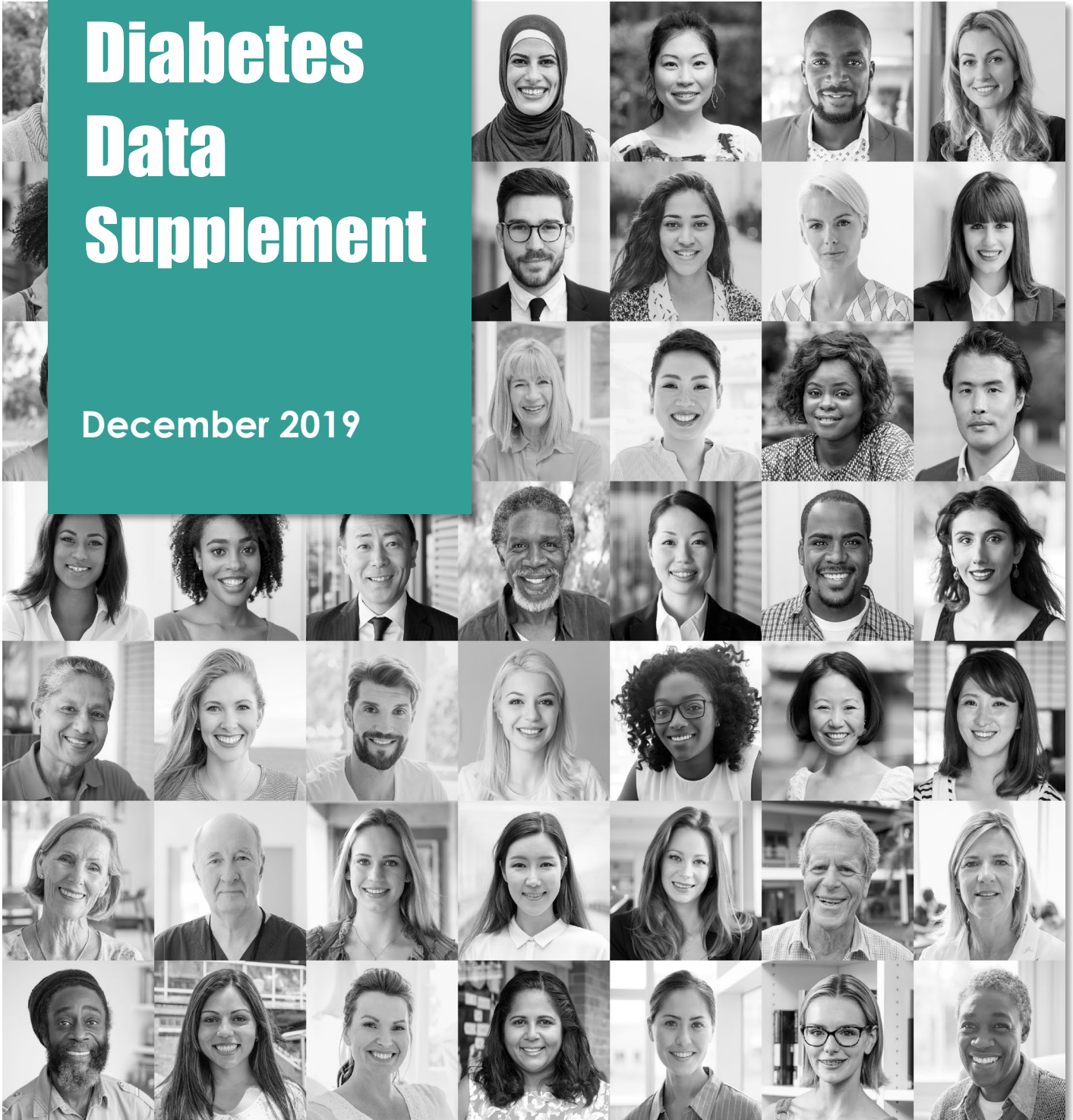


# Diabetes Data Supplement

December 2019



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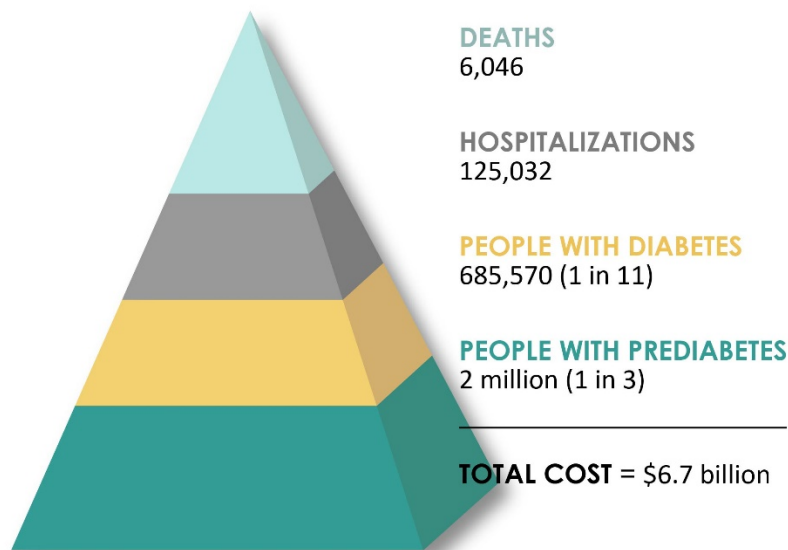


# Introduction

Diabetes is a chronic health condition that occurs when a person’s blood glucose (also called blood sugar) is too high.<sup>1,2</sup> The body either doesn’t make enough or doesn’t use insulin (a hormone made by the pancreas) well to help glucose from food get into cells for use as energy. When glucose builds up in the blood and doesn’t reach cells over time, it causes health problems (such as heart disease, stroke, kidney disease, vision loss, nerve damage, foot problems, and dental disease). Although diabetes has no cure, people can take steps to manage their diabetes and stay healthy. Different types of diabetes are defined in the *Technical Notes* on page 29.

The purpose of this data report is to provide current information on the status and financial burden of diabetes in Washington State. Overall the data demonstrate that diabetes is common, serious, and costly in our state (Figure 1).

**Figure 1. Burden and financial impact of diabetes in Washington State, 2017**



The report provides data for all Washington residents averaged together. It also breaks out the data for different Washington subpopulations, to the extent data sources allow, to provide an overview of important diabetes-related health disparities as well.

Statewide diabetes network members<sup>3</sup>, health care providers, public health professionals, policy makers, and other community members can use the data to help inform program and policy decision making around diabetes prevention and management.

## ***Snapshot of Diabetes in Washington State***

This section presents a summary of key data points highlighting the burden of diabetes across the state. More detailed information can be found in the main report text.

### **Prevalence**

- About 682,600 adults (or 1 in 8) had diabetes in 2017.
- After nearly doubling from 1990 to 2010, the growth in diagnosed diabetes among adults began to slow as of 2011.
- The growing size, racial and ethnic diversity, and aging of the state's population will lead to increasing numbers of people with diabetes, greater demand for health services, and additional diabetes-related costs.
- About 2,970 youth under 18 years of age (1 in 550) had diabetes in 2017.
- Onset of type 1 and type 2 diabetes in youth is increasingly common in recent decades.
- About 142,000 out of 2 million Medicaid enrollees had diabetes in 2017. The percent with diabetes has remained stable at around 7% from 2012 to 2017 and greatly varies across Medicaid coverage groups (ranging from a low of 0.5% in non-disabled children to a high of 39% in elderly dually eligible for Medicare-Medicaid). The increased number of enrollees with diabetes from 2012 to 2017 was driven by the Medicaid expansion under the Affordable Care Act in 2014.
- In 2017, 30,510 out of about 400,000 state public employees (or 7.6%) had diabetes. Members enrolled in Medicare due to disability were 3.3 times more likely to have diabetes than non-Medicare members.

### **Medical and Self Care**

- A majority of adults with diabetes statewide in 2017 are getting preventive treatment for diabetes, with most national Health People 2020 goals being met or close to being met.
- Around 20–40% of adults with diabetes statewide are not receiving certain recommended preventive medical services in 2017.
- While around half of adults with diabetes statewide in 2017 self-monitor their blood glucose and check feet daily, fewer are meeting recommendations for sufficient physical activity (15%) and healthy eating (for example, 39% consume vegetables twice or more daily, 13% consume fruit three times daily).
- Between 2015 and 2017, diabetes management improved across the Apple Health managed care population and exceeded the national average for Medicaid populations.
- Between 2015 and 2017, receipt of hemoglobin A1c testing and eye exams improved across the public employee population, and exceeded the national average for commercially insured populations.

## Coexisting Conditions and Complications

- Coexisting conditions increase the likelihood of complications related to diabetes and more complex medical needs.
- In 2017, adults with diabetes statewide were more likely to have other serious chronic conditions compared to those without diabetes – for example conditions like arthritis and depressive disorders (about 50% more often), heart disease and stroke (about 3 times as often), and kidney disease (more than 4 times as often).
- High blood pressure, high cholesterol, heart disease, stroke, arthritis, and cancer were more common in older adults with diabetes statewide in 2017. While younger adults with diabetes were more likely to have depressive disorder and current asthma.

## Hospitalizations

- Diabetes is the primary diagnosis for 10,790 hospitalizations of state residents, with an additional 114,242 hospitalizations including diabetes as a contributing reason.
- 2 out of 3 amputations and 1 out of 5 congestive heart failure hospitalizations could be prevented in the state if diabetes were eliminated.

## Deaths

- Diabetes is the seventh leading cause of death among state residents, causing 1,809 deaths and contributing to an additional 4,237 deaths in 2017.
- Among adults with diabetes, premature death leads to an average 4.3 years of life lost.

## Risk Factors

- In addition to those who already have diabetes, an estimated 2 million adults statewide (or 1 in 3) had prediabetes in 2017. Three of four adults with prediabetes were not aware of their condition.
- The percent of adults aware of having prediabetes increased from 7% in 2011 to 9% in 2017.
- About 7,900 live births in the state were affected by gestational diabetes in 2017. The percent of births with gestational diabetes steadily increased from 4% in 2003 to 9% in 2017.

