# Regional Variations Across the United States in the Prevalence of Overt Hepatic Encephalopathy and Rifaximin Utilization Among Commercially and Medicare Insured Adults

#3100

**Robert Wong[1,2]; Patrick Gagnon-Sanschagrin[3]; Zeev Heimanson[4]; Jessica Maitland[3]; Remi Bellefleur[3]; Annie Guérin[3]; Martha Sikes[4]; Brock Bumpass[5]; Olamide Olujohungbe[5]; Danellys Borroto[5]; George Joseph[5,6]; Ankur A Dashputre[5]**

[1]VA Palo Alto Health Care System, Palo Alto, CA 94304-1207; [2]Stanford University School of Medicine, Stanford, CA 94305; [3]Analysis Group, Inc., Montréal, QC H3B 0G7; [4]Salix Pharmaceuticals, Bridgewater, NJ 08807; [5]Bausch Health, Bridgewater, NJ 08807; [6]Now at BioNTech US Inc., Cambridge, MA

## Background

- Cirrhosis and its complications are associated with significant morbidity and mortality, leading to substantial clinical and economic burden[1]
- Regional trends in epidemiology and medications use for overt hepatic encephalopathy (OHE) may be informative to healthcare policy

## Objectives

- This study aimed to describe state-level prevalence of cirrhosis, OHE, and rifaximin 550mg utilization among patients with cirrhosis in the United States (US) in 2020

## Methods

- **Data source**: MarketScan® Commercial Claims Database (2006-2020) and Medicare 100% Research Identifiable Files (2006-2020)
- Commercially insured adults (18-64 years) and Medicare insured adults (≥65 years) with cirrhosis were identified, defined as ≥2 diagnoses of cirrhosis[a] or cirrhosis-related complications (i.e., varices, hepatorenal syndrome, OHE, spontaneous bacterial peritonitis)[b]
- Prevalence of cirrhosis in 2020 was calculated among patients with continuous health plan enrollment for the entire calendar year, and included patients diagnosed with cirrhosis in prior years if they met the enrollment requirement
- Prevalence of OHE was calculated among patients with cirrhosis in 2020, and included patients diagnosed with OHE in prior years if they met the enrollment requirement
- Rifaximin 550mg utilization was calculated as the proportion of patients with ≥1 rifaximin 550mg twice-daily (BID) prescription fill in 2020 among patients with cirrhosis in 2020
- The prevalence of cirrhosis, OHE, and rifaximin 550mg utilization were estimated for each US state (except Alaska and Hawaii), and for each of the commercial and Medicare populations, separately
- In states with denominator or numerator counts <11, the regional prevalence was imputed based on US Census regions (denoted by *)
- Each state-level prevalence was applied to American Community Survey (ACS) 2021 population estimates[2] to estimate the count of adults with cirrhosis, OHE, and rifaximin 550mg utilization in the US in 2020[c]

**Notes**: [a] Cirrhosis was defined as ICD-10 K70.3, K71.7, K74.3, K74.4, K74.5, K74.6; [b] Varices was defined as ICD-10 I85, I86.4; hepatorenal syndrome was defined as ICD-10 K76.7, K91.83; OHE was defined as ICD-10 K72.01, K72.11, K72.90, K72.91, K70.41, K71.11; spontaneous bacterial peritonitis was defined as ICD-10 K65.2; [c] 2021 ACS estimates were used with 2020 prevalence estimates given that the ACS did not release estimates for 2020 due to significant disruptions to data collection brought on by the coronavirus pandemic

