Release Date: May 2024

Trends in Overweight- and Obesity-Related Cancers in New York State, 2006-2020

Introduction

Obesity is a complex disease which increases the risk of many other diseases. It remains a significant public health concern. This report provides important statistics to community members, policy makers, advocates, healthcare professionals, and others as they engage in cancer control and prevention activities in their local communities and across the state. It also demonstrates the Department's commitment and efforts to reduce the overweight- and obesity-related cancer burdens among New Yorkers.

A telephone survey conducted in 2021 found that 34.5% of adults in New York State are considered overweight (body mass index between 25 and 30 kg/m^2) and 29.1% have obesity (body mass index ≥30).[1] Obesity affects children as well as adults. In New York State, an estimated 1 in 5 children have obesity.[2]

The International Agency for Research on Cancer has identified 13 different types of cancer where there is strong evidence for an association between high body mass index and cancer risk.[3] They are postmenopausal breast cancer, cancers of the colon and rectum, kidney, endometrium (corpus uterus), thyroid, pancreas, liver, ovary, gallbladder, and gastric cardia, multiple myeloma, meningioma, and adenocarcinoma of the esophagus. In general, the risk of developing cancer increases with the extent of weight gain and the period of time a person is overweight or obese. However, the extent to which obesity increases the cancer risk varies with cancer site and sex.[4,5]

In this report, we use New York State Cancer Registry data and describe recent trends in overweight- and obesity-related cancers among New Yorkers. In addition, we list major initiatives that the New York State Department of Health has launched to combat and prevent obesity.

Data and Statistics

Between 2016 and 2020, an average of 44,448 people per year were diagnosed with an overweight- and obesity-related cancer in New York State (Table 1). This represents 39% of the 114,869 cancer cases diagnosed each year (54% of the 57,478 cases among females and 23% of the 57,391 cases among males). The overweight- and obesity-related cancer incidence rate was much higher among females (233.7 per 100,000 persons) than among males (121.5), largely because of the inclusion of the female-specific sites of endometrial, ovarian, and postmenopausal female breast cancers and the absence of any male-specific sites. Overweight- and obesity-related cancer incidence rates increased sharply with age. Cases among individuals 50 years of age and above accounted for 90% of the total number of cases. Incidence also varied by race/ethnicity. Non-Hispanic Black and non-Hispanic White persons had higher rates than Hispanic persons and persons in the category of non-Hispanic other race groups combined.

Table 1 Average annual count and age-adjusted or age-specific rates[1] of overweight- and obesity-related invasive cancer cases[2] by demographic characteristics, New York State, 2016-2020

Characteristic	Males and Females			Males			Females		
	Count	Rate	(95% CI)[5]	Count	Rate	(95% CI)[5]	Count	Rate	(95% CI)[5]
Total	44,448	181.7	(180.9-182.5)	13,305	121.5	(120.5-122.4)	31,143	233.7	(232.5-234.9)
Age Group (years)									
<20	176	3.8	(3.6-4.1)	56	2.4	(2.1-2.6)	121	5.3	(4.9-5.8)
20-49	4,342	59.3	(58.5-60.1)	1,528	43.0	(42.0-43.9)	2,814	75.3	(74.1-76.6)
50-64	16,043	398.9	(396.1-401.7)	4,504	230.3	(227.2-233.4)	11,538	555.3	(550.7-559.9)
65-74	12,590	696.7	(691.3-702.2)	3,856	465.6	(459.0-472.3)	8,734	891.8	(883.4-900.2)
≥75	11,297	809.5	(802.8-816.3)	3,361	609.0	(599.8-618.3)	7,936	946.7	(937.2-956.3)
Race/ethnicity[3]									
NH White	29,902	188.9	(187.9-189.9)	9,041	124.9	(123.7-126.1)	20,861	246.8	(245.2-248.4)
NH Black	6,179	186.3	(184.2-188.4)	1,707	127.2	(124.4-130.0)	4,473	229.1	(226.1-232.2)
NH Other	2,996	148.7	(146.2-151.1)	946	102.9	(99.9-105.9)	2,050	188.9	(185.2-192.6)
Hispanic	5,023	151.7	(149.7-153.6)	1,515	105.9	(103.4-108.4)	3,508	189.4	(186.5-192.2)
Region[4]									
NYC	17,163	176.9	(175.7-178.1)	4,997	118.0	(116.5-119.5)	12,167	225.2	(223.4-227.0)
NYS excl. NYC	27,271	184.7	(183.7-185.8)	8,304	123.5	(122.3-124.8)	18,967	239.5	(238.0-241.1)

