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# Diabetes in New York State

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# Executive Summary

The State Health Innovation Plan, New York's roadmap for achieving the "Triple Aim" of better care, better population health and lower health care costs, describes the prevalence of diabetes as "arguably our biggest looming health challenge."<sup>1</sup> The numbers of New Yorkers currently diagnosed with the disease and the costs of caring for them, especially in the Medicaid program, underscore the magnitude of the challenge.

For the three years ending in 2013, according to federal government data, approximately 1.6 million adult New Yorkers a year had been diagnosed with diabetes. The State Department of Health (DOH) estimates that another 760,000 New Yorkers have the disease but do not know it. In addition, DOH estimates that 5 million New Yorkers have prediabetes, which is marked by higher-than-normal blood-sugar levels and indicates an elevated risk of developing diabetes, early heart disease and stroke. The federal Centers for Disease Control and Prevention (CDC) estimates that without lifestyle changes to reduce the risk of diabetes, 15 to 30 percent of individuals with prediabetes, or 750,000 to 1.5 million New Yorkers, will develop Type 2 diabetes within five to ten years.

Federal health survey data indicate an average 10.3 percent of New York adults had been diagnosed with diabetes over the three-year period ending in 2013. Over this time period, average annual diabetes prevalence in New York was slightly higher among men than women. Prevalence rates were higher among older New Yorkers than among those of middle age or younger; among African Americans compared to other racial groups; and among the poorest and the least educated New Yorkers. Diabetes was least common among New Yorkers in the 25-34 age range, white individuals, those earning \$50,000 or more a year, and those who have graduated from college.

In State Fiscal Year (SFY) 2013-14, diabetes-related costs incurred by approximately 460,000 New York Medicaid recipients diagnosed with the disease totaled over \$1.2 billion. In December 2012, DOH said diabetes had "reached epidemic proportions in New York State." DOH says the overall annual cost of diabetes in New York, attributable to both direct medical costs and lost productivity, is \$12 billion for all payers, including Medicaid. According to DOH data, for the three years ending in 2013, the unadjusted rates of hospitalizations for diabetes among New York Medicaid recipients were highest in Seneca, Bronx, Niagara, New York and Chemung counties and lowest in Tioga, Schuyler, Washington, Delaware and Yates counties.

DOH recorded 4,035 diabetes deaths in New York in 2013, the most recent year for which data are available. The number of deaths at least partially attributable to the disease is likely greater: the CDC indicates that diabetes may be underreported as a

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<sup>1</sup> See the New York State Health Innovation Plan, page 92, available at [www.health.ny.gov/technology/innovation\\_plan\\_initiative/docs/ny\\_state\\_health\\_innovation\\_plan.pdf](http://www.health.ny.gov/technology/innovation_plan_initiative/docs/ny_state_health_innovation_plan.pdf).

cause of death because only about 35 to 40 percent of people with diabetes who died had diabetes listed anywhere on their death certificates, and about 10 to 15 percent had it listed as the underlying cause of death.

Comparing State and national data, New York's annual adjusted diabetes death rates have been consistently lower than national rates for each of the last ten years. Both State and national diabetes death rates are significantly lower than they were ten years ago, despite some increase from 2010 to 2013. The highest average annual diabetes death rates in New York for the three years ending in 2013 are in a number of rural or semi-rural upstate counties, including Franklin, Genesee, Allegany and Wyoming. In New York City, average annual diabetes death rates were highest in the Bronx and Brooklyn, while those in Queens and Manhattan were below the statewide average. The rates in the Bronx and Brooklyn were only slightly lower than the highest diabetes death rates in the State.

While deaths and high costs resulting from diabetes are more common in adults, the disease is also one of the most common chronic illnesses in school-aged children, according to the CDC and the National Institutes of Health (NIH). Type 1 diabetes, which accounts for approximately 5 percent of all diagnosed cases of diabetes, is the leading cause of diabetes in children of all ages. However, as more children and adolescents become overweight or obese and inactive, the CDC and the NIH note that Type 2 diabetes is occurring more often among young people aged 10 or older.

New York's diabetes prevention activities are significant and have been sustained over many years, with millions of State and federal dollars invested in such initiatives each year. At the same time, according to the State Health Innovation Plan, prevention efforts for diabetes and other chronic conditions "clearly have room for improvement." Preventing diabetes remains a challenge not only in New York but across the country; nationally, the rate of noninstitutionalized adults with diagnosed diabetes has risen practically every year since 1996.

One of seven states that received the first federal funding for diabetes control in 1977, New York received nearly \$2.9 million in dedicated diabetes funding from the CDC in SFY 2014-15. Recent State budgets have supplemented federal diabetes funding with General Fund support, both for programs aimed at diabetes directly and for broader programs that address a variety of diseases and health issues.

For example, the SFY 2014-15 Enacted Budget included \$8.4 million in State funding for various local obesity and diabetes programs, as well as State and federal Medicaid funding totaling \$18 million for the State's public health improvement program. This latter initiative supports the State Prevention Agenda 2013-2017, DOH's current five-year plan for improving the health of all New Yorkers, which contains a number of diabetes-related objectives. These objectives include increasing the percentage of adults tested for high blood sugar or diabetes and reducing the rates of hospitalizations for short-term diabetes complications for children and adults. A total of 67 organizations statewide, including health plans, hospitals, local YMCAs and county

health departments, participate in the CDC's National Diabetes Prevention Program. The program encourages the use of evidence-based methods to help adults prevent or delay the onset of Type 2 diabetes by choosing healthier foods, becoming more physically active and improving problem-solving and coping skills. In addition, the CDC and the American Medical Association (AMA) recently launched a new, multiyear initiative to refer patients with prediabetes to evidence-based diabetes prevention programs.

DOH's 2008-2012 prevention plan also sought to reduce the rate of diabetes-related hospitalizations for children and adults, as well as overall diabetes prevalence in adults. However, results for all three objectives "moved in the wrong direction and remain substantially higher than the Prevention Agenda targets," according to DOH's progress report on the plan, which was presented in February 2012. DOH's ongoing efforts to combat diabetes include working to help New Yorkers keep their blood glucose under control, increasing diabetes screening in the Medicaid managed care program, and teaching adults with diabetes to manage the disease on their own more effectively.

DOH deserves credit for openly acknowledging the ongoing challenge of diabetes prevention and the insufficient progress in meeting this challenge. One of the keys to DOH's diabetes objectives – as outlined in its 2013-2017 prevention agenda – is the successful implementation of specific evidence-based diabetes care projects by networks of providers participating in New York Medicaid's Delivery System Reform Incentive Payment (DSRIP) program. The DSRIP program, the centerpiece of an agreement with the federal government through which the State expects to receive an estimated \$8 billion in additional federal health care funding, seeks to reduce avoidable hospital use by 25 percent by April 2020 and to improve health outcomes for the State's Medicaid population.

Meeting these goals will require steps such as the further transformation of patient care systems that historically have been resistant to change, greater utilization of primary care, and further development of community-based services that emphasize prevention and coordinated care. The State's success in addressing those goals will drive progress in the fight against diabetes – and greater success in battling the disease is a critical step in meeting New York's broader health care objectives.

Given the high costs of diabetes, both human and fiscal, the battle against the disease remains an important priority for New York.

# Diabetes in New York State

The State's approach to improving overall health care quality in New York involves a number of major initiatives, such as the Prevention Agenda 2013-2017, the Medicaid Waiver Amendment, the State Health Innovation Plan and the Population Health Improvement Program. These initiatives are part of New York's ongoing efforts to achieve the "Triple Aim" of enhancing the quality of care, improving population health and lowering health care costs, as set forth by the federal government.

