



National
Institute
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Development

**Cancer in Estonia:
incidence 2021,
survival 2017–2021 and
cancer cases
diagnosed in screening**

Report

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screening**

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

Reviewer: Keiu Paapsi

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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	an abnormal mass of tissue that usually does not contain cysts or liquid areas. Solid tumours may be benign (non-cancerous), or malignant (cancerous). Types of solid tumours are named for the type of cells that form them
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 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

ECR	Estonian Cancer Registry
ECSR	Estonian Cancer Screening Register
ICD-10	International Classification of Diseases, 10th version

Summary

Estonian cancer incidence data are available for more than 50 years – since 1968. Over the years, the annual number of new cancer cases has increased significantly. In 2021, 8224 new cancer cases were registered in Estonia, of which 4084 were diagnosed in men and 4140 in women. Excluding non-melanoma skin cancer, the overall number of cancer cases was 6978. Leading cancer sites in men were similar to previous years – the prostate (26% of all cancers in men) and lung (13%). In women, the leading sites were the breast and non-melanoma skin (both 19% of all cancers in women).

The increase in cancer cases in the long term is partly caused by the ageing of the population – more than a third of all cases in 2021 were diagnosed in patients older than 75 years. Among 54-year-old and younger women, cancer incidence was lower than among men in the same age, however, from the age 55, cancer incidence in men was remarkably higher than in women. The most frequent cancer sites vary across age groups. Cancer is quite rare in children – in 2021 20 cases of malignant tumours were diagnosed in children aged 0–14 of which leukaemia was the most frequent. In the age group 15–34, the leading cancer sites were testis, non-melanoma skin and brain in men and the breast, non-melanoma skin and thyroid in women. In the age group 35–54, the most common cancer sites in men were non-melanoma skin, the prostate and lung and the breast, non-melanoma skin and cervix uteri in women. In patients aged older than 55, the leading sites were the same as in the general population – the prostate, lung and non-melanoma skin in men and non-melanoma skin and the breast in women.

In 2021, the proportion of microscopically verified cancer cases was 90%, indicating a rather good quality of diagnosis. 3,4% of cancer cases were death certificate initiated (DCI) while ca 2% of cases were registered as death certificate only (DCO) cases, which is rather low, but nevertheless refers to incomplete notification of cancer cases to the ECR.

It is important to diagnose and treat cancer as early as possible, to enable more effective treatment. Half of the new cancer cases diagnosed in 2021 were localized at the time of diagnosis, but ca 20% of men and 15% of women already had distant metastasis. The highest proportion of distant metastasis at diagnosis was seen in pancreatic cancer both in men (60%) and women (50%). For more than 40% of patients, distant metastasis was found in lung cancer in both men and women.

Compared to 2020, the proportion of stage I lung cancer cases in women decreased remarkably and the proportion of stage IV cases increased, whereas the proportions remained similar in men. On the positive side, the proportion of stage I prostate cancers increased significantly, and stage IV cancers of cervix and prostate decreased.

The age-standardized total cancer incidence rates have levelled off in the past decade both in men and women. The decreasing trend of total cancer incidence in men can be partly contributed to the decrease in more common cancers such as lung and stomach cancers that have been in decline since the end of 1990s. In addition, the decrease in prostate cancer incidence that started in 2011 also continued in 2021. In the long-term, incidence of colorectal cancer has increased in both sexes, as well as breast cancer incidence in women.

Compared with the five-year mean (2015–2019) preceding the COVID-19 pandemic, the number of new cancer cases decreased by 8% (9% in men, 7% in women). Therefore, the decrease of new cancer cases that started in 2020 also continued in 2021, suggesting that the impacts of the pandemic were still ongoing. For instance, the number of haematological cancers was 16% lower than the mean in 2015–2019, decrease was 15% for kidney cancer, 11% for skin melanoma and 8% for prostate cancer. On the other hand, the decrease in new cancer cases for some cancer sites is related to the long-term effect

of reduction in risk behaviour (lung and stomach cancer) or to the positive effect of cancer screening program (cervical cancer).

On 31st December 2021, there were 68,433 persons (27,762 men and 40,671 women) in the population of Estonia with a history of cancer. The most frequent cancer sites among prevalent cases were prostate and breast as in previous years.

In 2017–2021, the one-year, five-year and ten-year relative survival estimates for all cancer cases diagnosed in Estonia were 78%, 65% and 61%, 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), colon and rectal cancer, skin melanoma and breast and corpus uteri cancer.

The proportion of stage I breast cancer cases was notably higher among those detected at screening compared with non-screen detected cases in the same age-group. Cervical cancer cases detected at screening were mostly diagnosed as *in situ* tumours or at stage I or II, whereas more than half of the non-screen detected cases in the same age-group were already at stage III or IV. The decrease in cervical cancer incidence that started in 2014 can now be associated with the positive effect of cancer screening. As expected, the proportion of stage I colorectal cancers diagnosed at screening is notably higher than in non-screen detected cases in the same age-group. Since the incidence of colorectal cancer is still rising, the preventive effect of cancer screening is not yet noticeable.

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 other epidemiological research.

In this report, incidence data were updated on 4 December 2023.

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). 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, that are 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).

On Figure 1 that shows the leading cancer sites in Estonia in 2021, in Tables 6a and 6b, that show the distribution of new cancer cases by cancer site and the most valid basis of diagnosis, as well as in Tables 7a and 7b that show the distribution of new cancer cases by site and extent of disease, the proportion percentages are rounded, and their sum might not be exactly 100%.

Cancer incidence data contains cases diagnosed during lifetime, cases diagnosed in autopsy and cases which are 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 when patient was alive.

To analyse cancer survival, data from the ECR about new malignant cancer cases diagnosed in patients aged ≥ 15 years, were used. The vital status of patients was determined by comparing the data of the ECR to the Estonian Death Registry and the Population Registry. Cancer survival was measured as one-year, five-year and ten-year relative survival ratio, calculated as the ratio of observed survival and expected survival of the underlying general population [3]. The expected survival rate was determined from Estonian population lifetables stratified by gender, age, and calendar year, using Ederer's II method [4]. The one-year, five-year and ten-year relative survival indicates what percentage of patients is alive (has not died because of cancer) one, five or ten years after being diagnosed with cancer. Period method was used to calculate survival for 2017–2021 [5]. For standardization by age, international standards were used [6]. To evaluate the change in relative survival for selected sites, the age-standardized five-year relative survival for 2007–2011, 2012–2016 and 2017–2021 was calculated (the cohort method was used for older periods) [5].

One of the aims of this report was to compare the TNM staging distribution of breast, cervical and colorectal cancer in different age-groups in 2019, 2020 and 2021, based on whether the cancer was diagnosed in screening or not. Data about new cancer cases of screening sites by ICD-10 codes and corresponding birth years invited to take part in screening in 2019–2021 was extracted from the ECR. Later, data from the Estonian Cancer Screening Register (ECSR) was added, to determine which cases were detected at screening.

When comparing the data of the ECR and the ECSR, it needs to be considered that the two registries have somewhat different methods for registration of cancer cases and publication of data. Firstly, the year of diagnosis of a cancer case detected at screening

is not always the same as in the ECR – for example some cases diagnosed in screening in 2020 are registered in 2021 in the ECR. Since the journey to microscopically verified diagnosis takes time and according to international rules for cancer registration, the ECR uses the date of microscopical examination as the date of cancer diagnosis instead of the date of mammography performed in screening. Secondly, the data about cancer cases diagnosed in screening published by the ECSR also include *in situ* tumours, whereas the ECR publishes *in situ* tumours separately. Thirdly, the ECR calculates person's age at the time of diagnosis by exact date, whereas the ECSR calculates it by year of birth. In chapter 9 which discusses cancer cases diagnosed in screening, person's age is calculated by year of birth and tables present malignant and *in situ* tumours separately.

This report analyses data from 2019, 2020 and 2021 when the target group for breast cancer screening was 50–68 years. For cervical cancer screening, the target group was 30–55 years in 2019 and 2020 but in 2021 the target group was expanded to 30–65. The age of target group for colorectal cancer screening was 60–66 in 2019 and 60–68 in 2020 and 2021.

1 Leading cancer sites

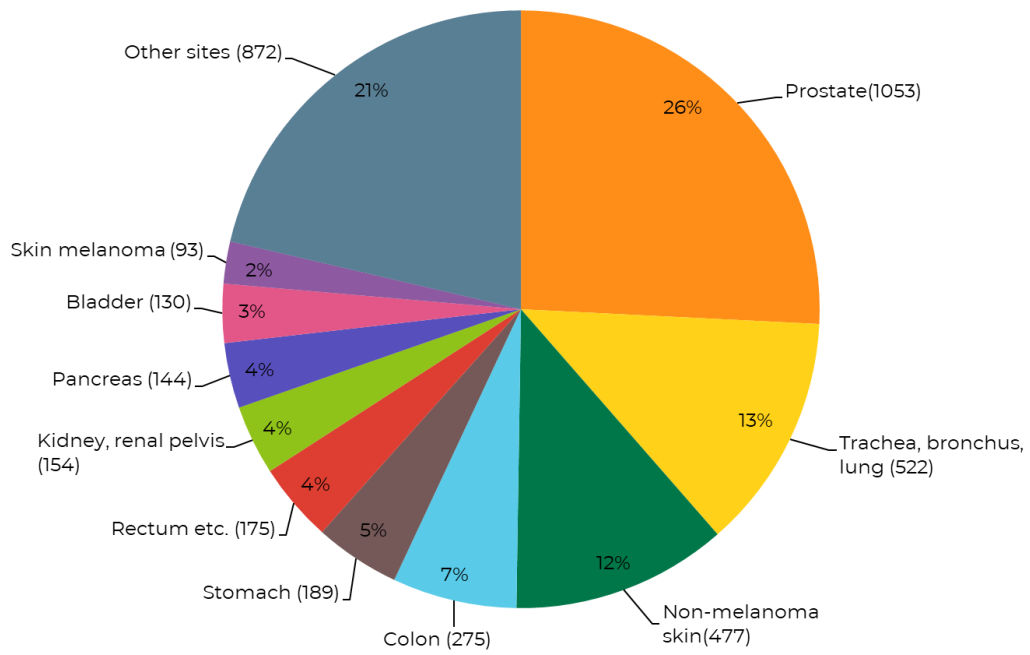
In 2021, 8224 new cancer cases were registered in Estonia – 4084 in men and 4140 in women. Excluding non-melanoma skin, the total number of cancer cases was 6978. The most common cancer sites are shown in Figure 1.

The leading cancer site in men was the prostate (26% of all cancers in men), followed by lung (13%), non-melanoma skin (12%), colon (7%), stomach (5%), rectum (4%) and kidney and renal pelvis (also 4%). Urinary bladder, skin melanoma and liver were also among the ten leading sites in men.

In women, the most common sites were the breast and non-melanoma skin (both 19% of all cancer cases), followed by colon (8%), corpus uteri (6%) and lung (also 6%). Among the ten most common sites were also stomach, pancreas, rectum, ovary, cervix and kidney and renal pelvis.

Tables 1a and 1b show the number of new cancer cases in 2021 and the crude and age-standardized incidence rates per 100 000 persons in men and women for the ten leading cancer sites.

Men



Women

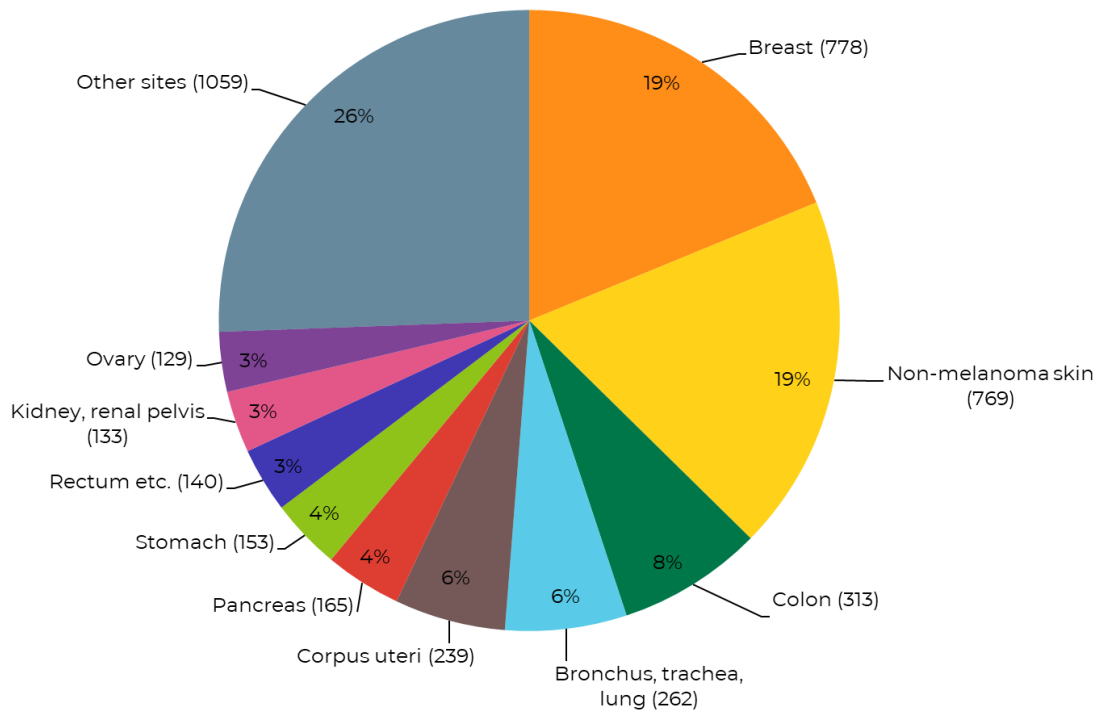


Figure 1. Leading cancer sites in Estonia 2021 (n, %)

Table 1a. Leading cancer sites in Estonia in men, 2021

Cancer site	ICD-10	New cases		Incidence rate per 100 000	
		Number	%	Crude	Standardized*
Prostate	C61	1053	25,8	166,6	87,2
Trachea, bronchus, lung	C33–C34	522	12,8	82,6	42,5
Non-melanoma skin	C44	477	11,7	75,5	38,5
Colon	C18	275	6,7	43,5	22,1
Stomach	C16	189	4,6	29,9	15,5
Rectum etc.	C19–21	175	4,3	27,7	14,2
Kidney, renal pelvis	C64–C65	154	3,8	45,2	13,0
Pancreas	C25	144	3,5	22,8	12,2
Bladder	C67	130	3,2	20,6	10,2
Skin melanoma	C43	93	2,3	14,7	8,1
All sites	C00–C97	4084	100	646,0	343,9

* Standardized by age (to the world standard population).