[1] Rates are per 100,000 persons, age-adjusted to the 2000 U.S. standard population except for the age-specific rates. Cancer data are from the New York State Cancer Registry as of November 2022.

[2] Overweight- and obesity-related cancers include adenocarcinoma of the esophagus; cancers of the breast (in postmenopausal women), colon and rectum, endometrium, gallbladder, gastric cardia, kidney, liver, ovary, pancreas, and thyroid; meningioma; and multiple myeloma.

[3] Race/ethnicity totals do not add to state totals because of a small number of cases for whom the race/ethnicity could not be determined.

[4] Region totals do not add to state totals because of a small number of cases for whom the region could not be determined.

[5] When comparing rates, the 95% confidence interval (95% CI) provides the statistical range containing the true population rate with a 95% probability.

NH: non-Hispanic

NH other: The category of "NH other race groups combined" refers to Asian, Pacific Islander, and American Indian/Alaskan Native persons. Due to low case counts, they were included in an aggregated race/ethnicity category.

NYS excl. NYC: New York State excluding New York City

Table 2 Age-adjusted incidence rates[1] of overweight- and obesity-related invasive cancers, average annual percent changes (AAPCs)[2,3] by cancer site and sex, New York State, 2006-2020

Cancer site	2006-2010			2016-2020			2006-2019
	% of cases	Rate	(95% CI)[4]	% of cases	Rate	(95% CI)[4]	AAPC[2,3]
Breast (postmenopausal women)	29	340.6	(337.8-343.5)	31	350.2	(347.6-352.9)	0.5 *
Colon and rectum	25	46.5	(46.1-46.9)	20	36.6	(36.3-37.0)	-2.3 *
Male		53.5	(52.8-54.2)		42.2	(41.7-42.8)	-2.3 *
Female		41.2	(40.7-41.7)		32.1	(31.6-32.5)	-2.4 *
Kidney (renal cell)	8	15.0	(14.7-15.2)	9	15.8	(15.6-16.0)	0.6 *
Male		21.1	(20.7-21.5)		22.3	(21.9-22.7)	0.5 *
Female		10.0	(9.8-10.3)		10.3	(10.0-10.5)	0.6 *
Endometrium (corpus uterus)	9	29.8	(29.4-30.3)	9	31.2	(30.7-31.6)	0.4 *
Thyroid	8	16.3	(16.1-16.6)	9	18.3	(18.1-18.6)	2.6 *
Male		8.2	(8.0-8.5)		10.0	(9.7-10.2)	2.7 *
Female		23.9	(23.4-24.3)		26.3	(25.9-26.8)	2.6 *
Pancreas	7	13.6	(13.4-13.8)	8	14.4	(14.2-14.6)	0.7 *
Male		15.5	(15.1-15.9)		16.4	(16.1-16.8)	0.7 *
Female		12.1	(11.8-12.3)		12.8	(12.5-13.1)	0.7 *
Multiple myeloma	4	7.2	(7.0-7.4)	4	7.7	(7.5-7.8)	1.1 *
Male		8.8	(8.5-9.1)		9.3	(9.1-9.6)	1.0 *
Female		6.0	(5.8-6.2)		6.4	(6.2-6.6)	1.0 *
Liver	4	7.3	(7.1-7.5)	4	6.8	(6.7-7.0)	-0.9 *
Male		12.1	(11.8-12.4)		11.2	(11.0-11.5)	-0.9 *
Female		3.4	(3.2-3.5)		3.1	(3.0-3.3)	-0.6
Ovary	4	13.3	(13.0-13.6)	3	11.2	(10.9-11.5)	-1.5 *
Adenocarcinoma of the esophagus	2	2.9	(2.8-3.0)	2	2.7	(2.6-2.8)	-0.6
Male		5.5	(5.2-5.7)		5.0	(4.8-5.2)	-0.8
Female		0.9	(0.8-1.0)		0.8	(0.7-0.9)	-1.1
Gastric cardia	1	2.3	(2.2-2.4)	1	2.3	(2.2-2.4)	-0.6
Male		4.0	(3.8-4.2)		3.9	(3.7-4.0)	-0.1
Female		1.0	(0.9-1.0)		1.0	(1.0-1.1)	0.7
Gallbladder	1	1.5	(1.4-1.6)	1	1.4	(1.3-1.5)	-0.4
Male		1.1	(1.0-1.2)		1.0	(1.0-1.1)	-0.5
Female		1.8	(1.7-1.9)		1.7	(1.6-1.8)	-0.2

