



Trends in the incidence of musculoskeletal diseases in Kazakhstan in 2011–2020: an information-analytical study

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Abstract

According to the World Health Organization, there is an increase in the incidence of musculoskeletal diseases worldwide. The problem of this group of diseases is that they are associated with the onset of temporary and permanent disability. A number of studies have demonstrated an increase in the incidence of musculoskeletal diseases in the US, Canada, Australia, and European countries. The current informational and analytical study was aimed to reflect on related morbidity trends in Kazakhstan. We analyzed data on the incidence of diseases of the musculoskeletal system in 2011–2020. Ten annual statistical yearbooks of the Ministry of Health of Kazakhstan were used to obtain data. The results showed an increase in the total incidence of musculoskeletal diseases of 304,492 cases between 2011 and 2020. Primary incidence of musculoskeletal disorders in the whole population increased by a factor of 1.5. The incidence rate of musculoskeletal diseases increased in the age group over 18 years and in the 0–14 years' child group. A comparative analysis of morbidity figures for rural and urban populations was also presented. An increase in the incidence of musculoskeletal diseases in both populations was observed. Finally, comparative data analysis on morbidity across Central Asian countries was provided. This information-analytical study shows that the incidence of musculoskeletal disorders is steadily increasing in Kazakhstan. The scientific community should pay attention to this trend to prevent further increases in the incidence of musculoskeletal disorders.

Keywords Musculoskeletal diseases · Incidence · Morbidity · Statistical yearbook · Kazakhstan

Introduction

The number of people suffering from musculoskeletal disorders is steadily increasing worldwide [1]. Factors influencing this growth are not only related to the global population growth, but are also associated with increased life expectancy and global spread of rheumatic diseases and injuries [2]. According to the World Health Organization data as of February 8, 2021, musculoskeletal disorders comprise an average of 150 different pathologies [3]. This broad group of clinical conditions and diseases includes osteoarthritis, rheumatoid arthritis, psoriatic arthritis, gouty arthritis, ankylosing spondylitis, systemic lupus erythematosus, osteoporosis, fractures, dislocations, and many other entities [3]. Although

musculoskeletal disorders are highly prevalent among the elderly, younger adults are also increasingly affected by the same diseases [4, 5]. The absolute number of subjects with musculoskeletal disorders is predicted to increase annually, particularly in developing countries [6].

Steadily increasing rate of temporary and permanent disabilities is a consequence of the global spread of musculoskeletal disorders [7]. Premature disabilities overburden societies with physical and psychological issues and result in economic hardships for individuals, their families, and societies. There are 1.71 billion people worldwide with musculoskeletal disorders [3]. A large number of them suffer from lumbago syndrome (568 million) [3]. The 2nd largest disease group presents with fractures (436 million) [3]. And the 3rd group is represented by subjects with osteoarthritis (343 million) [3].

Rheumatoid arthritis, one of the main autoimmune rheumatic diseases, affects 14 million people worldwide [8]. Overall, rheumatic diseases are spread across countries. In India, rheumatic diseases affect up to 24% of the population [9]. These diseases are among the most common

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chronic conditions leading to disability in Australia, Canada, Europe, and the US [10]. Joint pain is the most common reason of specialist referrals. At least 47.8 million people in the US suffer from arthritis, with a predicted increase to 60 million by 2020 [11]. Arthritis affects 8 million people in the UK and 108 million people across the European continent [12]. According to official data in Eastern European countries such as Ukraine, the percentage of rheumatic diseases increased by 40% in 1988–1993 [13]. In Bulgaria as of 2016, the number of patients with rheumatic diseases was 1712.1 per 100,000 population [14]. Musculoskeletal diseases are also supposedly a pressing issue in Kazakhstan. Therefore, the aim of this study was to explore related trends in Kazakhstan. We aimed to present the dynamics of musculoskeletal diseases in Kazakhstan in 2011–2020.

