Tobacco-Related Cancers in New York State

Introduction

The association between tobacco use and cancer is well known. Since the earliest epidemiologic studies of smoking and lung cancer first appeared in the mid-twentieth century, a vast amount of literature has accumulated documenting the strong and undisputable link between the use of tobacco products and the development of a variety of cancers. The landmark Surgeon General's report of 1964 (1) summarized evidence on the health effects of tobacco collected up to that time and concluded that "Cigarette smoking is a health hazard of sufficient importance in the United States to warrant appropriate remedial action." Since then, additional reports have strengthened this conclusion and established links between smoking and cancers of the lung, larynx, oral cavity, esophagus, urinary bladder, pancreas, kidney, cervix and stomach and acute myeloid leukemia, as well as a multitude of noncancerous conditions (2-12). In 2014, the 50th anniversary edition of the Surgeon General's report (13) added colorectal and liver cancers to the list of cancers caused by smoking. The report also concluded that smoking in cancer patients and survivors increases their risk of dying from cancer and other diseases.

The harmful effects of tobacco are felt not only by the people who smoke it. Secondhand smoke, also called involuntary smoking or environmental tobacco smoke, has been established as a cause of lung cancer in nonsmokers (13, 14), and there is mounting evidence of links with other cancers (15). Tobacco is hazardous in other forms as well. Smokeless tobacco, including chewing tobacco and snuff, has been linked with cancer of the oral cavity, especially the cheek and gum (10, 16).

Due to its range of deleterious effects, numerous reviews have pointed to tobacco as the single most important cause of overall mortality and cancer mortality in the US (13, 17-19). Estimates indicate that about 480,000 people die of tobacco-related causes each year in the United States, 170,000 of them from cancer, accounting for about 30% of cancer deaths (13). Smoking has also been found to be the single most important actual cause of death (nongenetic modifiable factor contributing to death) in the United States (20).

This report summarizes incidence and mortality for twelve tobacco-related cancers in New York State for the period 2012-2016. We examine the incidence of four cancers most closely related to tobacco by sex, race/ethnicity, and geography. We explore the incidence trends of tobacco-related cancers since 1976. Furthermore, this report reviews the pattern and trend of tobacco use in New York. Documentation of the extent of the problem is intended to inform and support tobacco prevention efforts.

Cancers Related to Tobacco

As indicated above, tobacco has been linked with a number of different cancers. While sharing the underlying mechanism of the uncontrolled growth and replication of the body's cells, different cancers are in fact different diseases. They have different occurrence patterns, natural histories, effective treatments, outlooks for survival, and sets of causes. The box below summarizes what is known about

the cancers that have been associated with tobacco use. Appendix Table A-1 lists the classification criteria for each cancer.

Cancers Related to Tobacco

Oral cavity – The oral cavity includes the mouth, pharynx (back of the throat) and salivary glands. Cancers of the oral cavity have been associated with all forms of tobacco use, including cigarettes, cigars, pipes and smokeless tobacco. Other established risk factors for these cancers include drinking alcoholic beverages in excess, a diet low in fruits and vegetables, and having had a prior oral cavity or other smoking-related cancer. Cancer of the lip in addition has been associated with outdoor occupations, and cancer of the oropharynx (the part of the throat just behind the mouth) with exposure to the human papilloma (HPV) virus.

Esophagus – The esophagus is the tube that connects the throat to the stomach. Adenocarcinoma of the esophagus, a specific cell type associated with stomach acid, has been increasing in New York. Cancer of the esophagus has been associated with the use of all forms of tobacco and with drinking alcoholic beverages; using tobacco and drinking alcoholic beverages combined raises risk much more than using either alone. Other known risk factors include acid reflux, obesity, and exposures to certain chemicals in the workplace.

Stomach – Stomach cancer has been declining in New York, but higher rates may still be found in people who have emigrated from countries with high rates. Aside from smoking, established risk factors for stomach cancer include infection with *Helicobacter pylori* (the bacterium that causes stomach ulcers), a family history of stomach cancer, exposure to high levels of ionizing radiation such as X rays, exposures in certain workplaces, and a diet low in vegetables, fruit and fiber.

Colorectal – The colon and rectum are part of the digestive system. The colon (large intestine) and rectum (the last 7-8 inches of the intestines) absorb water and eliminate waste products from the body. Colorectal cancer is the second leading cause of death from cancer in New York. Colorectal cancer has been associated with increasing body weight. Other risk factors include a family history of colorectal cancer, certain inherited diseases, and intestinal conditions such as polyps or inflammatory bowel disease. Heavy alcohol consumption also increases a person's risk of getting colorectal cancer.

Liver – The liver produces bile needed for digestion, processes nutrients from foods, and breaks down drugs and chemicals in the bloodstream. The most important risk factor for liver cancer is long-term infection with the hepatitis B or hepatitis C virus. Risk factors other than tobacco include long-term excessive alcohol use and cirrhosis, exposures to arsenic and vinyl chloride, obesity, and long-term use of anabolic steroids.

Pancreas – The pancreas, an organ located behind the stomach, makes enzymes that help break down food, and hormones including insulin that help the body use it. Survival from this cancer is particularly poor. Risk factors other than tobacco include having diabetes, certain inherited conditions, a family history of pancreatic cancer, and a personal history of certain conditions including pancreatitis and gallbladder disease.

Larynx – The larynx, or voicebox, is the organ that helps us speak. In addition to smoking, cancer of the larynx has been associated with drinking alcoholic beverages. People who both use tobacco and are

heavy drinkers have a much greater risk than people who do either one alone. Cancer of the larynx has also been associated with exposures to strong inorganic acids, such as sulfuric acid, in the workplace.

Lung – Cancer of the lung is the leading cause of death from cancer in New York, with over 9,000 New Yorkers dying from it each year. Most cases of lung cancer are caused by smoking. Other established risk factors include exposure to radon gas, asbestos exposures in the workplace, exposure to high levels of ionizing radiation such as X rays, and a history of other lung diseases.

Cervix – A woman's cervix is the lower opening of the uterus (womb) that connects it with the vagina (birth canal). Cervical cancer is nearly always caused by the human papilloma virus (HPV). Most women who have been infected by HPV, however, do not get cervical cancer. Smoking cigarettes increases a woman's chances of getting cervical cancer.

Bladder – The bladder stores urine before it leaves the body. Risk factors for bladder cancer other than smoking include exposures to certain chemicals in the workplace, exposures to high levels of ionizing radiation, certain drugs used to treat cancer, high levels of arsenic in drinking water, and a history of a prior bladder cancer.

Kidney – The kidneys filter blood and produce urine to remove waste products from the body. Rates of newly diagnosed kidney cancers have been increasing in New York and nationally over the past 30 years. Risk factors for kidney cancer other than smoking include certain inherited diseases or a family history of kidney cancer, obesity and chronic kidney disease.

Acute myelogenous leukemia – Leukemias are cancers of the blood cells. Acute myelogenous leukemia is a type of leukemia that has a rapid onset and mainly affects the myeloid type of white blood cell. Other than smoking, risk factors for acute myelogenous leukemia include having certain genetic conditions such as Down syndrome, exposure to high levels of ionizing radiation such as X rays, treatment with certain chemotherapy drugs, and long-term exposures to certain chemicals in the workplace, such as benzene.

In New York State, smoking-related cancers exact a sizeable toll. Table 1 shows average numbers of these twelve cancers diagnosed in a year in New York State and average numbers of New Yorkers who died from these cancers in a year over the five-year time period 2012-2016, the most recent available. As can be seen from this table, an average of almost 45,000 cases of tobacco-related cancers are diagnosed every year in New York. This represents 41% of the over 111,000 cancers diagnosed annually. Over 20,000 New Yorkers die from a smoking-related cancer every year, accounting for over half of the 35,000 cancer deaths in New York. The largest contributor to both new cancer diagnoses and cancer deaths is lung cancer.

Table 1 Incidence of and mortality from tobacco-related cancers, New York State, 2012-2016

Cancer Site	Incidence			Mortality		
	Cases[1]	Rate[2]	95% CI (+/-)	Deaths[3]	Rate[1]	95% CI (+/-)
All Tobacco-Related Cancers	45,435	194.9	0.8	20,392	86.5	0.5
Oral Cavity and Pharynx	2,558	10.9	0.2	502	2.1	0.1
Esophagus	1,072	4.5	0.1	860	3.6	0.1
Stomach	2,021	8.7	0.2	849	3.6	0.1
Colon and Rectum	8,981	38.9	0.4	3,079	13.0	0.2
Liver	1,851	7.6	0.2	1,066	4.4	0.1
Pancreas	3,294	14.0	0.2	2,591	11.0	0.2
Larynx	780	3.3	0.1	241	1.0	0.1
Lung and Bronchus	13,814	58.9	0.4	8,571	36.5	0.4
Cervix Uteri (females only)	855	7.7	0.2	275	2.3	0.1
Urinary Bladder	3,804	16.5	0.2	1,007	4.2	0.1
Kidney and Renal Pelvis	5,370	23.0	0.3	700	3.0	0.1
Acute Myeloid Leukemia	1,035	4.6	0.1	652	2.9	0.1

Source of data: New York State Cancer Registry. Data provisional, November 2018.

[1] Average number of new cases per year

[2] Rates are per 100,000, age adjusted to the 2000 US standard population, with 95% confidence intervals.

[3] Average deaths per year

Smoking Attributable Mortality in NYS

We used smoking prevalence and relative risks (RRs) of smoking to calculate the number and proportion of cancer deaths among adults 35 years and older attributable to cigarette smoking in New York. The prevalence of cigarette smoking within strata defined by sex and age group (35-54, 55-64, 65-74, and 75+ years) was estimated from the 2014 New York State Behavioral Risk Factor Surveillance System (BRFSS). The age- and sex-adjusted RRs for former and current smokers were extracted directly from Table 12.3 in the Surgeon General's report (13).

Table 2 shows the average numbers and proportion of deaths due to smoking in New York State from 2012 through 2016. A higher proportion of deaths can be attributed to smoking in men than in women.

