Cancer in Ireland 1994-2014: Annual Report of the National Cancer Registry

National Cancer Registry Ireland

2016

ABBREVIATIONS	
95% CI	95% confidence interval
APC	Annual percentage change
ASR	Age-standardised rate (European standard population)
CIN III	Cervical intraepithelial neoplasia (grade III)
CLL	Chronic lymphocytic leukaemia
CNS	Central nervous system
CSO	Central Statistics Office
ESP	European Standard Population
IARC	International Agency for Research on Cancer
ICD	International Statistical Classification of Diseases and Related Health Problems
NCR	National Cancer Registry
NMSC	Non-melanoma skin cancer
NOS	Not otherwise specified
OECD	Organisation for Economic Co-operation and Development
PSA	Prostate-specific antigen
TNM	Tumour, node, metastasis (staging)
WHO	World Health Organisation

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CONTENTS

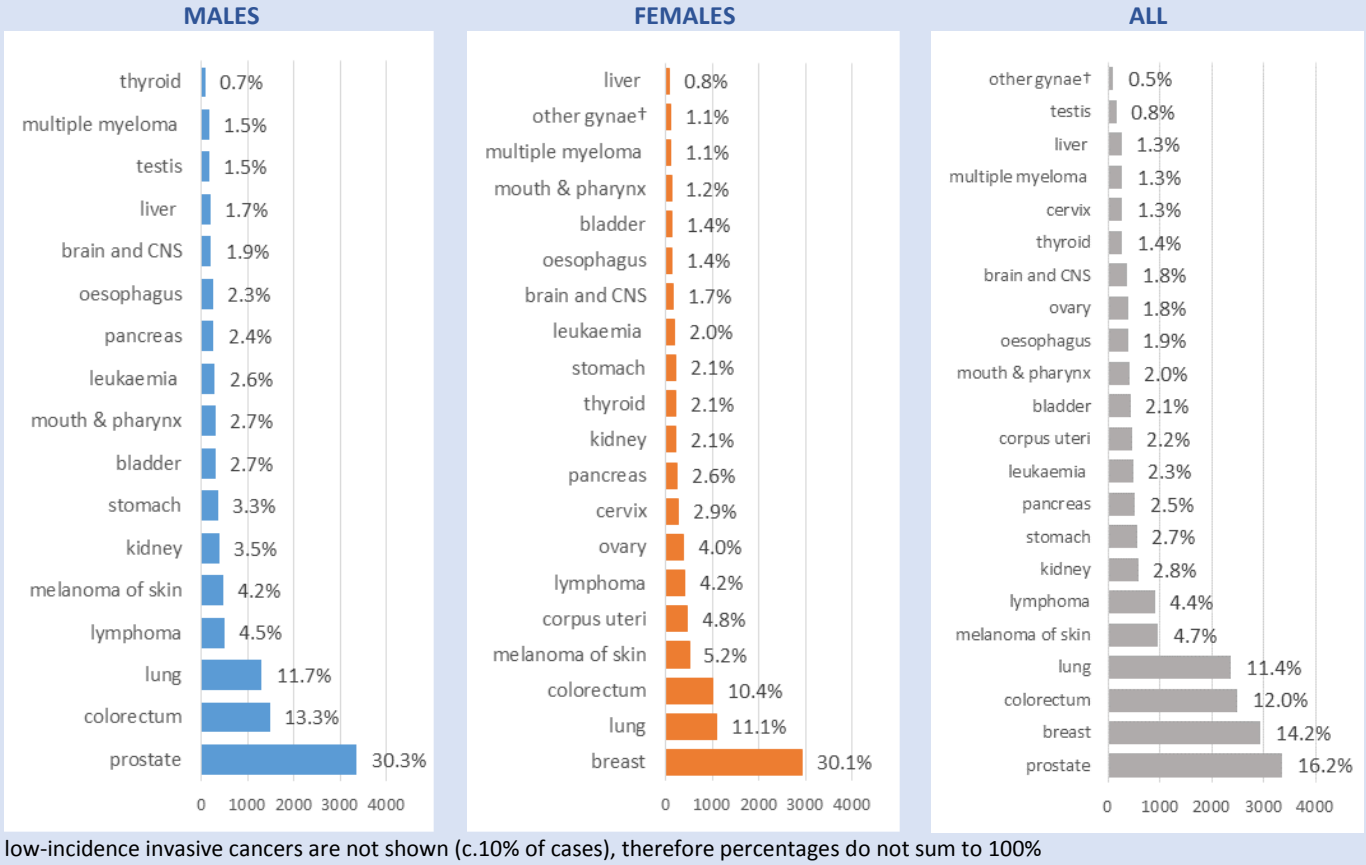
SUMMARY

This is the 21st annual statistical report of the National Cancer Registry. The report summarises cancer incidence, mortality and survival in Ireland for the period 1994 to 2014.

Cancer incidence

- On average, 37,591 cancers and other non-invasive tumours were diagnosed annually during the period 2012-2014.
- Excluding non-melanoma skin cancers (NMSC), 20,804 cases of invasive cancer were diagnosed annually (11,101 males, 9,703 females), representing 68% of all registered invasive cases.
- Excluding NMSC, the top five most common invasive cancers diagnosed in men were prostate (30%), colorectal (13%) and lung cancer (12%), lymphoma (5%) and melanoma of the skin (4%) (*Summary Figure 1*).
- Excluding NMSC, the top five cancers in women were breast (30%), lung (11%) and colorectal cancer (10%), melanoma of the skin (5%) and uterine cancer (corpus uteri, 5%).
- The lifetime risk (to age 75 years) of an invasive cancer diagnosis (excluding NMSC) was approximately 1 in 3 for men and 1 in 4 for women.

Summary Figure 1. Numbers, percentages and rank of the most commonly diagnosed invasive cancers (excluding NMSC): annual averages 2012-2014



low-incidence invasive cancers are not shown (c.10% of cases), therefore percentages do not sum to 100%
† vulva, vagina, uterus (NOS) and placenta

Cancer mortality

- An annual average of 8,655 deaths from cancer (males 4,590, females 4,065) occurred during the period 2011-2013, accounting for 30% of all deaths in Ireland during that period.

- The top five causes of cancer death in men were lung (24%), colorectal (13%), prostate (12%), pancreatic (5%) and oesophageal cancer (5%).
- The top five causes of cancer death in women were lung (18%), breast (17%), colorectal (10%), ovarian (7%) and pancreatic cancer (6%).
- The lifetime risk (to age 75 year) of dying from cancer was approximately 1 in 8 for men and 1 in 10 for women.

Cancer rates comparison: Ireland vs. EU-27 in 2012

- The cancer incidence rate in Irish males (invasive cancers excluding NMSC) was 10% higher than the EU average (453/100,000), partly due to increased diagnosis of prostate cancer in Ireland (52% higher). This was balanced against a lower incidence rate of lung cancer in Irish males (17% lower).
- The mortality rate estimate from cancer in males was slightly lower (9%) than the EU27 average partly due to a lower than average mortality rate from lung cancer (19% lower).
- The incidence rate in females was 16% higher than the EU average reflecting higher incidence of lung (55% higher), ovarian (24% higher), breast (13% higher) and colorectal cancer (14% higher) among Irish females.
- The mortality rate in females was 13% higher than the EU27 average. This was largely due to the higher death rates for lung (34% higher), breast (22% higher) and ovarian cancer (38% higher) in Irish females.

Cancer incidence trends

- As might be expected in a country where both the population and average age is increasing, the number of new cancer cases increased almost year on year during the period 1994-2014. However, numbers of new cases registered slowed markedly from 2011 in males and less markedly in females from 2009.
- After accounting for population growth and age structure, this translated into a statistically significant 2.3% annual decline in the male cancer rate during 2011-2014, and a less marked (non-significant) 0.9% annual decline in the female rate during the same period, excluding non-melanoma skin cancers (*Summary Table 1*, *Summary Figure 2*).
- The decline in the overall male cancer incidence rate during 2011-2014 appears to be largely due to declining or static rates in prostate, lung and colorectal cancers. There was a steady and significant fall in the male lung cancer rate during 1994-2014 and a marked decline in the prostate cancer rate during 2011-2014. This was balanced against steady increases in lymphomas and melanoma of the skin.
- The less marked recent decline in the overall female cancer rate since 2011 was heavily influenced by a significant decline in the breast cancer rate since 2008, following an earlier period of increase (strongly influenced by mammographic screening). This was balanced against steady increases in lung cancer, skin melanoma, uterine cancer and lymphoma
- Lung cancer incidence rates in males declined steadily over 1994-2014, while the female rate increased significantly over the same period. Lung cancer rates track smoking prevalence from decades past. As in other developed countries, it is likely that the period of peak smoking prevalence in females occurred some years later than that in males, which would help explain the contrasting lung cancer trends.
- Melanoma of the skin is largely preventable, but the rates in both sexes increased steadily and significantly during 1994-2014, particularly in men; the mortality rate also increased significantly in both sexes. The rates of non-melanoma skin cancer also increased steadily in both sexes over the full period 1994-2014.

Summary Table 1. Summary of incidence and mortality rate trends, by sex and cancer type.

Trends shown are for 1994-2014 (incidence) or 1994-2013 (mortality) unless otherwise indicated and are for age-standardised rates – see *Summary Figure 2* and *Figures 4-1 to 4-30* (main report) for trends in case numbers and deaths

MALES

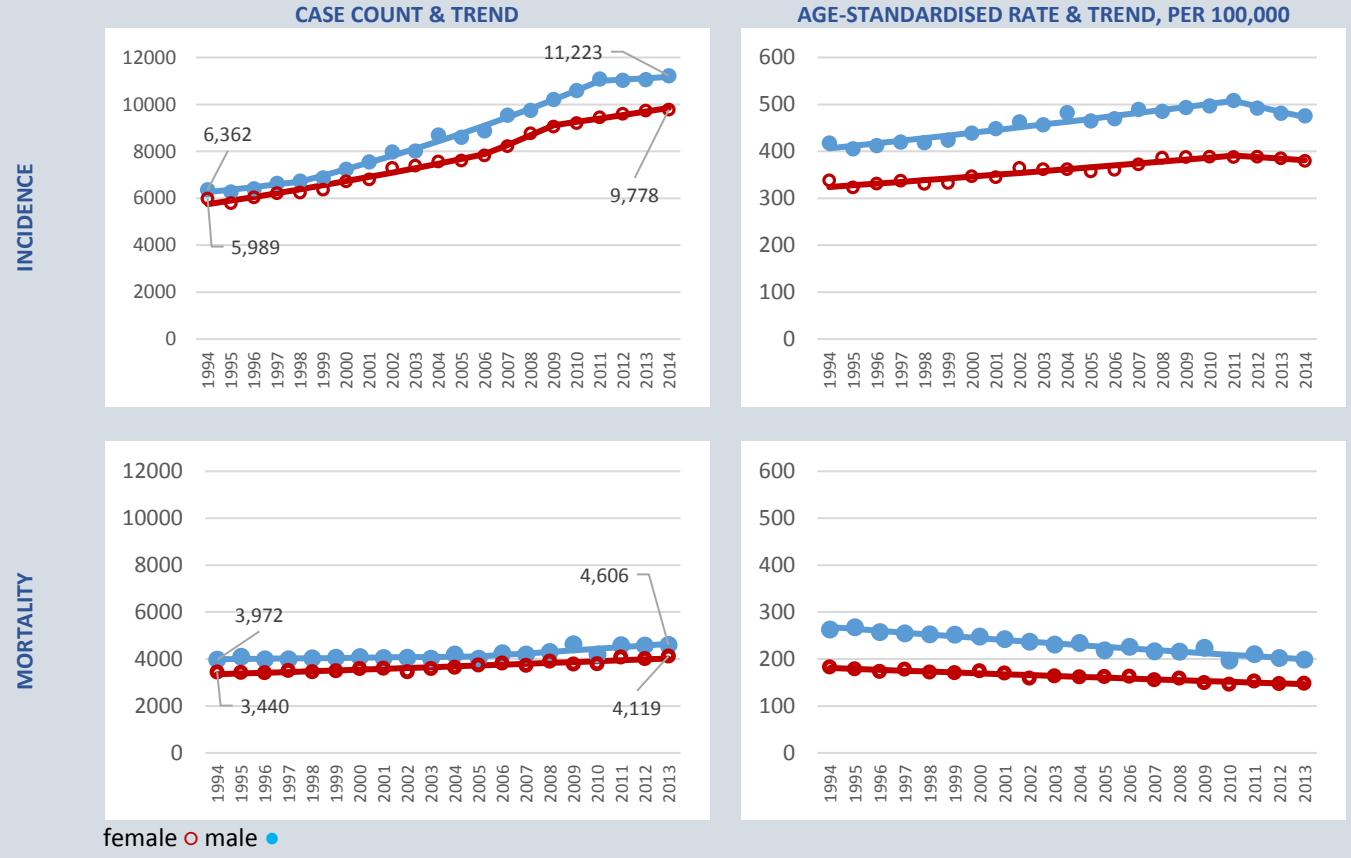
	INCIDENCE TREND	MORTALITY TREND
all invasive excl. NMSC*	↓2011-2014 -2.3% per year	↓ -1.5% per year
INCIDENCE INCREASE		
C01-14 mouth & pharynx	↑2001-2014	↓
C22 liver	↑	↑
C43 melanoma of skin	↑	↑
C64 kidney	↑	↓
C73 thyroid	↑	↔
C81 Hodgkin lymphoma	↑	↓
C82-85 non-Hodgkin lymphoma	↑	↓
INCIDENCE DECREASE		
C33-34 lung	↓	↓
C61 prostate	↓**2011-2014**	↓**2004-2013**
C67 bladder	↓	↓
C91-95 leukaemia	↓2004-2014	↔2010-2013
INCIDENCE STATIC		
C18-21 colorectum	↔**2009-2014**	↓
C91-95 leukaemia	↓2004-2014	↔2010-2013
C16 stomach	↔2003-2014	↓
C15 oesophagus	↔	↓
C25 pancreas	↔	↓2008-2013
C71-72 brain & CNS	↔	↔
C90 multiple myeloma	↔	↓

