

# RETROSPECTIVE STUDY EXAMINING HEALTH CARE UTILIZATION AND COSTS FOR PATIENTS WITH PSORIATIC ARTHRITIS AND PSORIASIS IN THE US



Merola JF<sup>1</sup>, Peterson S<sup>2</sup>, Dennis N<sup>3</sup>, Chakravarty SD<sup>4</sup>, Mesana L<sup>5</sup>, Lin I<sup>2</sup>, Pacou M<sup>3</sup>, Villacorta R<sup>2</sup>

<sup>1</sup>Brigham and Women's Hospital, Harvard Medical School, <sup>2</sup>Janssen Immunology Global Commercial Strategy Organization, Horsham, PA, USA, <sup>3</sup>Amaris, Paris, France, <sup>4</sup>Janssen Scientific Affairs, LLC, Horsham, PA, USA and Drexel University College of Medicine, Philadelphia, PA, USA, <sup>5</sup>Amaris, New York, USA

## Introduction

- Psoriasis (PsO) is a chronic inflammatory skin disorder that is characterized by plaques on the skin. It is estimated that PsO affects 2-4% of the United States population<sup>1</sup>.
- Psoriatic arthritis (PsA) is an inflammatory arthritis that often develops in people with PsO.
- The prevalence of PsA is estimated at 19.5% in North American patients with PsO<sup>2</sup>.
- The total direct and indirect costs of PsO are calculated to be \$11.25 billion annually in the United States<sup>3</sup>.
- Direct medical costs have been shown to be greater among patients with PsA than PsO alone, with an estimated incremental cost of \$9,188 (in 2011 dollars)<sup>3</sup>.
- Merola et al. (2018) found that the incremental total direct costs associated with PsA was \$18,482 compared to patients free of PsO and PsA<sup>4</sup>.
- A retrospective study that compares healthcare costs and resource utilization over five years of follow-up among patients with PsA, PsO (without PsA), and patients without PsO and PsA would give more insight into the additional costs and resources incurred by these patients.

## Methods

- The MarketScan Commercial Claims and Encounters Database was used with observations from January 1<sup>st</sup> 2009 through February 29<sup>th</sup> 2020.
- Patients with  $\geq 1$  inpatient or 2 outpatient diagnoses for PsO or PsA were selected as the case groups. Patients with PsO were required to have no PsA diagnosis in their entire claims history. All patients were  $\geq 18$  years old at the index date and had  $\geq 12$  months of continuous enrollment prior to and after the index date. Patients were followed until inpatient death, end of continuous enrollment, or end of study.
- For PsO and PsA patients, the index date was defined as the first date of diagnosis. The index date for the control group (patients without PsO and PsA) was assigned as 12 months after the beginning of continuous enrollment in the database.
- Control patients were matched 1:1 to cases (PsO and PsA combined) based on age, sex, and the number of non-rheumatological comorbidities, identified using the conditions in the Charlson Comorbidity Index<sup>5</sup>
- Medical and pharmacy expenditures were defined as total gross payments to providers (expressed in 2019 dollars). Linear mixed models were used for continuous outcomes, logistic mixed-effects models were used for binary outcomes, and Poisson or negative binomial mixed-effects models were used for count data.

## Objectives

To evaluate and compare the healthcare costs and resource utilization among patients with PsO, PsA and those without PsO and PsA living in the United States from January 1<sup>st</sup> 2009 to February 29<sup>th</sup> 2020.

## Results

### Patient characteristics

- Hyperlipidemia, hypertension, depression, anxiety, and rheumatoid arthritis were most common among patients with PsA and least common among the control group (Table 1).
- Other patient characteristics were well balanced among the matched cohorts.

Table 1. Baseline characteristics

	Control	PsO	PsA
Number of patients	255,708	208,434	47,274
Age – Mean (SD)	46.5 (11.9)	46.1 (12.2)	48.2 (10.5)
Male - N (%)	117320 (45.9%)	96768 (46.4%)	20552 (43.5%)
N comorbidities- Mean (SD)	0.38 (0.74)	0.35 (0.72)	0.48 (0.83)
Comorbidities - N (%)			
Hyperlipidemia	66098 (25.8%)	60135 (28.9%)	16215 (34.3%)
Hypertension	63801 (25.0%)	56341 (27.0%)	16434 (34.8%)
Diabetes	29026 (11.4%)	21444 (10.3%)	6655 (14.1%)
Depression	20278 (7.9%)	21604 (10.4%)	6615 (14.0%)
Anxiety	14691 (5.7%)	19247 (9.2%)	5479 (11.6%)
Rheumatoid arthritis	1996 (0.8%)	3010 (1.4%)	7668 (16.2%)