## Financial Impact

- Total estimated cost of diagnosed diabetes in the state was \$6.7 billion in 2017 dollars, comprising \$5.0 billion in direct health care costs and \$1.7 billion in reduced productivity.
- Total average cost per member in WA-APCD was much higher for people with diabetes (\$23,761) compared to those without diabetes (\$4,608) in 2017.
- The average lifetime cost of caring for a person with type 2 diabetes can range from \$55,000 to \$130,000.

## Health Disparities

- Some groups or communities carried a disproportionately high burden of diabetes and diabetes-related poor health outcomes in the state in 2017.
  - Gender: Males are more likely than females to have diabetes and experience increased diabetes-related hospitalizations and deaths.
  - Age: Adults age 65 years and older are more likely than their younger counterparts to have diabetes and co-existing conditions; and experience increased diabetes-related hospitalizations and deaths. Protective factors include greater likelihood of receiving certain types of preventive medical care and having a greater awareness of prediabetes.
  - Race and Ethnicity: Communities of color (including non-Hispanic Blacks, Native Hawaiian and Pacific Islanders, American Indian/Alaska Natives, and Hispanics) are more likely than non-Hispanic whites to have diabetes, and experience increased diabetes-related hospitalizations and deaths.
  - Socioeconomic Status: Adults with lower incomes and levels of education are more likely than adults with higher incomes and education to have diabetes. Adults with lower incomes are also less likely to be aware of having prediabetes.
  - Difference by age in Apple Health, and age and gender in public employee populations, were similar to statewide patterns.
  - County-specific numbers of adults with diabetes ranges from about 850 in Skamania County to 122,640 in King County. The increasing number of people with diabetes in certain regions will be impacted by future demographic shifts not predicted to spread consistently across the state.
- Creating health equity and increasing access to culturally and linguistically appropriate services is needed to improve diabetes prevention and management across different communities.



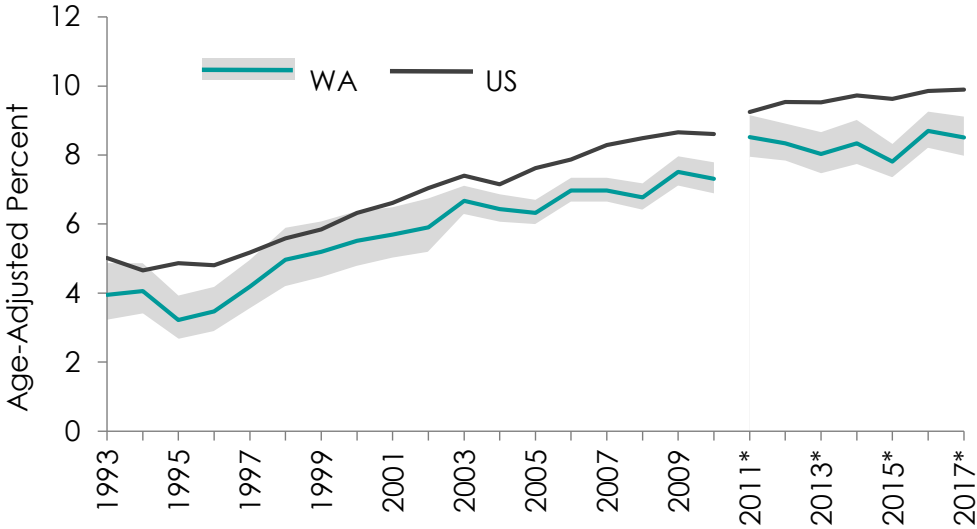
# Prevalence

## Statewide Adults

In 2017 about 682,600 Washington adults (or 1 in 8) had diabetes (both diagnosed and undiagnosed), with almost a fourth (24%) not aware of having it.<sup>4</sup> In the same year there were 41,470 new cases of diagnosed diabetes among adults.<sup>5</sup> Around 5% with diagnosed diabetes have type 1 with the remaining 95% having type 2.<sup>6</sup> Over a third (36%  $\pm$ 3%) of adults with diabetes were currently using insulin in 2017.<sup>5</sup>

Prevalence is the proportion of people in a population who have a given health condition in a certain timeframe – usually a year – whereas incidence is the proportion of newly identified cases of that same condition. That is, prevalence tells you how many people are living with a condition, and incidence tells you the rate at which new cases are occurring. The prevalence of adults with diabetes almost doubled during the 1990’s and thru the 2000’s. It began to slow as of 2011, remaining around 9% ( $\pm$ 1%) through 2017 (Chart 1). The incidence of diagnosed diabetes has remained stable at 7 ( $\pm$ 2) per 1,000 adults from 2014 to 2017.<sup>7</sup> While statewide data on diabetes trends in some high-risk subgroups are not available for comparison, a recent study indicated that all age, gender, and racial/ethnic groups have similarly flat trends in national prevalence since 2009.<sup>8</sup>

**Chart 1. Trends in self-reported diabetes among adults, Washington & U.S., 1993-2017**



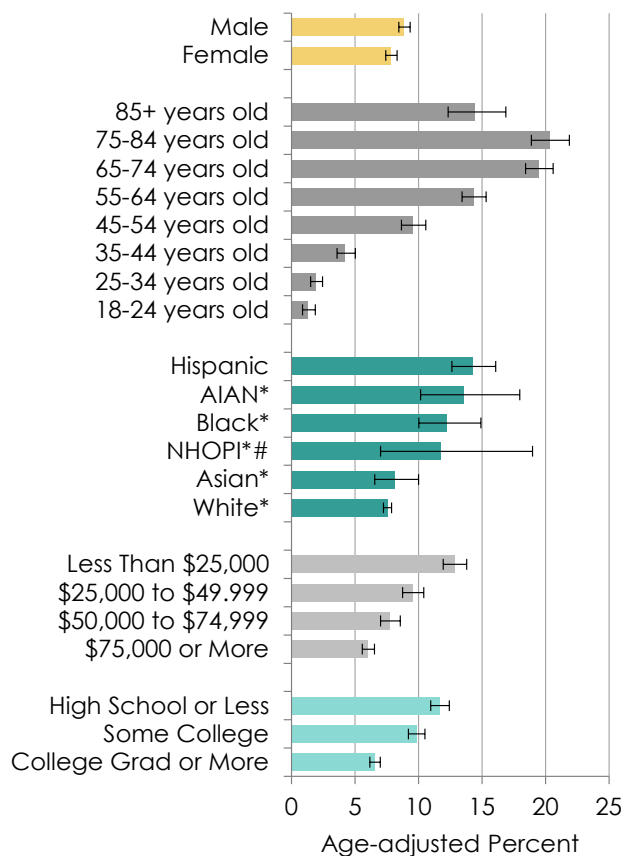
\*Data not comparable to earlier years due to changes in methods of collecting and analyzing data  
Source: Washington State Behavioral Risk Factor Surveillance System Survey

Although the trends in diabetes prevalence and incidence are encouraging, the number of people with diabetes still remains large. The state’s growing population, increasing racial and ethnic diversity, and aging<sup>9</sup> will have future diabetes health implications. Without substantial improvements in diabetes prevention, these shifts will lead to increasing numbers of people with diabetes, greater demand for medical and social services, and additional diabetes-related costs associated with private and public health programs.<sup>10</sup>

## Sociodemographic Disparities

Chart 2 shows the prevalence of self-reported diabetes by different sociodemographic groups. While each characteristic is presented separately, the burden of disease can be proportionally much greater than what is summarized here for individuals and communities with characteristics across multiple higher risk groups.

**Chart 2. Self-reported diabetes among adults by sociodemographic group, Washington State, 2015-17 combined**



\*Non-Hispanic, AIAN: American Indian/Alaska Native, NHOPI: Native Hawaiian/Other Pacific Islander

# RSE 25-29%, suggest using caution with potentially unreliable estimate

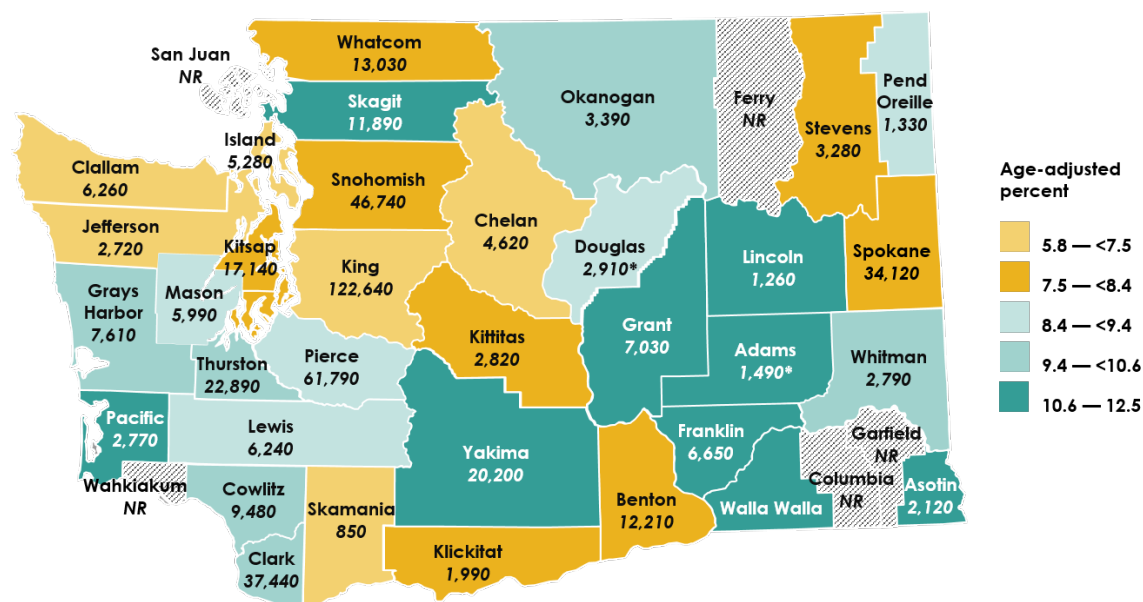
Source: Washington State Behavioral Risk Factor Surveillance System Survey

In looking at Chart 2, the prevalence of diabetes was highest in people 65 years of age and more (19% ±<1% of adults 65 years or more compared to 6% ±<1% under 65 years). Racial and ethnic disparities were apparent, with a greater prevalence of diabetes reported among non-Hispanic Black, Native American/Alaska Native, and Hispanic (any race) communities when compared to the non-Hispanic white population. The wide margin of error made it difficult to compare prevalence in Native Hawaiian/Other Pacific Islander communities. Income and education disparities were also evident, with income less than \$25,000/year or a high school education being associated with a roughly 2-fold higher prevalence of diabetes when compared to those in the highest levels of income or formal education. That the elderly, persons of color, and economically disadvantaged groups are disproportionately affected by diabetes underscores the need to focus on health equity and improve access to culturally and linguistically appropriate services.

