# Patient Diagnostic Journey and Time to Diagnosis in Axial Spondyloarthritis: A Retrospective Cohort Study Using US Claims Data

# Objective

To evaluate time to axial spondyloarthritis (axSpA) diagnosis and the patient journey from earliest observable back pain diagnosis to axSpA diagnosis in the US.

# Background

- The journey to axSpA diagnosis is often prolonged and challenging. In a study evaluating the burden associated with time to diagnosis, delayed diagnosis was found to result in poorer outcomes and increased costs.<sup>1</sup>
- Although inflammatory back pain is a hallmark feature of axSpA, less than a third of patients with inflammatory back pain go on to be diagnosed with axSpA.<sup>2</sup>
- Understanding the factors contributing to delays is crucial to improve diagnostic pathways and outcomes

# Methods

- This observational, retrospective, US MarketScan study used insurance claims data from the CCAE/MDCR (Jan 2008–Mar 2023) and Medicaid (Jan 2008–Dec 2022) databases.
- Adult patients with  $\geq$ 5 years of medical and pharmacy benefit utilized, and back pain onset prior to a new axSpA diagnosis were included in this analysis. ICD-10 codes used to identify patients with diagnoses of axSpA are listed in **Supplementary Table 1** (QR code).
- We report time to diagnosis (earliest observable back pain to first axSpA diagnosis), stratified by sex, and duration of **primary** (earliest observable back pain to first rheumatology visit) and **secondary** delay (first rheumatology visit to first axSpA diagnosis).
- Diagnostic journeys from earliest observable back pain to axSpA diagnosis were described by number of back pain episodes recorded on separate days, number, rate, and type of all-cause and back pain-related specialist visits, all-cause diagnostic tests (HLA-B typing, ESR, CRP) and imaging procedures (X-ray, CT scan, MRI of the spine or pelvis), and back pain-related healthcare resource utilization.
- Descriptive analyses were performed using SAS version 9.4. No imputation was performed on missing values.

# Results

#### Patient Demographics

• This analysis included 97,469 patients; patient demographics are described in **Table 1**.

#### Time to axSpA Diagnosis and Primary and Secondary Delay

- Overall, 29.0% of patients had a time to diagnosis  $\geq 6$  years (**Figure 1**). The mean (SD) time to diagnosis was 4.5 (2.8) years, with a median (Q1, Q3) of 4.4 (2.4, 6.3) years.
- Women experienced a slightly longer time to diagnosis (mean [SD]: 4.6 [2.8] years) than men (4.3 [2.8]), which was statistically significant (p<0.001).
- Among the 9,824 (10.1%) patients who saw a rheumatologist before axSpA diagnosis, median (Q1, Q3) primary delay was 2.6 (1.1, 4.6) years, and secondary delay was 1.7 (0.2, 3.7) years.

#### Characterizing the Patient Diagnostic Journey

- Between earliest observable back pain and axSpA diagnosis, median (Q1, Q3) number of back pain episodes was 13 (5, 28) and 55.9% of patients experienced >10 back pain episodes.
- Patients saw a range of specialists in their diagnostic journey; the rates of all-cause and back pain-related specialist visits are depicted in Figure 2.
- Patients saw, on average, 4.5 healthcare professionals per year for back pain-related causes or claims.
- 64.9% of patients had at least one back pain-related visit with their primary care provider, 64.7% with a chiropractor, 31.7% with an orthopedic surgeon, and 26.7% with a pain management specialist. 52.8% had a history of attending acute care and emergency services for back pain.
- Patients underwent a range of diagnostic tests and imaging procedures (Table 2).
- Back pain-related healthcare resource utilization and all-cause pharmacy claims per patient per year is reported in **Table 3**.
- 66.1% of patients had at least one prescription for NSAIDs during their axSpA diagnostic journey, 69.1% for opioids, and 59.9% for steroids.

