

# Analysis of Prevalence and Incidence of Multiple Myeloma in the Republic of Uzbekistan: Data and Trends

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**Abstract** This study aims to analyze the prevalence and incidence of multiple myeloma in the Republic of Uzbekistan, taking into account different regions, age groups, and gender of the population. Epidemiological data based on the analysis of a large volume of medical records and disease statistics were utilized to achieve this goal. The researchers meticulously analyzed the distribution of multiple myeloma among the population of Uzbekistan, identifying differences in the frequency of incidence in various regions of the country, as well as differences by age and gender. The findings allowed for the identification of key trends and patterns in the prevalence of multiple myeloma, which may contribute to the improvement of strategies for the diagnosis, prevention, and treatment of this oncological disease. This study holds significant importance for practical healthcare in Uzbekistan, as its findings can serve as a basis for developing targeted programs for early detection of multiple myeloma and improving the quality of medical care for these patients. Such statistical analyses are crucial for effective control of the spread of oncological diseases and enhancing treatment outcomes for specific patient groups.

**Keywords** Multiple myeloma, Disease epidemiology, Statistics, Diagnostics, Disease, Hematology, Pathology

## 1. Introduction

It is known that multiple myeloma (MM) is a B-cell lymphoproliferative malignancy characterized by plasma cells that produce a monoclonal immunoglobulin (paraprotein) [1-3]. The first documented description of MM was made by the British physician S. Solly in 1844 [4]. In 1940, Apitz discovered "proteins foreign to the blood, formed by pathological cells, with a homogeneous structure," which he called "paraproteins" [5]. In 1978, R.A. Kule and his group introduced the term "monoclonal gammopathy of undetermined significance" (MGUS), caused by the secretion of pathogenic immunoglobulins [6]. The disease has several names, including plasma cell myeloma, multiple myeloma, myelomatosis, Kahler-Rustizky disease, secreting lymphoma, generalized plasmacytoma, and elderly disease [7].

The incidence of multiple myeloma (MM) accounts for approximately 1% of all malignant neoplasms and 10-13% of all hematologic malignancies. The disease is more common in individuals of non-Negroid race, less common in those of Europoid race, and even less common in those of Mongoloid race. The peak age of onset of the disease is in the sixth decade of life. MM occurs in 3-5% of cases in individuals younger than 45 years and is rare in children and adolescents. Among individuals over 60 years old, the average incidence

is 37 cases per 100,000 population. The male-to-female ratio for this condition is 1.4:1. Each year, 3-5 people out of 100,000 are diagnosed with MM. In the Russian Federation, approximately 20,000 new cases of MM are diagnosed annually, with an average age of 62 years for affected individuals. The mortality rate from MM accounts for 18% of all hematologic malignancies.

In Uzbekistan, numerous researchers are examining this issue, however, the epidemiology of this pathology remains inadequately understood.

## 2. Research Objective

To conduct an analysis of epidemiological data to determine the prevalence of Multiple Myeloma in different regions of Uzbekistan and its distribution among the population by age and gender, in order to identify key trends and develop recommendations for improving the diagnosis, prevention, and treatment of this disease in the country.

## 3. Materials and Methods

In accordance with the conclusion of the medical expert commission and regulatory acts, a clinical fragment involving 208 patients was examined. Two groups were formed based on the inclusion and exclusion criteria for this study: the 1st group consisted of 208 patients with multiple myeloma who sought examination and treatment at the Republican

Specialized Scientific-Practical Medical Center for Hematology of the Ministry of Health of the Republic of Uzbekistan. Additionally, the study included the analysis of outpatient cards, medical histories, and reports from 2018 to 2023 at the Republican Specialized Scientific-Practical Medical Center for Hematology of the Ministry of Health of the Republic of Uzbekistan.