## Geographic Disparities

Figure 2 shows the percent of adults with diabetes (adjusted for age) and the estimated number of adults with diabetes for each county. County-specific prevalence of diabetes ranged from 7.0% (±<2%) in Whitman County to 15.7% (±<4.5%) in Pacific County in 2015–2017 combined. Future demographic shifts likely to impact the prevalence of diabetes (like population growth, diversity, and aging) are not predicted to spread evenly across the state. For example, rural communities are aging faster than suburban and urban areas<sup>9</sup>, and could see a relatively greater increase in the burden of diabetes in coming years.<sup>10</sup>

**Figure 2. Self-reported diabetes among adults by county, Washington State, 2015-17 combined**



# RSE 25-29%, suggest using caution with potentially unreliable estimate

NR: not reported if RSE ≥ 30%

Source: Washington State Behavioral Risk Factor Surveillance System Survey

## Statewide Youth

Diabetes is one of the most common chronic diseases of childhood.<sup>11</sup> In 2017, about 2,970 Washington youth under 18 years of age (or 1 in 550) had diabetes.<sup>12</sup>

Previously, type 2 diabetes was typically considered a disease of middle-aged and older people. While these age-groups remain at higher risk, onset in youth is increasingly common in recent decades.<sup>13</sup>

A recent national study across 5 clinical centers showed the incidence of type 1 and type 2 diabetes in youth has increased since early 2000 (Table 1).<sup>14</sup> These increases are critical because youth with diabetes could experience several years of disease duration and increased risk of early complications.

**Table 1. Diabetes incidence rates among youth, United States**

GROUP	TYPE 1 DIABETES (0-19 years old)			TYPE 2 DIABETES (10-19 years old)		
	Average Number New Cases/100,000		% annual increase	Average number new cases/100,000		% annual increase
	2002-2003	2011-2012		2002-2003	2011-2012	
<b>TOTAL</b>	<b>19.5</b>	<b>21.7</b>	<b>1.8</b>	<b>9.0</b>	<b>12.5</b>	<b>4.8</b>
Female	19.2	19.9	1.4	11.1	16.2	6.2
Male	19.8	23.4	2.2	7.0	9.0	3.7
0-4 years old	16.5	14.3	NR	—	—	—
5-9 years old	24.0	27.7	2.5	—	—	—
10-14 years old	26.4	31.8	2.1	8.0	12.1	5.1
15-19 years old	11.0	12.9	2.1	10.0	12.9	5.2
Non-Hispanic White	23.9	27.0	1.2	4.4	3.9	NR
Non-Hispanic Black	14.7	19.0	2.2	20.0	32.6	6.3
Hispanic	13.7	14.8	4.2	13.3	18.2	3.1
Asian or Pacific Islander	7.9	9.7	NR	11.0	12.2	8.5
Hispanic	6.6	6.5	NR	22.6	46.5	8.9

NR: not reported - no significant change observed after adjusting for age, sex, and race or ethnic group

Source: SEARCH for Diabetes in Youth, [www.searchfordiabetes.org](http://www.searchfordiabetes.org)

## **Apple Health Population**

In 2017, 142,058 out of 2 million Medicaid enrollees in Washington State had diabetes. Similar to statewide trends, the percent with diabetes remained stable at around 7% from 2012 to 2017. The percent of enrollees with diabetes greatly varied across Medicaid coverage groups, given different health risk profiles and use patterns (ranging from a low of 0.5% in non-disabled children to a high of 39% in elderly dually eligible for Medicare-Medicaid) (Chart 3 and 4).

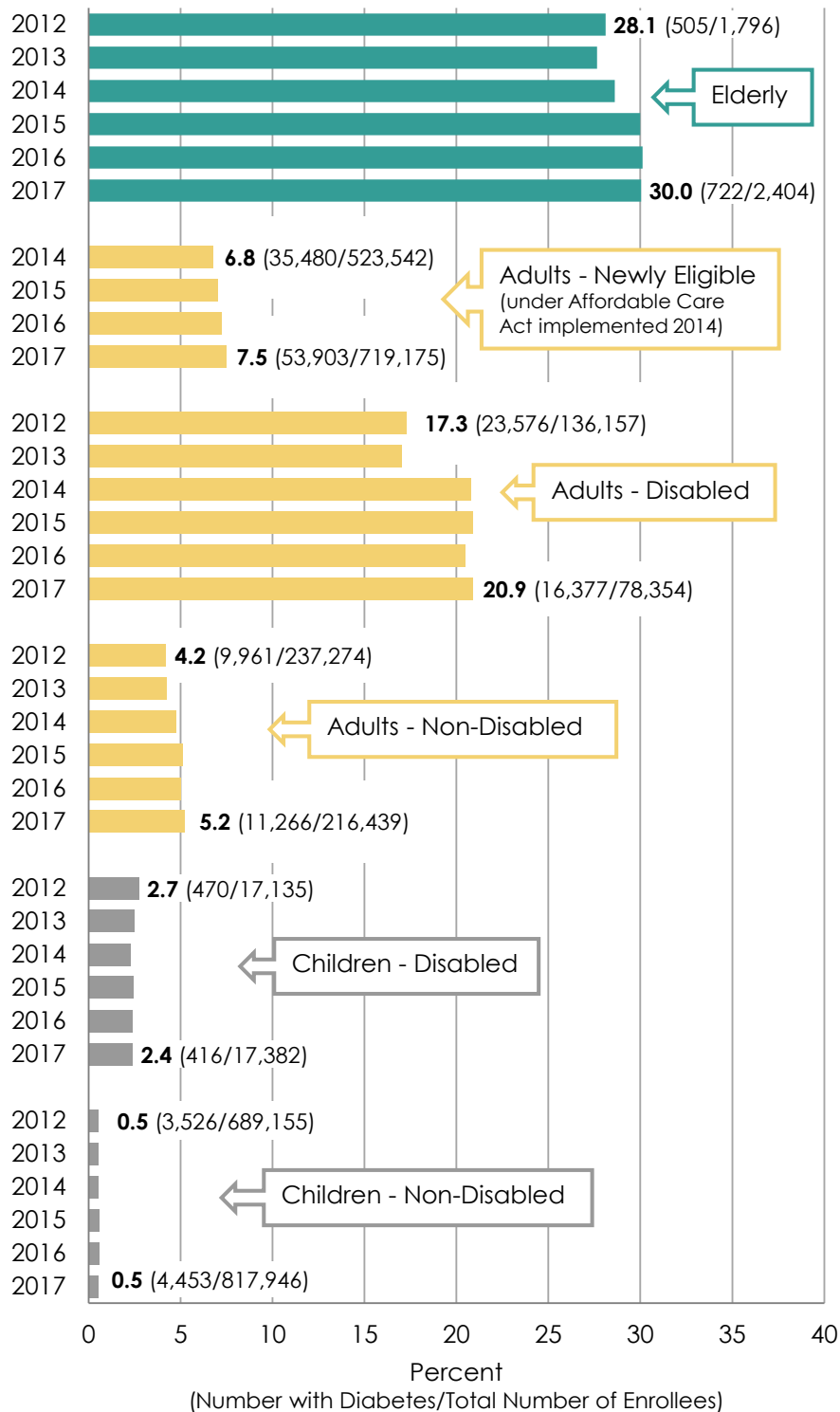
The number of Medicaid enrollees with diabetes increased by 60% from 88,528 in 2012. This was mainly driven by the Medicaid expansion under the Affordable Care Act that was implemented in 2014.

During the expansion an additional 35,480 adults with diabetes qualified for Medicaid as “newly eligible”. This “newly-eligible adult” population included people with relatively high health needs who were previously eligible for medical assistance under the Presumptive Supplemental Security Income, Disability Lifeline, and Alcohol and Drug Addiction and Treatment Support Act programs that were in the disabled adult coverage group in 2012 and 2013.

## **Medicaid Only**

Among Medicaid-only enrollees the percent with diabetes remained fairly stable from around 4% in 2012 to 5% in 2017 (Chart 3). Like the statewide population, the percent with diabetes was higher among the elderly compared to younger coverage groups.

**Chart 3. Percent of Medicaid-only enrollees with diabetes, Washington State, 2012-17**

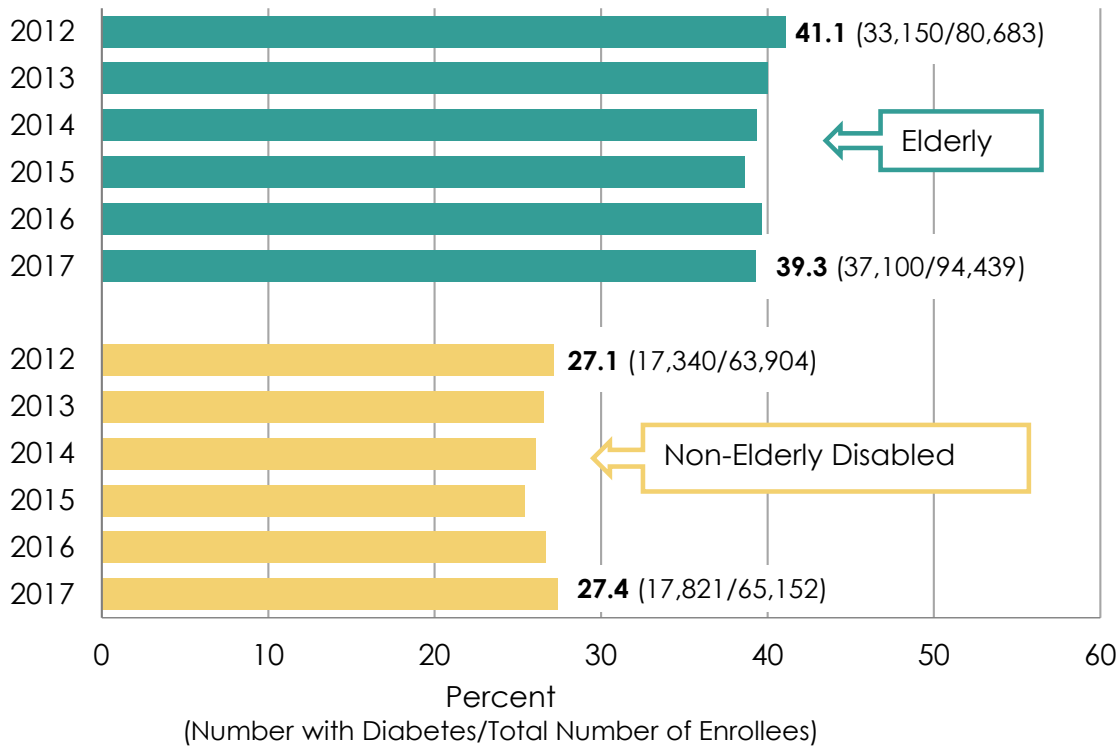


Source: Washington State ProviderOne Medicaid Management Information System and Comprehensive Assessment Reporting Evaluation Tool

## Dual-Eligible Medicare-Medicaid

The percent of enrollees dually eligible for Medicare-Medicaid were almost twice as likely to have diabetes as persons enrolled in comparable Medicaid-only coverage groups. In the dually eligible population, the percent with diabetes remained fairly stable from 35% in 2012 to 34% in 2017. The percent with diabetes also remained fairly stable within the elderly and non-elderly disabled coverage groups (Chart 4).

