

<https://doi.org/10.52645/MJHS.2026.1.17>

UDC: 616.72-002.77-036.22



REVIEW ARTICLE



Rheumatoid arthritis worldwide: inequalities in epidemiology and care

Elena Deseatnicova^{1*}, Valeria Frunze², Rodica Usatii³, Liliana Groppa¹

¹Discipline of Rheumatology and Nephrology, Department of Internal Medicine, *Nicolae Testemițanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

²Department of Radiology and Imaging, *Nicolae Testemițanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

³*Timofei Moșneaga* Republican Clinical Hospital, Chisinau, Republic of Moldova

ABSTRACT

Introduction. Rheumatoid arthritis (RA) is a chronic autoimmune disease affecting approximately 0.5% of the global population. It represents a major cause of disability, reduced quality of life, and healthcare burden. The prevalence of RA is rising, especially in older populations and in low-income regions.

Materials and methods. A systematic literature search was performed in PubMed, ScienceDirect and Google Scholar for articles published between 2000 and 2025. Search terms included “rheumatoid arthritis”, “epidemiology”, “risk factors”, “economic burden”, and “healthcare disparities”.

Results. RA prevalence ranges from 0.3% to 1.0%, with the highest values in Northern Europe (0.8–1.0%) and North America (0.7–0.9%), and the lowest in Africa (0.1–0.3%) and rural Asia (0.2–0.4%). Work incapacity has declined in several high-income countries, attributed to earlier diagnosis and the widespread use of disease-modifying antirheumatic drugs. Socio-economic status is a key factor for RA outcomes, with patients in the lowest income groups showing up to 50% higher disability rates. Other risk factors include female sex, HLA-DRB1 alleles, smoking, and environmental exposures. The economic burden is considerable, with direct and indirect costs disproportionately affecting low- and middle-income countries, where RA frequently results in early work disability.

Conclusions. RA causes disability and reduces quality of life. Its prevalence is rising worldwide, with higher detection and better outcomes in high-income countries, while low-income countries face underdiagnosis and limited access to modern therapies. Reducing these disparities requires stronger healthcare systems, early diagnosis, and affordable and accessible treatments.

Keywords: rheumatoid arthritis, epidemiology, prevalence, incidence, socio-economic factors, healthcare disparities.

Cite this article: Deseatnicova E, Frunze V, Usatii R, Groppa L. Rheumatoid arthritis worldwide: inequalities in epidemiology and care. *Mold J Health Sci.* 2026;13(1):120-127. <https://doi.org/10.52645/MJHS.2026.1.17>.

Manuscript received: 19.09.2025

Accepted for publication: 15.02.2026

Published: 15.03.2026

***Corresponding author:** Elena Deseatnicova, MD, PhD, associate professor

Department of Rheumatology and Nephrology
Nicolae Testemițanu State University of Medicine and Pharmacy
165, Ștefan cel Mare și Sfânt blvd, Chișinău, Republic of Moldova, MD 2004

e-mail: elena.deseatnicova@usmf.md

Authors' ORCID IDs

Elena Deseatnicova – <https://orcid.org/0000-0001-5029-2994>

Valeria Frunze – <https://orcid.org/0009-0000-1263-7963>

Rodica Usatii – <https://orcid.org/0009-0003-1486-5136>

Liliana Groppa – <https://orcid.org/0000-0002-3097-6181>

Key messages

What is not yet known on the issue addressed in the submitted manuscript

The role of economic and healthcare disparities in shaping rheumatoid arthritis prevalence and progression in different regions remains incompletely clarified.

The research hypothesis

Regional and socio-economic factors significantly influence the prevalence and management of rheumatoid arthritis worldwide.

The novelty added by manuscript to the already published scientific literature

This review combines recent data on RA epidemiology and emphasizes regional and socio-economic differences. It highlights practical aspects of health system inequalities and outlines future directions for improving global RA management.

Introduction

Rheumatoid arthritis (RA) is a chronic, systemic autoimmune disease characterized by persistent synovial inflammation, progressive joint destruction, and extra-articular manifestations. Beyond joint involvement, RA is associated with substantial systemic effects and comorbidities, contributing to functional disability, impaired quality of life and increased mortality [1, 2]. Despite notable advances in early diagnosis and therapeutic strategies, RA continues to represent a major global public health challenge [3].

The global burden of RA has been rising, with considerable heterogeneity across regions in both prevalence and outcomes [3, 4]. Prevalence estimates range from 0.1% to 2.0% worldwide, reflecting not only true differences in disease occurrence but also variation in genetic susceptibility, environmental exposures, healthcare infrastructure, and diagnostic practices [4, 5]. High-income regions such as North America and Western Europe typically report higher prevalence rates and better clinical outcomes, largely attributable to improved case detection, timely referral to specialists and broader access to advanced therapies [6, 7]. In contrast, many low- and middle-income countries report lower prevalence figures, which may reflect underdiagnosis, scarcity of rheumatology specialists, and restricted availability of effective treatments [8, 9].

In addition to geographic variation, demographic and socio-economic disparities further shape the global distribution of RA. The disease affects all adult age groups, with peak incidence observed in middle age, and is two to three times more common in women than in men [10, 11]. Ethnic differences are also pronounced, with certain Indigenous populations exhibiting prevalence rates several-fold higher than those observed in the general population. These disparities underscore the complex interplay between genetic, hormonal, environmental, and socio-cultural determinants of RA epidemiology.

