

Надійшла 29.12.2020

Акцептована 25.02.2021

УДК 616.61-006.6 (477)

DOI 10.26641/2307-5279.25.1.2021.231336

## **Dynamics of mortality of different layers in the population of Ukraine due to urinary bladder cancer in the regional aspect**

**N.O. Saidakova**<sup>1</sup>, ORCID: 0000-0002-7174-9540

**O.I. Yatsina**<sup>2</sup>, ORCID: 0000-0003-3081-9933

**V.P. Stus**<sup>3</sup>, ORCID: 0000-0002-4539-8126

**M.Y. Polyon**<sup>3</sup>, ORCID: 0000-0001-9307-1411

**G.E. Kononova**<sup>1</sup>, ORCID: 0000-0003-3284-3419

**V.M. Shilo**<sup>4</sup>, ORCID: 0000-0003-0772-6405

<sup>1</sup> *SI “Institute of Urology of the National Academy of Medical Sciences of Ukraine”*

<sup>2</sup> *Cancer Institute of the Ministry of Health of Ukraine*

<sup>3</sup> *Dnipropetrovsk Medical Academy of the Ministry of Health of Ukraine*

<sup>4</sup> *Cherkasy Regional Hospital of Cherkasy Regional Council*

### **Keywords:**

urinary bladder cancer, mortality, men, women, urban, rural population, administrative territories

### **Для цитування:**

ДСТУ 8302 2015:

Saidakova N.O., Yatsina O.I., Stus V.P., Polyon M.Yu., Kononova G.E., Shilo V.M. Dynamics of mortality of different layers in the population of Ukraine due to urinary bladder cancer in the regional aspect. *Урологія*. 2021. Т. 25, № 1. С. 5–10. DOI: 10.26641/2307-5279.25.1.2021.231336.

### **APA:**

Saidakova, N.O., Yatsina, O.I., Stus, V.P., Polyon, M.Yu., Kononova, G.E., & Shilo, V.M. (2021). Dynamics of mortality of different layers in the population of Ukraine due to urinary bladder cancer in the regional aspect. *Urologiya*, 25(1), 5–10. DOI: 10.26641/2307-5279.25.1.2021.231336.

Адреса для листування:

Н.О. Сайдакова

E-mail: urol.epid@gmail.com

### **SUMMARY**

The paper presents the results of a long (10-year) analysis of mortality rates of different segments of the population of Ukraine due to urinary bladder cancer in the regional aspect. The object of study was the data of official statistical reporting, and the peculiarity of the approach is the allocation of two five-year periods. The information obtained is alarming and needs attention in terms of early adoption of effective constructive measures of the organizational plan, as well as research on early diagnosis and further development and implementation of new technologies for treatment and rehabilitation. They were based on a steady increase in mortality among the adult population, the intensity of which has increased in recent years: in 2014–2018 by 4.5% to 5,008 per 100 thousand against 2.6% in 2009–2013. The most vulnerable is rural population, among which all years the figures are not only higher than among the city (in 2018 – 5,117 against 4,950 per 100 thousand), but also have a higher growth rate (4.9% vs. 4.2%). Noteworthy is the high mortality rate of men, which is 5–7 times higher than that of women, and which is much higher among rural residents (in 2018, 9,260 against 8,701 in urban areas). Another aspect is typical for women: against the background, on the contrary, lower mortality rates in the latter due to the growth rate (for 2014–2018 by 38.2% against 15.2% among the urban population) in 2018 they were equal to 1.753 on 100 thousand women. The identified administrative territories, which are distinguished by high mortality rates and, in the presence of minor fluctuations in their number and composition, remain for years of study; these include the areas of the Central region of the Northeast and Southeast.

## INTRODUCTION

The problem of health care, which is always in the center of attention of the state, is harmoniously connected with a number of complex transformations in the medical, social, economic spheres, as well as subject to the worldview and level of human health culture. Since its main goal is to preserve, improve the health of the population, prolong life expectancy, it is natural that its indicators are considered important criteria for the level of these aspects of society [1, 2]. One of the defining ones is mortality. Its unfavorable tendency, which is observed in some, but common pathologies, requires an analysis of the causes. After all, they are directly dependent on demographic and epidemiological processes [3, 4]. In addition, they are specific to each region. Malignant neoplasms of urological profile are part of the general topical issues of this area and the issue of mortality from them is one of the key in the system of special care [5, 6]. Recently, urinary bladder cancer (UBC), despite the fact that in terms of frequency in oncurological practice ranks third in the incidence and prevalence among the population of Ukraine (after prostate cancer (PC) and renal cancer (RC)), attracts the attention of experts in terms of development and introduction of the latest technologies for its diagnosis and treatment [7, 8, 9]. Especially surgical types with an emphasis on plastic-reconstructive recovery with radical cystectomy [10, 11]. An important fact is, as with any localization, early detection of the disease. Unfortunately, with UBC, the percentage of such cases during professional examinations is the lowest (in 2018 - 16.9% against 20.5% and 21.2% with RC and PC). This justifies the study of mortality due to UBC. The results will not only be the basis for developing a system of clinical, organizational, managerial measures, but also but also ensure their successful implementation [12, 13, 14].