**Chart 4. Percent of dual-eligible (Medicaid & Medicare) enrollees with diabetes, Washington State, 2012-17**

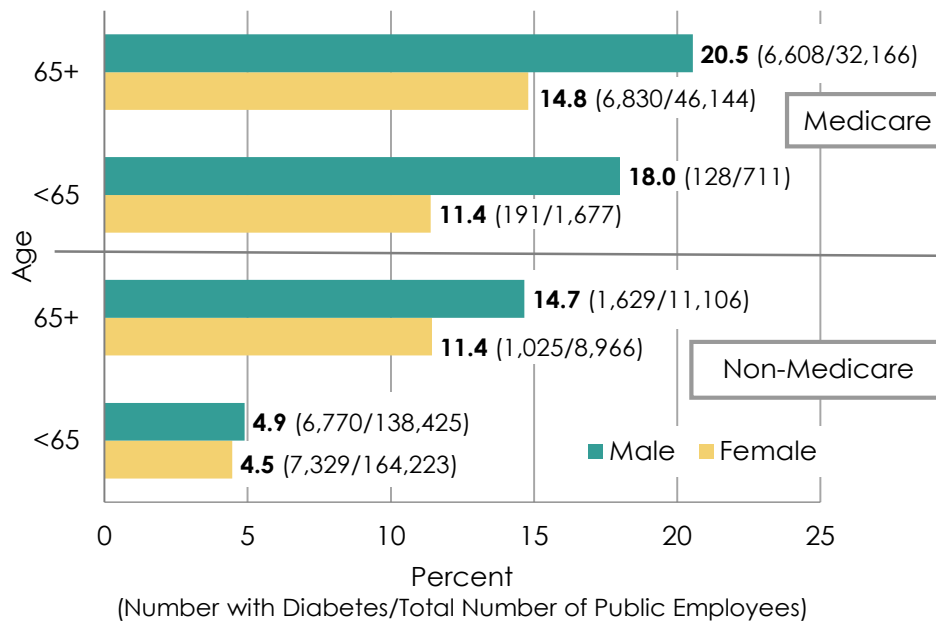


Source: Washington State ProviderOne Medicaid Management Information System and Comprehensive Assessment Reporting Evaluation Tool

## Public Employees Population

In 2017, 30,510 of an estimated 400,000 public employees in Washington State (7.6%) had diabetes. Public employees are served by Uniform Medical Plan, Kaiser Foundation Health Plan of Washington, and Kaiser Foundation Health Plan of the Northwest. The percent with diabetes greatly varied by age, gender, and Medicare coverage – ranging from a low of 4.5% in non-Medicare female members less than 65 years old to a high of 20.5% in Medicare male members 65 years and older (Chart 5).

**Chart 5. Percent of public employees with diabetes, Washington State, 2017**



Source: Washington State Public Employee Benefit Carrier submitted data



## Medical Care and Self-Management

Getting recommended medical services, practicing self-care daily, and managing health outcomes is necessary to mitigate the impact of living with diabetes. Individualized medical services and self-care practices for people with diabetes are guided by national recommendations that take into account factors like a person’s sociodemographic characteristics, diabetes control, and other health conditions.<sup>15</sup>

To engage in appropriate care, people with diabetes need access to health care services and programs. While a majority of Washington adults with diabetes had health care coverage in 2017, still 7% (±2%) did not have health insurance and 9% (±2%) did not have a personal health care provider.<sup>5</sup>

### Statewide Adults

Overall, a majority of Washington adults were getting preventive treatment for diabetes in 2017 (Table 2). Most Healthy People 2020 goals<sup>16</sup> have been met or are close to being met. Still around 20–40% of adults were not receiving certain recommended services.

**Table 2. Preventive medical care among adults with diabetes, Washington State and national targets, 2017**

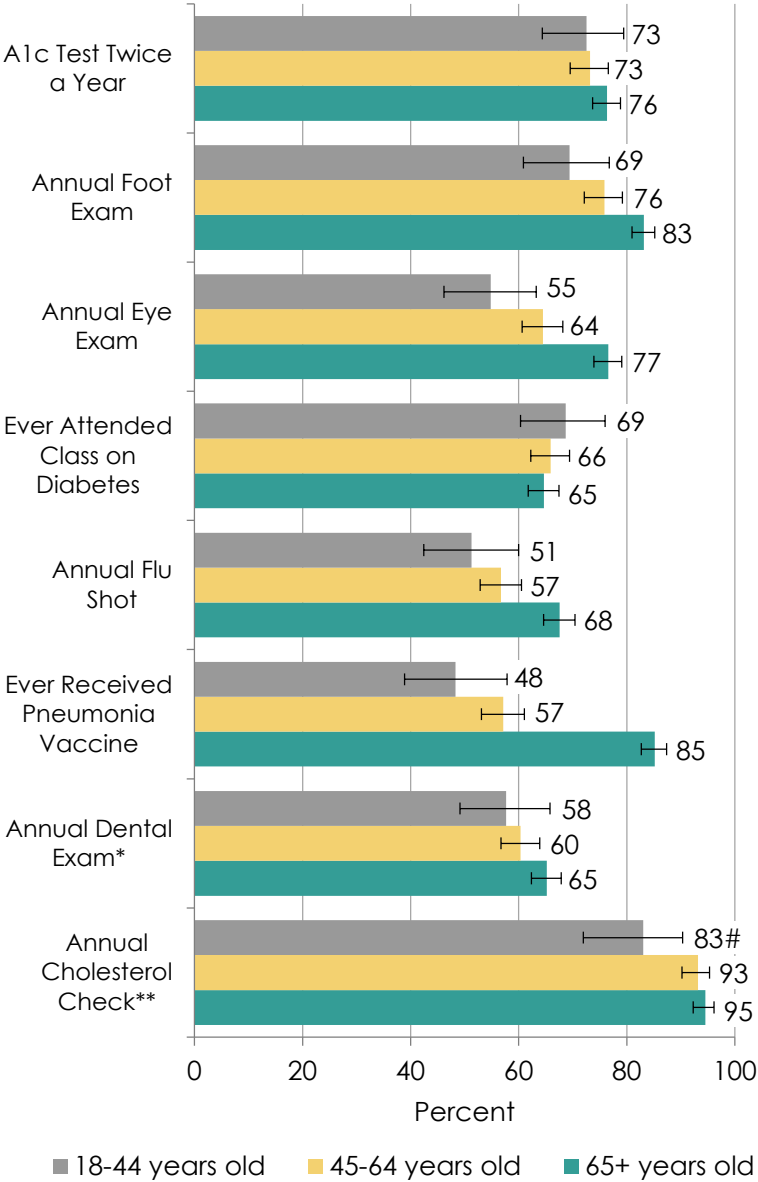
SERVICE	WASHINGTON STATE		HEALTHY PEOPLE 2020 TARGET	DIFFERENCE
	%	Age-adjusted %		
<b>Hemoglobin A1c Test 2x/y</b>	74.9 (±2.9)	73.5 (±6.0)	71.1	2.4
Annual foot exam	77.6 (±3.0)	70.9 (±6.2)	74.8	-3.9
<b>Annual eye exam</b>	69.3 (±3.3)	66.9 (±6.1)	58.7	8.2
<b>Ever attended class on diabetes</b>	66.6 (±3.1)	69.8 (±6.1)	62.5	7.3
Annual flu shot	61.7 (±3.4)	56.0 (±6.9)		
Ever received pneumonia vaccine	69.6 (±3.3)	55.5 (±7.1)		
Annual dental exam*	62.7 (±3.0)	60.9 (±6.3)	61.2	-0.3
Annual cholesterol check	92.0 (±1.8)	88.6 (±3.8)		

Services in **bold** meet or exceed 2020 target after adjusting for age; \*2016

Source: Washington State Behavioral Risk Factor Surveillance System Survey and Healthy People DATA2020 ([www.healthypeople.gov/2020/data-search](http://www.healthypeople.gov/2020/data-search))

When broken out by age, older adults with diabetes were more likely to get annual foot exams, eye exams, flu shots, cholesterol checks and ever have a pneumonia vaccine than younger adults (Chart 6).

