^ (^, ^) [8]	^ (^, ^) [*]	^ (^, ^) [10]	9.3 (6.2, 12.5) [34]	^ (^, ^) [*]	8.5 (5.8, 11.2) [38]	7.9 (7.3, 8.5) [696]	5.1 (3.9, 6.4) [69]	7.6 (7.0, 8.1) [781]

2006	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	5.8 (3.3, 8.4) [20]	^ (^, ^) [*]	5.8 (3.5, 8.0) [25]	7.3 (6.7, 7.9) [641]	4.7 (3.5, 5.9) [64]	7.0 (6.5, 7.5) [726]
2007	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	6.8 (4.1, 9.4) [25]	^ (^, ^) [*]	7.0 (4.5, 9.4) [32]	8.0 (7.4, 8.6) [713]	4.9 (3.6, 6.1) [65]	7.6 (7.1, 8.1) [800]
2008	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	8.6 (5.6, 11.6) [32]	^ (^, ^) [*]	7.9 (5.4, 10.5) [37]	8.1 (7.5, 8.8) [725]	4.8 (3.6, 6.0) [64]	7.6 (7.1, 8.2) [805]
2009	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [8]	5.3 (2.9, 7.6) [20]	^ (^, ^) [*]	5.3 (3.2, 7.4) [25]	7.1 (6.6, 7.7) [633]	4.9 (3.7, 6.2) [66]	6.9 (6.4, 7.4) [729]
2010	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	6.5 (3.8, 9.3) [23]	^ (^, ^) [*]	6.5 (4.1, 9.0) [29]	7.0 (6.4, 7.5) [639]	4.6 (3.5, 5.8) [64]	6.7 (6.2, 7.2) [725]
2011	^ (^, ^) [6]	0 (0, 0) [0]	^ (^, ^) [6]	9.6 (6.4, 12.8) [36]	^ (^, ^) [*]	8.4 (5.7, 11.0) [40]	7.3 (6.7, 7.8) [658]	4.3 (3.2, 5.4) [61]	6.9 (6.4, 7.4) [743]
2012	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [7]	8.3 (5.2, 11.4) [29]	^ (^, ^) [6]	7.9 (5.3, 10.6) [36]	7.1 (6.5, 7.7) [647]	4.7 (3.5, 5.9) [66]	6.8 (6.3, 7.3) [738]
2013	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	6.0 (3.5, 8.5) [23]	^ (^, ^) [*]	5.5 (3.4, 7.7) [26]	6.8 (6.2, 7.3) [625]	3.9 (2.9, 5.0) [53]	6.4 (5.9, 6.8) [696]
2014	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	6.7 (3.9, 9.4) [24]	^ (^, ^) [*]	6.1 (3.8, 8.4) [28]	7.1 (6.6, 7.7) [667]	3.8 (2.8, 4.8) [57]	6.6 (6.2, 7.1) [740]

2015	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	6.1 (3.4, 8.7) [22]	^ (^, ^) [7]	6.9 (4.4, 9.3) [31]	6.9 (6.4, 7.5) [659]	3.6 (2.6, 4.5) [53]	6.5 (6.0, 7.0) [735]
2016	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	7.1 (4.3, 9.9) [26]	^ (^, ^) [*]	7.1 (4.5, 9.6) [32]	7.3 (6.7, 7.9) [686]	4.2 (3.1, 5.2) [63]	6.9 (6.4, 7.4) [768]
2017	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	7.3 (4.4, 10.1) [27]	^ (^, ^) [*]	6.1 (3.8, 8.3) [29]	6.7 (6.1, 7.2) [638]	3.0 (2.1, 3.9) [44]	6.2 (5.8, 6.7) [710]
2018	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	8.4 (5.3, 11.6) [30]	^ (^, ^) [*]	7.1 (4.5, 9.6) [32]	7.0 (6.4, 7.6) [669]	4.1 (3.1, 5.1) [62]	6.5 (6.0, 7.0) [745]
2000 - 2018	6.1 (4.5, 7.7) [57]	4.1 (2.9, 5.3) [48]	4.9 (4.0, 5.9) [106]	7.3 (6.6, 7.9) [499]	4.3 (3.3, 5.3) [75]	6.8 (6.3, 7.4) [587]	7.3 (7.2, 7.5) [12,540]	4.5 (4.2, 4.7) [1,167]	6.9 (6.8, 7.1) [14,064]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Brain and other CNS cancer cases were defined by new malignant cancer diagnoses where brain and other CNS was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 14. Age-Adjusted[1] Cancer Incidence Rate (per 100,000 Population) by Year and Race for Meningioma Cancer[2], City of Flint, Genesee County, and State of Michigan, 2000-2018