Table 2 Number and proportion of cancer deaths in adults 35 years and older attributable to smoking, New York State, 2012-2016

Cancer Site	Deaths[1] attributable to smoking			Proportion of cancer deaths attributable to smoking (%)		
	Men	Women	Total	Men	Women	Total
Lung and Bronchus	3,633	3,127	6,760	81.5	76.2	79.0
Other Cancers[2]	1,553	674	2,227	22.9	13.6	19.0
All Tobacco-Related Cancers	5,186	3,801	8,987	46.2	41.9	44.3

Source of data: New York State Cancer Registry. Data provisional, November 2018.

[1] Average deaths per year

[2] Other caners consist of cancers of pharynx and oral cavity, esophagus, stomach, pancreas, larynx, cervix uteri (women), kidney and renal pelvis, bladder, liver, colon and rectum, and acute myeloid leukemia.

Smoking accounts for 79% of the deaths from lung cancer and 19% of deaths from the other 11 tobacco-related cancers. Overall, nearly half of all deaths from these twelve cancers combined in New York can be attributed to smoking. Our findings are consistent with those from Siegel's analysis of smoking-related cancer deaths nationwide (21).

Demographics

Table 3 illustrates variations in the incidence of the four cancers most closely related to smoking by demographic characteristics. All these cancers are diagnosed more often in males than in females. While the incidence rate of lung cancer is about one quarter (26%) higher in males than females, rates of the other cancers are two to over three times higher in males than females. Although the incidence rate of lung cancer in males is substantially higher than the rate in females, the numbers of males and females diagnosed with this cancer in a year are almost equal. This is due to the greater numbers of females than males at older ages, where incidence is greatest.

Table 3 Incidence of four cancers most closely related to smoking by personal characteristics, New York State, 2012-2016

Characteristic	Oral Cavity and Pharynx			Esophagus			Larynx			Lung and Bronchus		
	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)
Gender												
Male	1,748	16.3	0.4	809	7.7	0.2	621	5.8	0.2	6,830	67.0	0.7
Female	810	6.4	0.2	263	2.0	0.1	159	1.2	0.1	6,984	53.3	0.6
Race/Ethnicity												
non-Hispanic white	1,863	12.0	0.3	816	5.0	0.2	548	3.4	0.1	10,696	66.3	0.6
non-Hispanic black	253	8.0	0.5	118	3.9	0.3	110	3.5	0.3	1,540	50.7	1.2
non-Hispanic other	191	10.6	0.7	49	2.8	0.4	27	1.5	0.3	683	42.0	1.5
Hispanic	237	7.9	0.5	87	3.1	0.3	91	3.1	0.3	870	32.1	1.0

Source of data: New York State Cancer Registry. Data provisional, November 2018.

[1] Average number of new cases per year.

[2] Rates are per 100,000, age adjusted to the 2000 US standard population, with 95% confidence intervals.

The incidence rates of these cancers vary among different racial and ethnic groups. When males and females are combined, rates of all these cancers except for cancer of the larynx are greatest among non-Hispanic whites. The incidence of cancer of the larynx is lowest among non-Hispanic others, while non-Hispanic whites, non-Hispanic blacks, and Hispanics have similar rates. Hispanics and people in the category non-Hispanic other, which includes Asians and Pacific Islanders and American Indians/Alaska Natives, generally have lower rates of these cancers than non-Hispanic whites and non-Hispanic blacks, with the exception of oral cavity cancer, where rates in non-Hispanic others are higher than rates seen in non-Hispanic blacks.

Geographic Variation

New York City differs from the rest of the state in a number of ways important for cancer control. These include its racial and ethnic diversity, large immigrant population and wide range of income levels. As

discussed below, smoking rates also differ greatly between New York City and the rest of the state. Both regions, however, are large enough for robust comparisons to be made between them. Rates of the four cancers most closely related to smoking in New York State, New York City, and the rest of the state (i.e. New York State exclusive of New York City are contrasted in Table 4. The table shows that rates of all cancers are lower in New York City than in the rest of the state.

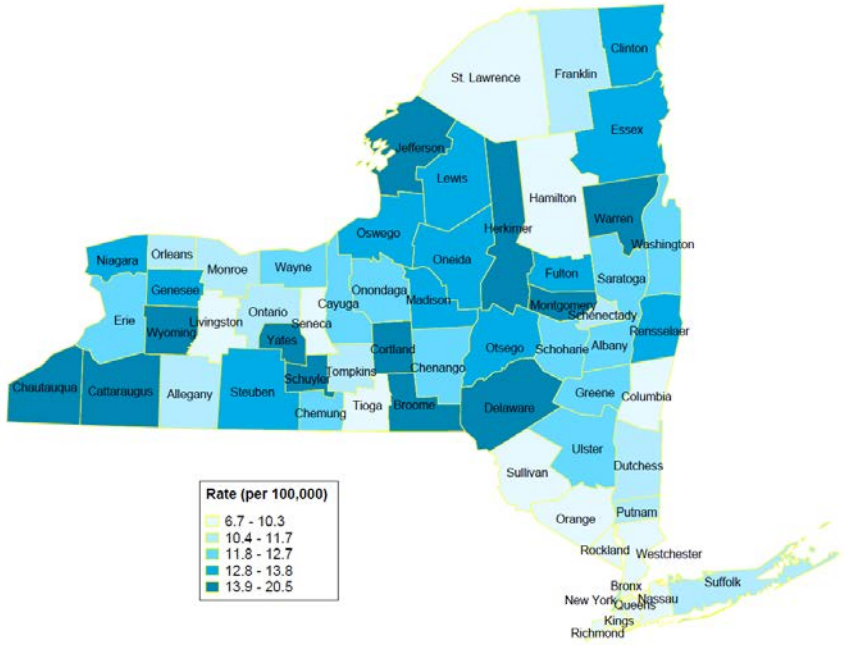
Table 4 Incidence of four cancers most closely related to tobacco, New York State, New York City, and New York State exclusive of New York City, 2012-2016

Region	Oral Cavity and Pharynx			Esophagus			Larynx			Lung and Bronchus		
	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% C (+/-)
NYS	2,558	10.9	0.2	1,072	4.5	0.1	780	3.3	0.1	13,814	58.9	0.4
NYC	891	9.7	0.3	324	3.5	0.2	285	3.0	0.2	4,300	47.0	0.6
NYS excl. NYC	1,666	11.7	0.3	749	5.2	0.2	495	3.4	0.1	9,513	66.5	0.6

Source of data: New York State Cancer Registry. Data provisional, November 2018.
[1] Average number of new cases per year.
[2] Rates are per 100,000, age adjusted to the 2000 US standard population, with 95% confidence intervals.

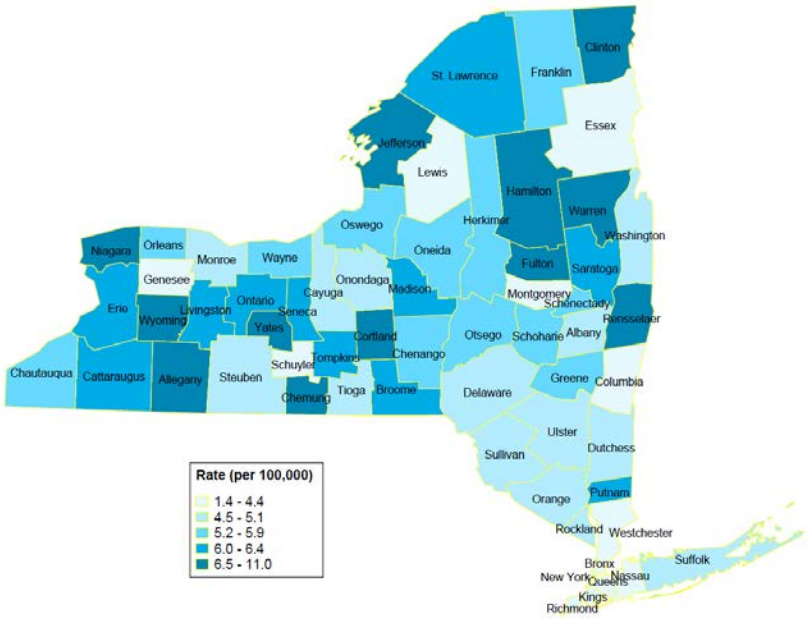
Figures 1-4 illustrate the variation in rates of the four cancers by county in New York. For these maps, counties were classified into quintiles (i.e. five groups with approximately even numbers of counties) based on incidence rates of each cancer. Appendix Table A-2 lists rates and numbers of cases of each cancer for each individual county.

Figure 1 Incidence rate[1] of oral cavity and pharynx cancer by county, 2012-2016



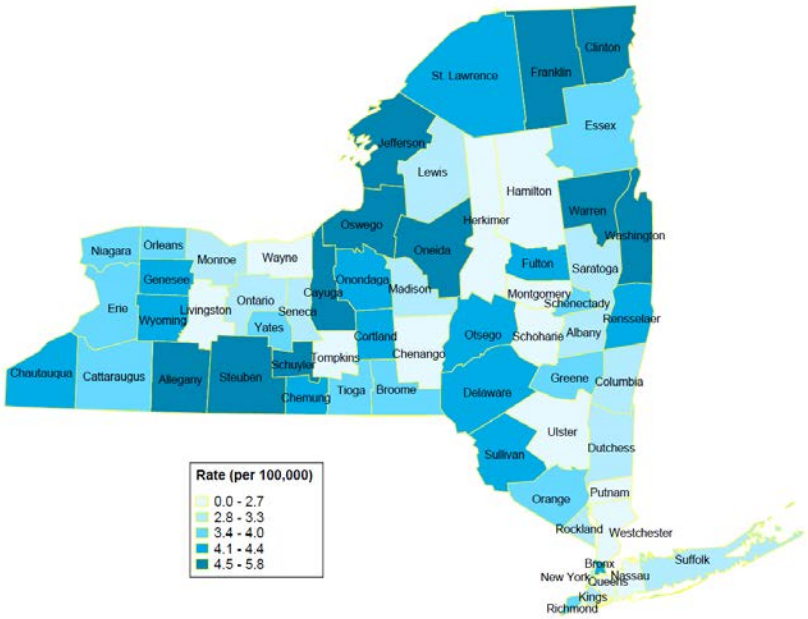
Source of data: New York State Cancer Registry. Data provisional, November 2018.
[1] Rates are per 100,000, age adjusted to the 2000 US standard population.

