

Received:
October 22, 2025
Revision accepted:
February 25, 2026
Published online:
May 29, 2026

TRENDS OF MORBIDITY AND MORTALITY IN POLAND FROM MALIGNANT TUMORS OF THE NASAL CAVITY AND MIDDLE EAR (ICD-C30)

Contributions:
A Study design/planning
B Data collection/entry
C Data analysis/statistics
D Data interpretation
E Preparation of manuscript
F Literature analysis/search
G Funds collection

Patrycja Zaborska¹A^BE-G , Jurek Olszewski^{2,3}CD 

¹ Department of Otolaryngology, Head and Neck Surgery, Świętokrzyskie Oncology Center in Kielce, Poland

² Department of Otolaryngology, Oncology, Audiology and Phoniatics, Medical University of Lodz, Poland

³ Department of Polish Dialectology and Logopaedics, University of Lodz, Poland

Corresponding author: Jurek Olszewski, Department of Otolaryngology, Oncology, Audiology and Phoniatics, Medical University of Lodz, Zeromskiego 113, 91-647, Lodz, Poland; jurek.olszewski@umed.lodz.pl

Abstract

Introduction: The aim of the study was to compare the incidence and mortality in Poland from malignant tumors of the nasal cavity and middle ear (ICD-C30) with other head and neck cancers over the years 2000 to 2022.

Material and methods: Incidence and death due to malignant tumors in Poland was based on data from the Polish National Cancer Registry (KRN) over the years 2000, 2005, 2010, 2015, 2020, and 2022. As a benchmark, we compare worldwide rates from the latest GLOBOCAN estimates developed by the International Agency for Research on Cancer (IARC) and distributed as Cancer Today in the Global Cancer Observatory.

Results: Based on figures from the Polish National Cancer Registry for the years 2000 and 2022, the incidence of malignant tumors of the nasal cavity and middle ear in the country has increased by 18.1%, with an increase of 15.5% in women and 20.4% in men. In terms of deaths from such tumors, however, the same source showed an overall increase of 33.3%, which comprised 56.2% for women and 20.7% for men.

Conclusions: A malignant tumor of the nasal cavity and middle ear (ICD-C30) is the 20th most common cancer of the head and neck. The Polish National Cancer Registry from 2022 shows that ICD-C30 is the 19th most common cancer of the head and neck in terms of deaths, comparable with malignant tumor of the gums (ICD-C03). In terms of incidence, the most common head and neck cancer based on the same source is thyroid cancer (ICD-C73), and in terms of deaths, laryngeal cancer (ICD-C32).

Keywords: incidence • mortality • malignant tumors • nasal cavity • middle ear

TRENDY ZACHOROWALNOŚCI I ŚMIERTELNOŚCI W POLSCE Z POWODU NOWOTWORÓW ZŁOŚLIWYCH JAMY NOSOWEJ I UCHA ŚRODKOWEGO (ICD-C30)

Streszczenie

Wstęp: Celem badania było porównanie częstości występowania i śmiertelności z powodu nowotworów złośliwych jamy nosowej i ucha środkowego (ICD-C30) w Polsce z innymi nowotworami głowy i szyi w latach 2000–2022.

Materiały i metody: Dane dotyczące zachorowalności i śmiertelności z powodu nowotworów złośliwych w Polsce oparto na informacjach pochodzących z Krajowego Rejestru Nowotworów (KRN) za lata 2000, 2005, 2010, 2015, 2020 i 2022. Jako punkt odniesienia porównujemy wskaźniki światowe z najnowszych szacunków GLOBOCAN opracowanych przez Międzynarodową Agencję Badań nad Rakiem (IARC) i opublikowanych jako Cancer Today w Global Cancer Observatory.

Wyniki: Na podstawie danych z KRN z lat 2000 i 2022 częstość występowania nowotworów złośliwych jamy nosowej i ucha środkowego w kraju wzrosła o 18,1%, przy czym wzrost ten wyniósł 15,5% wśród kobiet i 20,4% wśród mężczyzn. Jeśli chodzi o zgony spowodowane tymi nowotworami, to jednak to samo źródło wykazało ogólny wzrost o 33,3%, z czego 56,2% dotyczyło kobiet, a 20,7% mężczyzn.