One of the keys to achieving Triple Aim goals is preventing chronic conditions such as diabetes, which has been increasing at a faster pace in New York than in the rest of the country and is "arguably our biggest looming health challenge," according to the State Health Innovation Plan.<sup>2</sup> DOH says diabetes "has reached epidemic proportions" in New York and "threatens to overwhelm New York's health care system and affect an entire generation."<sup>3</sup> This report provides key measures of the diabetes challenge in New York, both human and budgetary, and summarizes State efforts to address it.

For the purposes of this report, diabetes refers to a group of metabolic disorders that result in too much sugar (glucose) in the blood, which can lead to a range of serious health consequences, including vision loss, nerve damage and numbness, high blood pressure, kidney disease, heart disease and death. Type 1 diabetes, once known as juvenile diabetes, arises when the pancreas does not produce insulin, a hormone that enables the body to process glucose, and affects 5 to 10 percent of diabetics. The most common form, Type 2 or adult-onset diabetes, occurs when the body does not use insulin properly (insulin resistance) and accounts for over 90 percent of cases.

## ***Prevalence of Diabetes and Prediabetes in New York***

This report uses several primary sources of information to quantify the prevalence of diabetes in New York State and other aspects of the disease. Data sources include: the CDC's Behavioral Risk Factor Surveillance System (BRFSS) for estimates of the number of State residents diagnosed with diabetes;<sup>4</sup> annual vital statistics tables available on the DOH website for the numbers of New Yorkers who have died from

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<sup>2</sup> See New York State Health Innovation Plan, page 92, available at [www.health.ny.gov/technology/innovation\\_plan\\_initiative/docs/ny\\_state\\_health\\_innovation\\_plan.pdf](http://www.health.ny.gov/technology/innovation_plan_initiative/docs/ny_state_health_innovation_plan.pdf).

<sup>3</sup> See New York State Prevention Agenda 2013-2017, Development of the Prevention Agenda 2013-2017, new York State Health Assessment 2012, Contributing Causes of Health Challenges, pages 23 and 26, available at [www.health.ny.gov/prevention/prevention\\_agenda/2013-2017/docs/challenges.pdf](http://www.health.ny.gov/prevention/prevention_agenda/2013-2017/docs/challenges.pdf).

<sup>4</sup> The BRFSS uses landline and cellphone surveys to determine the state-level prevalence of many major health risks – including diabetes – among adults. New York's annual BRFSS survey includes the question "Have you ever been told by a doctor that you have diabetes?" to assess whether the survey respondent has been diagnosed with diabetes. Due to the nature of the survey, the BRFSS numbers are somewhat imprecise, suggesting a range of likely prevalence numbers and rates rather than definitive counts and percentages. The 2012 and 2013 BRFSS data reflect changes initially made in 2011 in weighting methodology and the addition of cellphone-only respondents. For data analysis, the CDC indicates that the 2011 BRFSS data should be considered a baseline year and, along with the 2012 and 2013 data, are not directly comparable to previous years of data.

diabetes;<sup>5</sup> New York's Medicaid Data Warehouse (MDW) for diabetes-related Medicaid expenditures;<sup>6</sup> and Medicaid data workbooks prepared by DOH and the Salient Management Company, a DOH contractor, in connection with the State's DSrip program.<sup>7</sup> Data presented in this report corresponds to the three-year period 2011 through 2013, the most recent available, unless otherwise noted.<sup>8</sup>

BRFSS data show that approximately 10.3 percent of adult New Yorkers, or about 1.6 million individuals, have been told by a doctor that they have diabetes.<sup>9</sup> This rate exceeded the comparable three-year nationwide average of 9.6 percent, but was lower than the three-year average for 17 states.<sup>10</sup>

As shown in Figure 1, BRFSS data also indicate that the percentage of adult men with diabetes in New York and nationally was higher than the percentage of adult women with the disease. The prevalence of diabetes among adult New Yorkers increases with age, rising from 0.9 percent of individuals in the 25-34 age range, to 5.4 percent between 35 and 44, 11.3 percent between 45 and 54, 16.6 percent between 55 and 64, and 22.8 percent among those who were 65 or older, according to CDC data. These rates are all higher than comparable national rates.

Racial and ethnic minorities are disproportionately affected by diabetes, especially among the elderly, according to CDC data and the State Medicaid Redesign Team's Health Disparities Work Group.<sup>11</sup> Among racial groups, the prevalence of diabetes was highest for black adults, at 14.2 percent, compared to 11.4 percent among

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<sup>5</sup> See DOH website for New York State vital statistics data, available at [www.health.ny.gov/statistics/vital\\_statistics/](http://www.health.ny.gov/statistics/vital_statistics/), accessed April 29, 2015. DOH's annual vital statistics tables include population data by county, age and sex, as well as mortality information by cause of death, county, age and sex.

<sup>6</sup> The MDW is part of the mechanized claims processing and information retrieval system that states are required to have by the federal Centers for Medicare & Medicaid Services (CMS) and is the central point for reference, research and analysis of the New York State Medicaid program by the State Health Department (DOH) and other agencies and organizations, including the Office of the State Comptroller. For the purposes of this report, the Office of the State Comptroller accessed the MDW for Medicaid data on individuals diagnosed with diabetes at any time during the period from April 1, 2008 through March 31, 2014.

<sup>7</sup> See DOH website for Medicaid data workbooks, available at [www.health.ny.gov/health\\_care/medicaid/redesign/dsrip/performance\\_data/salient\\_performance\\_data.htm](http://www.health.ny.gov/health_care/medicaid/redesign/dsrip/performance_data/salient_performance_data.htm). Data accessed on May 26, 2015 and June 10, 2015.

<sup>8</sup> DOH's data use policy requires the following statement: "The New York State Department of Health makes no representation, warranty or guarantee relating to the data or analyses derived from these data." These data appear throughout this report.

<sup>9</sup> Figures reflect the averages for the three years ending in 2013. See CDC Behavioral Risk Factor Surveillance System, Prevalence and Trends Data, Chronic Health Indicators – All Years – All States, available at <http://apps.nccd.cdc.gov/BRFSS/list.asp?cat=CH&yr=0&qkey=8151&state=NY>, for prevalence data and DOH website for New York State vital statistics data, referenced above, for population data on the number of adult New Yorkers. The CDC uses age, sex, categories of ethnicity, geographic regions within states, marital status, education level, home ownership and type of phone ownership to weight BRFSS data. See CDC FAQ – Frequently Asked Questions #15, available at [www.cdc.gov/brfss/about/brfss\\_faq.htm](http://www.cdc.gov/brfss/about/brfss_faq.htm).

<sup>10</sup> See Appendix A for BRFSS data on average adult diabetes prevalence rates by state.

<sup>11</sup> See DOH report on the final recommendations of the Medicaid Redesign Team's Health Disparities Work Group, page 25, available at [www.health.ny.gov/health\\_care/medicaid/redesign/docs/health\\_disparities\\_report.pdf](http://www.health.ny.gov/health_care/medicaid/redesign/docs/health_disparities_report.pdf). Governor Cuomo created the Medicaid Redesign Team (MRT) by Executive Order in 2011 to identify ways to control costs and improve the health of Medicaid participants. The State is implementing a multiyear Medicaid reform action plan developed by MRT stakeholders and various work groups including the Health Disparities Work Group.

Hispanics and 8.4 percent among white adults. The rates of diabetes among adult Hispanics and blacks in New York were higher than comparable national averages.