Figure 2 Incidence rate[1] of esophageal cancer by county, 2012-2016



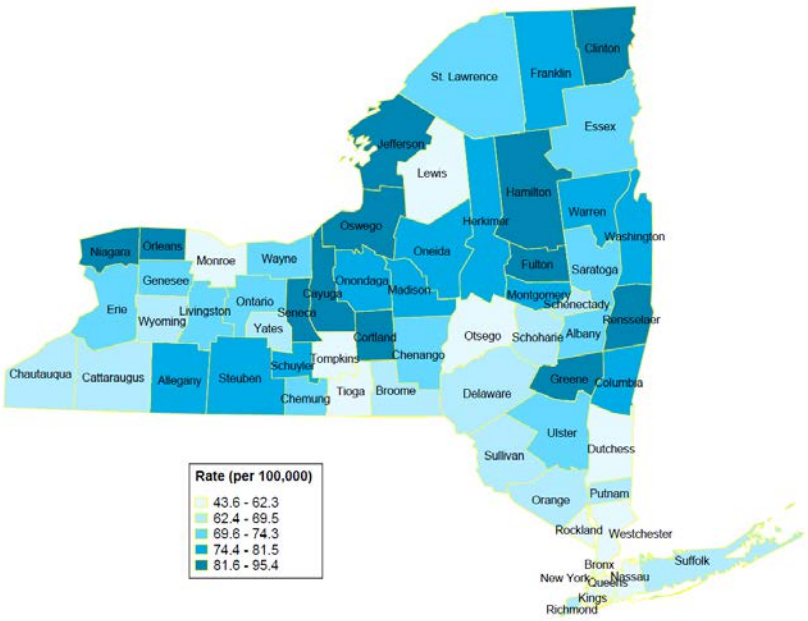
Source of data: New York State Cancer Registry. Data provisional, November 2018.
[1] Rates are per 100,000, age adjusted to the 2000 US standard population.

Figure 3 Incidence rate[1] of larynx cancer by county, 2012-2016



Source of data: New York State Cancer Registry. Data provisional, November 2018.
[1] Rates are per 100,000, age adjusted to the 2000 US standard population.

Figure 4 Incidence rate[1] of lung cancer by county, 2012-2016



Source of data: New York State Cancer Registry. Data provisional, November 2018.
[1] Rates are per 100,000, age adjusted to the 2000 US standard population.

For most of these cancers, rates are generally lowest in the five boroughs of New York City and in nearby counties, accounting for the difference between New York City and the rest of the state. The only exception to this pattern is cancer of the larynx. Though the rate of laryngeal cancer in New York City as a whole is lower than in the rest of the state, the boroughs of the Bronx and Richmond (Staten Island) have relatively high rates of laryngeal cancer.

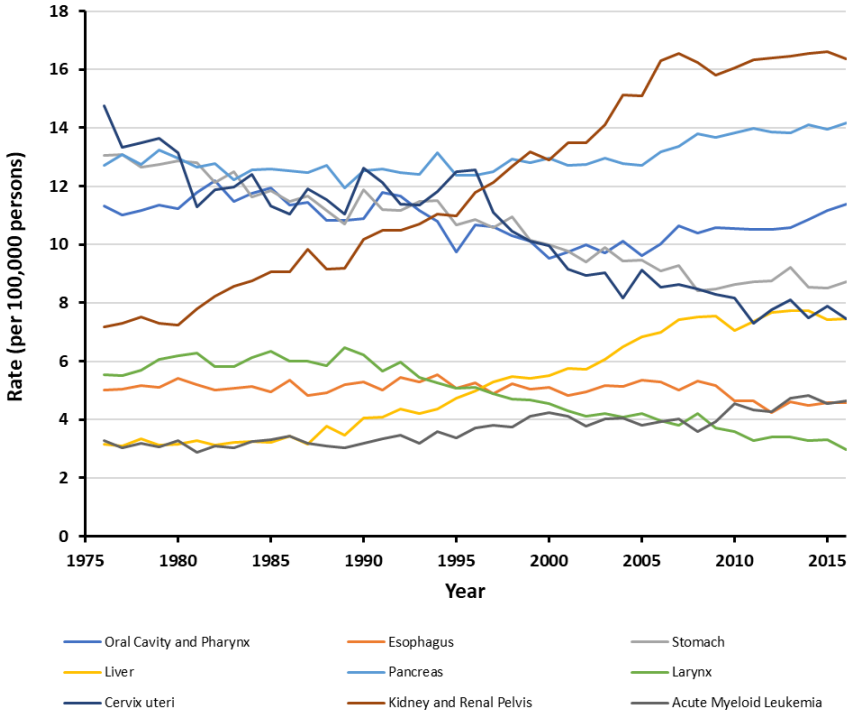
Time Trends

Cancer incidence rates for a given area often change over time. This can be for a number of reasons, including changes in the prevalence of various causes and risk factors, as well as changes in the practice of screening for and diagnosing the different cancers and in awareness of the cancer among the public and health care professionals. Due to the long latency of most cancers (the time it takes for cancer to develop after first exposure to a causal agent), one would not expect to see changes in risk or causal factors reflected in changes in cancer incidence rates for a number of years after these changes have occurred.

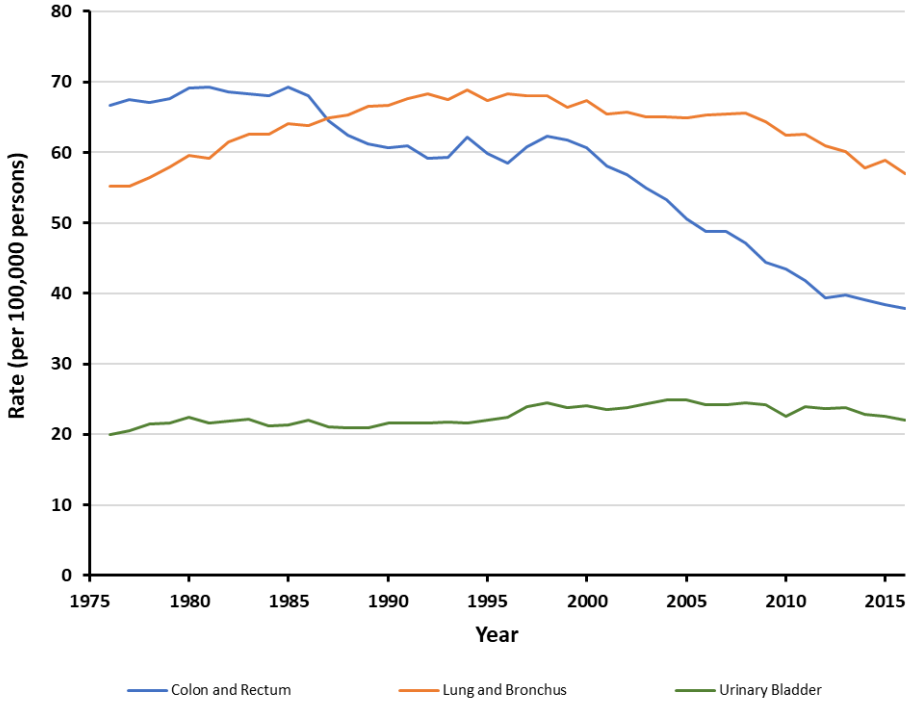
Figures 5a and 5b show changes in the incidence of all twelve smoking-related cancers in New York State since 1976, the first year for which reporting to the New York State Cancer Registry is considered complete on a statewide basis. The three most frequently diagnosed cancers, cancers of the lung, colon and rectum, and bladder, are shown on a different scale so as not to obscure smaller changes in the less frequently diagnosed cancers.

Figure 5 Time trend of incidence rate[1] of tobacco-related cancers, New York State, 1976-2016

(A) Cancers of the oral cavity, esophagus, stomach, liver, pancreas, larynx, cervix uteri (females only), and kidney, and acute myeloid leukemia



(B) Cancers of the colon and rectum, lung and bronchus, and bladder (including in situ)



Source of data: New York State Cancer Registry. Data provisional, November 2018.

[1] Rates are age adjusted to the 2000 US standard population.