Thus, the aim of the study was a ten-year analysis of mortality rates in Ukraine due to bladder cancer, taking into account gender, place of residence in the regional aspect.

## MATERIALS AND METHODS

When performing the work a standard approach was involved. The primary material was the data of official statistical reporting. The requirements of epidemiological research were also observed. The duration of observation was 10 years, which allows us to determine the nature of process changes. The study period covered 2009 - 2018. It is noteworthy that it was divided into two five-year plans in order to track their intensity, and this was required by the correctness of the approach, as information for 2014 - 2018, from known events in the country, caused incomplete information from uncontrolled today areas. Mortality rates are given per 100 thousand of the relevant population. It should be emphasized that they were analyzed among the entire adult population, as well as by sex and place of residence in a comparative aspect for individual administrative territories of Ukraine. The changes were assessed according to the well-known indicator of the study of time series - the rate of increase (decrease). Analytical-synthetic, comparative analyzes are used.

## RESULTS AND DISCUSSION

A ten-year analysis of the selected step-by-step two five-year periods of PCM mortality rates among the adult population of Ukraine shows their negative trends among different segments. At the same time, certain features and differences concerning gender, place of residence and administrative territories were revealed. A common feature was the increase in mortality in Ukraine as a whole, both among men and women, and in urban and rural areas, both in the presence of their varieties by year and in terms of individual groups (Tables 1, 2, 3.).

The data of Table 1 clearly shows that every five years the mortality rate from UBC increases, with the latter at a rate 1.7 times higher than the previous one. Thus, for 2014 to 2018, its value was 4.5% against 2.6% and mortality rates were 4,792 and 5,008, respectively, while in 2009 and 2013 - 5,008 and 5,140, respectively, per 100 thousand population (hereinafter the text provides only specific values of indicators for convenience). The dissimilarity

**TABLE 1.** Dynamics of mortality from bladder cancer among the adult population of Ukraine (per 100 thousand of the corresponding population)

Population	Indicators					
	2009	2013	T π/3, %	2014	2018	T π/3, %
Total population	5,008	5,140	2,6	4,792	5,008	4,5
Male	9,311	9,231	-0,8	8,686	8,898	2,4
Female	1,328	1,626	22,4	1,443	1,630	13,0

**TABLE 2.** Dynamics of mortality from urinary bladder cancer among adults living in urban areas (per 100 thousand of the relevant population)

Population	Indicators					
	2009	2013	Т п/з, %	2014	2018	Т п/з, %
Total population	4,864	5,090	4,6	4,752	4,950	4,2
Male	8,927	8,997	0,8	8,572	8,701	1,5
Female	1,431	1,785	24,7	1,521	1,753	15,2

**TABLE 3.** Dynamics of urinary bladder cancer mortality among the adult population living in rural areas (per 100 thousand of the relevant population)

Population	Indicators					
	2009	2013	Т п/з, %	2014	2018	Т п/з, %
Total population	5,317	5,249	-1,3	4,878	5,117	4,9
Male	10,124	9,727	-4,0	8,930	9,260	3,7
Female	1,103	1,272	15,3	1,268	1,753	38,2

manifested itself by gender, when its slight decrease among men (by 0.8%) in 2009–2013 was replaced by an increase (by 2.4%) in the following 2014–2018 (to 8,898 in 2018 against 9,311 in 2009), but the growth rate among women, on the contrary, became slower (by 13.0% against 22.4%, to 1,630 against 1,328, respectively). Over the years, there has been a decrease in oblasts with higher mortality rates than in the country as a whole (59.2% and 52.0%, respectively). With small deviations, these administrative territories remain unchanged. They represent the Central region with its oblasts (Vinnytsia, Zhytomyr, Kyiv, Khmelnytsky, Cherkasy), Northeast (Poltava, Sumy, Chernihiv) and Southeast (Luhansk, Dnipropetrovsk, Donetsk, Zaporizhia, Kirovohrad, Kharkiv). In 2018, in these oblasts, the indicator (at 5,008 in Ukraine as a whole) ranged from 5.28 in Zhytomyr to 7.2 in Luhansk and 7.04 in Kyiv.

