DYNAMICS OF MORBIDITY AND MORTALITY FROM MALIGNANT BONE NEOPLASMS IN UZBEKISTAN

K. G. Abdikarimov,

M. A. Gafur-Akhunov

Republican Specialized Scientific and Practical Medical

Center of Oncology and Radiology, Tashkent, Uzbekistan

Abstract

An epidemiological analysis of the dynamics of morbidity and mortality from malignant bone neoplasms in the Republic of Uzbekistan was carried out in this study.

Based on data from the State Oncological Register, it was established that more than 25,000 new cases of malignant tumors are registered annually in the country, of which about 320 cases (1.3%) are tumors of bone tissue.

Over the past nine years, a steady downward trend has been observed in both the absolute number of cases and in morbidity and mortality rates per 100,000 population among both men and women.

The largest proportion of patients with malignant bone neoplasms belongs to the 20–44-year-old age group. About 3,000 patients with this diagnosis are currently under dispensary observation in Uzbekistan.

The results obtained indicate a decrease in the prevalence and lethality of malignant bone neoplasms during the study period. At the same time, significant age-related differences in the structure of oncological morbidity were revealed, which requires further in-depth study of risk factors and improvement of preventive measures.

Keywords: Malignant bone neoplasms, morbidity, mortality, epidemiology.

Introduction

According to the World Health Organization (WHO), the incidence rate of malignant bone neoplasms (MBN) is 1.0 per 100,000 population, while the mortality rate is 0.5 per 100,000 population [2, 4, 12]. Understanding the prevalence of MBN is essential for developing effective strategies for screening, diagnosis, and treatment. The Surveillance, Epidemiology, and End Results (SEER) database plays an important role in providing information on incidence trends [11]. Supported by the U.S. National Cancer Institute, SEER collects and publishes data on cancer incidence and survival from population-based cancer registries covering approximately 34.6% of the U.S. population [13].

A review of literature indicates an increase in MBN incidence, attributed to advances in imaging technologies and improved awareness among healthcare professionals [4, 7, 9]. Incidence rates of MBN vary significantly across different populations and regions. According to SEER data, the overall incidence rate of primary malignant bone tumors in the United States is approximately 0.9 per 100,000 population per year [14, 15]. Osteosarcoma accounts for about

35% of all primary MBN cases, followed by chondrosarcoma (30%) and Ewing's sarcoma (16%) [8, 9].

Globally, MBN incidence rates differ depending on geographical location and other factors. For instance, the incidence of osteosarcoma is higher in some Asian countries compared to Western countries [10], likely due to differences in genetic background and environmental factors [9]. Several risk factors for MBN development have been identified, including age, as certain tumor types are more common in specific age groups. Moreover, some forms of MBN occur more frequently in men than in women [3, 5, 6].

Statistical data serve as the foundation for developing and monitoring cancer control programs. This article presents a detailed analysis of morbidity and mortality from MBN in Uzbekistan.

Purpose of the Study

To analyze the incidence and mortality rates of malignant bone neoplasms in the Republic of Uzbekistan.

Materials and Methods.

The study was based on statistical data on all cases of malignant neoplasms in Uzbekistan, collected from oncological institutions according to the official state reporting form No. 7 "Information on malignant neoplasms" of the Ministry of Health of the Republic of Uzbekistan for the period 2016–2024.

For calculation of all indicators, data from the State Statistics Committee on the average annual population by region were used.

Results

Annually, more than 25,000 new cases of malignant neoplasms are registered in Uzbekistan, among which over 320 cases (1.3%) are bone malignancies. Analysis of cases from 2016 to 2024 revealed 3,116 newly diagnosed and 2,141 deaths, accounting for 1.5% and 1.7% of all new and fatal cancer cases, respectively [1]. In 2024, MBN ranked 22nd in overall cancer incidence and 20th in mortality (Table 1).

