

# Significant Variation in Clinical Quality and Cost of Care for Californians with Diabetes in the Commercial Market

## Key Findings

- There is wide geographic variation in clinical quality measures for diabetes care; only 25% of individuals with diabetes have blood sugar under control in the lowest-scoring region
- Geography-adjusted total cost of care for individuals with diabetes is, on average, almost three times as high as for the overall commercial population statewide (\$13,785 vs. \$4,781)
- At the regional level, average geography-adjusted total cost of care for individuals with diabetes ranges from \$12,000 to over \$18,000
- Better results were observed on clinical quality for members with diabetes receiving care from providers taking financial risk (professional or full)
- Better blood sugar control was associated with lower ED utilization

## Atlas Overview

The Atlas is a benchmarking and hot-spotting improvement tool that includes results and information on about 30 million insured Californians. For commercial insurance, the Atlas tracks regional performance for clinical quality, average annual total cost of care per member, and hospital utilization, based on the care provided to roughly 14 million Californians enrolled in health maintenance organizations (HMOs), preferred provider organizations (PPOs), Accountable Care Organizations (ACOs), and self-insured arrangements. Statewide and Covered California region views are displayed.

## Diabetes in California's Commercial Market

Diabetes is a serious chronic illness that affects many Californians, influencing quality of life for individuals and cost of health care at the system level. Complications of diabetes include heart disease and stroke, blindness, nerve damage, kidney disease, and amputations. According to the Centers for Disease Control (CDC), diabetes was the 7th leading cause of death in the U.S. in 2016. The American Diabetes Association reports that diabetes for members under 65 years of age cost an estimated \$91 billion in 2017; average medical expenditures for those diagnosed with diabetes were 2.3 times higher than for those without diabetes.

Statewide, about 602,000 adults in the commercial market met the definition of diabetes (see page 2 for inclusion criteria), or 4.4% of the 13.7 million covered lives included in this analysis. In Table 1 (next page), the regions with the three lowest proportions of residents meeting the diabetes definition are shaded green; and the regions with the three highest proportions are shaded red. There was considerable variation by Covered California region, ranging from 2.6% in San Francisco County to 5.5% in Kern County. Aggregate total cost of care for the 602,000 adults with diabetes was \$6.9 billion in 2017, 12.7% of total cost of care for all commercial members. Data for this analysis was contributed by 8 health plans (see list of participating plans at the end of this data brief).

Based in Oakland, Calif., the nonprofit Integrated Healthcare Association (IHA)



convenes diverse stakeholders—including physicians, hospitals and health systems, purchasers, and health plans—committed to high-value, integrated care that improves quality and affordability for patients across California and the nation.

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**Table 1: Commercial Membership, Total and with Diabetes, by Covered California Region**

Region #	Region Name	Members with Diabetes	Total Members	% Members with Diabetes
1	Northern Counties	10,469	273,238	3.8%
2	North Bay Counties	22,951	574,926	4.0%
3	Greater Sacramento	36,673	905,075	4.1%
4	San Francisco County	9,850	374,460	2.6%
5	Contra Costa County	21,765	518,556	4.2%
6	Alameda County	30,064	763,574	3.9%
7	Santa Clara County	32,280	828,942	3.9%
8	San Mateo County	13,672	356,293	3.8%
9	Central Coast - North	7,082	212,919	3.3%
10	Central Valley - North	32,186	597,187	5.4%
11	Greater Fresno Area	19,934	376,629	5.3%
12	Central Coast - South	19,444	518,428	3.8%
13	Eastern Region	2,648	53,713	4.9%
14	Kern County	12,484	225,441	5.5%
15	Los Angeles - East	81,841	1,515,466	5.4%
16	Los Angeles - West	83,084	1,803,646	4.6%
17	Inland Empire	72,576	1,441,345	5.0%
18	Orange County	48,015	1,236,328	3.9%
19	San Diego County	45,152	1,170,998	3.9%
<b>Statewide</b>		<b>602,168</b>	<b>13,747,165</b>	<b>4.4%</b>

**Inclusion Criteria for Diabetes Members**

Individuals with diabetes are defined as follows: 1) age 18-64 years old; 2) continuous enrollment for the measurement year (2017) with no more than a 45-day gap; and 3) one or more of the following during the measurement year or the prior measurement year: a) two or more visits (outpatient, observation, ED, or inpatient nonacute) with a diagnosis of diabetes; b) one or more acute inpatient encounters with a diagnosis of diabetes; c) dispensed insulin or hypoglycemics/antihyperglycemics.