Year	City of Flint			Genesee County			State of Michigan		
	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]	White Rate per 100,000 (95% CI) [Count]	Black Rate per 100,000 (95% CI) [Count]	Total Rate per 100,000 (95% CI) [Count]
2000	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [19]	^ (^, ^) [*]	0.2 (0.1, 0.3) [24]
2001	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [8]	^ (^, ^) [*]	^ (^, ^) [13]
2002	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [11]	^ (^, ^) [*]	^ (^, ^) [15]
2003	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	0.2 (0.1, 0.3) [21]	^ (^, ^) [8]	0.3 (0.2, 0.4) [29]
2004	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [17]	^ (^, ^) [11]	0.3 (0.2, 0.4) [29]
2005	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [14]	^ (^, ^) [7]	0.2 (0.1, 0.3) [21]

2006	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [6]	^ (^, ^) [*]	^ (^, ^) [8]
2007	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [14]	^ (^, ^) [*]	^ (^, ^) [18]
2008	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [8]	^ (^, ^) [*]	^ (^, ^) [10]
2009	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [19]	^ (^, ^) [*]	0.2 (0.1, 0.3) [24]
2010	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [15]	^ (^, ^) [*]	^ (^, ^) [18]
2011	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [8]	^ (^, ^) [*]	^ (^, ^) [12]
2012	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [7]	^ (^, ^) [*]	^ (^, ^) [9]
2013	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [10]	^ (^, ^) [*]	^ (^, ^) [11]
2014	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [16]	^ (^, ^) [*]	^ (^, ^) [18]

2015	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [12]	^ (^, ^) [*]	^ (^, ^) [17]
2016	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [7]	^ (^, ^) [*]	^ (^, ^) [9]
2017	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [9]	0 (0, 0) [0]	^ (^, ^) [9]
2018	0 (0, 0) [0]	0 (0, 0) [0]	0 (0, 0) [0]	^ (^, ^) [*]	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [8]	0 (0, 0) [0]	^ (^, ^) [8]
2000 - 2018	0 (0, 0) [0]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [*]	^ (^, ^) [10]	0.1 (0.1, 0.1) [229]	0.3 (0.2, 0.3) [63]	0.1 (0.1, 0.2) [302]

[1]**Age-Adjusted Rates** are calculated for the population by the direct method, using the age distribution of the 2000 United States Standard Population.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000 – 2018, includes cases processed through November 30, 2020. Meningioma cancer cases were defined by new malignant cancer diagnoses where meningioma was the primary site. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services.

* Counts are suppressed when the number of cases are less than six and greater than zero.

^ Rates and the 95-percent confidence intervals are suppressed when the number of cases are less than 20 and greater than zero.