Wnioski: Nowotwór złośliwy jamy nosowej i ucha środkowego (ICD-C30) jest dwudziestym najczęściej występującym nowotworem głowy i szyi. Z danych KRN za rok 2022 wynika, że ICD-C30 zajmuje dziewiętnaste miejsce pod względem liczby zgonów wśród nowotworów

głowy i szyi, plasując się na podobnym poziomie co nowotwór złośliwy dziąseł (ICD-C03). Pod względem zachorowalności najczęstszym nowotworem głowy i szyi według tego samego źródła jest rak tarczycy (ICD-C73), a pod względem zgonów – rak krtani (ICD-C32).

Słowa kluczowe: zachorowania • zgony • nowotwory złośliwe • jama nosowa • ucho środkowe

Introduction

Head and neck cancer is the general name for malignant and benign tumors located in the area from the base of the skull to the clavicles, excluding the brain [1]. According to the international classification of diseases ICD-10, these are diseases corresponding to the codes C00–C15, C30–C33, C69, and C73 [2]. The ICD-C30 code corresponds to malignant tumors of the nasal cavity and middle ear, which are included together.

According to current data from the Polish National Cancer Registry, 10,801 people in Poland were diagnosed with head and neck cancer in 2013 and 5990 died; they accounted for 8% of all cancers diagnosed in men and 5% in women [3]. In Poland, similar to other European countries, a new epidemiological phenomenon is being observed, i.e., an increase in the number of new cases of head and neck cancer in people under 40 years of age who have never smoked or abused alcohol [4]. The growing incidence of head and neck cancer is primarily due to human papillomavirus (HPV). At the same time, it is surprising that many people still do not associate HPV with cancer (e.g., of the tongue).

Comprehensive nationwide analyses integrating multiple anatomical locations over extended periods of time are in fact limited, although reports from national registries and partial epidemiological studies do exist. Publications are fragmentary and concern only a given region or clinical center [1,2]. Figures on epidemiology of morbidity and mortality for Poland are based on the Polish National Cancer Registry.

The aim of this study was to analyse incidence and mortality due to malignant tumors of the nasal cavity and middle ear (ICD-C30) in Poland and compare them with other head and neck cancers in the country for the years 2000 to 2022.

Material and methods

The analysis of incidence and death due to malignant tumors in Poland was based on data from the Polish National Cancer Registry [3] for the years 2000 to 2022. The study included data for the following years: 2000, 2005, 2010, 2015, 2020, and 2022. For comparison with global data, figures on malignant tumors as reported in the latest GLOBOCAN estimates developed by the International Agency for Research on Cancer (IARC) and distributed as Cancer Today in the Global Cancer Observatory were used [5].

The incidence and mortality due to malignant tumors, including head and neck cancers, in 2000 and 2022, were statistically analysed. A Cochran–Armitage test for trend was performed. The following mathematical formulas were used in statistical calculations:

$$p = \frac{m}{n} \times 100\% \quad (1)$$

where: p is the proportion, m is the number of deaths due to head and neck cancer, n is the number of deaths due to all malignant tumors.

$$C = \frac{x_{2022} - x_{2000}}{x_{2000}} \times 100\% \quad (2)$$

where: C is the relative change, x_{2000} is the number of deaths in 2000, x_{2022} is the number of deaths in 2022.

$$G = \left(\frac{x_{2022}}{x_{2000}} \right)^{\frac{1}{n}} - 1 \times 100\% \quad (3)$$

where: G is the geometric mean, n is the number of periodic measurements, taken individually six times, in 2000, 2005, 2010, 2015, 2020, and 2022), x_{2000} and x_{2022} as above.

Proportions and relative growth were manually calculated when needed. MedCalc version 23.4 was used for all the statistical computations (MedCalc Software Ltd, Ostend, Belgium).

The study was a retrospective study and did not require the consent of the bioethics committee.

Results

Epidemiological data on the incidence of malignant tumors in Poland according to the Polish National Cancer Registry (data for 2000) indicate (**Table 1**) that the incidence of malignant tumors of the nasal cavity and middle ear (ICD-C30) involved 94 cases, which constituted 0.08% of all cases of malignant tumors.

The incidence of ICD-C30 cases in women involved 45 cases, which constituted 0.08% of all cancer cases and corresponding figures for men amounted to 49 cases, again 0.08% of all cases of malignant tumors.

So far as deaths are concerned, the data for 2000 from the Polish National Cancer Registry show that deaths in Poland due to ICD-C30 amounted to 45 cases, which constituted 0.05% of all deaths. For women, there were 16 cases, which was 0.04% of all deaths due to malignant tumors (**Table 1**). In men, the corresponding figures were 29, which was 0.06% of all deaths due to malignant tumors.