Table 2 Age-adjusted incidence rates[1] of overweight- and obesity-related invasive cancers, average annual percent changes (AAPCs)[2,3] by cancer site and sex, New York, 2006-2020 (*cont.*)

Cancer site	2006-2010			2016-2020			2006-2019
	% of cases	Rate	(95% CI)[4]	% of cases	Rate	(95% CI)[4]	AAPC[2,3]
Meningioma	<0.1	0.1	(0.1-0.2)	<0.1	0.1	(0.1-0.1)	-4.9 *
Male		0.1	(0.1-0.2)		0.1	(0.1-0.1)	-3.1
Female		0.2	(0.1-0.2)		0.1	(0.1-0.1)	-6.1 *
All overweight- and obesity-related cancers	100	188.8	(188.0-189.7)	100	181.7	(180.9-182.5)	-0.1
All overweight- and obesity-related cancers except colorectal cancer	—	142.3	(141.6-143.1)	—	145.1	(144.4-145.8)	0.5 *
Cancers not related to overweight or obesity	—	322.3	(321.2-323.4)	—	292.7	(291.7-293.7)	-0.8 *

[1] *Rates are per 100,000 persons, age-adjusted to the 2000 U.S. standard population except for the age-specific rates. Cancer data are from the New York State Cancer Registry as of November 2020.*

[2] *AAPCs are calculated using Joinpoint Trend Analysis Software.[8]*

[3] *The COVID-19 pandemic disrupted health services, leading to delays and reductions in cancer screening, diagnosis, and reporting of data to some cancer registries. This may have contributed to the decline in new cancer cases for many sites in 2020. To avoid incorrect interpretations, the 2020 data point is excluded from the trend analysis.[6,7]*

[4] *When comparing rates, the 95% confidence interval (95% CI) provides the statistical range containing the true population rate with a 95% probability.*

* *Indicates that the AAPC is statistically significantly different from zero at α=0.05 level.*

