

Rheumatic Diseases And Rheumatology Service Capacity In The Samarkand Region Of Uzbekistan: A Regional Analysis Of Routine Health Data, 2019–2024

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ABSTRACT

Aim. To describe the registered burden of rheumatic diseases and the capacity of specialist rheumatology services in the Samarkand region of Uzbekistan — a Central Asian setting for which no data have previously been reported in the international literature.

Methods. Retrospective analysis of routine health-service data for the Samarkand region (resident population 4,208,509 in 2024). Registered cases of 15 rheumatic conditions for 2019–2023 were extracted from the annual reports of the regional chief rheumatologist and from statutory statistical reporting forms of 34 primary care facilities (20 family polyclinics in Samarkand city and 14 district multiprofile central polyclinics). Workforce data (established posts, occupied posts, individual physicians, qualification category, district distribution) and service-utilisation data (dispensary registration, inpatient admissions) were analysed for 2022–2024. Crude registered prevalence was expressed per 100,000 resident population. Analyses were descriptive.

Results. Registered cases of rheumatic disease rose from 11,535 in 2019 to 13,828 in 2023 (+19.9%), with a transient fall in 2020 (11,296) coinciding with the COVID-19 pandemic. Crude registered prevalence in 2023 was 334.5 per 100,000 total population. Three conditions accounted for 77.2% of all registered cases in 2023: osteoarthritis (29.9%), rheumatoid arthritis (27.0%) and chronic rheumatic heart disease (20.3%). The largest relative increases were seen for osteoporosis (+45.3%), gout (+36.7%) and rheumatoid arthritis (+35.5%), whereas acute (–27.8%) and recurrent (–28.6%) rheumatic fever declined. In 2024 the region had 21.0 established rheumatology posts, 19.0 of them occupied, and 23 individual rheumatologists — 0.55 physicians per 100,000 total population and 0.87 per 100,000 adults; 11 of 23 physicians (47.8%) held no qualification category, and one district of 141,851 inhabitants had no established rheumatology post. Between 2022 and 2024, patients under dispensary follow-up increased by 55.1% (5,966 to 9,253) and rheumatology inpatient admissions by 61.0% (1,916 to 3,084).

Conclusion. In this Central Asian region the registered burden of rheumatic disease is rising and service utilisation is expanding rapidly, while specialist capacity remains 1.5- to 4-fold below levels reported for Europe, the USA and neighbouring CIS countries, with marked intra-regional inequity. These are the first published data on rheumatology service capacity from Central Asia and support task-sharing with primary care, structured referral pathways and targeted workforce expansion.

Keywords: rheumatic diseases; epidemiology; health services research; health workforce; primary health care; Uzbekistan; Central Asia.

1. INTRODUCTION

Rheumatic and musculoskeletal diseases (RMDs) are among the leading contributors to years lived with disability worldwide, and their burden continues to grow with population ageing and the increasing prevalence of metabolic risk factors [1]. Because most RMDs are chronic, progressive and functionally disabling, the outcome for an individual patient depends not only on the availability of effective drugs but on whether a health system can detect disease early, route the patient to a specialist without undue delay, and maintain structured long-term follow-up [2,3].

The capacity to deliver that care is distributed very unevenly. Recent syntheses of the global rheumatology workforce describe a persistent and widening gap between specialist supply and disease burden, with the most severe shortfalls in low- and middle-income countries and in rural areas of high-income countries [4–6]. Within Europe, the EULAR RheumaFacts project documented a more than tenfold difference in rheumatologist density between member countries [7]. In rural and remote settings, low specialist density has been repeatedly linked to later diagnosis, later initiation of disease-modifying therapy and higher rates of irreversible damage [8].

Population-level evidence on RMDs in low-resource settings has largely been generated through the WHO-ILAR Community Oriented Programme for the Control of Rheumatic Diseases (COPCORD), which has produced comparable community-based prevalence estimates from China, Ecuador, India, Nepal, Indonesia, Nigeria, Iran and Suriname, among others [9–16]. Central Asia is conspicuously absent from this map. To our knowledge, no study describing either the epidemiology of rheumatic disease or the organisation of rheumatology services in Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan or Turkmenistan has been indexed in PubMed. Health-system planning in the region therefore proceeds without a published empirical baseline, and the region contributes nothing to international comparisons of rheumatology capacity.