Table 15. Standardized Incidence Ratio (SIR)[1] for Invasive Cancers by Site and Race, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

Race	Cancer Site	Observed Number of Cases in the City of Flint	City of Flint Compared to Genesee County		City of Flint Compared to State of Michigan	
			Expected number of Cases	SIR (95% CI)	Expected number of Cases	SIR (95% CI)
All Races	Colon	662	628.06	1.05 (0.99, 1.12)	605.63	1.09 (1.02, 1.17)
	Rectum	273	259.96	1.05 (0.95, 1.16)	267.16	1.02 (0.92, 1.13)
	Stomach	160	128.14	1.25 (1.09, 1.42)	123.02	1.30 (1.14, 1.48)
	Lung and Bronchus	1,771	1,565.55	1.13 (1.09, 1.18)	1,344.12	1.32 (1.27, 1.37)
	Larynx	155	91.81	1.69 (1.47, 1.93)	77.47	2.00 (1.74, 2.29)
	Prostate Gland	1,427	1,376.67	1.04 (0.99, 1.08)	1,273.80	1.12 (1.07, 1.17)
	Ovary	116	149.77	0.77 (0.66, 0.90)	140.23	0.83 (0.71, 0.97)
	Testes	29	51.55	0.56 (0.40, 0.77)	57.24	0.51 (0.36, 0.69)
	Urinary Bladder	358	437.29	0.82 (0.75, 0.89)	427.46	0.84 (0.77, 0.91)
	Kidney and Renal Pelvis	322	342.54	0.94 (0.86, 1.03)	310.78	1.04 (0.94, 1.14)
	Brain and Other CNS	106	140.21	0.76 (0.64, 0.89)	141.31	0.75 (0.63, 0.88)

	Meningioma	*	*	2.00 (0.79, 4.20)	*	1.75 (0.69, 3.68)
White	Colon	291	297.57	0.98 (0.89, 1.08)	286.54	1.02 (0.92, 1.12)
	Rectum	131	121.01	1.08 (0.93, 1.25)	124.40	1.05 (0.91, 1.22)
	Stomach	49	54.20	0.90 (0.70, 1.15)	53.29	0.92 (0.71, 1.17)
	Lung and Bronchus	893	751.16	1.19 (1.12, 1.26)	637.27	1.40 (1.33, 1.48)
	Larynx	77	40.37	1.91 (1.56, 2.31)	34.26	2.25 (1.84, 2.72)
	Prostate Gland	451	559.94	0.81 (0.74, 0.87)	549.48	0.82 (0.76, 0.89)
	Ovary	54	71.96	0.75 (0.59, 0.94)	67.23	0.80 (0.63, 1.01)
	Testes	23	28.34	0.81 (0.55, 1.15)	30.91	0.74 (0.51, 1.05)
	Urinary Bladder	208	224.42	0.93 (0.82, 1.04)	218.04	0.95 (0.85, 1.07)
	Kidney and Renal Pelvis	134	157.33	0.85 (0.73, 0.98)	141.40	0.95 (0.82, 1.09)
	Brain and Other CNS	57	65.66	0.87 (0.69, 1.08)	66.41	0.86 (0.68, 1.07)
	Meningioma	0	0.58	0 (0, 0)	1.19	0 (0, 0)
Black	Colon	361	339.44	1.06 (0.97, 1.16)	379.07	0.95 (0.87, 1.04)

	Rectum	138	131.97	1.05 (0.90, 1.20)	147.45	0.94 (0.81, 1.08)
	Stomach	110	99.00	1.11 (0.94, 1.30)	102.99	1.07 (0.91, 1.25)
	Lung and Bronchus	861	774.60	1.11 (1.05, 1.18)	761.96	1.13 (1.07, 1.20)
	Larynx	76	61.71	1.23 (1.01, 1.49)	58.58	1.30 (1.06, 1.57)
	Prostate Gland	862	871.54	0.99 (0.93, 1.05)	941.68	0.92 (0.86, 0.97)
	Ovary	58	63.65	0.91 (0.72, 1.13)	54.57	1.06 (0.84, 1.32)
	Testes	6	5.30	1.13 (0.49, 2.23)	6.57	0.91 (0.40, 1.80)
	Urinary Bladder	138	130.71	1.06 (0.91, 1.22)	121.90	1.13 (0.98, 1.30)
	Kidney and Renal Pelvis	181	184.84	0.98 (0.86, 1.11)	191.41	0.95 (0.83, 1.07)
	Brain and Other CNS	48	48.83	0.98 (0.76, 1.25)	47.59	1.01 (0.78, 1.28)
	Meningioma	*	*	1.52 (0.60, 3.20)	*	1.97 (0.78, 4.15)

[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

* Counts are suppressed where the observed and/or expected counts are less than six and greater than zero.