Data for other years is also given in **Table 1**, where the figures for 2022 showed an incidence of 111 cases of ICD-30, which was 0.06% of all cases of malignant tumors. The total included 52 women and 59 men. For deaths, there were 60 cases due to ICD-C30, which was 0.06% of all deaths due to malignancy. The total comprised 25 women and 35 men, which respectively constituted 0.06% and 0.07% of all deaths due to malignant tumors.

Table 1. Incidence and mortality due to malignant tumors of the nasal cavity and middle ear (ICD-C30) in selected years in Poland (National Cancer Registry, accessed 1 October 2025)

Years	Incidence		Mortality		Total	
	Women	Men	Women	Men	Incidence	Mortality
2000	45	49	16	29	94	45
2005	45	55	28	28	100	56
2010	33	61	25	21	94	46
2015	62	60	28	28	122	56
2020	47	65	18	33	112	51
2022	52	59	25	35	111	60

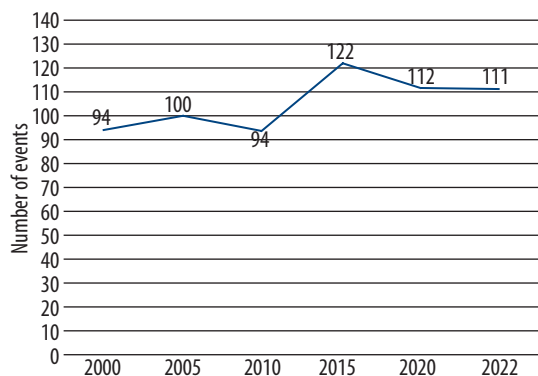
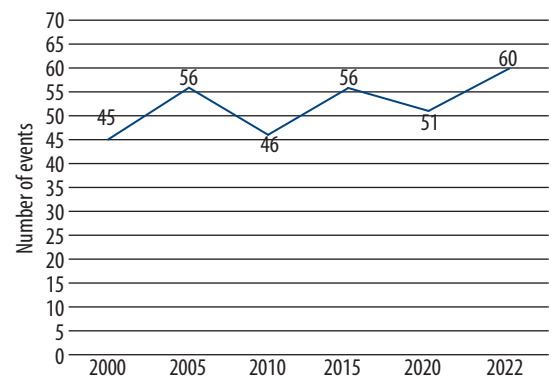
**Figure 1.** Incidence of malignant tumors of the nasal cavity and middle ear since 2000 in Poland (National Cancer Registry, accessed 1 September 2025). The average increase over the entire period is 18.1%

Figure 1 shows that from 2000 to 2022 the incidence of malignant tumors of the nasal cavity and middle ear increased by 18.1% ($p = 0.047$). The average rate of growth was 4.2% per measurement interval. Turning to mortality, **Figure 2** shows that the rate of mortality due to ICD-C30 increased by 33.3% from 2000 to 2022 ($p = 0.9159$). The average increase per measurement interval was 7.5%.

Data for 2000 shows that, according to the Polish National Cancer Registry, the incidence of all cancers in Poland was 118,869, including 7,775 incidences of head and neck cancer, representing 6.54% of all cases (**Table 2**). The total number of malignant tumors in women was 57,925 cases, including 2485 cases of head and neck cancer, some 4.29%. For men, the total was 60,944, including 5,290 cases of such cancers (8.68%).

The Polish National Cancer Registry also indicates that in 2000 there were 87,826 deaths in Poland from all malignant tumors, including the deaths of 3,820 due to cancers of the head and neck (4.35%). The figure of 3,820 was made up of 3,025 men and 795 women.

Figures for 2022 are shown in **Table 3**. In that year there were 395,538 incidences of all malignant tumors, of which

**Figure 2.** Mortality due to malignant tumors of the nasal cavity and middle ear since 2000 in Poland (National Cancer Registry, accessed 1 September 2025). The average increase over the entire period is 33.3%

12,100 were cases of the head and neck (3.06%). There were a total of 51,190 cases of malignant tumors, according to the Polish National Cancer Registry, including 3,025 men who incurred head and neck tumors (6.30%). The total number of female cases was 228,240, of which 6,094 were head and neck cancer (2.67%) and in men there were 167,298 malignant cases, of which 6,006 were of the head and neck (3.59%).

In terms of deaths, data show that there were 96,127 deaths due to all malignant tumors, including 4,989 deaths due to head and neck cancers (5.2%). Deaths of women totalled 44,223, of which 1,309 were from tumors of the head and neck (2.96%) (**Table 3**). For men, there were a total of 51,904 deaths, including 3,680 men who died of head and neck tumors (7.09%).

