



National
Institute
for Health
Development

**Cancer in Estonia:
incidence 2023,
survival 2019–2023 and
stage-specific incidence
2012–2023**

Tallinn 2026

**Cancer in Estonia:
incidence 2023,
survival 2019–2023
and stage-specific
incidence 2012–2023**

**Mari-Liis Zimmermann, Kaire Innos, Aleksei
Baburin, Keiu Paapsi, Margit Mägi**

National Institute for Health Development's **mission** is to promote research-based healthy choices.

Reviewer: Reeli Hallik

This work was supported by Estonian Research Council (grant nr PRG2543).

When using data from this publication, please use the following citation: Zimmermann M-L, Innos K, Paapsi K, Veerus P, Baburin A, Mägi M. Cancer in Estonia: incidence 2023, survival 2019–2023 and stage-specific incidence 2012–2023. Tallinn: National Institute for Health Development; 2026.

Table of contents

| | |
|--|----|
| Definitions..... | 4 |
| Abbreviations..... | 4 |
| Summary..... | 5 |
| Introduction and methods..... | 7 |
| 1 Leading cancer sites | 8 |
| 2 Cancer incidence by site..... | 11 |
| 3 Cancer incidence by age | 19 |
| 4 Cancer cases by basis of diagnosis | 24 |
| 5 Extent of disease at diagnosis..... | 31 |
| 5.1 Extent of solid tumours at diagnosis | 31 |
| 5.2 TNM staging of selected sites | 38 |
| 6 Cancer incidence trends..... | 42 |
| 6.1 Total incidence..... | 42 |
| 6.2 Incidence trends of selected sites | 43 |
| 7 Cancer prevalence..... | 45 |
| 8 Survival | 47 |
| 9 Stage-specific incidence of selected cancer sites 2012–2023..... | 53 |
| 9.1 Background | 53 |
| 9.2 Breast cancer | 53 |
| 9.3 Cervical cancer..... | 57 |
| 9.4 Colorectal cancer..... | 58 |
| 9.5 Lung cancer..... | 59 |
| 9.6 Prostate cancer | 60 |
| References | 61 |

Definitions

| | |
|------------------------------|---|
| Age-standardized rate | a summary of the rate a population would have if it had a standard age structure. Standardization is necessary when comparing several populations that differ with respect to age. It is a weighted mean of age-specific rates; the weights are taken from the population distribution of the standard population |
| Cancer screening | checking for disease when there are no symptoms. Since screening may find diseases at an early stage, there may be a better chance of curing the disease |
| Morphology | diagnostic description of a tumour that describes the shape, structure, form and size of cells |
| Prevalence | measure of the total number of people in a specific group who have (or had) a certain disease, condition, or risk factor at a specific point in time or during a given period of time |
| Solid tumours | A tumour that originates of a specific organ |
| Survival | probability of being alive after a certain time after the diagnosis of a particular disease. The survival rate is often stated as a five-year survival rate, which can be interpreted as the percentage of people who are alive five years after their diagnosis |
| TNM staging | a system for describing the amount and spread of cancer in a patient's body, using TNM (T – tumour, N – node, M – metastasis) where T describes the size of the tumour and any spread of cancer to nearby tissue, N describes spread of cancer to regional lymph nodes and M describes metastasis (spread of cancer to other parts of the body) |

Abbreviations

| | |
|---------------|--|
| APC | Annual percentage change |
| DCI | Death certificate initiated |
| DCO | Death certificate only |
| ECR | Estonian Cancer Registry |
| ICD-10 | International Classification of Diseases, 10th version |

Summary

Owing to internationally recognised population-based cancer registry, Estonian cancer incidence data are available for more than 55 years – since 1968. Over time, the annual number of new cancer cases has increased significantly. A total of 9,835 new cancer cases were registered in Estonia in 2023, with 5,010 cases diagnosed in men and 4,825 in women. Leading cancer sites in men were similar to previous years: the prostate (30% of all cancers in men), followed by non-melanoma skin (12%) and lung (11%). In women, the leading sites were non-melanoma skin and the breast (accounting for 21% and 18% of all new cancer cases).

The increase in cancer cases is partly due to population ageing – about half of all cases in 2023 were diagnosed in patients aged 70 years and older. Among women aged 54 and younger, cancer incidence was lower than among men in the same age group; however, from age 55 onwards, cancer incidence in men was remarkably higher than in women. Cancer is relatively rare in children and adolescents – in 2023, 21 cases of malignant tumours were diagnosed in children aged 0–14, and 36 new cases in the 15–24 age group.

The most frequent cancer sites vary in different age-groups. In children aged 0–14, leukaemia was diagnosed most frequently. In age group 15–34, the leading cancer sites were the testis and the brain in men and thyroid and non-melanoma skin in women. In the 35–54 age group, the most common cancer site was the prostate in men and the breast in women, followed by non-melanoma skin in both sexes. In the 55–74 age group, the leading sites were the prostate and lung in men and the breast and non-melanoma skin in women. In men aged 75 and older, the most frequent sites were the prostate and non-melanoma skin, while in women, non-melanoma skin was followed by the breast.

In 2023, the proportion of microscopically verified cancer cases was 92%, (90% in the previous year), indicating a rather good quality of diagnosis. 3% of cancer cases were death certificate initiated (DCI), while 2% were registered as death certificate only (DCO) cases. Although these proportions are rather low, they still indicate some degree of incomplete notification of cancer cases to the cancer registry.

It is crucial to diagnose cancer and start treatment as early as possible. In 2023, 56% of all new cancer cases were localized at the time of diagnosis, but approximately 16% of men and 15% of women already had distant metastasis. The proportion of lung cancer with distant metastasis at the time of diagnosis has increased in both sexes when compared to previous year, reaching 35% in men and 44% in women. Simultaneously, the proportion of pancreatic cancer with distant metastasis was high in both men and women (39% and 43%, respectively).

The proportion of stage I colon and rectal cancer has somewhat increased, while the proportion of stage IV has slightly decreased, remaining near 22% in both sexes. The proportion of early-stage breast cancer is slowly increasing, while the proportion of stage IV cases remained around 8%. About 28% of cervical cancer cases were diagnosed at stage I, but the proportion of stage III and IV increased, reaching 53%. Lung cancer was more often diagnosed at early stages, but the proportion of stage IV slightly increased in both sexes, especially in women, reaching 46%. The proportion of stage I prostate cancer remained around 36% while stage IV prostate cancers slightly decreased. The stage distribution of skin melanoma has been stable in recent years and in 2023 the proportion of stage IV cases somewhat decreased in both sexes.

In men, the total cancer incidence has been decreasing in recent decades and in women it has stabilized, but incidence trends vary by cancer site. The incidence of colon and rectal cancer has slightly decreased after 2019. Lung cancer incidence has been in decline for over two decades in men and has stabilized in women. The incidence of

stomach cancer has also been decreasing in both sexes. Breast cancer incidence in women is still rising. The incidence of prostate cancer had been decreasing since 2011 but increased again in 2022 and also 2023. Cervical cancer incidence has decreased since 2012 – this is a long-term trend that can be associated with the preventive screening program. Although the incidence of skin melanoma has been decreasing in recent years, in 2023 it slightly increased in both sexes. The incidence of kidney cancer has slightly decreased in men in the last decade. The incidence of non-Hodgkin lymphoma has been stable both in men and women.

As of 31st December 2023, there were 73,303 people (30,188 men and 43,115 women) in the Estonian population with a history of cancer. The most frequent cancer sites among prevalent cases were the same as in previous years – the prostate in men and the breast in women.

In 2018–2022, the one-year, five-year and ten-year relative survival estimates for all cancer cases diagnosed in Estonia were 79%, 66% and 62%, respectively. For most sites, survival estimates were higher for women than for men. In comparison with the Nordic countries, the survival gap remained for non-Hodgkin lymphoma, head and neck cancers (lip, oral cavity, pharynx), as well as for colon and rectal cancer, skin melanoma, and breast and corpus uteri cancer.

Stage-specific incidence trend analysis showed that the increase in total breast cancer incidence in the period 2012–2023 was mainly due to the increase in the number of cases diagnosed in stages I and II. In the time-period 2018–2021, the incidence of stage IV decreased, indicating the effectiveness of screening, and the subsequent increase in incidence by 17.2% per year may be due to improved diagnostics, the addition of new screening cohorts, and the opportunity for women without health insurance to participate in screening.

Overall incidence of cervical cancer has decreased by a statistically significant 5.5% each year since 2012. This analysis shows for the first time a significant reduction in incidence in stage IV (7.5% per year). The results suggest that screening has been effective and helped prevent cervical cancer at all stages.

Overall incidence of colorectal cancer has been stable in both sexes in years 2012–2023. In men, only the incidence of stage I increased significantly throughout the period (6.3% annually), and since 2017, the incidence of stage IV has decreased by 4.8% per year. The results also indicate that there has been a shift towards earlier detection in women, which has likely been contributed to by the introduction of screening.

The total incidence of lung cancer in men in the time-period 2012–2023 decreased statistically significantly (2.8% per year), with a decrease in the incidence of stage III and, in recent years, also in the incidence of stage IV. In women, the total incidence of lung cancer has been stable and there has been no statistically significant trend in the stages, but the incidence of stages I and II is rather increasing and the incidence of stages III and IV is decreasing. The results suggest that the COVID-19 pandemic did not cause a delay in lung cancer diagnosis.

Overall incidence of prostate cancer decreased by a statistically significant 2% per year between 2012 and 2018 but has since rapidly increased (15.8% per year). The incidence of early- stage tumours has increased rapidly throughout the period (10.9% per year).

Introduction and methods

The Estonian Cancer Registry (ECR) was founded in 1978, while reliable incidence data are available for as far back as 1968. The ECR is a population-based registry that collects data on all cancer cases in Estonia. The main task of the registry is to ensure the complete and reliable registration of incident cancer cases, which forms the basis for national cancer statistics, survival analysis and epidemiological research.

In this report, incidence data were updated on 17 February 2026.

For coding the topography and morphology of the tumour, the ECR uses the Third Edition of the International Classification of Diseases for Oncology (ICD-O-3). Stage is coded according to the TNM classification. For this report, the Tenth Revision of the International Classification of Diseases (ICD-10) has been used by converting the ICD-O-3 codes into ICD-10 codes [1]. The calculation of the age-standardized incidence rates is based on the World Standard Population [2].

In Estonia, the following tumours are to be reported: all malignant tumours (C00–C97), *in situ* tumours (D00–D09), benign tumours and tumours of uncertain or unknown behaviour of the brain and central nervous system, as well as of the endocrine organs located in the area of the brain (D32.0–D33.9, D35.2–D35.4, D42.0–D43.9, D44.3–D44.5), and other tumours of lymphoid, haematopoietic and related tissue (D45–D47).

In Figure 1, which shows the leading cancer sites in Estonia in 2022, as well as in Tables 6a and 6b (showing the distribution of new cancer cases by cancer site and the most valid basis of diagnosis) and Tables 7a, 7b, 8a and 8b (showing the distribution of new cancer cases by site and extent and the stage of disease), the percentage proportions may not sum to exactly 100% due to rounding.

Cancer incidence data include cases diagnosed during person's lifetime, cases diagnosed at autopsy, and cases registered solely based on a death certificate. The analysis of TNM staging distribution only includes cancer cases for which the ECR has information that cancer was diagnosed while the patient was alive.

Cancer survival analysis is based on data on incident cases diagnosed in patients aged ≥ 15 years, excluding autopsy and death certificate only cases. Follow-up for vital status was conducted by linkage with the Estonian Causes of Death Registry and the Estonian Population Registry. Cancer survival was measured as one-year, five-year and ten-year relative survival ratios, calculated as the ratio of the observed survival of cancer patients to the expected survival of the underlying general population [3]. Expected survival was calculated based on population lifetables stratified by gender, age, and calendar year according to Ederer II method [4]. The one-year, five-year and ten-year relative survival ratios can be interpreted as the proportion of patients alive (not dead from cancer) one, five or ten years after being diagnosed with cancer. Period method was used to calculate survival for 2019–2023 [5]. International Cancer Survival Standards were used for age-standardization [6]. To evaluate the change in relative survival for selected sites, the age-standardized five-year relative survival for 2009–2013, 2014–2018 and 2019–2023 was calculated (cohort method was used for earlier periods) [5].

In addition to incidence and survival, this report focused on assessing stage-specific incidence trends for selected cancer sites, which allows for a more accurate measurement of the effectiveness of early cancer detection. Overall and stage-specific age-standardized incidence rates were modeled using change point regression to detect the annual percentage change (APC) with 95% confidence interval (95% CI).

1 Leading cancer sites

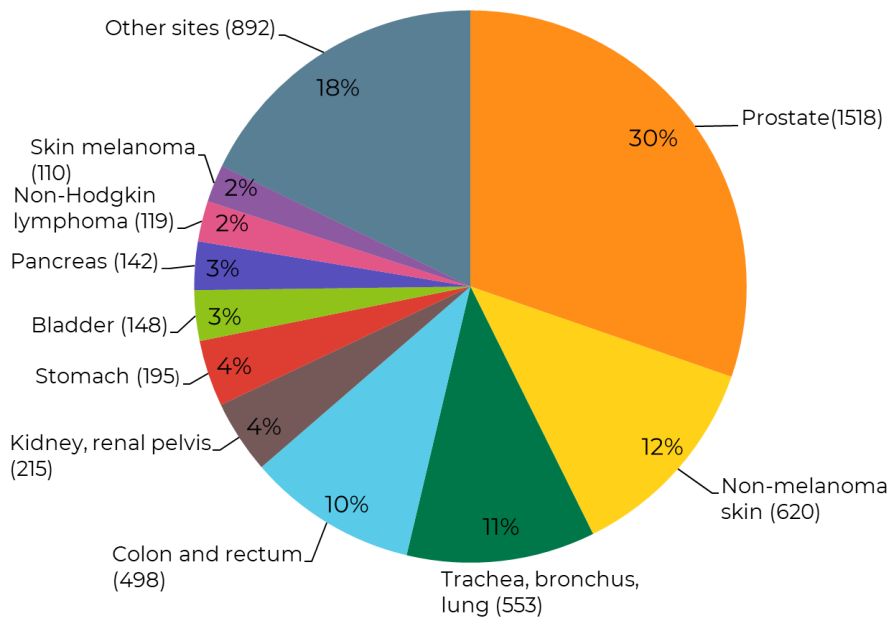
9,835 new cancer cases were registered in Estonia in 2023 – 5,010 in men and 4,825 in women. Excluding non-melanoma skin, the total number of cancer cases was 8,194. The most common cancer sites are shown in Figure 1.

The leading cancer site in men was the prostate with 1500 cases (30% of all cancers in men), followed by non-melanoma skin (12%), lung cancer (11%) and colorectal cancer (10%). Kidney and renal pelvis, stomach, bladder, pancreas, non-Hodgkin lymphoma and skin melanoma were also among the ten leading sites in men.

In women, the most common sites were non-melanoma skin (21% of all cancer cases) and the breast (18%), followed by colon and rectum (11%), lung (6%) and corpus uteri (5%). Among the ten most common sites were also pancreas, stomach, ovary, skin melanoma and kidney and renal pelvis.

Tables 1a and 1b show the number of new cancer cases in 2023 as well as the crude and age-standardized incidence rates per 100,000 persons in men and women for the ten leading cancer sites.

Men



Women

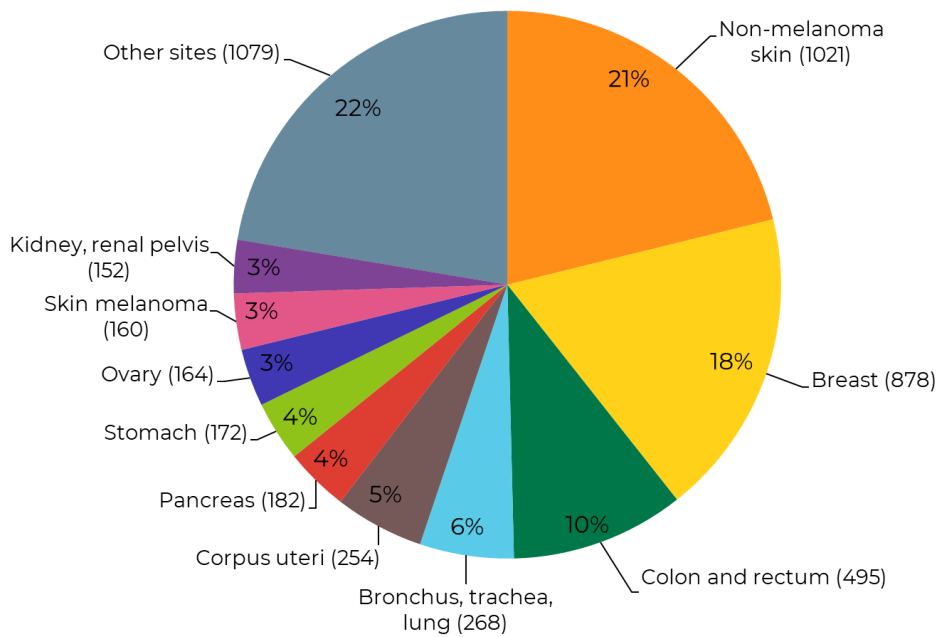


Figure 1. Leading cancer sites in Estonia 2023 (n, %).

Table 1a. Leading cancer sites in Estonia in men, 2023

| Cancer site | ICD-10 | New cases | | Incidence rate per 100,000 | |
|-------------------------|------------|-----------|------|----------------------------|---------------|
| | | Number | % | Crude | Standardized* |
| Prostate | C61 | 1,518 | 30.3 | 233.7 | 124.2 |
| Non-melanoma skin | C44 | 620 | 12.4 | 95.5 | 48.3 |
| Trachea, bronchus, lung | C33–C34 | 553 | 11.0 | 85.1 | 43.1 |
| Colon | C18 | 304 | 6.1 | 46.8 | 23.8 |
| Kidney, renal pelvis | C64–C65 | 215 | 4.3 | 33.1 | 18.1 |
| Stomach | C16 | 195 | 3.9 | 30.0 | 15.3 |
| Rectum | C19–20 | 194 | 3.9 | 29.9 | 15.5 |
| Bladder | C67 | 148 | 3.0 | 22.8 | 11.0 |
| Pancreas | C25 | 142 | 2.8 | 21.9 | 11.3 |
| Non-Hodgkin lymphoma | C82–C85/96 | 119 | 2.4 | 18.3 | 10.8 |
| All sites | C00–C97 | 5,010 | 100 | 771.4 | 412.9 |

* Age-standardized to the world standard population.

