The Economic Burden of Inflammatory Arthritis: A Systematic Review

8357

Xiaoyu Zhang[1], Jiaru Liu[2], Zhengwei Wang[1], James Galloway[3], Sam Norton[4], Sumeet Singla[5], Huajie Jin[1, 6]

[1] King's Health Economics, Institute of Psychiatry, Psychology & Neuroscience at King's College London, London, UK
[2] King's Business School, King's College London, London, UK
[3] Centre for Rheumatic Diseases, King's College London, London, UK
[4] Medical Statistics & Applied Health Research, Centre for Rheumatic Diseases, King's College London, London, UK
[5] Department of Medicine, Maulana Azad Medical College and Associated Lok Nayak Hospital, New Delhi, India
[6] Institute for Global Health and Development, Peking University, Beijing, China

Background & Methods

Inflammatory arthritis (IA) leads to high direct healthcare and indirect costs across regions. Earlier reviews were subtype-specific or outdated and often omitted direct non-healthcare or carer components, limiting comparability. We provide an updated, multi-subtype synthesis with methodological appraisal.

- **Protocol & search:** PRISMA; PROSPERO **CRD42023452485**; MEDLINE, Embase, Cochrane Database of Systematic Reviews, HMIC; last search **5 July 2025**.
- **Standardisation:** All costs **standardised to 2024 US dollar values** using the **CCEMG-EPPI Centre cost converter.**
- **Eligibility & outcomes**: Adults with AxSpA, PsA, ReA, seropositive/seronegative RA where available. Outcomes: **direct healthcare costs, direct non-healthcare costs, indirect costs when reported.**
- **Synthesis & statistics:** Narrative synthesis; **Cochran–Armitage test** for trends in **proportions** of cost components (e.g. medication, inpatient).

Study characteristics

n=82 studies; **28** countries; designs mainly **prevalence-based (96.3%)** with **bottom-up (93.9%)** costing; data largely **retrospective databases (86.1%)**. Perspectives: **healthcare system 48.8%**, **societal 41.5%**, **patients and families 8.5%**. **HCA ~90%** for productivity loss valuation; FCA seldom used.

Study landscape

- **Subtypes**: AxSpA n=49, PsA n=30, ReA n=2; RA update n=13; 8 studies separated serostatus.
- **Regions**: Europe **39.0**%, North America 26.8%, Asia 25.6%.

Cost ranges & benchmarking

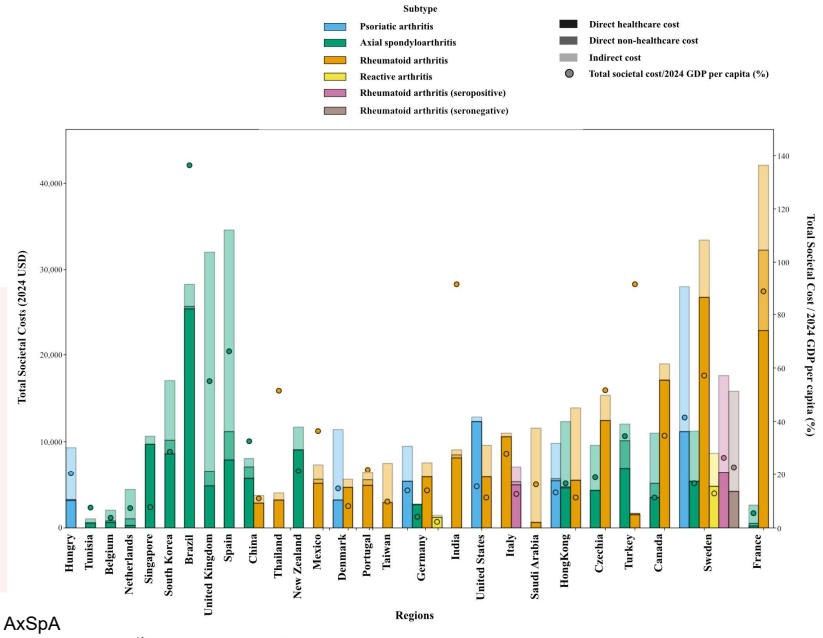
Per-patient annual costs (2024 USD)

- Direct healthcare costs: US$222–71,518 (AxSpA/PsA/ReA); RA recent: US$502–84,260.
- Direct non-healthcare costs: US$53–3,272.
- Indirect costs (productivity losses): US$79–25,456.

Benchmark to **GDP per capita**: 2.1%–136.4% overall; most estimates 10–30%.

