Nationale Krebsregistrierungsstelle
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National Agency for Cancer Registration

Diagnosis and treatment of breast cancer in Switzerland

Analyses of indicators based on cancer registry data 2020–2022

In collaboration with the Swiss Society of Senology

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Introduction

Based on the Cancer Registration Act (CRA), cancer cases and information on the diagnosis and treatment of cancer have been comprehensively recorded throughout Switzerland since 2020. These data enable nationwide analyses of cancer burden, prevention, early detection and cancer care, as defined in Art. 2 CRA.

With this report, the National Agency for Cancer Registration (NACR) presents an overview about the diagnosis and treatment of breast cancer in Switzerland based on population-based cancer registry data from the years 2020 to 2022. Results of various indicators are shown, which were defined in collaboration with the Swiss Society of Senology.

The indicators are, where possible, defined on the basis of nationally and internationally established indicators in the fields of epidemiology, quality assurance, certification and research. This approach allows for the comparison of data from Swiss cancer registries with findings from other countries, hospitals or tumour centres.

For each indicator, the in-/Exclusion criteria for the analyses and the results stratified by sex, age and stage are presented. Findings of a literature review are also mentioned in order to place the results in a national and international context.

Please note that in 2020 the CRA introduced a reporting obligation for cancer cases. At the same time, the COVID-19 pandemic began. Both factors may have influenced the present results. On one hand, not all information on cancer may have been reported yet; on the other hand, the pandemic and in particular the first wave of the pandemic in spring 2020 may have had an impact on the treatment of cancer cases.

The results of this comprehensive report are summarised in a brief report, which provides an overview of the key findings and formulates recommendations for improving prevention, early detection and care.

The brief report and the documents with the definitions of the indicators and the full results are published on the NACR website:
https://nkrs.ch/en/statistics-and-reports/indicators-on-diagnosis-and-treatment

Methodological notes

This analyses on breast cancer indicators includes Swiss cancer registry data from cases diagnosed between 2020 and 2022. For the analyses, the national cancer data set was used, which consists of data collected in the cantonal cancer registries for adult cancer cases and data collected in the national childhood cancer registry for children and adolescent cancer cases.
Some degree of underreporting cannot be excluded. Although there is no evidence of underreporting in the number of diagnoses, certain variables, such as treatment information, may be incomplete. The extent of underreporting may vary across registries. Nevertheless, data from all registries were included in all analyses.

For the analysis the following cases are included from the national cancer dataset of the NACR:

- Diagnoses with ICD-10 codes C50 (breast cancer) and D05 (in situ breast cancer) are included.

Indicator specific inclusion criteria are described in the respective chapter of the indicator. See also the document 'Definitions of breast cancer indicators 2020-2022' published on the NACR website. https://nkrs.ch/en/statistics-and-reports/indicators-on-diagnosis-and-treatment

- Most indicators include only primary tumours of breast cancer (C50), as defined by the IARC/IACR/ENCR 2004 rules. This means that only the first invasive cancer diagnosis of a certain type of morphology (Berg groups) of a person is counted (e.g. a sarcoma of the breast and an adenocarcinoma of the breast are considered as two separate primary diagnosis, whereas an invasive carcinoma NST and a lobular carcinoma are not counted as separate primary tumours). For in situ breast cancer (D05), a primary diagnosis is defined as an in situ breast cancer diagnosis without an invasive breast cancer diagnosis, or with breast cancer diagnosed more than four months after the in situ breast cancer diagnosis. If multiple D05 diagnoses are present, only the first, or the one with the more specific morphology code is considered the primary diagnosis. Laterality and ICD-O 3.2 Morphology Berg Groups do not influence the definition of a primary D05 diagnosis.
- Most indicators exclude cases diagnosed by death certificate only (DCO cases). Since for those patients no information on diagnosis and treatment is available.
- For two indicators (2 - Mortality, and 6 - Age at death) data from the mortality statistics from the Swiss Federal Statistical Office (FSO) are used. The statistics include 4'047 individuals that died with breast cancer (C50) between 2020 and 2022.

Figure 1 shows the number of all registered breast tumours in the national cancer data set and the inclusion and Exclusion criteria for the creation of the final analysis dataset.

C50, breast cancer

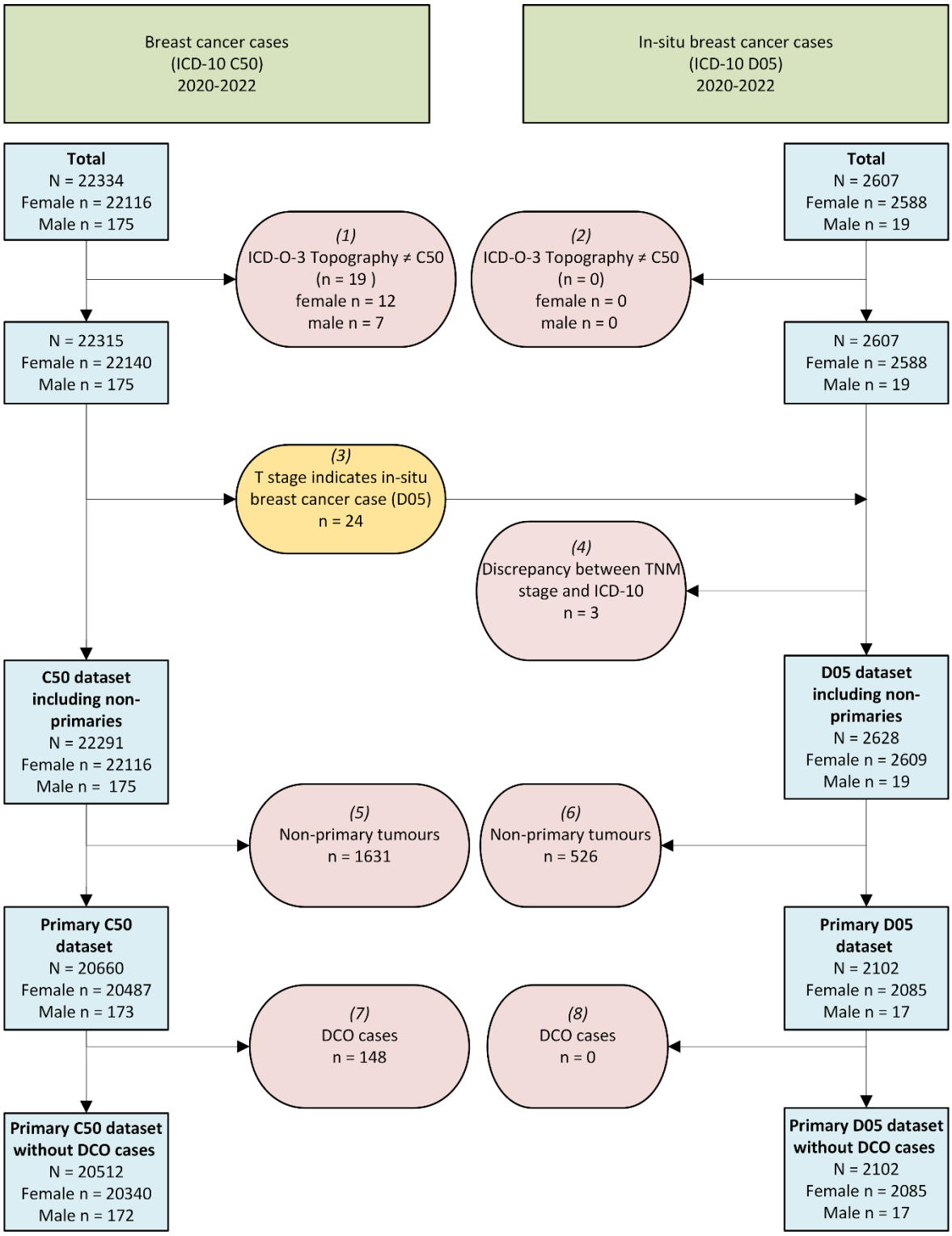
- The NACR dataset totally includes 22'334 cases of **invasive breast cancer (ICD-10 C50)** that have been diagnosed within the years 2020 and 2022.
- 19 cases with non-breast cancer specific ICD-O-3 topography code were excluded (wrong ICD-O to ICD-10 conversion from IACR tool).
- 24 cases of ICD-10 code C50 (breast cancer) with UICC stage 0 were reclassified to D05 (in situ breast cancer) based on T stage and further information (no neoadjuvant treatment).

- The final analysis dataset includes 22'291 cases of breast cancer, of which 20'660 are primary cancers. Among these, 20'512 are non-DCO cases.

D05, in situ breast cancer:

- The NACR dataset totally includes 2'607 cases of **in situ breast cancer (ICD-10 D05)** that have been diagnosed within the years 2020 and 2022.
- 3 cases were excluded because of a discrepancy between T stage information and ICD-10 information (unclear, if C50 or D05).
- 24 cases were added retrospectively, because they were recoded to be D05 instead of C50 based on the TNM information (see remark above to C50).
- The final analysis dataset contains 2'628 cases of in situ breast cancer, of which 2102 cases are primary cancers. All of them are non-DCO cases.

Fiure 1: Flow chart of case inclusion and Exclusion for the analysis dataset



(1) Nine cases with an ICD-10 code of C50 but a non-C50 topography were excluded from this analysis. 7 of these cases had a *morphology code of 8502 (secretory carcinoma), which in ICD-O-3 is restricted to C50, leading the IARC tool to automatically assign an ICD-10 code of C50. However, secretory carcinoma (8502) can also occur in other localisations, such as the head and neck region. Ten cases had a morphology code of 8085 and two cases a morphology code of 8509 and topography codes in the head and neck region.*

(2) *No cases had to be excluded due to a non-C50 ICD-O topography.*

(3) *24 cases had T stage information that suggests that the tumour was in situ rather than invasive. Accordingly, those cases were recoded from C50 to D05.*

(4) *Three cases of D05 had a discrepancy between T stage information and ICD-10 code and were therefor excluded from the dataset.*

(5) *Non primary C50 tumours according to the IARC/IACR/ENCR 2004 were excluded.*

(6) *Non primary D05 tumours were excluded (Definition of primary D05 tumour: being a breast tumour diagnosis without any breast cancer diagnosis or with a breast cancer later than 4 months after diagnosis of the in situ tumour. If multiple D05 diagnoses exist, only the first or the one with the more specific morphology code counts as the primary diagnosis. Laterality and Morphology Berg Groups according to ICD-O 3.2 do not affect the decision of primary D05 diagnosis).*

(7) *148 cases of C50 with basis of diagnosis with a Death Certificate Only (DCO) were excluded.*

(8) *No D05 case was diagnosed through DCO.*

General

1A Incidence (invasive breast cancer)

Objective	To show the incidence of invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660)
Results	- 20'487 women and 173 men were diagnosed with invasive breast cancer in 2020-2022. - Age-standardised incidence rates for invasive breast cancer in Switzerland were 111/100'000 person years in women and 1/100'000 person years in men. - Incidence rates increased with age. In women, from 42/100'000 in the youngest (<50 years) to 372/100'000 in the oldest age group (80+ years). However, most women were aged 50-69 years (N = 8966) and most men were aged 70-79 years (N = 68) at time of diagnosis. - Breast cancer was most frequently diagnosed in stage I and II (in women: age-standardised incidence rates 45-47/100'000 for stage I-II; 8-10/100'000 for stage III-IV).
Literature	- According to estimates from the European Cancer Information System (ECIS, 2022), incidence in female breast cancer (all ages) ranges from 70.4/100'000 in Bulgaria to 142.7 per 100'000 in Belgium. For men the incidence estimates range from 0.4 per 100'000 in Lithuania to 1.9 per 100'000 in Germany (standard population used is the European standard population 1976) (2). - Breast cancer age-standardised incidence estimate for Europe from 2018: 100.9/100'000 (Standard population used is the world standard population (Segi 1960, as used by Doll et al. 1966) (3). - Germany: Incidence breast cancer rate was 113/100'000 for women and stable at 1.1/ 100'000 for men in 2019-2020 (standard population used is the European standard population 1976) (4). - NORDAN countries: Age-standardised incidence rate was 138.1/100'000 for female breast cancer in 2019-2023 (standard population used is the Nordic standard population 2000) (5). - United Kingdom: Age-standardised incidence rate in women of 170/100'000 in 2017-2019 (standard population used is the European standard population 2013) (6). - Ireland: Age-standardised incidence rate in women of 163/100'000 in 2020, 207/100'000 in 2021 and 214/100'000 in 2022 (standard population used is the European standard population 2013) (7). - Austria: Age-standardised incidence rate in women of 112 (2020), 122 (2021) and 122 (2022) per 100'000 (standard population used is the European standard population 2013) (8). - Finland: Age-standardised incidence rate in women of 158 per 100'000 2022 (standard population used is the Finnish population 2014) (9). - United States: Age-standardised incidence rate in women of 132/100'000 2017-2021 (standard population used is US standard population 2000) (10).