Uzbekistan is the most populous country in Central Asia, and the Samarkand region is its most populous province, with more than 4.2 million residents. Its health system has been undergoing structural reform, including the roll-out of a national electronic health information system, which makes an explicit description of the current baseline both feasible and timely.

The aim of this study was to describe, using routine health-service data, the registered burden of rheumatic diseases in the Samarkand region of Uzbekistan between 2019 and 2023, together with the specialist workforce, its geographical distribution and the pattern of service utilisation between 2022 and 2024.

2. MATERIALS AND METHODS

2.1 Study design and setting

This was a retrospective, descriptive analysis of routinely collected health-service data covering the entire Samarkand region of the Republic of Uzbekistan. The region comprises 14 rural districts and two cities of regional subordination, and had a resident population of 4,025,160 in 2022, 4,134,523 in 2023 and 4,208,509 in 2024; adults aged 18 years and over accounted for 62.1%, 63.8% and 63.0% of the population in those years, respectively.

Rheumatology care in the region is delivered on three levels. Primary care is provided by family physicians and general internists in family polyclinics and district multiprofile central polyclinics; specialist outpatient rheumatology is provided by district rheumatologists where such a post exists; and inpatient and tertiary care is concentrated in the Samarkand Regional Multiprofile Medical Centre. Thirty-four primary care institutions were included in the service analysis: 20 family polyclinics in the city of Samarkand and 14 district multiprofile central polyclinics.

2.2 Data sources

Three sources were used. First, the annual reports of the regional chief rheumatologist for 2019–2023 provided the number of registered cases for each of 15 rheumatic conditions. Second, statutory statistical reporting forms of the 34 participating institutions and of the Regional Multiprofile Medical Centre provided data on staffing, dispensary registration, inpatient admissions, bed-days and mean length of stay for 2022–2024. Third, official demographic data from the Statistics Agency under the President of the Republic of Uzbekistan provided resident population denominators.

2.3 Definitions and indicators

A registered case was defined as a patient with a clinically verified rheumatic diagnosis recorded in the regional rheumatology reporting system in the reference year. Diagnoses followed ICD-10 categories as applied in national reporting, and had been established by the treating physician using the classification criteria in current clinical use for each condition. Crude registered prevalence was calculated as the number of registered cases divided by the mid-year resident population, expressed per 100,000. Because the reporting system captures patients in contact with health services rather than all prevalent cases in the community, this indicator represents service-detected prevalence and is a lower bound on true prevalence.

Workforce indicators were reported in three forms, which are not interchangeable: established posts (the staffing establishment approved for each institution), occupied posts (full-time-equivalent positions actually filled) and individual physicians (headcount, which may exceed occupied posts where physicians hold fractional appointments at more than one institution). Density was expressed per 100,000 total population and per 100,000 adults. Post occupancy was calculated as occupied posts divided by established posts.

2.4 Statistical analysis

Analyses were descriptive. Counts and proportions are presented for categorical variables and absolute and relative changes for time series. Relative change between 2019 and 2023 was calculated as $(\text{value 2023} - \text{value 2019}) / \text{value 2019} \times 100$. No inferential testing was performed, since the data represent a complete regional census of registered cases rather than a sample. Data were processed in IBM SPSS Statistics (IBM Corp., Armonk, NY, USA).

2.5 Ethics

The study used aggregated, de-identified administrative and statistical data and did not involve any intervention or contact with individual patients. It was approved by the Ethics Committee of Samarkand State Medical University (protocol No. [to be inserted], [date]). The requirement for individual informed consent was waived because no identifiable personal data were accessed.

3. RESULTS

3.1 Registered burden and its trend, 2019–2023

The number of registered rheumatic disease cases in the Samarkand region increased from 11,535 in 2019 to 13,828 in 2023, a relative increase of 19.9% over five years (mean 12,492.8 cases per year). The trend was not monotonic: a fall to 11,296 cases was recorded in 2020, followed by year-on-year increases of 10.9% (2021), 5.9% (2022) and 4.2% (2023). The 2020 decrease coincided with the first year of the COVID-19 pandemic and the associated reduction in scheduled outpatient activity, and is most plausibly interpreted as reduced case ascertainment rather than a true fall in disease occurrence. Absolute case numbers by condition are given in Table 1 and the trend in the five leading conditions is shown in Figure 1.