Key drivers

- **Medication** is the primary driver of **direct healthcare costs**, reflecting wider use of **bDMARDs**.
- **Hospitalisation** and **outpatient visits** remain major but declining contributors.
- **Productivity losses** from **work disability** and **absenteeism** dominate **indirect costs.**
- **Carer productivity losses** - up to **65%** of total productivity losses - substantially adds to the societal burden.
- **Comorbidities**, especially depression, cardiovascular and respiratory diseases, markedly increase total and direct healthcare costs.



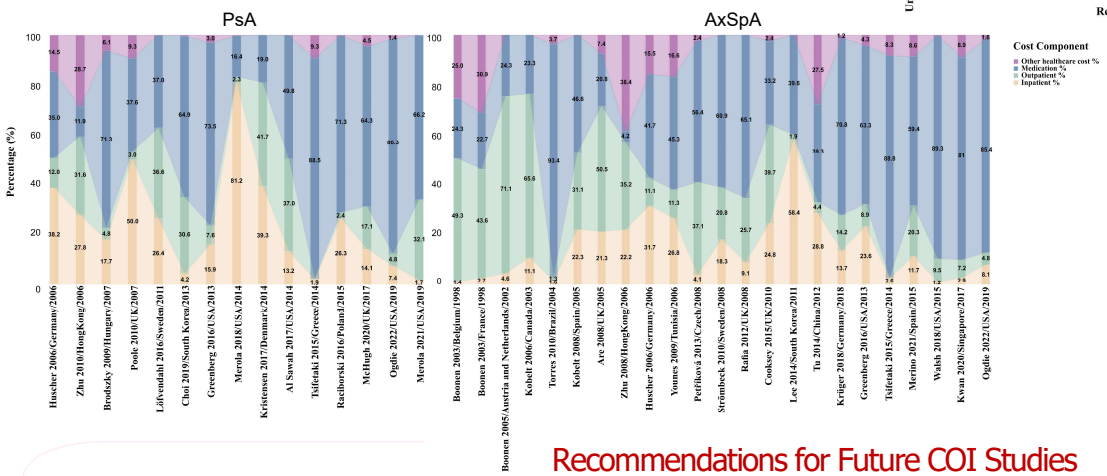
Proportions & Temporal Trends

Proportions

- Indirect costs **> 60%** of total societal costs in 14/31 estimates.
- Productivity losses reported in ~50% studies; **presenteeism** rarely captured.
- Carer productivity losses reported in ~33% studies; contributes **1.3–65%** of indirect costs.

Temporal trends (Cochran–Armitage)

- AxSpA: Direct ↑ (Z = 2.88, p = 0.0020); Productivity ↓ (Z = −2.85, p = 0.0022). Within direct (AxSpA): Medication ↑ (Z = 2.42, p = 0.0078).
- PsA: Inpatient ↓ (Z = −1.76, p = 0.0310).
- Pattern mirrors RA: **higher drug share, lower inpatient.**



Methodological Heterogeneity

- **Perspective / horizon** unclear in many studies.
- **Indirect cost methods** inconsistent (HCA vs FCA); **carer / non-healthcare** often omitted.
- **< 50%** report uncertainty **(modified CHEERS checklist).**
- **70%** omit sensitivity analysis **(Larg & Moss checklist).**
- Evidence dominated by **prevalence-based (96%), bottom-up (94%), retrospective data.**

Recommendations for Future COI Studies

Reporting

- State **price year + currency** clearly.
- Specify **perspective** and **time horizon**.
- Disaggregate **direct healthcare**, **direct non-healthcare**, **indirect**, **carer** components.

Productivity methods

- Report and justify **HCA / FCA**; test impact in sensitivity scenarios.

Scope & design

- Adopt **societal perspective** where possible.
- Include **comorbidities**, **technical examinations**, and **all-cause costs** for incremental burden.

Quality assurance

- Follow **modified CHEERS checklist and Larg & Moss checklist**; conduct **uncertainty and heterogeneity** analyses.

References

P.-H. Hsieh, O. Wu, C. Geue, E. McIntosh, I. B. McInnes, and S. Siebert, '02 Economic burden of rheumatoid arthritis: a systematic review of literature in biologic era', Ann. Rheum. Dis., vol. 79, no. 6, pp. 771–777, Jun. 2020, doi: 10.1136/annrheumdis-2019-216243.

Larg and J. R. Moss, 'Cost-of-Illness Studies: A Guide to Critical Evaluation', PharmacoEconomics, vol. 29, no. 8, pp. 653–671, Aug. 2011, doi: 10.2165/11588380-000000000-00000.

D. Husereau et al., 'Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement', BMJ, vol. 346, no. mar25 1, pp. f1049–f1049, Mar. 2013, doi: 10.1136/bmj.f1049.