

A.K. DYNYAK¹¹Almaty, the Republic of Kazakhstan

On the history of the study of malignant tumors and the organization of the cancer service in Kazakhstan

Relevance: *Ivan Petrovich Pavlov once said, «Never grasp the next without mastering the previous.» Current scientific studies on cancer, and not only cancer, make little use of the historical method. However, the analysis of an issue in the dynamics of historical development contributes to better understanding and making sound decisions. The materials on morbidity, mortality, the history of cancer research, and the development of the cancer service in Kazakhstan contribute to the formation of historical thinking and erudition.*

The purpose of the study was to analyze the cancer incidence in Kazakhstan based on the materials of scientific works of N.F. Kramchaninov of 1960-1970s and to uncover the directions and results relevant today.

Results: *Kazakhstani scientists have actively and fruitfully participated in the study of cancer epidemiology, etiology, pathogenesis, and prevention. Cancer diseases have been reported starting from the XIX century, with a constant growth trend. The role of UV rays in skin cancer etiology was studied for a long time and in detail; specific preventive measures were proposed.*

Conclusion: *The results obtained by researchers of past years deserve a thorough analysis, use in current conditions, and further research.*

Keywords: *the history of medicine, epidemiological features, incidence, mortality, cancer localization, skin cancer.*

Introduction: This year, Kazakh Institute of Oncology and Radiology turns 60 years old. In this view, it is interesting and useful to have a look back, review the history of oncology in Kazakhstan, gaining knowledge, find the ways to use the lessons learned. The proposed short historical review was prepared based on the writings of our compatriot, epidemiologist, scientist, and healthcare organizer Nikolai Fedorovich Kramchaninov (1919-1996) [1].

Epidemiological data. The scientific literature does not contain data on the incidence of malignancies in Kazakhstan in the pre-Soviet period. Only the State Republican Archive offers some relevant documents [2]. The earliest of them was the report from a district doctor A. Soloviev who informs about amputation of a foot and enucleation of a toe "because of malignant tumours" in the hospital of Atbasar in 1889. The report on the Semirechensk region told about 278 visits to the doctor in 1890 due to neoplasms and 248 visits per year on average in 1891-1897. The sanitary review on Petropavlovsk for 1896 reports about six malignant tumours registered in patients.

There are more details available for the city of Verny (former name of Almaty). Church records reported about 56 deaths from malignant tumours before 1900. Cancer localizations registered in 33 patients included: stomach – 16, uterus – 3, liver – 3, breast – 3, esophagus – 3, larynx – 1, intestine – 1, brain – 1, jaw – 1, kidney – 1. The first death from laryngeal cancer was officially registered in 1878, stomach cancer – in 1884, esophagus and uterine cancer – in 1889, breast cancer – in 1890, liver cancer and cancer of the jaw – in 1893, kidney cancer – in 1895. The average age of death was 47.6 years.

Later, the number of deaths from malignant tumours amounted to 21 in 1900-1905, 26 in 1906-1910, 31 in 1911-

1915, 21 in 1916-1920, 37 in 1921-1925, 97 in 1926-1930, 183 in 1931-1935, and 525 in 1936-1940. In total, 941 persons died from cancer from 1900 to 1940; of them, from cancer in the stomach – 402, the uterus – 114, the liver – 81, the esophagus – 63, the lung – 31, the brain – 24, the intestines – 28, the mammary gland – 14, the larynx – 12, the bladder – 16, the skin – 11, the spleen – 2, the tongue – 3, and the lip – 4. The average age of death was 51 years in 1900-1905, and 53.3 years in 1936-1940. Stomach cancer was heading the list in all years among all localizations. In 1926-1935, stomach cancer was followed by liver cancer and uterine cancer. In 1936-1940, uterine cancer was the second, liver cancer – the third, esophagus cancer – the fourth, and lung cancer – the fifth.

Death from bladder cancer was first registered in 1900, from cancer of the colon – in 1908, the lip – in 1911, the tongue – in 1915, the skin – in 1926, the spleen and the lung – in 1930, external genitalia and omentum – in 1932, the ovaries – in 1933, the spine – in 1934, the pancreas – in 1935, the gallbladder and bronchi – in 1936, the mediastinum and pleura – in 1938. The first death from sarcoma was registered in the city of Verny in 1906.