Table 1. Registered cases of rheumatic disease by condition, Samarkand region, 2019–2023 (n)

Condition	2019	2020	2021	2022	2023	Change 2019–2023, %
Osteoarthritis	3,200	3,050	3,600	4,028	4,140	+29.4
Rheumatoid arthritis	2,750	2,680	3,027	3,361	3,726	+35.5
Chronic rheumatic heart disease	2,950	2,920	2,885	2,838	2,810	–4.7
Osteoporosis	950	900	1,120	1,268	1,380	+45.3
Reactive arthropathy	480	560	640	563	545	+13.5
Gout	300	285	345	384	410	+36.7
Acute rheumatic fever	360	340	310	281	260	–27.8
Recurrent rheumatic fever	175	165	150	135	125	–28.6
Systemic lupus erythematosus	145	160	185	163	170	+17.2
Ankylosing spondylitis	85	82	90	94	97	+14.1
Systemic sclerosis	68	75	82	73	75	+10.3
Psoriatic arthritis	28	27	32	35	37	+32.1
Behçet disease	19	22	26	22	22	+15.8
Systemic vasculitis	14	17	22	17	18	+28.6
Dermatomyositis	11	13	16	13	13	+18.2
All rheumatic diseases	11,535	11,296	12,530	13,275	13,828	+19.9

Source: annual reports of the regional chief rheumatologist, Samarkand region.

Crude registered prevalence per 100,000 population is shown in Table 2. In 2023 the overall registered prevalence was 334.5 per 100,000 total population, corresponding to 524.5 per 100,000 adults. The three highest condition-specific rates in 2023 were osteoarthritis (100.1 per 100,000), rheumatoid arthritis (90.1) and chronic rheumatic heart disease (68.0).

Table 2. Crude registered prevalence of rheumatic disease per 100,000 resident population, Samarkand region, 2019–2023

Condition	2019	2020	2021	2022	2023
Osteoarthritis	‡	‡	‡	100.1	100.1
Rheumatoid arthritis	‡	‡	‡	83.5	90.1
Chronic rheumatic heart disease	‡	‡	‡	70.5	68.0
Osteoporosis	‡	‡	‡	31.5	33.4
Reactive arthropathy	‡	‡	‡	14.0	13.2
Gout	‡	‡	‡	9.5	9.9
Acute rheumatic fever	‡	‡	‡	7.0	6.3
Recurrent rheumatic fever	‡	‡	‡	3.4	3.0
Systemic lupus erythematosus	‡	‡	‡	4.0	4.1
Ankylosing spondylitis	‡	‡	‡	2.3	2.3
Systemic sclerosis	‡	‡	‡	1.8	1.8
Psoriatic arthritis	‡	‡	‡	0.87	0.89

Condition	2019	2020	2021	2022	2023
All rheumatic diseases	‡	‡	‡	329.8	334.5
Resident population (denominator)	‡	‡	‡	4,025,160	4,134,523

‡ Official resident population denominators for 2019–2021 to be inserted from Statistics Agency data before submission; rates for those years are then calculated as cases (Table 1) / population × 100,000.

3.2 Nosological structure

The structure of registered rheumatic disease was dominated by three conditions. In 2023, osteoarthritis accounted for 29.9% of all registered cases, rheumatoid arthritis for 27.0% and chronic rheumatic heart disease for 20.3% — together 77.2% of the total. Osteoporosis contributed a further 10.0%, reactive arthropathy 3.9% and gout 3.0%; the systemic connective tissue diseases and vasculitides together accounted for less than 2%.

The composition shifted over the five-year period. The share of chronic rheumatic heart disease fell from 25.6% in 2019 to 20.3% in 2023, and the combined share of acute and recurrent rheumatic fever fell from 4.6% to 2.8%. Over the same period the share of osteoarthritis rose from 27.7% to 29.9% and that of rheumatoid arthritis from 23.8% to 27.0%. The region is therefore in transition from a burden pattern dominated by post-streptococcal rheumatic disease toward one dominated by degenerative and immune-mediated inflammatory disease, while still carrying a substantial legacy of rheumatic heart disease.