Table 1b. Leading cancer sites in Estonia in women, 2021

Cancer site	ICD-10	New cases		Incidence rate per 100 000	
		Number	%	Crude	Standardized*
Breast	C50	778	18,8	111,3	60,6
Non-melanoma skin	C44	769	18,6	110,1	45,2
Colon	C18	313	7,6	44,8	15,4
Trachea, bronchus, lung	C33–C34	262	6,3	37,5	13,2
Corpus uteri	C54	239	5,8	34,2	15,6
Pancreas	C25	165	4,0	23,6	7,0
Stomach	C16	153	3,7	21,9	9,0
Rectum etc.	C19–C21	140	3,4	20,0	7,6
Kidney, renal pelvis	C64–C65	133	3,2	19,0	7,9
Ovary	C56	129	3,1	18,5	9,1
All sites	C00–C97	4140	100	592,5	260,6

* Standardized by age (to the world standard population).

2 Cancer incidence by site

Table 2a and 2b show the number of new cancer cases and 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 corresponding 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 and benign neoplasms and neoplasms of uncertain or unknown behaviour of the brain and central nervous system as well as of the endocrine organs that are located in the area of the brain are presented in tables 4a and 4b, together with the crude and age-standardized incidence rates in 2021 in men and women.

Table 2a. The number of new cases, crude and age-standardized incidence rates (ASIR) of cancer per 100 000 by cancer site in Estonia in men, 2021

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	ASIR*
All sites	C00–C97	4084	646,0	343,9
All sites (excl. non-melanoma skin)	C00–C97, excl. C44	3607	570,6	305,4
Lip, oral cavity, pharynx	C00–C14	147	23,3	13,8
Lip	C00	5	0,8	0,4
Tongue	C01–C02	29	4,6	2,8
Gum, floor of mouth etc.	C03–C06	27	4,3	2,7
Major salivary glands	C07–C08	6	0,9	0,5
Tonsil, oropharynx	C09–C10	41	6,5	3,8
Nasopharynx	C11	6	0,9	0,7
Pyriiform sinus, hypopharynx	C12–C13	31	4,9	2,7
Other lip, oral cavity, pharynx	C14	2	0,3	0,1
Digestive organs	C15–C26	988	156,3	81,7
Oesophagus	C15	71	11,2	6,2
Stomach	C16	189	29,9	15,5
Small intestine	C17	11	1,7	1,0
Colon	C18	275	43,5	22,1
Rectum etc.	C19–C21	175	27,7	14,2
Liver etc.	C22	86	13,6	7,7
Gallbladder etc.	C23–C24	31	4,9	2,2
Pancreas	C25	144	22,8	12,2
Other digestive organs	C26	6	0,9	0,5

* Standardized to the world standard population.

Table 2a. (cont.)

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	ASIR*
Respiratory, intrathoracic organs	C30–C39	579	91,6	47,4
Nasal cavities, ear, sinuses	C30–C31	4	0,6	0,3
Larynx	C32	48	7,6	4,3
Trachea, bronchus, lung	C33–C34	522	82,6	42,5
Thymus, heart, mediastinum, pleura	C37–C38	4	0,6	0,3
Respiratory organs etc.	C39	1	0,2	0,1
Bone, articular cartilage	C40–C41	5	0,8	0,8
Skin melanoma	C43	93	14,7	8,1
Non-melanoma skin	C44	477	75,5	38,5
Mesothelial and soft tissues	C45–C49	24	3,8	2,1
Breast	C50	6	0,9	0,6
Male genital organs	C60–C63	1098	173,7	93,3
Penis	C60	15	2,4	1,4
Prostate	C61	1053	166,6	87,2
Testis	C62	30	4,7	4,6
Other male genital organs	C63	—	—	—
Urinary organs	C64–C68	286	45,2	23,4
Kidney, renal pelvis	C64–C65	154	24,4	13,0
Ureter	C66	2	0,3	0,1
Bladder	C67	130	20,6	10,2
Other urinary organs	C68	—	—	—
Eye	C69	5	0,8	0,3
Brain, central nervous system	C70–C72	60	9,5	6,5
Meninges	C70	—	—	—
Brain	C71	58	9,2	6,1
Other central nervous system	C72	2	0,3	0,5
Thyroid gland	C73	24	3,8	2,1
Other endocrine	C74–C75	4	0,6	0,3
Site unknown or uncertain	C76–C80	59	9,3	4,3
Hodgkin lymphoma	C81	14	2,2	1,9
Non-Hodgkin lymphoma	C82–C85/96	76	12,0	6,6
Immunoproliferative diseases	C88	3	0,5	0,2
Multiple myeloma	C90	39	6,2	3,0
Leukaemia	C91–C95	97	15,3	9,0
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 Estonia in women, 2021

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	ASIR*
All sites	C00–C97	4140	592,5	260,6
All sites (excl. non-melanoma skin)	C00–C97, excl. C44	3371	482,4	215,4
Lip, oral cavity, pharynx	C00–C14	59	8,4	3,9
Lip	C00	6	0,9	0,2
Tongue	C01–C02	9	1,3	0,6
Gum, floor of mouth etc.	C03–C06	16	2,3	0,9
Major salivary glands	C07–C08	7	1,0	0,6
Tonsil, oropharynx	C09–C10	14	2,0	1,1
Nasopharynx	C11	3	0,4	0,2
Pyriform sinus, hypopharynx	C12–C13	4	0,6	0,3
Other lip, oral cavity, pharynx	C14	—	—	—
Digestive organs	C15–C26	907	129,8	46,1
Oesophagus	C15	20	2,9	1,0
Stomach	C16	153	21,9	9,0
Small intestine	C17	19	2,7	1,2
Colon	C18	313	44,8	15,4
Rectum etc.	C19–C21	140	20,0	7,6
Liver etc.	C22	48	6,9	2,7
Gallbladder etc.	C23–C24	45	6,4	2,0
Pancreas	C25	165	23,6	7,0
Other digestive organs	C26	4	0,6	0,2
Respiratory, intrathoracic organs	C30–C39	275	39,4	13,9
Nasal cavities, ear, sinuses	C30–C31	3	0,4	0,2
Larynx	C32	5	0,7	0,3
Trachea, bronchus, lung	C33–C34	262	37,5	13,2
Thymus, heart, mediastinum, pleura	C37–C38	3	0,4	0,2
Respiratory organs etc.	C39	2	0,3	0,0
Bone, articular cartilage	C40–C41	8	1,1	0,4
Skin melanoma	C43	121	17,3	9,3
Non-melanoma skin	C44	769	110,1	45,2
Mesothelial and soft tissues	C45–C49	30	4,3	2,1

* Standardized to the world standard population.

Table 2b. (cont.)

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	ASIR*
Breast	C50	778	111,3	60,6
Female genital organs	C51–C58	540	77,3	37,9
Vulva, vagina	C51–C52	35	5,0	1,8
Cervix uteri	C53	122	17,5	10,5
Corpus uteri	C54	239	34,2	15,6
Uterus unspecified	C55	3	0,4	0,1
Ovary	C56	129	18,5	9,1
Other female genital organs	C57	12	1,7	0,8
Placenta	C58	—	—	—
Urinary organs	C64–C68	193	27,6	10,5
Kidney, renal pelvis	C64–C65	133	19,0	7,9
Ureter	C66	7	1,0	0,3
Bladder	C67	53	7,6	2,3
Other urinary organs	C68	—	—	—
Eye	C69	12	1,7	0,6
Brain, central nervous system	C70–C72	41	5,9	3,2
Meninges	C70	1	0,1	—
Brain	C71	38	5,4	2,8
Other central nervous system	C72	2	0,3	0,3
Thyroid gland	C73	80	11,4	7,0
Other endocrine	C74–C75	3	0,4	0,2
Site unknown or uncertain	C76–C80	54	7,7	2,1
Hodgkin lymphoma	C81	13	1,9	2,0
Non-Hodgkin lymphoma	C82–C85/96	112	16,0	6,6
Immunoproliferative diseases	C88	1	0,1	—
Multiple myeloma	C90	47	6,7	2,2
Leukaemia	C91–C95	97	13,9	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 Estonia in men, 2021

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	ASIR*
Hodgkin lymphoma	C81	14	2,2	1,9
Non-Hodgkin lymphoma	C82–C85/96	76	12,0	6,6
Immunoproliferative diseases	C88	3	0,5	0,2
Multiple myeloma	C90	39	6,2	3,0
Leukaemia	C91–C95	97	15,3	9,0
Lymphoid leukaemia	C91	66	10,4	6,2
Acute lymphoid leukaemia	C91.0	4	0,6	1,2
Chronic lymphoid leukaemia	C91.1	59	9,3	4,7
Other lymphoid leukaemia	C91.2–C91.9	3	0,5	0,3
Myeloid leukaemia	C92	30	4,7	2,7
Acute myeloid leukaemia	C92.0	18	2,8	1,7
Chronic myeloid leukaemia	C92.1	10	1,6	0,9
Other myeloid leukaemia	C92.2–C92.9	2	0,3	0,1
Other leukaemia	C93–C95	1	0,2	0,1
Polycythaemia vera	D45	13	2,1	1,1
Myelodysplastic syndromes	D46	35	5,5	2,8
Other neoplasms of lymphoid, haematopoietic and related tissue	D47	44	7,0	3,6

* 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 Estonia in women, 2021

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	ASIR*
Hodgkin lymphoma	C81	13	1,9	2,0
Non-Hodgkin lymphoma	C82–C85/96	112	16,0	6,6
Immunoproliferative diseases	C88	1	0,1	0,0
Multiple myeloma	C90	47	6,7	2,2
Leukaemia	C91–C95	97	13,9	6,7
Lymphoid leukaemia	C91	57	8,2	3,5
Acute lymphoid leukaemia	C91.0	5	0,7	0,9
Chronic lymphoid leukaemia	C91.1	50	7,2	2,5
Other lymphoid leukaemia	C91.2–C91.9	2	0,3	0,1
Myeloid leukaemia	C92	33	4,7	2,4
Acute myeloid leukaemia	C92.0	25	3,6	1,6
Chronic myeloid leukaemia	C92.1	7	1,0	0,7
Other myeloid leukaemia	C92.2–C92.9	1	0,1	0,1
Other leukaemia	C93–C95	7	1,0	0,9
Polycythaemia vera	D45	22	3,1	1,0
Myelodysplastic syndromes	D46	22	3,1	0,9
Other neoplasms of lymphoid, haematopoietic and related tissue	D47	40	5,7	2,0

* Standardized to the world standard population.

Table 4a. The number of new cases of neoplasms *in situ*, benign and uncertain or unknown behaviour* and crude and age-standardized incidence rates (ASIR) per 100 000 by cancer site in Estonia in men, 2021

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	Standardized**
<i>In situ</i> neoplasms	D00–D09	157	24,8	12,5
Digestive organs excl. oesophagus and stomach	D01	8	1,3	0,6
Skin melanoma	D03	34	5,4	3,4
Non-melanoma skin	D04	43	6,8	2,8
Neoplasms of benign and uncertain or unknown behaviour of brain and central nervous system	D32, D33, D42, D43	35	5,5	3,2
Meninges	D32, D42	21	3,3	2,0
Brain, central nervous system	D33, D43	14	2,2	1,3
Neoplasms of benign and uncertain or unknown behaviour of intracranial endocrine glands	D35.2–D35.4, D44.3–D44.5	10	1,6	1,1

* 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* and crude and age-standardized incidence rates (ASIR) per 100 000 by cancer site in Estonia in women, 2021

Cancer site	ICD-10	Number of new cases	Incidence rate per 100 000	
			Crude	Standardized**
<i>In situ</i> neoplasms	D00–D09	215	30,8	16,2
Digestive organs excl. oesophagus and stomach	D01	4	0,6	0,4
Skin melanoma	D03	60	8,6	5,2
Non-melanoma skin	D04	75	10,7	3,1
Breast	D05	32	4,6	3,1
Cervix uteri	D06	21	3,0	3,0
Neoplasms of benign and uncertain or unknown behaviour of brain and central nervous system	D32, D33, D42, D43	83	11,9	6,5
Meninges	D32, D42	56	8,0	3,7
Brain, central nervous system	D33, D43	27	3,9	2,8
Neoplasms of benign and uncertain or unknown behaviour of intracranial endocrine glands	D35.2–D35.4, D44.3–D44.5	12	1,7	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 2021 among men and women are presented in Figure 2. Cancer incidence increases by age – whereas less than 100 new cases per 100 000 were diagnosed in people younger than 35, the same indicator was 2300 per 100 000 in people older than 75. More than a third of all new cancer cases were diagnosed among people over 75 years old. In women up to the age of 54 years, the cancer incidence rates are slightly higher than in men, whereas incidence in men 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 2021 20 cases were diagnosed in the age-group 0–14 and 120 cases in the age-group 15–34.

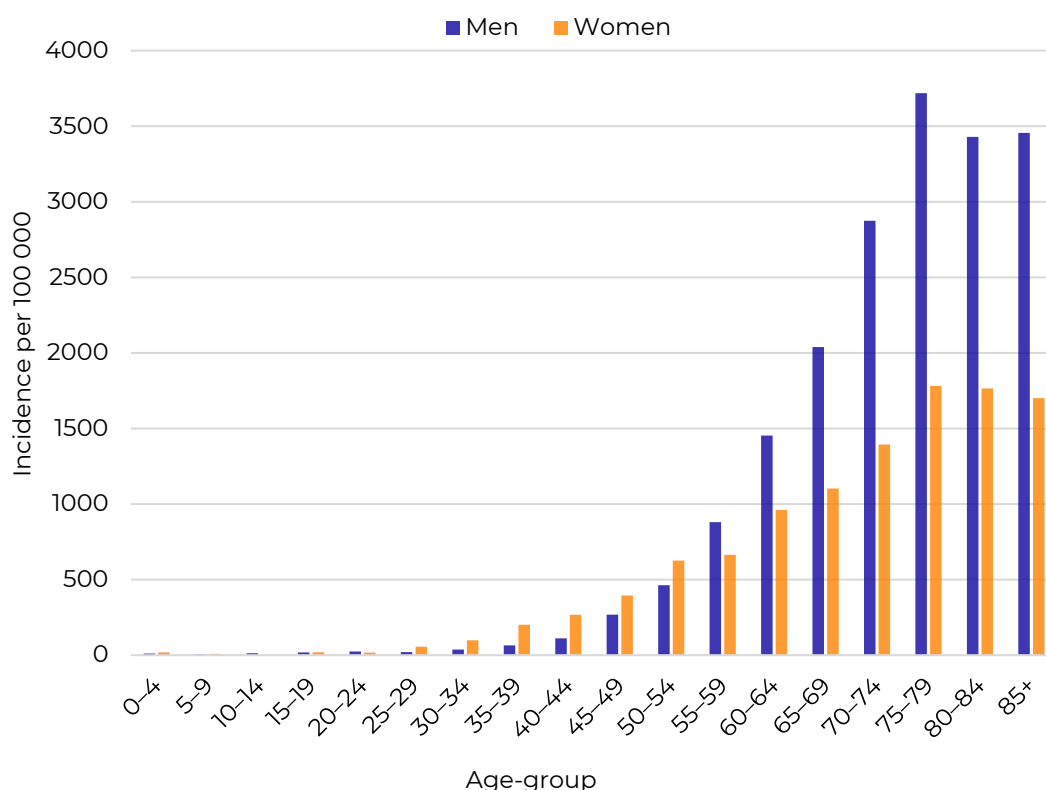


Figure 2. Age-specific cancer incidence in Estonia, 2021

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

In children aged 0–14, leukaemia was most frequently diagnosed followed by tumours of brain and central nervous system as well as kidney and renal pelvis among girls.