FEMALES

	INCIDENCE TREND	MORTALITY TREND
all invasive excl. NMSC*	↔2011-2014 -0.9% per year	↓ -1.1% per year
INCIDENCE INCREASE		
C01-14 mouth & pharynx	↑	↔
C22 liver	↑	↔2006-2013
C33-34 lung	↑	↑
C43 melanoma of skin	↑	↑
C54 uterine	↑	↑
C64 kidney	↑	↔
C73 thyroid	↑	↔2009-2013
C81 Hodgkin lymphoma	↑	↔
C82-85 non-Hodgkin lymphoma	↑	↔
INCIDENCE DECREASE		
C15 oesophagus	↓	↓
C16 stomach	↓	↓
C50 breast	↓**2008-2014**	↓
C56 ovary	↓	↓
C67 bladder	↓	↔
INCIDENCE STATIC		
C18-21 colorectum	↔	↓
C25 pancreas	↔	↔
C53 cervix	↔2010-2014	↔
C91-95 leukaemia	↔2010-2014	↓
C71-72 brain & CNS	↔	↓
C90 multiple myeloma	↔	↓

*C00-43, C45-96, i.e. excluding non-melanoma skin cancer (NMSC).
** ↑=significant increase, ↓=significant decrease, ↔=no change
The top three most common cancers in each sex are shown in **bold**.

Summary Figure 2. Trend in incidence and mortality by sex: All invasive cancers, excluding NMSC



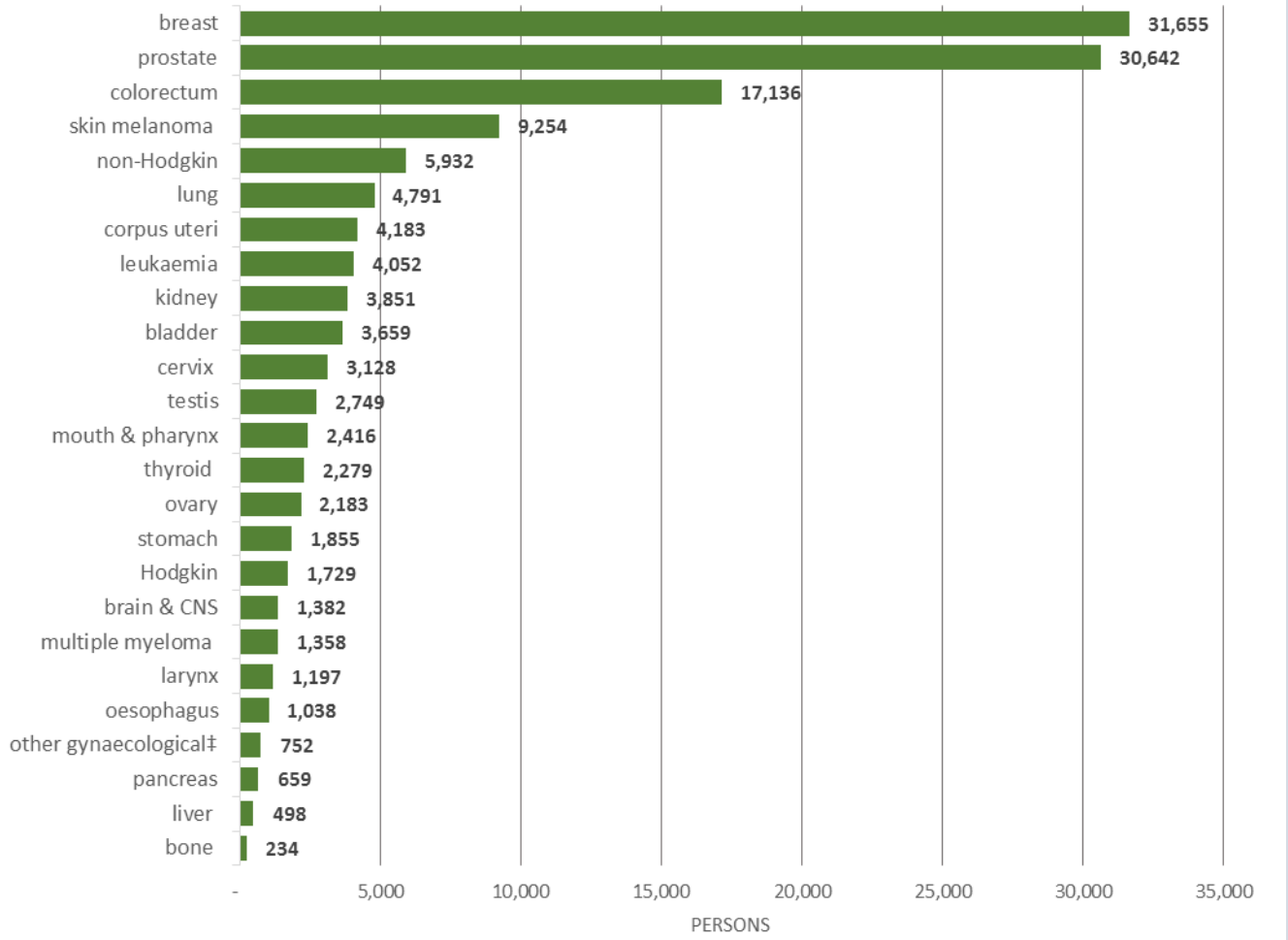
Cancer mortality

- Overall cancer mortality rates decreased steadily and significantly over the period 1994-2013, by an average of 1.5% annually in males and 1.1% annually in females (*Summary Table 1*, *Summary Figure 2*).
- However, reflecting a growing and aging population, the total numbers of cancer deaths continues to increase annually.
- Mortality rates for some individual cancers (notably melanoma of skin, uterine cancer, female lung cancer and male liver cancer) also show ongoing or recent increases.

Cancer prevalence

- As the number cancer of cases continues to rise in line with the population as expected, and mortality continues to fall, the number of persons living with cancer (or having a previous cancer diagnosis) continues to increase.
- 139,526 (43%) of all cancer patients registered by the National Cancer Registry during 1994-2014 (excluding non-melanoma skin cancer patients) were still alive at the end of 2014, or 3% of the total Irish population in 2014.
- Of these, 6,520 (4.7%) had been diagnosed with more than one distinct cancer type in a different body site (as opposed to multiple primaries of the same site, recurrences or metastases).
- The top six most common cancer diagnoses among survivors were: breast (previously diagnosed in 23% of survivors), prostate (22%) and colorectal cancer (12%), skin melanoma (7%) and non-Hodgkin lymphoma (4%) (*Summary Figure 3*).

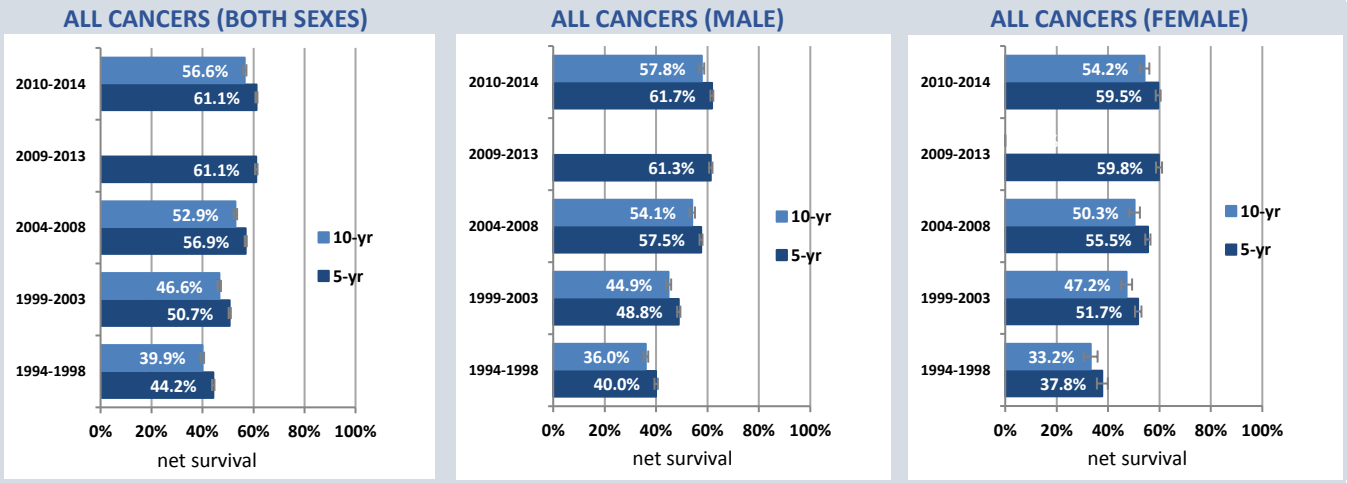
Summary Figure 3. Site-specific cancer prevalence: number of cancer survivors (diagnosed 1994-2014) on 31st December 2014, males and females combined



