



 **MANAGED CARE
DIGEST SERIES®**



TYPE 2 DIABETES REPORT™ LEHIGH VALLEY BUSINESS COALITION ON HEALTHCARE

With a Focus on How Cardiovascular Conditions Can Impact Diabetes Care

9th Edition

INTRODUCTION

Sanofi U.S. (Sanofi), in conjunction with the Lehigh Valley Business Coalition on Healthcare (LVBCH), is pleased to present the ninth edition of the **LVBCH Type 2 Diabetes Report™** for 2021, an overview of key demographic, utilization, pharmacotherapy, and charge measures for Type 2 diabetes patients, as well as a focus on how cardiovascular conditions can impact diabetes care. The report also provides national benchmarks that can help providers and employers identify opportunities to better serve the needs of their patients. All data are drawn from the Sanofi **Managed Care Digest Series®**.

Most of the data in this report (current as of calendar year 2020) were gathered by IQVIA, Durham, NC, a leading provider of innovative health care data products and analytic services. A review process takes place, before and during production of this report, between IQVIA and Forte Information Resources LLC. Data in this report may have been restated from prior years to account for updates to methodology and patient samples.

Sanofi, as sponsor of this report, maintains an arm’s-length relationship with the organizations that prepare the report and carry out the research for its contents. The desire of Sanofi is that the information in this report be completely independent and objective.

Through collective employer action and partnerships with providers/payers, LVBCH strives to improve the delivery, cost, and quality of health care in our communities. For a list of organizations, please visit www.lvbch.com. The role of LVBCH is to help make these data more widely available to interested parties.

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Data provided by: IQVIA, Durham, NC

DISTRIBUTION OF TYPE 2 DIABETES PATIENTS, BY AGE, 2018-2020

MARKET	0-17			18-35			36-64			65-79			80+		
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
Allentown	0.3%	0.4%	0.3%	2.0%	2.1%	2.7%	38.9%	39.6%	43.6%	41.9%	41.7%	38.9%	17.0%	16.1%	14.4%
Harrisburg	0.4	0.4	0.3	1.3	1.3	1.6	29.0	30.5	31.1	48.5	48.2	47.6	20.9	19.6	19.4
Reading	0.3	0.2	0.2	1.9	1.7	1.7	38.1	33.9	34.0	41.6	44.3	45.1	18.2	19.9	19.0
Scranton	0.3	0.3	0.3	1.6	1.6	1.8	30.8	30.6	32.2	46.8	47.1	46.3	20.5	20.4	19.4
Pennsylvania	0.3	0.3	0.3	1.8	1.8	2.0	34.8	34.3	35.0	45.1	45.8	45.4	18.0	17.9	17.4
NATION	0.3%	0.3%	0.3%	2.2%	2.1%	2.2%	39.8%	39.0%	39.3%	42.6%	43.4%	43.4%	15.1%	15.2%	14.9%

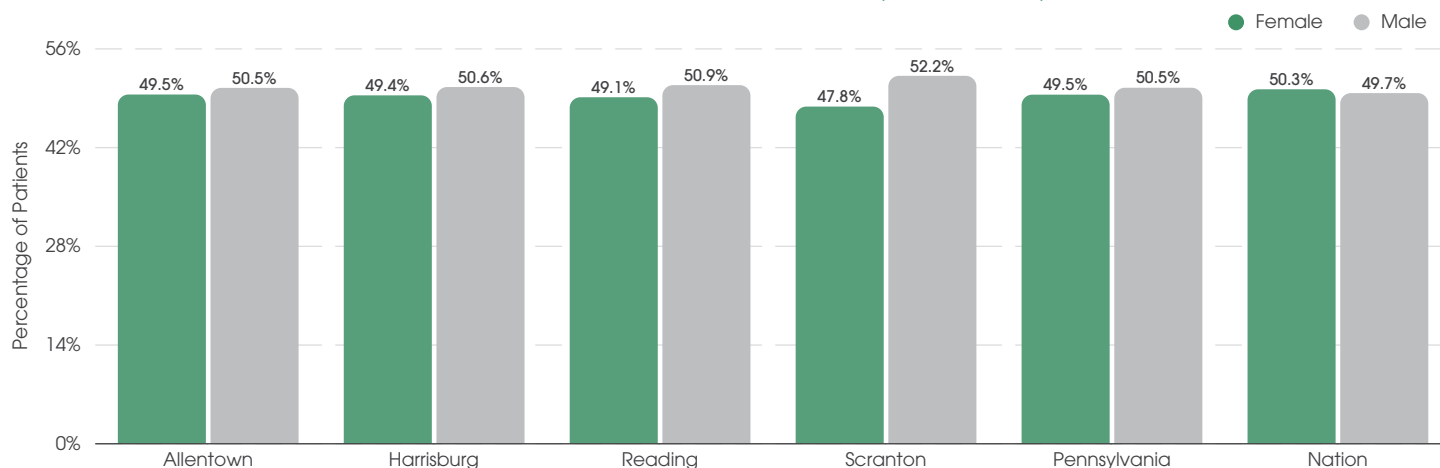
DISTRIBUTION OF TYPE 2 DIABETES PATIENTS, BY DURATION OF DISEASE, 2019-2020

MARKET	<5 Years		≥5 Years	
	2019	2020	2019	2020
Allentown	39.1%	36.1%	60.9%	63.9%
Harrisburg	34.6	27.8	65.4	72.2
Reading	27.4	23.4	72.6	76.6
Scranton	32.5	26.0	67.5	74.0
Pennsylvania	33.0	27.9	67.0	72.1
NATION	34.5%	30.0%	65.5%	70.0%

CARDIOVASCULAR DISEASE, STROKE PERCENTAGES ARE HIGHER IN PA VS. NATION

Compared with similar patients nationally, commercial patients in Pennsylvania with Type 2 diabetes were more likely to have cardiovascular disease (33.4% vs. 32.5%) or stroke (4.3% vs. 3.6%) in 2020. These percentages were even higher in Reading, where such patients were the most likely among the profiled Pennsylvania markets to have an A1c greater than 9.0% on their last exam in 2020.

DISTRIBUTION OF TYPE 2 DIABETES PATIENTS, BY GENDER, 2020



NOTE: Throughout this report, the Allentown market includes Bethlehem and Easton, and parts of New Jersey; the Harrisburg market includes Carlisle; the Scranton market includes Wilkes-Barre and Hazleton. An n/a indicates that data were not available.

PERCENTAGE OF TYPE 2 DIABETES PATIENTS, BY PAYER, 2019-2020

MARKET	Commercial Insurance ¹		Medicare		Medicaid ²	
	2019	2020	2019	2020	2019	2020
Allentown	37.4%	39.2%	45.7%	37.6%	16.9%	23.2%
Harrisburg	35.5	39.2	56.6	51.6	7.8	9.2
Reading	37.4	39.2	51.8	49.4	10.8	11.4
Scranton	36.9	40.7	54.5	50.8	8.6	8.5
Pennsylvania	34.3	36.5	51.9	49.0	13.8	14.5
NATION	39.1%	41.7%	48.3%	46.4%	12.5%	11.9%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH VARIOUS COMPLICATIONS, 2020

MARKET	Cardiovascular Disease	CKD	Hypoglycemia	Nephropathy	Neuropathy	PAD	Retinopathy	Stroke
Allentown	31.3%	20.7%	3.0%	34.0%	31.5%	15.2%	17.7%	4.4%
Harrisburg	28.1	18.6	1.8	30.3	29.8	14.8	18.1	3.8
Reading	36.1	16.4	2.3	26.9	29.4	15.5	24.1	4.6
Scranton	36.0	17.2	1.9	26.6	36.3	18.3	21.6	4.0
Pennsylvania	33.4	18.2	2.8	31.4	32.5	16.2	16.1	4.3
NATION	32.5%	17.5%	2.8%	30.2%	31.2%	14.6%	14.9%	3.6%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH VARIOUS COMPLICATIONS, OVERALL VS. LONG-ACTING BASAL CATEGORY 1 AND CATEGORY 2, 2019-2020³

MARKET	Cardiovascular Disease						Stroke					
	Overall		Cat. 1		Cat. 2		Overall		Cat. 1		Cat. 2	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Allentown	30.9%	31.3%	26.5%	29.4%	23.0%	19.4%	3.6%	4.4%	3.4%	3.3%	2.6%	n/a
Harrisburg	28.3	28.1	24.1	20.1	19.8	12.2	4.0	3.8	3.5	4.9	n/a	n/a
Reading	34.9	36.1	30.1	31.5	25.4	27.3	4.1	4.6	3.4	2.3	n/a	n/a
Scranton	39.3	36.0	32.1	29.3	28.5	28.1	3.8	4.0	3.0	3.2	2.1	2.7%
Pennsylvania	35.1	33.4	29.1	26.7	25.3	24.1	4.3	4.3	3.6	3.4	2.0	2.2
NATION	33.3%	32.5%	27.1%	25.8%	24.2%	23.4%	3.7%	3.6%	3.3%	3.2%	2.2%	2.2%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS, BY CO-OCCURRING CONDITION, 2019-2020⁴

MARKET	COVID-19		Depression		Hyperlipidemia		Hypertension		Obesity	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Allentown	n/a	6.9%	17.0%	16.8%	64.6%	61.2%	79.3%	79.4%	42.7%	41.2%
Harrisburg	n/a	5.3	14.0	12.4	56.5	54.4	80.9	80.3	34.8	30.0
Reading	n/a	7.3	11.6	10.6	69.3	67.7	78.0	77.7	28.5	27.1
Scranton	n/a	4.4	11.8	12.3	59.4	57.9	81.2	80.7	38.0	33.2
Pennsylvania	n/a	6.0	13.0	12.7	65.7	63.6	79.2	78.2	36.0	33.1
NATION	n/a	6.6%	12.0%	11.9%	66.9%	66.6%	80.6%	79.5%	29.9%	28.2%

Data source: IQVIA © 2021

¹ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

² Medicaid includes fee-for-service and managed care.

³ A complication is defined as a patient condition caused by diabetes. Complications of diabetes include, but are not limited to, atherosclerotic cardiovascular disease (ASCVD), cardiovascular (CV) disease, congestive heart failure, hypoglycemia, myocardial infarction (MI), nephropathy, neuropathy, peripheral artery disease (PAD), retinopathy, and stroke. ASCVD includes patients with acute coronary syndromes (ACS), MI, stroke, and other cardiovascular diseases.