Table 1b. Leading cancer sites in Estonia in women, 2023

| Cancer site | ICD-10 | New cases | | Incidence rate per 100,000 | |
|-------------------------|---------|-----------|------|----------------------------|---------------|
| | | Number | % | Crude | Standardized* |
| Non-melanoma skin | C44 | 1,021 | 21.2 | 141.6 | 57.1 |
| Breast | C50 | 878 | 18.2 | 121.8 | 66.4 |
| Colon | C18 | 375 | 7.8 | 47.9 | 16.3 |
| Trachea, bronchus, lung | C33–C34 | 268 | 5.6 | 37.2 | 13.2 |
| Corpus uteri | C54 | 254 | 5.3 | 35.2 | 16.7 |
| Pancreas | C25 | 182 | 3.8 | 25.2 | 8.0 |
| Stomach | C16 | 172 | 3.6 | 23.9 | 8.6 |
| Ovary | C56 | 164 | 3.4 | 22.8 | 11.9 |
| Skin melanoma | C43 | 160 | 3.3 | 22.2 | 11.8 |
| Kidney and renal pelvis | C64–C65 | 152 | 3.2 | 21.1 | 9.2 |
| All sites | C00–C97 | 4,825 | 100 | 669.4 | 296.5 |

* Age-standardized to the world standard population.

2 Cancer incidence by site

Tables 2a and 2b show the number of new cancer cases, as well as the crude and age-standardized incidence rates per 100,000 persons by cancer site in men and women. The number of new cancer cases by age groups and the age-specific incidence rates by cancer site in Estonia are available in the Health Statistics and Health Research Database (https://statistika.tai.ee/index_en.html).

In Tables 3a and 3b, the same data are presented for malignant neoplasms of lymphoid, haematopoietic, and related tissues, which also include polycythaemia vera, myelodysplastic syndromes and other neoplasms of uncertain behaviour of lymphoid, hematopoietic, and related tissue coded as D45–D47 in ICD-10.

The number of *in situ* neoplasms, benign neoplasms, and neoplasms of uncertain or unknown behaviour of the brain and central nervous system, as well as of the endocrine organs located in the area of the brain are presented in Tables 4a and 4b, together with the crude and age-standardized incidence rates for men and women in 2023.

Table 2a. The number of new cases, crude and age-standardized incidence rates (ASIR) of cancer per 100,000 by cancer site in men in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|-------------------------------------|--------------------|---------------------|----------------------------|-------|
| | | | Crude | ASIR* |
| All sites | C00–C97 | 5,010 | 771.4 | 412.9 |
| All sites (excl. non-melanoma skin) | C00–C97, excl. C44 | 4,390 | 675.9 | 364.5 |
| Lip, oral cavity, pharynx | C00–C14 | 157 | 24.2 | 14.4 |
| Lip | C00 | 7 | 1.1 | 0.5 |
| Tongue | C01–C02 | 34 | 5.2 | 3.2 |
| Gum, floor of mouth etc. | C03–C06 | 32 | 4.9 | 3.2 |
| Major salivary glands | C07–C08 | 6 | 0.9 | 0.3 |
| Tonsil, oropharynx | C09–C10 | 34 | 5.2 | 3.1 |
| Nasopharynx | C11 | 5 | 0.8 | 0.5 |
| Pyriiform sinus, hypopharynx | C12–C13 | 37 | 5.7 | 3.5 |
| Other lip, oral cavity, pharynx | C14 | 2 | 0.3 | 0.1 |
| Digestive organs | C15–C26 | 1,049 | 161.5 | 83.9 |
| Oesophagus | C15 | 60 | 9.2 | 5.0 |
| Stomach | C16 | 195 | 30.0 | 15.3 |
| Small intestine | C17 | 20 | 3.1 | 1.5 |
| Colon | C18 | 304 | 46.8 | 23.8 |
| Rectum | C19–C20 | 194 | 29.9 | 15.5 |
| Anus and anal canal | C21 | 6 | 0.9 | 0.5 |
| Liver etc. | C22 | 96 | 14.8 | 8.3 |
| Gallbladder etc. | C23–C24 | 32 | 4.9 | 2.6 |
| Pancreas | C25 | 142 | 21.9 | 11.3 |

* Standardized to the world standard population.

Table 2a. (continued)

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|------------------------------------|------------|---------------------|----------------------------|-------|
| | | | Crude | ASIR* |
| Other digestive organs | C26 | – | – | – |
| Respiratory, intrathoracic organs | C30–C39 | 613 | 94.4 | 48.3 |
| Nasal cavities, ear, sinuses | C30–C31 | 8 | 1.2 | 0.8 |
| Larynx | C32 | 44 | 6.8 | 3.7 |
| Trachea, bronchus, lung | C33–C34 | 553 | 85.1 | 43.1 |
| Thymus, heart, mediastinum, pleura | C37–C38 | 8 | 1.2 | 0.7 |
| Respiratory organs etc. | C39 | – | – | – |
| Bone, articular cartilage | C40–C41 | 13 | 2.0 | 1.8 |
| Skin melanoma | C43 | 110 | 16.9 | 9.3 |
| Non-melanoma skin | C44 | 620 | 95.5 | 48.3 |
| Mesothelial and soft tissues | C45–C49 | 36 | 5.5 | 3.7 |
| Breast | C50 | 6 | 0.9 | 0.5 |
| Male genital organs | C60–C63 | 1,569 | 241.6 | 131.5 |
| Penis | C60 | 15 | 2.3 | 1.2 |
| Prostate | C61 | 1,518 | 233.7 | 124.2 |
| Testis | C62 | 36 | 5.5 | 6.1 |
| Other male genital organs | C63 | – | – | – |
| Urinary organs | C64–C68 | 374 | 57.6 | 30.0 |
| Kidney, renal pelvis | C64–C65 | 215 | 33.1 | 18.1 |
| Ureter | C66 | 8 | 1.2 | 0.6 |
| Bladder | C67 | 148 | 22.8 | 11.0 |
| Other urinary organs | C68 | 3 | 0.5 | 0.2 |
| Eye | C69 | 8 | 1.2 | 0.8 |
| Brain, central nervous system | C70–C72 | 62 | 9.5 | 6.3 |
| Meninges | C70 | 1 | 0.2 | 0.1 |
| Brain | C71 | 60 | 9.2 | 6.1 |
| Other central nervous system | C72 | 1 | 0.2 | 0.1 |
| Thyroid gland | C73 | 26 | 4.0 | 2.4 |
| Other endocrine | C74–C75 | – | – | – |
| Site unknown or uncertain | C76–C80 | 52 | 8.0 | 3.6 |
| Hodgkin lymphoma | C81 | 14 | 2.2 | 2.0 |
| Non-Hodgkin lymphoma | C82–C85/96 | 119 | 18.3 | 10.8 |
| Immunoproliferative diseases | C88 | 4 | 0.6 | 0.3 |
| Multiple myeloma | C90 | 63 | 9.7 | 5.0 |
| Leukaemia | C91–C95 | 115 | 17.7 | 10.0 |
| Independent multiple sites | C97 | – | – | – |

* Standardized to the world standard population.

Table 2b. The number of new cases, crude and age-standardized incidence rates (ASIR) of cancer per 100,000 by cancer site, in women in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|-------------------------------------|--------------------|---------------------|----------------------------|-------|
| | | | Crude | ASIR* |
| All sites | C00–C97 | 4,825 | 669.4 | 296.5 |
| All sites (excl. non-melanoma skin) | C00–C97, excl. C44 | 3,804 | 527.7 | 239.4 |
| Lip, oral cavity, pharynx | C00–C14 | 79 | 11.0 | 5.1 |
| Lip | C00 | 4 | 0.6 | 0.1 |
| Tongue | C01–C02 | 28 | 3.9 | 1.8 |
| Gum, floor of mouth etc. | C03–C06 | 14 | 1.9 | 0.7 |
| Major salivary glands | C07–C08 | 13 | 1.8 | 1.0 |
| Tonsil, oropharynx | C09–C10 | 13 | 1.8 | 1.0 |
| Nasopharynx | C11 | 1 | 0.1 | 0.1 |
| Pyriform sinus, hypopharynx | C12–C13 | 6 | 0.8 | 0.5 |
| Other lip, oral cavity, pharynx | C14 | – | – | – |
| Digestive organs | C15–C26 | 1,014 | 140.7 | 48.7 |
| Oesophagus | C15 | 22 | 3.1 | 1.4 |
| Stomach | C16 | 172 | 23.9 | 8.6 |
| Small intestine | C17 | 17 | 2.4 | 1.0 |
| Colon | C18 | 345 | 47.9 | 16.3 |
| Rectum etc. | C19–C20 | 150 | 20.8 | 7.5 |
| Anus and anal canal | C21 | 24 | 3.3 | 1.3 |
| Liver etc. | C22 | 47 | 6.5 | 2.1 |
| Gallbladder etc. | C23–C24 | 51 | 7.1 | 2.3 |
| Pancreas | C25 | 182 | 25.2 | 8.0 |
| Other digestive organs | C26 | 4 | 0.6 | 0.1 |
| Respiratory, intrathoracic organs | C30–C39 | 289 | 40.1 | 14.5 |
| Nasal cavities, ear, sinuses | C30–C31 | 6 | 0.8 | 0.3 |
| Larynx | C32 | 8 | 1.1 | 0.5 |
| Trachea, bronchus, lung | C33–C34 | 268 | 37.2 | 13.2 |
| Thymus, heart, mediastinum, pleura | C37–C38 | 7 | 1.0 | 0.5 |
| Respiratory organs etc. | C39 | – | – | – |
| Bone, articular cartilage | C40–C41 | 8 | 1.1 | 0.7 |
| Skin melanoma | C43 | 160 | 22.2 | 11.8 |
| Non-melanoma skin | C44 | 1,021 | 141.6 | 57.1 |

* Standardized to the world standard population.

Table 2b. (continued)

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|-------------------------------|------------|---------------------|----------------------------|-------|
| | | | Crude | ASIR* |
| Mesothelial and soft tissues | C45–C49 | 32 | 4.4 | 2.2 |
| Breast | C50 | 878 | 121.8 | 66.4 |
| Female genital organs | C51–C58 | 610 | 84.6 | 43.4 |
| Vulva, vagina | C51–C52 | 41 | 5.7 | 2.2 |
| Cervix uteri | C53 | 132 | 18.3 | 11.1 |
| Corpus uteri | C54 | 254 | 35.2 | 16.7 |
| Uterus unspecified | C55 | 3 | 0.4 | 0.1 |
| Ovary | C56 | 164 | 22.8 | 11.9 |
| Other female genital organs | C57 | 13 | 1.8 | 1.0 |
| Placenta | C58 | 3 | 0.4 | 0.5 |
| Urinary organs | C64–C68 | 193 | 26.8 | 11.0 |
| Kidney, renal pelvis | C64–C65 | 152 | 21.1 | 9.2 |
| Ureter | C66 | 4 | 0.6 | 0.2 |
| Bladder | C67 | 36 | 5.0 | 1.6 |
| Other urinary organs | C68 | 1 | 0.1 | – |
| Eye | C69 | 15 | 2.1 | 0.8 |
| Brain, central nervous system | C70–C72 | 54 | 7.5 | 4.1 |
| Meninges | C70 | 1 | 0.1 | 0.1 |
| Brain | C71 | 53 | 7.4 | 3.9 |
| Other central nervous system | C72 | – | – | – |
| Thyroid gland | C73 | 89 | 12.3 | 8.8 |
| Other endocrine | C74–C75 | 4 | 0.6 | 0.3 |
| Site unknown or uncertain | C76–C80 | 60 | 8.3 | 2.1 |
| Hodgkin lymphoma | C81 | 12 | 1.7 | 1.8 |
| Non-Hodgkin lymphoma | C82–C85/96 | 142 | 19.7 | 8.0 |
| Immunoproliferative diseases | C88 | 2 | 0.3 | – |
| Multiple myeloma | C90 | 52 | 7.2 | 3.1 |
| Leukaemia | C91–C95 | 111 | 15.4 | 6.7 |
| Independent multiple sites | C97 | – | – | – |

* Standardized to the world standard population.

Table 3a. The number of new cases of malignant neoplasms of lymphoid, haematopoietic and related tissues, crude and age-standardized incidence rates (ASIR) per 100,000, in men in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|--|-------------|---------------------|----------------------------|-------|
| | | | Crude | ASIR* |
| Hodgkin lymphoma | C81 | 14 | 2.2 | 2.0 |
| Non-Hodgkin lymphoma | C82–C85/96 | 119 | 18.3 | 10.8 |
| Immunoproliferative diseases | C88 | 4 | 0.6 | 0.3 |
| Multiple myeloma | C90 | 63 | 9.7 | 5.0 |
| Leukaemia | C91–C95 | 115 | 17.7 | 10.0 |
| Lymphoid leukaemia | C91 | 66 | 10.2 | 5.7 |
| Acute lymphoid leukaemia | C91.0 | 6 | 0.9 | 0.9 |
| Chronic lymphoid leukaemia | C91.1 | 57 | 8.8 | 4.4 |
| Other lymphoid leukaemia | C91.2–C91.9 | 3 | 0.5 | 0.3 |
| Myeloid leukaemia | C92 | 46 | 7.1 | 4.1 |
| Acute myeloid leukaemia | C92.0 | 19 | 2.9 | 1.7 |
| Chronic myeloid leukaemia | C92.1 | 22 | 3.4 | 1.8 |
| Other myeloid leukaemia | C92.2–C92.9 | 5 | 0.8 | 0.5 |
| Other leukaemia | C93–C95 | 3 | 0.5 | 0.3 |
| Polycythaemia vera | D45 | 20 | 3.1 | 1.6 |
| Myelodysplastic syndromes | D46 | 30 | 4.6 | 2.1 |
| Other neoplasms of lymphoid, haematopoietic and related tissue | D47 | 38 | 5.9 | 3.2 |

* Standardized to the world standard population.

Table 3b. The number of new cases of malignant neoplasms of lymphoid, haematopoietic, and related tissues, crude and age-standardized incidence rates (ASIR) per 100,000, in women in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|--|-------------|---------------------|----------------------------|-------|
| | | | Crude | ASIR* |
| Hodgkin lymphoma | C81 | 12 | 1.7 | 1.8 |
| Non-Hodgkin lymphoma | C82–C85/96 | 142 | 19.7 | 8.0 |
| Immunoproliferative diseases | C88 | 2 | 0.3 | – |
| Multiple myeloma | C90 | 52 | 7.2 | 3.1 |
| Leukaemia | C91–C95 | 111 | 15.4 | 6.7 |
| Lymphoid leukaemia | C91 | 62 | 8.6 | 3.8 |
| Acute lymphoid leukaemia | C91.0 | 3 | 0.4 | 1.1 |
| Chronic lymphoid leukaemia | C91.1 | 57 | 7.9 | 2.6 |
| Other lymphoid leukaemia | C91.2–C91.9 | 2 | 0.3 | 0.1 |
| Myeloid leukaemia | C92 | 45 | 6.2 | 2.6 |
| Acute myeloid leukaemia | C92.0 | 27 | 3.7 | 1.4 |
| Chronic myeloid leukaemia | C92.1 | 12 | 1.7 | 0.5 |
| Other myeloid leukaemia | C92.2–C92.9 | 6 | 0.8 | 0.7 |
| Other leukaemia | C93–C95 | 4 | 0.6 | 0.2 |
| Polycythaemia vera | D45 | 21 | 2.9 | 1.0 |
| Myelodysplastic syndromes | D46 | 23 | 3.2 | 0.8 |
| Other neoplasms of lymphoid, haematopoietic and related tissue | D47 | 61 | 8.5 | 4.0 |

* Standardized to the world standard population.

Table 4a. The number of new cases of neoplasms *in situ*, benign, and uncertain or unknown behaviour*, along with crude and age-standardized incidence rates (ASIR) per 100,000 by cancer site in men in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|--|--------------------------|---------------------|----------------------------|----------------|
| | | | Crude | Standardized** |
| <i>In situ</i> neoplasms | D00–D09 | 226 | 34.8 | 17.7 |
| Digestive organs excl. oesophagus and stomach | D01 | 5 | 0.8 | 0.4 |
| Skin melanoma | D03 | 58 | 8.9 | 5.5 |
| Non-melanoma skin | D04 | 67 | 10.3 | 4.4 |
| Neoplasms of benign and uncertain or unknown behaviour of brain and central nervous system | D32, D33, D42, D43 | 48 | 7.4 | 4.7 |
| Meninges | D32, D42 | 32 | 4.9 | 2.7 |
| Brain, central nervous system | D33, D43 | 16 | 2.5 | 2.0 |
| Neoplasms of benign and uncertain or unknown behaviour of intracranial endocrine glands | D35.2–D35.4, D44.3–D44.5 | 13 | 2.0 | 1.3 |

* Neoplasms reportable to the Estonian Cancer Registry.

** Standardized to the world standard population.

Table 4b. The number of new cases of neoplasms *in situ*, benign, and uncertain or unknown behaviour*, along with crude and age-standardized incidence rates (ASIR) per 100,000 by cancer site in women in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Incidence rate per 100,000 | |
|--|--------------------------|---------------------|----------------------------|----------------|
| | | | Crude | Standardized** |
| <i>In situ</i> neoplasms | D00–D09 | 268 | 37.2 | 17.8 |
| Digestive organs excl. oesophagus and stomach | D01 | 4 | 0.6 | 0.4 |
| Skin melanoma | D03 | 67 | 9.3 | 6.2 |
| Non-melanoma skin | D04 | 97 | 13.5 | 3.5 |
| Breast | D05 | 41 | 5.7 | 3.6 |
| Cervix uteri | D06 | 15 | 2.1 | 1.9 |
| Neoplasms of benign and uncertain or unknown behaviour of brain and central nervous system | D32, D33, D42, D43 | 89 | 12.3 | 6.4 |
| Meninges | D32, D42 | 72 | 10.0 | 4.4 |
| Brain, central nervous system | D33, D43 | 17 | 2.4 | 2.0 |
| Neoplasms of benign and uncertain or unknown behaviour of intracranial endocrine glands | D35.2–D35.4, D44.3–D44.5 | 9 | 1.2 | 1.0 |

*Neoplasms reportable to the Estonian Cancer Registry.

** Standardized to the world standard population.

3 Cancer incidence by age

Age-specific cancer incidence rates in 2023 among men and women are presented in Figure 2. Cancer incidence increases with age – half of all cancer cases were diagnosed in people aged 70 years or older (48% in men and 52% in women).

In women younger than 55 years, incidence rates are slightly higher than in men, whereas in men, incidence increases rapidly from age 55 and is significantly higher than in women in older age groups. Cancer in children and young adults is rare – in 2023, 21 cases were diagnosed in 0–14 year-old children, 36 cases in 15–24 age-group and 287 new cases in age-group 25–39.