The consequences of RA extend well beyond individual health outcomes to impose a substantial socio-economic burden. Direct healthcare costs include specialist consultations, diagnostic imaging, pharmacological and non-pharmacological therapies, hospitalizations and rehabilitation, while indirect costs arise from work disability, productivity loss, and premature retirement [12]. Although the introduction of biologic and targeted synthetic disease-modifying antirheumatic drugs has led to substantial improvements in disease control, access to these therapies remains uneven worldwide, perpetuating inequalities in morbidity, disability and mortality [13, 14].

Given these challenges, a comprehensive understanding of current epidemiological patterns, risk factors, comorbidities and disease burden is essential to inform clinical practice, guide public health strategies and support evidence-based policy-making.

The objective of this review is to synthesize contemporary evidence on the global epidemiology of rheuma-

toid arthritis, with a particular focus on geographic and socio-economic disparities in prevalence and incidence, established and emerging risk factors and associated comorbidities and outcomes.

Material and methods

A narrative literature review was employed, using major databases such as ScienceDirect, PubMed, Google Scholar for articles published between 2000 and 2025. Keywords terms included “rheumatoid arthritis”, “epidemiology”, “social factors”, “economic burden”, and “risk factors”. Only articles published in English were included, with the addition of selected international publications in Romanian or Russian relevant to Eastern Europe.

Studies were eligible for inclusion if they: (i) examined the epidemiology, prevalence, or incidence of rheumatoid arthritis; (ii) discussed socio-economic or demographic factors associated with RA; or (iii) explored the economic burden of RA or disparities in treatment access. Eligible study types included original epidemiological studies (cross-sectional, cohort, or case-control), population-based reports or large registries, and systematic reviews or meta-analyses focused on RA epidemiology. Exclusion criteria included: case reports, case series with fewer than 50 patients, non-peer-reviewed sources, and purely experimental studies (in vitro or animal).

Data extraction and analysis. From each included study, data were extracted on: author, year of publication, country/region, study design, sample size, diagnostic criteria, prevalence and incidence estimates, reported risk factors, comorbidities and mortality data. Findings were synthesized descriptively and presented in summary tables. A narrative comparison was used to highlight geographic variation, socio-economic influences, and comorbidity trends.

Ethical considerations. Given the nature of the study as a review of existing literature, ethical approval was not required.

Quality considerations. This review is limited by the restriction to English, Romanian and Russian-language publications which may have led to the omission of relevant studies published in other languages. Potential heterogeneity in study designs and reporting standards was acknowledged. Limitations such as underdiagnosis in low-resource settings and variability in registry completeness were considered when interpreting the findings.

Results and discussions

Geographic and socio-economic disparities in prevalence and incidence. Global prevalence is estimated from around 0.1% to 2.0% across different populations [5, 15]. A 2021 meta-analysis found a global prevalence of about 0.46%, while the 2020 Global Burden of Disease study reported an age-standardized prevalence of ~0.21% [5, 15]. These differences highlight regional variation and disparities in estimation methods. Table 1 presents RA prevalence and incidence in selected countries to demonstrate global variability.

Table 1. Comparative prevalence and incidence of rheumatoid arthritis in different countries

Location	Prevalence (%)	Annual Incidence (per 100,000)
United States	~0.6% [5]resource allocation, and prevention. As part of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD	~20–50 (North America range) [5]resource allocation, and prevention. As part of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD
Canada	0.9%	-
France	~0.31% [16]	8.8 per 100,000 [16]
Romania	~1.0% [17]	-
Republic of Moldova	0.031% [18]	11 per 100,000 [18]
India	~0.75% [19]	0.5 to 1 per 1,000 [20]
Japan	~0.6–1.0% [16]	8 per 100,000 [16]
South Africa (rural)	0.0026%	- (extremely low, <1)

Note: Incidence “-” indicates not available or not reported in sources [5, 17–20].

High-income regions of North America and Northern Europe report a prevalence of around 0.5–1%. (the United States – 0.6%, Canada – 0.9%) [5, 19]resource allocation, and prevention. As part of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD. In Romania, RA prevalence was estimated at approximately 1% of the population. In contrast, lower prevalence is found in some parts of Asia (South Korea - 0.26%) and Africa (South African rural community – 0.003%, Nigeria – 0%) [15, 19, 21]as epidemiologists do not study established RA separated from RA as a whole; especially no incidence studies can be found, as incidence refers to new cases (early RA. Reported RA prevalence in the Republic of Moldova is about 0.03% [18]. However, underdiagnosis and underreporting may contribute to this low prevalence. True RA prevalence in Moldova is expected to be closer to that of other Eastern European countries.

RA incidence also shows geographic variation. Incidence in North America and Northern Europe is estimated at around 20–50 per 100,000 per year; in Japan and France around 8–9 per 100,000 [15, 16, 22]. The annual incidence in the Republic of Moldova was reported to be approximately 11 per 100,000 in 2015 [18].

Urban–rural differences are observed as well. RA prevalence is often higher in urban populations than rural ones within the same country [16, 23, 24]. For instance, an urban area in one study showed 0.69% prevalence vs 0.54% in a rural area [25]. Urban living may increase exposure to risk factors like pollution or unhealthy diets. A north-south gradient in Europe has been noted, with Northern Europe historically having higher RA prevalence than Southern Europe. Studies from Germany and Sweden reported a prevalence of around 0.65%, while in other European countries such as France or Italy, the prevalence was lower (0.19% and 0.41%) [26].