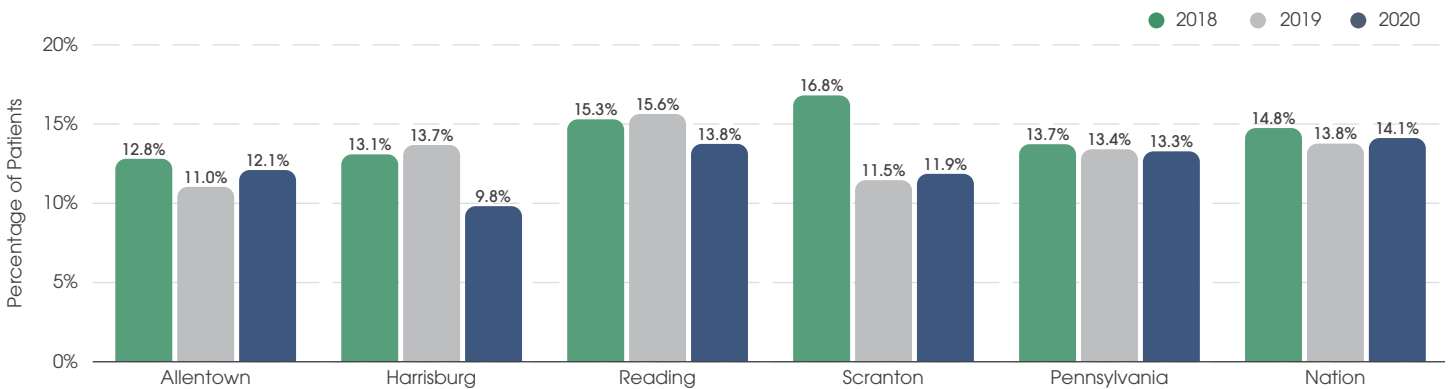
⁴ A co-occurring condition is a condition a patient with diabetes may also have, which may or may not be directly related to the diabetes. Co-occurring conditions were narrowed down to a subset of conditions, including, but not limited to, atherosclerotic cardiovascular disease (ASCVD); includes patients with acute coronary syndromes, myocardial infarction, stroke, and other cardiovascular conditions), chronic kidney disease (CKD), gastrointestinal (GI) symptoms, congestive heart failure, hypoglycemia, obesity, peripheral artery disease (PAD), and stroke.

NOTE: "Category 1" refers to long-acting basal insulins approved through 2014 and follow-on long-acting insulins approved after 2014. "Category 2" refers to non-follow-on long-acting basal insulins approved in or after 2015.

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS SERVICES, 2018-2020

MARKET	A1c Test ¹			Blood Glucose Test			Ophthalmologic Exam			Serum Cholesterol Test			Urine Microalbumin Test		
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
Allentown	84.2%	85.4%	85.9%	87.8%	88.0%	86.1%	53.1%	54.8%	50.4%	73.7%	74.3%	69.2%	43.1%	44.4%	39.7%
Harrisburg	85.2	85.8	84.8	88.8	89.0	86.6	58.9	60.5	57.8	76.5	76.5	71.2	45.5	45.6	42.0
Reading	89.5	84.5	83.7	87.5	87.1	85.4	78.3	73.3	67.3	73.4	72.2	67.7	41.7	41.6	38.1
Scranton	83.7	84.6	84.5	87.9	87.8	85.7	61.4	63.4	60.7	72.6	74.0	68.4	40.6	42.4	38.1
Pennsylvania	85.7	85.9	85.6	89.1	89.0	87.0	52.2	52.6	47.8	75.7	75.8	71.0	45.4	46.4	42.4
NATION	87.3%	87.7%	87.1%	90.7%	90.8%	89.7%	42.5%	42.2%	38.2%	78.1%	78.1%	75.0%	47.7%	47.6%	44.0%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH AN A1c LEVEL >9.0%, 2018-2020¹



COMPOSITE A1c LEVELS FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, BY DURATION OF DISEASE, 2019-2020¹

MARKET	<5 Years		≥5 Years	
	2019	2020	2019	2020
Allentown	7.09%	6.95%	7.34%	7.45%
Harrisburg	7.22	7.27	7.40	7.27
Reading	7.34	7.19	7.66	7.41
Scranton	7.10	7.15	7.45	7.29
Pennsylvania	7.23	7.21	7.48	7.46
NATION	7.15%	7.18%	7.46%	7.46%

A1c ABOVE 9.0% PORTION FALLS BY 7.0 POINTS AMONG PA PATIENTS ON CAT. 2 RX

Among Pennsylvania commercial patients with Type 2 diabetes receiving a Category 2 long-acting insulin, the share with an A1c level above 9.0% declined by 7.0 percentage points from 2018 to 2020; for similar patients on a Category 1 treatment, the decrease was 3.9 percentage points.

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING LONG-ACTING BASAL CATEGORY 1 VS. CATEGORY 2 WITH AN A1c LEVEL ≤7.0% OR >9.0%, 2018 AND 2020¹

MARKET	≤7.0% ²				>9.0% ³			
	Category 1		Category 2		Category 1		Category 2	
	2018	2020	2018	2020	2018	2020	2018	2020
Pennsylvania	25.6%	28.3%	22.8%	29.1%	30.0%	26.2%	29.1%	22.1%
NATION	23.7%	25.9%	21.6%	25.7%	34.7%	32.2%	34.5%	29.9%

Data source: IQVIA © 2021

¹ The A1c test measures the average blood glucose over the past 3 months. Figures reflect the percentage of diabetes patients who have had at least one A1c test in a given year.

² Positive percent change in this group indicates an increase, from 2016 to 2018, in the percentage of patients with A1c levels at or below 7.0%.

³ Negative percent change in this group indicates a reduction, from 2016 to 2018, in the percentage of patients with A1c levels above 9.0%.

NOTE: "Category 1" refers to long-acting basal insulins approved through 2014 and follow-on long-acting insulins approved after 2014. "Category 2" refers to non-follow-on long-acting basal insulins approved in or after 2015. Some data were unavailable for the selected markets.

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS INSULIN AND COMBINATION THERAPIES, 2019-2020¹

MARKET	Any Insulin Products		Long-Acting Basal Category 1		Long-Acting Basal Category 2		Fixed Ratio (Long-Acting Insulin/ GLP-1 RA)		Free Ratio (Variable Long-Acting Insulin + GLP-1 RA)		Rapid-/Short-Acting Insulin	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Allentown	32.3%	33.0%	17.9%	18.2%	7.7%	6.9%	0.9%	0.9%	7.4%	8.3%	13.8%	16.4%
Harrisburg	31.7	31.9	18.0	17.3	5.9	6.0	0.6	0.7	7.2	8.4	14.4	15.9
Reading	31.6	31.3	17.8	17.7	7.5	7.1	0.5	0.6	6.3	7.6	15.6	14.8
Scranton	29.6	28.9	15.0	14.5	8.2	8.2	0.7	0.7	7.8	8.2	15.4	15.3
Pennsylvania	31.3	31.1	17.0	17.0	7.3	7.1	0.9	0.8	7.5	8.5	15.5	15.7
NATION	29.4%	29.0%	16.7%	16.1%	7.2%	7.3%	0.9%	0.9%	7.2%	8.1%	13.4%	13.3%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH AN A1c LEVEL >9.0% RECEIVING VARIOUS INSULIN AND COMBINATION THERAPIES, 2019-2020^{1,2}

MARKET	Any Insulin Products		Long-Acting Basal Category 1		Long-Acting Basal Category 2		Fixed Ratio (Long-Acting Insulin/ GLP-1 RA)		Free Ratio (Variable Long-Acting Insulin + GLP-1 RA)		Rapid-/Short-Acting Insulin	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Allentown	50.0%	54.3%	25.0%	34.5%	20.5%	n/a	n/a	n/a	11.4%	12.1%	25.0%	26.7%
Scranton	56.3	55.7	24.7	27.1	20.9	19.4%	2.4%	n/a	19.2	15.1	29.1	26.2
Pennsylvania	52.7	51.4	28.9	28.1	14.0	12.1	1.7	1.7%	13.1	13.2	25.9	25.0
NATION	51.6%	49.8%	29.8%	28.7%	14.1%	13.5%	2.1%	2.0%	12.6%	13.9%	23.0%	22.2%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS NON-INSULIN ANTIDIABETIC THERAPIES, 2019-2020¹

MARKET	Any Non-Insulin Antidiabetic Product		Biguanides		DPP-4 Inhibitors		GLP-1 RAs		Insulin Sensitizing Agents		SGLT-2 Inhibitors	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2-18	2020
Allentown	91.7%	91.4%	62.6%	63.1%	13.6%	12.2%	15.9%	19.5%	3.8%	3.7%	17.8%	18.2%
Harrisburg	91.1	91.4	66.3	65.4	12.4	11.0	16.3	20.5	5.8	5.5	16.1	18.8
Reading	91.4	92.6	64.0	63.8	13.2	11.7	15.5	19.1	3.8	2.9	18.3	21.4
Scranton	92.5	92.4	66.9	66.8	14.9	13.8	19.3	21.9	6.0	5.4	18.1	20.2
Pennsylvania	91.6	91.9	66.2	66.4	12.7	11.9	17.6	21.1	4.8	4.6	16.7	19.2
NATION	92.7%	93.1%	68.3%	68.5%	11.3%	10.3%	18.0%	21.2%	6.5%	6.7%	15.6%	17.6%

Data source: IQVIA © 2021

Biguanides: Decrease the production of glucose by the liver, decrease intestinal absorption of glucose, and increase the peripheral uptake and use of circulating glucose.

Dipeptidyl Peptidase 4 (DPP-4) Inhibitors: Inhibit DPP-4 enzymes and slow inactivation of incretin hormones, helping to regulate glucose homeostasis through increased insulin release and decreased glucagon levels.

GLP-1 Receptor Agonists (RAs): Increase glucose-dependent insulin secretion and pancreatic beta-cell sensitivity, reduce glucagon production, slow rate of absorption of glucose in the digestive tract by slowing gastric emptying, and suppress appetite. "Fixed ratio (long-acting insulin/ GLP-1 RA)" refers to the two therapies combined in a single product. "Free ratio (variable long-acting insulin + GLP-1 RA)" refers to the two therapies taken separately and concurrently.

