

# Quantifying Race-Based Gaps in Care Across Three Chronic Diseases

## Analysis Finds Populations of Color More Likely to Seek Emergency Care, Require Inpatient Hospital Admission

### KEY FINDINGS:

- Patients of color visited the emergency room (ER) and were admitted as inpatients more often than White patients, suggesting that there were more frequent and more serious complications of their chronic conditions.
- Patients of color with Alzheimer's disease experienced 20% more ER visits and 54% more inpatient admissions compared with White patients.
- Patients of color with chronic obstructive pulmonary disease (COPD) visited the ER 39% more than White patients and were admitted to the hospital 43% more often.
- Patients of color with osteoporosis had 10% more ER visits and 12% more inpatient admissions compared with White patients.
- Overall healthcare utilization was higher among populations of color with Alzheimer's, COPD, and osteoporosis than the White population with these conditions. The Hispanic population in particular demonstrated high levels of healthcare utilization, with an average of 91 encounters per patient for Alzheimer's over a two-year period, 105 encounters per patient for COPD, and 71 encounters per patient for osteoporosis in the same timeframe.

### EXECUTIVE SUMMARY:

Chronic disease is the [leading cause](#) of death and disability in the United States and a top driver of healthcare costs. These diseases also epitomize the racial and socioeconomic disparities that continue to plague the U.S. healthcare system. Disproportionately [affecting populations of color](#), older adults, and those with lower income levels, chronic disease is associated with higher rates of morbidity, early mortality, and increased clinical complications.

These trends and disparities manifest in a variety of complex ways in the real-world healthcare experiences of the country's most underserved populations. While the causes of health disparities are complex, real-world data can inform our understanding of the unequal burden of disease and help identify systemic targets for intervention.

In order to get a more granular view of these disparities among populations of color, Komodo Health has tracked overall healthcare encounters, emergency room (ER) visits, and inpatient hospital admissions for patients suffering from Alzheimer's disease, osteoporosis, and COPD. These results were then stratified by race to spotlight variations in the healthcare experiences of patients representing different demographic groups.

This analysis provides further evidence that Asian, Black, Hispanic, and North American Native populations in the United States experience more frequent and serious complications stemming from their chronic conditions compared with White patients.

## METHODOLOGY:

This analysis used Komodo's Healthcare Map™, the industry's largest and most complete database of de-identified, real-world patient journeys in the United States, to evaluate healthcare utilization across demographic groups in patients with Alzheimer's disease, COPD, and osteoporosis. Patients with at least one encounter between January 1, 2017, and June 30, 2019, were included. Healthcare services received within two complete years after a patient's initial diagnosis were included, with the latest possible healthcare encounter date of June 30, 2021.

Healthcare encounters were evaluated for variations in frequency by race. Healthcare encounters included all medical visits, from primary care and specialist physicians to emergency services, but did not include prescriptions. Disease-related encounters for medical visits that contained a diagnosis for the disease of interest were analyzed. The utilization of CPT codes for emergency room evaluations and inpatient admissions were also analyzed.

Data on the following racial and ethnic groups was used: Asian, Black, Hispanic, North American Native, White and Other. Terms used for race and ethnicity in this report reflect the terms that were used in data collection. "Other" predominantly reflects individuals who identify as "some other race" but may also include individuals identifying as biracial or multiracial, as sources of this data use variable collection tools. All non-White patients were grouped to create an aggregate finding for patients of color. Results for patients of color were compared with those for the White patient population and the total population. All results are reported as a weighted average of the number of encounters over the number of patients in each group.

## RESULTS:

Of 1.8 million Alzheimer's patients, 24% were patients of color and 76% were White. Of 2.9 million COPD patients, 20% were patients of color and 80% were White. Of 5.9 million osteoporosis patients, 24% were patients of color and 76% were White.

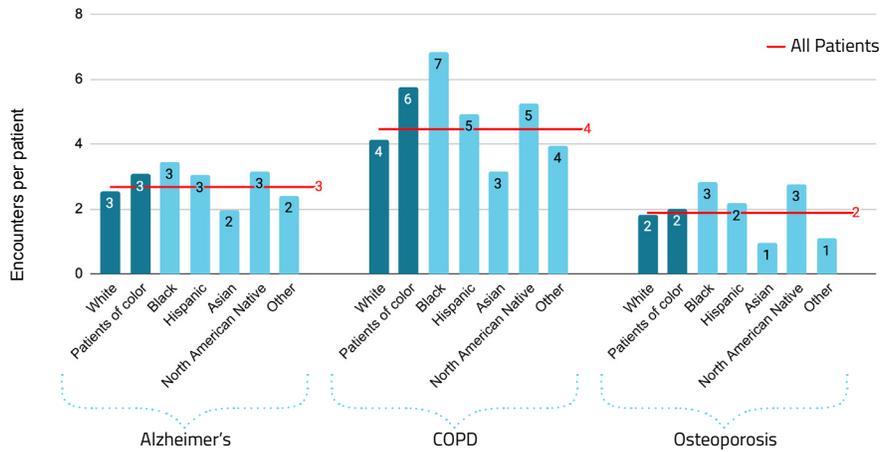
**BREAKDOWN OF PATIENTS BY RACE ACROSS DISEASES**

