

## 1.1. Breast cancer (QE-3) and colorectal cancer (QE-4) 5-year relative survival rate

### 1.1.1. Documentation sheet

<b>Description</b>	5-year relative survival by stage after a diagnosis of breast or colorectal cancer
<b>Calculation</b>	The 5-year relative survival is computed as the 5-year observed survival for the population diagnosed with the specified type of cancer (=proportion of people surviving 5 years after the diagnosis), divided by the 5-year expected survival of a comparable group from the general population residing in Belgium. The relative survival is expressed as a percentage and estimates the excess mortality that can be attributed to the cancer. A 100% 5-year relative survival indicates that patients who were diagnosed with the cancer (type) had a mortality rate similar to the general population of the same age, sex and region.
<b>Rationale</b>	<p>In Belgium, breast cancer is the most frequent cancer type in females, and also the leading cause of death by cancer in females. Colorectal cancer is the third and second most frequent cancer type in males and females respectively.<sup>1</sup></p> <p>In Belgium, for these two types of cancer, well-developed screening programmes exist, and evidence-based treatment strategies have been recommended in the national guidelines.<sup>2-4</sup> An increase in cancer survival reflects advances in public health interventions, such as greater awareness of the disease, successful screening programmes, and improved treatments.</p>
<b>Data source</b>	Belgian Cancer Registry (BCR): incidence years 2010-2020 Kruispunbank - Banque Carrefour for mortality data (vital status of patients diagnosed with cancer): 2004- 1 April 2022. Therefore, to allow 5 year follow-up, 5-year survival rates can be calculated for patients diagnosed between 1 January 2004 and 1 April 2017
<b>Technical definitions</b>	<p>Selection of patients: new diagnoses of cancer registered in the BCR, with the following ICD-10 codes:</p> <ul style="list-style-type: none"><li>• Breast cancer (for women only): C50</li><li>• Colorectal cancer: C18-C20</li></ul> <p>The following exclusion criteria have been applied:</p> <ul style="list-style-type: none"><li>• If the cancer is a subsequent cancer (only the first cancer for each patient is taken into account)</li><li>• If for a patient, the date of death or the date of lost to follow-up equalled the day of incidence</li><li>• If the patient had an unknown social security number (INSZ – NISS)</li><li>• If the patient was younger than 15 years old</li><li>• If the patient has no Belgian residence at the time of diagnosis</li></ul> <p>The relative survival is computed using the Ederer II method.<sup>5</sup></p> <p>The Region corresponds to the Region of the place of residence of the patients at time of their diagnosis.</p> <p>Combined stage: the pathological stage prevails over the clinical stage, except in case of clinical proof of distant metastases which are always considered as combined stage IV.</p>
<b>International comparability</b>	OECD study for international comparisons. Belgian survival rates published in the OECD Health Statistics may be different from those published by the Belgium Cancer Registry, <sup>6</sup> because in the OECD data relative survival rates are age standardised <sup>7</sup> to allow comparison across countries, while in alignment with most of the data

---

presented by the BCR, this standardisation was not carried out for the present analyses. The impact of the standardisation on the estimate (increase or decrease) is hard to predict, and depends of the age distribution, within a country.

Moreover, the comparison of survival estimates between countries often remains challenging in case of cancer types for which screening is organised. Between-countries differences in screening coverage will tend to bias the survival comparisons considering that screening artificially increases the survival time (by advancing the date of diagnosis, i.e. lead time bias, and by discovering not evolving tumours, i.e. overdiagnosis). The solution to this bias is to include a comparison of the stage-distributions and a comparison of survival by stage, but this is currently not possible with the OECD data.

---

**Limitations**

5-year relative survival can only be computed for patients diagnosed from 2004 to 1 April 2017, because follow-up is available until 1 April 2022. The specific impact of screening or different treatment strategies on the survival can hardly be disentangled. Evolution of survival by stage reflects better the impact of treatment alone.

---

**Dimension**

Quality, Effectiveness of care

---

**Related indicators**

Coverage of target group for breast cancer screening and colorectal cancer screening  
Percentage of patients with cancer discussed at the multidisciplinary team meeting (MDT)

---

**Reviewers**

Cindy De Gendt (BCR)

---

### 1.1.2. Results

An overview of the 1-year, 3-year and 5-year relative survival is provided in the following tables, for breast cancer (Table 1) and colorectal cancer (Table 2). Survival data are presented by year of incidence, combined stage<sup>a</sup>, region (of residence of the patient at diagnosis) and sex (when appropriate).

