



SIM Outcomes and Data Acquisition Report CY 2015 and CY 2016

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Introduction

By identifying the primary and secondary drivers within the Iowa healthcare system and leveraging changes to these drivers, the State Innovation Model (SIM) is designed to bend the cost curve and improve quality for Iowans throughout the state. The University of Iowa Public Policy Center (UI PPC) is conducting an evaluation of Iowa's SIM for the Iowa Medicaid Enterprise (IME) using two approaches. The first approach is an extensive process evaluation describing and assessing the activities and mechanisms for putting SIM activities and changes in place. The first report for this component of the evaluation is found at <http://ppc.uiowa.edu/publications/state-innovation-model-sim-baseline-process-implementation-report> .

The second approach includes the calculation of state-wide measures of access to care and cost of care related to the SIM Core Goals. These core goals are found in the Award Year 3 Operational Plan - https://dhs.iowa.gov/sites/default/files/SIM_AY3FinalOPSPPlan.pdf.

Background

The State Innovation Model grant has three primary aims.

- 1) Improve population health
- 2) Transform health care
- 3) Promote sustainability

For more information about these aims and their related goals please go to the SIM home page <http://dhs.iowa.gov/ime/about/initiatives/newSIMhome> .

In response to these aims and goals, the evaluation team at the UI PPC, in conjunction with the Iowa Department of Human Services (IDHS), Iowa Department of Public Health (IDPH), and the Centers for Medicare and Medicaid Innovation (CMMI), developed hypotheses and outcome measures to evaluate the effects of Iowa's SIM. Table 1 lists these hypotheses, measures, data sources and outcome target dates as provided in the evaluation plan.

This report provides data from CY 2015 and CY 2016, sometimes referred to as the measurement years. Due to the extensive implementation required for the SIM, both years are considered as baseline data, as the results of full implementation are not expected to be evident until CY 2017 at the earliest.

Measures removed from evaluation

As the SIM became more focused on people with diabetes, some goals were removed from the operational plan necessitating the removal of hypotheses from the evaluation. Hypotheses that have been removed are listed below and highlighted in gray in Table 1.

- The rate of elective C-sections and early elective deliveries will be reduced.
- Rates of low birth weight newborns will decrease over the 3 years of the SIM.

Table 1. Hypotheses and measures

Hypothesis	Measure	Data Source	Outcome Target date
The statewide diabetes rate will be reduced by 0.2% over the three years of the SIM.	Statewide diabetes rate	BRFSS	12/31/2018
The hospitalizations related to the long-term and short-term complications of diabetes will be reduced.	Admissions due to long-term and short term complication from diabetes	Iowa Hospital Association (IHA) inpatient file	12/31/2017
ER visits for diabetes related issues will be reduced.	ED visits due to long-term and short term complication from diabetes	IHA outpatient file	12/1/2017
Providers will integrate the statewide strategies for the care of diabetes.	Number of providers who integrate statewide strategies	Provider survey	12/1/2017
People with diabetes will experience improved quality of life (QoL).	Patient quality of life questions (to be determined)	Statewide consumer survey	11/1/2016 and 6/30/2018
People with obesity will have decreased BMI over the 3 years of the SIM.	Weight and height measure	BRFSS/YRBS	6/30/2017 and 6/30/2018
There will be an increase in the proportion of people interested in reducing tobacco use.	number of people requesting information from the Quitline	Iowa Quitline data and claims data	6/30/2017 and 6/30/2018
The rate of tobacco use will decrease by 1% over the 3 years of the SIM.	Rate of reported tobacco use	BRFSS/YRBS	6/30/2017 and 6/30/2018
The rate of elective C-sections and early elective deliveries will be reduced.	Rate of C-sections and early elective deliveries	IHA inpatient file	6/30/2017 and 6/30/2018
Rates of low birth weight newborns will decrease over the 3 years of the SIM.	Low birth weight rates	Birth certificate data	6/30/2017 and 6/30/2018
The rate of surgical site infections will be reduced.	Rate of surgical site infection	IHA inpatient file perhaps use National Healthcare Safety Network (NHSN)	6/30/2017 and 6/30/2018
The rate of Narcane use outside the hospital will be reduced.	Narcan use rates	Medicaid and/or Wellmark claims data	6/30/2017 and 6/30/2018
Glucose monitoring will increase.	Hemoglobin A1c rates	Medicaid and/or Wellmark claims data	6/30/2017 and 6/30/2018