Table 2. Healthcare resource utilization during follow-up

	Control	PsO	PsA
<b>Inpatient hospitalizations</b>			
Admission in 1st year - N (%)	12709 (5.0%)	13978 (6.7%)	4487 (9.5%)
Mean (SD) number of admissions	0.07 (0.34)	0.08 (0.37)	0.11 (0.44)
<b>Hospital outpatient services</b>			
Services in 1st year - N (%)	111836 (43.7%)	115962 (55.6%)	32661 (69.1%)
Mean (SD) number of services	8.3 (24.2)	9.7 (24.4)	15.5 (29.7)
<b>Physician office visits</b>			
Visits in 1st year - N (%)	188685 (73.8%)	205532 (98.6%)	46934 (99.3%)
Mean (SD) number of visits	4.5 (5.2)	6.2 (5.9)	9.3 (7.4)
<b>Radiology services</b>			
Services in 1st year - N (%)	113500 (44.4%)	117042 (56.2%)	36011 (76.2%)
Mean (SD) number of services	2.5 (5.6)	2.8 (5.6)	4.6 (6.4)
<b>Emergency room (ER) visits</b>			
Visits in 1st year - N (%)	30942 (12.1%)	31745 (15.2%)	9209 (19.5%)
Mean (SD) number of visits	0.7 (4.0)	0.9 (4.6)	1.4 (7.4)
<b>Laboratory services</b>			
Services in 1st year - N (%)	162768 (63.7%)	180941 (86.8%)	45202 (95.6%)
Mean (SD) number of services	9.0 (17.1)	11.3 (17.2)	20.7 (22.9)
<b>Outpatient pharmacy services</b>			
Prescription in 1st year - N (%)	155984 (61.0%)	176452 (84.7%)	40832 (86.4%)
Mean (SD) number of prescriptions	12.7 (19.3)	17.0 (21.0)	28.7 (29.1)

### Key points

- Healthcare resource utilization was greatest among patients with PsA and lowest among the control group for all categories: hospitalizations, hospital outpatient services, physician office visits, radiology services, ER visits, laboratory services, and outpatient pharmacy services (Table 2).
- Patients with PsA incurred greater healthcare costs than patients with PsO and the control group, with greater inpatient, outpatient, and outpatient pharmacy costs during each year of follow-up (Figure 1). These costs were also higher among PsO patients than the control group and increased over time.
- After 1 year of follow-up, the number of physician office visits, and the number of hospital outpatient services were significantly greater among patients with PsA than patients with PsO and patients without PsO and PsA ( $p < 0.0001$  for all comparisons).
- The odds of hospitalization were significantly greater among patients with PsA than PsO and the control group at each year of follow-up. The odds were also significantly greater among PsO patients than the control group from year one to three.
- All-cause healthcare costs, outpatient pharmacy costs, and annual drug costs were significantly greater among the patients with PsA than patients with PsO and the control group at 1 year ( $p < 0.0001$ ). These costs were also greater among PsO patients than the control group ( $p < 0.0001$ ).

Figure 1. Mean all-cause healthcare costs per patient year (PPPY)