Insulin Sensitizing Agents: Increase insulin sensitivity by improving response to insulin in liver, adipose tissue, and skeletal muscle, resulting in decreased production of glucose by the liver and increased peripheral uptake and use of circulating glucose.

Long-Acting Basal Category 1/Category 2: Insulin replacement product with a long duration of action. "Category 1" refers to long-acting basal insulins approved through 2014 and follow-on long-acting insulins approved after 2014. "Category 2" refers to non-follow-on long-acting basal insulins approved in or after 2015.

Mixed Insulin: Insulin replacement product combining a short-acting and an intermediate-acting insulin product.

Rapid-/Short-Acting Insulin: Insulin replacement product with a rapid onset and shorter duration of action than short-acting insulin.

Sodium/Glucose Cotransporter 2 (SGLT-2) Inhibitors: Lower blood glucose concentration so that glucose is excreted instead of reabsorbed.

¹ Patients who filled prescriptions for any insulin products may have also filled prescriptions for products in the non-insulin category, and vice versa.

² The A1c test measures the average blood sugar level during the past 2-3 months. Figures reflect the percentage of diabetes patients who have had at least one A1c test in a given year.

NOTE: Some data were unavailable for Harrisburg and Reading.

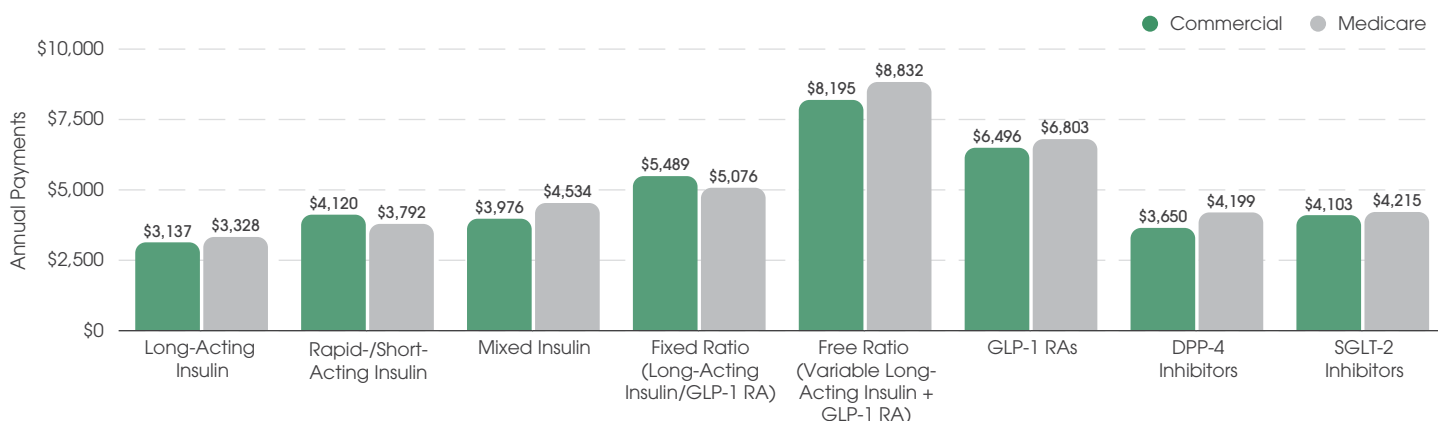
PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH VARIOUS COMPLICATIONS, OVERALL VS. LONG-ACTING BASAL CATEGORY 1 AND CATEGORY 2, 2019-2020³

MARKET	Chronic Kidney Disease						Hypoglycemia					
	Overall		Cat. 1		Cat. 2		Overall		Cat. 1		Cat. 2	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Allentown	17.4%	20.7%	19.6%	18.3%	15.6%	12.8%	3.7%	3.0%	4.8%	4.1%	7.1%	n/a
Harrisburg	16.7	18.6	17.9	17.7	10.4	12.8	1.9	1.8	2.7	3.9	n/a	n/a
Reading	14.8	16.4	16.5	18.6	13.4	12.8	2.9	2.3	4.1	n/a	4.3	n/a
Scranton	15.7	17.2	17.2	17.5	13.2	13.8	1.9	1.9	4.2	4.0	4.0	4.4%
Pennsylvania	17.8	18.2	17.1	16.1	13.8	13.7	3.0	2.8	4.3	3.8	4.3	3.9
NATION	17.1%	17.5%	15.8%	15.6%	13.3%	13.5%	3.0%	2.8%	4.3%	4.1%	4.2%	4.1%

PERCENTAGE OF AND ANNUAL PAYMENTS FOR COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS COMBINATION THERAPIES, 2020¹

	Use of 1 Non-Insulin Product		Use of 2 Non-Insulin Products		Use of 2 Products: 1 Insulin, 1 Non-Insulin		Use of 2 Insulin Products		Use of 3 Non-Insulin Products		Use of 3 Products: 1 Insulin, 2 Non-Insulin		Use of 3 Products: 2 Insulin, 1 Non-Insulin	
	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$
Allentown	36.3%	\$1,436	19.5%	\$3,455	7.0%	\$6,088	5.2%	\$6,328	10.7%	\$6,150	6.8%	\$7,428	9.2%	\$9,170
Harrisburg	37.0	1,256	20.1	3,162	6.5	5,827	5.8	7,026	10.5	5,913	7.1	7,885	7.3	11,518
Reading	36.7	1,469	21.8	3,996	7.0	6,026	4.7	6,164	9.8	7,235	7.1	9,142	8.7	9,816
Scranton	36.5	1,460	21.8	4,124	5.8	7,972	5.0	9,047	12.0	6,671	7.1	10,144	7.1	12,409
Pennsylvania	36.5	1,358	21.4	3,678	6.4	6,699	5.4	7,266	10.4	6,313	7.0	8,680	8.0	10,303
NATION	38.2%	\$1,346	22.0%	\$3,378	6.5%	\$6,366	4.3%	\$7,381	10.2%	\$5,963	7.3%	\$8,334	7.0%	\$10,306

ANNUAL PAYMENTS PER TYPE 2 DIABETES PATIENT RECEIVING VARIOUS INSULIN AND NON-INSULIN ANTIDIABETIC THERAPIES, BY PAYER, PENNSYLVANIA, 2020¹



Data source: IQVIA © 2021

¹ Figures reflect the per-patient yearly payments for diabetes patients receiving a particular type of therapy. These are the actual amounts paid by the insurer and patient for such prescriptions.

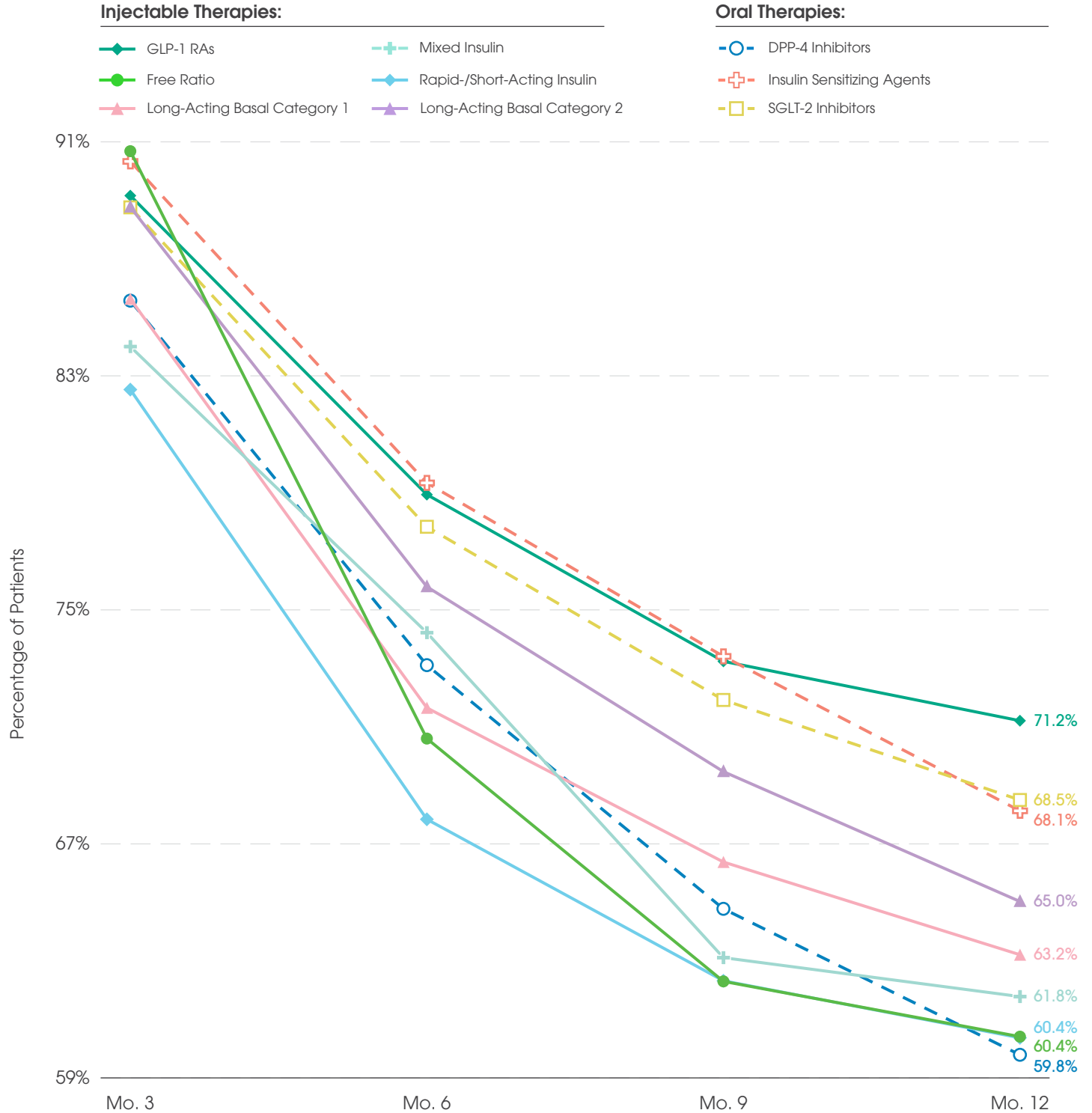
² Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

NOTE: "Category 1" refers to long-acting basal insulins approved through 2014 and follow-on long-acting insulins approved after 2014. "Category 2" refers to non-follow-on long-acting basal insulins approved in or after 2015. "Fixed ratio (long-acting insulin/GLP-1 RA)" refers to the two therapies combined in a single product. "Free ratio (variable long-acting insulin + GLP-1 RA)" refers to the two therapies taken separately and concurrently.