#### 1.1.2.1. Breast cancer

##### Belgium

For female breast cancer patients diagnosed between 2004 and 2017, 5-year relative survival is relatively stable over the years, with a small increase:

90.6% for the whole cohort, and 92.4% for patients diagnosed in 2017 (Table 1). The majority of patients is diagnosed at early stages (I (41.5%) or II (34.0%)), and for those groups relative survival at 5-year is the same as in the general (i.e. not having breast cancer) population (stage I, 100.8%), or slightly lower (stage II, 94.5%). For the women diagnosed at stage III, 11.3% of the breast cancer population, a notable increase of survival was observed over the years (72.0% in 2004 to 77.8% in 2017, Figure 1). For the small group of patients diagnosed at stage IV (7.2%), 5-year relative survival only reaches 34.9% on the whole cohort, and increased from 32.4% in 2004 to 40.2% in 2017. An increase in survival is observed for patients for whom stage at diagnosis was unknown in the BCR database, from 76.7% in 2004 to 86.6% in 2017.

**Table 1 - One-, 3- and 5-year relative survival for breast cancer, by year of incidence, stage and Region (2004-2020)**

Characteristic	N at risk	Unadjusted relative survival (%)					
		1-year		3-year		5-year	
		1-y RS	95% CI	3-y RS	95% CI	5-y RS	95% CI
Overall	164 955	97.7	[97.6, 97.8]	93.9	[93.8, 94.1]	90.6	[90.4, 90.8]
<b>Incidence year</b>							
2004	9 121	96.9	[96.5, 97.4]	92.4	[91.6, 93.1]	88.2	[87.3, 89.1]
2005	9 081	97.6	[97.2, 98.0]	92.8	[92.0, 93.5]	88.4	[87.5, 89.3]
2006	9 150	97.3	[96.8, 97.7]	92.9	[92.2, 93.6]	88.8	[87.9, 89.7]
2007	9 296	97.1	[96.6, 97.5]	93.1	[92.4, 93.8]	89.4	[88.5, 90.3]
2008	9 203	97.4	[97.0, 97.8]	93.0	[92.3, 93.7]	89.3	[88.4, 90.2]
2009	9 178	97.5	[97.0, 97.9]	93.0	[92.2, 93.7]	89.2	[88.2, 90.0]
2010	9 461	97.5	[97.1, 97.9]	93.2	[92.5, 93.9]	90.3	[89.4, 91.1]

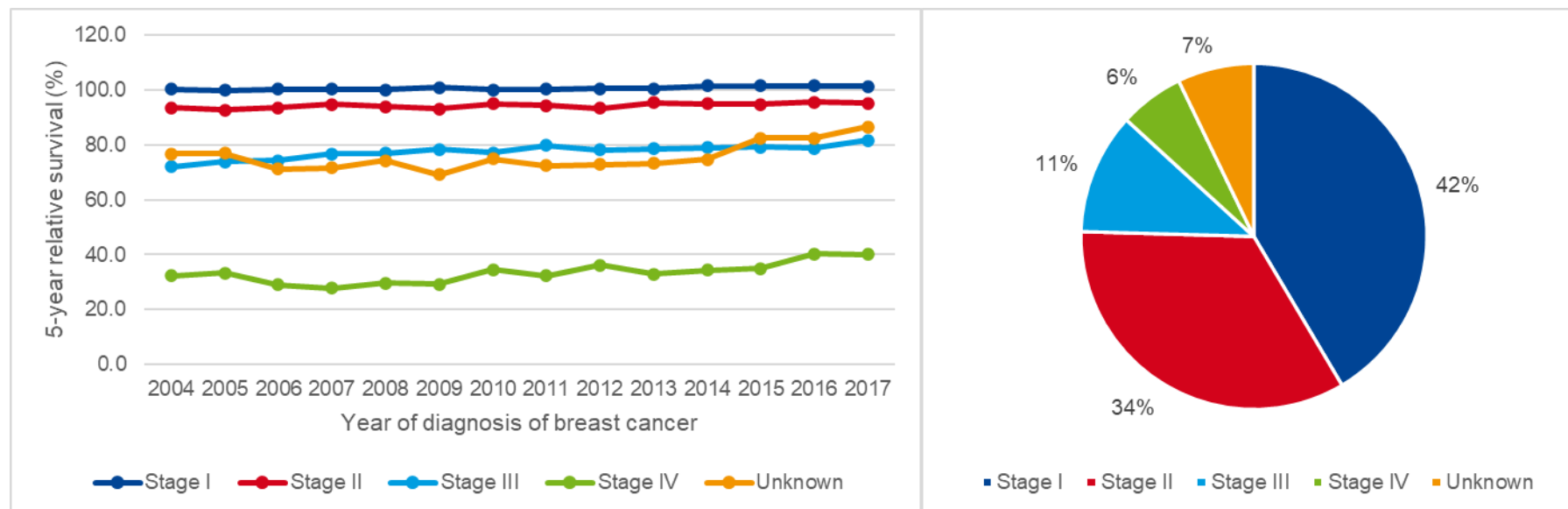
<sup>a</sup> Combined stage: because the clinical stage and/or pathological stage is lacking for some patients, a combined stage is defined. To determine this combined stage, a known pathological stage prevails over known clinical

stage, except when there is clinical proof of distant metastasis. When only pathological stage or clinical stage is known, the available stage is considered as the combined stage. Otherwise, when pathological stage and clinical stage are unknown, the combined stage also remains unknown.