In 15–34 year-old men the most common cancer sites were testis, non-melanoma skin and brain; in women breast, non-melanoma skin and thyroid gland.

In the age-group 35–54, the most frequently diagnosed cancer sites in men were non-melanoma skin, prostate, lung and lip, oral cavity and pharynx; in women the breast followed by non-melanoma skin and cervix.

In 55–74 year-old men the most common cancer sites were the same as in the general population – the prostate, lung cancer, non-melanoma skin and colon. Among women, leading sites were the breast, non-melanoma skin, corpus uteri, lung and colon.

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

Table 5a. Eight leading cancer sites by age-groups in Estonia in men, 2021

Age-group / Cancer site	ICD-10	New cases	
		Number	%
Age-group 0-14			
Leukaemia	C91-C95	5	45,5
Brain and central nervous system	C70-C72	3	27,3
Colon	C18	1	9,1
Bone, articular cartilage	C40-C41	1	9,1
Non-melanoma skin	C44	1	9,1
All sites	C00-C97	11	100
Age-group 15-34			
Testis	C62	15	35,7
Non-melanoma skin	C44	9	21,4
Brain and central nervous system	C70-C72	7	16,7
Hodgkin lymphoma	C81	5	11,9
Stomach	C16	2	4,8
Colon	C18	2	4,8
Bone, articular cartilage	C40-C41	1	2,4
Leukaemia	C91-C95	1	2,4
All sites	C00-C97	42	100
Age-group 35-54			
Non-melanoma skin	C44	61	14,9
Prostate	C61	55	13,4
Trachea, bronchus, lung	C33-C34	34	8,3
Lip, oral cavity, pharynx	C00-C14	29	6,6
Colon	C18	23	5,6
Skin melanoma	C43	22	5,4
Stomach	C16	21	5,1
Rectum etc.	C19-C21	20	4,9
All sites	C00-C97	410	100
Age-group 55-74			
Prostate	C61	704	30,2
Trachea, bronchus, lung	C33-C34	316	13,6
Non-melanoma skin	C44	209	9,0
Colon	C18	147	6,3
Stomach	C16	101	4,3
Lip, oral cavity, pharynx	C00-C14	99	4,2
Rectum etc.	C19-C21	93	4,0
Pancreas	C25	92	3,9
All sites	C00-C97	2332	100

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

Table 5a. (cont.)

Age-group / Cancer site	ICD-10	New cases	
		Number	%
Age-group ≥75			
Prostate	C61	294	22,8
Non-melanoma skin	C44	197	15,3
Trachea, bronchus, lung	C33–C34	172	13,3
Colon	C18	102	7,9
Stomach	C16	65	5,0
Rectum etc.	C19–C21	62	4,8
Bladder	C67	50	3,9
Renal pelvis	C64–C65	45	3,5
All sites	C00–C97	1289	100

Table 5b. Eight leading cancer sites by age-groups in Estonia in women, 2021

Age-group / Cancer site	ICD-10	New cases	
		Number	%
Age-group 0–14			
Leukaemia	C91–C95	4	44,4
Kidney, renal pelvis	C64–C65	2	22,2
Brain and central nervous system	C70–C72	2	22,2
Non-Hodgkin lymphoma	C82–C85, C96	1	11,1
All sites	C00–C97	9	100
Age-group 15–34			
Breast	C50	18	23,1
Non-melanoma skin	C44	14	17,9
Thyroid gland	C73	8	10,3
Cervix uteri	C53	6	7,7
Hodgkin lymphoma	C81	5	6,4
Stomach	C16	4	5,1
Colon	C18	4	5,1
Skin melanoma	43	4	5,1
All sites	C00–C97	78	100
Age-group 35–54			
Breast	C50	219	33,0
Non-melanoma skin	C44	133	20,1
Cervix	C53	39	5,9
Skin melanoma	C43	32	4,8
Corpus uteri	C54	31	4,7
Ovary	C56	27	4,1
Thyroid gland	C73	27	4,1
Colon	C18	22	3,3
All sites	C00–C97	663	100
Age-group 55–74			
Breast	C50	355	19,4
Non-melanoma skin	C44	291	15,9
Corpus uteri	C54	144	7,9
Trachea, bronchus, lung	C33–C34	138	7,5
Colon	C18	125	6,8
Kidney, renal pelvis	C64–C65	67	3,7
Pancreas	C25	65	3,5
Ovary	C56	65	3,5
All sites	C00–C97	1834	100

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

Table 5b. (cont.)

Age-group / Cancer site	ICD-10	New cases	
		Number	%
Age-group ≥75			
Non-melanoma skin	C44	331	21,3
Breast	C50	186	12,0
Colon	C18	162	10,4
Bronchus, trachea, lung	C33–C34	114	7,3
Pancreas	C25	94	6,0
Stomach	C16	64	4,1
Corpus uteri	C54	63	4,0
Rectum etc.	C19–21	60	3,9
All sites	C00–C97	1556	100

4 Cancer cases by basis of diagnosis

Basis of diagnosis is an important indicator that illustrates the accuracy of cancer diagnosis and the quality of 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 2021, 90% of new cases were microscopically verified indicating a rather good quality of diagnosis [7].

One important method to achieve completeness of cancer cases is comparing the data of ECR with the data of Estonian Causes of Death Registry. If the ECR does not have any data about a cancer diagnosis that is noted on a death certificate, the ECR conducts a data trace-back to the healthcare facility that sent the death certificate. Those cancer cases are called death certificate initiated (DCI) cases. In 2021, the proportion of DCI-s was 3,4% which is rather low, but nevertheless refers to incomplete notification of cancer cases to the ECR. Among those cases the most frequent was lung cancer (17%), cancers of unknown or uncertain site (11%), pancreatic cancer (9%) and prostate cancer (8%).

Cases that are registered solely based on death certificates after conducting unsuccessful trace-back of death certificate notifications, are called death certificates only (DCO) cases. In those cases, the date of cancer diagnosis in the ECR is the same as date of death, although in fact, cancer might have been diagnosed shortly or sometimes even long before the person died. High proportion of DCO cases refers to incomplete reporting of cancer cases but also to unsuccessful data trace-backs conducted by the cancer registry [7]. In 2021, the percentage of DCO cases was rather low (2,3%) in Estonia, indicating good quality of the data of cancer registry [8].

Table 6a. The distribution of new cancer cases by cancer site and the most valid basis of diagnosis in Estonia in men, 2021 (n, %)

Cancer site	ICD-10	Number of new cases	Microscopic (%)*	Non-microscopic (%)**	Death certificate only (%)***
All sites	C00–C97	4084	89,8	7,9	2,3
All sites (excl. non-melanoma skin)	C00–C97, excl. C44	3607	88,5	8,9	2,6
Lip, oral cavity, pharynx	C00–C14	147	91,8	6,8	1,4
Lip	C00	5	100	—	—
Tongue	C01–C02	29	96,6	3,4	—
Gum, floor of mouth etc.	C03–C06	27	100	—	—
Major salivary glands	C07–C08	6	83,3	—	16,7
Tonsil, oropharynx	C09–C10	41	80,5	17,1	2,4
Nasopharynx	C11	6	100	—	—
Pyramidal sinus, hypopharynx	C12–C13	31	93,5	6,5	—
Other lip, oral cavity, pharynx	C14	2	100	—	—
Digestive organs	C15–C26	988	85,4	12,0	2,5
Oesophagus	C15	71	87,3	9,9	2,8
Stomach	C16	189	89,4	8,5	2,1
Small intestine	C17	11	100	—	—
Colon	C18	275	92,4	6,2	1,5
Rectum etc.	C19–C21	175	94,9	3,4	1,7
Liver etc.	C22	86	76,7	19,8	3,5
Gallbladder etc.	C23–C24	31	58,1	35,5	6,5
Pancreas	C25	144	66,0	29,2	4,9
Other digestive organs	C26	6	50,0	50,0	—

* 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. (cont.)

Cancer site	ICD-10	Number of new cases	Microscopic (%)*	Non-microscopic (%)**	Death certificate only (%)***
Respiratory, intrathoracic organs	C30–C39	579	79,4	16,6	4,0
Nasal cavities, ear, sinuses	C30–C31	4	100	—	—
Larynx	C32	48	93,8	2,1	4,2
Trachea, bronchus, lung	C33–C34	522	78,4	18,0	3,6
Thymus, heart, mediastinum, pleura	C37–C38	4	50,0	25,0	25,0
Respiratory organs etc.	C39	1	—	—	100
Bone, articular cartilage	C40–C41	5	80,0	20,0	—
Skin melanoma	C43	93	96,8	1,1	2,2
Non-melanoma skin	C44	477	99,4	0,6	—
Mesothelial and soft tissues	C45–C49	24	91,7	4,2	4,2
Breast	C50	6	83,3	16,7	—
Male genital organs	C60–C63	1098	97,0	1,7	1,3
Penis	C60	15	93,3	—	6,7
Prostate	C61	1053	97,1	1,7	1,2
Testis	C62	30	96,7	3,3	—
Other male genital organs	C63	—	—	—	—
Urinary organs	C64–C68	286	90,6	6,3	3,1
Kidney, renal pelvis	C64–C65	154	89,6	7,1	3,2
Ureter	C66	2	100	—	—
Bladder	C67	130	91,5	5,4	3,1
Other urinary organs	C68	—	—	—	—

* 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. (cont)

Cancer site	ICD-10	Number of new cases	Microscopic (%)*	Non-microscopic (%)**	Death certificate only (%)***
Eye	C69	5	40,0	60,0	—
Brain, central nervous system	C70–C72	60	68,3	30,0	1,7
Meninges	C70	—	—	—	—
Brain	C71	58	69,0	29,3	1,7
Other central nervous system	C72	2	50,0	50,0	—
Thyroid gland	C73	24	95,8	4,2	—
Other endocrine	C74–C75	4	50,0	25,0	25,0
Site unknown or uncertain	C76–C80	59	32,2	52,5	15,3
Hodgkin lymphoma	C81	14	100	—	—
Non-Hodgkin lymphoma	C82–C85/C96	76	96,1	1,3	2,6
Immunoproliferative diseases	C88	3	100	—	—
Multiple myeloma	C90	39	100	—	—
Leukaemia	C91–C95	97	95,9	—	4,1
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 Estonia in women, 2021 (n, %)

Cancer site	ICD-10	Number of new cases	Microscopic (%)*	Non-microscopic (%)**	Death certificate only (%)***
All sites	C00–C97	4140	90,6	7,2	2,2
All sites (excl. non-melanoma skin)	C00–C97, excl. C44	3371	88,7	8,6	2,6
Lip, oral cavity, pharynx	C00–C14	59	96,6	1,7	1,7
Lip	C00	6	100	—	—
Tongue	C01–C02	9	100	—	—
Gum, floor of mouth etc.	C03–C06	16	100	—	—
Major salivary glands	C07–C08	7	85,7	14,3	—
Tonsil, oropharynx	C09–C10	14	92,9	—	7,1
Nasopharynx	C11	3	100	—	—
Pyramiform sinus, hypopharynx	C12–C13	4	100	—	—
Other lip, oral cavity, pharynx	C14	—	—	—	—
Digestive organs	C15–C26	907	82,5	14,3	3,2
Oesophagus	C15	20	80,0	15,0	5,0
Stomach	C16	153	89,5	7,2	3,3
Small intestine	C17	19	84,2	10,5	5,3
Colon	C18	313	87,2	9,9	2,9
Rectum etc.	C19–C21	140	93,6	4,3	2,1
Liver etc.	C22	48	81,3	18,8	—
Gallbladder etc.	C23–C24	45	68,9	28,9	2,2
Pancreas	C25	165	62,4	32,1	5,5
Other digestive organs	C26	4	50,0	50,0	—

* Histology, autopsy with histology, cytology, haematology.

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

*** Cases registered solely based on death certificates.

Table 6b. (cont)

Cancer site	ICD-10	Number of new cases	Microscopic (%)*	Non-microscopic (%)**	Death certificate only (%)***
Respiratory, intrathoracic organs	C30–C39	275	82,5	13,5	4,0
Nasal cavities, ear, sinuses	C30–C31	3	100	—	—
Larynx	C32	5	80,0	20,0	0,0
Trachea, bronchus, lung	C33–C34	262	82,4	13,7	3,8
Thymus, heart, mediastinum, pleura	C37–C38	3	100	—	—
Respiratory organs etc.	C39	2	50,0	—	50,0
Bone, articular cartilage	C40–C41	8	87,5	12,5	—
Skin melanoma	C43	121	97,5	0,8	1,7
Non-melanoma skin	C44	769	98,7	0,9	0,4
Mesothelial and soft tissues	C45–C49	30	93,3	3,3	3,3
Breast	C50	778	95,1	3,5	1,4
Female genital organs	C51–C58	540	95,0	3,5	1,5
Vulva, vagina	C51–C52	35	97,1	—	2,9
Cervix uteri	C53	122	97,5	0,8	1,6
Corpus uteri	C54	239	98,7	1,3	—
Uterus unspecified	C55	3	—	66,7	33,3
Ovary	C56	129	87,6	9,3	3,1
Other female genital organs	C57	12	91,7	8,3	—
Placenta	C58	—	—	—	—

* 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. (cont)

Cancer site	ICD-10	Number of new cases	Microscopic (%)*	Non-microscopic (%)**	Death certificate only (%)***
Urinary organs	C64–C68	193	83,4	13,0	3,6
Kidney, renal pelvis	C64–C65	133	84,2	14,3	1,5
Ureter	C66	7	100	—	—
Bladder	C67	53	79,2	11,3	9,4
Other urinary organs	C68	—	—	—	—
Eye	C69	12	33,3	50,0	16,7
Brain, central nervous system	C70–C72	41	61,0	31,7	7,3
Meninges	C70	1	100	—	—
Brain	C71	38	57,9	34,2	7,9
Other central nervous system	C72	2	100	—	—
Thyroid gland	C73	80	100	—	—
Other endocrine	C74–C75	3	100	—	—
Site unknown or uncertain	C76–C80	54	29,6	55,6	14,8
Hodgkin lymphoma	C81	13	92,3	—	7,7
Non-Hodgkin lymphoma	C82–C85/96	112	100	—	—
Immunoproliferative diseases	C88	1	100	—	—
Multiple myeloma	C90	47	97,9	—	2,1
Leukaemia	C91–C95	97	95,9	—	4,1
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 the time of diagnosis

The extent of solid tumours is defined as follows: 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 diagnosing it as early as possible is crucial for the patient's prognosis. Unfortunately, a significant proportion of new cancer cases in Estonia are diagnosed when the disease has already spread beyond the primary tumour site – in 2021 half of the new cancers in men and women were localized at the time of diagnosis, whereas around 20% 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 (57%) and women (47%). For more than 40% of patients, distant metastasis was found in lung cancer in both men and women, as well as in oesophagus cancer in women. 35% of men with stomach and oesophagus cancer already had distant metastasis at the time of diagnosis. That was also the case for 25% of male and female patients diagnosed with colon cancer, women with rectum cancer and men with kidney cancer.