Based on the 2022 figures, it appears that malignant tumors of the nasal cavity and middle ear (ICD-C30) is the 20th most common cancer in terms of incidence, i.e. the least common cancer, rating 13th in women and 20th in men. Moreover, the data shows that malignant tumor of the oral cavity, nasal, and middle ear (ICD-C30) in terms of deaths rate 19th [3], along with malignant tumor of the gums (ICD-C03). In women, the rating was 16th, along

Table 2. Summary of incidence and mortality due to head and neck cancer in 2000 (number of cases from National Cancer Registry, accessed 1 October 2025)

ICD	Location of organ	Incidence		Mortality		Total	
		Women	Men	Women	Men	Incidence	Mortality
C00	Oral lip	104	471	19	124	575	143
C01	Root of the tongue	16	69	3	59	85	62
C02	Other parts of the tongue	70	280	48	210	350	258
C03	Gum	34	57	13	22	91	35
C04	Floor of the mouth	43	249	27	159	292	186
C05	Palate	27	71	7	41	98	48
C06	Unspecified parts of the mouth	41	68	29	61	109	90
C07	Parotid gland	104	122	36	54	226	90
C08	Unspecified major salivary glands	54	59	17	51	113	68
C09	Palatine tonsil	68	268	27	176	336	203
C10	Oropharynx	46	208	13	64	254	77
C11	Nasopharyngeal part	47	139	43	81	186	124
C12	Piriform recess	2	22	–	7	24	7
C13	Laryngeal part of the pharynx	23	167	9	103	190	112
C14	Other unspecified locations in the throat	21	113	40	147	134	187
C30	Nasal cavity and middle ear	45	49	16	29	94	45
C31	Paranasal sinuses	40	80	27	48	120	75
C32	Larynx	325	2412	165	1465	2737	1630
C69	Eye	123	105	39	40	228	79
C73	Thyroid	1252	281	217	84	1533	301
Total	Head and neck cancers	2485	5290	795	3025	7775	3820

with malignant tumor of the palate (ICD-C05) and unspecified tumor of the large salivary glands (ICD-C08), while in men it rated 20th [3]. The most common head and neck cancer based on the National Cancer Registry of 2022 in terms of incidence is thyroid cancer (ICD-C73), and in terms of deaths, laryngeal cancer (ICD-C32) (Table 3). Deaths from laryngeal cancer are more common in men than in women (by a factor of 6.7 times). Malignant laryngeal cancer in men is the 11th most common malignant tumor in the Polish National Cancer Registry of 2022 in terms of incidence and deaths.

Figure 3 shows the incidence rates of IDC-C30 for women and men for 2000 and 2022, and the differences between the sexes are not significant ($p = 0.4522$). From 2000 to 2022, the incidence due to malignancies of the nasal cavity and middle ear increased by 15.6% in women ($p = 0.2022$) and in men by 20.4% ($p = 0.8424$).

For mortality, Figure 4 shows that the differences between women and men due to cancers of the nasal cavity and middle ear were not significant ($p = 0.5273$). From 2000

to 2022, the mortality due to malignant neoplasms of the nasal cavity and middle ear increased in women by 56.3% ($p = 0.8688$) and in men by 20.7% ($p = 0.9746$).

Discussion

Forecasts from the Polish Health Needs Map indicate that head and neck cancers will increase from 2022 to 2031. In 2022, the recorded incidence was 7,600, and by 2031, it is expected to increase by 10.5% to 8,400 [4]. In comparison, incidence data from the Polish National Cancer Registry for 2000 [3] showed that malignant tumors of the nasal cavity and middle ear increased by 18.1% in 2022, with a slight increase of 15.5% in women and 20.4% in men. Based on the Polish National Cancer Registry of 2022, men are more likely to suffer from malignant tumors of the nasal cavity and middle ear than women (by a factor of 1.13).