Demographic disparities. RA affects all adult age groups and both sexes. The peak age is 49 ~ 74 years [27]. In 2020,

global prevalence rates were lowest in young adults and highest in the 75–79 age group, reaching ~0.83% in that cohort [5]. RA is about 2–3 times more common in women than in men [28]. For example, a study in Argentina found a prevalence of 3.2% in women vs 0.6% in men. In a publication from Serbia, the rate was 0.29% among women compared to 0.09% among men. Some studies found no difference. The reasons are thought to include hormonal and genetic factors [28]. By 2050, an estimated 68.7% of rheumatoid arthritis cases will be in females [5]. However, men tend to develop RA at slightly older ages. They may experience more severe radiographic damage in some cases, though findings are mixed [29]. Additionally, healthcare utilization disparities by gender have been observed. Women with RA tend to seek medical care more often, possibly due to greater symptom burden or health awareness. This can influence apparent prevalence [30, 31]. Ethnic disparities are also significant in RA epidemiology, notably among Indigenous North American populations. Elevated RA prevalence has been documented in specific Indigenous groups such as the Pima, Chippewa, Blackfeet, Yakima, Tlingit, and Algonquin First Nations communities of Central Canada. The prevalence rates are approximately 5–6% (vs. 0.5–1% in the general population) [32, 33].

Risk factors and etiologic influences. RA develops through a combination of genetic predisposition and environmental triggers. The heritability of RA is estimated at 50–60%, with HLA-DRB1 being the main genetic risk factor [34, 35]. Cigarette smoking is the most established environmental risk factor for RA. Long-term smoking doubles the risk of RA and is especially linked to seropositive (RF or anti-CCP positive) RA [36–38]. Another emerging risk factor is silica dust exposure [39]. Obesity is associated with a modestly increased risk of RA or worse disease activity [40, 41]. Periodontal disease (chronic gum infection) caused by *Porphyromonas gingivalis* has been associated with RA, as it can citrullinate proteins and potentially trigger autoimmunity [42, 43]. Some studies suggest that moderate alcohol intake may even have a modest protective effect against RA [44, 45]. Geographic factors like climate and latitude have been posited (e.g. lower Vitamin D levels in northerly latitudes might contribute to autoimmunity), but data are inconclusive [33, 46, 47].

Disease outcomes and burden in RA. RA shows important geographic differences in prevalence and outcomes. High-income countries (for example, North American and Western European countries) generally report higher prevalence (around 0.5–1%). They achieve higher diagnosis rates and better outcomes, whereas many low-income countries report lower prevalence (often <0.3%). Part of this discrepancy is due to underdiagnosis in low-resource regions rather than true absence of disease [3, 5]. For example, in sub-Saharan Africa and rural South Asia, limited access to healthcare means many RA cases are never formally diagnosed. Nigeria has just 30 rheumatologists serving a population of about 200 million [48]. In India, there are approximately 100 registered rheumatologists for a population exceeding 1.3

billion people [49]. This shortage leads to many RA cases remaining undiagnosed, further contributing to the lower prevalence in these regions [23, 48, 50]. In contrast, high-income countries have well-developed healthcare systems that can accurately detect and document most RA cases, leading to higher reported prevalence rates.

The countries with the highest number of rheumatologists in Western Europe are France (2,600), Italy (1,800), Spain (1,155), the UK (950), Germany (800), and the Netherlands (775) [51]. Nearly 70% of suspected RA cases in Canada are evaluated by a rheumatologist within three months [24] like availability, pricing/funding, and acceptability. In Latin America (LA), there are also public health initiatives (like anti-smoking campaigns and early arthritis referral programs) that have stabilized or slightly reduced RA incidence in recent decades [5, 52] resource allocation, and prevention. As part of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD).

Treatment disparities are significant as well. Advanced therapies like biologic disease-modifying antirheumatic drugs (DMARDs) are more accessible in North America and Western Europe, leading to better disease control and reduced disability rates. In lower-income countries, access to such treatments is limited due to cost and healthcare infrastructure. For example, in a study across 37 European countries, only about 59% of RA patients who are eligible for biologic therapy (by EULAR criteria) receive it. This inequity in care contributes to worse outcomes in those regions [14, 53, 54]. Indeed, RA mortality and disability rates are highest in regions with limited healthcare resources, whereas high-income regions have seen significant declines in RA disability and mortality due to early treatment [5, 55].

RA significantly reduces patients' quality of life compared with healthy populations. Patients commonly experience limitations in physical function, chronic pain, disability, and decreased mental well-being, with high rates of anxiety, depression, and impaired social, environmental, and sexual functioning [56, 57]. Without effective treatment, RA can rapidly progress, causing joint deformities within the first 1–2 years of onset, resulting in long-term functional limitations [58, 59].

Work disability is a major issue in RA. Approximately 30–40% of RA patients discontinue working prematurely, a rate notably higher than in the general population [7]. Specifically, a Romanian cohort study found that 27% of RA patients reported permanent work disability due to their condition, resulting in productivity losses [60]. Factors such as older age, longer disease duration, greater comorbidity burden, and higher disability scores significantly elevate the risk of work disability [7].

RA is frequently accompanied by multiple comorbidities driven by chronic systemic inflammation and immune dysregulation. Cardiovascular diseases (CVD), notably ischemic heart disease and stroke, are the leading comorbidities, accounting for 30–40% of RA-associated mortality [61–63]. Other significant comorbidities include interstitial lung disease, observed in approximately 10% of RA patients, os-

teoporosis, metabolic syndrome, lymphomas, and mental health disorders such as depression and anxiety [55, 63–65]. If the disease course is monitored, co-morbidities may be prevented during the course of RA [7].

