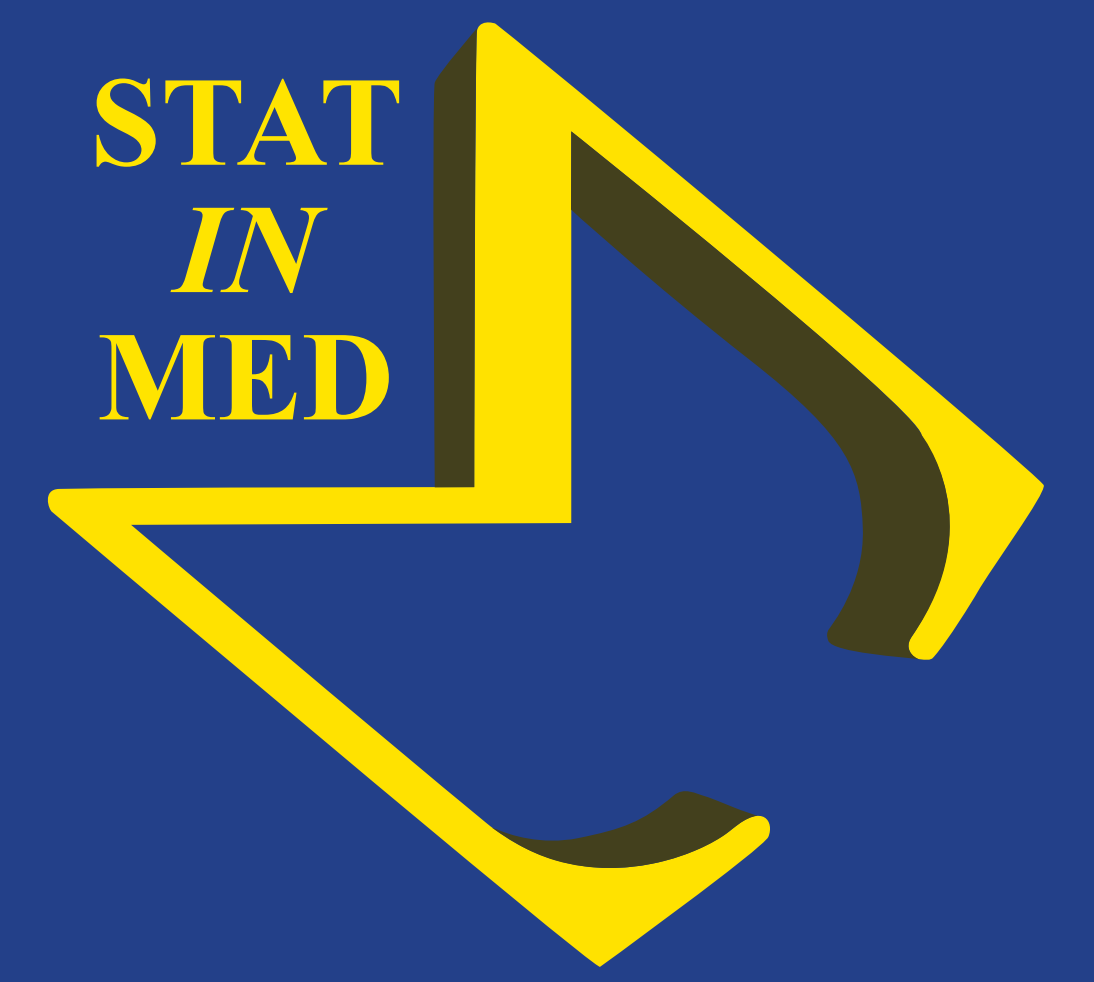


Assessing the Economic Burden and 30-day Readmission Rates among Patients with Chronic Obstructive Pulmonary Disease in the US Veterans Health Administration Population



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Objectives

Assess health care costs, 30-day readmission rates, and predictors of 30-day readmission among chronic obstructive pulmonary disease (COPD) patients in the US Veterans Health Administration (VHA) population. (01OCT2011-30SEP2016).