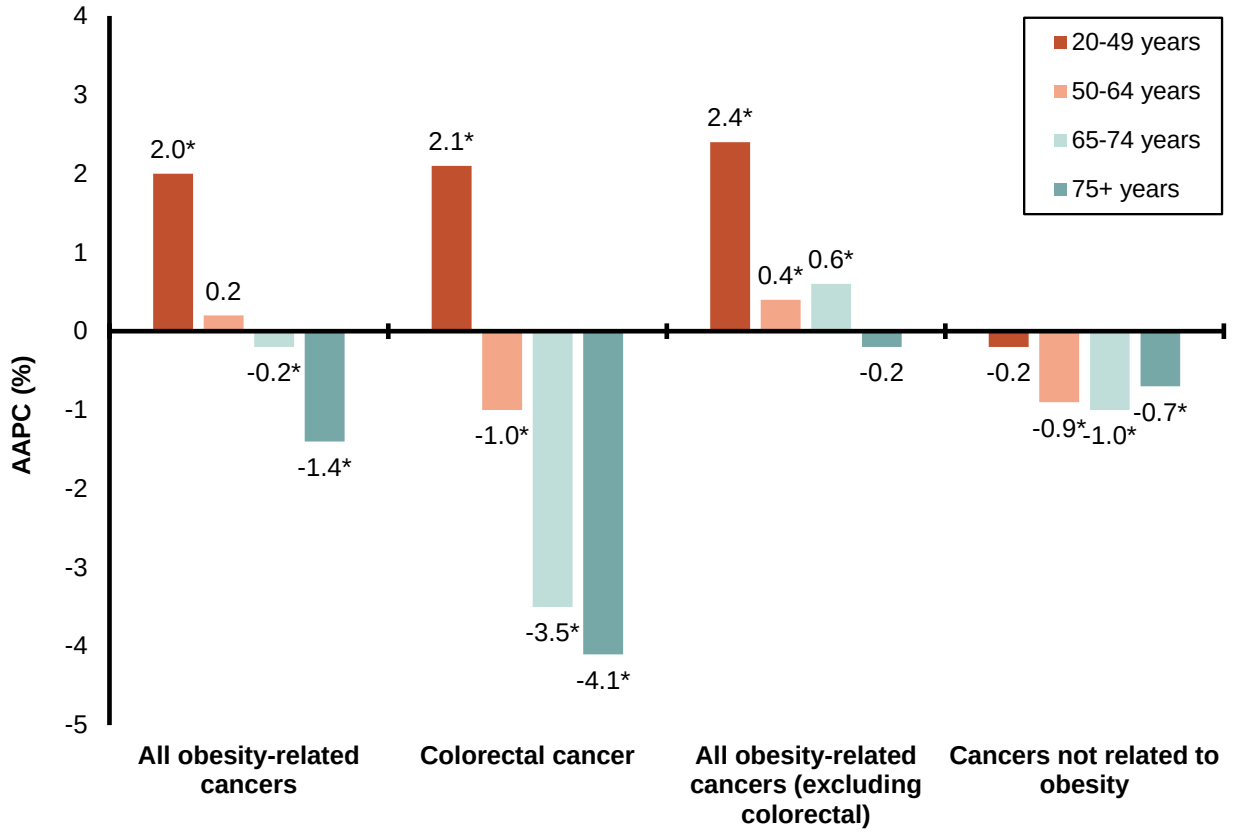
Incidence rates were lower in New York City than in areas outside of the City and the difference was statistically significant.

Table 2 presents the cancer rates for each of the overweight- and obesity-related cancers for two five-year periods (2006-2010 and 2016-2020) along with the trend from 2006 to 2019. The decline in the 2020 incidence rates for most cancer sites was attributed to a temporary, anomalous year caused by the COVID-19 pandemic.[6,7] The pandemic disrupted health services and thus led to delays and reductions in cancer screening, diagnosis, and reporting to some central cancer registries. Therefore the 2020 incidence rate was not used in the fit of the trend line(s). To calculate the trend, Joinpoint regression[8] was used to describe the average annual percent change (AAPC) of the cancer rates over the 14-year period.

Incidence rates of various overweight- and obesity-related cancers vary considerably, from 0.1 per 100,000 persons for meningioma to 36.6 for colorectal cancer in the 2016-2020 period (Table 2). Breast cancer rates are much higher still, over 350, though the numbers are not directly comparable as the at-risk population is restricted to women 50 years of age and older. Combining the overweight- and

obesity-related cancers together yields an age-adjusted rate of 181.7 per 100,000 persons for the 2016-2020 period, a rate that was significantly lower compared to the 2006-2010 period (188.8). This decrease was heavily influenced by the large decrease in colorectal cancer over the same period. Colorectal cancer screening detects and removes precancerous polyps. It reduces the cancer incidence over time. To control for the impact of change in screening rates on colorectal cancer, we examined incidence trends with and without colorectal cancer. When colorectal cancer is removed, and the other twelve sites are considered together, there was a marked average annual increase of 0.5% from 2006 to 2019. In comparison, rates for cancers not related to overweight or obesity decreased by 0.8% per year, and this decrease is statistically significant.

Figure 1 Average annual percentage change (AAPCs)[1] in overweight- and obesity-related cancer incidence rates[2] among adults by age group, New York State, 2006-2019[3].