2011	10 069	97.5	[97.1, 97.9]	93.6	[93.0, 94.3]	90.6	[89.7, 91.4]
2012	10 040	97.7	[97.2, 98.1]	93.8	[93.2, 94.5]	90.4	[89.6, 91.3]
2013	10 164	97.9	[97.5, 98.3]	94.2	[93.5, 94.8]	91.2	[90.3, 92.0]
2014	9 913	97.7	[97.3, 98.1]	94.6	[93.9, 95.2]	91.7	[90.8, 92.5]
2015	9 817	98.1	[97.7, 98.5]	94.5	[93.8, 95.1]	91.9	[91.1, 92.7]
2016	10 147	98.0	[97.6, 98.3]	94.9	[94.3, 95.5]	92.3	[91.5, 93.1]
2017	9 982	97.5	[97.1, 97.9]	94.9	[94.3, 95.5]	92.4	[91.6, 93.3]
2018	10 263	97.7	[97.3, 98.1]	94.9	[94.2, 95.5]		
2019	10 247	98.3	[97.9, 98.6]	95.6	[94.9, 96.3]		
2020	9 823	98.2	[97.8, 98.5]				
<b>Stage</b>							
I	68 432	100.5	[100.4, 100.5]	100.8	[100.7, 101.0]	100.8	[100.6, 101.0]
II	56 024	99.6	[99.5, 99.8]	97.2	[96.9, 97.4]	94.5	[94.1, 94.8]
III	18 710	96.3	[96.0, 96.7]	86.4	[85.8, 87.1]	77.8	[77.0, 78.6]
IV	9 971	76.7	[75.8, 77.6]	52.8	[51.8, 53.9]	34.9	[33.8, 36.1]
Unknown	11 818	90.9	[90.3, 91.5]	83.4	[82.5, 84.3]	77.3	[76.2, 78.3]
<b>Region</b>							
Brussels	14 804	97.5	[97.1, 97.8]	93.7	[93.1, 94.2]	90.4	[89.7, 91.2]
Flanders	95 922	97.8	[97.7, 97.9]	94.0	[93.7, 94.2]	90.5	[90.2, 90.8]
Wallonia	54 229	97.5	[97.3, 97.6]	93.9	[93.6, 94.2]	90.8	[90.4, 91.2]

Source: Belgian Cancer Registry

**Figure 1 – Five-year relative survival for breast cancer, by stage and year of incidence and distribution of patients across stages (2004-2020)**



