

Healthcare Cost and Utilization Before and After Diagnosis of *Pseudomonas Aeruginosa* Among Patients with Non-cystic Fibrosis Bronchiectasis in the U.S.

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OBJECTIVES

- Non-cystic fibrosis bronchiectasis (NCFBE) is a rare, chronic lung disease characterized by bronchial inflammation and permanent airway dilation.¹
- Chronic infections with *Pseudomonas aeruginosa* (PA) have been linked to higher morbidity and mortality in NCFBE patients.^{1,2}
- To understand the impact of PA in NCFBE on health care costs and burden, we assessed healthcare costs and utilization one year before and one year after PA diagnosis among US commercially insured NCFBE patients.

METHODS

- Using data from 2007-2013 PharMetrics Plus administrative claims, we included patients with >2 claims for bronchiectasis (ICD-9-CM: 494.xx) and >1 claim for PA (482.1 or 041.7); then excluded those with a claim for cystic fibrosis (277.xx).
- Patients were indexed at first claim for PA and were required to have >12 months before and after the index PA claim for assessment of healthcare cost and resource utilization.
- The mean difference in utilization and costs were assessed using paired t-test for statistical significance.

RESULTS

- Of 23,740 patients with NCFBE, 716 had PA (Figure 1).
- Patients with PA were mostly over age 50 (88.8%) and female (60.5%), had a high rate of cardiac arrhythmias (28.6%) and uncontrolled hypertension (49.6%) (Table 1).
- Total healthcare costs per patient in the year prior to PA diagnosis was \$36,213 on average compared to \$67,764 in the year following, for an increase of 87% or \$31,551 (p<0.0001) (Figure 2).
- Hospital cost represented the largest proportion of total healthcare cost after PA diagnosis (54%) and was associated with an 80% increase or \$16,243 (p=0.0004), representing an increase of 4 hospitalizations per patient (p<0.0001) (Figures 2-3).

