Measuring Type-2 Diabetes Care and Outcomes Across Patients and their Communities

Measurement Years: 2018 – 2022

CMS Qualified Entity (QE) Program Public Report

August 3, 2024

What We Do and Who We Serve

Vizient, Inc. is the nation's leading healthcare performance improvement company. As the largest member-owned health care company in the United States, Vizient understands what members need to deliver exceptional, cost-effective care. We work with a wide range of health care organizations to ensure that our innovative practices, knowledge base and expertise reach across communities and the care continuum. Vizient's diverse membership includes academic medical centers, pediatric facilities, community hospitals, integrated health delivery networks and non-acute health care providers. These members are interested in learning from our trusted experts, accelerating performance and improving care. Membership gives these organizations access to the ways we optimize each interaction along the continuum of care.

The Qualified Entity Program

In 2022, Vizient, Inc. obtained certification from the Centers for Medicaid and Medicare Services (CMS) to become a Qualified Entity (QE), allowing us to receive 100% of Medicare claims from all 50 states and the District of Columbia. As part of this certification, Vizient publishes an annual public report utilizing this data, in combination with other Vizient data resources, to provide measures of healthcare quality.

Report Topic and Measures

The rising prevalence of diabetes presents a significant challenge for both the healthcare system and patients with this complex disease. 11.6% of the US population (38.4 million people) is estimated to have type 1 or type 2 diabetes and 38% of US adults (97.6 million people) have prediabetes[1]. Each year, an increasing number of patients are facing the financial burden and worse health outcomes associated with diabetes. Meanwhile, hospitals are experiencing mounting pressure due to rising patient acuity and capacity constraints.

Diabetes incidence and prevalence are interconnected with health-related social needs, such as an individual's housing and food security, education level, economic outlook, access to transportation and healthcare. Healthcare systems are employing strategies to address the social needs of their patient populations. However, the data required to evaluate these efforts is often lacking. This report aims to provide examples of metrics that can be used by hospitals to track efforts to improve diabetes care and outcomes.

The report contains one standard quality measure, the percentage of T2D patients receiving diabetic eye exams annually, categorized by age group and payer. This measure serves as a benchmark for evaluating the delivery of essential care to T2D patients. Then, by categorizing neighborhoods according to their level of

social need using the VVI, we examine the disparities in rates of diabetic eye exams at the community-level. The report also includes relevant prevalence measures that provide insights into acute care utilization, disease prevention efforts, and the occurrence of diabetes complications. These measures offer a glimpse of the overall landscape and impact of T2D, enabling stakeholders to identify areas for measurement and improvement.

The standard measure included is the National Quality Forum endorsed Diabetic Eye Exam Rate. The alternative measure included is the Vizient Vulnerability Index (VVI). The following prevalence rates are included in the report: Inpatient Admission, ED Visit, Primary Care Physician (PCP) Visit, Diabetes Screening, Diabetes Prevention, Circulatory Complications, Kidney Complications, Neurological Complications, Ophthalmic Complications, Skin Complications, and Insulin Resistance.

Data Source

The data used for this report include healthcare claims from CMS representing Medicare FFS and a Proprietary Sg2 All-Payer Claims dataset representing Medicare Advantage, Commercial, and Medicaid payers. The period evaluated includes data from 2018-2022. The patent pending VVI was utilized to compare metrics in high and low social need neighborhoods. The VVI is a quantification of neighborhood resources and obstacles to care based on public data including US Census American Community Survey, USDA Food Research Atlas, Housing and Urban Development Comprehensive Housing Affordability Strategy data, EPA Environmental Justice data, FBI violent crime statistics, HRSA provider shortages, and tuned to Life Expectancy at Birth at the census tract level. This index summarizes the overall social need, as well as need within nine domains: economic, education, health care access, neighborhood resources, housing, social resources, clean environment, transportation, and public safety.

Executive Summary

This report aims to support CMS in the goal of enhancing quality of care by providing quality measures, with a focus on type 2 diabetes (T2D). Given the prevalence of this condition and its close association with social and environmental factors, quantifying the effect of these factors is crucial, especially as providers prioritize population health outcomes and value-based care. Through the utilization of the VVI and an all-payer claims dataset, the report provides measures of disparities in T2D care and outcomes for neighborhoods with high and low social needs. The findings reveal that T2D patients residing in neighborhoods with greater social needs exhibit disproportionate utilization of acute care services, lower rates of critical routine care, and higher rates of complications. By harnessing the VVI, healthcare providers can gain valuable insights into the specific social needs impacting their patients, enabling them to develop tailored interventions that promote health equity across diverse populations.

Quality Measures

Figure 1. Diabetic Eye Exam Rate among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

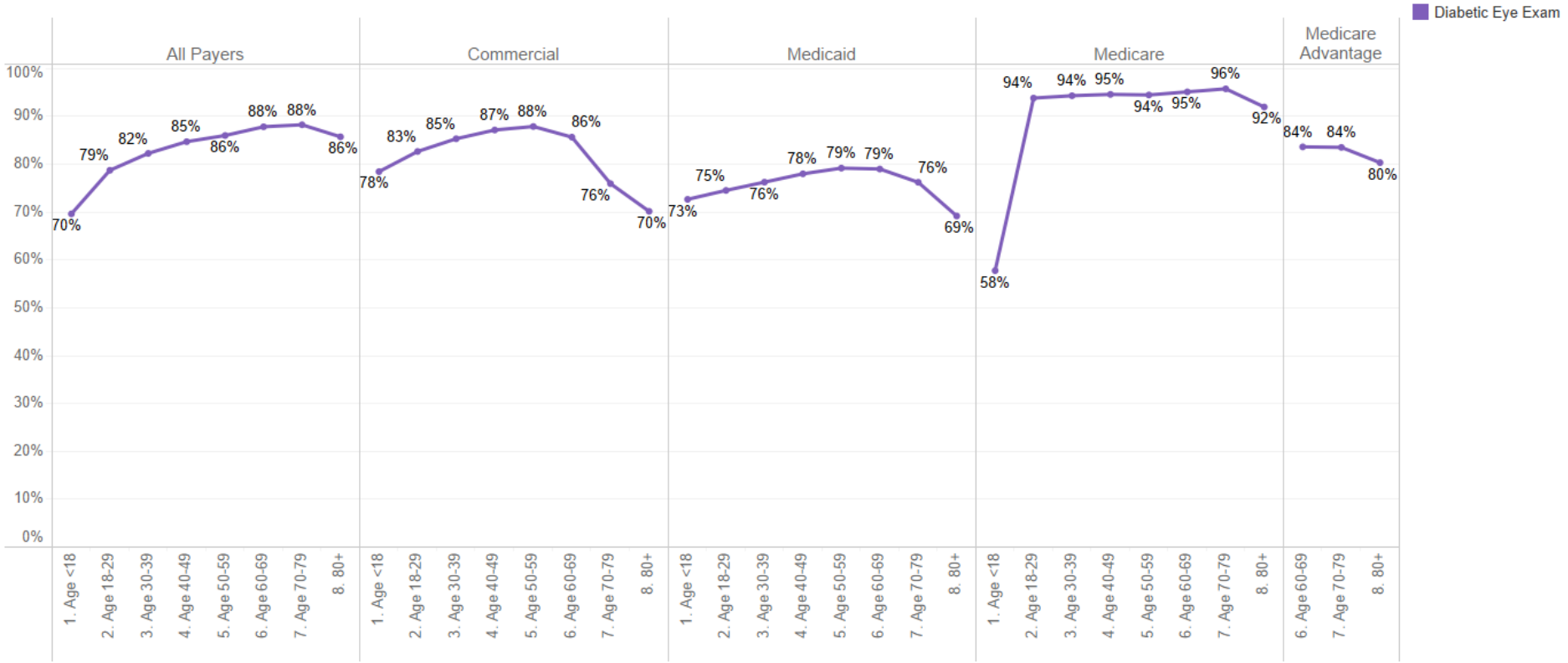


Figure 1[1] shows the percentage of T2D patients that got critical and routine diabetes care in the form of diabetic eye exams by age group and payer from 2018-2022. The rates differ significantly by payer class. T2D patients on Medicare had the highest rates of exams while patients in all other payer classes experienced lower rates of care. To meet the standard of care, all T2D patients would receive these exams annually.

[1] The data presented in Figures 1-11 is a combination of five years of data. Annual rates can be found in the Appendix.

Figure 2. Diabetic Eye Exam Rate among Type-2 Diabetes Patients by Age Group and VVI, 2018-2022