The number of deaths from cancer in 1941-1945 amounted to 859; the highest rate of 77.6 per 100 000 citizens was registered in 1942. In the future, the mortality from cancer increased up to 87.9 in 1946-1950, 100.3 in 1951-1955, and 123.2 in 1956-1960. Taking into account a high quality of diagnostics in Alma-Ata, since a burial required medical records, those indicators could be considered relevant.

The mortality from cancer in Alma-Ata was much lower than in Moscow, Leningrad, Yerevan and abroad. In 1939, the mortality amounted to 53.3, in 1959, it increased in all

ages to reach 124.0. By 1960, the indicator has reached 133.1. The list was headed by stomach cancer, as before (44.7), followed by lung cancer (20.4), and uterine cancer (10.3). Mortality in other localizations: the esophagus – 11.2, the liver – 8.1, the mammary gland – 4.5, the intestines – 4.5, the pancreas – 4.3, the bladder – 2.0. Those localizations amounted to 85.7% of all cancer cases.

Alma-Ata was associated with some specifics in incidence and mortality. Thus, e.g., Kazakh population had quite high mortality from esophageal cancer and low mortality – from cancer of the lungs, uterus, breast, larynx, rectum though the living conditions for the people of all nations were similar. N.F. Kramchaninov attributed it to the important role of household factors in the etiology of cancer.

The incidence and mortality in the districts of Alma-Ata also varied – from 115.5 to 1389. It is worth mentioning that lung cancer was more common in areas with less gas contamination, remote from industrial enterprises.

Despite the similar prevalence of smoking among all the ethnicities, the mortality could vary up to 4 times depending on the ethnicity. The author mentioned that such a difference could be explained by cancerogenic theory and proposed conducting additional research and observation. This situation could remain relevant since generally accepted etiological theories were sometimes in conflict with many epidemiological data. This might continue until the cause of cell malignization is disclosed, and reliable and specific recommendations for the prevention of malignant neoplasms are developed. Moreover, the efficiency of such recommendations shall be tested in practice.

Cancer control issues in Kazakhstan were first discussed at the first scientific congress of doctors of Turkestan on 23–28 October 1922 in Tashkent. Doctor E.V. Korchits, who worked in the Semirechensk region, which was part of Turkestan, made a program report “Malignant tumours in Turkestan.” He marked some important epidemiological features of the incidence: the aboriginal population had very few cases of cancer; skin cancer in the limbs, eyes and auricle was recorded only in men [3].

A meeting on cancer control, held at the People’s Commissariat of Health in 1925, had a great influence on the intensification of cancer research. A whole series of works appeared in print (I.B. Shusterman, 1926; S.L. Tapelson, 1929; N.N. Petrov, 1931; A.A. Bogomolets, 1934; A.I. Dombrowski, 1929). According to N.F. Kramchaninov, the article by S.I. Telyatnikov on primary lung cancer published in No. 5 of Kazakhstani Medical Journal for 1925, was one of the first studies on the prevalence of malignant tumours in Kazakhstan [3]. Then, N.F. Kramchaninov mentions the works by G.E. Voznesenskiy “Sarcoma in some regions of Kazakhstan” (1934) which summarized the data of 39 patients and “Cancer among the Kazakh population of Northern Semirechye and Syr-Daria” (1936) which included the data of 116 patients [4]. Thus, in Kyzylorda oblast, lip cancer was heading the list with 45 cases, followed by stomach cancer – 30 cases. Out of four patients with esophageal cancer, only one was Kazakh. Twenty-four patients had skin cancer in the face and head; two had lower leg and foot cancer. The

author emphasized the role of trauma in lip cancer. Most patients with skin cancer were male; the author reported a rare case of scalp cancer in a child of three years.

In 1936, Alma-Ata hosted the first congress of doctors of Kazakhstan. In the surgical section, some reports were devoted to the study of malignant tumours. N.F. Kramchaninov noted the data from the report of I.I. Fabrikov “Surgical care in the city of Guryev (1928-1934).” According to that report, out of 3942 operations performed, two were made for breast sarcoma, 10 – for uterine cancer, 10 – for esophageal cancer, 10 – for stomach cancer. In the same congress, E.A. Polkovsky noted the predominance of stomach cancer among the Russian population and esophageal cancer among the Kazakh population. He explained a higher prevalence of esophageal cancer among the Kazakh population with living conditions (the consumption of hot tea, soup and meat). L.D. Podvolotsky shared the data of the pathological department of the Alma-Ata Clinical Hospital for 1932-1935. Out of 4565 death cases, 73 died from malignant tumours (of them, from cancer – 54, sarcomas – 11, gliomatous brain tumours – 4, hypernephroma – 4), that amounted to 1.6 deaths from malignant tumours per every 100 deaths. A.N. Syzganov who presided the congress noted among other issues the priority for Kazakhstan’s People’s Commissariat for Healthcare to establish a branch of the Central Oncology Institute in Kazakhstan [3].