Race	Alzheimer's	COPD	Osteoporosis
<b>White</b>	76%	80%	76%
<b>Patients of Color</b>	24%	20%	24%
Black	10%	11%	7%
Hispanic	10%	6%	10%
Asian	3%	2%	5%
North American Native	<1%	<1%	<1%
Other	<1%	1%	2%
<b>Total Number of Patients</b>	1.8M	2.9M	5.9M

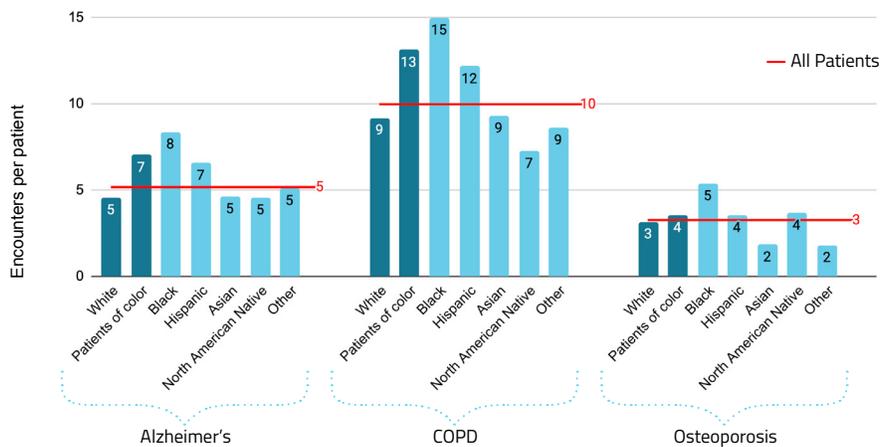
**Patients of color visited the ER and were admitted as inpatients more often than White patients, suggesting that there were more frequent and serious complications of their chronic conditions.**

Patients of color with Alzheimer’s disease experienced 1.20 times more visits to the ER and had 1.54 times the number of inpatient admissions compared with White patients. Patients of color with COPD had 1.39 times the number of ER visits and 1.43 times the number of inpatient admissions compared with White patients. The average number of inpatient admissions over a two-year period for Black patients with COPD was 15, compared with 9 on average for White patients. Patients of color with osteoporosis had 1.10 times the number of ER visits and 1.12 times the number of inpatient admissions compared with White patients.