#### 4. The Findings and Discussion of Our Own Research Results

The current status of multiple myeloma epidemiology in Uzbekistan is inadequately studied, with only sporadic publications dedicated to this issue. In order to conduct a more comprehensive examination of the detection rate of multiple myeloma in Uzbekistan, we have focused on the following key points:

1. Study of disease prevalence: Analyzing the yearly dynamics of new cases of multiple myeloma in Uzbekistan can help determine the trends in the spread of the pathology within the country.
2. Regional disparities: Comparing the detection rates of multiple myeloma in different regions of Uzbekistan may reveal variations in disease distribution.
3. Demographic considerations: Examining the prevalence of multiple myeloma among various age groups and gender can provide valuable insights into patterns of disease occurrence.

We found detailed analytical data on the detection rate of multiple myeloma in Uzbekistan to be useful for improving strategies for the diagnosis, treatment, and control of this oncological disease in the country. An analysis of the registration indicators of primary MM patients for the years 2018-2023 was conducted by us (see Table 1). In 2020, the

number of active primary MM cases was 122, and by 2023, the prevalence of the disease had increased to 809 cases (18.6% of the total number of registered primary cases).

**Table 1.** Primary incidence indicators of multiple myeloma from 2018 to 2023

Years	Registered	Primary installed
2018	605	66
2019	738	94
2020	701	122
2021	692	102
2022	803	119
2023	809	110
Total:	4348	613

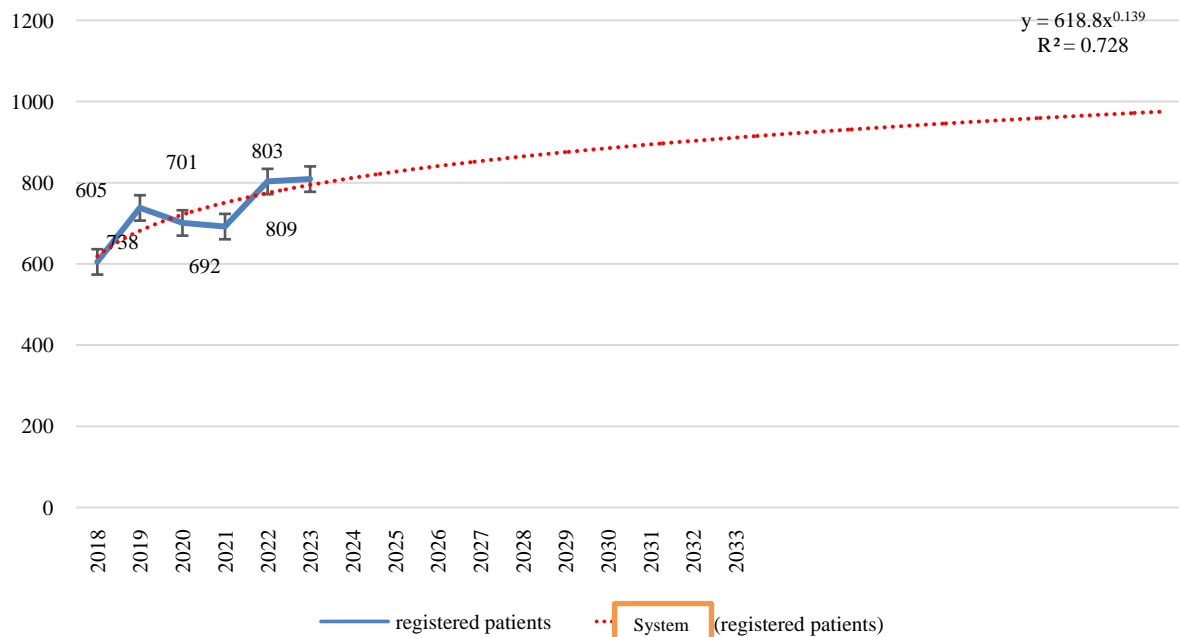
Our data indicates that the number of registered patients has increased by 1.3 times from 2018 to 2023, representing a growth of 25.2%. The number of newly registered patients has increased by 1.7 times compared to the same period, with the highest percentage observed in 2020 at 19.9% of the total number of newly identified individuals.