77% of uterine cancers were locally spread at the time of diagnosis whereas 60% of cervical and ovarian cancers had already spread to adjacent tissues or had distant metastasis. 67% of prostate cancers and 45% of breast cancers were locally spread at the time of diagnosis, distant metastasis was found in 11% and 7% of patients, respectively.

Table 7a. The distribution of new cancer cases by site and extent of disease in Estonia in men, 2021 (n, %)

Cancer site	ICD-10	Number of new cases	Localized (%)	Regional lymph nodes only (%)	Regional, adjacent tissues (%)	Distant metastasis (%)	Unknown (%)
All sites	C00–C80	3855	49,4	8,5	10,9	20,0	11,3
All sites (excl. non-melanoma skin)	C00–C80, excl. C44	3378	42,5	9,7	12,4	22,8	12,6
Lip, oral cavity, pharynx	C00–C14	147	23,1	34,7	23,8	9,5	8,8
Lip	C00	5	100	—	—	—	—
Tongue	C01–C02	29	31,0	44,8	3,4	10,3	10,3
Gum, floor of mouth etc.	C03–C06	27	37,0	29,6	29,6	—	3,7
Major salivary glands	C07–C08	6	66,7	—	16,7	—	16,7
Tonsil, oropharynx	C09–C10	41	4,9	41,5	29,3	12,2	12,2
Nasopharynx	C11	6	16,7	50,0	33,3	—	—
Pyriform sinus, hypopharynx	C12–C13	31	9,7	32,3	32,3	16,1	9,7
Other lip, oral cavity, pharynx	C14	2	—	—	50,0	50,0	—
Digestive organs	C15–C26	988	26,5	17,3	9,6	31,6	15,0
Oesophagus	C15	71	19,7	16,9	5,6	38,0	19,7
Stomach	C16	189	22,2	16,4	7,9	34,4	19,0
Small intestine	C17	11	18,2	—	54,5	18,2	9,1
Colon	C18	275	36,0	18,9	10,9	25,1	9,1
Rectum etc.	C19–C21	175	32,6	29,7	6,3	21,1	10,3
Liver etc.	C22	86	29,1	7,0	14,0	24,4	25,6
Gallbladder etc.	C23–C24	31	25,8	3,2	32,3	25,8	12,9
Pancreas	C25	144	9,7	11,8	4,9	55,6	18,1
Other digestive organs	C26	6	16,7	—	—	50,0	33,3

Table 7a. (cont)

Cancer site	ICD-10	Number of new cases	Localized (%)	Regional lymph nodes only (%)	Regional, adjacent tissues (%)	Distant metastasis (%)	Unknown (%)
Respiratory, intrathoracic organs	C30–C39	579	20,2	11,7	11,9	37,1	19,0
Nasal cavities, ear, sinuses	C30–C31	4	25,0	—	50,0	—	25,0
Larynx	C32	48	35,4	10,4	35,4	2,1	16,7
Trachea, bronchus, lung	C33–C34	522	18,8	12,1	9,4	40,8	19,0
Thymus, heart, mediastinum, pleura	C37–C38	4	25,0	—	25,0	25,0	25,0
Respiratory organs etc.	C39	1	—	—	—	—	100
Bone, articular cartilage	C40–C41	5	20,0	—	20,0	—	60,0
Skin melanoma	C43	93	54,8	6,5	18,3	10,8	9,7
Non-melanoma skin	C44	477	98,3	—	—	—	1,7
Mesothelial and soft tissues	C45–C49	24	45,8	4,2	8,3	25,0	16,7
Breast	C50	6	33,3	16,7	16,7	—	33,3
Male genital organs	C60–C63	1098	66,8	1,6	13,6	11,0	6,9
Penis	C60	15	40,0	20,0	13,3	6,7	20,0
Prostate	C61	1053	67,3	1,2	13,9	10,8	6,7
Testis	C62	30	63,3	6,7	3,3	20,0	6,7
Other male genital organs	C63	—	—	—	—	—	—
Urinary organs	C64–C68	286	52,1	1,0	17,1	19,9	9,8
Kidney, renal pelvis	C64–C65	154	46,1	—	20,1	25,3	8,4
Ureter	C66	2	100	—	—	—	—
Bladder	C67	130	58,5	2,3	13,8	13,8	11,5
Other urinary organs	C68	—	—	—	—	—	—
Eye	C69	5	80,0	—	—	—	20,0

Table 7a. (cont)

Cancer site	ICD-10	Number of new cases	Localized (%)	Regional lymph nodes only (%)	Regional, adjacent tissues (%)	Distant metastasis (%)	Unknown (%)
Brain, central nervous system	C70–C72	60	91,7	—	—	—	8,3
Meninges	C70	—	—	—	—	—	—
Brain	C71	58	91,4	—	—	—	8,6
Other central nervous system	C72	2	100	—	—	—	—
Thyroid gland	C73	24	62,5	16,7	4,2	12,5	4,2
Other endocrine	C74–C75	4	50,0	25,0	—	—	25,0
Site unknown or uncertain	C76–C80	59	—	3,4	—	54,2	42,4

Table 7a. The distribution of new cancer cases by site and extent of disease in Estonia in women, 2021 (n, %)

Cancer site	ICD-10	Number of new cases	Localized (%)	Regional lymph nodes only (%)	Regional, adjacent tissues (%)	Distant metastasis (%)	Unknown (%)
All sites	C00–C80	3870	51,4	11,3	9,1	15,3	12,8
All sites (excl. non-melanoma skin)	C00–C80, excl. C44	3101	40,0	14,0	11,4	19,1	15,5
Lip, oral cavity, pharynx	C00–C14	59	35,6	27,1	22,0	5,1	10,2
Lip	C00	6	83,3	—	—	—	16,7
Tongue	C01–C02	9	66,7	22,2	—	—	11,1
Gum, floor of mouth etc.	C03–C06	16	31,3	25,0	31,3	—	12,5
Major salivary glands	C07–C08	7	42,9	28,6	—	28,6	—
Tonsil, oropharynx	C09–C10	14	7,1	35,7	50,0	—	7,1
Nasopharynx	C11	3	—	33,3	33,3	—	33,3
Pyriform sinus, hypopharynx	C12–C13	4	25,0	50,0	—	25,0	—
Other lip, oral cavity, pharynx	C14	—	—	—	—	—	—
Digestive organs	C15–C26	907	26,8	13,7	10,5	31,9	17,2
Oesophagus	C15	20	10,0	20,0	10,0	45,0	15,0
Stomach	C16	153	31,4	8,5	6,5	27,5	26,1
Small intestine	C17	19	21,1	15,8	21,1	31,6	10,5
Colon	C18	313	35,1	14,4	11,2	24,6	14,7
Rectum etc.	C19–C21	140	25,7	21,4	14,3	24,3	14,3
Liver etc.	C22	48	27,1	6,3	10,4	43,8	12,5
Gallbladder etc.	C23–C24	45	8,9	11,1	13,3	48,9	17,8
Pancreas	C25	165	15,2	12,7	7,9	46,7	17,6
Other digestive organs	C26	4	25,0	—	—	25,0	50,0

Table 7b. (cont)

Cancer site	ICD-10	Number of new cases	Localized (%)	Regional lymph nodes only (%)	Regional, adjacent tissues (%)	Distant metastasis (%)	Unknown (%)
Respiratory, intrathoracic organs	C30–C39	275	25,5	11,3	8,0	38,2	17,1
Nasal cavities, ear, sinuses	C30–C31	3	33,3	—	66,7	—	—
Larynx	C32	5	20,0	40,0	20,0	—	20,0
Trachea, bronchus, lung	C33–C34	262	24,8	11,1	7,3	40,1	16,8
Thymus, heart, mediastinum, pleura	C37–C38	3	100	—	—	—	—
Respiratory organs etc.	C39	2	—	—	—	—	100
Bone, articular cartilage	C40–C41	8	50,0	—	12,5	25,0	12,5
Skin melanoma	C43	121	67,8	5,0	9,1	5,8	12,4
Non-melanoma skin	C44	769	97,8	0,3	—	0,1	1,8
Mesothelial and soft tissues	C45–C49	30	33,3	6,7	10,0	20,0	30,0
Breast	C50	778	45,2	29,4	2,7	6,8	15,8
Female genital organs	C51–C58	540	47,8	3,5	26,3	12,0	10,4
Vulva, vagina	C51–C52	35	57,1	17,1	8,6	8,6	8,6
Cervix uteri	C53	122	29,5	2,5	50,8	8,2	9,0
Corpus uteri	C54	239	77,4	2,5	7,1	7,9	5,0
Uterus unspecified	C55	3	—	—	—	33,3	66,7
Ovary	C56	129	12,4	3,1	43,4	23,3	17,8
Other female genital organs	C57	12	8,3	—	33,3	16,7	41,7
Placenta	C58	—	—	—	—	—	—

Table 7b. (cont)

Cancer site	ICD-10	Number of new cases	Localized (%)	Regional lymph nodes only (%)	Regional, adjacent tissues (%)	Distant metastasis (%)	Unknown (%)
Urinary organs	C64–C68	193	49,2	0,5	19,7	16,6	14,0
Kidney, renal pelvis	C64–C65	133	50,4	0,8	21,8	15,0	12,0
Ureter	C66	7	28,6	—	28,6	42,9	—
Bladder	C67	53	49,1	—	13,2	17,0	20,8
Other urinary organs	C68	—	—	—	—	—	—
Eye	C69	12	66,7	—	8,3	8,3	16,7
Brain, central nervous system	C70–C72	41	82,9	—	—	—	17,1
Meninges	C70	1	100	—	—	—	—
Brain	C71	38	81,6	—	—	—	18,4
Other central nervous system	C72	2	100	—	—	—	—
Thyroid gland	C73	80	76,3	6,3	7,5	8,8	1,3
Other endocrine	C74–C75	3	33,3	—	33,3	—	33,3
Site unknown or uncertain	C76–C80	54	—	3,7	—	38,9	57,4

5.2 TNM staging of selected sites

The TNM staging system is used to describe the size and spread of cancer. At stage 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 multimodal treatment that might change the tumour's size or spread. Since 2018 the 8th version of TNM Classification is used [9]. The TNM staging distribution of cancer cases diagnosed during lifetime in 2021 for selected sites is illustrated in Figure 3.

In men, the highest proportion of cases diagnosed at stage I was seen for kidney cancer skin melanoma and kidney cancer (43% and 42%, respectively). In women, 69% of corpus uteri cancer and 49% of skin melanoma were diagnosed at stage I. Stage I breast cancer was diagnosed in 32% of all cases, whereas the proportion of stage IV cases has levelled off around 7%.

The proportion of stage IV colorectal cancer is continuously around 25% in both men and women.

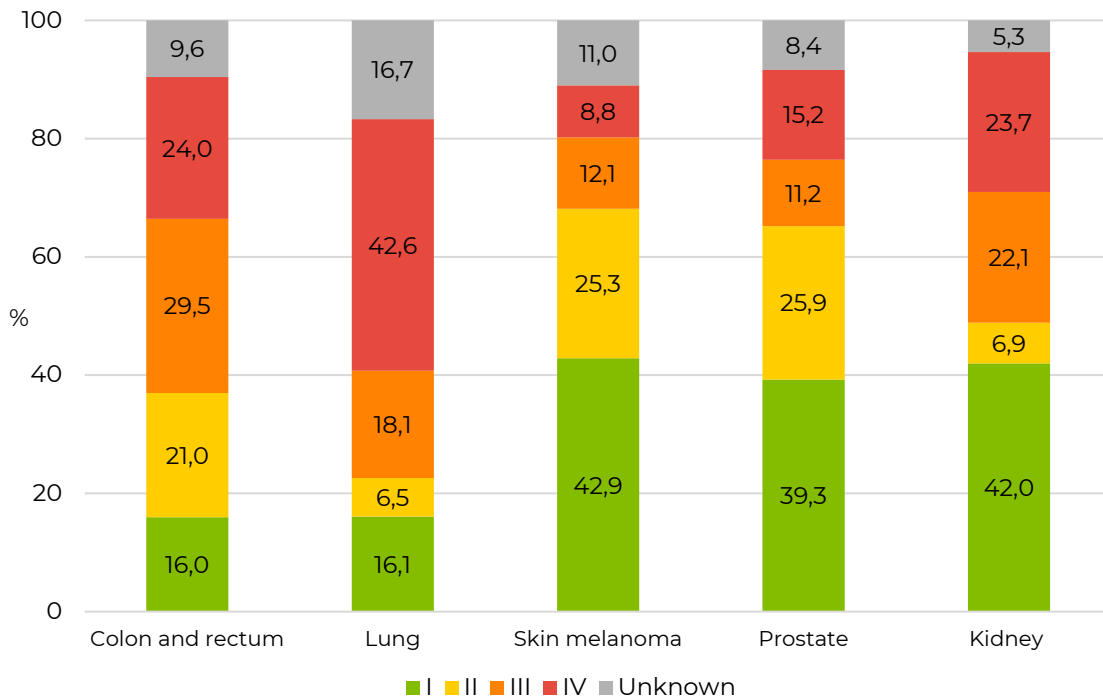
Whereas lung cancer staging distribution in men remained similar to 2020 (16% in stage I, 42% in stage IV), the proportion of stage I lung cancers in women decreased significantly (29% in 2020, 22% in 2021,) and the proportion of stage IV cancer increased (33% in 2020, 42% in 2021).

Of all cervical cancer cases 14% were in stage IV at the time of diagnosis (16% in 2020) and a third was diagnosed in stage I.

The proportion of stage I prostate cancer cases increased significantly, reaching 39% (29% in 2020) and stage IV cases slightly decreased, reaching 15% (17% in 2020).