Background

- COPD affects approximately 26.8 million Americans, of which an estimated 12 million remained undiagnosed.¹
- It is the third-leading cause of death in the United States together with asthma.^{1,2}
- Moreover, 45% to 75% of related health care expenditures are due to COPD exacerbations, as they often lead to emergency department (ED) visits, additional medication use, and costly inpatient stays.¹
- In 2008, COPD hospitalization costs ranged from \$7,242 for COPD admission to \$44,909 for COPD hospitalization, including intubation and intensive care.¹
- Maintenance medications are recommended and are found to be effective in controlling the symptoms, maintaining lung function, and preventing acute COPD exacerbation.²
- However, COPD patients may fail to use any maintenance medications,² thereby increasing the clinical and economic burden.

Methods

- Patients with ≥1 inpatient diagnosis for COPD (International Classification of Disease, 9th Revision, Clinical Modification codes 491, 492, 496) during the identification period (01OCT2012-30SEPT2015) were identified from the VHA dataset.
- The initial diagnosis date was designated as the index date.
- Patients without a COPD diagnosis, but with the same age, sex, race, and index year as COPD patients, were identified for comparison (control patients). For controls, the index date was randomly selected to minimize bias.
- Adult patients were required to have continuous medical and pharmacy benefits for ≥1 year pre- and post-index date.
- Health care costs and 30-day readmission rates during the 1-year follow-up period were compared among 1:1 matched patients with COPD and control patients.
- Logistic regression was used to examine predictors of 30-day readmission. Odds ratio (OR) and 95% confidence intervals (CIs) were reported.

Results

After 1:1 matching, a total of 30,412 patients were included in each cohort.

Baseline Characteristics

- The average age in both cohorts was 72 years.
- Most patients in both the cohorts were white (73.4%).
- As compared to controls, COPD patients had significantly higher mean Charlson Comorbidity Index (CCI) scores (3.2 vs 1.2, p<0.0001; Table 1).

30-day Readmission Rates and Health Care Costs

As compared to controls, COPD patients had significantly higher:

- 30-day readmission rate (17.4% vs 0.7%; p<0.0001); and
- inpatient (\$33,088 vs \$1,120; p<0.0001), outpatient (\$8,924 vs \$2,520; p<0.0001), and total costs (\$42,012 vs \$3,640; p<0.0001; Figure 1).

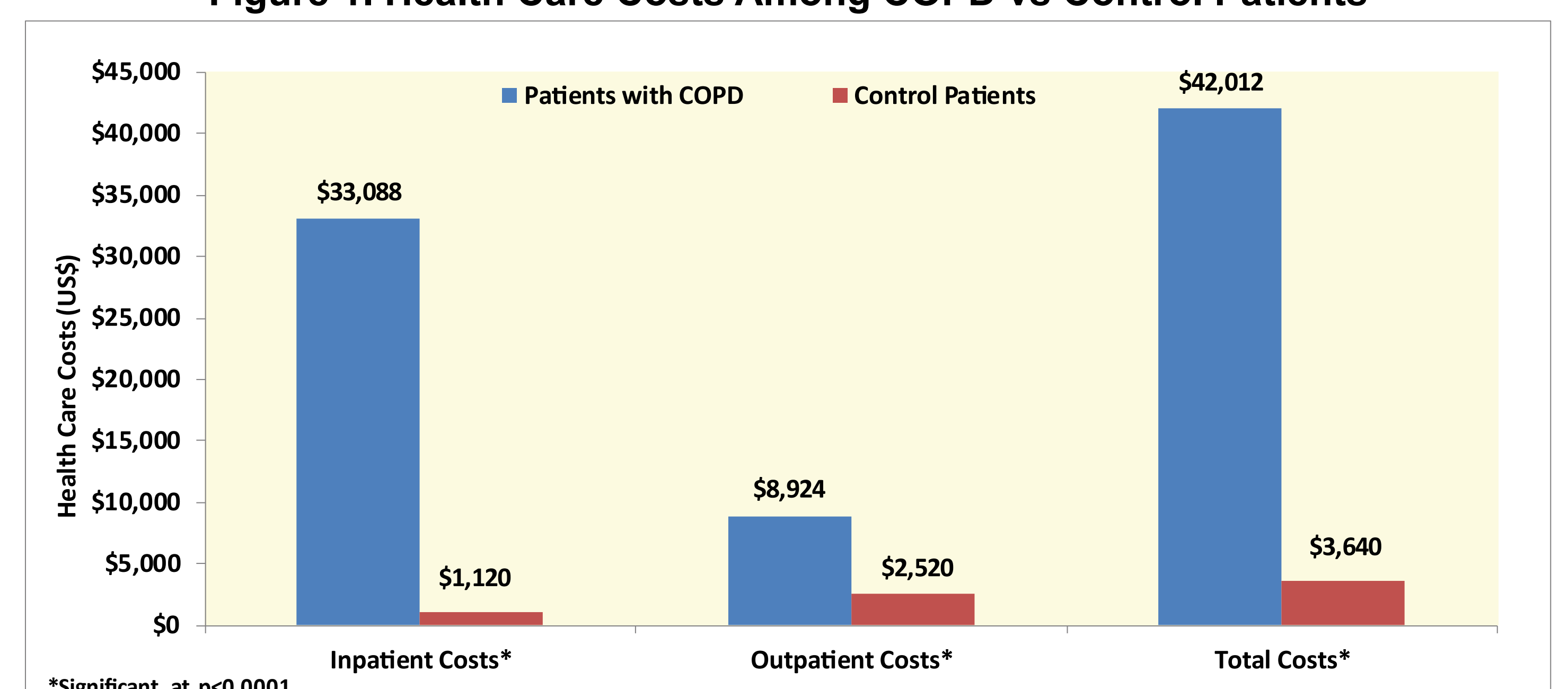
Results (cont'd)