Regions with the three lowest and three highest proportions of residents meeting the diabetes definition are shaded green and red, respectively.

**Wide Variation in Measures of Clinical Quality of Diabetes Care by Region**

The Atlas includes four measures of clinical quality related to diabetes screening and management:

- Blood sugar screening, indicating the proportion of members with diabetes who had a test for hemoglobin A1c during the measurement year
- Kidney disease monitoring, indicating the proportion of members with diabetes who had nephropathy

screening or evidence of nephropathy during the measurement year

- Blood sugar control < 8.0% indicating the proportion of members with diabetes whose most recent test result showed hemoglobin A1c under 8%
- Poorly controlled blood sugar (>9.0%), indicating the proportion of members with diabetes whose most recent test results showed hemoglobin A1c over 9% or was missing for the measurement year (for this measure, lower is better)

Analysis of Atlas 2017 results on these four measures at the level of the Covered California region shows enormous variation in clinical quality results across California regions, even for a commercially insured population. As shown in Table 2 (next page), in the worst-scoring region, only 25% of individuals with diabetes in the commercial market have their blood sugar in the desired range compared to approximately 60% in the best-performing regions.

The analysis also found that performance on each of four diabetes care measures was positively associated with higher screening levels for breast cancer and colorectal cancer among members with diabetes. This finding suggests that when members with diabetes obtain care, they also receive preventive screenings. [Previous IHA work](#) suggested that higher scores in specific clinical areas such as cardiovascular care and pulmonary care are correlated with higher scores on other measures; the current analysis of diabetes care provides additional and independent validation of this “good care leads to good care” phenomenon.

Table 3 (right) displays the results for each of the four clinical quality measures of diabetes care by region. The best scores are concentrated in the greater Bay Area: Contra Costa (5), Alameda (6), Santa Clara (7), and the North Bay Counties of Marin, Napa, Solano, and Sonoma (2). The worst clinical quality scores were in the Northern Counties, comprised of 22 rural counties north of Sacramento (1); Central Coast North, comprised of the counties of Monterey, San Benito, and Santa Cruz (9); and Eastern Region (13), representing the inland counties of Mono and Inyo (central) and Imperial (south).

### Total Cost of Care for Members with Diabetes Substantially Higher, and Varies by Region

Statewide average total cost of care is almost three times as high for members with diabetes compared to the commercial population (including diabetes members) in Atlas: \$13,785 vs. \$4,781. This analysis investigated geography-adjusted total cost of care per member per year, defined as the average cost for the care provided to commercial members aged 1-64 for a year, adjusted for differences in input costs

**Table 2: Geographic Variation in Diabetes Clinical Quality Measures**

Measure	Worst Scoring Region	Best Scoring Region	Range (percentage points)
Blood Sugar Screening	75.9%	92.5%	16.7%
Kidney Disease Monitoring	71.2%	90.6%	19.4%
Blood Sugar Control <8.0%	25.1%	61.1%	36.1%
Poorly Controlled Blood Sugar (>9.0%)*	70.3%	27.1%	43.2%

