

Introduction

- Multiple Sclerosis (MS) is a disease which impacts the central nervous system and causes unpredictable symptoms such as numbness, tingling, mood changes, memory problems, pain, fatigue, blindness, and/or paralysis.¹
- The estimated 2010 prevalence of MS in the US adult population cumulated over 10 years was 309.2 per 100,000.²
- The female to male prevalence ratio is 2.8 and there is a US north-south decreasing prevalence gradient.²
- Immunomodulatory agents, which includes newer disease modifying treatments such as monoclonal antibodies, have shown to be beneficial for patients with relapse-remitting multiple MS.³

Objectives

The current study aimed to examine demographics and real-world treatment patterns among patients with MS in a large, de-identified electronic health records (EHR) database in the US.

Methods

Data Source

Cerner Enviza EHR data is a national, de-identified clinical data warehouse (100 million+ patients total), designed to enable organizations to leverage clinical systems data across contributing organizations to create volumes of de-identified information. Data is extracted from the EHR of hospitals and clinics who have consented to such use. Encounters may include pharmacy, clinical and microbiology laboratory, admission and billing information from affiliated patient care locations. All admissions, medication orders and dispensing, laboratory orders and specimens are date and time stamped, providing a temporal relationship between treatment patterns and clinical information.

Sample

Patients must meet the following criteria to be eligible for inclusion in the study
Resident of the US
Identified diagnosis of MS (January 2015 - June 2022) using a combination of ICD-9, ICD-10, and SNOMED-CT codes