The history of cancer service of Kazakhstan. As part of the implementation of this decision, a branch of the Central State Oncological Institute under the direction of Professor I.S. Bakkal was opened for the first time in Kazakhstan in 1937 on the basis of the Alma-Ata city clinical hospital. In 1940, Kazakhstan’s People’s Commissariat for Healthcare issued an order on the further development of anti-cancer care in the Republic which provided for the opening of cancer offices in the outpatient clinics of oblast centres and the towns of Balkhash and Ridder (Leninogorsk), early detection of cases, conducting medical examinations, sanitary-educational work, organizing treatment, establishing custody of seriously ill patients, establishing accounting and studying mortality. It was proposed to allocate ten beds for patients with malignant tumours in surgical hospitals and departments, organize treatment, open pathomorphological laboratories, take measures to improve doctor skills.

In the same 1940, I.S. Bakkal published a large article called “Cancer and cancer control in Kazakhstan” which contained guidelines for accounting, diagnosis and treatment of cancer [5]. Thus, the first organizations on cancer treatment and control were established in Kazakhstan in 1937-1940.

In March 1947, Alma-Ata hosted the first medical conference where A.A. Epstein delivered his report “Modern methods of cancer prevention and the organization of anti-cancer control.” That report was later published in the journal “Health Care of Kazakhstan” No. 4 for 1947, which was fully dedicated to this issue [6]. It included the articles by A.I. Malinin “Pathogenesis, early diagnosis, treatment, and prevention of cervical cancer” [7], V.V. Zikeev “On the early diagnostics of cancer” [8], S.I. Telyatnikov “On the

question of pathogenesis and timely recognition of stomach cancer" [9], and A.I. Zikeeva "On the histological diagnosis of malignant tumours" [10]. In 1948, the same journal published the articles by K.D. Utegenova "Primary ovarian cancer in a clinical and histopathological sense" [11] and S.I. Telyatnikov "Primary lung cancer" [12].

N.F. Kramchaninov highlighted the article by M.I. Bryakin (1950) "Diagnosis of esophageal cancer" which "expressed a number of interesting thoughts, introduced the notion of a "very early" sign of esophageal cancer which precedes the systematic dysphagic syndrome "for 2-3 and even 4 months," which is very important for timely surgery" [3].

The journal "Health Care of Kazakhstan" No. 5 for 1956 was fully dedicated to the issue of malignant tumours.

A lot in the study of malignant tumours and skin cancer has been done by employees of the oncological sector of the Institute of Surgery of the Academy of Sciences of the Kazakh SSR [13].

In the 1960s, the methodology and areas of scientific research in the field of oncology were formed in Kazakhstan; our compatriots laid the foundations of the scientific epidemiology of malignant diseases [14].

Resolutions of the Governments of the USSR and the Kazakh SSR obliged research institutions and health authorities to strengthen scientific and practical work fully; oncological institutes were organized in the union republics; the work of oncological institutions revived. All this was due to a growing cancer incidence all over the world and a high share of inoperable forms of cancer.

The establishment of the Kazakh Research Institute of Oncology and Radiology in 1960 was of exceptional importance for the expansion of research and the organization of anti-cancer control in Kazakhstan.

Skin cancer study in Kazakhstan started later than the study of other localizations. In 1956, N.G. Lobanova presented her report "Data on the treatment of patients with skin cancer for the period from 1951 to 1954 of the Alma-Ata City Dispensary" at the inter-republican conference in Yerevan on the study of skin and lip cancer [15]. According to that report, skin cancer amounted to 25.9% and was leading in the structure of malignant tumours.

In 1959, at the second All-Union Conference of Oncologists, in his report "Issues of organizing cancer care in Kazakhstan," A.A. Korzun provided the details of the structure of malignant tumours for the period from 1950 to 1956. He presented data on mortality, an increase in the incidence of lung cancer, was one of the first in Kazakhstan to draw attention to the difference in the incidence of skin cancer in the southern and northern regions of the country [15].

