POPULATION HEALTH ASSESSMENT

2022

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CareVio® (CareVio) is an innovative care management organization that includes an interdisciplinary care coordination team comprised of Medical Directors, nurse care managers, social workers, pharmacists, and support staff who work to support primary care and specialty providers in caring for their members. CareVio uses robust clinical analytics and performance measurements to assist the primary care provider in improving quality, health outcomes, and the member experience, while lowering cost and optimizing resource utilization. All phases of care are addressed, especially those transitions of care, that are typically difficult to manage.

CareVio collaborates with providers in acute, post-acute, urgent, and community settings. In addition, CareVio partners with community resources to identify health equity opportunities within our service area. CareVio recognizes the value of the National Committee for Quality Assurance (NCQA) Accreditation for Health Plans and other organizations for their rigorous standards to improve the quality of care. Five of our programs including our policies and procedures are NCQA compliant and accredited, providing nationally recognized care management services to members. During 2022, CareVio established a national Registered Nurse licensure initiative to expand outreach beyond the Delaware Tri-State (Pennsylvania, Maryland, New Jersey, and Delaware) area.

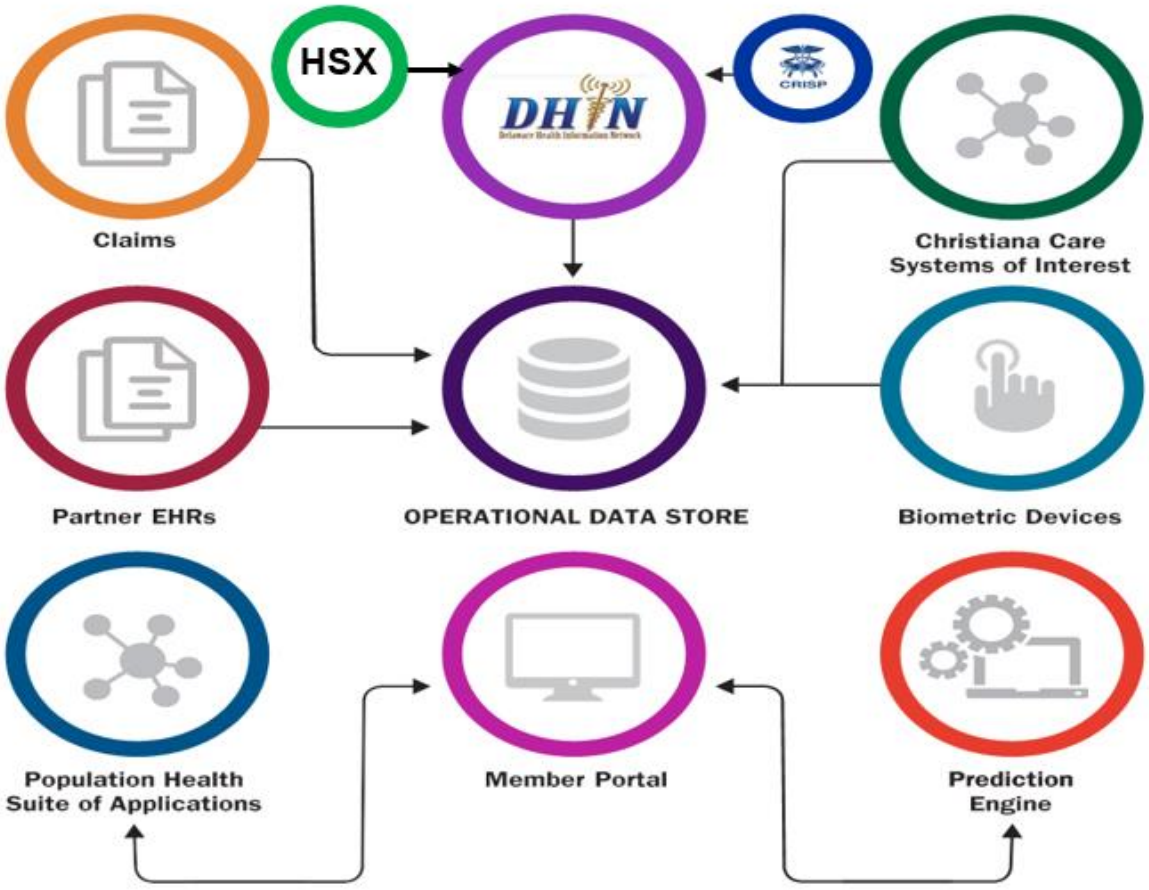
CareVio's mission is to deliver caring, compassionate, quality care and engage members in their health and wellness journey. Our main service area is identified as the three counties in Delaware: New Castle, Kent, and Sussex.

I. Population Assessment Overview

CareVio's Population Assessment evaluates member demographics, health conditions, cultural/linguistic needs, Social Determinants of Health, health equity opportunities, etc. CareVio used data from primary and secondary sources. Primary sources included payer claims and clinical systems data from electronic health platform records and health information exchanges. Secondary sources included local and federal publicly available data such as demographic and disability data from the United States Census Bureau. All measure calculations were based on standard definitions that were vetted through detailed review and guidance by the CareVio Clinical Leadership. This analysis focused on targeted populations, subpopulations, disease management programs, and Social Determinants of Health (SDOH). The objective of this assessment is to ensure that CareVio programming, activities and resources address both the needs of the majority of the population and the relevant subpopulations.

II. Data Sources

CareVio's Population Assessment involved the collection and descriptive analyses of several primary and secondary data sources. An example of the Operational Data Store Components is shown below.



Primary Data Sources: The following sources of primary data were used to analyze and develop CareVio's 2022 Population Assessment. CareVio used the most up-to-date version of each data set; however, there may be a slight variation in data reporting periods. Furthermore, receipt of complete claims data for 2022 may be outstanding prior to completion of this assessment.

A. CareVio Data Sources

(1) CareVio Claims and Encounter Data: Claims and encounter data for the entire member population were obtained from CareVio's internal medical and administrative databases. The data in this report represents claims and encounter data received by CareVio from service providers for dates of service between January 1st through November 30, 2022.
   (a) Methodology: Descriptive analyses of CareVio's findings with claims and encounter data were performed.

(2) PowerChart data: Data entered into PowerChart was utilized to capture data not readily available from claims. (PowerChart is a secondary data source Electronic Health Record)

(3) Program Data: Data entered into the CareVio Electronic Health Platform was utilized specifically for sub-population data and analysis.

(4) Health Information Exchange (HIE) data from surrounding areas.

B. Delaware Population 2022

Although CareVio's population has expanded outside of Delaware borders, the majority of the population reside in Delaware. Below notes the high-level demographic data for Delaware in 2022.

(1) Delaware's median age is 39.6 years of age, with a slight gender gap of 51.6% females vs. 48.3% males. (2022 World Population by Country, 2023)

(2) Black or African American population ranked second in the entire state population accounting for 22.18%; while those with the racial composition of white was ranked first at 67.44% (2022 World Population by Country, 2023)

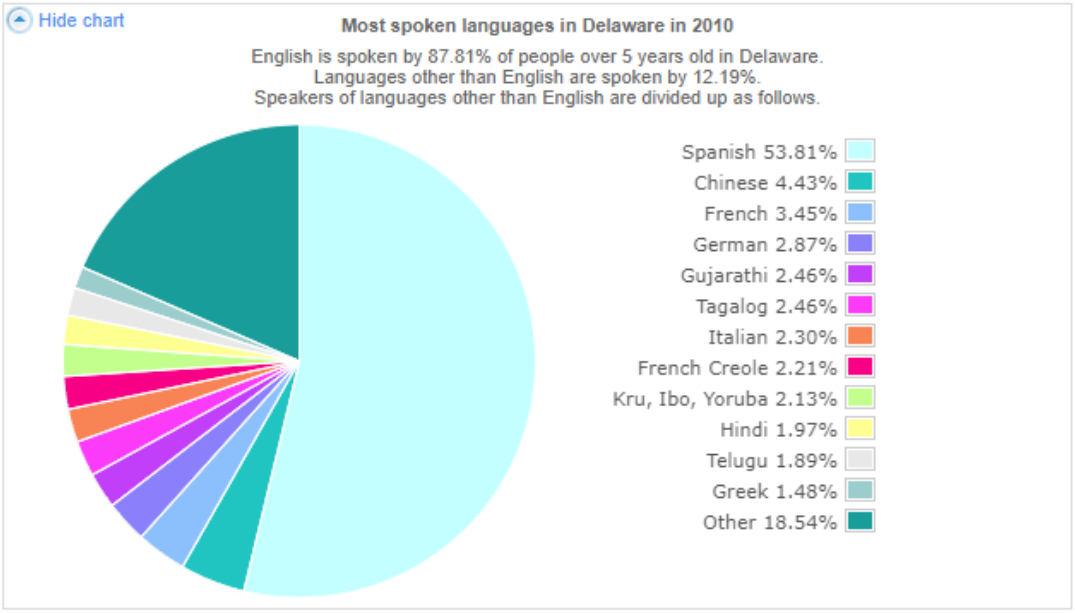
(3) The total population of Delaware identified as 90% non-Hispanic ethnicity, while 10% identified with an ethnicity of Hispanic (Quick Facts Delaware, 2022)

C. U.S. Census Bureau

(1) The 2020 Delaware Census (Quick Facts Delaware, 2022) identified the approximate population of Delaware in 2022 as 1,018,396 (an increase from 2021 of 28,448 people). The Census showed that the most heavily populated area was in New Castle County, followed by Sussex County, then Kent County, with the smallest population of the three counties for a second year in a row.

D. Modern Language Association (MLA) Language Map

(1) According to the MLA Language Map (MLA Language Map-Delaware, 2022), English is the predominant language spoken throughout Delaware, followed by Spanish. The graph below notates the languages spoken other than English. This data set has not been updated since previously reported in the CareVio 2021 Population Health Assessment report.



E. Geocoding

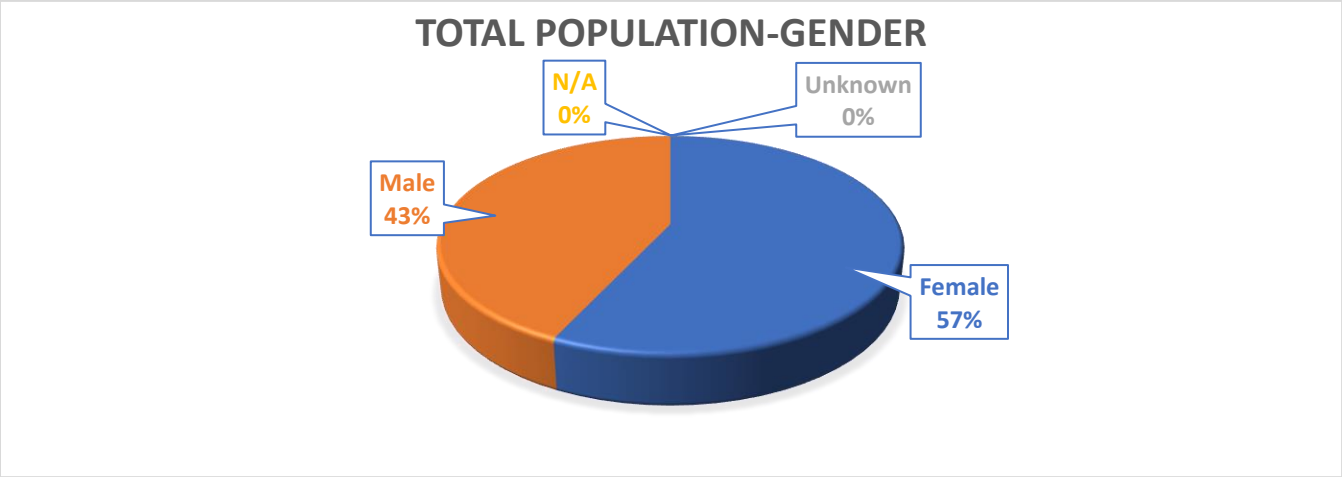
(1) Claims data was analyzed utilizing a geocoding map to identify the primary residence of the CareVio population by the zip code. How zip code may influence the health of its members is discussed later in this report.

III. Key Findings by CareVio Population By:

Data Source: CareVio Claims Data

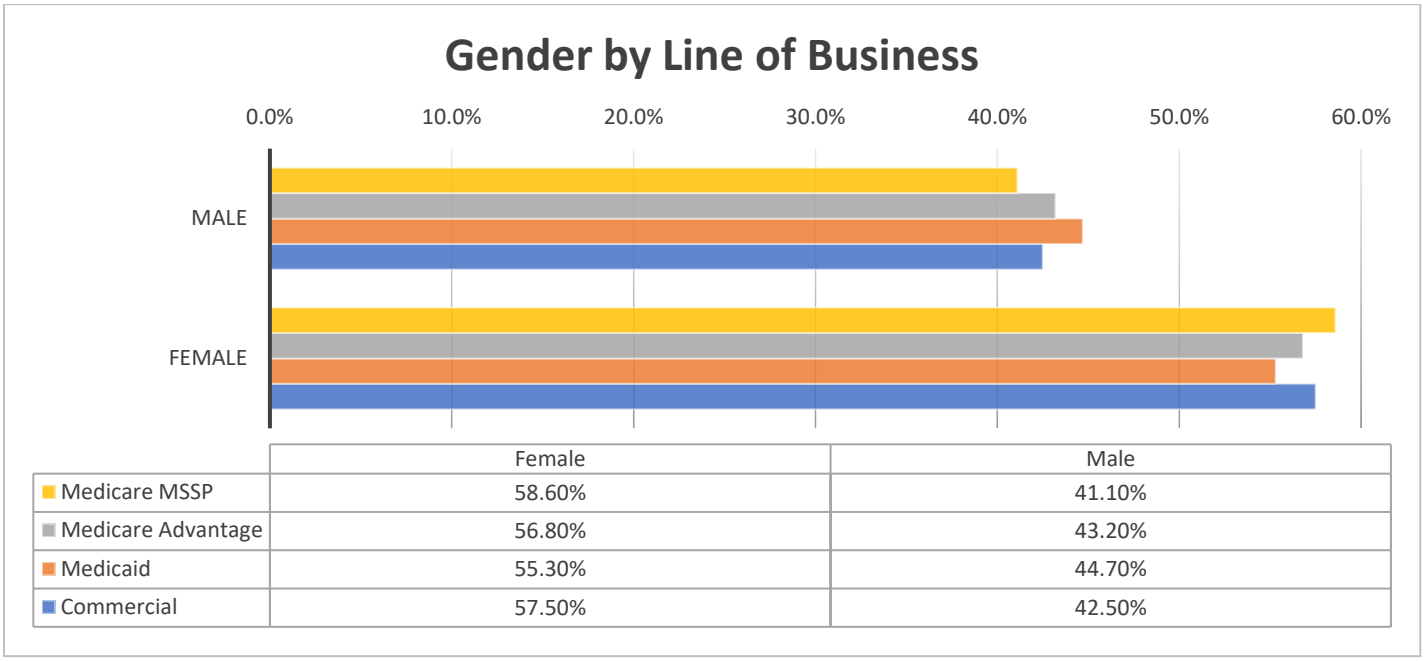
A. Gender

1. Total Population



Gender	Member Count	Member %
Female	70,757	57.0%
Male	53,466	43.0%
Unknown	16	0%
N/A	2	0%
Total %	**124,241**	**100.0%**

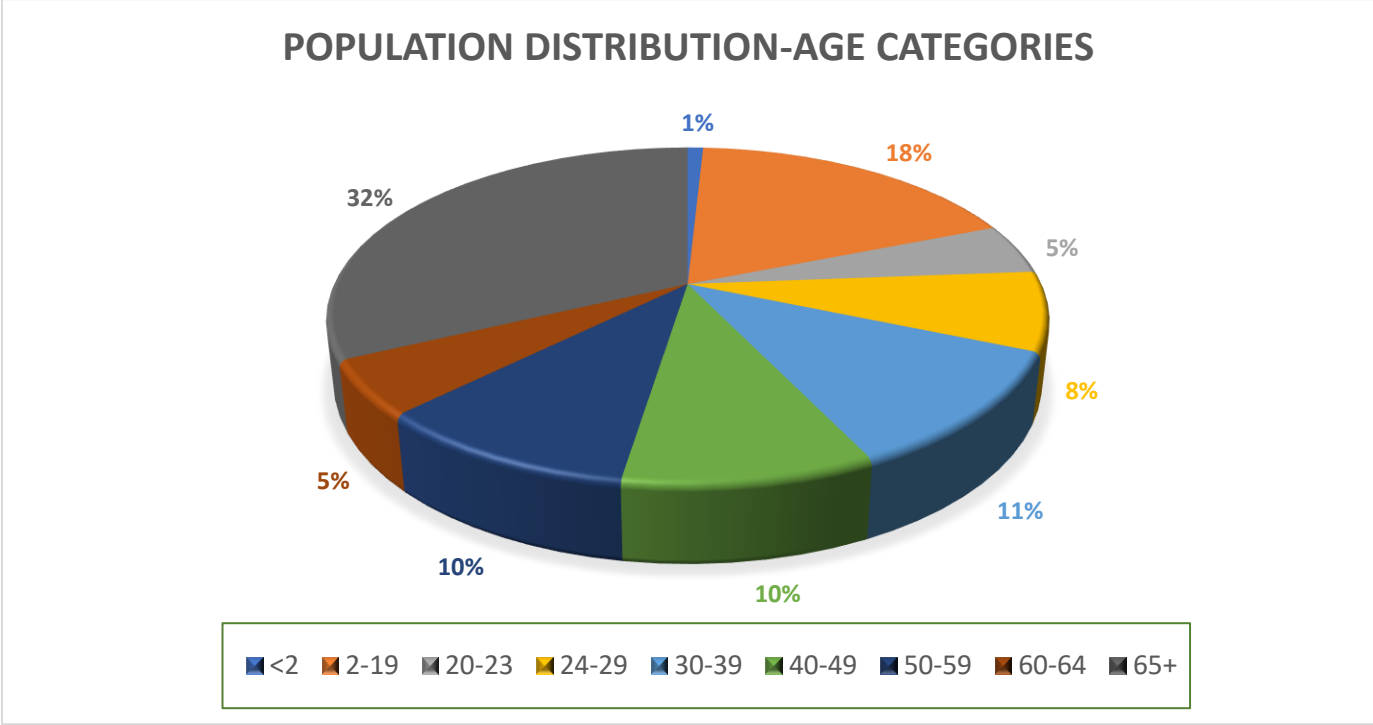
2. By Line of Business



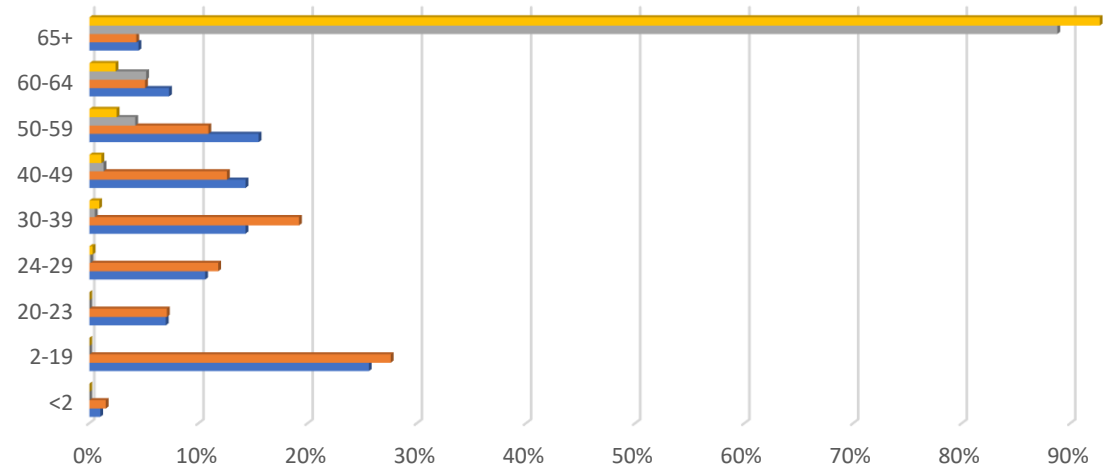
	Female	Male
Medicare MSSP	58.60%	41.10%
Medicare Advantage	56.80%	43.20%
Medicaid	55.30%	44.70%
Commercial	57.50%	42.50%

B. Age

1. Total Population



2. Claim Information by Age

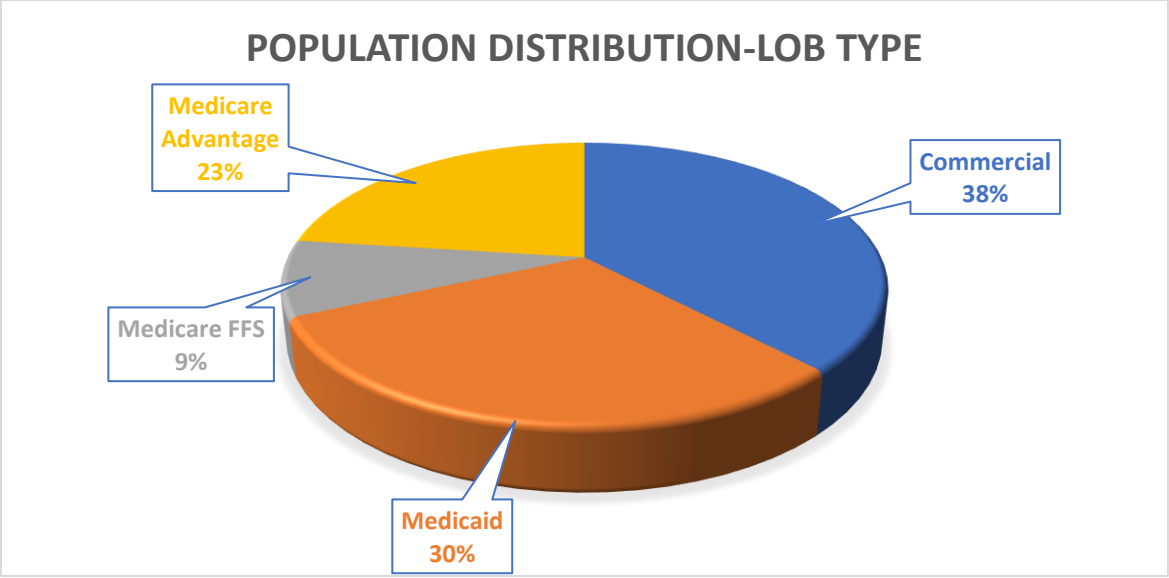


	<2	2-19	20-23	24-29	30-39	40-49	50-59	60-64	65+
Medicare FFS	0.0%	0.0%	0.0%	0.3%	0.9%	1.1%	2.5%	2.4%	92.7%
Medicare Advantage	0.0%	0.0%	0.0%	0.1%	0.5%	1.3%	4.2%	5.2%	88.8%
Medicaid	1.5%	27.6%	7.1%	11.8%	19.2%	12.6%	10.9%	5.1%	4.3%
Commercial	1.0%	25.6%	7.0%	10.6%	14.3%	14.3%	15.5%	7.3%	4.5%

C. Line of Business (LOB)

Data Source: CareVio Claims Data

LOB	Member Count	Member %
Commercial	47,598	38.31%
Medicaid	38,346	30.86%
Medicare Advantage	10,909	8.78%
Medicare MSSP	28,938	23.29%
Grand Total	124,421	100%

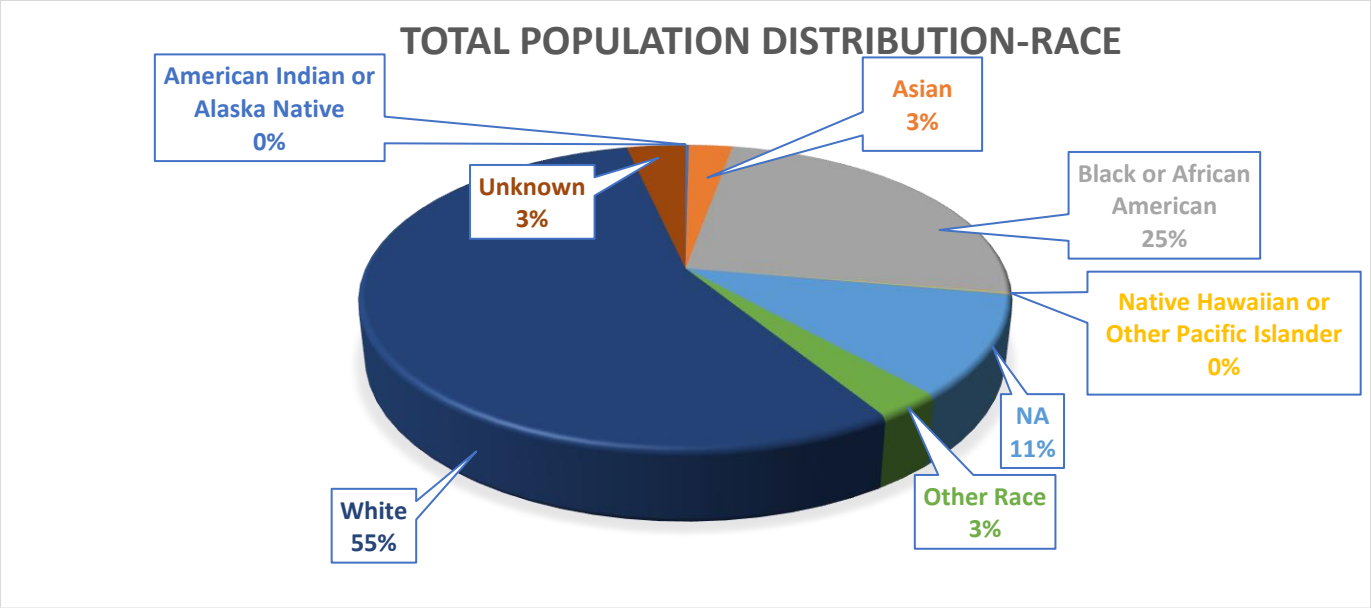


D. Race

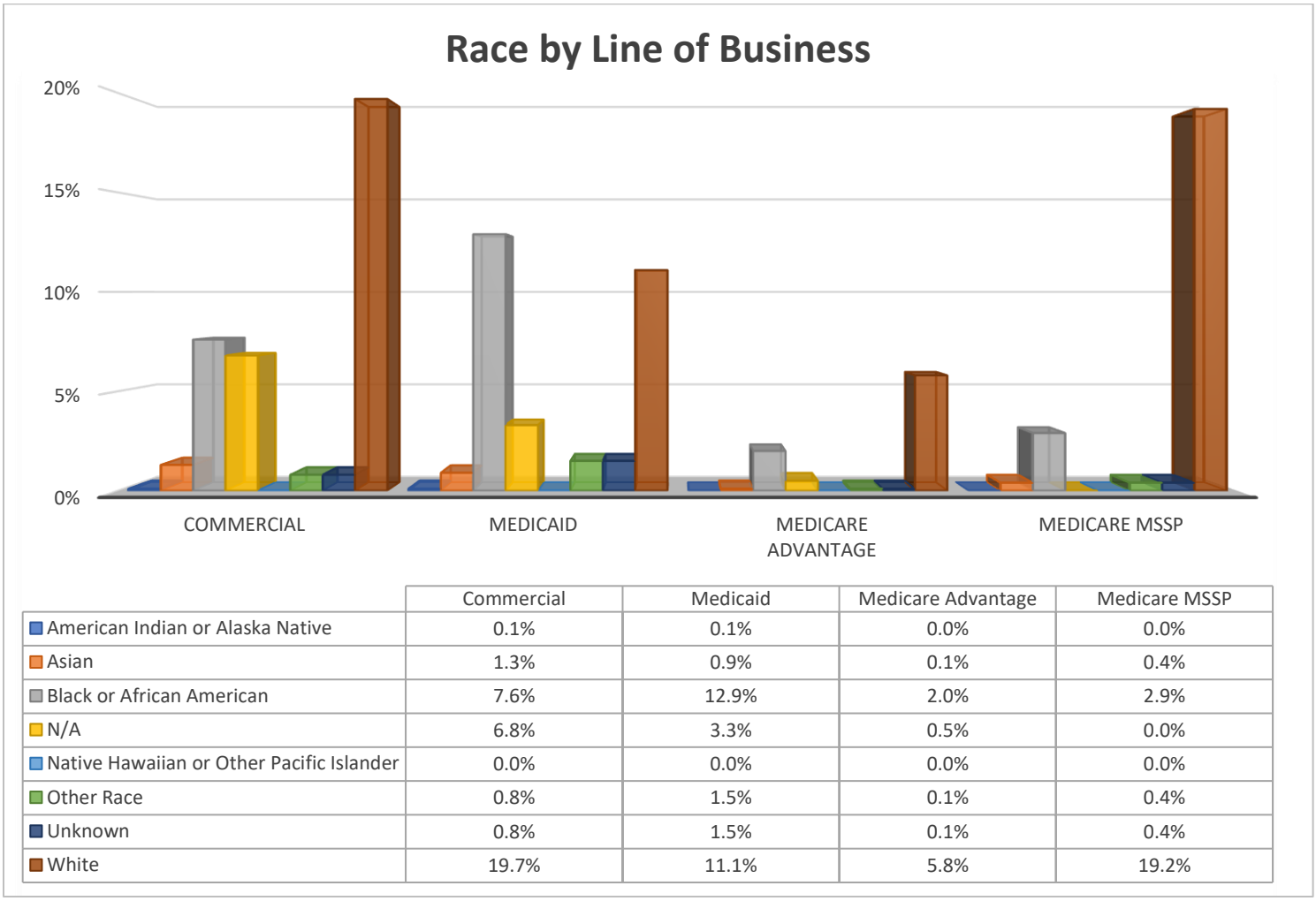
Data Source: CareVio Claims Data

1. Total Population

Race	Member Count	Member %
American Indian or Alaska Native	279	0.2%
Asian	3,249	2.6%
Black or African American	30,790	24.8%
Native Hawaiian or Other Pacific Islander	85	0.1%
NA	13,254	10.7%
Other Race	3,505	2.8%
White	68,727	55.3%
Unknown	4,352	3.5%
Total	**124,241**	**100.0%**



2. By Line of Business



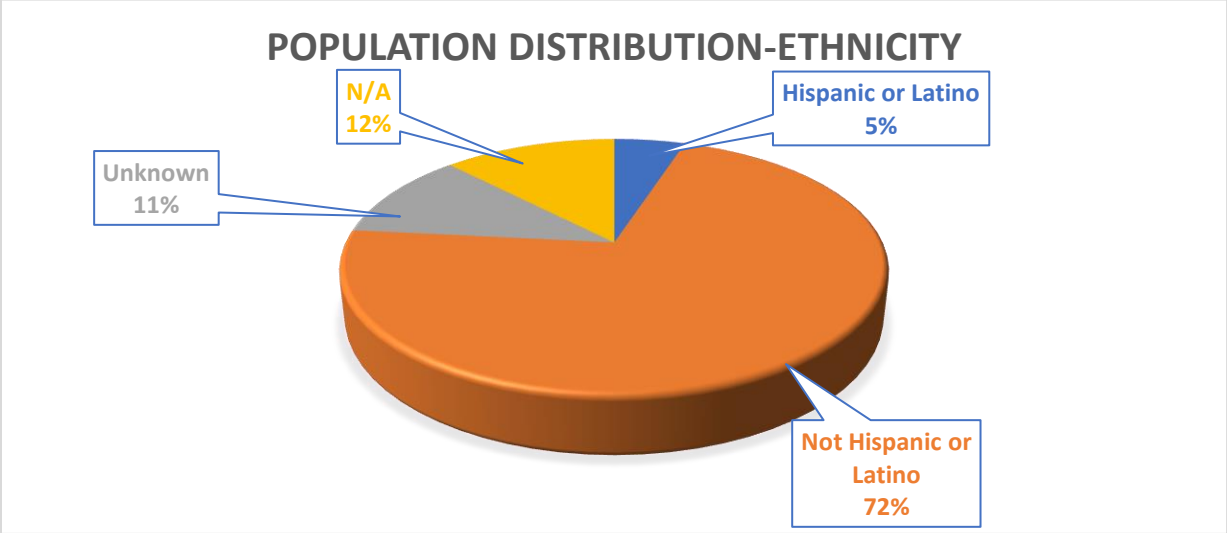
	Commercial	Medicaid	Medicare Advantage	Medicare MSSP
American Indian or Alaska Native	0.1%	0.1%	0.0%	0.0%
Asian	1.3%	0.9%	0.1%	0.4%
Black or African American	7.6%	12.9%	2.0%	2.9%
N/A	6.8%	3.3%	0.5%	0.0%
Native Hawaiian or Other Pacific Islander	0.0%	0.0%	0.0%	0.0%
Other Race	0.8%	1.5%	0.1%	0.4%
Unknown	0.8%	1.5%	0.1%	0.4%
White	19.7%	11.1%	5.8%	19.2%

E. Ethnicity

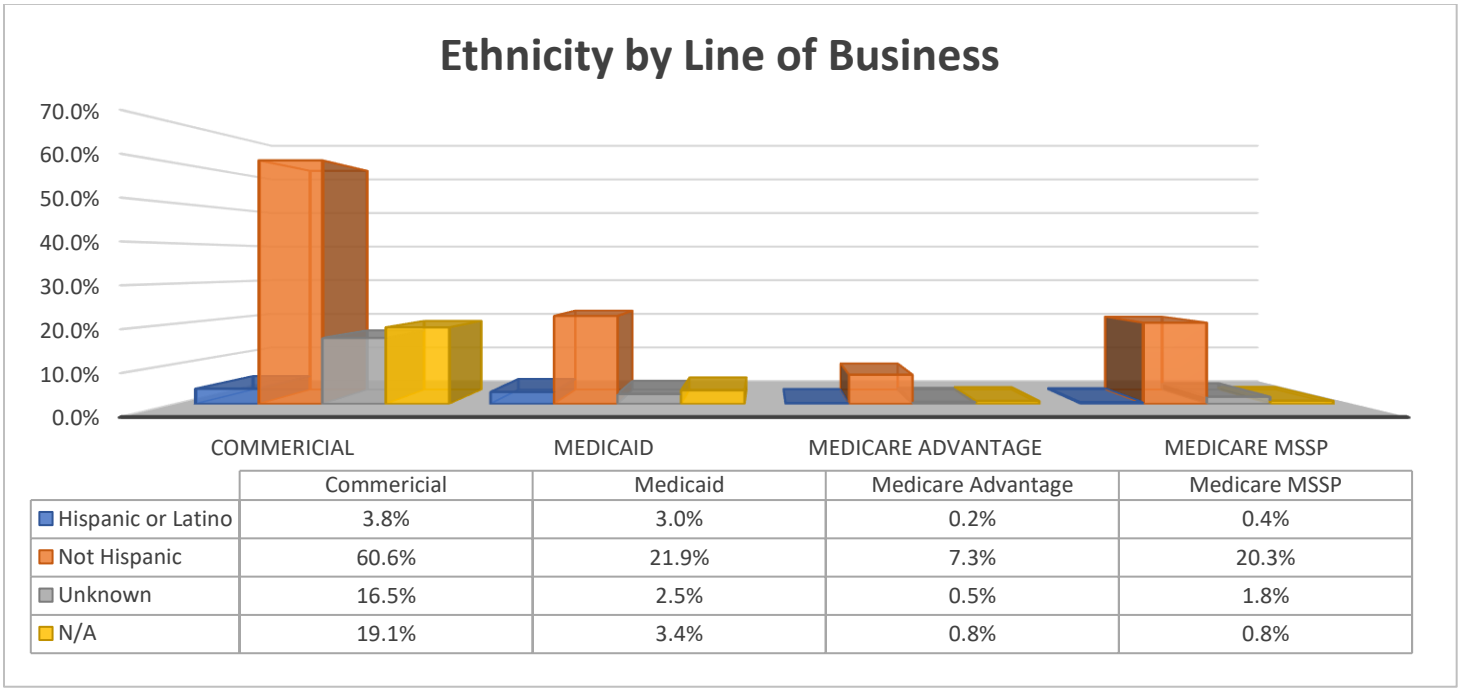
Data Source: CareVio Claims Data

1. Total Population

Ethnicity	Member Count	Member %
Hispanic or Latino	6,249	5.03%
Not Hispanic or Latino	88,965	71.61%
Unknown	13,773	11.09%
N/A	15,254	12.28%
Grand Total	**124,241**	**100%**



2. By Line of Business



	Commericial	Medicaid	Medicare Advantage	Medicare MSSP
Hispanic or Latino	3.8%	3.0%	0.2%	0.4%
Not Hispanic	60.6%	21.9%	7.3%	20.3%
Unknown	16.5%	2.5%	0.5%	1.8%
N/A	19.1%	3.4%	0.8%	0.8%

F. Primary Language

Data Source: CareVio Claims Data

1. Population by Primary Language

Primary Language	Member Count	Member %
English	91,434	73.6%
Undetermined	21,060	17%
Other	9,753	7.9%
Spanish	1,199	1.0%
Arabic	188	0.2%
Mandarin Chinese	162	0.1%
Slovenian	74	0.1%
Bengali	72	0.1%
Korean	71	0.1%
Vietnamese	50	0%
French	24	0%
Hindi	21	0%
Cantonese	21	0%
Russian	20	0%
Turkish	19	0%
Urdu	16	0%
Haitian Creole	12	0%
Italian	9	0%
Gujarati	9	0%
Tagalog	6	0%
Panjabi	6	0%
Polish	5	0%
Portuguese	4	0%
Swahili	3	0%
Greek	3	0%
TOTAL	**124,241**	**100%**