**Chart 6. Preventive medical care among adults with diabetes by age, Washington State, 2015 & 2017 combined**



\*2015 and 2016 combined, \*\*2017 only

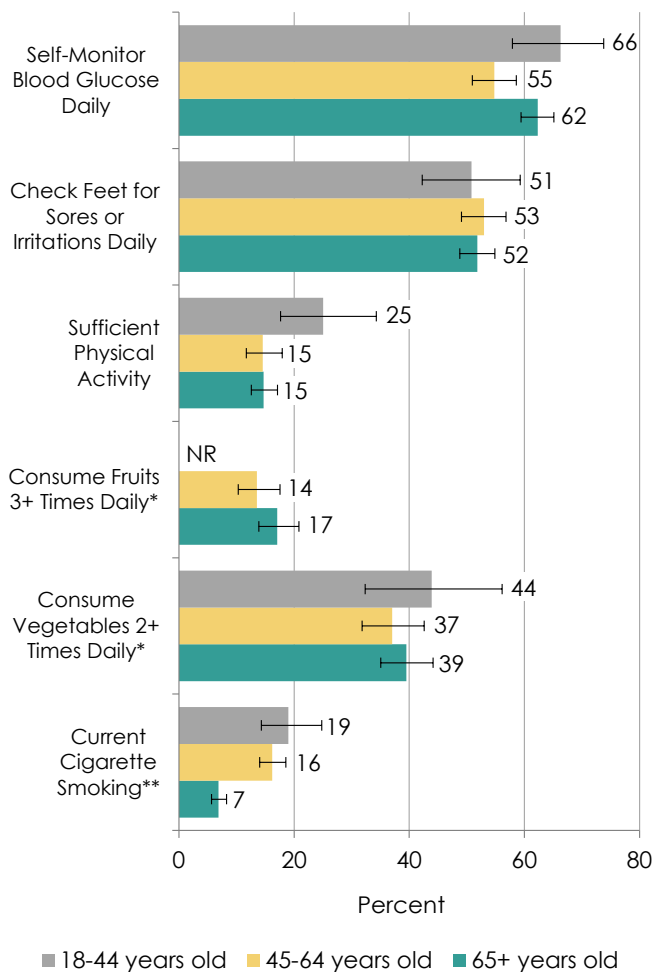
# RSE 25-29%, suggest using caution with potentially unreliable estimate

Source: Washington State Behavioral Risk Factor Surveillance System Survey

In looking at self-management, outside the medical care system, around half of adults with diabetes self-monitored their blood glucose daily (60% ±3%) and checked feet daily for sores or irritations (48% ±4%). Far fewer adults with diabetes were meeting recommendations for sufficient physical activity (15% ±3% got enough aerobic and muscle strengthening physical activity during leisure time) and healthy eating (39% ±4% consumed vegetables twice or more daily, 13% ±2% consumed fruit three times daily).

When broken out by age (Chart 7), adults 45-64 years old with diabetes were least likely to check their blood glucose daily, younger adults aged 18-44 years were more likely to get sufficient physical activity, and older adults aged 65 years or more were less likely to smoke cigarettes.

**Chart 7. Preventive self-care among adults with diabetes by age, Washington State, 2015 & 2017 combined**



Physical Activity: met recommendation of 150 minutes of moderate aerobic physical activity or 75 minutes of vigorous aerobic physical activity a week, combined with some form of muscle strengthening activity three times a week; Nutrition: met recommendation of three servings of vegetables and two servings of fruit a day

\*2017 only, \*\*2015-2017 combined; NR: not reported if RSE ≥ 30%

Source: Washington State Behavioral Risk Factor Surveillance System Survey

## Apple Health Population

Between calendar years 2015 and 2017, the average performance across Washington Medicaid managed care organizations improved for all diabetes management measures (Table 3). In 2017 the performance on hemoglobin A1c testing, eye exams, poor hemoglobin A1c control, and blood pressure control exceeded the national average (50<sup>th</sup> percentile benchmark). Performance on good hemoglobin A1c control improved more than 11 points between 2015 and 2017 and almost reached the national average.

**Table 3. Diabetes management among Apple Health managed care adult populations**

MEASURE	CALENDAR YEAR	% BY PLAN					AVERAGE ACROSS PLANS (population size adjusted)	NATIONAL BENCHMARKS (Medicaid managed care)	
		AMG	CCW	CHP	MHW	UHC		50 <sup>th</sup> percentile	75 <sup>th</sup> percentile
Annual Hemoglobin A1c Test	2015	86.8	87.0	89.0	89.9	86.9	88.3	86.0	89.4
	2016	90.1	91.5	90.5	88.7	88.3	89.6	87.1	90.1
	2017	87.8	87.8	90.0	89.5	89.8	89.2	87.8	90.5
Point Difference 2015-2017 → 0.9									
Annual Eye Exam	2015	49.0	58.1	54.4	58.5	53.8	55.5	53.3	61.5
	2016	54.2	66.6	63.5	57.2	54.5	59.1	55.1	63.3
	2017	52.3	59.4	63.5	61.3	56.5	59.7	57.9	64.2
Point Difference 2015-2017 → 4.2									
Good Hemoglobin A1c Control <8.0%	2015	41.3	36.9	27.6	49.0	36.3	39.0	46.8	52.6
	2016	54.6	45.7	51.8	50.3	45.3	49.6	48.9	53.7
	2017	49.9	37.7	51.6	53.0	51.1	49.9	51.3	55.5
Point Difference 2015-2017 → 11.0									
Poor Hemoglobin A1c Control >9.0% (lower % is better)	2015	49.9	54.5	64.6	35.8	52.1	49.9	43.8	36.9
	2016	33.8	43.4	37.2	37.3	44.5	39.0	41.1	35.5
	2017	37.5	51.3	38.0	33.1	34.8	37.4	38.2	33.1
Point Difference 2015-2017 → 12.5									
Blood Pressure Control <140/90 mm Hg	2015	59.4	60.9	62.4	68.2	58.6	63.0	59.7	68.6
	2016	63.7	58.5	73.7	66.7	62.5	66.0	60.6	68.6
	2017	64.7	60.3	68.9	72.0	65.2	67.8	63.0	70.8
Point Difference 2015-2017 → 4.8									

Source: Washington State Apple Health Managed Care Organization submitted HEDIS data

## Public Employees Population

Between calendar years 2015 and 2017, the average performance on diabetes management measures across Washington Public Employee Benefit carriers improved and exceeded the national average for hemoglobin A1c testing and eye exams (Table 4). Between 2016 and 2017 performance on poor hemoglobin A1c control improved but is still 2.5 points from meeting the national average. While performance on blood pressure control decreased by 2 points between 2016 and 2017, it still exceeded the national average.

**Table 4. Diabetes management among Public Employee Benefit carrier adult populations**

MEASURE	CALENDAR YEAR	% BY PLAN			AVERAGE ACROSS PLANS (population size adjusted)	NATIONAL BENCHMARKS (commercial managed care)	
		UMP	KPWA	KPNW		50 <sup>th</sup> percentile	75 <sup>th</sup> percentile
Annual Hemoglobin A1c Test	2015	91.5	90.9	96.2	93.0	91.3	93.8
	2016	93.7	92.0	94.3	93.4	91.6	93.8
	2017	93.7	93.3	96.0	93.8	92.2	94.4
<b>Point Difference 2015-2017 → 0.9</b>							
Annual Eye Exam	2015	58.8	77.1	79.9	70.1	58.4	69.2
	2016	64.5	77.7	81.5	71.7	55.0	68.1
	2017	72.3	76.9	82.3	74.0	56.2	69.4
<b>Point Difference 2015-2017 → 3.9</b>							
Good Hemoglobin A1c Control <8.0%	2015	NR	60.5	NR	*	60.4	64.2
	2016	49.4	61.9	NR	*	59.8	64.1
	2017	53.0	62.2	NR	*	62.5	65.9
<b>Point Difference 2015-2017 → *</b>							
Poor Hemoglobin A1c Control >9.0% (lower % is better)	2015	NR	28.6	22.6	*	26.5	23.3
	2016	40.6	25.6	22.9	30.3	28.0	23.8
	2017	34.6	22.6	22.7	28.1	25.6	21.3
<b>Point Difference 2015-2017 → 2.1</b>							
Blood Pressure Control <140/90 mm Hg	2015	NR	72.0	83.8	*	70.1	76.2
	2016	64.5	77.0	86.3	74.2	68.7	78.0
	2017	61.6	79.7	79.3	72.5	70.3	78.2
<b>Point Difference 2015-2017 → -1.7</b>							

NR: not reported by carrier; \*Only provided if all carriers submit performance measure data

Source: Washington State Public Employee Benefits Carrier submitted HEDIS data

## Coexisting Conditions and Complications

Many people with diabetes are managing additional coexisting chronic health conditions and complications along with their diabetes. Diabetes-related complications are more likely and severe in people whose diabetes is not well managed or those who have had diabetes longer.

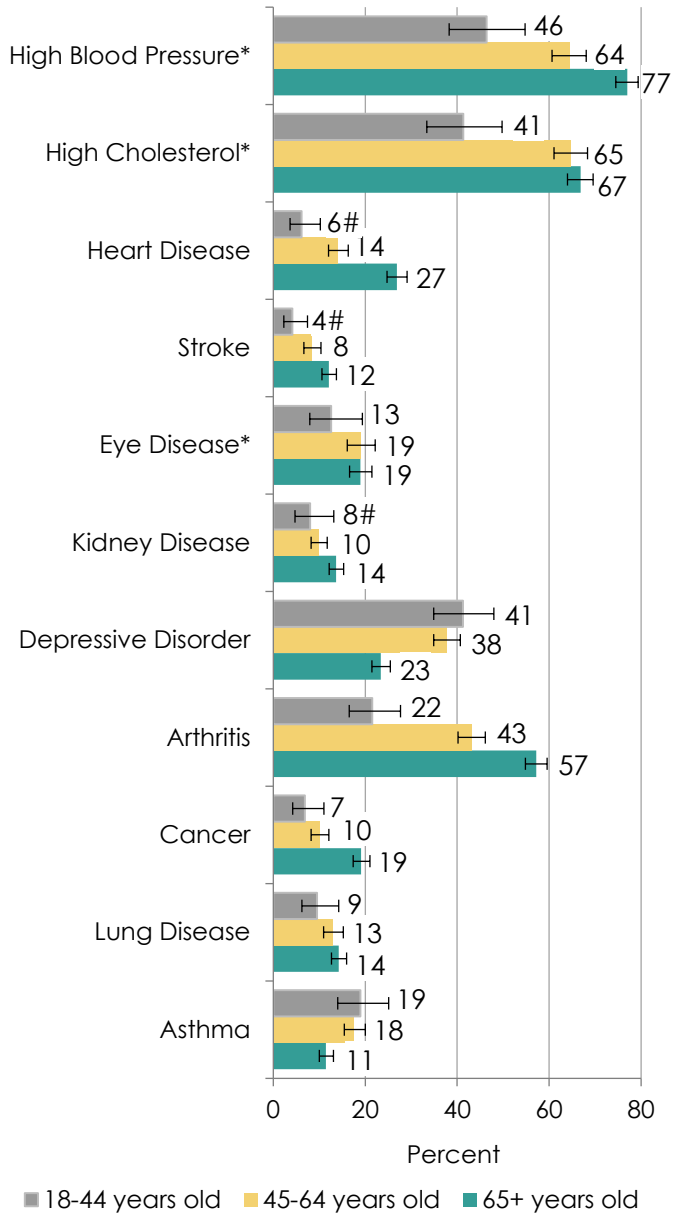
After accounting for differences in age, Washington adults with diabetes were more likely to have several other chronic health conditions than adults without diabetes: ever have kidney disease (4.6 times more likely), stroke (3.3 times more likely), heart disease (2.7 times more likely), high blood pressure (2.3 times more likely), high cholesterol (2.3 times more likely), lung disease (1.9 times more likely), asthma (1.6 times more likely), arthritis (1.5 times more likely), and depressive disorder (1.5 times more likely).