Table 1. Structure of cancer morbidity and mortality in Uzbekistan, 2024

SIGN	Morbidity		Mortality	
	absolute number.	% of first detected	absolute number.	% of first detected
Breast cancer	4757.	16.8	18.00	11.9
Colorectal cancer	22.45	7.9	1038.	6.9
Stomach	2070	7.3	1452.	9.6
Cervix	1970	6.9	824.	5.5.
Light	1742.	6.1	1314.	8.7
Brain	1221.	4.3	655.	4.3
Ovary	1131.	4.0	522.	3.5.
Liver	1093.	3.9	913.	6.1
Other skin neoplasms	942.	3.3	337.	2.2

European Journal of Interdisciplinary Research and Development
Volume- 44
October- 2025
Website: www.ejird.journalspark.org
ISSN (E): 2720-5746

Uterine bodies	9.35	3.3	328.	2.2
Kidney	811.	2.9	374.	2.5.
Esophagus	784.	2.8	610.	4.0
Pancreatic gland	737	2.6	543.	3.6.
Prostate gland	704.	2.5.	403.	2.7
Other and unclear locations of oral cavity and pharynx	697.	2.5.	367.	2.4.
urinary bladder	649.	2.3.	293.	1.9
Non-Hodgkin lymphomas	609.	2.1	268.	1.8
Thyroid gland	543.	1.9	126.	0.8
Leukemias	482.	1.7	208.	1.4
Connective and other soft tissues	437.	1.5.	231.	1.5.
No specified location	337.	1.2	258.	1.7
Bone	**325.**	**1.1**	**216.**	**1.4**
Malignant lymphomas	269.	0.9	159.	1.1
Larynx	261.	0.9	150.	1.0
Gallbladder	240.	0.8	151.	1.0
retroperitoneal space and peritoneum	149.	0.5	101.	0.7
Gingiva	136.	0.5	76.	0.5
Skin melanoma	133.	0.5	70.	0.5
Small intestine	132.	0.5	66.	0.4
Oral cavity	83.	0.3	61.	0.4

Over the past 9 years, the number of new cases and deaths from bone fractures has tended to decrease, as have the morbidity and mortality rates per 100,000 population, decreasing over the years among both sexes. However, it is worth noting that the number of new and estimated cases of bone fractures in men is higher than in women (Table. 2).

Table 2. Dynamics of incidence and mortality from malignant bone neoplasms in Uzbekistan during 2016–2024 among men and women.

Years	Morbidity				Mortality			
	Men		Women		Men		Women	
	absolute number.	per 100,000 population	absolute number.	per 100,000 population	absolute number.	per 100,000 population	absolute number.	per 100,000 population
2016	205.	1.3	186.	1.2	177.	1.1	142.	0.9
2017	213.	1.3	149.	0.9	150.	0.9	135.	0.8
2018	222.	1.4	148.	0.9	139.	0.8	108.	0.7
2019.	215.	1.3	136.	0.8	131.	0.8	78.	0.5
2020	172.	1.0	153.	0.9	135.	0.8	102.	0.6
2021	178.	1.0	127.	0.7	142.	0.8	102.	0.6
2022	191.	1.1	152.	0.9	105.	0.6	89.	0.5
2023	201	1.1	143.	0.8	114.	0.6	76.	0.4
2024	198	1.1	127.	0.7	138.	0.7	78.	0.4

Considering cases of bone fractures in the regions of the republic, it can be concluded that the lowest incidence rates were observed in Syrdarya, Bukhara, and Andijan regions in 2016, namely 0.5; 0.5 and 0.8 per 100,000 population, respectively. At the same time, in 2024, the

lowest indicator per 100,000 population was in Syrdarya (0.3), Kashkadarya (0.6), and Namangan (0.7) regions. It should be noted that in 2024, the highest morbidity rate per 100,000 population was recorded in Jizzakh (1.4), Tashkent city (1.2), and Fergana (1.1) regions. Overall, the number of newly identified cases of bone fractures and morbidity rates in the republic are showing a downward trend (Table. 3, 4).

Table 3. Dynamics of newly diagnosed cases of malignant bone neoplasms in Uzbekistan during 2016–2024 by regions of the Republic of Uzbekistan.

Regions	2016	2017	2018	2019.	2020	2021	2022	2023	2024
Republic of Uzbekistan	391.	362.	370.	351.	325.	305.	343.	344.	325.
Tashkent city	32.	26.	34.	17.	16.	28.	32.	43.	34.
Karakalpakstan R.	30.	41.	24.	25.	29.	21.	26.	23.	20.
Khorezm region	24.	31.	20.	9.	21.	16.	14.	16.	13.
Fergana region	49.	35.	37.	38.	32.	44.	41.	45.	44.
Tashkent region	49.	51.	58.	39.	30.	32.	35.	28.	31.
Surkhandarya region	33.	27.	21.	52.	31.	25.	21.	27.	25.
Syrdarya region	4.	8.	8.	6.	7.	5.	5.	4.	3.
Samarkand region	29.	33.	27.	42.	39.	28.	36.	21.	33.
Namangan region	25.	13.	24.	22.	18.	22.	17.	20.	22.
Navoi region	14.	8.	19.	7.	15.	9.	17.	12.	10.
Kashkadarya region	31.	29.	27.	30.	18.	23.	24.	18.	22.
Jizzakh region	37.	24.	28.	16.	14.	14.	8.	31.	22.
Bukhara region	10.	14.	22.	14.	32.	11.	30.	20.	18.
Andijan region	24.	22.	21.	34.	23.	27.	37.	36.	28.