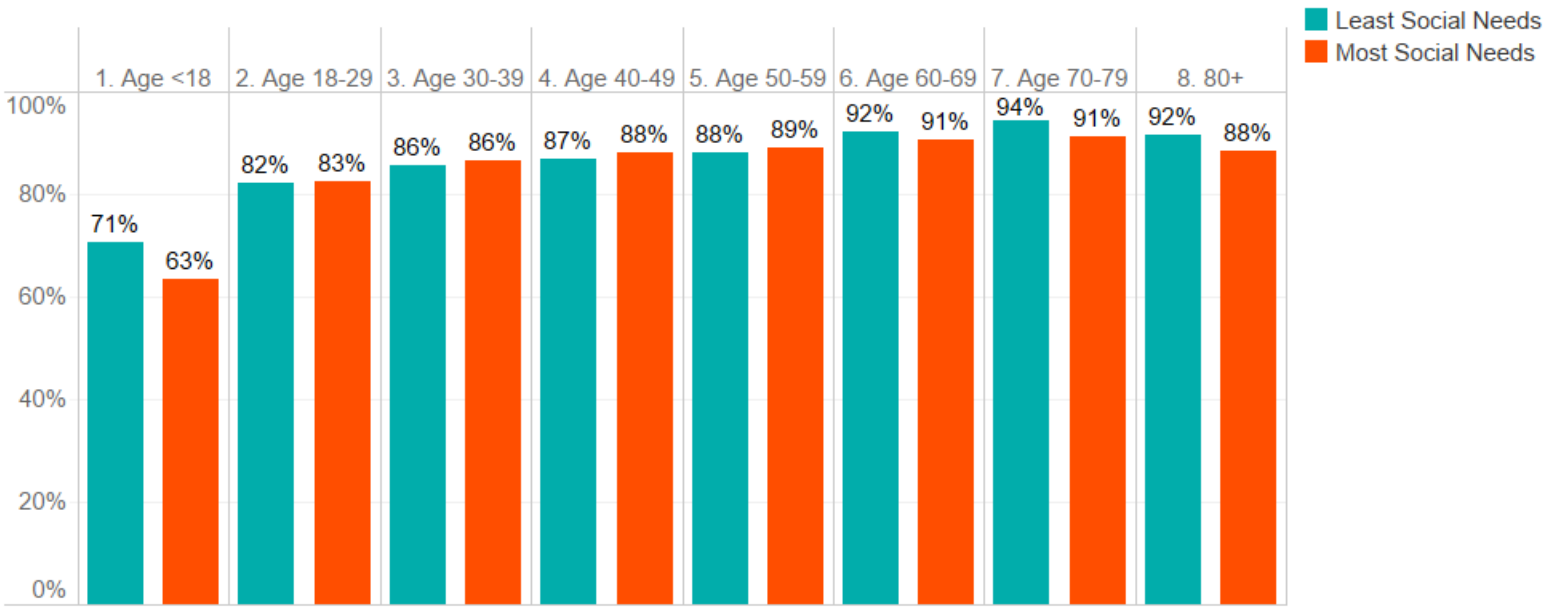


Figure 2 shows the percentage of T2D patients that received diabetic eye exams from 2018-2022, by age group and neighborhood social need, as defined by the VVI. We compare the rates for patients living in neighborhoods with the highest and lowest VVI scores. The VVI measures how much social needs and health-related resources a neighborhood has.

In the youngest age group (< 18), T2D patients living in neighborhoods with the least social needs had higher rates of eye exams compared to those living in neighborhoods with the most social needs. Rates for other age groups did not differ significantly between the neighborhoods.

Figure 3. Diabetic Eye Exam Rate among Type-2 Diabetes Patients by Payer, Age Group and VVI, 2018-2022

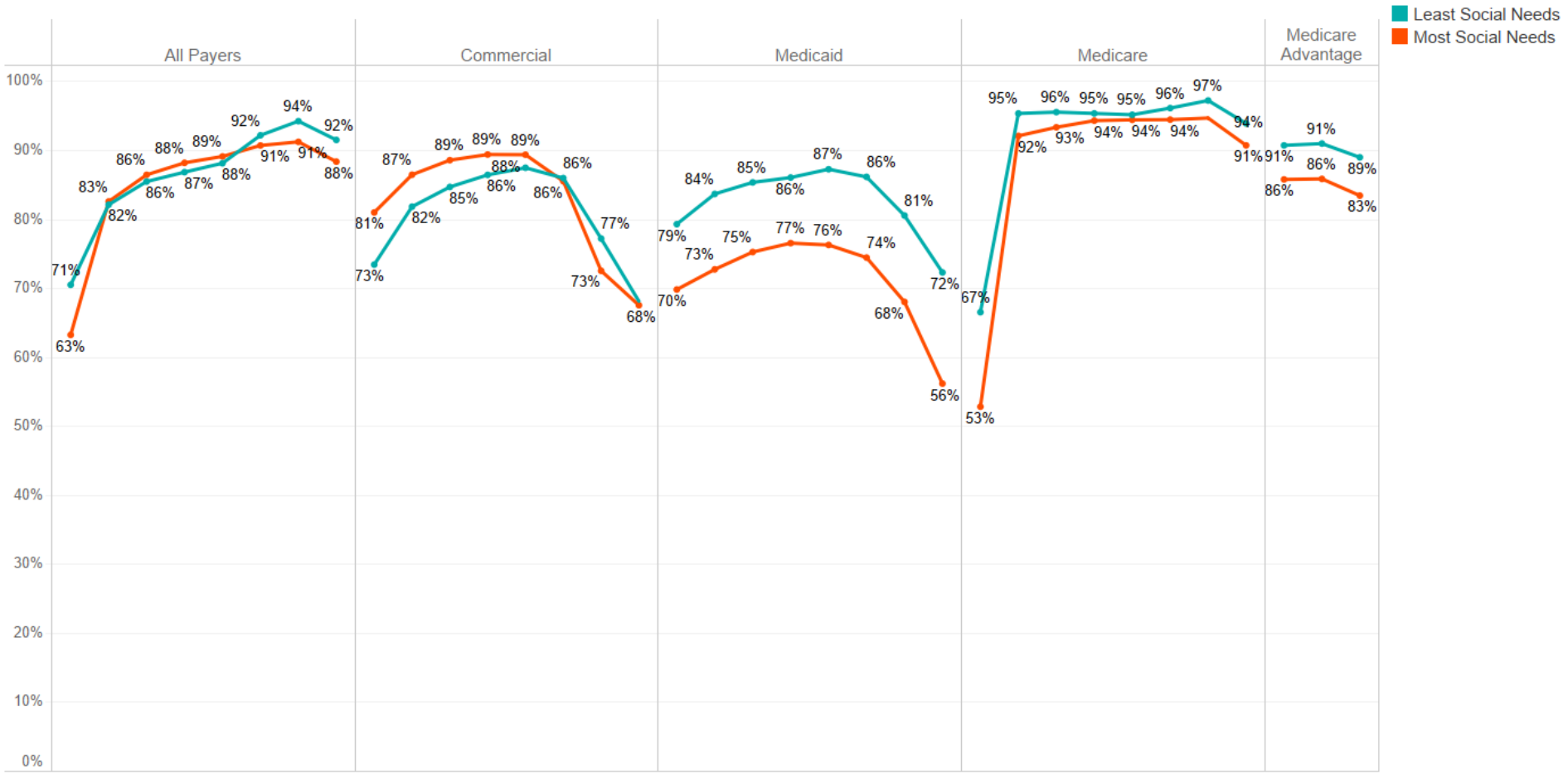


Figure 3 shows the percentage of T2D patients that received a diabetic eye exam by age, neighborhood social need and payer from 2018-2022. The exam rates for T2D patients on Medicaid were significantly higher in neighborhoods with the least social needs compared to those with the most.

Prevalence Measures – Acute Care Utilization

Figure 4. ED Visit and Inpatient Admission Rates among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

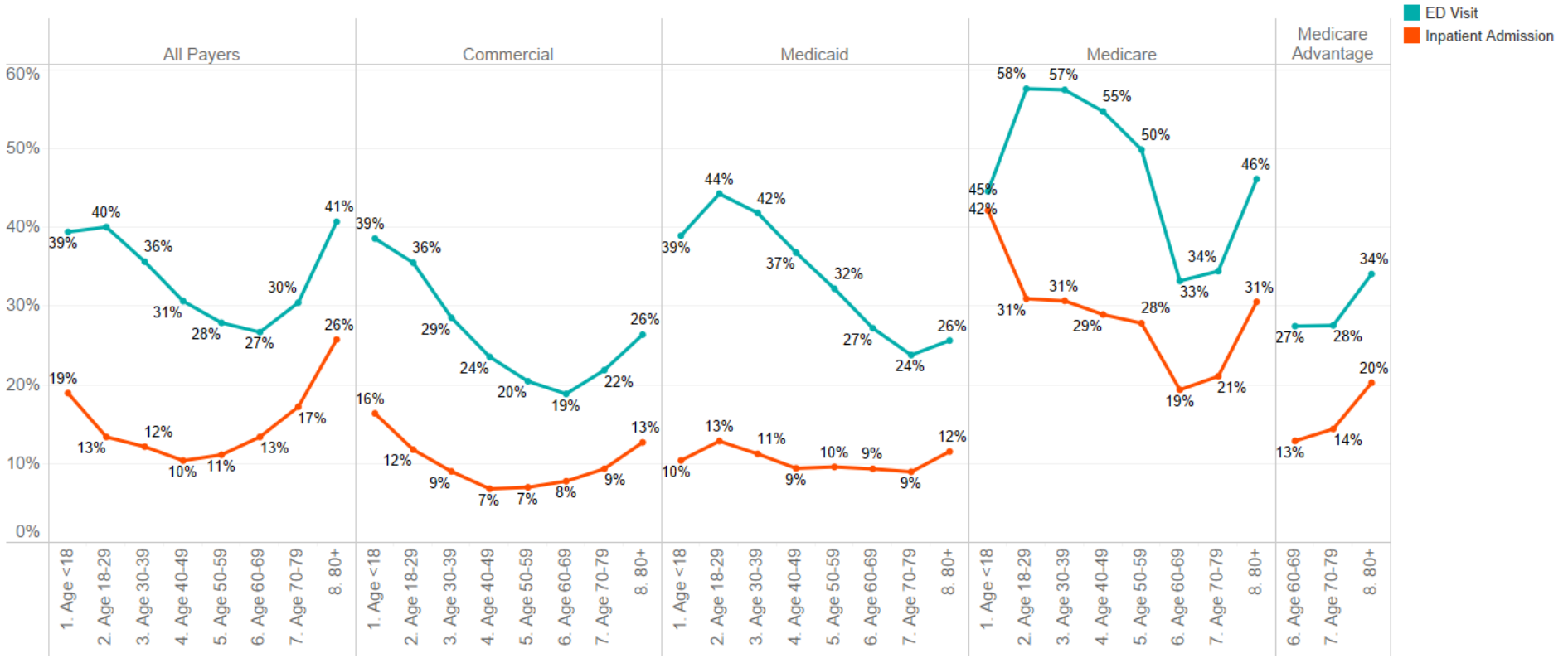


Figure 4 shows the percentage of T2D patients who had an ED visit or an inpatient admission by age and payer from 2018-2022. The rate of acute care utilization in this patient population is high with over half of the Medicare patients with T2D aged 18-59 visiting the ED. Younger T2D patients had a higher rate of ED visits than older groups and among Commercial and Medicare, younger patients were also admitted to the hospital at a higher rate than older patients.