N.F. Kramchaninov noted the active work of V.A. Smirnov: his first paper "The incidence of skin cancer in the Alma-Ata region" was published in 1960; in the future, he published another 17 papers, also together with S.N. Nugmanov and A.N. Kadyajkina. In 1963, he published a popular brochure "Early signs of cancer" in Russian and Kazakh languages with the data on skin cancer, in 1967 – another brochure in Kazakh "Skin tumours and their prevention." Summarized data was presented in the candidate thesis of V.A. Smirnov

"On the issue of pathomorphology and etiopathogenesis of skin cancer in regional coverage" (1962). This was the first major work on skin cancer in Kazakhstan [15].

In 1965, A.N. Kadyajkina published a paper on skin cancer which provided data on the incidence for 1962. The author explained the growth in incidence by the improvement of diagnostics and increased cancer control [15].

A.M. Karimov did a great job to study professional skin lesions under the influence of soot from the smokers of the Guryev fish factory [15].

The study of indicators in the context of localizations and precancers is of exceptional interest to clarify the etiology of cancer. There were few such works in Kazakhstan at that time. We know two of them: G.A. Uldanova "Malignant tumours of the organ of vision according to the materials of the Eye clinic of the Kazakh Medical Institute and the Kazakh Institute of Eye Diseases for 20 years (1938–1955)" and V. Roshchina "Epithelial tumours of the skin of the eyelids in children and young people" (1962, 1963) [15].

N.N. Vishnyakov and M.I. Isambev (1962) were the first in Kazakhstan to observe six patients in whom cancer occurred after chronic gunshot osteomyelitis, non-healing wounds and trophic ulcers. Separate reports on skin cancer were published in the same period by B. Abakov, F.Ya. Shestialtynov, K.F. Anastasieva A.D. Pavlyuk, and W. Bakenov [15].

N.F. Kramchaninov started to study skin cancer in 1960. In total, he collected data of 12,000 patients and published 71 papers [15-17]. He studied skin cancer from the point of regional features and the role of UV rays. According to his data, the incidence was commonly growing due to expanding gardening and horticulture and ignoring the dangers of excessive radiation exposure by the population. He developed the cancer genesis theory, identified the cell malignization conditions, the contributing features of life-style and behaviour, gave a scientific explanation of the epidemiological patterns of incidence and some clinical manifestations of the disease, developed and proposed a set of preventive measures, etc. Information on his scientific works on cancer is provided in the complete set of works that will be published in Kazakhstan this year.

Conclusion. Thus, researchers of the past period were actively studying the problems of oncology in Kazakhstan. Many questions of epidemiology were studied: the dynamics and structure of incidence, localization, features of territorial distribution, etc. Interesting hypotheses on etiology, pathogenesis, and prevention were proposed. The incidence was studied in conjunction with living conditions, features of life, behaviour, and habits of people. Modern researchers can be proud of their predecessors. Unfortunately, many issues of cancer etiology, spread and efficient prevention are still understudied and remain the focus of research of modern Kazakhstani oncologists.

References

1. Dynyak A.K. *The role of A.N. Syzganov and N.F. Kramchaninov in the study of epidemiology, etiology and prevention of cancer // Oncology and Radiology of Kazakhstan. – 2020. – № 1(55). – P. 42-45;*