\* Lower is better performance

**Table 3: Diabetes Clinical Quality Measure Performance by Covered California Region**

Region #	Region Name	Diabetes Care: Blood Sugar Screening	Diabetes Care: Kidney Disease Monitoring	Diabetes Care: Blood Sugar Control < 8.0%	Diabetes Care: Poorly Controlled Blood Sugar*
1	Northern Counties	75.9%	71.2%	25.1%	70.3%
2	North Bay Counties	91.7%	90.5%	57.9%	30.7%
3	Greater Sacramento	90.4%	89.4%	55.9%	33.2%
4	San Francisco County	89.0%	88.2%	56.4%	34.1%
5	Contra Costa County	92.5%	90.6%	61.1%	27.1%
6	Alameda County	92.2%	90.5%	59.2%	30.1%
7	Santa Clara County	92.1%	90.3%	58.9%	31.3%
8	San Mateo County	90.6%	89.8%	56.6%	33.8%
9	Central Coast - North	80.0%	75.0%	30.1%	64.5%
10	Central Valley - North	85.4%	85.9%	46.9%	44.0%
11	Greater Fresno Area	84.2%	81.1%	44.2%	47.7%
12	Central Coast - South	83.9%	83.3%	39.2%	54.3%
13	Eastern Region	82.0%	77.1%	26.5%	69.3%
14	Kern County	85.2%	84.5%	47.2%	44.7%
15	Los Angeles - East	87.8%	89.3%	54.4%	36.2%
16	Los Angeles - West	87.6%	88.9%	53.1%	37.9%
17	Inland Empire	88.6%	89.2%	56.9%	32.6%
18	Orange County	88.0%	88.8%	56.3%	35.7%
19	San Diego County	89.0%	89.8%	53.7%	38.1%
<b>State-wide</b>		<b>88.3%</b>	<b>88.2%</b>	<b>53.4%</b>	<b>37.3%</b>

\* Lower is better performance

Regions with the best and worst clinical quality scores are shaded green and red, respectively.

by region. The measure includes payments to providers by insurance and by members for all covered professional, pharmacy, hospital, and ancillary care. Members must have been continuously

enrolled in their health plan for at least nine months to be included in this measure. Since the objective of the analysis is to assess geographic variation in a specific population, the total cost of care

is not adjusted for the clinical risk of the population, but it is adjusted for known differences in geographic input costs.

Table 4 shows that the three lowest-cost regions' total costs of care for individuals with diabetes ranged from \$12,000 to about \$12,900, on average. Total cost of care was 16-53 percent higher in the four highest-cost regions (two of which tied at \$15,000). Region 1, made up of the 22 counties in the rural north, reached \$18,300, on average, after adjusting for known differences in geographic input costs.

All three of the regions with the lowest clinical quality scores for diabetes care—Northern Counties (1), Central

Coast North (9), and Eastern (13)—were also among the highest-cost regions.

### Effective Management of Blood Sugar Associated with Lower Rate of Emergency Department Visits

Statewide, the average rate of emergency department visits in the commercial population is 132 per thousand member years (PTMY). By comparison, the subset of those commercial members who have diabetes visit the emergency department at almost twice that rate—253 visits PTMY. Most of the 19 Covered California regions have emergency department visit

rates for diabetic members in the 200s, ranging from 221 (San Diego, Region 19) to 299 (Greater Sacramento, Region 3). However, there are two outliers on the high end: Eastern Region (Imperial, Inyo, and Mono, Region 13) at 428 visits PTMY and the Northern Counties (the 22 counties in the rural north, Region 1) at 387. One region, Kern (Region 14), is a low-end outlier at 174 emergency room visits PTMY.

Figure 1 (next page) suggests that effective management of blood sugar may reduce emergency department visits. Each Covered California region is arrayed on two axes: rate of emergency department visits and blood sugar control (Hemoglobin A1c <8). The resulting scatterplot highlights the relationship between clinical quality and utilization (R-squared = .44).

**Table 4: Geography-Adjusted Total Cost of Care for Members with Diabetes by Covered California Region**

Region #	Region Name	Geography Adjusted Total Cost of Care
1	Northern Counties	\$18,300
2	North Bay Counties	\$14,700
3	Greater Sacramento	\$14,400
4	San Francisco County	\$16,200
5	Contra Costa County	\$14,100
6	Alameda County	\$13,200
7	Santa Clara County	\$13,200
8	San Mateo County	\$14,400
9	Central Coast - North	\$15,000
10	Central Valley - North	\$14,400
11	Greater Fresno Area	\$13,500
12	Central Coast - South	\$14,700
13	Eastern Region	\$15,000
14	Kern County	\$12,000
15	Los Angeles - East	\$12,900
16	Los Angeles - West	\$13,800
17	Inland Empire	\$13,800
18	Orange County	\$13,800
19	San Diego County	\$12,600
	<b>Statewide, Commercial</b>	<b>\$4,781</b>
	Statewide, Diabetes Members	\$13,785