Table 4. Dynamics of the incidence rate per 100,000 population of malignant bone neoplasms in Uzbekistan during 2016–2024 by regions of the Republic of Uzbekistan.

Regions	2016	2017	2018	2019.	2020	2021	2022	2023	2024
Republic of Uzbekistan	1.2	1.1	1.1	1.1	1.0	0.9	1.0	0.9	0.9
Tashkent city	1.4	1.1	1.4	0.8	1.0	1.5.	1.2	1.5.	1.2
Karakalpakstan R.	1.7	2.3.	1.3	1.3	1.5.	1.1	1.3	1.1	1.0
Khorezm region	1.4	1.7	1.1	0.5	1.1	0.8	0.7	0.8	0.6
Fergana region	1.4	1.0	1.0	1.0	0.9	1.2	1.0	1.1	1.1
Tashkent region	1.7	1.8	2.0	1.3	1.0	1.1	1.2	0.9	1.0
Surkhandarya region	1.3	1.1	0.8	2.0	1.2	0.9	0.7	0.9	0.9
Syrdarya region	0.5	1.0	1.0	0.7	0.8	0.6	0.6	0.4	0.3
Samarkand region	0.8	0.9	0.7	1.1	1.0	0.7	0.9	0.5	0.8
Namangan region	0.9	0.5	0.9	0.8	0.6	0.8	0.6	0.7	0.7
Navoi region	1.5.	0.8	2.0	0.7	1.5.	0.9	1.6	1.1	0.9
Kashkadarya region	1.0	0.9	0.8	0.9	0.5	0.7	0.7	0.5	0.6
Jizzakh region	2.8	1.8	2.1	1.2	1.0	1.0	0.5	2.1	1.4
Bukhara region	0.5	0.8	1.2	0.7	1.7	0.6	1.5.	1.0	0.9
Andijan region	0.8	0.7	0.7	1.1	0.7	0.8	1.1	1.1	0.8

Table 5 presents the sex-age distribution of patients among the first-time identified cases of bone fractures. Overall, during the study period, there were 253 (14.4%) men under 14 years old, 122 (6.8%) between 15 and 17 years old, 71 (4.0%) between 18 and 19 years old, 552 (30.8%) between 20 and 44 years old, 533 (29.7%) between 45 and 65 years old, and 259 (14.4%) over 65 years old. And among women with bone IOP, 207 (15.7%) were registered in adolescence up to 14 years, 56 (4.2%) in 15-17 years, 44 (3.3%) in 18-19 years, 392 (29.7%) in 20-44 years, 413 (31.2%) in 45-35 years, and 209 (15.8%) in 65 years and older. 2. It is worth noting that the proportion of patients with bone fractures among both sexes is quite high at a relatively young age of 20-44 years.

Table 5. Age distribution of newly diagnosed cases of malignant bone neoplasms among men and women in Uzbekistan during 2016–2021.

Men

Years	Indicator	0-4	5-9	10-14.	15-17.	18-19.	20-44.	45-64.	65 and above
2016	absolute number	8.	4.	15.	14.	9.	71.	62.	22.
	specific weight	3.9	2.0	7.3	6.8	4.4	34.6	30.2	10.7
2017	absolute number	2.	9.	16.	13.	7.	69.	74.	23.
	specific weight	0.9	4.2	7.5	6.1	3.3	32.4	34.7	10.8
2018	absolute number	6.	6.	19.	15.	13.	67.	68.	28.
	specific weight	2.7	2.7	8.6	6.8	5.9	30.2	30.6	12.6
2019.	absolute number	3.	12.	15.	13.	10.	67.	65.	30.
	specific weight	1.4	5.6	7.0	6.0	4.7	31.2	30.2	14.0
2020	absolute number	5.	8.	6.	15.	6.	52.	57.	23.
	unit weight	2.9	4.7	3.5.	8.7	3.5.	30.2	33.1	13.4
2021	absolute number	7.	6.	16.	11.	6.	67.	42.	23.
	specific weight	3.9	3.4	9.0	6.2	3.4	37.6	23.6	12.9
2022	absolute number	6.	8.	13.	13.	6.	61.	53.	31.
	specific weight	3.1	4.2	6.8	6.8	3.1	31.9	27.7	16.2
2023	absolute number	7.	11.	19.	11.	5.	47.	63.	38.
	specific weight	3.5.	5.5.	9.5	5.5.	2.5.	23.4	31.3	18.9
2024	absolute number	4.	6.	21.	17.	9.	51.	49.	41.
	specific weight	2.0	3.0.	10.6	8.6	4.5.	25.8	24.7	20.7