We conducted an analysis of the statistical forecasting of the dynamics of the key indicators, including registered and newly diagnosed patients with multiple myeloma in Uzbekistan (see Figure 1, Figure 2). To address this task, we employed a statistical forecasting method [8].

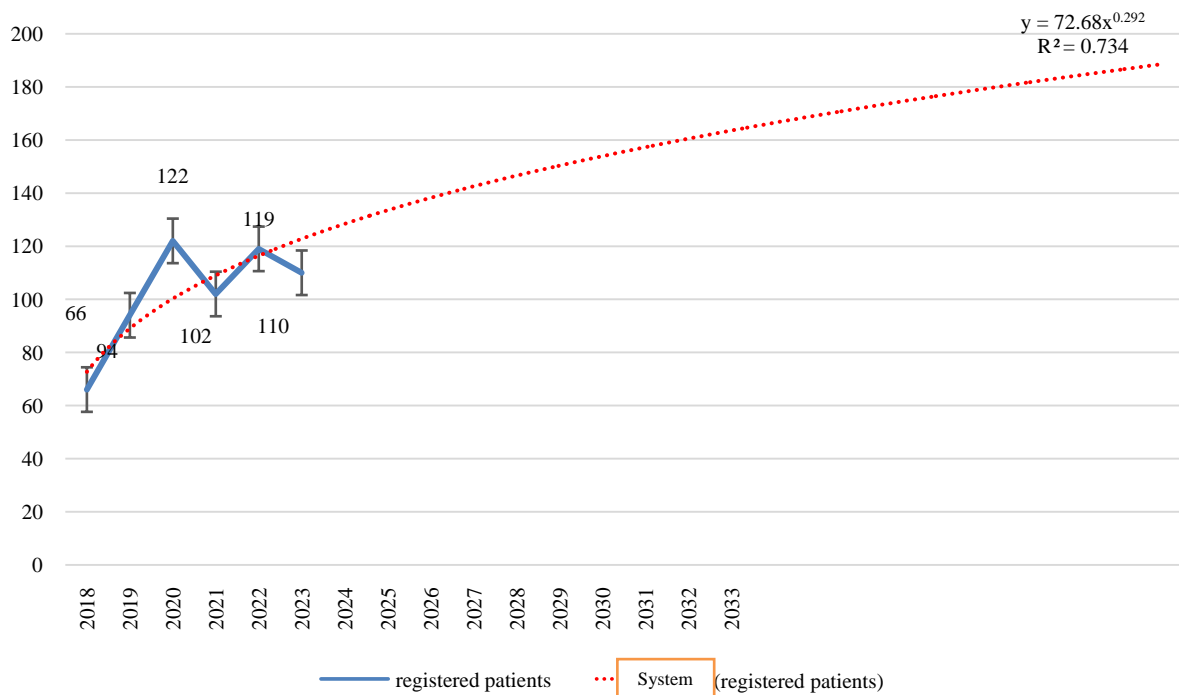
There is a noticeable trend towards a stable number of patients in both the group of registered patients and the group of newly diagnosed patients. However, it is projected that there will be an increase in the number of both newly diagnosed and registered patients from 2024 to 2033. It is estimated that the number of newly diagnosed patients during this period will be around 126 people, while the number of registered patients is expected to increase to approximately 856 people.