2. Primary Language by Line of Business

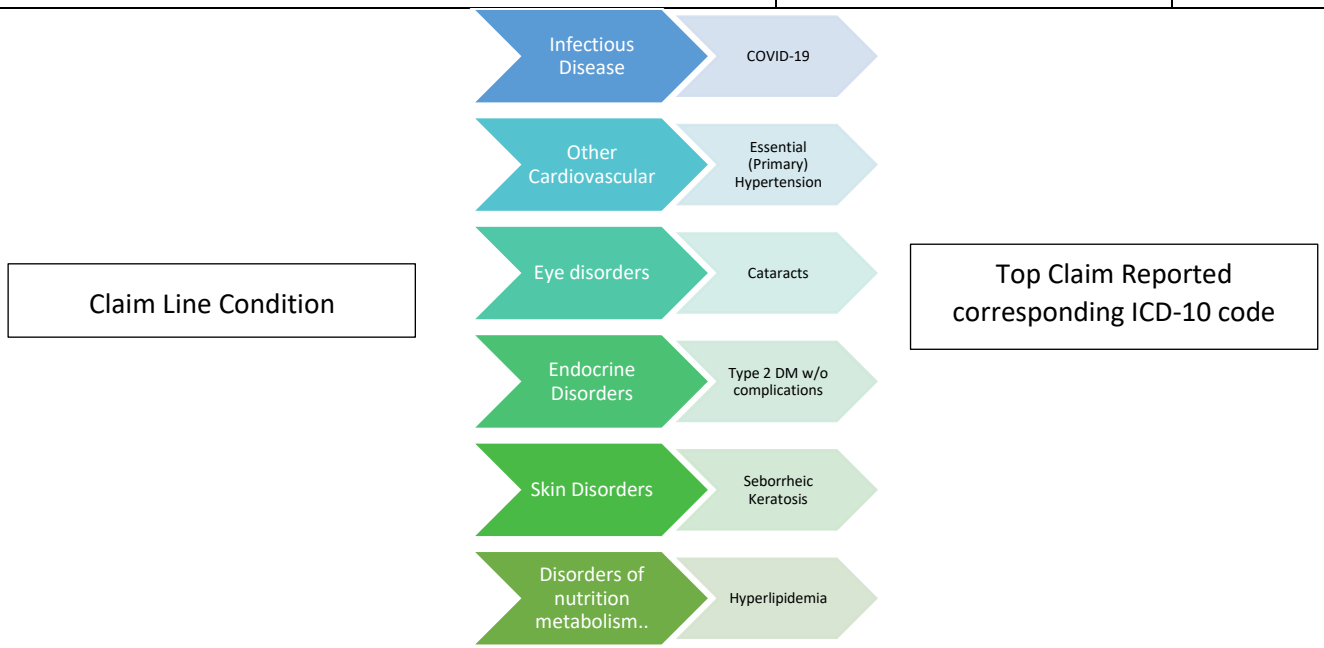
Primary Language	Commercial	Medicaid	Medicare Advantage	Medicare MSSP	Total %
English	68.6%	80.4%	75.7%	73.1%	73.6%
Undetermined	25.0%	14.6%	15.0%	6.8%	17.0%
Other	6.0%	1.4%	8.1%	19.0%	7.9%
Spanish	0.3%	2.3%	0.6%	0.5%	1.0%
Arabic	0.0%	0.4%	0.1%	0.0%	0.2%
Mandarin Chinese	0.0%	0.3%	0.1%	0.1%	0.1%
Slovenian	0.0%	0.1%	0.1%	0.1%	0.1%
Bengali	0.1%	0.1%	0.0%	0.0%	0.1%
Korean	0.0%	0.1%	0.2%	0.1%	0.1%
Vietnamese	0.0%	0.1%	0.1%	0.0%	0.0%
French	0.0%	0.0%	0.0%	0.0%	0.0%
Hindi	0.0%	0.0%	0.0%	0.0%	0.0%
Cantonese	0.0%	0.0%	0.0%	0.0%	0.0%
Russian	0.0%	0.0%	0.0%	0.0%	0.0%
Turkish	0.0%	0.0%	0.0%	0.0%	0.0%
Urdu	0.0%	0.0%	0.0%	0.0%	0.0%
Haitian Creole	0.0%	0.0%	0.0%	0.0%	0.0%
Italian	0.0%	0.0%	0.0%	0.0%	0.0%
Gujarati	0.0%	0.0%	0.0%	0.0%	0.0%
Tagalog	0.0%	0.0%	0.0%	0.0%	0.0%
Panjabi	0.0%	0.0%	0.0%	0.0%	0.0%
Polish	0.0%	0.0%	0.0%	0.0%	0.0%
Portuguese	0.0%	0.0%	0.0%	0.0%	0.0%
Swahili	0.0%	0.0%	0.0%	0.0%	0.0%
Greek	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**

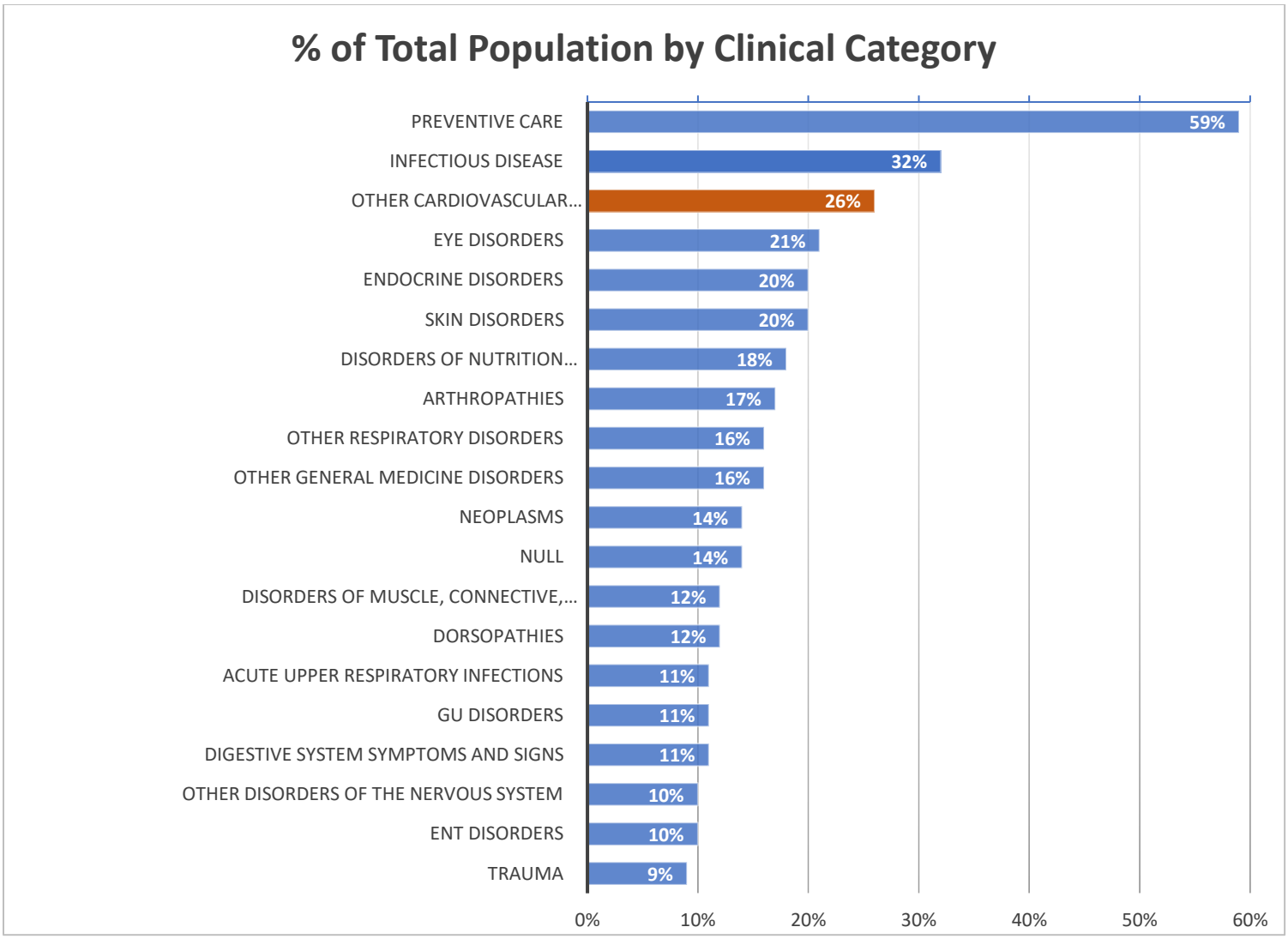
G. Top 20 Physical Health Conditions

Data source: CareVio Claims Data

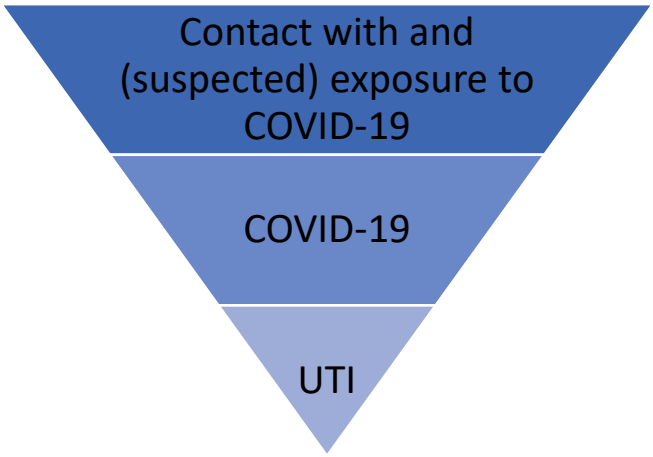
1. Population-Top 20 Physical Health Conditions

Claim Line Condition Name	Claim Member Count	Member %
Preventive care	72,915	59%
Infectious disease	39,562	32%
Other cardiovascular disorders	31,911	26%
Eye disorders	25,593	21%
Endocrine disorders	24,756	20%
Skin disorders	24,324	20%
Disorders of nutrition metabolism and development	21,854	18%
Arthropathies	21,115	17%
Other respiratory disorders	20,148	16%
Other general medicine disorders	19,911	16%
Neoplasms	17,973	14%
NULL	16,859	14%
Disorders of muscle, connective, and other soft tissues	15,487	12%
Dorsopathies	15,164	12%
Acute upper respiratory infections	13,982	11%
GU disorders	13,873	11%
Digestive system symptoms and signs	13,534	11%
Other disorders of the nervous system	12,876	10%
ENT disorders	12,629	10%
Trauma	11,153	9%

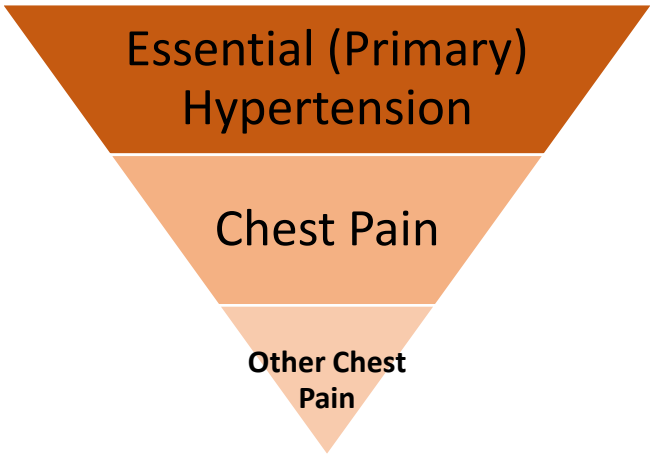




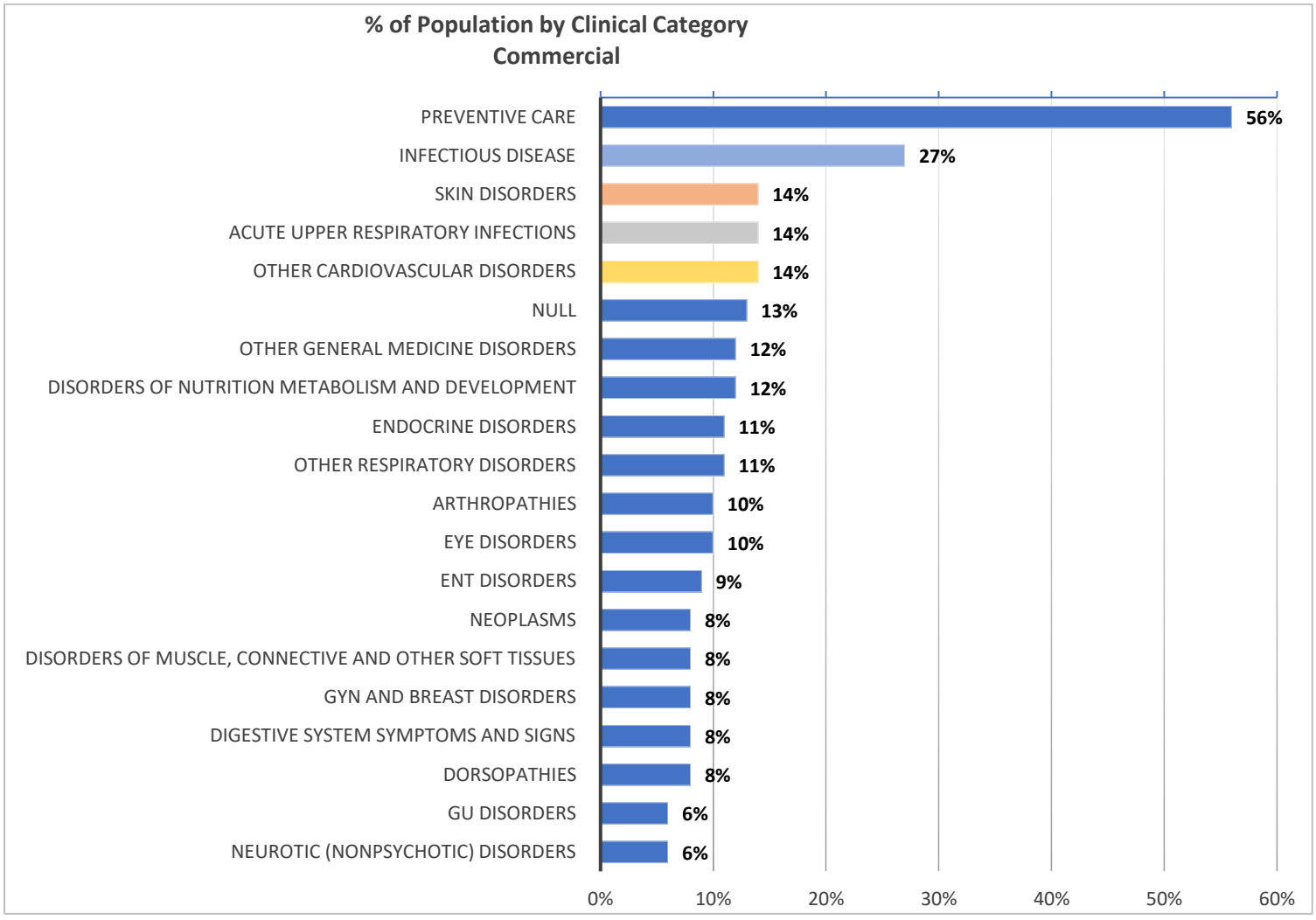
Infectious Disease Top 3

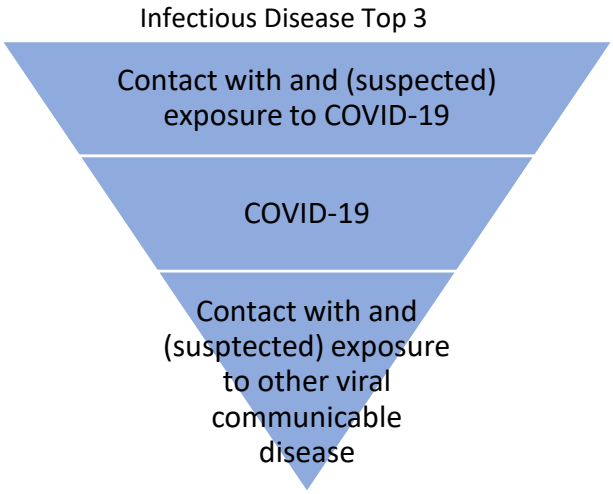


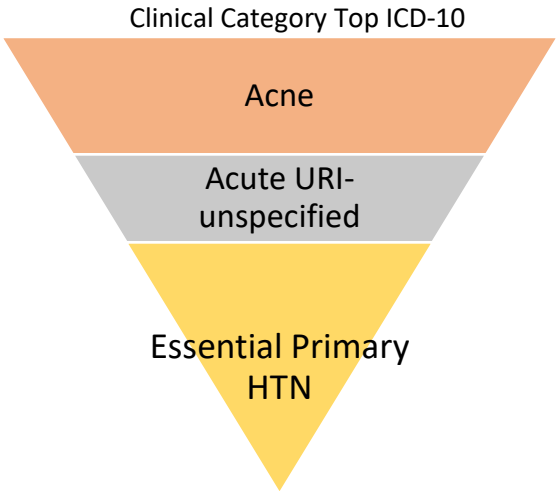
Other Cardiovascular Top 3

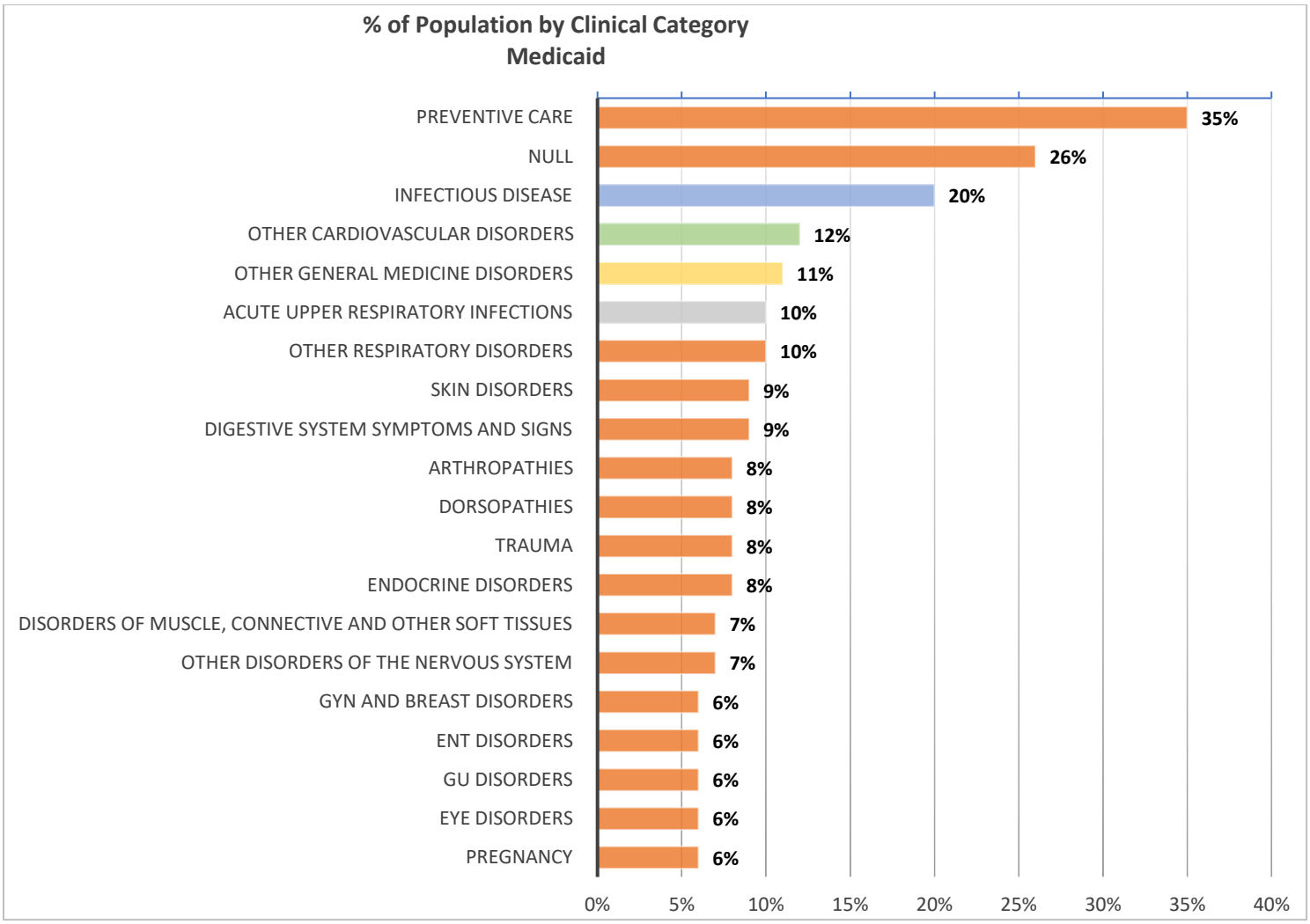


2. Top Clinical Categories by Line of Business

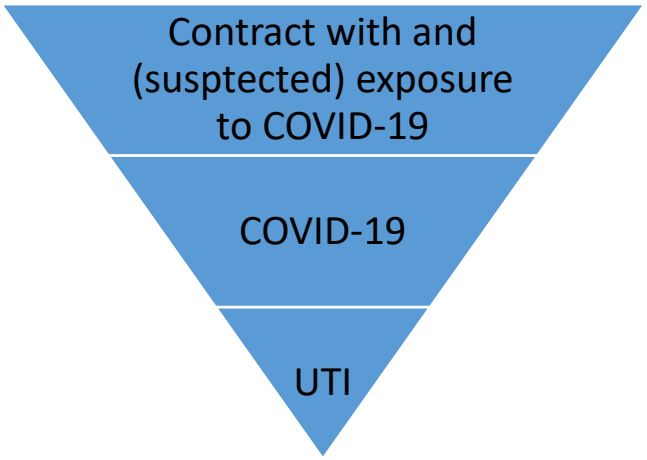




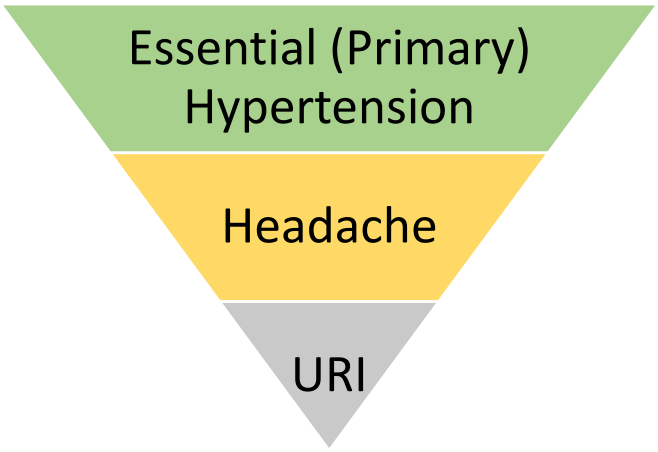


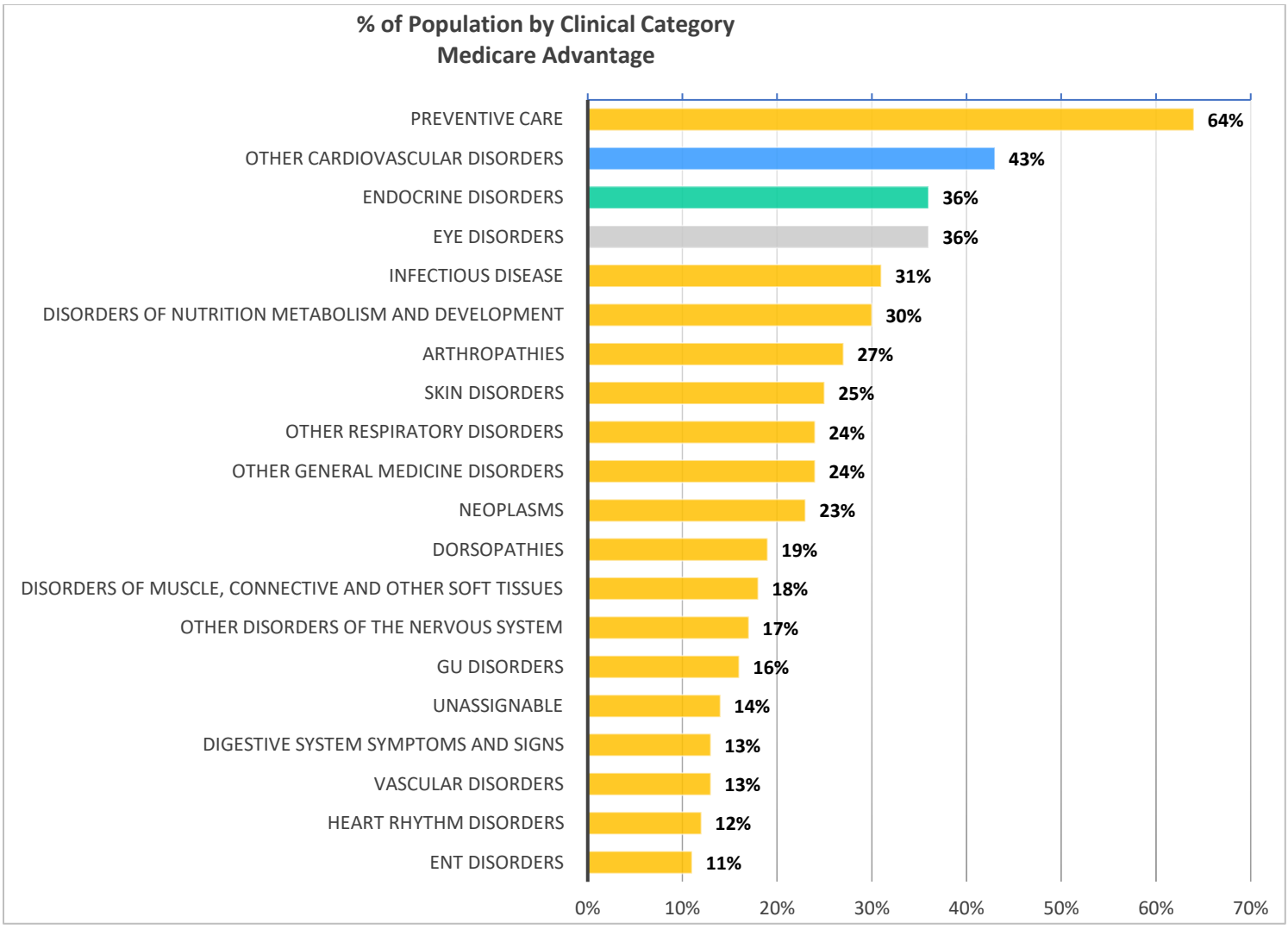


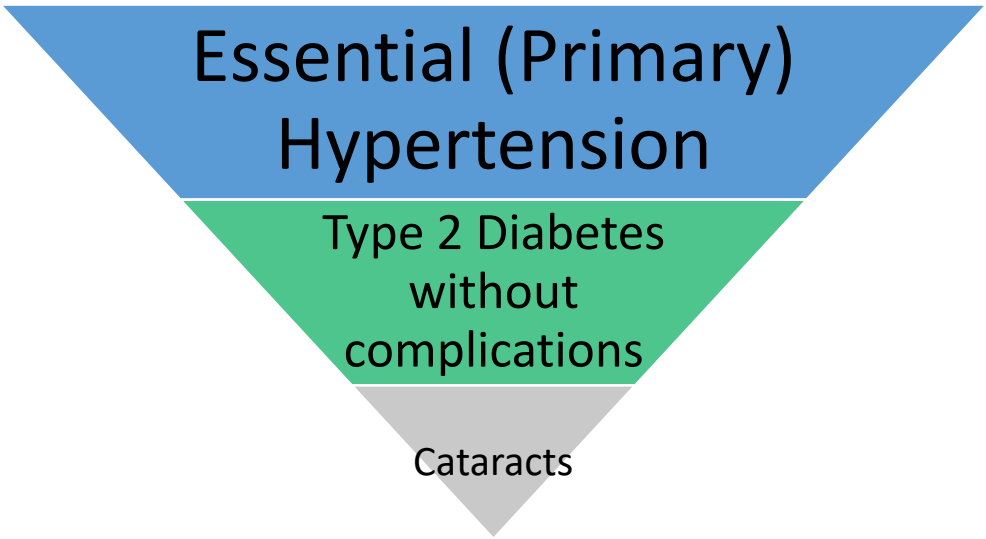
Infectious Disease Top 3 ICD-10

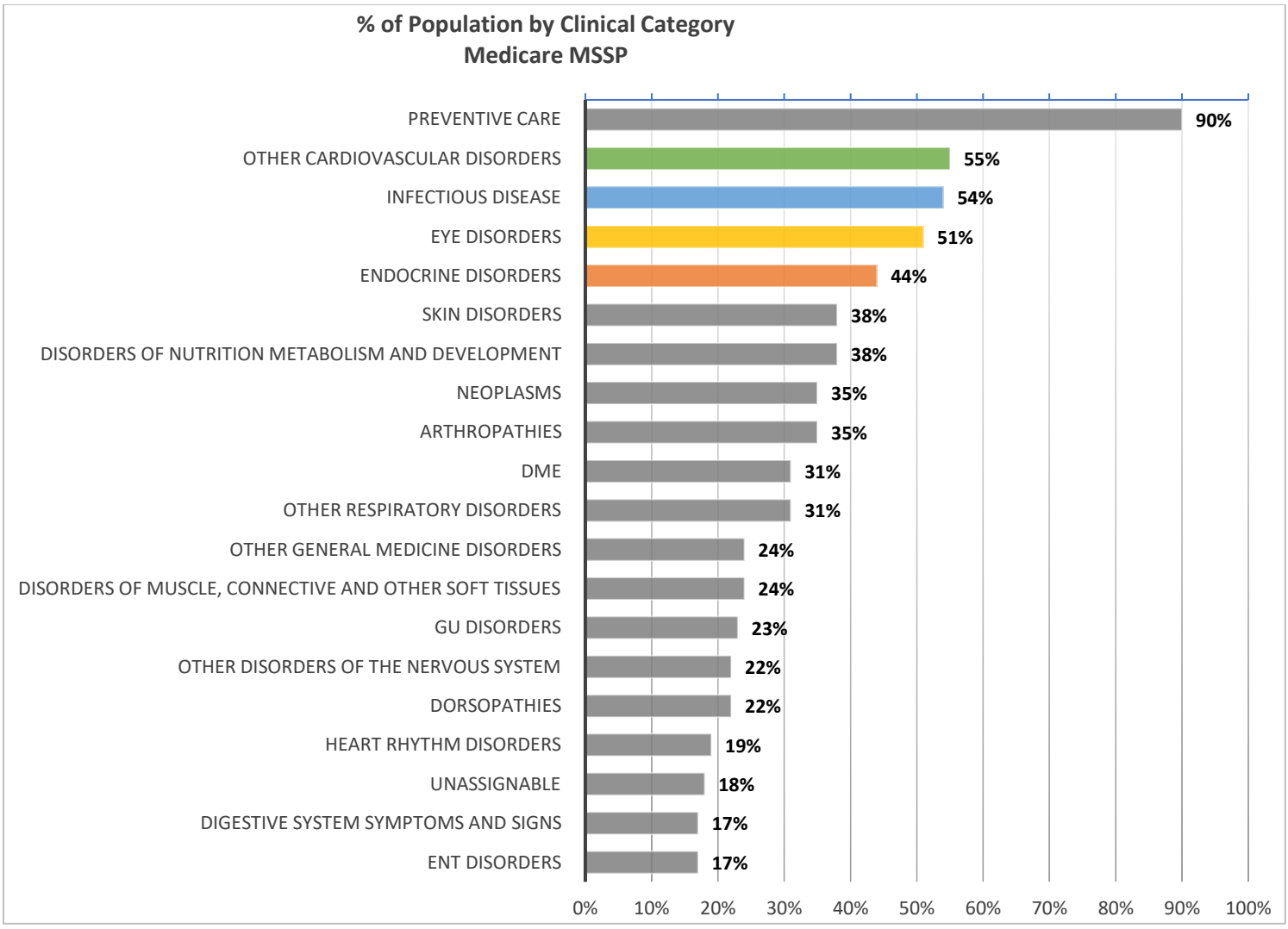


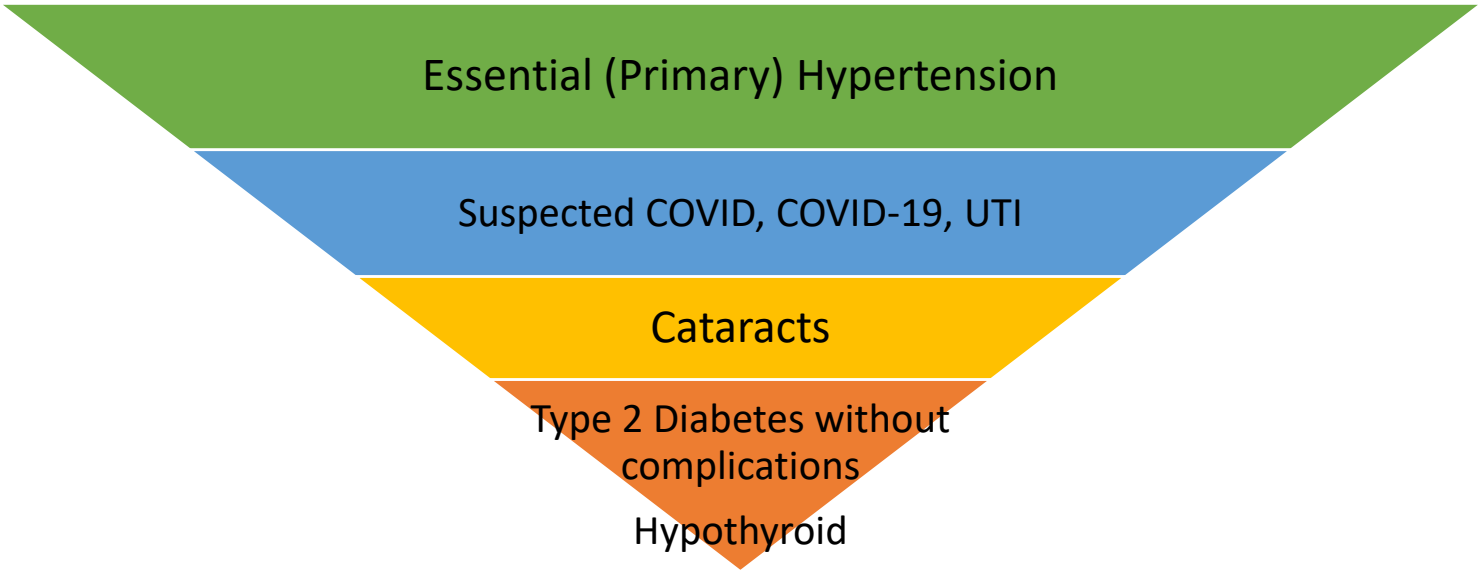
Clinical Category Top ICD-10




% of Population by Clinical Category
Medicare Advantage
PREVENTIVE CARE 64%
OTHER CARDIOVASCULAR DISORDERS 43%
ENDOCRINE DISORDERS 36%
EYE DISORDERS 36%
INFECTIOUS DISEASE 31%
DISORDERS OF NUTRITION METABOLISM AND DEVELOPMENT 30%
ARTHROPATHIES 27%
SKIN DISORDERS 25%
OTHER RESPIRATORY DISORDERS 24%
OTHER GENERAL MEDICINE DISORDERS 24%
NEOPLASMS 23%
DORSOPATHIES 19%
DISORDERS OF MUSCLE, CONNECTIVE AND OTHER SOFT TISSUES 18%
OTHER DISORDERS OF THE NERVOUS SYSTEM 17%
GU DISORDERS 16%
UNASSIGNABLE 14%
DIGESTIVE SYSTEM SYMPTOMS AND SIGNS 13%
VASCULAR DISORDERS 13%
HEART RHYTHM DISORDERS 12%
ENT DISORDERS 11%
0% 10% 20% 30% 40% 50% 60% 70%


Essential (Primary) Hypertension
Type 2 Diabetes without complications
Cataracts

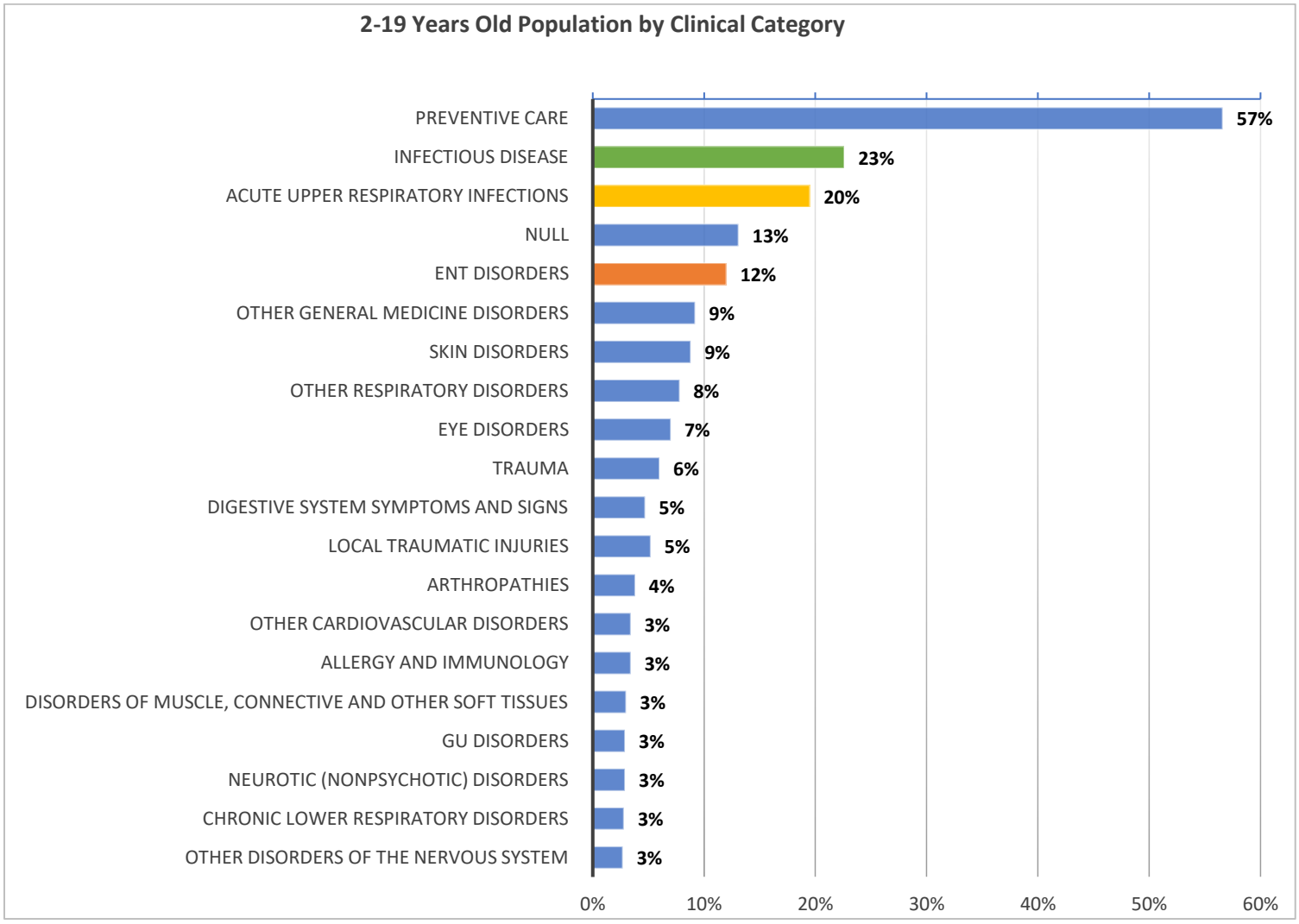

% of Population by Clinical Category
Medicare MSSP
PREVENTIVE CARE 90%
OTHER CARDIOVASCULAR DISORDERS 55%
INFECTIOUS DISEASE 54%
EYE DISORDERS 51%
ENDOCRINE DISORDERS 44%
SKIN DISORDERS 38%
DISORDERS OF NUTRITION METABOLISM AND DEVELOPMENT 38%
NEOPLASMS 35%
ARTHROPATHIES 35%
DME 31%
OTHER RESPIRATORY DISORDERS 31%
OTHER GENERAL MEDICINE DISORDERS 24%
DISORDERS OF MUSCLE, CONNECTIVE AND OTHER SOFT TISSUES 24%
GU DISORDERS 23%
OTHER DISORDERS OF THE NERVOUS SYSTEM 22%
DORSOPATHIES 22%
HEART RHYTHM DISORDERS 19%
UNASSIGNABLE 18%
DIGESTIVE SYSTEM SYMPTOMS AND SIGNS 17%
ENT DISORDERS 17%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