Hypothesis	Measure	Data Source	Outcome Target date
Monitoring of anti-coagulation medications will increase.	Protime rates	Medicaid and/or Wellmark claims data	6/30/2017 and 6/30/2018
The SIM will reduce the annual rate of preventable readmissions by the third year.	Avoidable readmissions at 7days and 30 days (HEDIS)	IHA inpatient data	6/30/2017 and 6/30/2018
The SIM will reduce the annual rate of preventable emergency department visits by the third year.	Rate of preventable ED visits as defined by NYC Billings algorithm	IHA outpatient file	6/30/2017 and 6/30/2018
The total cost of care per member in Iowa will be reduced below the national average by the third year.	Cost of care per person in Iowa	Either provided by third party vendor or calculated from Medicaid/Wellmark/Medicare claims data	12/31/2017 and 12/31/2018
The proportion of Medicaid primary care providers in value-based purchasing contracts will increase to 70% by the third year.	Proportion of Medicaid Primary care providers in VBP contracts	Medicaid provider dataset	12/31/2018

Utilization and cost

We have calculated three outcome measures relating to access and cost for the general population: ED Visits, Plan All-Cause Readmissions, and Total Cost of Care. The baseline measures were calculated using only Medicaid administrative data. Wellmark and Medicare data will be incorporated into the next report. All Medicaid members who were not additionally covered by Medicare were included in the measures.

We are currently developing an algorithm to combine the Wellmark, Medicare and Medicaid data to provide a statewide rate without combining the datasets. Through the application of weights to the outcomes, we hope to be able to simulate the statewide rates for ED visits, readmissions and Total Cost of Care for the CY 2017 report next October.