Shading indicates that the SIR was statistically higher or lower than 1.00. (95-percent confidence interval does not include the value of 1.0)

Table 16. Standardized Incidence Ratio (SIR)[1] for Invasive Cancers by Site, Race and Year, Comparing the City of Flint to Genesee County and the State of Michigan, Adjusted for Age and Sex, 2000– 2018[2]

Cancer Site	Race	Year	Observed Number of Cases in the City of Flint	City of Flint Compared to Genesee County		City of Flint Compared to State of Michigan	
				Expected number of Cases	SIR (95% CI)	Expected number of Cases	SIR (95% CI)
Colon	All Races	2000 - 2003	167	162.23	1.03 (0.90, 1.17)	165.45	1.01 (0.88, 1.15)
		2004 - 2008	201	200.62	1.00 (0.89, 1.13)	180.23	1.12 (0.99, 1.25)
		2009 - 2013	166	145.47	1.14 (1.00, 1.30)	137.90	1.20 (1.05, 1.37)
		2014 - 2018	128	131.34	0.97 (0.84, 1.13)	133.64	0.96 (0.82, 1.11)
	White	2000 - 2003	72	83.63	0.86 (0.70, 1.05)	85.30	0.84 (0.69, 1.03)
		2004 - 2008	84	99.74	0.84 (0.70, 1.01)	93.30	0.90 (0.75, 1.08)
		2009 - 2013	74	65.39	1.13 (0.92, 1.37)	60.57	1.22 (1.00, 1.48)
		2014 - 2018	61	58.19	1.05 (0.84, 1.30)	57.48	1.06 (0.85, 1.31)
	Black	2000 - 2003	93	83.48	1.11 (0.93, 1.32)	97.41	0.95 (0.80, 1.13)
		2004 - 2008	116	113.34	1.02 (0.87, 1.19)	102.30	1.13 (0.97, 1.32)

		2009 - 2013	88	80.81	1.09 (0.91, 1.30)	94.29	0.93 (0.78, 1.11)
		2014 - 2018	64	66.68	0.96 (0.77, 1.18)	87.62	0.73 (0.59, 0.90)
	All Races	2000 - 2003	74	67.59	1.09 (0.89, 1.33)	64.27	1.15 (0.94, 1.40)
		2004 - 2008	74	73.27	1.01 (0.82, 1.23)	75.53	0.98 (0.80, 1.19)
		2009 - 2013	72	61.31	1.17 (0.96, 1.43)	65.33	1.10 (0.90, 1.34)
		2014 - 2018	53	61.25	0.87 (0.68, 1.09)	65.12	0.81 (0.64, 1.02)
	White	2000 - 2003	38	34.65	1.1 (0.82, 1.44)	32.28	1.18 (0.88, 1.54)
		2004 - 2008	38	36.24	1.05 (0.79, 1.37)	37.71	1.01 (0.75, 1.32)
		2009 - 2013	33	26.61	1.24 (0.91, 1.66)	28.83	1.14 (0.84, 1.53)
		2014 - 2018	22	26.44	0.83 (0.56, 1.19)	28.44	0.77 (0.52, 1.10)
	Black	2000 - 2003	35	30.22	1.16 (0.86, 1.54)	33.54	1.04 (0.77, 1.38)
		2004 - 2008	34	32.75	1.04 (0.76, 1.38)	39.15	0.87 (0.64, 1.16)
		2009 - 2013	39	35.72	1.09 (0.82, 1.43)	38.53	1.01 (0.76, 1.32)
		2014 - 2018	30	33.97	0.88 (0.64, 1.20)	37.12	0.81 (0.58, 1.10)
Rectum							