[1] *AAPCs are calculated using Joinpoint Trend Analysis Software.*[8]

[2] *Cancer data are from the New York State Cancer Registry as of November 2022.*

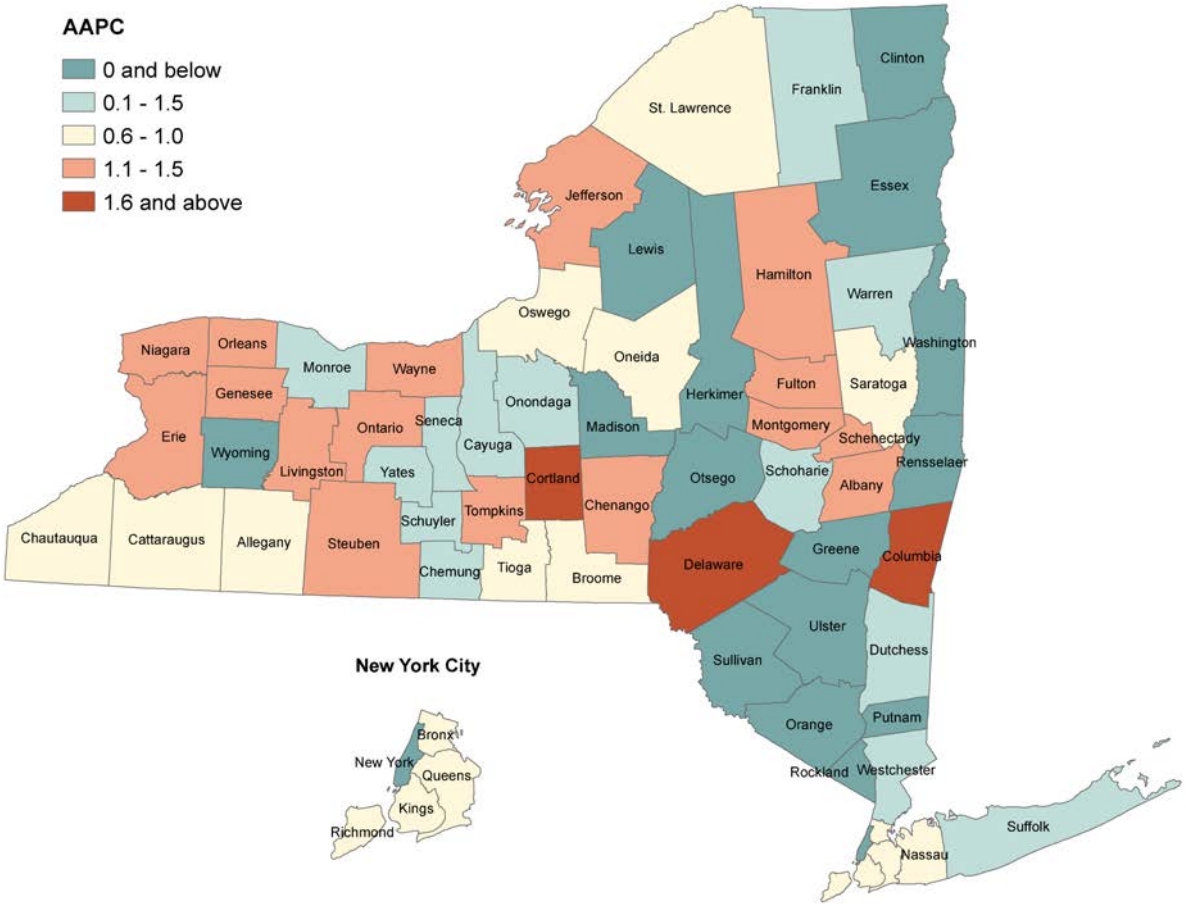
[3] *The COVID-19 pandemic disrupted health services, leading to delays and reductions in cancer screening, diagnosis, and reporting of data to some cancer registries. This may have contributed to the decline in new cancer cases for many sites in 2020. To avoid incorrect interpretations, the 2020 data point is excluded from the trend analysis.*[6,7]