PERSISTENCY RATES FOR PENNSYLVANIA COMMERCIAL TYPE 2 DIABETES PATIENTS ON INJECTABLE THERAPIES ARE HIGHEST FOR GLP-1 RAs AND CAT. 2 LONG-ACTING INSULIN; FOR ORAL THERAPIES, SGLT-2 INHIBITOR PERSISTENCY LEADS

In 2020, the percentage of new-to-brand commercial Type 2 diabetes patients in Pennsylvania who were persistent at month 6 with their therapy—measured as the portion of those who continued or restarted their prescription following an initial fill—was highest, by injectable therapy, for those who received a GLP-1 RA, followed by long-acting basal Category 2.

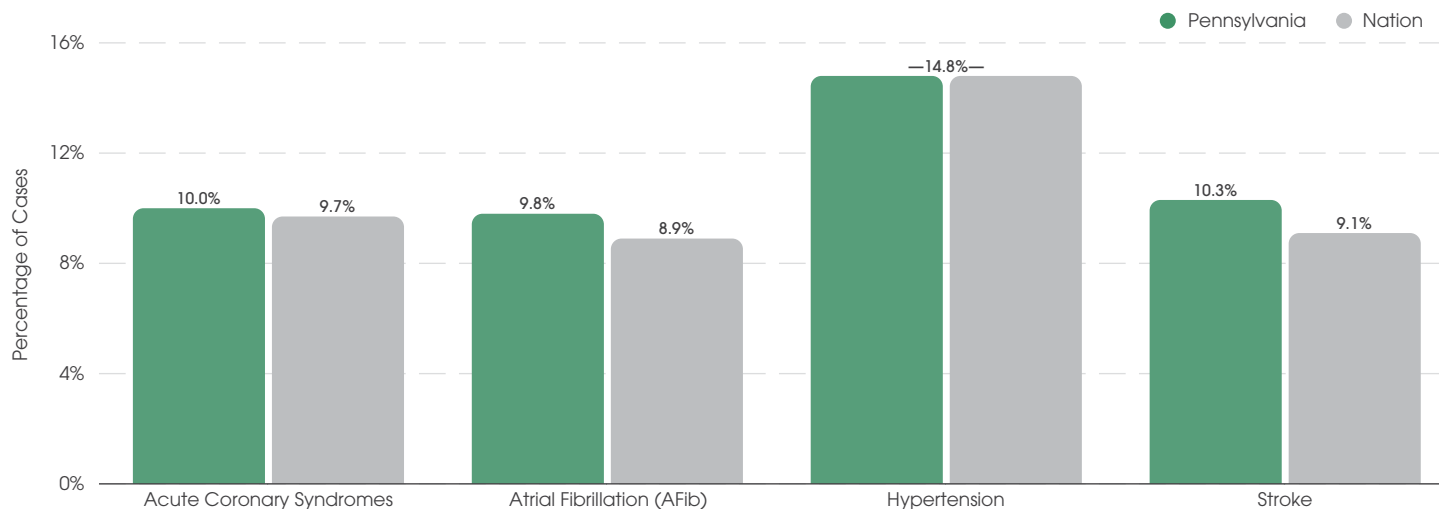
PERSISTENCY: COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS THERAPIES, PENNSYLVANIA, 2020



Data source: IQVIA © 2021

NOTE: "Persistence" measures whether patients maintain their prescribed therapy. It is calculated by identifying patients who filled a prescription for the reported drug class in the six months prior to the reported year, and then tracking prescription fills for those same patients in each of the months in the current reported year. If patients fill a prescription in a month, they are reported among the patients who have continued or restarted on therapy. Continued means that the patient has filled the drug group in each of the preceding months. Restarted means that the patient did not fill in one or more of the preceding months. Continuing and restarting patients are reported together. Persistence is tracked for patients who are new to therapy (those who have not filled the therapy in question in the six months prior to their first fill of the study period). "Category 1" refers to long-acting basal insulins approved through 2014 and follow-on long-acting insulins approved after 2014. "Category 2" refers to non-follow-on long-acting basal insulins approved in or after 2015. Some data were unavailable for the selected therapies.

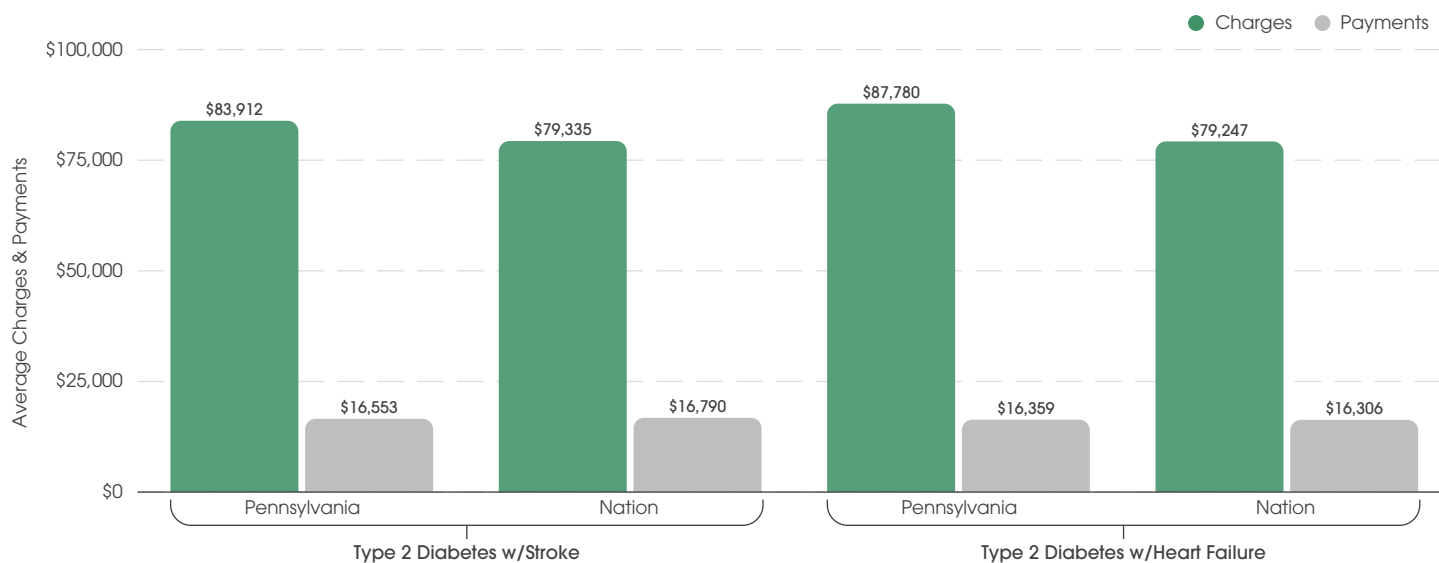
PERCENTAGE OF ALL-PAYER INPATIENT CASES WITH A SECONDARY DIAGNOSIS OF TYPE 2 DIABETES, BY FOUR PRIMARY CARDIOVASCULAR DIAGNOSES, 2020



INPATIENT FACILITY CHARGES PER YEAR FOR TYPE 2 DIABETES PATIENTS, OVERALL VS. WITH AFib OR CARDIOVASCULAR DISEASE, BY PAYER, 2020^{1,2}

MARKET	Commercial ³			Medicare		
	Overall	w/ AFib	w/ Cardiovascular Disease	Overall	w/ AFib	w/ Cardiovascular Disease
Allentown	\$55,664	\$94,681	\$65,490	\$55,886	\$66,601	\$55,738
Harrisburg	43,250	68,102	79,195	65,634	68,387	51,574
Reading	44,026	n/a	45,468	59,224	84,759	72,292
Scranton	48,732	n/a	n/a	62,398	47,930	71,918
Pennsylvania	56,779	61,019	62,439	62,379	67,457	66,305
NATION	\$51,471	\$57,040	\$56,732	\$56,364	\$61,884	\$60,643

MEDICARE CHARGES AND PAYMENT PER INPATIENT CLAIM, PENNSYLVANIA, 2020⁴



Data source: Definitive Healthcare © 2021

¹ Data reflect the charges generated for diabetes patients by the facilities that delivered care. The data also reflect the average amounts charged, not the amounts paid.