The data of comparative analysis by article need special attention. It is worth noting the high mortality of men, it is 5.5 - 7 times (by year) higher than women; in 2018 it was equal to 8,898 against 1,630 respectively. Areas in which it is higher than the average Ukrainian indicators coincide with the above, and the values ranged from 9.0 in Dnipropetrovsk to 13.8 and 13.3 in Luhansk and Kyiv. Both among the entire population and its male gender, the lowest mortality rates during the years of study were in Zakarpattia, Volyn, Zhytomyr, Rivne, and Ternopil oblasts, which belong to the Western region.

Against the background of much lower mortality of women, there was an increase in areas with higher than average rates in Ukraine. In particular, their

percentage was 40% in 2018 against 29.6% in 2009. In some cases, eight of the 10 also fell on the regions: Central (Vinnytsia, Zhytomyr, Khmelnytsky, Cherkasy regions), Southeast (Donetsk, Zaporizhia, Kirovograd, Kharkiv), one region was from the West (Lviv) and North-eastern (Chernihiv), where the value of the indicator ranged from 1.7 in Khmelnytsky to 2.5 in Zaporizhia and Kirovohrad oblasts. The smallest values were in Zhytomyr, Volyn, Kirovohrad, Mykolayiv oblasts.

Of particular interest in the comparative aspect of the tables 2 and 3, which contain information on the dynamics of mortality in terms of urban and rural populations. Apparently, its levels have always been higher among the adult population in rural areas, mainly due to males. However, the nature and intensity of changes vary by periods. In the last five years, the situation has significantly deteriorated when the growth rate (by 4.9% and 3.7% among the total and male population) replaced their decrease (by 1.3% and 4.0%, respectively) in the previous five years. As a result, in 2018 the values of the indicators were 5,117 and 9,260 against 5,249 and 9,727 in 2013, respectively. At the same time, the increase among urban residents in 2014–2018 was not so pronounced (by 4.2% against 4.6% in 2009–2013), but also manifested itself almost twice as much among men (by 1.5% against 0.8% respectively); values were equal in 2018 - 4,950 and 8,701, respectively. For women, the growth of mortality among urban residents was slower (by 15.2% against 24.7% in the second and first periods), and among rural residents, on the contrary, twice as intense (by 38.2% against 15.3%, respectively). This process took place against the background of lower levels.

The study of time series of indicators by regions showed that their number, with values higher than the average Ukrainian in urban areas has increased, and in rural areas has decreased in the last year. Thus, in the first case there were 6 of them in 2009, and in 2013 - 14, while in the second - there were 14 steadily, and in 2018. - 11. The vast majority of them were in the Central and South-Eastern regions and they almost coincided in place of residence. With the exception of some years, the oblasts of the Western region were characterized by low mortality rates from UBC among both urban and rural residents. More often it was Volyn, Zakarpattia, Ivano-Frankivsk, Rivne, Ternopil, and from other regions Mykolayiv (Southern). According to the analysis conducted between the oblasts with high mortality and those where the incidence and prevalence of pathology are also higher than the average in Ukraine, as well as the percentage of newly diagnosed cases in stage IV, a certain dependence was observed.

Thus, the obtained and presented data on the dynamics of mortality among the population of Ukraine caused by UBC, which are a criterion of their health, as well as assessments of the effectiveness of certain measures, specialized care, indicate a negative trend. With steady growth, the situation is particularly worrying in rural areas and among men. The latter acquires a special significance given the existing over-mortality of this category. The intense increase in female mortality cannot be ignored. After all, despite the fact that their values are significantly lower than among men, and among urban residents all these years exceeded the values of those who lived in rural areas, in 2018 the death rate equalized. The identified regional features should be considered the basic basis for planning the development of not only health care in terms of organizational forms, but also further research to improve diagnostics and modern methods of treatment with subsequent long-term medical and social rehabilitation.

## CONCLUSIONS

It is established that in Ukraine during 2009 - 2018 there is a steady increase in mortality due to UBC, the rate of which increases over the years; its levels are significantly higher among men (5-7 times a year), but the intensity of growth is higher among women (in 2014 - 2018 by 13.0% against 2.4%, respectively); in 2018, the values were 5,008, 8,898 and 1,630 per 100 thousand, respectively, among all, men and women, respectively.