RA is also associated with excess mortality. The Global Burden of Disease 2020 study reported about 38,300 deaths globally attributable to RA in 2020. The age-standardized mortality rate in RA has declined by ~24% since 1990, due to improved treatments. However, mortality improvements are uneven across regions [5, 66]. Mortality is higher for circulatory, respiratory, musculoskeletal, and digestive system diseases [67]. High-income regions saw the largest drop in RA mortality (a 44% decrease in RA-related deaths in Europe from 1990 to 2020), reflecting early use of effective therapies and better cardiovascular prevention [5].

These disparities in prevalence, incidence, comorbidities, and mortality trends underscore substantial global inequalities in the epidemiology and management of RA.

Socio-economic impact. The costs of RA can be categorized into direct medical costs and indirect costs (productivity losses) [40, 43]. Direct healthcare costs include inpatient care, outpatient services, diagnostic tests, long-term pharmacological and non-pharmacological treatments, laboratory and imaging studies, and various medical procedures. Additionally, costs extend to preventive programs, such as surgical interventions, rehabilitation, and therapeutic procedures. Expenses also cover salaries of healthcare professionals involved in patient care, as well as non-medical services like patient transportation, specialized dietary needs, and other logistical support [68] yielding frequency only to diseases of respiratory and cardiovascular systems. Given the fact that they are occurred in a young, working-age population, as well as people in older age groups, the treatment of these patients consumed large financial resources, which results in a high socio-economic importance of rheumatic diseases in general. The article focuses on the prevalence of these forms of pathology in Russia and several foreign countries, material costs of the medical care of such patients (including direct, indirect and additional costs).

A Medicare study in the USA found annual costs for RA patients to be \$20,919, compared to \$7,197 for non-RA individuals [69] 10th Revision clinical modification codes were identified. Healthcare expenditures (inpatient care, outpatient care, emergency department, office visits, prescription medications, home health, and others). The mean estimated annual cost per patient in Europe with RA was €12,902 (Western Europe mean is €14,997 vs. Central/Eastern Europe mean €3,752) [22].

RA patients spend significantly more on healthcare, mainly due to prescription medications [69] 10th Revision clinical modification codes were identified. Healthcare expenditures (inpatient care, outpatient care, emergency department, office visits, prescription medications, home health, and others). Treatment for RA focuses on the control and management of inflammation. Modern RA treatments (biologic and targeted synthetic DMARDs) are costly, contributing to higher treatment expenses. New RA patients or

those with less severe disease are usually prescribed less expensive non-biologic DMARDs. In contrast, patients who do not respond to DMARD treatment or exhibit more advanced disease are treated with biologics [70, 71].

However, these therapies have reduced other expenses by lowering rates of joint surgery, hospitalizations, and disability. For example, in Sweden, as biologic use increased from 2001 to 2010, RA patients saw significant declines in hospital admission rates and days on sick leave [23]. In developing countries, including Romania, healthcare system resources are limited and cannot cover the cost of treatment for all RA patients who would benefit from biological therapy [60].

According to EULAR recommendations, 32% of the total RA population in the European region is eligible for biologic DMARD treatment. However, only 59% of this population remains eligible after applying national reimbursement criteria (from 86% in 'high access' to 13% in 'low-access' countries) [53] partly owing to their high direct costs against a background of restricted healthcare budgets. This study compares the size of RA patient populations with access to reimbursed bDMARDs across 37 European countries, Russia, and Turkey, according to their treatment eligibility defined by European League Against Rheumatism (EULAR). The recent introduction of biosimilars has increased the availability and affordability of these medications in countries with limited resources [72].

In working-age populations, indirect costs from sick leave and permanent disability represent a major component of the overall RA burden. In Europe, work disability constitutes approximately 40–60% of the total RA-related costs. For example, annual indirect costs in England are estimated to reach up to €6.75 billion [69] 10th Revision clinical modification codes were identified. Healthcare expenditures (inpatient care, outpatient care, emergency department, office visits, prescription medications, home health, and others). In Romania, the average annual indirect cost per RA patient was calculated at €3,968.71 [60]. In Sweden, RA patients experienced an increase in sick leave and disability pension days from an average of 43 days per year prior to diagnosis to approximately 147 days annually after diagnosis [73]. Similarly, in Taiwan, indirect costs related to productivity losses accounted for 61.6% of the total RA economic burden, which was estimated at approximately \$224.9 million annually [74].

Trends and future projections. The Global Burden of Disease forecasts a significant increase in RA cases. The number of RA patients is expected to grow from ~18 million in 2020 to over 31 million by 2050. By 2050, nearly 70% of RA patients globally will be female over 60 years old. Not all regions will experience the same increase. By 2050, Central and Eastern Europe are expected to have stable or slightly lower RA case numbers due to declining populations and lower birth rates [5, 75].

Patient access programs and international collaborations are attempting to share expertise and improve care in low-resource areas. EULAR and ILAR are training rheuma-

tologists in Africa and Asia and helping to adapt treatment guidelines to local needs [76].

Future projections must consider environmental changes. Modifiable risk factors, particularly smoking, remain central to future risk. Other preventable factors include obesity and environmental exposures [40, 77]. Public health improvements in oral health might reduce RA risk linked to periodontal disease [78]. Early detection remains crucial: joint damage often occurs within the first 1-2 years of disease onset. Ensuring treatment access, especially affordable biologic or biosimilar DMARDs, and strengthening specialist care networks are essential [79].

Finally, the increasing burden of RA-related disability highlights the need for robust rehabilitation and support services. Assistive devices, physical therapy, and occupational therapy can help RA patients remain functional.