Figure 1. Patients without PA vs. Patients with PA

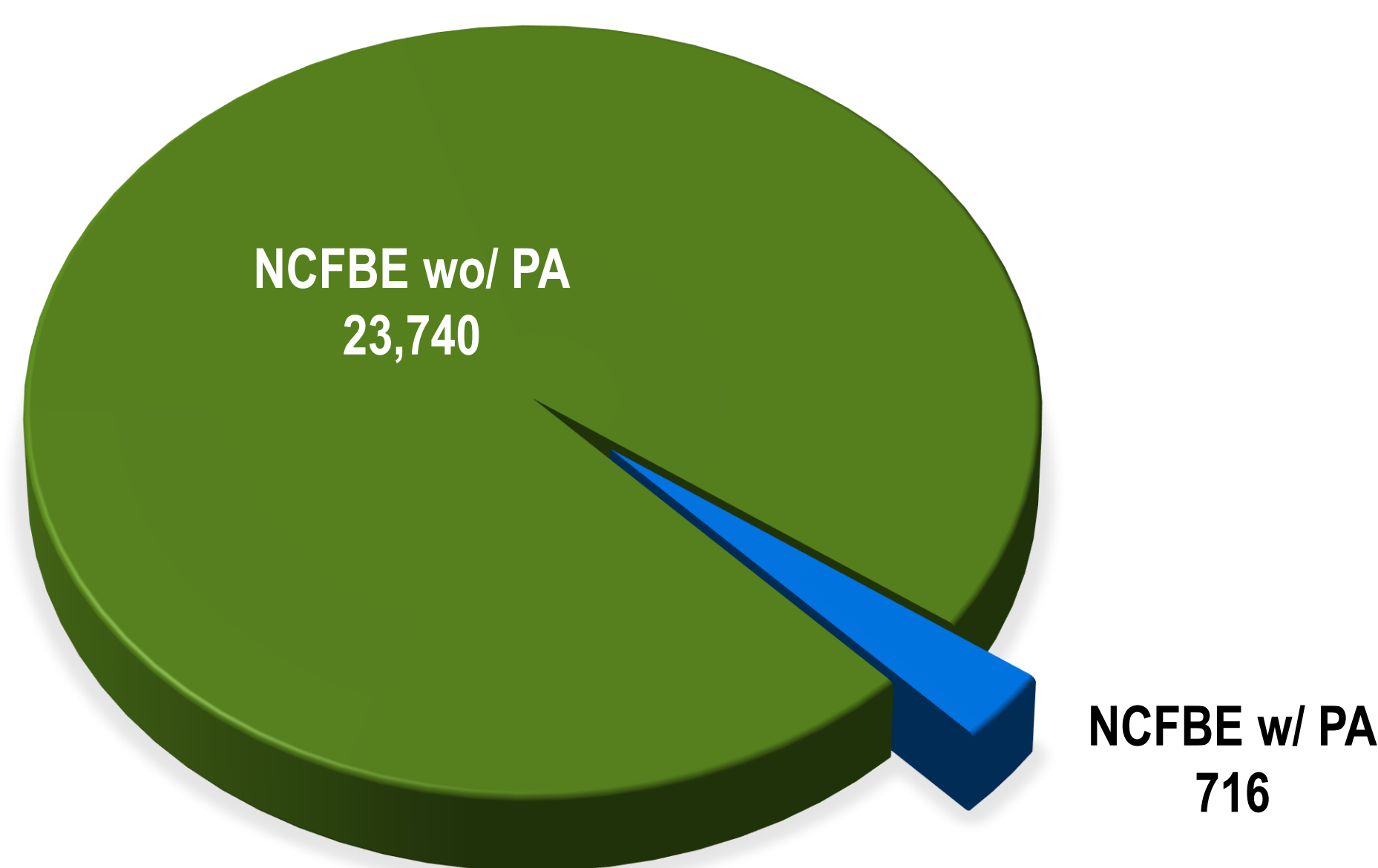


Table 1. Patient Demographics

	NCFBE w/ PA		NCFBE w/ PA	
Total, n (%)	716	(100.0%)	716	(100.0%)
Age, Mean (SD)				
age 0-17	22	3.07		
age 18-49	54	7.54		
age 50+	636	88.83		
Unknown				
Sex				
Female	433	60.47		
Male	282	39.39		
Unknown	1	0.14		
Comorbidities				
Alcohol abuse	11	1.54		
Cardiac arrhythmias	205	28.63		
Blood loss anemia	14	1.96		
CHF	118	16.48		
COPD	619	86.45		
Coagulopathies	42	5.87		
Deficiency anemia	64	8.94		
Depression	100	13.97		
Diabetes, controlled	38	5.31		
Diabetes, uncontrolled	148	20.67		
Drug abuse	10	1.4		
Fluid and electrolyte disorders	149	20.81		
HIV/AIDS	1	0.14		
Arterial hypertension, controlled	62	8.66		
Arterial hypertension, uncontrolled	355	49.58		
Hypothyroidism	99	13.83		
Liver disease	41	5.73		
Lymphoma	26	3.63		
Obesity	35	4.89		
Other neurological disease	73	10.2		
Paralysis	29	4.05		
Pulmonary circulation disease	69	9.64		
Peptic ulcer disease	10	1.4		
Peripheral vascular disease	77	10.75		
Psychosis	12	1.68		
Renal failure	57	7.96		
Rheumatoid arthritis	86	12.01		
Tumor	76	10.61		
Valvular disease	108	15.08		
Weight loss	90	12.57		

Figure 2. All-cause Healthcare Costs (Pre vs. Post PA)