3.3 Rheumatology workforce and its geographical distribution

In 2024 the regional health system had 21.0 established rheumatology posts, of which 19.0 (90.5%) were occupied, staffed by 23 individual physicians. Headcount exceeded occupied full-time-equivalent posts because several specialists hold fractional appointments at more than one institution. Overall density was 0.55 physicians per 100,000 total population, 0.45 occupied posts per 100,000 total population, and 0.87 physicians per 100,000 adults.

The qualification profile was heterogeneous: 6 physicians (26.1%) held the highest qualification category, 5 (21.7%) the first and 1 (4.3%) the second, while 11 (47.8%) held no qualification category at all — indicating that almost half the specialist workforce is early in professional career or has not undergone formal certification.

Distribution across the region was uneven (Table 3). Koshrabod district, with 141,851 residents of whom 84,684 are adults, had no established rheumatology post and therefore no specialist rheumatology provision whatsoever. Post occupancy was incomplete in Tayloq district (80%), Payariq district (57%) and Samarkand district (25%). Physician density by district ranged from 0 per 100,000 (Koshrabod) to 1.05 per 100,000 (Kattakurgan city). Notably, the two most populous territories — Samarkand city (585,232 residents) and Urgut district (559,226 residents) — each had only two rheumatologists, giving densities of 0.34 and 0.36 per 100,000, below the regional average (Figure 2).

Table 3. Rheumatology workforce by district, Samarkand region, 2024

District / city	Population	Established posts	Occupied posts	Physicians, n	Physicians per 100,000
Samarkand city	585,232	2.00	2.00	2	0.34
Urgut	559,226	2.00	2.00	2	0.36
Pastdargom	383,291	2.50	2.50	3	0.78
Kattakurgan district	293,774	1.00	1.00	1	0.34
Ishtikhan	275,902	1.00	1.00	1	0.36
Payariq	273,336	1.75	1.00	1	0.37
Samarkand district	272,843	1.00	0.25	2	0.73
Narpay	227,396	1.50	1.50	2	0.88
Tayloq	221,089	1.25	1.00	1	0.45
Bulungur	201,968	1.25	1.25	1	0.50
Jomboy	189,527	1.00	1.00	1	0.53
Oqdaryo	173,196	0.50	0.50	1	0.58
Nurobod	162,649	1.00	1.00	1	0.61

District / city	Population	Established posts	Occupied posts	Physicians, n	Physicians per 100,000
Pakhtachi	152,330	0.50	0.50	1	0.66
Koshrabod	141,851	0.00	0.00	0	0.00
Kattakurgan city	94,899	0.50	0.50	1	1.05
Region, total	4,208,509	21.00	19.00	23	0.55

Regional totals include posts and physicians at the Samarkand Regional Multiprofile Medical Centre, which are not attributed to an individual district and therefore exceed the sum of the district rows.

Placed in international context (Table 4), the density observed in the Samarkand region is below every comparator identified. It is approximately one quarter of the staffing norm applied in Kazakhstan, less than half the reported average for the Russian Federation, and one third to one half of the values reported for Romania, Belgium, the United States and the United Kingdom. It falls at the very bottom of the range described across European countries by the EULAR RheumaFacts project.

Table 4. Rheumatologist density: international comparison

Country / territory	Rheumatologists per 100,000 population	Source
Samarkand region, Uzbekistan	0.55	Present study, 2024
Kazakhstan (staffing norm)	2.00	Ministry of Health standard
Romania	1.67	EULAR RheumaFacts [7]
United States	1.65	ACR Workforce Study [6]
Belgium	1.48	EULAR RheumaFacts [7]
Russian Federation (mean)	1.30	National reporting
United Kingdom	1.00	NHS data
Germany	0.82	EULAR RheumaFacts [7]
Europe (reported range)	0.60–8.27	EULAR RheumaFacts [7]

3.4 Service utilisation, 2022–2024

Utilisation of rheumatology services grew substantially faster than the registered case load (Table 5). The number of patients under dispensary follow-up rose from 5,966 in 2022 to 9,253 in 2024, an increase of 55.1%, while the number of patients newly placed on dispensary registration rose from 417 to 995 (+138.6%). Inpatient admissions for rheumatic disease at the Regional Multiprofile Medical Centre rose from 1,916 to 3,084 (+61.0%), with first-ever diagnoses among admitted patients rising from 274 to 456 (+66.4%). Women accounted for the large majority of admissions throughout (84.2% in 2022, 63.0% in 2024).