Stomach	All Races	2000 - 2003	38	29.51	1.29 (0.96, 1.69)	28.69	1.32 (0.99, 1.74)
		2004 - 2008	45	35.35	1.27 (0.98, 1.63)	34.02	1.32 (1.02, 1.70)
		2009 - 2013	48	34.57	1.39 (1.08, 1.77)	31.87	1.51 (1.17, 1.92)
		2014 - 2018	29	30.34	0.96 (0.68, 1.30)	29.33	0.99 (0.71, 1.35)
	White	2000 - 2003	11	12.13	0.91 (0.51, 1.50)	13.37	0.82 (0.46, 1.36)
		2004 - 2008	9	15.39	0.58 (0.30, 1.02)	15.84	0.57 (0.30, 0.99)
		2009 - 2013	19	14.93	1.27 (0.83, 1.87)	13.27	1.43 (0.94, 2.10)
		2014 - 2018	10	12.36	0.81 (0.44, 1.37)	11.56	0.87 (0.47, 1.47)
	Black	2000 - 2003	27	29.70	0.91 (0.64, 1.25)	24.60	1.10 (0.77, 1.51)
		2004 - 2008	35	28.76	1.22 (0.90, 1.61)	27.15	1.29 (0.95, 1.71)
		2009 - 2013	29	23.46	1.24 (0.88, 1.69)	26.89	1.08 (0.77, 1.47)
		2014 - 2018	19	19.07	1.00 (0.65, 1.46)	24.59	0.77 (0.51, 1.13)
Lung and Bronchus	All Races	2000 - 2003	377	357.36	1.05 (0.97, 1.15)	312.19	1.21 (1.11, 1.32)
		2004 - 2008	492	448.29	1.10 (1.02, 1.18)	382.75	1.29 (1.19, 1.38)

		2009 - 2013	497	389.43	1.28 (1.18, 1.37)	332.42	1.50 (1.39, 1.61)
		2014 - 2018	405	379.99	1.07 (0.98, 1.16)	327.21	1.24 (1.14, 1.34)
	White	2000 - 2003	206	186.40	1.11 (0.98, 1.24)	157.17	1.31 (1.16, 1.47)
		2004 - 2008	242	231.84	1.04 (0.94, 1.16)	195.69	1.24 (1.11, 1.38)
		2009 - 2013	249	174.56	1.43 (1.28, 1.58)	148.69	1.67 (1.50, 1.86)
		2014 - 2018	196	168.12	1.17 (1.03, 1.31)	142.64	1.37 (1.22, 1.55)
	Black	2000 - 2003	168	159.99	1.05 (0.92, 1.19)	176.68	0.95 (0.83, 1.08)
		2004 - 2008	248	210.68	1.18 (1.06, 1.31)	207.93	1.19 (1.07, 1.33)
		2009 - 2013	245	217.89	1.12 (1.01, 1.25)	201.60	1.22 (1.09, 1.35)
		2014 - 2018	200	186.69	1.07 (0.95, 1.20)	182.76	1.09 (0.97, 1.23)
Larynx	All Races	2000 - 2003	33	19.09	1.73 (1.26, 2.31)	17.74	1.86 (1.36, 2.49)
		2004 - 2008	39	25.73	1.52 (1.14, 1.98)	21.78	1.79 (1.35, 2.34)
		2009 - 2013	53	26.13	2.03 (1.59, 2.55)	19.75	2.68 (2.11, 3.37)
		2014 - 2018	30	21.36	1.40 (1.01, 1.90)	18.78	1.60 (1.15, 2.17)

