



# Service Utilization and Expenditures among Adults with Diabetes in Maryland's Medicaid Managed Care Program

Jamie L. John, MHS;\* David Idala, MA;\* Carl H. Mueller, MS;\*\* Paula Henning, MA;\* Michael Nolin, MA;\* Cynthia Woodcock, MBA\*  
\*Hilltop; \*\*Tennessee Division of Health Care Finance and Administration



## Background

- Diabetes affects more than 29 million Americans, and those with diabetes have a higher risk of experiencing severe health issues, such as kidney failure, stroke, and amputations.<sup>1</sup>
- Diabetes is costly; in the U.S., the total estimated cost of diagnosed diabetes in 2012 was \$245 billion in direct medical costs and reduced productivity.<sup>2</sup>
- Because diabetes disproportionately affects individuals with low income, Medicaid plays an important role in providing health care coverage.<sup>3</sup>

## Objective

To provide a picture of diabetes-related service use and costs in HealthChoice, Maryland's Medicaid managed care program, in calendar years (CYs) 2013 and 2014.

## Methods

Participants of this study were: (1) aged 35-64 years and (2) enrolled in HealthChoice for all 12 months of the study year. We determined a diabetes diagnosis using the Healthcare Effectiveness Data and Information Set (HEDIS) clinical criteria for Comprehensive Diabetes Care measures. We used Medicaid administrative data to identify diabetes status, utilization by service category, and expenditures. We compared HealthChoice enrollees with diabetes to enrollees without diabetes.

## Results

- In both study years, the diabetes group had a higher proportion of males, older adults (aged 45-64), Blacks, Baltimore City residents, and enrollees with high and very-high comorbidity levels than the non-diabetes group.
- In CY 2014, the diabetes group had a higher proportion of enrollees who joined Medicaid through the Affordable Care Act (ACA) Medicaid expansion than the non-diabetes group.

**Table 1. Key Descriptive Statistics, CYs 2013 & 2014**  
Medicaid Enrollees Aged 35-64 with 12 Months of Managed Care Enrollment

Variables	CY 2013		CY 2014	
	Diabetes % of Total	Non-Diabetes % of Total	Diabetes % of Total	Non-Diabetes % of Total
<b>Sex</b>				
Male	35%	32%	38%	36%
Female	65%	68%	62%	64%
<b>Age Group</b>				
35-44	26%	51%	22%	44%
45-54	39%	33%	39%	35%
55-64	35%	16%	40%	21%
<b>Race/Ethnicity</b>				
Black	55%	50%	55%	50%
White	31%	35%	32%	37%
Other <sup>d</sup>	14%	14%	14%	13%
<b>Region</b>				
Baltimore City	31%	26%	30%	27%
<b>Comorbidity Level</b>				
Moderate	34%	44%	37%	45%
High	27%	20%	28%	20%
Very-High	35%	14%	32%	14%
<b>Medicaid Coverage Category</b>				
ACA Expansion	-	-	28%	26%
<b>Total Enrollees</b>	<b>12,900</b>	<b>82,995</b>	<b>19,315</b>	<b>119,673</b>
<b>% of Enrollees in CY</b>	<b>13.5%</b>	<b>86.5%</b>	<b>13.9%</b>	<b>86.1%</b>

## Results continued

- In both study years and across all service categories, a higher proportion of enrollees with diabetes than enrollees without diabetes used services, the largest difference noted in outpatient facility services.

**Table 2. Percentage of Enrollees who Used Services, by Diabetes Status and Service Category, CYs 2013 & 2014**

Service Category	CY 2013		CY 2014	
	Diabetes (% of Enrollees)	Non-Diabetes (% of Enrollees)	Diabetes (% of Enrollees)	Non-Diabetes (% of Enrollees)
Inpatient Facility	25%	11%	22%	11%
Outpatient Facility	72%	54%	70%	54%
Professional & Other Services	99%	90%	99%	91%
Prescription Drugs	99%	86%	99%	86%

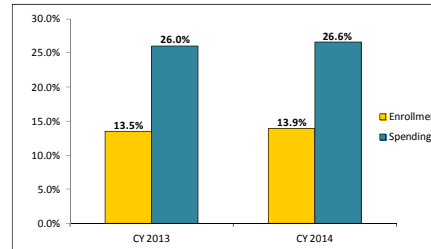
**Table 3. Total Expenditures by Diabetes Status, CYs 2013 & 2014**

	CY 2013		CY 2014	
	Expenditures	% of Total	Expenditures	% of Total
Diabetes	\$311,825,295	26.0%	\$471,030,078	26.6%
Non-Diabetes	\$886,193,948	74.0%	\$1,302,019,855	73.4%
<b>Total</b>	<b>\$1,198,019,243</b>	<b>100.0%</b>	<b>\$1,773,049,933</b>	<b>100.0%</b>