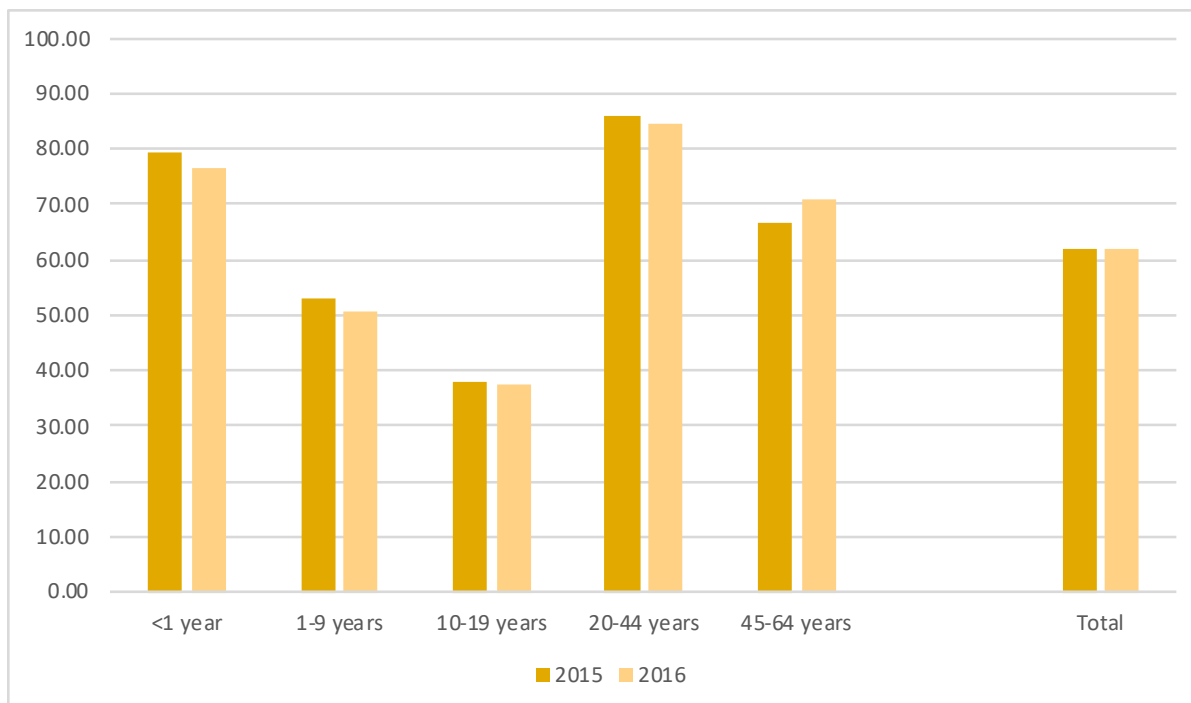
ED visits

ED visit rates for the Iowa Medicaid population were calculated according to HEDIS 2016 specifications for Emergency Department Utilization. Rates are reported as unadjusted visits per 1,000 months of eligibility (Table 2, Figure 1). These rates include Medicaid members who were eligible for at least 1 month during CY 2015 or CY 2016. The ED visit rates include all ED visits that did not result in an inpatient admission and were not related to behavioral health care.

Table 2. ED visits per 1,000 months of eligibility, CY 2015 and CY 2016

Age group	CY 2015	CY 2016
<1 year	79.21	76.39
1-9 years	53.16	50.76
10-19 years	37.76	37.42
20-44 years	85.78	84.60
45-64 years	66.70	70.96
Total	61.96	61.96

Figure 1. Emergency department utilization by age, CY 2015 and CY 2016



Overall there were 61.96 ED visits per 1,000 months of eligibility in both years. Infants under age one and adults ages 20-44 were the most likely to have an ED visit. Infants and children under 9 years of age had fewer ED visits per 1,000 months of eligibility in CY 2016 than CY 2015, while the rate of ED visits per 1,000 months of eligibility remained nearly unchanged in children and youth 10-19 years of age across both years. The only age group that showed an increase in the ED rate was adults 45-64 years of age.

Plan all-cause readmissions

Plan all-cause readmissions reflect hospital admissions that occur within the first 30 days following an index hospital discharge (NQF measure #1768). Index hospital discharges include discharges that occurred during the measurement year between January 1 and December 2 for Medicaid members eligible for at least 1 month after the index discharge. Readmissions are discharges that occur within 30 days after the index discharge and during the period January 2 to December 31. These discharges do not include pregnancy- or perinatal condition-related discharges for discharges with planned readmissions such as chemotherapy or transfusions.

The plan all-cause readmission rates are not risk adjusted as the HEDIS measure only includes risk adjustments for Medicare or commercially insured populations. Table 2 shows the unadjusted plan all-cause readmissions in CY 2015 and CY 2016 for the Iowa Medicaid population. The rate of observed readmissions was lower in CY 2016 for all three age groups.

Table 3. Unadjusted Plan All-Cause Readmissions, CY 2015 and CY 2016

Age group	Count of index stays (Denominator)		Count of 30-day readmissions (Numerator)		Observed Readmissions	
	CY 2015	CY 2016	CY 2015	CY 2016	CY 2015	CY 2016
18-44 years	7,810	10,288	763	858	9.8%	8.3%
45-54 years	4,418	3,290	545	376	12.3%	11.4%
55-64 years	3,575	2,697	403	257	11.3%	9.5%
Total	15,803	16,275	1,711	1,491	10.8%	9.2%

There was a total of 15,803 inpatient stays in CY 2015 and 16,275 inpatient stays in CY 2016. For over 1,700 of these visits (1,710) there was a readmission to the hospital within 30 days (10.8%). The readmission rates were lower for all age groups in CY 2016, with a total of 1,491 readmissions for a rate of 9%. In both years, adults ages 45-54 were most likely to have a readmission, while those 18-44 years of age were least likely to have a readmission.

Total cost of care

Total cost of care was calculated using the Health Partners analytic package with the Johns Hopkins ACG system (Adjusted Clinical Groups) to risk adjustment cost results for Medicaid members who were eligible for at least 9 months during CY 2015 or CY 2016 (see https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/dev_057642.pdf).

Table 4. Risk adjusted per member per month (PMPM) cost of care, CY 2015 and CY 2016

Year	Months of enrollment	Inpatient PMPM	Outpatient PMPM	Professional PMPM	Medical PMPM	Prescription PMPM	Total PMPM	% change Total PMPM
2016	5,493,831	\$80.04	\$88.97	\$146.16	\$315.16	\$96.93	\$412.09	+13.7%
2015	5,140,441	\$49.18	\$82.86	\$143.01	\$275.05	\$87.41	\$362.46	

The average risk-adjusted per member/per month cost for Medicaid members in CY 2016 was \$412.09, this represents a 13.7% increase in costs over CY 2015. The largest portion of this cost (\$275) was attributable to medical care (e.g., outpatient, professional and ancillary services).