2. Kramchaninov N.F. Zlokachestvennyye opukholy v g. Alma-Ata [Malignant tumors in Alma-Ata] // Anniversary collection of scientific and practical works of scientific and medical societies of the region: Pavlodar regional health department of the Kazakh SSR. (For official use only). – M., 1971. – Part I. – P. 93–95 [in Russian];
3. Kramchaninov N.F. Materialy k istorii izucheniya zlokachestvennykh opukholej v Kazakhstane [Materials for the history of the study of malignant tumors in Kazakhstan] // Works of Alma-Ata Medical Institute. – Alma-Ata, 1969. – Vol. XXV. – P. 364–368 [in Russian];
4. Voznesenskiy G.E. Rak sredi kazakhskogo naseleniya severnogo Semirechya i Syr-Dari [Cancer among the Kazakh population of Northern Semirechye and Syr-Daria] // Sovetskaya khirurgiya [Soviet surgery]. – 1936. – № 4 [in Russian];
5. Bakka I.S. Rak i organizatsiya borby s nim v Kazakhstane [Cancer and cancer control in Kazakhstan] // Lechebnoe delo [Medical care]. – 1940. – № 6–7 [in Russian];
6. Epstein A.A. Sovremennyye metody profilaktiki raka i organizatsiya protivorakovoy borby [Modern methods of cancer prevention and the organization of anti-cancer control] // Zdravookhraneniye Kazakhstana [Health Care of Kazakhstan]. – 1947. – № 4 [in Russian];
7. Malinin A.I. Patogenez, rannyya diagnostika, lechenie i profilaktika raka shejki matki [Pathogenesis, early diagnosis, treatment, and prevention of cervical cancer] // Zdravookhraneniye Kazakhstana [Health Care of Kazakhstan]. – 1947. – № 4 [in Russian];
8. Zikeev V.V. O rannej diagnostike raka [On the early diagnostics of cancer] // Zdravookhraneniye Kazakhstana [Health Care of Kazakhstan]. – 1947. – № 4 [in Russian];
9. Telyatnikov S.I. K voprosu o patogeneze i svoevremen-nom raspoznavanii raka zheludka [On the question of pathogenesis and timely recognition of stomach cancer] // Zdravookhraneniye Kazakhstana [Health Care of Kazakhstan]. – 1947. – № 4 [in Russian];
10. Zikeeva A.I. K gistologicheskoy diagnostike zlokachestvennykh opukholej [On the histological diagnosis of malignant tumours] // Zdravookhraneniye Kazakhstana [Health Care of Kazakhstan]. – 1947. – № 4 [in Russian];
11. Utegenova K.D. Pervichnyy rak yaichnikov v klinicheskom i patogistologicheskom otnoshenii [Primary ovarian cancer in a clinical and histopathological sense] // Zdravookhraneniye Kazakhstana [Health Care of Kazakhstan]. – 1948. – № 5 [in Russian];
12. Telyatnikov S.I. Pervichnyy rak legkikh [Primary lung cancer] // Zdravookhraneniye Kazakhstana [Health Care of Kazakhstan]. – 1948. – № 5 [in Russian];
13. Kramchaninov N.F., Zakharova A.B. Materialy k izucheniyu prichin zapushchennosti raka (po protokolam na vyyavleniye zapushchennoj formy zlokachestvennoj opukholy) [Materials for the study of the causes of cancer neglect (according to protocols for identifying a neglected form of a malignant tumor)] // Materials of the seventh scientific-practical conference of the institute and the conference of doctors of the regions of Northern Kazakhstan: proceedings of the Kazakh Institute of Epidemiology, Microbiology and Hygiene. – Almaty, 1966. – P. 242–244 [in Russian];
14. Syzganov A.N., Kramchaninov N.F. Krevye osobennosti zaboilevemosti i rasprostraneniya zlokachestvennykh novoobrazovaniy v Kazakhskoj SSR [Regional features of the incidence and spread of malignant neoplasms in the Kazakh SSR] // Clinical and experimental oncology issues: Proceedings of the Institute of Clinical and Experimental Surgery of the Academy of Sciences of the Kazakh SSR. – Alma-Ata, 1962. – Vol. 8. – P. 3–11 [in Russian];
15. Kramchaninov N.F. Materialy k istorii izucheniya raka kozhi v Kazakhstane [Materials for the history of the study of skin cancer in Kazakhstan] // Materials of the tenth scientific-practical conference of the Kazakh Institute of Epidemiology and Microbiology. – Alma-Ata, 1969. – Part I. – P. 193–196 [in Russian];
16. N.F. Kramchaninov. Krevye osobennosti rasprostraneniya raka kozhi v Kazakhstane [Regional features of the spread of skin cancer in Kazakhstan] // Yearbook of scientific works. Proceedings of the Alma-Ata Institute for Advanced Physicians of the USSR Ministry of Health. – Alma-Ata, 1967. – Vol. 3. – P. 474–478 [in Russian];
17. N.F. Kramchaninov. Materialy k izucheniyu zaboilevemosti naseleniya Kazakhstana rakom kozhi [Materials for the study of skin cancer incidence among the population of Kazakhstan] // Proceedings of the Kazakh Research Institute of Skin and Venereal Diseases. – Alma-Ata, 1964. – Vol. 9. – P. 51–64 [in Russian].