Figure 5. ED Visit and Inpatient Admission Rates among Type-2 Diabetes Patients by Age Group and VVI, 2018-2022

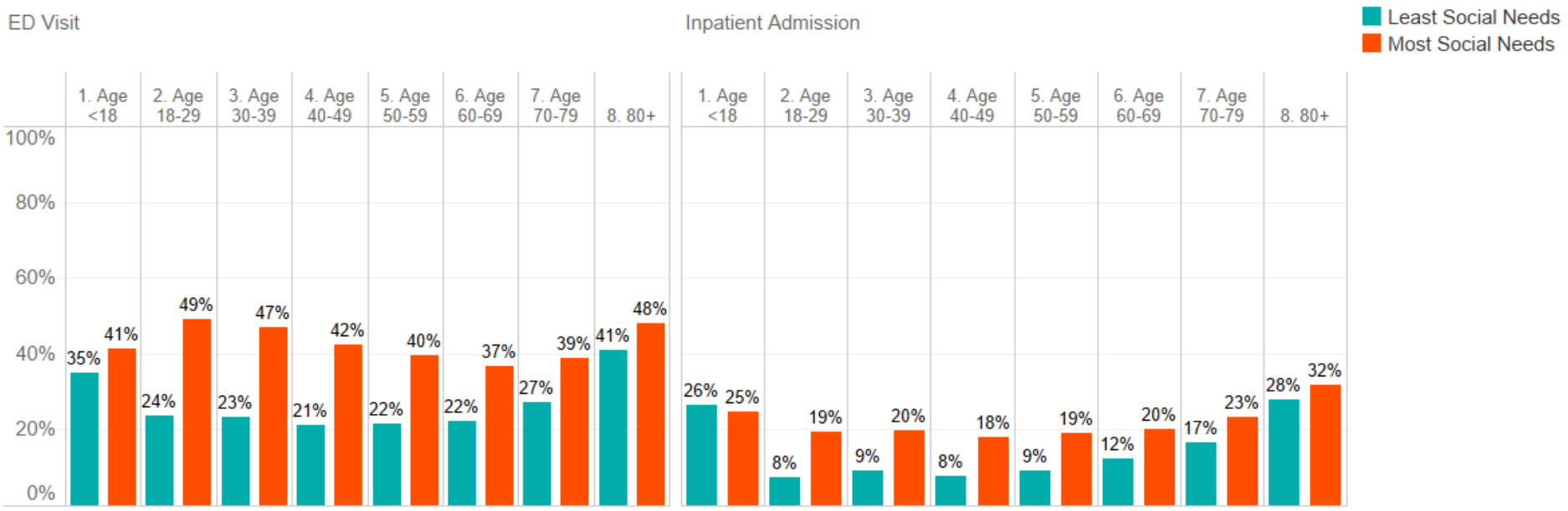


Figure 5 shows the percentage of T2D patients that used acute care services by age group and neighborhood social need, as defined by the VVI. T2D patients living in neighborhoods with the most social needs utilize acute care services at a higher rate than those living in neighborhoods with the least social needs. This difference is especially large for younger T2D patients, such as 18–49-year-olds. They have approximately double the rate of ED visits and inpatient admissions compared to patients in the same age category but living in neighborhoods with the least social needs. The difference between the rates decreases as patients get older, but the rate remained higher for patients living in neighborhoods with more social needs across all ages.

Figure 6. ED Visit and Inpatient Admission Rates among Type-2 Diabetes Patients by Payer Class, Age Group and VVI, 2018-2022

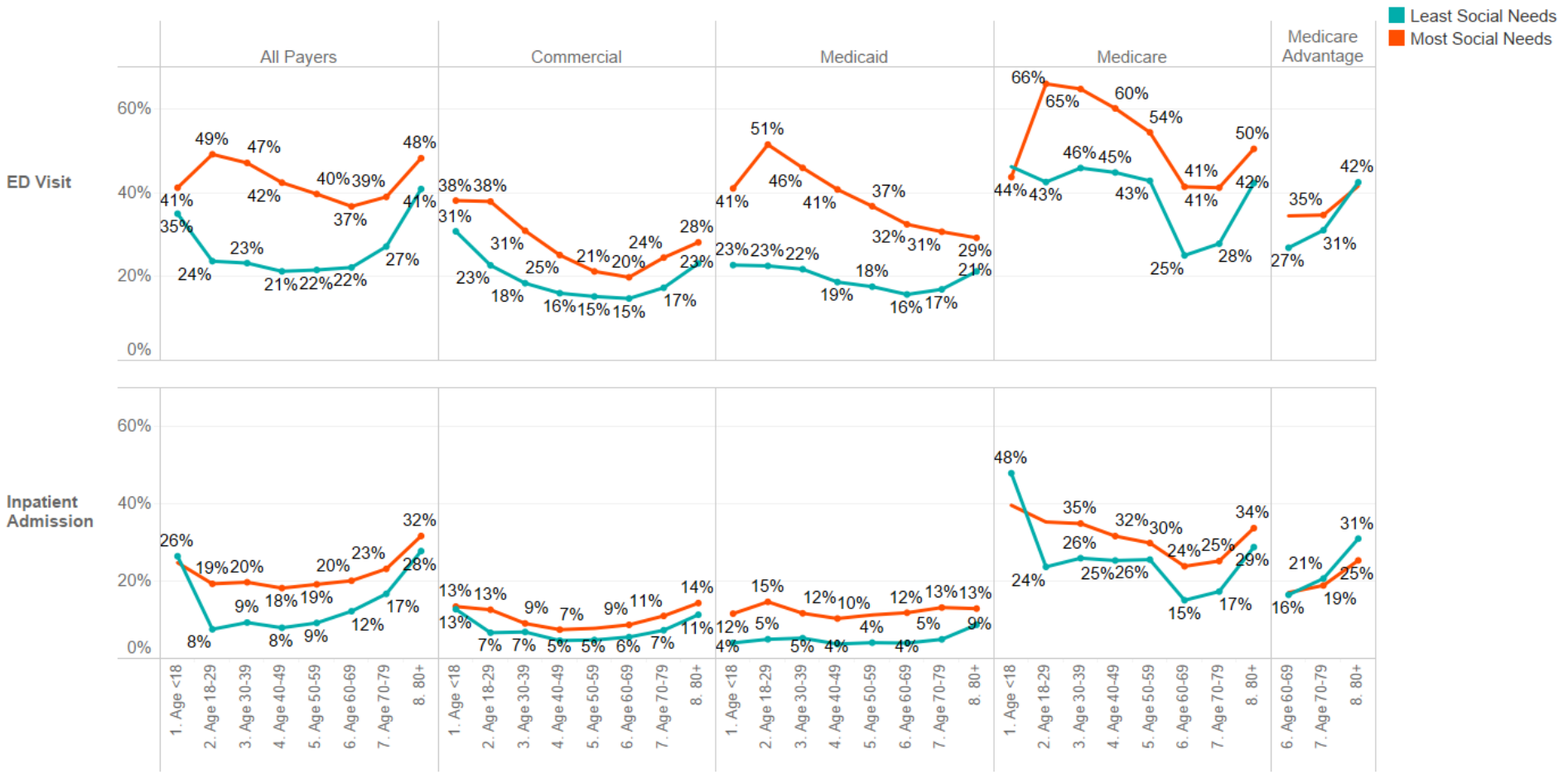


Figure 6 shows the percentage of T2D patients that used acute care services by age group, neighborhood social need and payer. Across all payer types, T2D patients living in neighborhoods with the most social needs have higher rates of acute care utilization. However, T2D patients on Medicaid show the largest rate difference between the neighborhoods with the most social needs compared to the least. Medicare patients under age 65, who are typically disabled patients who have received social security insurance for 18 months or more, show a similar trend to Medicaid.

Prevalence Measures – Disease Prevention

Figure 7. Primary Care Physician (PCP) Visit, Diabetes Screening, and Diabetes Prevention Rates among Type-2 Diabetes Patients, 2018-2022