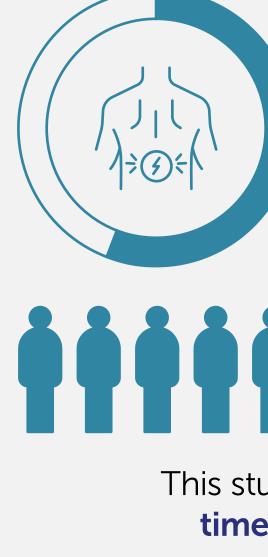
## Conclusions

Early axSpA diagnosis is crucial for timely access to care and treatment. This study shows that diagnostic delay is a challenge for patients with axSpA in the US, despite numerous back pain consultations, specialist visits, and diagnostic tests. Additionally, secondary delay after seeing a rheumatologist was high, possibly due to uncertainty in diagnosis. These findings highlight the urgent need for targeted medical education on inflammatory back pain and recognition of axSpA. Developing streamlined patient pathways is essential to expedite diagnosis, reduce disease burden, and optimize healthcare resource utilization.

### Summary



#### Of the patients studied here:

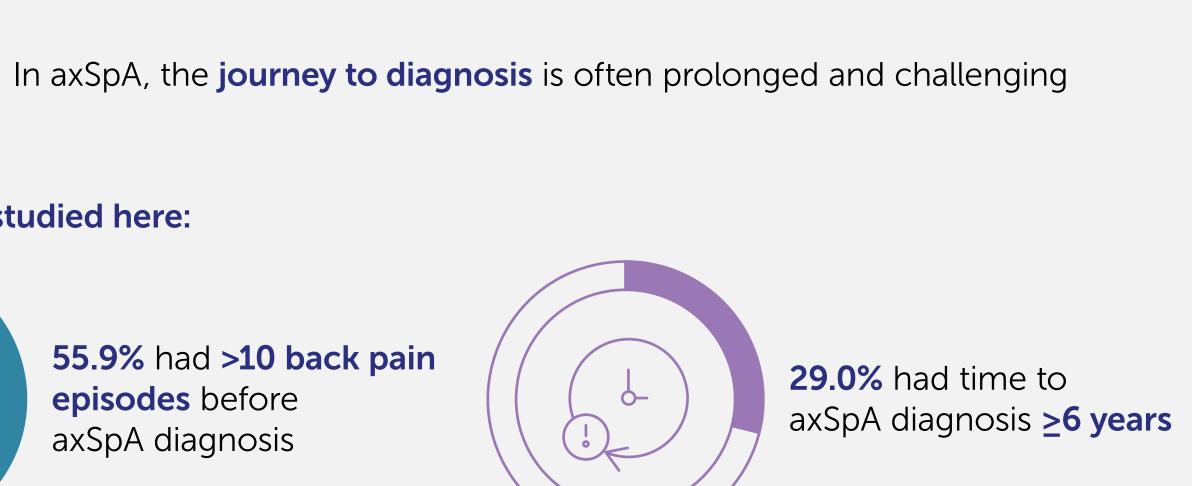


**Age**, years, mean (SD) **Sex**, n (%) Female Male **Race**, n (% Missing White Black Hispanic Other Length of look-back, years, mean (SD) Comorbidities, r Hyperlipidemia Fatigue Anxiety Depressior Atherosclerosis Malignancies Fibromyalgia Osteoporosis Extramusculoskeleta manifestations, n (%) Enthesitis/tendinitis Psoriasis Dactylitis Crohn's Disease Ulcerative colitis Uveitis Psoriatic arthritis (peripheral arthritis) **Insurance type**, n (% Commercial

Medicare Medicaid

ti confidence interval; CRP: C-reactive protein; CCAE: Commercial Claims and Encounters; csDMARDs: conventional Classification of Disease version 10; MDCR: Medicare Supplemental; NRI: magnetic resonance imaging; NSAIDs: conventional classification; US: United States. at a conventional classification of Disease version 10; MDCR: Medicare Supplemental; NRI: magnetic resonance imaging; NSAIDs: convertional classification; US: United States.