The mortality of the rural population in all years exceeds the indicators of the urban population

mainly due to males (5,117 against 4,950 and 9,260 against 8,701 per 100 thousand total and male population, respectively).

It is established that against the background of constantly lower mortality rates among females living in rural areas, due to their more intensive growth during the last five years of study, compared to urban residents (by 38.2% against 15.3% in 2009 - 2013, respectively), in 2018 they equalized and became equal to 1,753 per 100 thousand women.

The identified administrative territories, which are distinguished by high mortality rates and, in the presence of minor fluctuations in their number and composition, are remained for years of study; these include the Central, Northeastern and Southeastern regions.

## СПИСОК ЛІТЕРАТУРИ

1. Burger M., Catto J.W., Dalbagni G. et al. Epidemiology and Risk Factors of Urothelial Bladder Cancer. *Eur. Urol.* 2012.

2. Старченко И.И., Бабенко В.И., Прилуцкий А.К., Сидоренко М.И., Старченко О.В. Некоторые эпидемиологические и клинико-морфологические особенности рака мочевого пузыря. *Вісник проблем біології і медицини.* 2018. Т. 2(43), Вип. 1. С. 336–338.

3. Комяков Б.К., Гулиев Б.Г., Сергеев А.В. Выживаемость больных раком мочевого пузыря после радикальной цистэктомии. *Онкоурология.* 2016. Т. 12, № 1. С. 29–35.

4. Сайдакова Н.О., Шуляк О.В., Дмитришин С.П., Яцина О.І, Шило В.М., Мельничук Я.М., Кононова Г.Є. Загальна картина стану урологічної служби, основних показників діяльності, епідеміологічних процесів в Україні (2016–2017 роки). *Урологія.* 2018. Т. 22, № 3 (86). С. 6–10.

5. Матвеев Б.П. Клиническая онкология. М: Вердана, 2011. 934 с.

6. Сайдакова Н.О., Старцева Л.М., Кононова Г.Є., Кравчук Н.Г. Основні показники урологічної допомоги в Україні за 2017–2018 роки: відомче видання; МОЗ України; ДУ «Інститут урології НАМН України»; ДЗ Центр медичної статистики МОЗ України. К: Поліум, 2019. 128 с.

7. Карякин О.Б., Иванов С.А., Каприн А.Д. Рак мочевого пузыря: что нового в 2017–2018 гг. *Онкоурология.* 2018. Т. 14, № 4. С. 110–117.

8. Переверзев А.С., Петров С.Б. Опухоли мочевого пузыря. Харьков: Факт, 2002. 301 с.

9. Эшонхужаев У., Мамарасулова Д.З., Ибрагимов С.С., Назарова Н.М., Кузиева С.К. Особенности заболеваемости раком мочевого пузыря в разных группах населения. *Новый день в медицине.* 2016. № 2 (14). С. 61–63.

10. Магер В.О., Ильин К.А., Завацкий С.Е., Замятин А.В., Орлов А.С., Щеглова В.П., Коваленко Д.А. Анализ ранних послеоперационных осложнений и летальности у больных раком мочевого пузыря, перенесших радикальную цистэктомию. *Уральский медицинский журнал*. 2017. № 2 (146). С. 100–103.

11. Niedworok C., Gratzke C. Alternatives to cystectomy. *Urologe A*. 2015. Vol. 54, No. 4. P. 504–509.

12. Щепотін І.Б. Бюлетень національного канцер-реєстру України. Київ, 2014. № 15. 124 с.

13. Roupkt M., Neuzillet Y., Masson - Lecomte A. CCAFU french national guidelines 2016–2018 on bladder cancer. *Prog Uro*. 2016. No. 27, Suppl 1. P. S67–S91.

14. Vidal A., Arnold N., Vartolomei M.D. Oncological and functional outcomes of postoperative total parenteral nutrition after radical cystectomy in bladder cancer patients: A single-center

randomized trial. *Int J Urol*. 2016. Vol. 23, No. 12. P. 992–999.

## REFERENCES

1. Burger, M., Catto, J.W., Dalbagni, G., et al. (2012). Epidemiology and Risk Factors of Urothelial Bladder Cancer. *Eur. Urol*.

2. Niedworok, C., & Gratzke, C. (2015). Alternatives to cystectomy. *Urologe A.*, 54, 4, 504–509.

3. Roupkt M., Neuzillet Y., Masson-Lecomte A. (2016). CCAFU french national guidelines 2016–2018 on bladder cancer. *Prog Uro.*, 27, S67–S91.