Women

Years	Indicator	0-4	5-9	10-14.	15-17.	18-19.	20-44.	45-64.	65 and above
2016	absolute number	5.	5.	13.	8.	8.	60.	56.	31.
	specific weight	2.7	2.7	7.0	4.3	4.3	32.3	30.1	16.7
2017	absolute number	3.	6.	14.	6.	10.	38.	41.	31.
	specific weight	2.0	4.0	9.4	4.0	6.7	25.5	27.5	20.8
2018	absolute number	4.	9.	14.	7.	4.	42.	45.	23.
	specific weight	2.7	6.1	9.5	4.7	2.7	28.4	30.4	15.5
2019.	absolute number	7.	5.	8.	5.	6.	36.	47.	22.
	specific weight	5.1	3.7	5.9	3.7	4.4	26.5	34.6	16.2
2020	absolute number	4.	9.	17.	9.	2.	48.	47.	17.
	specific weight	2.6	5.9	11.1	5.9	1.3	31.4	30.7	11.1
2021	absolute number	2.	6.	13.	6.	2.	38.	45.	15.
	specific weight	1.6	4.7	10.2	4.7	1.6	29.9	35.4	11.8
2022	absolute number	4.	6.	13.	6.	4.	49.	47.	23.
	specific weight	2.6	3.9	8.6	3.9	2.6	32.2	30.9	15.1
2023	absolute number	2.	6.	17.	5.	3.	36.	51.	23.
	specific weight	1.4	4.2	11.9	3.5.	2.1	25.2	35.7	16.1
2024	absolute number	1.	6.	8.	4.	5.	45.	34.	24.
	specific weight	0.8	4.7	6.3	3.1	3.9	35.4	26.8	18.9

The extent to which the tumor process spreads is one of the important components of cancer prognosis. It should be noted that during the study period, the proportion of patients with I-II stages increased from 53.1% in 2016 to 67.1% in 2024, while the proportion of patients with III stages decreased from 36.2% to 19.1%. A sufficiently high indicator of patients with an uncertain stage is observed, averaging 4.1% for the studied period (6-table).

Table 6. Distribution of patients with bone fractures by stages in Uzbekistan in dynamics for 2016-2024.

Years	I.		II.		III.		IV.		not set stage	
	abs. num.	%	abs. num.	%	abs. num.	%	abs. num.	%	abs. num.	%
2016	13.	3.3	194.	49.7	142.	36.2	42.	10.7	0	0.0
2017	17.	4.7	199.	54.8	100.	27.5	44.	12.1	2.	0.6
2018	34.	9.2	182.	49.2	74.	20.0	45.	12.2	35.	9.5
2019.	33.	9.4	196.	55.8	72.	20.5	39.	11.1	11.	3.1
2020	17.	5.2	192.	59.1	67.	20.6	38.	11.7	11.	3.4
2021	25.	8.2	161.	52.8	67.	22.0	33.	10.8	19.	6.2
2022	20.	5.8	221.	64.4	67.	19.5	25.	7.3	10.	2.9
2023	21.	6.1	215.	62.5	55.	16.0	32.	9.3	21.	6.1
2024	20.	6.2	198	60.9	62.	19.1	27.	8.3	18.	5.5.

In Uzbekistan, almost 3,000 patients with bone fractures are registered, which constitutes 2.7% of all registered patients with fractures. The patient population has a tendency to decrease annually, as shown in Table 7.