**EMERGENCY ROOM VISITS PER PATIENT**

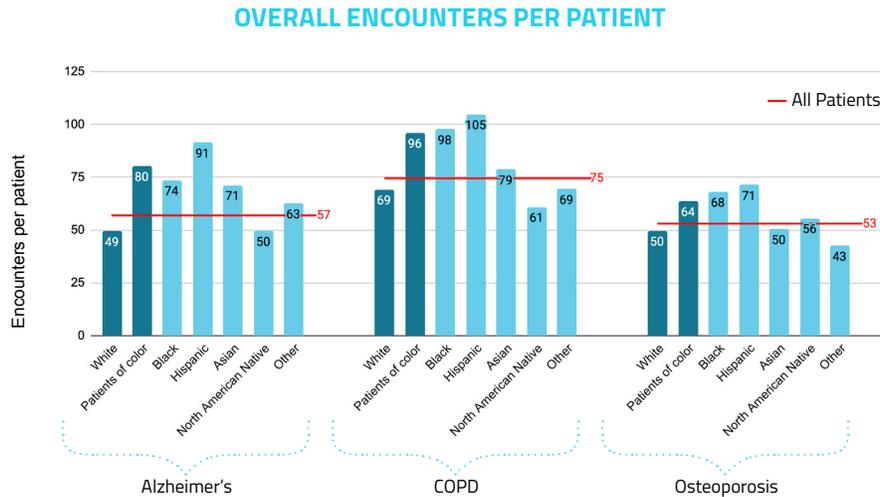


**INPATIENT ADMISSIONS PER PATIENT**



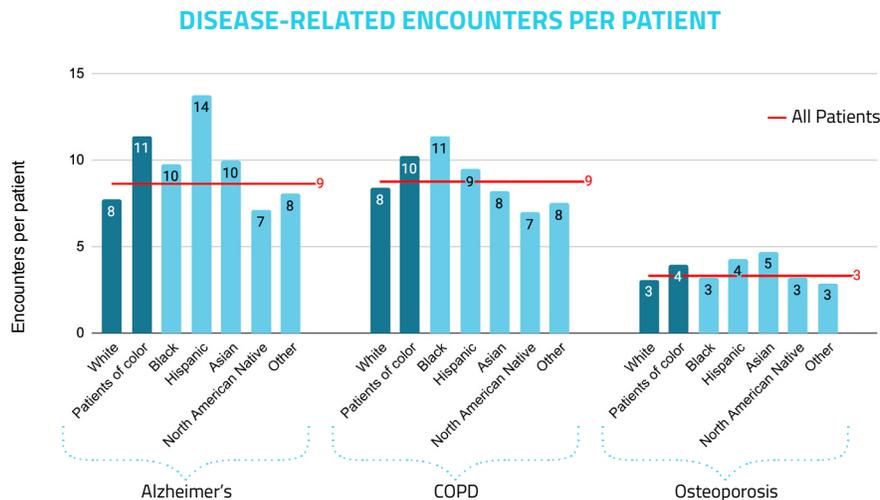
**Similarly, patients of color experienced more healthcare encounters overall compared with the White patient population.**

Overall healthcare utilization was higher among patients of color with Alzheimer’s, COPD, and osteoporosis than the White patient population. Patients of color with Alzheimer’s disease had 1.62 times more healthcare encounters overall compared with White patients. Patients of color with COPD had 1.39 times more healthcare encounters overall compared with White patients. Patients of color with osteoporosis had 1.28 times the number of encounters overall compared with White patients. The Hispanic population in particular demonstrated high levels of healthcare utilization over a two-year period, with an average of 91 encounters per patient for Alzheimer’s, 105 encounters per patient for COPD, and 71 encounters per patient for osteoporosis.



**Race-based disparities in care persisted in disease-specific care.**

When the overall healthcare encounters were limited to the disease area in question, disparities were observed among patients of color. This may be another signal of poorly controlled disease. Patients of color with Alzheimer’s disease had 1.47 times the number of Alzheimer’s encounters compared with White patients. Patients of color with COPD had 1.21 times the number of COPD encounters compared with White COPD patients. Patients of color with osteoporosis had 1.28 times the number of osteoporosis encounters compared with White osteoporosis patients.



## DISCUSSION:

A wealth of research has established that populations of color face more barriers to healthcare. Despite these barriers, the findings in this analysis demonstrate the higher overall utilization of the healthcare system by patients of color. This may reflect a higher severity of illness among populations of color, potentially due to factors such as a higher number of comorbidities, increased progression of disease prior to diagnosis, increased severity of illness, and poorer disease management, all of which lead to increased complication rates and healthcare needs.

Specifically, the higher rates of ER and inpatient visits seen in this analysis underscore that patients of color experience more frequent and serious complications from chronic diseases compared with White patients. ER visits and inpatient admissions may be considered a proxy for the quality of disease management and severity of chronic disease, as the rate of hospitalizations and ER visits will generally be lower when a disease is better controlled and closely followed by a primary care or specialist physician.

Racial disparities were particularly glaring across COPD patients. The causes of differences in disparity across diseases is likely multifactorial, related to screening protocols, behavioral and life science environmental risk factors, and variation in the rate of complications. While all diseases studied here are chronic, COPD is the most likely to have complications that require ER visits and inpatient hospitalizations. COPD is also influenced by behavioral factors, such as cigarette use, and environmental factors, such as pollution and second-hand smoke exposure, which both tend to appear more frequently in populations of color.

Disparities in care for osteoporosis patients were relatively less pronounced. Osteoporosis has a higher rate of screening and occurs at a lower rate in Black patients – the largest population of color in this analysis. Additionally, osteoporosis and Alzheimer’s patients tend to present to the ER or hospital with complaints or symptoms that are not directly related to these conditions.

The authors did not attempt to explain the many complex reasons for variations in care utilization across racial groups. More research is required to determine root causes of these disparities and to expand analysis into other conditions, comorbidities, and age groups. This analysis did not control for comorbidities or explore issues related to insurance type or coverage or geographic access to care. Our analysis also did not include any encounter data for uninsured patients. Populations of color are at higher risk of being uninsured compared with White patients, and uninsured patients of any race influence rates of total utilization of emergency services, as they have [fewer preventive healthcare visits](#).

Additional directions for future research could include describing preventive and specialty care disparities, as well as methods to address gaps in disease management. Further analysis could also be done to investigate disparities in care across additional chronic conditions disproportionately affecting different age groups and sociodemographic profiles.

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### About Komodo Health

Komodo Health builds groundbreaking software solutions powered by our Healthcare Map™ – the industry’s largest and most comprehensive view of real-world, patient journey data. Komodo’s next-generation analytics make it easy to unlock meaningful insights and create more cost-effective, value-driven solutions that improve patient outcomes. In our mission to reduce the global burden of disease, we help healthcare and life sciences enterprises answer healthcare’s most complex questions.