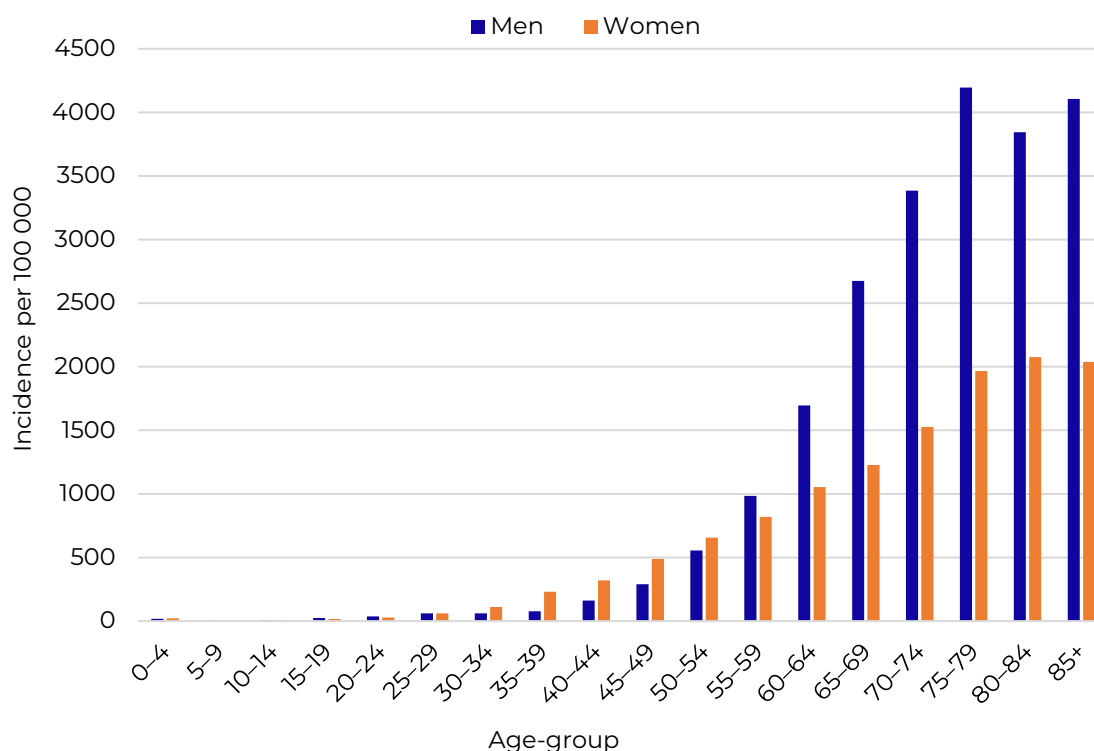


Figure 2. Age-specific cancer incidence in Estonia, 2023.

Tables 5a and 5b show that the most common cancer sites vary across age groups.

In boys aged 0–14, tumours of mesothelial and soft tissues and leukaemia were diagnosed most frequently; in girls leukaemia and tumours of kidney and renal pelvis.

In age group 15–34, the most common cancer sites were testis, brain and non-Hodgkin lymphoma in men, and thyroid, non-melanoma skin and the breast in women.

In age group 35–54, the most frequently diagnosed cancer sites were the prostate, non-melanoma skin and kidney and renal pelvis; in women the breast followed by non-melanoma skin and cervix uteri in women.

In men aged 55–74, the most common cancer sites were the same as in the general population – the prostate, lung cancer and non-melanoma skin. In women, the most frequent cancer site was breast like in the general population, followed by non-melanoma skin and corpus uteri.

In age group 75 and older, the most frequently diagnosed cancer sites in men were also the prostate, non-melanoma skin and lung. In women, the most common cancer site was non-melanoma skin, followed by the breast and colon.

Table 5a. Eight leading cancer sites by age group in men in Estonia, 2023

| Age group / Cancer site | ICD-10 | New cases | |
|----------------------------------|--------------|-----------|------|
| | | Number | % |
| Age group 0–14 | | | |
| Mesothelial and soft tissues | C45–C49 | 3 | 30.0 |
| Leukaemia | C91–C95 | 2 | 20.0 |
| Liver | C22 | 2 | 20.0 |
| Testis | C60 | 1 | 10.0 |
| Kidney, renal pelvis | C64–C65 | 1 | 10.0 |
| Colon | C18 | 1 | 10.0 |
| All sites | C00–C97 | 10 | 100 |
| Age group 15–34 | | | |
| Testis | C62 | 19 | 61.3 |
| Brain and central nervous system | C70–C72 | 8 | 25.8 |
| Non-Hodgkin lymphoma | C82–C85, C96 | 8 | 25.8 |
| Hodgkin lymphoma | C81 | 7 | 22.6 |
| Non-melanoma skin | C44 | 6 | 19.4 |
| Bone, articular cartilage | C40–C41 | 5 | 16.1 |
| Leukaemia | C91–C95 | 5 | 16.1 |
| Skin melanoma | C43 | 3 | 9.7 |
| All sites | C00–C97 | 74 | 100 |
| Age group 35–54 | | | |
| Prostate | C61 | 108 | 20.9 |
| Non-melanoma skin | C44 | 75 | 14.5 |
| Kidney, renal pelvis | C64–C65 | 38 | 7.4 |
| Lip, oral cavity, pharynx | C00–C14 | 35 | 6.8 |
| Trachea, bronchus, lung | C33–C34 | 27 | 5.2 |
| Non-Hodgkin lymphoma | C82–C85, C96 | 25 | 4.8 |
| Colon | C18 | 24 | 4.6 |
| Rectum etc. | C19–C20 | 19 | 3.7 |
| All sites | C00–C97 | 517 | 100 |
| Age group 55–74 | | | |
| Prostate | C61 | 1,044 | 36.1 |
| Trachea, bronchus, lung | C33–C34 | 356 | 12.3 |
| Non-melanoma skin | C44 | 289 | 10.0 |
| Colon | C18 | 151 | 5.2 |
| Kidney, renal pelvis | C64–C65 | 116 | 4.0 |
| Rectum etc. | C19–C20 | 107 | 3.8 |
| Stomach | C16 | 106 | 3.7 |
| Lip, oral cavity, pharynx | C00–C14 | 94 | 3.3 |
| All sites | C00–C97 | 2,888 | 100 |

*In age group 0–14 all sites are shown, in other age-groups 8 more common sites are shown.

Table 5a. (continued)

| Age group / Cancer site | ICD-10 | New cases | |
|-------------------------|---------|-----------|------|
| | | Number | % |
| Age group ≥75 | | | |
| Prostate | C61 | 366 | 24.1 |
| Non-melanoma skin | C44 | 250 | 16.4 |
| Trachea, bronchus, lung | C33–C34 | 170 | 11.2 |
| Colon | C18 | 125 | 8.2 |
| Stomach | C16 | 71 | 4.7 |
| Rectum etc. | C19–C20 | 67 | 4.4 |
| Urinary bladder | C67 | 62 | 4.1 |
| Kidney, renal pelvis | C64–C65 | 59 | 3.9 |
| All sites | C00–C97 | 1,521 | 100 |

Table 5b. Eight leading cancer sites by age group in women in Estonia, 2023

| Age group / Cancer site | ICD-10 | New cases | |
|----------------------------------|---------|-----------|------|
| | | Number | % |
| Age group 0–14 | | | |
| Leukaemia | C91–C95 | 3 | 27.3 |
| Kidney, renal pelvis | C64–C65 | 3 | 27.3 |
| Brain and central nervous system | C70–C72 | 1 | 9.1 |
| Mesothelial and soft tissues | C45–C49 | 1 | 9.1 |
| Hodgkin lymphoma | C81 | 1 | 9.1 |
| Colon | C18 | 1 | 9.1 |
| Non-melanoma skin | C44 | 1 | 9.1 |
| All sites | C00–C97 | 11 | 100 |
| Age group 15–34 | | | |
| Thyroid gland | C73 | 17 | 19.3 |
| Non-melanoma skin | C44 | 13 | 14.8 |
| Breast | C50 | 11 | 12.5 |
| Skin melanoma | C43 | 10 | 11.4 |
| Cervix uteri | C53 | 5 | 5.7 |
| Hodgkin lymphoma | C81 | 5 | 5.7 |
| Colon | C18 | 4 | 4.5 |
| Ovary | C56 | 2 | 2.3 |
| All sites | C00–C97 | 88 | 100 |
| Age group 35–54 | | | |
| Breast | C50 | 258 | 32.3 |
| Non-melanoma skin | C44 | 155 | 19.4 |
| Cervix uteri | C53 | 48 | 6.0 |
| Skin melanoma | C43 | 45 | 5.6 |
| Corpus uteri | C54 | 39 | 4.9 |
| Ovary | C56 | 34 | 4.3 |
| Thyroid gland | C73 | 27 | 3.4 |
| Colon | C18 | 22 | 2.8 |
| All sites | C00–C97 | 799 | 100 |
| Age group 55–74 | | | |
| Breast | C50 | 411 | 19.6 |
| Non-melanoma skin | C44 | 393 | 18.8 |
| Corpus uteri | C54 | 147 | 7.0 |
| Trachea, bronchus, lung | C33–C34 | 132 | 6.3 |
| Colon | C18 | 130 | 6.2 |
| Ovary | C56 | 90 | 4.3 |
| Kidney, renal pelvis | C64–C65 | 80 | 3.8 |
| Pancreas | C25 | 75 | 3.6 |
| All sites | C00–C97 | 2,094 | 100 |

*In age group 0–14 all sites are shown, in other age-groups 8 more common sites are shown.

Table 5b. (continued)

| Age-group / Cancer site | ICD-10 | New cases | |
|-------------------------|---------|-----------|------|
| | | Number | % |
| Age-group ≥75 | | | |
| Non-melanoma skin | C44 | 459 | 25.0 |
| Breast | C50 | 198 | 10.8 |
| Colon | C18 | 188 | 10.3 |
| Bronchus, trachea, lung | C33–C34 | 117 | 6.4 |
| Pancreas | C25 | 97 | 5.3 |
| Stomach | C16 | 91 | 5.0 |
| Rectum | C19–C20 | 69 | 3.8 |
| Corpus uteri | C54 | 67 | 3.7 |
| All sites | C00–C97 | 1,833 | 100 |

4 Cancer cases by basis of diagnosis

The basis of diagnosis is an important indicator that reflects the accuracy of cancer diagnosis and data quality in a cancer registry. The distribution of new cancer cases by cancer site and the most valid basis of diagnosis are presented in Tables 6a and 6b.

One of the most important data quality indicators of a cancer registry is the percentage of microscopically verified (with histological, cytological, or haematological confirmation) cancer cases. In 2023, 92% of new cases were microscopically verified, indicating rather good quality [7].

An important method used to achieve high completeness of cancer cases is comparing the data of the ECR with the data of Estonian Causes of Death Registry. If the ECR has no record of a cancer diagnosis noted on a death certificate, it initiates a trace-back to the healthcare facility that issued the death certificate. Such cases are labelled death certificate initiated (DCI) cases. In 2023, the proportion of DCI cases was 3%, which is relatively low, but still indicates to some incompleteness in the notification of cancer cases to the ECR. Among DCI cases, lung cancer was the most frequent (22%), followed by cancers of unknown or uncertain site (11%), kidney and renal pelvis cancer (9%), and prostate cancer (7%).

Cases that are registered solely based on death certificates after conducting unsuccessful trace-back of death certificate notifications, are called death certificate only (DCO) cases. In DCO cases, the date of cancer diagnosis in the ECR is the same as the date of death, although cancer may have been diagnosed shortly before death or sometimes a long time before death. A high proportion of DCO cases indicates incomplete reporting of cancer cases, as well as unsuccessful data trace-backs conducted by the cancer registry [7]. In 2023, the percentage of DCO cases was rather low (2%) in Estonia, indicating good data quality [8].

Table 6a. The distribution of new cancer cases by cancer site and the most valid basis of diagnosis in men in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Microscopic (%)* | Non-microscopic (%)** | Death certificate only (%)*** |
|-------------------------------------|--------------------|---------------------|------------------|-----------------------|-------------------------------|
| All sites | C00–C97 | 5,010 | 92.5 | 5.5 | 2.0 |
| All sites (excl. non-melanoma skin) | C00–C97, excl. C44 | 4,390 | 91.5 | 6.2 | 2.3 |
| Lip, oral cavity, pharynx | C00–C14 | 157 | 94.9 | 3.8 | 1.3 |
| Lip | C00 | 7 | 100 | – | – |
| Tongue | C01–C02 | 34 | 97.1 | 2.9 | – |
| Gum, floor of mouth etc. | C03–C06 | 32 | 100 | – | – |
| Major salivary glands | C07–C08 | 6 | 100 | – | – |
| Tonsil, oropharynx | C09–C10 | 34 | 88.2 | 11.8 | – |
| Nasopharynx | C11 | 5 | 100 | – | – |
| Pyriform sinus, hypopharynx | C12–C13 | 37 | 94.6 | 2.7 | 2.7 |
| Other lip, oral cavity, pharynx | C14 | 2 | 50.0 | – | 50.0 |
| Digestive organs | C15–C26 | 1,049 | 87.3 | 10.6 | 2.1 |
| Oesophagus | C15 | 60 | 91.7 | 5.0 | 3.3 |
| Stomach | C16 | 195 | 92.8 | 5.1 | 2.1 |
| Small intestine | C17 | 20 | 100 | – | – |
| Colon | C18 | 304 | 94.7 | 3.6 | 1.6 |
| Rectum | C19–C20 | 194 | 95.9 | 2.6 | 1.5 |
| Anus and anal canal | C21 | 6 | 100 | – | – |
| Liver etc. | C22 | 96 | 70.8 | 27.1 | 2.1 |
| Gallbladder etc. | C23–C24 | 32 | 71.9 | 25.0 | 3.1 |
| Pancreas | C25 | 142 | 62.7 | 33.8 | 3.5 |

* Histology, autopsy with histology, cytology, haematology.

** Clinical only, instrumental clinical, biochemical/immunological, surgery/autopsy without histology.

*** Cases registered solely based on death certificates.

Table 6a. (continued)

| Cancer site | ICD-10 | Number of new cases | Microscopic (%)* | Non-microscopic (%)** | Death certificate only (%)*** |
|------------------------------------|---------|---------------------|------------------|-----------------------|-------------------------------|
| Other digestive organs | C26 | – | – | – | – |
| Respiratory, intrathoracic organs | C30–C39 | 613 | 84.7 | 11.3 | 4.1 |
| Nasal cavities, ear, sinuses | C30–C31 | 8 | 87.5 | 12.5 | – |
| Larynx | C32 | 44 | 97.7 | 2.3 | – |
| Trachea, bronchus, lung | C33–C34 | 553 | 83.7 | 11.8 | 4.5 |
| Thymus, heart, mediastinum, pleura | C37–C38 | 8 | 75.0 | 25.0 | – |
| Respiratory organs etc. | C39 | – | – | – | – |
| Bone, articular cartilage | C40–C41 | 13 | 84.6 | – | 15.4 |
| Skin melanoma | C43 | 110 | 99.1 | – | 0.9 |
| Non-melanoma skin | C44 | 620 | 99.5 | 0.3 | 0.2 |
| Mesothelial and soft tissues | C45–C49 | 36 | 86.1 | 11.1 | 2.8 |
| Breast | C50 | 6 | 100 | – | – |
| Male genital organs | C60–C63 | 1,569 | 97.8 | 1.1 | 1.1 |
| Penis | C60 | 15 | 100 | – | – |
| Prostate | C61 | 1,518 | 97.8 | 1.1 | 1.2 |
| Testis | C62 | 36 | 97.2 | 2.8 | – |
| Other male genital organs | C63 | – | – | – | – |
| Urinary organs | C64–C68 | 374 | 90.1 | 7.2 | 2.7 |
| Kidney, renal pelvis | C64–C65 | 215 | 87.9 | 8.8 | 3.3 |
| Ureter | C66 | 8 | 100 | – | – |
| Bladder | C67 | 148 | 93.2 | 4.7 | 2.0 |

* Histology, autopsy with histology, cytology, haematology.

** Clinical only, instrumental clinical, biochemical/immunological, surgery/autopsy without histology.

*** Cases registered solely based on death certificates.

Table 6a. (continued)

| Cancer site | ICD-10 | Number of new cases | Microscopic (%)* | Non-microscopic (%)** | Death certificate only (%)*** |
|-------------------------------|-------------|---------------------|------------------|-----------------------|-------------------------------|
| Other urinary organs | C68 | 3 | 66.7 | 33.3 | – |
| Eye | C69 | 8 | 25.0 | 75.0 | – |
| Brain, central nervous system | C70–C72 | 62 | 80.6 | 19.4 | – |
| Meninges | C70 | 1 | 100 | – | – |
| Brain | C71 | 60 | 81.7 | 18.3 | – |
| Other central nervous system | C72 | 1 | – | 100 | – |
| Thyroid gland | C73 | 26 | 92.3 | 3.8 | 3.8 |
| Other endocrine | C74–C75 | – | – | – | – |
| Site unknown or uncertain | C76–C80 | 52 | 40.4 | 38.5 | 21.2 |
| Hodgkin lymphoma | C81 | 14 | 100 | – | – |
| Non-Hodgkin lymphoma | C82–C85/C96 | 119 | 99.2 | – | 0.8 |
| Immunoproliferative diseases | C88 | 4 | 100 | – | – |
| Multiple myeloma | C90 | 63 | 96.8 | 1.6 | 1.6 |
| Leukaemia | C91–C95 | 115 | 95.7 | – | 4.3 |
| Independent multiple sites | C97 | – | – | – | – |

* Histology, autopsy with histology, cytology, haematology.

** Clinical only, instrumental clinical, biochemical/immunological, surgery/autopsy without histology.

*** Cases registered solely based on death certificates.

Table 6b. The distribution of new cancer cases by cancer site and the most valid basis of diagnosis in women in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Microscopic (%)* | Non-microscopic (%)** | Death certificate only (%)*** |
|-------------------------------------|--------------------|---------------------|------------------|-----------------------|-------------------------------|
| All sites | C00–C97 | 4,825 | 91.4 | 6.7 | 1.9 |
| All sites (excl. non-melanoma skin) | C00–C97, excl. C44 | 3,804 | 89.5 | 8.2 | 2.4 |
| Lip, oral cavity, pharynx | C00–C14 | 79 | 93.7 | 3.8 | 2.5 |
| Lip | C00 | 4 | 75.0 | – | 25.0 |
| Tongue | C01–C02 | 28 | 92.9 | 7.1 | – |
| Gum, floor of mouth etc. | C03–C06 | 14 | 92.9 | – | 7.1 |
| Major salivary glands | C07–C08 | 13 | 100 | – | – |
| Tonsil, oropharynx | C09–C10 | 13 | 92.3 | 7.7 | – |
| Nasopharynx | C11 | 1 | 100 | – | – |
| Pyramidal sinus, hypopharynx | C12–C13 | 6 | 100 | – | – |
| Other lip, oral cavity, pharynx | C14 | – | – | – | – |
| Digestive organs | C15–C26 | 1,014 | 83.0 | 14.0 | 3.0 |
| Oesophagus | C15 | 22 | 90.9 | 9.1 | – |
| Stomach | C16 | 172 | 89.5 | 6.4 | 4.1 |
| Small intestine | C17 | 17 | 94.1 | 5.9 | – |
| Colon | C18 | 345 | 92.2 | 7.2 | 0.6 |
| Rectum | C19–C20 | 150 | 94.0 | 5.3 | 0.7 |
| Anus and anal canal | C21 | 24 | 91.7 | 8.3 | – |
| Liver etc. | C22 | 47 | 63.8 | 29.8 | 6.4 |
| Gallbladder etc. | C23–C24 | 51 | 64.7 | 29.4 | 5.9 |
| Pancreas | C25 | 182 | 58.8 | 34.1 | 7.1 |

* Histology, autopsy with histology, cytology, haematology.