	White	2000 - 2003	16	8.45	1.89 (1.19, 2.88)	8.16	1.96 (1.23, 2.98)
		2004 - 2008	20	12.18	1.64 (1.09, 2.39)	10.09	1.98 (1.31, 2.88)
		2009 - 2013	26	10.91	2.38 (1.67, 3.31)	8.51	3.06 (2.14, 4.24)
		2014 - 2018	15	9.44	1.59 (0.98, 2.45)	7.91	1.90 (1.17, 2.92)
	Black	2000 - 2003	17	14.83	1.15 (0.73, 1.72)	13.33	1.27 (0.81, 1.91)
		2004 - 2008	19	16.34	1.16 (0.76, 1.71)	16.71	1.14 (0.74, 1.67)
		2009 - 2013	25	18.17	1.38 (0.96, 1.92)	14.80	1.69 (1.17, 2.36)
		2014 - 2018	15	12.44	1.21 (0.74, 1.86)	14.42	1.04 (0.64, 1.60)
Prostate Gland	All Races	2000 - 2003	17	14.83	1.15 (0.73, 1.72)	13.33	1.27 (0.81, 1.91)
		2004 - 2008	19	16.34	1.16 (0.76, 1.71)	16.71	1.14 (0.74, 1.67)
		2009 - 2013	25	18.17	1.38 (0.96, 1.92)	14.80	1.69 (1.17, 2.36)
		2014 - 2018	15	12.44	1.21 (0.74, 1.86)	14.42	1.04 (0.64, 1.60)
	White	2000 - 2003	135	176.27	0.77 (0.66, 0.88)	162.08	0.83 (0.72, 0.96)
		2004 - 2008	128	174.00	0.74 (0.63, 0.85)	170.12	0.75 (0.65, 0.87)

		2009 - 2013	106	137.06	0.77 (0.65, 0.91)	128.05	0.83 (0.70, 0.97)
		2014 - 2018	82	95.87	0.86 (0.71, 1.03)	108.02	0.76 (0.63, 0.91)
	Black	2000 - 2003	229	228.58	1.00 (0.90, 1.12)	250.53	0.91 (0.82, 1.02)
		2004 - 2008	236	239.06	0.99 (0.88, 1.10)	255.01	0.93 (0.83, 1.03)
		2009 - 2013	233	240.97	0.97 (0.87, 1.08)	248.20	0.94 (0.84, 1.05)
		2014 - 2018	164	172.32	0.95 (0.83, 1.08)	199.42	0.82 (0.72, 0.94)
Ovary	All Races	2000 - 2003	31	38.94	0.8 (0.58, 1.07)	37.22	0.83 (0.60, 1.12)
		2004 - 2008	34	45.72	0.74 (0.55, 0.99)	40.66	0.84 (0.62, 1.11)
		2009 - 2013	30	34.88	0.86 (0.62, 1.17)	35.50	0.85 (0.61, 1.15)
		2014 - 2018	21	31.82	0.66 (0.44, 0.95)	28.80	0.73 (0.49, 1.05)
	White	2000 - 2003	18	20.36	0.88 (0.57, 1.31)	19.03	0.95 (0.61, 1.40)
		2004 - 2008	13	21.79	0.60 (0.35, 0.95)	20.87	0.62 (0.37, 0.99)
		2009 - 2013	10	15.79	0.63 (0.34, 1.07)	16.16	0.62 (0.34, 1.05)
		2014 - 2018	13	14.86	0.87 (0.52, 1.39)	12.60	1.03 (0.61, 1.64)