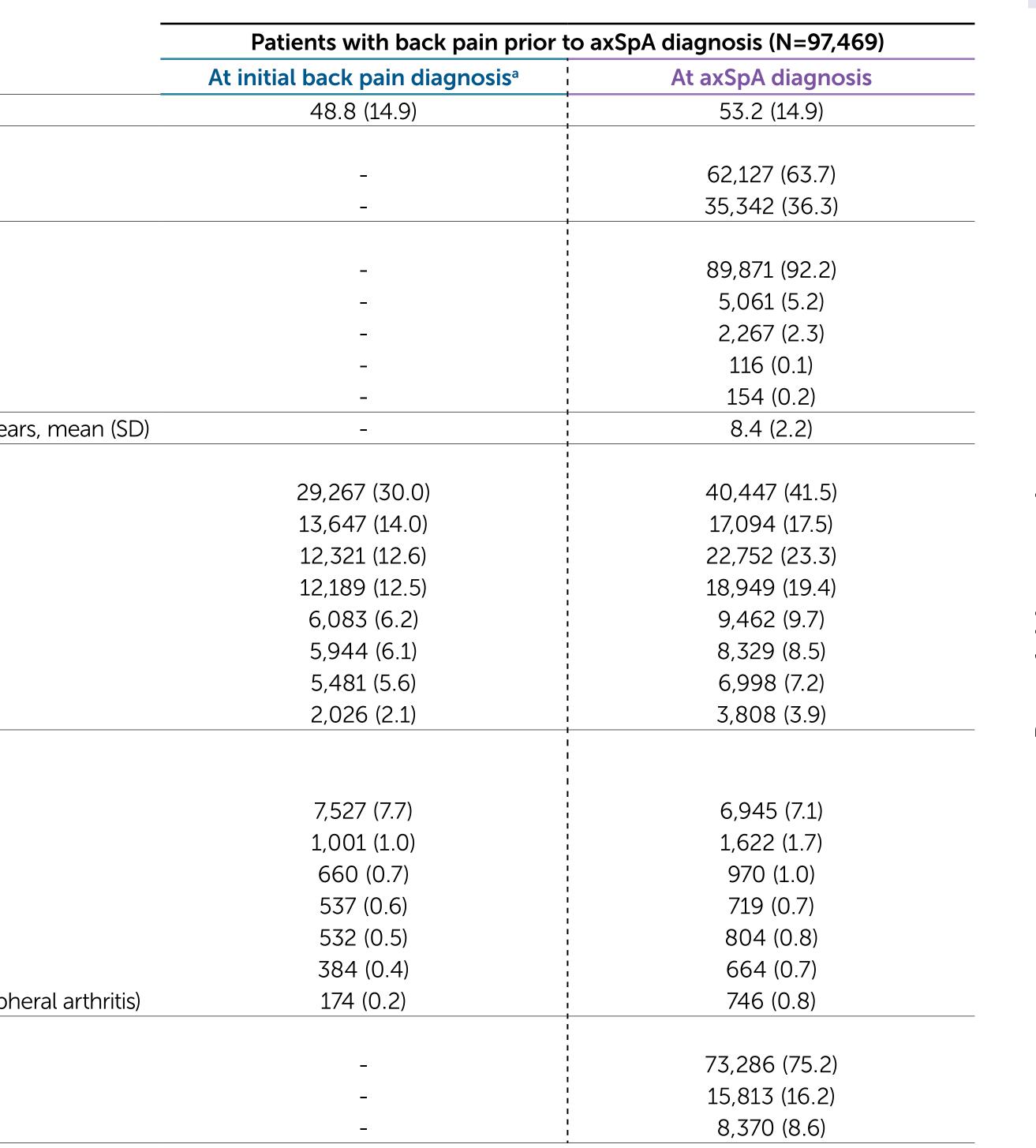
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On average, patients saw **4.5 healthcare professionals a year** for their back pain, from initial back pain diagnosis until axSpA diagnosis