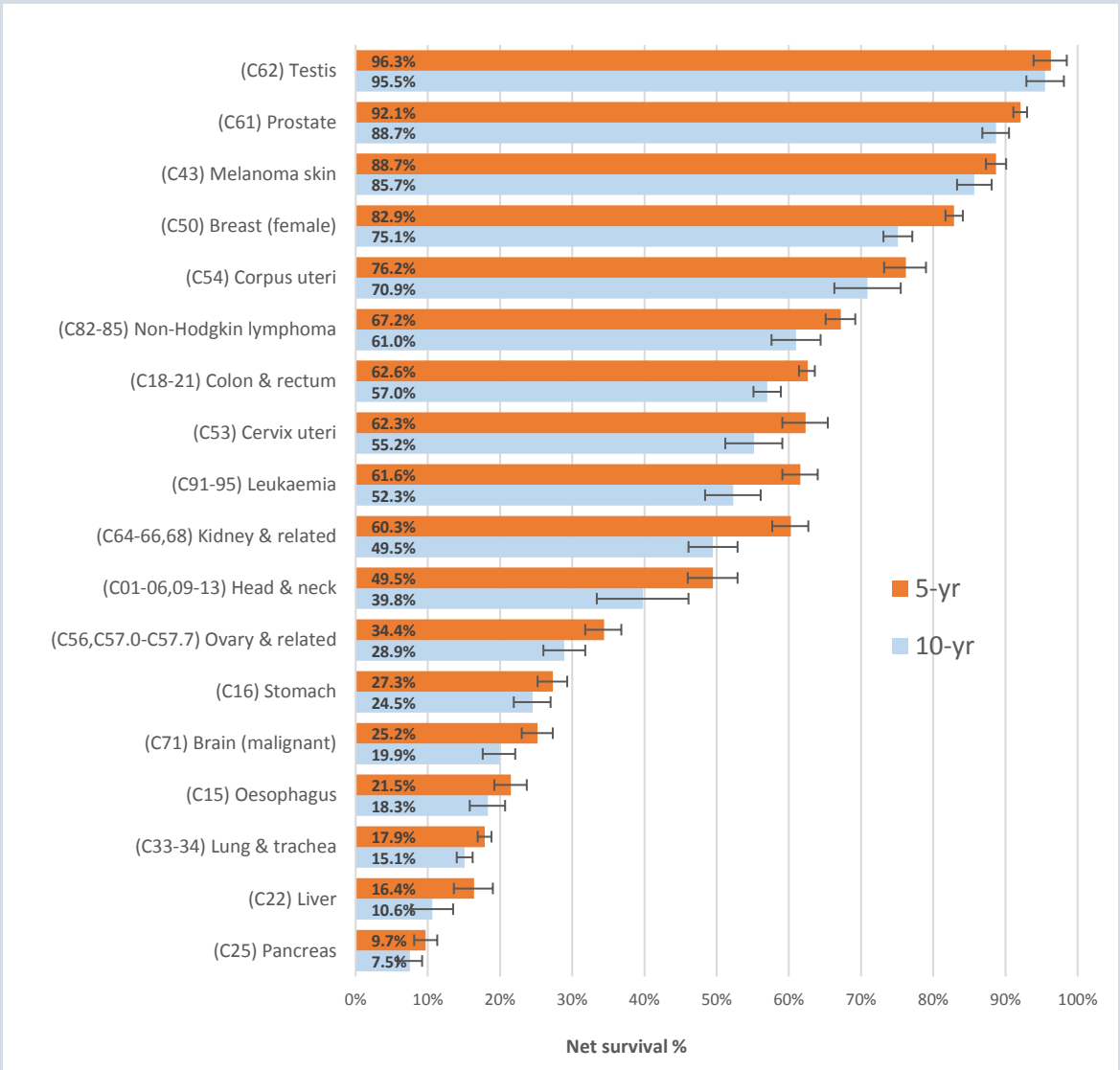
Cancer survival

- Over four consecutive diagnosis periods, five-year net survival for all cancers pooled (excluding NMSC and discounting deaths from other causes) increased incrementally: 1994-1998 (44%), 1999-2003 (51%), 2004-2008 (57%) and 2009-2013 (61%) (*Summary Figure 4*).
- Males and females showed similar patterns of survival improvement over time, although lung cancer survival showed more marked improvements among females. Notable improvements were also seen for colorectal, breast and prostate cancers, though with some evidence of a slowing down in the rate of improvement for breast and prostate cancer.
- Estimates of ten-year net survival are presented in this report for the first time, based on all available follow-up of patients during 2010-2014. Estimates averaged 58% for male cancer patients, 54% for female patients, and ranged from as high as 96% for testicular cancer to as low as 7.5% for pancreatic cancer (*Summary Figure 5*).

Summary Figure 4. Age-standardised 5-year and 10-year net survival (with 95% confidence intervals) for all cancers excluding NMSC, by diagnosis period



Summary Figure 5. 5-year and 10-year net survival (age-standardised) for invasive cancers in Ireland, 2010-2014



1. INCIDENCE 2012-2014

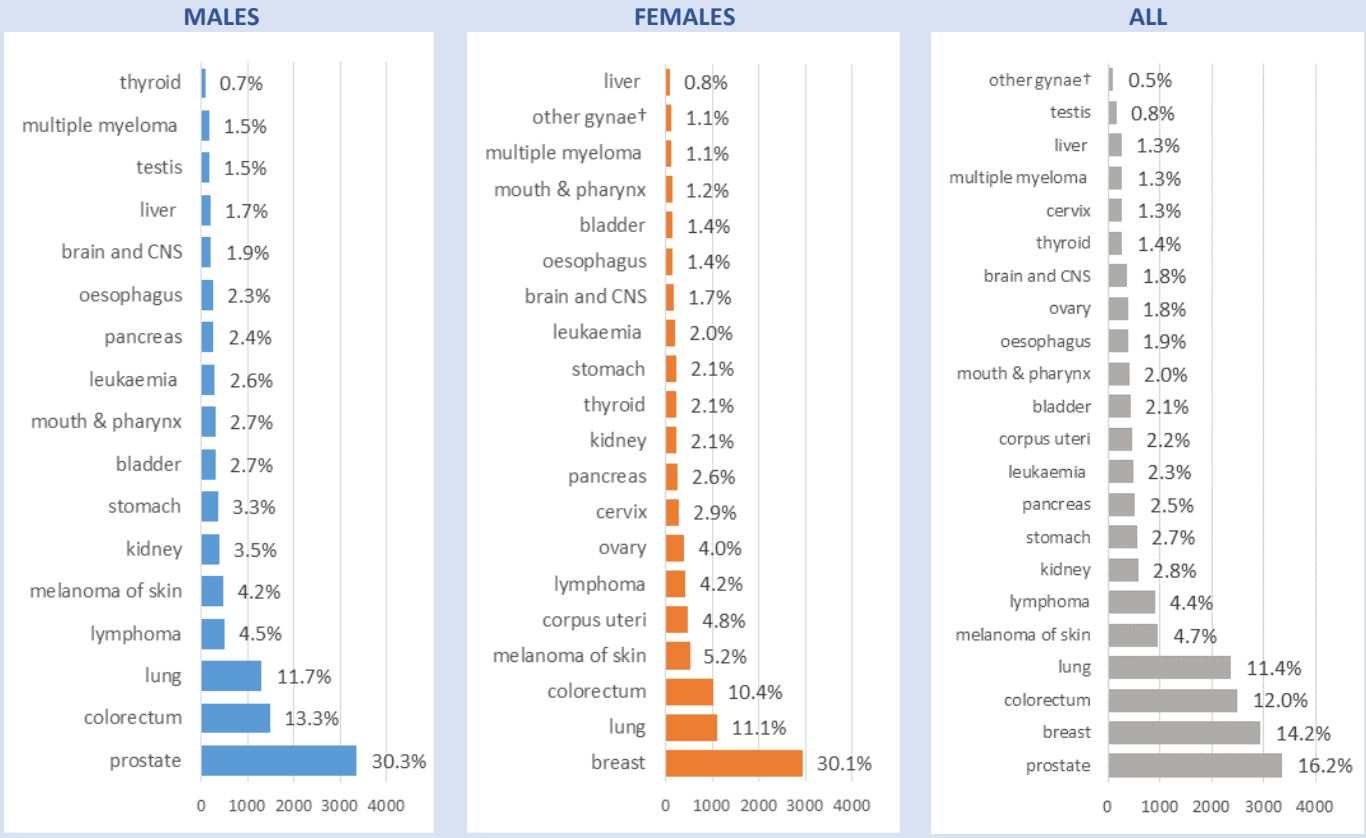
- An average of 37,591 cancers and other (non-invasive) tumours was registered per year during 2012-2014 inclusive, representing an age-standardised incidence rate of 755 female cases and 794 male cases per 100,000 per year (Table 1-1).
- Approximately 18% of these were non-invasive tumours (in situ carcinomas, tumours of uncertain behaviour and benign brain and CNS tumours) and 26% were invasive non-melanoma skin cancers (NMSC, 9,868 cases per year).
- Invasive cancers (incl. NMSC) averaged 30,672 per year during 2012-2014, or an age-standardised rate of 548 female and 720 male cases per 100,000 per year.
- For *all invasive cancers excluding NMSC*, the figures most often quoted in international comparisons, 20,804 cases were registered annually, representing 68% of all registered invasive cases and equivalent to an incidence rate of 385 cases per 100,000 females and 483 cases per 100,000 males per year. This rate was 26% higher for men than for women.
- The cumulative lifetime risk (to age 75 years) of an invasive cancer diagnosis was approximately 1 in 3 for men and 1 in 4 for women. Further statistics on lifetime risk by individual cancer type are given in Appendix I.

Table 1-1. Annual average incidence of most common cancers: 2012-2014

	CASES			RATE** per 100,000		% RISK to age 75 yr		% of all invasive cancers excl. NMSC #		
ICD10 cancer site*	**male**	**female**	**all**	**male**	**female**	**male**	**female**	**male**	**female**	**all**
C00-96 all invasive cancers	16,618	14,054	30,672	720.0	547.6	44.1	35.2	-	-	-
C00-43,C45-96 invasive excl.NMSC #	11,101	9,703	20,804	483.3	384.5	33.4	26.6	100.0%	100.0%	100.0%
C00-D48 all registered tumours	18,330	19,261	37,591	793.9	754.5	47.3	44.6	-	-	-
D00-48 all non-invasive tumours	1,712	5,207	6,919	73.9	206.9	5.7	14.5	-	-	-
mouth & pharynx	297	118	414	13.2	4.8	1.2	0.4	2.7%	1.2%	2.0%
oesophagus	251	137	387	10.9	4.9	0.9	0.4	2.3%	1.4%	1.9%
stomach	361	204	565	15.5	7.5	1.2	0.6	3.3%	2.1%	2.7%
colorectum	1,476	1,013	2,489	63.8	38.1	4.9	2.9	13.3%	10.4%	12.0%
liver	191	73	264	8.2	2.7	0.7	0.2	1.7%	0.8%	1.3%
pancreas	266	252	518	11.5	9.1	0.9	0.7	2.4%	2.6%	2.5%
lung and trachea	1,303	1,078	2,381	56.2	41.2	4.4	3.4	11.7%	11.1%	11.4%
melanoma of skin	467	501	968	20.2	20.0	1.5	1.6	4.2%	5.2%	4.7%
NMSC	5,517	4,351	9,868	236.7	163.1	16.1	11.7	-	-	-
breast	29	2,919	2,947	1.2	121.6	0.1	9.5	0.3%	30.1%	14.2%
cervix		277	277		11.5		0.9	-	2.9%	1.3%
corpus uteri		465	465		19.2		1.7	-	4.8%	2.2%
ovary		384	384		15.4		1.2	-	4.0%	1.8%
other gynaecological†		103	103		4.1		0.3	-	1.1%	0.5%
prostate	3,364		3,364	148.4		13.3		30.3%	-	16.2%
testis	172		172	7.3		0.5		1.5%	-	0.8%
kidney	383	208	591	16.7	8.3	1.3	0.7	3.5%	2.1%	2.8%
bladder	304	134	438	13.0	4.7	1.0	0.3	2.7%	1.4%	2.1%
all brain and CNS	298	331	629	13.0	13.5	1.0	1.1	-	-	-
brain & CNS: malignant	207	164	371	9.0	6.7	0.8	0.5	1.9%	1.7%	1.8%
brain and CNS: benign	57	131	188	2.5	5.2	0.2	0.4	-	-	-
brain and CNS: uncertain	34	36	70	1.5	1.5	0.1	0.1	-	-	-
thyroid gland	75	206	281	3.3	8.6	0.3	0.7	0.7%	2.1%	1.4%
lymphoma (total)	500	410	911	21.8	16.5	1.7	1.4	4.5%	4.2%	4.4%
Hodgkin lymphoma	81	59	140	3.6	2.6	0.3	0.2	0.7%	0.6%	0.7%
non-Hodgkin lymphoma	420	351	771	18.2	13.9	1.5	1.2	3.8%	3.6%	3.7%
multiple myeloma	163	108	271	7.1	4.0	0.5	0.3	1.5%	1.1%	1.3%
leukaemia	290	192	483	12.6	7.6	0.9	0.6	2.6%	2.0%	2.3%
other invasive tumours (‡)	1,002	757	1,760					9.0%	7.8%	8.5%

* invasive cancer included all tumours classified as behaviour 3 in ICD-O-3 classification (including some neoplasms previously classified as uncertain behaviour, e.g. polycythaemia vera) [1]
**rates are standardised to the 1976 European standard population (ESP) [2]– see Appendix I for rates standardised to the 2013 ESP
† vulva, vagina, uterus (NOS) and placenta
‡ see Appendix I for further site-specific statistics
# excluding non-melanoma skin cancer (NMSC)

Figure 1-1.
Numbers, percentages and rank of the most commonly diagnosed invasive cancers (excluding NMSC): annual averages 2012-2014



low-incidence invasive cancers are not shown (c.10% of cases), therefore percentages do not sum to 100%
† vulva, vagina, uterus (NOS) and placenta

- If NMSC was excluded, prostate and female breast cancer were the most commonly diagnosed invasive cancers overall, and each comprised almost one-third of all invasive cancers in men and women respectively during the period 2012-2014 (Figure 1-1).
- Colorectal cancer, lung cancer, lymphoma, and melanoma of skin were the 2nd, 3rd, 4th and 5th most common cancers in males, respectively.
- Lung cancer, colorectal cancer, melanoma of skin, and uterine cancer (corpus uteri) were the 2nd, 3rd, 4th and 5th most common cancers in females respectively. Lung cancer moved up the ranks from 3rd place to 2nd place ahead of colorectal cancer since publication of the NCR annual report of 2014 [1].
- There was little change observed in the relative frequency or ranks of the common cancer types from the last annual report (2015) [2].