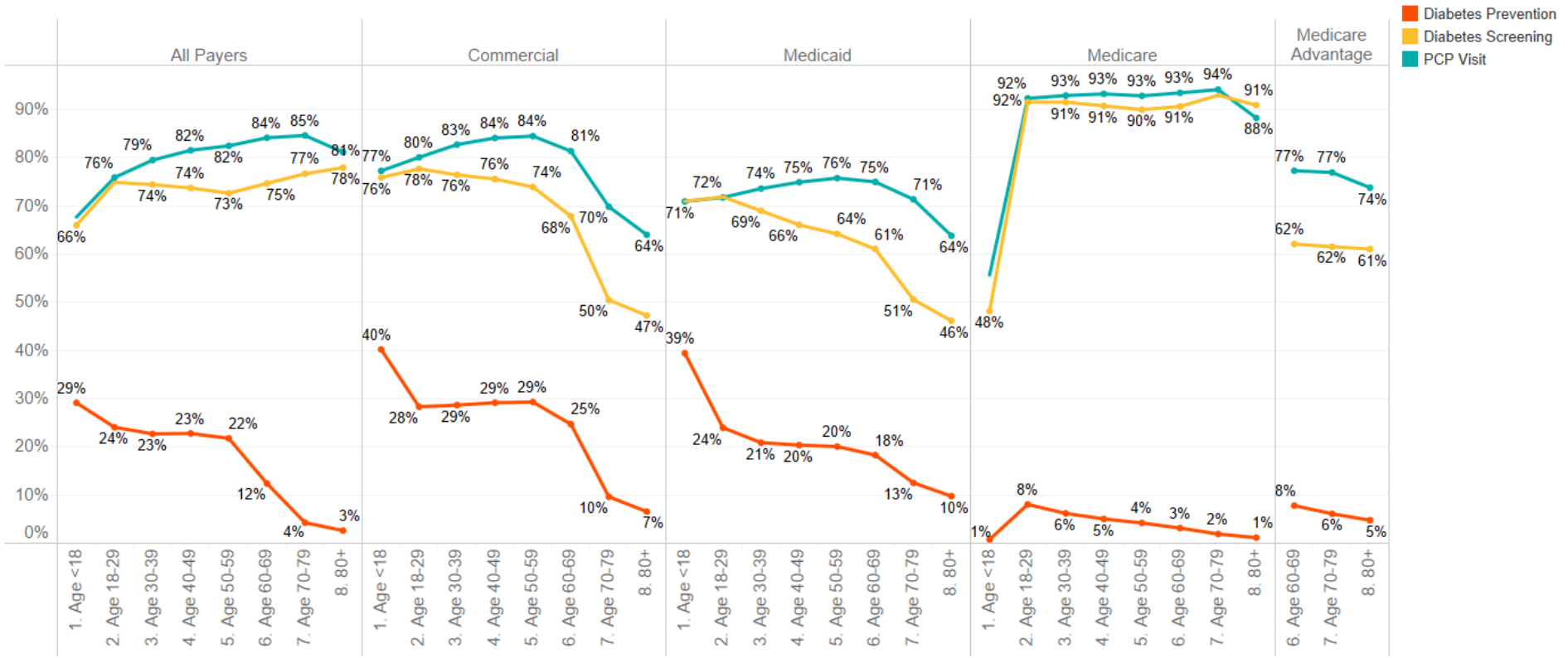


Figure 7 shows the percentage of T2D patients that used preventive services such as PCP Visits, diabetes screening and diabetes prevention by age group and payer from 2018-2022. For Medicare patients, the rate of PCP visits was highly correlated with screening. T2D prevention services, such as counseling on smoking cessation, nutrition, and physical activity, were more common among younger age groups in all payer types.

Figure 8. Primary Care Physician (PCP) Visit, Diabetes Screening, and Diabetes Prevention Rates among Type-2 Diabetes Patients by Age Group and VVI, 2018-2022

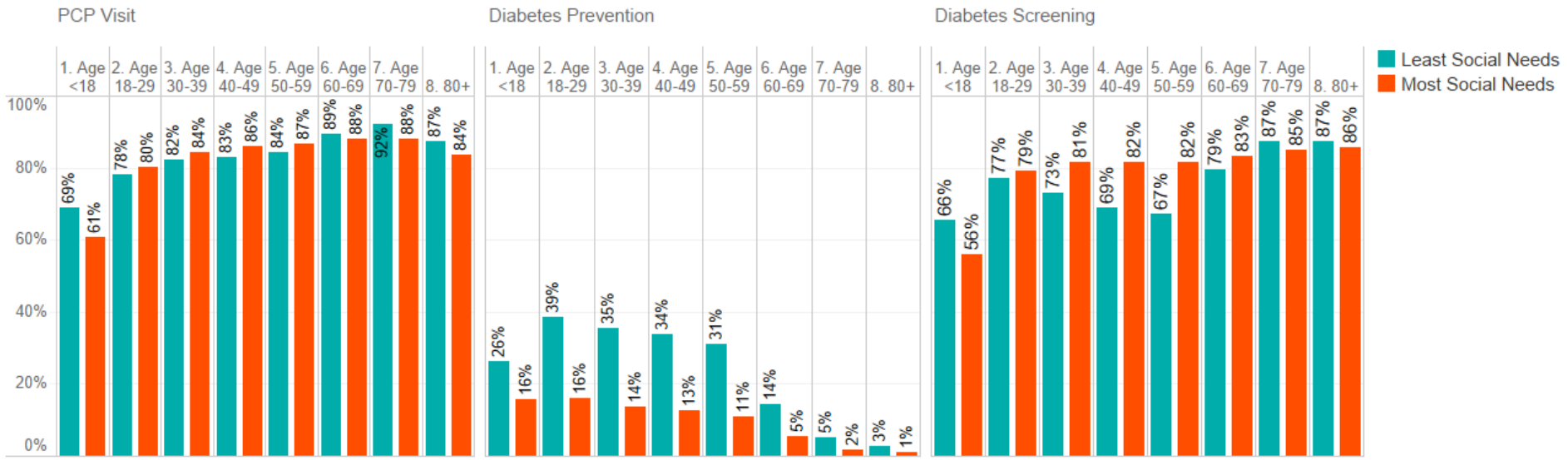


Figure 8 shows the percentage of T2D patients that used preventive services by age group and neighborhood social need, as defined by the VVI. T2D patients living in neighborhoods with the most social needs utilize diabetes prevention services at a higher rate than those living in neighborhoods with the least social needs. This difference is especially large for younger T2D patients, such as 18–59-year-olds. On the other hand, for middle age groups (30-59-year-olds) diabetes screening rates were higher in neighborhoods with the highest social need, or the least health resources.

Figure 9. Primary Care Physician (PCP) Visit, Diabetes Screening, and Diabetes Prevention Rates among Type-2 Diabetes Patients by Payer Age Group and VVI, 2018-2022

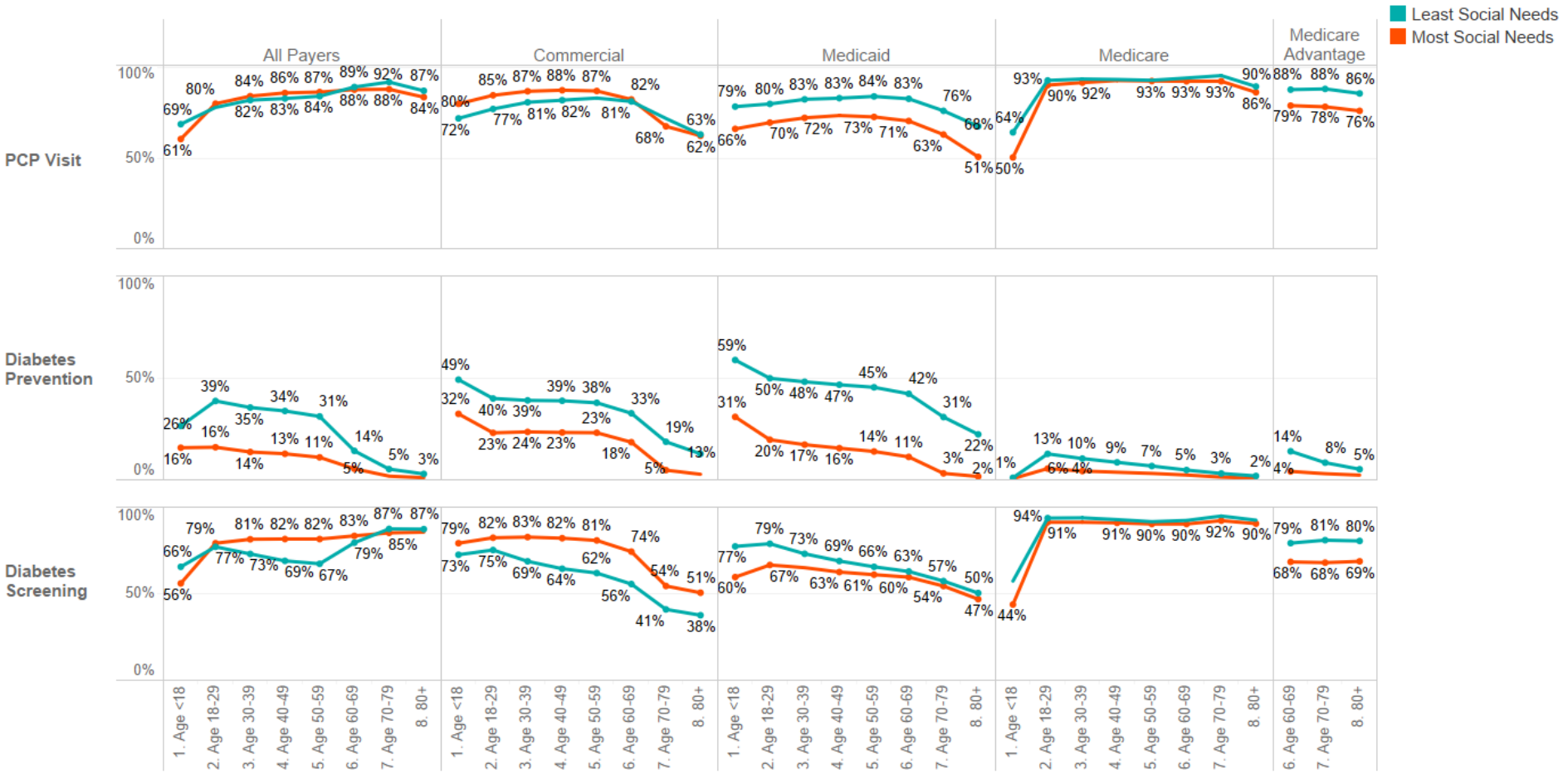


Figure 9 shows the percentage of T2D patients that used preventive services by age group, neighborhood social need and payer. Across all three preventive services, the rates of utilization for T2D patients on Medicaid were higher in neighborhoods with the least social needs compared to those with the most.