Remarks	

Table 1A: Number of new diagnoses, crude- (CR) and directly age-standardised* incidence rate (DASR) per 100'000 person years for breast cancer (C50) 2020-2022

Stratification	Group		N	CR	DASR	Lower 95% CI**	Upper 95% CI**
Overall			20660				
Sex		Female	20487	155.74	111.34	108.44	114.56
		Male	173	1.33	0.92	0.72	1.71
Age category (years) + Sex	0–49	Male	8	0.10	0.08	0.03	1.26
	50–69	Male	61	1.79	1.99	1.27	4.45
	70-79	Male	68	6.57	5.15	3.76	11.52
	80+	Male	36	6.64	8.43	4.44	22.28
	0–49	Female	3947	51.33	42.38	39.89	45.38
	50–69	Female	8966	261.69	251.75	242.69	261.81
	70-79	Female	4385	371.03	364.75	345.17	387.46
	80+	Female	3189	371.86	381.31	356.98	409.29
UICC Stage + Sex	I	Male	47	0.36	0.25	0.15	1.06
	II	Male	85	0.66	0.43	0.31	1.22
	III	Male	22	0.17	0.07	0.04	0.90
	IV	Male	11	0.08	0.11	0.03	0.94
	NA	Male	8	0.06	0.06	0.02	0.90
	I	Female	8153	61.98	44.58	42.84	46.68
	II	Female	8335	63.36	46.57	44.63	48.86
	III	Female	1876	14.26	9.61	8.78	10.86
	IV	Female	1421	10.80	7.98	7.18	9.20
	NA	Female	702	5.34	2.60	2.24	3.49

* European Standard Population 1976
** CI = Confidence interval

1B Incidence (in situ breast cancer)

Objective	To show the incidence of in situ breast cancer
In-/Exclusion criteria	1. ICD code = D05 (N = 2628) 2. Only primary in situ tumours (D05) diagnosed without or before a diagnosis of an invasive breast cancer (N = 2102)
Results	- 2085 women and 17 men were diagnosed with in situ breast cancer in 2020-2022. - Age-standardised incidence rates for in situ breast cancer in Switzerland were 12/100'000 person years in women and 0.9/100'000 person years in men. - Incidence rates increased with age up to the age of 80 years. In women, from 5/100'000 in the youngest age group (<50 years) to 30-35/100'000 in the age group between 50 and 79 years. However, most patients were aged 50-69 years at time of diagnosis (1198 women and 10 men).
Literature	- United Kingdom: Age-standardised incidence rate of in situ breast cancer in women 2017-2019 was 26/100'000 (standard population used is the European standard population 2013) (11). - Finland: Age-standardised incidence rate of in situ breast cancer 2023 was 24/100'000 for women (standard population used is Finland population 2014) (12). - Netherlands: Age-standardised incidence rate of ductal carcinoma in situ in women was 15/100'000 (2020), 21/100'000 (2021), 20/100'000 (2022) (standard population used is the European standard population from 1976) (13).
Remarks	

Table 1B: Number of new diagnoses, crude- (CR) and directly age-standardised* incidence rate (DASR) per 100'000 person years for in situ breast cancer (D05) 2020-2022

Stratification	Group		N	CR	DASR	Lower 95% CI**	Upper 95% CI**
Overall			2102				
Sex		Female	2085	15.85	12.35	11.4	13.7
		Male	17	0.13	0.14	0.06	0.96
Age category (years) + Sex	0-49	Male	0	0	0	0	0
	50–69	Male	10	0.29	0.43	0.14	2.88
	70-79	Male	3	0.29	0.19	0.04	7.04
	80+	Male	4	0.74	1.58	0.1	15.46
	0–49	Female	411	5.35	4.76	3.87	6.33
	50–69	Female	1198	34.97	33.08	30.26	37.09
	70-79	Female	357	30.21	29.27	23.49	39.26
	80+	Female	119	13.88	11.39	8.34	20.1

* European Standard Population 1976
** CI = Confidence interval

2 Mortality

Objective	To show the mortality of invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 4047)
Results	- 4025 women and 22 men died of invasive breast cancer in 2020-2022. - Age-standardised mortality rates were 17/100'000 person years in women and 0.1/100'000 person years in men. - Mortality rates increased with age. In women, from 3/100'000 in the youngest age group (<50 years) to 189/100'000 in the oldest age group (80+ years).
Literature	- Germany: 22/100'000 women and 0.2/100'000 men 2020-2021(standard population used is the European standard population 1976) (4). - Finland: 25.2/100'000 women in 2022 (Standard population used is the Finnish population 2014) (9). - According to estimates from the European Cancer Information System (ECIS, 2022), female breast cancer mortality rates across all ages in Europe were estimated to range from 15.5 per 100'000 in Spain to 28.4 per 100'000 in Cyprus. Among men, rates ranged from 0.0 per 100'000 in Luxembourg and Malta to 0.6 per 100'000 in Romania (standard population used is the European standard population from 1976) (14).
Remarks	

Table 2: Number of deaths, crude (CR) and directly age-standardised* mortality rate (DASR) per 100'000 person years for breast cancer (C50) 2020-2022

Stratification	Group		N	CR	DASR	Lower 95% CI**	Upper 95% CI**
Overall			4047	15.49			
Sex		Female	4025	30.6	16.97	16.39	17.56
		Male	22	0.17	0.11	0.07	0.17
Age category (years) + Sex	0–49	Female	281	3.65	3.07	2.72	3.46
	50–69	Female	1096	31.99	31.3	29.47	33.22
	70-79	Female	999	84.53	82.24	77.18	87.56
	80+	Female	1649	192.29	189.34	180.29	198.74
	0–49	Male	0	0	0	0	0.06
	50–69	Male	7	0.21	0.2	0.08	0.42
	70–79	Male	8	0.77	0.71	0.3	1.42
	80+	Male	7	1.29	1.33	0.53	2.78

Data source: FSO cause of death statistics data

* European Standard Population 1976

** CI = Confidence interval

3 Survival

Objective	To show the observed and relative survival of invasive breast cancer
In-/Exclusion criteria	2. ICD code = C50 (N = 22 291) 3. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660)
Results	- 96.1% and 92.9% of all breast cancer patients were still alive one and two years after diagnosis, respectively (observed survival). - Compared to the general population, the one- and two-year survival was 97.8% and 96.3% (relative survival). - The one- and two-year survival of men was lower compared to women. - Survival decreased with increasing age at diagnosis. - Survival decreased also with higher disease stage at time of the diagnosis. However, compared to the general population, patients with stage I breast cancer did not have worse one- or two-year survival.
Literature	- According to the CONCORD-3 study, including 37.5 million patients diagnosed with 18 cancers (2000-2014) from 322 cancer registries in 71 countries, age-standardized five-year net survival for female breast cancer patients was ≥85% in 25 countries including Switzerland, 80–84% in 13 countries, 70–79% in 12 countries, and remained lower in Thailand (69%) and India (66%). In the EU-28 countries, 5-year net survival ranges from 79% in Croatia to 93% in Cyprus (15). - During the period 2019–2021, one-year survival for breast cancer (males and females) in England and Wales combined was reported at 97%, three year survival was 90% respectively (16). - In Germany, 5-year relative survival for female breast cancer patients in 2019–2020 was 88% (4). - Earlier data from the European Cancer Information System (ECIS, 2000–2007) indicated that Switzerland had one of the highest one-year relative survival rates for female breast cancer patients in Europe (96.82%, lowest 1-year relative survival: Lithuania 87.2% vs. highest 1-year relative survival 97.26% in Sweden) (14). - Routine data from hospital discharge records, cancer registries, and death registries for breast cancer in women from Finland, the Turin metropolitan area, Scotland, Sweden, Hungary and Norway 2000-2007 indicating one-year survival ranging from 94.1% in Scotland to 97.1% in Italy (17).
Remarks	

Table 3: One- and two-year observed and relative survival for breast cancer (C50) 2020-2022

Stratification	Group	Survival	No. of deaths	Observed Survival*	Relative Survival**	Lower 95% CI***	Upper 95% CI***
Overall		Year 1	804	0.961	0.978	0.975	0.981
		Year 2	632	0.929	0.963	0.959	0.967
Sex	Female	Year 1	790	0.961	0.978	0.975	0.981
	Female	Year 2	624	0.926	0.963	0.959	0.967
	Male	Year 1	14	0.919	0.950	0.909	0.994
	Male	Year 2	8	0.822	0.933	0.881	0.989
Age category (years)	0–49	Year 1	28	0.993	0.994	0.991	0.996
	0–49	Year 2	47	0.98	0.982	0.978	0.987
	50–69	Year 1	161	0.982	0.987	0.984	0.989
	50–69	Year 2	124	0.968	0.977	0.973	0.981
	70–79	Year 1	205	0.954	0.970	0.964	0.976
	70–79	Year 2	154	0.918	0.952	0.943	0.960
	80+	Year 1	410	0.867	0.942	0.929	0.955
	80+	Year 2	307	0.766	0.910	0.892	0.928
UICC Stage	I	Year 1	88	0.989	1.002	1.000	1.005
	I	Year 2	91	0.978	1.005	1.002	1.008
	II	Year 1	147	0.983	1.001	0.998	1.003
	II	Year 2	200	0.958	0.995	0.990	0.999
	III	Year 1	100	0.947	0.972	0.962	0.983
	III	Year 2	121	0.882	0.929	0.914	0.945
	IV	Year 1	258	0.816	0.833	0.813	0.854
	IV	Year 2	165	0.699	0.728	0.704	0.754

* Observed survival represents the proportion of patients who are alive at a given time after diagnosis.
** Relative survival: survival of the patients adjusted for the expected mortality in the general Swiss population of the same age, sex, and calendar year, effectively estimating the excess mortality due to the disease.
*** CI = Confidence interval

4 Prevalence

Objective	To show the prevalence of invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660)
Results	- At the end of 2022, 19'362 patients lived in Switzerland with breast cancer which was diagnosed in the last three years (three-year prevalence). 13'490 patients lived with breast cancer, which was diagnosed less than two years ago (two-year prevalence), and 6882 patients lived with breast cancer diagnosis which was diagnosed less than one year ago (one-year prevalence). - The proportion of breast cancer patients with a diagnosis in the last three years in the Swiss population by the end of 2022 was 29/100'000 in women and 0.2/100'000 in men.
Literature	- 5-year prevalence for breast cancer (male+female) per 100'000 in 2022 (18) o in Germany: 740 o in Austria: 559 o in Sweden: 641 o in The Netherlands: 820 o in the United Kingdom: 733 o in France (metropolitan): 803 o in Denmark: 782
Remarks	

Table 4.1: Prevalence counts and proportion (per 100'000) for breast cancer (C50) diagnosed between 2020-2022 and alive on 31 Dec 2022 (three-year prevalence)

Stratification	Group	Estimated counts*	Lower CI***	Upper CI***	Proportion**	Lower CI***	Upper CI***
Overall		19361	19089.23	19635.67	219.63	216.54	222.74
Sex	Female	19204	18933.34	19477.56	432.97	426.87	439.14
	Male	157	133.40	183.57	3.58	3.05	4.19
Age category (years)****	0–49	3364	3251.27	3479.64	63.87	61.73	66.07
	50–69	8678	8496.37	8862.54	375.40	367.55	383.39
	70–79	4287	4159.62	4417.29	570.44	553.49	587.78
	80+	3032	2925.03	3141.89	624.32	602.30	646.95
UICC Stage	I	8070	7894.88	8248.03	91.54	89.56	93.56
	II	8168	7991.81	8347.09	92.66	90.66	94.69
	III	1746	1665.05	1829.86	19.81	18.89	20.76
	IV	1199	1132.09	1268.84	13.60	12.84	14.39
	NA	178	152.81	206.16	2.02	1.73	2.34

* Estimated prevalence counts = sum of observed and predicted counts (patients diagnosed between 2020–2022 who were alive on December 31, 2022).
** Prevalence proportion = estimated prevalence counts divided by the corresponding population at risk (patients diagnosed between 2020–2022 and alive on December 31, 2022, per 100'000 population)
*** CI = Confidence interval
****Attained age at Dec 31, 2022

Table 4.2: Prevalence counts and proportion (per 100'000) for breast cancer (C50) diagnosed between 2021-2022 and alive on 31 Dec 2022 (two-year prevalence)

Stratification	Group	Estimated counts*	Lower CI***	Upper CI***	Proportion**	Lower CI***	Upper CI***
Overall		13490	13263.31	13719.60	153.03	150.46	155.63
Sex	Female	13384	13158.20	13612.70	301.75	296.66	306.91
	Male	106	86.78	128.20	2.42	1.98	2.93
Age category (years)****	0–49	2431	2335.31	2529.60	46.16	44.34	48.03
	50–69	6011	5859.99	6164.92	260.03	253.50	266.69
	70–79	2931	2825.84	3039.07	390.01	376.02	404.39
	80+	2117	2027.77	2209.14	435.91	417.54	454.89
UICC Stage	I	5617	5471.06	5765.85	63.72	62.06	65.41
	II	5624	5477.97	5772.94	63.80	62.14	65.49
	III	1213	1145.69	1283.23	13.76	13.00	14.56
	IV	905	846.99	965.94	10.27	9.61	10.96
	NA	131	109.53	155.45	1.49	1.24	1.76

* Estimated prevalence counts = sum of observed and predicted counts (patients diagnosed between 2021–2022 who were alive on December 31, 2022).
** Prevalence proportion = estimated prevalence counts divided by the corresponding population at risk (patients diagnosed between 2021–2022 and alive on December 31, 2022, per 100'000 population)