Among inpatients, deforming osteoarthritis (1,080 to 1,472 admissions) and rheumatoid arthritis (610 to 840) predominated, with the steepest relative increases recorded for systemic lupus erythematosus (51 to 165, +223.5%), gout (72 to 205, +184.7%) and systemic sclerosis (114 to 253, +121.9%). Mean length of stay across institutions ranged from 5.2 to 9.8 days in 2024.

Table 5. Rheumatology service utilisation, Samarkand region, 2022–2024

Indicator	2022	2023	2024	Change 2022–2024, %
Patients under dispensary follow-up	5,966	8,435	9,253	+55.1
— of whom osteoarthritis	2,842	2,842	2,942	+3.5
— of whom rheumatoid arthritis	2,126	2,226	2,296	+8.0
— of whom gout	212	222	242	+14.2
Newly placed on dispensary register	417	608	995	+138.6
Removed from dispensary register	156	538	608	+289.7
Inpatient admissions (regional centre)	1,916	2,856	3,084	+61.0
— first-ever diagnosis among admissions	274	360	456	+66.4
— women	1,613	1,915	1,944	+20.5
— men	212	306	399	+88.2

4. DISCUSSION

This is, to our knowledge, the first description of the burden of rheumatic disease and of rheumatology service capacity from Central Asia to appear in the international literature. Three findings stand out: a registered case load that grew by one fifth in five years; a nosological structure in epidemiological transition, still carrying a substantial legacy of chronic rheumatic heart disease; and a specialist workforce that is smaller, relative to population, than in any comparator country we were able to identify, and unevenly distributed within the region.

4.1 Burden and structure in international context

Registered prevalence of 334.5 per 100,000 is far below community-based prevalence estimates obtained by COPCORD surveys, in which musculoskeletal complaints are typically reported by 10–30% of adults and specific rheumatic diagnoses by several per cent [9–16]. The difference is expected and instructive: COPCORD estimates the burden that exists in the community, whereas routine reporting captures only the burden that reaches and is retained by the health system. The gap between the two is itself a measure of unmet need. A COPCORD-type community survey in the Samarkand region would allow that gap to be quantified directly, and is a logical next step.

The structural findings are consistent with an epidemiological transition observed in other middle-income settings. The decline in acute and recurrent rheumatic fever (–27.8% and –28.6% over five years) and the slow decline in chronic rheumatic heart disease are compatible with improved primary and secondary prophylaxis of streptococcal infection, while the parallel rise in osteoarthritis, osteoporosis and gout reflects population ageing and the accumulation of metabolic risk. Nevertheless, chronic rheumatic heart disease still accounted for one in five registered cases in 2023 — a proportion that would be exceptional in Western European reporting and that positions the region between the classical low-income and high-income burden profiles.

The rise in registered rheumatoid arthritis (+35.5%) should be interpreted cautiously. In a system where dispensary registration and specialist supply were both expanding, an increase in registered cases may reflect improved ascertainment as much as rising incidence. The disproportionate growth of newly registered patients (+138.6% over two years) relative to the registered case load supports an ascertainment component.

4.2 Workforce capacity and access

At 0.55 rheumatologists per 100,000 population, the Samarkand region sits at or below the lowest values documented across Europe [7] and at roughly a quarter of the staffing norm applied in neighbouring Kazakhstan. The international literature has consistently linked low specialist density to delayed diagnosis and delayed initiation of disease-modifying therapy [4,5,8], and delay in inflammatory arthritis has been shown to be common even in well-resourced systems [24–26]. In a region where nearly half the specialist workforce holds no qualification category and where one district of 141,851 residents has no established post, the risk of late presentation and preventable damage is correspondingly higher.

Two features of the distribution deserve emphasis. First, absolute density understates the problem, because the two most populous territories — Samarkand city and Urgut district — have densities below the regional mean. Second, headcount overstates available capacity: only 19.0 of 21.0 established posts were occupied, and several physicians hold fractional appointments across institutions, so the effective full-time-equivalent density is 0.45 per 100,000. Workforce planning based on headcount alone would therefore systematically overestimate capacity, a distinction also stressed in international workforce analyses [4,6].