## APPENDIX

### APPENDIX A. MEDICAL ENCOUNTERS FOR PATIENTS WITH ALZHEIMER'S BY RACE [1]

Race	% of pts	Overall Encounters		Disease-Related Encounters [2]		Emergency Room Visits		Inpatient Admissions	
		# per pt	Ratio to White pts	# per pt	Ratio to White pts	# per pt	Ratio to White pts	# per pt	Ratio to White pts
<b>White</b>	76%	49.41	1.00	7.74	1.00	2.55	1.00	4.57	1.00
<b>Patients of Color</b>	24%	80.29	1.62	11.41	1.47	3.07	1.20	7.03	1.54
Black	10%	73.65	1.49	9.78	1.26	3.45	1.35	8.38	1.83
Hispanic	10%	91.39	1.85	13.77	1.78	3.04	1.19	6.57	1.44
Asian	3%	71.22	1.44	9.97	1.29	1.98	0.78	4.63	1.01
North American Native	<1%	49.50	1.00	7.14	0.92	3.16	1.24	4.58	1.00
Other	<1%	62.63	1.27	8.06	1.04	2.42	0.95	5.10	1.12
<b>All Patients</b>	100%	56.96	—	8.64	—	2.68	—	5.17	—

#### Notes:

[1] Patients included in analysis are those with at least one diagnosis for Alzheimer's between January 1, 2017, and June 30, 2019. Medical encounters were analyzed for two-years following a patient's earliest diagnosis within the study period.

[2] Disease-related encounters are encounters that contain a diagnosis for Alzheimer's and are therefore related to the disease or complications related to the disease.

### APPENDIX B. MEDICAL ENCOUNTERS FOR PATIENTS WITH COPD BY RACE [1]

Race	% of pts	Overall Encounters		Disease-Related Encounters [2]		Emergency Room Visits		Inpatient Admissions	
		# per pt	Ratio to White pts	# per pt	Ratio to White pts	# per pt	Ratio to White pts	# per pt	Ratio to White pts
<b>White</b>	80%	69.18	1.00	8.41	1.00	4.14	1.00	9.20	1.00
<b>Patients of Color</b>	20%	95.97	1.39	10.21	1.21	5.76	1.39	13.12	1.43
Black	11%	97.68	1.41	11.38	1.35	6.84	1.65	14.99	1.63
Hispanic	6%	104.81	1.52	9.47	1.13	4.93	1.19	12.17	1.32
Asian	2%	78.63	1.14	8.20	0.97	3.15	0.76	9.31	1.01
North American Native	<1%	60.97	0.88	6.98	0.83	5.25	1.27	7.26	0.79
Other	1%	69.43	1.00	7.52	0.89	3.95	0.95	8.62	0.94
<b>All Patients</b>	100%	74.51	—	8.77	—	4.46	—	9.98	—

#### Notes:

[1] Patients included in analysis are those with at least one diagnosis for COPD between January 1, 2017, and June 30, 2019. Medical encounters were analyzed for two-years following a patient's earliest diagnosis within the study period.

[2] Disease-related encounters are encounters that contain a diagnosis for COPD or other respiratory distress and are therefore related to the disease or complications related to the disease.

## APPENDIX C. MEDICAL ENCOUNTERS FOR PATIENTS WITH OSTEOPOROSIS BY RACE [1]

Race	% of pts	Overall Encounters		Disease-Related Encounters [2]		Emergency Room Visits		Inpatient Admissions	
		# per pt	Ratio to White pts	# per pt	Ratio to White pts	# per pt	Ratio to White pts	# per pt	Ratio to White pts
<b>White</b>	76%	49.69	1.00	3.11	1.00	1.84	1.00	3.18	1.00
<b>Patients of Color</b>	24%	63.57	1.28	3.98	1.28	2.02	1.10	3.54	1.12
Black	7%	68.07	1.37	3.21	1.03	2.83	1.54	5.38	1.69
Hispanic	10%	71.30	1.43	4.31	1.39	2.17	1.18	3.54	1.11
Asian	5%	50.43	1.02	4.73	1.52	0.95	0.52	1.83	0.58
North American Native	<1%	55.59	1.12	3.19	1.03	2.77	1.51	3.69	1.16
Other	2%	42.57	0.86	2.91	0.93	1.09	0.59	1.81	0.57
<b>All Patients</b>	100%	53.04	—	3.32	—	1.88	—	3.27	—

### Notes:

[1] Patients included in analysis are those with at least one diagnosis for osteoporosis between January 1, 2017, and June 30, 2019. Medical encounters were analyzed for two-years following a patient's earliest diagnosis within the study period.

[2] Disease-related encounters are encounters that contain a diagnosis for osteoporosis and are therefore related to the disease or complications related to the disease.