A more detailed breakdown of incidence statistics by cancer site is given in Appendix I.

2. MORTALITY 2011-2013

- Cancer continues to be the second most common cause of death in Ireland, after diseases of the circulatory system, and an annual average of 8,655 deaths from cancer or other neoplasms occurred during the period 2011-2013.
- Cancer represented about 30% of all deaths in Ireland for the period 2011-2013 and an age-standardised mortality rate of 149 deaths per 100,000 females and 204 deaths per 100,000 males per year (Table 2-1).
- All-cancer mortality rates were approximately 36% higher in men than in women.
- The lifetime risk (to age 75 year) of dying from cancer was approximately 1 in 10 for women and 1 in 8 for men.

Table 2-1. Annual average mortality attributed to cancer: 2011-2013

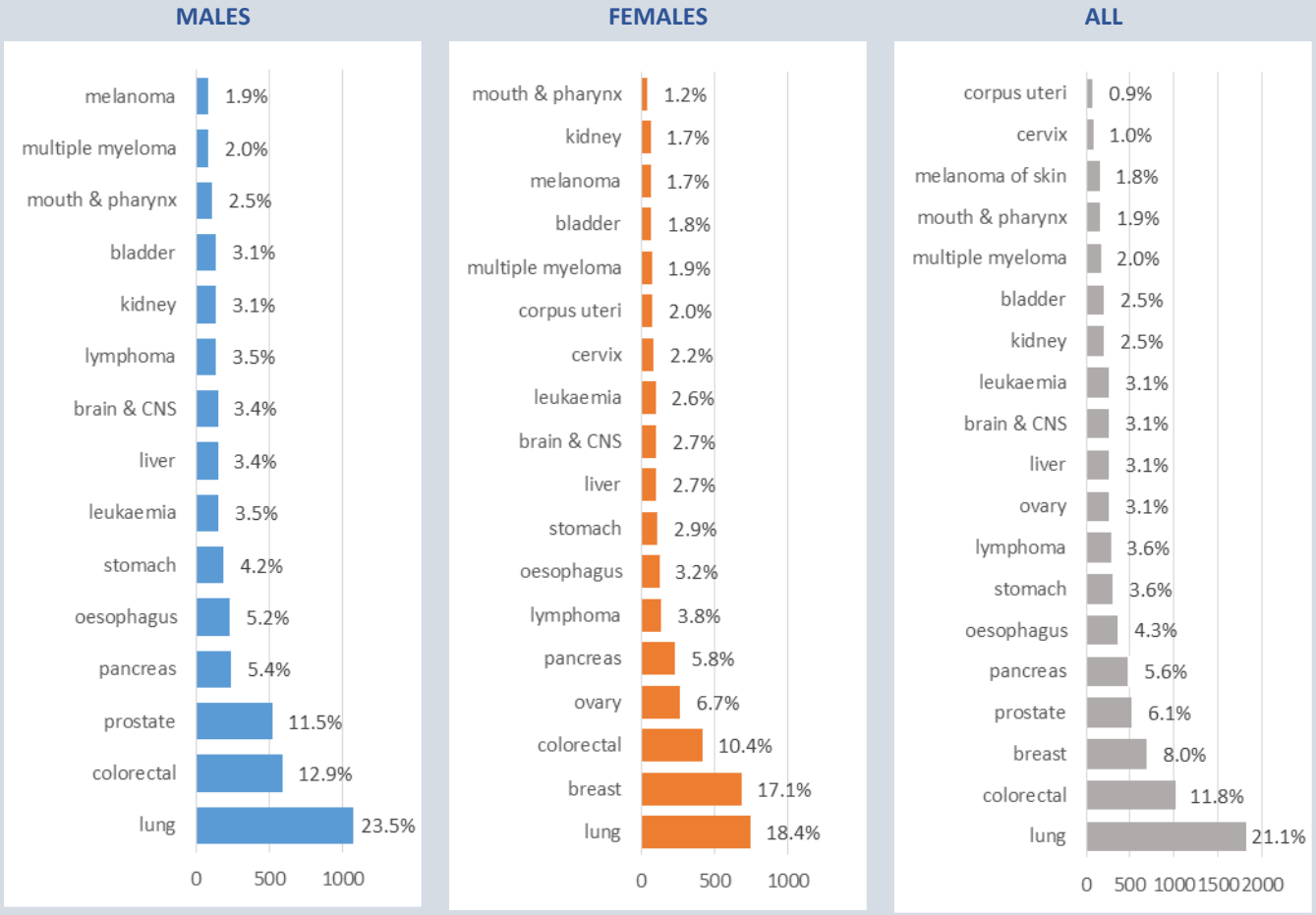
	DEATHS			RATE* per 100,000		% RISK to age 75 yr		% of all cancer deaths		
	male	female	all	male	female	male	female	male	female	all
C00-96 all cancers	4,590	4,065	8,655	203.6	149.2	12.7	10.1	100.0%	100.0%	100.0%
mouth & pharynx	117	48	165	5.3	1.8	0.4	0.1	2.5%	1.2%	1.9%
oesophagus	240	129	369	10.7	4.5	0.8	0.3	5.2%	3.2%	4.3%
stomach	193	119	313	8.6	4.2	0.6	0.3	4.2%	2.9%	3.6%
colorectal	594	424	1,018	26.4	14.8	1.7	0.9	12.9%	10.4%	11.8%
liver	157	111	268	6.9	3.9	0.5	0.2	3.4%	2.7%	3.1%
pancreas	246	237	483	10.9	8.5	0.8	0.6	5.4%	5.8%	5.6%
lung	1,079	749	1,827	47.7	28.2	3.5	2.1	23.5%	18.4%	21.1%
melanoma of skin	89	70	159	4.0	2.6	0.3	0.2	1.9%	1.7%	1.8%
breast		694	694		26.5		2.0	0.0%	17.1%	8.0%
cervix		89	89		3.8		0.3	0.0%	2.2%	1.0%
corpus uteri		82	82		3.0		0.2	0.0%	2.0%	0.9%
ovary		272	272		10.6		0.8	0.0%	6.7%	3.1%
prostate	527		527	23.4		1.0		11.5%	0.0%	6.1%
kidney	144	70	214	6.4	2.6	0.5	0.2	3.1%	1.7%	2.5%
bladder	141	72	213	6.2	2.2	0.3	0.1	3.1%	1.8%	2.5%
brain & CNS	157	108	265	7.0	4.4	0.6	0.4	3.4%	2.7%	3.1%
lymphoma	146	142	288	6.4	5.2	0.3	0.3	3.5%	3.8%	3.6%
multiple myeloma	94	79	173	4.2	2.7	0.3	0.2	2.0%	1.9%	2.0%
leukaemia	161	104	264	7.1	3.7	0.4	0.2	3.5%	2.6%	3.1%
others cancers	505	466	972					10.7%	11.2%	11.0%

WHO mortality database [3]
*rates are standardised to the 1976 European standard population (ESP) [4]

- Lung cancer was the leading cause of cancer death in both sexes, averaging 1,827 deaths per year or 18% of cancer deaths in women and 24% of cancer deaths in men during the period 2011-2013 (Table 2-1, Figure 2-1).
- Colorectal cancer was the next most common cause of cancer death in both sexes, averaging 1,018 deaths per year or 13% of cancer deaths in males and 10% of cancer deaths in females.
- Deaths from lung, colorectal, breast and prostate cancers combined made up almost half (47%) of all deaths from cancer during this period.
- Deaths from cancers of the pancreas, oesophagus and stomach in males ranked 4th, 5th and 6th respectively, and comprised 15% of all cancer deaths in males. Mortality rankings for these high-fatality cancers ranked were much higher than their incidence rankings (Figure 1-2).
- Deaths from cancers of the ovary and pancreas ranked 4th and 5th respectively in females and comprised almost 13% of cancer deaths in women, again much higher than the incidences ranking for these high-fatality cancers (Figure 1-2).

A more detailed breakdown of mortality statistics by cancer site is given in Appendix II.

Figure 2-1. Number, percentages and rank of the most common cancer deaths: annual averages 2011-2013



Cancers accounting for smaller percentages of cancer deaths (c10% in total) are not shown, therefore percentages do not sum to 100%.
Data from WHO mortality database [3]

3. INCIDENCE AND MORTALITY: COMPARISON OF IRELAND AND EU-27 IN 2012

The European Cancer Observatory (ECO) was developed in collaboration between IARC and 130 ENCR member registries [5]. The ECO provides a comprehensive window on cancer incidence, mortality and prevalence for Europe as a whole and for individual countries and registries. *Estimates* of cancer incidence and mortality in Ireland and EU-27 are presented for 2012, as this was the most recent comprehensive comparison available (Tables 3-1, 3-2). The average pooled estimates for 27 members of the EU (in 2012) are presented for comparison.

It cannot be excluded that some of this international variation might reflect differences in completeness of cancer registration. Almost half of the population of Europe falls outside the coverage of cancer registration and some countries may not have recorded all incident cancer cases that occurred within their borders, or incidence may have been estimated from mortality statistics. Some countries have regional registries that do not cover the whole population of the country (e.g. Spain, Italy, Poland, France and Germany) [10]. Ireland has a national cancer registry which covers the whole population (since 1994) and completeness of registration is estimated as 98% [11].

Table 3-1. Comparison of estimated incidence and mortality rates in Ireland with EU(27) average rates in 2012 Invasive tumours, excluding NMSC: Males

INCIDENCE				MORTALITY			
	EU-27 rate*	**Ireland rate***	**difference %**		**EU-27 rate***	**Ireland rate***	**difference %**
prostate	110.8	168.7	52%	oesophagus	7.0	10.6	51%
oesophagus	8.4	12.5	49%	melanoma	2.8	3.8	36%
leukaemia	11.8	17.0	44%	m. myeloma	3.0	3.9	30%
melanoma	13.2	17.7	34%	non-Hodgkin	4.9	5.8	18%
m. myeloma	5.5	7.0	27%	prostate	18.9	22.1	17%
testis	7.2	9.1	26%	brain	6.0	6.9	15%
non-Hodgkin	13.8	17.2	25%	colorectal	23.8	25.4	7%
Hodgkin	2.6	2.9	12%	leukaemia	6.8	7.1	4%
brain	8.1	9.0	11%	Hodgkin	0.5	0.5	0%
colorectal	59.0	65.1	10%	thyroid	0.4	0.4	0%
ALL SITES	**452.9**	**499.6**	**10%**	kidney	6.7	6.5	-3%
pancreas	12.2	11.3	-7%	pancreas	11.9	11.0	-8%
kidney	17.4	15.7	-10%	**ALL SITES**	**211.9**	**193.1**	**-9%**
stomach	15.2	13.4	-12%	stomach	10.4	8.8	-15%
lung	66.3	54.9	-17%	lung	56.4	45.9	-19%
bladder	29.1	20.5	-30%	testis	0.3	0.2	-33%
mouth & pharynx	18.3	11.9	-35%	bladder	8.4	5.6	-33%
thyroid	3.5	1.9	-46%	mouth & pharynx	7.2	4.3	-40%

European Cancer Observatory [6][7]; *age-standardised rate (weighted by ESP 1976)