Methods

This study is informational and analytical in nature. For the analysis of epidemiological features of diseases of musculoskeletal system in Kazakhstan, we analyzed 10-year statistical data based on statistical yearbooks of the Ministry of Health of Kazakhstan titled—"Population health of the Republic of Kazakhstan and activity of public health organizations" (2011–2020 years) [15]. Statistics on the activities of health care organisations and health indicators in the Republic of Kazakhstan for each year are presented in each compendium. All yearbooks contain 20 sections each of which reflects numerical data of the activities of health-care organizations and health indicators. The indicators in the sections are divided into public, private, and departmental. All the numerical data in these compilations are generated by the Statistics tool of the Republican State Enterprise for

"Republican e-Health Centre". All morbidity indicators for the period 2011–2020 belonging to the category 'musculoskeletal and connective tissue diseases' are included in the inclusion criteria. The exclusion criteria are morbidity rates from other disease categories that are not relevant for the period 2011–2020. Two tables, each with a 10-year summary, are generated to group the information obtained from the ten collections into a separate Word document. All the data are presented in Table 1. Morbidity per 100,000 population by sex and place of residence is reported. Morbidity per 100,000 is divided into age groups in Table 2. All statistical data are presented in absolute and relative numbers.

Results

Morbidity of total population of Kazakhstan has increased almost 1.4-fold from 682,585 to 987,077 in 2011–2020. During the same period, the level of overall morbidity in subjects above 18 years has increased from 563,226 to 861,178. An increase in the overall incidence is also noted in 0–14 age group, with an increase of 16,019 cases by 2020. In contrast, in 15–17 age group, the total incidence decreased over the decade from 45,821 to 36,342 cases. Alongside the increase in general morbidity, there has been an increase in primary morbidity by 122,052 since 2012. The dynamic of general and primary morbidity in the population is shown in Fig. 1.

The relative incidence rate per 100,000 has increased from 1,616 to 2,086.5 over the study period. At the same time, morbidity of females has increased from 1,619.4 to 2,336.9 per 100,000 over the same period.

The following incidence data are available for urban population: in 2011, the rate is 2006.7 per 100,000; there is a gradual decrease in the incidence rate from 1965.5 to 1834.6

Table 1 Gender- and residence-based distribution of the incidence of musculoskeletal diseases in Kazakhstan in 2011–2020 (per 100,000 inhabitants)

	Dynamic in 2011–2020									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
The entire population of the country	1616.0	1603.7	1549.0	1503.4	1631.7	1884.3	2022.2	2117.3	2098.5	2086.5
Female population	1619.4	1661.7	1663.7	1640.8	1807.2	2094.7	2290.1	2408.3	2308.8	2336.9
Urban population	2006.7	1965.5	1905.0	1834.6	1974.3	2231.1	2413.3	2594.6	2531.8	2605.6
Rural population	1146.4	1165.1	1114.5	1073.1	1181.0	1421.4	1497.1	1457.8	1450.2	1342.9

Table 2 Age-related incidence of musculoskeletal diseases in 2011–2020 in Kazakhstan (per 100,000 inhabitants)

	Dynamic in 2011–2020									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
0 to 14 years	1002.2	966.6	817.0	757.0	752.9	927.3	1078.4	1165.7	1135.7	978.1
15 to 17 years	2895.2	2893.1	2882.1	2796.7	2787.0	3022.3	3032.3	2952.7	2838.0	2317.7
Above 18 years	1743.5	1749.6	1738.2	1711.8	1908.9	2203.8	2352.9	2468.4	2465.7	2553.6