Conclusions

Rheumatoid arthritis remains a global health problem with clear geographic and socio-economic inequalities. High-income countries have improved outcomes through early diagnosis, treat-to-target strategies and access to modern therapies, which reduced disability and mortality. In contrast, low-income regions continue to face underdiagnosis, limited treatment options and insufficient healthcare infrastructure, resulting in higher disease burden. Future efforts should prioritize earlier diagnosis, wider availability of affordable therapies, stronger healthcare systems, and preventive strategies. International initiatives such as EULAR and ILAR play an important role in reducing disparities and supporting equitable access to effective RA management worldwide.

Competing interests

None declared.

Authors' contribution

ED conceived the research idea; ED, VF, RU and LG developed the aim and objectives of the literature review; ED, VF, RU drafted the manuscript and realized the literature search; ED, VF, RU and LG designed the study and revised the manuscript critically. All authors have read and approved the final version of the manuscript.

Ethics approval

Not needed for this study.

Acknowledgements and funding

No external funding.

Provenance and peer review

Not commissioned, externally peer-reviewed.

References

- Smolen JS, Aletaha D, McInnes IB. Rheumatoid arthritis. *Lancet*. 2016;388(10055):2023-2038. doi: 10.1016/S0140-6736(16)30173-8.
- Cross M, Smith E, Hoy D, et al. The global burden of rheumatoid arthritis: estimates from the Global Burden of

- Disease 2010 study. *Ann Rheum Dis.* 2014;73(7):1316-1322. doi: 10.1136/annrheumdis-2013-204627.
3. Finckh A, Gilbert B, Hodkinson B, et al. Global epidemiology of rheumatoid arthritis. *Nat Rev Rheumatol.* 2022;18(10):591-602. doi: 10.1038/s41584-022-00827-y.
 4. Safiri S, Kolahi AA, Hoy D, et al. Global, regional and national burden of rheumatoid arthritis 1990-2017: a systematic analysis of the Global Burden of Disease study 2017. *Ann Rheum Dis.* 2019;78(11):1463-1471. doi: 10.1136/annrheumdis-2019-215920.
 5. Black RJ, Cross M, Haile LM, et al. Global, regional, and national burden of rheumatoid arthritis, 1990-2020, and projections to 2050: a systematic analysis of the Global Burden of Disease Study 2021. *Lancet Rheumatol.* 2023;5(10):e594-e610. doi: 10.1016/S2665-9913(23)00211-4.
 6. Alamanos Y, Drosos AA. Epidemiology of adult rheumatoid arthritis. *Autoimmun Rev.* 2005;4(3):130-136. doi: 10.1016/j.autrev.2004.09.002.
 7. Uhlig T, Moe RH, Kvien TK. The burden of disease in rheumatoid arthritis. *Pharmacoeconomics.* 2014;32(9):841-851. doi: 10.1007/S40273-014-0174-6.
 8. Chopra A, Abdel-Nasser A. Epidemiology of rheumatic musculoskeletal disorders in the developing world. *Best Pract Res Clin Rheumatol.* 2008;22(4):583-604. doi: 10.1016/j.berh.2008.07.001.
 9. Mody GM, Cardiel MH. Challenges in the management of rheumatoid arthritis in developing countries. *Best Pract Res Clin Rheumatol.* 2008;22(4):621-641. doi: 10.1016/J.BERH.2008.04.003.
 10. Crowson CS, Matteson EL, Myasoedova E, et al. The lifetime risk of adult-onset rheumatoid arthritis and other inflammatory autoimmune rheumatic diseases. *Arthritis Rheum.* 2011;63(3):633-639. doi: 10.1002/ART.30155.
 11. Oliver JE, Silman AJ. Why are women predisposed to autoimmune rheumatic diseases? *Arthritis Res Ther.* 2009;11(5):252. doi: 10.1186/AR2825.
 12. Kvien TK. Epidemiology and burden of illness of rheumatoid arthritis. *Pharmacoeconomics.* 2004;22(2 Suppl 1):1-12. doi: 10.2165/00019053-200422001-00002.