* *Indicates that the AAPC is significantly different from zero at α=0.05 level.*

Many researchers have noted relatively higher increases in overweight- and obesity-related cancers in younger age groups.[9-11] This has been widely posited as evidence of a cohort effect related to obesity, as the obesity epidemic has been concentrated in younger age groups.[12] Data from New York generally support this observation (Figure 1). For all overweight- and obesity-related cancers, rates have declined steeply in the over-75 age group, declined modestly in the 65-74 age group, increased modestly in the 50-64 age group, and increased substantially in the 20-49 age group. However, when colorectal cancer is excluded, rates have increased in all age groups except the over 75 age group in recent years, with the largest annual percentage increase of 2.4% in the 20-49 age group. Colorectal cancer rates decreased in all age groups except the 20-49 age group, which saw a statistically significant annual percent increase of 2.1%.

The long-term trends in overweight- and obesity-related cancers excluding colorectal by county are shown in Figure 2. There are five levels of shading in the map with the darker cyan representing a decreasing trend in the incidence rates of overweight- and obesity-related cancers (excluding colorectal

Figure 2 County map of the average annual percentage change (AAPC, %) in overweight- and obesity-related cancers excluding colorectal cancer, New York State, 2006-2019.



cancer) and the dark orange representing counties with a higher increasing trend in incidence. The different shade levels do not represent statistical differences between counties.

New York State Department of Health Initiatives

Health Equity

Social determinants of health are the conditions in which people are born, grow, work, live, and age. Disparities in obesity underscore the need to address these conditions, remove barriers to health, advance health equity, and reduce the burden of chronic disease in New York State. Strategies to address obesity should focus on improving the conditions, as well as the set of systems shaping conditions, for groups experiencing the greatest disparities. Preventing and reducing the burden of chronic diseases is part of the New York State Prevention Agenda 2019-2024.[13] One of our major goals is to create community environments, policies, and systems that support healthy food and beverage choices, and safe and accessible physical activity opportunities. In addition, we need to increase efforts to reduce health disparities and inequities.

Prevention Agenda 2019-2024

The New York State Prevention Agenda 2019-2024[13] (https://health.ny.gov/prevention/prevention_agenda/2019-2024/) was released in 2019. It sets goals to improve the health of New Yorkers in five priority areas and to reduce health disparities. One priority area is to prevent chronic diseases. The two focus areas within this priority are 1) improving healthy eating and food security, and 2) increasing physical activity, with the same overarching goal of reducing obesity and risk of chronic diseases.

The specific aims for the focus area of healthy eating and food security include 1) increasing access to healthy and affordable foods and beverages; 2) increasing skills and knowledge to support healthy food and beverage choices; and 3) increasing food and nutrition security. Objectives in this focus area call for reducing the percentage of children and adults who are obese, decreasing the percentage of adults who consume one or more sugary drinks per day, and decreasing the percentage of adults who consume less than one fruit and less than one vegetable per day.

The specific goals for the focus area of physical activity are for people of all ages and abilities. They include 1) improving community environments that support active transportation and recreational physical activity; 2) promoting school, child care, and worksite environments that support physical activity; and 3) increasing access to safe indoor and/or outdoor places for physical activity. Objectives in this focus area call for reducing the percentage of children and adults who are obese, increasing the percentage of adults age 18 years and older who participate in leisure-time physical activity, increasing the percentage of adults who meet the aerobic and muscle strengthening physical activity guidelines, increasing the percentage of adults age 18 and over who walk or bike to get from one place to another, and increasing the percentage of high school students who were physically active for a total of at least 60 minutes/day on all 7 days.

The Prevention Agenda acknowledges the necessary role of multiple sectors in accomplishing these objectives. Sectors within which activities can be conducted to reduce illness, disability and deaths related to obesity include the health care delivery system; employers, businesses and unions; the media; academic institutions; community-based health and human service agencies; governmental and non-governmental public health agencies; policy makers and elected officials; community members; and philanthropic organizations.