Source: Belgian Cancer Registry

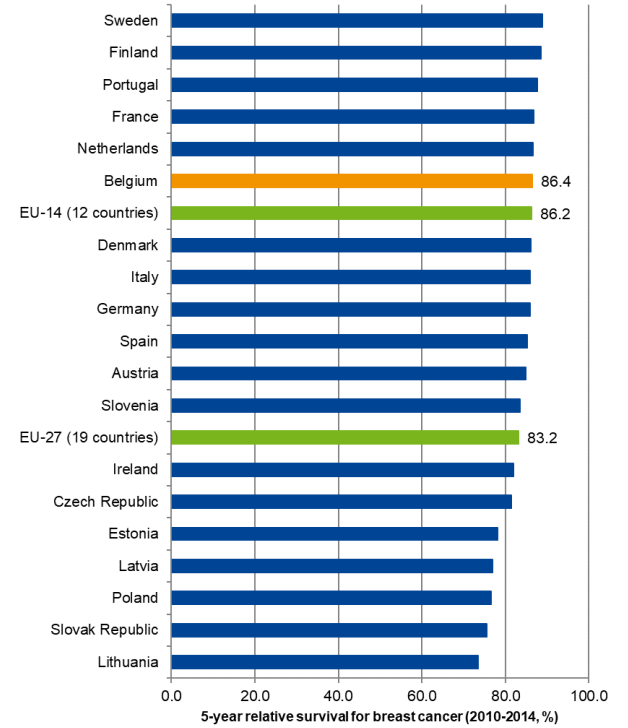
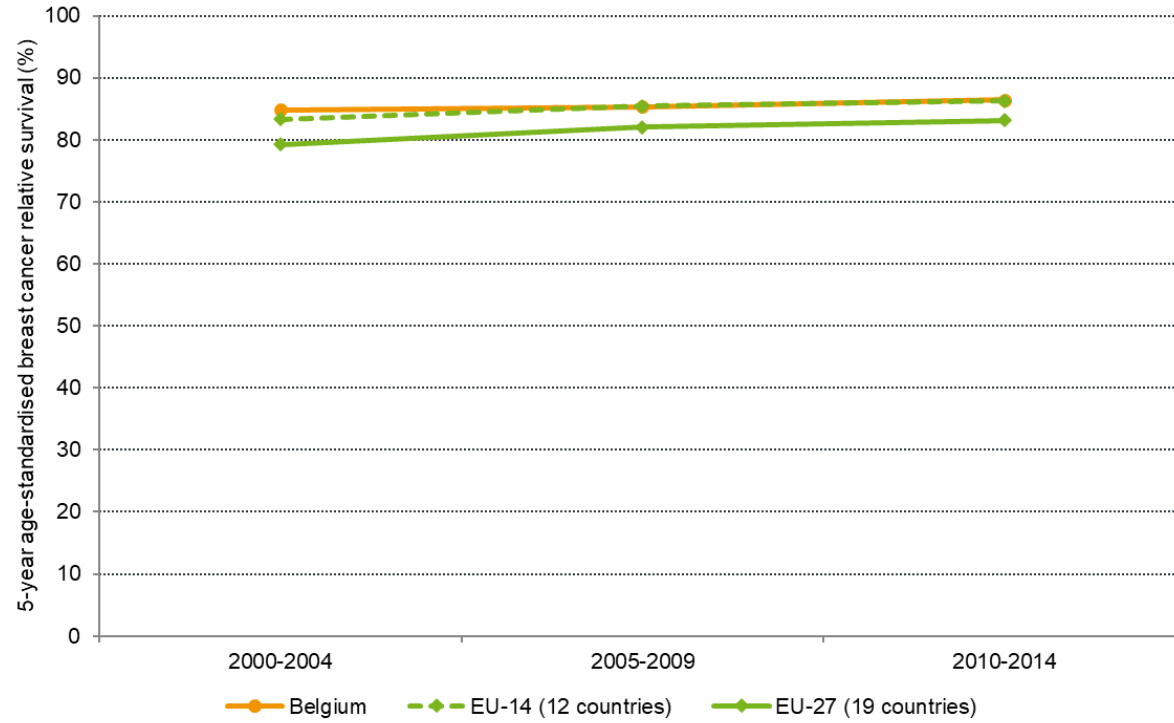
### Regional comparison

On the whole cohort, differences in 5-year relative survival amount for less than 1 percentage point between Regions: Wallonia (90.8%), Flanders (90.5%) and Brussels Capital Region (90.4%).

### International comparison

Results from the international comparisons (Figure 2), show lower 5-year survival rates for Belgium than displayed in Table 1: in this study, 5-year relative survival for Belgium is only 86.4% (compared to 90.6% in Table 1), and place Belgium just above the European average of EU-15 countries (86.2%, Figure 2). One reason for this difference is that the most recent period available for the international comparison is the 2010-2014 period (vs 2004-2017 cohorts for results from Table 1); other explanations are provided in the technical fiche, under heading international comparison.

Figure 2 – 5-year age-standardised relative survival for breast cancer: international comparison



Source: OECD Health data 2023

**Impact of COVID-19 pandemic**

Not yet applicable for 5-year survival.

### 1.1.2.2. Colorectal cancer

#### Belgium

For patients diagnosed with colorectal cancer between 2004 and 2017, overall 5-year relative survival slightly increases from 63.2% for patients diagnosed in 2004 to 71.9% for patients diagnosed in 2017 (Table 2).

Survival is highly dependent on the stage, with 96.3% 5-year relative survival for patients diagnosed at stage I and 17.8% for patients diagnosed at stage IV. The majority of patients is diagnosed either at stage II (26.6%) or III (25.1%). For stage III, the 5-year relative survival increases notably (61.0% to 73.6%) over the 2004-2017 period, see Figure 3.

**Table 2 – One-, 3- and 5-year relative survival for colorectal cancer, by year of incidence, stage and Region (2004-2020)**