- The age-standardised incidence rate in Irish males was 500/100,000, which was 10% higher than the EU average (453/100,000), partly due to higher incidence (or diagnosis levels) of prostate cancer in Ireland (52% higher). This was balanced against a lower incidence rate of lung cancer in Ireland (17% lower) (Table 3-1)
- The mortality rate estimate from cancer in males was 193/100,000, which was slightly lower (9%) than the EU27 average (212/100,000), partly due to a lower than average mortality rate from lung cancer (19% lower) (Table 3-1)

Table 3-2. Comparison of estimated incidence and mortality rates in Ireland with EU(27) average rates in 2012

Invasive tumours, excluding NMSC: Females

INCIDENCE				MORTALITY			
	EU-27 rate*	**Ireland rate***	**difference %**		**EU-27 rate***	**Ireland rate***	**difference %**
oesophagus	2.0	5.1	155%	oesophagus	1.7	4.2	147%
lung	26.1	40.4	55%	ovary	7.4	10.2	38%
melanoma	13.1	18.6	42%	lung	20.6	27.6	34%
non-Hodgkin	9.6	12.9	34%	m. myeloma	3.0	3.9	30%
cervix	11.3	15.1	34%	non-Hodgkin	3.0	3.8	27%
m. myeloma	5.5	7.0	27%	breast	22.4	27.4	22%
ovary	12.6	15.6	24%	cervix	3.7	4.3	16%
bladder	6.1	7.5	23%	brain	4.0	4.6	15%
Hodgkin	2.1	2.5	19%	**ALL SITES**	**128.4**	**145.6**	**13%**
ALL SITES	**330.1**	**382.4**	**16%**	corpus uteri	3.3	3.7	12%
leukaemia	7.1	8.2	15%	melanoma	1.8	2.0	11%
colorectal	36.1	41.3	14%	kidney	2.7	3.0	11%
breast	108.8	122.4	13%	bladder	2.0	2.1	5%
kidney	8.0	8.7	9%	Hodgkin	0.3	0.3	0%
pancreas	9.0	9.2	2%	colorectal	14.2	14.1	-1%
brain	5.9	5.9	0%	pancreas	8.5	8.4	-1%
stomach	7.1	6.7	-6%	leukaemia	4.0	3.8	-5%
mouth & pharynx	5.5	4.9	-11%	stomach	4.9	4.4	-10%
corpus uteri	17.9	15.6	-13%	mouth & pharynx	1.7	1.5	-12%
thyroid	9.3	4.7	-49%	thyroid	0.5	0.3	-40%

European Cancer Observatory [6][7]; * age-standardised rate (weighted by ESP 1976)

- The incidence rate in females was 382/100,000, 16% higher than the EU average (330/100,000), mostly reflecting higher incidence of lung (55% higher), melanoma (42% higher), cervix (34% higher), ovarian (24% higher), breast (13% higher) and colorectal cancer (14% higher) among Irish females (Table 3-2)
- The mortality rate in females was 13% higher than the EU27 average: 146 *vs.* 128/100,000 respectively. This was largely due to the higher death rates for lung (34% higher), breast (22% higher) and ovarian cancer (38% higher) in Irish females relative to the European average (Table 3-2)

4. TRENDS IN INCIDENCE AND MORTALITY IN IRELAND 1994-2014

Annual percentage changes (APC) in incidence over time were fitted by Joinpoint regression to case/death counts and annual age-standardised rates (ASR) of incidence and mortality [8][9].

- In interpreting the trends reported in this section, possible changes in diagnostic activity (e.g. introduction or expansion of screening) or coding practices should be borne in mind, as well as possible changes in the true underlying risk of the cancers involved. Some mention of such factors is made under detailed results for specific cancer types (Figures 4-3 to 4-30), along with brief summaries of confirmed or probable risk factors (main sources: World Cancer Research Foundation www.wcrf.org [10], American Cancer Society http://www.cancer.org/ [11]).
- In some of the graphs presented (e.g. Figure 4-1) numbers of cases and deaths tend to increase over time due to natural population increase and aging but the age-standardised rate (ASR, calculated by reference to the 1976 European Standard Population weights) can actually decrease over time after adjustment for changes in age structure and population.

Table 4-1 Summary of incidence and mortality age-standardised rate trends for cancers in males

SITE (& INCIDENCE RANK)	INCIDENCE				MORTALITY			
	PERIOD	APC	95%CI	TREND	PERIOD	APC	95%CI	TREND
all invasive excl. NMSC	2011-2014	-2.3	[-4.5,-0.1]	↓	1994-2013	-1.5	[-1.7,-1.3]	↓
all invasive excl. NMSC & prostate	2008-2014	-0.5	[-1.0,0.0]	↓				
INCIDENCE RATE INCREASE								
C81 Hodgkin lymphoma†(4th)	1994-2014	2.2	[1.4,3.0]	↑	1994-2013	-4.4	[-6.4,-2.4]	↓
C82-85 non-Hodgkin lymphoma †(4th)	1994-2014	1.7	[1.3,2.1]	↑	1994-2013	-1.3	[-2.2,-0.3]	↓
C43 melanoma of skin (5th)	1994-2014	5.0	[4.4,5.7]	↑	1994-2013	5.1	[3.6,6.6]	↑
C64 kidney (6th)	1994-2014	2.8	[2.3,3.4]	↑	1994-2013	0.9	[-0.1,2.0]	↔
C01-14 mouth & pharynx (9th)	2001-2014	2.8	[2.1,3.6]	↑	1994-2013	-1.8	[-2.7,-1.0]	↓
C22 liver (14th)	1994-2014	6.5	[5.6,7.4]	↑	1994-2013	9.2	[7.8,10.6]	↑
C73 thyroid (17th)	1994-2014	6.4	[4.6,8.2]	↑	1994-2013	-0.4	[-2.2,1.5]	↔
C44 NMSC	2001-2014	3.0	[2.7,3.4]	↑				
INCIDENCE RATE DECREASE								
C61 prostate (1st)	2011-2014	-3.9	[-7.8,0.2]	↔	2004-2013	-3.6	[-4.8,-2.5]	↓
C33-34 lung (3rd)	1994-2014	-0.8	[-1.0,-0.6]	↓	1994-2013	-1.8	[-2.1,-1.5]	↓
C67 bladder (8th)	1994-2014	-2.9	[-3.4,-2.5]	↓	1994-2013	-1.0	[-1.7,-0.2]	↓
C91-95 leukaemia (10th)	2004-2014	-3.0	[-4.5,-1.4]	↓	2010-2013	6.0	[-6.2,19.8]	↔
INCIDENCE RATE STATIC								
C18-21 colorectum (2nd)	2009-2014	-1.4	[-2.9,0.2]	↔	1994-2013	-1.7	[-2.1,-1.2]	↓
C16 stomach (7th)	2003-2014	-0.2	[-0.9,0.5]	↔	1994-2013	-3.4	[-4.0,-2.9]	↓
C25 pancreas (11th)	1994-2014	0.6	[0.0,1.2]	↔	2008-2013	-3.4	[-6.6,-0.1]	↓
C15 oesophagus (12th)	1994-2014	-0.3	[-0.9,0.3]	↔	1994-2013	-0.8	[-1.3,-0.2]	↓
C71-72 malignant brain & CNS (13th)	1994-2014	-0.2	[-0.7,0.3]	↔	1994-2013	-0.6	[-1.4,0.2]	↔
C90 multiple myeloma (16th)	1994-2014	0.3	[-0.3,0.9]	↔	1994-2013	-1.4	[-2.0,-0.8]	↓
C91-95 leukaemia excl. CLL	1994-2014	-0.2	[-0.8,0.5]	↔				

APC: average annual percentage change in rate over period and 95% confidence interval (95%CI) based on annual data points fitted with Joinpoint regression. Trend: ↑=significant increase, ↓=significant decrease, ↔=no change (static), at the 95% level. The top five most common invasive cancers in males are shown in bold type. Incidence data covered the period 1994 to 2014 (21 years). Mortality data (where available) covered the period 1994-2013 (20 years). Where more than one discrete trend was observed over the full 20-21 year period, only the most recent trend is shown. See Figures 4-1 to 4-31 for a full visual representation of each individual cancer trend.
†Lymphomas were pooled for rank.

- The incidence rate of all invasive cancer (excl. NMSC) in males declined by 2.3% annually during the period 2011-2014 after a prolonged and steady increase before 2011, although this recent trend was barely within the bounds of statistical significance. It is too early to tell if this downward trend will be sustained in males (Fig. 4-1).

- If the most common cancer, prostate cancer, was excluded from the dataset, the downward trend was much reduced (-0.5% annually during 2008-2014). The overall recent downward trend in male cancer rates was largely influenced by the declining rate of prostate cancer during the period 2011-2014 and lung cancer during 1994-2014.
- From a healthcare provision perspective, the actual number of male cancer cases increased almost year on year during 1994-2014, but the increase slowed during 2011-2014 (Fig. 4-1) mostly due to the fall-off in prostate cancers (Fig. 4-18) and to a lesser extent lung cancers (Fig. 4-9).

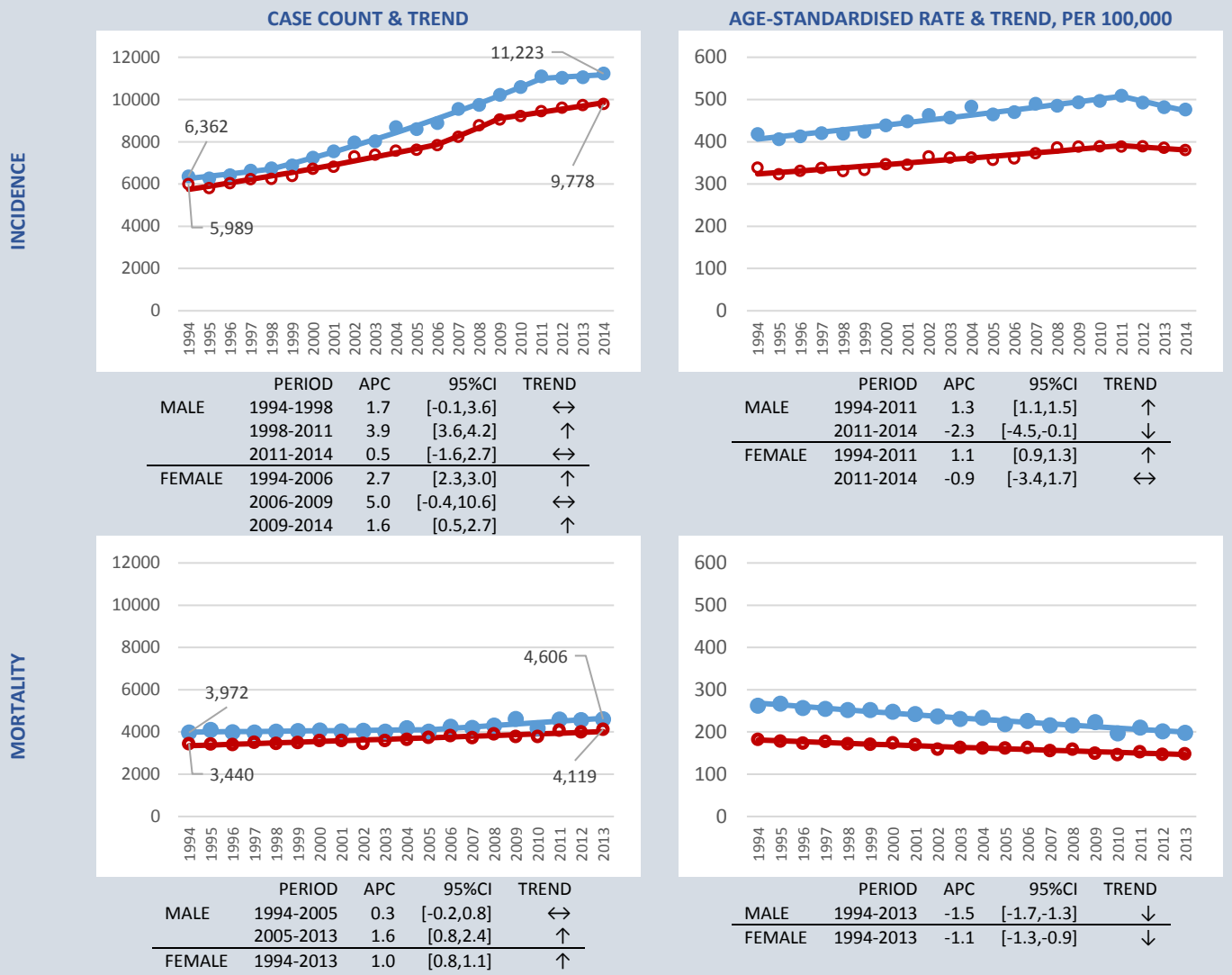
Table 4-2 Summary of incidence and mortality age-standardised rate trends for cancers in females