Compared with previous years, the proportion of unknown stage at the time of diagnosis has notably increased. In 2021 15% of lung cancer cases had unknown stage in both men and women, as well as over 10% of breast, colon and rectum cancers and skin melanoma cases. However, based only on the data of the ECR, it is difficult to say whether the stage was unspecified in the health care facility or not reported to the registry.

Men



Women

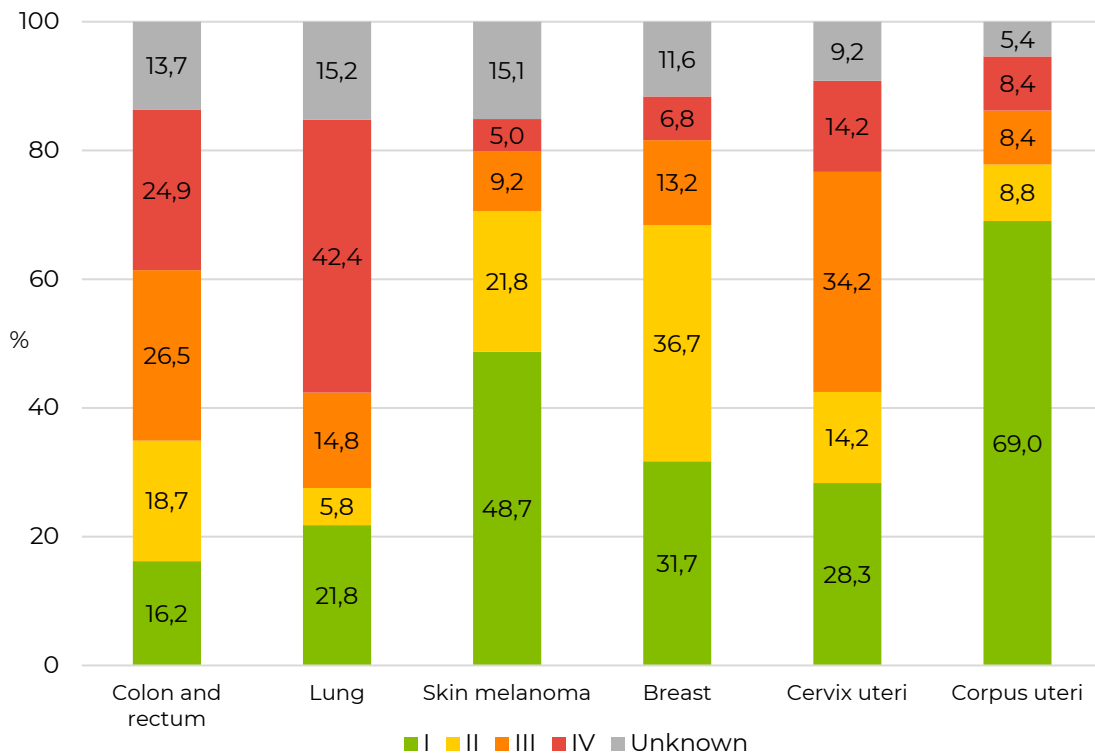


Figure 3. The TNM staging distribution at diagnosis of selected sites during lifetime in Estonia, 2021

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 of lifestyle-related cancers have all contributed to increasing number of new cancer cases, reaching more than 8200 in 2021 (Figure 4).

Compared with the five-year mean (2015–2019) preceding the COVID-19 pandemic, the number of new cancer cases decreased by 8% (9% in men, 7% in women). Therefore, the decrease of new cancer cases, that started in 2020 also continued in 2021, suggesting that the impacts of the pandemic were still ongoing. These include somewhat limited access to health care services that may have caused a drop in the number of cases usually found in screening or cases with mild symptoms found randomly during health check-ups, and COVID-related deaths in patients who otherwise would have had cancer diagnosis in the near future. For instance, the number of haematological cancers was 16% smaller than the mean in 2015–2019, decrease was 15% for kidney cancer, 11% for skin melanoma and 8% for prostate cancer. On the other hand, the decrease in new cancer cases for some cancer sites is related to the long-term effect of reduction in risk behaviour (lung and stomach cancer) or to the positive effect of cancer screening program (cervical cancer). However, further analysis is needed to provide reliable information about factors that impact cancer incidence trends.

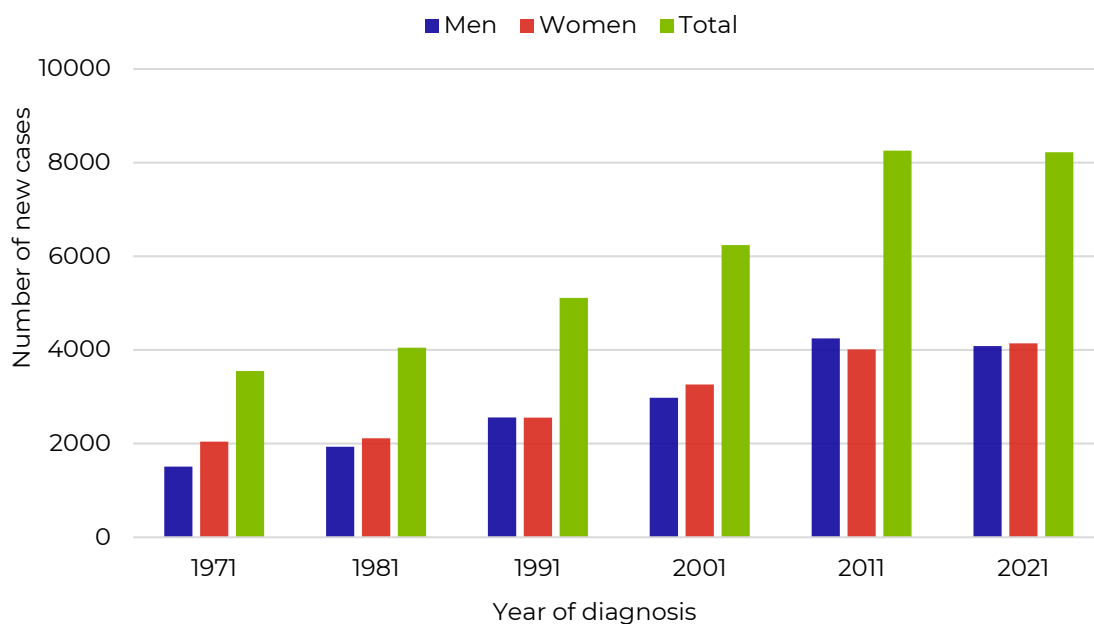


Figure 4. Number of new cancer cases in Estonia, selected years

6.2 Selected sites

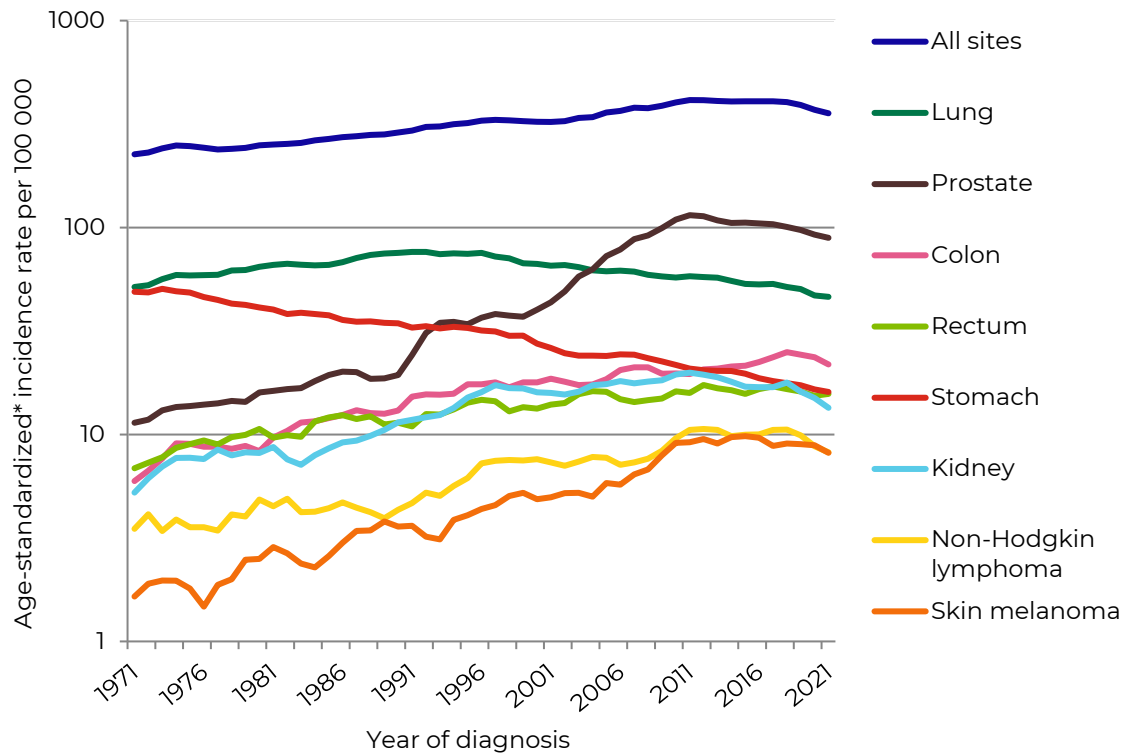
One of the priorities of Estonian Cancer Control Plan 2021–2030 is to achieve a decreasing trend in age-standardized cancer incidence as a result of prevention activities [10]. Time trends of age-standardized cancer incidence for selected sites in 1971–2021 are presented in Figure 5. In men, total cancer incidence has started to decrease during recent decades and in women it has stabilized [11], but incidence trends vary by cancer sites.

The decreasing trend of total cancer incidence in men can be partly contributed to the decrease in prostate cancer incidence that started in 2011 [12] and has continued in 2021. In addition, the incidence of lung and stomach cancer have been in decline since the end of 1990s [13, 14]. Incidence of kidney cancer, skin melanoma and non-Hodgkin lymphoma have been quite stable in the recent decade.

In women, the number of the breast, cervical, stomach, colon and rectal cancer decreased in 2021. However, in the long-term, the incidence of breast and rectal cancer are still increasing in Estonia [11]. The incidence of lung cancer, skin melanoma and non-Hodgkin lymphoma have stabilized in the recent years.

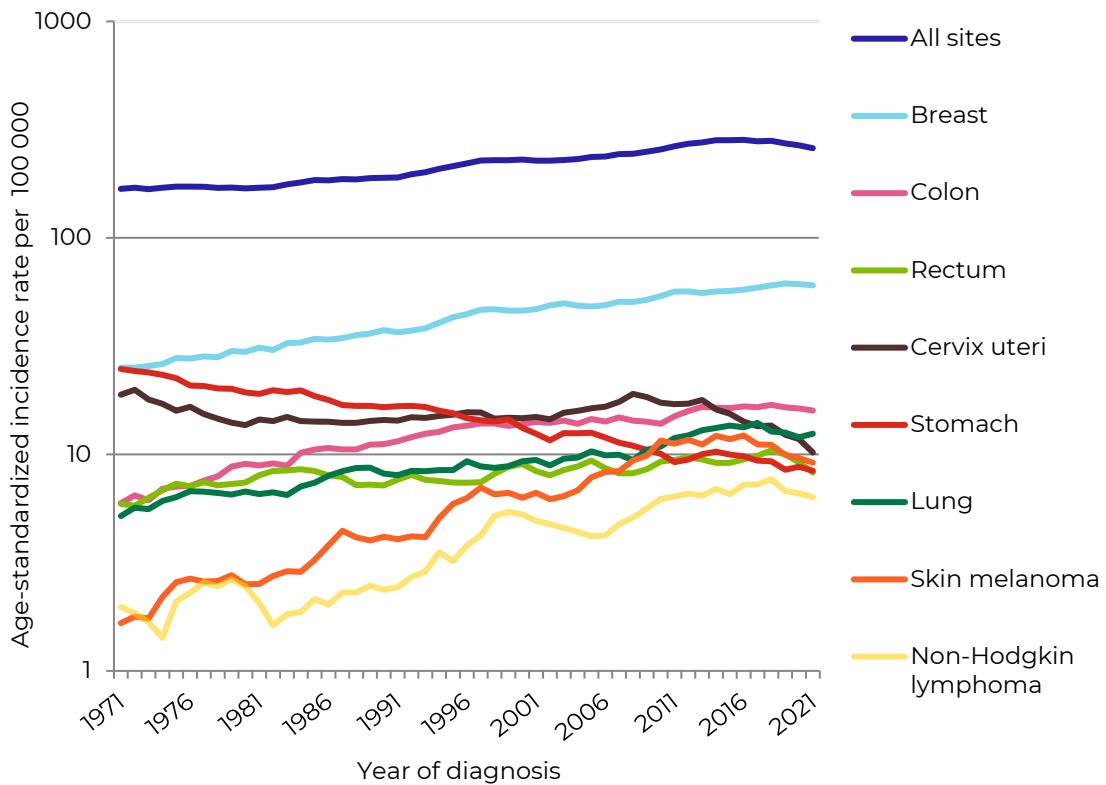
Trends of cancer sites related to screening are presented in more detail in chapter 9.3.

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, 1968–2021 (selected sites)

7 Cancer prevalence

On the 31 December 2021, there were 68433 people (27 762 men and 40 671 women) in the population of Estonia who had been diagnosed with cancer at some point during their lifetime. The number has continuously increased (Figure 6) because cancer incidence is rising, and the survival of cancer patients is improving [15].