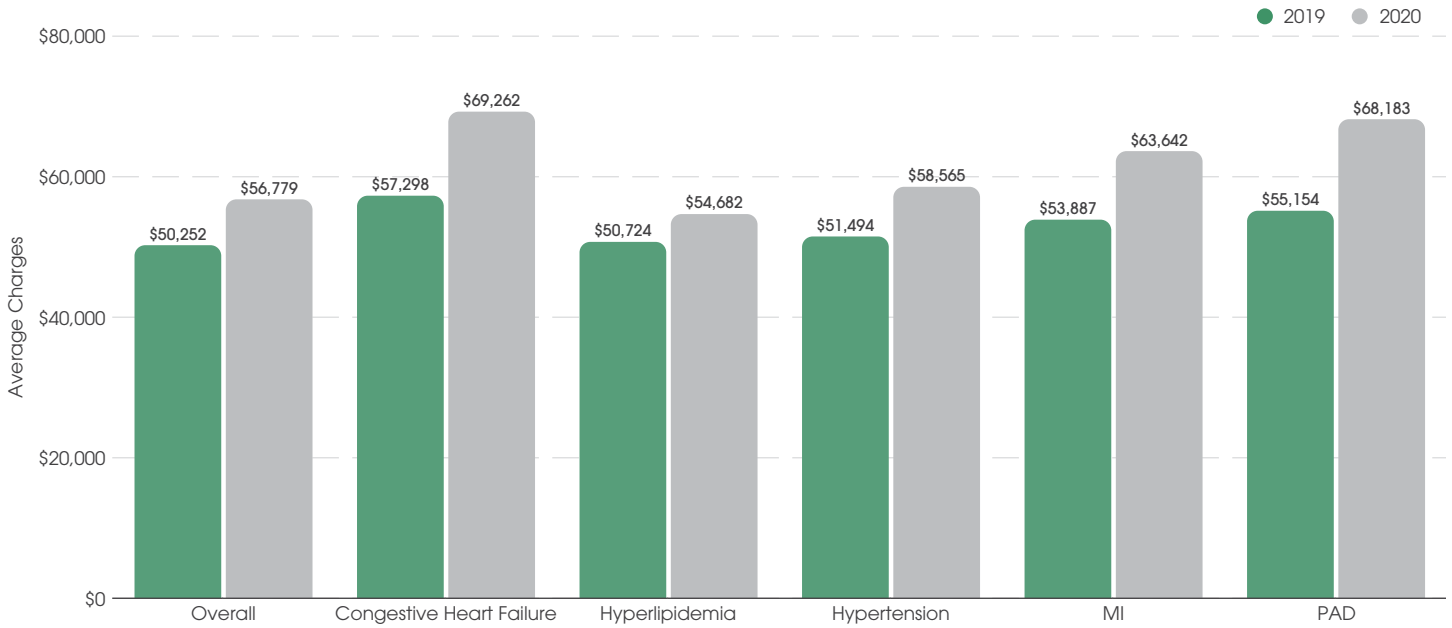
² A complication is defined as a patient condition caused by diabetes. Complications of diabetes include, but are not limited to, atherosclerotic cardiovascular disease (ASCVD), cardiovascular (CV) disease, congestive heart failure, hypoglycemia, myocardial infarction (MI), nephropathy, neuropathy, peripheral artery disease (PAD), retinopathy, and stroke. ASCVD includes patients with acute coronary syndromes (ACS), MI, stroke, and other cardiovascular diseases.

³ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

⁴ Charge data are per-case averages for patients with a particular diagnosis of interest. Charges may be for treatment related to other diagnoses. Data reflect the total charges billed by the acute-care hospital for the entire episode of care, and may include accommodation, pharmacy, laboratory, radiology, etc. Data are from submitted claims forms and do not necessarily indicate final amounts paid.

NOTE: Throughout this report, unless otherwise specified, hospital case data include primary and secondary diagnoses. Secondary diagnoses and charges and reimbursement data come from IQVIA's Hospital Procedure & Diagnosis (HPD) database. Hospital data are based on all short-term, acute-care hospitals and are effective as of 2018. Psychiatric, rehabilitation, armed forces, and long-term acute-care hospitals are excluded.

INPATIENT FACILITY CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, OVERALL VS. WITH COMMON CO-OCCURRING CONDITIONS, PENNSYLVANIA, 2019-2020^{1,2}



OUTPATIENT FACILITY CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, OVERALL VS. WITH COMMON CO-OCCURRING CONDITIONS, 2020^{1,2}

MARKET	Overall	w/ Congestive Heart Failure	w/ Hyperlipidemia	w/ Hypertension	w/ MI	w/ PAD
Pennsylvania	\$16,400	\$24,728	\$15,248	\$18,097	\$30,302	\$21,407
NATION	\$14,345	\$21,221	\$14,069	\$15,349	\$22,133	\$20,481

INPATIENT PROFESSIONAL CHARGES PER YEAR FOR TYPE 2 DIABETES PATIENTS, OVERALL VS. WITH AFib OR CARDIOVASCULAR DISEASE, BY PAYER, 2020^{3,4}

MARKET	Commercial ⁵			Medicare		
	Overall	w/ AFib	w/ Cardiovascular Disease	Overall	w/ AFib	w/ Cardiovascular Disease
Allentown	\$4,990	\$6,520	\$6,214	\$4,700	\$5,861	\$5,540
Harrisburg	3,211	3,657	4,088	3,977	4,875	4,788
Reading	5,186	5,383	6,134	3,249	3,596	3,545
Scranton	4,048	6,256	4,906	4,566	5,828	5,453
Pennsylvania	3,741	4,936	4,569	3,982	5,029	4,619
NATION	\$4,575	\$5,989	\$5,506	\$5,092	\$6,675	\$6,038

Data source: IQVIA © 2021

¹ Data reflect the charges generated for diabetes patients by the facilities that delivered care. The data also reflect the average amounts charged, not the amounts paid.

² A co-occurring condition is a condition a patient with diabetes may also have, which may or may not be directly related to the diabetes. Co-occurring conditions were narrowed down to a subset of conditions, including, but not limited to, atherosclerotic cardiovascular disease (ASCVD; includes patients with acute coronary syndromes, myocardial infarction, stroke, and other cardiovascular conditions), chronic kidney disease (CKD), gastrointestinal (GI) symptoms, congestive heart failure, hypoglycemia, obesity, peripheral artery disease (PAD), and stroke.

³ Professional charges are those generated by the providers delivering care to patients with diabetes in various settings.

⁴ A complication is defined as a patient condition caused by diabetes. Complications of diabetes include, but are not limited to, atherosclerotic cardiovascular disease (ASCVD), cardiovascular (CV) disease, congestive heart failure, hypoglycemia, myocardial infarction (MI), nephropathy, neuropathy, peripheral artery disease (PAD), retinopathy, and stroke. ASCVD includes patients with acute coronary syndromes (ACS), MI, stroke, and other cardiovascular diseases.

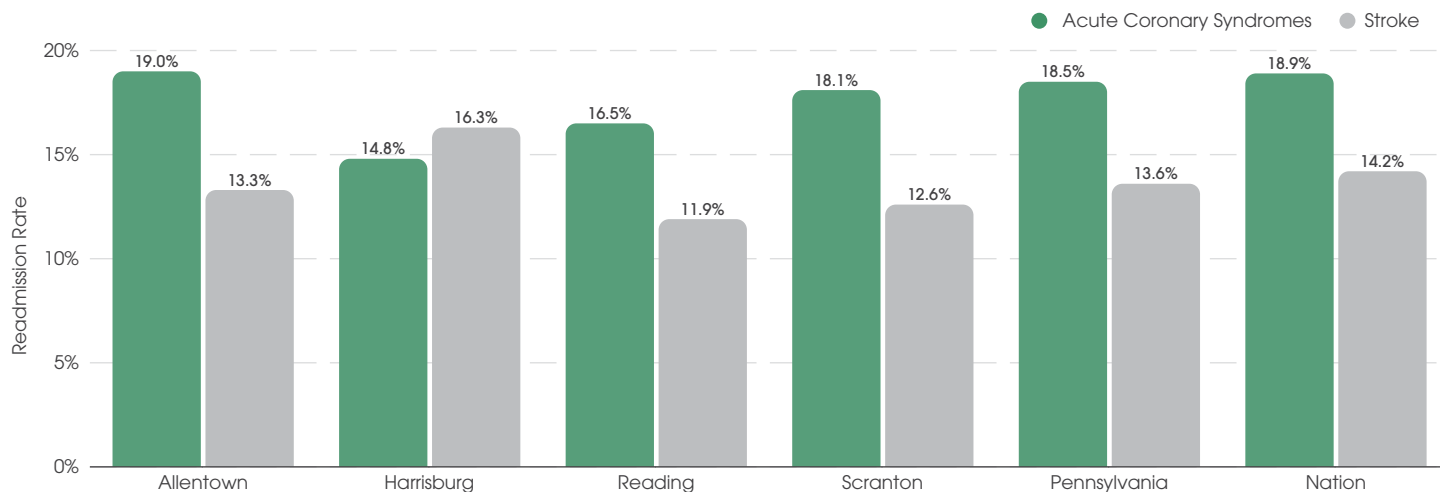
⁵ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

NOTE: Some data were unavailable for the selected markets.

AVERAGE LENGTH OF STAY (DAYS) AND CHARGES PER MEDICARE PRIMARY INPATIENT ACUTE CORONARY SYNDROMES CASE, 2019-2020

MARKET	Average Length of Stay		Average Charges ¹	
	2019	2020	2019	2020
Allentown	4.0	3.9	\$154,195	\$154,269
Harrisburg	4.8	5.1	104,053	120,580
Reading	4.2	4.2	90,600	87,282
Scranton	4.6	4.4	145,971	139,635
Pennsylvania	4.3	4.2	107,886	110,027
NATION	4.3	4.2	\$101,968	\$107,689

30-DAY MEDICARE HOSPITAL READMISSION RATES FOR ACUTE CORONARY SYNDROMES OR STROKE, 2020



AVERAGE LENGTH OF STAY (DAYS) AND CHARGES PER MEDICARE PRIMARY INPATIENT STROKE CASE, 2020

MARKET	Average Length of Stay	Average Charges ¹
Allentown	7.2	\$130,029
Harrisburg	6.1	56,702
Reading	6.7	62,834
Scranton	8.7	81,801
Pennsylvania	6.2	75,452
NATION	6.5	\$68,615

EMERGENCY DEPARTMENT PROFESSIONAL CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, OVERALL VS. WITH STROKE, 2019-2020^{2,3}

MARKET	Overall		w/ Stroke	
	2019	2020	2019	2020
Allentown	\$1,101	\$1,075	\$2,013	\$1,719
Harrisburg	1,230	1,198	1,597	1,093
Reading	1,795	1,984	2,426	2,834
Scranton	1,202	1,338	1,272	1,748
Pennsylvania	1,287	1,319	1,701	1,806
NATION	\$1,794	\$1,875	\$2,489	\$2,581

Data source: IQVIA © 2021

¹ Charge data are per-case averages for patients with a particular diagnosis of interest. Data reflect the total charges billed by the acute-care hospital for the entire episode of care, and may include accommodation, pharmacy, laboratory, radiology, and other charges not billed by the physician. Data do not necessarily indicate final amounts paid.