## Results

### Figure 1. Prevalence of cirrhosis

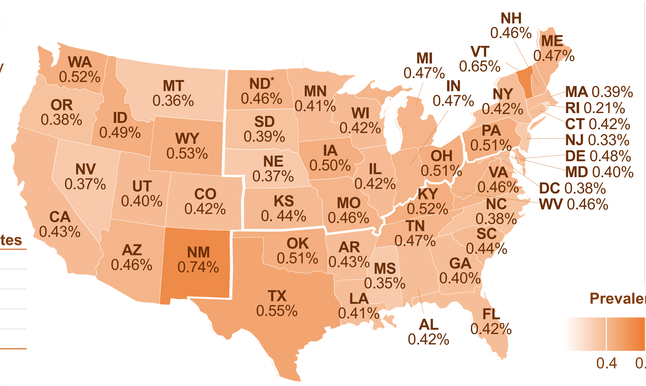
**COMMERCIAL (Age 18-64)**

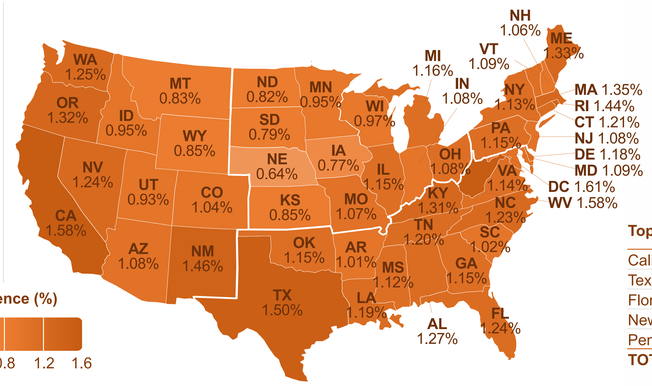
Overall US prevalence of cirrhosis among commercially insured adults in 2020:

**0.45%**

Range: **0.21% to 0.74%** (Rhode Island and New Mexico)

| Top 5 states | Extrapolated population estimates |
|---|---|
| California | 69,523 |
| Texas | 64,007 |
| Florida | 36,574 |
| New York | 34,954 |
| Pennsylvania | 29,075 |
| **TOTAL (US)** | **617,870** |




**MEDICARE (Age ≥65)**

Overall US prevalence of cirrhosis among Medicare insured adults in 2020:

**1.20%**

Range: **0.64% to 1.61%** (Nebraska and District of Columbia)

| Top 5 states | Extrapolated population estimates |
|---|---|
| California | 85,763 |
| Texas | 53,900 |
| Florida | 53,891 |
| New York | 36,307 |
| Pennsylvania | 26,373 |
| **TOTAL (US)** | **628,515** |

### Figure 2. Prevalence of OHE among adults with cirrhosis

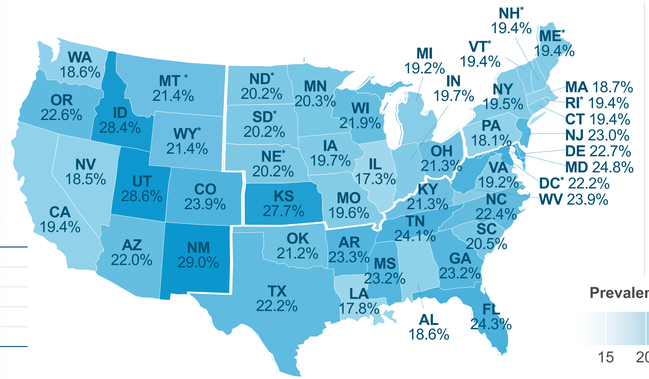
**COMMERCIAL (Age 18-64)**

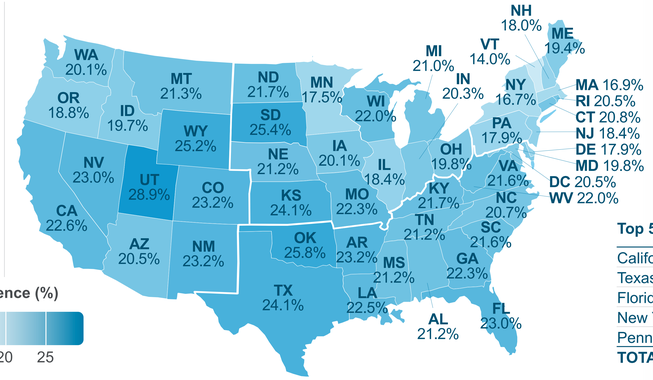
Overall prevalence of OHE among adults with cirrhosis in the US in 2020:

**21.4%**

Range: **17.3% to 29.0%** (Illinois and New Mexico)

| Top 5 states | Extrapolated population |
|---|---|
| Texas | 14,177 |
| California | 13,502 |
| Florida | 8,877 |
| New York | 6,799 |
| Ohio | 5,351 |
| **TOTAL (US)** | **130,087** |