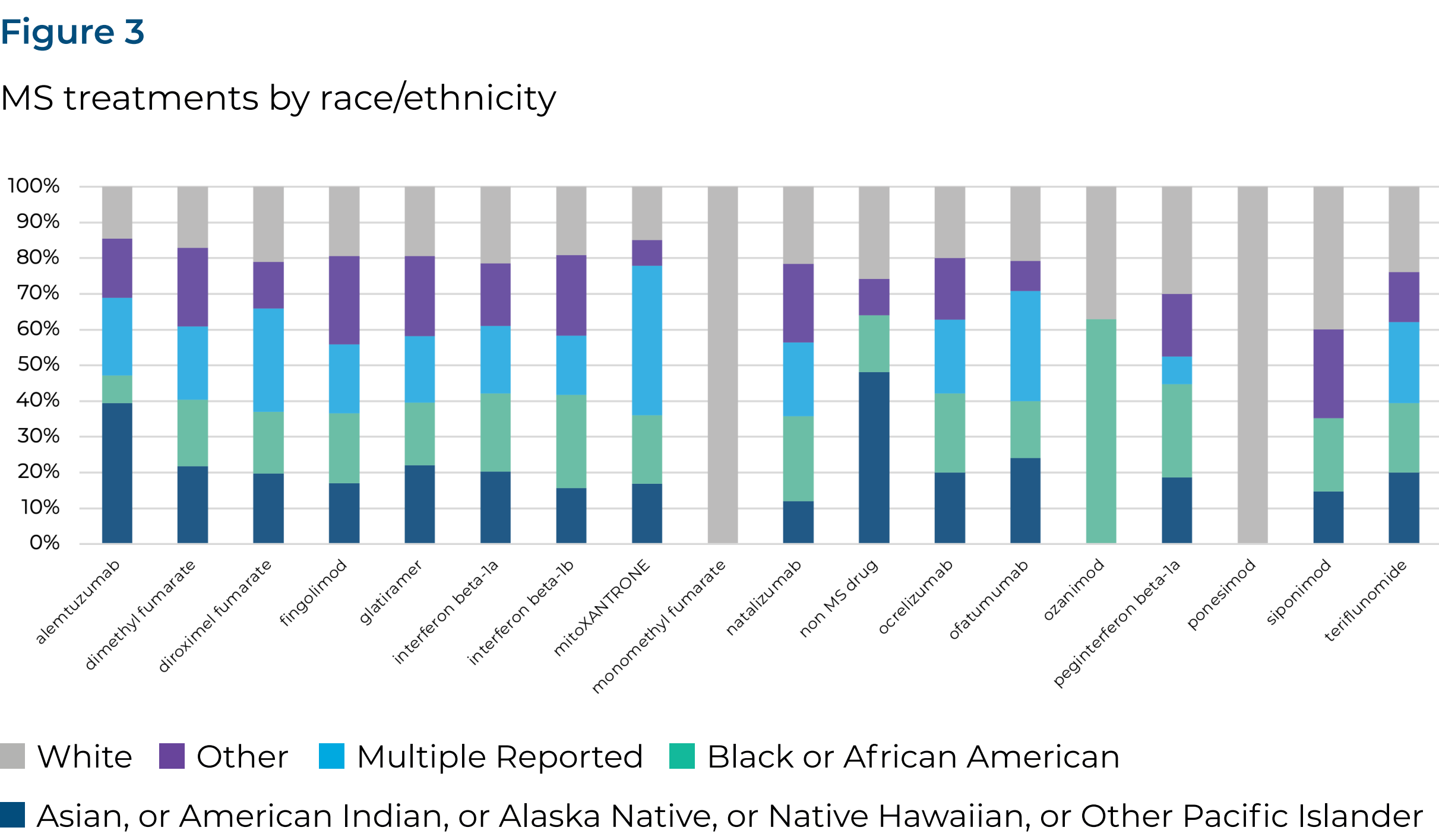
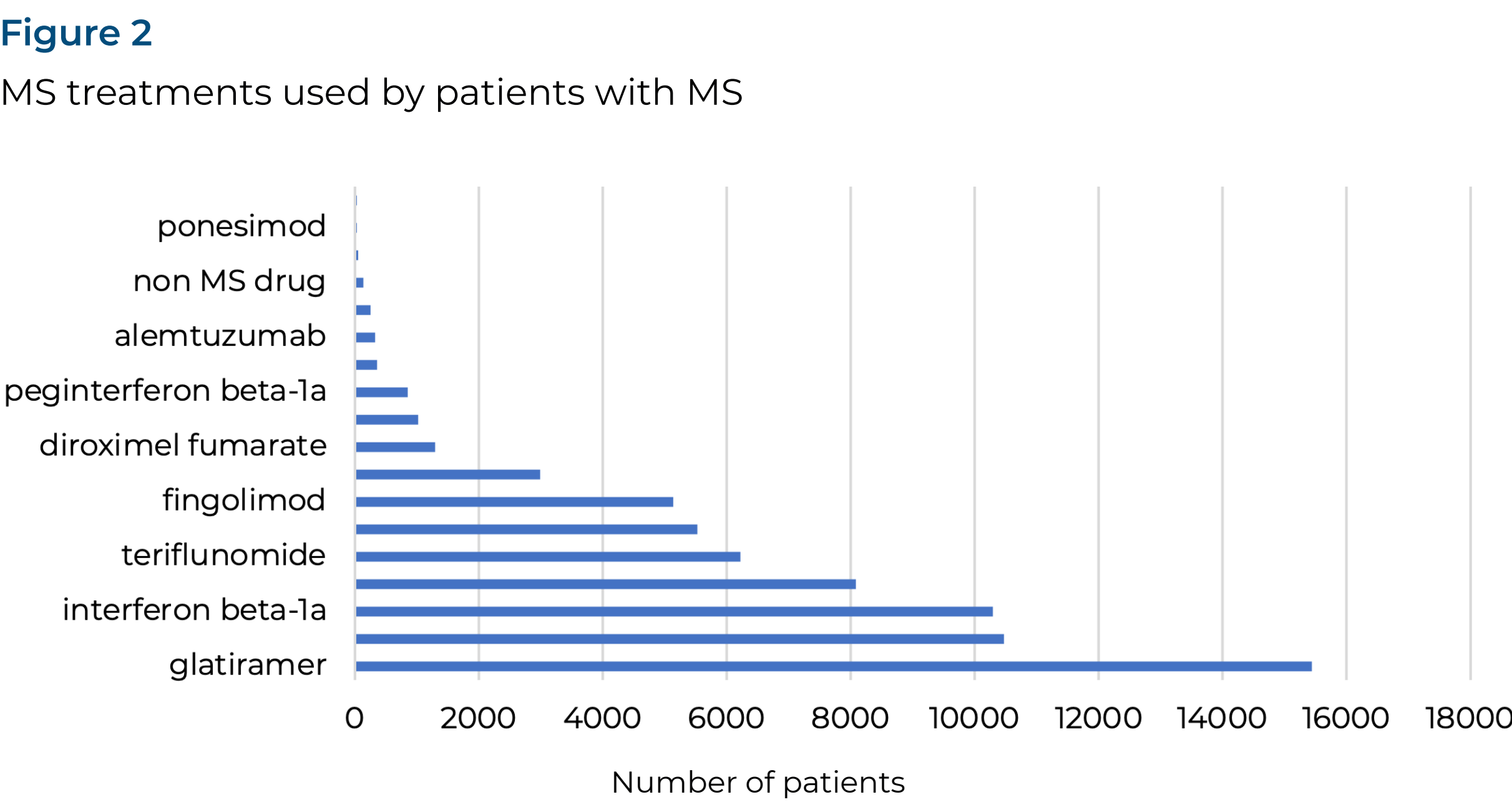