As part of the SIM activities, the IDPH awarded funds to counties and county groups to organize area stakeholders and providers to enhance the referral and care coordination systems in an effort to provide not just health care service, but additional service related to social determinants of health such as housing and employment. These counties are referred to as C3 counties. The C3 counties in these analyses include those awarded funds during C3 award year 1: Appanoose, Buena Vista, Calhoun, Dallas, Decatur, Des Moines, Hamilton, Humboldt, Linn, Lucas, Marion, Monroe, Pocahontas, Ringgold, Sac, Sioux, Wayne, Webster, and Wright. We chose comparison counties based on a variety of county characteristics such as age and race distribution. The comparison counties include: Adair, Adams, Black Hawk, Butler, Carroll, Cass, Cerro Gordo, Clinton, Franklin, Hardin, Marshall, Montgomery, Pottawattamie, and Union.

C3 counties showed a slightly higher increase in costs than comparison counties, 14.9% as compared to 13.9%. The Total PMPM cost for C3 counties was higher than the total for all counties in Iowa (Table 4) for both CY 2015 and CY 2016, while comparison counties had lower Total PMPM costs than all counties in Iowa for both years.

Table 5. Risk adjusted per member per month (PMPM) cost of care for C3 counties and comparison counties, CY 2015 and CY 2016

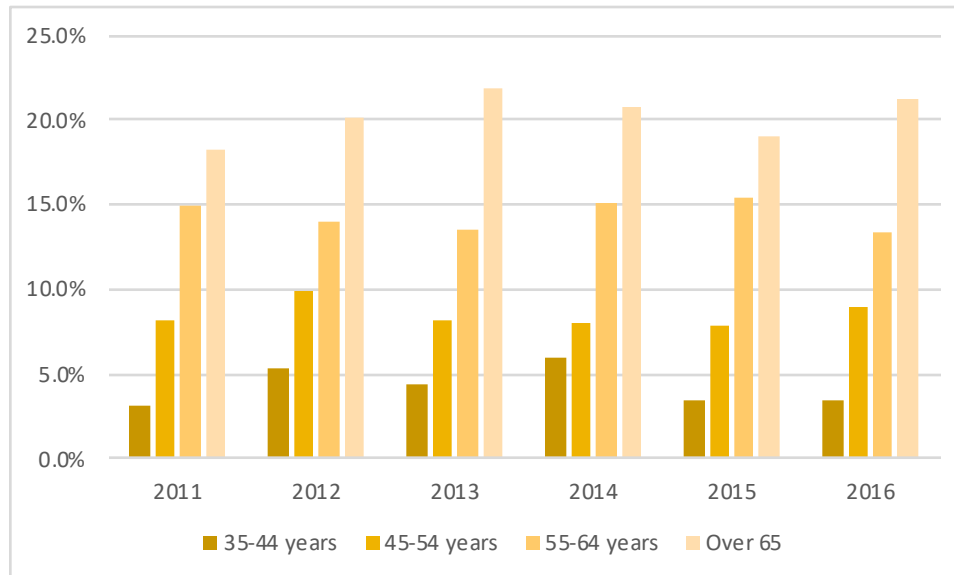
Year	Months of enrollment	Inpatient PMPM	Outpatient PMPM	Professional PMPM	Medical PMPM	Precription PMPM	Total PMPM	% change Total PMPM
C3 Counties								
2016	967,325	\$76.38	\$92.91	\$153.52	\$322.82	\$97.93	\$420.75	+14.9%
2015	906,494	\$50.26	\$84.12	\$145.60	\$279.99	\$86.15	\$366.14	
Comparison Counties								
2016	972,481	\$81.75	\$88.46	\$136.16	\$306.38	\$96.91	\$403.28	+13.9%
2015	912,348	\$48.00	\$85.73	\$132.93	\$266.66	\$87.46	\$354.12	