BRFSS data indicate that adult New Yorkers in the lowest income category, less than \$15,000 a year, had the highest prevalence of diabetes, 15.9 percent, while adult New Yorkers with incomes of \$50,000 or more had the lowest prevalence of the disease at 6.4 percent. By education level, diabetes was most common among adult New Yorkers with less than a high school education: 18.1 percent versus 6 percent of adult New Yorkers who graduated from college. Except for college graduates, New York's average diabetes rates by education level exceeded comparable national rates.

**Figure 1**

**BRFSS Estimates of Adults Ever Told by a Doctor That They Have Diabetes**  
 (by average percentage for the three years ending in 2013)

Year	New York	U.S.
<b>Overall</b>	10.3	9.6
<b>By Gender</b>		
<b>Male</b>	10.5	10.1
<b>Female</b>	10.0	9.3
<b>By Age</b>		
<b>18-24</b>	NA	0.6
<b>25-34</b>	0.9	2.2
<b>35-44</b>	5.4	5.1
<b>45-54</b>	11.3	9.7
<b>55-64</b>	16.6	15.9
<b>65+</b>	22.8	20.8
<b>By Race</b>		
<b>White</b>	8.4	9.2
<b>Black</b>	14.2	13.5
<b>Hispanic</b>	11.4	9.5
<b>Other</b>	12.0	9.3
<b>Multi-Racial</b>	NA	10.6
<b>By Annual Income</b>		
<b>Less than \$15,000</b>	15.9	14.7
<b>\$15,000- 24,999</b>	13.7	12.9
<b>\$25,000- 34,999</b>	11.8	11.2
<b>\$35,000- 49,999</b>	11.2	9.5
<b>\$50,000+</b>	6.4	6.6
<b>By Education</b>		
<b>Less than H.S.</b>	18.1	14.5
<b>H.S. or G.E.D.</b>	11.3	10.8
<b>Some post-H.S.</b>	9.5	9.2
<b>College graduate</b>	6.0	6.5

Source: CDC Behavioral Risk Factor Surveillance System.

In addition to the approximately 1.6 million adult New Yorkers diagnosed with diabetes, an estimated 760,000 adult New Yorkers have the disease but do not know it,<sup>12</sup> and five million New Yorkers have been diagnosed with prediabetes.<sup>13</sup> A person with prediabetes has a blood-sugar level that is higher than normal, but not high enough for a diabetes diagnosis.<sup>14</sup>

The CDC says persons with prediabetes are at higher risk for developing Type 2 diabetes and other serious health problems, including heart disease and stroke.<sup>15</sup> According to the CDC, without certain lifestyle changes such as weight loss and moderate physical activity, 15 to 30 percent of individuals with prediabetes, or between 750,000 and 1.5 million New Yorkers, will develop Type 2 diabetes within five years.<sup>16</sup>

While Type 1 diabetes is the leading cause of the disease in children of all ages, the CDC and the NIH say Type 2 diabetes is occurring more often among young people aged 10 or older, as more children and adolescents become overweight or obese and inactive.<sup>17</sup> Recent federal research found that, in 2009, 10.6 percent of an estimated 191,986 U.S. youth with diabetes had Type 2 diabetes.<sup>18</sup> During 2008 and 2009, 21.6 percent of new cases of diabetes among people younger than 20 years were for Type 2 diabetes.<sup>19</sup>

## ***Diabetes Deaths in New York State***

DOH recorded 4,035 diabetes deaths in New York in 2013, the last year for which data are available.<sup>20</sup> However, the CDC indicates that diabetes generally may be underreported as a cause of death because, nationwide, only about 35 to 40 percent of people with diabetes who died from 2000 through 2002 had diabetes listed anywhere on the death certificate and about 10 to 15 percent had it listed as the underlying cause of death.<sup>21</sup>

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<sup>12</sup> See DOH publication, "Vision Impairment and Diabetes, 5 Key Messages," key message #1, available at [www.health.ny.gov/publications/0939.pdf](http://www.health.ny.gov/publications/0939.pdf).

<sup>13</sup> See DOH public health toolkit news release and public service announcement templates, revised March 2015, at [www.health.ny.gov/press/public\\_health\\_toolkit/news\\_and\\_psa\\_templates/2015\\_spring/psa/all\\_psas.pdf](http://www.health.ny.gov/press/public_health_toolkit/news_and_psa_templates/2015_spring/psa/all_psas.pdf).

<sup>14</sup> See CDC publication "Prediabetes – Could It Be You?" available at [www.cdc.gov/diabetes/pubs/statsreport14/prediabetes-infographic.pdf](http://www.cdc.gov/diabetes/pubs/statsreport14/prediabetes-infographic.pdf).

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

<sup>17</sup> See Overview of Diabetes in Children and Adolescents from the National Diabetes Education Program of the NIH and the CDC, available at [http://ndep.nih.gov/media/Overview-of-Diabetes-Children-508\\_2014.pdf](http://ndep.nih.gov/media/Overview-of-Diabetes-Children-508_2014.pdf).

<sup>18</sup> See "Prevalence of Diabetes in U.S. Youth in 2009: the SEARCH for Diabetes in Youth Study," available at <http://care.diabetesjournals.org/content/37/2/402.long>.

<sup>19</sup> See CDC's National Diabetes Statistics Report 2014, available at [www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf](http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf).

<sup>20</sup> See DOH website for New York State vital statistics data for 2013, available at [www.health.ny.gov/statistics/vital\\_statistics/2013/table31a.htm](http://www.health.ny.gov/statistics/vital_statistics/2013/table31a.htm), accessed April 29, 2015.

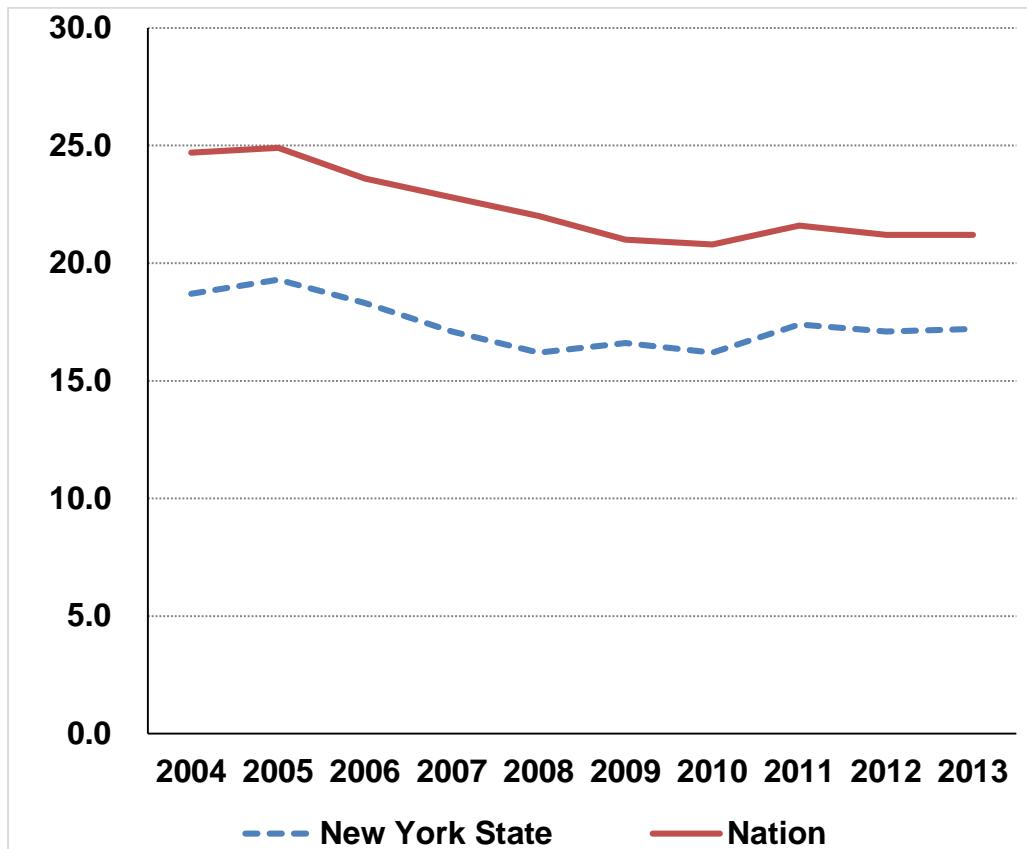
<sup>21</sup> See CDC's National Diabetes Statistics Report, 2014, available at [www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf](http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf).