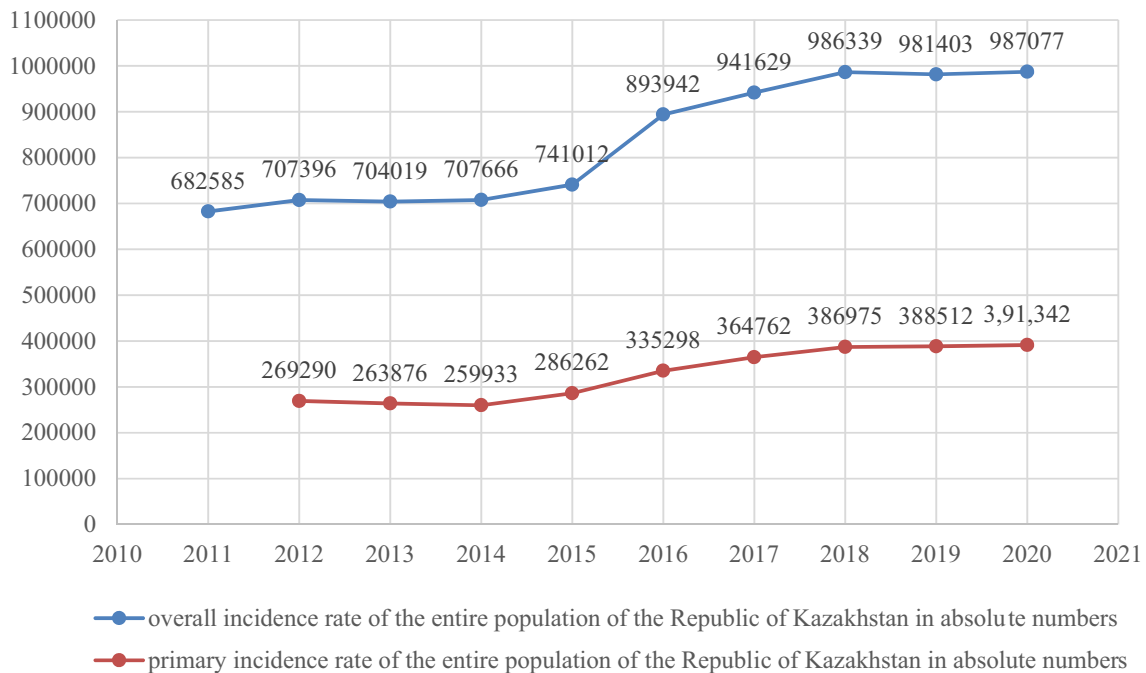


Fig. 1 Dynamics of general and primary incidence of musculoskeletal disorders in the population of Kazakhstan. *Statistical data on diseases of the musculoskeletal system according to statistical yearbooks

of the Ministry of Health of Kazakhstan titled—“Population health of the Republic of Kazakhstan and activity of public health organizations” (2011–2020 years). *The graphs were made using Excel

per 100,000 in 2012–2014; a gradual increase from 1974.3 to 2594.6 per 100,000 in 2015–2018; however, there is a slight decline in the incidence rate to 2531.8 in 2018–2019 and a further gradual increase to 2605.6 per 100,000 by 2020.

A fluctuating morbidity trend has been identified among rural subjects: from 2011 to 2012—from 1146.4 to 1165.1 per 100,000, from 2013 to 2014—1073.1 per 100,000, from 2015 to 2017—again an increase to 1497.1 per 100,000, and from 2018 a gradual decrease that reached 1342.9 per 100,000 by 2020. The rural and urban morbidity dynamic is presented in Fig. 2.

In comparative terms, the urban incidence rate is 2006.7 per 100,000 in 2011 and rural morbidity is 1,146.4 per 100,000. After a 10-year interval, the urban incidence rate is already 2,605.6 per 100,000 and rural incidence rate 1,342.9 per 100,000. The distribution of morbidity among the urban and rural subjects is shown in Table 1.

The incidence rate of diseases of musculoskeletal system in the age group above 18 years is as follows: 1743.5 per 100,000 in 2011 and 2553.6 per 100,000 in 2020. In the age group 0–14 years, there has been a decrease in the incidence rate during the study period, from 1,002.2 to 978.1 per 100,000 inhabitants. During the same period, the age group 15–17 showed a similar trend, with the incidence rate declining from 2,895.2 to 2,317.7 per 100,000 inhabitants. Data by age group are presented in Table 2.

Discussion

Musculoskeletal diseases are an urgent issue in Kazakhstan. According to the annual statistical yearbooks titled “On the state of health of the population of the Republic of Kazakhstan and the activities of health care organizations” (Ministry of Health of Kazakhstan), there is an increase in morbidity throughout the country. The predominant majority in the age structure are people older than 18 years. This is particularly important for the whole society whose work activities may be associated with increased strain, triggering—work-related musculoskeletal disorders [16]. Based on our results, the overall morbidity incidence rate in Kazakhstan has increased 1.4 times. The primary morbidity rate for the entire population of the country has risen 1.5-fold. In the 10-year time-span, the incidence rate increased in the age group above 18 years and in the child group 0–14 years, while a reduction in the incidence rate was recorded in the 15–17-year-old group. A decline in the incidence was recorded across the country from 2019 to 2020 at the beginning of the COVID-19 pandemic.