**Table 4. Average Spending per User, by Diabetes Status and Service Category, CYs 2013 & 2014**

Service Category	CY 2013		CY 2014	
	Diabetes	Non-Diabetes	Diabetes	Non-Diabetes
Inpatient Facility	\$27,078	\$20,938	\$29,272	\$20,946
Outpatient Facility	\$8,748	\$4,953	\$9,163	\$5,047
Professional & Other Services	\$6,717	\$4,196	\$6,160	\$4,051
Prescription Drugs	\$4,628	\$2,204	\$5,452	\$2,550
<b>Total</b>	<b>\$24,173</b>	<b>\$10,714</b>	<b>\$24,387</b>	<b>\$10,937</b>

**Figure 1. Enrollees with Diabetes as a Percentage of Enrollment and Spending within Group, CYs 2013 & 2014**  
Medicaid Enrollees Aged 35-64 Years and 12 Months of Managed Care Enrollment



- Though enrollees with diabetes made up 13.5% of the cohort, they accounted for 26.0% of spending in CY 2013. CY 2014 had similar results.

## Results continued

We conducted a logistic regression on 2014 data to test whether enrollees with diabetes were more likely to have an inpatient admission and ED visit<sup>5</sup> than those without diabetes.

**Table 5. Logistic Regression – Predicting Odds of an Inpatient Admission and ED Visit, CY 2014**

Variable	Odds of Receiving an Inpatient Admission Odds Ratio (95% CI)	Odds of Visiting the ED Odds Ratio (95% CI)
Diabetes	<b>1.22***</b> (1.17, 1.27)	<b>1.04*</b> (1.00, 1.07)
Female	0.96 (0.93, 1.00)	<b>1.13***</b> (1.10, 1.16)
Black <sup>6</sup>	<b>1.15***</b> (1.11, 1.20)	<b>1.39***</b> (1.35, 1.43)
Other <sup>6</sup>	<b>1.09**</b> (1.02, 1.16)	<b>0.77***</b> (0.74, 0.81)
Age (years)	<b>0.98***</b> (0.98, 0.98)	<b>0.96***</b> (0.96, 0.97)
Baltimore <sup>7</sup>	<b>1.22***</b> (1.17, 1.28)	<b>1.37***</b> (1.33, 1.41)
ACA Medicaid Expansion <sup>8</sup>	<b>0.88***</b> (0.84, 0.92)	<b>0.93***</b> (0.90, 0.95)
High Comorbidity <sup>9</sup>	<b>7.38***</b> (6.96, 7.82)	<b>2.71***</b> (2.63, 2.79)
Very High Comorbidity <sup>9</sup>	<b>31.84***</b> (30.07, 33.72)	<b>5.74***</b> (5.54, 5.95)

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

- Enrollees with diabetes had higher odds of receiving an inpatient admission (22%) and an ED visit (4%) after adjusting for other characteristics.
- Enrollees who joined Medicaid through the ACA expansion had lower odds of receiving an inpatient admission (12%) and an ED visit (7%) compared to other Medicaid coverage groups.

## Conclusion

Adult HealthChoice enrollees with diabetes are more likely to use the health care system and have substantially higher expenditures than those without diabetes. Based on the regression analysis, other characteristics (such as race/ethnicity and location of residence) may influence service use in addition to a diagnosis of diabetes. The results of this study should not be extrapolated to all HealthChoice or Medicaid enrollees. Expanding the study participants' age and enrollment criteria and using statistical methods to reduce selection bias would provide a more complete picture of the effect of diabetes on service use and expenditures in Medicaid.

## Acknowledgements/References

A portion of this study was funded by MedChi, the Maryland State Medical Society.

<sup>1</sup> Centers for Disease Control and Prevention. (2016, July 25). *At a glance 2016: Diabetes, working to reverse the US epidemic*. Retrieved from <https://www.cdc.gov/chronicdisease/resources/publications/aag/pdf/2016/diabetes-aag.pdf>  
<sup>2</sup> American Diabetes Association. (2013). *Economic costs of diabetes in the U.S. in 2012*. *Diabetes Care*, 36(4), 1033-1046.  
<sup>3</sup> The Kaiser Commission on Medicaid and the Uninsured. (2012, November). *The role of Medicaid for people with diabetes*. Retrieved from [https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8383\\_d.pdf](https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8383_d.pdf)  
<sup>4</sup> Other races/ethnicities include Asian, Hispanic, Native American, Alaskan/Pacific Islander, and Unknown.  
<sup>5</sup> ED visit was defined as a visit to a hospital emergency department that did not lead to an inpatient admission.  
<sup>6</sup> Compared to White enrollees; <sup>7</sup> Compared to all other Maryland regions; <sup>8</sup> Compared to non-expansion enrollees; <sup>9</sup> Compared to moderate comorbidity level.