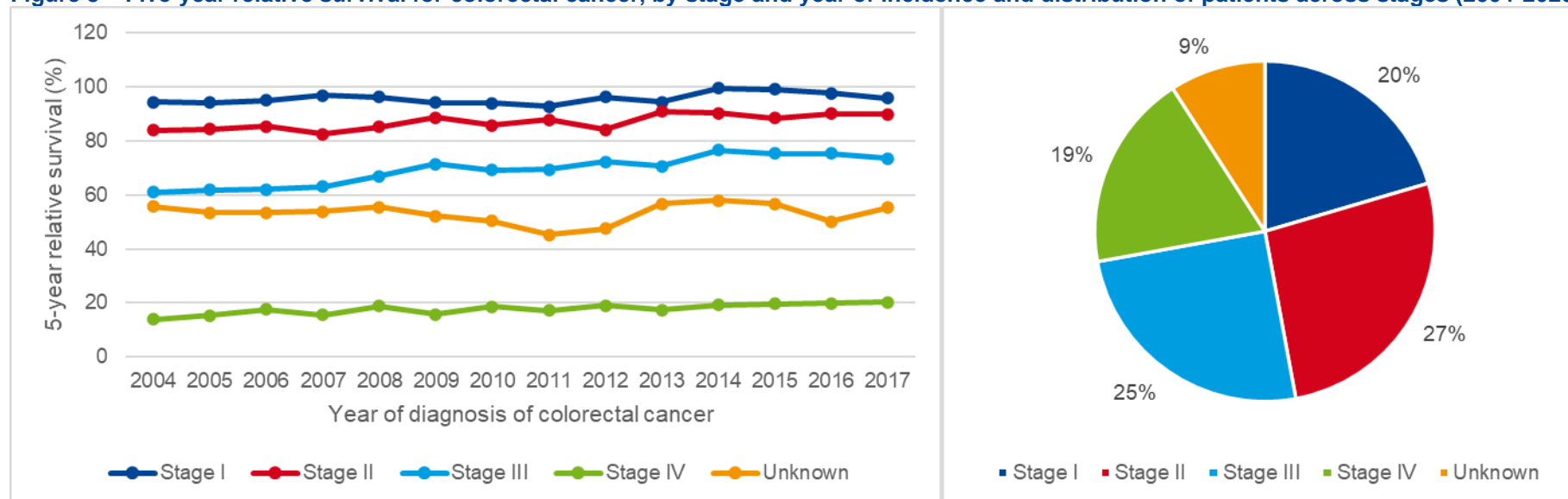
Characteristic	Frequency count	Unadjusted relative survival (%)					
		1-year		3-year		5-year	
		1-y RS	95% CI	3-y RS	95% CI	5-y RS	95% CI
Overall	119 326	85.1	[84.9, 85.4]	73.8	[73.5, 74.1]	68.4	[68.0, 68.8]
<b>Incidence year</b>							
2004	6 933	82.3	[81.2, 83.3]	68.9	[67.6, 70.2]	63.2	[61.7, 64.6]
2005	6 839	83.1	[82.0, 84.1]	70	[68.7, 71.3]	63.5	[62.0, 65.0]
2006	6 910	82.7	[81.7, 83.7]	70.3	[69.0, 71.6]	64.4	[62.9, 65.8]
2007	6 897	83.1	[82.1, 84.1]	69.9	[68.6, 71.2]	64.3	[62.8, 65.8]
2008	7 186	83.6	[82.6, 84.5]	71.9	[70.6, 73.1]	66	[64.6, 67.4]
2009	7 105	84.4	[83.4, 85.3]	72.8	[71.5, 74.1]	67.4	[65.9, 68.8]
2010	7 224	84.8	[83.8, 85.7]	72	[70.8, 73.3]	66.4	[65.0, 67.8]
2011	7 293	84.1	[83.1, 85.0]	72.1	[70.9, 73.4]	66.4	[65.0, 67.8]
2012	7 256	85.1	[84.1, 86.0]	73.4	[72.1, 74.6]	68	[66.5, 69.4]
2013	7 326	85.9	[84.9, 86.8]	74.2	[73.0, 75.5]	69.4	[67.9, 70.7]
2014	8 200	88.5	[87.6, 89.3]	79.1	[78.0, 80.2]	75.1	[73.8, 76.4]
2015	7 321	87.2	[86.3, 88.0]	78	[76.8, 79.2]	73.1	[71.7, 74.5]
2016	7 102	86.3	[85.4, 87.2]	76.9	[75.7, 78.1]	72.5	[71.1, 73.9]

2017	6 793	87.0	[86.0, 87.9]	76.8	[75.5, 78.0]	71.9	[70.4, 73.3]
2018	6 462	86.4	[85.5, 87.4]	76.7	[75.4, 78.0]		
2019	6 555	86.9	[85.9, 87.8]	75.6	[74.2, 76.9]		
2020	5 924	85.4	[84.4, 86.5]				
<b>Stage</b>							
I	24 403	97.9	[97.5, 98.1]	97.5	[97.1, 98.0]	96.3	[95.6, 96.9]
II	31 787	93.6	[93.3, 94.0]	90.4	[89.9, 90.9]	87.3	[86.6, 88.0]
III	29 897	89.3	[88.9, 89.7]	77	[76.4, 77.6]	69.7	[69.0, 70.4]
IV	22 360	61.5	[60.9, 62.2]	28.9	[28.3, 29.6]	17.8	[17.2, 18.4]
Unknown	10 879	67.6	[66.6, 68.6]	56.3	[55.2, 57.4]	53.4	[52.2, 54.6]
<b>Region</b>							
Brussels	9 102	82.1	[81.2, 83.0]	69.9	[68.7, 71.1]	64.7	[63.3, 66.1]
Flanders	74 107	86.2	[85.9, 86.5]	75.3	[74.9, 75.7]	70.1	[69.7, 70.6]
Wallonia	36 117	83.7	[83.3, 84.2]	71.6	[71.0, 72.2]	65.8	[65.1, 66.4]
<b>Sex</b>							
Males	64 709	86.00	[85.7, 86.3]	74.5	[74.0, 74.9]	68.3	[67.8, 68.8]
Females	54 617	84.1	[83.8, 84.5]	72.9	[72.5, 73.4]	68.5	[68.0, 69.0]