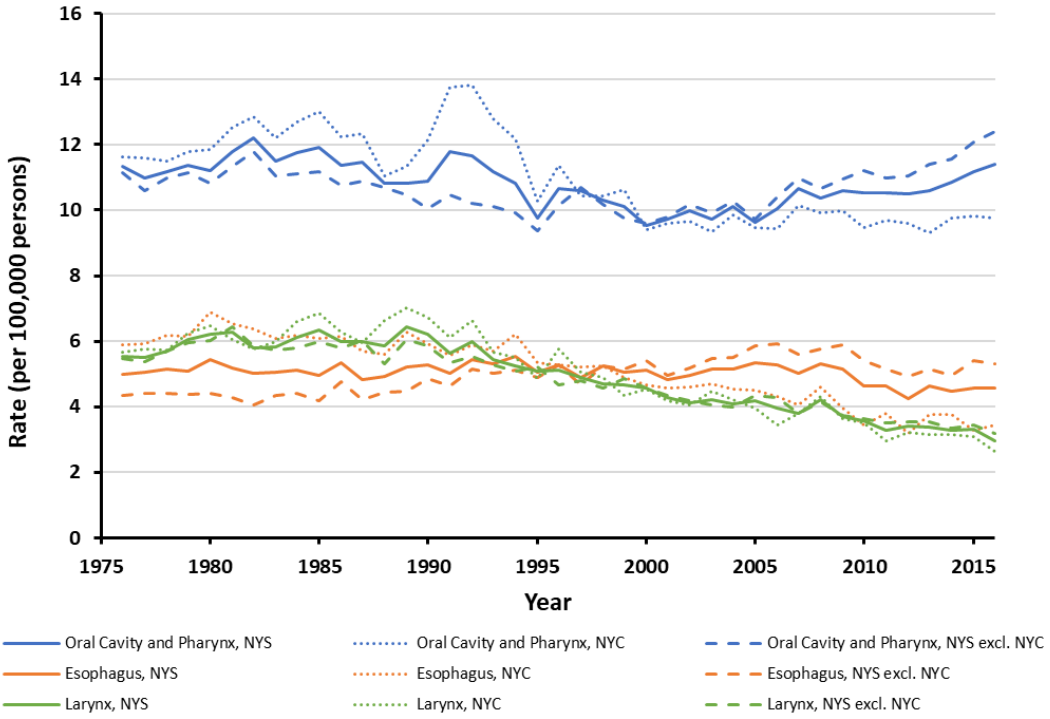
The figures show that, not surprisingly, the different cancers followed different trends over time. Both cancer of the kidney and cancer of the liver showed a steady increase over this time period up until around the mid-2000s. In addition to tobacco, kidney cancer is related to obesity (22). There is also evidence that improvements in detection may have led to greater diagnosis of this cancer. Liver cancer is related to infection with the hepatitis B and hepatitis C viruses. It occurs more frequently in immigrants from areas where these infections are common, including parts of Asia, Africa, South America, and Central America. A study has also shown increasing incidence of liver cancer among white males, which was attributed to increasing rates of infection with the hepatitis C virus during the 1960s and 1970s (23). Cancers of the cervix and stomach showed a generally downward trend during this time period, as observed nationally. Cancers of the larynx and the lung, the two cancers most closely associated with tobacco use, both rose in the early portion of this period, and then began to decline. The decline in larynx cancer rates started around 1990, while the decline in lung cancer rates did not start until the 1990s. The incidence of colorectal cancer among males and females combined was greater than the incidence of lung cancer until around 1987, as colorectal cancer incidence declined and lung cancer incidence increased. Colorectal cancer incidence levelled off between the late 1980s and late 1990, then began to decline more rapidly around the year 2000. This decline is believed to be due to the greater use of colorectal screening tests, which can actually prevent the cancer by identifying and removing pre-cancerous lesions (24).

Figure 6 shows time trends in the four cancers most closely associated with smoking for New York State, New York City, and New York State exclusive of New York City. As previously shown in Table 4 and Figures 1-4, in the most recent time period rates of all these cancers except cancer of the larynx were lower in New York City than in the rest of the state. However, this was not always the case. Rates of cancers of the oral cavity, esophagus and larynx were higher in New York City than in the rest of the state until the mid- to late-1990s.

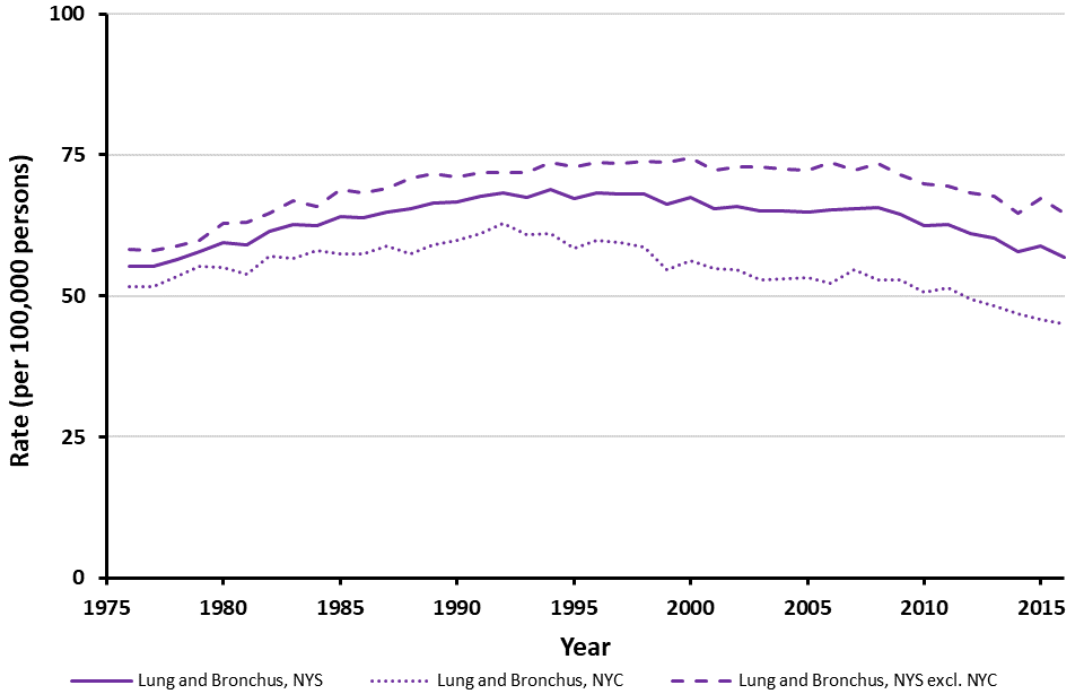
The figures show that the time trends for these cancers were somewhat different in New York City and the rest of the state. Generally, the decline in rates for cancers of the oral cavity, larynx and lung was steeper in New York City than in the rest of the state, and for lung cancer it started earlier in New York City. In the latest decade, the incidence rate for oral cancer in New York City remained unchanged, while that rate for the rest of the state increased after a steady decline over two decades. For cancer of the esophagus, the incidence rate declined in New York City, while it increased somewhat in the rest of the state until the late 2000s, so that there was little change in the statewide rate until the mid-2000s. The figure also shows an increase in oral cavity cancer rates during the early 1990s that was due almost entirely to an increase in New York City.

Figure 6 Time trend of incidence rate[1] of selected tobacco-related cancers, New York State, New York City, and New York State exclusive of New York City, 1976-2016

(A) Cancers of the oral cavity, esophagus, and larynx



(B) Cancer of the lung



Source of data: New York State Cancer Registry. Data provisional, November 2018.

[1] Rates are age adjusted to the 2000 US standard population.

Tobacco Use in New York

As stated above, tobacco use is the single most important cause of cancer deaths, accounting for almost a third of all deaths from cancer. Information on tobacco use behaviors can be used for targeting and monitoring tobacco control activities.

Demographics

Table 5 shows the percentage of adults in different groups who reported that they were current smokers, that is, smoked at least 100 cigarettes in their lifetime and now smoke every day or some days. Historically, males begin smoking earlier than females and are now more likely to be current smokers. When males and females are combined, people age 65 and older are less likely to smoke currently than younger people. Smoking rates are highest in people with lower education and income levels, and among people reporting frequent mental distress.

Table 5 Percent of adults who are current smokers by demographics, New York State, 2016

Demographics		Percent	95% CI
Total New York State		14.2	13.4-14.9
Sex	Male	16.7	15.4-17.9
	Female	11.9	11.0-12.8
Race/ethnicity	non-Hispanic white	15.7	14.7-16.7
	non-Hispanic black	16.3	13.8-18.9
	non-Hispanic other race or multiracial	7.9	5.6-10.1
	Hispanic	11.9	10.1-13.7
Age	18-24	11.7	9.1-14.3
	25-34	17.1	15.1-19.2
	35-44	17.0	14.9-19.2
	45-54	18.4	16.4-20.5
	55-64	15.3	13.5-17.1
	65+	6.5	5.5-7.5
Educational attainment	Less than high school	19.2	16.6-21.8
	High school or G.E.D	18.5	16.9-20.1
	Some post-high school	16.6	14.9-18.2
	College graduate	6.5	5.6-7.3
Annual household income	Less than $25,000	19.8	18.1-21.6
	$25,000-34,999	16.8	13.9-19.8
	$35,000-49,999	15.8	13.3-18.2
	$50,000-74,999	14.2	12.1-16.4
	$75,000+	9.7	8.4-11.0
Frequent mental distress[a]	Yes	26.0	11.8-13.4
	No	12.6	23.1-28.9

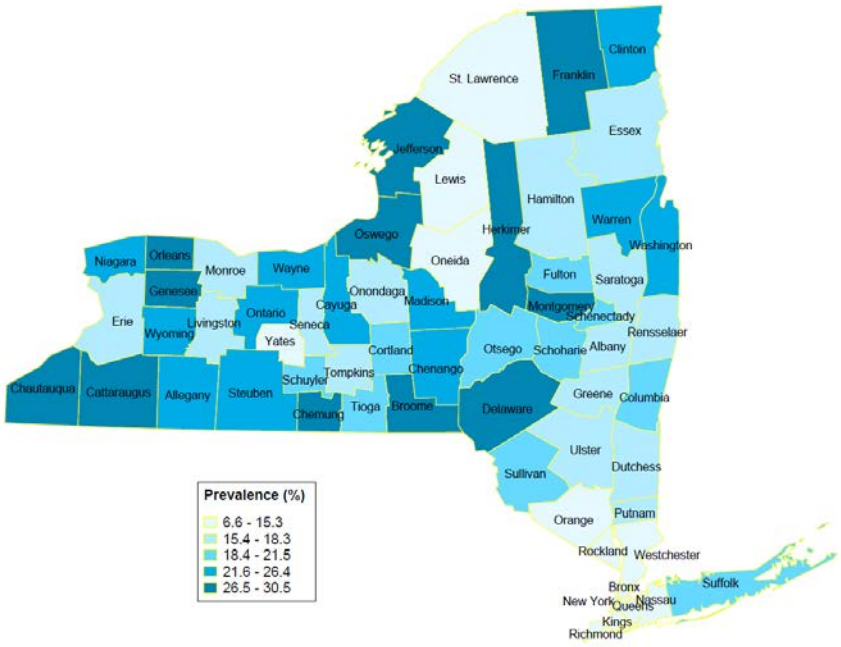
Source of data: New York State Behavioral Risk Factor Surveillance System 2016.