	Black	2000 - 2003	13	13.15	0.99 (0.58, 1.57)	12.88	1.01 (0.60, 1.60)
		2004 - 2008	20	21.88	0.91 (0.61, 1.33)	15.00	1.33 (0.88, 1.94)
		2009 - 2013	19	18.42	1.03 (0.68, 1.51)	14.77	1.29 (0.84, 1.89)
		2014 - 2018	6	11.21	0.54 (0.23, 1.06)	12.59	0.48 (0.21, 0.94)
Testes	All Races	2000 - 2003	*	10.98	0.64 (0.30, 1.20)	12.68	0.55 (0.26, 1.04)
		2004 - 2008	10	15.52	0.64 (0.35, 1.09)	17.16	0.58 (0.32, 0.99)
		2009 - 2013	7	13.02	0.54 (0.25, 1.01)	14.00	0.50 (0.23, 0.94)
		2014 - 2018	*	11.85	0.42 (0.17, 0.89)	13.26	0.38 (0.15, 0.79)
	White	2000 - 2003	*	*	0.85 (0.33, 1.78)	*	0.71 (0.28, 1.50)
		2004 - 2008	8	9.06	0.88 (0.44, 1.59)	9.47	0.84 (0.42, 1.52)
		2009 - 2013	*	*	0.70 (0.28, 1.47)	*	0.67 (0.26, 1.41)
		2014 - 2018	*	*	0.81 (0.32, 1.71)	*	0.73 (0.29, 1.53)
	Black	2000 - 2003	*	*	0.69 (0.12, 2.16)	*	1.40 (0.24, 4.41)
		2004 - 2008	*	*	1.47 (0.25, 4.62)	*	1.15 (0.20, 3.62)

		2009 - 2013	*	*	1.62 (0.28, 5.10)	*	1.08 (0.19, 3.39)
		2014 - 2018	0	0	^ (^, ^)	1.55	0 (0, 0)
Urinary Bladder	All Races	2000 - 2003	63	80.54	0.78 (0.63, 0.96)	96.85	0.65 (0.52, 0.80)
		2004 - 2008	97	116.51	0.83 (0.70, 0.99)	118.23	0.82 (0.69, 0.97)
		2009 - 2013	98	115.15	0.85 (0.71, 1.01)	107.31	0.91 (0.77, 1.08)
		2014 - 2018	100	122.81	0.81 (0.69, 0.96)	107.28	0.93 (0.78, 1.10)
	White	2000 - 2003	40	44.76	0.89 (0.67, 1.16)	53.31	0.75 (0.57, 0.98)
		2004 - 2008	60	63.62	0.94 (0.75, 1.17)	65.11	0.92 (0.73, 1.14)
		2009 - 2013	55	55.82	0.99 (0.78, 1.23)	51.16	1.08 (0.85, 1.35)
		2014 - 2018	53	57.18	0.93 (0.73, 1.17)	50.20	1.06 (0.83, 1.33)
	Black	2000 - 2003	21	22.17	0.95 (0.63, 1.36)	24.23	0.87 (0.58, 1.25)
		2004 - 2008	36	35.99	1.00 (0.74, 1.32)	30.91	1.16 (0.86, 1.54)
		2009 - 2013	36	31.39	1.15 (0.85, 1.51)	33.93	1.06 (0.79, 1.40)
		2014 - 2018	45	41.09	1.10 (0.84, 1.40)	32.97	1.37 (1.05, 1.75)

Kidney and Renal Pelvis	All Races	2000 - 2003	57	57.13	1.00 (0.79, 1.24)	58.54	0.97 (0.77, 1.21)
		2004 - 2008	88	94.03	0.94 (0.78, 1.12)	82.26	1.07 (0.89, 1.28)
		2009 - 2013	91	90.16	1.01 (0.84, 1.20)	83.80	1.09 (0.91, 1.29)
		2014 - 2018	86	99.92	0.86 (0.71, 1.03)	85.37	1.01 (0.84, 1.21)
	White	2000 - 2003	27	28.34	0.95 (0.67, 1.31)	28.13	0.96 (0.68, 1.32)
		2004 - 2008	34	45.05	0.75 (0.56, 1.00)	39.74	0.86 (0.63, 1.14)
		2009 - 2013	41	40.74	1.01 (0.76, 1.31)	36.39	1.13 (0.85, 1.46)
		2014 - 2018	32	42.53	0.75 (0.55, 1.01)	36.83	0.87 (0.63, 1.17)
	Black	2000 - 2003	29	27.44	1.06 (0.76, 1.44)	35.80	0.81 (0.58, 1.10)
		2004 - 2008	52	51.13	1.02 (0.80, 1.28)	46.58	1.12 (0.87, 1.41)
		2009 - 2013	48	48.63	0.99 (0.76, 1.26)	56.02	0.86 (0.66, 1.09)
		2014 - 2018	52	55.84	0.93 (0.73, 1.17)	52.11	1.00 (0.78, 1.26)
Brain and Other CNS	All Races	2000 - 2003	24	31.71	0.76 (0.52, 1.06)	32.37	0.74 (0.51, 1.04)
		2004 - 2008	33	40.71	0.81 (0.59, 1.08)	42.12	0.78 (0.57, 1.05)