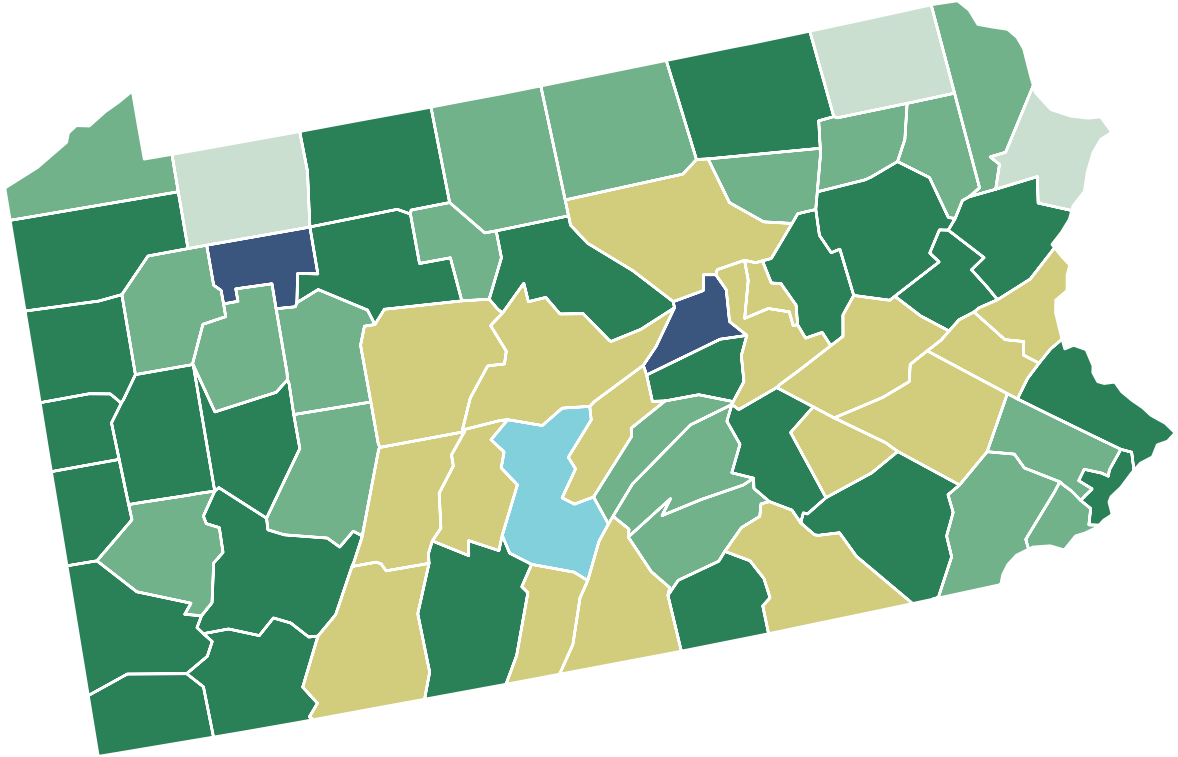
² Professional charges are those generated by the providers delivering care to patients with diabetes in various settings.

³ A complication is defined as a patient condition caused by diabetes. Complications of diabetes include, but are not limited to, atherosclerotic cardiovascular disease (ASCVD), cardiovascular (CV) disease, congestive heart failure, hypoglycemia, myocardial infarction (MI), nephropathy, neuropathy, peripheral artery disease (PAD), retinopathy, and stroke. ASCVD includes patients with acute coronary syndromes (ACS), MI, stroke, and other cardiovascular diseases.

NOTE: Average length of stay and charge data come from IQVIA's Hospital Procedure & Diagnosis (HPD) database. Hospital data are based on all short-term, acute-care hospitals and are effective as of 2018. Psychiatric, rehabilitation, armed forces, and long-term acute-care hospitals are excluded. Data for acute coronary syndromes and stroke in 2018 vary from previous years due to changes in the ICD-10 codes.

COVID-19 CASES PER 100K POPULATION, BY COUNTY, AS OF OCTOBER 13, 2021

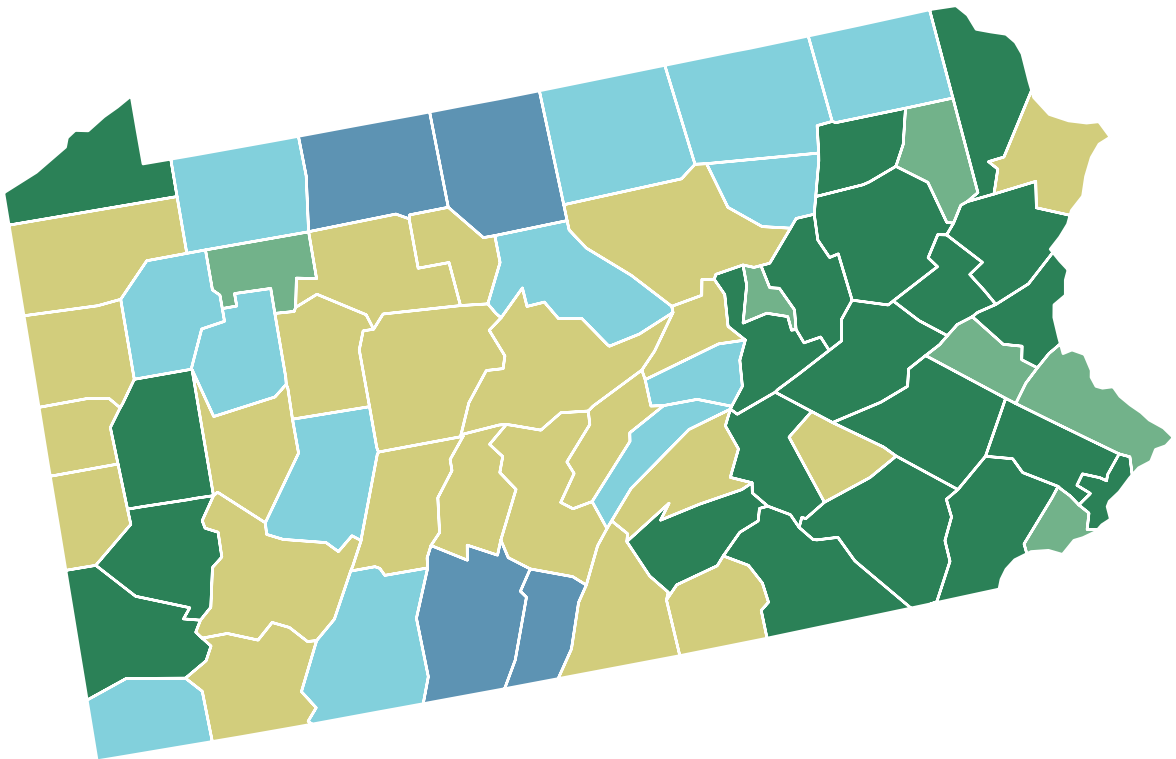
- <9,000
- 9,000–10,999
- 11,000–12,999
- 13,000–14,999
- 15,000–16,999
- 17,000–18,999
- ≥19,000



Data source: Centers for Disease Control and Prevention © 2021

PERCENTAGE OF AGE 12+ POPULATION FULLY VACCINATED, BY COUNTY, AS OF OCTOBER 14, 2021

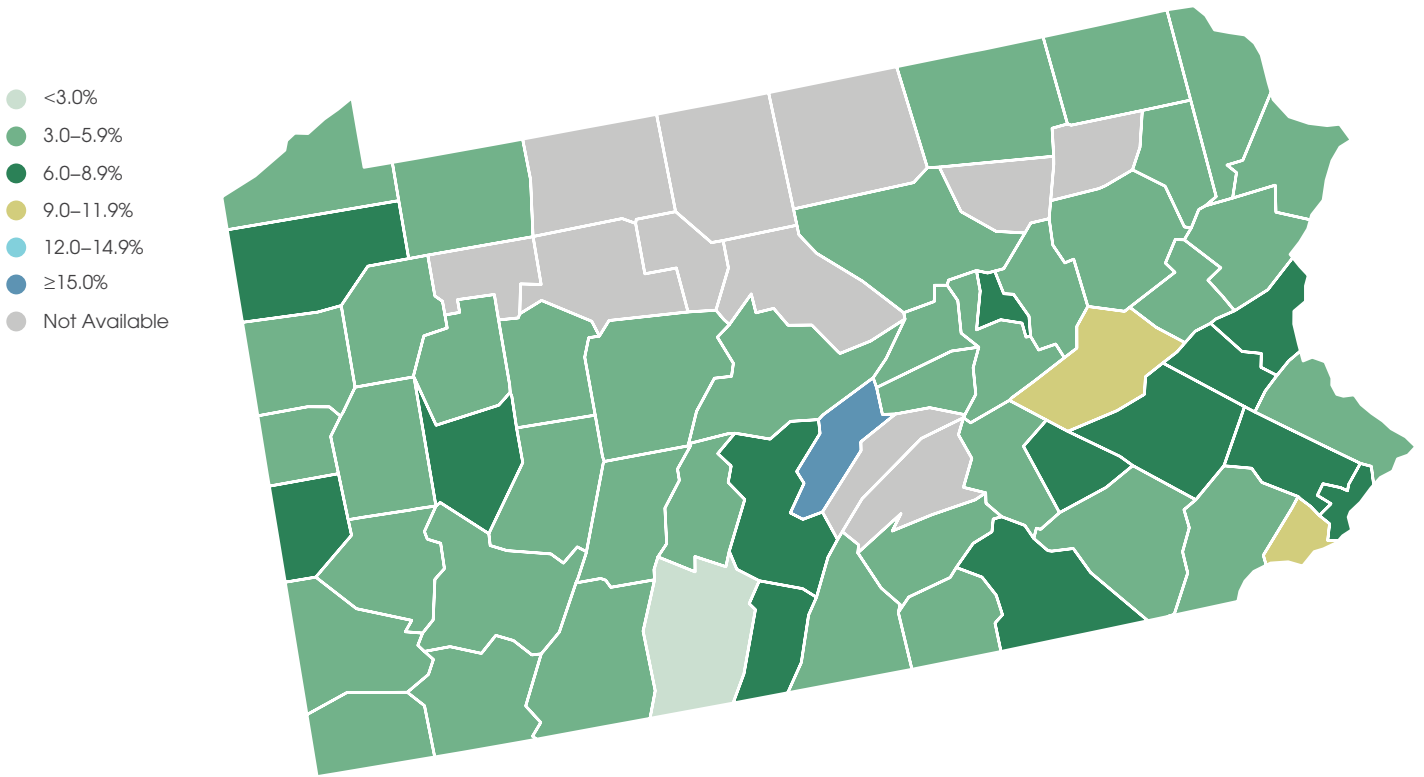
- <30.0%
- 30–39.9%
- 40–49.9%
- 50.0–59.9%
- 60–69.9%
- ≥70.0%