[a] Frequent mental distress is defined as yes if respondents report problems with stress, depression, or emotions on at least 14 of the previous 30 days. This indicator was formerly referred to as poor mental health.

Geographic Variation

Current smoking rates are not uniformly distributed across New York State. In 2016, the New York State Department of Health conducted the Expanded Behavioral Risk Factor Surveillance System (Expanded BRFSS) survey to provide stable estimates of behavioral risk factors for each county in New York State. Figure 7 shows the distribution of current smoking by county in New York State in 2016. Appendix Table A-3 shows rates for individual counties. As with many of the cancers most closely related to cigarette smoking, smoking rates are generally lower in the boroughs of New York City and the New York City suburbs. High rates of current smoking are seen in many upstate counties, including counties in the north central part of the state and in the southern tier. It is important to note that smoking patterns may not correspond exactly with patterns of cancer incidence rates because the smoking data show current smoking, while risk of a tobacco-related cancer reflects tobacco use patterns over a person's lifetime. Also, not all people in an area who were diagnosed with cancer would have been long-term residents of that area.

Figure 7 Prevalence[1] of adults who are current smokers by county, New York State, 2016



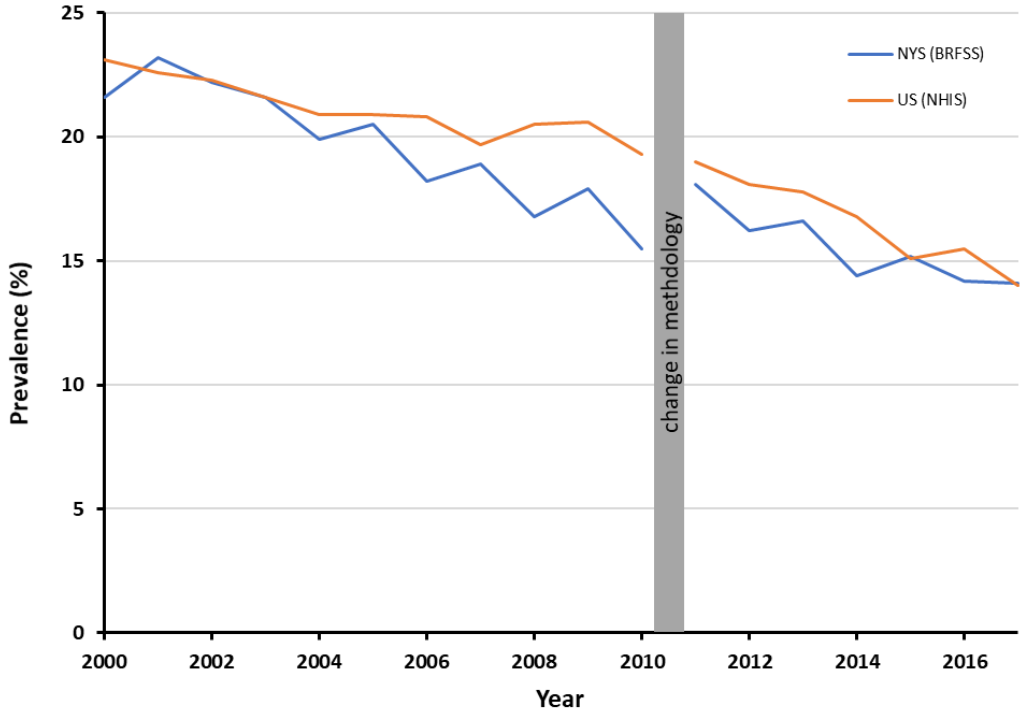
Sources of data: New York State Expanded Behavioral Risk Factor Surveillance System 2016.
[1] Prevalence is age adjusted to the 2000 US standard population.

Time Trends

Smoking rates have been declining over time both in New York State and nationally. Figure 8 compares adult smoking rates in New York State with national rates since 2000. As the chart shows, smoking rates were similar and declined at a similar rate in New York and nationally from 2000 through about 2003. After 2003, rates began to decline more rapidly in New York, so that in 2010, 15.5% of New Yorkers currently smoked, compared with 19.3% of Americans.

In 2011, there was a change in the method used to collect and compute the data, on which adult smoking prevalence estimates are based, to make the findings more representative of the general population (25). Prevalence estimates from the two different methodologies should therefore not be compared. Between 2011 through 2017, the prevalence of current smoking among adults in New York, as measured by the new methodology, declined by an average of 3.9% per year. In comparison, the prevalence of adult current smoking nationwide decreased by an average of 4.8% per year. Therefore in 2017, the prevalence in New York was similar to that in the US as a whole.

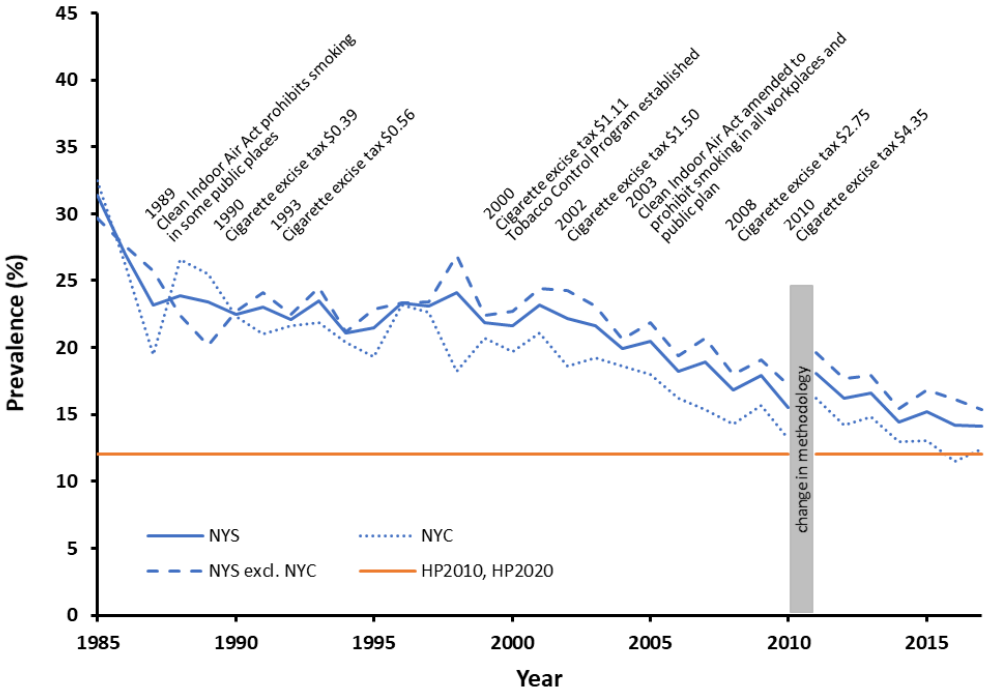
Figure 8 Prevalence of adults who are current smokers, New York State and United States, 2000-2017



Sources of data: Behavioral Risk Factor Surveillance System (New York State) and National Health Interview Survey (US).

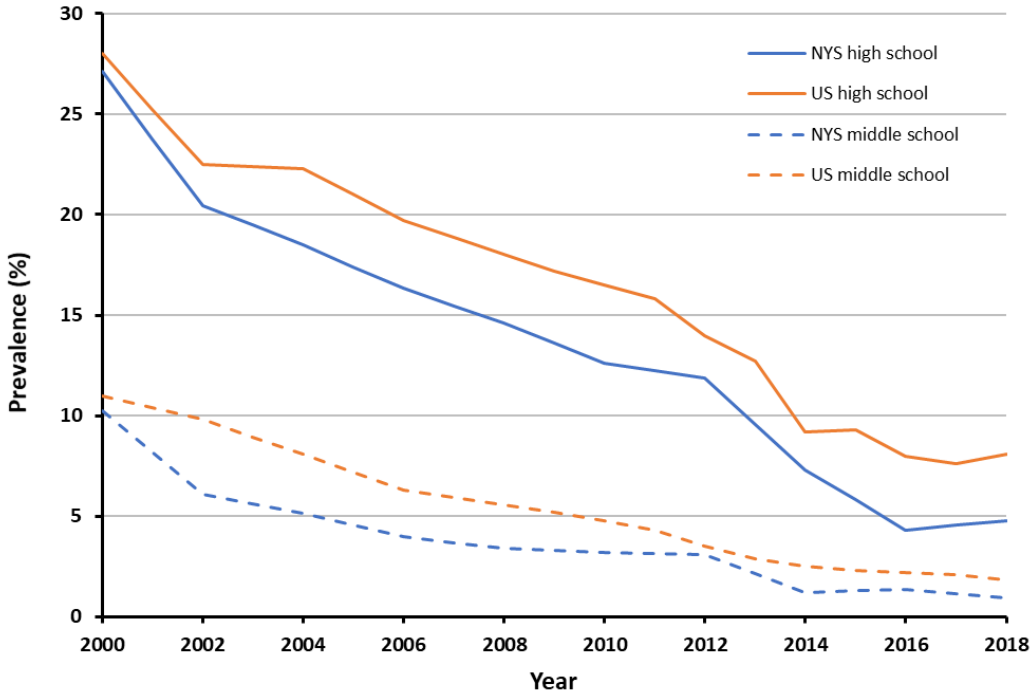
Figure 9 shows the decline in smoking rates for adults in New York State since 1985 by region. Tobacco control milestones are also shown. Following a sharp drop between 1985 and 1987, the rate of adult current smoking stayed fairly constant until the early 2000s, when it began to decline again. Smoking rates were lower in New York City than the rest of the state for almost all of this time, with the exception of two years in the late 1980s. In the late 1990s, rates in New York City started declining more rapidly than in the rest of the state. Furthermore, an additional cigarette excise tax of $1.50 in New York City was passed in 2002. The statewide rate of 14.1% in 2017, based on the new, more representative methodology, is the lowest recorded since surveys began, and the current New York City rate of 12.4% is approaching the Healthy People 2020 goal of 12%.

