

# Cardiovascular Burden and Medication Use Among Patients with Idiopathic Pulmonary Fibrosis

Karina Raimundo, MS,<sup>1</sup> Michael S. Broder, MD, MSHS,<sup>2</sup> Eunice Chang, PhD,<sup>2</sup> Sheila R. Reddy, PhD, RPh,<sup>2</sup> Elya Papoyan, MPH,<sup>2</sup> John Stauffer, MD<sup>1</sup>

<sup>1</sup>Genentech, Inc., South San Francisco, CA; <sup>2</sup>Partnership for Health Analytic Research, LLC, Beverly Hills, CA

## BACKGROUND & PURPOSE

- Idiopathic pulmonary fibrosis (IPF) is a chronic, progressive, interstitial pneumonia of unknown cause that occurs predominantly in older adults.<sup>1</sup>
  - Median survival from diagnosis is approximately 3-5 years.<sup>2</sup>
- IPF is associated with increased healthcare resource utilization, including hospitalization, in addition to increased cardiovascular and other comorbidity,<sup>3,4</sup> that may require concomitant use of related medications.
- The objective of this analysis was to describe the type and prevalence of specific cardiovascular risk factors/comorbidities and related medication use in patients with IPF.

## METHODS

### Study Design

- Descriptive cross-sectional analysis using a large US commercial insurance claims database to identify 3 yearly cohorts of patients with IPF between 2009 and 2011.

### IPF Patient Selection

- Patients were identified separately by each identification (ID) year, 2009, 2010, and 2011.
- Inclusion criteria:
  - Having  $\geq 1$  inpatient claim or  $\geq 2$  outpatient claims with IPF (ICD-9-CM code 516.3) as one of the listed diagnoses during the ID year AND
  - Continuously enrolled during the ID year.
- Exclusion criteria:
  - Having evidence of another type of interstitial lung disease (ILD; based on claim with ICD-9-CM code for other ILD) after the last IPF claim<sup>5</sup> in the ID year.

### Study Measures

- Study measures reported in the ID year:
  - Patient characteristics: age, sex, geographic region, and health plan type.
  - Usual physician specialty.
  - Cardiovascular risk factors and comorbidities, which included: myocardial infarction (MI), cerebrovascular disease (CVD), congestive heart failure (CHF), diabetes with chronic complications, ischemic heart disease (IHD, includes MI and angina), peripheral vascular disease (PVD), and pulmonary hypertension.
  - Cardiovascular-related medication use (over-the-counter medications such as aspirin were not captured). Medication classes included: antidiabetic agents, antihyperlipidemics, antithrombotic agents, beta blockers, calcium channel blockers, cardiac arrhythmia agents, diuretics, nitrates, pulmonary hypertension agents, renin-angiotensin inhibitors, and smoking cessation drugs.

### Statistical Analysis

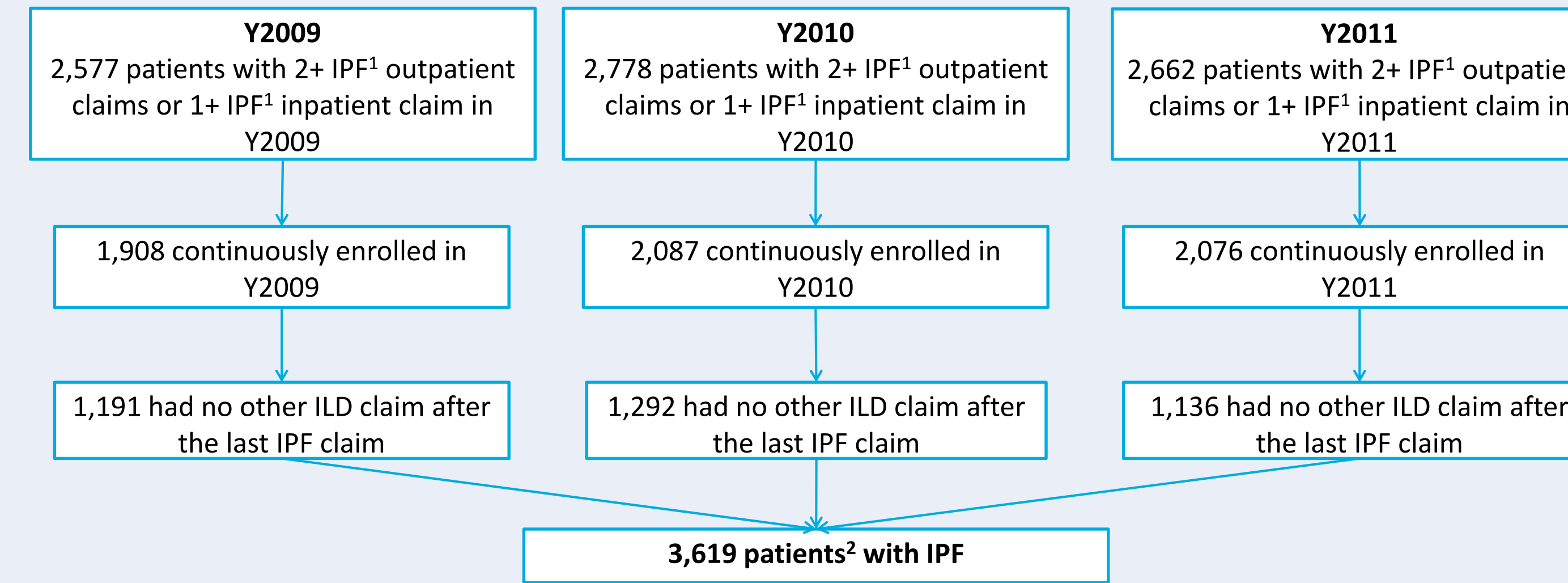
- Descriptive results for the combined and individual ID years were generated.