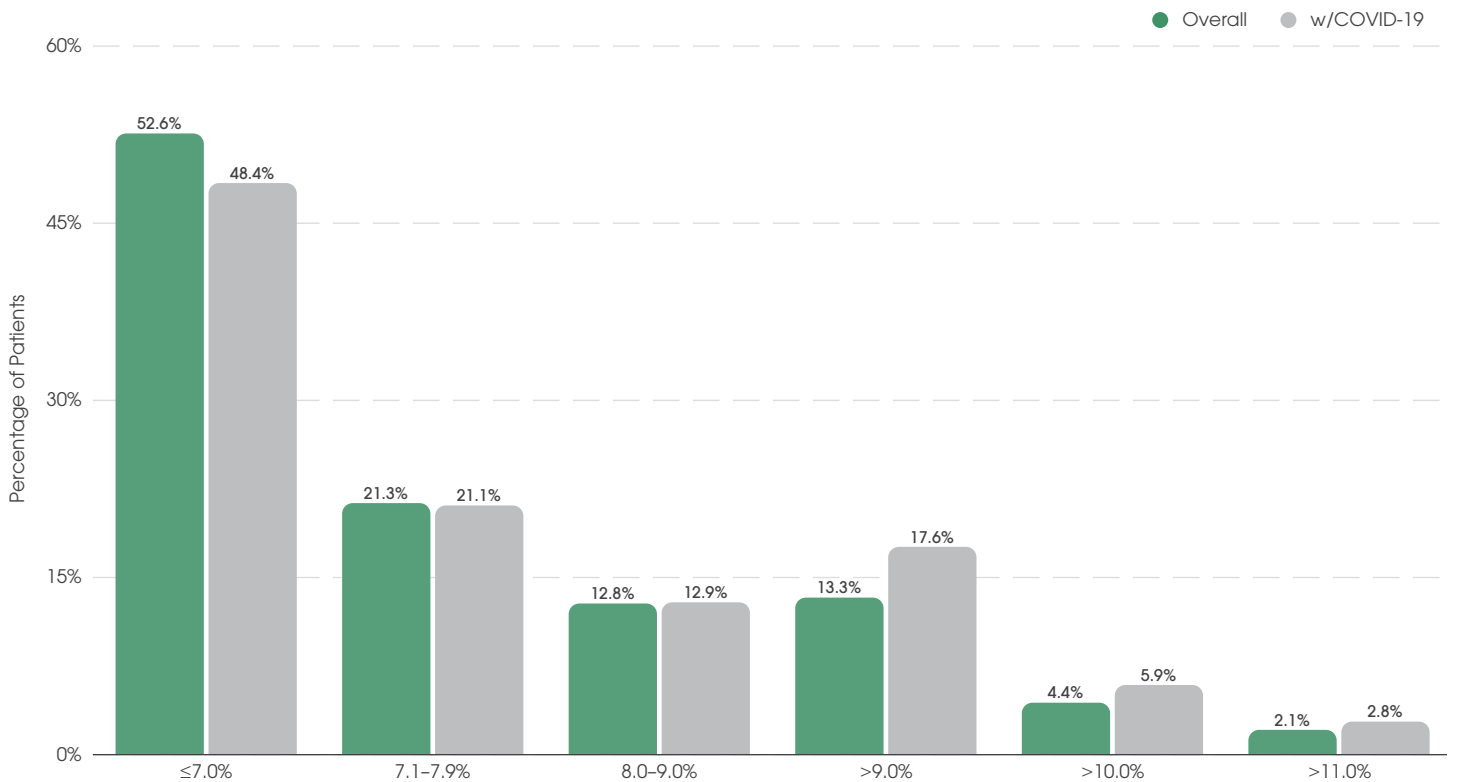
Data source: Centers for Disease Control and Prevention © 2021

¹ Figures shown are age-adjusted percentages.

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH COVID-19, BY COUNTY, 2020



PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS, OVERALL VS. WITH COVID-19, BY A1c LEVEL RANGE, PENNSYLVANIA, 2020¹



Data source: IQVIA © 2021

¹ The A1c test measures the average blood glucose over the past 3 months. Figures reflect the percentage of diabetes patients who have had at least one A1c test in a given year.

TOTAL NUMBER OF COMMERCIAL INPATIENT AND OUTPATIENT TYPE 2 DIABETES CASES, 2019-2020				
MARKET	Inpatient		Outpatient	
	2019	2020	2019	2020
Allentown	15,616	13,330	15,869	12,269
Harrisburg	7,472	7,511	6,254	4,649
Reading	2,514	2,770	3,450	3,087
Scranton	6,888	7,698	5,999	4,315
Pennsylvania	153,827	151,480	174,217	154,076
NATION	3,484,030	3,423,470	4,245,806	3,607,558

Data source: Definitive Healthcare © 2021

PROFESSIONAL CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, BY SETTING, 2019-2020 ¹										
MARKET	Ambulatory Surgery		Emergency Department		Inpatient		Outpatient		Office/Clinic	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Allentown	\$2,737	\$2,770	\$1,101	\$1,075	\$4,606	\$4,990	\$1,766	\$1,846	\$1,934	\$1,677
Harrisburg	1,769	1,702	1,230	1,198	3,360	3,211	1,493	1,433	1,896	1,656
Reading	2,848	2,950	1,795	1,984	4,580	5,186	1,813	1,547	2,424	2,012
Scranton	2,919	3,001	1,202	1,338	4,133	4,048	1,512	1,343	2,172	2,177
Pennsylvania	2,476	2,562	1,287	1,319	3,703	3,741	1,474	1,426	1,835	1,671
NATION	\$3,180	\$3,258	\$1,794	\$1,875	\$4,304	\$4,575	\$1,724	\$1,715	\$2,394	\$2,266

PROFESSIONAL INPATIENT CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, OVERALL VS. WITH HYPOGLYCEMIA, 2019-2020 ^{1,4}				
MARKET	Overall		w/ Hypoglycemia	
	2019	2020	2019	2020
Allentown	\$4,606	\$4,990	\$5,632	\$7,640
Harrisburg	3,360	3,211	5,223	3,573
Reading	4,580	5,186	7,832	6,710
Scranton	4,133	4,048	7,001	6,226
Pennsylvania	3,703	3,741	5,580	5,322
NATION	\$4,304	\$4,575	\$6,043	\$6,393

PROFESSIONAL INPATIENT CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, BY ACTUAL COMPLICATION, 2019-2020 ^{1,4}										
MARKET	Cardiovascular Disease		Nephropathy		Neuropathy		PAD		Retinopathy	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Allentown	\$5,680	\$6,214	\$5,686	\$6,007	\$5,569	\$6,408	\$6,347	\$7,345	\$5,165	\$5,687
Harrisburg	4,417	4,088	3,924	3,747	4,170	3,712	4,204	4,245	3,944	3,185
Reading	5,425	6,134	5,064	6,109	5,351	6,842	5,574	7,319	4,358	4,238
Scranton	4,816	4,906	5,103	4,940	4,909	4,449	5,553	5,460	4,015	4,105
Pennsylvania	4,433	4,569	4,442	4,586	4,247	4,336	4,698	4,905	3,979	3,892
NATION	\$5,125	\$5,506	\$5,258	\$5,634	\$5,066	\$5,406	\$5,596	\$5,915	\$4,645	\$4,914

Data source: IQVIA © 2021

¹ Professional charges are those generated by the providers delivering care to patients with diabetes in various settings.

² Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

³ Medicaid includes fee-for-service and managed care.

⁴ A complication is defined as a patient condition caused by diabetes. Complications of diabetes include, but are not limited to, atherosclerotic cardiovascular disease (ASCVD), cardiovascular (CV) disease, congestive heart failure, hypoglycemia, myocardial infarction (MI), nephropathy, neuropathy, peripheral artery disease (PAD), retinopathy, and stroke. ASCVD includes patients with acute coronary syndromes (ACS), MI, stroke, and other cardiovascular diseases.

AVERAGE ANNUAL PAYMENTS PER COMMERCIAL TYPE 2 DIABETES PATIENT RECEIVING VARIOUS INSULIN AND COMBINATION THERAPIES, 2020¹

MARKET	Long-Acting Insulin	Rapid-/Short-Acting Insulin	Mixed Insulin	Fixed Ratio (Long-Acting Insulin/ GLP-1 RA)	Free Ratio (Variable Long-Acting Insulin + GLP-1 RA)	GLP-1 RAs	DPP-4 Inhibitors	SGLT2 Inhibitors
Allentown	\$2,835	\$3,597	\$2,930	\$4,846	\$7,421	\$6,218	\$3,508	\$4,045
Harrisburg	3,335	4,079	3,018	5,151	8,323	6,250	3,667	4,043
Reading	2,893	4,038	3,410	5,297	7,947	6,343	3,789	4,254
Scranton	3,666	4,956	4,930	5,873	9,650	6,997	3,802	4,255
Pennsylvania	3,137	4,120	3,976	5,489	8,195	6,496	3,650	4,103
NATION	\$3,158	\$3,852	\$3,543	\$4,854	\$7,836	\$6,308	\$3,611	\$4,005

AVERAGE ANNUAL OUT-OF-POCKET COSTS PER COMMERCIAL TYPE 2 DIABETES PATIENT RECEIVING VARIOUS INSULIN AND COMBINATION THERAPIES, 2020²