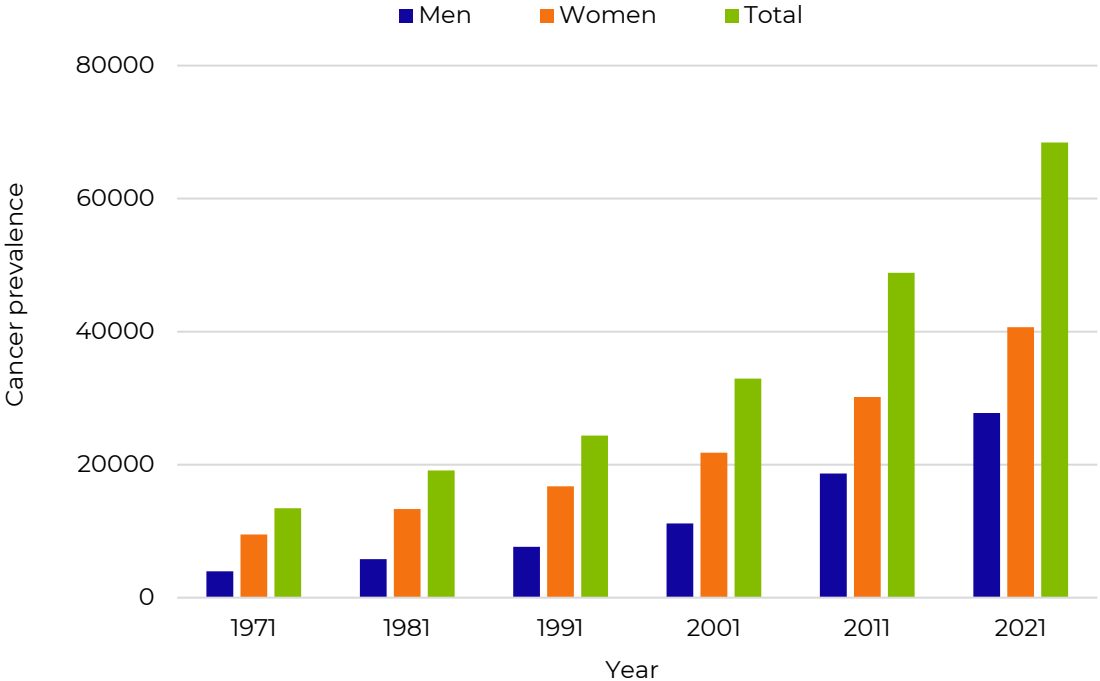


Figure 6. Number of persons with a life-time history of cancer in Estonia at the end of corresponding year

Since one person can have multiple tumours during his or her lifetime, the number of prevalent cases was remarkably higher – a total of 76 000 of which 31 369 in men and 44 631 in women. Excluding non-melanoma skin cancer, the leading site in men was the prostate (43%) and in women the breast (31%). The proportion of corpus uteri cancer was around 10% of all prevalent cases. Colon cancer in both men and women as well as cervical cancer constituted around 7% of all prevalent cases, but the proportion of other cancer sites was less than 6% (Tables 8a and 8b).

Table 8a. The most frequent cancer sites among prevalent cases in Estonia on 31 December 2021, men

Cancer site	ICD-10	Prevalent cases	
		Number	%
Prostate	C61	11130	43,4
Colon	C18	1769	6,9
Kidney, renal pelvis	C64–C65	1490	5,8
Trachea, bronchus, lung	C33–C34	1329	5,2
Rectum etc.	C19–21	1276	5,0
Bladder	C67	1150	4,5
Skin melanoma	C43	944	3,7
Stomach	C16	902	3,5
All sites except non-melanoma skin	C00–C97, but C44	25633	100

Table 8b. The most frequent cancer sites among prevalent cases in Estonia on 31 December 2021, women

Cancer site	ICD-10	Prevalent cases	
		Number	%
Breast	C50	10376	30,9
Corpus uteri	C54	3321	9,9
Colon	C18	2598	7,7
Cervix uteri	C53	2548	7,6
Skin melanoma	C43	1897	5,7
Rectum etc.	C19–C21	1464	4,4
Kidney, renal pelvis	C64–C65	1445	4,3
Ovary	C56	1303	3,9
All sites except non-melanoma skin	C00–C97, but C44	33558	100

8 Survival

Estimating cancer survival allows a comprehensive assessment of cancer control measures, as it accounts for both early diagnosis and the efficiency of cancer treatment.

In 2017–2021, the one-year, five-year and ten-year relative survival estimates for all cancer cases diagnosed in Estonia were 78%, 65% and 61%, respectively (Table 9). Excluding non-melanoma skin, the respective estimates were 74%, 58% and 53%. 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 2007–2011, 2012–2016 and 2017–2021. Survival has increased the most for skin melanoma, rectal cancer, and leukaemia (by 8%). Survival for lung and kidney cancer as well as for lip, oral cavity and pharynx cancer has increased by 7% and by 6% for colon cancer.

One-year, five-year and ten-year relative survival ratios for selected sites by extent of disease at the time of diagnosis are presented in Table 10. For localized tumours, the five-year and ten-year relative survival was 100% for prostate cancer, over 90% for skin melanoma and breast cancer and over 80% for colon, corpus uteri and kidney cancer. In case of distant metastasis at the time of diagnosis, five-year and ten-year relative survival was the highest for prostate cancer (36% and 17%, respectively).

One of the outcome indicators of the Estonian Cancer Control Plan 2021–2030 is relative cancer survival with an aim to reach 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 11 [16]. Survival in Estonia is at the same level as in the Nordic countries for stomach, pancreatic, lung, cervical, ovarian, prostate, testicular and kidney cancer as well as for Hodgkin lymphoma. In comparison with the Nordic countries, the biggest survival gap remains for non-Hodgkin's lymphoma and head and neck cancers (lip, oral cavity, pharynx) but also for colon and rectal cancer, skin melanoma, breast cancer and corpus uteri cancer.

Table 9. One-year, five-year and ten-year relative survival (%) by cancer site and gender in Estonia in 2017–2021

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	78	75	81	65	62	67	61	58	63
All sites (excl. non-melanoma skin)	C00–96, excl. C44	74	72	76	58	56	59	53	51	54
Lip, oral cavity, pharynx	C00–14	68	64	79	46	40	60	39	31	58
Oesophagus	C15	34	32	44	10	8	18	8	6	18
Stomach	C16	52	53	50	29	30	28	26	26	26
Colon	C18	77	76	77	60	59	61	56	54	57
Rectum etc.	C19–21	82	81	84	62	60	64	56	54	57
Anus and anal canal	C21	84	76	86	56	40	61	50	56	52
Liver	C22	27	25	30	8	7	11	5	5	5
Gallbladder etc.	C23–24	31	33	30	14	16	13	11	12	11
Pancreas	C25	24	25	24	6	6	7	5	4	5
Throat	C32	82	81	88	59	59	57	47	46	53
Lung	C34	46	42	54	21	17	29	15	12	23
Skin melanoma	C43	94	92	96	84	79	88	83	78	86
Non-melanoma skin	C44	100	100	100	100	100	100	100	100	100
Soft tissues	C48–49	73	74	72	51	49	53	49	45	52
Breast	C50	94	89	94	82	60	82	75	67	75
Cervix uteri	C53	—	—	85	—	—	66	—	—	62
Corpus uteri	C54	—	—	91	—	—	79	—	—	75
Ovary	C56	—	—	73	—	—	47	—	—	36
Prostate	C61	—	99	—	—	94	—	—	92	—
Testis	C62	—	98	—	—	98	—	—	98	—
Kidney	C64	80	79	82	70	70	71	64	62	66
Bladder, other urinary organs	C65–68	74	77	67	57	60	49	50	51	46

Table 9. (cont.)

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	42	43	42	19	18	20	16	14	18
Thyroid	C73	93	93	93	91	89	91	89	85	90
Hodgkin lymphoma	C81	93	92	94	88	86	91	87	83	90
Non-Hodgkin lymphoma	C82–85/96	76	76	77	60	60	59	51	51	51
Multiple myeloma	C90	75	78	72	48	49	48	25	21	27
Leukaemia	C91–95	75	77	73	59	60	59	50	51	49

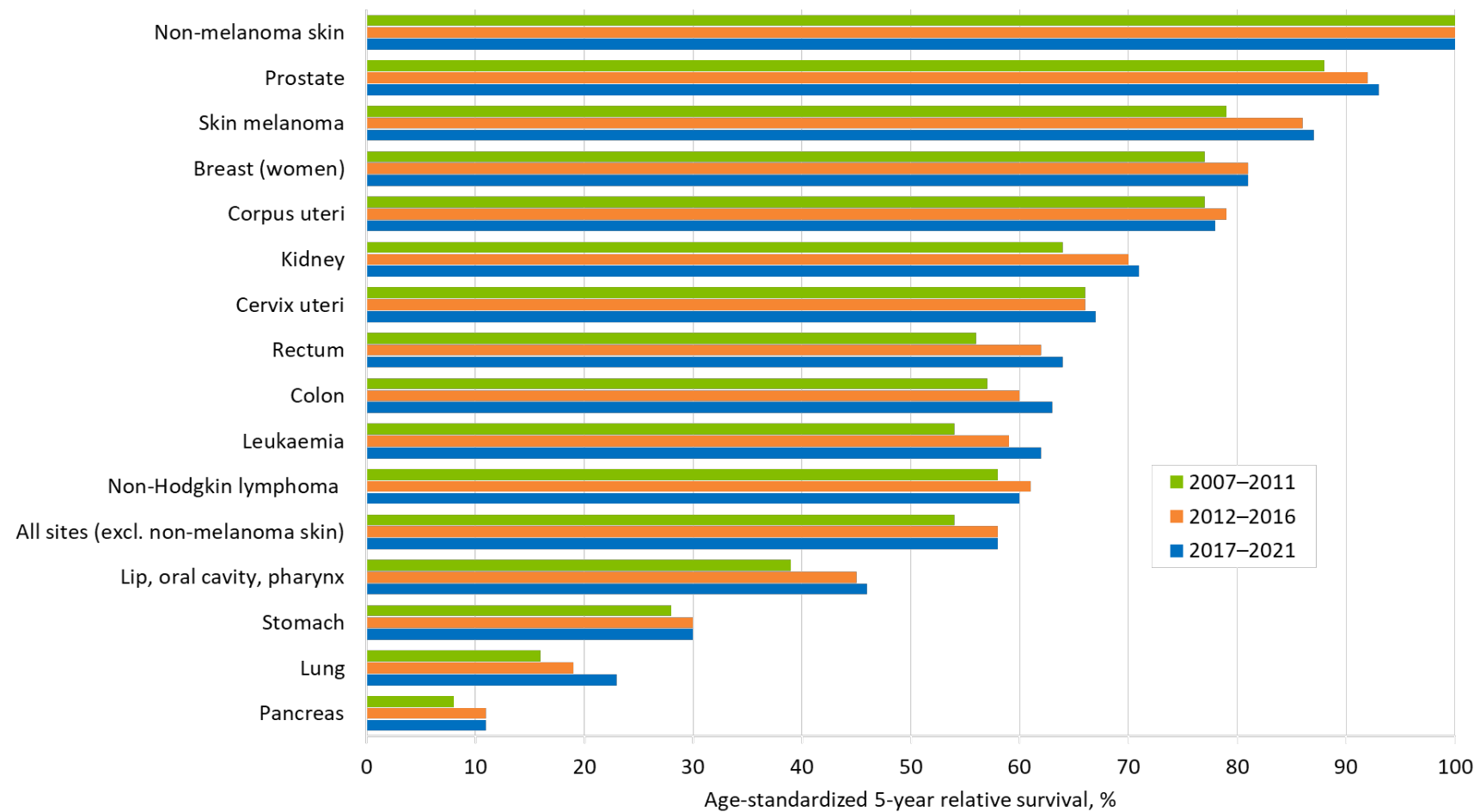


Figure 7. Age-standardized five-year relative survival in Estonia in 2007–2011, 2012–2016 and 2017–2021

Table 10. One-year, five-year and ten-year relative survival for selected sites by extent of disease in Estonia in 2017–2021

Cancer site	ICD-10	One-year relative survival (%)			Five-year relative survival (%)			Ten-year relative survival (%)		
		Localized cancer	Lymph nodes, adjacent tissues	Distant metastasis	Localized cancer	Lymph nodes, adjacent tissues	Distant metastasis	Localized cancer	Lymph nodes, adjacent tissues	Distant metastasis
Lip, oral cavity, pharynx	C00–14	88	68	33	69	42	6	65	31	8
Stomach	C16	87	72	26	74	38	3	70	30	3
Colon	C18	95	87	46	91	72	12	86	72	8
Rectum	C19–20	94	92	52	86	74	13	77	69	8
Pancreas	C25	61	50	12	34	12	1	28	8	0
Lung	C34	90	58	20	67	20	2	50	14	1
Skin melanoma	C43	100	95	47	96	65	18	95	61	16
Breast (women)	C50	100	98	61	96	84	19	93	73	7
Corpus uteri	C54	99	88	43	92	59	16	89	53	10
Prostate	C61	100	100	84	100	97	36	100	88	17
Kidney	C64	96	89	38	91	76	18	85	61	9

Table 11. Age-standardized five-year relative survival (%) for selected sites in Estonia, Finland, and Denmark [16] in 2017–2021

Cancer site	ICD-10	Men			Women		
		Estonia	Finland	Denmark	Estonia	Finland	Denmark
Lip, oral cavity, pharynx	C00–14	40	65	62	59	78	67
Stomach	C16	31	29	30	30	36	37
Colon	C18	62	66	73	64	71	73
Rectum	C19–20	61	68	72	68	74	75
Pancreas	C25	9	11	12	12	13	14
Lung	C34	18	17	25	33	26	32
Skin melanoma	C43	81	92	96	90	95	98
Breast	C50	–	–	–	81	91	90
Cervix uteri	C53	–	–	–	67	70	77
Corpus uteri	C54	–	–	–	78	83	83
Ovary	C56	–	–	–	45	49	46
Prostate	C61	93	94	90	–	–	–
Testis	C62	98	94	96	–	–	–
Kidney	C64	71	73	77	73	75	77
Hodgkin lymphoma	C81	85	90	94	89	92	95
Non-Hodgkin lymphoma	C82–85/96	57	68	79	62	76	85

9 Cancer cases diagnosed in screening

9.1 Cancer screening in Estonia

Organized cancer screening program in Estonia started in 2002 with breast cancer screening, followed by cervical cancer screening in 2006 and colorectal cancer screening in 2016. The aim of preventive screening such as cervical and colorectal cancer screening is to reduce cancer incidence by detecting and treating precancerous lesions and thus avoiding the development of malignant tumours. The aim of early detection screening such as breast cancer screening is to reduce cancer mortality by detecting cancer at an early stage that will enable more effective treatment with less side effects [17].