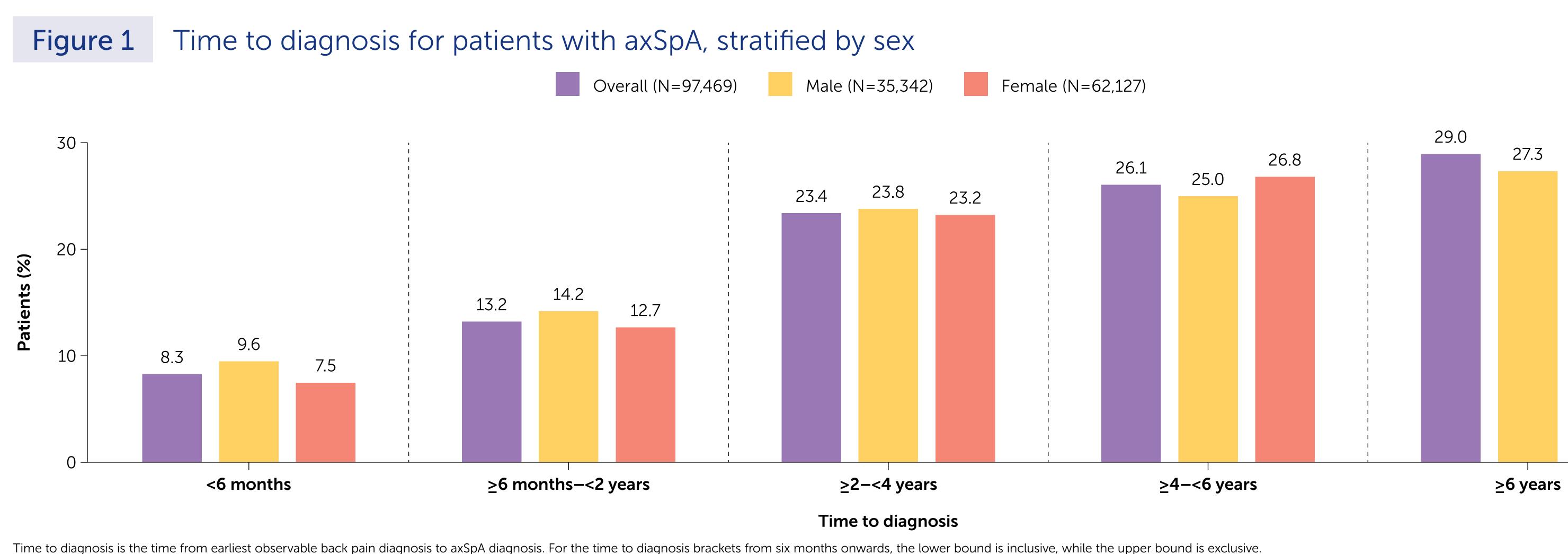
This study shows that, despite numerous specialist visits and diagnostic tests, time to diagnosis remains a challenge for patients with axSpA in the US