*** CI = Confidence interval
****Attained age at Dec 31, 2022

Table 4.3: Prevalence counts and proportion (per 100'000) for invasive breast cancer (C50) diagnosed in 2022 and alive on 31 Dec 2022 (one-year prevalence)

Stratification	Group	Estimated counts*	Lower CI***	Upper CI***	Proportion **	Lower CI***	Upper CI***
Overall		6882	6720.36	7046.55	78.07	76.23	79.93
Sex	Female	6835	6673.91	6999.00	154.10	150.47	157.80
	Male	47	34.53	62.50	1.07	0.79	1.43
Age category (years)****	0–49	1320	1249.74	1393.18	25.06	23.73	26.45
	50–69	3019	2912.26	3128.65	130.60	125.98	135.34
	70–79	1496	1421.14	1573.78	199.06	189.10	209.41
	80+	1047	984.53	1112.39	215.59	202.73	229.05
UICC Stage	I	2852	2748.28	2958.63	32.35	31.18	33.56
	II	2809	2706.07	2914.84	31.86	30.70	33.07
	III	632	583.68	683.25	7.17	6.62	7.75
	IV	507	463.82	553.11	5.75	5.26	6.27
	NA	82	65.22	101.78	0.93	0.74	1.15

* Estimated prevalence counts = sum of observed and predicted counts (patients diagnosed in 2022 who were alive on December 31, 2022).
** Prevalence proportion = estimated prevalence counts divided by the corresponding population at risk (patients diagnosed in 2022 and alive on December 31, 2022, per 100'000 population)
*** CI = Confidence interval
****Attained age at Dec 31, 2022

5A Age at diagnosis (invasive breast cancer)

Objective	To show the age distribution at the time of diagnosis in patients with invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660)
Results	- On average, women were aged 64 years and men 71 years at the time of diagnosis. - Most diagnoses occurred in women aged 50-69 (44%) and in men aged 70-79 years (39%). - In stage I, 51% of patients were 50-69 years and 9% 80+ years of age (highest and lowest proportion). - In stage IV, 38% of patients were 50-69 years and 16% <50 years of age (highest and lowest proportion).
Literature	- Italian population-based study including female patients with breast cancer diagnosed between 2013 and 2019: 46.2% of patients aged 50-69 years (19). - Incidence data from three French registries (2007–2012): 28.6% of breast cancer diagnosed at age 40–54 years, 36.4% at age 55–69 years, 30.5% at age ≥70 years (20). - Hungarian study examining breast cancer stage and molecular subtypes: 51.4% of cases detected <45 and >65 years (outside the screening age group) (21) - Publication based on cancer registry data on median age at breast cancer diagnosis in females: ○ Netherlands: 61 years (1989-2017)(22) ○ Belgium: 64 years (23) ○ Ireland: 60 years (2018-2020) (24)
Remarks	

Table 5A.1: Median and mean age at diagnosis for breast cancer (C50) 2020-2022

Stratification	Group	N	Median	Mean
Overall		20660	64.20	63.97
Sex	Female	20487	64.10	63.91
	Male	173	72.40	71.15

Table 5A.2: Age at diagnosis for breast cancer (C50) 2020-2022

			Age category (years)							
		Total	0-49		50-69		70-79		80+	
Stratification	**Group**	**N**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Overall		20660	3934	19.04	9026	43.69	4462	21.60	3238	15.67
Sex	Female	20487	3926	19.16	8965	43.76	4394	21.45	3202	20487
	Male	173	8	4.62	61	35.26	68	39.31	36	173
UICC Stage	I	8202	1382	16.85	4174	50.89	1860	22.68	786	9.58
	II	8421	1908	22.66	3484	41.37	1722	20.45	1307	15.52
	III	1898	378	19.92	663	34.93	392	20.65	465	24.50
	IV	1432	222	15.5	548	38.27	351	24.51	311	21.72
	NA	707	44	6.22	157	22.21	137	19.38	369	52.19

5B Age at diagnosis (in situ breast cancer)

Objective	To show the age distribution at the time of diagnosis in patients with in situ breast cancer
In-/Exclusion criteria	1. ICD code = D05 (N = 2628) 2. Only primary in situ tumours (D05) diagnosed without or before a diagnosis of breast cancer (N = 2102)
Results	- On average, women were aged 60 years and men 69 years at the time of diagnosis. - Most diagnoses occurred in women and men aged 50-69 (58% and 59%).
Literature	- United States: Estimated in situ breast cancer cases in females 2024: 31% aged 60-69 years, 24% 50-59 years (25). - A population-based, retrospective cohort study from the Netherlands Cancer Registry analysing data from women with DCIS who underwent breast-conserving surgery, reported that median age at diagnosis was 60 years (26).
Remarks	

Table 5B.1: Median and mean age at diagnosis for in situ breast cancer (D05) 2020-2022

Stratification	Group	N	Median	Mean
Overall		2102	59.50	60.20
Sex	Female	2085	59.3	60.1
	Male	17	66.9	68.96

Table 5B.2: Age at diagnosis for in situ breast cancer (D05) 2020-2022

		Total	Age category (years)							
			0-49		50-69		70-79		80+	
Stratification	Group	N	N	%	N	%	N	%	N	%
Overall		2102	406	19.31	1211	57.61	361	17.17	124	5.90
Sex	Female	2085	406	19.47	1201	57.60	358	17.17	120	5.76
	Male	17	0	0	10	58.82	3	17.65	4	23.53

6 Age at death

Objective	To show the age distribution at time of death in patients with invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 4047)
Results	- Deaths are most frequent in patients aged 80 years and older in women (41%) and most frequent in men aged 70-79 years (36%). - 7% (N = 281) of all breast cancer deaths affect patients aged 0-49 years.
Literature	- Ireland: Median age at death in females: 72 years (2018-2020) (24).
Remarks	

Table 6: Age at death for breast cancer (C50) 2020-2022

			Age category (years)							
		Total	0-49		50-69		70-79		80+	
Stratification	**Group**	**N**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Overall		4047	281	6.9	1103	27.3	1007	24.9	1656	40.9
Sex	Female	4025	281	7.0	1096	27.2	999	24.8	1649	41.0
	Male	22	0	0	7	31.8	8	36.4	7	31.8

Data source: FSO cause of death statistics data

Diagnosis

7 Stage distribution at diagnosis

Objective	To show the stage distribution at the time of diagnosis in breast cancer patients
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Including only tumours that were histologically verified (N = 20'164) 5. Including only carcinomas (N = 20'160) 6. Excluding 210 (1.04%) cases with missing UICC stage information (N = 19'950)
Results	- The vast majority of breast cancer was diagnosed in stage I and II (41% and 42%), 10% were diagnosed in stage III and 7% in stage IV. - In women, stage I and IV were more frequent than in men, while in men, stage II and III were more frequent than in women. - In patients aged <50 and 80+ years, stage II was most frequent. - In patients aged 50-69 and 70-79 years, stage I was most frequent - The proportion of stage IV was highest in patients aged >80 years (10.84% vs. 5.71% in patients aged <50 years). - 64% of patients detected in an organised screening program (OSP) had stage I and 31% stage II, while in patients of the same age and living in the same canton, the respective proportions were 44% and 40%. - Only 5% of patients detected in OSP had stage III or IV, while the proportion of stage III and IV in patients who were diagnosed outside of the program was 16%.
Literature	- Germany (2019-2020) and Belgium (2023) show a similar stage distribution at breast cancer diagnosis like Switzerland (4,23,27). - Ireland: 36% Stage I, 40% stage II, 14% stage III, 6% stage IV, 5% stage X(2018-2020) (24). - A systematic review with meta-analysis across 81 countries including population-based data on over 2 million women with breast cancer (2000-2022) has shown, that in all but one (Republic of Moldova) of the European countries with available TNM stage data 60% or more of the cases had stage I or II. Also in Australia most women are diagnosed with an early-stage breast cancer (stage I or II) (28).(28)
Remarks	

Table 7: Stage distribution at diagnosis for breast cancer (C50) 2020-2022

			Stage							
		Total	Stage I		Stage II		Stage III		Stage IV	
Stratification	Group	N	N	%	N	%	N	%	N	%
Overall		19950	8200	41.1	8420	42.21	1898	9.51	1432	7.18
Sex	Female	19785	8153	41.21	8335	42.13	1876	9.48	1421	7.18
	Male	165	47	28.48	85	51.52	22	13.33	11	6.67
Age category (years)	0–49	3889	1381	35.51	1908	49.06	378	9.72	222	5.71
	50–69	8868	4173	47.06	3484	39.29	663	7.48	548	6.18
	70–79	4325	1860	43.01	1722	39.82	392	9.06	351	8.12
	80+	2868	786	27.41	1306	45.54	465	16.21	311	10.84
Detection in OSP*	Yes	2009	1692	63.86	627	31.21	65	3.24	34	1.69
	No **	3859	69	43.85	1546	40.06	342	8.86	279	7.23
	NA	143	1692	48.25	54	37.76	11	7.69	9	6.29

* OSP = Organised Screening program. Only female patients in screening age and living in cantons with organised screening programs included. OSP for age 50-69 years: Ticino, Grison, St. Gallen. OSP for age 50-74 years: Basel-Stadt, Bern, Fribourg, Geneva, Jura, Neuchâtel, Thurgau, Vaud, Valais.
**Detection by clinical symptoms, incidental discovery, opportunistic screening, palpable lump, death with or without autopsy, other

8A Method of first detection (invasive breast cancer)

Objective	To show the proportion of the different methods of detection for invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 1410 (6.87%) cases with missing information on method of first detection (N = 19'102)
Results	- Symptoms/palpable lump was the most frequent method of first detection, accounting for 48% of cases in women and 80% of cases in men. - In women, also screening (opportunistic and organised) was a frequent method of detection (46%), especially in the age group of 50-69 years (58%). - In the age group below 50 years, symptoms 10% of all cases were diagnosed in organised screening, with 16% at stage I and 21% in age group 50-79 years - An incidental discovery of breast cancer was quite rare (6%); however, in the age group of 80+ years, 12% of all breast cancer cases were found incidentally. - Stage I was most often detected by screening examinations (63%), whereas in higher stages, the most frequent method of detection was symptoms/ palpable lump (56% - 75%).
Literature	- In the Katowice region in Poland, early detection of breast cancer was initiated by self-examination in 63.7% of cases, by mammography in 22.8%, and by clinical examination in 13.5%. (CAVE: Relatively low participation rate in the national breast cancer screening program) (29). - An earlier study from the United States, which investigated the method of first detection in 361 breast cancer survivors, reported that 25% of cases were initially identified through breast self-examination (30).
Remarks	- The proportion of 10% of all breast cancer cases detected through organised screening programs throughout Switzerland must be viewed in the context that not all, but only 12 cantons had an organised screening program between 2020 and 2022.

Table 8A: Method of first detection for invasive breast cancer (C50) 2020-2022

			Method of first detection									
		Total	Clinical symptoms / palpable lump		Opportunistic screening*		Organised screening program**		Incidental discovery		Death (with or without autopsy) / Other	
Stratification	Group	N	N	%	N	%	N	%	N	%	N	%
Overall		19102	9295	48.66	6647	34.8	2016	10.55	1082	5.66	62	0.32
Sex	Female	18941	9167	48.4	6628	34.99	2016	10.64	1068	5.64	62	0.33
	Male	161	128	79.5	19	11.8	0	0.00	14	8.70	0	0.00
Age category (years)	0–49	3729	2446	65.59	1174	31.48	0	0.00	106	2.84	3	0.08
	50–69	8470	3316	39.15	3106	36.67	1748	20.64	288	3.40	12	0.14
	70–79	4126	1880	45.56	1614	39.12	268	6.50	353	8.56	11	0.27
	80+	2777	1653	59.52	753	27.12	0	0.00	335	12.06	36	1.30
UICC Stage	I	7715	2394	31.03	3575	46.34	1283	16.63	454	5.88	9	0.12
	II	7811	4397	56.29	2428	31.08	627	8.03	329	4.21	30	0.38
	III	1770	1223	69.10	399	22.54	65	3.67	76	4.29	7	0.40
	IV	1360	1020	75.00	169	12.43	34	2.50	129	9.49	8	0.59
	NA	446	261	58.52	76	17.04	7	1.57	94	21.08	8	1.80

8B Method of first detection (in situ breast cancer)

Objective	To show the proportion of the different methods of detection for in situ breast cancer
In-/Exclusion criteria	1. ICD code = D05 (N = 2628) 2. Only in situ tumours (D05) diagnosed without or before a diagnosis of an invasive breast cancer (N = 2102) 3. Excluding 0 (0%) cases detected by death certificate only (N = 2102) 4. Excluding 126 (5.99%) cases with missing information on method of first detection (N = 1967)
Results	- Screening (opportunistic or organised) was the most frequent method of first detection of in situ breast cancer in women (76%). - In men, 69% of in situ breast cancer were detected by symptoms/ palpable lump. - An incidental discovery of an in situ breast tumour was quite rare (5%). However, it was more frequent in men (19%) than in women (4%) and in the age group 80+ years (10%) and 0-49 years (8%) compared to the age groups between 50 and 79 years (3-4%).
Literature	-
Remarks	The proportion of 22% of all in situ breast cancer cases detected through organised screening programs throughout Switzerland must be viewed in the context that not all only 12 cantons had an organised screening program between 2020 and 2022.