## RESULTS

### Basic Demographic and Physician Characteristics (Figure 1, Table 1)

- We identified 3,619 patients with IPF from 2009 to 2011. By ID year: 1,191 patients in 2009, 1,292 in 2010 and 1,136 in 2011.
  - Mean (SD) age was 70.4 (11.0) years, and 50.5% were women.
  - All geographic regions were represented.
  - 62.6% had Medicare coverage.
- About half of patients (49.5%) received usual IPF care from a pulmonologist.

### Figure 1: Patient Identification



<sup>1</sup> Claims with IPF as one of the listed diagnoses.

<sup>2</sup> N=3,006 unique patients.

### Table 1: Patient Characteristics

	Index Year			All N=3,619
	2009 N=1,191	2010 N=1,292	2011 N=1,136	
Age, year, mean (SD)	69.8 (11.1)	70.0 (11.4)	71.3 (10.6)	70.4 (11.0)
Female, no. (%)	600 (50.4)	671 (51.9)	558 (49.1)	1,829 (50.5)
Region, no. (%)				
Midwest	297 (24.9)	309 (23.9)	279 (24.6)	885 (24.5)
Northeast	152 (12.8)	160 (12.4)	171 (15.1)	483 (13.3)
South	473 (39.7)	545 (42.2)	481 (42.3)	1,499 (41.4)
West	269 (22.6)	278 (21.5)	205 (18.0)	752 (20.8)
Plan type, no. (%)				
Commercial	538 (45.2)	446 (34.5)	370 (32.6)	1,354 (37.4)
Medicare	653 (54.8)	846 (65.5)	766 (67.4)	2,265 (62.6)
Usual physician specialty for IPF care, no. (%)				
Pulmonology	586 (49.2)	652 (50.5)	553 (48.7)	1,791 (49.5)
Primary care	213 (17.9)	217 (16.8)	187 (16.5)	617 (17.0)
Other <sup>a</sup>	61 (5.1)	52 (4.0)	43 (3.8)	156 (4.3)
Unknown	331 (27.8)	371 (28.7)	353 (31.1)	1,055 (29.2)

<sup>a</sup> All other specialties were < 2%.

### Table 2: Cardiovascular Risk Factors & Comorbidities

	Index Year			All N=3,619
	2009 N=1,191	2010 N=1,292	2011 N=1,136	
Ischemic heart disease <sup>a</sup> , no. (%)	426 (35.8)	443 (34.3)	423 (37.2)	1,292 (35.7)
Myocardial Infarction, no. (%)	89 (7.5)	92 (7.1)	84 (7.4)	265 (7.3)
Congestive heart failure, no. (%)	303 (25.4)	349 (27.0)	319 (28.1)	971 (26.8)
Cerebrovascular disease, no. (%)	195 (16.4)	203 (15.7)	170 (15.0)	568 (15.7)
Peripheral vascular disease, no. (%)	132 (11.1)	141 (10.9)	125 (11.0)	398 (11.0)
Diabetes with chronic complications, no. (%)	117 (9.8)	125 (9.7)	99 (8.7)	341 (9.4)
Pulmonary hypertension, no. (%)	101 (8.5)	131 (10.1)	79 (7.0)	311 (8.6)

<sup>a</sup>IHD includes MI and Angina

### Table 3: CV-Related Medication Use

	Index Year			All N=3,619
	2009 N=1,191	2010 N=1,292	2011 N=1,136	
CV-Related Medications, no. (%)	866 (72.7)	971 (75.2)	863 (76.0)	2,700 (74.6)
Antihyperlipidemics	530 (44.5)	597 (46.2)	567 (49.9)	1,694 (46.8)
Diuretics	435 (36.5)	500 (38.7)	424 (37.3)	1,359 (37.6)
Renin-angiotensin inhibitors	409 (34.3)	485 (37.5)	389 (34.2)	1,283 (35.5)
Beta blockers	370 (31.1)	428 (33.1)	397 (34.9)	1,195 (33.0)
Calcium channel blockers	276 (23.2)	309 (23.9)	293 (25.8)	878 (24.3)
Antithrombotic agents	278 (23.3)	294 (22.8)	268 (23.6)	840 (23.2)
Antidiabetic agents	254 (21.3)	295 (22.8)	232 (20.4)	781 (21.6)
Nitrates	102 (8.6)	125 (9.7)	111 (9.8)	338 (9.3)
Smoking cessation drugs	55 (4.6)	59 (4.6)	40 (3.5)	154 (4.3)
Cardiac arrhythmia agents	49 (4.1)	35 (2.7)	41 (3.6)	125 (3.5)
Pulmonary hypertension agents	34 (2.9)	46 (3.6)	30 (2.6)	110 (3.0)

## CONCLUSION & CLINICAL IMPLICATIONS

- Cardiovascular risk factors/comorbidities were common among patients with IPF, with IHD being the most prevalent condition, followed by congestive heart failure, cerebrovascular disease and peripheral vascular disease.
- Use of cardiovascular-related medication was evident for three-quarters of patients (74.6%), the most common being anti-hyperlipidemics, diuretics, renin-angiotensin inhibitors, beta blockers, calcium channel blockers, anti-thrombotic agents, anti-diabetic agents.
- These considerations should be taken into account in the overall management of patients with IPF.

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