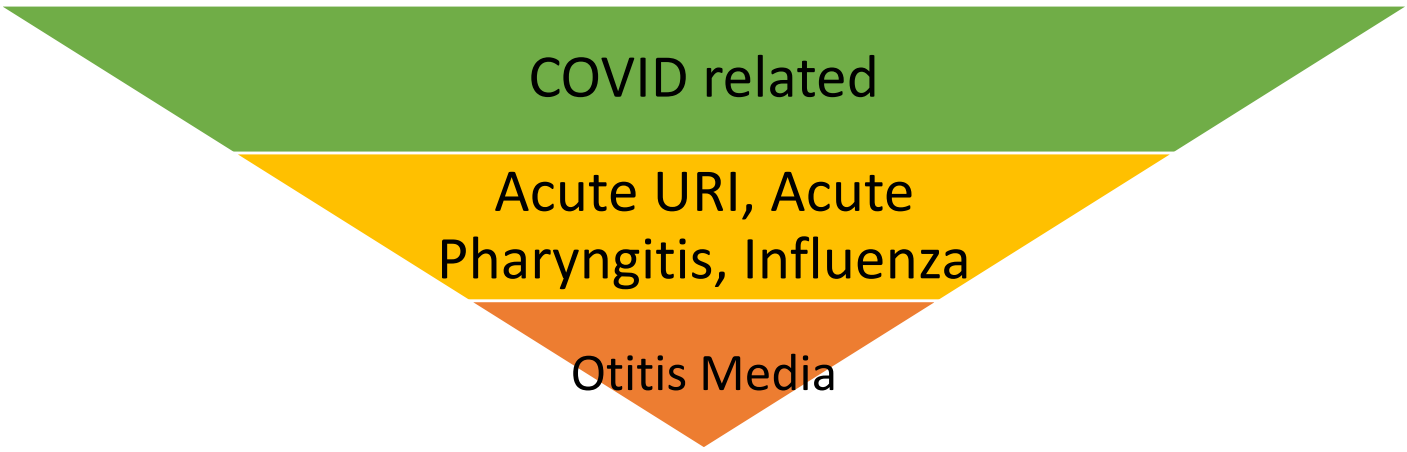

Essential (Primary) Hypertension
Suspected COVID, COVID-19, UTI
Cataracts
Type 2 Diabetes without complications
Hypothyroid

H. Children and Adolescents (ages 2-19)

Data Source: CareVio Claims Data

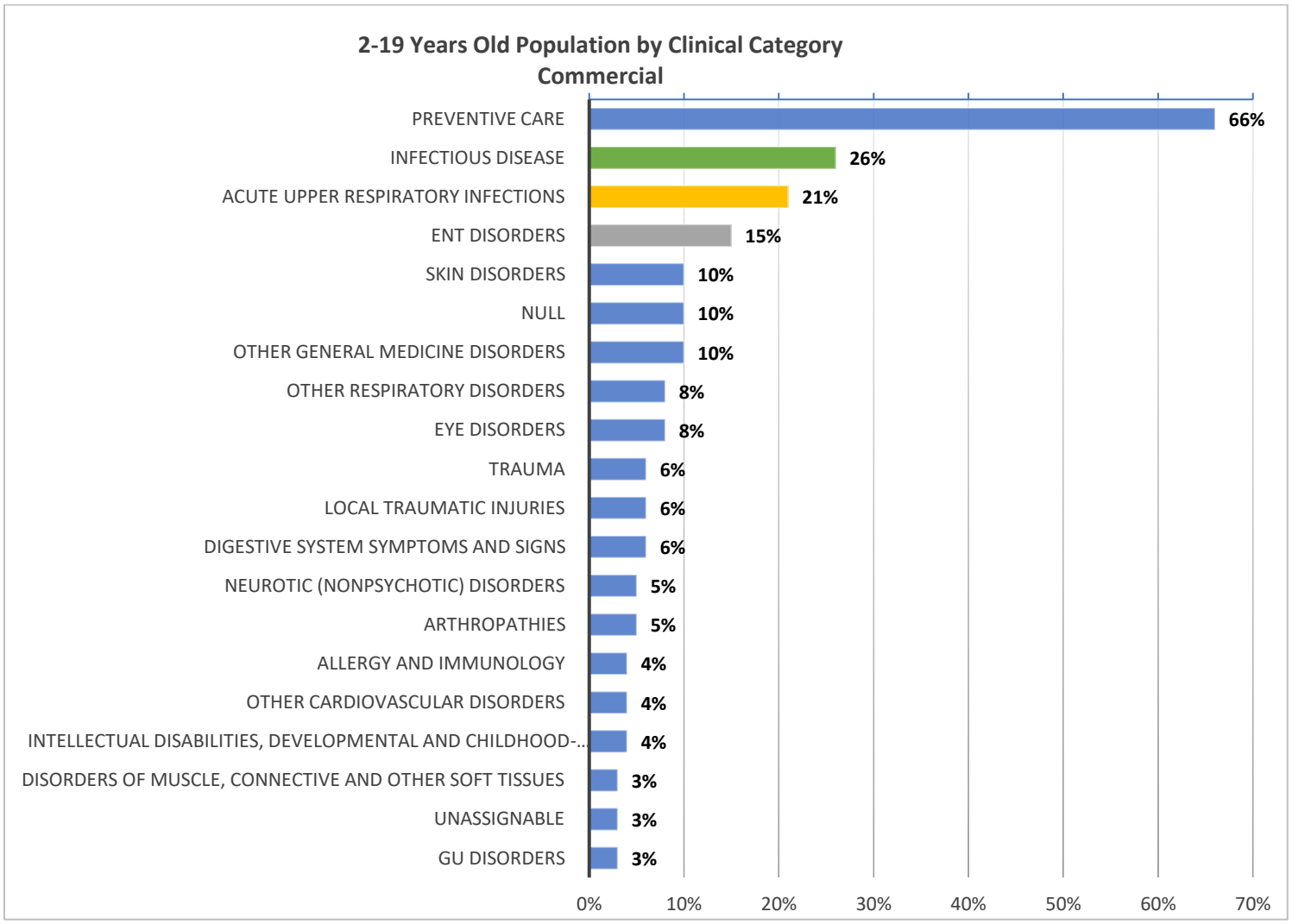
1. Children and Adolescent Population- Top 20 Physical Health Conditions

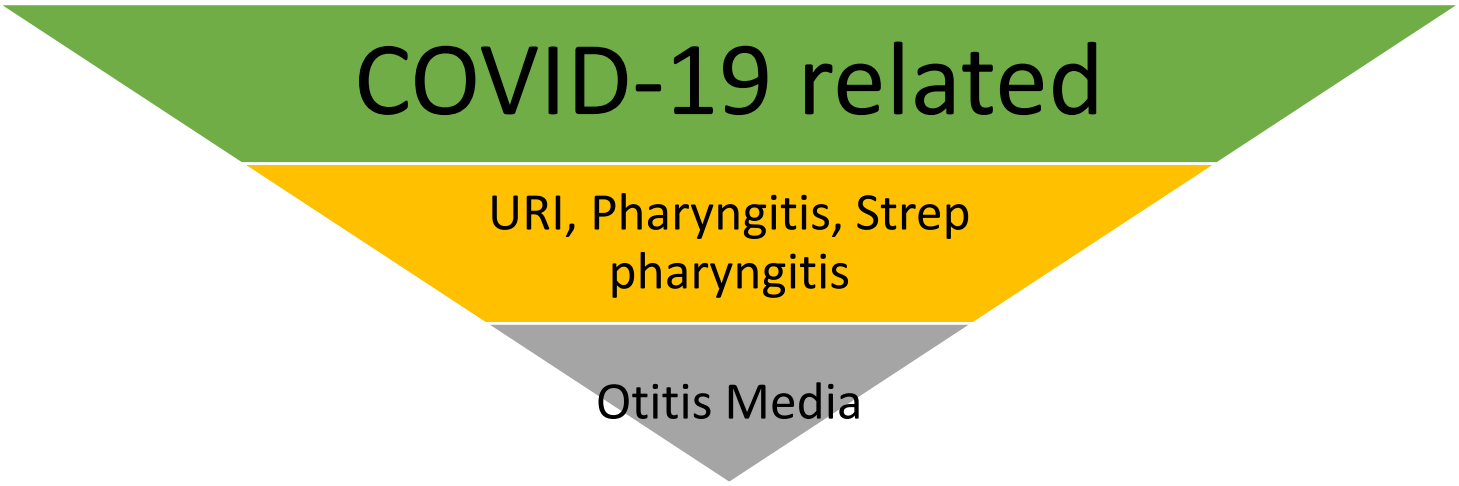


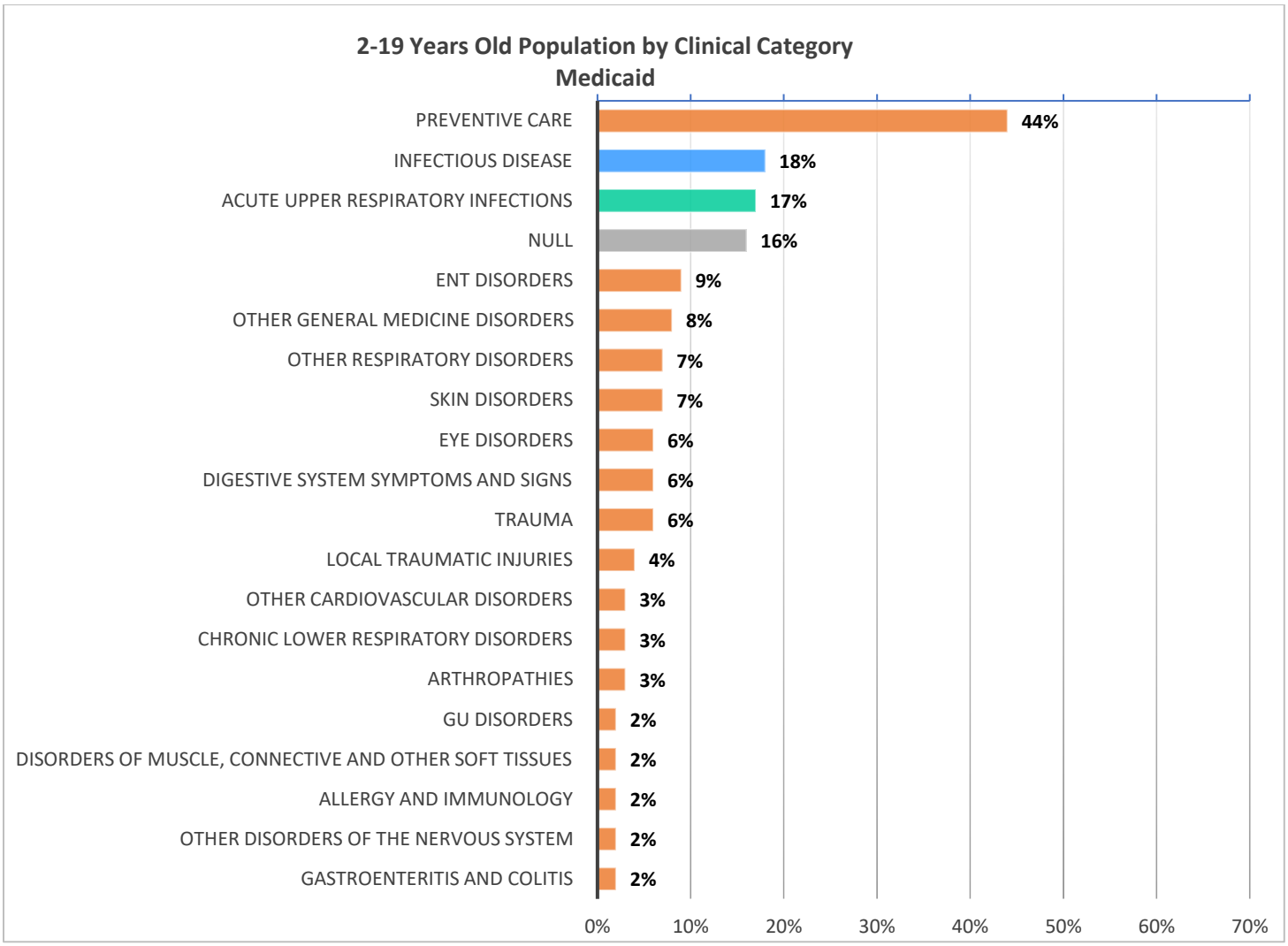


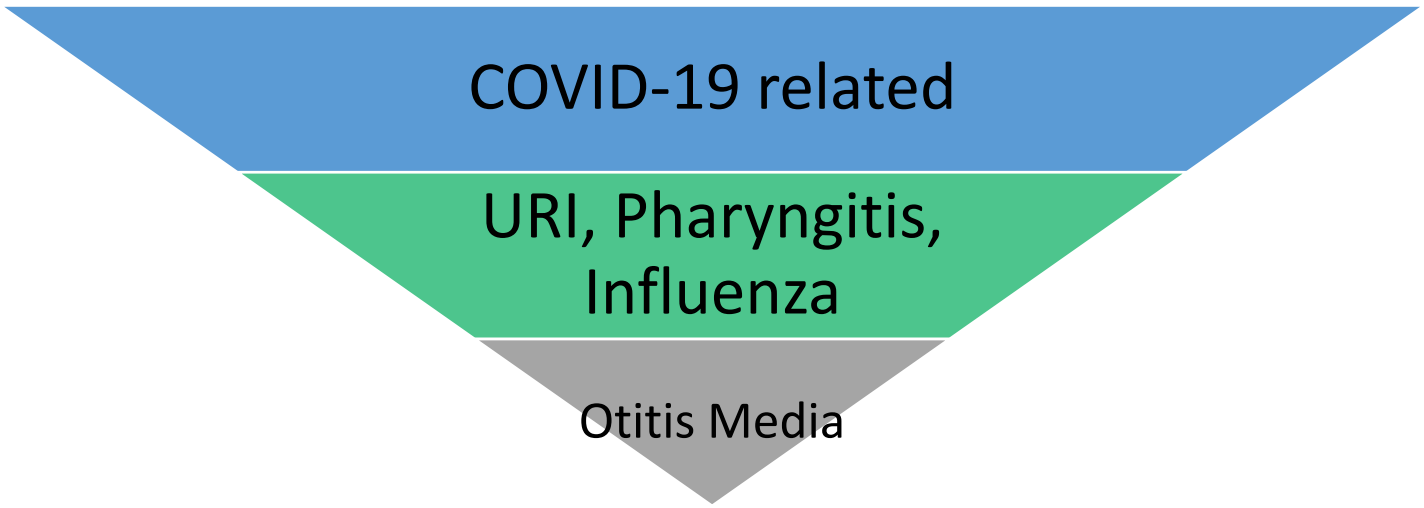
2. *Children and Adolescents Clinical Category by Line of Business*

Data Source: CareVio Claims Data





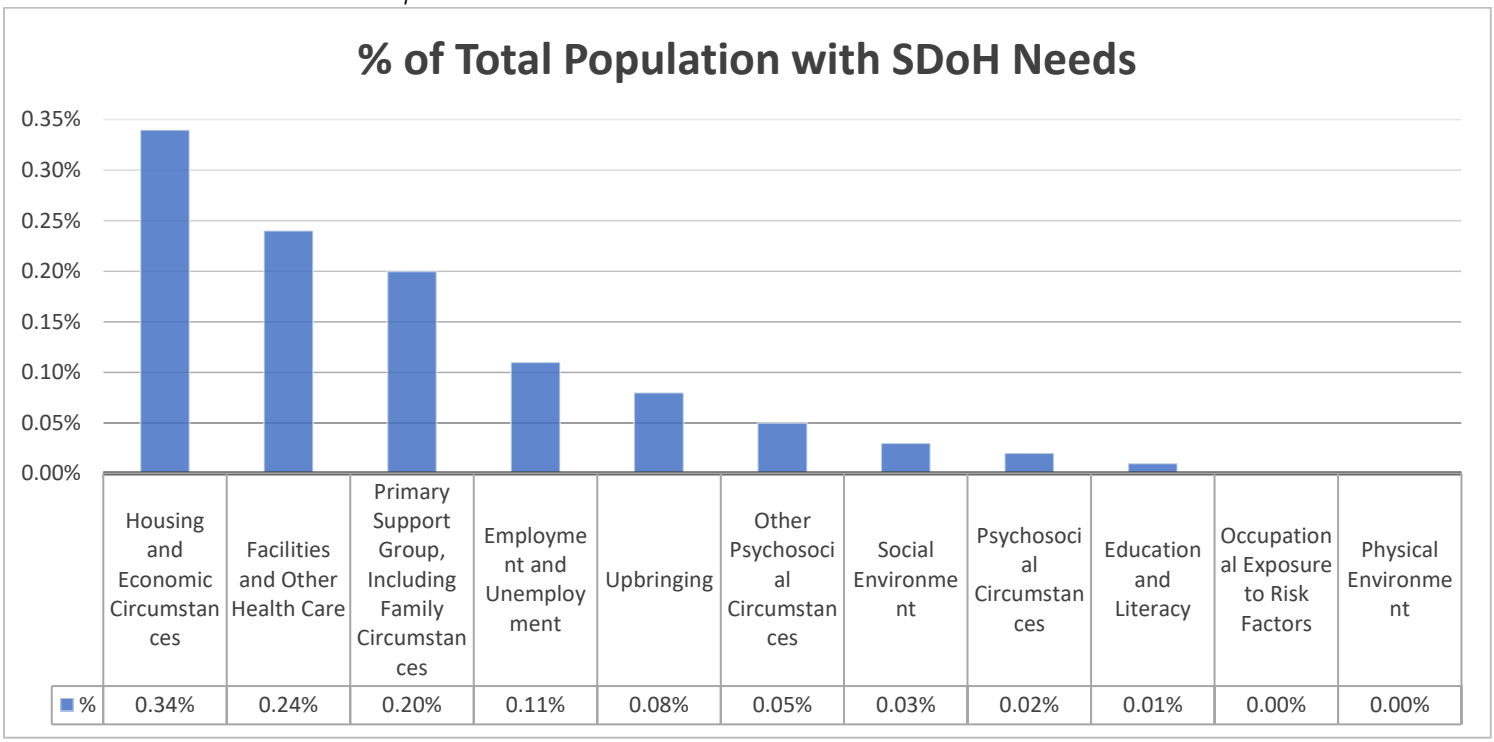

2-19 Years Old Population by Clinical Category
Medicaid
PREVENTIVE CARE 44%
INFECTIOUS DISEASE 18%
ACUTE UPPER RESPIRATORY INFECTIONS 17%
NULL 16%
ENT DISORDERS 9%
OTHER GENERAL MEDICINE DISORDERS 8%
OTHER RESPIRATORY DISORDERS 7%
SKIN DISORDERS 7%
EYE DISORDERS 6%
DIGESTIVE SYSTEM SYMPTOMS AND SIGNS 6%
TRAUMA 6%
LOCAL TRAUMATIC INJURIES 4%
OTHER CARDIOVASCULAR DISORDERS 3%
CHRONIC LOWER RESPIRATORY DISORDERS 3%
ARTHROPATHIES 3%
GU DISORDERS 2%
DISORDERS OF MUSCLE, CONNECTIVE AND OTHER SOFT TISSUES 2%
ALLERGY AND IMMUNOLOGY 2%
OTHER DISORDERS OF THE NERVOUS SYSTEM 2%
GASTROENTERITIS AND COLITIS 2%
0% 10% 20% 30% 40% 50% 60% 70%


COVID-19 related
URI, Pharyngitis, Influenza
Otitis Media

I. Social Determinants of Health

Data Source: CareVio Claims, PowerChart

1. Total Population



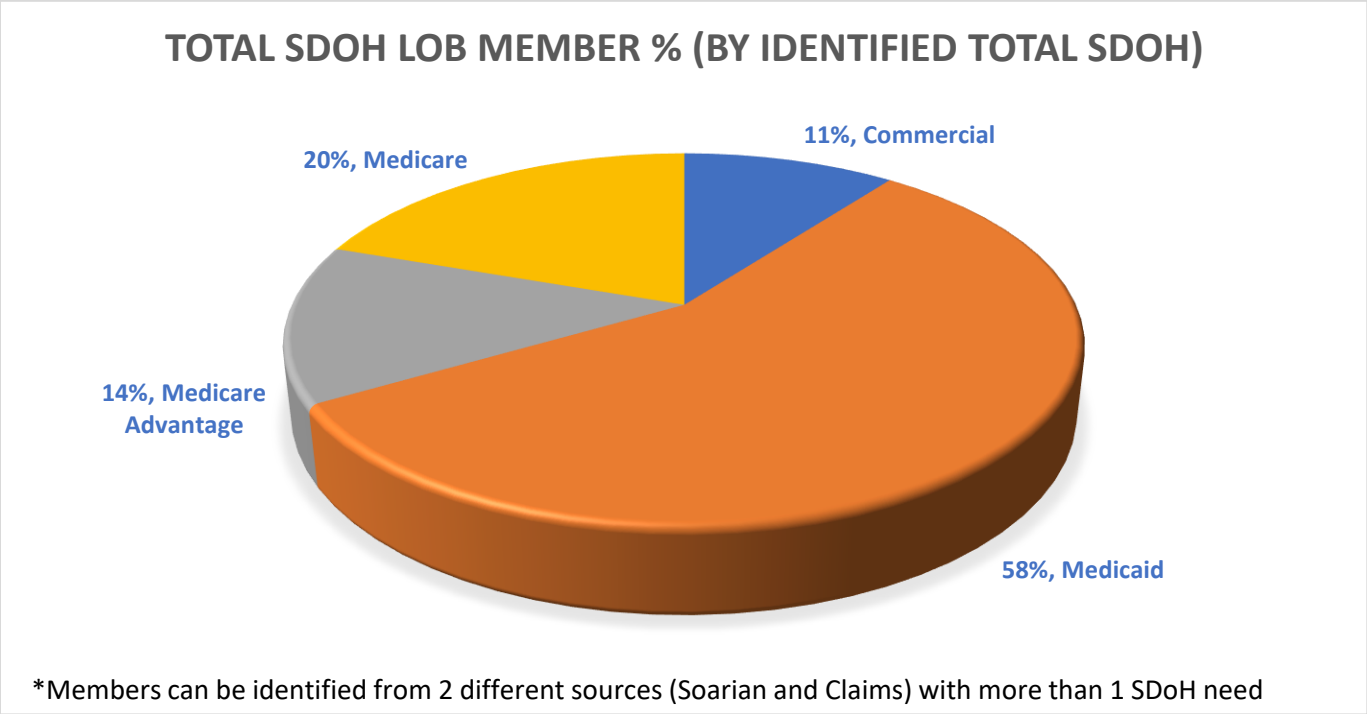
*Appendix C

2. By Line of Business

SDoH Category	Commercial	Medicaid	Medicare Advantage	Medicare	Grand Total (% of Total Population)
Housing and Economic Circumstances	10	342	54	38	426 **(0.34%)**
Facilities and Other Health Care	16	100	89	116	303 **(0.24%)**
Primary Support Group, Including Family Circumstances	53	123	31	64	260 **(0.20%)**
Employment and Unemployment	25	104	11	7	142 **(0.11%)**
Upbringing	9	81	12	14	104 **(0.08%)**
Other Psychosocial Circumstances	11	49	7	14	73 **(0.05%)**
Social Environment	2	26	5	10	38 **(0.03%)**
Psychosocial Circumstances	12	21	1	2	33 **(0.02%)**
Education and Literacy	8	17	1	2	24 **(0.01%)**
Occupational Exposure to Risk Factors	5	3	2	2	8 **(0.00%)**
Physical Environment	1	1	1	1	1 **(0.00%)**
Total SDoH Count **(% of Total Payer Population)**	129 **(0.2%)**	705 **(1.8%)**	173 **(1.6%)**	247**(0.9%)**	1208 **(10%)**
Total SDoH % (by identified total SDoH)	**11%**	**58%**	**14%**	**20%**	

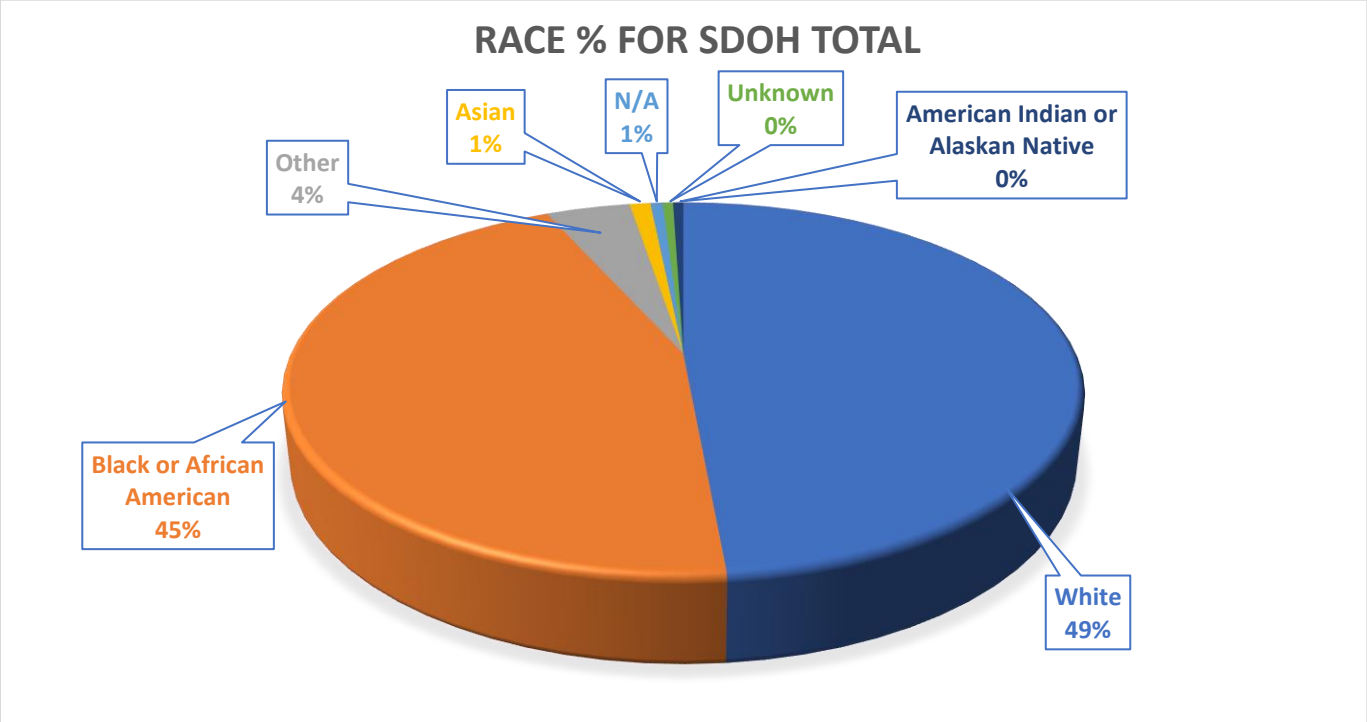
*Members can be counted twice within percentages

3. By Line of Business for Total SDOH Identified



*Members can be identified from 2 different sources (Soarian and Claims) with more than 1 SDoH need

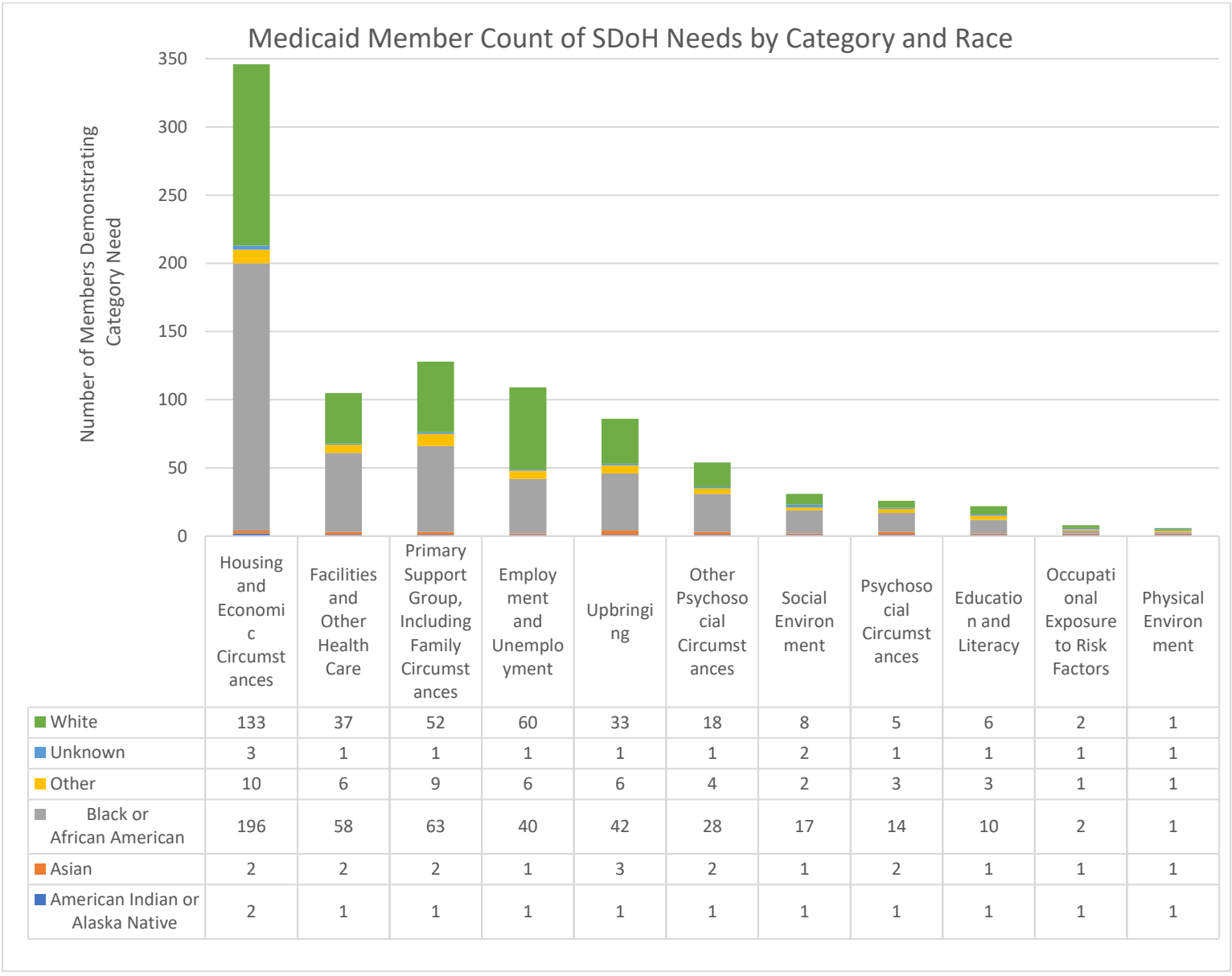
4. Race by SDoH Identified



5. Language Literacy among Members with SDoH Needs

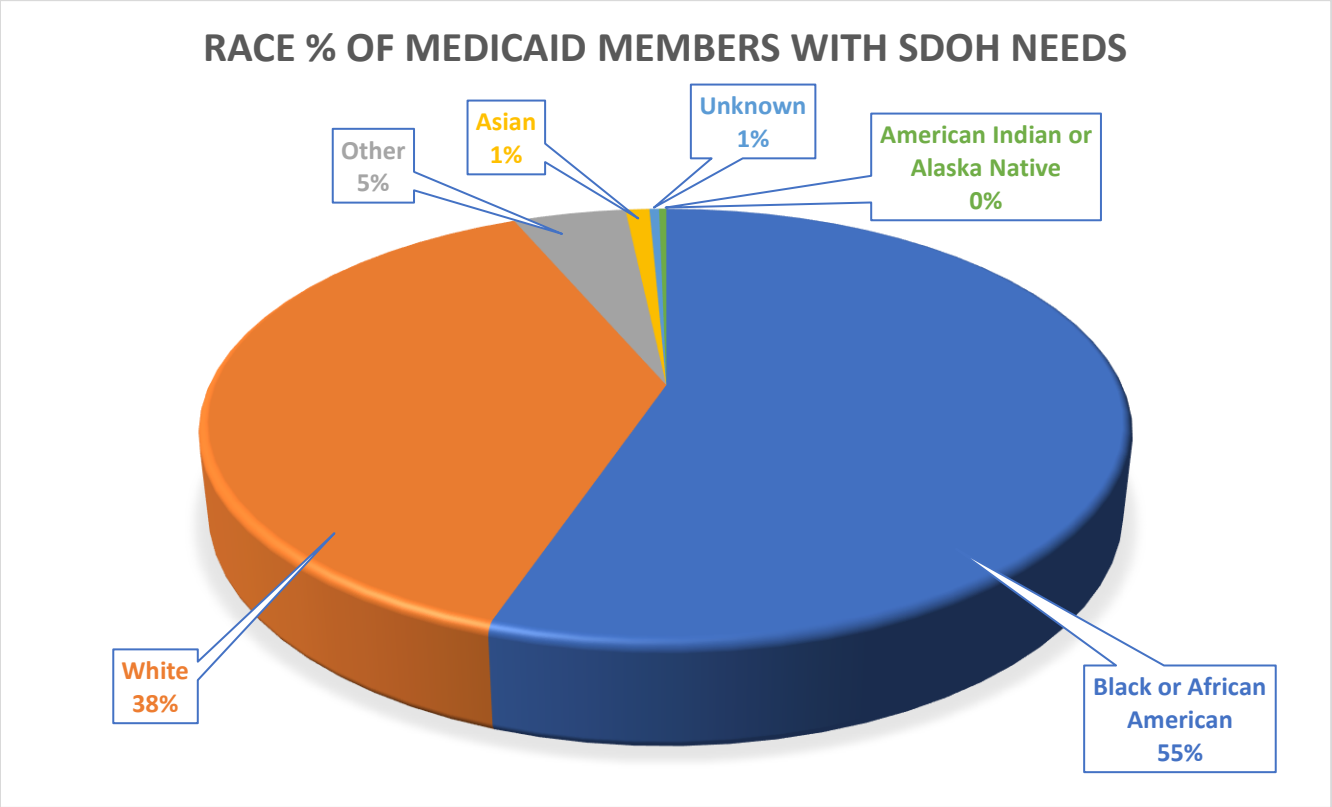
Language	Member Count (% of SDoH Population)
English	1,160 **(96.0%)**
Other	22 **(1.8%)**
Undetermined	18 **(1.5%)**
Spanish	8 **(0.7%)**
Grand Total	**1,208 (100%)**

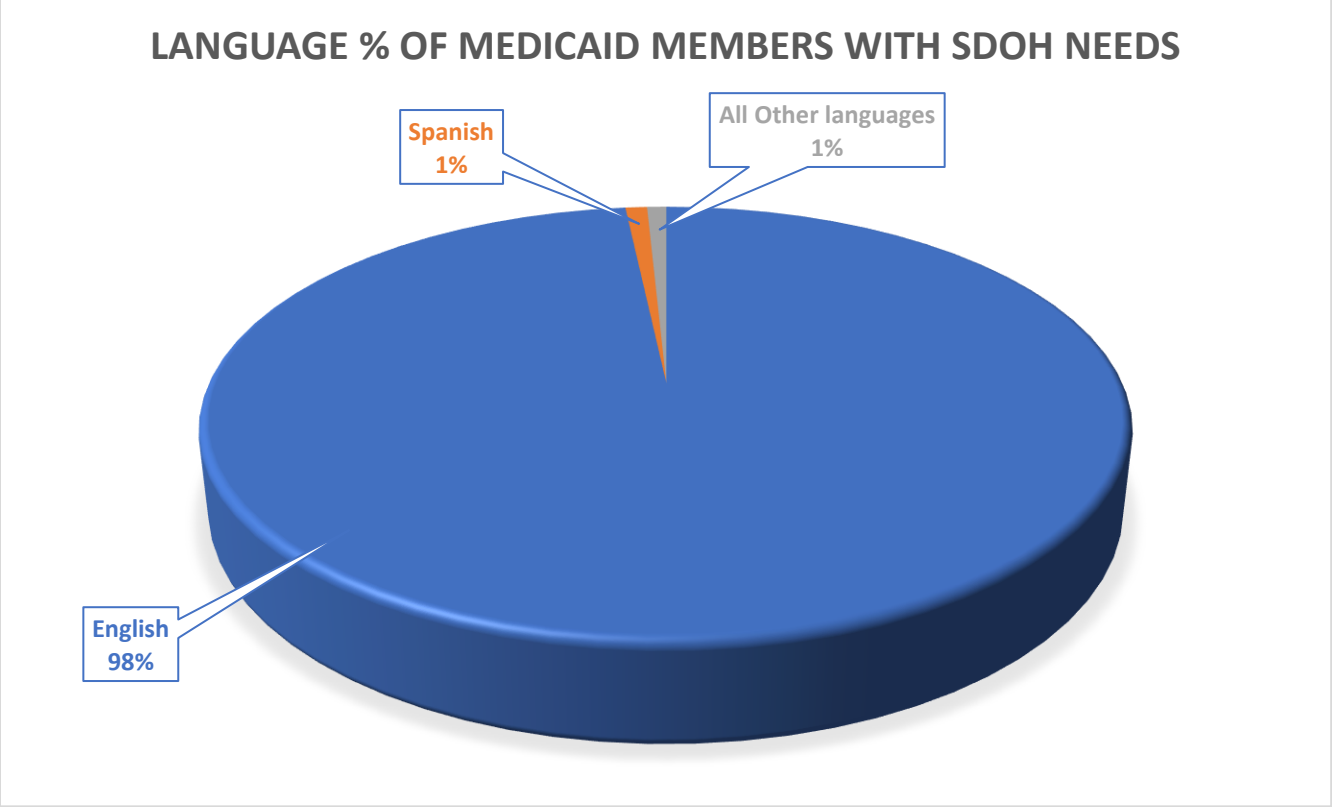
6. Medicaid SDoH



	Housing and Economic Circumstances	Facilities and Other Health Care	Primary Support Group, Including Family Circumstances	Employment and Unemployment	Upbringing	Other Psychosocial Circumstances	Social Environment	Psychosocial Circumstances	Education and Literacy	Occupational Exposure to Risk Factors	Physical Environment
White	133	37	52	60	33	18	8	5	6	2	1
Unknown	3	1	1	1	1	1	2	1	1	1	1
Other	10	6	9	6	6	4	2	3	3	1	1
Black or African American	196	58	63	40	42	28	17	14	10	2	1
Asian	2	2	2	1	3	2	1	2	1	1	1
American Indian or Alaska Native	2	1	1	1	1	1	1	1	1	1	1

7. Medicaid SDoH Member Demographics

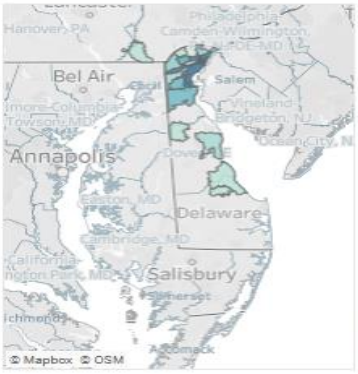




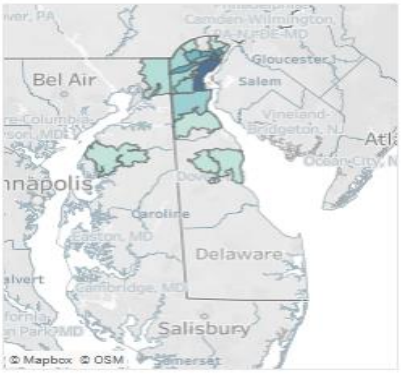
8. Medicaid SDoH Needs by Category and Zip Code Geocoding