Table 8B: Method of first detection for in situ breast cancer (D05) 2020-2022

		Method of first detection									
	Total	Clinical symptoms / palpable lump		Opportunistic screening*		Organised screening program**		Incidental discovery		Death (with or without autopsy) / Other	
		N	%	N	%	N	%	N	%	N	%
Overall	1976	385	19.48	1060	53.64	439	22.22	88	4.45	4	0.20

Due to low numbers of cases per sex and age groups, the results of this indicator are not presented by these categories.
*Opportunistic screening: Screening outside an organised screening program
**Organised screening program: Screening programs organised at cantonal level. Defined for a target population (e.g. females in age 50-69 resp. 50-74).

9A First detection in an organised screening program (invasive breast cancer)

Objective	To show the proportion of invasive breast cancer diagnosis with first detection in an organised screening program (OSP)
In-/Exclusion criteria:	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Including only females of screening age living in cantons with an organised screening program between 2020-2022 (BS, BE, FR, GE, GR, JU, NE, SG, TG, TI, VS, VD) (N = 6119) 5. Excluding 153 (2.50%) cases with missing information on method of first detection (N = 5966)
Results	- 34% of all female patients with invasive breast cancer who live in cantons with OSP and belong to the OSP target age group were diagnosed within the OSP. - Among patients with stage I, 43% and among stage II 29% were detected through OSP.
Literature	- According to cancer registry data from the United Kingdom and Ireland from 2017, 48.9% of breast cancer cases were screen detected for ages 50-64 (31). - Finland: 23% of breast cancer is screen detected (2000-2010) (32).
Remarks	- An average participation rate of 47% in the screening programs in Switzerland 2019-2021 should be considered when interpreting the results (33).

Table 9A: First detection in an organised screening program (OSP) for women with invasive breast cancer at screening age living in a canton with an OSP 2020-2022

		Total*	Detected in OSP	
Stratification	**Group**	**N**	**N**	**%**
Overall		5966	2016	33.79
UICC Stage	I	2975	1283	43.13
	II	2173	627	28.85
	III	407	65	15.97
	IV	313	34	10.86
	NA	98	7	7.14

* Only female patients in screening age and living in cantons with organised screening programs included. OSP for age 50-69 years: Ticino, Grison, St. Gallen. OSP for age 50-74 years: Basel-Stadt, Bern, Fribourg, Geneva, Jura, Neuchâtel, Thurgau, Vaud, Valais.

9B First detection in an organised screening program (in situ breast cancer)

Objective	To show the proportion of in situ breast cancer diagnosis with first detection in an organised screening program (OSP)
In-/Exclusion criteria	1. ICD code = D05 (N = 2628) 2. Only primary in situ tumours (D05) diagnosed without or before a diagnosis of an invasive breast cancer (N = 2102) 3. Excluding 0 (0%) cases detected by death certificate only (N = 2102) 4. Including only females of screening age living in cantons with an organized screening program between 2020-2022 (BS, BE, FR, GE, GR, JU, NE, SG, TG, TI, VS, VD) (N = 843) 5. Excluding 0 (0%) cases with missing information on method of first detection (N = 843)
Results	- 52% of all female patients with an in situ breast cancer who live in cantons with OSP and belong to the OSP target age group were diagnosed within the OSP.
Literature	- Finland: 41% of in situ breast cancer are screen detected (2000-2010) (32).
Remarks	- An average participation rate of 47% in the screening programs in Switzerland 2019-2021 should be considered when interpreting the results (33).

Table 9B: First detection in an organised screening program (OSP) for women with in situ breast cancer (D05) at screening age living in a canton with an OSP 2020-2022

	Total*	**Detected in OSP**	
	N	**N**	**%**
Overall	843	439	52.08

* Only female patients in screening age and living in cantons with organised screening programs included. OSP for age 50-69 years: Ticino, Grison, St. Gallen. OSP for age 50-74 years: Basel-Stadt, Bern, Fribourg, Geneva, Jura, Neuchâtel, Thurgau, Vaud, Valais.

10 Histological confirmation of the diagnosis

Objective	To show the proportion of invasive breast cancer with histological confirmation of the diagnosis
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 1 case (<0.01%) with missing information on most valid basis of diagnosis (N = 20'511)
Results	- 98% of all cases were histologically verified. - In females (98.3%) and in younger patients (0-49 years: 99.6%) the proportion was higher than in males (96.5%) and older patients (80+ years: 94.8%).
Literature	- According to the German Cancer Society (DKG), the target value for pretherapeutic histological confirmation of breast cancer diagnosis is ≥ 90% (34). - According to the annual report of the certified gynaecological cancer centres from German Cancer Society (DKG) from 2024 (data from 2022), in 98.4% of the cases, pretherapeutic histological confirmation was performed (35). - According to the quality indicators defined by EUSOMA, the target proportion of patients with initial histopathological diagnosis of breast cancer trough needle biopsy is 98% with a minimum acceptable standard of 95% (36).
Remarks	

Table 10: Histological confirmation of the breast cancer diagnosis (C50) 2020-2022

		Total	Histological confirmation*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20511	20164	98.31
Sex	Female	20339	19998	98.32
	Male	172	166	96.51
Age category (years)	0–49	3932	3917	99.62
	50–69	9017	8926	98.99
	70–79	4440	4362	98.24
	80+	3122	2959	94.78
UICC Stage	I	8200	8200	100.00
	II	8420	8420	100.00
	III	1898	1898	100.00
	IV	1432	1432	100.00
	NA	561	214	38.15

* Histological confirmation includes pretherapeutic biopsy and/or surgical resection.

11A Morphology (invasive breast cancer)

Objective	To show the distribution of morphological types of invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only invasive primary tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- The proportion of invasive cancer NST among all invasive cancer cases was 72%, the proportion of lobular carcinoma was 14%. - Mucinous, papillary, metaplastic, neuroendocrine, salivary gland carcinomas or other carcinomas accounted each for less than 2% of the cases. - Mesenchymal tumours (e.g. angiosarcomas) were rarely diagnosed (0.2%). - The proportion of invasive cancer NST decreased with age, while the proportion of invasive lobular carcinoma increased.
Literature	- Data from the Austrian Cancer Registry on the morphology of newly diagnosed breast cancer in women from 2020–2022 show: 64.9% were invasive ductal and ductular carcinomas, 13.9% invasive lobular carcinomas (8). - According to pathology references, NST is the most common type of invasive breast cancer (75-80%) (37). - An older study from the United States report that invasive lobular carcinomas of the breast account for about 8% of breast cancer cases (38) - Finland: 73% ductal carcinoma, 17% lobular carcinoma in a female population (32). - According to the federal evaluation of breast surgery by the Institute for Quality Assurance and Transparency in Healthcare (IQTIG) from 2023 including data from 2022, 77.7% of breast cancer patients who underwent surgery had an invasive ductal carcinoma, and 12.3% had an invasive lobular carcinoma (39).
Remarks	

Table 11A: Invasive breast cancer (C50) by morphology 2020-2022

Group		Overall	Age category (years) 0–49	50–69	70–79	80+
Total: All morphologies	N	20512	3932	9017	4441	3122
Invasive carcinoma NST	N	14785	3179	6702	2948	1956
	%	72.08	80.85	74.33	66.38	62.65
Invasive lobular carcinoma	N	2972	336	1243	852	541
	%	14.49	8.55	13.79	19.18	17.33
Other ductal and lobular invasive neoplasms	N	1543	273	699	334	237
	%	7.52	6.94	7.75	7.52	7.59
Mucinous carcinomas	N	374	46	108	104	116
	%	1.82	1.17	1.2	2.34	3.72
Papillary invasive neoplasms	N	170	17	49	59	45
	%	0.83	0.43	0.54	1.33	1.44
Metaplastic carcinomas	N	130	22	54	26	28
	%	0.63	0.56	0.6	0.59	0.9
Neuroendocrine invasive neoplasms	N	57	5	28	16	8
	%	0.28	0.13	0.31	0.36	0.26
Rare and salivary gland-type invasive tumours	N	29	6	10	8	5
	%	0.14	0.15	0.11	0.18	0.16
Unspecific carcinomas	N	136	17	47	33	39
	%	0.66	0.43	0.52	0.74	1.25
Paget disease +/- invasive carcinoma	N	78	13	28	17	20
	%	0.38	0.33	0.31	0.38	0.64
Mesenchymal and fibroepithelial malign tumours	N	41	6	15	10	10
	%	0.2	0.15	0.17	0.23	0.32
Inflammatory carcinoma	N	34	8	17	7	2
	%	0.17	0.2	0.19	0.16	0.06
Only clinical diagnosis/morphology unknown	N	163	4	17	27	115
	%	0.79	0.1	0.19	0.61	3.68

Due to low numbers of male cases per morphology group, the results of this indicator are not presented stratified by sex.

11B Morphology (in situ breast cancer)

Objective	To show the distribution of morphological types of in situ breast cancer
In-/Exclusion criteria	1. ICD code = D05 (N = 2628) 2. Only in situ breast cancer (D05) diagnosed without or before a diagnosis of breast cancer (N = 2102) 3. Excluding 0 (0%) cases detected by death certificate only (N = 2102)
Results	- 80% of all cases were ductal carcinomas in situ/DCIS, 8% were papillary carcinoma in situ and 6% lobular carcinoma in situ/LCIS (including pleomorphic LCIS). - The proportion of DCIS and LCIS decreased with age, while the proportion of papillary in situ neoplasms increased.
Literature	- An Italian study on screen-detected in situ breast cancers reported that 89% were ductal carcinoma in situ (DCIS), while 11% were lobular carcinoma in situ (LCIS) (40). - According to the WHO Classification of Tumours, papillary DCIS tends to be more common in postmenopausal women, it is also the most common type of DCIS in males (41).
Remarks	- The proportion of pleomorphic LCIS was low (<1%).

Table 11B: In situ breast cancer (D05) by morphology 2020-2022

			Age category (years)			
Group		**Overall**	**0–49**	**50–69**	**70–79**	**80+**
Total: All morphologies	N	2102	406	1211	361	124
In situ ductal neoplasms/DCIS	N	1746	345	1035	285	81
	%	83.1	84.98	85.54	78.95	65.32
In situ lobular neoplasms/LCIS	N	132	32	90	8	2
	%	6.28	7.88	7.43	2.22	1.61
In situ papillary neoplasms	N	178	23	63	56	36
	%	8.47	5.67	5.21	15.51	29.03
Paget disease +/- in situ carcinoma	N	43	6	20	12	5
	%	2.05	1.48	1.65	3.32	4.03
Unspecific in situ carcinomas	N	3	0	3	0	0
	%	0.14	0	0.25	0	0

Due to low numbers of male cases per morphology groups, the results of this indicator are not presented stratified by sex.

12 Proportion of in situ breast cancer among all breast tumours

Objective	To show the proportion of in situ breast cancer among all breast tumours
In-/Exclusion criteria	1. ICD code = C50 and D05 (N = 24'919) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) and only primary in situ tumours (D05) diagnosed without or before a diagnosis of an invasive breast cancer (N = 22'762) 3. Excluding 148 (0.65%) cases detected by death certificate only (N = 22'614)
Results	- About 9% of all breast tumours were in situ carcinomas, 91% were invasive cancer cases. - The proportion of in situ tumours was higher in the age group 50-69 years (12%) and in patients diagnosed in organised screenings (18%).
Literature	- Danish data from a population-based screening mammography program showed that ductal carcinoma in situ (DCIS) constituted 13–14% of screen-detected cancers 2007-2010 (42). - In 2017 in the United States, 25% of screen detected breast tumours were DCIS (43).

Table 12: Proportion of in situ breast cancer (D05) among all breast tumours 2020-2022

		Total	Invasive (C50)		D05 (in situ)	
Stratification	**Group**	**N**	**N**	**%**	**N**	**%**
Overall		22614	20512	90.70	2102	9.30
Sex	Female	22425	20340	90.70	2085	9.30
	Male	189	172	91.01	17	8.99
Age category (years)	0–49	4338	3932	90.64	406	9.36
	50–69	10228	9017	88.16	1211	11.84
	70–79	4802	4441	92.48	361	7.52
	80+	3246	3122	96.18	124	3.82
Detection in OSP *	Yes	2455	2016	82.12	439	17.88
	No **	9611	8676	90.27	935	9.73

* OSP = Organised Screening program. Only female patients in screening age and living in cantons with organised screening programs included. OSP for age 50-69 years: Ticino, Grison, St. Gallen. OSP for age 50-74 years: Basel-Stadt, Bern, Fribourg, Geneva, Jura, Neuchâtel, Thurgau, Vaud, Valais.
**Detection by clinical symptoms, incidental discovery, opportunistic screening, palpable lump, death with or without autopsy, other

13A Synchronous bilateral breast cancer

Objective	To show the proportion of patients with synchronous bilateral invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Primary and non-primary cancer (C50) (N = 22'291) 3. Excluding 149 (0.67%) cases detected by death certificate only (Cases N = 22'142, Patients N = 21'350)
Results	- Around 3% of all patients had bilateral invasive breast cancer within 4 months of diagnosis. - Bilateral cancer was more frequent in elderly patients (>80 years: 5%) compared to younger patients (0-49 years: 2%).
Literature	- A nationwide Danish cohort study (1999–2015) reported that 2% of patients with primary breast cancer were registered with synchronous bilateral breast cancer (44). - Data from the nationwide Swedish Cancer Registry, including women diagnosed with primary breast cancer between 1970 and 2000, show that 1.5% developed synchronous (within three months) bilateral breast cancer (45). - According to the 2024 annual report of the certified gynaecological cancer centres of the German Cancer Society (DKG), 3.16% of female breast cancer cases and 1.48% of male breast cancer cases were synchronous (35).
Remarks	- Possible underreporting or underregistration of synchronous contralateral tumours.