Prevalence Measures – Outcomes

Figure 10. Complication Rates among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

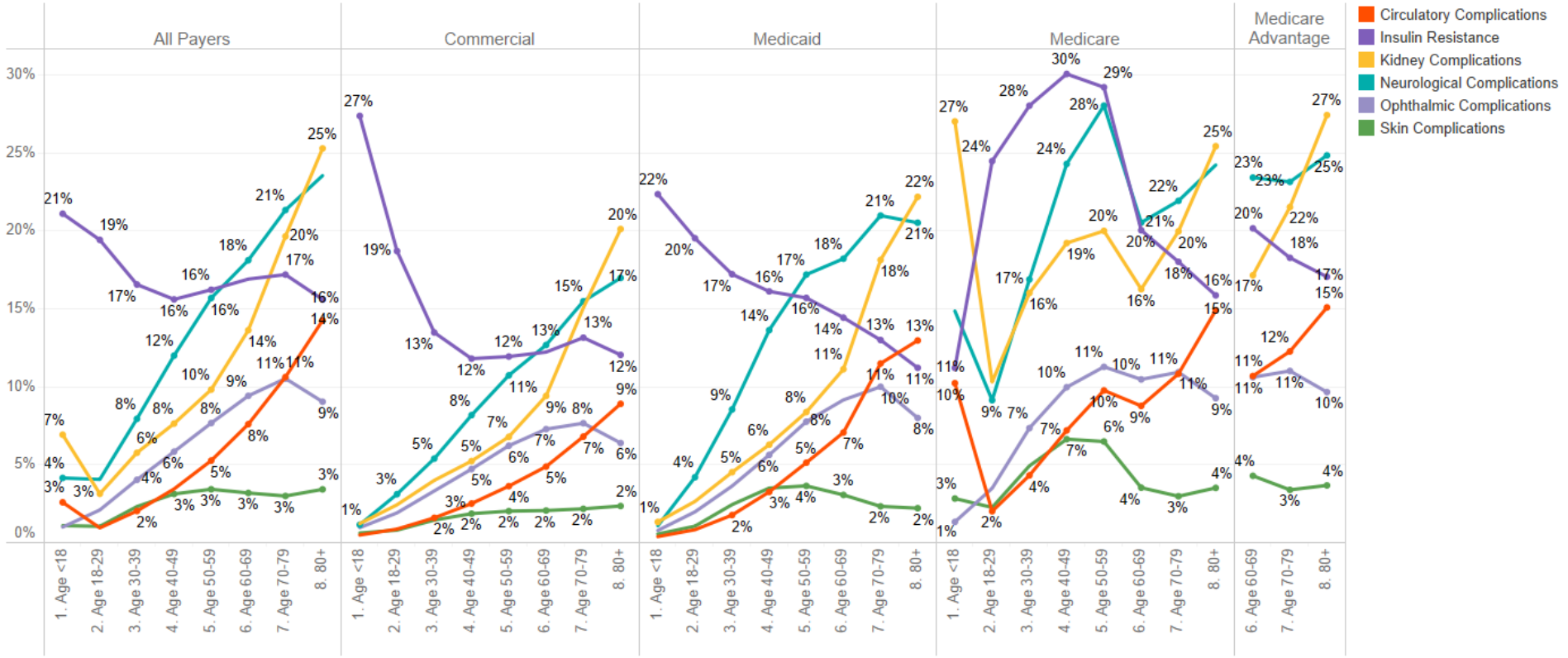


Figure 10 shows the percentage of T2D patients with the following diabetes complications: Circulatory, Insulin Resistance, Kidney, Neurological, Ophthalmic, and Skin. Among Commercial and Medicaid, as patients get older, the rate of insulin dependence goes down while the rate increases for kidney, neurological, circulatory, and skin complications. T2D patients in the youngest age group on Medicare had strikingly high rates of complications. For kidney and circulatory complications, the rates were comparable to patients in their eighties.

Figure 11. Complication Rates among Type-2 Diabetes Patients by Age Group and VVI, 2018-2022

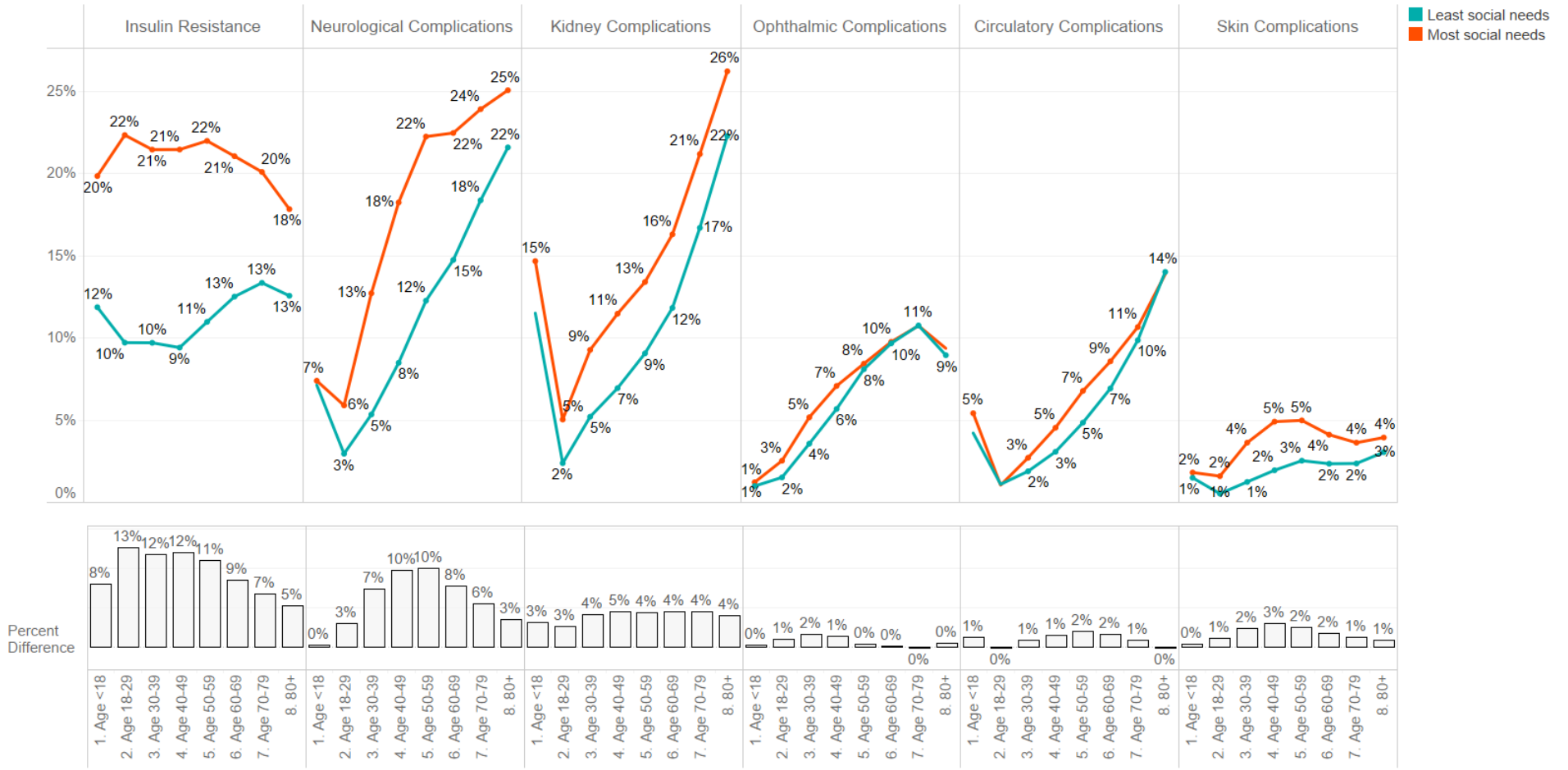
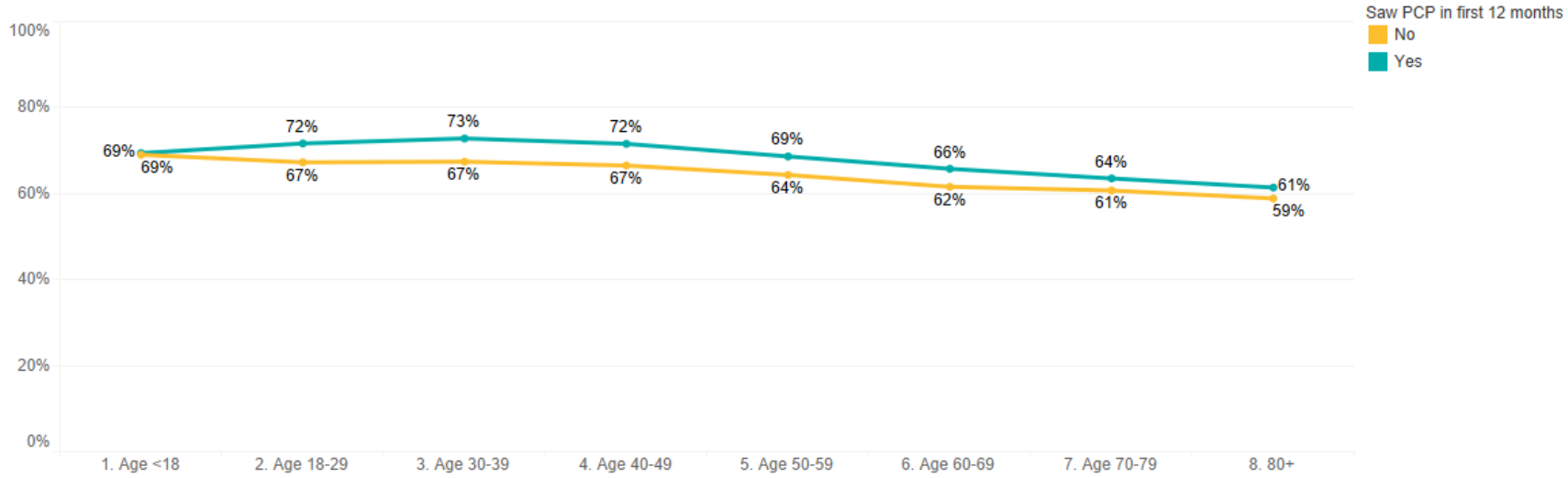


Figure 11 shows the percentage of T2D patients with diabetes complications by age group and neighborhood social need in 2022. The rates of insulin resistance, neurological, kidney, and skin complications were significantly different for patients living in neighborhoods with the most social needs compared to those living in neighborhoods with the least. The differences between rates based on neighborhood for complications like Neurological and Skin appear to peak in the middle age groups. The differences in rates between neighborhoods for insulin resistance were the largest in younger age groups (18-59).