Comparing age-adjusted State and national data from 2004 through 2013, New York's rates of reported diabetes deaths have been consistently lower than national rates for each of the last ten years, as shown in Figure 2.<sup>22</sup>

**Figure 2**

**New York and National Diabetes Death Rates by Year**

(Age-adjusted diabetes deaths per 100,000 population)



Sources: NYS DOH vital statistics reports, and CDC mortality data and vital statistics reports.

Figure 2 also shows that current State and national diabetes death rates are significantly lower than they were ten years ago, despite modest increases since 2010.

Average annual diabetes death rates for 2011 through 2013 were 17.2 deaths per 100,000 population in New York State as a whole, reflecting a rate of 20.4 in New York City and 15.3 in the rest of the State, while the national rate was 21.3. For 2004 through 2006, average annual rates were 18.8, 21.1 and 17.3 in the State, the City and the rest of the State, respectively, while the national rate was 24.4 per 100,000 population. (Three-year averages are used to smooth annual fluctuations.)

<sup>22</sup> According to the CDC, "Age adjustment is a technique for 'removing' the effects of age from crude rates so as to allow meaningful comparisons across populations with different underlying age structures." See CDC FAQ - Frequently Asked Questions #6, available at <http://wonder.cdc.gov/wonder/help/faq.html#6>.

Over the last three years for which data are available, the highest average annual diabetes death rates in New York were found in a number of rural or semi-rural upstate counties including Franklin, Genesee, Allegany and Wyoming. Within New York City, the highest death rates were in the Bronx and Brooklyn, both well above the statewide average.<sup>23</sup>

### ***Diabetes Hospitalizations among New York Medicaid Recipients***

Hospitalizations for diabetes are another key indicator of the human impact of the disease, and an important factor driving the cost of diabetes for the Medicaid system and for purchasers of private health insurance. Statewide, unadjusted rates of Medicaid hospitalizations for diabetes or lower-extremity amputations among patients with diabetes averaged about 386 per 100,000 enrollees, according to DOH data.<sup>24</sup>

Two counties, Seneca and Bronx, had hospitalization rates more than 25 percent above the statewide average. Other counties with the highest average unadjusted Medicaid hospitalization rates for diabetes and lower-extremity amputations among adults with diabetes were Niagara, New York and Chemung, while the lowest rates occurred in Tioga, Schuyler, Washington, Delaware and Yates counties, as shown in Figure 3.

**Figure 3**

#### **Average Medicaid Hospitalizations for Diabetes Among Adult Enrollees**

(for Calendar Years 2011, 2012 and 2013; unadjusted rates per 100,000 enrollees)

County	Hospitalizations for Diabetes	Medicaid Population	Diabetes Hospitalization Rate
<b><u>Five Highest</u></b>			
Seneca	25	4,340	576.0
Bronx	2,908	525,041	553.8
Niagara	155	32,424	478.0
New York (Manhattan)	1,639	364,179	450.0
Chemung	65	16,036	403.3
<b><u>Five Lowest</u></b>			
Tioga	11	7,074	160.2
Schuyler	5	3,174	157.5
Washington	12	7,905	151.8
Delaware	9	7,176	125.4
Yates	3	3,486	95.6
<b>Statewide</b>	<b>15,006</b>	<b>3,885,171</b>	<b>386.2</b>

Source: NYS DOH DSRIP performance data.

<sup>23</sup> Appendix B provides average diabetes death rates for all counties in the State for the three years ending in 2013.

<sup>24</sup> See DOH DSRIP Performance Data, Medicaid Inpatient Prevention Quality Indicators for Adult Discharges by Patient County: Beginning 2011, available at [www.health.data.ny.gov/Health/Medicaid-Inpatient-Prevention-Quality-Indicators-P/6kit-7svn](http://www.health.data.ny.gov/Health/Medicaid-Inpatient-Prevention-Quality-Indicators-P/6kit-7svn), accessed June 10, 2015

Medicaid diabetes hospitalization rates in twelve counties exceeded the statewide average of 386.2 hospitalizations per 100,000 enrollees. Appendix C provides county-by-county data on average Medicaid hospitalization rates for diabetes.

## ***The Cost of Diabetes in New York***

Increases in the prevalence of diabetes are contributing to the growth in health care costs for employers, consumers and taxpayers. The CDC estimates that diabetes costs in the United States totaled \$245 billion in 2012: \$176 billion in direct medical costs and \$69 billion in indirect costs related to disability, work loss and premature death.<sup>25</sup>

In a 2012 written request to the federal government to reinvest federal Medicaid savings in the State's health care system, DOH estimated that diabetes costs New York \$12 billion a year in direct medical costs and lost productivity for all payers, including Medicaid.<sup>26</sup>

## ***Costs of Diabetes Among New York's Medicaid Recipients***

Diabetes-related costs for approximately 460,000 Medicaid recipients who were diagnosed with the disease and incurred diabetes-related Medicaid expenditures in SFY 2013-14 represent approximately 10 percent of DOH's estimated \$12 billion in overall diabetes spending in the State.<sup>27</sup>

Over the five-year period ending in March 2014, annual diabetes-related expenditures for Medicaid recipients with a diabetes diagnosis increased by \$293.7 million, or 31.0 percent (13.8 percent, adjusted for medical care cost inflation), to over \$1.2 billion, as shown in Figure 4.<sup>28</sup> Diabetes-related spending grew significantly faster than overall Medicaid expenditures – over the same time period, total New York Medicaid spending from all sources (federal, State and local governments) increased 20.6 percent (4.7 percent, adjusted for inflation).<sup>29</sup>

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<sup>25</sup> See CDC National Diabetes Statistics Report, 2014, page 8, available at [www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf](http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf).

<sup>26</sup> See New York State Medicaid Redesign Team Waiver Amendment Request, page 90, available at [www.health.ny.gov/health\\_care/medicaid/redesign/docs/2012-08-06\\_waiver\\_amendment\\_request.pdf](http://www.health.ny.gov/health_care/medicaid/redesign/docs/2012-08-06_waiver_amendment_request.pdf).

<sup>27</sup> Office of the State Comptroller analysis of Medicaid fee-for-service claims and managed care encounter data from DOH.

<sup>28</sup> Office of the State Comptroller analysis of Medicaid fee-for-service claims and managed care encounter data from DOH; see also U.S. Bureau of Labor Statistics Consumer Price Index (CPI) Detailed Reports for April 2008 through March 2009, and April 2013 through March 2014, utilizing the medical care expenditure category of the Consumer Price Index for all Urban Consumers, Northeast Region, available at [www.bls.gov/cpi/#tables](http://www.bls.gov/cpi/#tables).