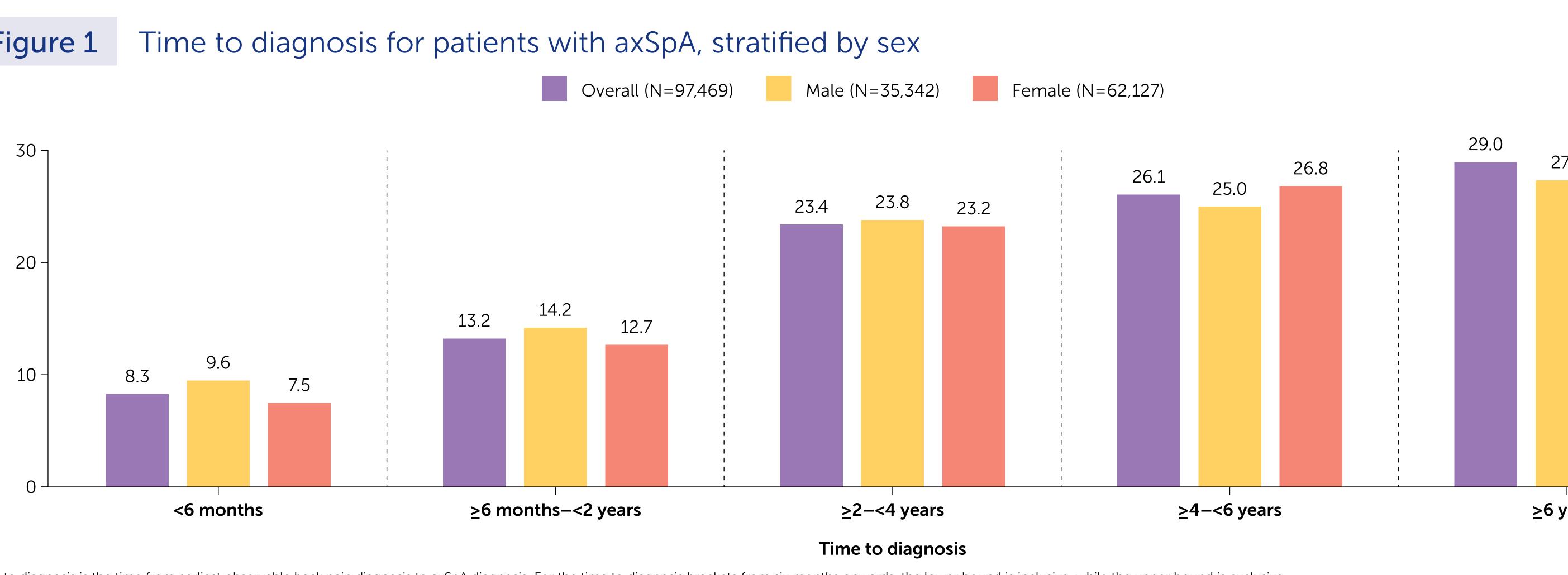
### **Table 1**Patient demographics and comorbidities