Figure 12. Rate of No Complications or Insulin Dependence after 5 years since Type-2 Diabetes Diagnosis, by PCP Visit



Percent Difference	0.4%	4.4%	5.4%	5.0%	4.3%	4.2%	2.8%	2.5%

Figure 12 shows the percentage of T2D diabetes patients with no complications or insulin dependence after five years with T2D, categorized by whether the patient had a visit with a PCP in the first 12 months of diagnosis. There was a significantly higher percentage of patients who managed their T2D well and did not need insulin among those who saw a PCP within 12 months of diagnosis.

Discussion of Findings

Type-2 diabetes is a complicated, expensive, and life-changing condition that impacts many adults in the U.S., and an increasing number of young people. The rising prevalence of the disease worsens patients' health outcomes and adds more demands to the already overwhelmed healthcare system. As healthcare

providers place a greater emphasis on population health outcomes and value-based care, addressing the social and environmental factors that affect diabetes is key to achieving health equity. The health-related social needs, like housing and food security, education level, economic outlook, access to transportation and healthcare that surround a patient's daily life contribute to the higher prevalence of diabetes in underserved communities. This report aims to provide examples of how to quantify geographic disparities in diabetes care and outcomes using the VVI and an all-payer claims dataset.

Using the VVI, we identified neighborhood-level variation in diabetes care and outcomes. Among T2D patients, those living in neighborhoods with the highest level of social need were disproportionately utilizing acute care services, had lower rates of critical routine care, and higher rates of complications. In addition, we found the following key items:

- A patient's payer type mattered in addition to neighborhood. For instance, T2D patients on Medicaid exhibited the biggest gap in rates between patients residing in the most and the least resourced neighborhoods for acute care utilization, PCP visits, getting screening, prevention and diabetic eye exams.

- The youngest category of T2D patients on Medicare, under 18 years old, had alarming rates of complications. These patients experienced kidney and circulatory complications at a rate similar to patients in their eighties. The teenage group had higher complication rates than other younger groups suggesting a greater vulnerability to complications for this group. Patients under 65 who are on Medicare are typically disabled.

- Among patients diagnosed with T2D in 2018, we calculated the percentage that did not develop insulin resistance or complications over a 5-year period. We looked at the difference between the patients who saw a PCP within a year of their T2D diagnosis and those who did not see a PCP in the first year. Our results suggest that the PCP visit is important for controlling T2D well and avoiding complications in the future.

This analysis highlights the critical need for healthcare systems to address the multifaceted challenges of diabetes care, particularly in underserved communities. By leveraging comprehensive all-payer claims data and the VVI, healthcare providers can gain valuable insight into the social needs most affecting their patients, enabling them to tailor interventions and improve health equity across populations.

References

1) Centers for Disease Control and Prevention. National Diabetes Statistics Report website. https://www.cdc.gov/diabetes/data/statistics-report/index.html. Accessed [5/14/2024].

Appendix

Additional Data Tables

Table A1. Diabetes Eye Exam Rate among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

		Diabetic Eye Exam				
		All Payers	Commercial	Medicaid	Medicare	Medicare Advantage
2018	1. Age <18	71%	68%	77%	34%	
	2. Age 18-29	74%	69%	75%	93%	
	3. Age 30-39	78%	74%	77%	94%	
	4. Age 40-49	81%	77%	79%	94%	
	5. Age 50-59	83%	78%	81%	94%	
	6. Age 60-69	88%	79%	81%	94%	83%
	7. Age 70-79	89%	77%	80%	95%	83%
	8. 80+	86%	71%	73%	91%	79%
2019	1. Age <18	75%	80%	75%	41%	
	2. Age 18-29	80%	84%	75%	95%	
	3. Age 30-39	84%	87%	77%	95%	
	4. Age 40-49	87%	89%	79%	96%	
	5. Age 50-59	88%	89%	81%	96%	
	6. Age 60-69	91%	87%	82%	96%	87%
	7. Age 70-79	92%	77%	83%	97%	88%
	8. 80+	89%	72%	79%	93%	87%
2020	1. Age <18	68%	80%	71%	61%	
	2. Age 18-29	80%	84%	74%	94%	
	3. Age 30-39	83%	87%	76%	94%	
	4. Age 40-49	86%	88%	78%	95%	
	5. Age 50-59	87%	89%	79%	95%	
	6. Age 60-69	89%	86%	79%	95%	85%
	7. Age 70-79	90%	75%	75%	96%	86%
	8. 80+	87%	69%	68%	92%	83%
2021	1. Age <18	68%	80%	72%	58%	
	2. Age 18-29	80%	85%	75%	94%	
	3. Age 30-39	83%	87%	77%	94%	
	4. Age 40-49	86%	89%	79%	94%	
	5. Age 50-59	87%	89%	80%	94%	
	6. Age 60-69	89%	87%	79%	95%	85%
	7. Age 70-79	89%	76%	76%	95%	86%
	8. 80+	87%	70%	70%	92%	84%
2022	1. Age <18	70%	80%	70%	50%	
	2. Age 18-29	79%	84%	74%	92%	
	3. Age 30-39	82%	87%	76%	92%	
	4. Age 40-49	84%	89%	76%	93%	
	5. Age 50-59	85%	89%	77%	93%	
	6. Age 60-69	82%	87%	75%	94%	78%
	7. Age 70-79	76%	75%	67%	96%	76%
	8. 80+	72%	69%	58%	93%	70%

Table A2. Rate of ED Visits and Inpatient Admissions among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

		ED Visit Rate					Inpatient Admission Rate				
		All Payers	Commercial	Medicaid	Medicare	Medicare Advantage	All Payers	Commercial	Medicaid	Medicare	Medicare Advantage
2018	1. Age <18	40%	37%	45%	24%		11%	10%	12%	42%	
	2. Age 18-29	44%	36%	51%	60%		14%	10%	15%	32%	
	3. Age 30-39	41%	29%	47%	60%		14%	7%	13%	31%	
	4. Age 40-49	35%	24%	41%	57%		12%	6%	11%	29%	
	5. Age 50-59	33%	21%	36%	52%		13%	6%	11%	28%	
	6. Age 60-69	29%	20%	30%	35%	26%	15%	8%	10%	20%	13%
	7. Age 70-79	32%	24%	28%	36%	27%	19%	10%	10%	22%	15%
	8. 80+	43%	29%	31%	48%	33%	28%	15%	13%	32%	21%
2019	1. Age <18	41%	40%	45%	28%		14%	17%	12%	43%	
	2. Age 18-29	43%	38%	49%	60%		15%	13%	14%	31%	
	3. Age 30-39	38%	30%	46%	60%		13%	10%	12%	31%	
	4. Age 40-49	33%	25%	41%	58%		11%	7%	10%	30%	
	5. Age 50-59	30%	21%	36%	53%		12%	8%	11%	29%	
	6. Age 60-69	29%	20%	30%	35%	32%	15%	9%	10%	20%	15%
	7. Age 70-79	34%	24%	27%	36%	33%	19%	11%	8%	22%	18%
	8. 80+	45%	29%	31%	49%	43%	29%	14%	11%	32%	25%
2020	1. Age <18	40%	37%	37%	47%		26%	19%	11%	45%	
	2. Age 18-29	39%	35%	44%	55%		14%	12%	14%	31%	
	3. Age 30-39	35%	28%	41%	55%		13%	10%	12%	30%	
	4. Age 40-49	30%	23%	36%	52%		11%	7%	10%	28%	
	5. Age 50-59	27%	20%	31%	47%		11%	7%	9%	27%	
	6. Age 60-69	26%	18%	26%	31%	28%	14%	8%	9%	19%	14%
	7. Age 70-79	30%	21%	22%	32%	28%	18%	9%	9%	20%	15%
	8. 80+	40%	25%	23%	43%	35%	26%	12%	11%	29%	21%
2021	1. Age <18	40%	39%	37%	45%		23%	18%	10%	41%	
	2. Age 18-29	39%	35%	42%	56%		13%	12%	12%	30%	
	3. Age 30-39	34%	28%	39%	54%		12%	10%	11%	30%	
	4. Age 40-49	30%	24%	34%	52%		10%	7%	9%	28%	
	5. Age 50-59	27%	20%	30%	47%		11%	7%	9%	27%	
	6. Age 60-69	26%	19%	26%	32%	30%	13%	8%	9%	18%	14%
	7. Age 70-79	30%	21%	21%	33%	30%	17%	9%	9%	20%	16%
	8. 80+	41%	25%	22%	45%	38%	25%	12%	11%	29%	22%
2022	1. Age <18	36%	40%	34%	38%		14%	16%	8%	38%	
	2. Age 18-29	36%	34%	39%	52%		11%	11%	11%	28%	
	3. Age 30-39	31%	28%	37%	52%		9%	8%	10%	28%	
	4. Age 40-49	26%	23%	33%	50%		7%	6%	8%	26%	
	5. Age 50-59	23%	20%	29%	45%		8%	6%	8%	25%	
	6. Age 60-69	21%	19%	24%	31%	22%	9%	7%	9%	18%	9%
	7. Age 70-79	23%	20%	19%	34%	20%	11%	8%	8%	20%	9%
	8. 80+	29%	24%	19%	46%	23%	17%	11%	11%	30%	13%

Table A3. Rate of Primary Care Physician Visits, Diabetes Screening, and Diabetes Prevention among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