Table 13A: Synchronous bilateral invasive breast cancer (C50) 2020-2022

		Total patients*	Patients with synchronous** bilateral invasive breast cancer	
Stratification	**Group**	**N**	**N**	**%**
Overall		21350	718	3.36
Age category (years)	0–49	3995	88	2.20
	50–69	9325	255	2.73
	70–79	4718	198	4.20
	80+	3312	177	5.34

Due to low numbers of male cases with bilateral breast cancer, the results of this indicator are not presented stratified by sex.
*Primary and non-primary invasive breast cases
**Contralateral breast cancer diagnosed within four months of the initial breast cancer diagnosis is considered synchronous

13B Synchronous bilateral in situ and invasive breast cancer

Objective	To show the proportion of patients with synchronous bilateral in situ breast and invasive cancer
In-/Exclusion criteria	1. ICD code = C50 or D05 (N = 24'919) 2. Only primary invasive tumours (C50) and all in situ tumours (D05) (N = 23'288) 3. Excluding 148 (0.64%) cases detected by death certificate only (N = 23'140 of 22813 patients)
Results	- Around 1% of all patients had bilateral invasive and in situ breast cancer within 4 months of diagnosis. - Bilateral invasive and in situ cancer was more frequent in patients aged 50-79 years (1-1.2%) compared to younger (0.9%) and older patients (0.8%).
Literature	
Remarks	- Possible underreporting or underregistration of synchronous contralateral tumours.

Table 13B: Synchronous bilateral invasive and in situ breast cancer 2020-2022

		Total*	**Patients with synchronous** bilateral in situ and invasive breast cancer**	
Stratification	**Group**	**N**	**N**	**%**
Overall		22813	238	1.04
Age category (years)	0–49	4371	38	0.87
	50–69	10322	125	1.21
	70–79	4856	50	1.03
	80+	3265	25	0.77

Due to low numbers of male cases with bilateral breast cancer, the results of this indicator are not presented stratified by sex.
*Primary invasive breast cases; primary and non-primary in situ breast cancer cases
**Contralateral invasive/in situ breast cancer diagnosed within four months of the initial breast cancer diagnosis is considered synchronous

14A Metachronous bilateral breast cancer

Objective	To show the proportion of patients with metachronous bilateral invasive breast cancer
Remarks	This indicator could not be analysed due to the short observation period.

14B Metachronous bilateral in situ and invasive breast cancer

Objective	To show the proportion of patients with metachronous bilateral in situ and invasive breast cancer
Remarks	This indicator could not be analysed due to the short observation period.

15 Oestrogen receptor status

Objective	To show the proportion of a positive oestrogen receptor (ER) status in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 350 (1.7%) cases with missing ER status (N = 20'162)
Results	- 87% of all breast cancer cases were ER positive. - In men, the proportion was higher than in women (99% vs. 87%). - In older patients, the proportion was higher than in younger patients (0-49 years 82%, >80 years 89%). - Among the different stages, the highest proportion was found in stage I cancer (91%).
Literature	- The Irish population based tumour registry report that the proportion of ER-positive female breast cancer cases between 2004 and 2013 was 82.2% (46). - Population-based cancer registry data from the United States (2004-2020): 81.6% of female breast cancers were ER positive (47). - The nationwide Dutch pathology registry showed ,with data obtained in 2013-2016, a mean positivity rate of 87.2% for Oestrogen receptor status (48). - Data from six European cancer registries including postmenopausal patients, diagnosed with advanced breast cancer (locally advanced/metastatic breast cancer) between 2000 and 2014, indicate Oestrogen receptor positivity in 85.7% (49).
Remarks	

Table 15: Oestrogen receptor (ER) status in breast cancer (C50) 2020-2022

		Total	ER status positive*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20162	17634	87.46
Sex	Female	19993	17467	87.37
	Male	169	167	98.82
Age category (years)	0–49	3896	3177	81.55
	50–69	8928	7843	87.85
	70–79	4368	3956	90.57
	80+	2970	2658	89.49
UICC Stage	I	8154	7394	90.68
	II	8386	7146	85.21
	III	1886	1648	87.38
	IV	1412	1177	83.36
	NA	324	269	83.02

*Oestrogen receptor status percentage value between 1-100%

16 Progesterone receptor status

Objective	To show the proportion of a positive progesterone receptor (PR) status in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 386 (1.71%) cases with missing PR status (N = 20'126)
Results	- 77% of all cases were PR positive. - In men, the proportion was higher than in women (92% vs. 77%). - The proportions across different age groups were similar. - Among the different stages, the highest proportion was found in stage I cancer (81%).
Literature	- The nationwide Dutch pathology registry showed, with data obtained in 2013-2016, a mean positivity rate of 71.3% for Progesterone receptor status (48). - Data from six European cancer registries including postmenopausal patients, diagnosed with advanced breast cancer (locally advanced/metastatic breast cancer) between 2000 and 2014, indicate progesterone receptor positivity in 68.5% (49).
Remarks	

Table 16: Progesterone receptor (PR) status in breast cancer (C50) 2020-2022

		Total	PR status positive*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20126	15427	76.65
Sex	Female	19957	15272	76.52
	Male	169	155	91.72
Age category (years)	0–49	3894	2907	74.65
	50–69	8910	6801	76.33
	70–79	4360	3462	79.40
	80+	2962	2257	76.20
UICC Stage	I	8139	6630	81.46
	II	8371	6234	74.47
	III	1886	1416	75.08
	IV	1407	949	67.45
	NA	323	198	61.30

*Progesterone receptor percentage value between 1-100%

17 Hormone receptor status

Objective	To show the proportion of a positive hormone receptor (HR) status in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 347 cases with missing HR status (N = 20'165)
Results	- 88% of all cases were hormone receptor-positive. - In men, the proportion was higher than in women (99% vs. 88%). - In older patients, the proportion tended to be higher than in younger patients (0-49 years 82%, >80 years 90%). - Among the different stages, the highest proportion was found in stage I cancer (91%).
Literature	- Data from six European cancer registries including postmenopausal patients, diagnosed with advanced breast cancer (locally advanced/metastatic breast cancer) between 2000 and 2014, indicate hormone receptor positivity in 60.4% (49).
Remarks	

Table 17: Hormone receptor (HR) status in breast cancer (C50) 2020-2022

		Total	HR status positive*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20165	17735	87.95
Sex	Female	19996	17568	87.86
	Male	169	167	98.82
Age category (years)	0–49	3898	3206	82.25
	50–69	8928	7881	88.27
	70–79	4369	3977	91.03
	80+	2970	2671	89.93
UICC Stage	I	8154	7429	91.11
	II	8388	7193	85.75
	III	1886	1656	87.80
	IV	1412	1184	83.85
	NA	325	273	84.00

*Oestrogen and/or Progesterone receptor status percentage value between 1-100

18 HER2 receptor status

Objective	To show the proportion of positive HER2 receptor status in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 489 (2.38%) cases with no information on HER2 receptor status (missing information, not performed, unknow whether performed or not) (N = 20'023)
Results	- 14% of all cases were HER2-positive. - In women, the proportion was higher than in men (14% vs. 9%). - In younger patients, the proportion was higher than in older patients (0-49 years 20%, >80 years 10%). - Among the different stages, the highest proportion was found in stage IV cancer (22%).
Literature	- Data from the Côte d'Or breast cancer registry (1998-2011) show stable HER2-positivity rates at 13.1% between 1998 and 2011 (50). - The nationwide Dutch pathology registry showed, with data obtained in 2013-2016, lower values of HER2-positivity (9.9% 2013-2016) (48).
Remarks	

Table 18: HER2 receptor status in breast cancer (C50) 2020-2022

		Total	HER2-positive*	
Stratification	**Group**		**N**	**%**
Overall		20023	2812	14.04
Sex	Female	19857	2797	14.09
	Male	166	15	9.04
Age category (years)	0–49	3883	785	20.22
	50–69	8876	1288	14.51
	70–79	4331	443	10.23
	80+	2933	296	10.09
UICC Stage	I	8086	880	10.88
	II	8356	1326	15.87
	III	1871	244	13.04
	IV	1402	306	21.83
	NA	308	56	18.18

* HER2 gene overexpressed or amplified

19 Tumour proliferation labelling (Ki-67)

Objective	To show the distribution of the Ki-67 antigen expression in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 856 (2.38%) cases without information on tumour proliferation labelling (N = 19'656)
Results	- 41% of all breast cancer cases had a Ki-67 antigen expression of 0-9%, 25% of 10-19%. - Men had a higher proportion of low Ki-67 antigen expression than women (0-9%: 41% vs. 27%). - Elderly patients had a higher proportion of low Ki-67 antigen expression than younger patients (0-9%: 41% in 80+ years of age vs. 29% in 0-49 years of age patients). - Among the different stages, the highest proportion of a low Ki-67 expression was found in stage I cancer (53%).
Literature	- According to data from the Regensburg Cancer Registry, among female patients diagnosed with invasive breast cancer between January 2005 and December 2011, 57% of tumour samples exhibited Ki-67 proliferation indices of ≤15% (51). - According to the S3 guideline on breast cancer, "the experts emphasised that [due to the heterogeneous methodological approach] it is not possible to specify generally valid Ki-67 thresholds for prognosis, prediction and monitoring" (52).
Remarks	

Table 19: Tumour proliferation labelling (Ki-67) in breast cancer (C50) 2020-2022

Strati-fication	Group	Total	Ki-67 0-9%		Ki-67 10-19%		Ki-67 20-29%		KI-67 30-39%		Ki-67 ≥40%	
			N	%	N	%	N	%	N	%	N	%
Overall		19656	8053	40.97	4828	24.56	2815	14.32	1230	6.26	2730	13.89
Sex	Female	19491	8009	41.09	4769	24.47	2781	14.27	1217	6.24	2715	13.93
	Male	165	44	26.67	59	35.76	34	20.61	13	7.88	15	9.09
Age category (years)	0–49	3791	1118	29.49	794	20.94	636	16.78	299	7.89	944	24.9
	50–69	8730	3777	43.26	2150	24.63	1156	13.24	523	5.99	1124	12.88
	70–79	4283	1993	46.53	1104	25.78	571	13.33	231	5.39	384	8.97
	80+	2852	1165	40.85	780	27.35	452	15.85	177	6.21	278	9.75
UICC Stage	I	8012	4286	53.49	1851	23.1	866	10.81	309	3.86	700	8.74
	II	8206	2851	34.74	2077	25.31	1286	15.67	615	7.49	1377	16.78
	III	1815	528	29.09	500	27.55	350	19.28	141	7.77	296	16.31
	IV	1330	284	21.35	327	24.59	272	20.45	145	10.9	302	22.71
	NA	293	104	35.49	73	24.91	41	13.99	20	6.83	55	18.77

20 Triple-negative breast cancer

Objective	To show the proportion of triple-negative (TN) invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 560 (2.73%) cases without information on TN status (N = 19'952)
Results	- 9% of all cases were triple-negative breast cancer. - The proportion was higher in younger patients than in older patients (0-49 years: 13%, 80+ years 7%). - Among the different stages, the lowest proportion was found in stage I cancer (6%); the proportions in stage II-IV were similar (9-10%).
Literature	- According to a systematic literature search from 2014, triple-negative breast cancer accounts for 10-20% of invasive breast cancer cases (53). - Data from 2019 collected at eight major oncology hospitals in Bulgaria show that 3.4% of patients were diagnosed with triple-negative breast cancer (54).
Remarks	

Table 20: Triple-negative (TN) breast cancer (C50) 2020-2022

		Total	TN*	
Stratification	**Group**	**N**	**N**	**%**
Overall		19952	1689	8.47
Sex	Female	19786	1689	8.54
	Male	166	0	0.00
Age category (years)	0–49	3869	494	12.77
	50–69	8843	702	7.94
	70–79	4318	279	6.46
	80+	2922	214	7.32
UICC Stage	I	8066	508	6.30
	II	8326	843	10.12
	III	1867	171	9.16
	IV	1394	139	9.97
	NA	299	28	9.36

*Oestrogen and Progesterone receptor status negative (0%) and HER2 status negative (HER2 gene not overexpressed or amplified)

Treatment

21 Treatment decision at a tumour board

Objective	To show the proportion of invasive breast cancer cases with treatment decision at a tumour board
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- In 85% of breast cancer diagnoses, a tumour board with a treatment decision was conducted. - It was more frequently conducted in women than in men (85% vs. 80%). - The proportion of conducted tumour boards was higher in younger patients than in older patients (0-49 years: 87%, 80+ years: 78%). - A tumour board was most often conducted at stage II and III cancer diagnoses (stage II and III: 87%).
Literature	- Results from a large international survey involving 39 countries show that 51% of tumour boards discussed breast cancer patients of all disease stages, while 22% focused exclusively on patients with early-stage disease (55). - A survey from the American Society of Clinical Oncology (ASCO) of randomly selected international ASCO members (living outside the United States) involved in breast cancer care, reported that 49% discussed all newly diagnosed patients with early stage breast cancer in multidisciplinary tumour boards, while 34.5% indicated only selected cases were reviewed (56). - According to the German Cancer Society (DKG) the target value for pretherapeutic case discussion at a tumour board is ≥40%, for postoperative case discussion at a tumour board it is ≥95% (34). - In accordance with the guidelines for the certification of breast centres by the Swiss Cancer League and the Swiss Society of Senology: All new cases with histopathological findings of class B3 (=benign lesions with uncertain biological potential) and higher are presented at the pre-therapeutic tumour board with pathology findings. All patients with malignant findings are discussed at the tumour board after the operation. Otherwise, a reason for non-presentation must be provided (57). - According to the European Society of Breast Cancer Specialists/Advanced Breast Cancer Global Alliance quality indicators for metastatic breast cancer care: The aim is to discuss 99% (minimum standard: 50%) of cases of patients with advanced breast cancer at a tumour board (58).
Remarks	- Possible underreporting of tumour board information.