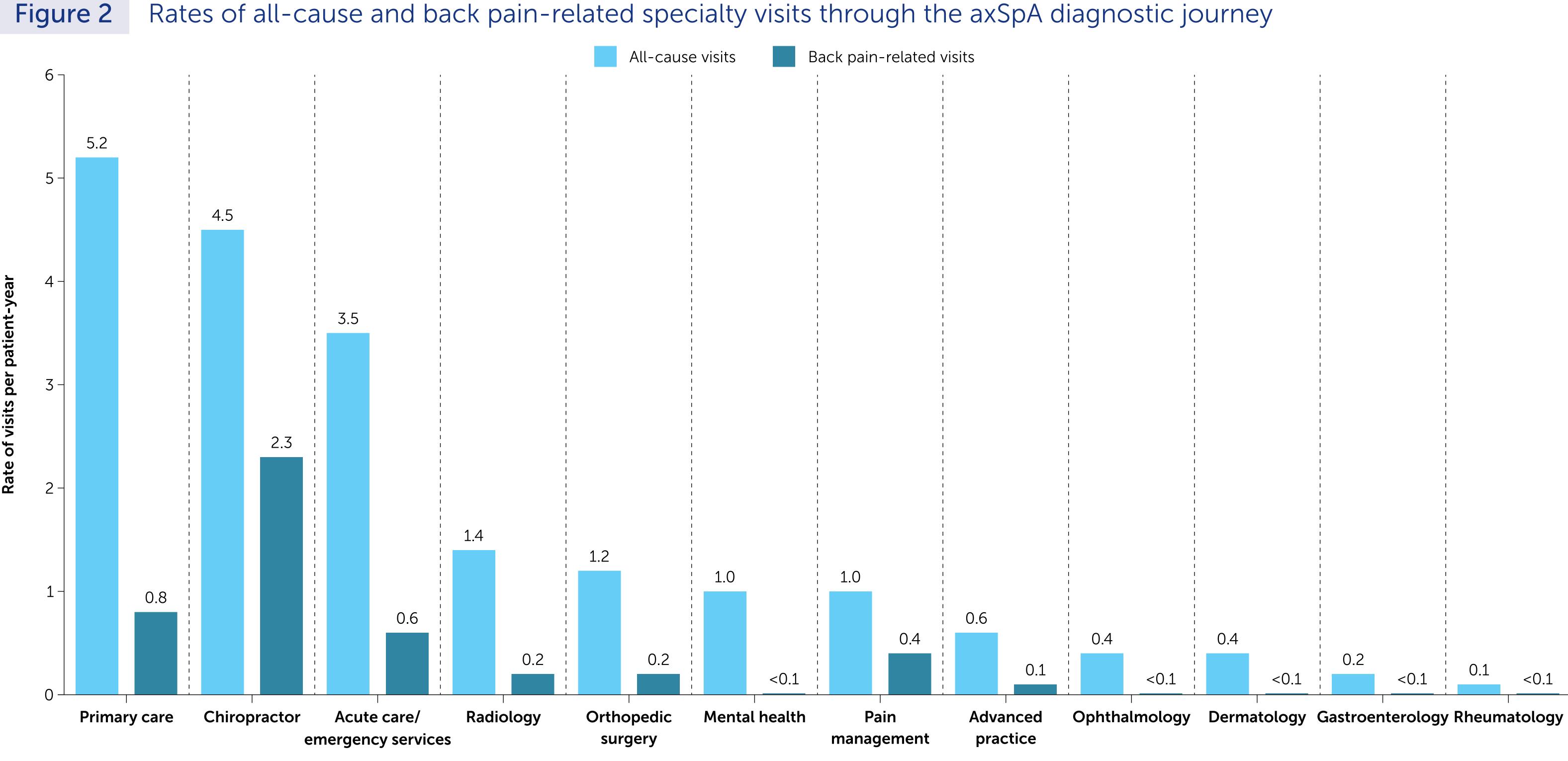


**[a]** Initial back pain diagnosis is defined as the time of earliest observable back pain prior to axSpA diagnosis.

Patients with back pain prior to axSpA diagnosis (N=97,469). axSpA diagnostic journey is defined as the time from earliest observable back pain diagnosis to axSpA diagnosis.







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Table 2

### Number of diagnostic tests and imaging procedures at the population level and mean time to first instance of each procedure

	Patients undergoing diagnostic test or imaging procedure, n (%)	<b>Time to first testing or imaging</b> <b>procedure</b> , years, mean (SD)	
Diagnostic tests			
HLA-B typing <sup>a</sup>	1,905 (2.0)	3.7 (2.7)	
ESR test	29,659 (30.4)	2.4 (2.2)	
CRP test	21,589 (22.1)	2.8 (2.4)	
maging procedures			
X-ray	77,291 (79.3)	1.4 (2.0)	
СТ	16,663 (17.1)	2.3 (2.4)	
MRI	49,092 (50.4)	2.0 (2.3)	

Patients with back pain prior to axSpA diagnosis (N=97,469). [a] For HLA-B typing, databases were searched using CPT code 81374 - HLA typing.

### Table 3 Healthcare resource utilization per patient per year and all-cause pharmacy claims

	<b>Patients with ≥1 claim</b> , n (%)	Occurrence per patient per year mean (SD)
Back pain-related healthcare resource utilization		
Hospitalizations	7,430 (7.6)	0.1 (4.6)
Outpatient visits	97,089 (99.6)	10.5 (35.5)
Emergency department visits	22,325 (22.9)	0.5 (8.8)
Pharmacy claims		
NSAID prescriptions	64,385 (66.1)	1.8 (10.4)
Opioid prescriptions	67,374 (69.1)	2.8 (9.1)
Steroid prescriptions	58,425 (59.9)	1.0 (7.6)
csDMARD prescriptions	6,362 (6.5)	0.2 (1.0)
Biologic prescriptions/procedures	1,451 (1.5)	0.1 (0.6)
Antidepressant/anxiolytic prescriptions	48,359 (49.6)	2.5 (5.0)

Patients with back pain prior to axSpA diagnosis (N=97,469).

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