SITE (& INCIDENCE RANK)	INCIDENCE				MORTALITY			
	PERIOD	APC	95%CI	TREND	PERIOD	APC	95%CI	TREND
all invasive excl. NMSC	2011-2014	-0.9	[-3.4,1.7]	↔	1994-2013	-1.1	[-1.3,-0.9]	↓
all invasive excl. NMSC & breast	1994-2014	0.7	[0.6,0.9]	↑				
INCIDENCE RATE INCREASE								
C33-34 lung (2nd)	1994-2014	2.3	[2.0,2.5]	↑	1994-2013	0.4	[0.0,0.7]	↑
C43 melanoma of skin (4th)	1994-2014	2.5	[2.0,3.1]	↑	1994-2013	2.2	[0.6,3.7]	↑
C54 uterine (5th)	1994-2014	2.5	[2.0,3.0]	↑	1994-2013	1.6	[0.5,2.8]	↑
C81 Hodgkin lymphoma† (6th)	1994-2014	2.3	[1.0,3.6]	↑	1994-2013	-1.1	[-3.6,1.4]	↔
C82-85 non-Hodgkin lymphoma† (6th)	1994-2014	1.7	[1.1,2.3]	↑	1994-2013	-1.0	[-2.1,0.1]	↔
C64 kidney (10th)	1994-2014	2.9	[2.2,3.5]	↑	1994-2013	0.6	[-0.7,1.9]	↔
C73 thyroid (11th)	1994-2014	8.5	[7.2,9.8]	↑	2009-2013	12.4	[-2.3,29.5]	↔
C01-14 mouth & pharynx (17th)	1994-2014	2.1	[1.2,3.1]	↑	1994-2013	-0.7	[-1.9,0.5]	↔
C22 liver (20th)	1994-2014	5.0	[3.4,6.5]	↑	2006-2013	2.3	[-2.0,6.7]	↔
C44 NMSC	2000-2014	2.5	[2.1,2.9]	↑				
INCIDENCE RATE DECREASE								
C50 breast (1st)	2008-2014	-1.1	[-2.0,-0.2]	↓	1994-2013	-1.9	[-2.3,-1.5]	↓
C56 ovary (7th)	1994-2014	-0.6	[-1.1,-0.1]	↓	1994-2013	-0.8	[-1.5,-0.2]	↓
C16 stomach (12th)	1994-2014	-1.2	[-1.7,-0.7]	↓	1994-2013	-3.4	[-4.0,-2.8]	↓
C15 oesophagus (15th)	1994-2014	-1.1	[-1.6,-0.5]	↓	1994-2013	-1.5	[-2.3,-0.8]	↓
C67 bladder (16th)	1994-2014	-2.4	[-3.3,-1.5]	↓	1994-2013	-0.6	[-1.8,0.6]	↔
D06 cervix (in situ)	2011-2014	-8.9	[-16.1,-1.1]	↓				
INCIDENCE RATE STATIC								
C18-21 colorectum (3rd)	1994-2014	0.0	[-0.3,0.3]	↔	1994-2013	-1.9	[-2.4,-1.5]	↓
C53 cervix (8th)	2010-2014	-6.7	[-14.4,1.7]	↔	1994-2013	-0.7	[-1.6,0.1]	↔
C25 pancreas (9th)	1994-2014	0.5	[-0.2,1.1]	↔	1994-2013	0.3	[-0.2,0.9]	↔
C91-95 leukaemia (13th)	2010-2014	-6.7	[-14.4,1.8]	↔	1994-2013	-1.4	[-2.5,-0.3]	↓
C71-72 brain & CNS (14th)	1994-2014	0.5	[-0.2,1.2]	↔	1994-2013	-1.2	[-2.1,-0.3]	↓
C90 multiple myeloma (18th)	1994-2014	0.0	[-1.0,1.0]	↔	1994-2013	-1.6	[-2.6,-0.5]	↓
C91-95 leukaemia excl. CLL	1994-2014	0.1	[-0.9,1.0]	↔				
D05 breast (in-situ)	2009-2014	-0.4	[-5.4,4.9]	↔				

APC: annual percentage change in rate over period and 95% confidence interval (95%CI) based on annual data points fitted with Joinpoint regression. Trend: ↑=significant increase, ↓=significant decrease, ↔=no change (static), at the 95% level.
The top five most common cancers in females are shown in bold type. Incidence data covered the period 1994 to 2014 (21 years). Mortality data (where available) covered the period 1994-2013 (20 years). Where more than one discrete trend was observed over the full 20-21 year period, only the most recent trend is shown. See Figures 4-1 to 4-31 for a full visual representation of each individual cancer trend.
†Lymphomas were pooled for rank.

- The incidence rate of all invasive cancer (excl. NMSC) in females declined by 0.9% annually during the period 2011-2014 after a prolonged increase during 1994-2011. However, the recent trend was not statistically significant, and it is too early to tell if this will become a sustained downward trend (Fig. 4-1).
- If breast cancer was excluded from the dataset, a steady and significant increase of 0.7% annually was the underlying trend in females; the recent decline in female breast cancer during 2008-2014 (1.1% annually) largely accounts for the overall marginal downward trend.
- Cases of invasive cancer increased year on year during 1994-2014; however the accrual of new cases slowed significantly during 2009-2014, mostly attributable to fewer breast cancers (Fig. 4-1).

Figure 4-1. Trend in incidence and mortality by sex: C00-43, C45-96 All invasive cancers, excluding NMSC



	PERIOD	APC	95%CI	TREND
MALE	1994-1998	1.7	[-0.1,3.6]	↔
	1998-2011	3.9	[3.6,4.2]	↑
	2011-2014	0.5	[-1.6,2.7]	↔
FEMALE	1994-2006	2.7	[2.3,3.0]	↑
	2006-2009	5.0	[-0.4,10.6]	↔
	2009-2014	1.6	[0.5,2.7]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2011	1.3	[1.1,1.5]	↑
	2011-2014	-2.3	[-4.5,-0.1]	↓
FEMALE	1994-2011	1.1	[0.9,1.3]	↑
	2011-2014	-0.9	[-3.4,1.7]	↔

	PERIOD	APC	95%CI	TREND
MALE	1994-2005	0.3	[-0.2,0.8]	↔
	2005-2013	1.6	[0.8,2.4]	↑
FEMALE	1994-2013	1.0	[0.8,1.1]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-1.5	[-1.7,-1.3]	↓
FEMALE	1994-2013	-1.1	[-1.3,-0.9]	↓

female ○ **male** ● APC: annual percentage change over the PERIOD and 95% confidence interval (95%CI) based on data points fitted with Joinpoint regression. Trend: ↑=significant increase, ↓=significant decrease, ↔=no change, at the 95% level.
Incidence data covered the period 1994 to 2014. WHO mortality data (where available) covered the period 1994-2013.

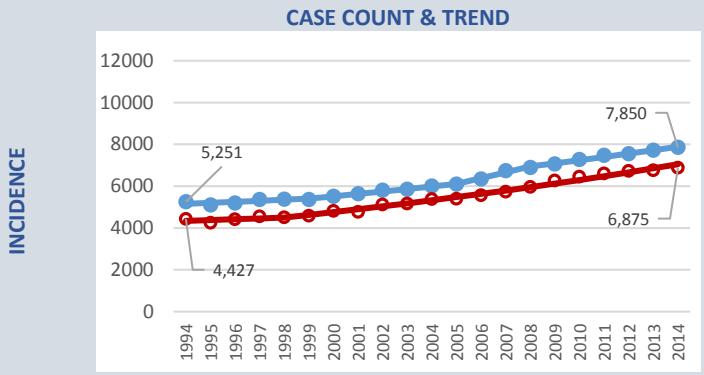
Males:

- After a slow increase from 1994 to 1998, case numbers increased significantly up to 2011, thereafter the annual case count increased only marginally during 2011-2014.
- After a sustained increase during 1994-2011, the incidence rate declined significantly during 2011-2014.
- The decline in the overall rate of invasive cancers reflects a decline in prostate cancer rates since 2011 (following earlier increases), an ongoing fall in lung cancer rates and a marginal decline in colorectal cancer rates 2009-2014 (Table 4-1).
- Numbers of deaths increased significantly over the period 2005-2013, following a more stable trend during 1994-2005.
- After adjusting for population increase and aging, the mortality rate declined steadily during 1994-2013 (Fig. 4-1).

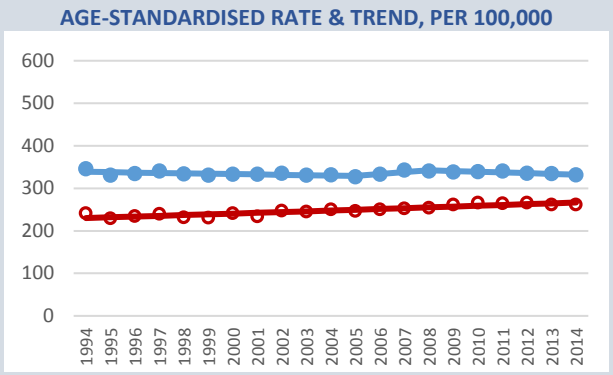
Females:

- Cases increased in a step-like fashion since 1994 with one brief period of rapid increase during 2006-2009. Thereafter, cases increased less steeply but significantly during 2009-2014.
- Incidence rates increased steadily and significantly during 1994-2011 followed by a non-significant decline 2011-2014.
- The recent marginal decline in the overall rate of invasive cancer in females was heavily influenced by a recent decline in breast cancer rates, against a background of decreases and increases in rates of other cancer types (Table 4-2).
- Numbers of deaths increased steadily during 1994-2014, but the overall mortality rate declined over the same period after adjusting for population increase and aging.

Figure 4-2. Trend in incidence by sex: C00-43, C45-96 All invasive cancers, excluding NMSC, prostate cancer & breast cancer (in females)



	PERIOD	APC	95%CI	TREND
MALE	1994-1999	0.9	[0.1,1.8]	↑
	1999-2005	2.1	[1.3,2.9]	↑
	2005-2008	4.3	[0.9,7.9]	↑
	2008-2014	2.1	[1.6,2.7]	↑
FEMALE	1994-1998	0.9	[-1.1,3.0]	↔
	1998-2014	2.8	[2.6,3.1]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-2005	-0.3	[-0.5,0.0]	↓
	2005-2008	1.3	[-1.6,4.4]	↔
	2008-2014	-0.5	[-1.0,0.0]	↓
FEMALE	1994-2014	0.7	[0.6,0.9]	↑

The graphs above are included to assess the influence of prostate cancer on trends in overall cancer rates in males and the influence of breast cancer on overall cancer trends in females (cf. Fig. 4-1).

Males:

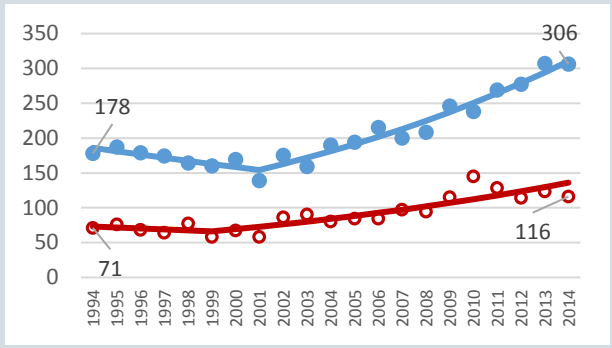
- Case numbers increased significantly during 1994-2014, with one period of steeper increase during 2005-2008.
- The incidence rate declined significantly during 1994-2005, with a marginal increase during 2005-2008. Thereafter, the rate declined significantly during 2008-2014, but with a less marked decline than that seen in for the dataset including prostate cancer.

Females:

- Case numbers increased marginally during 1994-1998, followed by a steeper and significant increase during 1998-2014.
- The incidence rate increased steadily and significantly during 1994-2014.