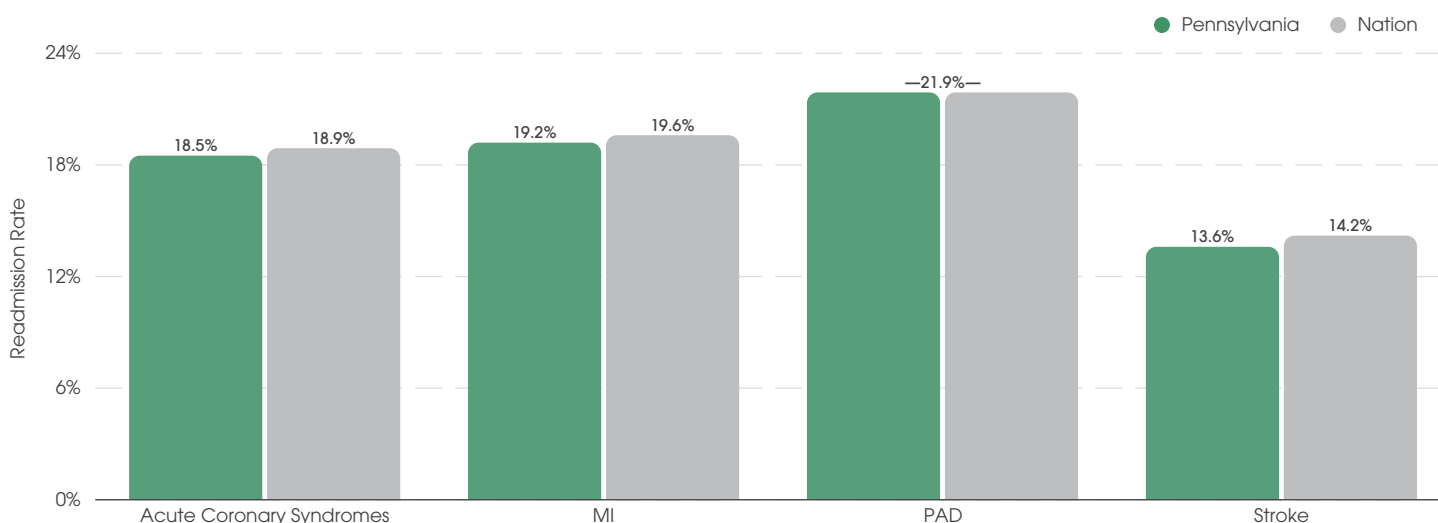
MARKET	Long-Acting Insulin	Rapid-/Short-Acting Insulin	Mixed Insulin	Fixed Ratio (Long-Acting Insulin/GLP-1 RA)	GLP-1 RAs	DPP-4 Inhibitors	SGLT2 Inhibitors
Allentown	\$215	\$159	\$212	\$215	\$270	\$233	\$217
Harrisburg	219	191	226	239	262	252	273
Reading	215	185	171	365	281	243	291
Scranton	138	133	173	217	173	170	172
Pennsylvania	222	175	218	242	269	239	249
NATION	\$238	\$180	\$210	\$240	\$271	\$257	\$253

READMISSION RATES FOR ALL-PAYER PATIENTS DIAGNOSED WITH TYPE 2 DIABETES, BY TYPE OF THERAPY, 2018–2020³

MARKET	Three-Day Readmissions			30-Day Readmissions		
	Long-Acting Basal Category 1	Long-Acting Basal Category 2	Three Non-Insulin Antidiabetic Products	Long-Acting Basal Category 1	Long-Acting Basal Category 2	Three Non-Insulin Antidiabetic Products
NATION	6.9%	3.7%	15.6%	19.0%	15.8%	31.4%

Data source: IQVIA © 2021

30-DAY READMISSION RATES FOR MEDICARE PATIENTS WITH SELECT CARDIOVASCULAR CONDITIONS, 2020



Data source: Definitive Healthcare © 2021

¹ Figures reflect the per-patient yearly payments for diabetes patients receiving a particular type of therapy. These are the actual amounts paid by the insurer and patient for such prescriptions.
² Out-of-pocket cost is the actual amount paid by the patient for each prescription. This cost mainly includes copayments, but can also include tax, deductibles, and cost differentials where applicable.
³ Figures reflect the percentages of Type 2 diabetes patients who were readmitted to an inpatient facility in the three-year period between 2018 and 2020. These percentages include patients who filled multiple prescriptions. Readmissions are not necessarily due to Type 2 diabetes. Readmissions data are available down to the national level only.
 NOTE: "Category 1" refers to long-acting basal insulins approved through 2014 and follow-on long-acting insulins approved after 2014. "Category 2" refers to non-follow-on long-acting basal insulins approved in or after 2015. "Fixed ratio (long-acting insulin/GLP-1 RA)" refers to the two therapies combined in a single product. "Free ratio (variable long-acting insulin + GLP-1 RA)" refers to the two therapies taken separately and concurrently.

METHODOLOGY

IQVIA generated the data for this report out of health care professional (837p) and institutional (837i) insurance claims, representing nearly 11.4 million unique patients nationally in 2020 with a diagnosis of Type 2 diabetes (ICD-10 codes E08, E09, E11, E13). Of these, almost 538,000 resided in Pennsylvania. Data from physicians of all specialties are included.

IQVIA also gathers data on prescription activity from the National Council for Prescription Drug Programs (NCPDP). These data account for some 4 billion prescription claims annually, or more than 92% of the retail prescription universe. These prescription data represent the sampling of prescription activity from a variety of sources, including retail chains, mass merchandisers, and pharmacy benefit managers. Cash, Medicaid, and third-party transactions are tracked. Data arriving into IQVIA are put through a rigorous process to ensure that data elements match to valid references, such as product codes, ICD-10 (diagnosis) and CPT-4 (procedure) codes, and provider and facility data.

Proprietary lab data derive from one of the largest independent commercial lab companies in the U.S. Patient information is de-identified, matched, and linked with other patient data assets (e.g., medical claims data). The most common attributes used are the de-identified patient ID, observation date, diagnosis, test name, test code, and test result.

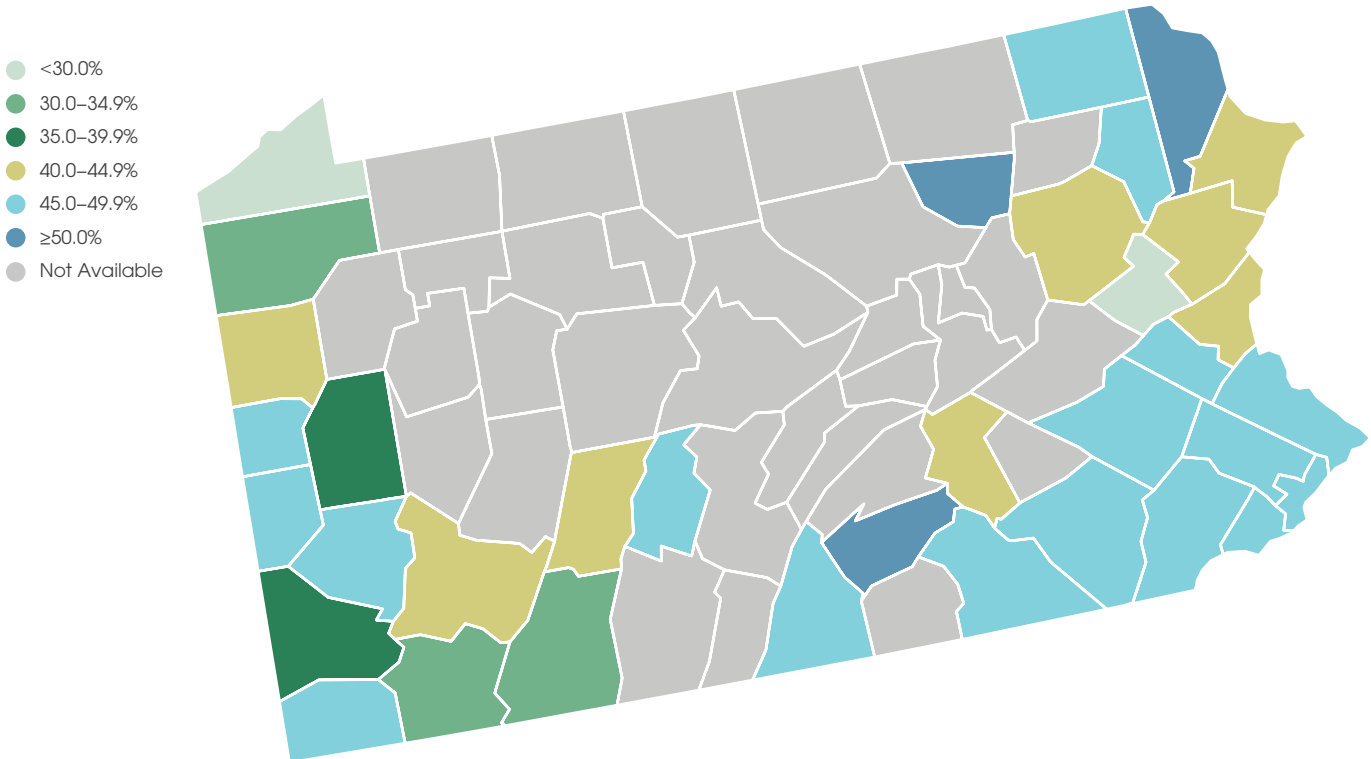
Claims undergo a careful de-duplication process to ensure that when multiple, voided, or adjusted claims are assigned to a patient encounter, they are applied to the database, but only for a single, unique patient.

Through its patient encryption methods, IQVIA creates a unique, random numerical identifier for every patient, and then strips away all patient-specific health information that is protected under the Health Insurance Portability and Accountability Act (HIPAA). The identifier allows IQVIA to track disease-specific diagnosis and procedure activity across the various settings where patient care is provided (hospital inpatient, hospital outpatient, emergency rooms, clinics, doctors offices, and pharmacies), while protecting the privacy of each patient.

Case volume, length of stay, and charges per case data are from Definitive Healthcare. Definitive Healthcare Medicare Standard Analytic Files (SAFs) are part of the Limited Data Set (LDS) files released on a yearly and quarterly basis by the Centers for Medicare & Medicaid Services (CMS). The SAFs capture adjudicated claims and are 100% Medicare fee-for-service claims (does not include Medicare Advantage). The SAFs are available for all claim settings (e.g., inpatient, outpatient, home health, skilled nursing facility, and hospice). The adjudicated claims are “final action” claims, and the payment amount reflects the actual payment made by Medicare to the provider. If the claim was denied, there is a zero payment amount. The Definitive Healthcare commercial data set is sourced from some of the largest medical claim clearinghouses in the United States and includes a mixture of professional and institutional claims processed through those clearinghouses.

Professional claims are generated for work performed by physicians, suppliers, and other non-institutional providers for both inpatient and outpatient services. Institutional claims are generated for work performed by hospitals, skilled nursing facilities, and other institutions for inpatient and outpatient services (e.g., use of equipment/supplies, laboratory, radiology). Claims data are aggregated and reported as cases.

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH AN A1c >7.0%, 2020¹



Data source: IQVIA © 2021

¹ The A1c test measures the average blood glucose over the past 3 months. Figures reflect the percentage of diabetes patients who have had at least one A1c test in a given year.