**MEDICARE (Age ≥65)**

Overall prevalence of OHE among adults with cirrhosis in the US in 2020:

**20.9%**

Range: **14.0% to 28.9%** (Vermont and Utah)

| Top 5 states | Extrapolated population estimates |
|---|---|
| California | 19,352 |
| Texas | 12,982 |
| Florida | 12,397 |
| New York | 6,064 |
| Pennsylvania | 4,728 |
| **TOTAL (US)** | **132,706** |

### Figure 3. Prevalence of rifaximin 550mg utilization among adults with cirrhosis

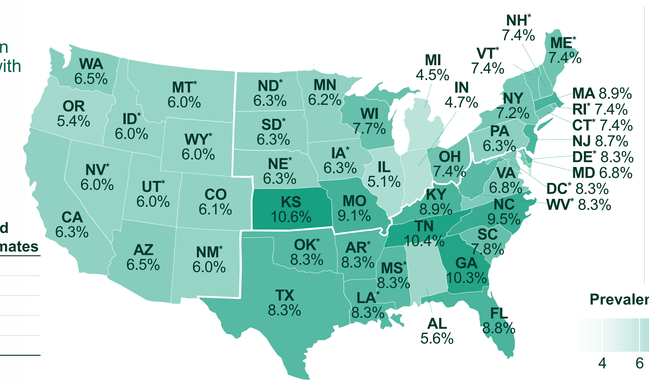
**COMMERCIAL (Age 18-64)**

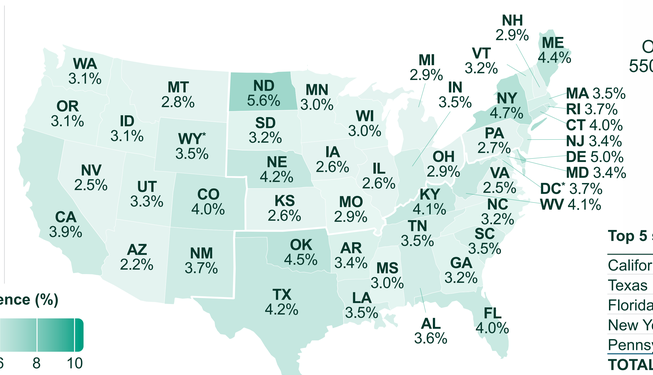
Overall prevalence of rifaximin 550mg BID among patients with cirrhosis in the US in 2020:

**6.3%**

Range: **4.5% to 10.6%** (Michigan and Kansas)

| Top 5 states | Extrapolated population estimates |
|---|---|
| Texas | 5,290 |
| California | 4,383 |
| Florida | 3,225 |
| New York | 2,510 |
| Georgia | 1,874 |
| **TOTAL (US)** | **45,289** |




**MEDICARE (Age ≥65)**

Overall prevalence of rifaximin 550mg BID among patients with cirrhosis in the US in 2020:

**3.1%**

Range: **2.2% to 5.6%** (Arizona and North Dakota)

| Top 5 states | Extrapolated population estimates |
|---|---|
| California | 3,300 |
| Texas | 2,274 |
| Florida | 2,138 |
| New York | 1,707 |
| Pennsylvania | 713 |
| **TOTAL (US)** | **22,142** |

## Conclusions

- Prevalence of cirrhosis, OHE, and rifaximin utilization varied by state
- Medicare-insured adults had greater prevalence of cirrhosis compared to commercially-insured adults
- One in five patients with cirrhosis in the US were estimated to have OHE in 2020, in both commercially insured and Medicare populations
- Commercially insured patients had greater utilization of rifaximin 550mg despite similar rates of OHE

## Limitations

- This claim-based study is subject to common limitations including billing inaccuracies and missing data
- Definition of OHE was based on literature and clinical input, but no unanimous consensus on ICD code exists from 2015 through the analysis period

## References

1. Hirode G, Saab S, Wong RJ. Trends in the Burden of Chronic Liver Disease Among Hospitalized US Adults. JAMA Netw Open. 2020 Apr 1;3(4):e201997. doi: 10.1001/jamanetworkopen.2020.1997. PMID: 32239220; PMCID: PMC7118516.
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