Figure 9 Percent current smokers among New York adults by region, 1985-2017, with selected tobacco control milestones



Sources of data: New York State Behavioral Risk Factor Surveillance System 1985-2017 and New York State Tobacco Control Program

Figure 10 Smoking prevalence among middle and high school students, New York State and United States, 2000-2018



Sources of data: New York State Youth Tobacco Survey 2000-2018 and National Youth Tobacco Survey 2000-2018.

Smoking among Youth

Most adults who smoke regularly started before the age of 18 (26), and very few begin smoking as adults. Therefore, one of the key objectives of national and statewide tobacco control programs is to prevent youth from starting to smoke. Figure 10 shows the percentage of middle-school and high-school students who smoked on at least one day in the past 30 days in New York State and nationally since 2000. Between 2000 and 2018, the smoking rate among New York high school students declined from 27.1% to 4.8%, a reduction of 82%. The rate among New York middle school students declined from 10.2% to 0.9%, a reduction of 91%. While rates in both high school and middle school students in New York were similar to the national rates in 2000, youth smoking rates declined more rapidly in New York.

Other Forms of Tobacco

Besides cigarettes, other forms of tobacco have been linked with cancer. These include cigars and pipes, and smokeless tobacco such as chewing tobacco and snuff. These forms of tobacco have been especially closely linked with cancers of the lip (pipe smoking) and oral cavity (smokeless tobacco).

Cigars are the most frequently used tobacco product after cigarettes among adults. In 2015-2016, the prevalence of current cigar smoking among adults in New York was 6.6%, comparable to the 7.2% in the rest of the nation (27). The proportion of adults in New York who smoked cigars has not changed significantly since 2003 (28).

A much smaller proportion of adult New Yorkers use smokeless tobacco, including chewing tobacco and snuff. In 2017, approximately 2.5% of adults in New York currently used smokeless tobacco some days or every day (29). This is comparable to the 4.0% of people in the country as a whole who used smokeless tobacco in 2017.

Data from the New York State Youth Tobacco Survey indicate that the rates of other than cigarette use and e-cigarette use among HS youth were both higher than the rate of cigarette use in recent years (30). As of 2016, e-cigarettes became the most commonly used tobacco product. In 2018, the prevalence of using other tobacco products among high school students was 9.2%, while the prevalence of cigarette smoking was 4.8%.

Electronic Nicotine Delivery Systems (ENDS) or E-cigarettes

Electronic nicotine delivery systems (ENDS), or electronic cigarettes (e-cigarettes), are battery-powered devices that heat a solution of liquid nicotine and other chemicals, creating an emission that is inhaled by the user. They contain a tobacco-derived substance (nicotine) that is the addictive component in all tobacco products (31). Public health concerns about e-cigarettes are that they may lead to combustible tobacco use by those who would otherwise not have smoked (32,33), or that they help people maintain or strengthen nicotine addiction by allowing nicotine use in places where use of combustible tobacco is prohibited as well as challenge tobacco-free norms. Moreover, several studies suggest that e-cigarette use is negatively associated with cigarette smoking cessation (34,35).

Use of ENDS remains a concern for youth (particularly high school students) in New York State (30, 36). In 2016, the percentage of high school students who ever tried ENDS reached 43.8% and 20.6% of high school students were current ENDS users. By 2018, 27.4% of high school students were using ENDS. In recent years, ENDS have become the most commonly used tobacco products among youth.

Conclusion

In New York as elsewhere, tobacco-related cancers exact a heavy toll. The good news is that cancers caused by tobacco are entirely preventable. Progress has been made in lowering smoking rates in New York over the past decades, and this progress is now beginning to be seen in the leveling off and decline in some of the cancers most closely related to smoking.

But much more needs to be done. Efforts at tobacco control in New York have focused on keeping youth from starting and motivating and supporting smokers to quit. Environmental approaches such as limiting even further the places where smoking is allowed and where tobacco can be sold, and restricting industry strategies to reduce the price of tobacco are being undertaken with the aim of reducing nonsmoker exposure to secondhand smoke, maintaining the high cost of tobacco, and further denormalizing tobacco use behavior. A network of contractors is now working with health care systems and mental health organizations to improve the reach and delivery of evidence-based tobacco dependence treatment to all New Yorkers who smoke or use other tobacco products. Contractors are focusing on systems serving populations most impacted by tobacco, including people with low income, low educational attainment, or those who report frequent mental distress or serious mental illness. Information contained in this report can help to continue the process.

Sources of Data

The New York State Cancer Registry is a population-based cancer incidence registry responsible for the collection of demographic, diagnostic and treatment information on all patients diagnosed with and/or treated for cancer at hospitals, laboratories and other health care facilities throughout New York State. Submission of data is mandated under New York State Public Health Law, section 2401. The Cancer Registry collects a wide variety of information that can be used for research and public health planning and evaluation. Cancer Registry data are routinely used by programs within the Department of Health, county and local health departments, patient advocacy groups, public interest groups, researchers and the public. Because the Registry has collected statewide data since 1976, it can be used to monitor cancer incidence patterns and trends for all areas of New York State. (http://www.health.ny.gov/statistics/cancer/registry/about.htm)

The New York State Behavioral Risk Factor Surveillance System (BRFSS) is an annual statewide telephone surveillance system designed by the Centers for Disease Control and Prevention (CDC). New York State has participated annually since 1985. The BRFSS monitors modifiable risk behaviors and other factors contributing to the leading causes of morbidity and mortality in the population. New York State's BRFSS sample represents the non-institutionalized adult household population, aged 18 years and older. Data from the BRFSS are useful for planning, initiating, and supporting health promotion and disease prevention programs at the state and federal level, and monitoring progress toward achieving health objectives for the state and nation. (http://www.health.ny.gov/statistics/brfss/)

The Expanded Risk Factor Surveillance System (Expanded BRFSS) augments the Behavioral Risk Factor Surveillance System (BRFSS). Expanded BRFSS is a random-digit-dialed telephone survey conducted periodically among adults 18 years of age and older representative of the non-institutionalized civilian population in New York State. The goal of Expanded BRFSS is to collect county-specific data on preventive health practices, risk behaviors, injuries and preventable chronic and infectious diseases. This report draws upon the results of the 2016 Expanded BRFSS. A standard questionnaire was utilized in all areas. (http://www.health.ny.gov/statistics/brfss/expanded/)

The National Health Interview Study (NHIS), conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention, is a cross-sectional household interview survey that is the principal source of information on the health of the civilian noninstitutionalized population of the United States. NHIS data are used by the Department of Health and Human Services to monitor trends in illness and disability and to track progress toward achieving national health objectives. The data are also used by the public health research community for epidemiologic and policy analysis. (http://www.cdc.gov/nchs/nhis/about_nhis.htm)

The National Youth Tobacco Survey (NYTS) is a multi-stage cross-sectional survey administered by the Centers for Disease Control and Prevention to youth in grades 6 to 12. The goal of this survey is to obtain nationally representative data on the tobacco-related beliefs, attitudes, and behaviors and exposures to pro- and anti-tobacco influences of middle school and high school youth. Items measured as part of the NYTS survey include use of cigarettes, cigars, smokeless tobacco and other tobacco products as well as correlates of tobacco use such as demographics, minors' access to tobacco, and exposure to secondhand smoke. (http://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm)

The Youth Tobacco Survey (YTS) was developed by CDC in collaboration with U.S. states to provide state-level information on trends in youth tobacco use, access, and perceptions and to evaluate the cumulative effectiveness of tobacco use reduction programs. Starting in 2000, NYSDOH modified the CDC instrument and conducted the YTS biennially to produce separate estimates for New York City, the rest of the state, and the state as a whole. The New York YTS includes students in grades 6 through 12 attending public, parochial, and private schools in New York. Indicators assessed by the New York YTS include tobacco use, secondhand smoke exposure, social network influences, prevalence of cigarette smoking on school property, and exposure to pro-tobacco messages. (https://www.cdc.gov/tobacco/data_statistics/surveys/yts/index.htm)

The Adult Tobacco Survey (ATS) was developed by the New York Tobacco Control Program (NY TCP) in partnership with RTI International, the independent evaluator for the NY TCP. The survey has been fielded continually to the noninstitutionalized adult population, aged 18 years or older, in New York State. Since 2003, the ATS has assessed 1) adult attitudes and beliefs toward, and use of, tobacco; 2) purchasing behavior and cessation attempt behavior among adult smokers; 3) health status and health-related problems; 4) attitudes toward, and exposure to, secondhand smoke; 5) perceptions of risk related to tobacco use; 6) recollection of exposure to tobacco or anti-tobacco advertising; and 7) attitudes toward newly enacted secondhand smoking policies. (https://health.data.ny.gov/Health/Adult-Tobacco-Survey-Beginning-2003/ckfz-a669/data)

For Further Information

Information on occurrence patterns, risk factors and possible prevention strategies for different types of cancer is available at http://www.health.ny.gov/statistics/cancer/registry/abouts/ .

Detailed statistics on cancer incidence and mortality in New York, as well as a comprehensive description of the New York State Cancer Registry, are available at http://www.health.ny.gov/statistics/cancer/registry/ .

Other useful sources of information on cancer, including symptoms and treatment, include the Web sites of the American Cancer Society (http://www.cancer.org/index) and the National Cancer Institute (http://www.cancer.gov/)

Additional information on data from the New York State Behavioral Risk Factor Surveillance System and Expanded BRFSS may be accessed from http://www.health.ny.gov/statistics/brfss/ and https://health.data.ny.gov/.

Information about the New York State Tobacco Control Program may be found at http://www.health.ny.gov/prevention/tobacco_control/. The Tobacco Control Program also maintains the New York State Smokers' Quitline at 1-866-NY-QUITS (1-866-697-8487) and the associated Web site http://www.nysmokefree.com/, which provide assistance and support to smokers trying to quit.