Obesity Prevention Programs and Activities

The New York State Department of Health works with many partners and contractors to develop and implement a range of obesity prevention programs in community, child care, school and heath care settings:

- The *Hunger Prevention and Nutrition Assistance Program* provides funding to 42 contractors that support approximately 2,700 emergency food programs. These contractors provide nutritious food to those in need throughout New York State. This program supports eight regional food banks, food pantries, soup kitchens and shelters. Its policies assure that healthy foods, such as fresh produce, low-fat milk and whole grain cereals are available through these organizations. This program also supports the implementation of the *Just Say Yes to Fruits and Vegetables initiative*, nutrition education workshops, and food demonstrations at the food banks. In addition, the program supports policy, systems and environmental strategies to improve access to healthier foods and physical activity and reduce consumption of sugary beverages. The *Just Say Yes* initiative helps to ensure low-income families in New York eat nutritious foods, make the most of their food budgets and prepare foods safely. Workshops provide practical nutrition information using the lesson plans approved by the United States Department of Agriculture, as well as recipes and cooking demonstrations focusing on fruits, vegetables and low-fat ingredients.

- The *Nourish New York Initiative* is administered by the *Hunger Prevention and Nutrition Assistance Program* in partnership with the Department of Agriculture and Markets. Currently, there are 39 *Hunger Prevention and Nutrition Assistance Program* grantees that also receive *Nourish New York* funding, with two additional *Nourish New York* grantees. This initiative provides a total of $50M annually for the purchase and distribution of New York State grown or produced food items. These products are purchased through New York State farmers and distributed through the approximately 2,700 emergency food programs in the State.

- The *New York State Special Supplemental Nutrition Program for Women, Infants and Children* aims to ensure the health and well-being of income eligible families with young children. The Program has 85 local providers (hospitals, local health departments, and community-based organizations) at 364 service sites. It provides breastfeeding support, nutrition counseling, health education, health care referrals, referrals to other services, and nutritious foods to approximately 430,00 women, infants, and children each month. These food benefits are tailored to each participant and are valued at over $300 million annually. They can be redeemed at more than 2,800 authorized retail food vendors

across the state. The Department has developed initiatives that assist participants in achieving healthier lifestyles and contribute to decreasing overweight and obesity.

- The *New York State Child and Adult Care Food Program* provides reimbursement to childcare and day care programs that serve nutritious meals and snacks to children and adults in care. The Meal Pattern was implemented to establish nutrition requirements that align more closely with the Dietary Guidelines for Americans and with recommendations for preventing overweight and obesity in early childhood.
    - The *Eat Well Play Hard in Child Care Settings Program* is funded by the United States Department of Agriculture Supplemental Nutrition Assistance Program Nutrition Education and Obesity Prevention program. It is administered by the New York State Department of Health's *Child and Adult Care Food Program* in partnership with the New York State Office of Temporary and Disability Assistance. It is a nutrition education and obesity prevention intervention in childcare centers who participate in the *Child and Adult Care Food Program* and serve low-income children and their families.
    - The *Farm to Preschool Initiative* is a part of *Eat Well Play Hard in Child Care Settings Program*. *Farm to Preschool* is designed to address barriers to eating fresh produce. The intervention includes six components, one of which is to establish a method of produce distribution which includes live recipe demonstrations to highlight how to use bountiful seasonal produce in meals and snacks at home. For those centers with on-site markets, educators conduct the recipe demonstrations alongside the produce vendor(s), highlighting the most abundant fruits or vegetables available for purchase or distribution.
    - The primary focus of the *Eat Well Play Hard in Child Care Settings Farm to Preschool Evaluation* is to assess the initiative's impact in helping parents of children enrolled in *Child and Adult Care Food Program*-eligible centers access, purchase, and eat more fresh fruits and vegetables. The survey collected information about accessibility, availability, and other purchasing related behaviors. It also contained open-ended questions. The questions are developed to better understand the facilitators and barriers to access fresh fruits and vegetables, and how to promote healthy eating behaviors among parents, center staff, and children. Feedback from participants help make informed programmatic improvements.
- New York State Department of Health is funded by the Centers for Disease Prevention and Control to conduct activities as part of the *State Physical Activity and Nutrition Program*. This five-year project began September 30, 2023. The program uses a policy, systems, and environmental change approach, collaborate with partners, and inform and scale evidence-based initiatives. Through this project, the Department is charged with promoting healthy food service guidelines and nutrition standards, expanding fruit and vegetable prescription programs, integrating obesity prevention into Early Care and Education settings, implementing continuity of care for breastfeeding families, and designing communities to increase access to physical activity. Much of this work is carried out through two Department-funded initiatives.