Table 21: Treatment decision at a tumour board in breast cancer (C50) 2020-2022

		Total	Treatment decision at tumour board*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20512	17333	84.50
Sex	Female	20340	17196	84.54
	Male	172	137	79.65
Age category (years)	0–49	3932	3407	86.65
	50–69	9017	7741	85.85
	70–79	4441	3735	84.10
	80+	3122	2450	78.48
UICC Stage	I	8200	6977	85.09
	II	8420	7344	87.22
	III	1898	1660	87.46
	IV	1432	1142	79.75
	NA	562	210	37.37

* Cases without any information on treatment decision were considered as having had no tumour board 1533 (12.9%). Preoperative as well as postoperative tumour boards were taken into account (but only one tumour board was counted per case).

22 Surgical treatment

Objective	To show the proportion of surgical treatment in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- 88% of all patients received a surgical treatment. - The proportion was higher in younger compared to older patients (0-49 years: 95%, 80+ years 68%). - The proportion of surgical treatment was higher in lower stages compared to higher stages at diagnosis (stage I: 97%, stage IV 25%).
Literature	- According to cancer registry data from the United Kingdom and Ireland from 2019, 76.4% of breast cancer cases underwent surgical treatment (31). - The Cancer Registry of Lower Saxony (Germany) reported that in 2022, 71% of breast cancer patients underwent surgery within 12 months after diagnosis. Among patients with stage I breast cancer, 89.9% received surgery, compared to 86.9% of those with stage II, 82.2% with stage III, and 25.4% with stage IV disease (59).
Remarks	- Possible underreporting of treatment information.

Table 22: Surgical treatment in breast cancer (C50) 2020-2022

		Total	Surgery	
Stratification	**Group**	**N**	**N**	**%**
Overall		20512	18054	88.48
Sex	Female	20340	17904	88.48
	Male	172	150	87.86
Age category (years)	0–49	3932	3729	95.17
	50–69	9017	8356	92.90
	70–79	4441	3884	88.37
	80+	3122	2085	68.16
UICC Stage	I	8200	7929	96.70
	II	8420	8018	95.23
	III	1898	1660	87.46
	IV	1432	353	24.65
	NA	562	94	16.73

23 Types of surgical treatment

Objective	To show the distribution of the surgical procedures in breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 1609 (7.84%) cases with UICC stage IV / metastatic cancer (N = 18'903) 5. Including only cases undergone surgery (N = 17'700)
Results	- 72% of all patients with non-metastatic breast cancer and surgical treatment received breast-conserving surgery (BCS), 7% nipple/skin-preserving mastectomy and 20% a total mastectomy. - More women than men received BCS (73% vs. 18%), whereas the proportion of total mastectomy was higher in men than in women (78% vs. 20%) - The proportion of BCS was highest among the age groups of 50-69 and 70-79 years (79% and 75%) compared to younger and older patients (0-49 years: 62%, 80+ years 59%). - Nipple/skin-preserving mastectomy was most frequently done in the youngest age group (0-49 years: 17%) and total mastectomy in oldest age group (80+ years 40%). - The proportion of BSC was higher in lower stages compared to higher stages (stage I: 84%, stage III 35%), whereas the proportion of total mastectomy was higher in advanced stages (stage I: 11%, stage III: 54%).
Literature	- According to the German Cancer Society (DKG), the target value for breast-conserving surgery in pT1 is ≥70% (34). - According to the annual report of the certified gynaecological cancer centres from the German Cancer Society (DKG) from 2024 (data from 2022), in 83.9% breast-conserving surgery in (y)pT1 was performed ((y)pT0 and M1 are included in the analysis) (35). - Currently, no target values have been defined by the DKG for mastectomies; however, mastectomy rates below 15% or above 40% must be justified (34). - According to the annual report of the certified gynaecological cancer centres from the German Cancer Society (DKG) from 2024 (data from 2022), 26.51% of patients were treated with a mastectomy (35). - An audit by Public Health England of screen-detected breast cancers from April 2017 to March 2018 showed that 17% of women underwent mastectomy, 80% had breast-conserving surgery (60). - According to the quality indicators defined by EUSOMA, the target proportion of patients with invasive breast cancer who undergo breast-conserving surgery is 95%, with a minimum acceptable standard of 85% (36).
Remarks	

Table 23: Types of surgical treatment in non-metastatic breast cancer (C50) undergone surgery 2020-2022

			Type of surgical treatment*							
		Total	Breast-conserving surgery (BSC)		Nipple/skin-preserving mastectomy		Total mastectomy		Other surgery**	
Stratification	Group	N	N	%	N	%	N	%	N	%
Overall		17700	12811	72.38	1263	7.14	3600	20.34	26	0.15
Sex	Female	17555	12785	72.83	1257	7.16	3487	19.86	26	0.15
	Male	119	26	17.93	6	4.14	113	77.93	0	0.00
Age category (years)	0–49	3638	2241	61.60	611	16.79	783	21.52	3	0.08
	50–69	8214	6496	79.08	530	6.45	1170	14.24	18	0.22
	70–79	3813	2867	75.19	102	2.68	842	22.08	2	0.05
	80+	2035	1207	59.31	20	0.98	805	39.56	3	0.15
UICC Stage	I	7929	6654	83.92	423	5.33	843	10.63	9	0.11
	II	8018	5537	69.06	651	8.12	1816	22.65	14	0.17
	III	1660	572	34.46	183	11.02	902	54.34	3	0.18
	NA	93	48	51.61	6	6.45	39	41.94	0	0

*In case of several surgical procedures, only the most invasive one was considered

** Other surgery includes unspecific CHOP codes that cannot be clearly assigned to a category (e.g., surgical treatment not elsewhere classified, surgical intervention not elsewhere classified, other breast surgery).

24 Resection status

Objective	To show the proportion of patients without detectable local residual tumour after surgery in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate (N = 20'512) 4. Excluding 1609 (7.84%) cases with UICC stage IV / metastatic cancer (N = 18'903) 5. Including only cases undergone surgery (N = 17'700) 6. Excluding 2981 (16.84%) cases with resection margin > 50mm or without any information about resection status (N = 14'719)
Results	- 96% of non-metastatic breast cancer cases had a tumour free resection margin after surgery. - The proportion of tumour free resection margin was higher in men than in women (99% vs. 96%). - No differences according to age was observed (for all age groups: 95%-96%). - The proportion of a tumour free resection margin was higher in lower stages compared to higher stages (stage I: 98%, stage III: 91%).
Literature	- The Cancer Registry of Lower Saxony (Germany) reported that in 2022 among patients with stage I breast cancer who underwent surgery, 97.8% had a R0 resection, compared to 96.9% of those with stage II, 94.3% with stage III and 76.9% with stage IV (59). - Q-Label: According to the guidelines for the certification of breast centres by the Swiss Cancer League and the Swiss Society of Senology: Proportion of R0/R1 resections in all invasive tumours after completion of surgery for primary carcinomas and locoregional recurrences to be operated on (without DCIS), limit value of R0 resection is 95% (p.13) (57). - A comprehensive review and meta-analysis of studies on patients undergoing breast-conserving surgery, published between 1980 and 2021, found that 9.4% of patients had positive surgical margins—defined as the presence of tumour cells at the inked surface of the resected specimen. Moreover, 17.8% of patients had either positive or close margins, indicating a minimal distance between tumour cells and the resection edge (61). - Finnish Cancer Registry data on women diagnosed with breast cancer between 1995 and 2017 showed that positive margins were present in approximately 20% of patients treated with breast-conserving surgery and in 5% of those undergoing mastectomy (62).
Remarks	

Table 24: Resection status in non-metastatic breast cancer (C50) undergone surgery 2020-2022

		Total	Tumour free margin	
Stratification	**Group**	**N**	**N**	**%**
Overall		14719	14119	95.92
Sex	Female	14585	13987	95.9
	Male	134	132	98.51
Age category (years)	0–49	2668	2547	95.46
	50–69	6868	6616	96.33
	70–79	3331	3196	95.95
	80+	1852	1760	95.03
UICC Stage	I	6946	6790	97.75
	II	6329	6014	95.02
	III	1388	1262	90.92
	NA	56	53	94.64

25 Sentinel lymph node examination

Objective	To show the proportion of sentinel lymph node (SLN) examination in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 1609 (7.84%) cases with UICC stage IV / metastatic cancer (N = 18'903) 5. Excluding 3042 (16%) cases with neoadjuvant therapy (N = 15'861) 6. Including only cases with no regional lymph node metastasis (pN0) (N = 9'721) 7. Including only cases undergone surgery (N = 9'509) 8. Excluding 103 (1.08%) cases without any information on sentinel or regional lymph node examination (N = 9'406)
Results	- 87% of all patients with breast cancer without metastases on a regional (pN0) and distant level (M0) only received a sentinel lymph node examination (without other regional lymph node examination). - More men than women have undergone this procedure (92% vs. 87%). - The proportion was slightly lower among younger patients than among older patients (0-49 years: 85%, 80+ years 87%). - The proportion of sentinel lymph node examination alone was higher at lower stages compared to higher stages (stage I: 87%, stage III: 66%).
Literature	- The Cancer Registry of Lower Saxony (Germany) reported that 2019-2023 a lymph node biopsy was performed in 81.3 % of female patients with lymph node–negative invasive breast cancer who had not received any preoperative tumour-specific therapy (63). - According to the German Cancer Society (DKG), the target value for sentinel lymph node biopsy alone in pN0 (women and men) is ≥ 80% (34). According to the annual report of the certified gynaecological cancer centres from German Cancer Society (DKG) from 2024 (data from 2022), in 93.3% of the cases sentinel lymph node biopsy alone was performed in women, in 90.69% of men respectively (35).
Remarks	- Possible underreporting of sentinel lymph node examination information.

Table 25: Sentinel lymph node (SLN) examination only, in non-metastatic (regional, distant) breast cancer without neo-adjuvant treatment 2020-2022

		Total	SLN examination	
Stratification	**Group**	**N**	**N**	**%**
Overall		9406	8171	86.87
Sex	Female	9345	8115	86.84
	Male	61	56	91.80
Age category (years)	0–49	1487	1258	84.60
	50–69	4704	4101	87.18
	70–79	2296	2014	87.72
	80+	919	798	86.83
UICC Stage	I	6769	5914	87.37
	II	2595	2228	85.86
	III	35	23	65.71
	NA	7	6	85.71

26 Radiotherapy

Objective	To show the proportion of radiotherapy in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- 64% of all patients with breast cancer received radiotherapy. - The proportion was higher in women than in men (65% vs. 34%). - The proportion of radiotherapy was higher among younger patients than among older patients (0-49 years: 69%, 80+ years: 32%). - The proportion of radiotherapy was higher in lower stages compared to higher stages (stage I: 72%, stage IV 18%).
Literature	- According to data from the Cancer Registry of Lower Saxony (Germany), 82.2% of breast cancer patients received radiotherapy in 2022. The proportion of patients undergoing radiotherapy decreased with advancing stage: 62.6% in stage I, 55.8% in stage II, 53.8% in stage III, and 34.4% in stage IV disease (64). - According to cancer registry data from the United Kingdom and Ireland from 2019, 38% of breast cancer patients received radiotherapy (31). - Based on data from a population-based study on the use of radiotherapy in breast cancer patients in the Netherlands, the utilization rate of radiotherapy increased from 64.4% in 2011 to 70.3% in 2015 (65).
Remarks	- Possible underreporting of radiotherapy information.