Diabetes

Statewide diabetes rates

The most recent SIM operational plan focuses on improving the quality of care and outcomes for people with diabetes. One of the outcomes related to these efforts states ‘ The statewide diabetes rate will be reduced by 0.2% over the three years of the SIM.’ The Centers for Disease Control (CDC) administers the Behavioral Risk Factor Surveillance System (BRFSS) questionnaire annually in all 50 states. The crude prevalence diabetes rates are available online through the CDC site and through annual reports compiled by the Iowa Department of Public Health and posted to the IDPH website at <http://idph.iowa.gov/brfss> . Figure 2 provides the crude diabetes prevalence rates by year and age group. These rates reflect the percent of respondents that indicated their doctor had told them they have diabetes at some time. The rates vary over time somewhat, but hover around 3-5% for those 35-44 years of age, 8-10% for those 45-54 years of age, 13-15% for those 55-64 years of age and 18-21% for those 65 and over. It will be difficult to detect a 0.2% change in the diabetes rates over time as the year to year fluctuations range from reductions of 2.4% to increases of 2.2%. We may rely on the combination of Wellmark, Medicaid and Medicare data to provide more sensitive, claims-based rates for this measure. However, even this approach may not yield results sensitive to a 0.2% shift.

Figure 2. BRFSS crude diabetes rates by age group and year



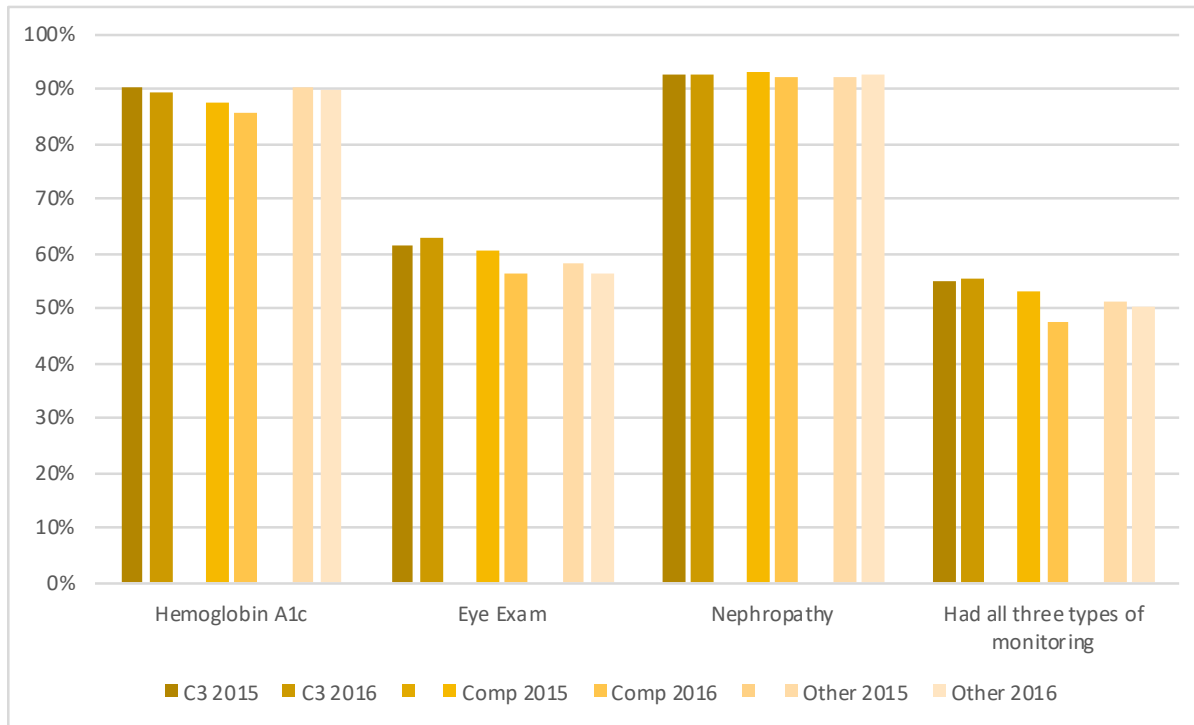
Diabetes monitoring

Three diabetes monitoring outcomes are currently tracked by PPC: Hemoglobin A1c, eye exam, and medical attention for nephropathy for all Medicaid members with diabetes. The Medicaid statewide results are shown in Table 6 and Figure 3. Though these rates are generally lower in CY 2016 than they were in CY 2015, the C3 counties show the least reduction in rates across the two years for all three measures. As a baseline measure, this may indicate that the C3 counties already have improved rates of monitoring when compared to the comparison counties and the rest of the state.