<sup>29</sup> Office of the State Comptroller analysis of DOB Financial Plan documents and DOB data submissions for SFYs 2008-09 and 2013-14, and U.S. Bureau of Labor Statistics Consumer Price Index (CPI) Detailed Reports for April 2008 through March 2009, and April 2013 through March 2014, utilizing the medical care expenditure category of the Consumer Price Index for all Urban Consumers, Northeast Region, available at [www.bls.gov/cpi/#tables](http://www.bls.gov/cpi/#tables).

**Figure 4**

**Diabetes-Related Medicaid Expenditures in New York State  
by Category of Service**  
(in millions of dollars)

	SFY 2008-09	SFY 2013-14	Five-Year Change	Percentage Change
<b>Prescription Drugs</b>	\$295.3	\$540.5	\$245.1	83.0%
<b>Personal Care</b>	128.4	234.1	105.7	82.3%
<b>Inpatient</b>	139.2	137.2	-2.1	-1.5%
<b>Home Health</b>	206.5	109.7	-96.8	-46.9%
<b>Physician</b>	23.4	46.1	22.7	97.0%
<b>Clinic (non ER)</b>	36.0	45.4	9.4	26.1%
<b>Nursing</b>	76.7	32.7	-44.0	-57.4%
<b>Emergency Room</b>	1.4	3.2	1.8	125.0%
<b>Other Service Categories</b>	39.1	90.8	51.7	132.2%
<b>Total</b>	<b>\$946.1</b>	<b>\$1,239.8</b>	<b>\$293.7</b>	<b>31.0%</b>

Source: Office of the State Comptroller analysis of Medicaid fee-for-service claims and managed care encounter data from DOH.

Among specific service categories, prescription drugs represented the largest portion of the Medicaid program's diabetes-related expenses – growing from about \$295 million or 31.2 percent of overall diabetes-related Medicaid spending in SFY 2008-09 to over \$540 million or 43.6 percent in SFY 2013-14. Spending on inpatient hospital services, meanwhile, decreased from 14.7 percent of overall Medicaid diabetes-related expenses in SFY 2008-09 to 11.1 percent in SFY 2013-14. The decrease in inpatient spending likely reflects State efforts to reduce avoidable hospital use.

### **New York State's Response to Diabetes**

New York has engaged in diabetes prevention activities for many years, spending millions of dollars to battle the disease. However, according to the State Health Innovation Plan, New York's efforts to prevent diabetes, as well as other chronic conditions, "clearly have room for improvement."<sup>30</sup> Preventing diabetes remains a challenge not only in New York but across the country; nationally, the unadjusted rate of noninstitutionalized adults with diagnosed diabetes has risen in practically every year since 1996.<sup>31</sup>

<sup>30</sup> See the New York State Health Innovation Plan, page 41, available at [www.health.ny.gov/technology/innovation\\_plan\\_initiative/docs/ny\\_state\\_health\\_innovation\\_plan.pdf](http://www.health.ny.gov/technology/innovation_plan_initiative/docs/ny_state_health_innovation_plan.pdf). The New York State Health Innovation Plan was developed by DOH, the State Department of Financial Services, the State Civil Service Department, the State Office of Mental Health and the State Office of Alcoholism and Substance Abuse Services. In December 2014, DOH received a \$99.9 million federal award to implement the plan, which is considered to be New York's roadmap for achieving the "triple aim" of better care, better population health and lower health care costs.

<sup>31</sup> See CDC website for data on rates of civilian, noninstitutionalized adults with diagnosed diabetes in the United States, 1980-2011, available at [www.cdc.gov/diabetes/statistics/prev/national/figageadult.htm](http://www.cdc.gov/diabetes/statistics/prev/national/figageadult.htm).

New York was one of seven states that received the first funding from the CDC for a diabetes control program in 1977, according to the State's strategic plan for the prevention and control of the disease.<sup>32</sup> During its early years, the State's diabetes control program "focused on assessment of regional-level diabetes care resources and patient/provider education," but in 2001 the State "changed its name to [the] Diabetes Prevention and Control Program (DPCP) to reflect its new emphasis on primary prevention of diabetes."<sup>33</sup> The State's DPCP identifies three goals which, DOH says, align the program with CDC's national diabetes program framework:

1. Prevent Type 2 diabetes.
2. Prevent complications, disabilities and the burdens associated with diabetes.
3. Eliminate diabetes-related health disparities.<sup>34</sup>

State and federal diabetes prevention funding in New York, excluding the Medicaid program, totaled nearly \$11.3 million in SFY 2014-15. Spending on prevention efforts comprised:

- \$8.4 million in State funding, including \$4.4 million for a program called Creating Healthy Places to Live, Work and Play, which seeks to promote healthy lifestyles, and prevent obesity and Type 2 diabetes; \$1.9 million for Healthy Schools New York to increase physical activity and healthful eating; and \$1.2 million for obesity prevention in pediatric health care settings.
- \$2.9 million in federal funding from the CDC, including \$1.8 million for State and local public health activities to prevent obesity, diabetes, heart disease and stroke, and \$1.1 million for State public health activities to prevent and control diabetes, heart disease, obesity and associated risk factors.<sup>35</sup>

In addition, the SFY 2014-15 Enacted Budget provided \$18 million in State and federal Medicaid funding for New York's population health improvement program (PHIP) which, DOH says, helps support the State Prevention Agenda 2013-2017, New York's five-year plan for improving the health of all New Yorkers.<sup>36</sup>

The State Prevention Agenda 2013-2017 was developed at DOH's request by the New York State Public Health and Health Planning Council, and reflects the contributions of approximately 140 organizations across New York, including local health departments,

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<sup>32</sup> See New York State Strategic Plan for the Prevention and Control of Diabetes, page 7, available at [www.health.ny.gov/diseases/conditions/diabetes/docs/stateplandiabetes.pdf](http://www.health.ny.gov/diseases/conditions/diabetes/docs/stateplandiabetes.pdf).

<sup>33</sup> Ibid.

<sup>34</sup> See DOH's description of its Diabetes Prevention and Control Program, available at [www.health.ny.gov/prevention/prevention\\_agenda/chronic\\_disease/diabetes.htm](http://www.health.ny.gov/prevention/prevention_agenda/chronic_disease/diabetes.htm).

<sup>35</sup> Figures were provided by the DOH Bureau of Community Chronic Disease Prevention in a June 4, 2015 email message to the Office of the State Comptroller.