		PCP Visit Rate					Diabetes Prevention Rate					Diabetes Screening Rate				
		All Payers	Commercial	Medicaid	Medicare	Medicare Advantage	All Payers	Commercial	Medicaid	Medicare	Medicare Advantage	All Payers	Commercial	Medicaid	Medicare	Medicare Advantage
2018	1. Age <18	68%	65%	76%	34%		32%	26%	41%	2%		71%	67%	77%	25%	
	2. Age 18-29	70%	66%	73%	92%		18%	18%	22%	8%		72%	66%	75%	92%	
	3. Age 30-39	75%	70%	75%	93%		16%	19%	20%	6%		70%	62%	73%	91%	
	4. Age 40-49	77%	72%	76%	93%		15%	19%	20%	5%		68%	60%	70%	90%	
	5. Age 50-59	79%	73%	78%	92%		14%	19%	20%	4%		67%	57%	68%	90%	
	6. Age 60-69	84%	73%	77%	93%	76%	8%	15%	18%	3%	6%	74%	54%	64%	90%	61%
	7. Age 70-79	86%	70%	75%	93%	76%	4%	8%	15%	2%	5%	79%	50%	54%	92%	61%
	8. 80+	82%	65%	67%	87%	72%	2%	6%	11%	1%	4%	80%	49%	50%	90%	59%
2019	1. Age <18	73%	79%	74%	40%		38%	42%	42%	4%		75%	80%	78%	28%	
	2. Age 18-29	77%	81%	73%	93%		25%	29%	25%	9%		79%	81%	77%	93%	
	3. Age 30-39	81%	84%	74%	94%		23%	29%	22%	7%		79%	80%	74%	93%	
	4. Age 40-49	84%	86%	76%	94%		23%	30%	22%	5%		78%	80%	72%	93%	
	5. Age 50-59	85%	86%	78%	94%		22%	30%	21%	4%		77%	78%	70%	92%	
	6. Age 60-69	87%	83%	78%	95%	80%	12%	26%	21%	3%	7%	80%	72%	67%	92%	69%
	7. Age 70-79	88%	71%	79%	95%	81%	4%	10%	17%	2%	5%	83%	54%	60%	94%	70%
	8. 80+	85%	65%	74%	89%	80%	2%	7%	15%	1%	4%	84%	51%	57%	93%	71%
2020	1. Age <18	66%	79%	69%	58%		23%	42%	37%	1%		63%	76%	70%	51%	
	2. Age 18-29	77%	82%	71%	93%		23%	28%	22%	7%		75%	79%	71%	91%	
	3. Age 30-39	81%	84%	73%	93%		22%	28%	19%	6%		75%	77%	68%	91%	
	4. Age 40-49	83%	85%	75%	93%		22%	28%	19%	5%		75%	77%	65%	90%	
	5. Age 50-59	84%	86%	75%	93%		21%	29%	19%	4%		74%	76%	63%	89%	
	6. Age 60-69	86%	82%	74%	93%	80%	12%	25%	17%	3%	8%	77%	70%	61%	90%	66%
	7. Age 70-79	87%	69%	70%	94%	80%	4%	10%	10%	2%	7%	80%	51%	49%	93%	66%
	8. 80+	83%	63%	63%	88%	77%	2%	7%	8%	1%	5%	81%	48%	46%	91%	66%
2021	1. Age <18	66%	80%	71%	56%		24%	44%	38%	1%		61%	75%	67%	48%	
	2. Age 18-29	78%	83%	72%	92%		26%	30%	24%	8%		74%	78%	69%	91%	
	3. Age 30-39	81%	85%	74%	92%		25%	31%	21%	6%		74%	78%	66%	91%	
	4. Age 40-49	83%	86%	75%	92%		25%	32%	21%	5%		74%	77%	64%	90%	
	5. Age 50-59	84%	86%	76%	92%		24%	32%	21%	5%		73%	75%	63%	89%	
	6. Age 60-69	85%	83%	76%	93%	80%	14%	27%	19%	4%	9%	76%	70%	61%	90%	65%
	7. Age 70-79	86%	71%	71%	94%	81%	4%	11%	11%	2%	7%	78%	51%	49%	92%	66%
	8. 80+	83%	65%	65%	88%	79%	3%	7%	9%	1%	6%	79%	48%	44%	90%	66%
2022	1. Age <18	67%	79%	67%	48%		34%	43%	40%	1%		66%	77%	67%	42%	
	2. Age 18-29	76%	82%	70%	91%		27%	31%	26%	7%		74%	79%	69%	90%	
	3. Age 30-39	79%	84%	72%	91%		27%	32%	22%	6%		73%	78%	65%	89%	
	4. Age 40-49	80%	86%	72%	91%		27%	32%	21%	5%		72%	77%	62%	88%	
	5. Age 50-59	81%	86%	72%	90%		27%	32%	20%	4%		70%	76%	59%	87%	
	6. Age 60-69	77%	83%	70%	92%	70%	18%	27%	17%	3%	8%	63%	69%	55%	89%	51%
	7. Age 70-79	70%	69%	62%	94%	68%	6%	10%	9%	2%	6%	54%	47%	41%	93%	47%
	8. 80+	67%	62%	53%	89%	63%	4%	6%	6%	1%	5%	54%	42%	36%	91%	45%

Table A4. Rate of Circulatory, Kidney, and Neurological Complications among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

		Circulatory Complications Rate					Kidney Complications Rate					Neurological Complications Rate				
		All Payers	Commercial	Medicaid	Medicare	Medicare Advantage	All Payers	Commercial	Medicaid	Medicare	Medicare Advantage	All Payers	Commercial	Medicaid	Medicare	Medicare Advantage
2018	1. Age <18	0%	0%	0%	5%		2%	1%	2%	21%		1%	1%	1%	10%	
	2. Age 18-29	1%	1%	1%	2%		3%	2%	3%	10%		5%	3%	5%	10%	
	3. Age 30-39	2%	1%	2%	4%		6%	4%	5%	15%		10%	6%	10%	18%	
	4. Age 40-49	3%	2%	3%	7%		8%	5%	6%	18%		14%	8%	15%	25%	
	5. Age 50-59	5%	3%	5%	9%		11%	6%	8%	19%		18%	11%	18%	28%	
	6. Age 60-69	7%	4%	7%	8%	9%	14%	9%	11%	16%	16%	19%	12%	19%	21%	23%
	7. Age 70-79	10%	6%	11%	10%	10%	18%	14%	17%	19%	20%	21%	15%	22%	22%	22%
	8. 80+	13%	8%	13%	14%	13%	23%	19%	21%	24%	25%	23%	17%	22%	24%	23%
2019	1. Age <18	0%	0%	0%	7%		1%	1%	1%	24%		1%	1%	1%	13%	
	2. Age 18-29	1%	1%	1%	2%		3%	2%	3%	10%		4%	3%	5%	9%	
	3. Age 30-39	2%	1%	2%	4%		6%	4%	5%	16%		9%	6%	9%	18%	
	4. Age 40-49	3%	2%	3%	7%		8%	5%	6%	19%		13%	9%	15%	25%	
	5. Age 50-59	5%	3%	5%	10%		10%	7%	9%	20%		16%	11%	18%	29%	
	6. Age 60-69	8%	4%	8%	9%	12%	14%	9%	11%	16%	18%	19%	13%	20%	21%	27%
	7. Age 70-79	11%	7%	14%	11%	14%	20%	15%	18%	20%	23%	22%	16%	24%	23%	27%
	8. 80+	15%	9%	15%	15%	17%	25%	20%	23%	25%	30%	25%	17%	24%	25%	29%
2020	1. Age <18	4%	1%	0%	10%		11%	1%	1%	27%		6%	1%	1%	15%	
	2. Age 18-29	1%	1%	1%	2%		3%	2%	3%	11%		4%	3%	4%	9%	
	3. Age 30-39	2%	2%	2%	5%		6%	4%	5%	17%		8%	5%	9%	17%	
	4. Age 40-49	4%	3%	3%	7%		8%	5%	6%	20%		12%	8%	14%	24%	
	5. Age 50-59	5%	4%	5%	10%		10%	7%	8%	21%		16%	11%	17%	28%	
	6. Age 60-69	8%	5%	7%	9%	11%	14%	9%	11%	16%	18%	18%	12%	18%	20%	25%
	7. Age 70-79	11%	7%	12%	11%	13%	20%	15%	20%	20%	23%	22%	15%	21%	22%	25%
	8. 80+	15%	9%	13%	15%	16%	26%	20%	24%	26%	29%	24%	17%	20%	24%	27%
2021	1. Age <18	4%	1%	1%	11%		11%	1%	1%	27%		6%	1%	1%	15%	
	2. Age 18-29	1%	1%	1%	2%		3%	3%	3%	10%		4%	3%	4%	9%	
	3. Age 30-39	2%	2%	2%	4%		6%	4%	4%	16%		7%	5%	8%	15%	
	4. Age 40-49	4%	3%	3%	7%		8%	5%	6%	19%		11%	8%	13%	22%	
	5. Age 50-59	6%	4%	5%	10%		10%	7%	8%	20%		15%	11%	16%	27%	
	6. Age 60-69	8%	5%	7%	9%	12%	14%	10%	11%	16%	18%	18%	13%	18%	20%	24%
	7. Age 70-79	11%	7%	11%	11%	14%	21%	15%	19%	20%	23%	22%	15%	20%	21%	24%
	8. 80+	15%	9%	13%	15%	17%	27%	21%	24%	26%	30%	24%	17%	20%	24%	26%
2022	1. Age <18	2%	1%	0%	10%		5%	1%	1%	29%		3%	1%	1%	15%	
	2. Age 18-29	1%	1%	1%	2%		3%	3%	2%	9%		3%	3%	4%	7%	
	3. Age 30-39	2%	2%	2%	4%		5%	4%	4%	16%		6%	5%	8%	15%	
	4. Age 40-49	3%	3%	3%	8%		7%	6%	6%	20%		10%	8%	13%	23%	
	5. Age 50-59	5%	4%	5%	11%		9%	7%	9%	21%		13%	11%	16%	27%	
	6. Age 60-69	7%	6%	7%	10%	10%	12%	10%	11%	17%	15%	16%	13%	17%	20%	20%
	7. Age 70-79	10%	7%	10%	12%	11%	18%	16%	17%	22%	19%	18%	16%	18%	22%	19%
	8. 80+	12%	9%	11%	16%	12%	24%	21%	20%	29%	24%	20%	17%	17%	25%	19%