4. Vidal, A., Arnold, N., & Vartolomei, M.D. (2016). Oncological and functional outcomes of postoperative total parenteral nutrition after radical cystectomy in bladder cancer patients: A single-center randomized trial. *Int J Urol.*, 23, 12, 992–999.

## РЕФЕРАТ

**Динаміка смертності різних верств населення України внаслідок раку сечового міхура в регіональному аспекті**

Н.О. Сайдакова, О.І. Яцина,  
В.П. Стусь, М.Ю. Поліон,  
Г.Є. Кононова, В.М. Шило

У роботі представлені результати тривалого (10-річного) аналізу показників смертності різних верств населення України внаслідок раку сечового міхура в регіональному аспекті. Об'єктом вивчення стали дані офіційної статистичної звітності, а особливістю підходу – виділення двох п'ятирічних періодів. Отримані відомості насторожують і потребують уваги в плані скорішого прийняття дієвих конструктивних заходів організаційного плану, а також наукових досліджень по ранній діагностиці та подальшої розробки і впровадження новітніх технологій лікування та реабілітації. Їх підґрунтям стали виявлене стійке зростання смертності серед дорослого населення, інтенсивність якого збільшується в останні роки: за 2014–2018 рр. на 4,5% до 5,008 на 100 тис. проти 2,6% за 2009–2013 рр. Найбільш уразливим виглядає сільське населення, серед якого усі роки показники не тільки вищі, ніж серед міського (у 2018 р. – 5,117 проти 4,950 на 100 тис.), але й мають більший темп зростання (на 4,9% проти 4,2%). Звертає на себе увагу висока смертність чоловіків, що в 5–7 разів перевищує жіночу, і яка значно більша серед сільських мешканців (у 2018 р. 9,260 проти 8,701

## РЕФЕРАТ

**Динамика смертности различных слоёв населения Украины в результате рака мочевого пузыря в региональном аспекте**

Н.А. Сайдакова, А.И. Яцина,  
В.П. Стусь, Н.Ю. Полион,  
Г.Е. Кононова, В.Н. Шило

В работе представлены результаты длительного (10-летнего) анализа показателей смертности разных слоёв населения Украины вследствие рака мочевого пузыря в региональном аспекте. Объектом изучения стали данные официальной статистической отчетности, а особенностью подхода – выделение двух пятилетних периодов. Полученные сведения настораживают и требуют внимания в плане скорейшего принятия действенных конструктивных мер организационного плана, а также научных исследований по ранней диагностике, дальнейшей разработки и внедрению новейших технологий лечения и реабилитации. Их основой стали – устойчивый рост смертности среди взрослого населения, интенсивность которого увеличивается в последние годы: по 2014–2018 гг. на 4,5% до 5,008 на 100 тыс. против 2,6% за 2009–2013 года. Наиболее уязвимым выглядит сельское население, среди которого все годы показатели не только выше, чем среди городского (в 2018 г. – 5,117 против 4,950 на 100 тыс.), но и имеют больший темп роста (на 4,9% против 4,2%). Обращает на себя внимание высокая смертность мужчин, которая в 5–7 раз превышает женскую, и значительно

в міській). Інша картина характерна для жінок: на тлі, навпаки, менших величин смертності серед останніх за рахунок темпу їх приросту (за 2014–2018 рр. на 38,2% проти 15,2% серед міського населення), вони у 2018 р. зрівнялися із рівнем смертності міського населення – 1,753 на 100 тис. жіночого населення. Виявлені адміністративні території, що виділяються за високими показниками смертності і, при наявності незначних коливань за кількістю своєю та складом, зберігаються впродовж років вивчення; до них відносяться області Центрального регіону, Північно-Східного та Південно-Східного.

**Ключові слова:** рак сечового міхура, смертність, чоловіки, жінки, міське, сільське населення, адміністративні території.

больше среди сельских жителей (в 2018 г. 9,260 против 8,701 городских). Другая картина характерна для женщин: на фоне, наоборот, меньших величин смертности среди последних за счет темпа их прироста относительно городских жителей (по 2014–2018 гг. на 38,2% против 15,2% среди городского населения) уровни смертности в 2018 году сравнялись – 1,753 на 100 тыс. женского населения. Выявлены административные территории, которые выделяются своими высокими показателями смертности и, при наличии незначительных колебаний по количеству и составу, сохраняются по годам изучения; к ним относятся области Центрального региона, Северо-Восточного и Юго-Восточного.

**Ключевые слова:** рак мочевого пузыря, смертность, мужчины, женщины, городское, сельское население, административные территории.