** Clinical only, instrumental clinical, biochemical/immunological, surgery/autopsy without histology.

*** Cases registered solely based on death certificates.

Table 6b. (continued)

| Cancer site | ICD-10 | Number of new cases | Microscopic (%)* | Non-microscopic (%)** | Death certificate only (%)*** |
|------------------------------------|---------|---------------------|------------------|-----------------------|-------------------------------|
| Other digestive organs | C26 | 4 | 25.0 | 50.0 | 25.0 |
| Respiratory, intrathoracic organs | C30–C39 | 289 | 79.2 | 16.6 | 4.2 |
| Nasal cavities, ear, sinuses | C30–C31 | 6 | 83.3 | 16.7 | – |
| Larynx | C32 | 8 | 87.5 | 12.5 | – |
| Trachea, bronchus, lung | C33–C34 | 268 | 78.4 | 17.2 | 4.5 |
| Thymus, heart, mediastinum, pleura | C37–C38 | 7 | 100 | – | – |
| Respiratory organs etc. | C39 | – | – | – | – |
| Bone, articular cartilage | C40–C41 | 8 | 87.5 | 12.5 | – |
| Skin melanoma | C43 | 160 | 99.4 | 0.6 | – |
| Non-melanoma skin | C44 | 1,021 | 98.7 | 1.0 | 0.3 |
| Mesothelial and soft tissues | C45–C49 | 32 | 93.8 | 3.1 | 3.1 |
| Breast | C50 | 878 | 96.9 | 2.3 | 0.8 |
| Female genital organs | C51–C58 | 610 | 95.1 | 2.8 | 2.1 |
| Vulva, vagina | C51–C52 | 41 | 95.1 | – | 4.9 |
| Cervix uteri | C53 | 132 | 97.7 | 1.5 | 0.8 |
| Corpus uteri | C54 | 254 | 97.2 | 2.4 | 0.4 |
| Uterus unspecified | C55 | 3 | 33.3 | – | 66.7 |
| Ovary | C56 | 164 | 91.5 | 4.9 | 3.7 |
| Other female genital organs | C57 | 13 | 84.6 | 7.7 | 7.7 |

* Histology, autopsy with histology, cytology, haematology.

** Clinical only, instrumental clinical, biochemical/immunological, surgery/autopsy without histology.

*** Cases registered solely based on death certificates.

Table 6b. (continued)

| Cancer site | ICD-10 | Number of new cases | Microscopic (%)* | Non-microscopic (%)** | Death certificate only (%)*** |
|-------------------------------|------------|---------------------|------------------|-----------------------|-------------------------------|
| Placenta | C58 | 3 | 100 | – | – |
| Urinary organs | C64–C68 | 193 | 82.9 | 14.5 | 2.6 |
| Kidney, renal pelvis | C64–C65 | 152 | 82.9 | 14.5 | 2.6 |
| Ureter | C66 | 4 | 50.0 | 50.0 | – |
| Bladder | C67 | 36 | 86.1 | 11.1 | 2.8 |
| Other urinary organs | C68 | 1 | 100 | – | – |
| Eye | C69 | 15 | 26.7 | 73.3 | – |
| Brain, central nervous system | C70–C72 | 54 | 75.9 | 18.5 | 5.6 |
| Meninges | C70 | 1 | 100 | – | – |
| Brain | C71 | 53 | 75.5 | 18.9 | 5.7 |
| Other central nervous system | C72 | – | – | – | – |
| Thyroid gland | C73 | 89 | 100 | – | – |
| Other endocrine | C74–C75 | 4 | 75.0 | – | 25.0 |
| Site unknown or uncertain | C76–C80 | 60 | 36.7 | 46.7 | 16.7 |
| Hodgkin lymphoma | C81 | 12 | 100 | – | – |
| Non-Hodgkin lymphoma | C82–C85/96 | 142 | 97.2 | – | 2.8 |
| Immunoproliferative diseases | C88 | 2 | 100 | – | – |
| Multiple myeloma | C90 | 52 | 96.2 | 1.9 | 1.9 |
| Leukaemia | C91–C95 | 111 | 99.1 | – | 0.9 |
| Independent multiple sites | C97 | – | – | – | – |

* Histology, autopsy with histology, cytology, haematology.

** Clinical only, instrumental clinical, biochemical/immunological, surgery/autopsy without histology.

***Cases registered solely based on death certificates.

5 Extent of disease at diagnosis

5.1 Extent of solid tumours at diagnosis

The extent of solid tumours is defined as following: localized tumour confined entirely to the organ where it started; spread to regional lymph nodes only; spread to adjacent tissues; spread to other distant organs or distant lymph nodes (distant metastasis).

The development of cancer in the human body is usually a slow process and early diagnosis is crucial for the patient's prognosis. Unfortunately, a significant proportion of new cancer cases in Estonia are diagnosed after the disease has already spread beyond the primary tumour site. In 2023, 56% of the new cancer cases were localized at the time of diagnosis, whereas around 16% of men and 15% of women already had distant metastasis.

The distribution of new cancer cases by the extent of disease at the time of diagnosis for different solid cancers in men and women is presented in Tables 7a and 7b.

The highest proportion of distant metastasis at diagnosis was seen in pancreatic cancer both in men (39%) and women (43%). The proportion of lung cancer with distant metastasis at the time of diagnosis has increased in both sexes, reaching 35% in men and 44% in women (in 2022 33% and 34%, respectively). The proportion of colorectal cancer with distant metastasis in both men and women has somewhat decreased, remaining around 21%. In men, the proportion of distant metastasis was also high for stomach (41%) and oesophageal cancer (32%); in women, this was the case for stomach (34%) and ovarian cancer (26%). About half of the breast cancers and 67% of prostate cancers were locally spread at the time of diagnosis, whereas respectively 8% and 9% of cases already had distant metastasis.

The extent of disease was unknown for around 9% of all solid tumours, but for some cancer sites the proportion of unknown extent was much higher – for instance, the extent was unknown for about 20% of all oesophageal and 17% of liver cancers in men and 18% of pancreatic and 17% of stomach cancers in women. However, based only on the data of the ECR, it is not possible to ascertain whether the extent was unspecified at the health care facility or not reported to the registry.

Table 7a. The distribution of new cancer cases by site and extent of disease in men in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Localized (%) | Regional lymph nodes only (%) | Regional, adjacent tissues (%) | Distant metastasis (%) | Unknown (%) |
|-------------------------------------|--------------------|---------------------|---------------|-------------------------------|--------------------------------|------------------------|-------------|
| All sites | C00–C80 | 4,695 | 55.8 | 8.4 | 11.0 | 16.3 | 8.6 |
| All sites (excl. non-melanoma skin) | C00–C80, excl. C44 | 4,075 | 49.4 | 9.6 | 12.6 | 18.7 | 9.6 |
| Lip, oral cavity, pharynx | C00–C14 | 157 | 21.7 | 32.5 | 33.8 | 5.1 | 7.0 |
| Lip | C00 | 7 | 85.7 | – | 14.3 | – | – |
| Tongue | C01–C02 | 34 | 26.5 | 35.3 | 32.4 | 2.9 | 2.9 |
| Gum, floor of mouth etc. | C03–C06 | 32 | 31.3 | 31.3 | 31.3 | 6.3 | – |
| Major salivary glands | C07–C08 | 6 | 16.7 | 16.7 | 50.0 | 16.7 | – |
| Tonsil, oropharynx | C09–C10 | 34 | 11.8 | 32.4 | 38.2 | 5.9 | 11.8 |
| Nasopharynx | C11 | 5 | – | 20.0 | 80.0 | – | – |
| Pyriform sinus, hypopharynx | C12–C13 | 37 | 10.8 | 43.2 | 29.7 | 5.4 | 10.8 |
| Other lip, oral cavity, pharynx | C14 | 2 | – | – | – | – | 100 |
| Digestive organs | C15–C26 | 1,049 | 32.7 | 18.7 | 7.2 | 29.3 | 12.1 |
| Oesophagus | C15 | 60 | 15.0 | 31.7 | 1.7 | 31.7 | 20.0 |
| Stomach | C16 | 195 | 23.6 | 15.4 | 4.6 | 41.0 | 15.4 |
| Small intestine | C17 | 20 | 15.0 | 15.0 | 25.0 | 45.0 | – |
| Colon | C18 | 304 | 45.1 | 18.8 | 7.6 | 21.4 | 7.2 |
| Rectum etc. | C19–C20 | 194 | 32.0 | 28.9 | 6.7 | 20.1 | 12.4 |
| Anus and anal canal | C21 | 6 | 66.7 | – | – | 33.3 | – |
| Liver etc. | C22 | 96 | 45.8 | 3.1 | 3.1 | 31.3 | 16.7 |
| Gallbladder etc. | C23–C24 | 32 | 25.0 | 9.4 | 31.3 | 25.0 | 9.4 |
| Pancreas | C25 | 142 | 21.1 | 17.6 | 8.5 | 38.7 | 14.1 |

Table 7a. (continued)

| Cancer site | ICD-10 | Number of new cases | Localized (%) | Regional lymph nodes only (%) | Regional, adjacent tissues (%) | Distant metastasis (%) | Unknown (%) |
|------------------------------------|---------|---------------------|---------------|-------------------------------|--------------------------------|------------------------|-------------|
| Other digestive organs | C26 | – | – | – | – | – | – |
| Respiratory, intrathoracic organs | C30–C39 | 613 | 27.7 | 16.2 | 10.9 | 32.8 | 12.4 |
| Nasal cavities, ear, sinuses | C30–C31 | 8 | 12.5 | – | 62.5 | 25.0 | – |
| Larynx | C32 | 44 | 54.5 | 2.3 | 31.8 | – | 11.4 |
| Trachea, bronchus, lung | C33–C34 | 553 | 25.5 | 17.7 | 8.7 | 35.3 | 12.8 |
| Thymus, heart, mediastinum, pleura | C37–C38 | 8 | 50.0 | – | – | 50.0 | – |
| Respiratory organs etc. | C39 | – | – | – | – | – | – |
| Bone, articular cartilage | C40–C41 | 13 | 53.8 | – | – | 23.1 | 23.1 |
| Skin melanoma | C43 | 110 | 59.1 | 5.5 | 15.5 | 11.8 | 8.2 |
| Non-melanoma skin | C44 | 620 | 97.6 | 0.2 | 0.5 | 0.3 | 1.5 |
| Mesothelial and soft tissues | C45–C49 | 36 | 50.0 | – | 5.6 | 22.2 | 22.2 |
| Breast | C50 | 6 | 33.3 | 66.7 | – | – | – |
| Male genital organs | C60–C63 | 1,569 | 66.3 | 1.1 | 17.0 | 9.2 | 6.3 |
| Penis | C60 | 15 | 33.3 | 40.0 | 6.7 | 13.3 | 6.7 |
| Prostate | C61 | 1,518 | 66.7 | 0.7 | 17.5 | 8.8 | 6.5 |
| Testis | C62 | 36 | 66.7 | 5.6 | 2.8 | 25.0 | – |
| Other male genital organs | C63 | – | – | – | – | – | – |
| Urinary organs | C64–C68 | 374 | 69.8 | 1.3 | 7.8 | 13.9 | 7.2 |
| Kidney, renal pelvis | C64–C65 | 215 | 64.2 | 1.9 | 8.8 | 17.7 | 7.4 |
| Ureter | C66 | 8 | 75.0 | – | 12.5 | 12.5 | – |
| Bladder | C67 | 148 | 78.4 | 0.7 | 6.1 | 7.4 | 7.4 |
| Other urinary organs | C68 | 3 | 33.3 | – | – | 66.7 | – |

Table 7a. (continued)

| Cancer site | ICD-10 | Number of new cases | Localized (%) | Regional lymph nodes only (%) | Regional, adjacent tissues (%) | Distant metastasis (%) | Unknown (%) |
|-------------------------------|---------|---------------------|---------------|-------------------------------|--------------------------------|------------------------|-------------|
| Eye | C69 | 8 | 100 | – | – | – | – |
| Brain, central nervous system | C70–C72 | 62 | 91.9 | – | – | – | 8.1 |
| Meninges | C70 | 1 | 100 | – | – | – | – |
| Brain | C71 | 60 | 93.3 | – | – | – | 6.7 |
| Other central nervous system | C72 | 1 | – | – | – | – | 100 |
| Thyroid gland | C73 | 26 | 34.6 | 42.3 | 7.7 | 7.7 | 7.7 |
| Other endocrine | C74–C75 | – | – | – | – | – | – |
| Site unknown or uncertain | C76–C80 | 52 | – | 3.8 | – | 46.2 | 50.0 |

Table 7b. The distribution of new cancer cases by site and extent of disease in women in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases | Localized (%) | Regional lymph nodes only (%) | Regional, adjacent tissues (%) | Distant metastasis (%) | Unknown (%) |
|-------------------------------------|--------------------|---------------------|---------------|-------------------------------|--------------------------------|------------------------|-------------|
| All sites | C00–C80 | 4,506 | 56.3 | 12.1 | 7.9 | 14.7 | 8.9 |
| All sites (excl. non-melanoma skin) | C00–C80, excl. C44 | 3,485 | 44.0 | 15.6 | 10.2 | 19.1 | 11.1 |
| Lip, oral cavity, pharynx | C00–C14 | 79 | 41.8 | 21.5 | 19.0 | 6.3 | 11.4 |
| Lip | C00 | 4 | 75.0 | – | – | – | 25.0 |
| Tongue | C01–C02 | 28 | 46.4 | 21.4 | 14.3 | 7.1 | 10.7 |
| Gum, floor of mouth etc. | C03–C06 | 14 | 50.0 | 7.1 | 14.3 | 7.1 | 21.4 |
| Major salivary glands | C07–C08 | 13 | 53.8 | 15.4 | 23.1 | 7.7 | – |
| Tonsil, oropharynx | C09–C10 | 13 | 23.1 | 38.5 | 23.1 | – | 15.4 |
| Nasopharynx | C11 | 1 | – | 100 | – | – | – |
| Pyriiform sinus, hypopharynx | C12–C13 | 6 | – | 33.3 | 50.0 | 16.7 | – |
| Other lip, oral cavity, pharynx | C14 | – | – | – | – | – | – |
| Digestive organs | C15–C26 | 1,014 | 31.4 | 16.8 | 8.6 | 30.0 | 13.3 |
| Oesophagus | C15 | 22 | 13.6 | 27.3 | 4.5 | 50.0 | 4.5 |
| Stomach | C16 | 172 | 31.4 | 13.4 | 4.1 | 33.7 | 17.4 |
| Small intestine | C17 | 17 | 29.4 | 17.6 | 5.9 | 41.2 | 5.9 |
| Colon | C18 | 345 | 41.2 | 15.4 | 8.7 | 25.2 | 9.6 |
| Rectum etc. | C19–C20 | 150 | 31.3 | 28.7 | 14.0 | 16.0 | 10.0 |
| Anus and anal canal | C21 | 24 | 45.8 | 29.2 | 8.3 | 8.3 | 8.3 |
| Liver etc. | C22 | 47 | 29.8 | 4.3 | 4.3 | 40.4 | 21.3 |
| Gallbladder etc. | C23–C24 | 51 | 17.6 | 15.7 | 19.6 | 29.4 | 17.6 |
| Pancreas | C25 | 182 | 18.1 | 13.7 | 7.1 | 42.9 | 18.1 |

Table 7b. (continued)

| Cancer site | ICD-10 | Number of new cases | Localized (%) | Regional lymph nodes only (%) | Regional, adjacent tissues (%) | Distant metastasis (%) | Unknown (%) |
|------------------------------------|---------|---------------------|---------------|-------------------------------|--------------------------------|------------------------|-------------|
| Other digestive organs | C26 | 4 | – | – | – | 75.0 | 25.0 |
| Respiratory, intrathoracic organs | C30–C39 | 289 | 29.4 | 11.8 | 4.5 | 41.5 | 12.8 |
| Nasal cavities, ear, sinuses | C30–C31 | 6 | 16.7 | – | 66.7 | – | 16.7 |
| Larynx | C32 | 8 | 62.5 | – | 25.0 | – | 12.5 |
| Trachea, bronchus, lung | C33–C34 | 268 | 27.6 | 12.7 | 2.6 | 44.0 | 13.1 |
| Thymus, heart, mediastinum, pleura | C37–C38 | 7 | 71.4 | – | – | 28.6 | – |
| Respiratory organs etc. | C39 | – | – | – | – | – | – |
| Bone, articular cartilage | C40–C41 | 8 | 62.5 | 12.5 | – | 12.5 | 12.5 |
| Skin melanoma | C43 | 160 | 71.3 | 10.6 | 9.4 | 6.3 | 2.5 |
| Non-melanoma skin | C44 | 1,021 | 98.1 | 0.3 | 0.2 | – | 1.4 |
| Mesothelial and soft tissues | C45–C49 | 32 | 62.5 | – | 6.3 | 21.9 | 9.4 |
| Breast | C50 | 878 | 49.3 | 29.3 | 2.3 | 8.0 | 11.2 |
| Female genital organs | C51–C58 | 610 | 44.3 | 4.6 | 28.9 | 14.4 | 7.9 |
| Vulva, vagina | C51–C52 | 41 | 43.9 | 22.0 | 12.2 | 9.8 | 12.2 |
| Cervix uteri | C53 | 132 | 29.5 | 6.8 | 47.7 | 9.8 | 6.1 |
| Corpus uteri | C54 | 254 | 73.2 | 3.5 | 9.1 | 9.4 | 4.7 |
| Uterus unspecified | C55 | 3 | – | – | – | – | 100 |
| Ovary | C56 | 164 | 15.2 | 0.6 | 47.6 | 25.6 | 11.0 |
| Other female genital organs | C57 | 13 | 15.4 | – | 53.8 | 15.4 | 15.4 |

Table 7b. (continued)

| Cancer site | ICD-10 | Number of new cases | Localized (%) | Regional lymph nodes only (%) | Regional, adjacent tissues (%) | Distant metastasis (%) | Unknown (%) |
|-------------------------------|---------|---------------------|---------------|-------------------------------|--------------------------------|------------------------|-------------|
| Placenta | C58 | 3 | – | – | – | 100 | – |
| Urinary organs | C64–C68 | 193 | 66.3 | 1.0 | 13.5 | 14.5 | 4.7 |
| Kidney, renal pelvis | C64–C65 | 152 | 67.8 | 1.3 | 12.5 | 15.1 | 3.3 |
| Ureter | C66 | 4 | 50.0 | – | – | 25.0 | 25.0 |
| Bladder | C67 | 36 | 63.9 | – | 19.4 | 11.1 | 5.6 |
| Other urinary organs | C68 | 1 | – | – | – | – | 100 |
| Eye | C69 | 15 | 80.0 | – | 6.7 | – | 13.3 |
| Brain, central nervous system | C70–C72 | 54 | 88.9 | – | – | – | 11.1 |
| Meninges | C70 | 1 | 100 | – | – | – | – |
| Brain | C71 | 53 | 88.7 | – | – | – | 11.3 |
| Other central nervous system | C72 | – | – | – | – | – | – |
| Thyroid gland | C73 | 89 | 76.4 | 18.0 | 1.1 | 4.5 | – |
| Other endocrine | C74–C75 | 4 | 25.0 | – | – | 50.0 | 25.0 |
| Site unknown or uncertain | C76–C80 | 60 | – | – | – | 41.7 | 58.3 |

5.2 TNM staging of selected sites

The TNM staging system is used to describe the size and the extent of cancer. At stages I and II, the tumour is usually localized and rather small. At stage III, the cancer has grown beyond the primary tumour to nearby lymph nodes or organs and tissues. At stage IV, the cancer has spread from the primary tumour to distant organs or distant lymph nodes. TNM values depend on the exact cancer site, and in some cases, on tumour morphology.