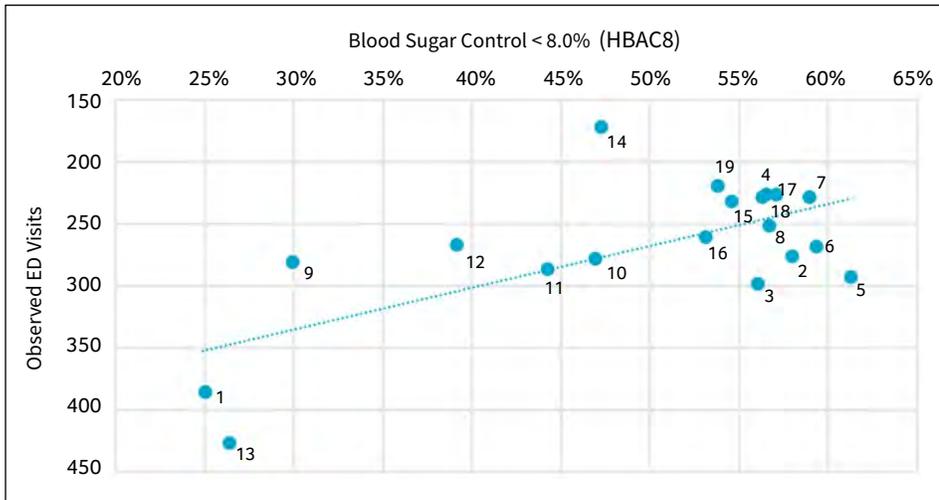
Regions with the lowest and highest costs are shaded green and red, respectively.

### Better Performance on Diabetes Care Among Risk-Bearing Providers

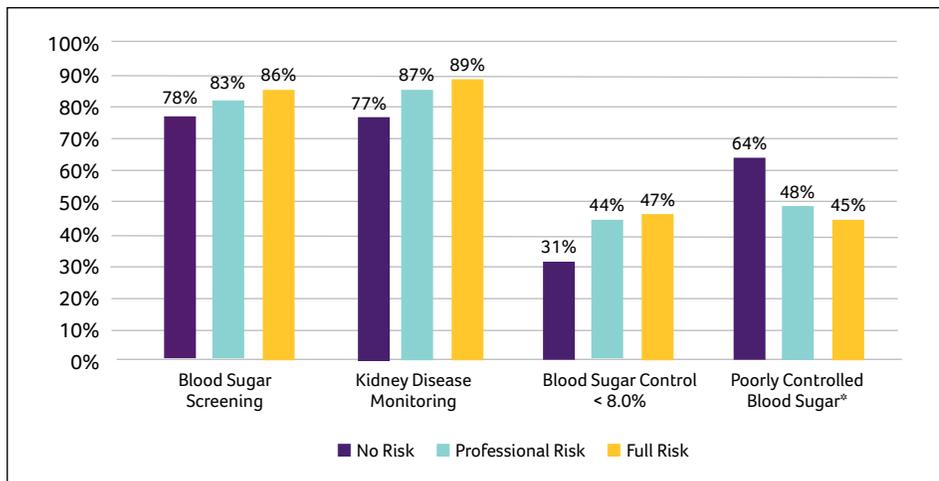
A recent analysis based on Atlas results shows that financial risk-bearing among providers is associated with better clinical quality and lower cost of care for commercial members. This analysis explores whether these findings hold for members with diabetes. Unlike the other sections of this data brief, this portion of the analysis excludes Kaiser Permanente. While data from Kaiser Permanente is included in the Atlas, those data are excluded from this analysis because the size of the membership—over 6 million commercial lives—would dominate the results. Accordingly, this specific analysis is based on data contributed by 7 health plans, representing over 7 million lives. Financial risk-sharing is defined in three categories:

- **no risk**, indicating that the provider is paid fee-for-service rather than through capitation;

**Figure 1: Relationship Between Diabetes Blood Sugar Control and Emergency Department Visits by Region**



**Figure 2: Diabetes Clinical Quality Measures by Provider Risk Sharing Type**



\* Lower is better performance

received appropriate **kidney disease monitoring**, compared to 87% and 89% of members cared for by providers taking professional and full risk.