Source: Belgian Cancer Registry



**Figure 3 – Five-year relative survival for colorectal cancer, by stage and year of incidence and distribution of patients across stages (2004-2020)**



Source: Belgian Cancer Registry

### Analysis by demographic characteristics

There are no significant differences between sex; the 5-year relative survival for colorectal cancer is 68.3% for males and 68.5% for females over the 2004-2017 period.

### Regional comparison

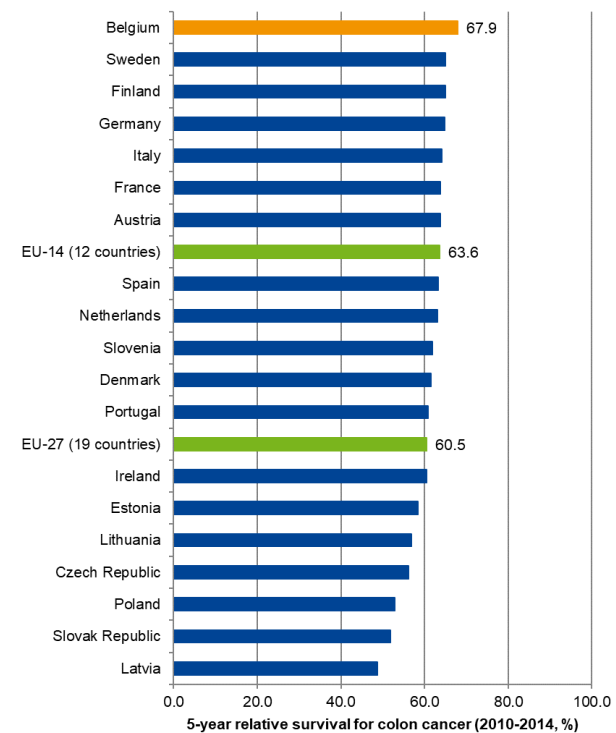
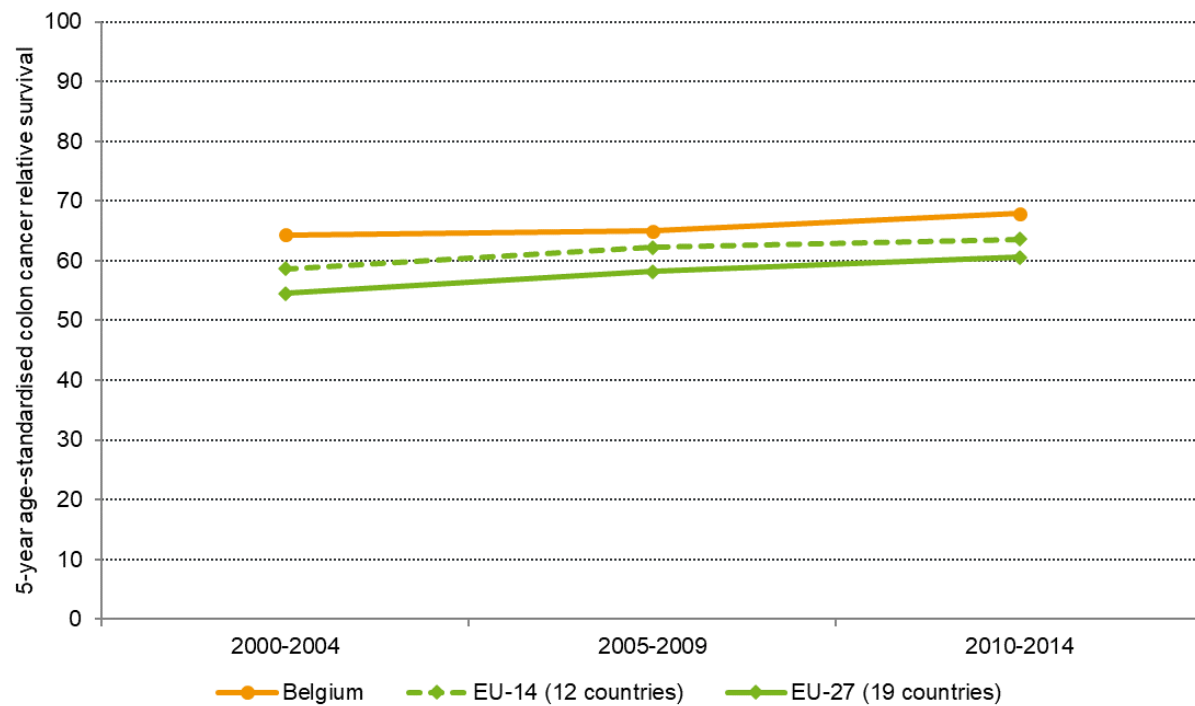
Small regional differences are observed for the 5-year relative survival for colorectal cancer: survival is 3 percentage points higher in Flanders (68.6%) than in the Wallonia (65.6%), with even lower rates in the Brussels-Capital Region (64.2%). This could partly be explained by the differences in screening (see P-9). In all three Regions overall survival rates improved

between 2004 and 2012, with the most impressive improvement observed in Flanders (64.3% in 2004 versus 69.0% in 2012).