The ECR collects data about TNM and the stage of disease at the time of diagnosis, before its progression or before the application of multimodal treatment that may change the tumour's size or spread. Since 2018, the 8th version of TNM Classification is used [9]. The TNM stage distribution of cancer cases diagnosed during person's lifetime in 2023 for selected sites is seen in Tables 8a and 8b and in Figure 3.

In the case of colorectal cancer, an increase in the proportion of cases diagnosed at stage I can be observed (21% in men, 18% in women), while the proportion of cases diagnosed at stage IV somewhat decreased, reaching approximately 22% in both sexes (23% in 2022).

Stage I breast cancer was diagnosed in 34% of cases in women, while the proportion of cases diagnosed with distant metastases reached 8% (7% a year earlier). The number of cervical cancer cases diagnosed in stage I decreased slightly compared to 2022, remaining at around 28% (30% in 2022), while the proportion of cases diagnosed in stage III or IV increased, reaching 53% (46% in 2022).

21% of lung cancer cases in men were diagnosed in stage I (18% in 2022). The proportion of stage IV cases increased in both sexes in 2023, but especially in women, reaching 46% (36% in 2022), however, part of the change may have been due to the proportion of cases with unknown stage, which decreased from 14% to 10% in both sexes.

The proportion of prostate cancer cases at stage I remained around 36% (35% in 2022), while the proportion of cases diagnosed at stage IV continued to decline slightly, being less than 13%. The stage distribution of skin melanoma has remained stable in recent years, and in 2023 a decrease in the proportion of cases diagnosed at stage IV among both sexes could be observed.

The proportion of cancer cases with unknown stage has slightly decreased, remaining around 10%. However, based only on the data of the ECR, it is not possible to ascertain whether the stage was not determined at the health care facility or not reported to the registry.

Stage-specific incidence trends for selected sites are discussed in more detail in chapter 9.

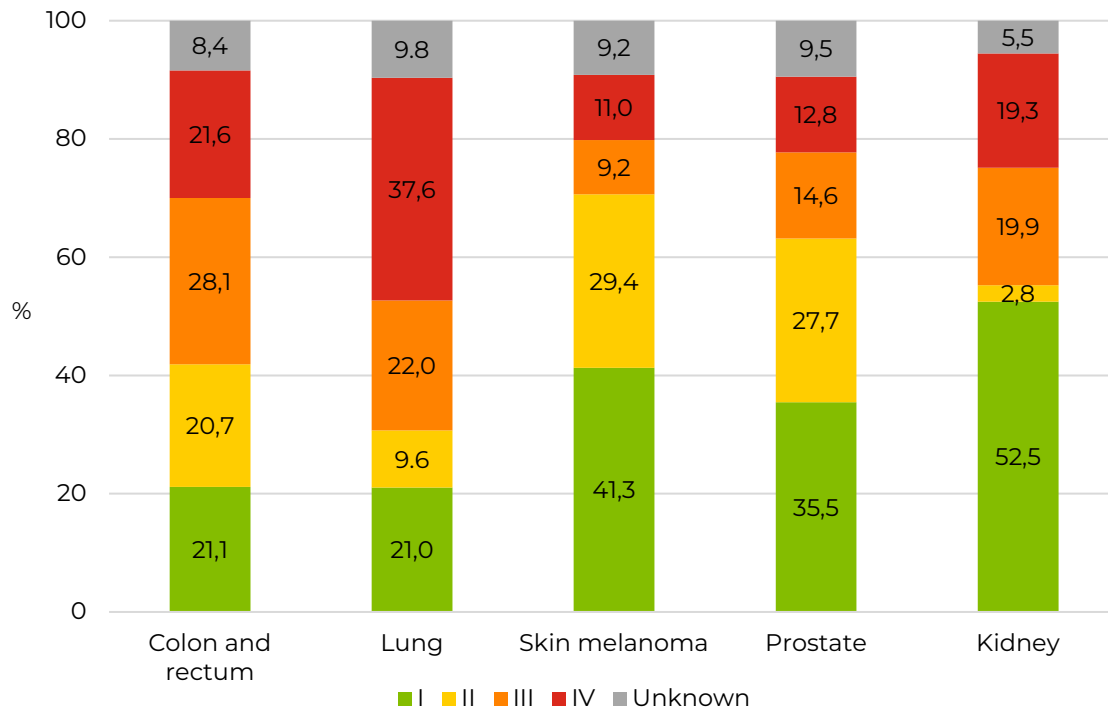
Table 8a. The TNM staging distribution at diagnosis of selected sites during lifetime in men in Estonia, 2023

| Cancer site | ICD-10 | Number of new cases (n) | Stage I (%) | Stage II (%) | Stage III (%) | Stage IV (%) | Stage unknown (%) |
|---------------------------|---------|-------------------------|-------------|--------------|---------------|--------------|-------------------|
| Lip, oral cavity, pharynx | C00–C14 | 154 | 14.3 | 7.1 | 20.1 | 52.0 | 6.5 |
| Oesophagus | C15 | 57 | 5.3 | 12.3 | 26.3 | 38.6 | 17.5 |
| Stomach | C16 | 189 | 15.3 | 13.8 | 11.6 | 42.3 | 16.9 |
| Colon | C18 | 297 | 22.6 | 25.3 | 22.9 | 21.9 | 7.4 |
| Rectum | C19–C20 | 190 | 19.0 | 13.7 | 36.3 | 21.1 | 10.0 |
| Liver etc. | C22 | 90 | 14.4 | 18.9 | 13.3 | 35.6 | 17.8 |
| Gallbladder etc. | C23–C24 | 30 | 6.7 | 26.7 | 20.0 | 30.0 | 16.7 |
| Pancreas | C25 | 135 | 14.1 | 18.5 | 14.1 | 41.5 | 11.9 |
| Larynx | C32 | 42 | 26.2 | 9.5 | 35.7 | 14.3 | 14.3 |
| Trachea, bronchus, lung | C33–C34 | 519 | 21.0 | 9.6 | 22.0 | 37.6 | 9.8 |
| Skin melanoma | C43 | 109 | 41.3 | 29.4 | 9.2 | 11.0 | 9.2 |
| Non-melanoma skin | C44 | 617 | 80.9 | 10.1 | 3.9 | 0.7 | 4.5 |
| Prostate | C61 | 1,491 | 35.5 | 27.7 | 14.6 | 12.8 | 9.5 |
| Testis | C62 | 36 | 55.6 | 13.9 | 22.2 | 2.8 | 5.6 |
| Kidney, renal pelvis | C64–C65 | 197 | 49.8 | 5.1 | 19.3 | 20.8 | 5.1 |
| Urinary bladder | C67 | 143 | 42.7 | 32.2 | 4.9 | 9.1 | 11.2 |
| Thyroid gland | C73 | 23 | 47.8 | 30.4 | 13.0 | 4.4 | 4.4 |

Table 8b. The TNM staging distribution at diagnosis of selected sites during lifetime in women in Estonia, 2023.

| Cancer site | ICD-10 | Number of new cases (n) | Stage I (%) | Stage II (%) | Stage III (%) | Stage IV (%) | Stage unknown (%) |
|---------------------------|---------|-------------------------|-------------|--------------|---------------|--------------|-------------------|
| Lip, oral cavity, pharynx | C00–C14 | 77 | 26.0 | 20.8 | 14.3 | 29.9 | 9.1 |
| Oesophagus | C15 | 21 | – | 4.8 | 38.1 | 52.4 | 4.8 |
| Stomach | C16 | 164 | 17.1 | 18.9 | 7.3 | 34.2 | 22.6 |
| Colon | C18 | 342 | 17.8 | 26.9 | 19.9 | 25.4 | 9.9 |
| Rectum | C19–C20 | 149 | 19.5 | 13.4 | 40.3 | 16.1 | 10.7 |
| Liver etc. | C21 | 24 | 8.3 | 37.5 | 37.5 | 8.3 | 8.3 |
| Gallbladder etc. | C22 | 43 | 16.3 | 4.7 | 11.6 | 48.8 | 18.6 |
| Pancreas | C23–C24 | 47 | 10.6 | 17.0 | 25.5 | 31.9 | 14.9 |
| Larynx | C25 | 167 | 13.2 | 15.0 | 12.0 | 46.7 | 13.2 |
| Trachea, bronchus, lung | C33–C34 | 253 | 24.5 | 5.9 | 13.4 | 46.3 | 9.9 |
| Skin melanoma | C43 | 160 | 55.6 | 20.6 | 13.1 | 5.6 | 5.0 |
| Non-melanoma skin | C44 | 1,048 | 84.1 | 7.2 | 3.2 | 1.2 | 4.4 |
| Breast | C50 | 870 | 34.0 | 38.5 | 11.4 | 8.1 | 8.1 |
| Vagina, vulva | C51–C52 | 39 | 41.0 | 5.1 | 25.6 | 17.9 | 10.3 |
| Cervix uteri | C53 | 131 | 28.2 | 12.2 | 35.9 | 16.8 | 6.9 |
| Corpus uteri | C54 | 252 | 67.5 | 7.5 | 11.1 | 9.9 | 4.0 |
| Ovary | C56 | 158 | 15.8 | 7.0 | 41.8 | 26.0 | 9.5 |
| Kidney, renal pelvis | C64–C65 | 146 | 58.9 | 3.4 | 18.5 | 15.8 | 3.4 |
| Urinary bladder | C67 | 35 | 42.9 | 20.0 | 17.1 | 11.4 | 8.6 |
| Thyroid gland | C73 | 89 | 76.4 | 13.5 | 4.5 | 5.6 | – |

Men



Women

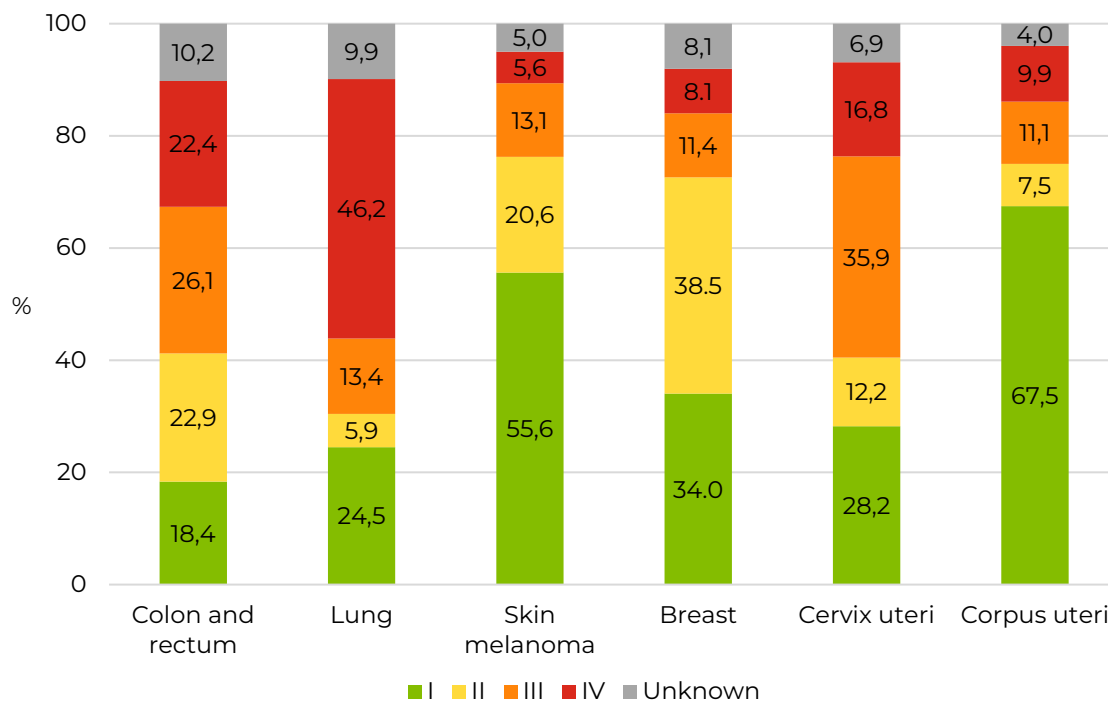


Figure 3. The TNM staging distribution at diagnosis of selected sites during lifetime in Estonia, 2023.

6 Cancer incidence trends

6.1 Total incidence

Cancer incidence data in Estonia are available for more than 50 years. The ageing of the population, improvements in diagnostic methods and increase in lifestyle-related cancers have all contributed to the increasing number of new cancer cases. In 2019, the number of new cancer cases exceeded 9,000 for the first time, but in 2020 and 2021 it declined (8509 and 8376 new cases, respectively) likely due to factors related to the COVID-19 pandemic such as limited access to healthcare services that may have led to a decrease in the number of cases usually detected at screening or cases with mild symptoms diagnosed incidentally during health check-ups. Additionally, COVID-related deaths may have occurred in patients who would otherwise have been diagnosed with cancer in the near future [10]. In 2022, the number of new cancer cases returned to the pre-pandemic level and in 2023 over 9800 new cases were diagnosed (Figure 4).

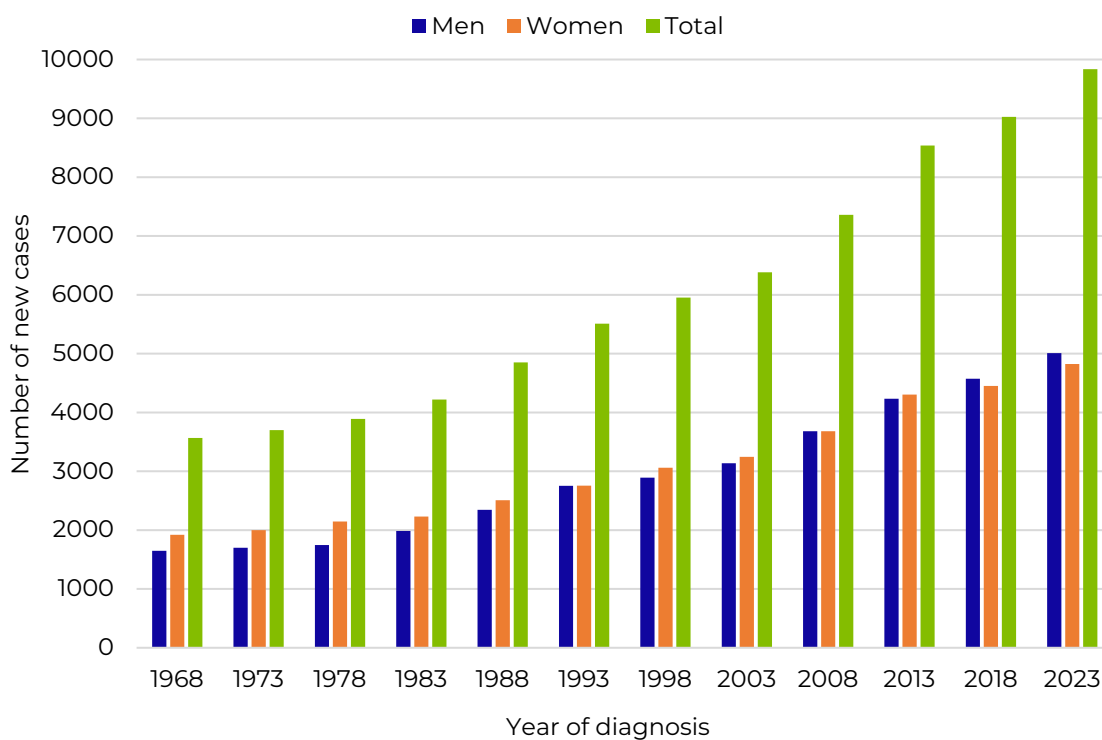


Figure 4. Number of new cancer cases in Estonia in 1968–2023 selected years.

6.2 Incidence trends of selected sites

One of the priorities of the Estonian Cancer Control Plan 2021–2030 is to achieve a decreasing trend in age-standardized cancer incidence through effective prevention activities [11]. Time trends of age-standardized cancer incidence for selected sites in 1968–2023 are presented in Figure 5. In recent decades, overall cancer incidence has decreased in men and stabilized in women [12], but incidence trends vary by cancer site.

The incidence of colon and rectal cancer slightly decreased after 2019, but so far it is difficult to assess, whether the decline is related to the preventive effect of the screening program or the impact of COVID-19 pandemic. In 2023, the colorectal cancer incidence slightly increased in men and decreased in women.