**Table 2.** Study of the prevalence and diagnosis of multiple myeloma in the Republic of Uzbekistan

№	Region	Population (million people)	Identification of MM	Per 100,000 population	Must identify
1	Karakalpakstan	1 900 000,00	3	0,15	27,55
2	Andijan region	3 300 000,00	5	0,15	47,85
3	Bukhara region	2 000 000,00	6	0,3	29,00
4	Jizzakh region	1 400 000,00	1	0,07	20,30
5	Kashkadarya region	3 400 000,00	7	0,20	49,30
6	Navay region	1 000 000,00	5	0,5	14,50
7	Namangan region	3 000 000,00	6	0,2	43,50
8	Samarkand region	4 100 000,00	7	0,17	59,45
9	Syrdarya region	2 800 000,00	1	0,03	40,60
10	Surkhandarya region	900 900,00	6	0,66	13,06
11	Tashkent region	3 000 000,00	17	0,56	43,50
12	Fergana region	3 900 000,00	7	0,17	56,55
13	Khorezm region	1 900 000,00	8	0,42	27,55
14	Tashkent	2 900 000,00	23	0,79	42,05
	By Republic	36 200 000,00	102,16	0,28	524,90



**Figure 1.** Expected admission number of patients with multiple myeloma in the Republic of Uzbekistan

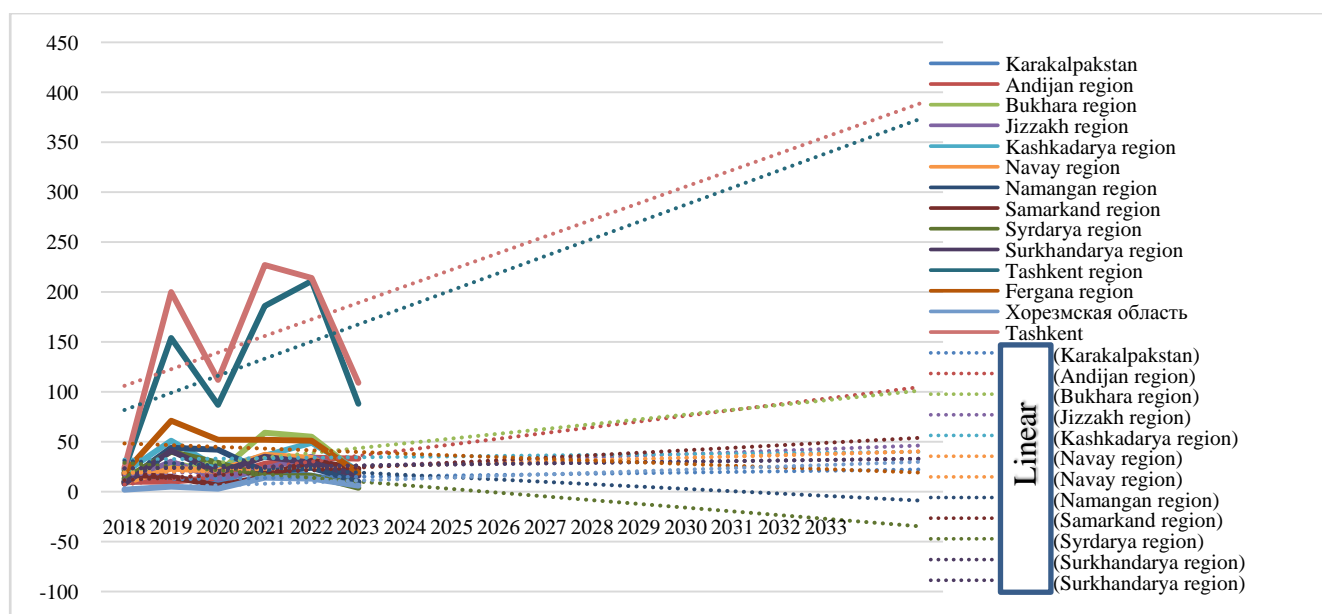


**Figure 2.** Prognosis for identifying initially diagnosed patients with multiple myeloma in the Republic of Uzbekistan

The incidence of multiple myeloma varies depending on the country, race, and gender, accounting for approximately 10-15% of hematologic malignancies and 0.8% of all oncological diseases. The age-standardized rates worldwide are 1.7 per 100,000 among men and 1.2 per 100,000 among women. In Uzbekistan, our data shows an incidence of 0.28 cases per 100,000 populations, but the average statistical data suggests it should be 1.45 cases per 100,000 population. If Uzbekistan's population was 36.2 million people at the

beginning of 2023, we would expect to identify 524 new cases of multiple myeloma annually.