<sup>36</sup> See DOH Public Health Improvement Program Request for Applications, page 3, available at [www.grantsgateway.ny.gov/intelligents\\_nysgg/\\_upload/go\\_5000129.php\\_rfa\\_1405280128\\_final\\_with\\_addendum\\_1\\_and\\_2.pdf](http://www.grantsgateway.ny.gov/intelligents_nysgg/_upload/go_5000129.php_rfa_1405280128_final_with_addendum_1_and_2.pdf).

health care providers, health plans, community-based organizations, advocacy groups, academics and employers, as well as State agencies, schools and businesses.<sup>37</sup> The 2013-2017 Prevention Agenda includes diabetes-related objectives to:

1. Increase the percentage of adults who had a test for high blood sugar or diabetes within the past three years;
2. Increase the percentage of adult health plan members with diabetes whose blood glucose is in good control (hemoglobin A1C less than 9 percent);
3. Increase the percentage of Medicaid managed care plan members who received all four screening tests for diabetes;
4. Reduce the rate of hospitalizations for short-term diabetes complications; and
5. Increase by 5 percent the percentage of adults with diabetes who have taken a course or class to learn how to manage the condition.<sup>38</sup>

All objectives but the fourth – reducing hospitalization rates for short-term diabetes problems for children and adults – are new to the Prevention Agenda 2013-2017. In addition to reducing short-term diabetes hospitalization rates for children and adults, the original State prevention agenda for 2008-2012 also sought to reduce adult diabetes prevalence. However, results for all three diabetes-related objectives in the earlier plan “moved in the wrong direction and remain substantially higher than the Prevention Agenda targets,” according to a DOH assessment conducted to help develop the current State prevention agenda for 2013-2017.<sup>39</sup>

The lack of progress on diabetes prevention objectives cited as part of DOH’s original prevention agenda for 2008-2012, and documented in the development of DOH’s 2013-2017 prevention agenda, underscores New York’s ongoing struggle with preventing chronic conditions like diabetes. The objective in the State Prevention Agenda 2013-2017 of reducing the hospitalization rate for children with short-term diabetes complications to 3.06 per 10,000 children aged 6-17 by 2017 reflects little change from the actual children’s hospitalization rates of 3.1 and 3.2 achieved in 2012 and 2013, respectively.<sup>40</sup> The original State prevention agenda sought to reduce the

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<sup>37</sup>See DOH description of the New York State Prevention Agenda 2013-2017, available at [www.health.ny.gov/prevention/prevention\\_agenda/2013-2017/summary.htm](http://www.health.ny.gov/prevention/prevention_agenda/2013-2017/summary.htm).

<sup>38</sup> See the New York State Prevention Agenda 2013-2017, Preventing Chronic Diseases Action Plan, pages 23-26, available at [www.health.ny.gov/prevention/prevention\\_agenda/2013-2017/docs/prevent\\_chronic\\_diseases.pdf](http://www.health.ny.gov/prevention/prevention_agenda/2013-2017/docs/prevent_chronic_diseases.pdf).

<sup>39</sup> See paragraph immediately preceding Figure 18 in DOH document describing the progress to date on the New York State Prevention Agenda 2008-2012 (document is not paginated), available at [www.health.ny.gov/prevention/prevention\\_agenda/2013-2017/docs/progress\\_to\\_date.pdf](http://www.health.ny.gov/prevention/prevention_agenda/2013-2017/docs/progress_to_date.pdf).

<sup>40</sup> See DOH 2013-2017 Prevention Agenda Dashboard – State Level, available at [http://apps.health.ny.gov/doh2/applinks/ebi/SASStoredProcess/guest?program=/EBI/PHIG/apps/dashboard/pa\\_dashboard&p=str&ind\\_id=pa28\\_0](http://apps.health.ny.gov/doh2/applinks/ebi/SASStoredProcess/guest?program=/EBI/PHIG/apps/dashboard/pa_dashboard&p=str&ind_id=pa28_0).

rate from 3.1 to 2.3 by 2013.<sup>41</sup> The prevention agenda 2008-2012 also sought to reduce the adult diabetes prevalence rate from 8.2 to 5.7 by 2013, but the actual rate for 2012 was 9.7.<sup>42</sup>

The national equivalent to the State Prevention Agenda, Healthy People 2020,<sup>43</sup> has 20 diabetes-related objectives. Of those, 12 sets of results improved over various time periods from 1997 through 2013, including objectives to reduce diabetes death rates, increase diabetes education and increase self-monitoring of blood glucose. Six measures worsened, including objectives to reduce the number of new cases of diagnosed diabetes, increase the proportion of persons with diabetes whose condition has been diagnosed, and reduce the proportion of persons with diabetes with an A1C greater than 9 percent. There was no data related to two objectives.<sup>44</sup>

In developing its 2013-2017 Prevention Agenda, DOH decided to drop diagnosed diabetes prevalence as an indicator for measuring progress in fighting the disease. That decision was based on several factors, including the lack of a national Healthy People 2020 goal related to reducing diagnosed diabetes prevalence and the likelihood that some new prevention agenda strategies to improve diabetes detection (such as promoting screening for prediabetes and diabetes) would increase diagnosed diabetes prevalence over the four-year period. In addition, DOH concluded that another metric – adult obesity prevalence – would be a better indicator of success or failure of the Prevention Agenda strategies to prevent Type 2 diabetes.<sup>45</sup>

The 2013-2017 Prevention Agenda includes an objective to reduce the percentage of adult New Yorkers who are obese by 5 percent, from 24.5 percent in 2011 to 23.2 percent by December 31, 2017.<sup>46</sup> Reports on childhood obesity issued by the Office of the State Comptroller in 2012 and 2008 highlighted the numbers of children in New York who are overweight or obese and the escalating health care costs of the State's obesity epidemic.<sup>47</sup>

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<sup>41</sup> See DOH 2008-2012 Prevention Agenda Toward the Healthiest State, available at [www.health.ny.gov/prevention/prevention\\_agenda/chronic\\_disease/index.htm](http://www.health.ny.gov/prevention/prevention_agenda/chronic_disease/index.htm).

<sup>42</sup> The actual rate for 2012 was provided by the DOH Office of Public Health Practice in a February 4, 2015 email message to the Office of the State Comptroller.

<sup>43</sup> The U.S. Department of Health and Human Services unveiled Healthy People 2020 in December 2010 and described the initiative as the nation's new 10-year goals and objectives for health promotion and disease prevention.

<sup>44</sup> See Healthy People 2020 webpage for data on the status of diabetes-related program objectives, available at [www.healthypeople.gov/2020/data-search/Search-the-Data?f%5B%5D=field\\_topic\\_area%3A3514&ci=0&se=0&pop](http://www.healthypeople.gov/2020/data-search/Search-the-Data?f%5B%5D=field_topic_area%3A3514&ci=0&se=0&pop).

<sup>45</sup> Factors cited by DOH in deciding to eliminate diagnosed diabetes prevalence as an indicator for measuring progress in its 2013-2017 prevention agenda are part of a March 25, 2015 DOH email to the Office of the State Comptroller on development of the 2013-2017 prevention agenda.

<sup>46</sup> See New York State Prevention Agenda 2013-2017, Preventing Chronic Diseases Action Plan, Focus Area 1: Reduce Obesity in Children and Adults, available at [www.health.ny.gov/prevention/prevention\\_agenda/2013-2017/plan/chronic\\_diseases/focus\\_area\\_1.htm#goals](http://www.health.ny.gov/prevention/prevention_agenda/2013-2017/plan/chronic_diseases/focus_area_1.htm#goals).

<sup>47</sup> See "Soaring Health Care Costs Highlight Need to Address Childhood Obesity," October 2012, available at [www.osc.state.ny.us/reports/obesity\\_and\\_child\\_obesity\\_10\\_23\\_12.pdf](http://www.osc.state.ny.us/reports/obesity_and_child_obesity_10_23_12.pdf), and "Preventing and Reducing Childhood Obesity in New York," October 2008, available at [www.osc.state.ny.us/reports/health/childhoodobesity.pdf](http://www.osc.state.ny.us/reports/health/childhoodobesity.pdf).