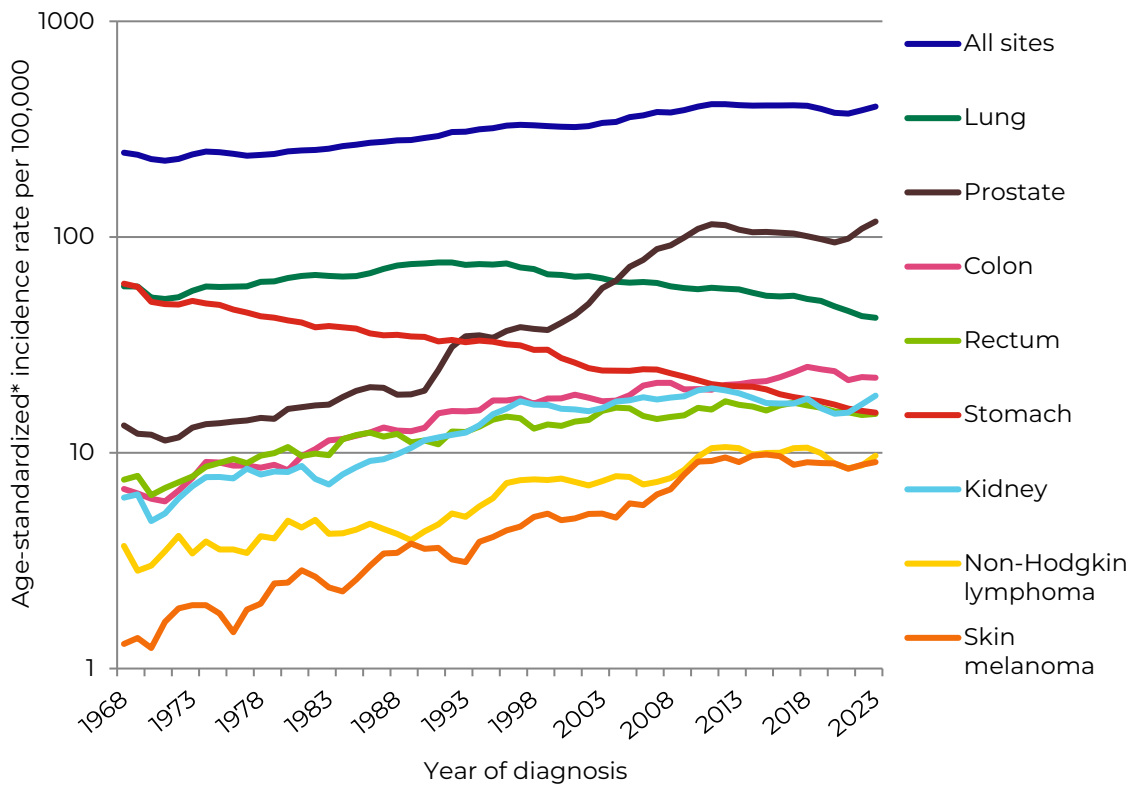
Lung cancer incidence has been in decline for over two decades in men but when compared to 2022, it slightly increased in 2023. In women, lung cancer incidence has been stable. The incidence of stomach cancer has been decreasing in both sexes, whereas breast cancer incidence in women is still rising.

The incidence of prostate cancer had been decreasing since 2011 but increased again in 2022 and also 2023. Available data suggest that the increase is due to overdiagnosis of low-risk tumours resulting from widespread use of prostate-specific antigen (PSA) testing, rather than actual risk increase [12].

Cervical cancer incidence in Estonia remained among one of the highest in Europe [13] but has decreased since 2012. This long-term trend can be associated with the preventive effect of the screening program.

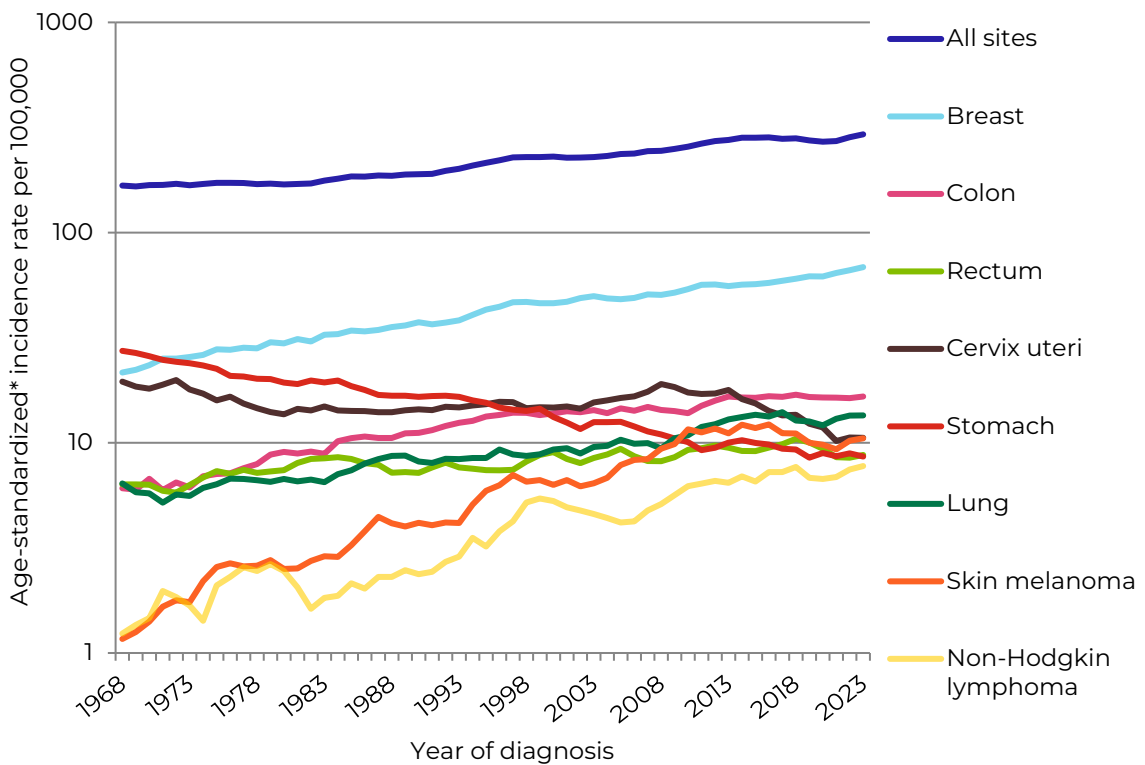
Although the incidence on skin melanoma had somewhat decreased in previous years, in 2023 it increased in both men and women. Kidney cancer incidence has slightly decreased among men in the last decade. The incidence of non-Hodgkin lymphoma has been stable both in men and women.

Men



* Standardized to the world standard population; calculated as the three-year running average.

Women



* Standardized to the world standard population; calculated as the three-year running average.

Figure 5. Trends in age-standardized cancer incidence in Estonia, 1968–2023 (selected sites).

7 Cancer prevalence

Cancer prevalence depends on incidence (the number of new cancer cases diagnosed in the population) and on survival (how long cancer patients survive after diagnosis). As of 31 December 2023, there were 73,303 people in Estonia (30,188 men and 43,115 women) who had been diagnosed with cancer at some point during their lifetime. The number of people with a history of cancer has continuously increased (Figure 6) due to rising cancer incidence and improving survival rates of cancer patients [14].

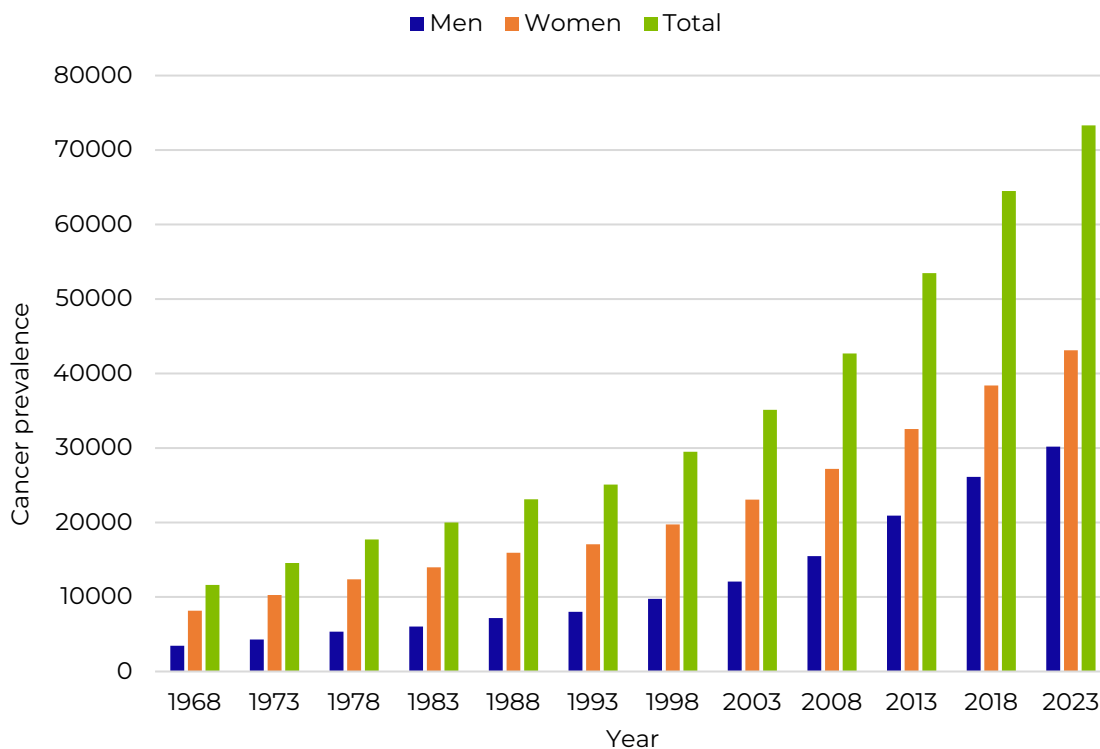


Figure 6. Number of persons with a life-time history of cancer in Estonia at the end of corresponding year.

Since one person can have multiple tumours during their lifetime, the number of prevalent cases was remarkably higher – a total of 81,752, of which 34,239 were in men and 47,513 in women. Excluding non-melanoma skin cancer, the leading site was the prostate (45%) among men and the breast (31%) among women (Tables 9a and 9b). The proportion of corpus uteri cancer was around 10%, the proportions of other sites were less than 8%.

Table 9a. The most frequent cancer sites among prevalent cases in men in Estonia as of 31 December 2023

| Cancer site | ICD-10 | Prevalent cases | |
|------------------------------------|--------------------|-----------------|------|
| | | Number | % |
| Prostate | C61 | 12,537 | 44.6 |
| Colon | C18 | 1,900 | 6.8 |
| Kidney, renal pelvis | C64–C65 | 1,625 | 5.8 |
| Trachea, bronchus, lung | C33–C34 | 1,429 | 5.1 |
| Rectum etc. | C19–21 | 1,349 | 4.8 |
| Bladder | C67 | 1,160 | 4.1 |
| Skin melanoma | C43 | 1,045 | 3.7 |
| Stomach | C16 | 918 | 3.3 |
| All sites except non-melanoma skin | C00–C97, excl. C44 | 28,104 | 100 |

Table 9b. The most frequent cancer sites among prevalent cases in women in Estonia as of 31 December 2023

| Cancer site | ICD-10 | Prevalent cases | |
|------------------------------------|--------------------|-----------------|------|
| | | Number | % |
| Breast | C50 | 11,204 | 31.4 |
| Corpus uteri | C54 | 3,407 | 9.6 |
| Colon | C18 | 2,733 | 7.7 |
| Cervix uteri | C53 | 2,568 | 7.2 |
| Skin melanoma | C43 | 2,036 | 5.7 |
| Rectum etc. | C19–C21 | 1,544 | 4.3 |
| Kidney, renal pelvis | C64–C65 | 1,529 | 4.3 |
| Ovary | C56 | 1,359 | 3.8 |
| All sites except non-melanoma skin | C00–C97, excl. C44 | 35,632 | 100 |

8 Survival

Estimating cancer survival allows a comprehensive assessment of cancer control, as it measures the combined effect of early diagnosis and the efficiency of cancer care. In 2019–2023, the one-year, five-year and ten-year relative survival estimates for all cancer cases diagnosed in Estonia were 79%, 66% and 62%, respectively (Table 10). Excluding non-melanoma skin, the respective estimates were 75%, 60% and 54%. Table 9 presents relative survival ratios for all sites combined and for selected sites. For most sites, survival estimates were higher for women than for men.

Figure 7 shows the change in age-standardized five-year relative survival comparing time-periods 2009–2013, 2014–2018 and 2019–2023. Survival has increased the most for leukaemia (10%), lung cancer and renal cancer (both by 8%). Survival has increased by 7% for Hodgkin lymphoma and rectal cancer, and by 6% for skin melanoma.

One-year, five-year and ten-year relative survival ratios for selected sites by the stage of disease at the time of diagnosis are presented in Table 11. For stage I tumours, the five-year relative survival was >95% in case of skin melanoma, breast cancer in women, prostate and renal cancer and $\geq 90\%$ in case of corpus uteri, colon and rectal cancer. The five-year relative survival for stage II tumours was highest for prostate cancer (100%), breast cancer in women (92%) and colon cancer (91%). In stage IV, the five-year relative survival was less than 30% for most cancer sites, except for prostate cancer (61%).

One important outcome indicator of the Estonian Cancer Control Plan 2021–2030 is relative cancer survival, aiming to achieve survival estimates similar to those seen in the Nordic countries [11]. Age-standardized five-year relative survival for selected sites in Estonia, Finland and Denmark are presented in Table 12 [15]. Survival rates in Estonia are comparable to those in the Nordic countries for stomach, pancreatic, lung, cervical, ovarian, prostate, testicular, and Hodgkin lymphoma. The biggest survival gaps in comparison with the Nordic countries remain for non-Hodgkin's lymphoma and head and neck cancers (lip, oral cavity, pharynx), as well as for colon and rectal cancer, skin melanoma, and breast and corpus uteri cancers.

Table 10. One-year, five-year and ten-year relative survival by cancer site and gender in Estonia in 2019–2023

| Cancer site | ICD-10 | One-year relative survival (%) | | | Five-year relative survival (%) | | | Ten-year relative survival (%) | | |
|-------------------------------------|-------------------|--------------------------------|-----|-------|---------------------------------|-----|-------|--------------------------------|-----|-------|
| | | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| All sites | C00–96 | 79 | 77 | 81 | 66 | 63 | 69 | 62 | 59 | 64 |
| All sites (excl. non-melanoma skin) | C00–96, excl. C44 | 75 | 74 | 77 | 60 | 59 | 61 | 54 | 53 | 55 |
| Lip, oral cavity, pharynx | C00–14 | 71 | 69 | 77 | 48 | 42 | 60 | 39 | 30 | 57 |
| Oesophagus | C15 | 39 | 36 | 49 | 13 | 10 | 23 | 9 | 6 | 23 |
| Stomach | C16 | 53 | 52 | 55 | 32 | 30 | 35 | 28 | 27 | 31 |
| Colon | C18 | 78 | 78 | 79 | 63 | 62 | 63 | 57 | 58 | 57 |
| Rectum etc. | C19–20 | 83 | 82 | 84 | 63 | 62 | 64 | 56 | 55 | 57 |
| Anus and anal canal | C21 | 86 | 71 | 89 | 63 | 54 | 65 | 57 | 66 | 56 |
| Liver | C22 | 32 | 30 | 37 | 11 | 10 | 13 | 5 | 5 | 5 |
| Gallbladder etc. | C23–24 | 34 | 31 | 36 | 13 | 9 | 15 | 10 | 6 | 13 |
| Pancreas | C25 | 27 | 27 | 27 | 7 | 7 | 7 | 5 | 4 | 6 |
| Throat | C32 | 82 | 82 | 75 | 59 | 60 | 50 | 44 | 45 | 41 |
| Lung | C34 | 47 | 44 | 54 | 23 | 19 | 32 | 16 | 13 | 26 |
| Skin melanoma | C43 | 94 | 93 | 94 | 85 | 82 | 87 | 82 | 80 | 85 |
| Non-melanoma skin | C44 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Soft tissues | C48–49 | 78 | 84 | 74 | 53 | 62 | 47 | 48 | 56 | 43 |
| Breast | C50 | 95 | 93 | 95 | 84 | 66 | 84 | 77 | 61 | 77 |
| Cervix uteri | C53 | – | – | 85 | – | – | 68 | – | – | 63 |
| Corpus uteri | C54 | – | – | 90 | – | – | 79 | – | – | 74 |
| Ovary | C56 | – | – | 75 | – | – | 49 | – | – | 36 |
| Prostate | C61 | – | 99 | – | – | 95 | – | – | 92 | – |
| Testis | C62 | – | 99 | – | – | 96 | – | – | 96 | – |
| Kidney | C64 | 85 | 85 | 86 | 74 | 73 | 76 | 67 | 65 | 69 |
| Bladder, other urinary organs | C65–68 | 73 | 75 | 69 | 53 | 56 | 46 | 47 | 49 | 41 |

Table 10. (continued)

| Cancer site | ICD-10 | One-year relative survival (%) | | | Five-year relative survival (%) | | | Ten-year relative survival (%) | | |
|-------------------------------|-----------|--------------------------------|-----|-------|---------------------------------|-----|-------|--------------------------------|-----|-------|
| | | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Brain, central nervous system | C70-72 | 43 | 46 | 39 | 17 | 16 | 17 | 14 | 13 | 15 |
| Thyroid | C73 | 94 | 92 | 94 | 91 | 92 | 90 | 88 | 81 | 90 |
| Hodgkin lymphoma | C81 | 96 | 98 | 92 | 90 | 92 | 88 | 89 | 91 | 88 |
| Non-Hodgkin lymphoma | C82-85/96 | 74 | 73 | 75 | 58 | 59 | 57 | 53 | 53 | 53 |
| Multiple myeloma | C90 | 76 | 78 | 75 | 49 | 51 | 48 | 29 | 27 | 30 |
| Leukaemia | C91-95 | 75 | 77 | 74 | 61 | 61 | 61 | 50 | 50 | 50 |

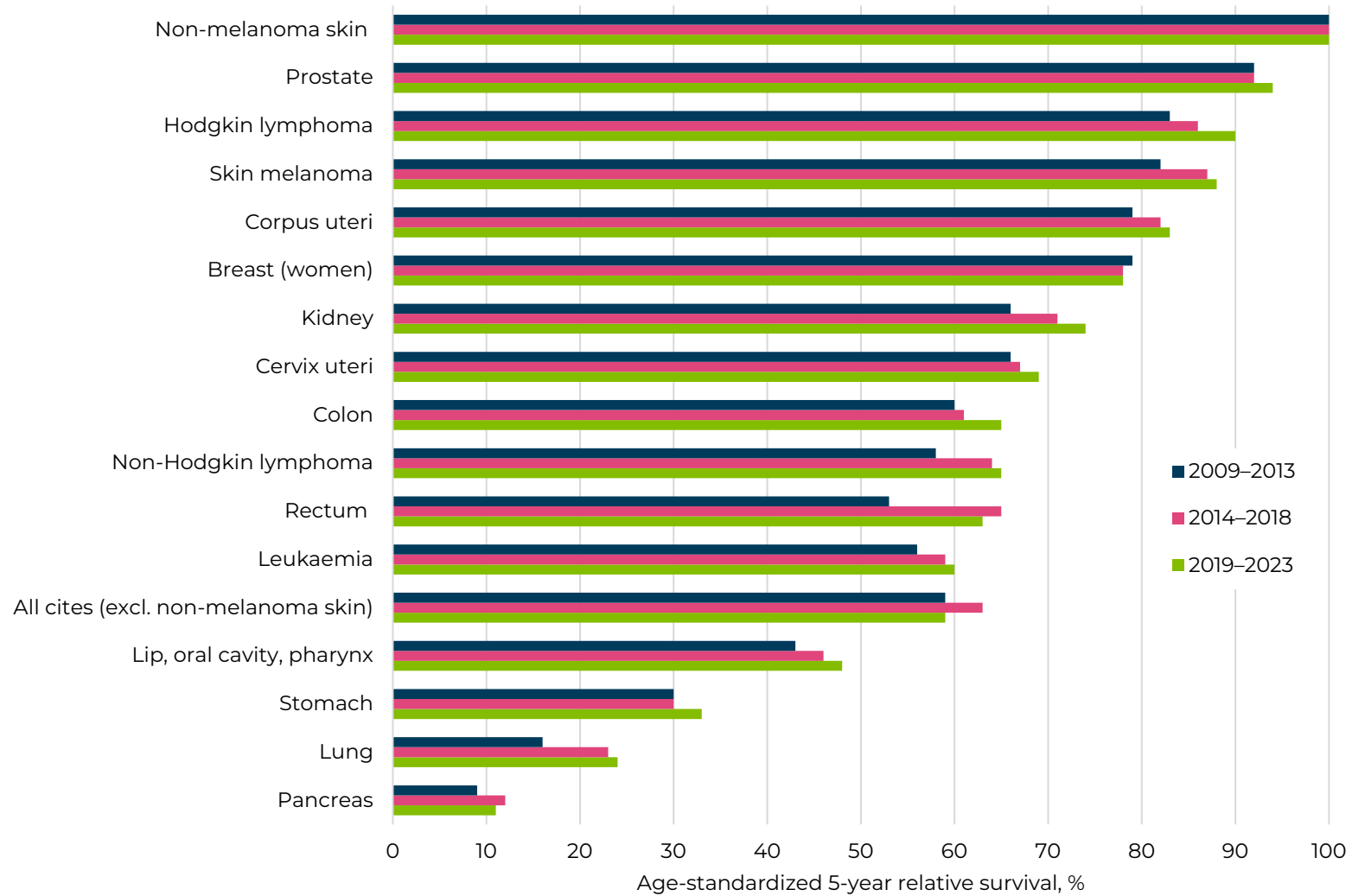


Figure 7. Age-standardized five-year relative survival in Estonia in 2009–2013, 2014–2018 and 2019–2023.