The analysis of disease incidence by regions of the republic and the forecast of the risk of an increase in patients with a diagnosis of "Multiple Myeloma" revealed moderate fluctuations in the frequency of this disease (see Figure 3). It is anticipated that the number of cases of the disease will vary depending on the region during the projected period.



**Figure 3.** Distribution of multiple myeloma cases and projected growth of the disease by regions of Uzbekistan

The data we have obtained indicates that the lowest number of individuals with the studied pathology are found in the Khorezm region and Karakalpakstan, while the highest detection rates are observed in the Tashkent region and the city of Tashkent.

The distribution of multiple myeloma cases and the projected growth of incidence rates by region in Uzbekistan show that the lowest projected level of disease detection will be in the Syrdarya and Namangan regions, whereas the highest growth is projected in the Tashkent region and the city of Tashkent.

According to the distribution of patients by gender in the study group of 208 individuals, 53.3% (111 patients) were male, while 46.7% (97 patients) were female (Table 3).

**Table 3.** Distribution of patients in the main study group by gender

№	Groups of patients	Number of patients, abs.	%
2.	Men	111	53,3
3.	Women	97	46,7
Total:		208	100.0

Patients were categorized by age into the following groups: early adulthood, middle adulthood, elderly, and older adults (see Table 4).

**Table 4.** Distribution of patients with multiple myeloma by age group

Age	Number of patients, abs	Number of patients, %
Up to 40 years old	-	
40-50 years	2	1,5
50-60 years	10	7,8
60-70 years	70	55,1
Over 70 years old	45	35,4
Total	127	100

As shown in Table 4, the age group with the highest prevalence of MM among patients is 50-70 years old, accounting for 46-47% of cases. In the main group of MM patients, only 47% were aged 50-60 years and 46% were aged 60-70 years. The lowest prevalence was observed in the age group 20-30 years, accounting for only 4% of cases.

During the analysis of the distribution of male patients within the age group of 60-74 years, a different picture was observed compared to females. In the elderly age group of 71-76 years, males predominated with a proportion of 22.5%, while females accounted for 13.5% of cases.

Among middle-aged patients, 71 out of 20 (28.2%) were males, while 74 out of 19 (25.7%) were females. It is worth noting that in the age group of 75-90 years, acute myeloid leukemia was only observed in males, with 71 out of 2 (2.8%) cases registered. However, long-lived individuals of both male and female genders were not identified.

Thus, epidemiological data on MM significantly differ depending on the geographical region of Uzbekistan. Therefore, the study of MM epidemiology remains a relevant and in-demand direction in oncology-hematology.

## 5. Conclusions

Studying the epidemiology of multiple myeloma in Uzbekistan is a necessary and important step in understanding the prevalence and characteristics of this oncological disease in the region. Having detailed data on the incidence rate in different areas, age groups, and among men and women allows for the identification of potential high-risk groups and the determination of ways to optimize diagnosis, prevention, and therapy. The results of our study emphasize the importance of further monitoring and analyzing the epidemiological indicators of multiple myeloma to improve the quality of

oncological care, ensure early detection, and provide the most effective treatment for this disease in Uzbekistan and potentially develop more tailored strategies for controlling its spread.

Our recommendations for further steps include the need for conducting additional research such as investigating risk factors: studying possible causes and factors influencing the occurrence of multiple myeloma in Uzbekistan could be beneficial for developing prevention strategies and more effective disease control, implementing an early detection and screening system, providing training for healthcare professionals on diagnosing and treating this type of cancer, and other measures aimed at improving outcomes in the fight against multiple myeloma in Uzbekistan.

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