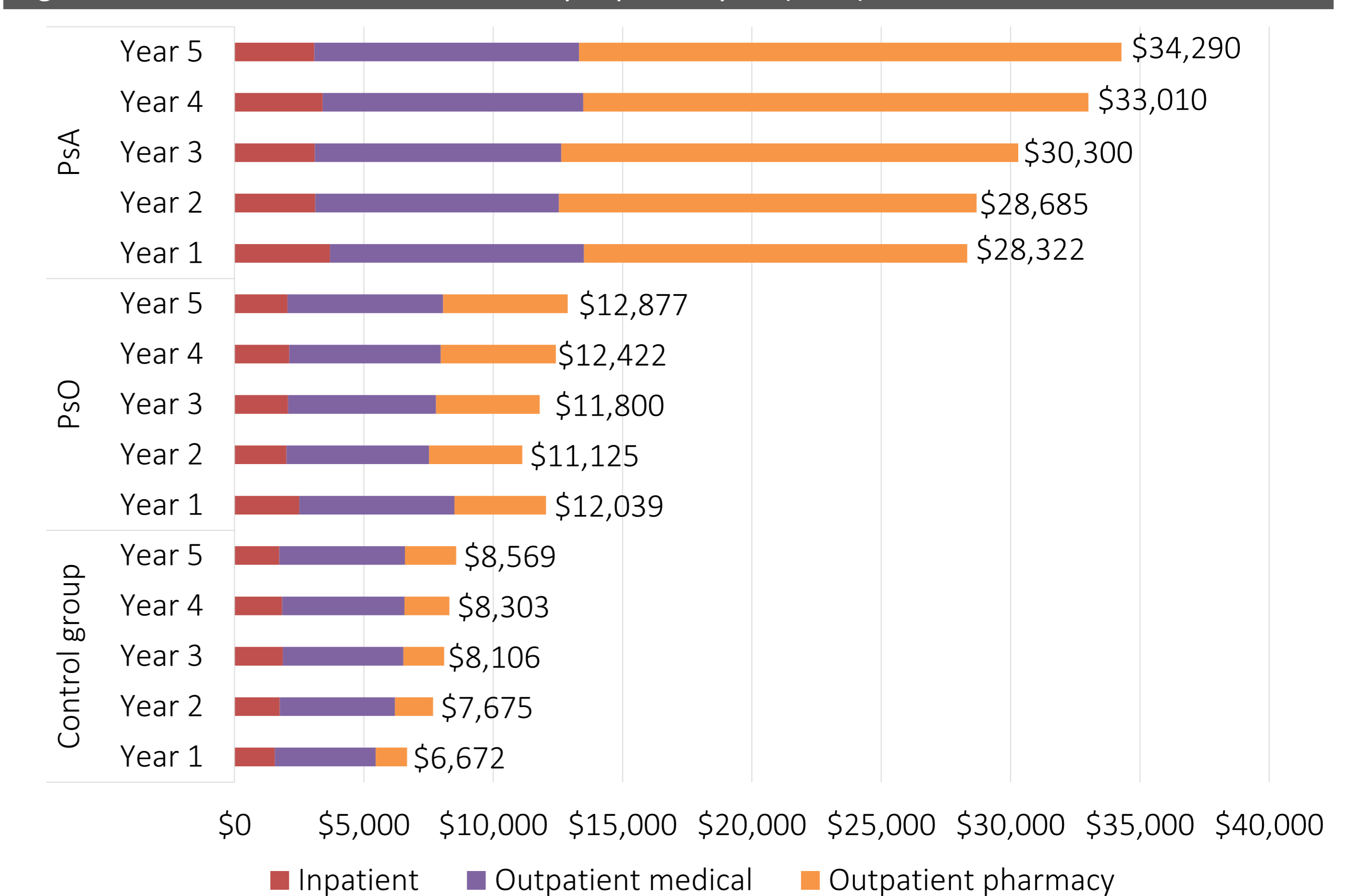


Table 3. Mean healthcare costs during follow up (PPPY)

Mean (SD) costs	Control	PsO	PsA
All-cause healthcare costs	\$7,542 (27,204)	\$11,856 (33,793)	\$29,621 (41,937)
Inpatient costs	\$1,709 (15,739)	\$2,228 (20,473)	\$3,376 (21,460)
Outpatient medical costs	\$4,358 (16,853)	\$5,812 (18,835)	\$9,720 (21,791)
Outpatient pharmacy costs	\$1,474 (7,181)	\$3,817 (12,633)	\$16,526 (24,289)
Annual drug costs	\$6,256 (278,125)	\$12,726 (373,214)	\$46,465 (785,412)

## Conclusions

- PsA patients incur significantly greater healthcare resource utilization and costs than patients with PsO and the control group, costing 2.5x and 3.9x more on average, respectively. Compared to the control group, healthcare resource utilization and costs are also greater among patients with PsO, costing 1.6x more on average. These costs tend to increase over time.
- The results from this study add important detail to the body of literature comparing healthcare costs and resource utilization among patients with PsO, patients with PsA, and a control group for up to five years of follow-up.
- Robust methods were used to create matched cohorts and to model outcomes over time, minimizing the bias of the comparative results.
- A limitation of this study is that certain underlying confounding factors (e.g. disease severity, alcohol, and smoking) could not be accounted for given the variables available in the MarketScan Databases.
- The cost and resource utilization disparity between these patient groups demonstrates the high remaining unmet medical need for patients with PsA and PsO.

## References

- Li, K, Armstrong A. A Review of Health Outcomes in Patients with Psoriasis. *Dematologic Clinics*. 2012;30(1):61-72.
- Alinaghi F, Calov M, Kristensen LE, et al. Prevalence of psoriatic arthritis in patients with psoriasis: A systematic review and meta-analysis of observational and clinical studies. *Journal of the American Academy of Dermatology*. 2019;80(1):251-265. e219.
- Merola, J, Guerin A, Jarvis JL, Wang K, Sundaram M, editors. Incremental burden of psoriatic arthritis is substantial among patients with mild and moderate to severe psoriasis. *Journal of the American Academy of Dermatology*; 2014.
- Merola, J, Herrera V, Palmer J. Direct healthcare costs and comorbidity burden among patients with psoriatic arthritis in the USA. *Clin Rheumatol*. 2018;37(10):2751-61.
- Charlson, M, Pompei P, Ales K, MacKenzie C. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chron Dis*. 1987;40(5):373-83.