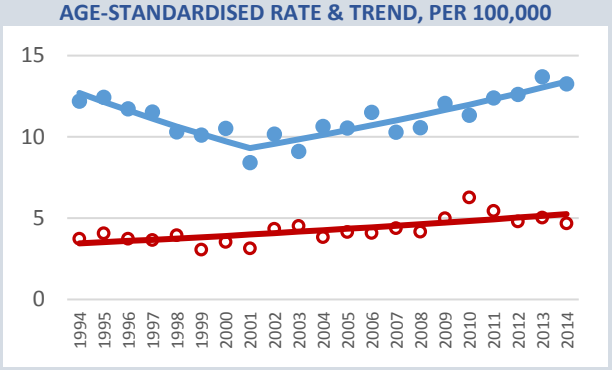
Figure 4-3. Trend in incidence and mortality by sex: C01-14 Cancer of mouth & pharynx

CASE COUNT AND TREND

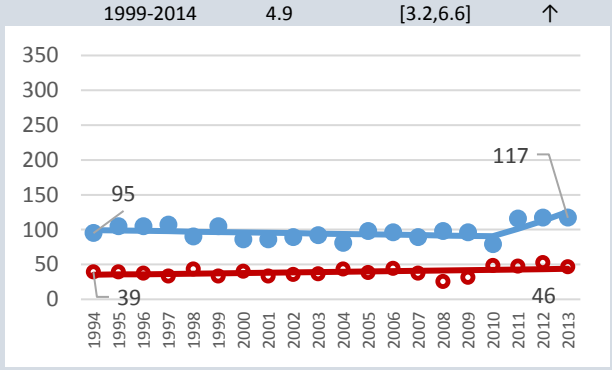


	PERIOD	APC	95%CI	TREND
MALE	1994-2001	-2.6	[-4.7,-0.5]	↓
	2001-2014	5.5	[4.8,6.3]	↑
FEMALE	1994-1999	-2.0	[-11.0,7.9]	↔
	1999-2014	4.9	[3.2,6.6]	↑

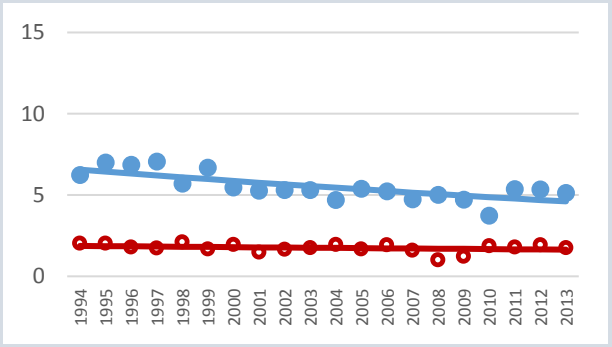
AGE-STANDARDISED RATE & TREND, PER 100,000



	PERIOD	APC	95%CI	TREND
MALE	1994-2001	-4.4	[-6.4,-2.2]	↓
	2001-2014	2.8	[2.1,3.6]	↑
FEMALE	1994-2014	2.1	[1.2,3.1]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-2010	-0.6	[-1.5,0.3]	↔
	2010-2013	11.5	[0.4,23.9]	↑
FEMALE	1994-2013	1.2	[-0.1,2.4]	↔



	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-1.8	[-2.7,-1.0]	↓
FEMALE	1994-2013	-0.7	[-1.9,0.5]	↔

Males:

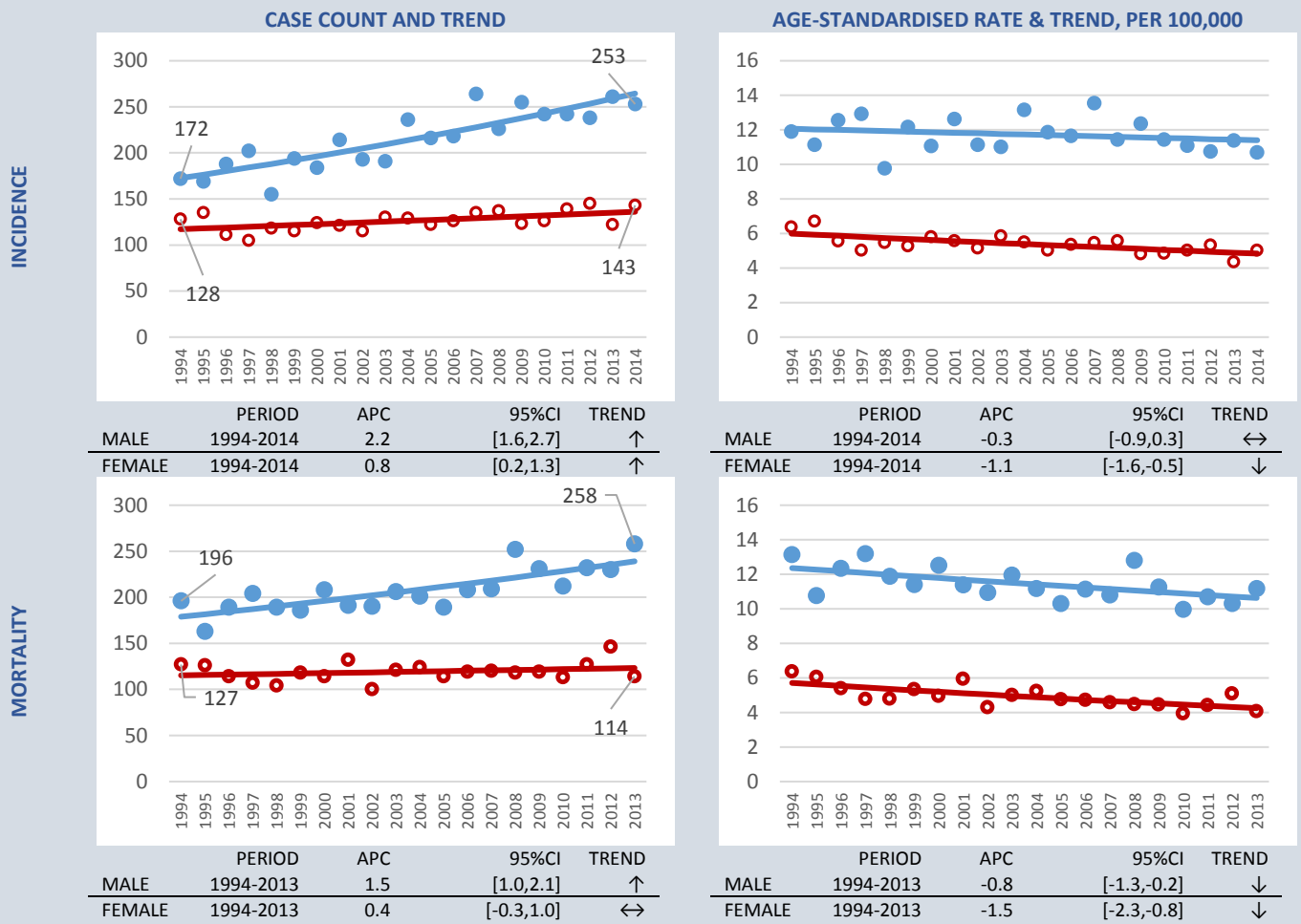
- After a period of significant decline from 1994, cases increased sharply and significantly during 2001-2014.
- The incidence rate increased significantly during 2001-2014.
- Deaths increased significantly during 2010-2013, following a stable trend (or marginal decline) during 1994-2010.
- The mortality rate declined significantly during 1994-2013.

Females:

- After a period of decline from 1994, cases increased significantly during 1999-2014.
- The incidence rate increased steadily over the full period 1994-2014.
- Deaths increased marginally during 1994-2013.
- The mortality rate was static or declined slightly over the same period.

- The rather complex trends seen for these cancers may reflect trends in a number of established risk-factors, including tobacco smoking, alcohol consumption, and exposure to cancer-causing strains of human papillomavirus (HPV).

Figure 4-4. Trend in incidence and mortality by sex: C15 Oesophageal cancer



INCIDENCE

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	2.2	[1.6,2.7]	↑
FEMALE	1994-2014	0.8	[0.2,1.3]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	-0.3	[-0.9,0.3]	↔
FEMALE	1994-2014	-1.1	[-1.6,-0.5]	↓

MORTALITY

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	1.5	[1.0,2.1]	↑
FEMALE	1994-2013	0.4	[-0.3,1.0]	↔

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-0.8	[-1.3,-0.2]	↓
FEMALE	1994-2013	-1.5	[-2.3,-0.8]	↓

The number of incident cases was very similar to the number of deaths which reflects the poor prognosis for this cancer.

Males:

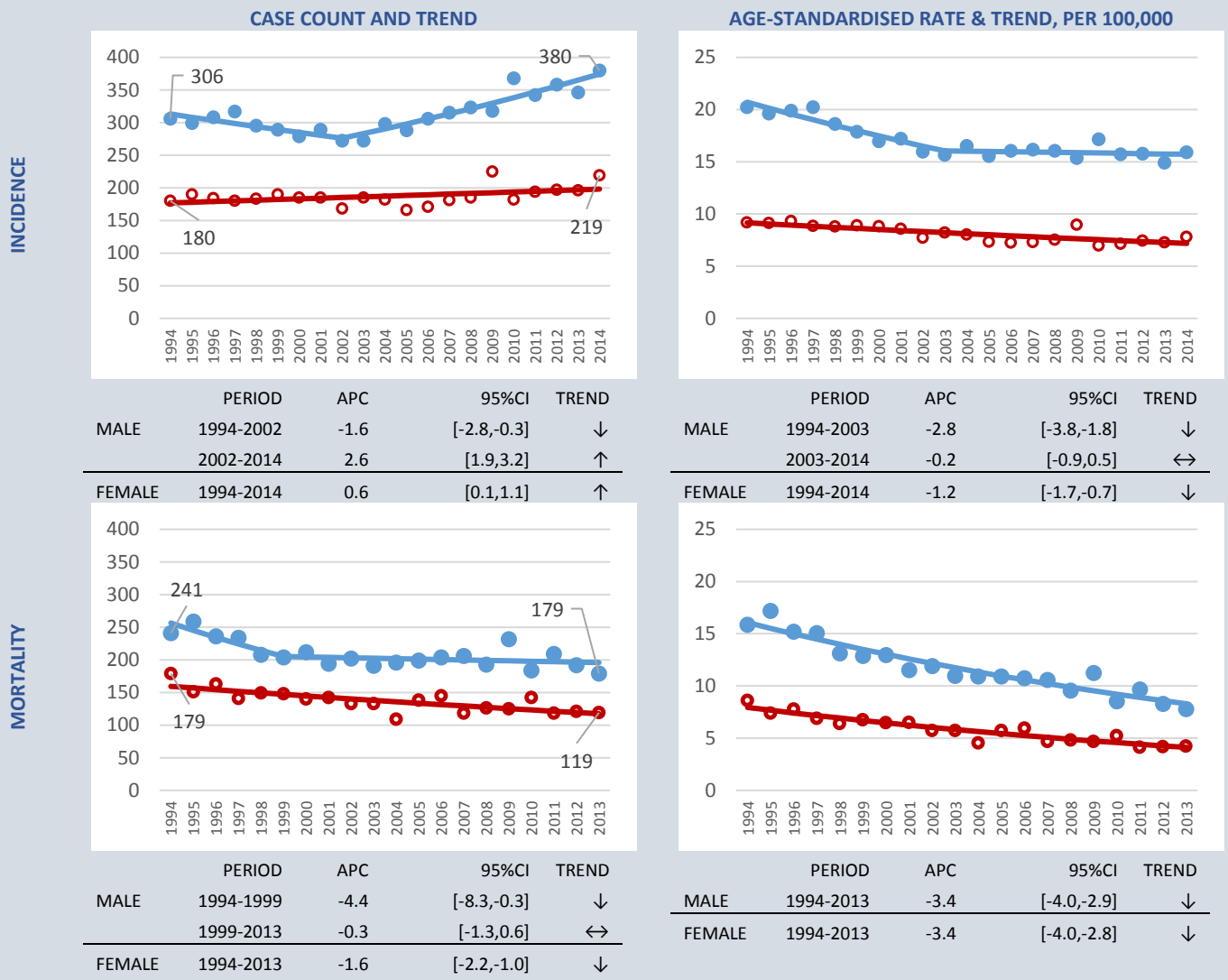
- Cases increased significantly during 1994-2014.
- The incidence rate was static over the same period.
- Deaths increased significantly during 1994-2013.
- The mortality rate declined significantly during the same period.