Every two years, women who have not been diagnosed with breast cancer within five years and have not received mammography within 12 months are invited to participate in breast cancer screening. The age of breast cancer screening target group has been changed repeatedly (Figure 8) and in 2024, women aged 50–68 years as well as 70 and 74 years old (including uninsured women) are invited to participate. Women aged 30–65 years are invited for cervical cancer screening at five-year intervals if they have not been diagnosed with cervical cancer within five years. For colorectal cancer screening, men and women aged 60–68 are invited every two years, unless they have previously been diagnosed with colorectal cancer or have had screening colonoscopy within 10 years. Since 2015, the Estonian Cancer Screening Register based in the National Institute for Health Development has been collecting and analysing the cancer screening data.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
1943	60																									
1944		60																								
1945		59				63																				
1946	57																									
1947			58		60		62																			
1948		56		58		60		62																		
1949	54			57		59		61		63						69										
1950			55		57		59		61							68						74				
1951		53		55		57		59		61		63					68							74		
1952	51			54		56		58		60		62					67								74	
1953			52		54		56		58		60		62					67						72		74
1954		50			53		55		57		59		61					66		68		70		72		
1955			50		52		54		56		58		60		62				66		68		70		72	
1956				50		52		54		56		58		60		62				66		68		70		
1957		47			50		52		54		56		58		60		62		64		66		68		70	
1958							52		54		56		58		60		62		64		66		68		70	
1959							50		52		54		56		58		60		62		64		66		68	
1960								50		52		54		56		58		60		62		64		66		
1961									50		52		54		56		58		60		62		64		66	
1962										50		52		54		56		58		60		62		64		66
1963											50		52		54		56		58		60		62		64	
1964												50		52		54		56		58		60		62		64
1965													50		52		54		56		58		60		62	
1966														50		52		54		56		58		60		62
1967															50		52		54		56		58		60	
1968																50		52		54		56		58		60
1969																	50		52		54		56		58	
1970																		50		52		54		56		58
1971																			50		52		54		56	
1972																				50		52		54		56
1973																					50		52		54	
1974																						50		52		54
1975																							50		52	
1976																								50		52
1977																									50	

Figure 8. Birth year and age of the target group for breast cancer screening in Estonia in 2003–2027

9.2 Screening coverage in men and women invited to screening

The World Health Organization (WHO) has set a target of screening 70% of men and women who are invited so that screening programs would be cost efficient and fulfil their aim of reducing cancer incidence and mortality [18]. Screening coverage of all cancer sites in Estonia continues to be below the recommended level and during the COVID-19 pandemic it decreased even more (Figure 9). In the years 2019–2021 that are analysed in this report, the screening coverage remained below 59% but it has increased since 2022. In 2023 the screening coverage was higher than ever before, reaching over 60% for every site – 64,5% for breast cancer screening [19], 64% for cervical cancer [20] and 60,4% for colorectal cancer screening [21].

A positive shift towards increasing coverage in cervical cancer screening is evident since 2021, when the pilot study of HPV self-sampling began and some women in the screening target group were offered a possibility to participate in screening by taking the HPV test at home and sending it to the laboratory for analysis. Previous studies have confirmed that HPV self-sampling tests are an acceptable method also for women who otherwise would likely not get tested in a clinic, helping to increase the screening coverage [22]. In 2023, nearly 5000 women (10% of all participants) decided to take the HPV test at home. Although women are more likely to take part of colorectal cancer screening (65% of women and 55% of men in 2023) [21], the increase of screening coverage in 2023 was more noticeable among men.

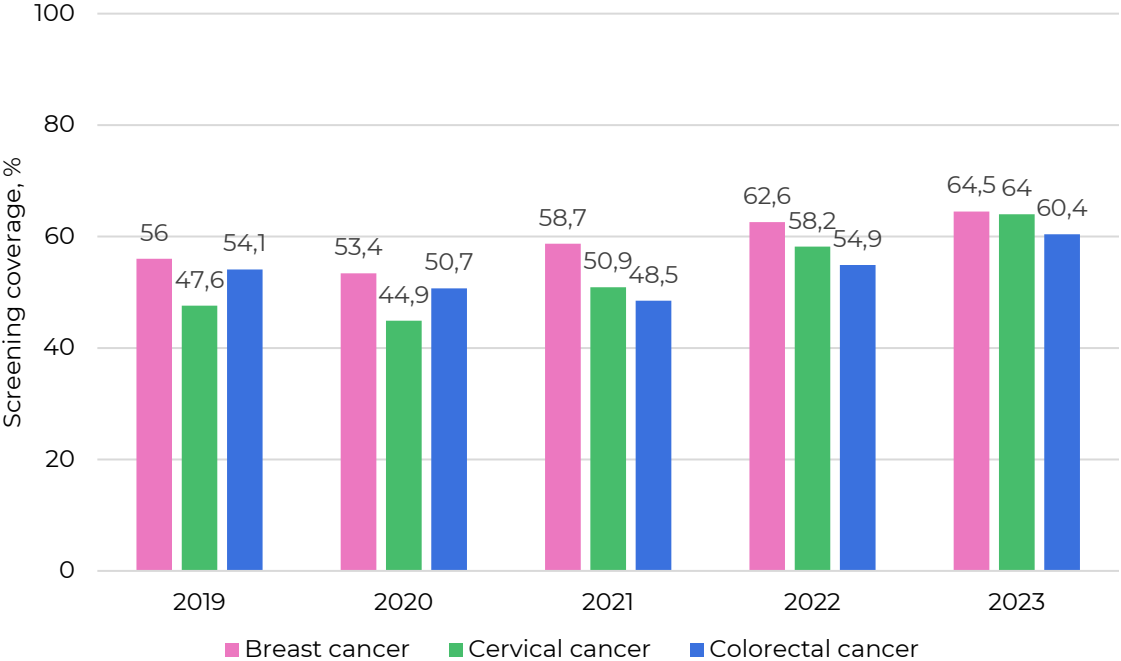


Figure 9. Screening coverage in target groups by cancer site in Estonia in 2019–2023 [18, 19, 20]

9.3 Incidence trends of cancer sites detected at screening

One of the priorities of the Estonian Cancer Control Plan is to achieve a decreasing trend in cervical and colorectal cancer incidence by preventive screening [10]. The incidence of cervical cancer has been decreasing since 2014 and now it is clear that the screening program has had a positive effect [17]. Meanwhile, the incidence of colorectal cancer is continuously increasing [11] and a turn to decline was not seen in 2021, so a preventive effect of screening is not yet noticeable. Breast cancer incidence is also increasing [11], and screening has not significantly affected the incidence trend.

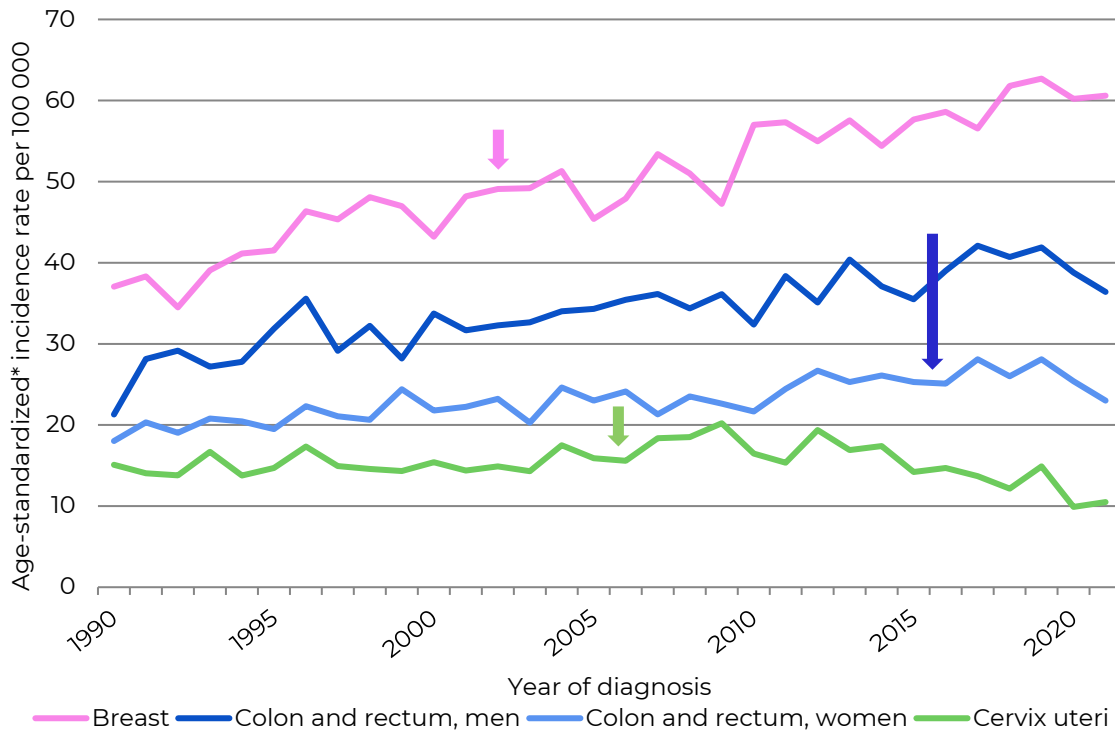


Figure 10. Trends in age-standardized incidence of cancer sites detected at screening in Estonia, 1990–2021, arrows mark the start of screening program

* Standardized to the world standard population

9.4 TNM staging of cancers diagnosed in screening

9.4.1 Breast cancer

In the age-group invited to breast cancer screening (50–68 years), 61% of cancer cases diagnosed during lifetime were detected at screening (65% in 2020 and 62% in 2021) (Table 12). The TNM staging distribution shows that remarkably more cases detected at screening were at stage I when compared to non-screen detected cancer cases (58% and 31%, respectively in 2019). However, a small decline in stage I proportion was seen in both groups in 2020 which continued in 2021 in the non-screen group. The proportion of stage IV cases increases with age.

Table 12. The TNM stage distribution of breast cancer at diagnosis in cancer screening age-group and other age-groups in Estonia, 2019–2021

Year / Stage	Cases diagnosed in screening, 50–68 age-group		Other cases in 50–68 age-group		Cases in age-group <=49		Cases in age-group >=69	
	Number	%	Number	%	Number	%	Number	%
2019								
<i>In situ</i>	12	5,1	12	7,8	6	4,2	7	2,0
I	138	58,5	46	29,9	34	23,6	92	26,6
II	56	23,7	58	37,7	64	44,4	111	32,1
III	21	8,9	21	13,6	22	15,3	51	14,7
IV	5	2,1	11	7,1	9	6,3	40	11,6
Unknown	4	1,7	6	3,9	9	6,3	45	13,0
Total	236	100	154	100	144	100	346	100
2020								
<i>In situ</i>	19	7,7	4	3,0	9	6,1	10	3,4
I	101	41,1	37	27,8	38	25,7	65	22,0
II	86	35,0	8,1	35,3	53	35,8	115	39,0
III	22	8,9	41,1	15,0	25	16,9	43	14,6
IV	8	3,3	5	3,8	8	5,4	29	9,8
Unknown	10	4,1	20	15,0	15	10,1	33	11,2
Total	246	100	133	100	148	100	295	100
2021								
<i>In situ</i>	16	6,8	4	2,8	7	4,8	5	1,8
I	106	45,1	38	26,4	36	24,8	64	23,3
II	70	29,8	54	37,5	61	42,1	95	34,5
III	25	10,6	14	9,7	23	15,9	39	14,2
IV	4	1,7	13	9,0	5	3,4	30	10,9
Unknown	14	6,0	21	14,6	13	9,0	42	15,3
Total	235	100	144	100	145	100	275	100

While the stage distribution in the screening group has remained at relatively same level in 2019–2021, the proportion of lower stages in other breast cancer cases in the 50–68 age-group have somewhat decreased (Figure 11). The proportion of stage III and IV cancer cases but also of cases with unknown stage have slightly increased. The number of breast cancer cases with unknown staging increased during the COVID-19 pandemic.

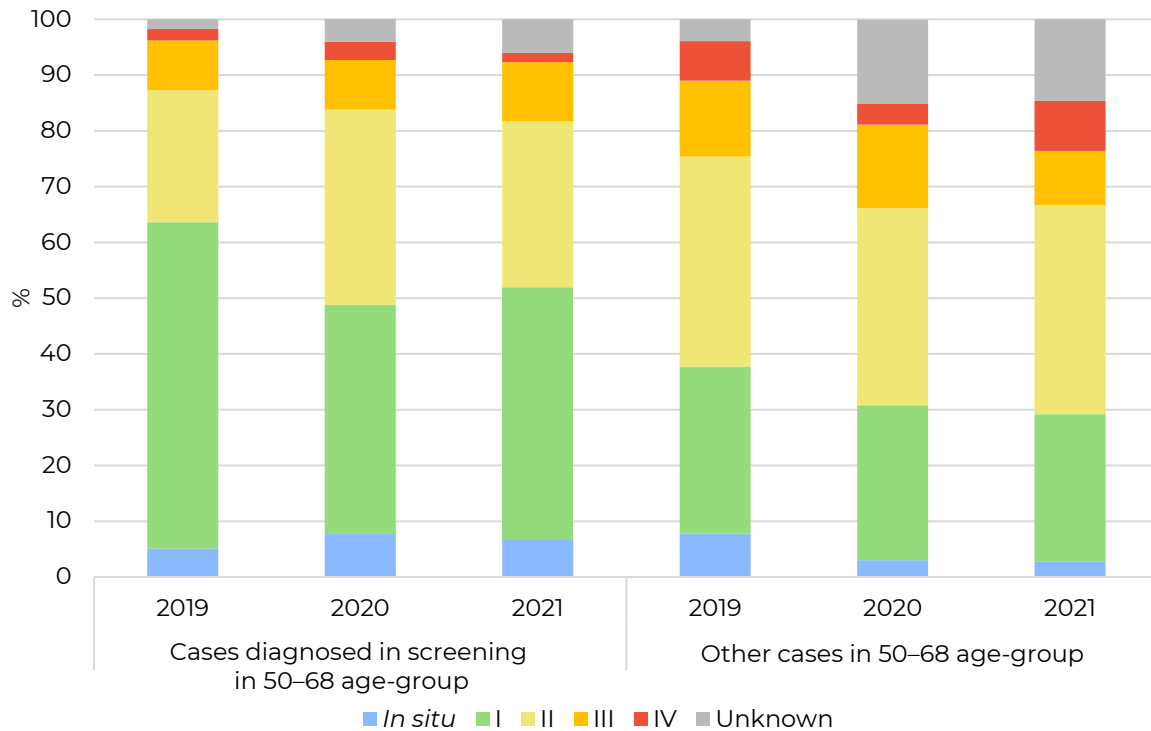


Figure 11. Stage distribution of breast cancer cases diagnosed in screening and other cases in 50–68 age-group in Estonia in 2019–2021

9.4.2 Cervical cancer

In the age-group invited to screening, 23% of cervical cancer cases diagnosed during lifetime were detected at screening (29% in 2020 and 28% in 2021) (Table 13). The target group of cervical cancer screening was expanded in 2021 from age 30–55 to 30–65, so the number of cervical cancer cases diagnosed in screening was somewhat higher in 2021.

A significant proportion of cancer cases detected at screening were diagnosed as *in situ* tumours or at stage I or II, reaching over 90% in 2020, whereas over half of the non-screening detected cases were diagnosed at stage III or IV (Figure 12). While no cervical cancer cases were diagnosed at stage IV in screening, 10% of cases in the non-screen age-group were diagnosed at stage IV and the proportion of stage IV cases increased with age – over 25% of cervical cancer cases among women over 65 years were diagnosed at stage IV in 2021.