4.3 Implications for service organisation

Expanding specialist training is necessary but slow. The international experience suggests that capacity can be increased in the medium term without waiting for the specialist pipeline. Structured training of primary care providers, as in

Project ECHO rheumatology programmes [22] and the rheumatoid arthritis training programme delivered on the Navajo Nation [23], has been shown to improve primary care management and reduce inappropriate referral. Electronic consultation between primary care and rheumatology has reduced waiting times and avoided face-to-face appointments [21], and non-physician-led triage has proved feasible for prioritising referrals [20]. Integrated musculoskeletal care programmes evaluated in Europe demonstrate that such models can be implemented within existing primary care structures [29]. Given that the Samarkand region already delivers primary care through 34 identifiable institutions, and that a national electronic health information system is being rolled out, these approaches appear directly transferable.

The rapid growth in dispensary registration (+55.1% in two years) indicates that the system is already absorbing more patients into structured follow-up. Whether that follow-up meets quality standards is a separate question; internationally accepted quality indicator sets for rheumatoid arthritis care [27] provide a framework against which the regional service could be audited, and doing so would be a natural continuation of this work.

4.4 Strengths and limitations

The principal strength of this study is completeness: it covers the entire population of a region of more than four million people, using statutory reporting that includes every public institution providing rheumatology care.

Several limitations must be acknowledged. First, the data are administrative and were not collected for research; individual diagnoses could not be independently verified against classification criteria, and misclassification cannot be excluded. Second, registered prevalence measures contact with services rather than true community prevalence, and will underestimate the latter — probably differentially, since ascertainment is likely to be poorest in the districts with least specialist provision. This introduces a bias that acts against the observed geographical inequity being an artefact, but it also means that districts with more rheumatologists may appear to have more disease. Third, rates were not age-standardised, so part of the observed increase reflects the changing age structure of the population as well as population growth of approximately 4.6% between 2022 and 2024; the underlying case-count increase of 19.9% over 2019–2023 is therefore an upper bound on the increase in age-standardised prevalence. Fourth, the epidemiological series covers 2019–2023 while service and workforce data cover 2022–2024, so the two components are not fully contemporaneous. Fifth, private-sector activity is not captured by the reporting system. Finally, the 2020 data point is affected by pandemic-related disruption to routine outpatient services and should not be interpreted as a true fall in disease occurrence.

5. CONCLUSION

In the Samarkand region of Uzbekistan the registered burden of rheumatic disease rose by 19.9% between 2019 and 2023, reaching 334.5 registered cases per 100,000 population, with osteoarthritis, rheumatoid arthritis and chronic rheumatic heart disease together accounting for more than three quarters of cases. Service utilisation is expanding rapidly, yet specialist capacity — 0.55 rheumatologists per 100,000 population, with one district having no established post at all — remains well below every international comparator identified. These first published data from Central Asia establish a baseline for regional health-system planning and support a strategy combining targeted workforce expansion with task-sharing, structured referral pathways and audit of care quality against internationally accepted indicators.