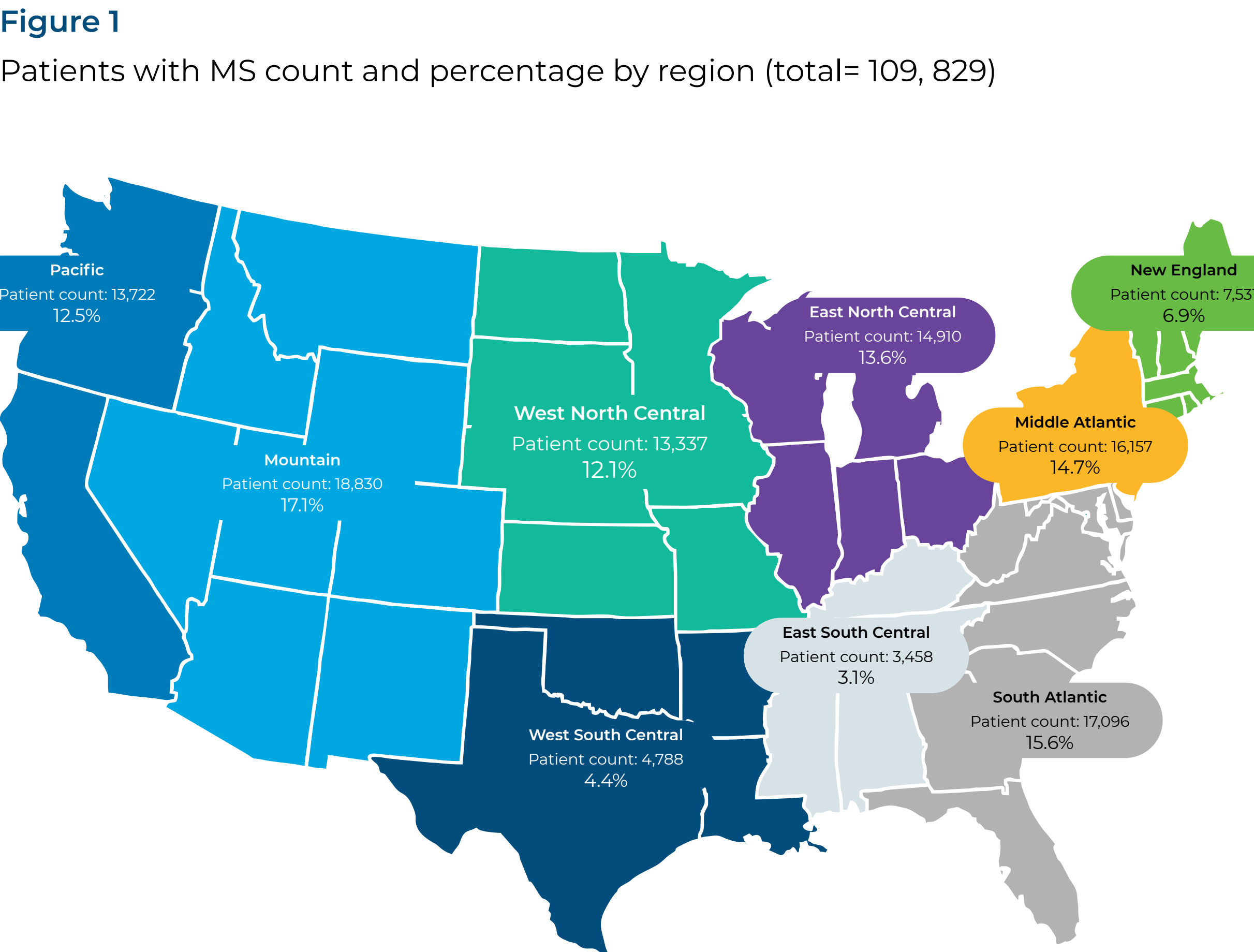
Measures