Table 11. One-year, five-year and ten-year relative survival for selected sites by the stage of disease in Estonia in 2019–2023

| Paige | RHK-10 | One-year relative survival (%) | | | | Five-year relative survival (%) | | | | Ten-year relative survival (%) | | | |
|---------------------------|--------|--------------------------------|-----|-----|----|---------------------------------|-----|-----|----|--------------------------------|-----|-----|----|
| | | I | II | III | IV | I | II | III | IV | I | II | III | IV |
| Lip, oral cavity, pharynx | C00–14 | 98 | 95 | 84 | 62 | 87 | 81 | 61 | 30 | 83 | 67 | 42 | 24 |
| Stomach | C16 | 92 | 86 | 77 | 29 | 86 | 68 | 40 | 5 | 81 | 59 | 34 | 4 |
| Colon | C18 | 97 | 94 | 90 | 48 | 94 | 91 | 75 | 14 | 91 | 83 | 73 | 9 |
| Rectum | C19–20 | 98 | 93 | 92 | 53 | 90 | 85 | 76 | 14 | 83 | 74 | 68 | 9 |
| Pancreas | C25 | 70 | 62 | 56 | 13 | 38 | 16 | 4 | 2 | 33 | 10 | 6 | 1 |
| Lung | C34 | 94 | 83 | 60 | 23 | 73 | 56 | 20 | 3 | 56 | 37 | 14 | 2 |
| Skin melanoma | C43 | 100 | 97 | 96 | 47 | 100 | 84 | 66 | 23 | 100 | 76 | 62 | 20 |
| Breast (women) | C50 | 100 | 99 | 97 | 66 | 100 | 92 | 79 | 25 | 98 | 85 | 64 | 9 |
| Corpus uteri | C54 | 99 | 95 | 92 | 41 | 94 | 75 | 66 | 16 | 91 | 63 | 57 | 6 |
| Prostate | C61 | 100 | 100 | 100 | 93 | 100 | 100 | 100 | 61 | 100 | 100 | 95 | 43 |
| Kidney | C64 | 100 | 93 | 94 | 46 | 97 | 86 | 84 | 21 | 96 | 69 | 69 | 10 |

Table 12. Age-standardized five-year relative survival (%) for selected sites in Estonia, Finland, and Denmark [15] in 2019–2023

| Cancer site | ICD-10 | Men | | | Women | | |
|---------------------------|-----------|---------|---------|---------|---------|---------|---------|
| | | Estonia | Finland | Denmark | Estonia | Finland | Denmark |
| Lip, oral cavity, pharynx | C00–14 | 42 | 66 | 63 | 60 | 78 | 71 |
| Stomach | C16 | 30 | 33 | 32 | 37 | 42 | 39 |
| Colon | C18 | 64 | 67 | 72 | 66 | 71 | 73 |
| Rectum | C19–20 | 64 | 70 | 72 | 67 | 74 | 75 |
| Pancreas | C25 | 10 | 11 | 14 | 12 | 14 | 15 |
| Lung | C34 | 19 | 17 | 27 | 36 | 29 | 35 |
| Skin melanoma | C43 | 85 | 93 | 96 | 90 | 95 | 98 |
| Breast | C50 | – | – | – | 83 | 92 | 91 |
| Cervix uteri | C53 | – | – | – | 69 | 70 | 76 |
| Corpus uteri | C54 | – | – | – | 78 | 83 | 83 |
| Ovary | C56 | – | – | – | 46 | 50 | 47 |
| Prostate | C61 | 94 | 94 | 91 | – | – | – |
| Testis | C62 | 96* | 94 | 98 | – | – | – |
| Kidney | C64 | 72 | 76 | 81 | 79 | 74 | 79 |
| Hodgkin lymphoma | C81 | 92 | 90 | 90 | 88 | 92 | 95 |
| Non-Hodgkin lymphoma | C82–85/96 | 57 | 68 | 80 | 61 | 75 | 84 |

* Not standardized due to a small number of cases,

9 Stage-specific incidence of selected cancer sites 2012–2023

9.1 Background

Estimating stage-specific incidence trends allows for a more precise measurement of the effectiveness of early cancer detection when compared to the percentage distribution of stages. For example, the proportion of cases diagnosed at an advanced stage among new cases may decrease only because the number of cases diagnosed at an early stage has increased significantly, e.g. due to the introduction of screening or the implementation of another early detection method. Estimating stage-specific trends allows for monitoring the actual number of cases in the population. An effective screening or early detection measure should initially show an increase in early-stage incidence, followed by a decrease in late-stage incidence. When interpreting stage-specific trends, it should be noted that some cases have unknown stage (i.e., not assigned by the health care facility or not reported to the cancer registry). For the cancer sites analyzed, the proportion of cases with unknown stage was approximately 10% during the study period, and for most cancers this proportion decreased over time.

In Estonia, national population-based screening is implemented for the prevention or early detection of three cancers: breast cancer (since 2004), cervical cancer (2006) and colorectal cancer (2016). In addition, research and pilot projects are underway for the early detection of lung and prostate cancer. In the case of lung cancer, screening is targeted at the risk group, i.e. long-term smokers [16]. In the case of prostate cancer, a risk-based screening pathway is implemented, which is adjusted based on the level of risk identified by various examinations (e.g. ultrasound, magnetic resonance imaging) [17].

9.2 Breast cancer

Breast cancer incidence (all stages combined) showed a statistically significant annual increase by 1.9% in 2012–2023 (Figure 8 and Table 13). Analysis of stage-specific trends shows that the increase in incidence is mainly due to an increase in the number of cases diagnosed in stages I and II, which have increased significantly by more than 3% annually (Figure 9 and Table 13). A slight and not significant decrease is seen in stage III incidence. The incidence of stage IV cases increased until 2018, which may be due to improved diagnostics, as the incidence of unknown stage has decreased. In the period 2018–2021, the incidence of stage IV decreased rapidly (12.2% annually), indicating the effectiveness of screening. However, this was followed by an increase in incidence of 17.2% per year, which may be due to several factors. First, improved diagnostics may be responsible for better detection of distant metastases. Second, new screening cohorts have been added in recent years, and from 2021, women without health insurance have also been able to participate in screening. Third, this may be the impact of the COVID-19 pandemic, which may have limited access to screening or early detection more broadly. Trends need to be monitored further to draw definitive conclusions.

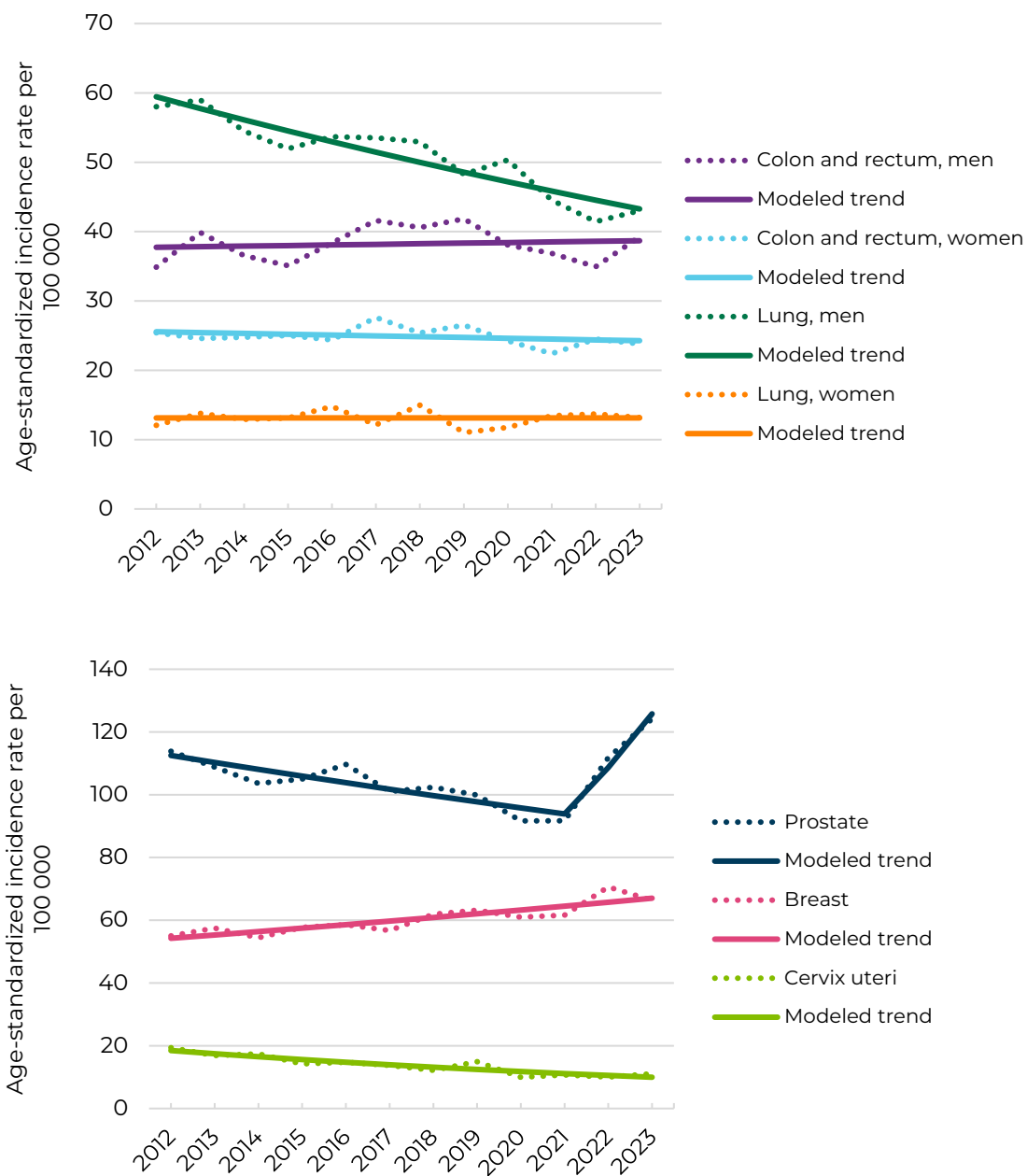


Figure 8. Age-standardized incidence rates (observed and modeled) of selected cancer sites in Estonia, 2012–2023.

Table 13. Annual percent change (APC) of age-standardized incidence of selected cancer sites by stage in Estonia, 2012–2023

| Men | | | | | Women | | | | |
|------------------|-----------|------------------|-------------|---------------------------|------------------|--------|------------|-------------|--------------------|
| Cancer site | ICD-10 | Stage | Time-period | APC (95% CI*) | Cancer site | ICD-10 | Stage | Time-period | APC (95% CI*) |
| Colon and rectum | C18-20 | All stages | 2012–2023 | 0.2 (-1.8; 2.3) | Colon and rectum | C18-20 | All stages | 2012–2023 | -0.5 (-1.4; 0.4) |
| | | I | 2012–2023 | 6.3 (1.1; 12.4) | | | I | 2012–2023 | 2.7 (-2.8; 8.6) |
| | | II | 2012–2023 | -2.2 (-4.3; -0.3) | | | II | 2012–2018 | 2.0 (-4.4; 8.6) |
| | | III | 2012–2017 | 5.5 (2.0; 17.9) | | | III | 2018–2021 | -11.5 (-17.6; 6.3) |
| | | | 2017–2023 | -2.0 (-9.8; 0.32) | | | | 2021–2023 | 5.6 (-8.4; 17.8) |
| | | IV | 2012–2017 | 2.0 (-3.7; 23.2) | | | IV | 2012–2023 | 0.6 (-0.7; 1.9) |
| | | | 2017–2023 | -4.8 (-21.1; -0.1) | | | | 2012–2023 | -2.0 (-4.3; 0.3) |
| Unknown | 2012–2023 | 0.11 (-2.5; 2.9) | Unknown | 2012–2023 | -1.4 (-5.5; 2.8) | | | | |
| Lung | C34 | All stages | 2012–2023 | -2.8 (-3.8; -1.9) | Lung | C34 | All stages | 2012–2023 | -0.0 (-2.1; 2.2) |
| | | I-II | 2012–2023 | -0.1 (-2.1; 2.0) | | | I-II | 2012–2023 | 2.6 (-0.9; 6.6) |
| | | III | 2012–2023 | -3.7 (-5.2; -2.3) | | | III | 2012–2023 | -1.9 (-6.5; 2.8) |
| | | IV | 2012–2018 | -1.6 (-4.9; 11.8) | | | IV | 2012–2023 | -1.2 (-4.5; 2.1) |
| | | | 2018–2023 | -8.2 (-22.1; -4.3) | | | | Unknown | 2012–2023 |
| Unknown | 2012–2023 | -0.6 (-3.7; 2.7) | | | | | | | |

*95% CI – confidence interval

Statistically relevant values are in bold

Table 13. (continued)

| Men | | | | | Women | | | | | | |
|----------|--------|------------|-------------|----------------------------|-----------|---------------------------|--------------|-------------|----------------------------|----------------------|---------------------------|
| Site | ICD-10 | Stage | Time-period | APC (95% CI*) | Site | ICD-10 | Stage | Time-period | APC (95% CI*) | | |
| Prostate | C61 | All stages | 2012–2018 | -2.0 (-4.3; -0.9) | Breast | C50 | All stages | 2012–2023 | 1.9 (1.1;2.9) | | |
| | | | 2018–2023 | 15.8 (4.6; 21.4) | | | | I | 2012–2023 | 3.9 (2.2;5.6) | |
| | | T1N0M0 | 2012–2023 | 10.9 (8.4; 14.4) | | | II | 2012–2023 | 3.0 (1.0;5.0) | | |
| | | T2N0M0 | 2012–2021 | -4.5 (-6.8; -3.2) | | | III | 2012–2023 | -1.3 (-3.3; 0.6) | | |
| | | | 2021–2023 | 14.9 (2.6; 22.8) | | | IV | 2012–2018 | 3.3 (1.4; 7.0) | | |
| | | T3-4N0M0 | 2012–2017 | -1.7 (-4.6; 7.8) | | | | 2018–2021 | -12.2 (-16.9; -6.6) | | |
| | | | 2017–2021 | -12.0 (-19.6; -7.8) | | | | 2021–2023 | 17.2 (6.3; 28.6) | | |
| | | | 2021–2023 | 22.1 (5.7; 37.6) | | | Unknown | 2012–2023 | -1.8 (-8.0; 4.7) | | |
| | | T1-4N1M0 | 2012–2023 | 0.1 (-4.8; 5.5) | | | Cervix uteri | C53 | All stages | 2012–2023 | -5.5 (-7.7; -3.5) |
| | | T1-4N0-1M1 | 2012–2023 | 4.0 (1.3; 7.0) | | | | | I | 2012–2023 | -6.1 (-9.8; -2.9) |
| | | Unknown | 2012–2023 | -5.6 (-8.3; 3.2) | | | | | II | 2012–2023 | -7.1 (-11.6; -3.0) |
| | | | | | | | | III | 2012–2023 | -1.9 (-6.1; 2.4) | |
| | | | | IV | 2012–2023 | -7.5 (-15.1; -0.9) | | | | | |
| | | | | Unknown | 2012–2023 | -8.6 (-12.7; -5.0) | | | | | |

*95% CI – confidence interval

Statistically relevant values are in bold

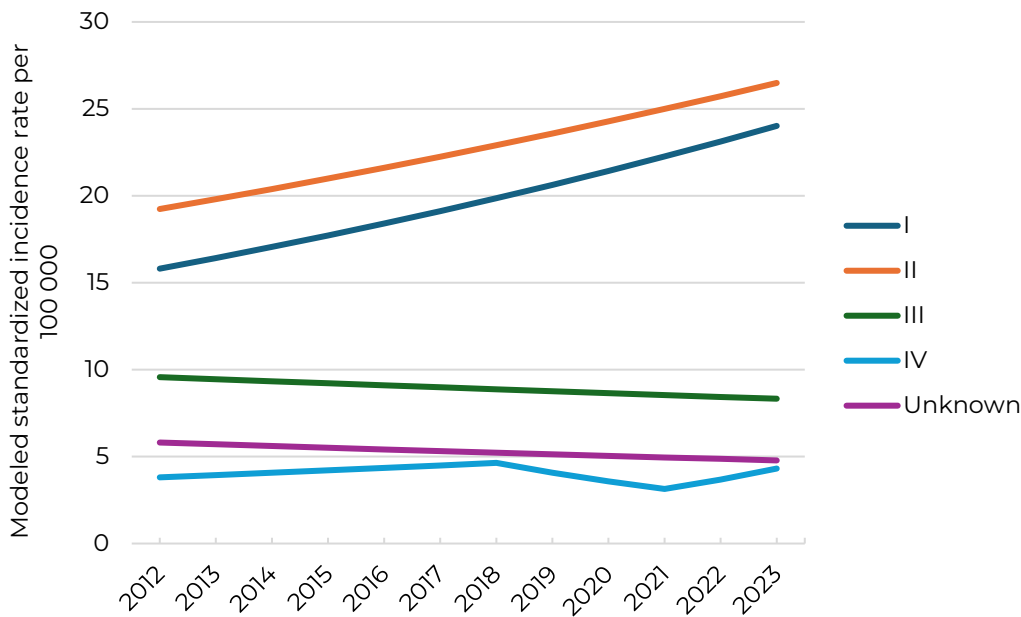


Figure 9. Modeled age-standardized incidence trend of breast cancer by stage in Estonia 2012–2023.