Education and Literacy

Employment and Unemployment

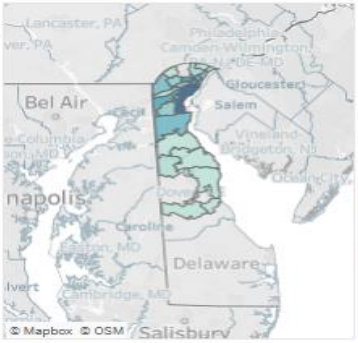


Facilities and Other HealthCare



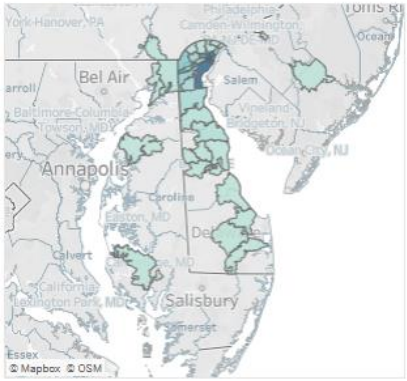
Other Psychosocial Circumstances

Primary Support Group, Including Family Circumstances



Psychosocial Circumstances

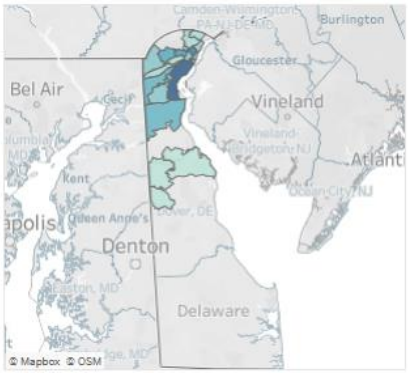
Housing and Economic Circumstances



Occupational Exposure to Risk Factors

Social Environment

Upbringing



J. Members with Disabilities

Data Source: CareVio Claims Data

Disability	Commercial Member Count	Medicaid Member Count	Medicare Advantage Member Count	Medicare Member Count	Total # in Disability Category (% of total population)
Intellectual Disabilities	12	5	0	43	60
Pervasive and Specific Developmental Disorders	165	61	0	65	291
Hearing Impairment	362	210	456	2,057	3,085
Visual Impairment	231	184	108	462	3,376
Speech Impairment	40	50	50	222	362
Ambulatory Issues/Mobility Impairment	234	629	500	1,987	3,350
TOTAL	**1,044**	**1,139**	**1,114**	**4,836**	**10,524 (8.47%)**
TOTAL % of Payer Population	**2%**	**2.9%**	**10.2%**	**16.7%**	

*Appendix A

**Member may have more than one disability, and may be attributed to more than one insurance payer

Total CareVio Population with at least one disability 6% (7,545 members)

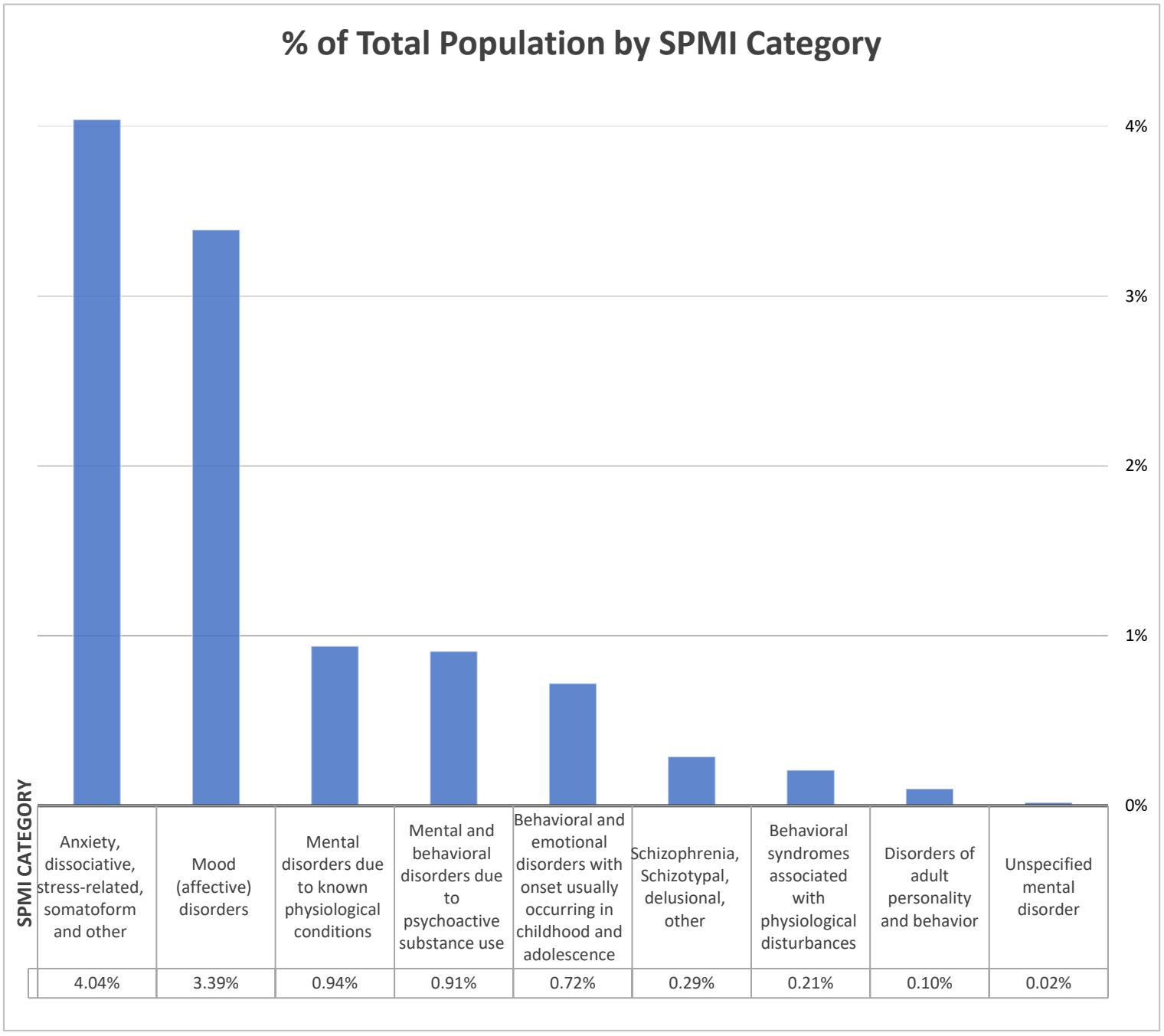
K. Members with Serious and Persistent Mental Illness

Data Source: CareVio Claims Data

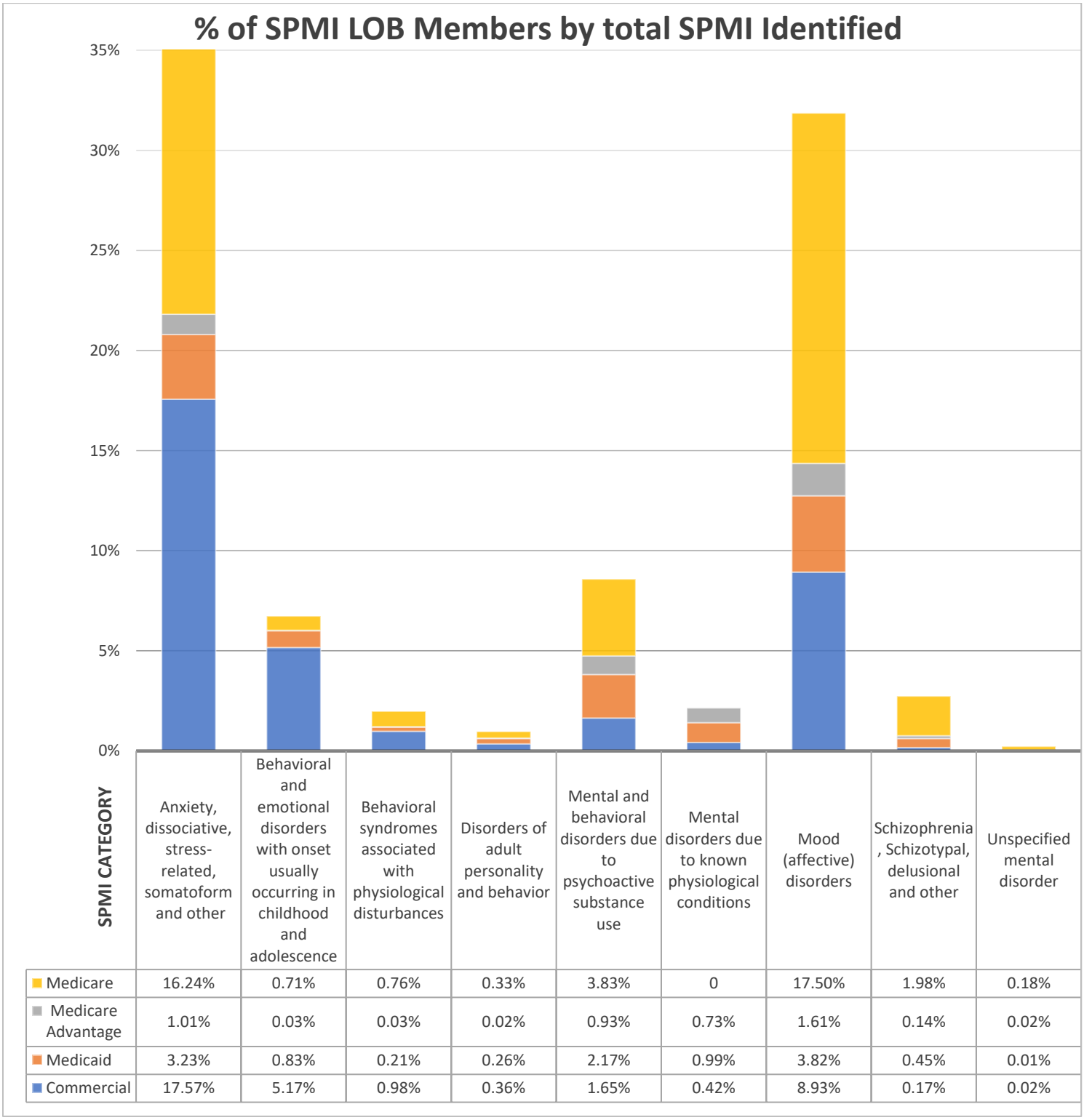
1. Total Population

SPMI Category	Distinct Member Count	SPMI Claims / total SPMI Identified (%)	% of Total Population (124,241)
Anxiety, dissociative, stress-related, somatoform and other	5,025	38.00%	4.04%
Mood (affective) disorders	4,209	31.90%	3 .39%
Mental disorders due to known physiological conditions	1,165	8.50%	0.94%
Mental and behavioral disorders due to psychoactive substance use	1,134	8.60%	0.91%
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	891	6.70%	0.72%
Schizophrenia, Schizotypal, delusional, and other	363	2.70%	0.29%
Behavioral syndromes associated with physiological disturbances	263	2.00%	0.21%
Disorders of adult personality and behavior	128	1.00%	0.10%
Unspecified mental disorder	30	0.20%	0.02%
TOTAL	**13,208**	**99.9%**	**10.63%**

*Appendix B


% of Total Population by SPMI Category
4%
3%
2%
1%
0%
SPMI CATEGORY
Anxiety, dissociative, stress-related, somatoform and other
Mood (affective) disorders
Mental disorders due to known physiological conditions
Mental and behavioral disorders due to psychoactive substance use
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence
Schizophrenia, Schizotypal, delusional, other
Behavioral syndromes associated with physiological disturbances
Disorders of adult personality and behavior
Unspecified mental disorder
4.04%
3.39%
0.94%
0.91%
0.72%
0.29%
0.21%
0.10%
0.02%

2. By Line of Business (SPMI Prevalence per LOB)

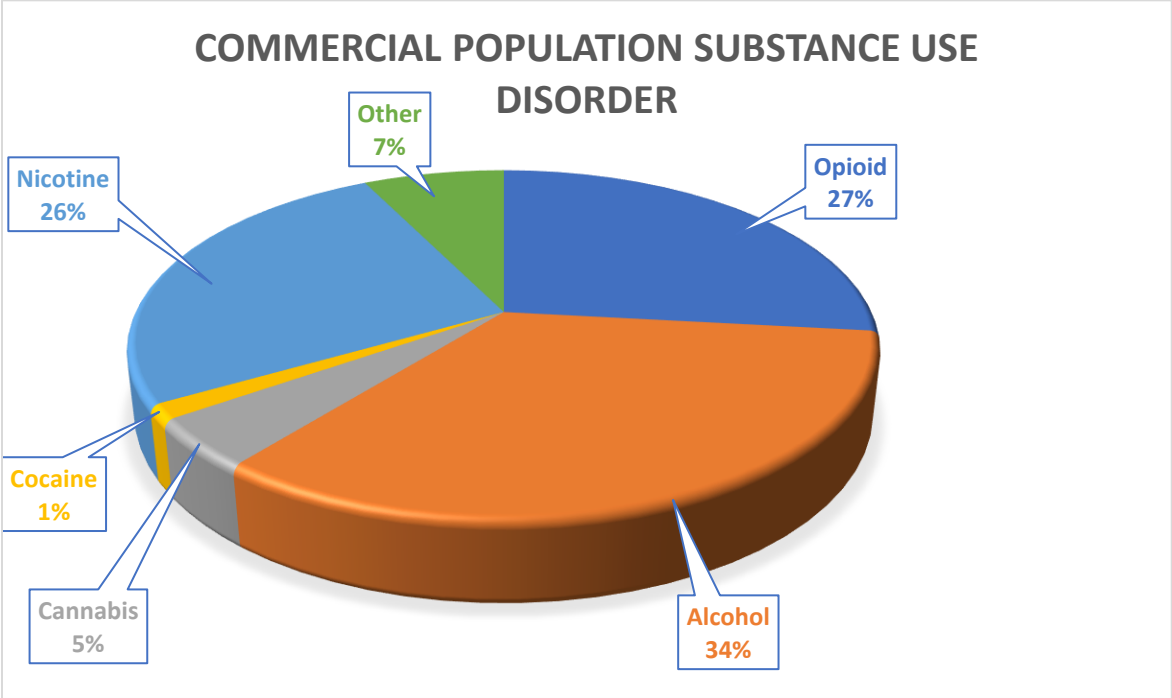


SPMI CATEGORY	Anxiety, dissociative, stress-related, somatoform and other	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	Behavioral syndromes associated with physiological disturbances	Disorders of adult personality and behavior	Mental and behavioral disorders due to psychoactive substance use	Mental disorders due to known physiological conditions	Mood (affective) disorders	Schizophrenia, Schizotypal, delusional and other	Unspecified mental disorder
Medicare	16.24%	0.71%	0.76%	0.33%	3.83%	0	17.50%	1.98%	0.18%
Medicare Advantage	1.01%	0.03%	0.03%	0.02%	0.93%	0.73%	1.61%	0.14%	0.02%
Medicaid	3.23%	0.83%	0.21%	0.26%	2.17%	0.99%	3.82%	0.45%	0.01%
Commercial	17.57%	5.17%	0.98%	0.36%	1.65%	0.42%	8.93%	0.17%	0.02%

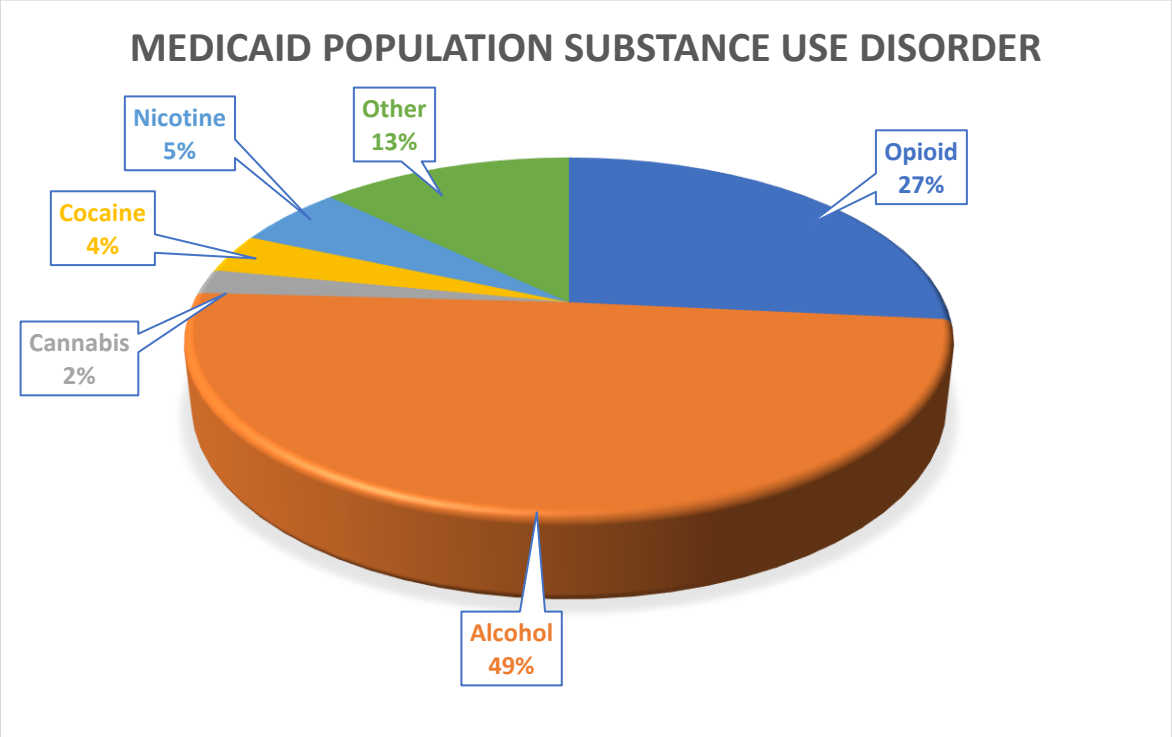
** SPMI claims data does not reflect 100% of SPMI diagnoses, as CMS redacts/masks some behavioral health information.

***Lower results may be correlated to redaction/masking of behavioral health claims

3. *SPMI Category: Mental and Behavioral disorders due to psychoactive substance use (substance use disorder)*

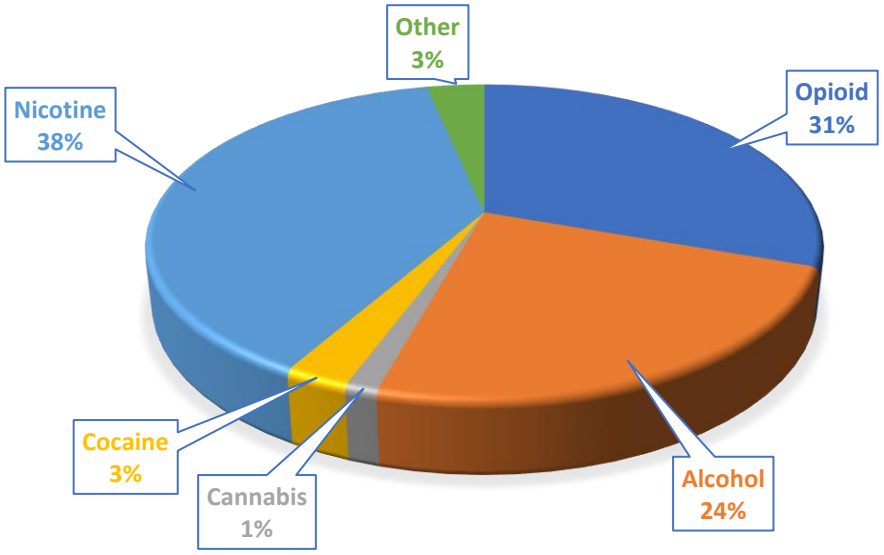


Substance	Member Count
Alcohol	98
Opioid	77
Nicotine	75
Other	21
Cannabis	13
Cocaine	4
TOTAL	288



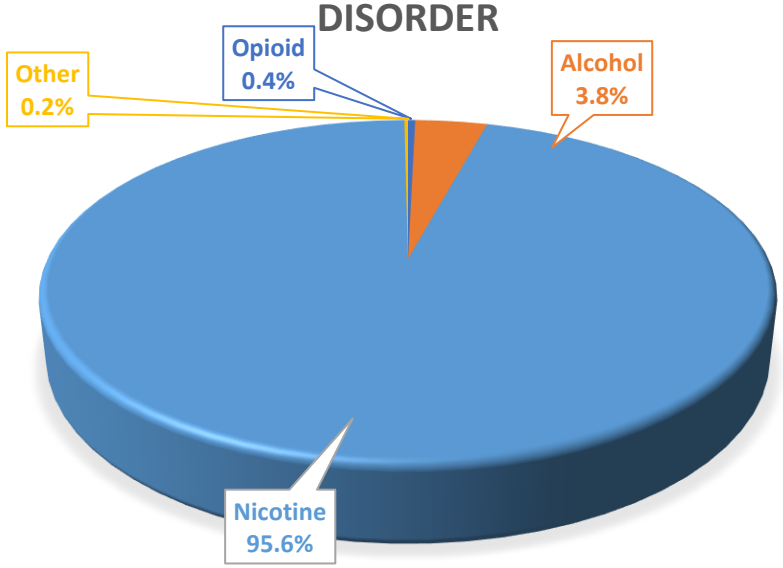
Substance	Member Count
Alcohol	223
Opioid	120
Other	58
Nicotine	25
Cannabis	10
Cocaine	16
TOTAL	452

MEDICARE ADVANTAGE POPULATION SUBSTANCE USE DISORDER



Substance	Member Count
Nicotine	58
Opioid	46
Alcohol	36
Cannabis	2
Cocaine	4
Other	5
TOTAL	151

MEDICARE MSSP POPULATION SUBSTANCE USE DISORDER



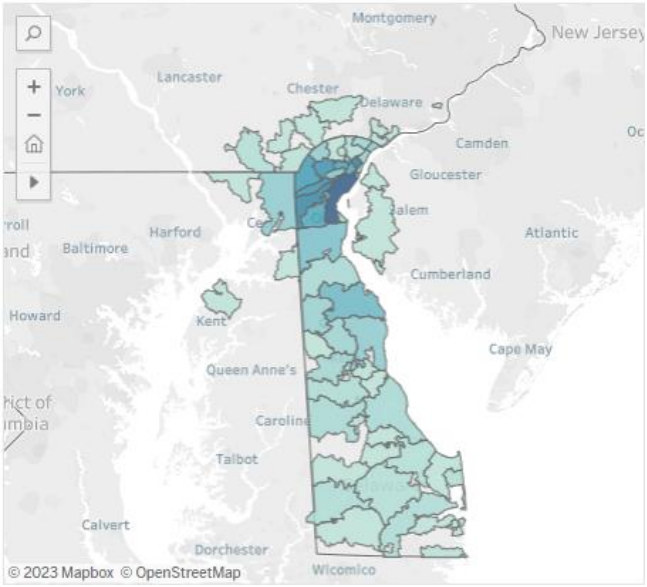
Substance	Member Count
Nicotine	502
Alcohol	20
Opioid	2
Other	1
TOTAL	525

L. Other Subpopulations

Data Source: CareVio Program Data (enrolled in a program >60 days)

1. Comprehensive Case Management (CCM) Denominator: 472 Unique Patients

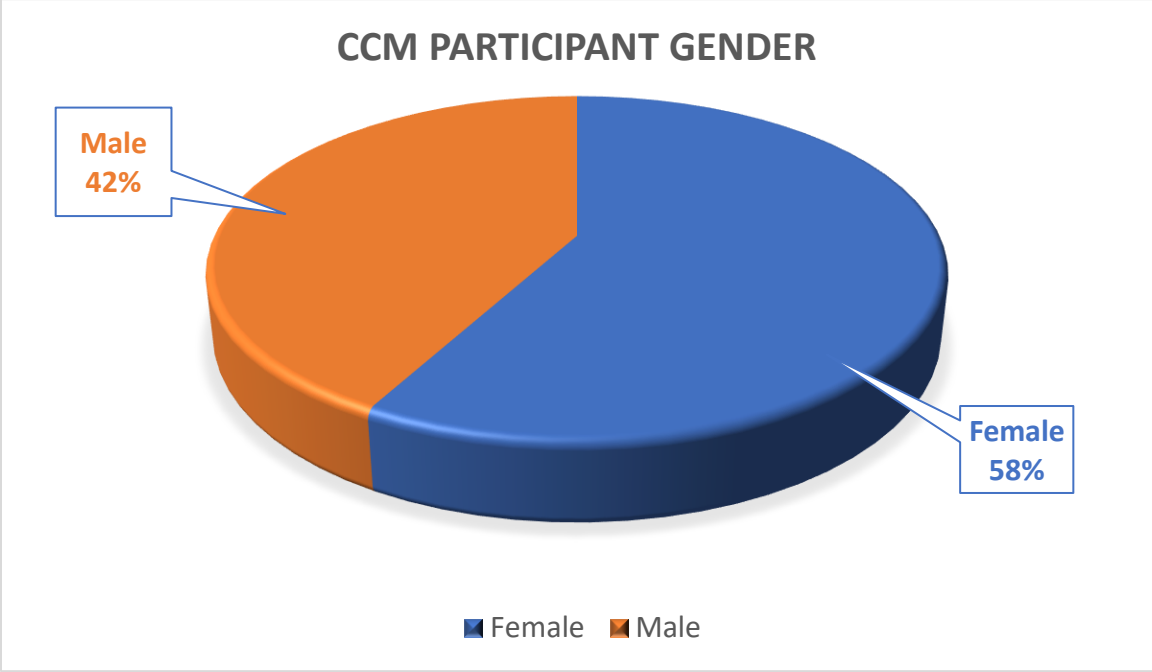
CCM Member demographic location



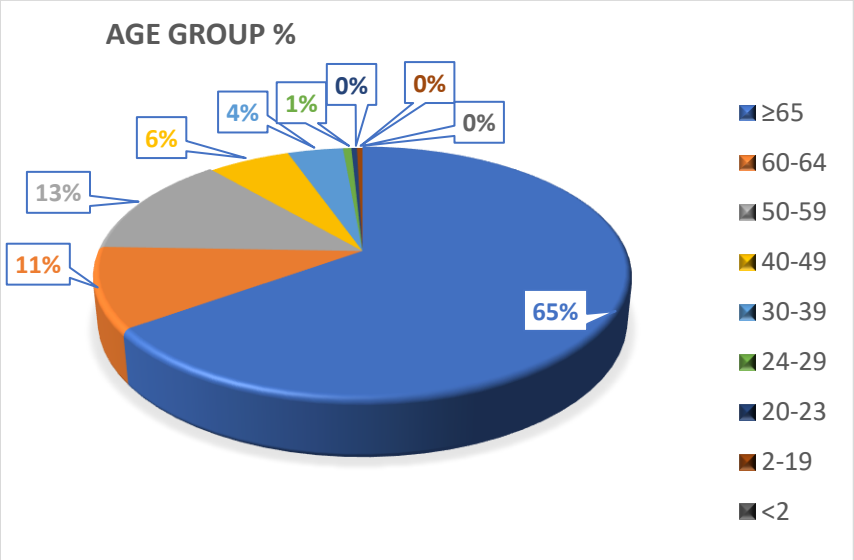
Top 3 Zip codes in Delaware:

19702, 19720 and 19802

CCM Participant Gender

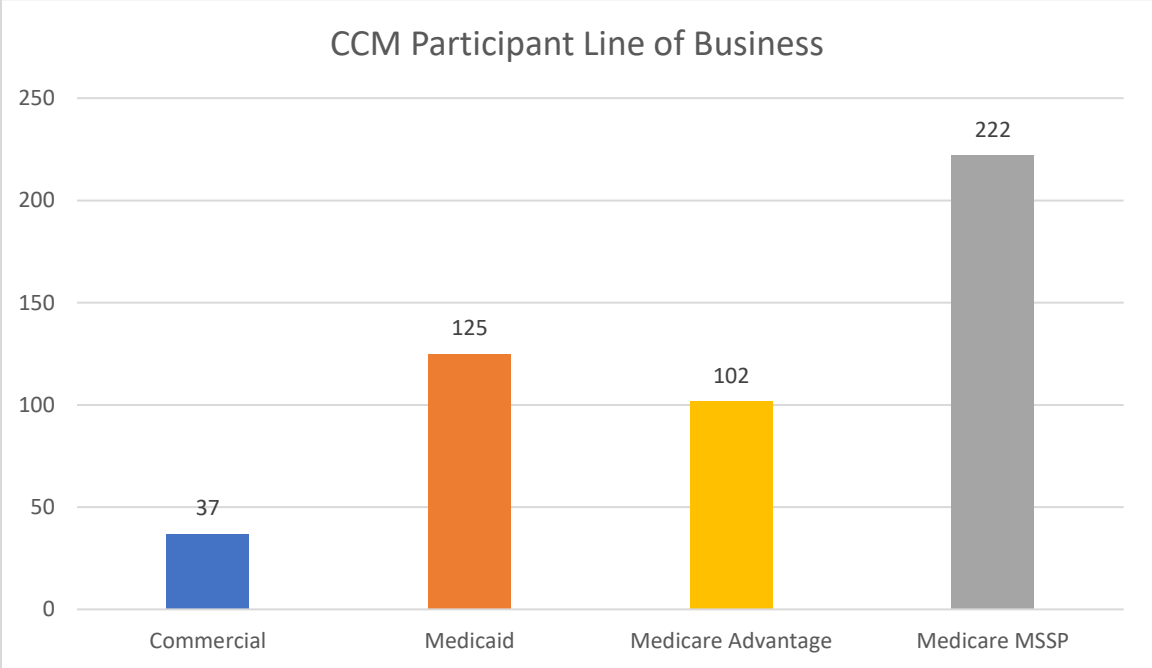


CCM Age Distribution

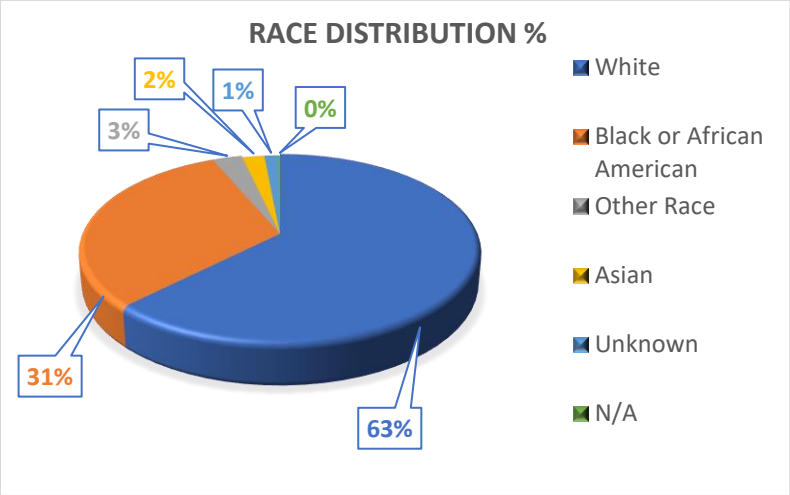


Age	Member Count	Member %
≥65	307	65%
60-64	49	10.4%
50-59	62	13.1%
40-49	28	5.9%
30-39	19	4.0%
24-29	3	0.6%
20-23	2	0.4%
2-19	2	0.4%
<2	0	0.0%

CCM Participant Member Count by Line of Business

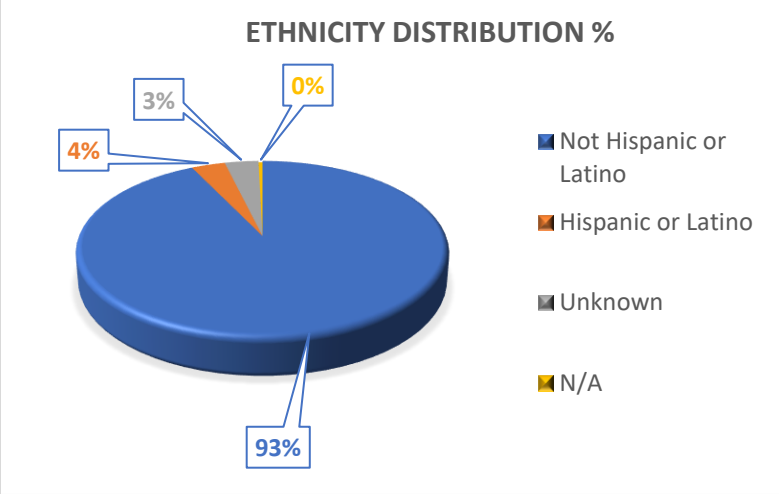


CCM Race Distribution



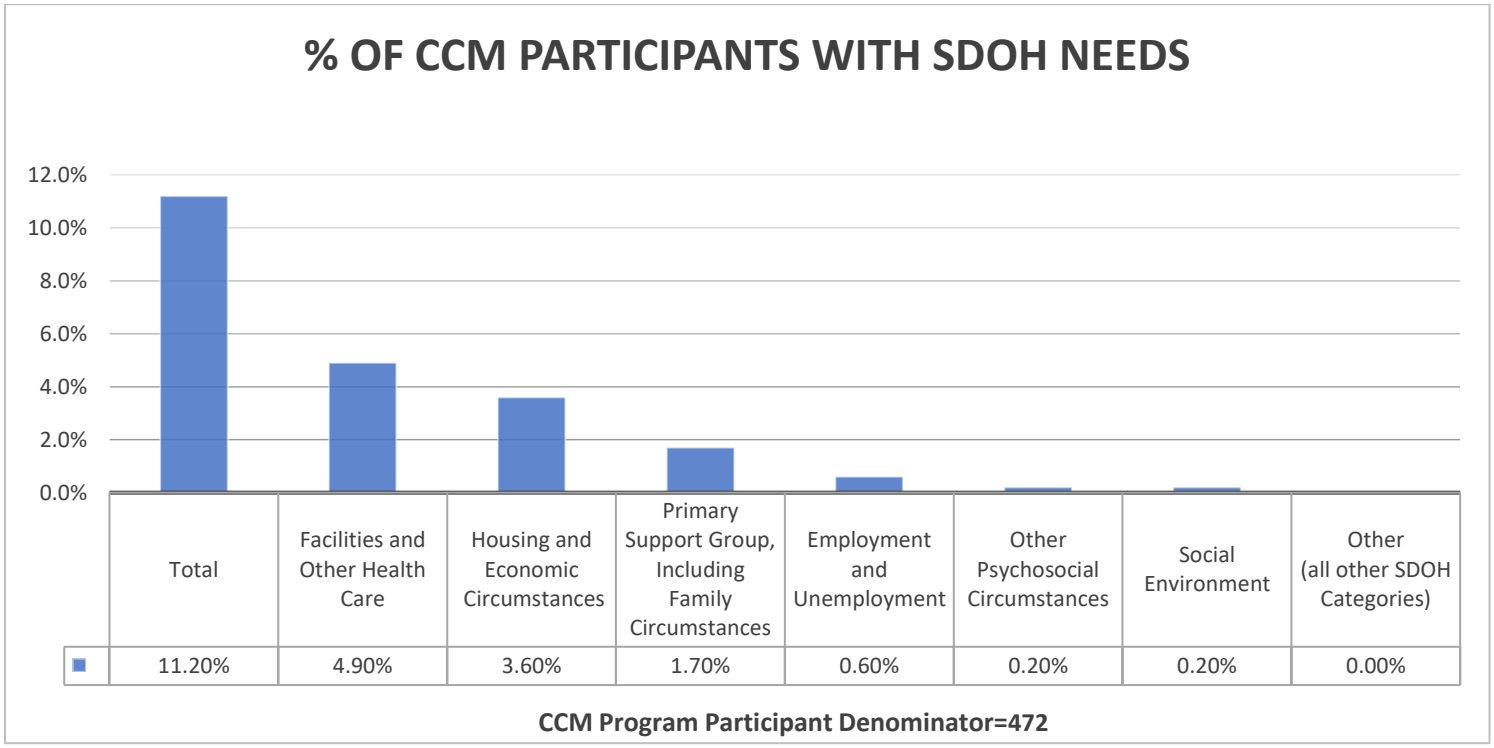
Race	Member Count	Member %
White	295	62.5%
Black or African American	147	31.1%
Other Race	13	2.8%
Asian	10	2.1%
Unknown	6	1.3%
N/A	1	0.2%

CCM Ethnicity Distribution

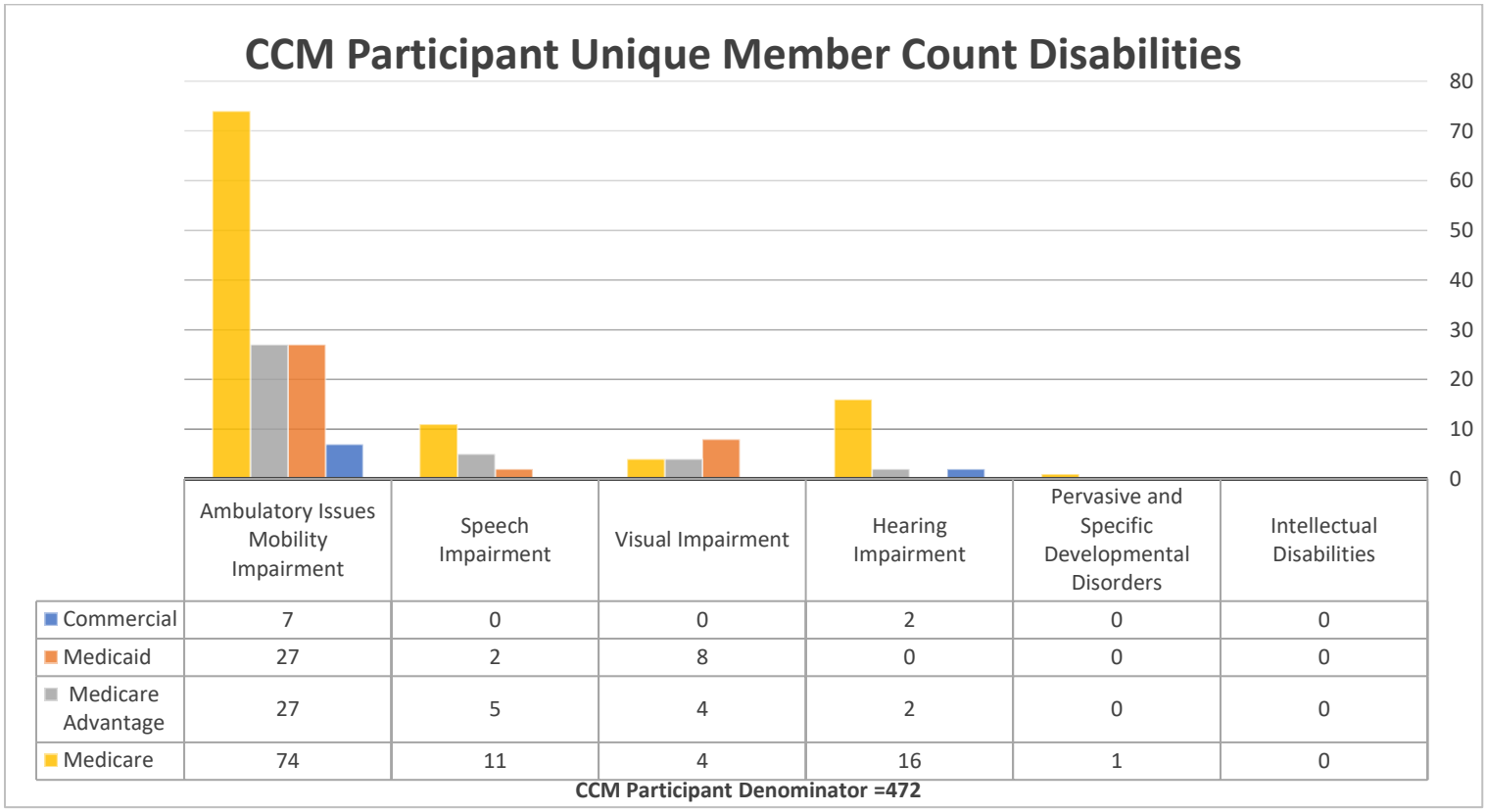


Ethnicity	Member Count	Member %
Not Hispanic or Latino	438	92.8%
Hispanic or Latino	16	3.4%
Unknown	16	3.4%
N/A	2	0.4%