State Expanded BRFSS and New York City Community Health Survey data posted on the DOH website show that adult obesity prevalence was 25.4 percent in 2013, an increase of 0.9 percentage points or 3.7 percent over 2011, although DOH does not consider such change to be “significant.”<sup>48</sup> Except for the percentage of adult health plan members with diabetes who are adequately controlling their blood glucose, State data posted on the DOH website show that all other prevention agenda indicators for diabetes showed no significant change or worsened from January 2013, when the 2013-2017 prevention agenda was released, to April 2015.<sup>49</sup>

One of the keys to achieving the diabetes-related objectives of the current State Prevention Agenda, including the reduction in adult obesity prevalence, is the successful implementation of the evidence-based diabetes management strategies that were chosen by 10 of the 25 networks of providers participating in the DSRIp program.<sup>50</sup>

Essential components of DSRIp’s diabetes management strategies include care coordination teams to disseminate basic health information about the disease and the implementation of consistent guidelines for practitioners caring for patients with diabetes. Of the ten DSRIp networks implementing diabetes management strategies, six serve parts of New York City, one serves Nassau and Queens counties, one serves Suffolk County, one serves the Hudson Valley (Delaware, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester counties) and one serves the North Country (Jefferson, Lewis and St. Lawrence counties).

Other important diabetes-related initiatives underway in New York include:

- the State’s participation in a federal grant program, under which New York will provide direct cash payments or lottery tickets to Medicaid beneficiaries who manage or prevent the onset of diabetes;<sup>51</sup>
- the State’s Diabetes Physicians Incentive program to enhance disease-treatment programs through incentives to physicians to monitor patients more actively;<sup>52</sup>

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<sup>48</sup> See New York State Prevention Agenda Dashboard – State Level, available at [http://apps.health.ny.gov/doh2/applinks/ebi/SASStoredProcess/guest?\\_program=/EBI/PHIG/apps/dashboard/pa\\_dashboard](http://apps.health.ny.gov/doh2/applinks/ebi/SASStoredProcess/guest?_program=/EBI/PHIG/apps/dashboard/pa_dashboard).

<sup>49</sup> Ibid.

<sup>50</sup> DSRIp seeks to reduce avoidable hospital use by 25 percent over the next five years and improve health outcomes for the State’s Medicaid population by providing financial incentives for health care providers to collaborate on strategies and projects to transform the State’s health care system.

<sup>51</sup> See the New York State Health Innovation Plan, page 179, available at [www.health.ny.gov/technology/innovation\\_plan\\_initiative/docs/ny\\_state\\_health\\_innovation\\_plan.pdf](http://www.health.ny.gov/technology/innovation_plan_initiative/docs/ny_state_health_innovation_plan.pdf).

<sup>52</sup> Ibid., page 92.

- a new primary care delivery model integrating behavioral health into primary care settings to improve outcomes for mental health and other chronic conditions such as diabetes;<sup>53</sup> and
- targeted consumer engagement through grants to communities to provide diabetes education and support.<sup>54</sup>

In April 2015, the Executive and the DOH announced a statewide campaign to prevent obesity that is intended to provide access to healthy and affordable food in schools in underserved communities throughout the State, as well as education and training to help 25 local agencies implement the initiative.<sup>55</sup> As noted in the news release announcing the campaign, obesity and being overweight can cause serious health problems, including Type 2 diabetes.<sup>56</sup>

In addition, a total of 67 organizations in New York, including health plans, hospitals, local YMCAs and county health departments, participate in the CDC's National Diabetes Prevention Program, which recognizes local programs that have shown they can effectively help adults prevent or delay the onset of Type 2 diabetes by making lifestyle changes such as eating healthier and including physical activity in their daily lives.<sup>57</sup>

The CDC and the American Medical Association (AMA) also recently launched a new, multiyear initiative to refer patients with prediabetes to evidence-based diabetes prevention programs.<sup>58</sup> Under this initiative, called Prevent Diabetes STAT, the CDC and the AMA have developed a toolkit to serve as a guide for physicians and other health care providers on the best methods to screen and refer high-risk patients to diabetes prevention programs in their communities.<sup>59</sup>

The CDC recommends that individuals who may be susceptible to diabetes talk with health professionals about screening, and cites research findings that moderate weight loss and exercise can prevent or delay Type 2 diabetes among adults at high risk. Ultimately, according to the CDC, achieving real progress against diabetes requires "a national effort – by everyone from physicians to employers to patients to community organizations."<sup>60</sup>

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<sup>53</sup> Ibid., page 200.

<sup>54</sup> Ibid., page 199.

<sup>55</sup> See Executive news release announcing a statewide campaign to fight obesity, available at [www.governor.ny.gov/news/governor-cuomo-announces-statewide-campaign-fight-obesity](http://www.governor.ny.gov/news/governor-cuomo-announces-statewide-campaign-fight-obesity).

<sup>56</sup> Ibid.

<sup>57</sup> See CDC registry of recognized diabetes prevention programs in New York State, available at [http://nccd.cdc.gov/DDT\\_DPRP/State.aspx?STATE=NY](http://nccd.cdc.gov/DDT_DPRP/State.aspx?STATE=NY).

<sup>58</sup> See CDC Newsroom Releases, available at [www.cdc.gov/media/releases/2015/p0311-diabetes-stat.html](http://www.cdc.gov/media/releases/2015/p0311-diabetes-stat.html).

<sup>59</sup> Ibid.

<sup>60</sup> "Prevent Diabetes STAT," Centers for Disease Control and American Medical Association, available at [http://www.ama-assn.org/sub/prevent-diabetes-stat/index.html?utm\\_source=\(direct\)&utm\\_medium=\(none\)&utm\\_term=vanity&utm\\_content=prediabetes\\_stat&utm\\_campaign=partnership](http://www.ama-assn.org/sub/prevent-diabetes-stat/index.html?utm_source=(direct)&utm_medium=(none)&utm_term=vanity&utm_content=prediabetes_stat&utm_campaign=partnership).

## Conclusion

Over more than three decades, federal and State programs have devoted millions of dollars to diabetes prevention efforts in New York. Recent State budgets have supplemented federal anti-diabetes funding with General Fund support, both for programs aimed at diabetes directly and for broader programs that address a variety of diseases and health issues. The serious human costs of the disease have been amply demonstrated in public health statistics, and the budgetary cost is well illustrated by New York's expenditure of more than \$1.2 billion in SFY 2013-14 on diabetes-related treatments for Medicaid recipients diagnosed with the disease.

New York's annual adjusted diabetes death rates have been consistently lower than national rates for each of the last ten years. Current State and national diabetes death rates are also significantly lower than they were ten years ago, but have been on the rise since 2010. Yet diabetes prevalence rates are higher in New York than nationally, and the State's diabetes-related Medicaid expenditures in SFY 2013-14 were 31 percent higher than those five years earlier. The DOH says diabetes "has reached epidemic proportions" in New York and "threatens to overwhelm New York's health care system and affect an entire generation."

Clearly, the battle against diabetes in New York and nationally must continue, and perhaps intensify. Research findings indicate that the harmful consequences of diabetes can be reduced among high-risk adults by preventative measures including weight loss and exercise, screening and appropriate treatment. DOH deserves credit for openly recognizing the need for improvement in the State's efforts to prevent diabetes and other chronic conditions. The Department is undertaking new efforts against the disease, largely through its ongoing Medicaid reform initiative. The success of these efforts will be reflected in outcomes including the further transformation of patient care systems that have historically resisted change, greater utilization of primary care, and further development of community-based services that emphasize prevention and coordinated care.