Table 13. The TNM stage distribution of cervical cancer at diagnosis in cancer screening age-group and other age-groups in Estonia, 2019–2021

Year/ Stage	Number	%	Number	%	Number	%	Number	%
2019	Cases diagnosed in screening, 30–55 age-group		Other cases in 30–55 age-group		Cases in <=29 age-group		Cases in >=56 age-group	
<i>In situ</i>	6	30,0	9	13,6	3	60,0	1	0,1
I	8	40,0	25	37,9	2	40,0	14	16,1
II	–	–	7	10,6	–	–	18	20,7
III	5	25,0	16	24,2	–	–	28	32,2
IV	–	–	8	12,1	–	–	16	18,4
Unknown	1	5,0	1	1,5	–	–	10	11,5
Total	20	100	66	100	5	100	87	100
2020	Cases diagnosed in screening, 30–55 age-group		Other cases in 30–55 age-group		Cases in <=29 age-group		Cases in >=56 age-group	
<i>In situ</i>	3	23,1	4	12,5	2	33,3	1	1,4
I	8	61,5	12	37,5	1	16,7	13	17,6
II	1	7,7	–	–	1	16,7	7	9,5
III	1	7,7	12	37,5	1	16,7	29	39,2
IV	0	0,0	4	12,5	–	–	15	20,3
Unknown	0	0,0	–	–	1	16,7	9	12,2
Total	13	100	32	100	6	100	74	100
2021	Cases diagnosed in screening, 30–65 age-group		Other cases in 30–65 age-group		Cases in <=29 age-group		Cases in >=66 age-group	
<i>In situ</i>	8	33,3	10	16,1	3	50,0	–	–
I	10	41,7	17	27,4	2	33,3	6	12,0
II	1	4,2	5	8,1	–	–	11	22,0
III	4	16,7	21	33,9	1	16,7	15	30,0
IV	0	0,0	5	8,1	–	–	12	24,0
Unknown	1	4,2	4	6,5	–	–	6	12,0
Total	24	100	62	100	6	100	50	100

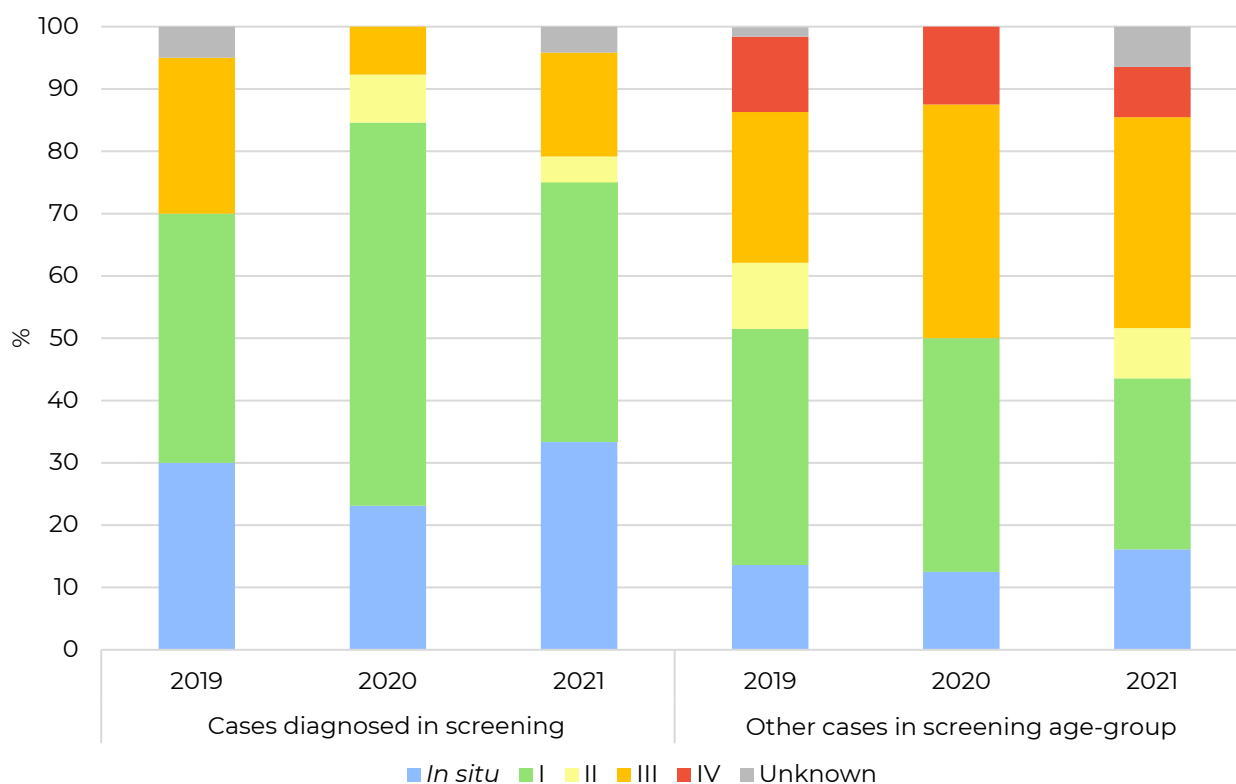


Figure 12. Stage distribution of cervical cancer cases diagnosed in screening and other cases in screening age-group in Estonia in 2019–2021

9.4.3 Colorectal cancer

Among men, in the age-group invited to screening, 39% of colorectal cancer cases diagnosed during lifetime were detected at screening (56% in 2020 and 55% in 2021) (Table 14a). Among women, the same indicator was 31% in 2019, 49% in 2020 and 34% in 2021 (Table 14b).

As expected, the proportion of stage I cancer cases diagnosed in screening was higher than in cases that were not diagnosed in screening in the same age-group (Tables 14a and 14b). However, in men, the proportion of cancer cases diagnosed at stage I decreased in both groups. Significantly more cancer cases that were non-screen detected in age group 60–68 in both men and women were diagnosed at stage IV in 2019–2021, reaching over 31% of all cases in 2021 (Figure 13). In 2020 during COVID-19 pandemic the number of colorectal cancer cases with unknown staging increased, but it is possible that the correct stage was not reported to the ECR.

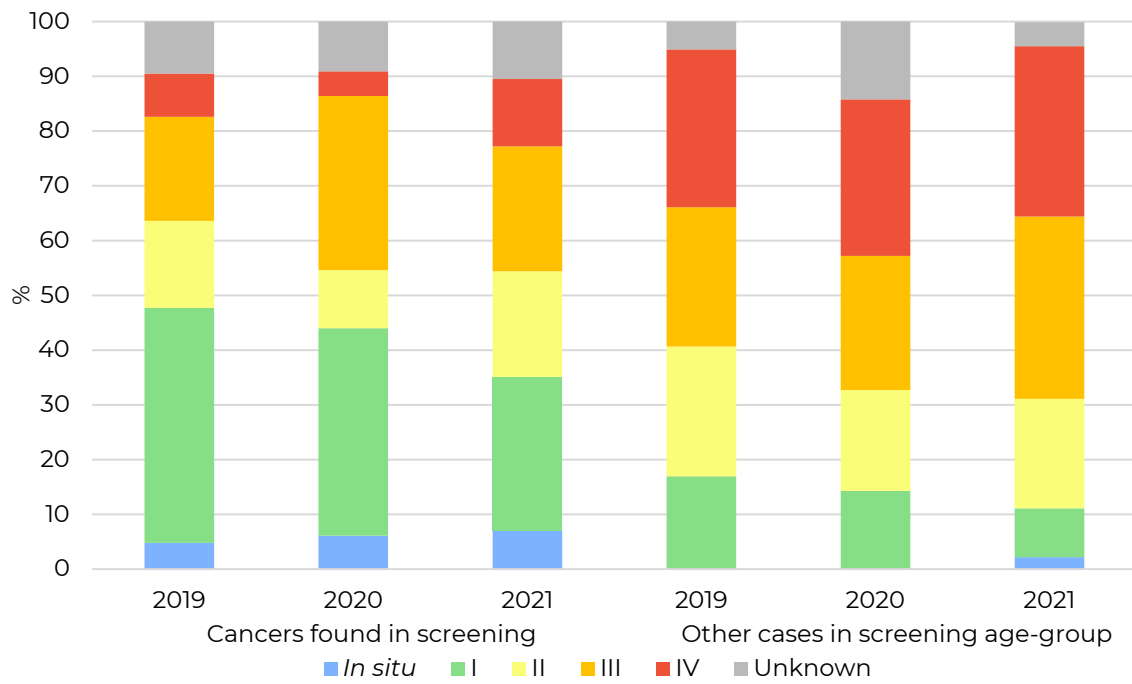
Table 14a. The TNM stage distribution of colorectal cancer at diagnosis in cancer screening age-group and other age-groups in Estonia in 2019–2021, men

Year/ Stage	Number	%	Number	%	Number	%	Number	%
2019	Cases diagnosed in screening, 60–66 age-group		Other cases in 60–66 age-group		Cases in <=59 age-group		Cases in >=67 age-group	
<i>In situ</i>	3	4,8	–	–	–	–	4	1,3
I	27	42,9	10	16,9	6	9,7	49	15,7
II	10	15,9	14	23,7	16	25,8	77	24,7
III	12	19,0	15	25,4	22	35,5	68	21,8
IV	5	7,9	17	28,8	14	22,6	84	26,9
Unknown	6	9,5	3	5,1	4	6,5	30	9,6
Total	63	100	59	100	62	100	312	100
2020	Cases diagnosed in screening, 60–68 age-group		Other cases in 60–68 age-group		Cases in <=59 age-group		Cases in >=69 age-group	
<i>In situ</i>	4	6,1	–	–	1	1,5	2	0,7
I	25	37,9	7	14,3	6	9,1	39	13,5
II	7	10,6	9	18,4	11	16,7	64	22,1
III	21	31,8	12	24,5	28	42,4	76	26,3
IV	3	4,5	14	28,6	13	19,7	74	25,6
Unknown	6	9,1	7	14,3	7	10,6	34	11,8
Total	66	100	49	100	66	100	289	100
2021	Cases diagnosed in screening, 60–68 age-group		Other cases in 60–68 age-group		Cases in <=59 age-group		Cases in >=69 age-group	
<i>In situ</i>	4	7,0	1	2,2	–	–	3	1,1
I	16	28,1	4	8,9	11	16,7	39	14,2
II	11	19,3	9	20,0	14	21,2	59	21,5
III	13	22,8	15	33,3	19	28,8	79	28,8
IV	7	12,3	14	31,1	16	24,2	67	24,5
Unknown	6	10,5	2	4,4	6	9,1	27	9,9
Total	57	100	45	100	66	100	274	100

Table 14b. The TNM stage distribution of colorectal cancer at diagnosis in cancer screening age-group and other age-groups in Estonia in 2019–2021, women

Year/ Stage	Number	%	Number	%	Number	%	Number	%
2019	Cases diagnosed in screening, 60–66 age-group		Other cases in 60–66 age-group		Cases in <=59 age-group		Cases in >=67 age-group	
<i>In situ</i>	–	–	–	–	1	1,8	3	0,8
I	19	55,9	6	14,0	10	17,5	54	14,1
II	3	8,8	11	25,6	14	24,6	81	21,1
III	8	23,5	13	30,2	17	29,8	108	28,2
IV	2	5,9	12	27,9	11	19,3	91	23,8
Unknown	2	5,9	1	2,3	4	7,0	46	12,0
Total	34	100	43	100	57	100	383	100
2020	Cases diagnosed in screening, 60–68 age-group		Other cases in 60–68 age-group		Cases in <=59 age-group		Cases in >=69 age-group	
<i>In situ</i>	3	5,9	–	–	2	3,3	3	1,0
I	12	23,5	6	11,8	10	16,4	48	15,7
II	11	21,6	8	15,7	15	24,6	60	19,6
III	13	25,5	17	33,3	17	27,9	87	28,4
IV	6	11,8	13	25,5	13	21,3	72	23,5
Unknown	6	11,8	7	13,7	4	6,6	36	11,8
Total	51	100	51	100	61	100	306	100
2021	Cases diagnosed in screening, 60–68 age-group		Other cases in 60–68 age-group		Cases in <=59 age-group		Cases in >=69 age-group	
<i>In situ</i>	–	–	1	1,8	1	1,8	2	0,7
I	14	48,3	6	10,5	4	7,0	45	15,8
II	4	13,8	11	19,3	11	19,3	53	18,7
III	8	27,6	17	29,8	18	31,6	67	23,6
IV	2	6,9	18	31,6	13	22,8	75	26,4
Unknown	1	3,4	4	7,0	10	17,5	42	14,8
Total	29	100	57	100	57	100	284	100

Men



Women

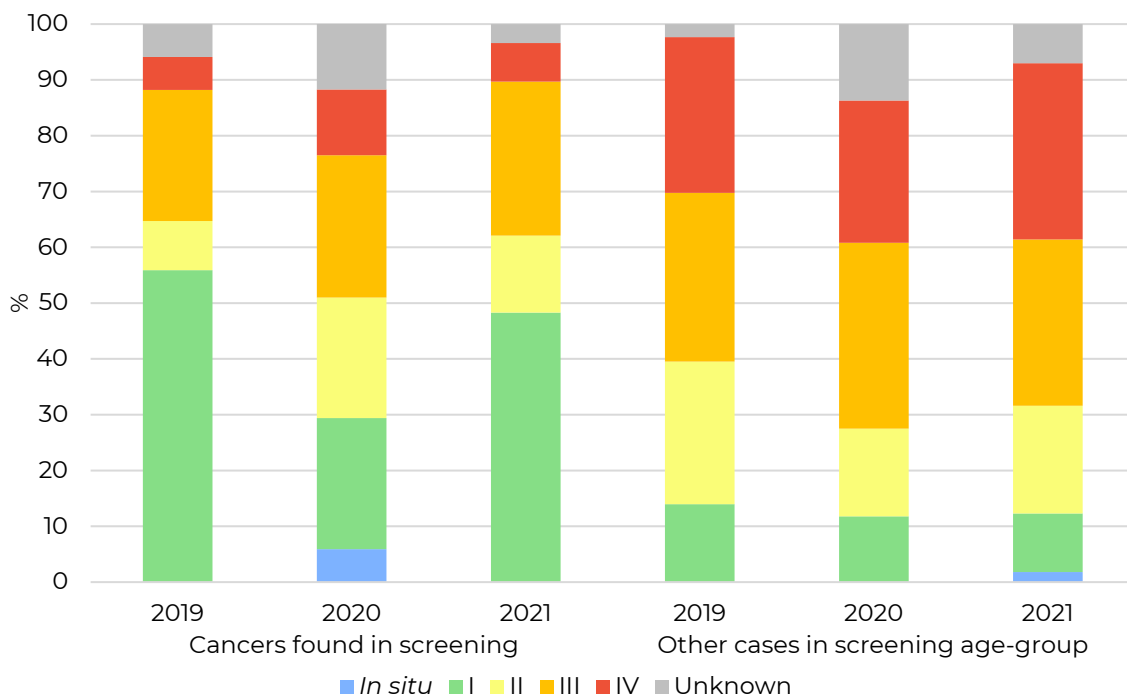


Figure 13. Stage distribution of colorectal cancer cases diagnosed in screening and other cases in screening age-group in Estonia in 2019–2021

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