		2009 - 2013	30	34.20	0.88 (0.63, 1.19)	34.29	0.87 (0.63, 1.19)
		2014 - 2018	19	33.38	0.57 (0.37, 0.84)	33.05	0.57 (0.38, 0.84)
	White	2000 - 2003	11	15.91	0.69 (0.39, 1.14)	15.84	0.69 (0.39, 1.15)
		2004 - 2008	19	19.19	0.99 (0.65, 1.45)	20.54	0.93 (0.61, 1.36)
		2009 - 2013	17	15.62	1.09 (0.69, 1.63)	15.45	1.10 (0.70, 1.65)
		2014 - 2018	10	14.72	0.68 (0.37, 1.15)	14.95	0.67 (0.36, 1.13)
	Black	2000 - 2003	13	10.11	1.29 (0.76, 2.04)	10.95	1.19 (0.70, 1.89)
		2004 - 2008	14	15.04	0.93 (0.56, 1.46)	14.52	0.96 (0.58, 1.51)
		2009 - 2013	12	12.66	0.95 (0.55, 1.53)	12.18	0.99 (0.57, 1.60)
		2014 - 2018	9	11.39	0.79 (0.41, 1.38)	10.07	0.89 (0.47, 1.56)
Meningioma	All Races	2000 - 2003	*	*	2.25 (0.39, 7.08)	*	2.34 (0.40, 7.34)
		2004 - 2008	*	*	3.25 (0.56, 10.22)	*	2.26 (0.39, 7.11)
		2009 - 2013	*	*	2.18 (0.09, 10.32)	*	1.49 (0.06, 7.03)
		2014 - 2018	0	0.58	0 (0, 0)	0.51	0 (0, 0)

	White	2000 - 2003	0	0.12	0 (0, 0)	0.36	0 (0, 0)
		2004 - 2008	0	0	^ (^, ^)	0.36	0 (0, 0)
		2009 - 2013	0	0.10	0 (0, 0)	0.28	0 (0, 0)
		2014 - 2018	0	0.31	0 (0, 0)	0.23	0 (0, 0)
	Black	2000 - 2003	*	*	1.33 (0.23, 4.19)	*	2.35 (0.41, 7.39)
		2004 - 2008	*	*	1.35 (0.23, 4.24)	*	1.86 (0.32, 5.85)
		2009 - 2013	*	*	1.62 (0.06, 7.64)	*	2.16 (0.09, 10.22)
		2014 - 2018	0	0	^ (^, ^)	0.26	0 (0, 0)

[1]**SIR** is the ratio of observed to expected cases, where expected cases are calculated by multiplying the age-sex specific cancer incidence rates for the comparison population (Genesee County or state of Michigan) to population estimates for the City of Flint.

[2]**Source of Michigan Cancer Cases:** Michigan Resident Cancer Incidence File, 2000-2018, includes cases processed through November 30, 2020. Division for Vital Records & Health Statistics, Michigan Department of Health and Human Services. Cancer cases were defined by new malignant cancer diagnoses where the listed cancer site was the primary site.

* The observed and/or expected counts are less than six and greater than zero and are therefore suppressed.

^ There were zero observed cases in the City of Flint and therefore and SIR could not be calculated.

Shading indicates that the SIR was statistically higher or lower than 1.00. (95-percent confidence interval does not include the value of 1.0)