CCM SDOH

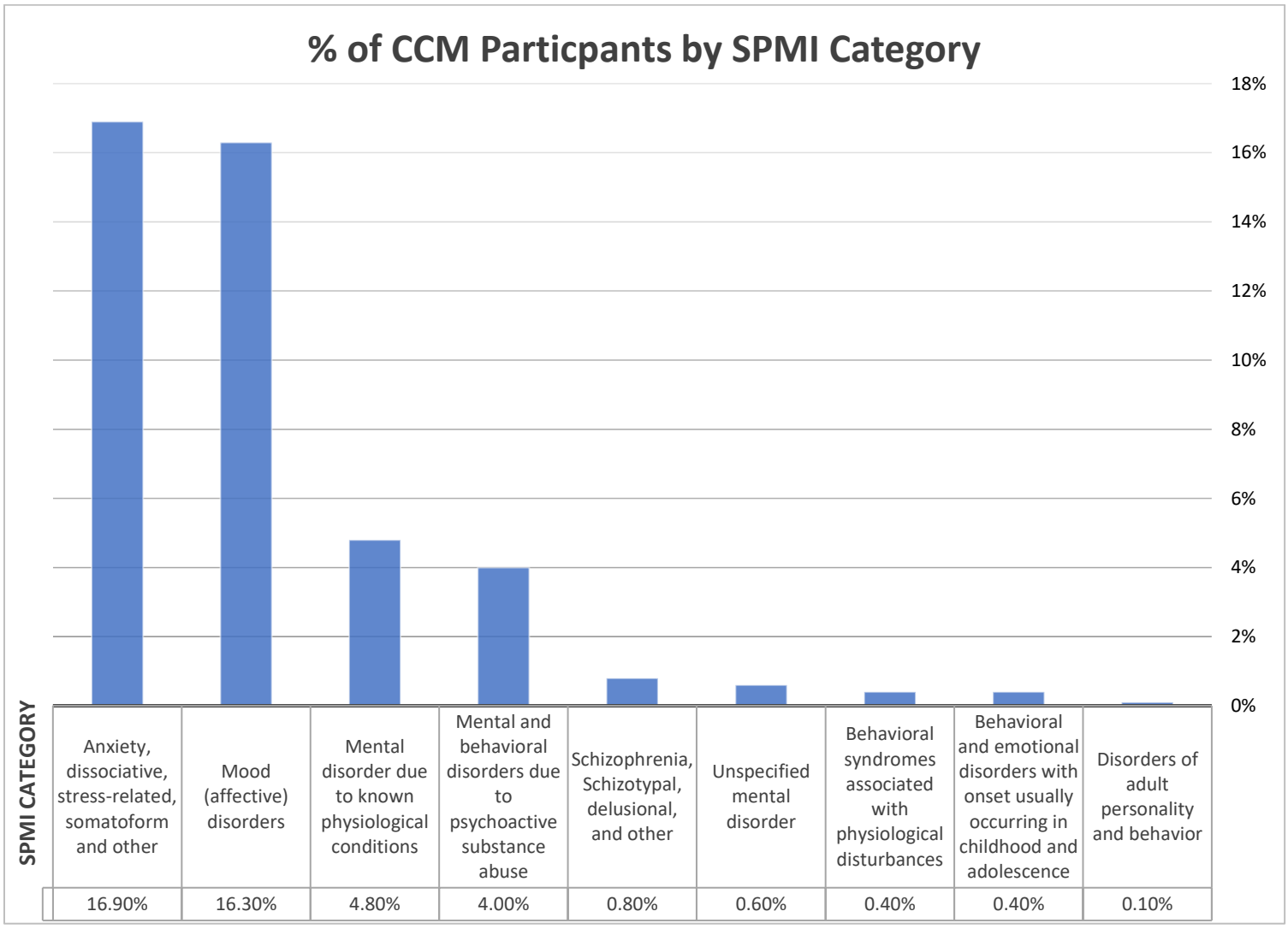


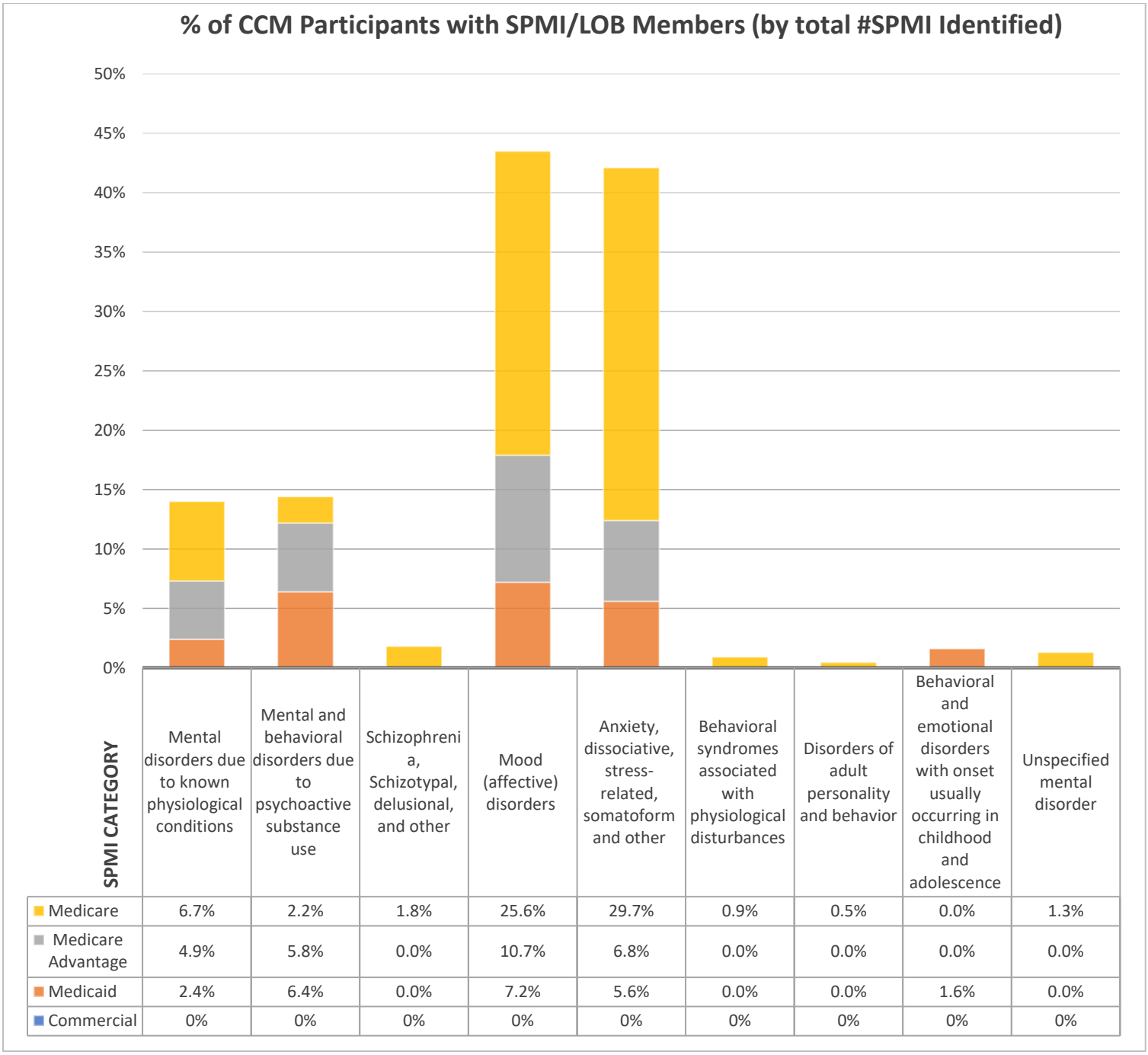
CCM Disabilities



CCM SPMI Distribution

SPMI Category	Total Member Count (% of CCM Participant)
Anxiety, dissociative, stress-related, somatoform and other	80 (16.9%)
Mood (affective) disorders	77 (16.3%)
Mental disorder due to known physiological conditions	23 (4.8%)
Mental and behavioral disorders due to psychoactive substance abuse	19 (4%)
Schizophrenia, Schizotypal, delusional, and other	4 (0.8%)
Unspecified mental disorder	3 (0.6%)
Behavioral syndromes associated with physiological disturbances	2 (0.4%)
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	2 (0.4%)
Disorders of adult personality and behavior	1 (0.1%)
Total SPMI Member Count of Participants in CCM Program	**211 (45 %)**





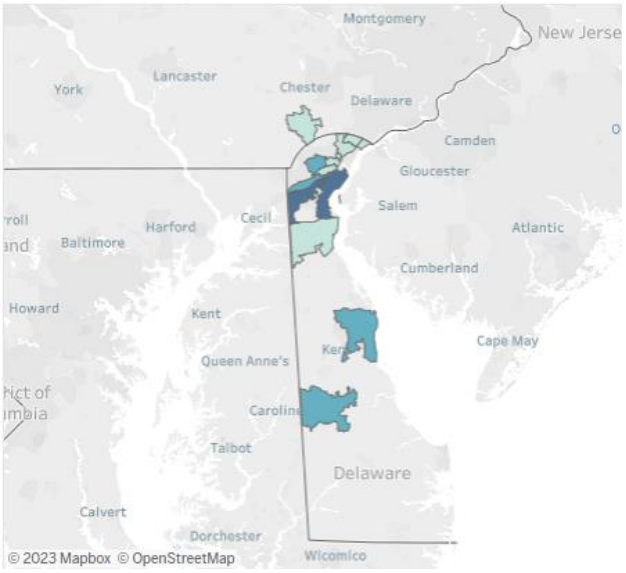
SPMI CATEGORY	Mental disorders due to known physiological conditions	Mental and behavioral disorders due to psychoactive substance use	Schizophrenia, Schizotypal, delusional, and other	Mood (affective) disorders	Anxiety, dissociative, stress-related, somatoform and other	Behavioral syndromes associated with physiological disturbances	Disorders of adult personality and behavior	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	Unspecified mental disorder
Medicare	6.7%	2.2%	1.8%	25.6%	29.7%	0.9%	0.5%	0.0%	1.3%
Medicare Advantage	4.9%	5.8%	0.0%	10.7%	6.8%	0.0%	0.0%	0.0%	0.0%
Medicaid	2.4%	6.4%	0.0%	7.2%	5.6%	0.0%	0.0%	1.6%	0.0%
Commercial	0%	0%	0%	0%	0%	0%	0%	0%	0%

** SPMI claims data does not reflect 100% of SPMI diagnoses, as CMS redacts/masks some behavioral health information.

***Lower results may be correlated to redaction/masking of behavioral health claims

2. Chronic Obstructive Pulmonary Program Denominator: 22 Unique Patients

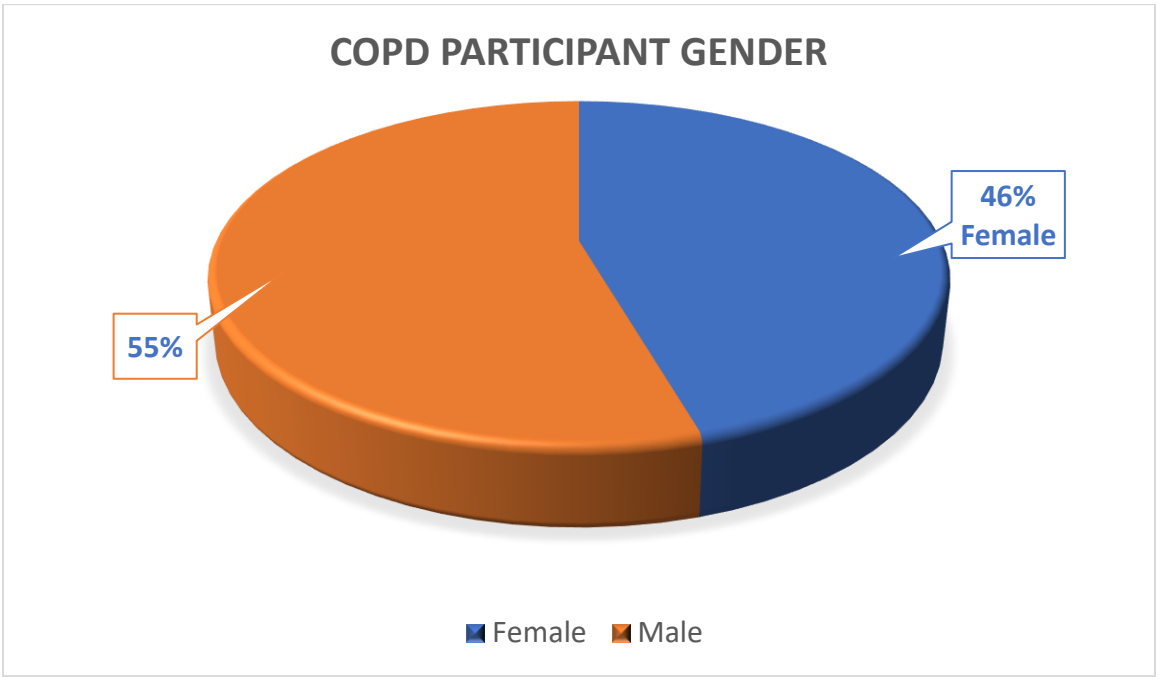
COPD Member demographic location



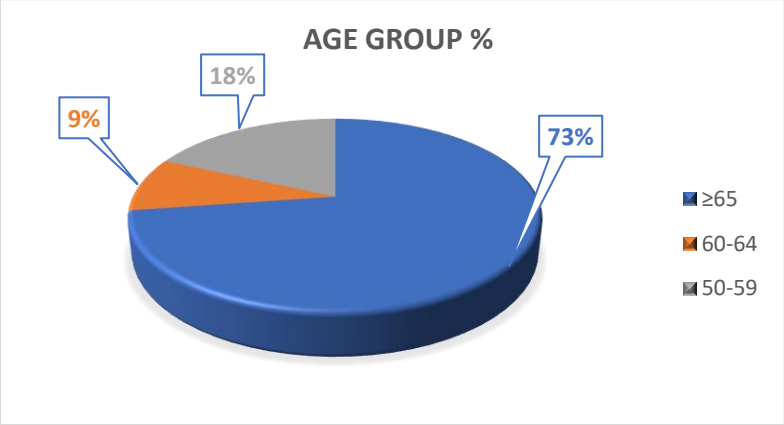
Top 3 Zip codes:

19702, 19720, and 19713

COPD Participant Gender

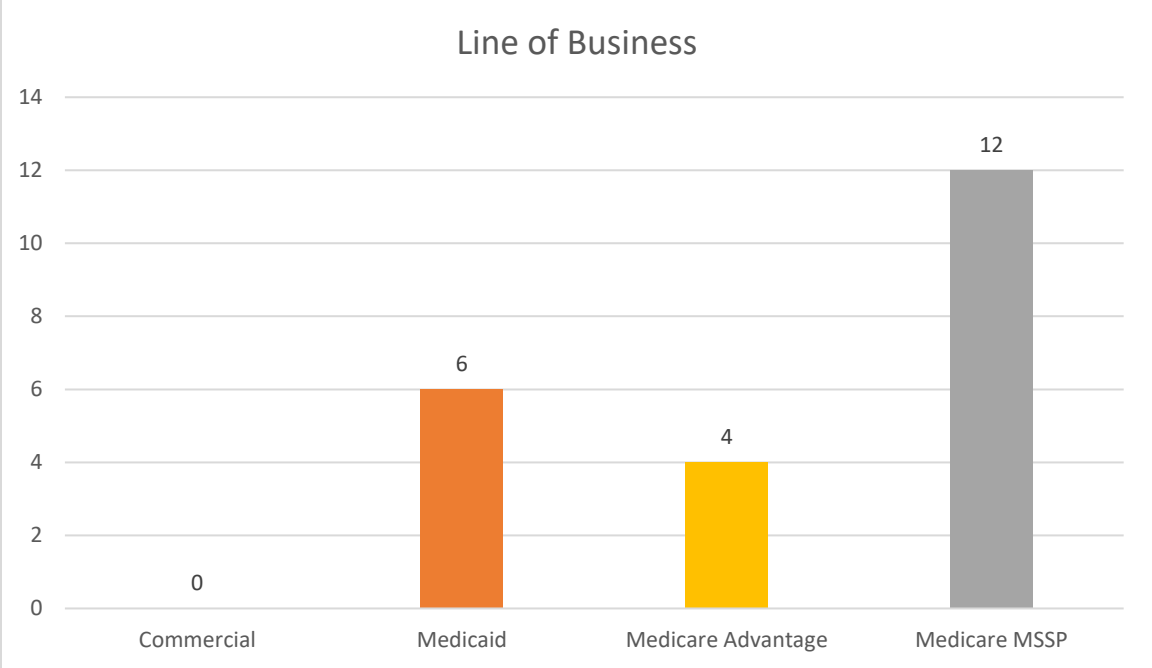


COPD Age Distribution

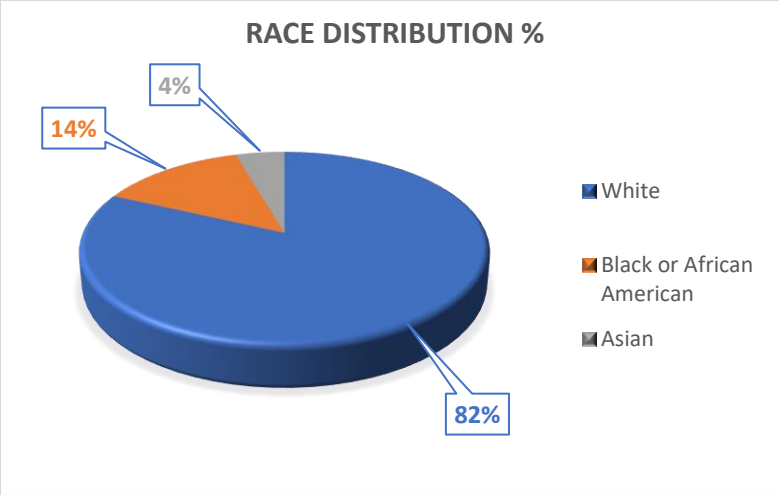


Age	Member Count	Member %
≥65	16	72.7%
60-64	2	9.1%
50-59	4	18.2%

COPD Participant Member Count by Line of Business

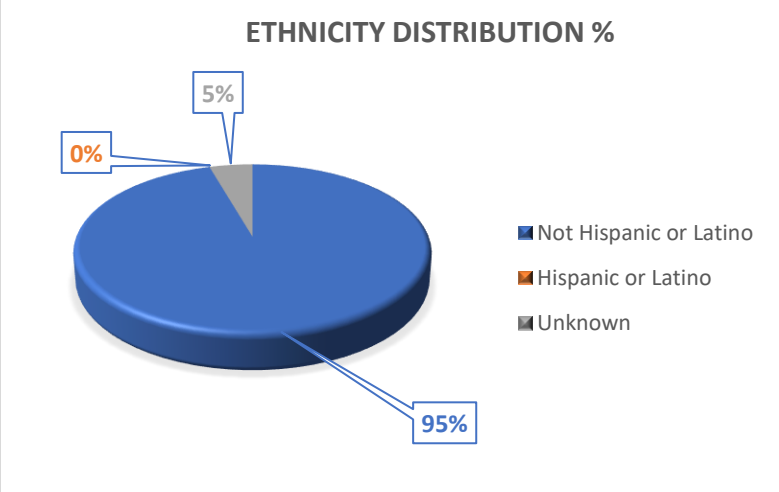


COPD Race Distribution



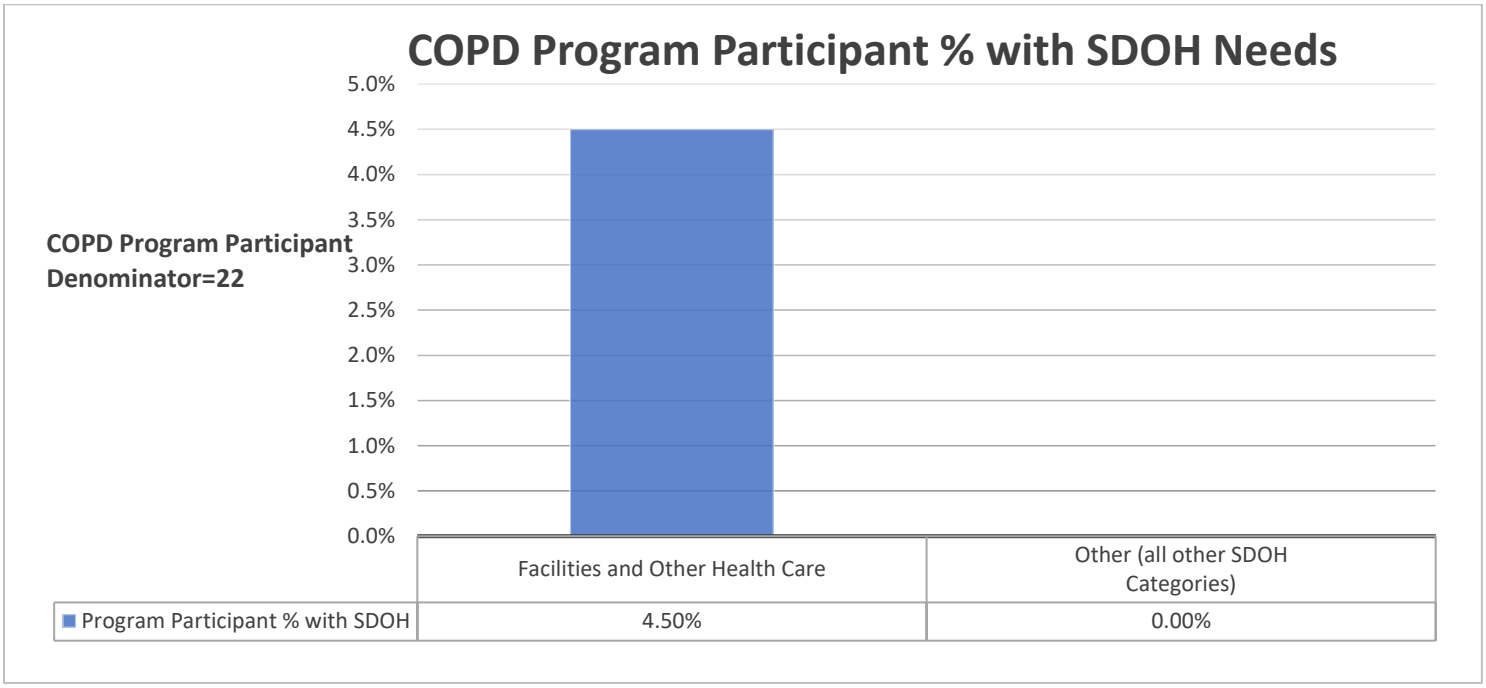
Race	Member Count	Member %
White	18	81.8%
Black or African American	3	13.6%
Asian	1	4.5%

COPD Ethnicity Distribution

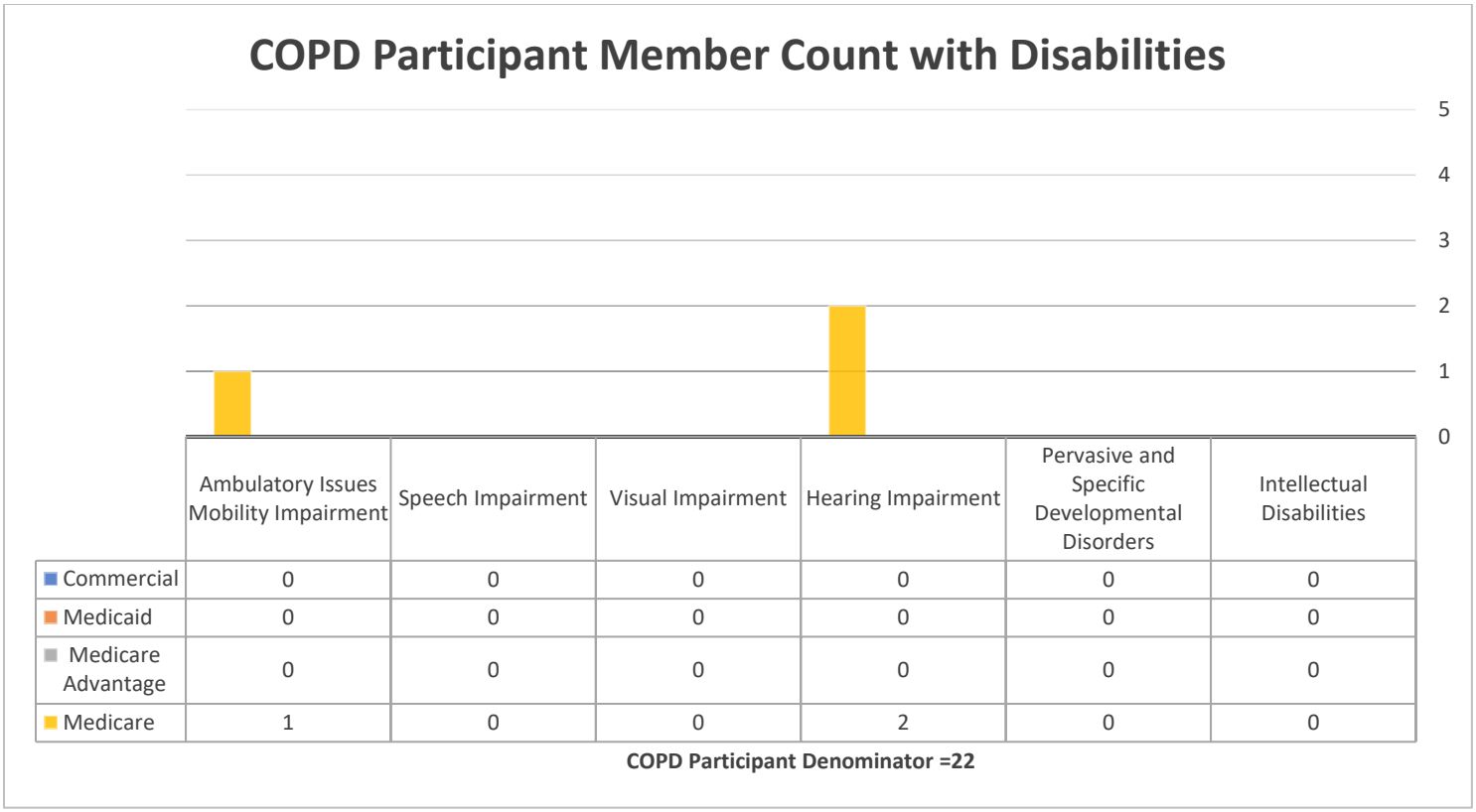


Ethnicity	Member Count	Member %
Not Hispanic or Latino	21	95.5%
Hispanic or Latino	0	0%
Unknown	1	4.5%

COPD SDOH



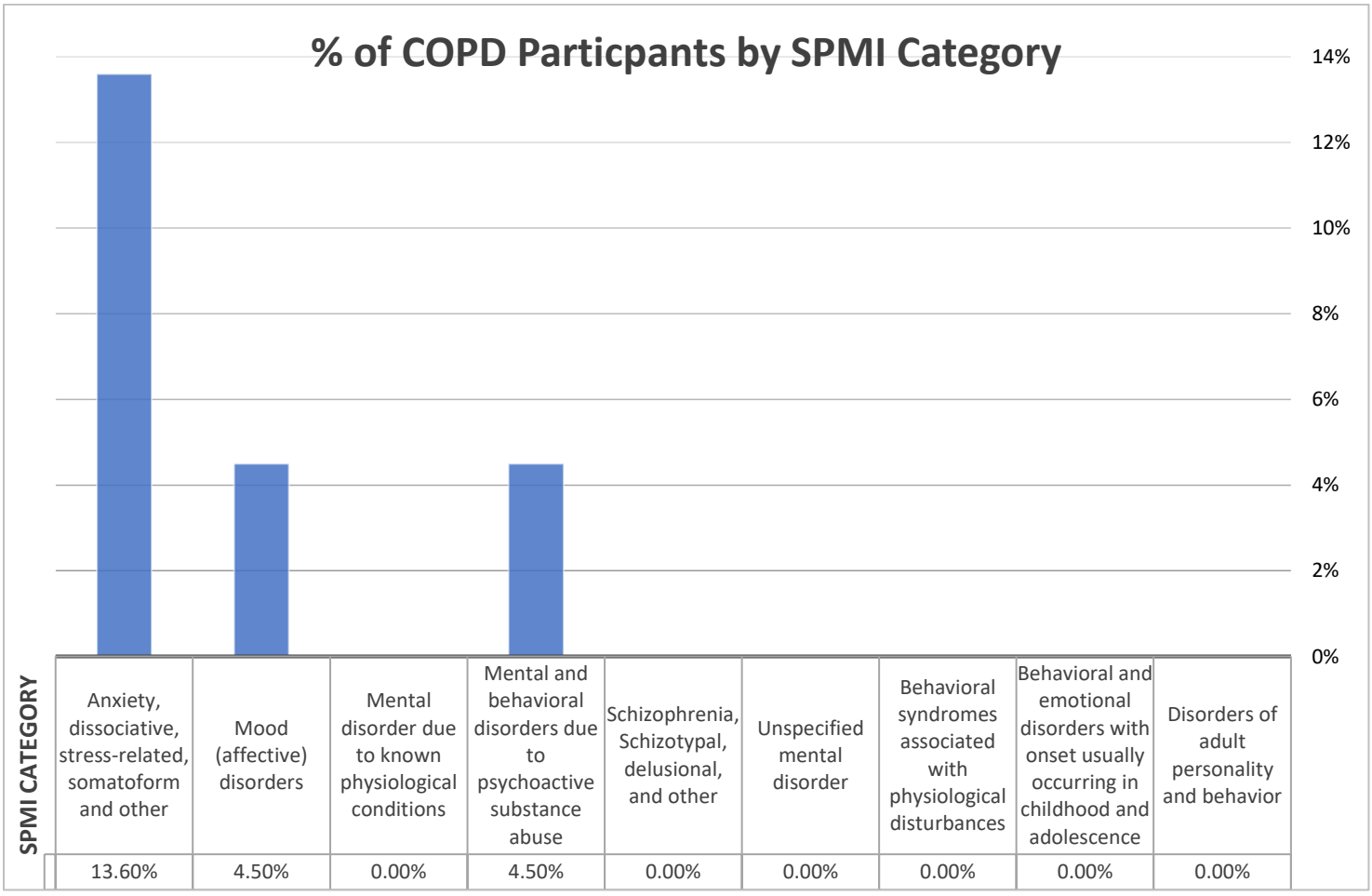
COPD Disabilities

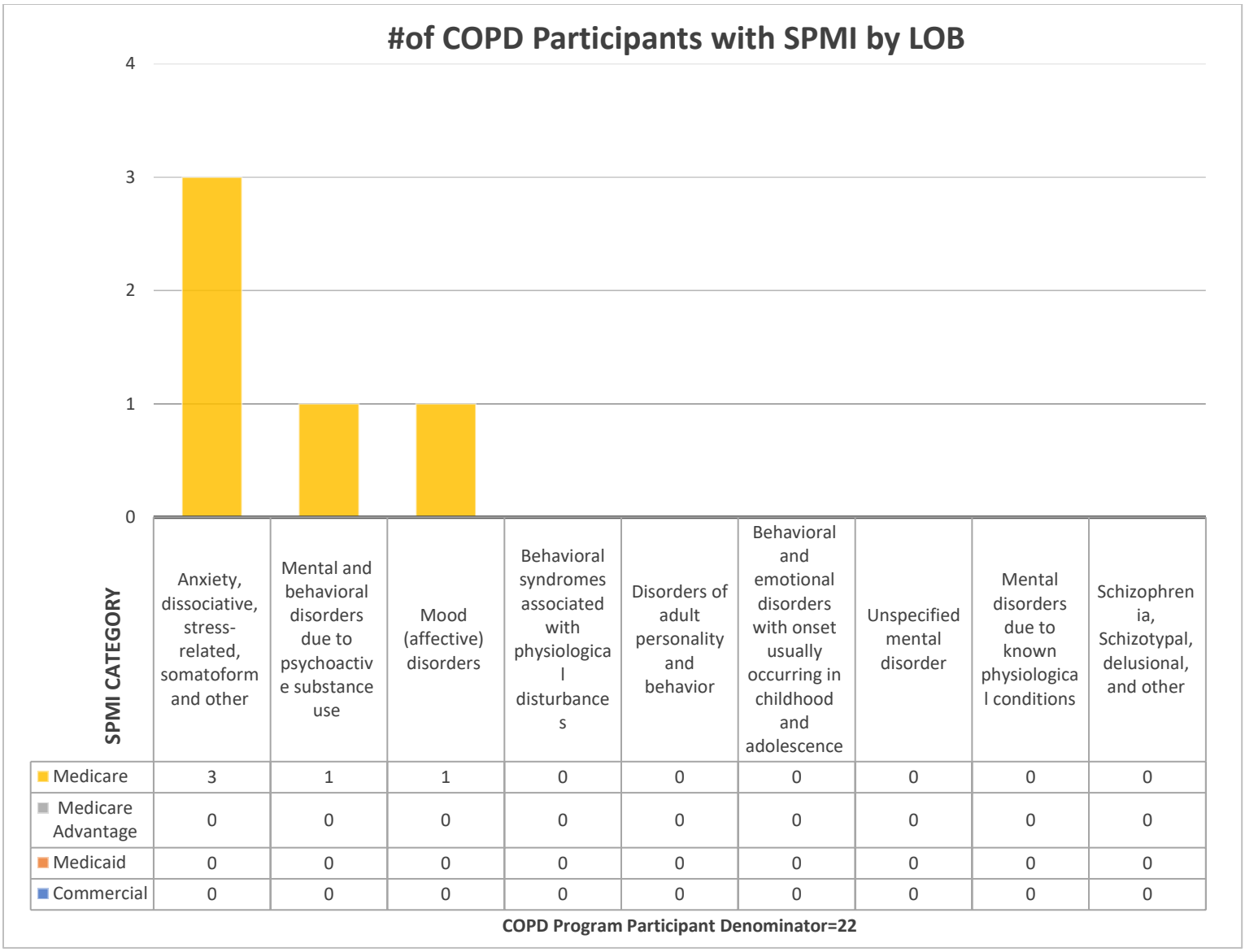


**Member can have more than 1 disability

COPD SPMI Distribution

SPMI Category	Total Member Count (% of COPD Participant)
Mental disorders due to known physiological conditions	0
Mental and behavioral disorders due to psychoactive substance use	1 (4.5%)
Schizophrenia, Schizotypal, delusional, and other	0
Mood (affective) disorders	1 (4.5%)
Anxiety, dissociative, stress-related, somatoform and other	3 (13.6%)
Behavioral syndromes associated with physiological disturbances	0
Disorders of adult personality and behavior	0
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	0
Unspecified mental disorder	0
Total SPMI Member Count of Participants in COPD Program	**5 (22.7%)**





SPMI CATEGORY	Anxiety, dissociative, stress-related, somatoform and other	Mental and behavioral disorders due to psychoactive substance use	Mood (affective) disorders	Behavioral syndromes associated with physiological disturbances	Disorders of adult personality and behavior	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	Unspecified mental disorder	Mental disorders due to known physiological conditions	Schizophrenia, Schizotypal, delusional, and other
Medicare	3	1	1	0	0	0	0	0	0
Medicare Advantage	0	0	0	0	0	0	0	0	0
Medicaid	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0

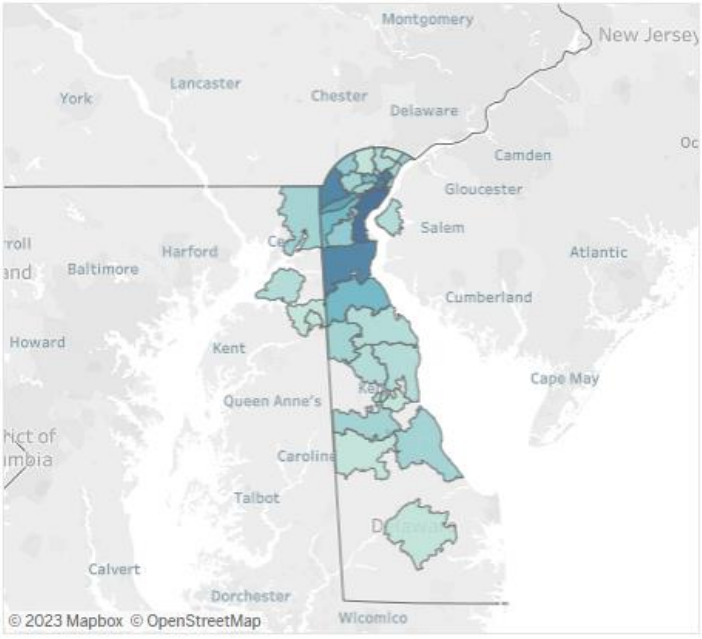
COPD Program Participant Denominator=22

** SPMI claims data does not reflect 100% of SPMI diagnoses, as CMS redacts/masks some behavioral health information.

***Lower results may be correlated to redaction/masking of behavioral health claims

3. Congestive Heart Failure (CHF) Denominator: 140 Unique Patients

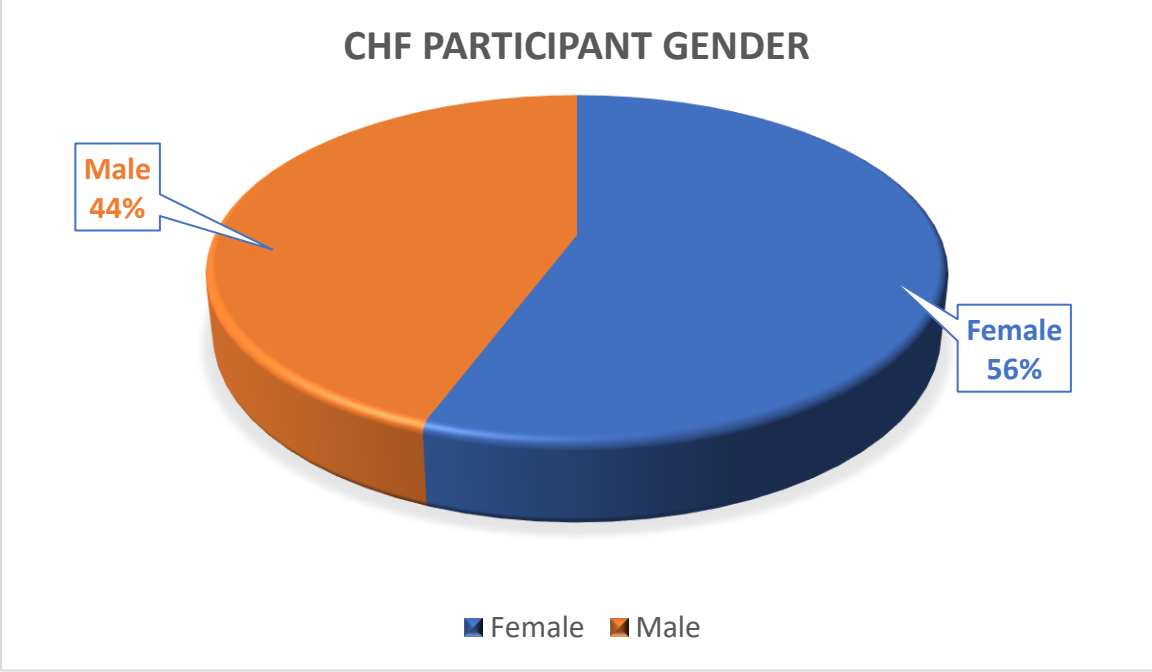
CHF Member demographic location



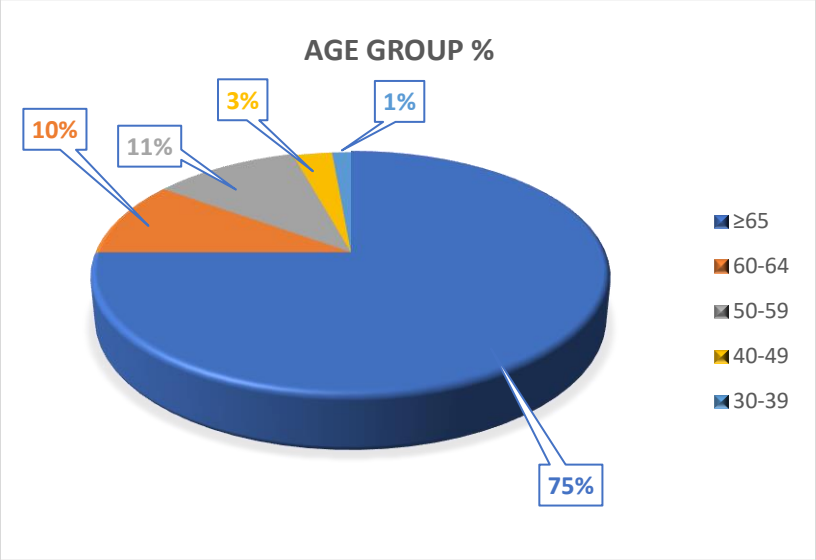
Top 3 Zip codes:

19720, 19801, and 19802

CHF Participant Gender

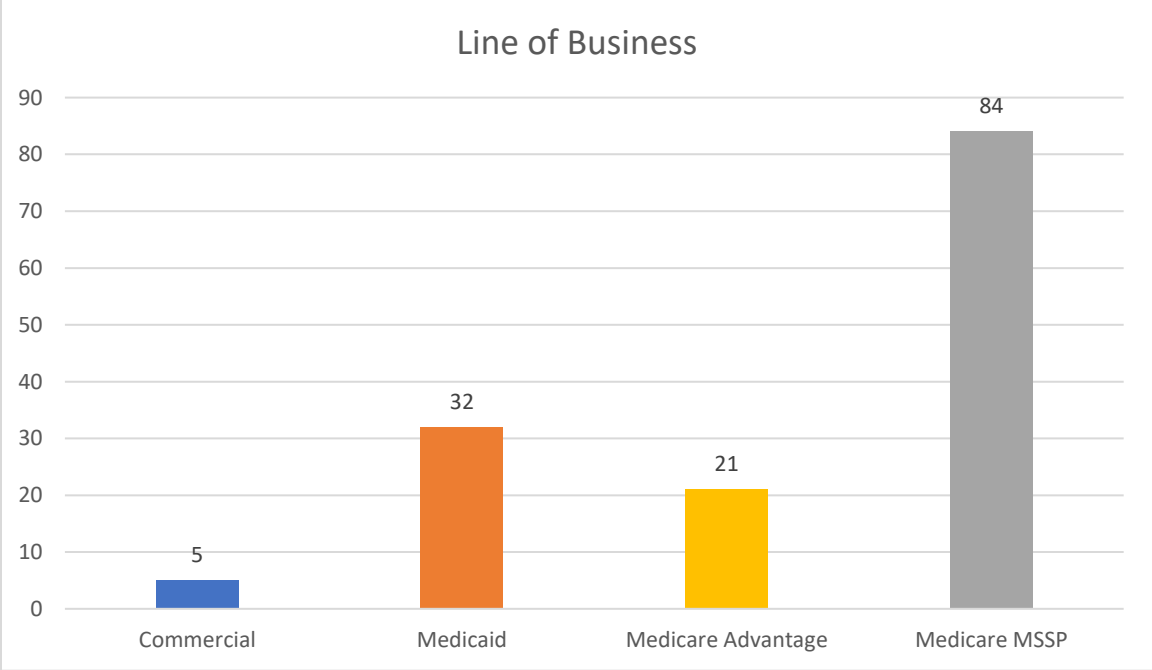


CHF Age Distribution

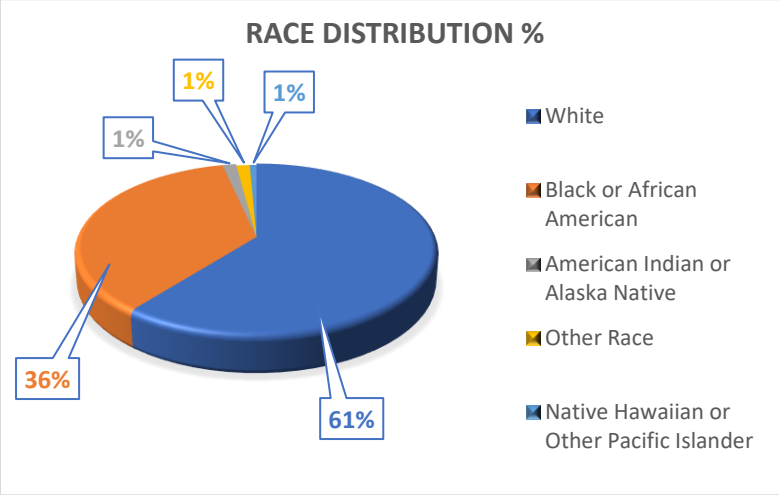


Age	Member Count	Member %
≥65	105	75%
60-64	14	10%
50-59	15	10.7%
40-49	4	2.9%
30-39	2	1.4%

CHF Participant Member Count by Line of Business

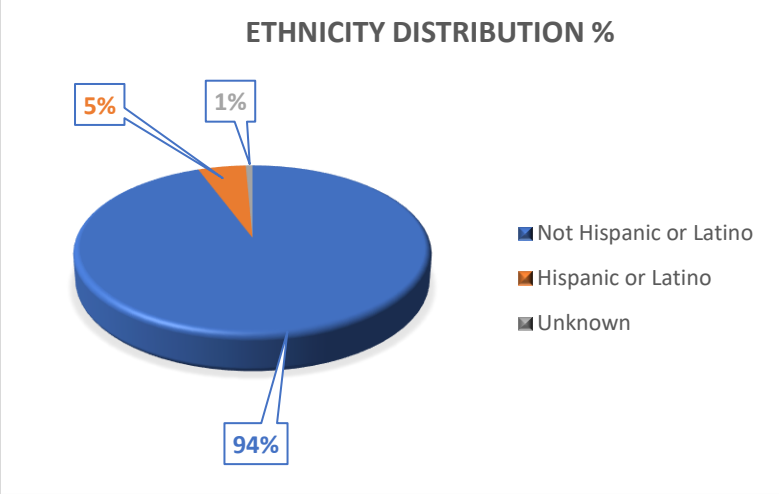


CHF Race Distribution



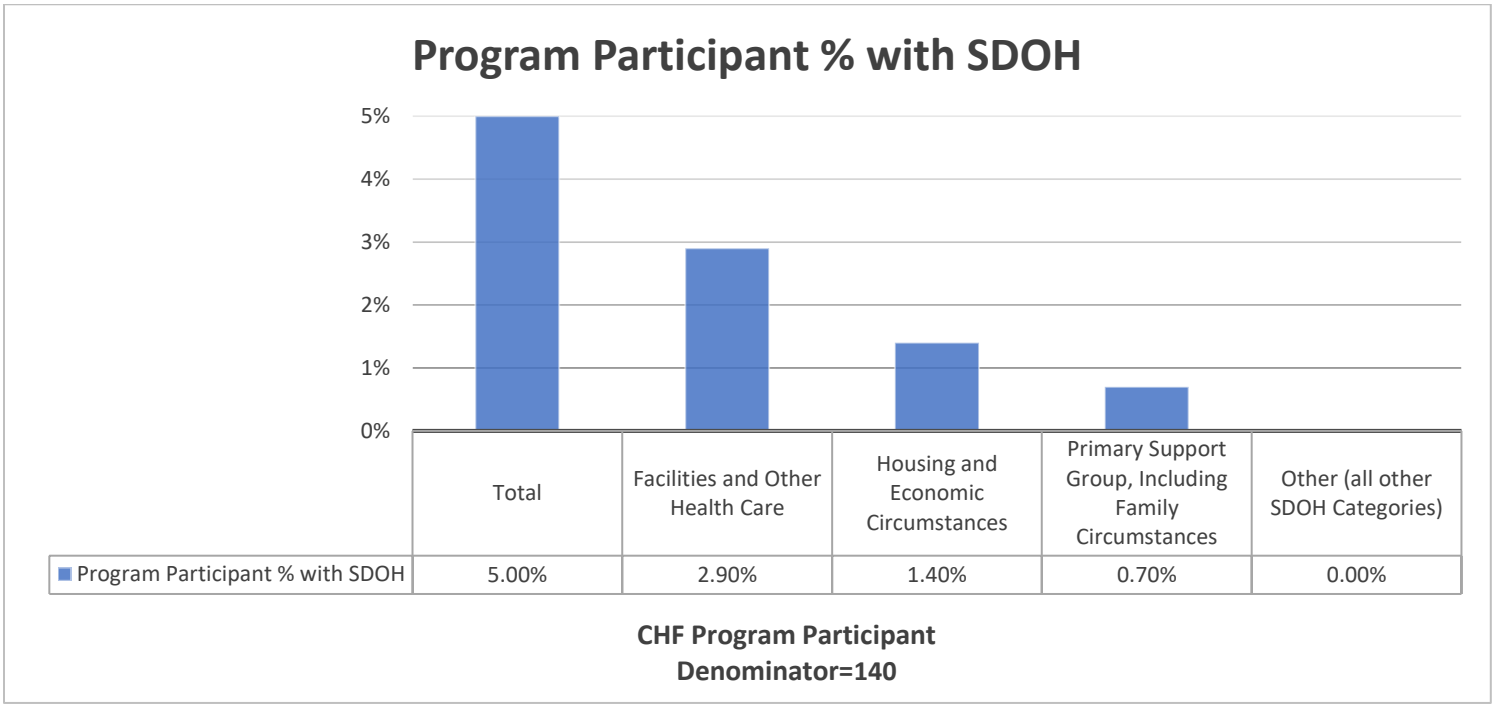
Race	Member Count	Member %
White	85	60.7%
Black or African American	50	35.7%
American Indian or Alaska Native	2	1.4%
Other Race	2	1.4%
Native Hawaiian or Other Pacific Islander	1	0.7%

CHF Ethnicity Distribution



Ethnicity	Member Count	Member %
Not Hispanic or Latino	132	94.3%
Hispanic or Latino	7	5.0%
Unknown	1	0.7%

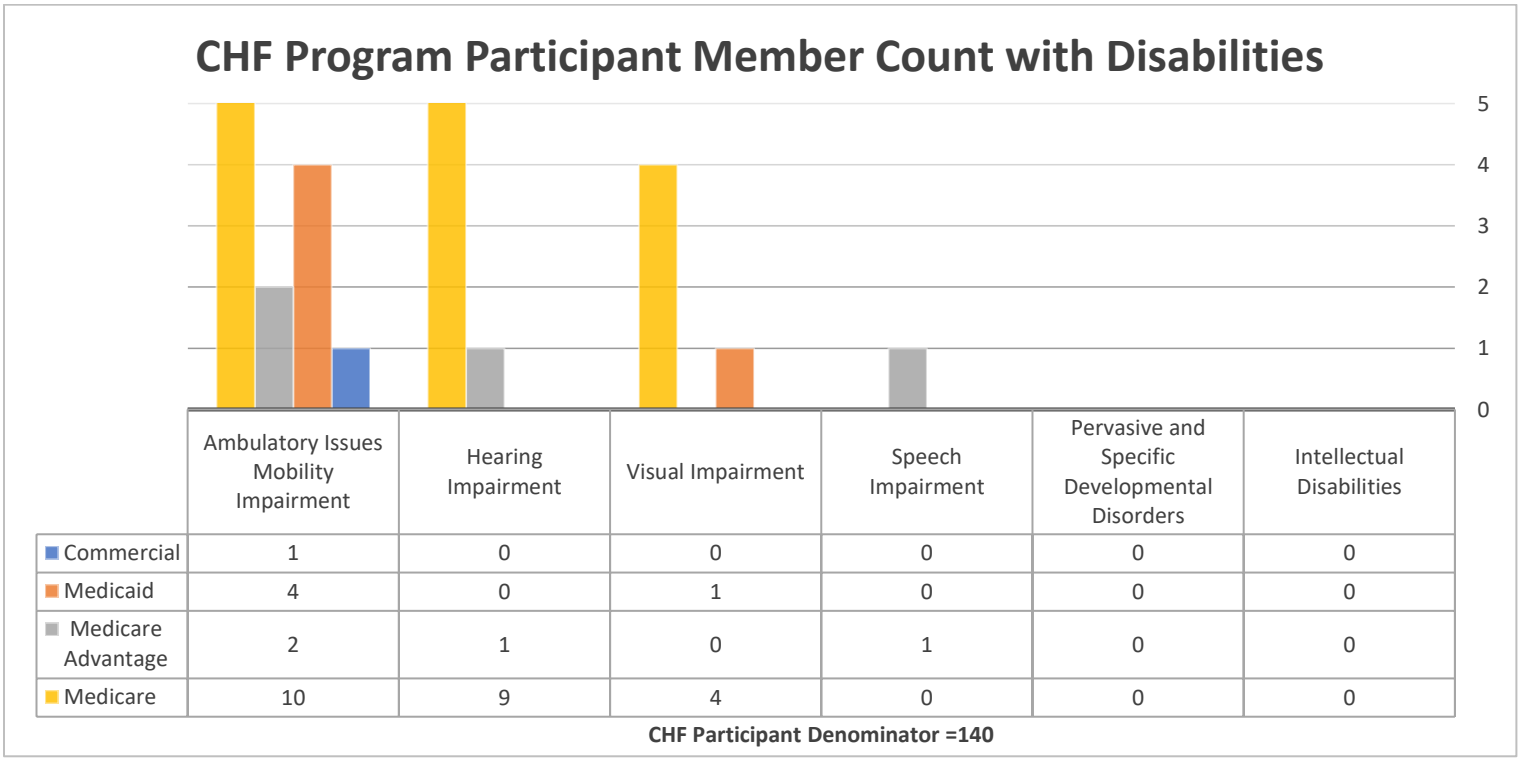
CHF SDOH



	Total	Facilities and Other Health Care	Housing and Economic Circumstances	Primary Support Group, Including Family Circumstances	Other (all other SDOH Categories)
Program Participant % with SDOH	5.00%	2.90%	1.40%	0.70%	0.00%

CHF Program Participant Denominator=140

CHF Disabilities

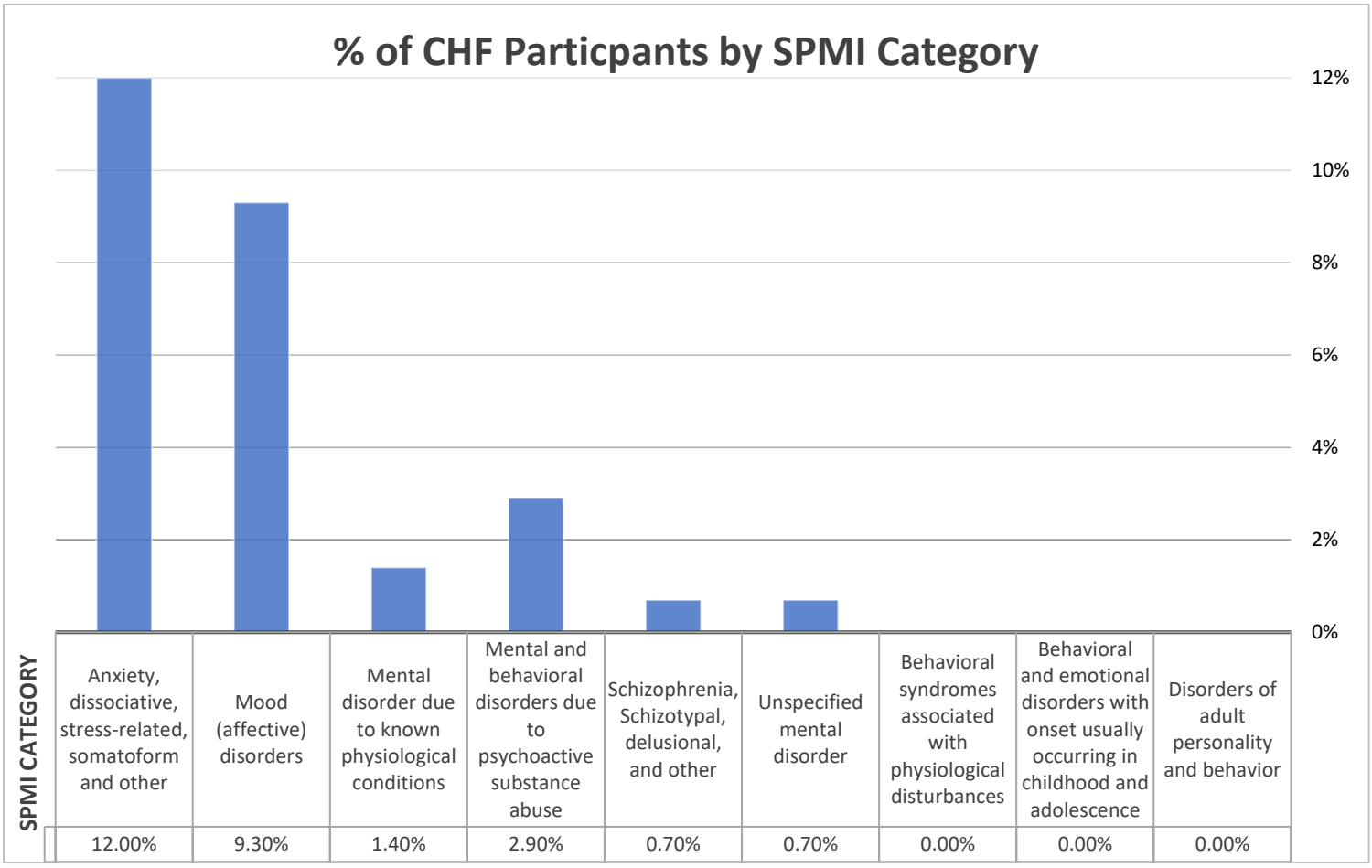


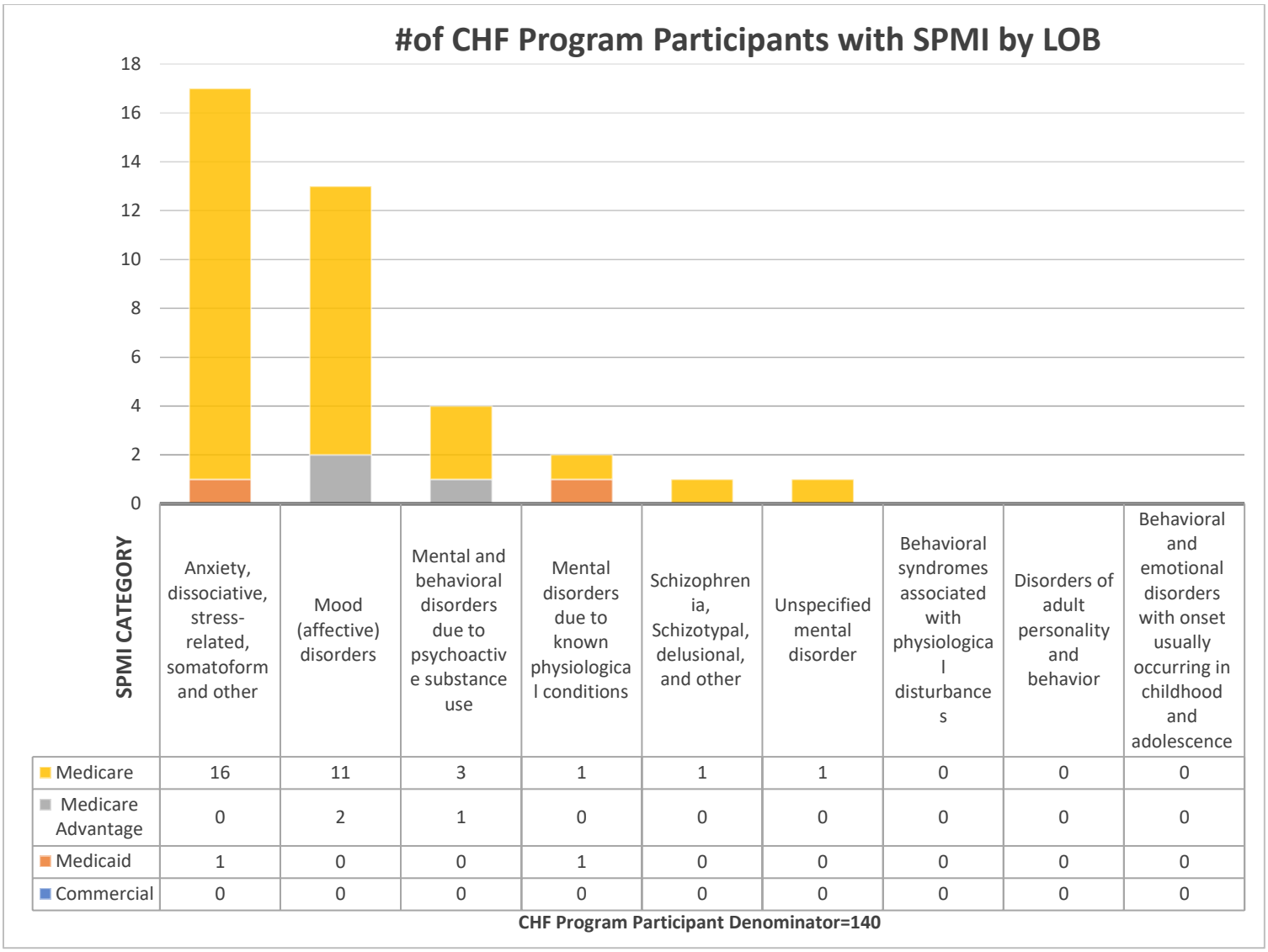
	Ambulatory Issues Mobility Impairment	Hearing Impairment	Visual Impairment	Speech Impairment	Pervasive and Specific Developmental Disorders	Intellectual Disabilities
Commercial	1	0	0	0	0	0
Medicaid	4	0	1	0	0	0
Medicare Advantage	2	1	0	1	0	0
Medicare	10	9	4	0	0	0

CHF Participant Denominator =140

CHF SPMI Distribution

SPMI Category	Total Member Count **(% of CHF Participant)**
Anxiety, dissociative, stress-related, somatoform and other	17**(12%)**
Mood (affective) disorders	13 **(9.3%)**
Mental disorder due to known physiological conditions	2 **(1.4%)**
Mental and behavioral disorders due to psychoactive substance abuse	4 **(2.9%)**
Schizophrenia, Schizotypal, delusional, and other	1 **(0.7%)**
Unspecified mental disorder	1 **(0.7%)**
Behavioral syndromes associated with physiological disturbances	0
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	0
Disorders of adult personality and behavior	0
Total SPMI Member Count of Participants in CHF Program	**38 (27%)**





SPMI CATEGORY	Anxiety, dissociative, stress-related, somatoform and other	Mood (affective) disorders	Mental and behavioral disorders due to psychoactive substance use	Mental disorders due to known physiological conditions	Schizophrenia, Schizotypal, delusional, and other	Unspecified mental disorder	Behavioral syndromes associated with physiological disturbances	Disorders of adult personality and behavior	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence
Medicare	16	11	3	1	1	1	0	0	0
Medicare Advantage	0	2	1	0	0	0	0	0	0
Medicaid	1	0	0	1	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0

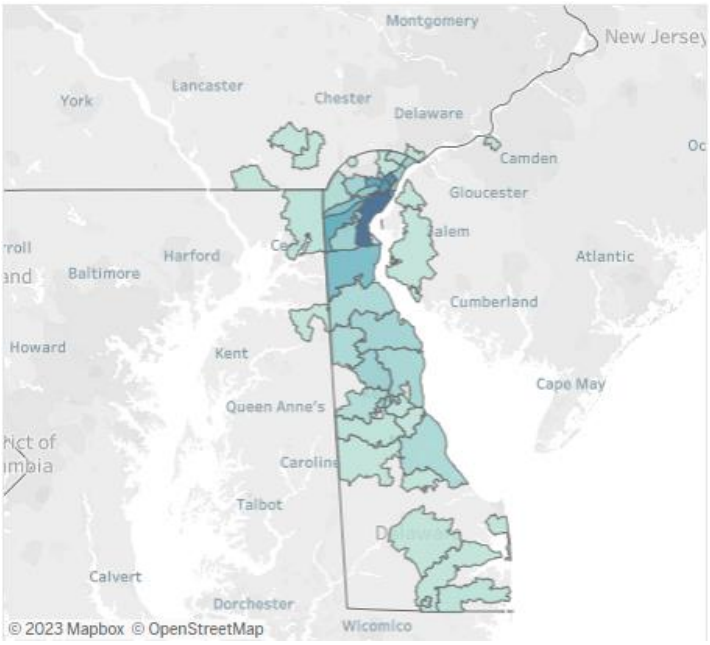
CHF Program Participant Denominator=140

** SPMI claims data does not reflect 100% of SPMI diagnoses, as CMS redacts/masks some behavioral health information.

***Lower results may be correlated to redaction/masking of behavioral health claims

4. Diabetes Program Denominator: 287 Unique Patients

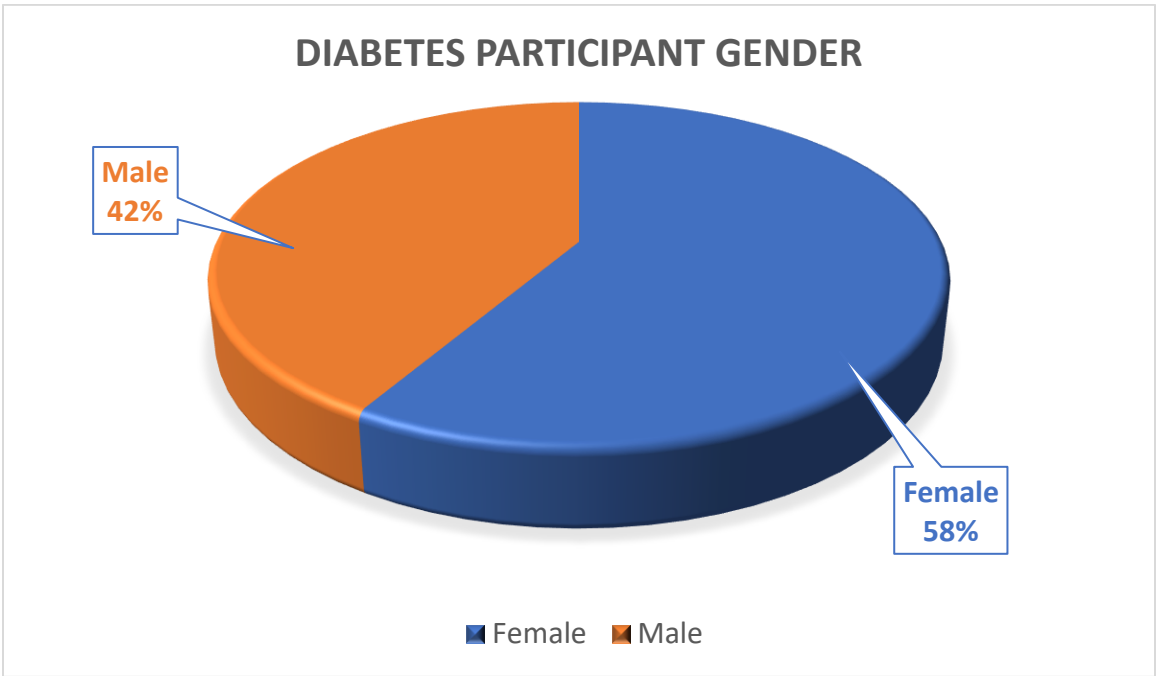
Diabetes Member demographic location



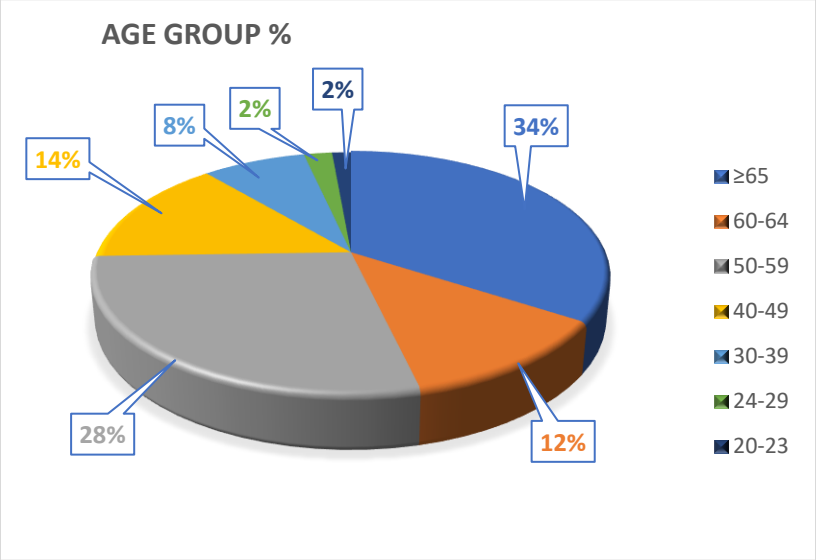
Top 3 Zip codes:

19720, 19801, and 19802

Diabetes Participant Gender

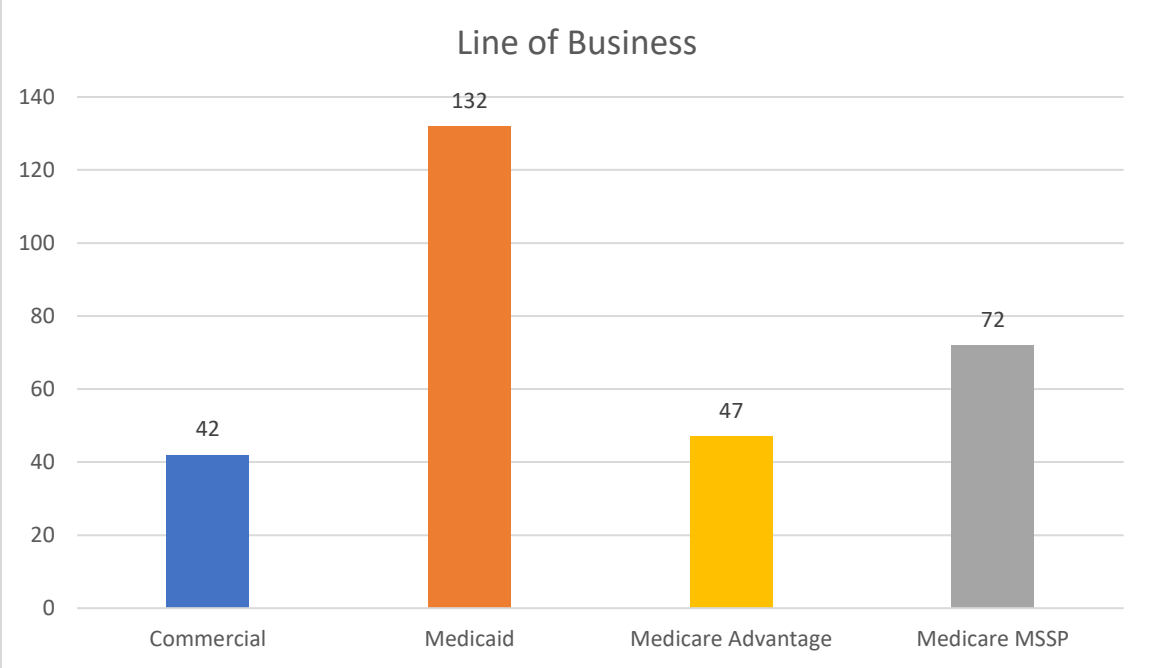


Diabetes Age Distribution

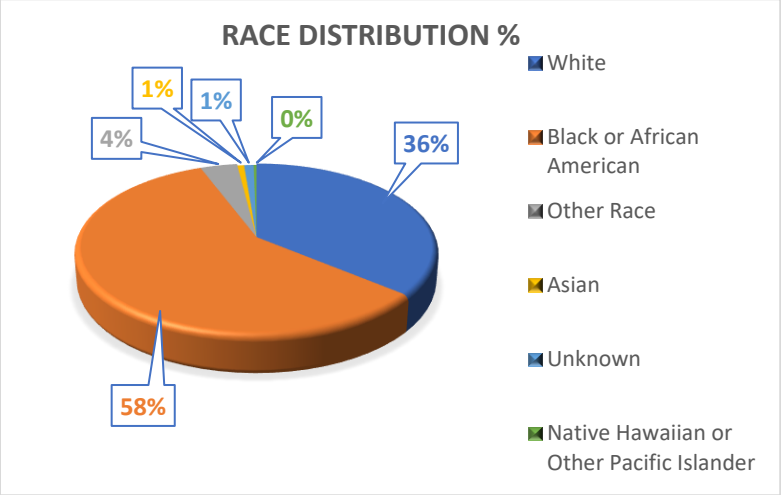


Age	Member Count	Member %
≥65	98	34.1%
60-64	35	12.2%
50-59	81	28.2%
40-49	41	14.3%
30-39	22	7.7%
24-29	6	2.1%
20-23	4	1.4%

Diabetes Participant Member Count by Line of Business

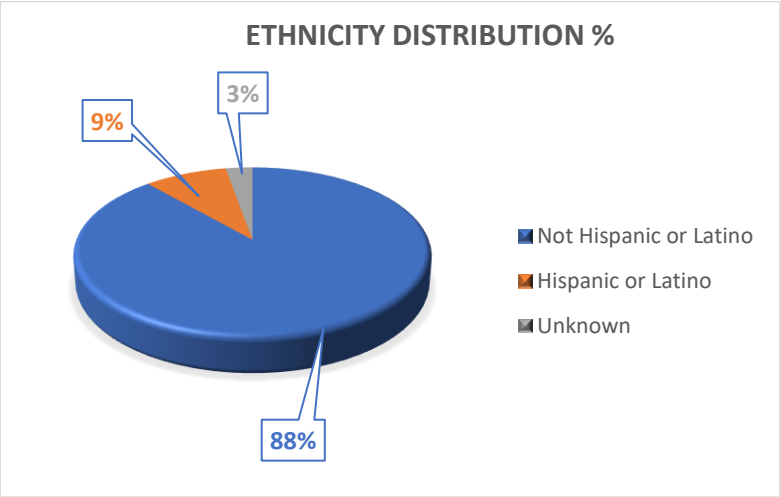


Diabetes Race Distribution



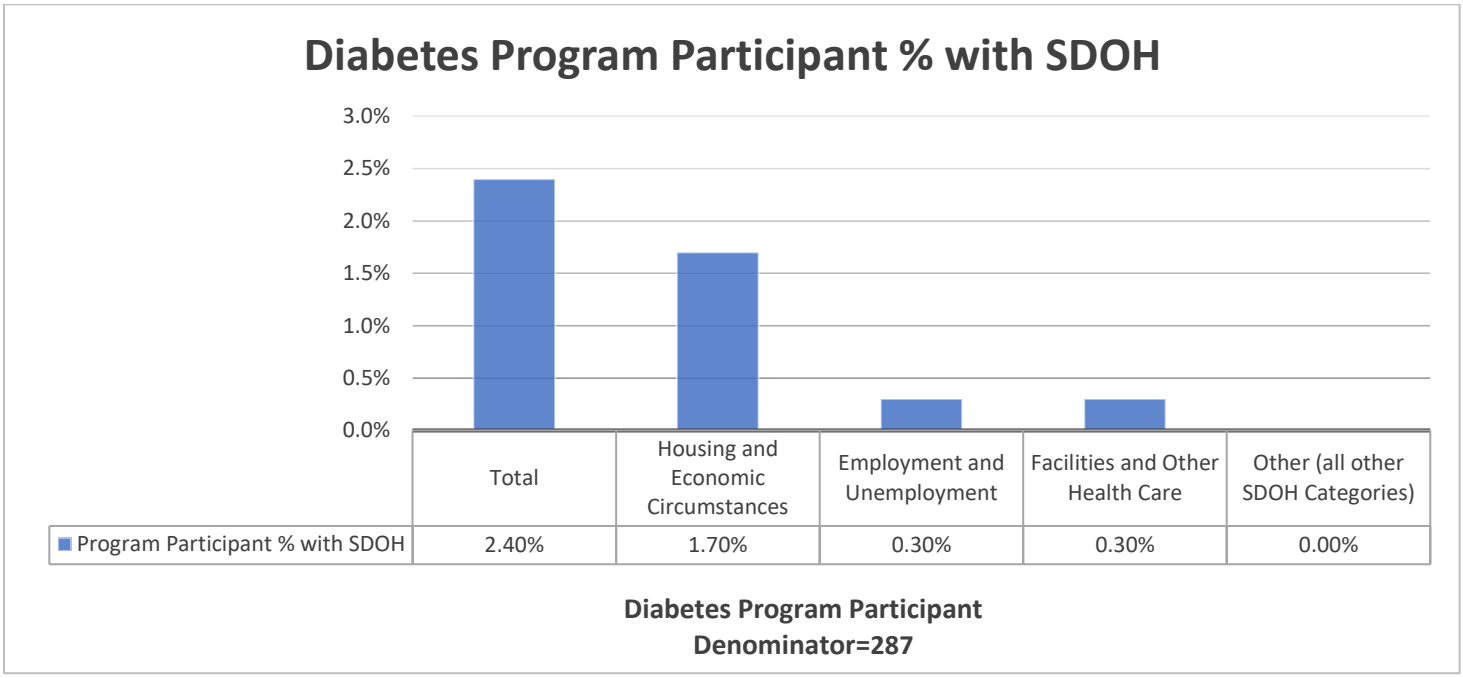
Race	Member Count	Member %
White	103	35.9%
Black or African American	167	58.2%
Other Race	11	3.8%
Asian	2	0.7%
Unknown	3	1.0%
Native Hawaiian or Other Pacific Islander	1	0.3%