In terms of mortality, data for 2000 from the Polish National Cancer Registry [3] show that deaths due to IDC-C30 increased by 33.3% in 2022, with an increase of 56.2% in women and 20.7% in men. Based on the Polish

Table 3. Summary of the number of incidence and mortality due to head and neck cancer in 2022 (National Cancer Registry, accessed 1 October, 2025)

ICD	Location of organ	Incidence		Mortality		Total	
		Women	Men	Women	Men	Incidence	Mortality
C00	Oral lip	81	203	28	75	284	103
C01	Root of the tongue	54	193	47	160	247	207
C02	Other parts of the tongue	209	422	122	293	631	415
C03	Gum	52	61	23	37	113	60
C04	Floor of the mouth	108	393	95	281	501	376
C05	Palate	50	89	25	52	139	77
C06	Unspecified parts of the mouth	131	193	78	121	324	199
C07	Parotid gland	146	158	65	98	304	163
C08	Unspecified major salivary glands	72	68	25	42	140	97
C09	Palatine tonsil	231	543	93	308	774	401
C10	Oropharynx	66	234	60	218	300	278
C11	Nasopharyngeal part	52	106	36	80	158	116
C12	Piriform recess	23	165	14	84	188	98
C13	Laryngeal part of the pharynx	40	229	42	232	269	274
C14	Other unspecified locations in the throat	30	119	32	116	149	148
C30	Nasal cavity and middle ear	52	59	25	35	111	60
C31	Paranasal sinuses	57	92	33	65	149	98
C32	Larynx	267	1525	181	1214	1792	1395
C69	Eye	266	249	76	59	515	135
C73	Thyroid	4107	905	209	110	5012	319
Total	Head and neck cancers	6094	6006	1309	3680	12100	4989

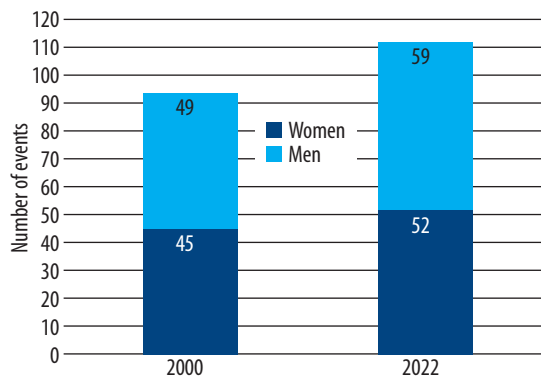


Figure 3. Incidences, by gender, of malignant tumors of the nasal cavity and middle ear against the background of all malignant tumors in 2000 and 2022 (National Cancer Registry, accessed 1 September 2025). There is no statistical difference between the increases for men and women

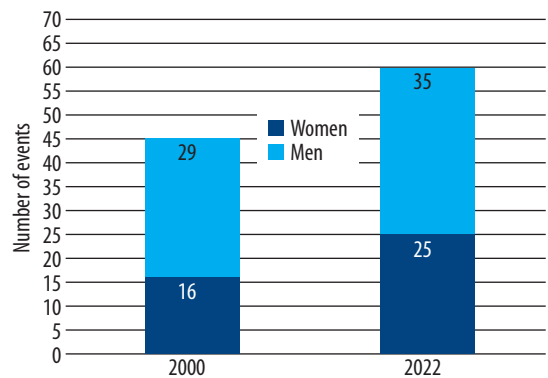


Figure 4. Mortality, by gender, due to malignant tumors of the nasal cavity and middle ear in 2000 and 2022 (National Cancer Registry, accessed 1 September 2025). There is no statistical difference between the increases for men and women

National Cancer Registry of 2022, deaths from cancer of the nasal cavity and middle ear are more common in men than in women (by 1.4 times).

Head and neck cancers are still diagnosed in stages III and IV, regardless of when they began. For these patients, medical treatment can only be palliative, with the aim being just to prolong life and improve comfort.

Data from the Polish National Cancer Registry show that from 2000 to 2022 the incidence of head and neck cancers increased by 55.6% (by 145.2% in women and 13.5% in men). Based on the Polish National Cancer Registry of 2022, women are slightly more likely to suffer from head and neck cancer than men, but only by 1.44%. For deaths, data from the Polish National Cancer Registry [3] show that there was an increase of head and neck cancer from 2000 to 2022 by 30.6% (by 64.7% in women and 21.7% in men). Based on the Polish National Cancer Registry of 2022 [3], deaths from head and neck cancer are more common in men than in women by 2.8 times.

Age is the strongest risk factor for cancer. It increases in both sexes with age. The risk of developing the disease is highest in both men and women at the turn of the fifth and sixth decade of life. In those aged 45–64, 60% of males and 52% of females will be diagnosed with head and neck cancers. Younger people, males aged 5–44 and females aged 10–29, are most at risk of external causes such as accidents (traffic, falls, poisonings, drownings), suicides, and crime. In old age, men are most threatened by diseases of the circulatory system and, to a slightly lesser extent, cancer.