Data from other Central Asian countries were obtained to compare with local statistics. According to the Statistical Collection titled—“Health of the Population of the Republic of Tajikistan. 30 Years of State Independence”, Tajikistan, like Kazakhstan, has seen an increase in morbidity. While in 2011, the morbidity rate was 3729

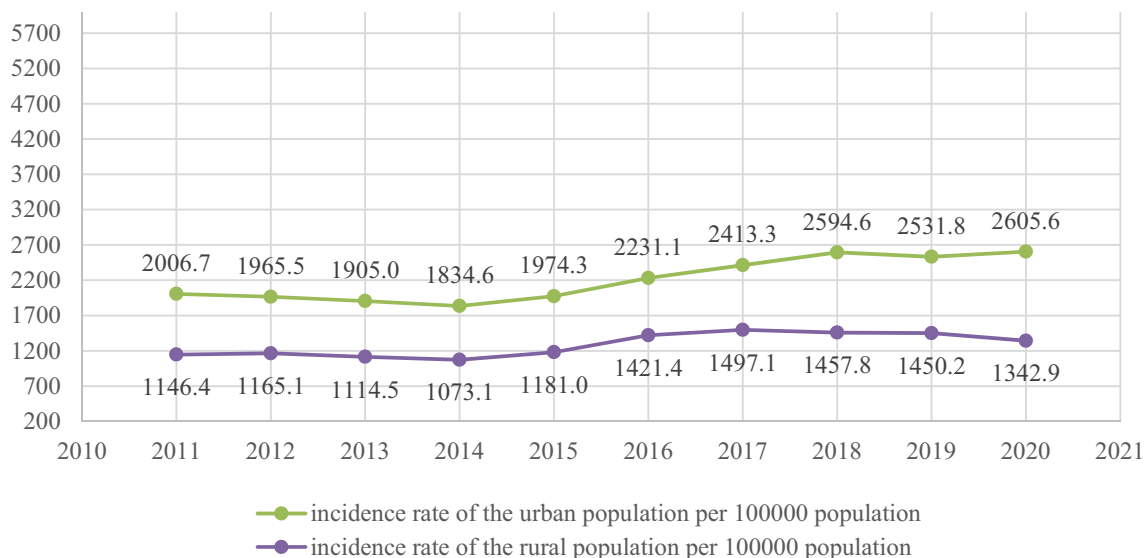


Fig. 2 Dynamics of incidence of musculoskeletal disorders among rural and urban populations in Kazakhstan (per 100 000 inhabitants) *Statistical data on diseases of the musculoskeletal system according to statistical yearbooks of the Ministry of Health of

Kazakhstan titled—“Population health of the Republic of Kazakhstan and activity of public health organizations” (2011–2020 years). *The graphs were made using Excel

cases, by 2020, it had reached 52,483. In 2019, the incidence rate was higher at 64,417 [17]. A notable morbidity dynamic was observed in Kyrgyzstan. According to the National Statistical Committee of the Kyrgyz Republic, the primary incidence of diseases of the musculoskeletal system and connective tissue decreased from 40,276 to 37,751 cases from 2011 to 2020 [18]. However, 55,000 cases were reported in 2019 [18]. The COVID-19 pandemic and related quarantine are the most likely reasons for a sharp decline in the incidence from 2019 to 2020. Apparently, referrals to doctors had declined in the pandemic.

A decrease in domestic and crime-related injuries, which also account for a proportion of musculoskeletal disorders, can also be a big issue. A reverse increase in the incidence of musculoskeletal diseases from 2019 to 2020 could mean an improvement in the diagnostic capacity of health facilities. The consequence of this increase in musculoskeletal diseases is a steady increase in the rate of temporary and permanent disability among the patients [19]. Premature disability, in addition to physical and psychological damage, causes economic damage, primarily to the patients, their families, and ultimately to the whole health-care system and the state.

The limitations of this study are that the incidence rates for 2021, 2022 and 2023 are not reflected in the study. The authors plan to make a new information and analysis study as soon as the new statistical yearbooks are available.

Conclusion

As this informational-analytical study demonstrates, morbidity incidence throughout the country has been steadily increasing over the study period. Musculoskeletal diseases is a priority issue due to the poorly understood etiopathogenesis and progressive course. The issue of timely diagnosis and complexity of therapeutic tactic confound an increasing level of disabilities in the population. This study results draw the attention to this big issue and encourage the scientific community to act jointly to prevent further increases in the incidence of musculoskeletal diseases.

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Data availability All data processed for this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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