Table 26: Radiotherapy in breast cancer (C50) 2020-2022

		Total	Radiotherapy	
Stratification	**Group**	**N**	**N**	**%**
Overall		20512	13190	64.30
Sex	Female	20340	13131	64.56
	Male	172	59	34.3
Age category (years)	0–49	3932	2694	68.51
	50–69	9017	6677	74.05
	70–79	4441	2824	63.59
	80+	3122	995	31.87
UICC Stage	I	8200	6272	71.66
	II	8420	6193	67.80
	III	1898	1464	68.39
	IV	1432	294	17.74
	NA	562	38	9.43

27A Radiotherapy after breast-conserving surgery for invasive breast cancer

Objective	To show the proportion of radiotherapy after breast-conserving surgery (BCS) in patients with invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 1609 (7.84%) cases with UICC stage IV / metastatic cancer (N = 18'903) 5. Including only cases with breast-conserving surgery (N = 12'811)
Results	- 86% of patients with non-metastatic breast cancer and BCS received radiotherapy. - More women than men received radiotherapy after BCS (86% vs. 54%). - The proportion was higher among younger patients than among older patients (0-49 years: 88%, 80+ years: 62%). - The proportion was comparable over all stages (stage I-III: 81% - 86%).
Literature	- According to the German Cancer Society (DKG), the target value for radiotherapy after breast-conserving surgery for breast cancer is ≥ 90% (34). According to the annual report of the certified gynaecological cancer centres from German Cancer Society (DKG) from 2024(data from 2022), in 97.7% of the cases, radiotherapy after breast-conserving surgery in was performed (35). - The cancer registry of Lower Saxony (Germany) reported that 68.5% of patients received radiotherapy following breast-conserving surgery (2019-2023) (63). - According to the National Audit of Primary Breast Cancer State of the Nation Report 2024, adjuvant radiotherapy was administered to 84.9 % of women with early invasive breast cancer (stage I–IIIa) following breast-conserving surgery in England and Wales between 2019 and 2021 (66). - According to the quality indicators defined by EUSOMA, the target proportion of patients with invasive breast cancer who undergo radiotherapy after breast-conserving surgery is 95%, with a minimum acceptable standard of 85% (36).
Remarks	- Possible underreporting of radiotherapy information.

Table 27A: Radiotherapy after breast-conserving surgery (BCS) in non-metastatic breast cancer (C50) 2020-2022

		Total	Radiotherapy	
Stratification	**Group**	**N**	**N**	**%**
Overall		12811	10959	85.54
Sex	Female	12785	10945	85.61
	Male	26	14	53.85
Age category (years)	0–49	2241	1965	87.68
	50–69	6496	5807	89.39
	70–79	2867	2441	85.14
	80+	1207	746	61.81
UICC Stage	I	6654	5738	86.23
	II	5537	4742	85.64
	III	572	462	80.77
	NA	48	17	35.42

27B Radiotherapy after breast-conserving surgery for DCIS

Objective	To show the proportion of radiotherapy after breast-conserving surgery (BCS) in patients with ductal carcinoma in situ (DCIS)
In-/Exclusion criteria	1. ICD code = D05 (N = 2'628) 2. Only in situ breast cancer (D05) diagnosed without or before a diagnosis of an invasive breast cancer (N = 2'102) 3. Excluding cases detected by death certificate only (N = 2'102) 4. Including only cases with ICD-O morphology code 8500/2 (N = 1283) 5. Including only cases with breast-conserving surgery (N = 1'032)
Results	- 65% of patients with DCIS and BCS received radiotherapy. - The proportion was higher among younger patients than among older patients (0-49 years: 61%, 80+ years: 23%).
Literature	- A population-based, retrospective cohort study from the Netherlands Cancer Registry reported that 74% of women with DCIS diagnosed 1989-2021 who underwent breast-conserving surgery, received adjuvant radiotherapy (67). - According to the German Cancer Society (DKG), there is no target value for radiotherapy after breast-conserving surgery for DCIS at the moment (34). According to the annual report of the certified gynaecological cancer centres from German Cancer Society (DKG) from 2024 (data from 2022), in 78.8% of the cases, radiotherapy after breast-conserving surgery in DCIS was performed (35).
Remarks	- Possible underreporting of radiotherapy information.

Table 27B: Radiotherapy after breast-conserving surgery (BCS) in ductal carcinoma in situ (DCIS) (D05) 2020-2022

		Total	Radiotherapy	
Stratification	**Group**	**N**	**N**	**%**
Overall		1032	665	64.44
Age category (years)	0–49	166	101	60.84
	50–69	658	448	68.09
	70–79	169	107	63.31
	80+	39	9	23.08

Due to low numbers of male cases, the results of this indicator are not presented stratified by sex.

28 Chemotherapy

Objective	To show the proportion of chemotherapy in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- 34% of all patients with breast cancer received chemotherapy. - The proportion in women was a bit higher than in men (34% vs. 30%). - The proportion of chemotherapy was higher among younger patients than among older patients (0-49 years: 60%, 80+ years: 7%). - The proportion of radiotherapy was higher in higher stages compared to lower stages (stage I: 19%, stage IV 43%).
Literature	- According to data from the Cancer Registry of Lower Saxony (Germany), 27.1% of breast cancer patients received chemotherapy in 2022. The proportion of patients receiving chemotherapy was 17% in stage I, 30.7% in stage II, 40.6% in stage III, and 20.7% in stage IV disease (68). - According to cancer registry data from the United Kingdom and Ireland from 2019, 32.6% of breast cancer patients received chemotherapy (31).
Remarks	- Possible underreporting of chemotherapy information.

Table 28: Chemotherapy in breast cancer (C50) 2020-2022

		Total	Chemotherapy*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20512	6930	33.79
Sex	Female	20340	6879	33.82
	Male	172	51	29.65
Age category (years)	0–49	3932	2348	59.72
	50–69	9017	3376	37.44
	70–79	4441	1000	22.52
	80+	3122	206	6.60
UICC Stage	I	6622	1594	19.44
	II	8200	3518	41.78
	III	8420	1124	59.22
	IV	1898	608	42.46
	NA	1432	86	15.30

* Adjuvant as well as neo-adjuvant chemotherapy were taken into account (but only one chemotherapy was counted per case).

29 Chemotherapy for HER2-positive invasive breast cancer

Objective	To show the proportion of chemotherapy in patients with HER2-positive invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate (N = 20'512) 4. Including only HER2-positive breast cancer (N = 2812)
Results	- 77% of HER2 receptor-positive breast cancer cases received chemotherapy. - The proportion in men and women was similar (80% vs. 77%). - The proportion was higher among younger patients than among older patients (0-49 years: 91%, 80+ years: 25%). - The proportion of chemotherapy in HER2 receptor-positive breast cancer was highest in stage II and stage IV cancer cases (84% and 77%).
Literature	- According to the S3 guideline, an adjuvant chemotherapy for HER2-positive breast cancer is recommended (52).
Remarks	- Possible underreporting of chemotherapy information.

Table 29: Chemotherapy for HER2-positive breast cancer (C50) 2020-2022

		Total	Chemotherapy	
Stratification	**Group**	**N**	**N**	**%**
Overall		2812	2178	77.45
Sex	Female	2797	2166	77.44
	Male	15	12	80.00
Age category (years)	0–49	785	712	90.70
	50–69	1288	1086	84.32
	70–79	443	305	68.85
	80+	296	75	25.34
UICC Stage	I	880	620	70.45
	II	1326	1117	84.24
	III	244	169	69.26
	IV	306	237	77.45
	NA	56	35	62.50

30 Chemotherapy for triple-negative invasive breast cancer

Objective	To show the proportion of chemotherapy in patients with triple-negative invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Including only triple-negative invasive breast cancer (N = 1689)
Results	- 80% of triple-negative breast cancer cases received chemotherapy. - The proportion was higher among younger patients than among older patients (0-49 years: 94%, 80+ years: 31%). - The proportion of chemotherapy for triple-negative invasive breast cancer cases was highest among stage II and IV tumours (85% and 79%).
Literature	- A Bulgarian study using 2019 data from eight major oncology clinics reported that 84% of triple-negative breast cancer patients received chemotherapy only, 90%% received chemotherapy as part of their overall treatment regimen (54). - According to the S3 guideline, an adjuvant chemotherapy for triple-negative breast cancer is recommended (52).
Remarks	- Possible underreporting of chemotherapy information.

Table 30: Chemotherapy for triple-negative breast cancer (C50) 2020-2022

		Total	Chemotherapy	
Stratification	**Group**	**N**	**N**	**%**
Overall		1689	1358	80.40
Age category (years)	0–49	494	466	94.33
	50–69	702	619	88.18
	70–79	279	207	74.19
	80+	214	66	30.84
UICC Stage	I	508	393	77.36
	II	843	719	85.29
	III	171	120	70.18
	IV	139	110	79.14
	NA	28	16	57.14

Due to low numbers of male cases, the results of this indicator are not presented stratified by sex.

31 Hormone therapy

Objective	To show the proportion of hormone therapy in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- 64% of all patients with cancer received hormone therapy. - The proportion of women and men was similar (66% vs. 64%). - The proportion of hormone therapy was lower among patients aged 0-49 and 80+ years compared to patients aged 50-79 years (61% and 57% vs. 66% - 67%). - The proportion of hormone therapy across the different stages was similar (64% - 66%).
Literature	- According to data from the Cancer Registry of Lower Saxony (Germany), 21.9% of breast cancer patients received hormone therapy in 2022. The proportion of patients receiving hormone therapy was 22.3% in stage I, 23.5% in stage II, 22% in stage III, and 32.7% in stage IV disease (68).
Remarks	- Possible underreporting of hormone therapy information.

Table 31: Hormone therapy in breast cancer (C50) 2020-2022

		Total	Hormone therapy	
Stratification	**Group**	**N**	**N**	**%**
Overall		20512	13038	63.56
Sex	Female	20340	12924	63.54
	Male	172	114	66.28
Age category (years)	0–49	3932	2393	60.86
	50–69	9017	5909	65.53
	70–79	4441	2972	66.92
	80+	3122	1764	56.50
UICC Stage	I	8200	5371	65.50
	II	8420	5378	63.87
	III	1898	1232	64.91
	IV	1432	932	65.08
	NA	562	125	22.24

32 Hormone therapy for hormone receptor-positive invasive breast cancer

Objective	To show the proportion of hormone therapy in patients with hormone receptor (HR)-positive invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Including only hormone receptor-positive cases (ER or/and PR >0%) (N = 17'735)
Results	- 73% of patients with HR-positive breast cancer received hormone therapy. - The proportion in women was a bit higher than in men (73% vs. 68%). - The proportion of hormone therapy was similar up to the age of 79 years (72%-75%), but lower among patients aged 80+ years (66%). - The proportion of hormone therapy was a bit lower in stage I (72%) and higher in stage IV (78%) compared to stages II and III (74%).
Literature	- The cancer registry of Lower Saxony (Germany) reported that 28.4% of patients with hormone receptor-positive breast cancer received hormone therapy 2019-2023 (63). - According to the German Cancer Society (DKG), the target rate for hormone therapy in hormone receptor-positive breast cancer is ≥ 95% (only patients without metastases included) (34). - According to the European Society of Breast Cancer Specialists/Advanced Breast Cancer Global Alliance quality indicators for metastatic breast cancer care: The goal is that 85% of cases with advanced oestrogen receptor-positive breast cancer receive anti-hormone therapy (58). - The National Quality Forum (American College of Surgeons) quality measure QI 0220 specifies that women diagnosed with AJCC T1cN0M0 or Stage IB–III hormone receptor–positive breast cancer should receive or be recommended adjuvant hormone therapy within 365 days of diagnosis (69).
Remarks	- Possible underreporting of hormone therapy information.

Table 32: Hormone therapy for hormone receptor-positive breast cancer (C50) 2020-2022

		Total	Hormone Therapy	
Stratification	**Group**	**N**	**N**	**%**
Overall		17735	12897	72.72
Sex	Female	17568	12783	72.76
	Male	167	114	68.26
Age category (years)	0–49	3206	2323	72.46
	50–69	7881	5871	74.50
	70–79	3977	2953	74.25
	80+	2671	1750	65.52
UICC Stage	I	7429	5326	71.69
	II	7193	5314	73.88
	III	1656	1221	73.73
	IV	1184	919	77.62
	NA	273	117	42.86

33 Targeted therapy/Immunotherapy

Objective	To show the proportion of targeted therapy/immunotherapy in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- 17% of all patients with invasive breast cancer received a targeted therapy/immunotherapy. - More women than men have undergone targeted therapy/immunotherapy (17% vs. 8%). - The proportion was higher among younger patients than among older patients (0-49 years: 29%, 80+ years: 7%). - The proportion was higher in higher stages compared to lower stages (stage I: 9%; stage IV: 47%).
Literature	- The cancer registry of Lower Saxony (Germany) reported that 17.5% of breast cancer patients received targeted therapy/immunotherapy 2022. The proportion of patients receiving targeted therapy/immunotherapy was 2.8% in stage I, 5.3% in stage II, 2% in stage III, and 2.7% in stage IV disease(63).
Remarks	- Possible underreporting of targeted therapy/immunotherapy information.

Table 33: Targeted therapy/immunotherapy for breast cancer (C50) 2020-2022

		Total	Targeted therapy/immunotherapy*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20512	3517	17.15
Sex	Female	20340	3503	17.22
	Male	172	14	8.14
Age category (years)	0–49	3932	1126	28.64
	50–69	9017	1626	18.03
	70–79	4441	560	12.61
	80+	3122	205	6.57
UICC Stage	I	8200	769	9.38
	II	8420	1624	19.29
	III	1898	378	19.92
	IV	1432	667	46.58
	NA	562	79	14.06

* Targeted therapy/immunotherapy includes antibody therapy.