Table A5. Rate of Insulin Resistance, Ophthalmic, and Skin Complications among Type-2 Diabetes Patients by Age Group and Payer, 2018-2022

		Insulin Resistance Rate					Ophthalmic Complications Rate					Skin Complications Rate				
		All Payers	Commercial	Medicaid	Medicare	Medicare Advantage	All Payers	Commercial	Medicaid	Medicare	Medicare Advantage	All Payers	Commercial	Medicaid	Medicare	Medicare Advantage
2018	1. Age <18	23%	23%	25%	21%		1%	1%	1%	2%		1%	1%	1%	2%	
	2. Age 18-29	20%	18%	22%	24%		2%	2%	2%	4%		1%	1%	1%	2%	
	3. Age 30-39	18%	13%	19%	28%		4%	3%	3%	7%		3%	2%	2%	5%	
	4. Age 40-49	17%	12%	17%	30%		6%	4%	5%	10%		4%	2%	3%	6%	
	5. Age 50-59	18%	12%	17%	29%		8%	5%	7%	11%		4%	2%	3%	6%	
	6. Age 60-69	18%	13%	15%	20%	19%	9%	6%	9%	10%	10%	3%	2%	3%	3%	4%
	7. Age 70-79	17%	14%	14%	18%	18%	10%	7%	11%	11%	10%	3%	2%	2%	3%	3%
	8. 80+	16%	13%	12%	16%	16%	9%	6%	9%	9%	9%	3%	2%	2%	3%	3%
2019	1. Age <18	26%	29%	26%	26%		1%	1%	1%	1%		1%	1%	1%	3%	
	2. Age 18-29	21%	20%	21%	25%		2%	2%	2%	4%		1%	1%	1%	2%	
	3. Age 30-39	18%	14%	19%	29%		4%	3%	3%	8%		2%	1%	2%	5%	
	4. Age 40-49	17%	12%	17%	31%		6%	5%	5%	10%		3%	2%	4%	7%	
	5. Age 50-59	17%	12%	17%	30%		8%	6%	8%	12%		3%	2%	4%	7%	
	6. Age 60-69	18%	13%	15%	21%	23%	10%	7%	9%	11%	12%	3%	2%	3%	4%	5%
	7. Age 70-79	18%	14%	14%	19%	21%	11%	8%	12%	11%	12%	3%	2%	2%	3%	4%
	8. 80+	17%	13%	13%	16%	21%	10%	7%	10%	10%	11%	4%	2%	2%	4%	5%
2020	1. Age <18	19%	29%	22%	11%		1%	1%	1%	1%		1%	1%	0%	3%	
	2. Age 18-29	20%	19%	20%	25%		2%	2%	2%	3%		1%	1%	1%	2%	
	3. Age 30-39	17%	14%	17%	28%		4%	3%	3%	7%		2%	1%	3%	5%	
	4. Age 40-49	16%	12%	16%	30%		6%	5%	5%	10%		3%	2%	4%	7%	
	5. Age 50-59	16%	12%	15%	29%		7%	6%	7%	11%		3%	2%	4%	7%	
	6. Age 60-69	17%	12%	14%	20%	21%	9%	7%	8%	10%	11%	3%	2%	3%	4%	4%
	7. Age 70-79	18%	13%	13%	18%	19%	10%	7%	9%	10%	11%	3%	2%	2%	3%	4%
	8. 80+	16%	12%	11%	16%	18%	9%	6%	7%	9%	10%	3%	2%	2%	3%	4%
2021	1. Age <18	19%	28%	21%	11%		1%	1%	1%	1%		1%	1%	1%	3%	
	2. Age 18-29	19%	18%	18%	24%		2%	2%	2%	3%		1%	1%	1%	2%	
	3. Age 30-39	16%	13%	16%	27%		4%	3%	4%	7%		2%	1%	2%	5%	
	4. Age 40-49	15%	12%	15%	29%		6%	5%	6%	10%		3%	2%	3%	7%	
	5. Age 50-59	16%	12%	15%	28%		8%	6%	8%	11%		3%	2%	4%	7%	
	6. Age 60-69	17%	12%	14%	19%	21%	10%	8%	9%	10%	11%	3%	2%	3%	3%	5%
	7. Age 70-79	17%	13%	12%	17%	19%	11%	8%	9%	11%	12%	3%	2%	3%	3%	4%
	8. 80+	16%	12%	11%	15%	18%	10%	7%	7%	9%	11%	4%	2%	2%	3%	4%
2022	1. Age <18	21%	27%	20%	12%		1%	1%	1%	1%		1%	1%	1%	3%	
	2. Age 18-29	18%	18%	17%	24%		2%	2%	2%	3%		1%	1%	1%	3%	
	3. Age 30-39	14%	13%	16%	27%		4%	3%	4%	7%		2%	1%	2%	5%	
	4. Age 40-49	13%	12%	15%	29%		5%	5%	6%	10%		3%	2%	4%	7%	
	5. Age 50-59	14%	12%	15%	29%		7%	7%	8%	12%		3%	2%	4%	7%	
	6. Age 60-69	14%	12%	14%	20%	17%	9%	8%	10%	11%	9%	3%	2%	3%	4%	4%
	7. Age 70-79	14%	13%	12%	19%	14%	9%	8%	9%	12%	10%	3%	2%	3%	3%	3%
	8. 80+	13%	11%	10%	16%	13%	8%	7%	7%	10%	8%	3%	2%	2%	4%	3%

Standard Measures Methodologies

Diabetic Eye Exam

Why we selected this measure
We selected the diabetic eye exam as a key measure due to the heightened risk individuals with diabetes face for developing serious eye conditions. Often, these conditions may not present symptoms until they have progressed to a more severe stage. By conducting comprehensive eye exams, issues can be detected at an early stage, significantly reducing the risk of long-term damage to the eyes caused by diabetes.
Description
Percentage of patients with a diagnosis of type-2 diabetes who had an eye exam.
Numerator
Patients with an eye screening for diabetic retinal disease. This includes patients who had one of the following: • Diabetic with a diagnosis of retinopathy that overlaps the measurement period and a retinal or dilated eye exam by an eye care professional in the measurement period • Diabetic with no diagnosis of retinopathy overlapping the measurement period and a retinal or dilated eye exam by an eye care professional in the measurement period or the year prior to the measurement period
Denominator
Patients with type-2 diabetes.
Exclusions
Patients using hospice services during the measurement period, patients aged 66 or order residing in long term care, patients aged 66 or older with dementia or other advanced illnesses.

Alternative Measures Methodologies

Vizient Vulnerability Index (VVI)

Why we selected this measure
The Vizient Vulnerability Index considers factors such as poverty, unemployment, low educational attainment, minority status, language proficiency, housing quality and access to transportation and healthcare. By analyzing these factors, the VVI helps identify at-risk communities that may face higher risks and challenges due to socio-economic disparities and structural inequalities. Integrating claims data with this index allows us to understand disease progression and cost of care models with a fairer and more equitable lens.
Description
The Vizient Vulnerability Index is a quantification of neighborhood resources and obstacles to care based on public data including US Census American Community Survey, USDA Food Research Atlas, Housing and Urban Development Comprehensive Housing Affordability Strategy data, EPA Environmental Justice data, FBI violent crime statistics, HRSA provider shortages, and tuned to Life Expectancy at Birth at the census tract level. This has been summarized to the zip code level to summarizing the characteristics of a provider's catchment area in terms of overall vulnerability, as well as in nine domains: economic, education, health care access, neighborhood resources, housing, social resources, clean environment, transportation, and public safety.
Specifications
The Vizient Vulnerability Index is a neighborhood index that provides context to our understanding of the effects of differential neighborhood resourcing. It applies to virtually all zip codes in the United States (more than 99%). The data that comprises the Vizient Vulnerability Index includes public data from the American Community Survey 5-year summaries of 2016-2020, as well as USDA Food Access Research Atlas, HUD CHAS dataset of housing problems, EPA EJScreen data and Drinking Water Safety data, FCC Broadband speeds, FBI Uniform Crime Reporting supplemented by Gun Violence Archive data, HRSA provider shortage areas, CMS hospital location data, CDC Opioid dispensing data, NEPHTN park access data, AHRQ alcohol sales data, Opportunity Atlas incarceration data, NLCD tree cover data, and Harvard Dataverse voting participation data tested against 2015-2019 estimates of life expectancy from the USALEEP project.
Constructing the VVI
The Vizient Vulnerability Index is built from nine domains: Economic, Education, Health Care Access, Neighborhood Resources, Housing, Clean Environment, Social Environment, Transportation, and Public Safety. Each domain is weighted according to the correlation between that domain and life expectancy in a small geographic area. The weights vary according to their variable correlations to life expectancy in different areas. The composite score is a linear combination of the

domains, using the weights as described above for the geographic area in question. Each domain is significant in some parts of the country. Outliers are left in the data with no truncation. High outliers are reported as “high vulnerability” regardless of how high that value is.

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As the nation’s largest member-driven health care performance improvement company, Vizient provides solutions and services that empower health care providers to deliver high-value care by aligning cost, quality and market performance. With analytics, advisory services and a robust sourcing portfolio, we help members improve patient outcomes and lower costs.