References

1. US Department of Health, Education, and Welfare. Smoking and health. Report of the Advisory Committee to the Surgeon General of the Public Health Service. Washington, DC: US Department of Health, Education, and Welfare; Public Health Service; 1964.
2. US Department of Health, Education, and Welfare. The health consequences of smoking: a public health service review, 1967. Washington, DC: US Department of Health, Education, and Welfare; Public Health Service; 1967.
3. US Department of Health, Education, and Welfare. The health consequences of smoking: 1968 supplement to the 1967 public health service review. Washington, DC: US Department of Health, Education, and Welfare; Public Health Service; 1968.
4. US Department of Health, Education, and Welfare. The health consequences of smoking: 1969 supplement to the 1967 public health service review. Washington, DC: US Department of Health, Education, and Welfare; Public Health Service; 1969.
5. US Department of Health, Education, and Welfare. The health consequences of smoking: a report of the Surgeon General: 1971. Washington, DC: US Department of Health, Education, and Welfare; Public Health Service; Mental Health Administration; 1971.
6. US Department of Health, Education, and Welfare. The health consequences of smoking: a report of the Surgeon General: 1972. Washington, DC: US Department of Health, Education, and Welfare; Public Health Service; Health Services and Mental Health Administration; 1972.
7. US Department of Health, Education, and Welfare. The health consequences of smoking: January 1973. Washington, DC: US Department of Health, Education, and Welfare, Public Health Service, 1973.
8. US Department of Health, Education, and Welfare. The health consequences of smoking 1974. Washington, DC: US Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, 1974.
9. US Department of Health, Education, and Welfare. The health consequences of smoking 1975. Washington, DC: US Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, 1975.
10. World Health Organization. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 89: Smokeless Tobacco and Some Tobacco-Specific N-Nitrosamines. Lyon (France): World Health Organization, International Agency for Research on Cancer, 2007. [accessed April 10, 2019].

11. US Department of Health and Human Services. The health consequences of smoking: cancer: a report of the Surgeon General. Washington, DC: US Department of Health and Human Services, Public Health Service, Office of Smoking and Health, 1982.

12. US Department of Health and Human Services. The health consequences of smoking: a report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004.

13. U.S Department of Health and Human Services. The Health Consequences of Smoking – 50 Years of Progress: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.

14. US Department of Health and Human Services. The Health Consequences of Involuntary Smoking: a report of the Surgeon General, US Department of Health and Human Services, Public Health Service, Centers for Disease Control, Office on Smoking and Health, 1986.

15. U.S. Department of Health and Human Services. The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotions, Office on Smoking and Health, 2006.

16. Centers for Disease Control and Prevention. Smokeless Tobacco: Health Effects. Available at: https://cdc.gov/tobacco/data_statistics/fact_sheets/smokeless/health_effects/index.htm. Accessed on April 25, 2019.

17. Doll R and Peto R. The Causes of Cancer, New York: Oxford University Press, 1981.

18. Colditz GA, DeJong HW, Hunter DJ, Trichopoulos D, Willett WC. Harvard Report on Cancer Prevention, Volume 1, Causes of Human Cancer, Cancer Causes & Control 7, Suppl. 1, November 1996.

19. Danaei G, Ding IL, Mozaffarian D, et al. The Preventable Causes of Death in the United States: Comparative Risk Assessment of Dietary, Lifestyle and Metabolic Risk Factors. PLoS Med 2009; 6(4): e000058.

20. Mokdad AH, Marks JS, Stroup DF and Gerberding JL. Actual causes of death in the United States, 2000. JAMA 2004; 291(10):1238-1245.

21. Siegel RL, Jacobs EJ, Newton CC, et al. Deaths due to cigarette smoking for 12 smoking-related cancers in the United States. JAMA Internal Medicine 2015; 175: 1574-1576.

22. Eheman C, Henley SJ, Ballard-Barbash R, et al., Annual report to the nation on the status of cancer, 1975-2008, featuring cancers associated with excess weight and lack of sufficient physical activity, Cancer 2012; 118: 2338-2366.

23. El-Serag HB, Davila JA, Petersen NJ, and McGlynn KA. The continuing increase in the incidence of hepatocellular carcinoma in the United States: an update. Ann Intern Med 2003; 139: 817-823.

24. Edwards BK, Ward E, Kohler BA, et al. Annual report to the nation on the status of cancer, 19752006, featuring colorectal cancer trends and impact of interventions (risk factors, screening, and treatment) to reduce future rates. Cancer 2010; 116:544-573.

25. Yusuf HR, Tsai J, Atras HK, et al. Methodologic Changes in the Behavioral Risk Factor Surveillance System in 2011 and Potential Effects on Prevalence Estimates. MMWR Morb Mortal Wkly Rep, 2012; 31(22): 410-413.

26. US Department of Health and Human Services. Preventing tobacco use among youth and young adults. Atlanta, GA: US Department of Health and Human Services, CDC; 2012. Available at: https://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/full-report.pdf. Accessed on April 25, 2019.

27. New York State Department of Health. Exploring differences in tobacco use among New York adults. July 2018. Available at: https://www.health.ny.gov/prevention/tobacco_control/reports/docs/2018_nys_tobacco_use_differences.pdf. Accessed on April 25, 2019.

28. New York State Department of Health Tobacco Control Program. Trends in Adult Use of Smokeless Tobacco and Cigars in New York. StatShot Vol. 5, No. 4, May 2012. Available at: https://www.health.ny.gov/prevention/tobacco_control/reports/statshots/volume5/n4_use_of_other_tobacco_products_by_adults.pdf. Accessed on April 25, 2019.

29. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. BRFSS Prevalence & Trends Data. 2015. Available at: https://www.cdc.gov/brfss/brfssprevalence/. Accessed on April 25, 2019.

30. New York State Department of Health Tobacco Control Program. Electronic Cigarette Use by Youth Increased 160% Between 2014 and 2018. StatShot Vol. 11, No. 5, February 2018. Available at: https://www.health.ny.gov/prevention/tobacco_control/reports/statshots/volume11/n5_e-cigarette_use_by_youth.pdf. Accessed on April 25, 2019.

31. Marynak KL, Gammon DG, Rogers T, et al. Sales of Nicotine-Containing Electronic Cigarette Products: United States, 2015. Am J Pub Health. 2017. 107(5): 702-705.

32. Park JY, Seo DC, Lin HC. E-cigarette use and intention to initiate or quit smoking among U.S. youths. American Journal of Public Health. Am J Pub Health. 2016, 106(4):672-678.

33. Soneji S, Barrington-Trimis JL, Wills TA, et al. Association Between Initial Use of e-Cigarettes and Subsequent Cigarette Smoking Among Adolescents and Young Adults. A Systematic Review and Meta-analysis. JAMA Pediatr. 2017, 17(8): 788-797.

34. Kalkhoran S and Glantz S. E-cigarettes and smoking cessation in real-world and clinical settings: a systematic review and meta-analysis. Lancet Respir Med. 2016, 4(2): 116-128.

35. Kulik MC, Lisa NE, and Glantz SA. E-cigarettes Associated with Depressed Smoking Cessation: A Cross-sectional Study of 28 European Union Countries. Am J Prev Med, 2018; 54(4): 603-609.

36. New York State Department of Health Tobacco Control Program. Use of Electronic Cigarette and Similar Devices among NYS Youth, 2014-2016. StatShot Vol. 10, No. 5, December 2017. Available at: https://www.health.ny.gov/prevention/tobacco_control/reports/statshots/volume10/n5_ends_use_doubles.pdf. Accessed on April 25, 2019.

Appendix

Table A-1 Classification criteria used for tobacco-related cancers

Cancer	ICD-O-3 Site Codes	ICD-O-3 Histology Codes
Oral Cavity and Pharynx	C00.0–14.8	8000–9049, 9056–9139, 9141–9589
Esophagus	C16.0-16.9	8000–9049, 9056–9139, 9141–9589
Stomach	C16.0-16.9	8000–9049, 9056–9139, 9141–9589
Colon and Rectum	C18.0–20.9, C26.0	8000–9049, 9056–9139, 9141–9589
Liver	C22.0	8000–9049, 9056–9139, 9141–9589
Pancreas	C25.0-25.9	8000–9049, 9056–9139, 9141–9589
Larynx	C32.0-32.9	8000–9049, 9056–9139, 9141–9589
Lung and Bronchus	C33.0-34.9	8000–9049, 9056–9139, 9141–9589
Cervix Uteri (female only)	C53.0-53.9	8000–9049, 9056–9139, 9141–9589
Urinary Bladder	C67.0-67.9	8000–9049, 9056–9139, 9141–9589
Kidney and Renal Pelvis	C64.9-65.9	8000–9049, 9056–9139, 9141–9589
Acute Myeloid Leukemia		9840; 9861; 9865–9869; 9871–9874; 9895–9898; 9910–9911; 9920

https://www.cdc.gov/cancer/npcr/pdf/public-use/predefined-seer-stat-variables.pdf

Table A-2 Cancer incidence by region/county, selected tobacco-related cancers, 2012-2016