 13. Smolen JS, Landewé RBM, Bijlsma JWJ, et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2019 update. *Ann Rheum Dis.* 2020;79(6):S685-S699. doi: 10.1136/annrheumdis-2019-216655.
 14. Putrik P, Ramiro S, Kvien TK, et al. Variations in criteria regulating treatment with reimbursed biologic DMARDs across European countries. Are differences related to country's wealth? *Ann Rheum Dis.* 2014;73(11):2010-2021. doi: 10.1136/ANNRHEUMDIS-2013-203819.
 15. Almutairi K, Nossent J, Preen D, Keen H, Inderjeeth C. The global prevalence of rheumatoid arthritis: a meta-analysis based on a systematic review. *Rheumatol Int.* 2021;41(5):863-877. doi: 10.1007/s00296-020-04731-0.
 16. Garner R, Ding T, Deighton C. Management of rheumatoid arthritis. *Med (United Kingdom).* 2014;42(5): 237-242. doi: 10.1016/j.mpmed.2014.02.004.
 17. Şuța C, Şuța M, Craiu E. Prevalența artritei reumatoide în rândul populației cauziene din Europa [Prevalence of rheumatoid arthritis in Caucasian population across Europe]. *Rom J Rheumatol.* 2014;23(4):169-174. Romanian.
 18. Bujor O. Tratatamentul de fond, calitatea vieții și prognosticul în artrita reumatoidă [Background treatment, quality of life and prognosis in rheumatoid arthritis] [dissertation]. Chisinau: Nicolae Testemițanu SIMPh; 2019. Romanian.
 19. Otón T, Carmona L. The epidemiology of established rheumatoid arthritis. *Best Pract Res Clin Rheumatol.* 2019;33(5):101477. doi: 10.1016/j.berh.2019.101477.
 20. Handa R, Rao URK, Lewis JFM, Rambhad G, Shiff S, Ghia CJ. Literature review of rheumatoid arthritis in India. *Int J Rheum Dis.* 2016;19(5):440-451. doi: 10.1111/1756-185X.12621.
 21. Guo Q, Wang Y, Xu D, Nossent J, Pavlos NJ, Xu J. Rheumatoid arthritis: pathological mechanisms and modern pharmacologic therapies. *Bone Res.* 2018;6(1):15. doi: 10.1038/s41413-018-0016-9.
 22. Benucci M, Rogai V, Atzeni F, Hammen V, Sarzti-Puttini P, Migliore A. Costs associated with rheumatoid arthritis in Italy: past, present, and future. *Clin Outcomes Res.* 2016;8:33-41. doi: 10.2147/CEOR.S91006.
 23. Rudan I, Sidhu S, Papan A, et al. Prevalence of rheumatoid arthritis in low- and middle-income countries: a systematic review and analysis. *J Glob Health.* 2015;5(1):010409. doi: 10.7189/jogh.05.010409.
 24. Ugarte-Gil MF, Silvestre AMR, Pons-Estel BA. Access to an optimal treatment. Current situation. *Clin Rheumatol.* 2015;34(Suppl 1):S59-66. doi: 10.1007/s10067-015-3018-7.
 25. Almutairi KB, Nossent JC, Preen DB, Keen HI, Inderjeeth CA. The prevalence of rheumatoid arthritis: a systematic review of population-based studies. *J Rheumatol.* 2021;48(5):669-676. doi: 10.3899/JRHEUM.200367.
 26. Silva-Fernández L, Macía-Villa C, Seoane-Mato D, et al. The prevalence of rheumatoid arthritis in Spain. *Sci Reports.* 2020;10(1):1-9. doi: 10.1038/s41598-020-76511-6.
 27. Yu F, Chen H, Li Q, et al. Secular trend of mortality and incidence of rheumatoid arthritis in global, 1990-2019: an age period cohort analysis and jointpoint analysis. *BMC Pulm Med.* 2023;23(1):1-11. doi: 10.1186/S12890-023-02594-2.
 28. Symmons DPM. Epidemiology of rheumatoid arthritis: determinants of onset, persistence and outcome. *Best Pract Res Clin Rheumatol.* 2002;16(5):707-722. doi: 10.1053/BERH.2002.0257.
 29. Ahlmén M, Svensson B, Albertsson K, Forslind K, Hafström I. Influence of gender on assessments of disease activity and function in early rheumatoid arthritis in relation to radiographic joint damage. *Ann Rheum Dis.* 2010;69(1):230-233. doi: 10.1136/ARD.2008.102244.