When broken down by age group (Chart 8), older adults with diabetes were more likely to have high blood pressure, high cholesterol, heart disease, stroke, arthritis, and cancer than younger adults with diabetes; whereas younger adults with diabetes were more likely to have depressive disorder and current asthma.

A recent study indicated the proportion of common diabetes-related complications that were directly attributed to having diabetes was substantial in Washington State.<sup>17</sup> On average diabetes caused:

- Self-reported complications impacting 14% of mobility limitations, 12% of limitations in instrumental activities of daily living, and 18% of severe visual impairment or blindness among adults.
- Diabetes-associated hospitalizations impacting 20% of congestive heart failure cases, 8% of myocardial infarctions, and 62% of lower extremity amputations among state residents. Meaning, almost 2 out of 3 amputations and 1 out of 5 congestive heart failure hospitalizations could be prevented in the state if diabetes were eliminated.
- Complications among Medicare beneficiaries impacting 17% of coronary heart disease cases, 28% of chronic kidney disease cases, and 22% of peripheral vascular disease cases.

**Chart 8. Self-reported coexisting chronic health conditions among adults with diabetes by age, Washington State, 2015–17 combined**



\*2015 and 2017 combined

# RSE 25–29%, suggest using caution with potentially unreliable estimate

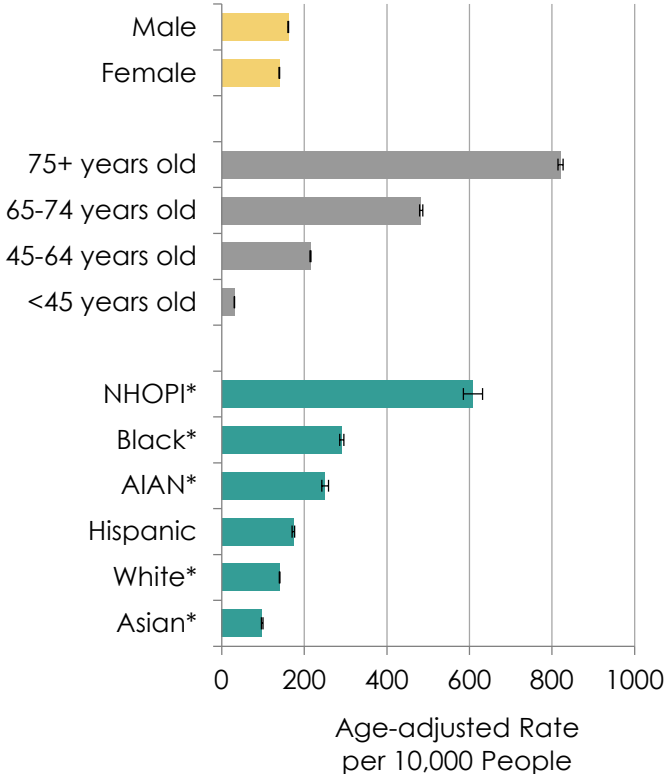
Source: Washington State Behavioral Risk Factor Surveillance System Survey

# Hospitalizations

Determining the frequency of inpatient diagnosis for diabetes provides better understanding of the burden of diabetes on populations, health care delivery system, and related costs. Diabetes was the primary diagnosis or reason for 10,790 hospitalizations of Washington residents in 2017. Just looking at primary reasons for hospitalizations can mask the true impact for diseases like diabetes where the primary diagnosis listed is typically a resulting complication like heart disease or stroke. When considering all diagnostic fields, an additional 114,242 hospitalizations included diabetes as a contributing diagnosis or reason (17% of total hospitalizations).

Patterns of diabetes hospitalization rates by age, gender, race, and Hispanic ethnicity were similar to those for diabetes prevalence. Hospitalizations were considerably higher for Pacific Islanders than for any other race or ethnicity group (Chart 9). While hospitalization rates increased dramatically with age, 44% of hospitalizations with diabetes occurred in adults less than 65 years old.

**Chart 9. Diabetes hospitalization rates by demographic group, Washington State, 2016 and 2017 combined**



\*Non-Hispanic, AIAN: American Indian/Alaska Native, NHOPI: Native Hawaiian/Other Pacific Islander  
 Rates are for hospitalizations with any listed diagnosis of diabetes

Source: Washington State Comprehensive Hospitalization Abstract Reporting System

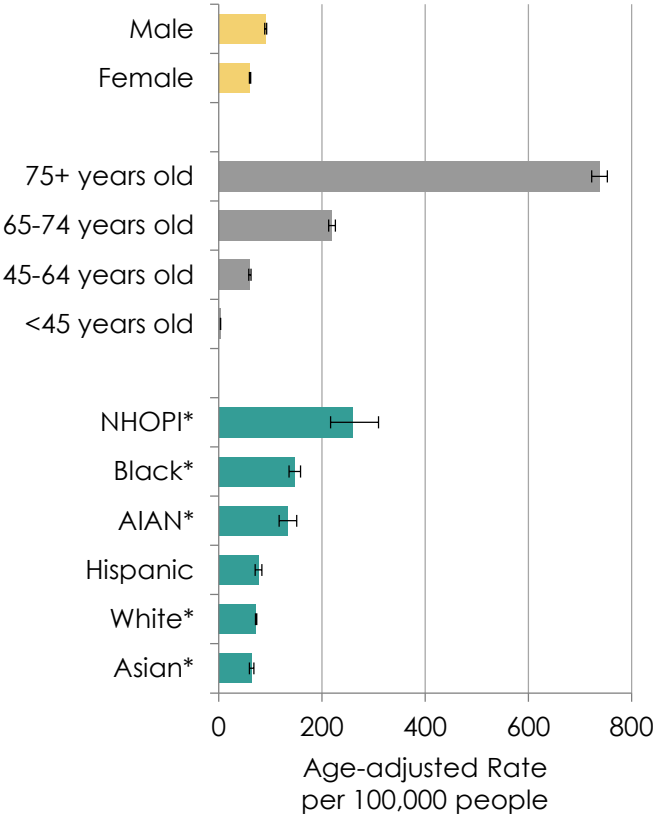


# Deaths

In 2017, diabetes was the seventh leading cause of death, causing 1,809 deaths among Washington residents. In the same year, an additional 4,237 deaths had diabetes listed as a contributing cause. A recent study indicated premature deaths caused an average 4.3 years of life lost for each adult with diabetes statewide.<sup>18</sup>

Patterns of diabetes death rates by age, gender, race, and Hispanic origin were similar to those for diabetes prevalence. As with hospitalizations, diabetes death rates were highest among Native Hawaiian/Other Pacific Islanders (Chart 10). While deaths rates increased dramatically with age, 1 in 5 deaths with diabetes occurred in adults less than 65 years old.

**Chart 10. Diabetes death rates by demographic group, Washington State, 2015–17 combined**



\*Non-Hispanic, AIAN: American Indian/Alaska Native, NHOPI: Native Hawaiian/Other Pacific Islander  
 Rates are for deaths with diabetes as any listed cause  
 Source: Washington State Death Certificate System

# Risk Factors

There are several risk factors associated with the development of diabetes (Table 5).<sup>19</sup> In 2017 over half (55% ±2%) of Washington adults at risk for diabetes (based on age and weight) received a test for high blood sugar or diabetes in the last three years.<sup>5</sup>

**Table 5. Known risk factors for developing diabetes**

TYPE 2	TYPE 1
<ul style="list-style-type: none"> <li>• Have prediabetes</li> <li>• Are overweight</li> <li>• Are 45 years or older</li> <li>• Have a parent, brother, or sister with type 2 diabetes</li> <li>• Are physically active less than 3 times a week</li> <li>• Have ever had gestational diabetes during pregnancy or given birth to a baby who weighed more than 9 lbs</li> <li>• Are African American, Hispanic/Latino American, American Indian, or Alaska Native (some Pacific Islanders and Asian Americans are also at higher risk)</li> <li>• Use tobacco</li> <li>• Have high blood pressure or high cholesterol</li> </ul>	<p>Risk factors for type 1 diabetes are not as clear as for type 2 diabetes, Known risk factors include:</p> <ul style="list-style-type: none"> <li>• Have a parent, brother, or sister with type 1 diabetes</li> <li>• Age: a person can get type 1 diabetes at any age, but it’s more likely to develop when they are a child, teen, or young adult</li> </ul> <p><i>Nationally whites are more likely to develop type 1 diabetes than African Americans and Hispanic/Latino Americans</i></p>

## Prediabetes

Prediabetes is a health condition where blood glucose (also call blood sugar) levels are higher than normal but not high enough to be diagnosed as diabetes.<sup>20,21</sup> Prediabetes occurs in people who do not have enough insulin (a hormone made by the pancreas) to get glucose from food into cells for use as energy. The extra glucose stays in the bloodstream and overtime raises the risk for type 2 diabetes, heart disease, and stroke.