Table 6. Diabetes monitoring by county type and year, CY 2015 and CY 2016

Monitoring outcome		CY 2015			CY 2016		
		C3	Comp	Other	C3	Comp	Other
Hemoglobin A1c	Number	2,775	2,967	10,522	3,072	3,178	11,290
	%	90.3%	87.6%	90.3%	89.5%	85.6%	89.8%
Eye exam	Number	1,890	2,055	6,756	2,151	2,088	7,095
	%	61.5%	60.7%	58.0%	62.7%	56.3%	56.5%
Medical attention for Nephropathy	Number	2,845	3,156	10,722	3,175	3,414	11,642
	%	92.6%	93.2%	92.1%	92.5%	92.0%	92.6%
Had all three types of monitoring	Number	1,690	1,793	5,972	1,896	1,758	6,296
	%	55.0%	52.9%	51.3%	55.2%	47.4%	50.1%

Figure 3. Diabetes outcomes by county type and year, CY 2015 and CY 2016



Admissions related to Diabetes

The rate of admission for diabetes-related problems is expected to decrease over the SIM as monitoring results in early detection of problems leading to fewer admissible events. There are two measures listed in the SIM: admission rate for short-term complications of diabetes and admission rate for long-term complications of diabetes. For the purposes of this report we have also added the rate of admission for uncontrolled diabetes and the admission rate for lower-extremity amputation among patients with diabetes. These rates are calculated using the Agency for Health Research and Quality (AHRQ) outcome calculator utilizing the Prevention Quality Indicators (PQI) related to diabetes for Medicaid members eligible for at least 9 months in CY 2015 or CY 2016. Table 7 shows that the rates for three of the four admission types fell from CY 2015 to CY 2016. Only admissions for uncontrolled diabetes increased from one year to the next, and this increase was nearly twofold from 28.28 admissions per 100,000 members to 54.01 admissions per 100,000 members.

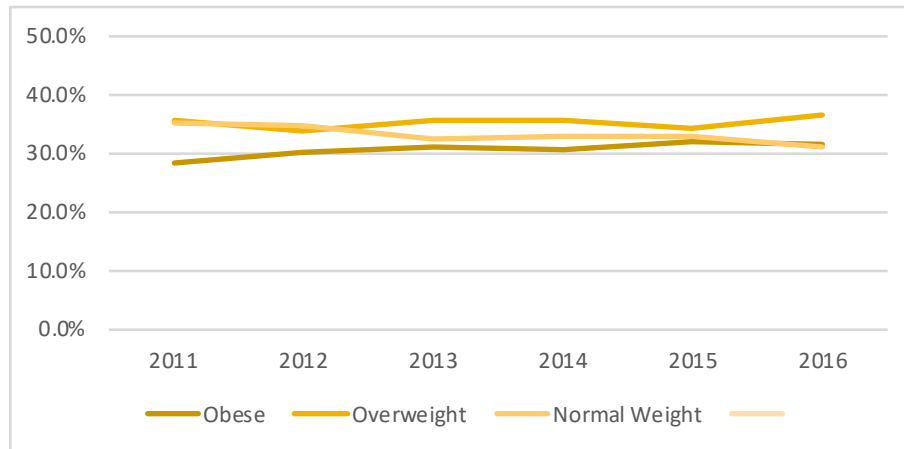
Table 7. Number of admissions related to diabetes per 100,000 members, CY 2016

Type of admission	CY 2015	CY 2016
Diabetes Short-term Complications	282.83	262.02
Diabetes Long-term Complications	97.53	72.76
Uncontrolled Diabetes	28.28	54.01
Lower-extremity Amputation	13.17	9.37

Obesity

SIM activities are designed to support providers and patients as they lower individual BMI. These efforts are expected to have the following result: People with obesity will have decreased BMI over the 3 years of the SIM. Though we need to have the state-specific BRFSS data to report this measure, the statewide obesity rates are available through the CDC and IDPH annual reports (Figure 4). The rate of obesity has risen from 29.2% to 31.6%, a 12% increase. Unlike the crude prevalence rates for diabetes, this rate does not vary from year to year – increasing one year and then decreasing the next. This rate rises steadily over time to nearly 32% in CY 2016 with a mirrored decrease in the rate of people with normal weight over that time.