Demographics	Medications	Statistical Analyses
Age	Prescribed treatments for MS	Descriptive analyses: Patient demographic and prescription treatments were assessed using frequencies and percentages for categorical variables and means and standard deviations for continuous variables.
Race		
Ethnicity		
Geographic region (9 US Census)		

Results

Table 1. Demographics of patients with MS (N=116,782)

	%	n
Age group		
0-29	3.7	4,277
30-39	9.9	11,568
40-49	17.3	20,171
50-59	22.3	26,019
60-69	24.3	28,326
70+	22.6	26,360
Missing	0.1	61
Gender		
Female	74.4	86,936
Male	25.4	29,713
Other/Unknown	0.1	133
Race		
Asian, or American Indian or Alaska Native, or Native Hawaiian or Other Pacific Islander	1.0	1,206
White	79.4	92,772
Black or African American	9.9	11,561
Multiple Reported	0.5	593
Other	4.2	4,883
Missing	4.9	5,767
Ethnicity		
Hispanic/Latino	8.2	9,540
Non-Hispanic	79.2	92,536
Multiple Reported	0.1	136
Missing	12.5	14,570



Discussion

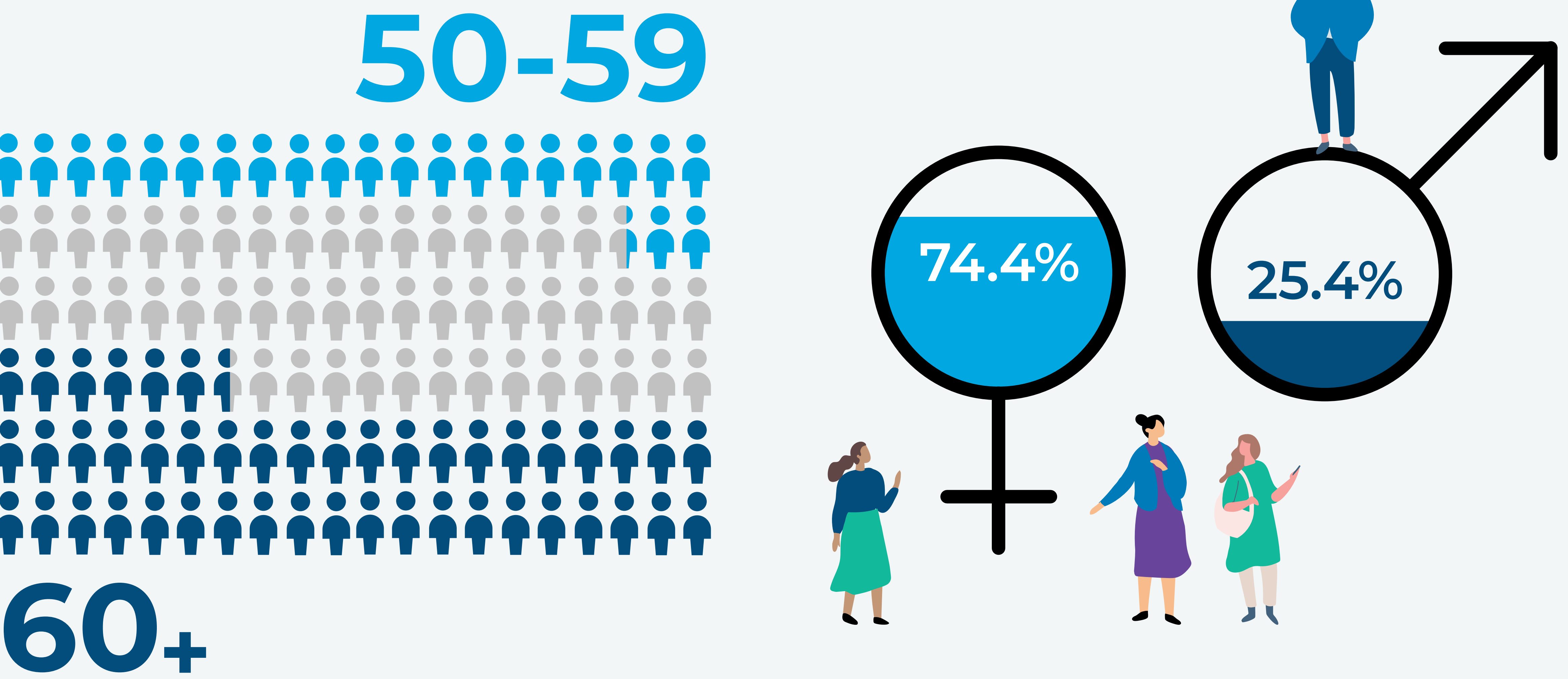
Gender and altitude findings were consistent with recent published epidemiological findings using health claims data for MS.² Findings of higher use of the newer monoclonal antibodies among Blacks/African Americans are consistent with published clinical trial data showing greater benefits of these treatments over interferon beta-1b among Blacks/African Americans, who tend to have more severe disease courses.⁴⁻⁵

There are several study limitations to be noted. First, the availability and accuracy of EHR data are dependent on the availability and accuracy with which the data were entered into the EHR database. Second, the prescription data obtained from EHR may be incomplete since EHR data can only capture information on individuals while they were within the EHR network, any prior medical or prescription history outside of this EHR network was not available. Finally, there are other social determinants of health variables not currently captured in the EHR, such as income and education, which may impact findings.