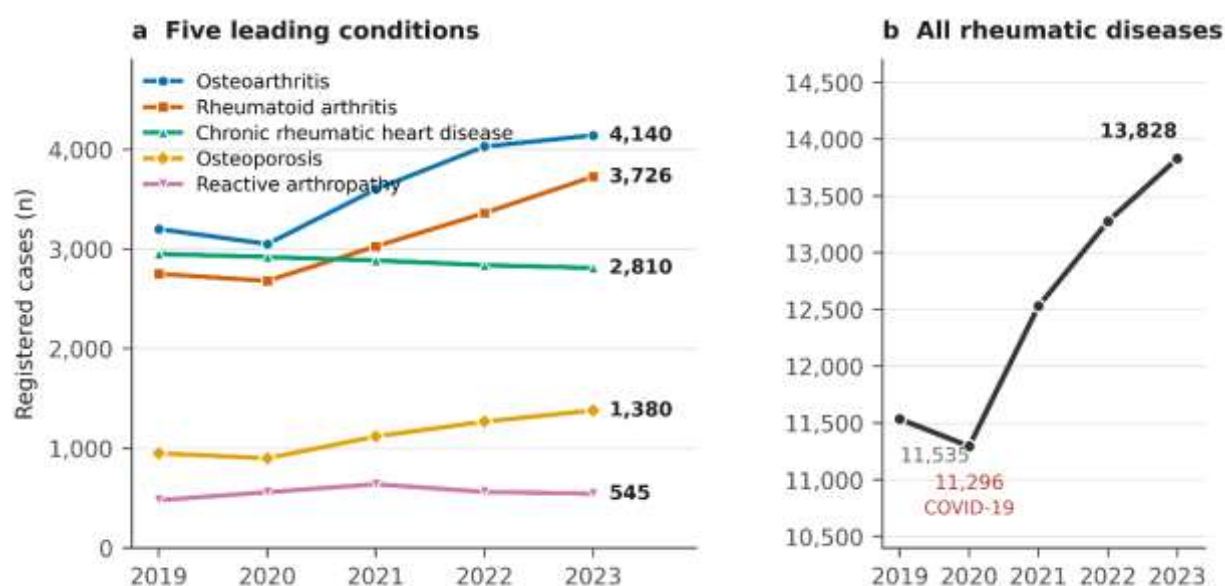


Figure 1. Registered cases of rheumatic disease, Samarkand region, 2019–2023. (a) The five leading conditions by case number. (b) All rheumatic diseases combined; the fall recorded in 2020 coincided with the first year of the COVID-19 pandemic and reduced scheduled outpatient activity. Source: annual reports of the regional chief rheumatologist.

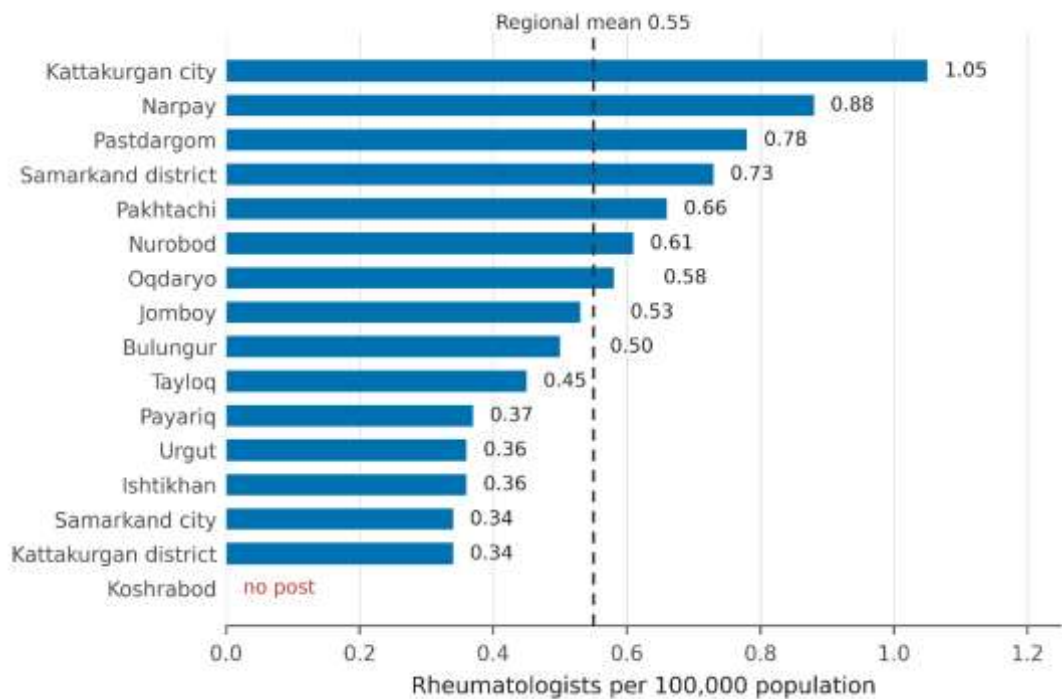


Figure 2. Rheumatologist density by district, Samarkand region, 2024 (physicians per 100,000 resident population). The dashed line marks the regional mean of 0.55 per 100,000. Koshrabod district (141,851 residents) had no established rheumatology post.

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