Diabetes Ethnicity Distribution

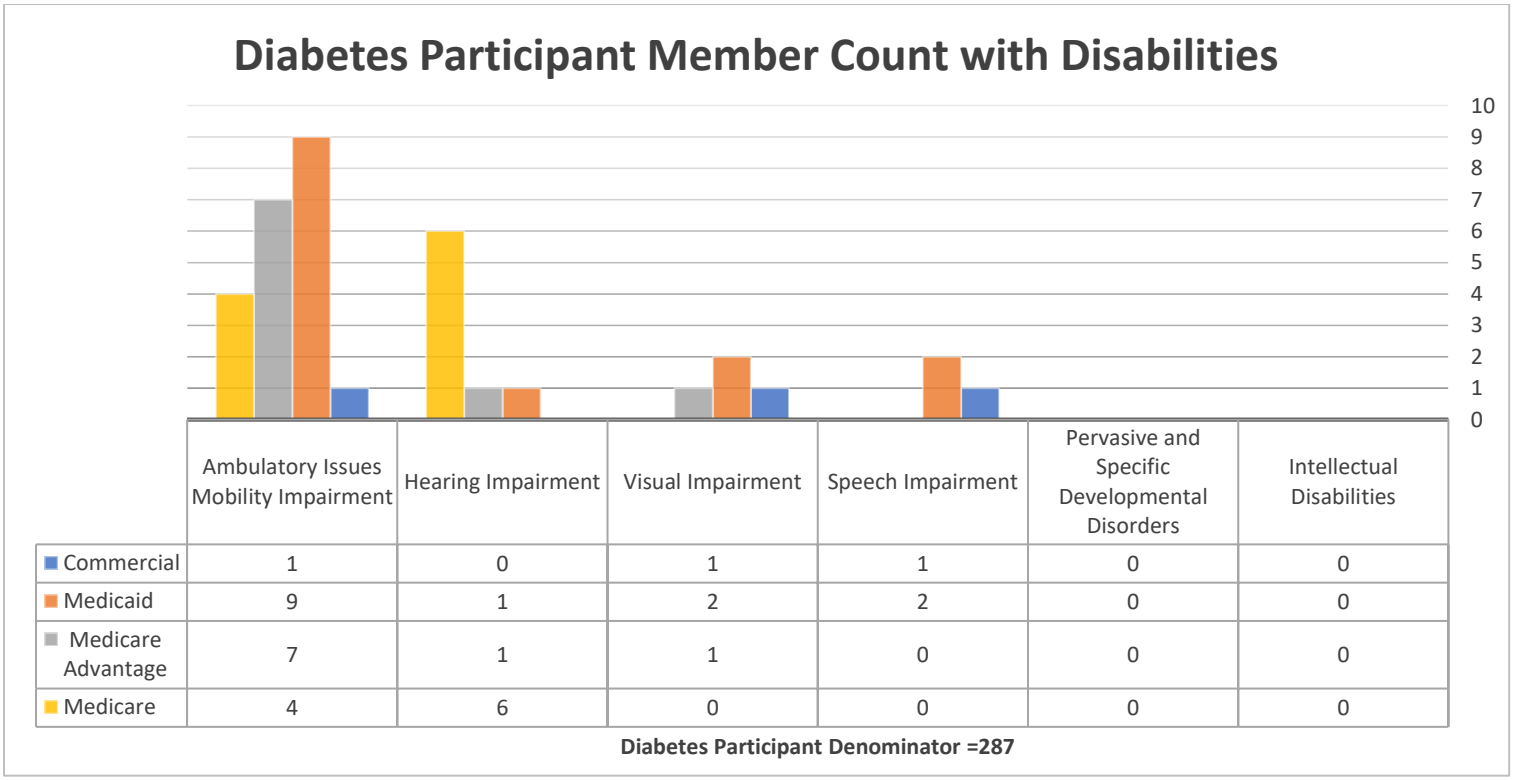


Ethnicity	Member Count	Member %
Not Hispanic or Latino	254	88.5%
Hispanic or Latino	25	8.7%
Unknown	8	2.8%

Diabetes SDOH

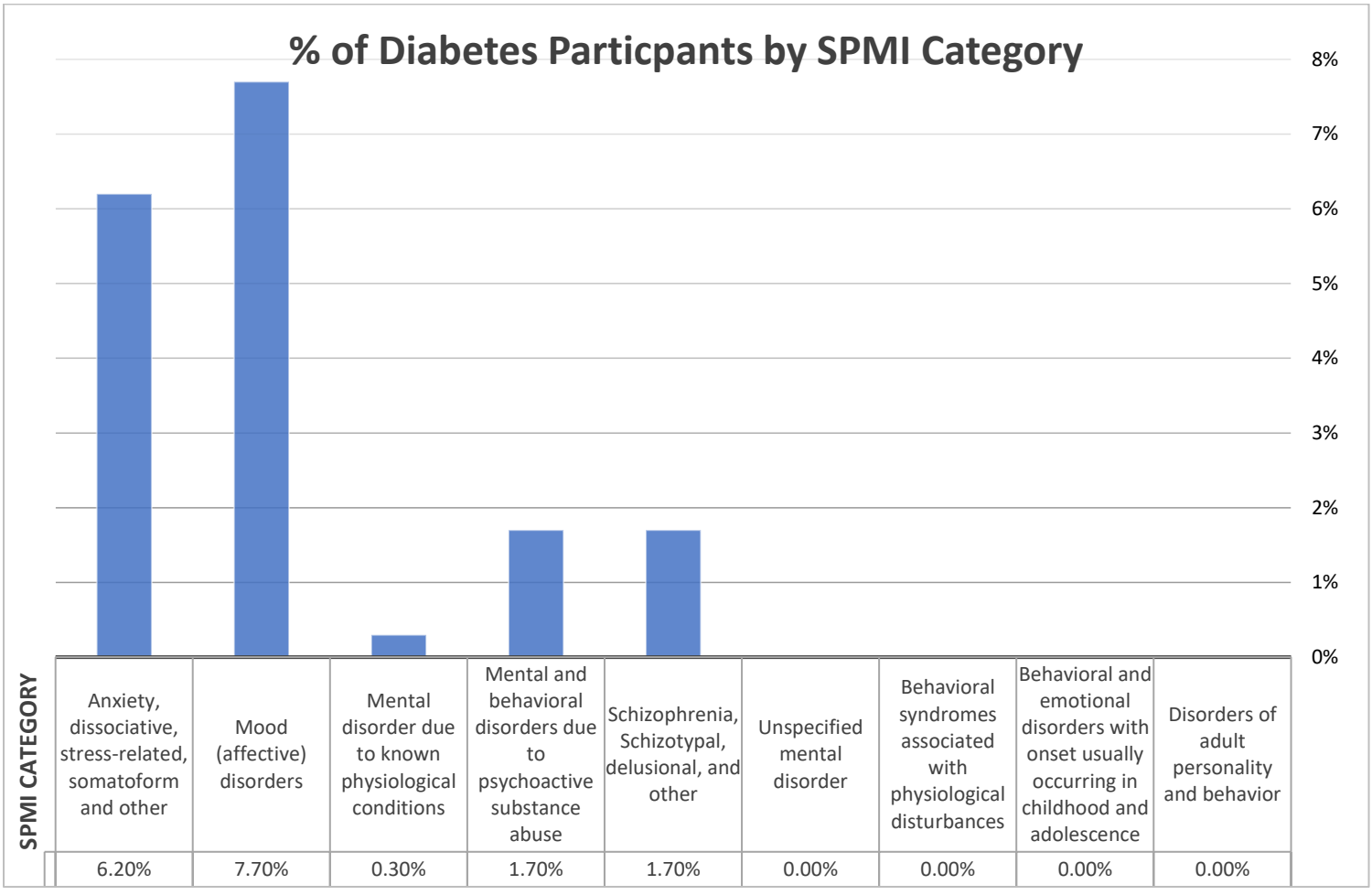


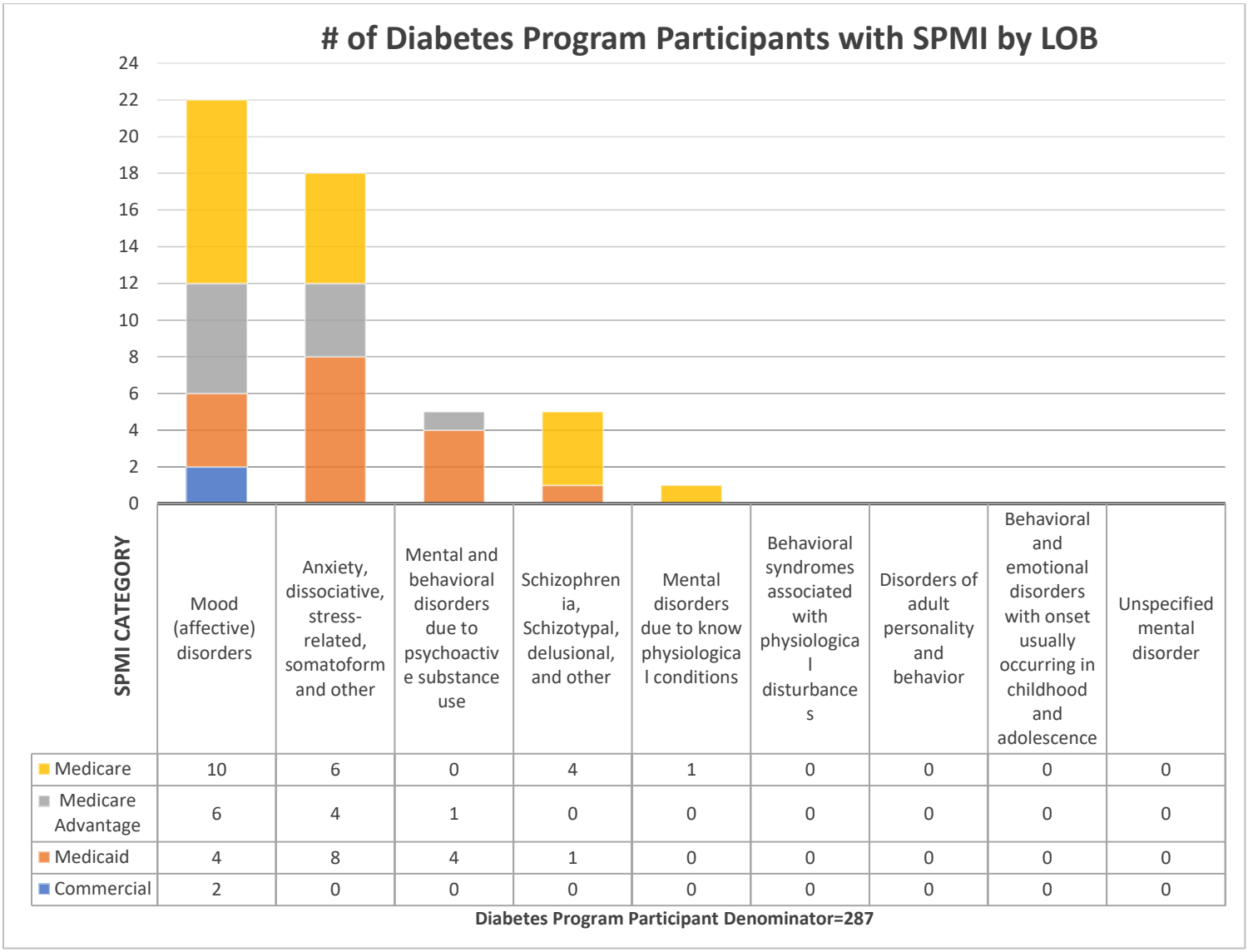
Diabetes Disabilities



Diabetes SPMI Distribution

SPMI Category	Total Member Count (% of Diabetes Participant)
Anxiety, dissociative, stress-related, somatoform and other	18 **(6.2%)**
Mood (affective) disorders	22 **(7.7%)**
Mental disorder due to known physiological conditions	1 **(0.3%)**
Mental and behavioral disorders due to psychoactive substance abuse	5 **(1.7%)**
Schizophrenia, Schizotypal, delusional, and other	5 **(1.7%)**
Unspecified mental disorder	0
Behavioral syndromes associated with physiological disturbances	0
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	0
Disorders of adult personality and behavior	0
Total SPMI Member Count of Participants in Diabetes Program	**51 (17.7%)**





SPMI CATEGORY	Mood (affective) disorders	Anxiety, dissociative, stress-related, somatoform and other	Mental and behavioral disorders due to psychoactive substance use	Schizophrenia, Schizotypal, delusional, and other	Mental disorders due to know physiological conditions	Behavioral syndromes associated with physiological disturbances	Disorders of adult personality and behavior	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	Unspecified mental disorder
Medicare	10	6	0	4	1	0	0	0	0
Medicare Advantage	6	4	1	0	0	0	0	0	0
Medicaid	4	8	4	1	0	0	0	0	0
Commercial	2	0	0	0	0	0	0	0	0

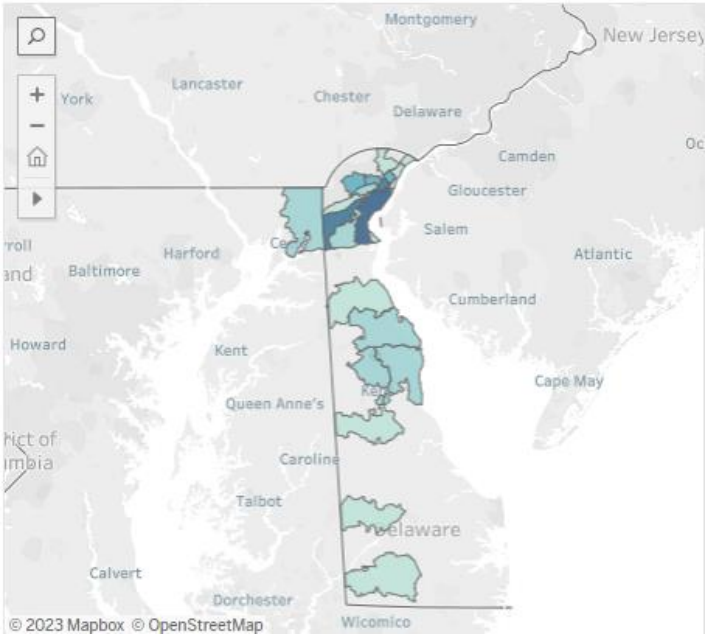
Diabetes Program Participant Denominator=287

** SPMI claims data does not reflect 100% of SPMI diagnoses, as CMS redacts/masks some behavioral health information.

***Lower results may be correlated to redaction/masking of behavioral health claims

5. High Risk Pregnancy Denominator: 56 Unique Patients

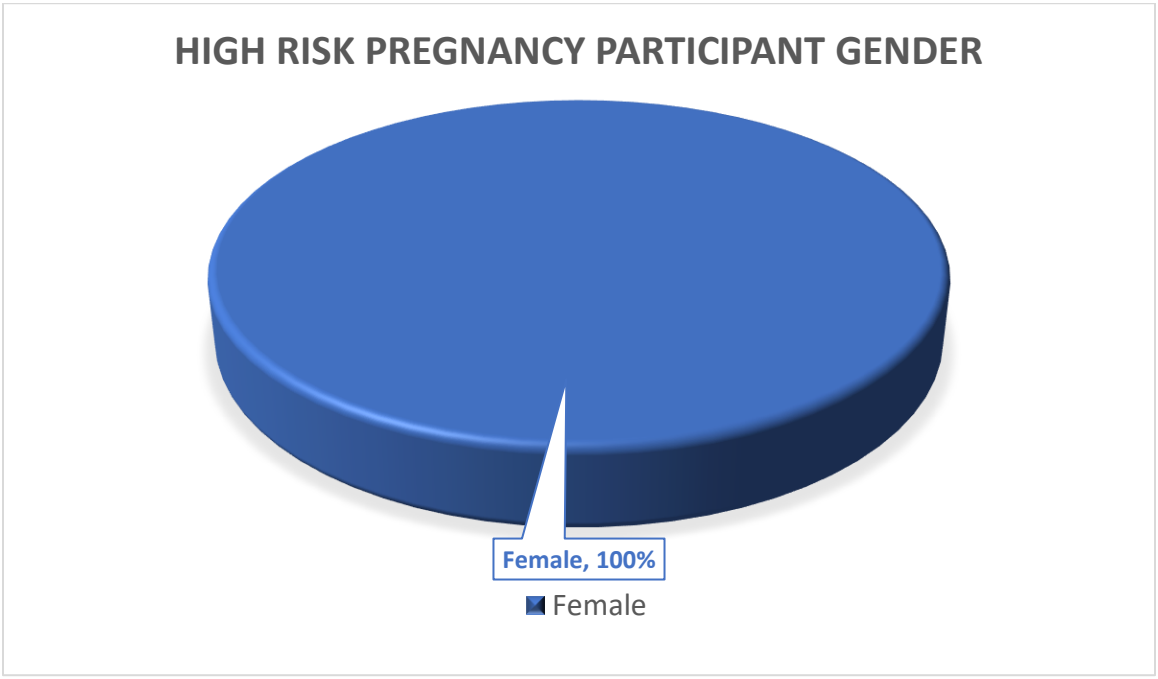
High Risk Pregnancy Member demographic location



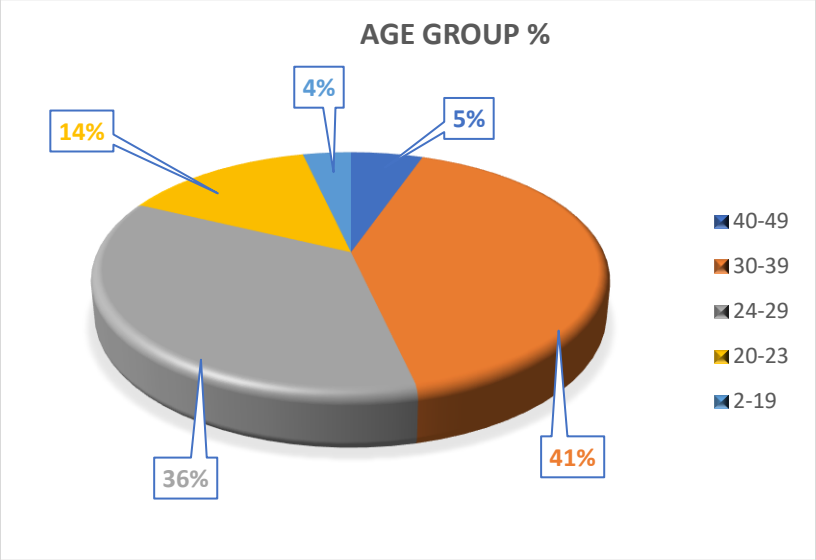
Top 3 Zip codes:

19702, 19720, and 19801

High Risk Pregnancy Participant Gender

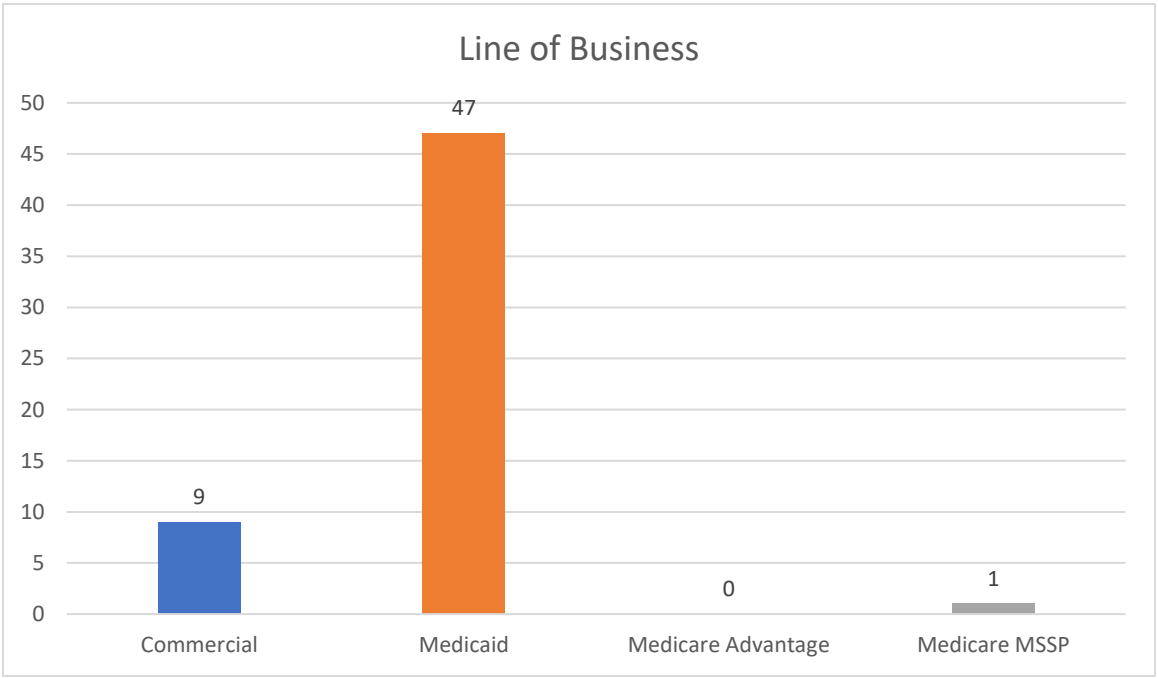


High Risk Pregnancy Age Distribution

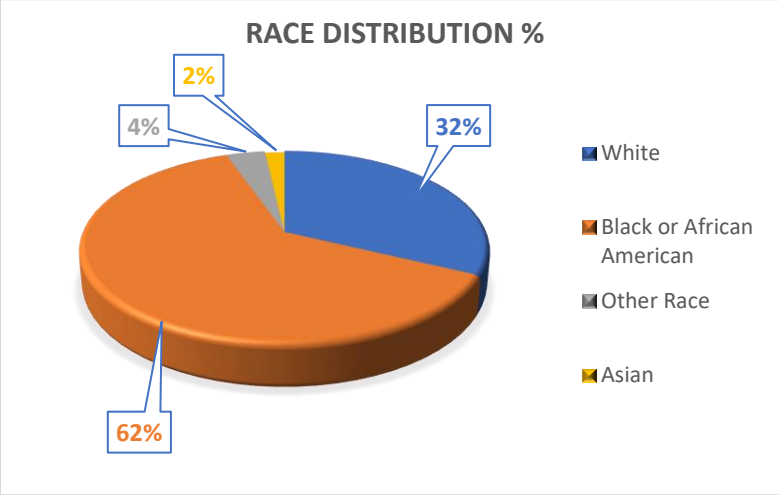


Age	Member Count	Member %
40-49	3	5.36%
30-39	23	41.07 %
24-29	20	35.71%
20-23	8	14.29%
2-19	2	3.57%

High Risk Pregnancy Participant Member Count by Line of Business

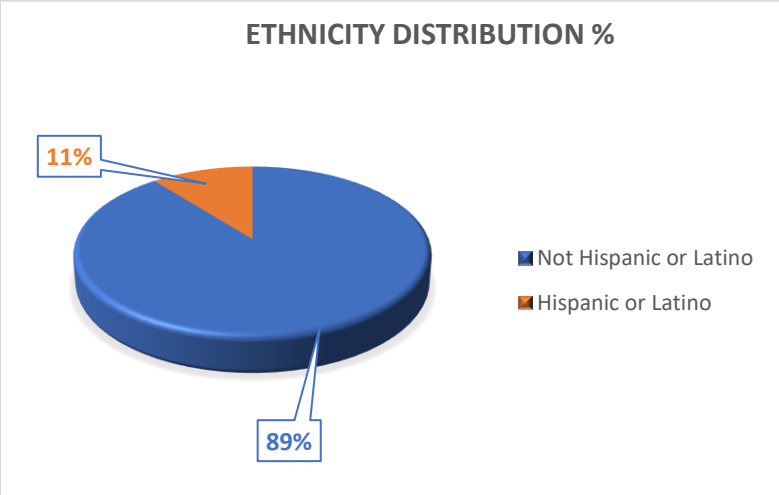


High Risk Pregnancy Race Distribution



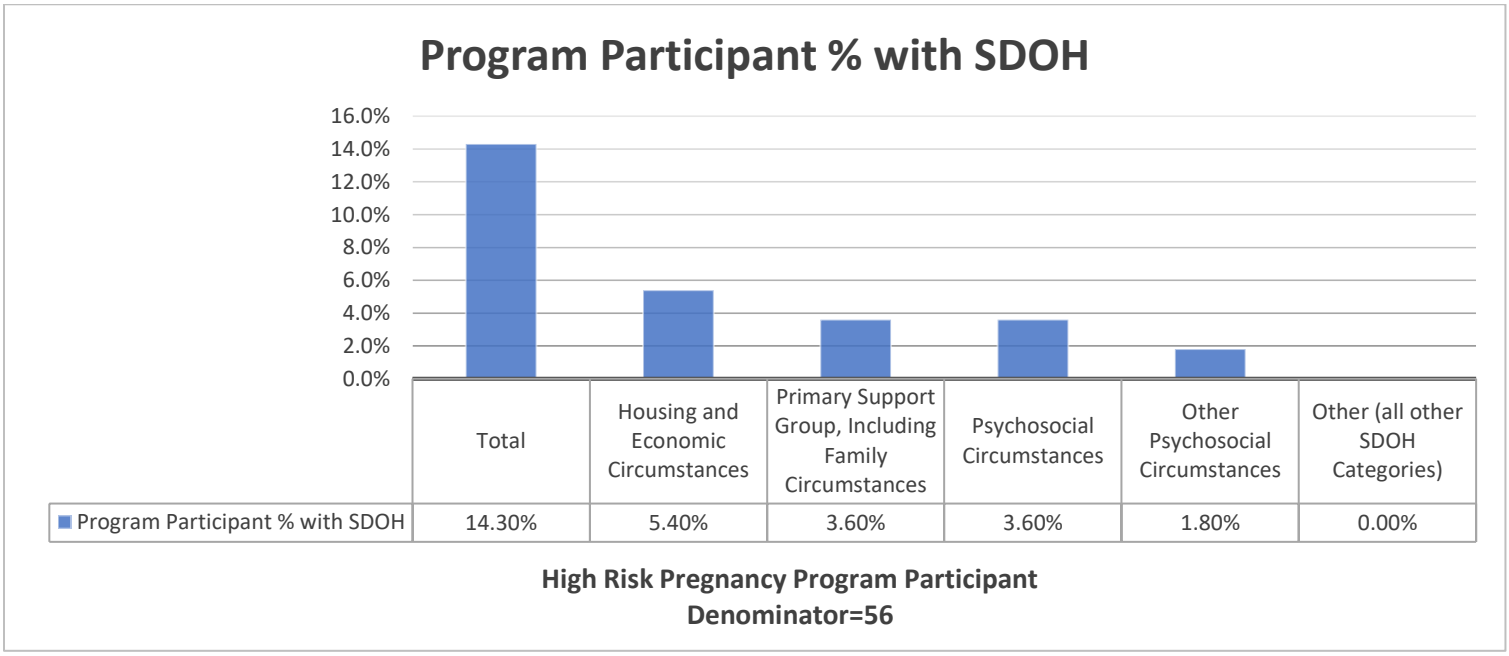
Race	Member Count	Member %
White	18	32.1%
Black or African American	35	62.5%
Other Race	2	3.6%
Asian	1	1.8%

High Risk Pregnancy Ethnicity Distribution

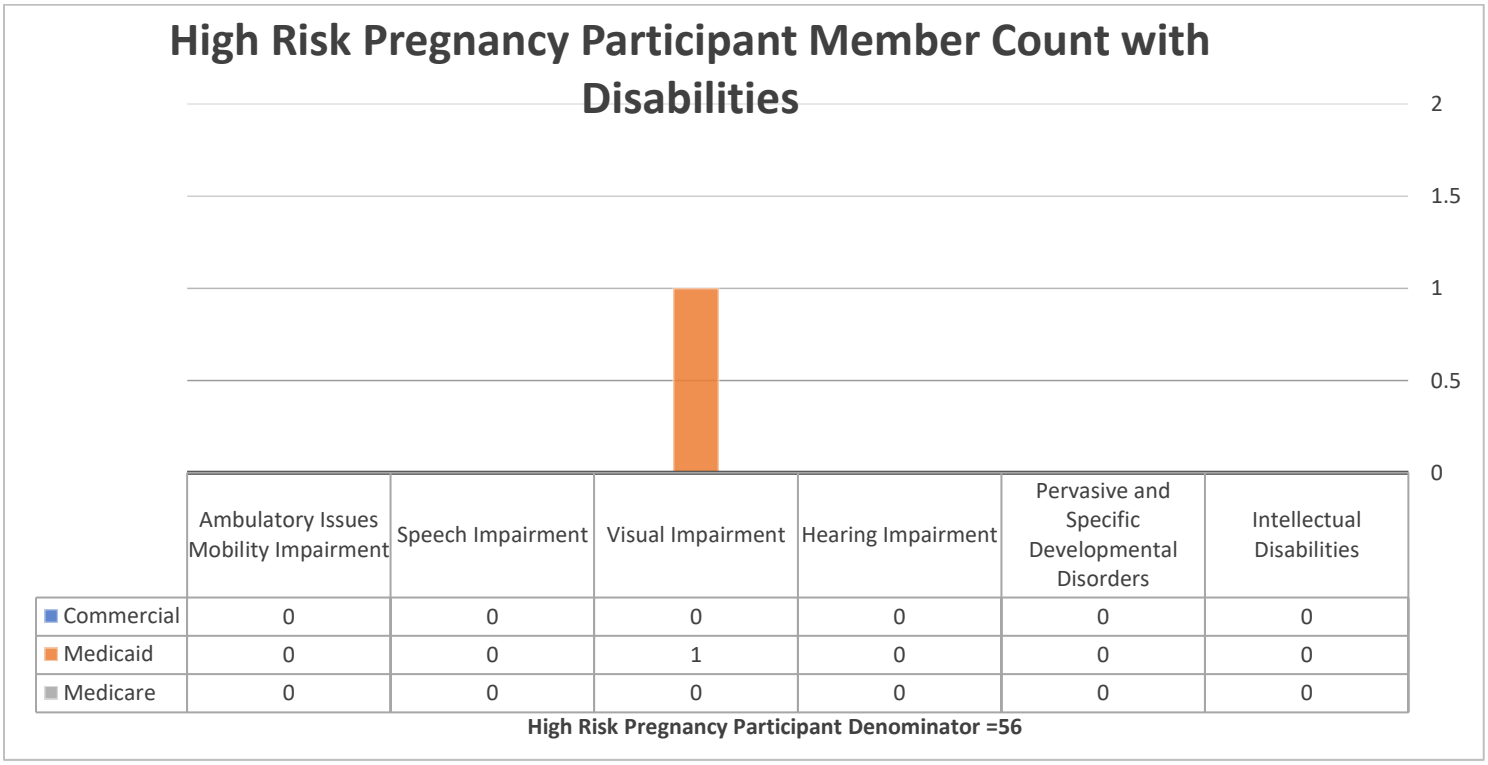


Ethnicity	Member Count	Member %
Not Hispanic or Latino	50	89.29%
Hispanic or Latino	6	10.71%

High Risk Pregnancy SDOH

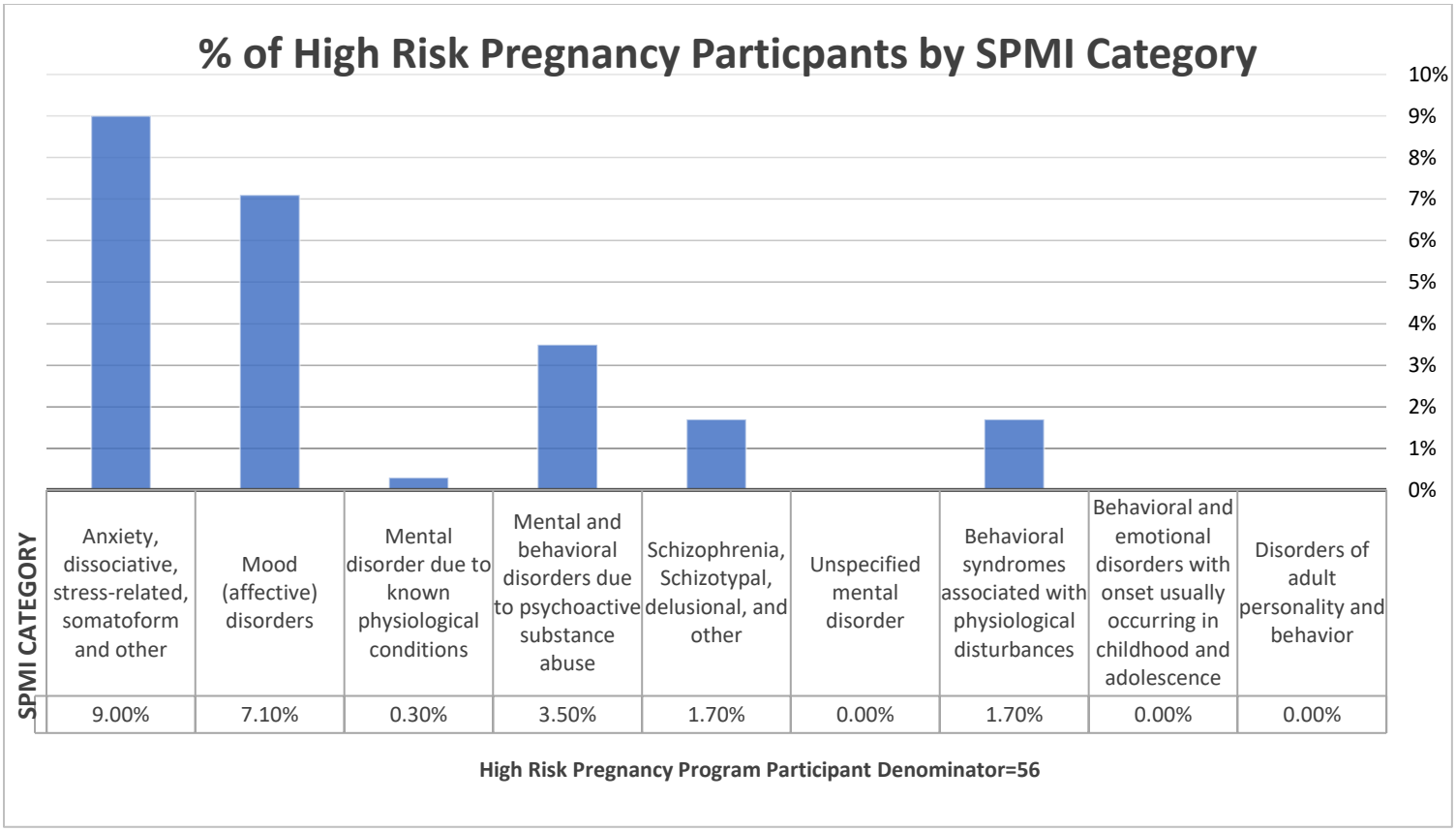


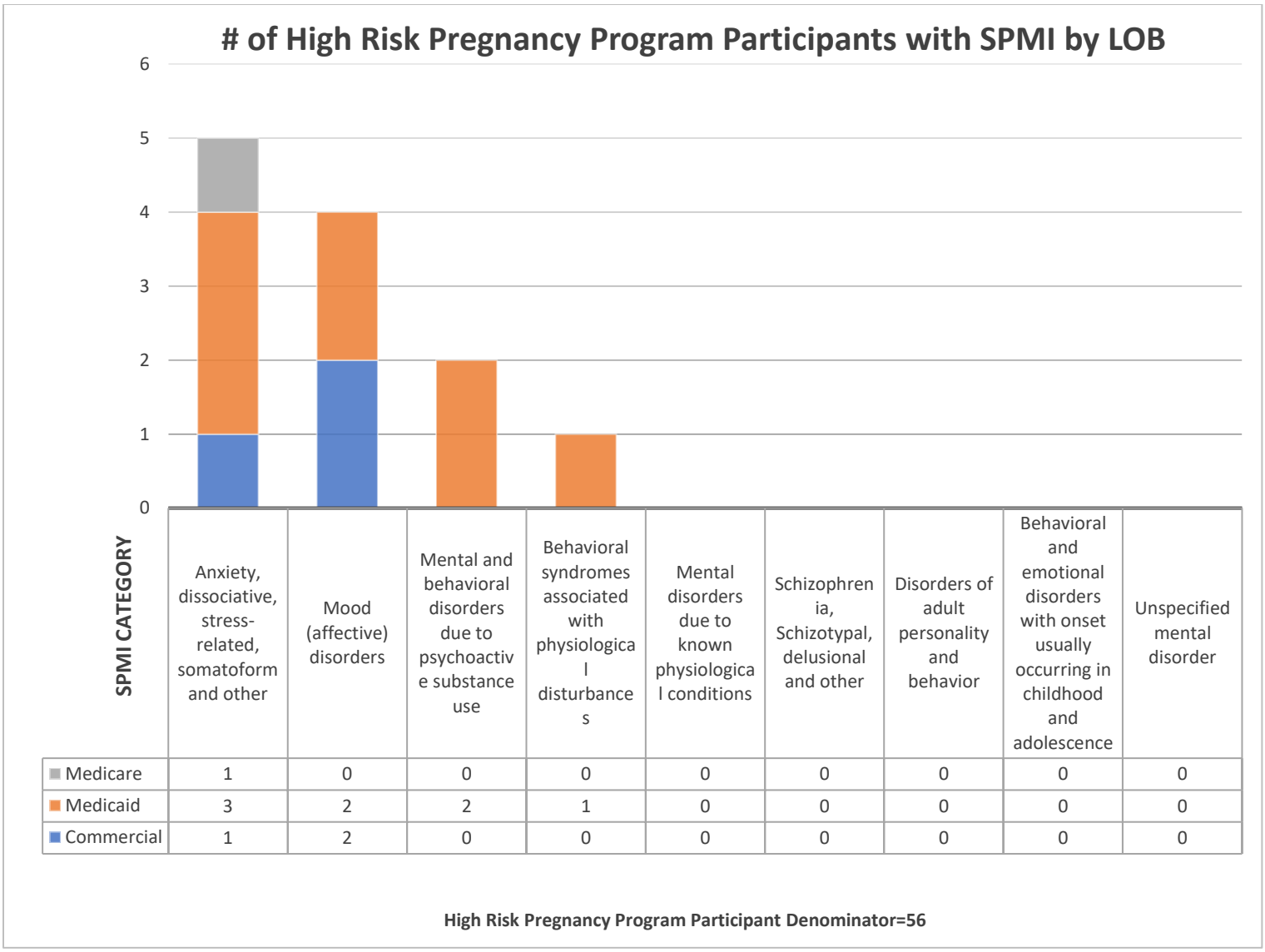
High Risk Pregnancy Disabilities



High Risk Pregnancy SPMI Distribution

SPMI Category	Total Member Count **(% of High Risk Pregnancy Participant)**
Anxiety, dissociative, stress-related, somatoform and other	5 **(9%)**
Mood (affective) disorders	4 **(7.1)**
Mental disorder due to known physiological conditions	0
Mental and behavioral disorders due to psychoactive substance abuse	2 **(3.5%)**
Schizophrenia, Schizotypal, delusional, and other	0
Unspecified mental disorder	0
Behavioral syndromes associated with physiological disturbances	1 **(1.7%)**
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	0
Disorders of adult personality and behavior	0
Total SPMI Member Count of Participants in High Risk Pregnancy Program	12 **(21.4%)**



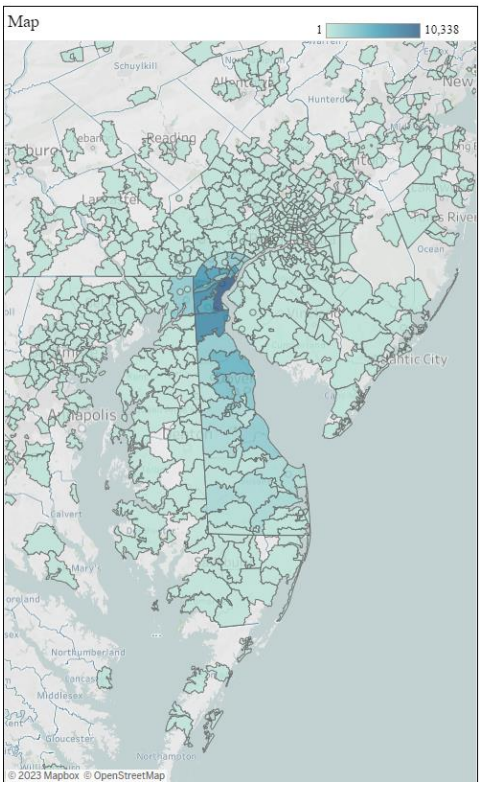


** SPMI claims data does not reflect 100% of SPMI diagnoses, as CMS redacts/masks some behavioral health information.

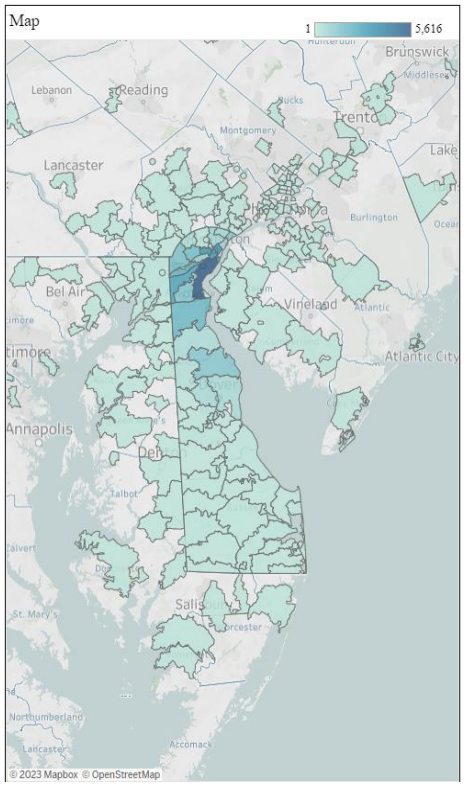
***Lower results may be correlated to redaction/masking of behavioral health claims

M. Population Assessment Heat Map

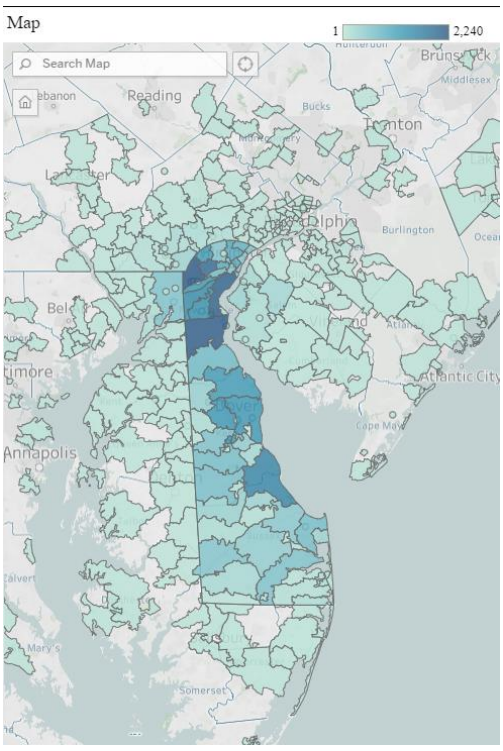
Total Population



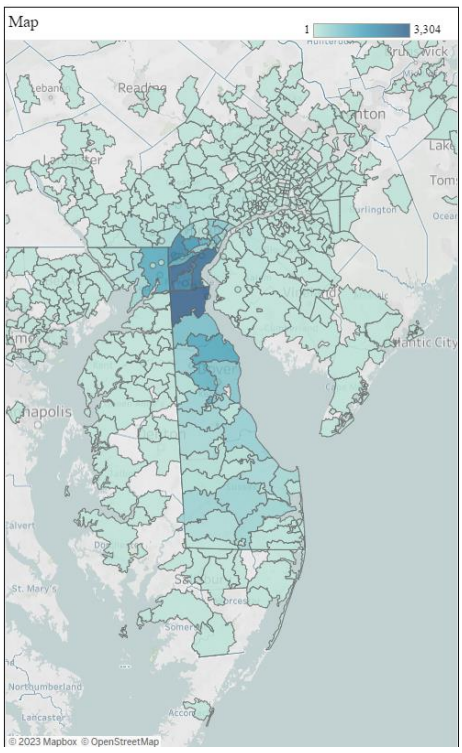
Medicaid



Medicare



Commercial



Member Count: Top 20 Cities	
WILMINGTON	31629
NEWARK	18479
NEW CASTLE	10149
MIDDLETOWN	7492
DOVER	5954
BEAR	5321
SMYRNA	4265
CLAYMONT	2321
TOWNSEND	2315
MILFORD	2301
ELKTON	2289
HOCKESSIN	2288
CLAYTON	1335
FELTON	1323
LEWES	1160
MILLSBORO	1159
SEAFORD	1151
HARRINGTON	1111
MAGNOLIA	1054
GEORGETOWN	974

IV. Executive Summary

Key Findings of Total Population

The CareVio Population Assessment for 2022 analyzes and compares CareVio member and regional data, while comparing to 2021 where applicable. This analysis focused on targeted populations, subpopulations, disease management programs, and Social Determinants of Health (SDOH). Data specific to Delaware (DE) was utilized for comparison analyses as the CareVio population primarily resides in the state of Delaware.