# Appendices

## Appendix A: Adult Diabetes Prevalence by State, 2011-2013

(Average Percentage of Adults Ever Told by a Doctor That They Have Diabetes)

State	Three-Year Average
West Virginia	12.7
Alabama	12.6
Mississippi	12.6
South Carolina	12.1
Louisiana	11.9
Tennessee	11.8
Arkansas	11.3
Oklahoma	11.2
Florida	11.0
North Carolina	10.9
Indiana	10.7
Kentucky	10.7
Ohio	10.7
Texas	10.6
New Mexico	10.3
Georgia	10.3
Michigan	10.3
Arizona	10.3
Virginia	10.3
<b>New York</b>	<b>10.3</b>
Missouri	10.2
Delaware	10.1
Pennsylvania	9.9
Maryland	9.8
Illinois	9.7
Maine	9.7
California	9.6
<b>Nationwide (States and DC)</b>	<b>9.6</b>
Nevada	9.6
Kansas	9.5
Oregon	9.5
Rhode Island	9.2
New Jersey	9.1
Iowa	9.1
New Hampshire	9.0
Connecticut	8.9
South Dakota	8.8
Washington	8.8
Idaho	8.8
Wyoming	8.6
Nebraska	8.6
North Dakota	8.6
District of Columbia	8.4
Wisconsin	8.3
Massachusetts	8.3
Hawaii	8.2
Montana	7.6
Vermont	7.6
Alaska	7.3
Minnesota	7.3
Utah	7.0
Colorado	6.9

Source: CDC BRFSS data, available at <http://apps.nccd.cdc.gov/BRFSS/list.asp?cat=CH&yr=0&qkey=8151&state=US>.

## Appendix B: New York Diabetes Death Rates by County, 2011-2013 (Highest to Lowest)

County	Average Annual Population	Average Annual Adjusted Death Rate
Franklin	51,678	32.3
Genesee	59,808	31.2
Allegany	48,415	28.4
Wyoming	41,789	27.3
Bronx	1,406,403	26.1
Kings (Brooklyn)	2,563,476	25.2
Schuyler*	18,445	24.7
Cattaraugus	79,394	24.2
Niagara	215,128	23.3
Lewis*	27,148	22.9
Erie	918,993	22.7
Warren	65,569	22.4
Clinton	81,730	22.1
St. Lawrence	111,962	22.0
Herkimer	64,283	21.8
Broome	198,208	21.4
Wayne	92,957	21.2
Oswego	121,698	21.1
Cortland	49,271	20.5
Chautauqua	133,662	20.3
Essex	38,968	20.3
Schoharie	32,174	20.2
Richmond (Staten Island)	471,272	19.9
Washington	63,064	19.7
Fulton	54,897	19.5
Otsego	61,770	19.4
Rensselaer	159,716	19.2
Montgomery	49,918	18.8
Sullivan	76,786	18.7
Jefferson	119,225	18.5
Oneida	233,809	18.5
Schenectady	155,172	18.3
Steuben	98,915	17.1
Ulster	181,746	16.6
Queens	2,272,265	16.4
Seneca*	35,304	16.4
Onondaga	467,400	16.0
Chemung	88,752	16.0
Tompkins	102,631	15.9
Orange	374,992	15.6
Livingston	64,862	15.2
New York (Manhattan)	1,615,732	15.2
Albany	305,322	15.0
Columbia	62,431	14.6
Greene*	48,694	14.1
Yates*	25,318	14.1
Delaware	47,186	14.0
Cayuga	79,589	14.0
Putnam	99,728	13.1
Saratoga	222,293	13.1
Tioga*	50,588	13.0
Ontario	108,716	12.9
Madison	72,710	12.7
Dutchess	297,412	12.6
Orleans*	42,564	12.3
Monroe	747,681	12.2
Suffolk	1,499,276	11.9
Chenango*	49,851	11.0
Westchester	962,124	10.6
Rockland	317,939	10.2
Nassau	1,348,605	10.0
Hamilton*	4,781	9.2
<b>New York City</b>	<b>8,329,148</b>	<b>20.4</b>
<b>Rest of State</b>	<b>11,233,047</b>	<b>15.3</b>
<b>New York State</b>	<b>19,562,195</b>	<b>17.2</b>

\* Fewer than 10 events in the numerator, therefore the rate is unstable.

Rates per 100,000 residents.

Source: DOH 2011-2013 Vital Statistics Data as of April 2015, available at [http://www.health.ny.gov/statistics/vital\\_statistics/](http://www.health.ny.gov/statistics/vital_statistics/), accessed April 29, 2015.

**Appendix C: Average Medicaid Hospitalizations for Diabetes – Adult Enrollees**  
 (Calendar Years 2011, 2012 and 2013; unadjusted rates per 100,000 enrollees)

County	Hospitalizations for Diabetes	Medicaid Population	Diabetes Hospitalization Rate
Seneca	25	4,340	576.0
Bronx	2,908	525,041	553.8
Niagara	155	32,424	478.0
New York (Manhattan)	1,639	364,179	450.0
Chemung	65	16,036	403.3
Richmond (Staten Island)	341	84,828	402.0
Kings (Brooklyn)	3,264	815,709	400.2
Monroe	449	112,285	399.6
Erie	550	138,052	398.2
Albany	150	37,987	395.7
Suffolk	615	155,581	395.1
Onondaga	264	67,242	392.1
Westchester	414	107,422	385.7
St. Lawrence	73	19,187	382.2
Cortland	31	8,124	381.6
Rensselaer	80	20,891	381.3
Nassau	509	135,780	374.6
Schenectady	88	24,694	357.7
Genesee	26	7,293	356.5
Clinton	48	13,777	350.8
Oneida	152	43,709	347.0
Columbia	29	8,358	343.0
Steuben	53	15,423	341.5
Chautauqua	85	24,995	341.4
Orange	148	45,037	328.6
Orleans	22	6,682	324.2
Fulton	39	12,053	323.6
Cattaraugus	44	13,825	320.7
Essex	18	5,754	318.6
Oswego	66	20,857	316.4
Cayuga	36	11,308	315.4
Dutchess	86	28,815	299.6
Queens	1,798	631,716	284.7
Otsego	24	8,485	278.9
Jefferson	46	16,637	278.5
Herkimer	28	9,958	277.8
Franklin	26	9,261	277.2
Chenango	26	9,487	274.1
Wyoming	13	4,896	265.5
Broome	91	34,473	264.9
Ontario	33	12,518	261.0
Wayne	31	12,016	260.8
Warren	22	8,889	247.5
Saratoga	52	20,918	247.0
Greene	19	7,626	244.8
Ulster	59	25,298	234.5
Livingston	18	7,614	232.0
Lewis	8	3,621	230.1
Tompkins	21	10,099	207.9
Schoharie	9	4,489	207.9
Allegany	16	7,672	204.2
Sullivan	27	13,569	201.4
Hamilton	1	525	190.4
Rockland	83	44,079	188.3
Putnam	9	4,728	183.3
Montgomery	18	10,066	175.5
Madison	17	10,032	172.8
Tioga	11	7,074	160.2
Schuyler	5	3,174	157.5
Washington	12	7,905	151.8
Delaware	9	7,176	125.4
Yates	3	3,486	95.6
<b>Statewide</b>	<b>15,006</b>	<b>3,885,171</b>	<b>386.2</b>

Source: DOH DSRIP Performance Data, Medicaid Inpatient Prevention Quality Indicators for Adult Discharges by Patient County: Beginning 2011, available at [www.health.data.ny.gov/Health/Medicaid-Inpatient-Prevention-Quality-Indicators-P/6kj7svn](http://www.health.data.ny.gov/Health/Medicaid-Inpatient-Prevention-Quality-Indicators-P/6kj7svn), accessed June 10, 2015.