30. Tarannum S, Widdifield J, Wu CF, Johnson SR, Rochon P, Eder L. Understanding sex-related differences in healthcare utilisation among patients with inflammatory arthritis: a population-based study. *Ann Rheum Dis.* 2023;82(2):283-291. doi: 10.1136/ARD-2022-222779.
31. Tarannum S, Widdifield J, Wu F, et al. POS0159 sex-related disparities in healthcare utilization in patients with inflammatory arthritis: a population-based study. *Ann Rheum Dis.* 2022;81(Suppl 1):308-309. doi: 10.1136/ANNRHEUMDIS-2022-EULAR.1204.
32. Peláez-Ballestas I, Granados Y, Quintana R, et al. Epidemiology and socioeconomic impact of the rheumatic diseases on indigenous people: an invisible syndemic public health problem. *Ann Rheum Dis.* 2018;77(10):1397-1404. doi: 10.1136/ANNRHEUMDIS-2018-213625.
33. El-Gabalawy H. The impact of rheumatoid arthritis on first nations and how we can work with communities to prevent it. *J Rheumatol.* 2024;51(Suppl 1):3-9. doi: 10.3899/jrheum.2024-0369_dunlop-dottridge.
34. Rantapää Dahlqvist S, Andrade F. Individuals at risk of seropositive rheumatoid arthritis: the evolving story. *J Intern Med.* 2019;286(6):627-643. doi: 10.1111/JOIM.12980.
35. Kurkó J, Besenyei T, Laki J, Glant TT, Mikecz K, Szekanecz Z. Genetics of rheumatoid arthritis - a comprehensive review. *Clin Rev Allergy Immunol.* 2013;45(2):170-9. doi: 10.1007/S12016-012-8346-7.
36. Roh S. Smoking as a preventable risk factor for rheumatoid arthritis: rationale for smoking cessation treatment in patients with rheumatoid arthritis. *J Rheum Dis.* 2019;26(1):12-19. doi: 10.4078/JRD.2019.26.1.12.
37. Alsalahy MM, Nasser HS, Hashem MM, Elsayed SM. Effect of tobacco smoking on tissue protein citrullination and disease progression in patients with rheumatoid arthritis. *Saudi Pharm J.* 2010;18(2):75-80. doi: 10.1016/J.JSPS.2010.02.002.
38. Ishikawa Y, Terao C. The impact of cigarette smoking on risk of rheumatoid arthritis: a narrative review. *Cells.* 2020;9(2):475. doi: 10.3390/CELLS9020475.
39. Boudigaard SH, Schlünssen V, Vestergaard JM, et al. Occupational exposure to respirable crystalline silica and risk of autoimmune rheumatic diseases: a nationwide cohort study. *Int J Epidemiol.* 2021;50(4):1213-1226. doi: 10.1093/IJE/DYAA287.
40. Crowson CS, Matteson EL, Davis JM, Gabriel SE. Contribution of obesity to the rise in incidence of rheumatoid arthritis. *Arthritis Care Res (Hoboken).* 2013;65(1):71. doi: 10.1002/ACR.21660.
41. Poudel D, George MD, Baker JF. The impact of obesity on disease activity and treatment response in rheumatoid arthritis. *Curr Rheumatol Rep.* 2020;22(9):56. doi: 10.1007/S11926-020-00933-4.
42. Gabarrini G, De Smit M, Westra J, et al. The peptidylarginine deiminase gene is a conserved feature of *Porphyromonas gingivalis*. *Sci Reports.* 2015;5(1):1-8. doi: 10.1038/srep13936.
43. Maresz KJ, Hellvard A, Sroka A, et al. *Porphyromonas gingivalis* facilitates the development and progression of destructive arthritis through its unique bacterial peptidylarginine deiminase (PAD). *PLOS Pathog.* 2013;9(9):e1003627. doi: 10.1371/JOURNAL.PPAT.1003627.
44. Hedenstierna L, Bellocco R, Ye W, et al. Effects of alcohol consumption and smoking on risk for RA: results from a Swedish prospective cohort study. *RMD Open.* 2021;7(1):e001379. doi: 10.1136/RMDOPEN-2020-001379.
45. Lu B, Solomon DH, Costenbader KH, Karlson EW. Alcohol Consumption and risk of incident rheumatoid arthritis in women: a prospective study. *Arthritis Rheumatol (Hoboken, NJ).* 2014;66(8):1998-2005. doi: 10.1002/ART.38634.
46. Hajjaj-Hassouni N, Mawani N, Allali F, et al. Evaluation of vitamin D status in rheumatoid arthritis and its association with disease activity across 15 countries: "The COMORA study". *Int J Rheumatol.* 2017;2017:5491676. doi: 10.1155/2017/5491676.
47. Bellan M, Sainaghi PP, Pirisi M. Role of vitamin D in rheumatoid arthritis. *Adv Exp Med Biol.* 2017;996:155-168. doi: 10.1007/978-1-60327-303-9_54.
48. Nicholas A, Alare K, AbdulBasit Opeyemi M, Oluwatosin A. The outlook of rheumatological care in Africa: current state, challenges, and recommendation. *Ann Med Surg.* 2022;82:104689. doi: 10.1016/J.AMSU.2022.104689.
49. Kumar B. Global health inequities in rheumatology. *Rheumatology.* 2017;56(1):4-5. doi: 10.1093/RHEUMATOLOGY/KEW064.
50. Almoallim H, Al Saleh J, Badsha H, et al. A review of the prevalence and unmet needs in the management of rheumatoid arthritis in Africa and the Middle East. *Rheumatol Ther.* 2020;8(1):1-16. doi: 10.1007/S40744-020-00252-1.
51. Huertas MP. THU0659 Eurorheumavision: are the largest european rheumatology societies the ones with the most oral communications? *Ann Rheum Dis.* 2018;77(Suppl 2):523-524. doi: 10.1136/ANNRHEUMDIS-2018-EULAR.1352.
52. Myasoedova E, Davis J, Matteson EL, Crowson CS. Is the epidemiology of rheumatoid arthritis changing? Results from a population-based incidence study, 1985-2014. *Ann Rheum Dis.* 2020;79(4):440-444. doi: 10.1136/annrheumdis-2019-216694.
53. Kaló Z, Vokó Z, Östör A, et al. Patient access to reimbursed biological disease-modifying anti-rheumatic drugs in the European region. *J Mark Access Heal Policy.* 2017;5(1):1345580. doi: 10.1080/20016689.2017.1345580.
54. Putrik P, Ramiro S, Kvien TK, et al. Inequities in access to biologic and synthetic DMARDs across 46 European countries. *Ann Rheum Dis.* 2014;73(1):198-206. doi: 10.1136/annrheumdis-2012-202603.
55. Jeganathan N, Nguyen E, Sathanathan M. Rheumatoid arthritis and associated interstitial lung disease: mortality rates and trends. *Ann Am Thorac Soc.* 2021;18(12):1970-1977. doi: 10.1513/ANNAL-