The total population for those within the entire CareVio population for 2022 was 124,241 members, an increase of nearly 4,400 members compared to 2021. Within this population, females were more prevalent than males, which aligns with the state of DE population as noted in data from the U.S. Census Bureau (2022 World Population by Country, 2023). The age of the CareVio population in 2022 was primarily comprised of members who were greater than or equal to 65 years of age, due to the high representation of members in the Medicare Shared Savings Program (MSSP) and Medicare Advantage attributed populations. The second most populated age range was 2-19 years old, similar to the previous year. CareVio members were primarily identified with a race of White, while the second most identified race was African American. Within the Medicaid population, African American was the most predominant race; while the Commercial, Medicare Advantage and Medicare MSSP populations identified White as the predominant race. The most frequently reported ethnicity was Non-Hispanic. As with the majority of analyses depicted above, ethnicity and primary language of the CareVio population aligned with the demographics for the state of Delaware. The number of Spanish speaking members doubled in 2022 as compared with 2021.

When evaluating for racial bias and health equity, there is a high correlation between race and ethnicity in specific zip codes within Delaware. In Northern New Castle County, zip codes 19805, 19802, 19801 and 19720 have a high ratio of non-White residents. In addition, although CareVio's total population is approximately 25% Black or African American, there is a significantly higher percentage of Black or African American members enrolled in its programs. CareVio recognizes that to achieve Health Equity in Delaware, these areas may require more resources than others. CareVio has embedded Registered Nurse Case Managers within Primary Care Practices where SDOH reports are high, racial disparities are identified, and Medicaid populations are noted to be more prevalent. Additionally, the southern geographic portion of Delaware, is noted to having inequities in healthcare access due to limited access of primary care. In late 2022, the state of Delaware launched an online dashboard to identify equity gaps. Use of this dashboard provides CareVio with a resource to identify health inequities across the state of DE and in zip codes where CareVio members reside. "Of the 3 counties in Delaware state, the entirety of Sussex and Kent County and a few areas of New Castle County have been federally designated as 'medically underserved'" (Malayala, 2021).

Geocoding

The geocoding heat maps for the 2021 and 2022 CareVio Population Health Assessment are consistent, including that the most populated zip code of the CareVio population is 19720, located in New Castle County. The population in this zip code accounts for 8.3% of the total CareVio population. The city of New Castle (zip code 19720) has a poverty rate of 11%, according to the Delaware Department of Health and Social Services (2022) and represents 54% of the Medicaid beneficiaries of the total CareVio population. It will be shown later in this report that CareVio programs have a high number of enrolled Medicaid beneficiaries that reside in the city of New Castle. Delaware Department of Health and Social Services (2023) noted that the poverty rate for zip codes 19801, 19802, and 19805 ranges from 20-26%; these three zip codes account for approximately 12% of

the CareVio total Population. It will be important to compare disease prevalence and SDOH needs for CareVio members residing in these zip codes vs. the rest of the CareVio population.

The commercial population is noted to predominantly reside in the northern part of the state where the businesses associated with commercial insurance are located. In 2022, it was observed that the population with commercial insurance has grown to include more regions in the neighboring states of Maryland, Pennsylvania, and New Jersey. Most commercially insured members reside in the zip code 19709, located in New Castle County. This zip code according to Delaware Department of Health and Social Services (2023), has a very low poverty and deprivation index. Accordingly, there were only 42 members (representing 0.03% of CareVio total population) who resided in this zip code that participated in CareVio programs, which may indicate better health outcomes and healthy equity in that geographic area.

The Medicaid population primarily resides within more urban zip codes, which are common areas of poverty in the state. The zip codes including 19801, 19720, 19805 and 19802 represent the highest Medicaid population in the state. Within those zip codes, the CareVio total population is 25,158 (20.2%) members, with 61% attributed to Medicaid.

There are differences in the geographic and demographic data between 2021 and 2022 relative to attributed insurance. Due to a change in the CareVio contractual population, there is a higher distribution of members who reside outside of the Delaware state borders. In 2021, most of the Medicare population (Medicare MSSP and Medicare Advantage) resided in southern Delaware, specifically Sussex County. In 2022, the Medicare MSSP overall member attribution decreased by more than 11,000 members. This change was due to fewer Accountable Care Organization (ACO) participating provider practices in Sussex County; hence fewer ACO members in the CareVio population. Also due to contractual changes, there were fewer members with a Commercial insurance payer in 2022. In 2022, the population with Commercial insurance resided in a more widespread demographic region. Additionally, in 2022 the Medicaid overall member attribution increased by almost 10,000 members.

Top 20 Physical Health Conditions in 2022

Preventative care remained the most frequent condition across the claims for all insurance payers. There was a decrease in the number of preventative care claims for the Commercial and Medicaid population, and a slight increase in the Medicare Advantage and Medicare MSSP population as compared with 2021. In 2022, infectious disease was the second most frequent claims clinical category, similar to 2021 data for the total CareVio population. Within the Commercial, Medicare MSSP, and Medicaid population, Infectious disease was within the top three most frequent clinical categories. One key difference identified found that the Infectious Disease category was the fifth most frequent in the Medicare Advantage population. Further analysis conducted identified that the top two claims' diagnoses (per ICD-10 codes) in the infectious disease clinical category were COVID-19 related. Urinary Tract Infections were a frequent recurring ICD-10 claim among the Medicaid and Medicare Advantage populations.

The Medicare Advantage and Medicare MSSP populations data showed that Cardiovascular was the second most frequent clinical category. The ICD-10 code for Essential (Primary) Hypertension was the top reported claim code in cardiovascular clinical categories for the total population as well as all insurance payer claims analyses. It is also noteworthy that within the Medicaid Top 20 Clinical Categories claims reported, Pregnancy was noted, whereas it was not noted in the 2021 data.

Within the total population of 2-19 years of age, infectious disease was the second most frequent clinical category followed by Acute Upper Respiratory Infections (URI). Similar to the data above, the infectious

disease clinical category was mainly comprised of COVID-19 related claims. The acute URI clinical category in the Commercial population for those 2-19 years of age was related to claims diagnoses of acute URI unspecified, acute pharyngitis and streptococcal pharyngitis. Analysis of the Medicaid population of 2-19 years of age revealed that acute URI, acute pharyngitis, and influenza were the top reported claims codes. Ear infections (Otitis Media) was identified as a top reported claim code among the analysis of the total population and individual payers for those age 2-19. This finding is not surprising given the age range and reported statistics that 80% of all children experience a case of otitis media in their lifetime (Danishyar, 2022).

Social Determinants of Health

As discussed in the CareVio 2021 Population Health Assessment Report, Social Determinant of Health (SDOH) data can be difficult to obtain. Historically, SDOH screening data was obtained during provider office visits, hospital utilization visits or while members were in community settings but was not commonly collected in claims. Secondary to the upcoming 2024 mandatory reporting of SDOH by the Centers for Medicare & Medicaid Services (CMS), more SDOH data was available in 2022. Identification of SDOH needs is critical as "SDOH are primary drivers of population health, with up to 80% of health outcomes being attributed to socioeconomic factors, physical environment, and health-related behaviors" (Heidari, et al., 2023).

SDOH data collection in 2022 varied slightly from data collection in 2021. In 2022, more SDOH Category data Z-codes (11) were utilized to identify specific and individualized needs within the total CareVio population (see Appendix C). Approximately 10% of the CareVio total population reported at least one SDOH need. The SDOH category "Housing and Economic Circumstances" was the most frequently reported need. The second most frequent SDOH category was a need for "Facilities and Other Health Care", which rose slightly from 2021 data. The SDOH category "Primary Support Group Including Family Circumstances" was the third most reported determinant, a change from 2021 data.

When comparing the SDOH needs of the population from 2021 to 2022 within the Medicare and Medicare Advantage populations, the most notable change is that the determinant of "Social Environment" has decreased. This change may be related to a decrease in social isolation that was prevalent secondary to the COVID-19 pandemic. The change in this determinant need is encouraging. It is possible that less social isolation in 2022 has resulted in improved mental and health outcomes. A study related to "Social Isolation and Health" noted that being socially connected significantly reduces the risk for mortality and increases survival by 50%. An increase in the relation between social isolation influencing mental and cognitive health, as well as physical health was identified in the meta-analysis (Holt-Lunstad, 2020).

In 2022, the Medicaid population had the highest (58%) number of SDOH needs reported. Within this population, "Housing and Economic Circumstances" was the highest determinant need (similar to 2021), followed by "Primary Support Group, Including Family Circumstances". Through Geocoding, the area with the highest need for housing and economic circumstances was in the geographical zip code 19801. According to the state of Delaware "Equity Counts Data Center" (Delaware Department of Health and Social Services, 2023), this zip code has an approximate population of 17,447, with a poverty and area deprivation index that is twice that of the entire state. CareVio's population within that zip code is 4,113, which is 26% of the total residents. Within the CareVio population in this zip code, 76% of the population has Medicaid, most are young to middle age (ages 2-39), 71.5% are African American, and 52% are female.

Language literacy was evaluated amongst any CareVio population member reporting SDOH. English was the most commonly reported language (96%), followed by 'Undetermined' as the second most common response. This data aligns with the overall total population noting 'undetermined' as the second highest response amongst all claims data.

Disabilities

In 2022, CareVio reporting expanded the number and type of disabilities reported. Expanding data collection to include other disabilities provides CareVio the opportunity to develop a more robust strategy to promote Health Equity among its population. Additionally, capturing expanded data categories aligns with those efforts put forth by the United States Census during American Community Surveys (U.S. Census Bureau, 2021). Members with a majority of "Pervasive and Specific Developmental Disorders" (such as Autism, Asperger's, etc.) were most prevalent in the Commercial population. This finding may be due to younger members covered on parental insurance. The Medicare MSSP and Medicare Advantage population noted hearing impairment and ambulatory or mobility issues as the top reported disability. According to the Centers for Disease Control (CDC, 2022), of those with some type of disability, 11.1% were mobility/ambulatory related. The total CareVio population that identified with disabilities accounts for 6% of its members. Members may have more than one disability reported.

Severe and Persistent Mental Illness

Reporting of the number and type of Severe and Persistent Mental Illnesses (SPMI) was also expanded. This expanded reporting provides CareVio with an opportunity to evaluate the mental health diagnoses observed and available in this population. Populations with an SPMI incur the highest medical costs of any population group (Schiff, 2019). Approximately 10.63% of the CareVio Population reported an SPMI, with anxiety as the most frequently reported. The second most reported SPMI was mood disorders, which decreased in comparison to the CareVio 2021 data. This decrease may correlate with a possible decrease in social isolation, which may have reduced the number of members diagnosed with depression.

Of the total SPMI reported (13,208) the category 'Mental and behavioral disorders due to psychoactive substance use' represented 8.5% (1,134). This category accounted for 0.91% of the total CareVio population. This category includes ICD-10 codes that are related to Substance Use Disorders (SUD). While it may seem inconsequential that the total CareVio population reflects less than 1 percent with a SUD, it is notable that of those members diagnosed with any SPMI, a significant number are related to SUD. Most of these members were either attributed to Medicaid or Medicare Advantage. Of the reported SPMI pertaining to SUD, the Medicaid population accounted for 18% of the claims, while the Medicare Advantage population represented 20.5% of claims. The "Delaware Substance Use Disorder Treatment System Needs Assessment" (HMA Institute on Addiction, 2022) notes that the Delaware Medicaid population had the 5th highest rate of SUD in 2018 in comparison to other states. While the Medicare Advantage population with a SUD SPMI reported was relatively high, this finding may be linked to expanded telehealth services secondary to the COVID-19 emergency (Freed et al., 2023). The most frequently reported SUD in the Medicaid and Commercial populations was alcohol abuse, followed by opioid abuse. According to the Kaiser Family Foundation (Saunders, 2023) this reported data has been consistent in the Medicaid population in Delaware for years. The Medicare Advantage insurance payer population most frequently reported SUD was nicotine abuse, followed by opioid abuse. The Medicare MSSP population most frequently reported nicotine abuse with all other substance use minimally reported. As previously mentioned in this report, the lack of SUD identified in the Medicare MSSP population may be correlated to the masking of behavioral health related claims.

The reported occurrences of SPMI across payers noted some key distinctions. While mood disorders were the most prevalent among the Medicare population followed by anxiety; the Commercial population reported anxiety first, followed by mood disorders. The most frequently reported SPMI in the Medicaid population was anxiety, followed by mental and behavioral disorders due to psychoactive substance use. As noted previously in this report, SPMI claims data does not reflect 100% of SPMI diagnoses, as CMS redacts/masks some behavioral health information.

CareVio Subpopulations Key Findings

Comprehensive Case Management:

Members enrolled in the Comprehensive Case Management program (*472*) were mostly female, greater than or equal to 65 years of age, non-Hispanic, and White. Members in this program primarily resided within the zip code 19720, the most populated zip code in New Castle County.

A total of 11.2% of program participants had SDOH needs identified; the categories most reported were 'Facilities and other health care' and 'Housing and Economic Circumstances'. These two categories were also the most frequently reported SDOH needs areas for the total CareVio population. Subcategories within the 'Facilities and other Health Care' category relate to those factors which influence health status and contact with health services. The zip code, 19720, with the highest number of program participants, has a deprivation index that significantly exceeds that of the Delaware state average (Delaware Department of Health and Social Services, 2023).

For members participating in a Comprehensive Case Management program, the most frequently reported disability across all payers was ambulatory issues/mobility impairment. Given the advanced age of the population majority, this finding was not unexpected.

Almost half (45%) of the members who participated in the Comprehensive Case Management program had an SPMI diagnosis. Anxiety and mood disorders were the most frequently reported SPMI. Reported SPMI was highest among the Medicare MSSP population who participated in the Comprehensive Case Management program.

In conclusion, members identified for the CareVio Comprehensive Case Management program have multiple or comprehensive co-morbid conditions, increased healthcare utilization, and increased health care costs. As the data above reflects, in 2022, 45% of members had at least one SPMI reported. As noted by Sporinova, Braden, Tonelli, et al., (2019) those with identified SPMI and chronic diseases were directly associated with higher healthcare costs and utilization.

High Risk Chronic Obstructive Pulmonary Disease:

Members enrolled in a CareVio high-risk Chronic Obstructive Pulmonary Disease (COPD) program (*22*) were most often male, greater than or equal to 65 years of age, non-Hispanic, and White. Members in this program primarily resided in the zip code of 19702. According to America's Health Rankings (America's Health Rankings, 2022), Delaware ranks 39th in air pollution compared to the continental United States. The zip code (19720) identified is located among the worst areas of air quality (America's Health Rankings, 2022) in Delaware along with the highest percentage of adult smokers (Pearce, et al., 2019).

Only one program participant reported a SDOH need, which was included in the category of 'Facilities and other health care'.

Among participating members in the COPD program, a total of 2 disability categories were reported: hearing impairment and ambulatory issues/mobility impairment. Those members who reported these disabilities were attributed to the Medicare MSSP payer.

Nearly twenty-three percent, 5 out of 22 COPD participants, were identified with SPMI. The most frequently reported category was anxiety, followed by mood disorders, which may be linked to the COPD disease process. Lokesh, et al., (2022) provided study results that indicate the relationship between mental health issues such as anxiety and depression, have a "bi-directional relationship with COPD; each one making the other worse".

High Risk Congestive Heart Failure

Members enrolled in a high-risk Congestive Heart Failure program (*140*) were most often female, greater than or equal to 65 years of age, non-Hispanic and White. Members in this program primarily resided in the zip codes of 19720, 19801, and 19802. Medicare MSSP attribution was the most common insurance among participants. As identified in the CareVio 2022 Annual Report, the female and African American participating population increased from data reported in 2021.

Nearly 5% of program participants reported a SDOH need. The most common needs were 'Facilities and other health care', followed by 'Housing and Economic Circumstances' and 'Primary Support Group, Including Family Circumstances'. These SDOH needs were most frequently seen for members in Medicare MSSP. This finding aligns with the data for the total CareVio population. Additionally, the three most frequent residential zip codes for CHF program participants are among those with the highest SDOH needs.

Disabilities were most frequently reported for members in a High Risk Congestive Heart Failure Program who were attributed to Medicare MSSP. The most common disabilities were ambulatory issues/mobility impairment and hearing impairment. Twenty-three percent of participants reported at least 1 disability.

Roughly 26% of program participants reported SPMI. Similar to what has been observed in other CareVio programs, the most frequent SPMI categories reported were anxiety and mood disorders. The progression of heart failure and increased rate of mortality in these patients is associated with depression and anxiety (Celano, et al., (2018). These two categories accounted for 20.3% of the total reported SPMI for participants in this program. It is important for CareVio to be aware of the frequency of reported anxiety and depression in this population. These SPMI diagnoses may result in decreased quality of life and unplanned utilization. Palliative care services may be an appropriate option for these members.

High Risk Diabetes

Members enrolled in a high-risk Diabetes program (*287*) were most often female, greater than or equal to 65 years of age, non-Hispanic, and African American. Members in this program primarily resided in the zip codes of 19720, 19801 and 19802. In the report, "The Impact of Diabetes in Delaware 2021" (Delaware Division of Public Health, 2021), the Delaware demographic data was nearly identical to that of the CareVio program participant population. Medicaid was the most common attributed insurance payer for CareVio program participants.

Notably, only 2.4% of the Diabetes program participants reported a SDOH need. The SDOH need category of 'Housing and Economic Circumstances' was reported five times more frequently than that of the need category of 'Employment and Unemployment'. This finding aligns with the data for the total CareVio population. Additionally, the three most frequent residential zip codes for High Risk Diabetes program participants are among those with the highest SDOH needs. Each of these zip codes have high poverty and deprivation rates in the state of Delaware. According to Fossi, et al., (Fossi, et al., 2019), food insecurity within high SDOH need areas directly relates to uncontrolled Diabetes.

A total of 21 (7.3%) disabilities were reported from the Diabetes program participants. The most frequently reported disability was hearing impairment, followed by ambulatory issues/mobility impairment.

Nearly eighteen percent of High-Risk Diabetes program participants had an SPMI diagnosis. Among those identified, anxiety and mood disorders were the most frequently reported. Reported SPMI was highest among the Medicare MSSP and Medicaid population who participated in the program.

High Risk Pregnancy:

Members enrolled in a high-risk pregnancy program (*56*) were most often in the age range of 30-39, followed by the age range of 24-29. Members in this program primarily resided in the zip code 19720 and 19801, a change from the previous year data. Most members were African-American (62.5%) and attributed to a Medicaid insurance plan (84%), remaining consistent for the second year in a row. Pregnancy represented 6% of claims in the Medicaid population. In Delaware, the preterm birth rate (preterm is defined as prior to 37 weeks of pregnancy) has continued to rise yearly since 2018 (March of Dimes, 2021). The 2021 data reflects that the Delaware preterm birth rate was 11% of all live births vs. the 2021 national rate of 10.5% (March of Dimes, 2021). The African-American preterm birth rate average in Delaware from 2019-2021 was 13.8% (March of dimes, 2021).

Among the High-Risk Pregnancy program participants, 14.3% had identified SDOH needs. 'Housing and Economic Circumstances' was the most frequently reported need accounting for 5.4% of participants; while categories of 'Primary Support Group, Including Family Circumstances' and 'Psychosocial Circumstances' each accounted for 3.6% of participants. As noted by Dr. Hoffman pregnant women living in poverty have worse maternal health outcomes (Hoffman, 2018). The majority of High-Risk Pregnancy program participants reside in the zip code 19801, an area with a high poverty rate and deprivation index (Delaware Department of Health and Social Services, 2023).

Few disabilities were reported in the High-Risk pregnancy program. One participant was identified with a visual impairment. However, 21.4% of the High-Risk Pregnancy Program population reported at least 1 SPMI. Anxiety and mood disorders were the most frequently identified SPMI categories. The SPMI category 'Mental and Behavioral Disorders due to Psychoactive Substance Abuse" for the Medicaid participating program members was reported at a rate of 3.6%. While this SPMI category was not the most frequently reported, it is important as a focus area as nearly "20% of pregnant/postpartum women in Delaware's Medicaid program have Substance Use Disorder (SUD)", the fifth-highest rate for the nation (Gaudenzia, 2022).

<u>CareVio Subpopulation Programs Summary</u>

Review of the CareVio program participants in 2022 identified similarities to 2021, but also revealed new areas of opportunity. There was a total of 977 members who participated in the subpopulation programs listed above. In all programs, with the exception of High-Risk Pregnancy, the majority of program participants were ≥65 years of age. The majority of program participants resided in the geographical location of 19720, previously

noted as the most populated region in Delaware. Most program participants were either attributed to Medicare MSSP or Medicaid insurance payers. The most frequent disability that was reported among all program participants was related to ambulatory and mobility. Thirty-two percent of CareVio program participants were diagnosed with at least one SPMI. Additionally, 7% of CareVio program participants reported at least one SDOH need area. While this may appear low for the overall program participants, some programs reflected higher SDOH needs for participants than others.

V. Opportunities for Improvement/Action Plan

As part of the improvement plan proposed in the 2021 CareVio Population Health Assessment, several interventions were implemented, including expanded data collection. The outcomes from these interventions had a positive impact on the programs and participants. As noted in the CareVio 2021 Population Health Assessment, a focus on SDOH screening was a priority. During 2022, CareVio expanded use of data collection tools, including a SDOH screening tool that was integrated into each assessment questionnaire. Data captured in the SDOH screening assessments identified needs that triggered an electronic task referral prompt for the CareVio care managers. These prompts were instrumental in increasing the number of referrals to community resources that were specific to each type of SDOH need. In particular, CareVio increased their partnerships with community organizations to address the housing needs of its members. The partnership with the Housing Alliance of Delaware and New Castle County Government provided CareVio the ability to refer homeless members to the New Castle County Hope Center, a former hotel that was converted into a shelter for those with emergency shelter needs (New Castle County Delaware, 2022). Through this partnership, referred members are able to meet with housing coordinators in an attempt to gain access to permanent and affordable housing. A SDOH electronic dashboard was implemented and enhanced during 2022 to integrate multiple data sources (those which were mentioned in this report previously). The extent of SDOH needs could be visualized on geocoding maps based on data that was captured from inpatient and outpatient settings.

Medically underserved areas were identified and discussed in the CareVio 2021 Population Health Assessment report. Progress was made in expanding primary care access to the southern region of Delaware, especially for those over the age of 65. Early in 2023, two primary care practices were opened in the region. Access to primary care continues to be a need as the population continues to grow. Specifically, it is estimated that the population of Sussex County, Delaware will continue to grow, including an increase of residents age 65 or older (ChristianaCare, 2023).

The 2022 population assessment findings provide CareVio with opportunities to enhance and expand case management programming. As noted in the key findings of the total CareVio population, hypertension was a diagnosis frequently reported in claims data. This finding prompted CareVio to implement a Metabolic Case Management program to address hypertension, as one of the criteria for eligibility. This pilot program will initially be offered to members within the Commercial population, with the potential to expand to other segments of the population in 2024, after program effectiveness is determined. The premise of the Metabolic program is to drive metabolic syndrome best practice, facilitate abatement of symptoms, and subsequently improve health outcomes by controlling the risk factors, such as hypertension.

The Delaware Drug Overdose Fatality Review Commission released the 2022 Delaware Drug Overdose Fatality Annual Report in April 2023 (Lawes, Stout, McGee, 2023). Significant findings include the incidence of those with depression and anxiety who also had substance use disorder. The CareVio 2022 Population Health

Assessment identified that the prevalence of anxiety and depression is not only high among program participants, but also the total population. This data motivated CareVio to expand case management programming to include a Behavioral Health program that focuses on eligible members with behavioral health conditions, such as SUD, exacerbations of SPMI, suicidal and homicidal ideation, etc. This program commenced the first quarter of 2023. In Delaware, the death rate from drug overdoses has risen by 33% since 2011 (Kaiser Family Foundation, 2023). Based on this data, CareVio is committed to educating care managers and social workers on providing targeted care management services to those members with a substance use disorder.

Due to the high rate of mental and physical conditions among the CareVio total population, CareVio is planning to increase outreach in the community setting. In 2023, CareVio will hire an additional Registered Nurse care manager to improve engagement in the community. This nurse will be a subject matter expert in the provision of maternal and pediatric care. This additional resource will enable CareVio to better meet the growing needs of the high-risk maternity and pediatric populations who are living in areas with high SDOH needs that may be difficult to engage telephonically.

In addition to the opportunities and action plan discussed thus far, CareVio plans to continue expanding programming offerings to members based on data from member assessments. While asthma may not seem prevalent among pediatric members (age 2-19), it has been reported in 3% of the CareVio total population based on claims data. Furthermore, CareVio identified through analysis of quality measures, a high rate of asthma among pediatric members, especially those attributed to Medicaid. According to America's Health Rankings (2023), Delaware's percentage of children with asthma was 9.6%, reflecting a higher rate than the United States average of 6.9% (America's Health Rankings, 2023). Thus, a Pediatric Asthma case management program was established in 2023. This program will provide member centric care to pediatric members between the ages of 4-18 with a diagnosis of asthma. For all members enrolled in CareVio's pediatric asthma program, CareVio care coordinators will complete an asthma control test; educate the member and member's families on the disease process and risk factors; assess for barriers to medication access, adherence, and affordability; establish an individualized care plan with focused goals; and refer members and their families to appropriate available resources. One of the main goals for this program is to decrease asthma related emergency room utilization and improve health outcomes through better control and management of asthmatic symptoms.

Finally, CareVio acknowledged through the analysis of preliminary data in the 2022 Annual and Population Health Assessment Reports the importance of palliative care opportunities for appropriate members. Implementation of a palliative care program began in late 2022. The purpose of this program is to assess, plan, facilitate, coordinate care, advocate for services, and provide options to its members with serious illness. The Palliative Care program is facilitated by a licensed clinical social worker and is a supportive program that works in conjunction with other CareVio programs. The Palliative Care program will interface with providers and all members of the health care team, including the members and their families, to proactively intervene with action plans based on evidence-based, best practice guidelines. Through engagement and partnership with members and providers, CareVio staff will be influential in driving best practices in palliative care, facilitating symptom management, addressing stressors associated with serious illness, identifying psychosocial needs, and improving quality of life.

The CareVio Population Health Assessment provides a framework to better understand the core population served including recognition of key social, mental, and physical health needs. Furthermore, the assessment identifies opportunities for expanded CareVio programming, activities, and resources to address both the needs of the majority of the population and the relevant subpopulations. The assessment reveals target populations that may be at increased risk of poor health outcomes. CareVio has implemented or is in the process of implementing strategies that address specific opportunities to improve the health of the community served. These strategies include but are not limited to:

- Metabolic Syndrome program that focuses on hypertension
- Behavioral Health program to address substance use and other mental health conditions
- Pediatric Asthma program that focuses on symptom management and improving health outcomes
- Expansion of CareVio Community Programs, including increased outreach in the community setting
- Palliative Care program to facilitate symptom management and improve quality of life

Meet the Team

A. Meet The Team

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B. Appendix A

Disabilities: ICD-10 codes utilized for obtaining disabilities via claims data

Disability Category	Code
Intellectual Disabilities	F70: Mild intellectual disabilities F71: Moderate intellectual disabilities F72: Severe intellectual disabilities F73: Profound intellectual disabilities F78: Other intellectual disabilities F79: Unspecified intellectual disabilities
Pervasive and Specific Developmental Disorders	F80: Specific developmental disorders of speech and language F82: Specific developmental disorders of scholastic skills F84: Pervasive developmental disorders F88: Other disorders of psychological development F89: Unspecified disorder of psychological development
Hearing Impairment	H90: Conductive and Sensorineural hearing loss H91: Other and unspecified hearing loss
Visual Impairment	H53: Visual disturbances H54: Blindness and low vision
Mobility Impairment	R26-R26.9: Abnormalities of gait and mobility Z74.09: Other reduced mobility
Speech Impairment	R47: Speech disturbances, not elsewhere classified

ICD-10-CM. (2023).

C. Appendix B

Severe and Persistent Mental Illness (SPMI): ICD-10 codes utilized for SPMI via claims data

SPMI Category	Code
Mental disorders due to known physiological conditions	F01: Vascular dementia F02: Dementia in other disease classified elsewhere F03: Unspecified dementia F04: Amnestic disorder due to known physiological condition F05: Delirium due to known physiological condition F06: Other mental disorders due to known physiological condition F07: Personality and behavioral disorders due to known physiological condition F09: Unspecified mental disorder due to known physiological condition
Mental and behavioral disorders due to psychoactive substance use	F10: Alcohol related disorders F11: Opioid related disorders F12: Cannabis related disorders F13: Sedative, hypnotic, or anxiolytic related disorders F14: Cocaine related disorders F15: Other stimulant related disorders F16: Hallucinogen related disorders F17: Nicotine dependance F18: Inhalant related disorders F19: Other psychoactive substance related disorders
Schizophrenia, Schizotypal, delusional, and other non-mood psychotic disorders	F20: Schizophrenia F21: Schizotypal disorder F22: Delusional disorder F23: Brief psychotic disorder F24: Shared psychotic disorder F25: Schizoaffective disorder F28: Other psychotic disorder not due to a substance or known physiological condition F29: Unspecified psychosis not due to a substance or known physiological condition
Mood (affective) disorders	F30: Manic episode F31: Bipolar disorder F32: Depressive episode F33: Major depressive disorder, recurrent F34: Persistent mood [affective] disorder F35: Unspecific mood [affective] disorder
Anxiety, dissociative, stress-related, somatoform and other non-psychotic disorders	F40: Phobic anxiety disorders F41: Other anxiety disorders F42: Obsessive-compulsive disorder F43: Reaction to severe stress, and adjustment disorder F44: Dissociative and conversion disorders F45: Somatoform disorders F48: Other non-psychotic mental disorders
Behavioral syndromes associated with physiological disturbances and physical factors	F50: Eating disorders

	F51: Sleep disorders not due to a substance or known physiological condition F52: Sexual dysfunction not due to a substance or known physiological condition F53: Mental behavioral disorders associated with disorders or disease classified elsewhere F55: Abuse of non-psychoactive substances F59: Unspecified behavioral syndromes associated with physiological disturbances and physical factors
Disorders of adult personality and behavior	F60: Specific personality disorders F63: Impulse disorders F64: Gender identity disorders F65: Paraphilias F66: Other sexual disorders F68: Other disorders of adult personality and behavior F69: Unspecified disorder of adult personality and behavior
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	F90: Attention-deficit hyperactivity disorders F91: Conduct disorders F93: Emotional disorders with onset specific to childhood F94: Disorders of social functioning with onset specific to childhood and adolescence F95: Tic disorder F98: Other behavioral and emotional disorders with onset usually occurring in childhood and adolescence
Unspecified mental disorder	F99: Mental disorder, not otherwise specified

ICD-10-CM. (2023).

D. Appendix C

Social Determinant of Health (SDOH): ICD-10 codes utilized via claims and Soarian encounters

SDOH Category	Code
Occupational Exposure to Risk Factors	Z57.8 - Occupational exposure to other risk factors Z57.0 - Occupational exposure to noise Z57.9 - Occupational exposure to unspecified risk factor Z57.5 - Occupational exposure to toxic agents in other industries Z57.2 - Occupational exposure to dust Z57.31 - Occupational exposure to environmental tobacco smoke Z57.4 - Occupational exposure to toxic agents in agriculture
Primary Support Group, Including Family Circumstances	Z63.4 - Disappearance and death of family member Z63.0 - Problems in relationship with spouse or partner Z63.79 - Other stressful life events affecting family and household Z63.8 - Other specified problems related to primary support group Z63.6 - Dependent relative needing care at home Z63.9 - Problem related to primary support group, unspecified Z63.5 - Disruption of family by separation and divorce Z63.72 - Alcoholism and drug addiction in family Z63.32 - Other absence of family member Z63.31 - Absence of family member due to military deployment Z63.71 - Stress on family due to return of family member from military deployment Z63.1 - Problems in relationship with in-laws
Psychosocial Circumstances	Z64.0 - Problems related to unwanted pregnancy Z64.1 - Problems related to multiparity
Education and Literacy	Z55.9 - Problems related to education and literacy, unspecified Z55.3 - Underachievement in school Z55.8 - Other problems related to education and literacy Z55.0 - Illiteracy and low-level literacy Z55.5 - Less than a high school diploma Z55.4 - Educational maladjustment and discord with teachers and classmates
Employment and Unemployment	Z56.0 - Unemployment, unspecified Z56.6 - Other physical and mental strain related to work Z56.9 - Unspecified problems related to employment Z56.3 - Stressful work schedule Z56.1 - Change of job Z56.5 - Uncongenial work environment Z56.89 - Other problems related to employment Z56.2 - Threat of job loss Z56.4 - Discord with boss and workmates
Housing and Economic Circumstances	Z59.0 - Homelessness Z59.00 - Homelessness unspecified Z59.8 - Other problems related to housing and economic circumstances Z59.9 - Problem related to housing and economic circumstances, unspecified Z59.1 - Inadequate housing

	Z59.4 - Lack of adequate food Z59.6 - Low income Z59.01 - Sheltered homelessness Z59.02 - Unsheltered homelessness Z59.3 - Problems related to living in residential institution Z59.41 - Food insecurity Z59.89 - Other problems related to housing and economic circumstances Z59.812 - Housing instability, housed, homelessness in past 12 months Z59.7 - Insufficient social insurance and welfare support Z59.2 - Discord with neighbors, lodgers, and landlord Z59.48 - Other specified lack of adequate food Z59.811 - Housing instability, housed, with risk of homelessness
Facilities and Other Health Care	Z75.1 - Person awaiting admission to adequate facility elsewhere Z75.8 - Other problems related to medical facilities and other health care Z75.5 - Holiday relief care Z75.2 - Other waiting period for investigation and treatment Z75.3 - Unavailability and inaccessibility of health-care facilities Z75.0 - Medical services not available in home
Other Psychosocial Circumstances	Z65.8 - Other specified problems related to psychosocial circumstances Z65.3 - Problems related to other legal circumstances Z65.9 - Problem related to unspecified psychosocial circumstances Z65.5 - Exposure to disaster, war, and other hostilities Z65.1 - Imprisonment and other incarceration Z65.2 - Problems related to release from prison
Social Environment	Z60.2 - Problems related to living alone Z60.4 - Social exclusion and rejection Z60.9 - Problem related to social environment, unspecified Z60.8 - Other problems related to social environment Z60.0 - Problems of adjustment to life-cycle transitions Z60.5 - Target of (perceived) adverse discrimination and persecution
Upbringing	Z62.820 - Parent-biological child conflict Z62.810 - Personal history of physical and sexual abuse in childhood Z62.811 - Personal history of psychological abuse in childhood Z62.21 - Child in welfare custody Z62.819 - Personal history of unspecified abuse in childhood Z62.22 - Institutional upbringing Z62.812 - Personal history of neglect in childhood Z62.890 - Parent-child estrangement NEC Z62.898 - Other specified problems related to upbringing Z62.9 - Problem related to upbringing, unspecified Z62.29 - Other upbringing away from parents Z62.891 - Sibling rivalry Z62.1 - Parental overprotection Z62.822 - Parent-foster child conflict
Physical Environment	Z58.0 Exposure to noise Z58.1 Exposure to air pollution Z58.2 Exposure to water pollution

	Z58.3 Exposure to soil pollution Z58.4 Exposure to radiation Z58.5 Exposure to other pollution Z58.6 Inadequate drinking-water supply Z58.7 Exposure to environmental tobacco smoke Z58.81 Exposure to lead Z58.82 Exposure to asbestos Z58.89 Other problems related to physical environment Z58.9 Problem related to physical environment, unspecified

ICD-10-CM. (2023).

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