In 2021, those over 80 years of age were most at risk of dying from COVID-19, while for women 30–74 years the highest risk was by malignant tumors in general, which are replaced by circulatory system diseases only in the oldest age. After cancer, COVID-19 was the second most common cause of death in women aged 35–64. Of the 36 types of cancer listed, 8 concern the head and neck [5]. Worldwide, almost half of all cases (49.2%) and most (56.1%) cancer deaths in 2022 occurred in Asia, where 59.2% of the world's population lives.

Based on projected changes in population growth and aging, and assuming overall cancer rates remain unchanged,

References

1. Oncology. Handbook for students and doctors. Kordek R, Editor. Gdańsk: Via Medica; 2007, s. 147–58.
2. Wierzbicka M, Markowski J, Pietruszewska W, Burduk P, Mikaszewski B, Rogowski M, et al. Algorithms of follow-up in patients with head and neck cancer in relation to primary location and advancement. Consensus of Polish ENT Society Board and Head Neck Experts. *Front Oncol*, 2023; 13: 1298541. <https://doi.org/10.3389/fonc.2023.1298541>
3. Polish National Cancer Registry, <https://onkologia.org/pl/en>.
4. Ministry of Health. National Oncology Strategy, 2025 [in Polish]. Available from: <https://onkologia.pacjent.gov.pl/pl/narodowa-strategia-onkologiczna> [Accessed 15.12.2025].
5. Bray F, Laversane M, Sung H, Ferlay J, Siegel RL, Soerjomataram J, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*, 2024; 74(3): 229–63. <https://doi.org/10.3322/caac.21834>
6. Neamțiu L, Martos C, Giusti F, Negroar Carvalho R, Randi G, Dimitrova N, et al. Impact of the first wave of the COVID-19 pandemic on cancer registration and cancer care: a European survey. *Eur J Public Health*, 2022; 32(2): 311–5. <https://doi.org/10.1093/eurpub/ckab214>
7. Cancer Registry of Norway. Cancer in Norway 2020. Cancer incidence, mortality, survival and prevalence in Norway. Larsen IK, Editor. Oslo: Cancer Registry of Norway, 2021.

more than 35 million new cases of cancer are projected to occur in 2050, a 77% increase from the 20 million cases estimated for 2022.

The coronavirus disease pandemic caused over 6 million deaths between 2020 and 2022 and has severely impacted healthcare systems around the world. Many cancer registries around the world reported disruptions in their operations during the first wave of the pandemic [6]. The subsequent impact on cancer rates may be moderate and short-term. Several registries reported [7–9] that the receipt of relatively fewer pathology reports in the earlier months was compensated by increased diagnostic activity in the later months.

Conclusions

1. Compared to the data from the Polish National Cancer Registry from 2000, both the incidence and death rates of malignant tumors of the nasal cavity and middle ear increased in 2022, as did other head and neck cancers.
2. Malignant tumor of the nasal cavity and middle ear (ICD-C30) is the 20th most common cancer of the head and neck.
3. The Polish National Cancer Registry from 2022 shows that malignant tumor of the nasal cavity and middle ear (ICD-C30) is the 19th most common cancer of the head and neck in terms of deaths, along with malignant tumor of the gums (ICD-C03).
4. The most common head and neck cancer based on the 2022 Polish National Cancer Registry in terms of incidence is thyroid cancer (ICD-C73), and in terms of deaths, laryngeal cancer (ICD-C32).



Funding

This research and article did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare no conflicts of interest.

8. Johansson ALV, Larønningen S, Skovlund CW, Kristiansen MF, Mørch LS, Friis S, et al. The impact of the COVID-19 pandemic on cancer diagnosis based on pathology notifications: a comparison across the Nordic countries during 2020. *Int J Cancer*, 2022; 151(3): 381–95. <https://doi.org/10.1002/ijc.34029>
9. Han X, Yang NN, Nogueira L, Jiang C, Wagle NS, Zhao J, et al. Changes in cancer diagnoses and stage distribution during the first year of the COVID-19 pandemic in the USA: a cross-sectional nationwide assessment. *Lancet Oncol*, 2023; 24(8): 855–67. [https://doi.org/10.1016/s1470-2045\(23\)00293-0](https://doi.org/10.1016/s1470-2045(23)00293-0)

Patrycja Zaborska, email: patrycja.zaborska@gmail.com •  0009-0009-0599-4239
Jurek Olszewski, email: jurek.olszewski@umed.lodz.pl •  0000-0002-8868-9679