- SATS.202102-1150C.
56. Goma SH, Raouf M, Razek A, Abdelbary NM. Impact of rheumatoid arthritis on the quality of life and its relation to disease activity. *Egypt Rheumatol Rehabil.* 2019;46(4):304-312. doi: 10.4103/ERR.ERR_39_19.
 57. Matcham F, Scott IC, Rayner L, et al. The impact of rheumatoid arthritis on quality-of-life assessed using the SF-36: a systematic review and meta-analysis. *Semin Arthritis Rheum.* 2014;44(2):123-130. doi: 10.1016/J.SEMARTHRT.2014.05.001.
 58. Myasoedova E, Davis JM, Achenbach SJ, Matteson EL, Crowson CS. Trends in prevalence of functional disability in rheumatoid arthritis compared with the general population. *Mayo Clin Proc.* 2019;94(6):1035-1039. doi: 10.1016/J.MAYOCP.2019.01.002.
 59. Ji J, Zhang L, Zhang Q, et al. Functional disability associated with disease and quality-of-life parameters in Chinese patients with rheumatoid arthritis. *Health Qual Life Outcomes.* 2017;15(1):1-7. doi: 10.1186/S12955-017-0659-Z/TABLES/3.
 60. Codreanu C, Mogoşan C, Popescu C, Paveliu MS. Analysis of the indirect costs of rheumatoid arthritis in Romania. *Biomed Res Int.* 2019;2019:9343812. doi: 10.1155/2019/9343812.
 61. Jagpal A, Navarro-Millán I. Cardiovascular co-morbidity in patients with rheumatoid arthritis: a narrative review of risk factors, cardiovascular risk assessment and treatment. *BMC Rheumatol.* 2018;2(1):1-14. doi: 10.1186/s41927-018-0014-y.
 62. England BR, Thiele GM, Anderson DR, Mikuls TR. Increased cardiovascular risk in rheumatoid arthritis: mechanisms and implications. *BMJ.* 2018;361:1-17. doi: 10.1136/bmj.k1036.
 63. Giles JT. Extra-articular manifestations and comorbidity in rheumatoid arthritis: potential impact of pre-rheumatoid arthritis prevention. *Clin Ther.* 2019;41(7):1246-1255. doi: 10.1016/j.clinthera.2019.04.018.
 64. Simon TA, Thompson A, Gandhi KK, Hochberg MC, Suissa S. Incidence of malignancy in adult patients with rheumatoid arthritis: a meta-analysis. *Arthritis Res Ther.* 2015;17(1):1-10. doi: 10.1186/s13075-015-0728-9.
 65. Marcucci E, Bartoloni E, Alunno A, et al. Extra-articular rheumatoid arthritis. *Reumatismo.* 2018;70(4):212-224. doi: 10.4081/reumatismo.2018.1106.
 66. Zhang Y, Lu N, Peloquin C, et al. Improved survival in rheumatoid arthritis: a general population-based cohort study. *Ann Rheum Dis.* 2017;76(2):408-413. doi: 10.1136/ANNRHEUMDIS-2015-209058.
 67. van den Hoek J, Boshuizen HC, Roorda LD, et al. Mortality in patients with rheumatoid arthritis: a 15-year prospective cohort study. *Rheumatol Int.* 2017;37(4):487-493. doi: 10.1007/S00296-016-3638-5.
 68. Lila AM, Lila VA. Sotsial'naia znachimost' i ekonomicheskie posledstviia revmaticheskikh zabolevanii [Social significance and economic consequences of rheumatic diseases]. *Gig Sanit.* 2017;96(4):387-392. doi: 10.18821/0016-9900-2017-96-4-387-392. Russian.
 69. Huang Y, Li J, Agarwal SK. Economic and humanistic burden of rheumatoid arthritis: results from the US National Survey Data 2018–2020. *ACR Open Rheumatol.* 2024;6(11):746-754. doi: 10.1002/ACR2.11728.
 70. Johnson K, Karos R, Avalos-Reyes E, Casadio F, Hamburger M, Leprai C. Total cost of care for patients with rheumatoid arthritis [abstract]. *Arthritis Rheumatol.* 2020;72(Suppl 10) ACR Meeting Abstracts. [cited 2025 March 16]. Available from: <https://acrabstracts.org/abstract/total-cost-of-care-for-patients-with-rheumatoid-arthritis/>
 71. Curtis JR, Chastek B, Becker L, et al. Cost and effectiveness of biologics for rheumatoid arthritis in a commercially insured population. *J Manag Care Pharm.* 2015;21(4):318-328. doi: 10.18553/JMCP.2015.21.4.318.
 72. Cubberley C, Maharaj A. Global RA treatment recommendations: an update from the various international societies. *Best Pract Res Clin Rheumatol.* 2025;39(1):102019. doi: 10.1016/J.BERH.2024.102019.
 73. Neovius M, Simard JF, Askling J. How large are the productivity losses in contemporary patients with RA, and how soon in relation to diagnosis do they develop? *Ann Rheum Dis.* 2011;70(6):1010-1015. doi: 10.1136/ARD.2010.136812.
 74. Wang BCM, Hsu PN, Furnback W, et al. Estimating the economic burden of rheumatoid arthritis in Taiwan using the National Health Insurance Database. *Drugs Real World Outcomes.* 2016;3(1):107-114. doi: 10.1007/S40801-016-0063-8.
 75. Lau CS. Burden of rheumatoid arthritis and forecasted prevalence to 2050. *Lancet Rheumatol.* 2023;5(10):e567-e568. doi: 10.1016/S2665-9913(23)00240-0.
 76. Elmamoun M, Eraso M, Anderson M, et al. International league of associations for rheumatology recommendations for the management of psoriatic arthritis in resource-poor settings. *Clin Rheumatol.* 2020;39(6):1839-1850. doi: 10.1007/S10067-020-04934-7.
 77. Reitsma MB, Flor LS, Mullany EC, Gupta V, Hay SI, Gakidou E. Spatial, temporal, and demographic patterns in prevalence of smoking tobacco use and initiation among young people in 204 countries and territories, 1990–2019. *Lancet Public Heal.* 2021;6(7):e472-e481. doi: 10.1016/S2468-2667(21)00102-X.
 78. Bingham CO, Moni M. Periodontal disease and rheumatoid arthritis: the evidence accumulates for complex pathobiologic interactions. *Curr Opin Rheumatol.* 2013;25(3):345-53. doi: 10.1097/BOR.0B013E32835FB8EC.
 79. Cai Y, Zhang J, Liang J, et al. The Burden of rheumatoid arthritis: findings from the 2019 Global Burden of Diseases Study and Forecasts for 2030 by Bayesian age-period-cohort analysis. *J Clin Med.* 2023;12(4):1-11. doi: 10.3390/jcm12041291.