Table 1. Baseline Characteristics of COPD vs Control Patients

Baseline Characteristics	Patients with COPD (N= 3,0412)		Control Patients (N= 3,0412)			
	N/Mean	%/SD	N/Mean	%/SD	p-value	STD
Age (Mean)	72	15	72	15	1.0000	0.00
Age Group						
18-25 years	1	0.00%	1	0.00%	1.0000	0.00
26-34 years	11	0.04%	11	0.04%	1.0000	0.00
35-54 years	1,044	3.4%	1,044	3.4%	1.0000	0.00
55-64 years	7,625	25.1%	7,625	25.1%	1.0000	0.00
65+ years	21,731	71.5%	21,731	71.5%	1.0000	0.00
Sex						
Male	29,387	96.6%	29,387	96.6%	1.0000	0.00
Female	1,025	3.4%	1,025	3.4%	1.0000	0.00
Race						
Black	4,150	13.7%	4,150	13.7%	1.0000	0.00
White	22,319	73.4%	22,319	73.4%	1.0000	0.00
Race unknown	3,415	11.2%	3,415	11.2%	1.0000	0.00
Other race	528	1.7%	528	1.7%	1.0000	0.00
Charlson Comorbidity Index Score	3.2	2.4	1.2	1.6	<0.0001	98.3

COPD: chronic obstructive pulmonary disease; SD: standard deviation; STD: standardized difference