In addition to those who already have diabetes, an estimated 2 million Washington adults had prediabetes in 2017.<sup>22</sup> Fifteen to thirty percent of these individuals will develop type 2 diabetes within 5 years.<sup>23</sup>

Three quarters of adults with prediabetes were not aware of their condition in 2017.<sup>5</sup> This finding is consistent with national assessments, where self-reported prediabetes awareness is much lower than the prevalence of prediabetes (37%, based on 2011-2012 surveys of adult fasting glucose or A1C level).<sup>24</sup> However, the percent of Washington adults aware of having

prediabetes has been increasing from 7% ( $\pm$ <1%) in 2011 to 9% ( $\pm$ <1%) in 2017. Previous analysis<sup>10</sup> showed awareness of prediabetes increased with age (from 2% in adults 18-25 years old to 13% in adults 65 years and older) and was 1.5 times higher among adults with incomes less than \$25,000 compared to those with incomes of \$75,000 or more.

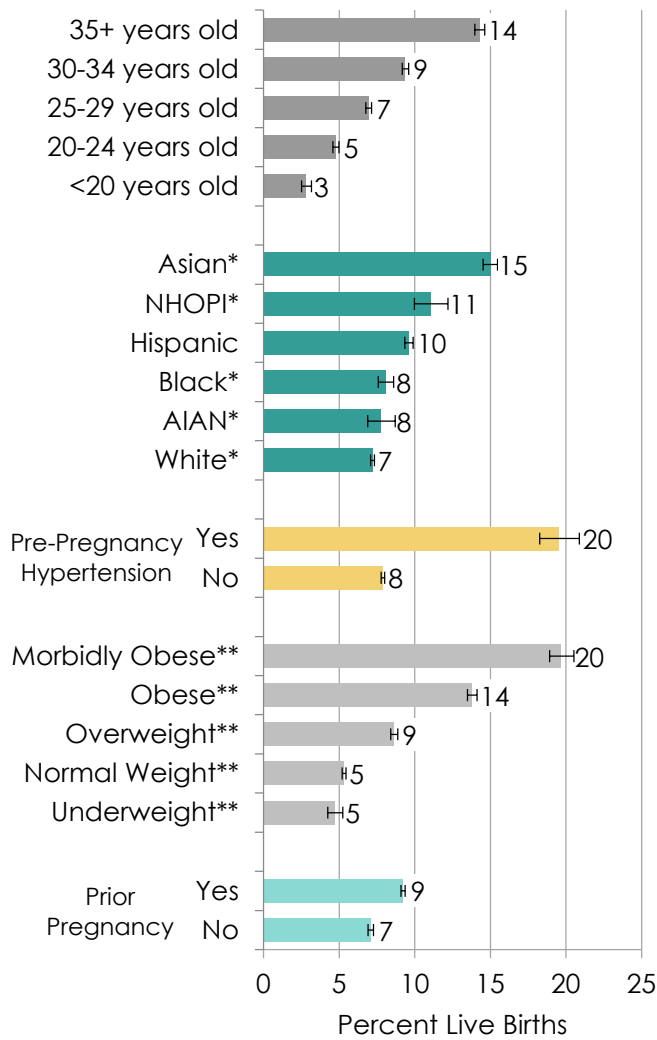
## ***Gestational Diabetes***

Gestational diabetes develops in some pregnant women who have never had diabetes and usually goes away after the baby is born. Women who have gestational diabetes during pregnancy have a 20–60% chance of developing type 2 diabetes in the next 5 to 10 years.<sup>25</sup> The baby could also be at increased risk of health problems, obesity during childhood, and type 2 diabetes later in life.

In 2017, 7,878 of live births in Washington State were affected by gestational diabetes. The percent of births where mothers had gestational diabetes steadily increased from 4% in 2003 to 9% in 2017.

The percent of births to mothers with gestational diabetes increased with maternal age and was highest among Asian mothers (Chart 11). The greatest burden of gestational diabetes was seen among women with pre-pregnancy hypertension and women who were morbidly obese.

**Chart 11. Percent of live births with gestational diabetes by maternal characteristics, Washington State, 2015–17 combined**



\*Non-Hispanic, AIAN: American Indian/Alaska Native, NHOPI: Native Hawaiian/Other Pacific Islander  
 \*\*Pre-pregnancy body mass index (kg/m<sup>2</sup>): underweight (<18.5), normal weight (18.5-24.9), overweight (25.0-29.9), obese (30.0-39.9), morbidly obese (40.0+)  
 Source: Washington State Birth Certificate System

# Financial Impact

## Statewide

The total estimated cost of diagnosed diabetes in Washington State was \$6.7 billion in 2017 dollars. This comprised \$5.0 billion in direct health care costs (including hospital and institutional care; physician and emergency department visits and other outpatient care; and outpatient medications, equipment, and supplies) and \$1.7 billion in reduced productivity (including work-related absences, reduced productivity at work and at home, unemployment from chronic disability, and premature deaths).<sup>26</sup> These costs reflect the additional expenditures the state incurs because of diabetes, meaning the extra costs for people with diabetes that is above the expected expenditures that would occur for the same people in the absence of diabetes.

Data from the Washington State All-Payer Health Care Claims Database (WA-APCD) provided additional insight into the financial impact of diabetes for individuals in the state. Estimated healthcare costs for WA-APCD members with diabetes totaled \$4.9 billion in 2017. This included paid and out-of-pocket amounts where medical service and pharmacy claims (prescriptions dispensed by physicians) had been made. The total average cost per member was much higher for people with diabetes (\$23,761) compared to those without diabetes (\$4,608). These costs are further broken out by service type and gender in Table 6. About 43% of total prescriptions costs for members with diabetes were for diabetes-specific medications.

**Table 6. Healthcare costs for WA-APCD members with diabetes, 2017**

SERVICE TYPE	TOTAL COST	AVERAGE COST PER PERSON	
	with diabetes	with diabetes	without diabetes
Medical	\$3,980,309,262	\$19,231	\$3,744
Female		\$18,057	\$3,939
Male		\$20,444	\$3,528
Pharmacy (prescriptions)	\$937,593,764	\$4,530	\$864
Female		\$4,643	\$905
Male		\$4,413	\$818

Source: Washington State All-Payers Claims Database (WA-APCD)

## **National Trends**

Nationally, the total cost of diabetes increased between 2012 and 2017 (health care costs, 26% increase; lost productivity costs, 23% increase).<sup>26</sup> These increases are influenced by the growing number of people with diabetes and increased costs per person with diabetes, especially among adults 65 years and older.

Nationally in 2017, the average health care cost for those with diabetes was \$16,750 per person per year, of which \$9,600 was directly due to their diabetes.<sup>26</sup> This was twice the cost for people without diabetes. The largest contributors to health care costs for diabetes include: higher use prescription medications (beyond antihyperglycemics), higher use of hospital inpatient services, medications and supplies to directly treat diabetes, and more visits to physicians and other health providers.<sup>26</sup>

The average lifetime cost of caring for a person with type 2 diabetes can range from \$55,000 to \$130,000.<sup>27</sup> The cost of a new case of type 2 diabetes imposed on the healthcare system is particularly high in people diagnosed with type 2 diabetes at younger ages, mostly due to the longer cumulative time to manage diabetes. Women have greater lifetime medical costs than men primarily because even though women have fewer complications, on average, they live longer than men. Fifty-three percent of the age–gender weighted average of the lifetime medical cost is due to treating diabetes-related complications.

# Data Sources

## Behavioral Risk Factor Surveillance System (BRFSS)

Statewide health-related data source that provides information on health status and conditions, risk factors, and healthcare access and utilization. Telephone survey is conducted among adults ages 18 and older living in non-institutional settings. Since 2003, survey given in English and Spanish and small counties oversampled to allow reporting of information by county. From 1987–2010, survey included adults living in households with landline telephones. With the incorporation of cell phone respondents in 2011, weighting methods have changed making data from 2011 not comparable to data in 2010 and earlier. To maximize the ability to generalize from the sample to Washington State residents, respondents' answers are weighted based on probability of selection into the sample and demographic characteristics of state's population.

## Birth Certificate System

Statewide birth data source that provide public health information about births and newborns. System covers all births to Washington State residents, including those for residents who give birth in other states. Gestational diabetes recorded on birth certificates is used to monitor the impact of gestational diabetes statewide.

## Census Population Counts and Intercensal and Postcensal Estimates

The U.S. Decennial Census is conducted every 10 years to get a count of people living in each state. Locally developed intercensal and postcensal estimates provide state population counts for noncensus years. These data are used as denominators for calculating rates of health events.

## Comprehensive Hospitalization Abstract Reporting System (CHARS)

Statewide hospitalization data source that includes information for Washington residents with inpatient admissions in Washington nonfederal, acute care hospitals. Reason for hospitalization coding transitioned from International Classification of Disease, Clinical Modification, Ninth Revision (ICD-9-CM) to Tenth Revision (ICD-10-CM) in October 1, 2015.

## Death Certificate System

Statewide death data source that provides information about causes of death and characteristics of decedents. The system covers all deaths in Washington and those of Washington residents who die in other states. Underreporting of specific race and ethnicity classifications (such as among American Indian or Alaska Natives) may underestimate death rates for these groups. Causes of death coding transitioned from World Health Organization, International Classification of Disease Ninth Revision (ICD-9) to Tenth Revision (ICD-10) in January 1, 1999.

## **ProviderOne Medicaid Management Information System**

Statewide Medicaid administrative fee-for-service claims and managed care encounter data source. Covers Medicaid enrollees in fee-for-service and 5 managed care plans (Amerigroup Washington, Coordinated Care Washington, Community Health Plan of Washington, Molina Healthcare of Washington, United Healthcare Community Plan). Includes information on individuals dually eligible for Medicare-Medicaid.

## **Comprehensive Assessment Reporting Evaluation Tool (CARE)**

Statewide data collected from individuals receiving aging and long-term support services through the state's Department of Social and Health Services. The tool is used by case managers to document a client's functional ability, determine eligibility for long-term care services, evaluate what and how much assistance a client will receive, and develop a plan of care.

## **Washington State Public Employee Benefit Carrier submitted data**

Administrative claims and encounter data submitted by benefit carriers that serve Public Employee Benefits plan members. Carriers include Uniform Medical Plan, Kaiser Foundation Health Plan of Washington, and Kaiser Foundation Health Plan of the Northwest.

## **Washington State All-Payers Claims Database (WA-APCD)**

State-specific health insurance data source that contains claims from more than 50 commercial health care payers; the Medicaid program, including its five managed care plans; and Medicare Advantage, the health maintenance organization products for Medicare members. Medicare fee-for-service to be added in 2019.