Region/County	Oral Cavity and Pharynx			Esophagus			Larynx			Lung and Bronchus		
	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)
New York State	2,558	10.9	0.2	1,072	4.5	0.1	780	3.3	0.1	13,814	58.9	0.4
New York City	891	9.7	0.3	324	3.5	0.2	285	3.0	0.2	4,300	47.0	0.6
Bronx	142	9.9	0.7	50	3.5	0.5	58	4.1	0.5	639	46.2	1.6
Kings	246	9.2	0.5	96	3.6	0.3	78	2.8	0.3	1,243	46.7	1.2
New York	207	11.0	0.7	70	3.6	0.4	56	2.9	0.4	903	47.2	1.4
Queens	239	9.0	0.5	87	3.2	0.3	71	2.6	0.3	1,153	43.6	1.1
Richmond	56	9.8	1.2	22	3.7	0.7	23	3.8	0.7	362	64.7	3.1
NYS excl. NYC	1,666	11.7	0.3	749	5.2	0.2	495	3.4	0.1	9,513	66.5	0.6
Albany	46	12.2	1.7	19	4.8	1.0	12	3.0	0.8	267	71.8	4.0
Allegany	7	11.7	4.2	5	8.7	3.6	3	5.3	3.0	48	76.1	10.0
Broome	37	14.7	2.3	16	6.2	1.4	9	3.7	1.2	172	65.3	4.5
Cattaraugus	16	15.3	3.6	6	6.1	2.3	4	3.8	1.9	73	67.5	7.2
Cayuga	13	12.1	3.2	5	4.8	2.0	6	5.8	2.2	92	87.2	8.3
Chautauqua	27	15.2	2.8	10	5.3	1.6	8	4.3	1.5	124	68.0	5.5
Chemung	13	11.8	3.1	8	6.9	2.3	5	4.1	1.8	87	73.9	7.2
Chenango	9	12.0	3.9	4	5.7	2.8	2	2.0	1.7	51	71.3	9.1
Clinton	13	12.8	3.3	7	6.8	2.5	6	5.3	2.2	91	91.3	8.7
Columbia	10	10.3	3.1	5	4.4	2.1	3	3.3	1.8	73	74.6	8.0
Cortland	8	14.3	4.8	4	7.7	3.6	2	4.2	2.7	47	81.8	10.9
Delaware	12	17.0	5.0	4	5.1	2.6	3	4.4	2.6	52	69.5	9.0
Dutchess	40	10.5	1.5	18	4.7	1.0	11	2.8	0.8	230	60.8	3.6
Erie	149	12.5	0.9	75	6.1	0.6	47	4.0	0.5	900	74.3	2.2
Essex	8	13.1	4.7	2	3.7	2.6	2	3.4	2.8	45	72.6	9.9
Franklin	7	11.3	4.0	4	5.9	3.0	3	4.5	2.5	48	78.1	10.3
Fulton	10	13.0	3.9	6	8.2	3.2	3	4.2	2.3	67	87.7	9.8
Genesee	11	13.8	4.0	3	3.6	2.1	4	4.3	2.2	59	73.6	8.7
Greene	9	12.5	4.1	4	5.9	2.9	2	3.9	2.6	60	82.4	9.7
Hamilton	1	6.8	14.1	1	8.8	16.1	0	0.0	10.6	8	88.9	32.5
Herkimer	14	16.2	4.1	5	5.3	2.3	2	2.4	1.6	71	80.1	8.7
Jefferson	17	14.7	3.3	7	6.5	2.3	5	4.6	1.8	104	92.1	8.1
Lewis	4	13.7	6.4	1	3.2	3.2	1	3.3	3.5	20	56.6	11.7
Livingston	8	10.3	3.6	5	6.4	2.7	2	2.2	1.6	58	70.8	8.5
Madison	13	13.8	3.6	6	6.0	2.5	3	3.0	1.8	72	76.7	8.2
Monroe	106	11.5	1.0	44	4.8	0.7	29	3.1	0.5	571	62.3	2.3
Montgomery	9	14.1	4.6	3	4.3	2.7	2	2.3	1.9	52	75.8	9.7
Nassau	178	10.2	0.7	75	4.2	0.4	47	2.6	0.3	957	54.2	1.6
Niagara	37	13.1	2.0	21	6.8	1.4	12	3.8	1.1	241	82.2	4.8
Oneida	40	13.3	2.0	16	5.3	1.2	16	5.1	1.2	235	75.3	4.4
Onondaga	70	12.3	1.4	29	5.0	0.9	25	4.3	0.8	435	75.1	3.2
Ontario	17	11.3	2.6	9	6.2	2.0	5	3.1	1.4	107	71.0	6.3

Region/County	Oral Cavity and Pharynx			Esophagus			Larynx			Lung and Bronchus		
	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)	Cases[1]	Rate[2]	95% CI (+/-)
Orange	40	9.7	1.4	20	4.9	1.0	16	4.0	0.9	255	65.5	3.7
Orleans	6	11.0	4.3	3	5.5	3.0	2	3.4	2.5	45	83.7	11.4
Oswego	19	12.8	2.7	9	5.6	1.8	8	5.0	1.7	139	95.4	7.4
Otsego	11	12.9	3.8	5	5.3	2.4	4	4.4	2.2	51	59.2	7.7
Putnam	14	10.8	2.7	8	6.2	2.1	3	2.5	1.4	79	63.7	6.6
Rensselaer	27	13.5	2.4	13	6.6	1.7	8	4.1	1.4	168	85.8	6.0
Rockland	39	10.3	1.5	18	4.6	1.0	11	2.8	0.8	183	48.8	3.2
St. Lawrence	14	10.0	2.5	9	6.4	2.0	6	4.4	1.7	97	70.7	6.5
Saratoga	36	12.5	1.9	17	6.0	1.4	9	3.1	1.0	207	72.4	4.6
Schenectady	23	11.6	2.3	11	5.8	1.7	8	3.7	1.3	137	69.1	5.4
Schoharie	5	12.3	5.3	3	5.6	3.6	1	1.5	2.1	31	66.8	11.1
Schuyler	4	18.9	9.1	0	1.4	3.1	1	5.5	4.9	21	77.7	15.7
Seneca	3	6.7	3.6	3	6.1	3.7	2	3.0	2.6	39	81.7	12.1
Steuben	18	13.0	2.9	7	5.1	1.8	7	5.4	1.9	103	76.2	6.8
Suffolk	218	11.7	0.7	94	5.0	0.5	61	3.3	0.4	1,209	66.1	1.7
Sullivan	10	9.3	2.9	5	5.1	2.2	4	4.1	1.9	71	69.4	7.5
Tioga	6	7.8	3.2	3	4.7	2.5	3	4.0	2.5	44	61.7	8.5
Tompkins	12	11.7	3.2	7	6.3	2.3	3	2.6	1.6	56	54.8	6.7
Ulster	31	12.3	2.0	13	5.1	1.3	6	2.4	1.0	172	69.8	4.8
Warren	14	15.8	4.0	8	7.7	2.7	5	5.4	2.3	81	81.5	8.3
Washington	11	12.7	3.6	4	4.7	2.3	4	4.7	2.3	63	74.6	8.5
Wayne	16	12.7	3.0	7	5.3	2.0	3	2.7	1.5	89	73.1	7.1
Westchester	117	9.7	0.8	46	3.7	0.5	32	2.6	0.4	592	48.4	1.8
Wyoming	8	15.5	5.2	4	8.1	3.8	2	4.2	2.8	35	67.4	10.5
Yates	6	20.5	8.1	4	11.0	5.5	1	3.6	3.5	23	66.7	12.8

Source of data: New York State Cancer Registry. Data provisional, November 2018.

[1] Average number of new cases per year

[2] Rates are per 100,000, age adjusted to the 2000 US standard population, with 95% confidence intervals.

Table A-3 Prevalence[1] of adults who are current smokers by region/county, New York State, 2016

Region	County	Percent	95% CI	County	Percent	95% CI
New York City						
	Bronx	11.4	8.5 - 14.3	Queens	11.2	8.5 - 13.8
	Kings	13.3	10.8 - 15.8	Richmond	12.8	7.6 - 18.0
	New York	9.8	7.5 - 12.0			
New York State excluding New York City						
	Albany	16.4	12.6 - 20.2	Oneida	15.3	10.8 - 19.8
	Allegany	24.7	19.0 - 30.4	Onondaga	18.0	14.4 - 21.6
	Broome	26.8	20.6 - 33.0	Ontario	24.5	17.1 - 31.8
	Cattaraugus	28.0	22.8 - 33.3	Orange	13.2	9.7 - 16.7
	Cayuga	21.9	17.2 - 26.6	Orleans	29.7	22.0 - 37.5
	Chautauqua	28.9	24.6 - 33.2	Oswego	30.5	23.6 - 37.4
	Chemung	27.9	21.0 - 34.8	Otsego	21.3	14.9 - 27.6
	Chenango	23.4	17.1 - 29.7	Putnam	18.3	11.7 - 25.0
	Clinton	24.0	19.1 - 28.9	Rensselaer	18.3	13.3 - 23.3
	Columbia	20.3	14.1 - 26.4	Rockland	6.6	3.9 - 9.3
	Cortland	21.5	15.5 - 27.6	Saratoga	17.3	12.8 - 21.7
	Delaware	28.5	21.6 - 35.4	Schenectady	19.9	14.5 - 25.3
	Dutchess	16.4	12.0 - 20.8	Schoharie	19.6	13.2 - 26.0
	Erie	18.3	13.7 - 23.0	Schuyler	21.1	12.1 - 30.1
	Essex	17.6	11.7 - 23.5	Seneca	15.7	10.1 - 21.4
	Franklin	29.5	22.3 - 36.8	St. Lawrence	15.1	10.0 - 20.2
	Fulton	19.1	14.2 - 24.1	Steuben	23.5	16.7 - 30.4
	Genesee	27.3	21.1 - 33.5	Suffolk	18.5	13.9 - 23.1
	Greene	16.4	10.4 - 22.4	Sullivan	20.1	14.0 - 26.2
	Hamilton	15.5	6.8 - 24.3	Tioga	21.5	14.6 - 28.5
	Herkimer	29.0	22.1 - 35.9	Tompkins	17.3	11.4 - 23.1
	Jefferson	27.8	20.9 - 34.7	Ulster	15.6	10.9 - 20.3
	Lewis	14.2	7.9 - 20.4	Warren	26.4	20.6 - 32.2
	Livingston	16.8	11.0 - 22.6	Washington	25.3	18.8 - 31.8
	Madison	22.5	14.0 - 31.0	Wayne	24.6	18.8 - 30.3
	Monroe	16.2	11.8 - 20.7	Westchester	9.4	5.4 - 13.4
	Montgomery	29.9	21.8 - 38.0	Wyoming	26.4	19.3 - 33.5
	Nassau	8.1	5.0 - 11.3	Yates	14.3	8.9 - 19.7
	Niagara	25.5	18.4 - 32.6			

Sources of data: New York State Expanded Behavioral Risk Factor Surveillance System 2016.

[1] Prevalence are age adjusted to the 2000 US standard population, with 95% confidence intervals.