34 Targeted therapy/Immunotherapy for HER2-positive invasive breast cancer

Objective	To show the proportion of targeted therapy/immunotherapy in patients with HER2-positive invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Including only cases with pT ≥ 1c (N = 13'469) 5. Including only HER2-positive invasive breast cancer cases (N = 1'238)
Results	- 70% of patients with HER2-positive breast cancer received targeted therapy/immunotherapy (pT ≥ 1c). - The proportion was higher among younger patients than among older patients (0-49 years: 82%, 80+ years: 32%). - The proportion was lower among lower stages compared to stage IV (stage I: 73%, stage II: 68%, stage III: 61%, stage IV: 80%).
Literature	- According to the German Cancer Society (DKG), the target rate for a Trastuzumab therapy duration >1 year in HER2-positive cases (≥pT1c) is ≥ 95% (34). According to the 2022 annual report of the certified gynaecological cancer centres of the German Cancer Society (DKG) from 2024, Trastuzumab therapy for more than one year was administered in 95.1% of HER2-positive breast cancer patients (excluding M1 cases) (35). - In a national cohort study from England, including women aged 50+ years, diagnosed with breast cancer between 2014 and 2019, 63.8% of HER2-positive breast cancer got HER2-targeted therapies as firstline treatment (70). - The cancer registry of Lower Saxony (Germany) reported that 35.6% of patients with HER2-positive breast cancer received therapy with Trastuzumab for over a year (2019-2023) (63). - According to the European Society of Breast Cancer Specialists/Advanced Breast Cancer Global Alliance quality indicators for metastatic breast cancer care: The goal is that 95% of cases with HER2-positive metastatic breast cancer receive antibody therapy with trastuzumab (58).
Remarks	- Possible underreporting of targeted therapy/immunotherapy information.

Table 34: Targeted therapy/immunotherapy for HER2-positive breast cancer (C50; only pT ≥ 1c) 2020-2022

		Total	Targeted therapy/ immunotherapy*	
Stratification	**Group**	**N**	**N**	**%**
Overall		1238	870	70.27
Age category (years)	0–49	233	190	81.55
	50–69	539	438	81.26
	70–79	253	173	68.38
	80+	213	69	32.39
UICC Stage	I	390	284	72.82
	II	534	365	68.35
	III	143	87	60.84
	IV	142	114	80.28
	NA	29	20	68.97

Due to low numbers of male cases, the results of this indicator are not presented stratified by sex.
* Targeted therapy/immunotherapy includes antibody therapy.

35 Neoadjuvant treatment

Objective	To show the proportion of neoadjuvant treatment in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512)
Results	- 16% of all patients with breast cancer received neoadjuvant treatment. - The proportion was higher among women than among men (16% vs. 6%). - The proportion was higher among younger patients than among older patients (0-49 years: 33%, 80+ years 2%). - The proportion was highest in stages II and III (23% and 25%).
Literature	- Since 2017, neoadjuvantly treated carcinomas in the German mammography screening program have been fully documented. Their use increased from <10% (median 2017) to 13% in 2022 (median) (27). - According to the annual report of the certified gynaecological cancer centres from German Cancer Society (DKG) from 2024 (data from 2022), 19% of primary breast cancer patients underwent neoadjuvant treatment before surgery (35).
Remarks	- Possible underreporting of neoadjuvant treatment information.

Table 35: Neoadjuvant therapy in breast cancer (C50) 2020-2022

		Total	Neoadjuvant therapy*	
Stratification	**Group**	**N**	**N**	**%**
Overall		20512	3213	15.66
Sex	Female	20340	3203	15.75
	Male	172	10	5.81
Age category (years)	0–49	3932	1312	33.37
	50–69	9017	1445	16.03
	70–79	4441	380	8.56
	80+	3122	76	2.43
UICC Stage	I	8200	593	7.23
	II	8420	1951	23.17
	III	1898	480	25.29
	IV	1432	171	11.94
	NA	562	18	3.20

*Start of chemotherapy or targeted therapy/immunotherapy before surgery

36 Time between diagnosis and start of treatment

Objective	To show the time between the diagnosis and the start of the first treatment in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Only cases with surgery, chemotherapy, radiotherapy, hormone therapy or targeted therapy/immunotherapy with start between the day of diagnosis and 9 months after the diagnosis (N = 19'700)
Results	- The mean and median of time between diagnosis and start of the first treatment was 28 and 23 days respectively. - In women, the time to treatment was a bit longer than in men (mean: 28 vs. 27 days; median: 23 vs. 22 days). - The average time to treatment was a bit longer in older patients compared to younger patients (0-49 years: 27 days; 80+ years: 29 days). - The average time to treatment was shortest in stage I (26 days) and in stage IV patients (27 days) and longest in patients with stage II (28 days) and III (30 days).
Literature	- According to the guidelines for the certification of breast centres by the Swiss Cancer League and the Swiss Society of Senology: Treatment should be started within 20 working days after biopsy or initial consultation (57) - Data from the United States (2015-2018) show a median time to treatment initiation in female breast cancer patients of 43.5 days in 2015 could be reduced to 29 days in 2018 (71). - The Cancer Registry of Lower Saxony (Germany) reported that in 2022, time to surgery exceeded 28 days in 73.7% of breast cancer patients, while 18.5% underwent surgery within 15–28 days (59). In the same time period, the median interval between diagnosis and the start of systemic therapy (chemotherapy, hormone therapy, targeted therapy/immunotherapy, or stem cell transplantation) and radiotherapy was 7 (68) and 17 (64) weeks respectively.
Remarks	

Table 36: Time between diagnosis and start of treatment in breast cancer (C50) 2020-2022

Stratification	Group	N	Time to first treatment (in days)	
			Mean	Median
Overall		19700	27.52	23
Sex	Female	19534	27.53	23
	Male	166	26.74	22
Age category (years)	0–49	3882	27.13	23
	50–69	8835	27.07	23
	70–79	4267	27.87	23
	80+	2716	28.97	24
UICC Stage	I	8063	26.27	22
	II	8253	28.06	24
	III	1825	30.46	26
	IV	1316	27.24	22
	NA	243	30.09	26

37 Time between diagnosis and surgery

Objective	To show the time between the diagnosis and the surgery in invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 4. Excluding 1609 (7.84%) cases with UICC stage IV / metastatic cancer (N = 18'903) 5. Only cases with surgery with start between the day of diagnosis and 9 months after the diagnosis and without neoadjuvant treatment (N = 14'553)
Results	- The mean and median time between diagnosis and surgery in non-metastatic invasive breast cancer was 29 and 24 days respectively. - In women, the time to surgery was longer than in men (mean: 29 vs. 24 days; median: 25 vs. 22 days). - The average time to surgery was longer in older patients compared to younger patients (0-49 years: 29 days; 80+ years: 34 days). - The time to surgery was shortest in patients with stage I (mean 27 days; median 22 days) and longest in patients with stage III (mean 35 days; median: 28 days).
Literature	- Data from the SEER-Medicare linked database (SMDB) including patients ≥66 years who were diagnosed with non-metastatic breast cancer between 1992 and 2009, show that 77.7% of patients had less than 30 days between diagnosis and breast cancer surgery (72). - In Germany, the median time to surgery in patients with invasive breast cancer including DCIS in 2020 was 21 days, with 25.3% of patients undergoing surgery ≥14 and <21 days after breast cancer diagnosis (73).
Remarks	

Table 37: Time between diagnosis and surgery in non-metastatic invasive breast cancer (C50) 2020-2022

			Time to surgery (in days)	
Stratification	**Group**	**N**	**Mean**	**Median**
Overall		14553	28.99	24.00
Sex	Female	14419	29.02	24.00
	Male	134	25.11	22.00
Age category (years)	0–49	2387	28.71	23.00
	50–69	6808	27.59	23.00
	70–79	3426	29.03	24.00
	80+	1932	34.16	27.00
UICC Stage	I	7302	26.99	22.00
	II	6017	30.09	24.00
	III	1160	35.36	28.00
	NA	74	36.12	28.50

Course of the disease

38 New event during the course of the disease

Objective	To show the proportion of a new event (recurrence, progression, metachronous metastasis) during the course of the disease in patients with breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660) 3. Excluding 148 (0.72%) cases detected by death certificate only (N = 20'512) 6. Excluding 1609 (7.84%) cases with UICC stage IV / metastatic cancer (N = 18'903) 4. Including only cases diagnosed in 2020 and 2021 (N = 12'433)
Results	- 1% of all patients with non-metastatic invasive breast cancer suffered from a new event in the first year after the diagnosis. - The proportion was higher among younger and among older patients (0-49 years: 1.3%; 80+ years: 2.1%) than among patients aged 50-79 years (0.7%). - The proportion of a new event within the first year after the diagnosis increased with stage at diagnosis (stage I: 0.3%; stage II: 1%; stage III: 3.5%).
Literature	- A review by the International Agency for Research on Cancer (IARC), covering 23 population-based studies from 11 cancer registries in 8 countries, reported recurrence rates ranging from 1.1% to 28.3% for median follow-up times between 3.5 and 14.8 years (74). - According to the 2024 annual report of the certified gynaecological cancer centres of the German Cancer Society (DKG), 15.2% of patients (excluding primary M1 patients) presented with newly developed (local) recurrence and/or distant metastases within one year after diagnosis (35). - A retrospective analysis of 84 studies shows that the proportion of events (local recurrence, contralateral recurrence (and/or new primary breast cancer), distant disease, secondary cancers, or death from any cause) among all randomised patients has decreased over time: from 19 to 31% in studies started before 1990 to 4 to 13% in studies started after 2010 (75).
Remarks	- Possible underreporting of information on event during the course of the disease.

Table 38: New event within one year after the diagnosis in non-metastatic invasive breast cancer (C50) 2020-2021

Stratification	Group	Time	Total N	New event N	New event %
Overall		Year 1	12433	123	0.99
Age category (years)	0–49	Year 1	2406	30	1.25
	50–69	Year 1	5567	37	0.66
	70–79	Year 1	2659	18	0.68
	80+	Year 1	1801	38	2.11
UICC Stage	I	Year 1	5334	15	0.28
	II	Year 1	5598	55	0.98
	III	Year 1	1260	44	3.49
	NA	Year 1	241	9	3.73

Due to low numbers of male cases, the results of this indicator are not presented stratified by sex.

39 Event-free survival

Objective	To show the event-free survival (no recurrence, progression, metachronous metastasis or death) in patients with invasive breast cancer
In-/Exclusion criteria	1. ICD code = C50 (N = 22'291) 2. Only primary invasive tumours (C50) according to ENCR rules for multiple primaries (1) (N = 20'660)
Results	- 95% of all patients with invasive breast cancer had no event (progression, relapse, metachronous metastases or death) in the first year after diagnosis; 89% had no event two years after the diagnosis. - The proportion of an event was higher in women than in men (year 1: 95% vs. 90%; year 2: 90% vs. 85%). - The event free survival was higher in younger patients than in older patients (year 1: 0-49 years: 98%, 80+ years: 85%; year 2: 0-49 years: 94%, 80+ years: 73%). - The event free survival was higher in less advanced stages than in advanced stages (year 1: stage I: 99%, stage IV: 74%; year 2: stage I: 97%, stage IV: 56%).
Literature	- Older data from nine Italian cancer registries (2003–2005) show that five-year disease-free survival varies by breast cancer subtype: 77.9 % for HER2-positive and 80.5 % for triple-negative breast cancer (76).
Remarks	- Possible underreporting of information on event during the course of the disease.

Table 39: One- and two-year observed event-free survival for breast cancer (C50) 2020-2022

Stratification	Group	Survival interval	Number of events	Observed event free survival *	lower 95% CI**	upper 95%CI**
Overall		Year 1	1074	0.947	0.944	0.950
		Year 2	973	0.898	0.894	0.902
Sex	Female	Year 1	1057	0.948	0.945	0.951
	Female	Year 2	964	0.899	0.895	0.903
	Male	Year 1	17	0.901	0.846	0.938
	Male	Year 2	9	0.848	0.785	0.894
Age category (years)	0–49	Year 1	97	0.975	0.970	0.980
	0–49	Year 2	135	0.940	0.932	0.947
	50–69	Year 1	260	0.971	0.967	0.974
	50–69	Year 2	269	0.940	0.935	0.945
	70–79	Year 1	247	0.944	0.937	0.950
	70–79	Year 2	206	0.896	0.887	0.905
	80+	Year 1	470	0.848	0.835	0.860
	80+	Year 2	363	0.728	0.712	0.744
UICC Stage	I	Year 1	110	0.987	0.984	0.989
	I	Year 2	159	0.966	0.962	0.970
	II	Year 1	218	0.974	0.970	0.977
	II	Year 2	329	0.934	0.928	0.939
	III	Year 1	154	0.919	0.906	0.930
	III	Year 2	166	0.829	0.811	0.845
	IV	Year 1	364	0.743	0.719	0.765
	IV	Year 2	254	0.559	0.533	0.585

* Observed event free survival represents the proportion of patients who did not have an event and were alive at a given time after diagnosis
** CI = Confidence Interval

Comorbidities and hereditary predispositions

40 Comorbidities

Objective	To show the distribution of comorbidities in breast cancer patients
Remarks	- This indicator could not be analysed in sufficient quality (underreporting).

41 Charlson Index

Objective	To show the distribution of the Charlson Index in breast cancer patients
Remarks	- This indicator could not be analysed in sufficient quality (underreporting).

42 Familial and hereditary predispositions

Objective	To show the proportion of familial and hereditary predispositions in breast cancer patients
Remarks	- This indicator could not be analysed in sufficient quality (underreporting).

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