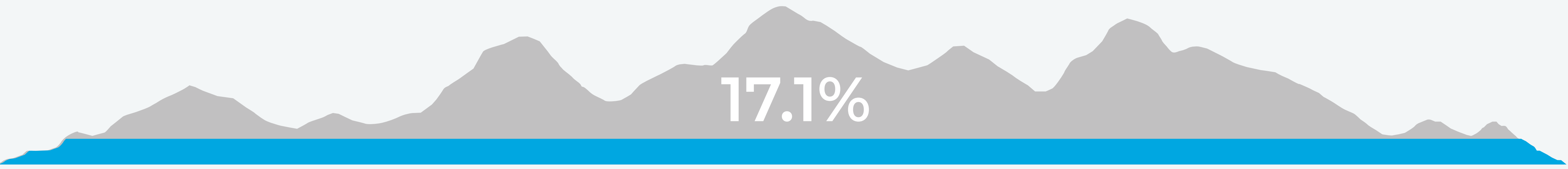
Overview of Results

Patient Demographics

A total of **116,782 patients with MS** were identified in the EHR database.



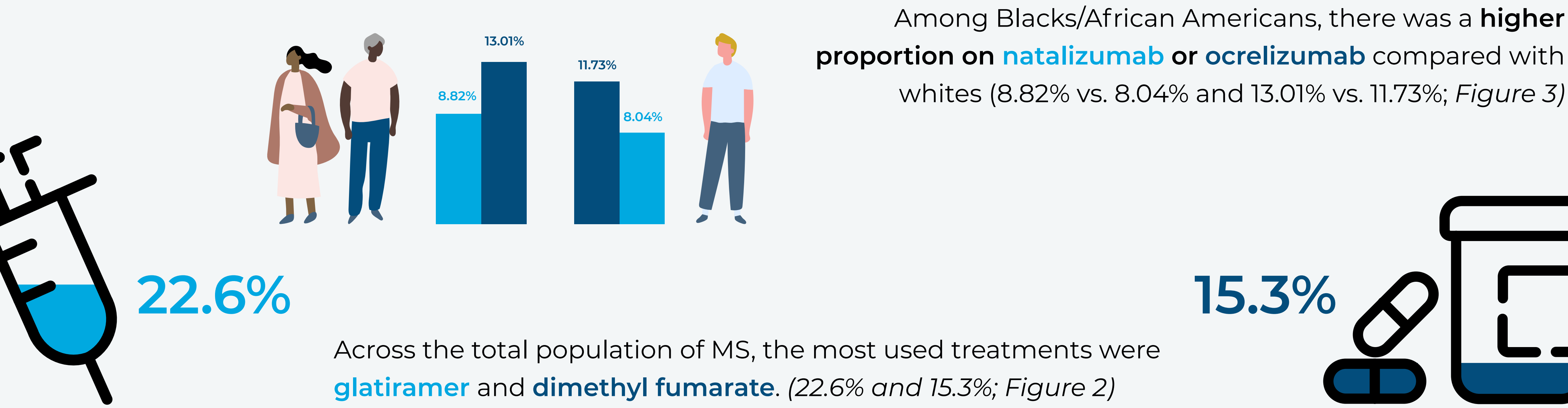
A **higher proportion of MS** was among those of 60 years old and over and 50-59 years old (46.8% and 22.3%, respectively; *Table 1*)



There was a **higher prevalence among higher altitude** regions (e.g., Mountain: 17.1%, East North Central: 13.6%, West North Central: 12.1%, East South Central: 3.1%, West South Central: 4.4%; *Figure 1*)

MS Treatment Use

Treatment regimens **did not differ** by gender or region.



Across the total population of MS, the most used treatments were **glatiramer** and **dimethyl fumarate**. (22.6% and 15.3%; *Figure 2*)

Conclusions

In a large national electronic health records database, **MS was found to have higher prevalence in females compared with males and those residing in higher altitude regions. Treatment patterns did not reveal any gender or region differences. However, race/ethnicity differences were demonstrated. Further explorations in understanding social determinants of health factors and access to newer and more efficacious treatments in MS is needed.**

References

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