- 31% of members with diabetes cared for by providers not taking risk had **blood sugar control <8.0%**, compared to 44% and 47% of members cared for by providers taking professional and full risk.
- 64% of members with diabetes cared for by providers not taking risk had **poorly controlled blood sugar (>9.0%)**, compared to 48% and 45% of members cared for by providers taking professional and full risk (for this measure, lower is better).

These findings are consistent with the results of the analysis conducted on the commercial population as a whole. They suggest a relationship between financial risk-sharing and diabetes care management, perhaps due to incentive alignment driving improvement in care coordination.

### Multiple Complex Drivers of Regional Variation in Cost and Quality

Analysis of Atlas 2017 results for commercial members with diabetes reveals significant regional variation in clinical quality and cost of care. Of particular concern are those regions with relatively low rates of blood sugar control, since poorly controlled blood sugar can lead to complications. Indeed, Atlas results show an association between better blood sugar control and a lower rate of emergency department visits among members with diabetes.

Three regions from across the state—Northern Counties, Eastern Region, and Central Coast North—score at the bottom on clinical quality measures for diabetes care, and among the highest

- **professional risk**, indicating capitation for only professional services (non-facility clinician and ancillary services such as outpatient lab tests); and
- **full risk**, indicating capitation for both professional and facility costs. Full risk can be through a single provider contract (“global risk”), or through separate contracts for professional and facility services (“dual risk”).

As shown in Figure 2, the results indicate that when the provider is bearing

financial risk (either professional or full), performance is better on all four measures of clinical quality in diabetes care.

- 78% of members with diabetes cared for by providers not taking risk (i.e., paid fee-for-service) received appropriate **blood sugar screening**, compared to 83% and 86% of members cared for by providers taking professional and full risk, respectively.
- 77% of members with diabetes cared for by providers not taking risk

in the state for total cost of care for diabetes members. Two of the three regions (Northern Counties and Eastern Region) also have the top rates in the state for emergency department use among diabetes members. What is driving these results?

While demographics shed some light on the results, the picture is complex. Northern Counties and Eastern Region are the two regions with the lowest average household income in the state: \$44,485 for Eastern Region and \$46,074 for Northern Counties, compared to \$65,719 statewide; but average income for Central Coast North, at \$65,479, matches the statewide average. The rate of high school graduation is low in Eastern Region (67%) and in Central Coast North (76%) compared to an average of 81% statewide; but the graduation rate in Northern Counties is above the state average at 86%. Race and ethnicity vary as well: the 22-county rural Northern Counties region is 74% White while the inland Eastern Region area is 73% Hispanic; the Central Coast North area is more evenly split between Hispanic (47%) and White (43%).

Access to coverage and care doubtless play a role, and there is increasing acknowledgement in health care

industry and policy circles that social determinants of health are central drivers of population health. Through this lens, the “bad” results on quality and cost observed in the three regions are at least as much about equity and disparities as they are about provider performance and patient compliance. Adequate income, affordable housing, access to transportation, availability of healthy foods, and safe places to walk and exercise outdoors all contribute to the health of a community and of a region.

As with all complex systems, many factors are at play. Population characteristics, delivery system attributes, and social determinants all likely contribute to the geographic variation in quality and cost for diabetes members. Regardless, it’s clear that more can be done to screen and manage diabetes. The association between financial risk-bearing among providers and quality results for members with diabetes is promising; but such a pathway is not feasible in all regions. Atlas results on geographic variation within the state present a challenge to the health care industry, public health officials, and policymakers alike: How can we best support quality improvement and better patient outcomes for members with diabetes in lower-performing regions?

#### Health Plan Data Contributors

Aetna  
Anthem Blue Cross  
Blue Shield of California  
Cigna  
Kaiser Permanente  
Sharp Health Plan  
UnitedHealthcare  
Western Health Advantage

**Note:** All results are based on administrative (claims and encounter) data, with some supplemental lab results and pharmacy data. Clinical data will be incomplete when using administrative data and may result in rates that are lower than actual performance due to data limitations.