### International comparison

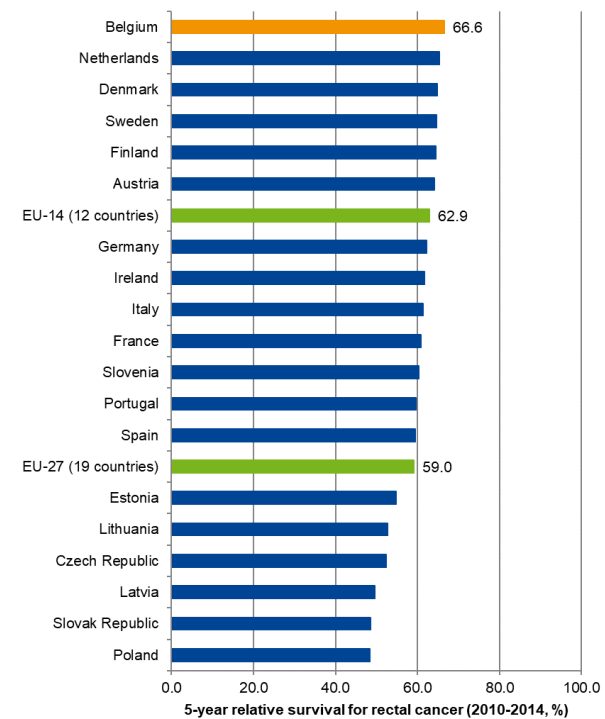
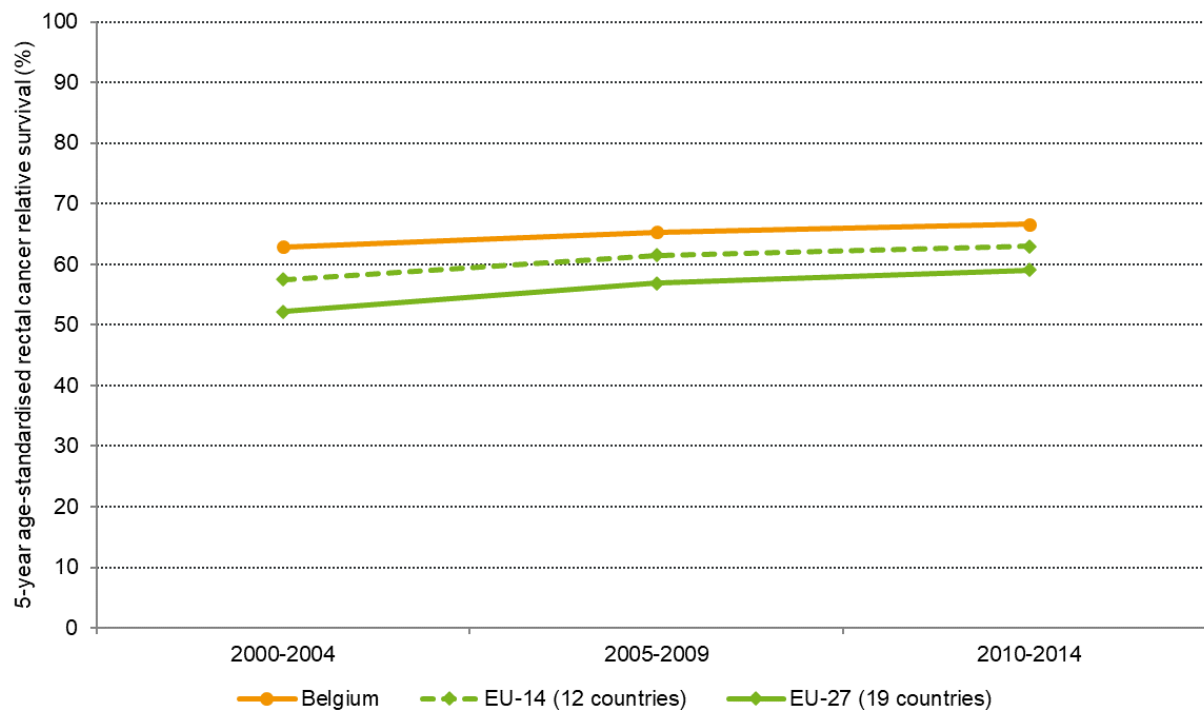
Results from the international comparisons (OECD Health Statistics) are presented for colon cancer (Figure 4) and rectal cancer (Figure 5) separately, and show slightly lower 5-year survival rates for Belgium than displayed in Table 2 (67.9% for colon cancer, 66.6% for rectal cancer). Differences between OECD Health Statistics and results published in Table 2 are explained in the technical fiche, under the heading international comparison. Keeping in mind these limitations, the OECD places Belgium at the highest survival rate of European countries (12 of the EU-14 and 19 of the EU-27 countries).