9.3 Cervical cancer

The incidence of cervical cancer (all stages combined) has decreased by 5.5% each year (statistically significant) since 2012 (Figure 8 and Table 13). Also, the incidence has significantly decreased in all stages, except for stage III where the observed decrease is statistically not significant (Figure 10 and Table 13). While previous analyses showed a decrease in incidence only in early stages [11], this analysis shows for the first time a significant decrease in incidence also in stage IV cases (7.5% per year). Improvements in diagnostics are indicated by a statistically significant decrease in the incidence of tumors with an unknown stage. The results of the analysis suggest that cervical cancer screening is effective and has helped prevent cervical cancer at any stage.

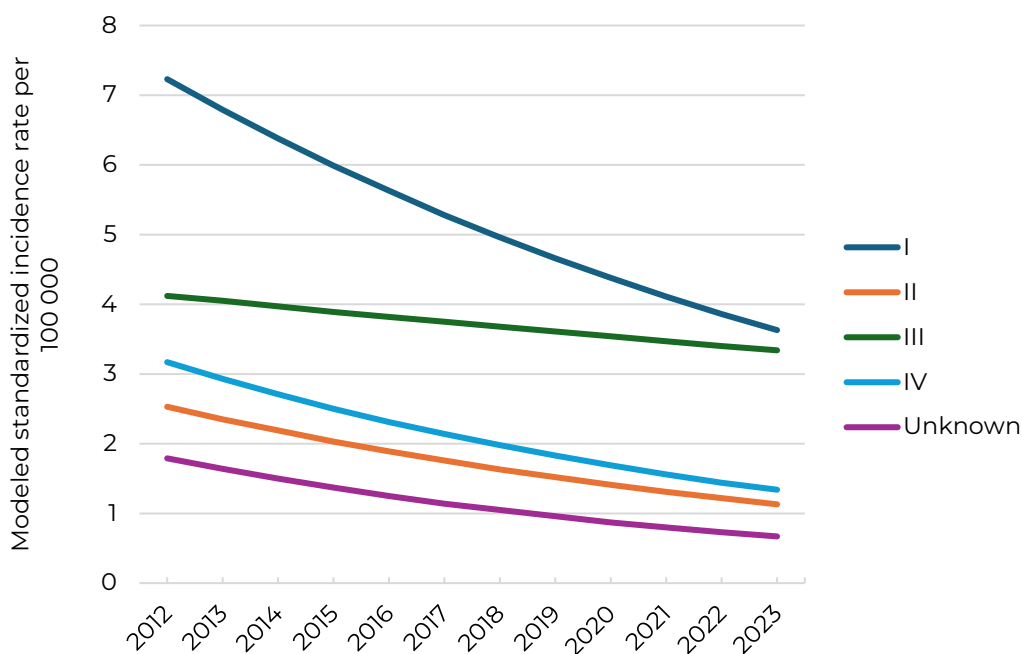


Figure 10. Modeled age-standardized incidence trend of cervical cancer by stage in Estonia 2012–2023.

9.4 Colorectal cancer

The incidence of colorectal cancer (all stages combined) has been stable in both men and women during 2012–2023 (Figure 8 and Table 13). In men, only the incidence of stage I increased statistically significantly throughout the period (6.3% annually) (Figure 11 and Table 13). Since 2017, the incidence of stage IV has decreased annually by 4.8%. The decline in incidence after 2017 was also observed in stage III, but it was statistically not significant. No statistically significant stage-specific trends were observed in women, but the incidence of stage I increased most rapidly (Figure 12 and Table 13). The results suggest that there has been a shift towards earlier detection, probably due to starting of national screening program. The trend changes in stages II and III in both men and women may be related to improved diagnostics, particularly in lymph node examination.

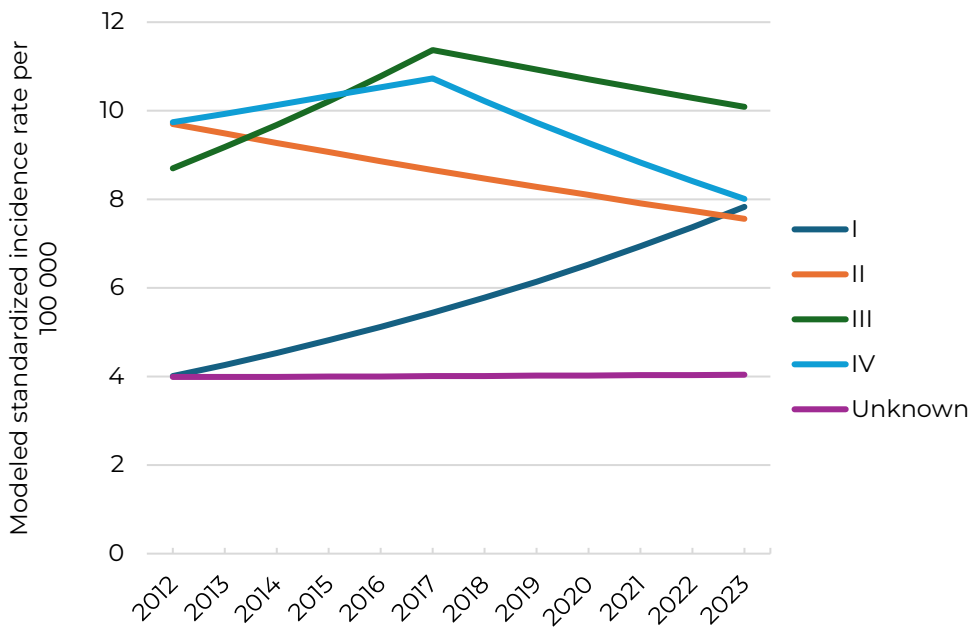


Figure 11. Modeled age-standardized incidence trend of colorectal cancer by stage in men in Estonia 2012–2023.

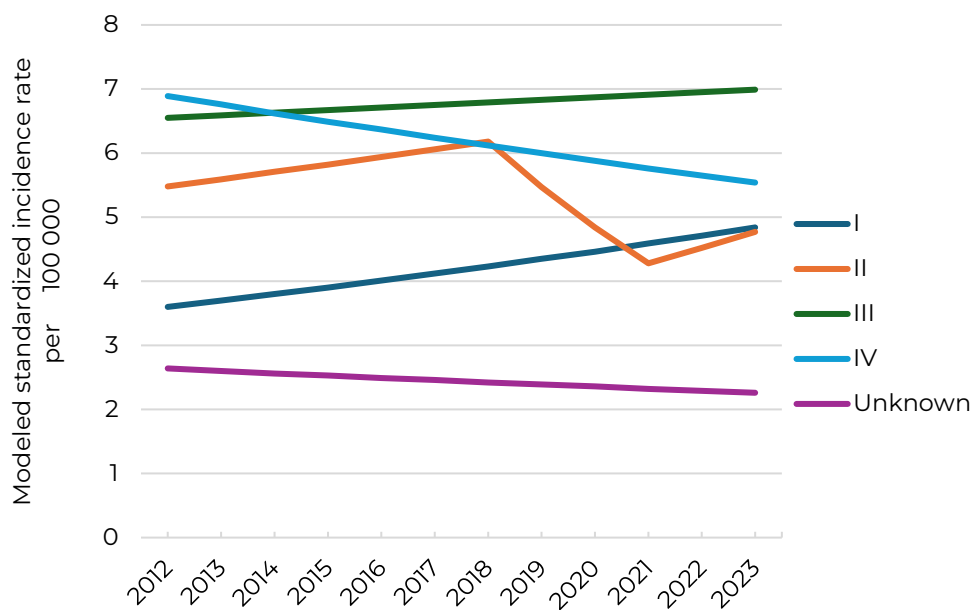


Figure 12. Modeled age-standardized incidence trend of colorectal cancer by stage in women in Estonia 2012–2023.

9.5 Lung cancer

Lung cancer incidence (all stages combined) has been in a long-term decline in men and in the period 2012–2023, the incidence decreased statistically significantly by 2.8% per year (Figure 8 and Table 13). Due to changes in the TNM classification, stage I and II incidence were analyzed together and have remained stable. The decline has occurred throughout the period in stage III and in recent years also in stage IV incidence (Figure 13 and Table 13). In women, lung cancer incidence (all stages combined) has been stable (Figure 8 and Table 13). No statistically significant trend was evident for any stage, but in general, the incidence of stages I and II is rather increasing and that of stages III and IV is rather decreasing (Figure 14 and Table 13). Overall, the results suggest that the COVID-19 pandemic did not cause a delay in lung cancer diagnosis. To assess the results of the lung cancer screening pilot projects conducted in recent years, trends need to be monitored further.

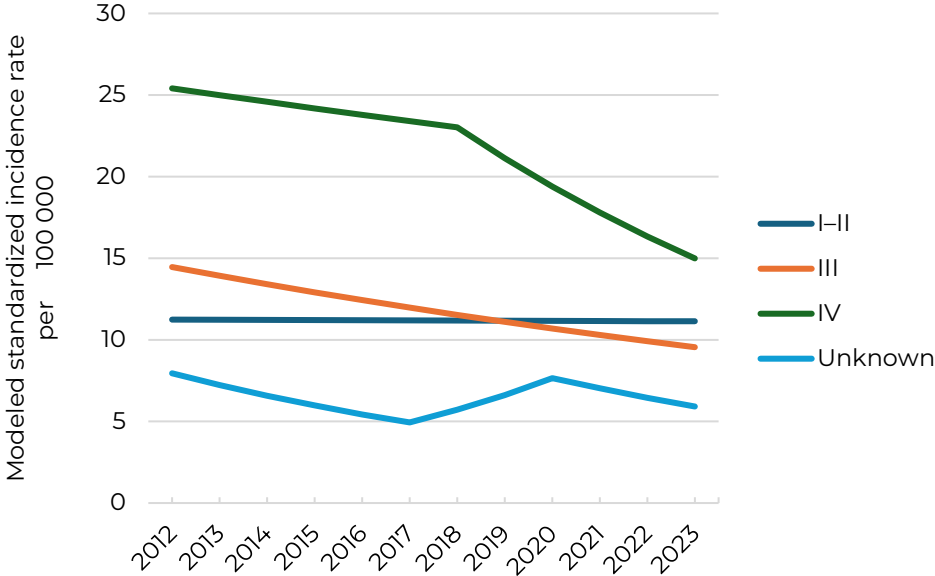


Figure 13. Modeled age-standardized incidence trend of lung cancer by stage in men in Estonia 2012–2023.

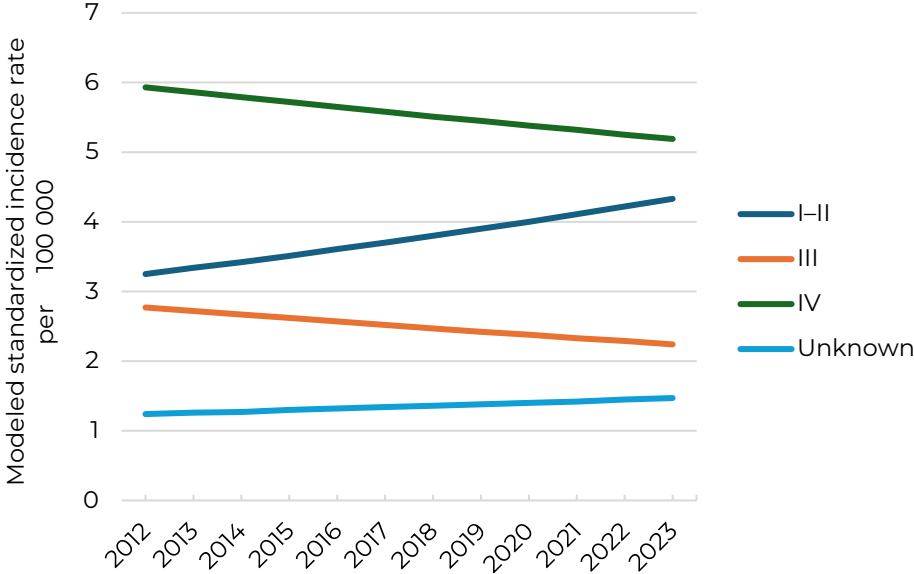


Figure 14. Modeled age-standardized incidence trend of lung cancer by stage in women in Estonia 2012–2023.

9.6 Prostate cancer

The incidence of prostate cancer (all stages combined) decreased by a statistically significant 2% each year between 2012 and 2018 but has increased rapidly since then (15.8% per year) (Figure 8 and Table 13). In the case of prostate cancer, the stage is divided into the following groups: T1N0M0, T2N0M0, T3-4N0M0, T1-4N1M0, T1-4N0-1M1. The incidence of tumours in the earliest stage (T1N0M0) has increased very rapidly throughout the period (10.9% per year) (Figure 15 and Table 13). After a long period of decline, the incidence of tumors in T2N0M0 and T3-4N0M0 has also increased significantly since 2021. The incidence of tumors that have spread to regional lymph nodes (T1-4N1M0) has remained stable. A statistically significant increase in the incidence of tumors with distant metastases (T1-4N0-1M1), can be observed throughout the period. While the increase in the incidence of tumors diagnosed at a very early stage can be primarily attributed to the more widespread use of prostate-specific antigen (PSA) testing in the post-COVID-19 pandemic period, the increase in the incidence of advanced tumors may be explained by improved diagnostics. This hypothesis is supported by the simultaneous statistically significant downward trend in the incidence of tumors with unknown stage.

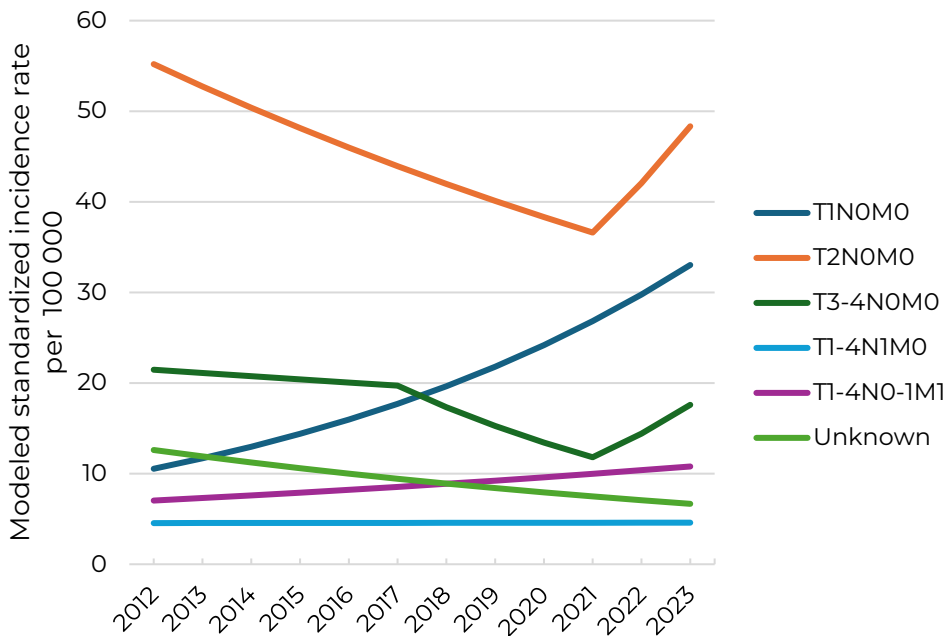


Figure 15. Modeled age-standardized incidence trend of prostate cancer by stage in Estonia 2012–2023

References

- [1] Ferlay J, Burkhard C, Whelan S, et al. Check and conversion programs for cancer registries. IARC Technical Report No. 42, Lyon 2005.
- [2] Waterhouse J, Muir C, Correa P, et al. Cancer in Five Continents, Vol III. IARC Scientific Publications No. 15. Lyon, 1976, p. 456.
- [3] Dickman PW, Adami HO. Interpreting trends in cancer patient survival. *J Intern Med* 2006; 260: 103–17.
- [4] Ederer F, Heise H. Instructions to IBM 650 programmers in processing survival computations. Methodological note no. 10. Bethesda, MD: End Results Evaluation Section, National Cancer Institute; 1959.
- [5] Brenner H, Gefeller O, Hakulinen T. Period analysis for 'up-to-date' cancer survival data: theory, empirical evaluation, computational realisation and applications. *Eur J Cancer* 2004; 40: 326–35.
- [6] Corazziari I, Quinn M, Capocaccia R. Standard cancer patient population for age standardising survival ratios. *Eur J Cancer* 2004; 40: 2307–2316.
- [7] Bray F, Parkin DM. Evaluation of data quality in the cancer registry: principles and methods. Part I: comparability, validity and timeliness. *Eur J Cancer* 2009;45:47–55.
- [8] Orumaa M, Lang K, Mägi M, et al. Eesti vähiregistri andmete valiidus aastatel 1995–2008. *Eesti Arst* 2015;94(6):339–346.
- [9] Brierley JD, Gospodarowicz MK, Wittekind C, eds. International Union Against Cancer (UICC). TNM Classification of Malignant Tumours, 8th Edition. Oxford: Wiley Blackwell; 2017.
- [10] Zimmermann M-L, Innos K, Härmaorg P, et al. Vähk Eestis: haigestumus 2021, elulemus 2017–2021 ja sõeluuringul avastatud vähijuhud. Tallinn: Tervise Arengu Instituut; 2024.
- [11] Vähitõrje tegevuskava 2021–2030. Tallinn: Sotsiaalministeerium, Tervise Arengu Instituut; 2021.
- [12] Tervise Arengu Instituut. Rahvastiku tervise aastaraamat 2025. Eesti rahvastiku tervis ja selle mõjurid. Fookusteema: vähitõrje. Tallinn: Tervise Arengu Instituut, 2025.
- [13] European Cancer Information System (2024). <https://ecis.jrc.ec.europa.eu>.
- [14] Zimmermann M-L, Innos K, Paapsi K, Veerus P, Baburin A, Mägi M. Vähk Eestis: haigestumus 2022, elulemus 2018–2022 ja HPV-ga seotud vähid 1998–2022. Tallinn: Tervise Arengu Instituut; 2025
- [15] Larønningen S, Ferlay J, Bray F, et al. NORDCAN: Cancer Incidence, Mortality, Prevalence and Survival in the Nordic Countries, Version 9.2 (23.06.2022). Association of the Nordic Cancer Registries. Cancer Registry of Norway. Available from: <https://nordcan.iarc.fr/>. Accessed 15.05.2026
- [16] Tartu Ülikool, peremeditsiini ja rahvatervishoiu instituut. Kopsuvähi sõeluuring Eestis. Kättesaadav: https://tervis.ut.ee/et/soeluuring?gad_source=1. Accessed 31.05.2026.
- [17] Tervise Arengu Instituut. Eesnäärmevähi varase avastamise uuring. <https://www.tai.ee/et/env>. Accessed 31.05.2026.