# Technical Notes

## Diabetes and Prediabetes Defined

Diabetes<sup>1,2</sup> is a chronic health condition that occurs when a person's blood glucose (also called blood sugar) is too high. The body either doesn't make enough or doesn't use insulin (a hormone made by the pancreas) well to help glucose from food get into cells for use as energy. When glucose builds up in the blood and doesn't reach cells over time, it causes health problems (such as heart disease, stroke, kidney disease, vision loss, nerve damage, foot problems, and dental disease). Although diabetes has no cure, people can take steps to manage their diabetes and stay healthy.

- About 5% of people who have diabetes have type 1. In type 1 diabetes the immune system attacks and destroys the cells in the pancreas and stops the body from making insulin. Symptoms of type 1 diabetes can develop quickly. Although it can appear at any age it is usually diagnosed in children, teens, and young adults. People with type 1 diabetes need to take insulin daily to survive. It is unknown how to prevent type 1 diabetes.
- About 90% of people with diabetes have type 2. In type 2 diabetes the body does not make or use insulin well to keep blood glucose at normal levels. People at risk should get blood sugar tested as symptoms of type 2 diabetes may not be visible. Although it can appear at any age, it is usually diagnosed in adults (but more children, teens, and young adults are being diagnosed). Type 2 diabetes develops over many years and can be prevented or delayed with healthy lifestyle changes.
- Gestational diabetes develops in some pregnant women who have never had diabetes and usually goes away after the baby is born. Pregnant women with gestational diabetes are at greater risk for developing type 2 diabetes later in life. The baby could also be at increased risk of health problems, obesity during childhood, and type 2 diabetes later in life.

Prediabetes<sup>20,21</sup> is a health condition where blood glucose (also call blood sugar) levels are higher than normal but not high enough to be diagnosed as diabetes. Prediabetes occurs in people who do not have enough insulin (a hormone made by the pancreas) to get glucose from food into cells for use as energy. The extra glucose stays in the bloodstream and overtime raises the risk for type 2 diabetes, heart disease, and stroke.

## Diabetes Case-Finding Criteria and Codes

### Prevalence

- Statewide BRFSS Respondents – Adults considered to have diabetes if they answer yes to survey question “Has a doctor, nurse, or other health professional ever told you that you have diabetes?” Females told they only had diabetes during pregnancy or those reporting prediabetes/borderline diabetes are excluded.

- Medicaid Enrollees – Presence of diabetes identified using ProviderOne fee-for-service claim and managed care encounter data using Chronic Illness and Disability Payment System (CDPS) and MedicaidRx categories based on ICD-CM diagnosis codes and national prescription drug codes, Medicare Part A, B and D data, and CARE data using diabetes ICD-CM diagnosis codes (ICD-9-CM 250, 3572, 3620, 36641, and 6480). CDPS categories are listed below. A 2-year window was used to identify enrollees with diabetes, meaning an individual may have diabetes during the measurement year or the year prior to the measurement year of analysis.

DIAGNOSES DISEASE CATEGORY	DESCRIPTION	SAMPLE DIAGNOSES
DIA1H	Diabetes, type 1 high	Type 1 diabetes with renal manifestations/coma
DIA1M	Diabetes, type 1 medium	Type 1 diabetes without complications
DIA2M	Diabetes, type 2 medium	Type 2 or unspecified diabetes with complications
DIA2L	Diabetes, type 2 low	Type 2 or unspecified diabetes without complications

Prescription Disease Category	Description	Summary Drug Descriptions
MRX10	Diabetes	Hypoglycemics, insulin

- Public Employees – Presence of diabetes identified using coding and criteria for Healthcare Effectiveness Data and Information Set measures, [www.ncqa.org/hedis](http://www.ncqa.org/hedis) provided by the National Committee for Quality Assurance (NCQA).
- WA-APCD Members – Presence of diabetes identified using coding and criteria provided by Centers for Medicare and Medicaid Services, Chronic Conditions Warehouse, <https://www2.ccwdata.org/web/guest/condition-categories>

### Hospitalizations

Hospitalizations with diabetes are identified using codes ICD-9-CM 250 prior to 10/1/2015 and ICD-10-CM E10-E11, E13 after 10/1/2015. In this report, diabetes-related hospitalization rates were calculated where diabetes was listed as either a primary reason (listed in first diagnosis field) or secondary reason (listed in next 8 diagnosis fields) for inpatient admissions or observation stays. The unit of analysis is the hospitalization episode, not the individual. Thus, one person hospitalized three times in a year counts as three hospitalizations for that year. Each hospitalization for an illness or injury is an adverse event for the person who experiences it.

## **Deaths**

Deaths with diabetes are identified using codes ICD-9 250 prior to 1999 and ICD-10 E10-E14 for 1999 and later. In this report, diabetes-related death rates were calculated where diabetes was listed as either an underlying cause or contributing cause of death. Up to an additional 20 causes can be listed along with the underlying cause. Deaths due to diabetes are greatly underestimated when only assessing diabetes listed as an underlying cause of death.<sup>18</sup>

## **Births**

A birth where mother has gestational diabetes is recorded by the hospital on the birth certificate based on a check box that differentiates pre-pregnancy diabetes (diagnosis before this pregnancy) from gestational diabetes (diagnosis in this pregnancy).

## **Clinical Diagnostic Coding Transitions**

Clinical diagnoses are coded according to World Health Organization, International Classification of Diseases Ninth Version Clinical Modification (ICD-CM-9) prior to October 1, 2015 and Tenth Version Clinical Modification (ICD-10-CM) after.

Causes of death are coded according to World Health Organization, International Classification of Disease Ninth Revision (ICD-9) for 1979-1998 and Tenth Revision (ICD-10) for 1999 and later.

## **Healthcare Effectiveness Data and Information Set Measures**

Healthcare Effectiveness Data and Information Set (HEDIS) measures are developed and maintained by the National Committee for Quality Assurance (NCQA). For this report, Washington State Health Care Authority analysts used data submitted by individual Medicaid managed care organizations (MCO) and Public Employee Benefit (PEB) carriers. A combination of claims/encounter analyses and hybrid data collection methods were used to calculate HEDIS measures. The hybrid method first assembles clinical information from electronic medical records that is then supplemented by sampling patient chart data to capture information that may be underreported in electronic records. When employing the hybrid method, rates are weighted for the population size to account for the sampling process. The Medicaid MCO and PEB carrier averages were calculated utilizing the reported rate of each plan and weighted for their population size to create a true statewide average for each measure.

The measures presented in this report are among adults aged 18-75 years old with type 1 or type 2 diabetes. Measure results are not adjusted for differences in comorbidities or sociodemographic factors. Performance on measures may be influenced by these factors that are outside the direct control of Medicaid MCOs and PEB carriers. Individuals enrolled in Apple Health as part of the Medicaid expansion in March 2014 are represented in HEDIS measure results for Medicaid MCOs for the first time during the 2015 calendar year. Apple Health measures include enrollees dually eligible for Medicare (in fully capitated Medicare Advantage programs) and Medicaid.

## Race and Ethnicity

Race and ethnicity categories follow the federal standards for reporting on race and ethnicity and reflect self-identified race and ethnicity, with the exception of death data. In analysis, Hispanic or Latino ethnicity was considered before race. Data presented for Hispanics includes Hispanics of any race. Data presented for the five race categories: American Indian or Alaska Native (AIAN), Asian, Black or African American, Native Hawaiian or Pacific Islander (NHOPI) and White includes only non-Hispanics. In addition, these race categories include people who identify with a single race only. The 4% of Washingtonians who identify with multiple races are not presented. This will have a greater impact on younger populations who are more likely to identify with multiple races. We have not included multiple races as we don't currently have denominators for all people who identify with a given race. In addition, this group represents people with a variety of different identities. A higher proportion of people identifying as AIAN and Black identify with multiple races and are more impacted by this exclusion. It is also important to note the single race only categories (e.g., American Indian or Alaska Native, Asian, Black, Hispanic, Native Hawaiian or Other Pacific Islander, White) presented throughout this report include aggregate groups of people and may obscure differences in health status and risk or protective behaviors of subpopulations. For example, subpopulations of Asians, such as Chinese, Filipino, Asian Indian, Vietnamese, Korean and other groups may have different health status from what is presented for Asians. Similarly, African born Black populations may have different health status from U.S. born Blacks and what is presented for Blacks.

## Age-Adjustment

Age-adjustment is a statistical process applied to rates or proportions of disease, death, or other health outcomes which allows populations with different age structures to be compared. Age confounding occurs when the two populations being compared have different age distributions and the risk of the disease or outcome varies across the age groups. The process of age-adjustment by the direct method changes the amount that each age group contributes to the overall rate or proportion in each population, so that the overall rates or proportions are based on the same age structure. Rates and proportions that are based on the same age distribution can be compared to each other without the presence of confounding by age. Adjustment is accomplished by first multiplying the age-specific rates or proportions of disease by age-specific weights. The weights used in the age-adjustment of data in this report are the proportion of the 2000 US population within each age group. The weighted rates or proportions are then summed across the age groups to give the age-adjusted rate or proportion.

## Confidence Intervals

Confidence intervals provide a measure of how much a rate, percent or other estimate might vary due to random factors or chance. They are used with survey data to account for the difference between a sample from a population and the population itself. A 95% confidence interval captures the true value of the estimate in 95 out of 100 cases. Confidence intervals are generally large for small sample sizes and decrease as the sample size increases. Confidence intervals do not account for variation due to missing, incomplete, or inaccurate data. For survey

data in this report, the 95% confidence intervals are portrayed on line graphs with shading around the Washington State line, on bar and column charts with error bars, and in text as a number spread around an estimate (e.g.,  $\pm 1\%$ ).

## **Relative Standard Error**

The relative standard error (RSE) provides a measure of reliability (also termed ‘statistical stability’) for statistical estimates. When the RSE is large, the estimate is imprecise and such rates or proportions are considered ‘unstable’ or ‘not reliable.’ In these instances, the data analyst needs to balance issues of the right-to-know with presenting data that might be misleading. For this report, any data element where the RSE was 30% or greater was suppressed due to the unreliability of the estimate. Data elements where the RSE was between 25% and 29% were annotated with a flag (#) to suggest using caution with the potentially unreliable estimate.

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