Figure 4 – 5-year age-standardised relative survival for colon cancer: international comparison



Source: OECD Health data 2023

**Figure 5 – 5-year age-standardised relative survival for rectal cancer: international comparison**



**Impact of COVID-19 pandemic**

Not yet applicable for 5-year survival.

## Key points

- **The relative survival 5 years after the diagnosis of breast cancer and colorectal cancer is respectively 92.4% and 71.9%, based on the cohort of patients diagnosed in 2017. For both cancers, survival is mainly determined by the extent of disease at diagnosis (i.e. the stage). For breast cancer, the majority of patients (75%) are diagnosed at early stages (i.e. stage I or II), while for colorectal cancer diagnosis mainly (52%) occurs at later stages (i.e. II or III), this information is indispensable when interpreting the difference in prognosis between these two cancers.**
- **Trends over time (period 2004-2017) show stable relative survival rates for breast cancer patients, and an increase for colorectal cancer patients. A notable increase is particularly observed for stage III patients with colorectal cancer.**
- **No regional differences in relative survival rates are observed for breast cancer. Colorectal cancer survival shows lower relative survival rates in Brussels and Wallonia compared to Flanders, but this requires further analysis (taking into account possible differences in patient populations and in coverage of the screening programme) before drawing conclusions on regional differences in quality of care.**
- **Comparison of Belgian survival results with other European countries is complicated by several data and methodological limitations, and thus should be interpreted with caution. In the most recent data from OECD Health Statistics, Belgium has outstanding 5-year age-standardised survival rates for colon and rectal cancer, 67.9% for colon cancer and 66.6% for rectal cancer, compared to the European (EU-14) average of 63.6% and 62.9%. Belgian results for breast cancer survival are 86.4%, very close to the average European results for breast cancer patients (86.2%). These results are based on a cohort of patients diagnosed between 2010 and 2014.**

## References

1. Belgian Cancer Registry. Cancer figures [Web page]. Available from: <https://kankerregister.org/Cancer%20Figures>
2. Wildiers H, Stordeur S, Vlayen J, Scholten R, van de Wetering F, Bourgain C, et al. Breast cancer in women : diagnosis, treatment and follow-up. Brussels: Belgian Health Care Knowledge Centre (KCE); 2013. KCE Reports 143 (D/2013/10.273/38) Available from: [https://kce.fgov.be/sites/default/files/page\\_documents/KCE\\_143\\_Breast\\_cancer.pdf](https://kce.fgov.be/sites/default/files/page_documents/KCE_143_Breast_cancer.pdf)
3. Peeters M, Van Cutsem E, Bielen D, Bols A, Demetter P, D'Hoore A, et al. Guideline on the management of rectal cancer: update of capita selecta – Part: 1 Introduction and Methodology. Good Clinical Practice (GCP). Brussels: Belgian Health Care Knowledge Centre (KCE); 2016 18/01/2016. KCE Reports 260 Available from: [https://kce.fgov.be/sites/default/files/page\\_documents/KCE\\_260\\_Rectal\\_cancerupdateofcapitaselecta\\_part1.pdf](https://kce.fgov.be/sites/default/files/page_documents/KCE_260_Rectal_cancerupdateofcapitaselecta_part1.pdf)
4. Peeters M, Leroy R, Robays J, Veereman G, Bielen D, Ceelen W, et al. Colon Cancer: Diagnosis, Treatment and Follow-Up. Good Clinical Practice (GCP). Brussels: Belgian Health Care Knowledge Centre (KCE); 2014 17/01/2014. KCE Reports 218 (D/2014/10.273/15) Available from: [https://kce.fgov.be/sites/default/files/page\\_documents/KCE\\_218\\_Colon\\_cancer.pdf](https://kce.fgov.be/sites/default/files/page_documents/KCE_218_Colon_cancer.pdf)
5. Ederer F, Heise H. Instructions to IBM 650 programmers in processing survival computations. Bethesda MD: National Cancer Institute; 1959. Methodological Note No.10
6. Belgian Cancer Registry. Cancer Survival in Belgium. Brussels: 2012.
7. OECD. Healthcare Quality and Outcomes (HCQO) indicators – 2022-23 Definitions. <https://www.oecd.org/els/health-systems/Definitions-of-Health-Care-Quality-Outcomes.pdf>