Table 7. Patients with bone fractures registered in Uzbekistan in dynamics for 2016-2024

Years	Were registered at the end of the year		
	absolute number.	per 100,000 population	Contingent accumulation index
2016	3585.	11.2	9.2
2017	3192.	9.9	8.8
2018	2821.	8.6	7.6
2019.	2812.	8.5	8.0
2020	2866.	8.5	8.8
2021	2789	8.1	9.1
2022	2828.	7.9	8.2
2023	2933.	8.0	8.5
2024	2891.	7.8	8.9

Conclusion

As a result of the work done, it can be concluded that in Uzbekistan, more than 300 new cases and more than 200 deaths from bone fractures are registered annually. The incidence of the disease among men is somewhat higher than among women. Also, in the 20-44 age category, a significant number of patients with bone fractures are registered. It should also be noted that the proportion of patients with early stages of bone fractures increases over the years, while the proportion of advanced forms decreases.

References

1. State departmental reporting forms of the Ministry of Health of the Republic of Uzbekistan "Information on malignant neoplasms" - Form No. 7 for 2016-2024.

2. Valiyev A.K., Tararikova A.A., Teplyakov V.V., Musayev E.R., Rogozhin D.V., Sushentsov E.A. et al. Practical recommendations for the medicinal treatment of malignant bone tumors. RUSSCO Practical Recommendations, Part 1. Malignant Tumors, 2023 (vol. 13), #3s2, pp. 335-355.

3. Valiyev A.K., Tararikova A.A., Teplyakov V.V., Musayev E.R., Rogozhin D.V., Sushentsov E.A., Machak G.N., Konev A.A., Fedorova A.V., Fedoseenko D.I. Primary malignant tumors of bones. Malignant tumors. 2024;14 (3s2-2):367-392. https://doi.org/10.18027/2224-5057-2024-14-3s2-1.2-14

4. Merabishvili Vakhtang Mikhailovich, Chepik Oleg Fedorovich, Merabishvili Elvira Nazarovna Malignant neoplasms of bones. Morbidity, mortality, reliability of accounting, survival of patients, taking into account histological forms // Siberian Oncological Journal. 2015. No3. URL: https://cyberleninka.ru/article/n/zlokachestvennye-novoobrazovaniya-kostey-zabolevaemost-smertnost-dostovernost-ucheta-vyzhivaemost-bolnyh-s-uchetom-gistologicheskih (accessed: 01.07.2025).

5. Basu MA, Chawla SP. Giant cell tumor of bone: an update. Curr Oncol Rep. 2021; 23:51.

6. Bielack SS, Blattmann C, Borkhardt A, et al. Osteosarcoma and causes of death: report of 1520 deceased patients from the cooperative osteosarcoma study group (COSS). Eur J Cancer. 2022; 176: 50-57.

7. Choi JH, Ro JY. The 2020 WHO classification of bone tumors: An updated review. Adv Anat Pathol. 2021; 28: 119-138.

8. Cole S, Gianferante DM, Zhu B, Mirabello L. Osteosarcoma: a surveillance, epidemiology, and final results program-based analysis from 1975 to 2017. Cancer. 2022; 128: 2107-2118.

9. Franchi A. Epidemiology and classification of bone tumors. Clin Cases Miner Bone Metab. 2012 May;9 (2):92-5. Epub 2012 Sep 30. PMID: 23087718; PMCID: PMC3476517.

10. Klangjorhor J, Pongnikorn D, Phanphaisarn A, Chaiyawat P, Teeyakasem P, Suksakit P, Pasena A, Udomruk S, Orrapin S, Pornwattanavate S. An analysis of the incidence and survival rates of bone sarcoma patients in Thailand: reports from population-based cancer registries 2001-2015. Cancer Epidemiol. 2022;76:102056.

11. Mirzaei S, Saghari S, Bassiri F, Raesi R, Zarrabi A, Hushmandi K, Sethi G, Tergaonkar V. NF-κB as a regulator of cancer metastasis and therapy response: a focus on epithelial-mesenchymal transition. J Cell Physiol. 2022;237 (7):2770-95.

12. National Comprehensive Cancer Network. NCCN Guidelines. https://www.nccn.org/guidelines/guidelines-detail?category=1&id=1418

13. Viale PH. The American Cancer Society's facts & figures: 2020 edition. J Adv Practitioner Oncol. 2020;11 (2):135.

14. Xu Y, Shi F, Zhang Y, Yin M, Han X, Feng J, Wang G. Twenty-year outcome of prevalence, incidence, mortality and survival rate in patients with malignant bone tumors. Int J Cancer. 2024;154 (2):226-40.

15. Yu K, Chen Y, Tian Y, Kang H, Song K, Dong Y, Peng R, Li F. Characteristics, incidence, and risk factors for death from fatal pneumonia among patients with primary malignant bone tumors: an observational study based on SEER. Translational Cancer Res. 2021;10 (8):3659.