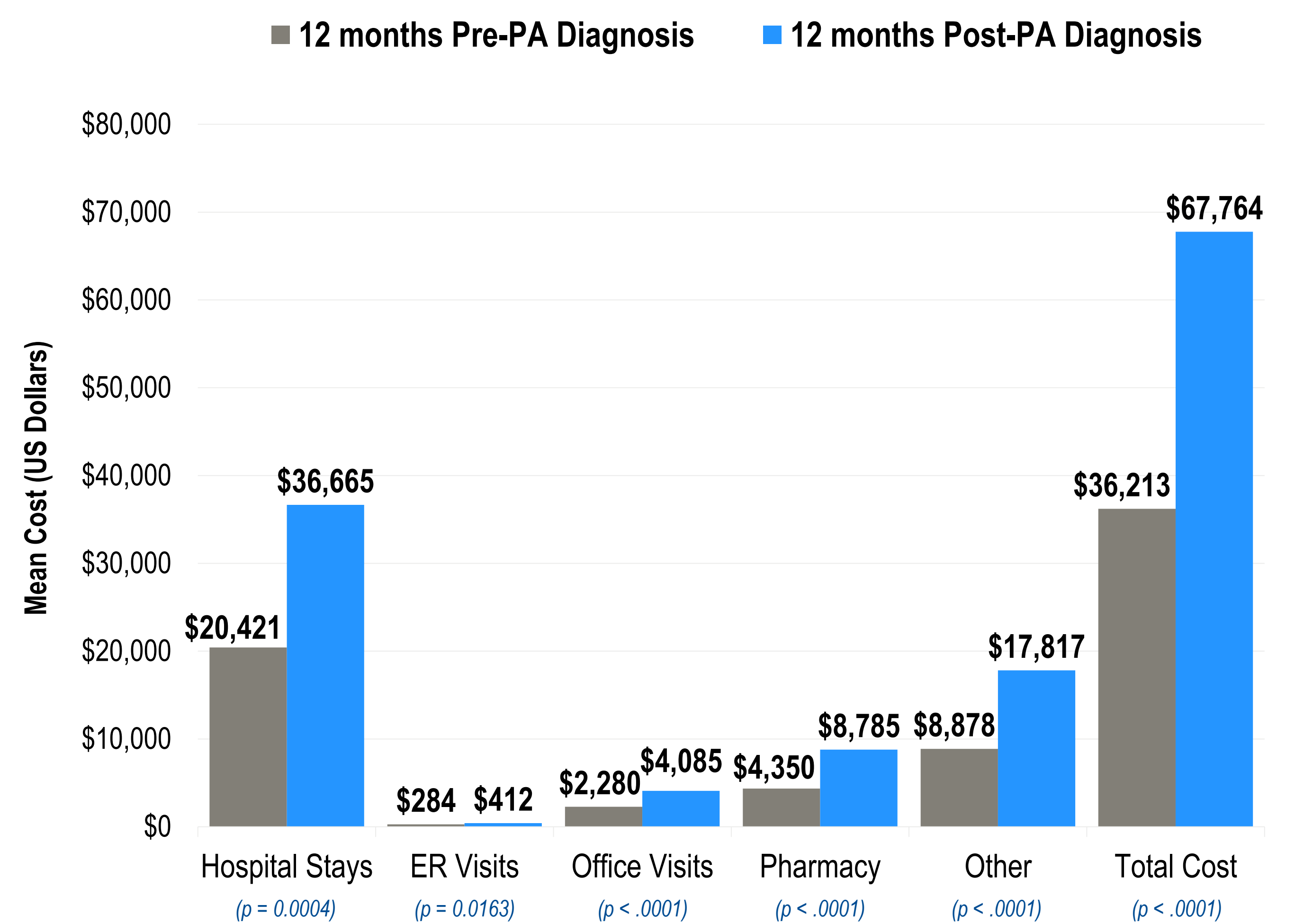
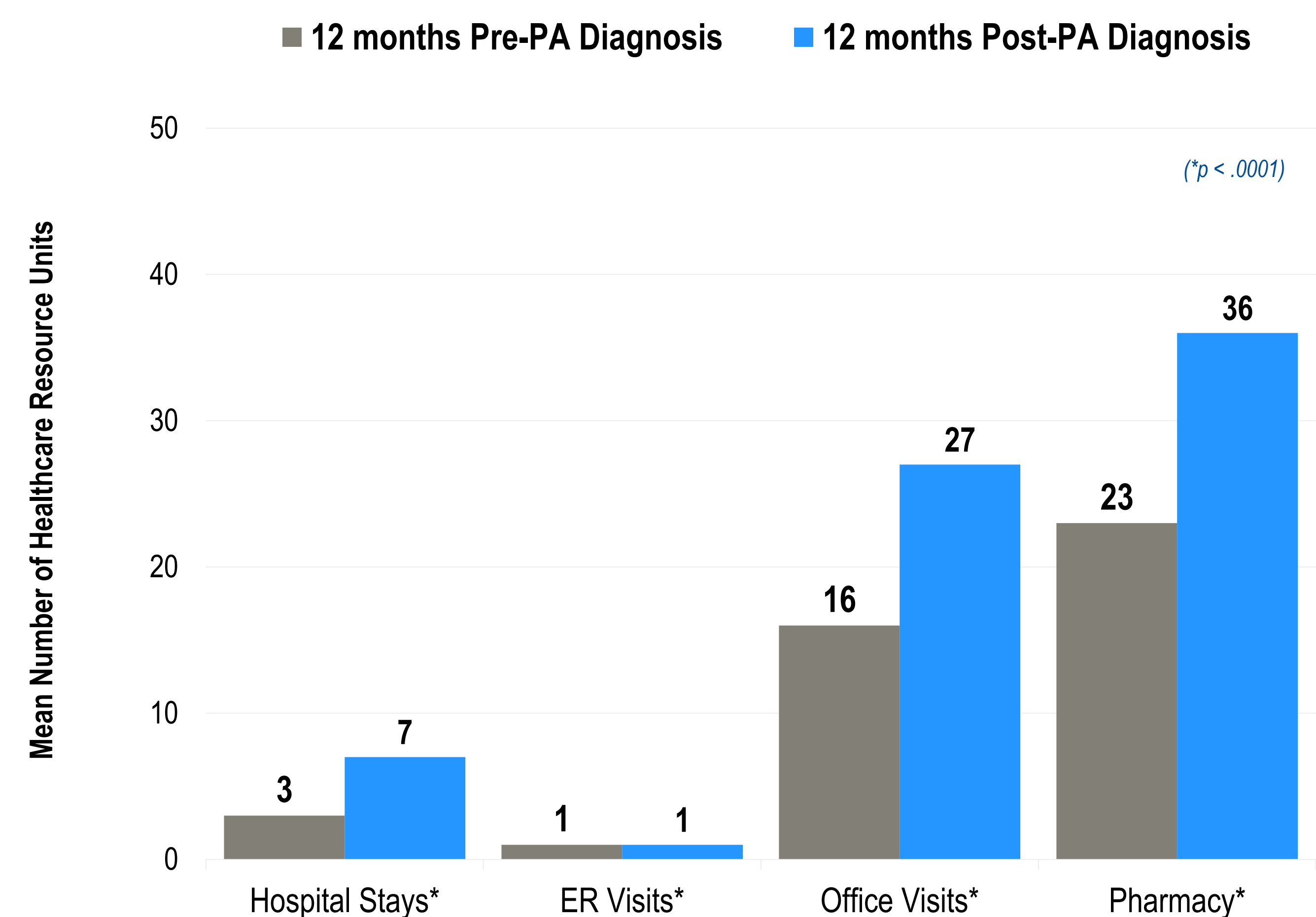


Figure 3. Healthcare Utilization (Pre vs. Post PA)



CONCLUSIONS

- NCFBE patients with evidence of PA incur substantially greater healthcare costs and utilization after diagnosis of PA.
- While these patients may have had PA prior to diagnosis, they appear to consume greater healthcare services post-diagnosis.
- Future research should explore methods of earlier identification of NCFBE patients with PA, as this may lead to a reduction in US healthcare costs.

REFERENCES

1. Pamela J. McShane, Edward T. Naureckas, Gregory Tino, and Mary E. Strek "Non-Cystic Fibrosis Bronchiectasis," *American Journal of Respiratory and Critical Care Medicine*, Vol. 188, No. 6 (2013), pp. 647-656.
2. Elphick HE, Smyth RL. Infections in patients with cystic fibrosis: effects of a longer survival. *The Microbe-Host Interface in Respiratory Tract Infections*. England: Horizon Scientific Press Ltd, 2004.