- *Creating Healthy Schools and Communities* is a comprehensive, community-based participatory approach to increasing opportunities for physical activity and improved nutrition for people across the age span. This program supports twenty-five grantees. The grantees establish and expand local public health efforts to implement evidence-based physical activity and nutrition strategies that build on existing community assets and coalitions in high-need communities of New York State. A Physical Activity and Nutrition Center of Excellence provides training, technical assistance, and support to the grantees.

- *Breastfeeding Friendly New York* funds nine local organizations to increase breastfeeding initiation, exclusivity and duration. These organizations advance policy, system and environmental changes to protect and promote breastfeeding in health care practices, worksites and public places. They seek to reduce racial/ethnic and communities' disparities in breastfeeding. Moreover, the Department awards the Breastfeeding Friendly Practices designation to pediatric, family, and obstetric/gynecologic provider practices that have meet specific standards for breastfeeding policies and procedures in outpatient settings.

- *Social marketing and out of home media campaigns* encourage healthy lifestyle changes such as decreasing consumption of sugar-sweetened beverages, promoting water as the beverage of choice and encouraging families to engage in regular physical activity throughout New York State. The target audiences are young, low-income men (18-34 years of age) and families of African American or Hispanic descent. The multi-modal campaigns feature advertisements on TV, radio, social media, billboards, buses, subways and shopping malls.

- The *iChoose600® Media Campaign* was developed to increase consumer awareness about calories in chain restaurants and to provide consumers with guidance on selecting meals within daily calorie recommendations.

- For more information about these initiatives, please visit https://www.health.ny.gov/prevention/obesity/prevention_activities/

Comprehensive Cancer Control Plan

The New York State Comprehensive Cancer Control Plan 2018-2023[14] was created as a guide to identify and address the cancer burden in New York State. The Plan was developed by the New York State Cancer Consortium, a statewide network of individuals and organizations from the public and private sectors that collaborate to reduce the human and economic burden of cancer in New York. The New York State Department of Health is a major partner in and facilitator of/for the Consortium. Focused on the health outcomes of cancer, the Plan includes measurable objectives and suggested strategies for meeting the objectives, including evidence-based and evidence-informed interventions, and best and promising practices. The Plan is structured around seven priority areas spanning the cancer continuum, including cancer-related health equity, health promotion and cancer prevention, early detection, treatment, and survivorship. The health promotion and cancer prevention priority area includes specific goals for the reduction of obesity, risk factors for obesity, and behaviors that contribute to obesity. The Plan suggests various strategies to meet these goals, including 1) promote policies and initiatives that

increase opportunities for physical activity; 2) promote policies and initiatives that increase access to affordable, nutritious foods; 3) promote health plan coverage of medical nutrition therapy and lifestyle change programs (e.g., diabetes prevention programs) that help individuals eat healthier and get more physical activity; and 4) promote and support primary care practices to screen patients on their nutritional and physical activity needs and make appropriate referrals to community-based resources.

Conclusion

The burden of overweight- and obesity-related cancer among New Yorkers is high and growing, even as incidence rates of other cancers collectively trend downward. The upward trend is more pronounced among persons under age 50, even though this age group represents a small proportion of the total cancers. The overall decrease in colorectal cancer incidence reflects the success of colorectal cancer screening. The increase in colorectal cancer incidence in the 20-49 age group underscores the importance of initiating screening at age 45. All of these findings are consistent with the national picture[5,15] and logically follow from increases of overweight and obesity rates in the U.S. in recent decades. In order to stem this trend, comprehensive cancer control strategies must continue to include components to promote healthy weight.

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