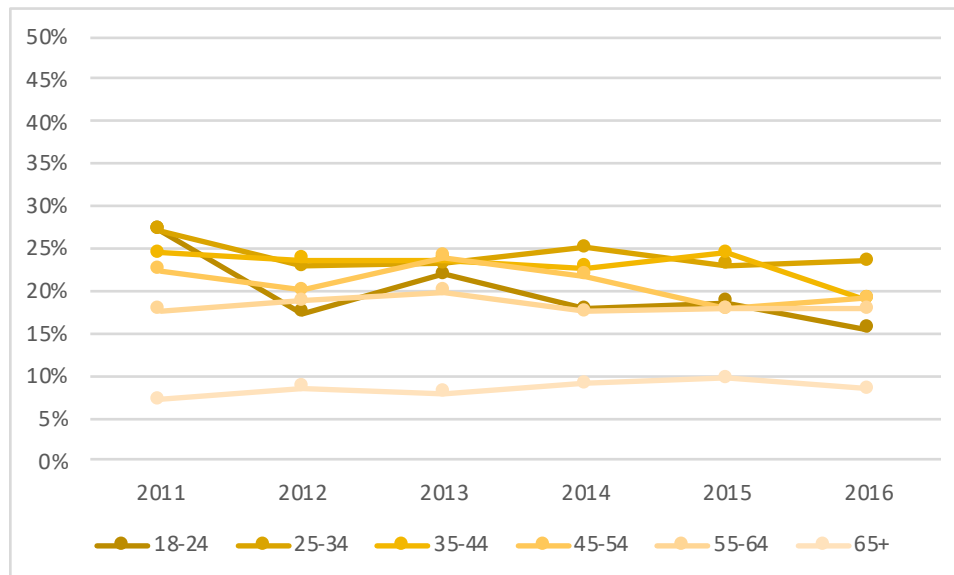
Figure 4. Obesity rates by BMI category and year, CY 2011-CY 2016



Tobacco use

Reducing tobacco use is an outcome within the SIM. Figure 5 provides the tobacco use rate by age group and year as provided by the BRFSS. Tobacco use has consistently been decreasing for all age groups except those 55-64 years of age and those 65 years of age and over. The SIM goal is to reduce tobacco use by 1% over the 3 years of the SIM; this may be difficult to measure since the rates are already going down an average of 1% per year from CY 2011 to CY 2016 for the four lower age groups.

Figure 5. Tobacco use by age and year, CY 2011-2016



Data acquisition

Completion of many of the outcome measures for the SIM evaluation require an extensive set of databases and data collection tools. Table 8 lists the databases and data collection tools that are needed to complete the evaluation plan as originally outlined and the progress that has been made to acquire and assimilate these data.

Table 8. Data acquisition progress

Dataset/Tool	Source	Progress	Acquisition date
Behavioral Risk Factor Surveillance System (BRFSS)	IDPH	Have identified dataset fields needed for research, in the process of signing data use agreement	6/30/2018
Youth Risk Behavior Surveillance System (YRBSS)	IDPH	Have identified dataset fields needed for research, in the process of signing data use agreement	6/30/2018
Iowa Hospital Association (IHA) inpatient file	IHA	Data from 2013-2014 have been acquired, acquisition 2015 data is ongoing	6/30/2018
IHA outpatient file	IHA	No efforts have been made to acquire this data	6/30/2018
Iowa Quitline data and claims data	IDPH	This data may not be available	May not be acquired
Medicaid claims and enrollment data	IDHS	Acquired and assimilated on a monthly basis	Completed
Wellmark claims and enrollment data	Wellmark BCBS	Data will not be acquired. Working with UI College of Public Health to complete outcomes and weight results to statewide rates	Completed
Medicare claims and enrollment data	CMS	Data has arrived at PPC for CY 2014	Ongoing

There have been significant challenges encountered trying to obtain many of these datasets including lengthy approval processes, adjusting the timing of secondary datasets to the timing of the SIM, preparation and testing of the secure data enclave, and negotiation of type and level of data to be provided. As indicated in the table however, all of these datasets will continue to be pursued with acquisition anticipated to occur in 2018. Most recently, in response to SIM goal adjustments, the Birth certificate data and PRAMS dataset were not needed. An updated DUA was submitted to IDPH and is currently under review.