Figure 1. Health Care Costs Among COPD vs Control Patients



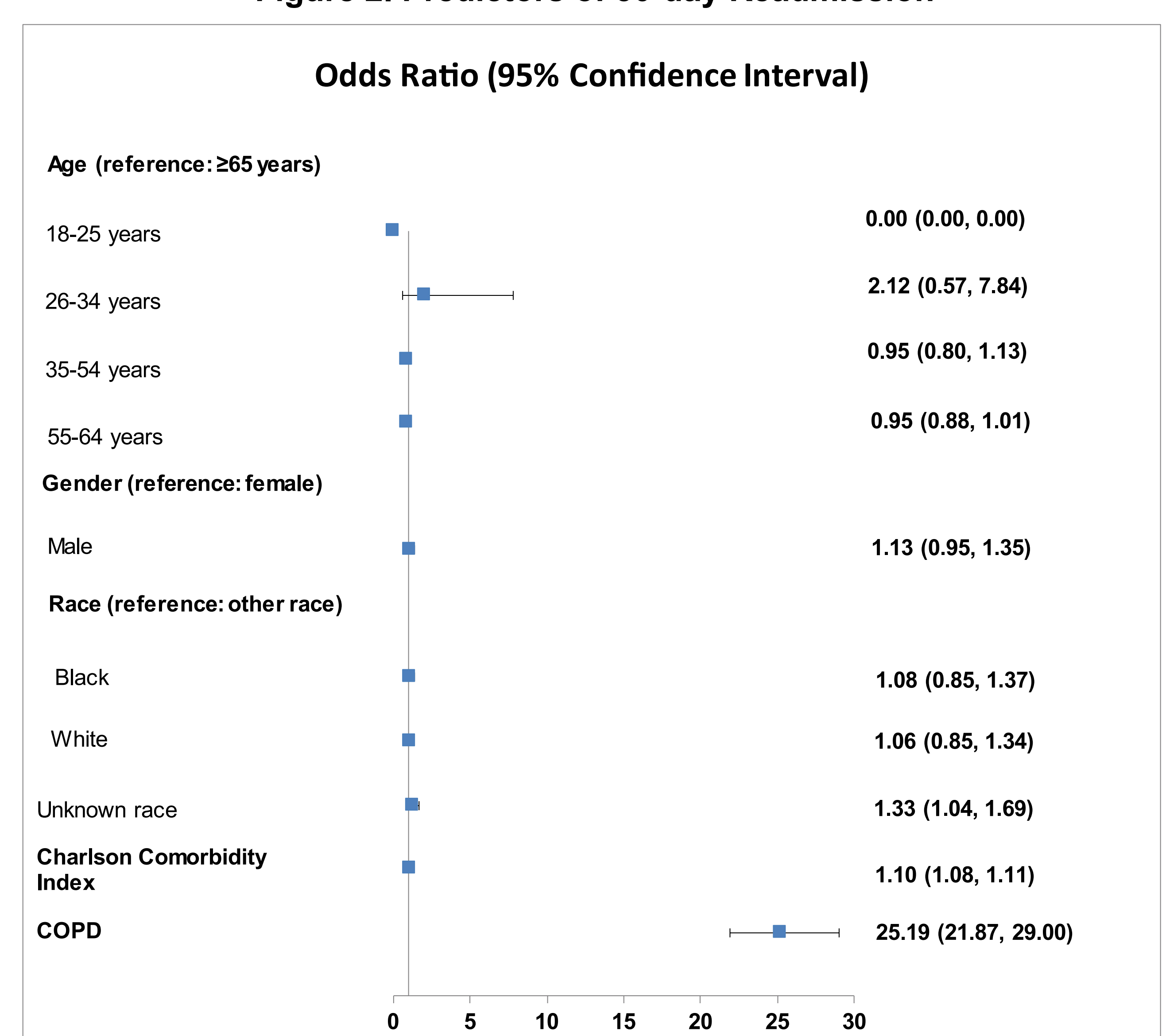
COPD: chronic obstructive pulmonary disease

Predictors of 30-day Readmission

The likelihood of 30-day re-admission was higher among:

- Patients with higher CCI scores (OR: 1.10; 95% CI: 1.08-1.11; p<0.0001; Figure 2); and
- COPD patients as compared to control patients (OR: 25.19, 95% CI: 21.87-29.00; p<0.0001).

Figure 2. Predictors of 30-day Readmission



COPD: chronic obstructive pulmonary disease

Conclusions

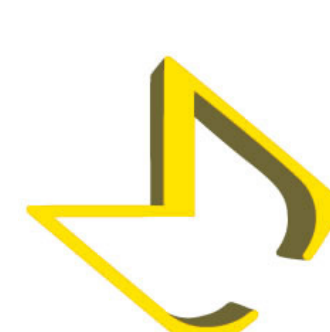
- Patients with COPD had significantly higher 30-day readmission rates and economic burden than controls.
- Higher CCI score was considered a significant positive predictor of 30-day readmission.
- Age, sex, and race did not significantly affect 30-day readmission.

References

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- 2Simoni-Wastila L, Wei YJ, Qian J, et al. Association of chronic obstructive pulmonary disease maintenance medication adherence with all-cause hospitalization and spending in a Medicare population. *Am J Geriatr Pharmacother*. 2012;10(3):201-10.

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