Females:

- Cases increased significantly during 1994-2014, though not as markedly as in males
- The incidence rate declined significantly over the same period.
- Deaths were static during 1994-2013.
- The mortality rate declined significantly over the same period.

- Known risk factors for oesophageal cancer include smoking, being overweight or obese, and alcohol consumption, although their influence varies between the two main histological subtypes of oesophageal cancer (adenocarcinoma and squamous cell carcinoma). Although overall incidence rates are currently declining or stable, the balance between the influence of smoking and that of other factors may change over time and trends by histological subtype might be more informative.

Figure 4-5. Trend in incidence and mortality by sex: C16 Stomach cancer



	PERIOD	APC	95%CI	TREND
MALE	1994-2002	-1.6	[-2.8,-0.3]	↓
	2002-2014	2.6	[1.9,3.2]	↑
FEMALE	1994-2014	0.6	[0.1,1.1]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2003	-2.8	[-3.8,-1.8]	↓
	2003-2014	-0.2	[-0.9,0.5]	↔
FEMALE	1994-2014	-1.2	[-1.7,-0.7]	↓

	PERIOD	APC	95%CI	TREND
MALE	1994-1999	-4.4	[-8.3,-0.3]	↓
	1999-2013	-0.3	[-1.3,0.6]	↔
FEMALE	1994-2013	-1.6	[-2.2,-1.0]	↓

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-3.4	[-4.0,-2.9]	↓
FEMALE	1994-2013	-3.4	[-4.0,-2.8]	↓

Males:

- After a period of decline during 1994-2002, cases increased sharply and significantly during 2002-2014.
- The incidence rate declined significantly up to 2003, thereafter it was static during 2003-2014.
- Deaths declined significantly during 1994-1999, and were stable or declined marginally thereafter up to 2013.
- The mortality rate declined significantly during 1994-2013.

Females:

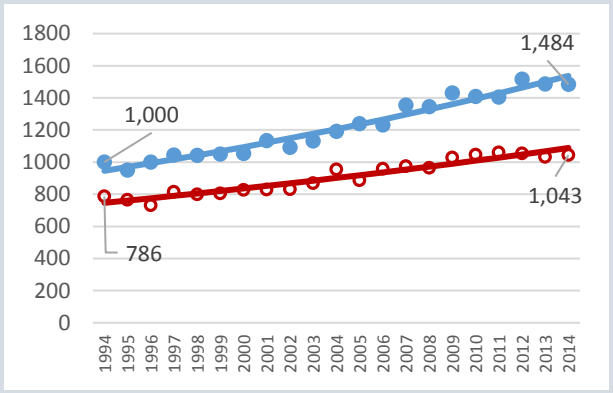
- Cases increased steadily during the full period 1994-2014.
- The incidence rate decreased marginally over the same period.
- Deaths declined significantly during 1994-2013.
- The mortality rate declined significantly over the same period.

- Exposure to the bacterium *Helicobacter pylori* (associated with disadvantaged social status in early childhood) and tobacco smoking are confirmed causes of stomach cancer, and there is probably an association with consumption of alcohol, salt-preserved foods and processed meats and with higher levels of body fat. Declines seen in incidence rates of stomach cancer here are consistent with declines in some of these factors, although the detailed trends (apparently slower decline in women and a stabilisation of rates in men) suggest potential for further improvement.

Figure 4-6. Trend in incidence and mortality by sex: C18-21 Colorectal cancer (including anus)

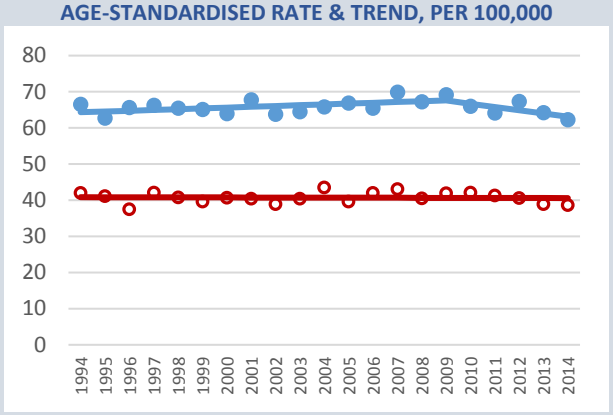
INCIDENCE

CASE COUNT AND TREND



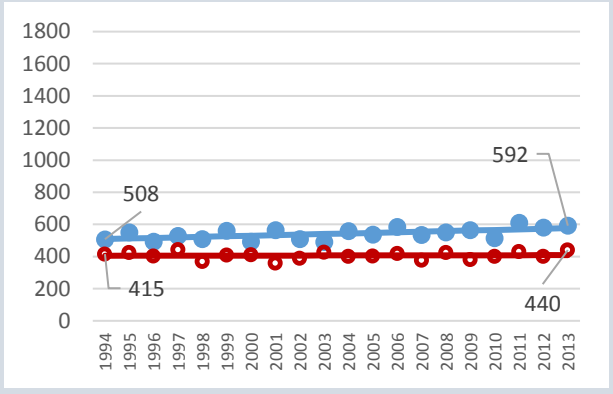
	PERIOD	APC	95%CI	TREND
MALE	1994-2014	2.5	[2.2,2.7]	↑
FEMALE	1994-2014	1.9	[1.6,2.2]	↑

AGE-STANDARDISED RATE & TREND, PER 100,000

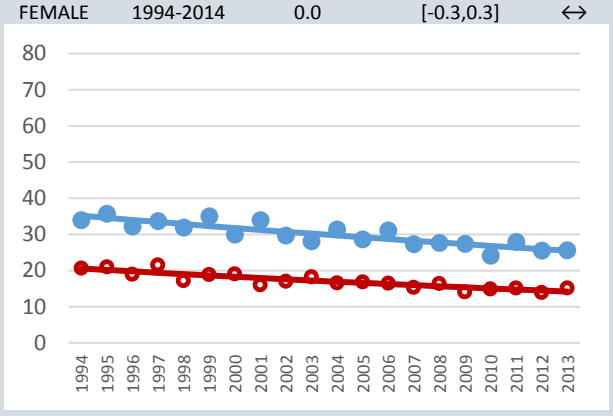


	PERIOD	APC	95%CI	TREND
MALE	1994-2009	0.3	[0.0,0.7]	↔
	2009-2014	-1.4	[-2.9,0.2]	↔
FEMALE	1994-2014	0.0	[-0.3,0.3]	↔

MORTALITY



	PERIOD	APC	95%CI	TREND
MALE	1994-2013	0.7	[0.2,1.1]	↑
FEMALE	1994-2013	0.1	[-0.4,0.5]	↔



	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-1.7	[-2.1,-1.2]	↓
FEMALE	1994-2013	-1.9	[-2.4,-1.5]	↓

Males:

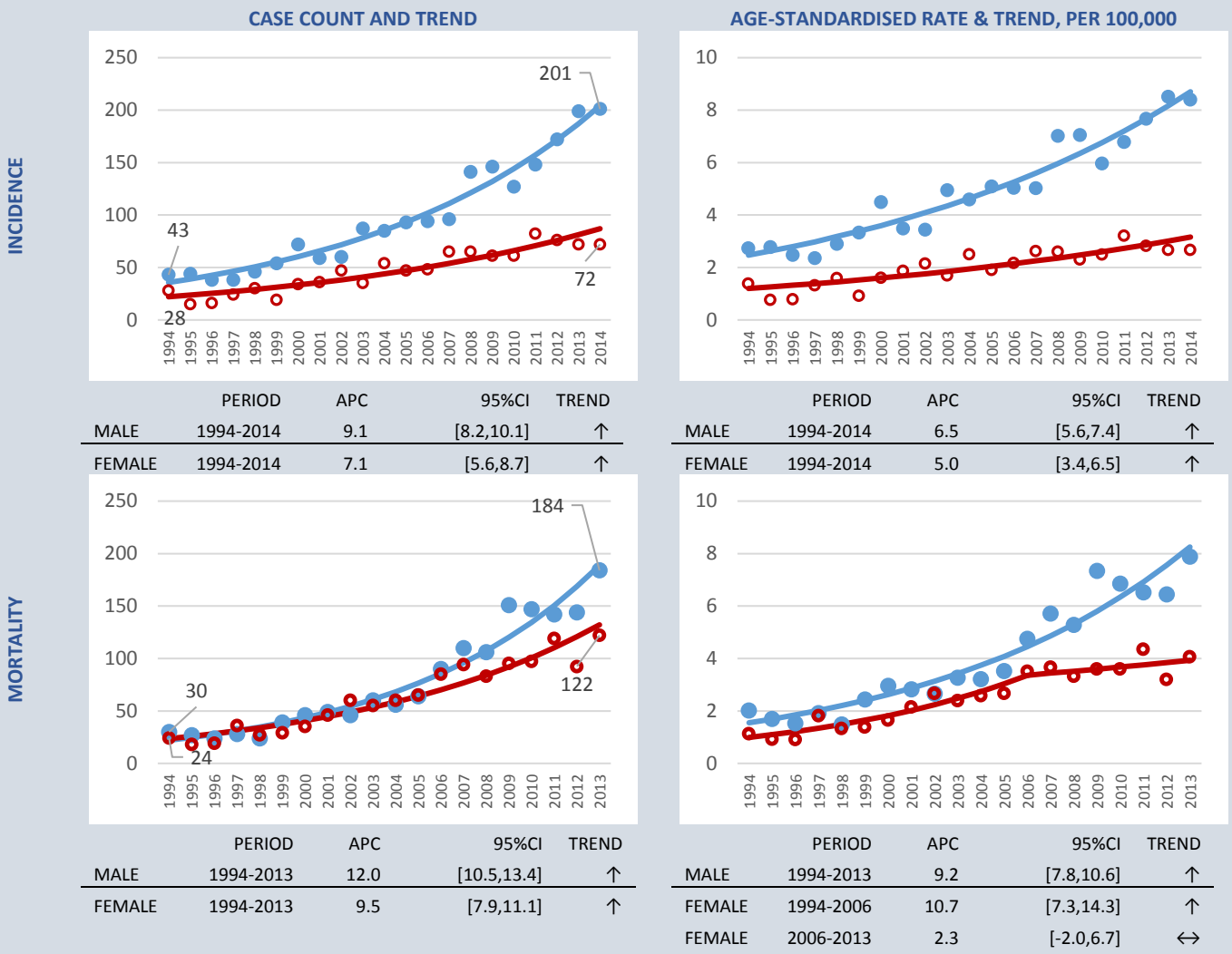
- Cases increased significantly and steadily during the full period 1994-2014.
- After a long static period from 1994 to 2009, the incidence rate declined modestly but non-significantly during the period 2009-2014.
- Deaths increased significantly during 1994-2013.
- The mortality rate declined significantly during 1994-2013.

Females:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate was static over the same period.
- Deaths were static during the full period 1994-2013.
- The mortality rate declined significantly over the same period.

- Modifiable factors that increase colorectal cancer risk include higher consumption of red meat, processed meat and alcohol and higher body fat, and low consumption of dietary fibre. Incidence rates of colorectal cancer in Ireland appear to be fairly static, with only limited evidence of a possible recent decrease.

Figure 4-7. Trend in incidence and mortality by sex: C22 Liver cancer (including intrahepatic bile ducts)



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	9.1	[8.2,10.1]	↑
FEMALE	1994-2014	7.1	[5.6,8.7]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	6.5	[5.6,7.4]	↑
FEMALE	1994-2014	5.0	[3.4,6.5]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	12.0	[10.5,13.4]	↑
FEMALE	1994-2013	9.5	[7.9,11.1]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	9.2	[7.8,10.6]	↑
FEMALE	1994-2006	10.7	[7.3,14.3]	↑
FEMALE	2006-2013	2.3	[-2.0,6.7]	↔

For males, the number of incident cases was very similar to the number of deaths during 1994-2014. For females, the number of recorded deaths generally exceeded the number of incident cases during 1999-2013. It is likely that some deaths attributed to primary liver cancer actually refer to secondary liver tumours (from a different primary site).

Males:

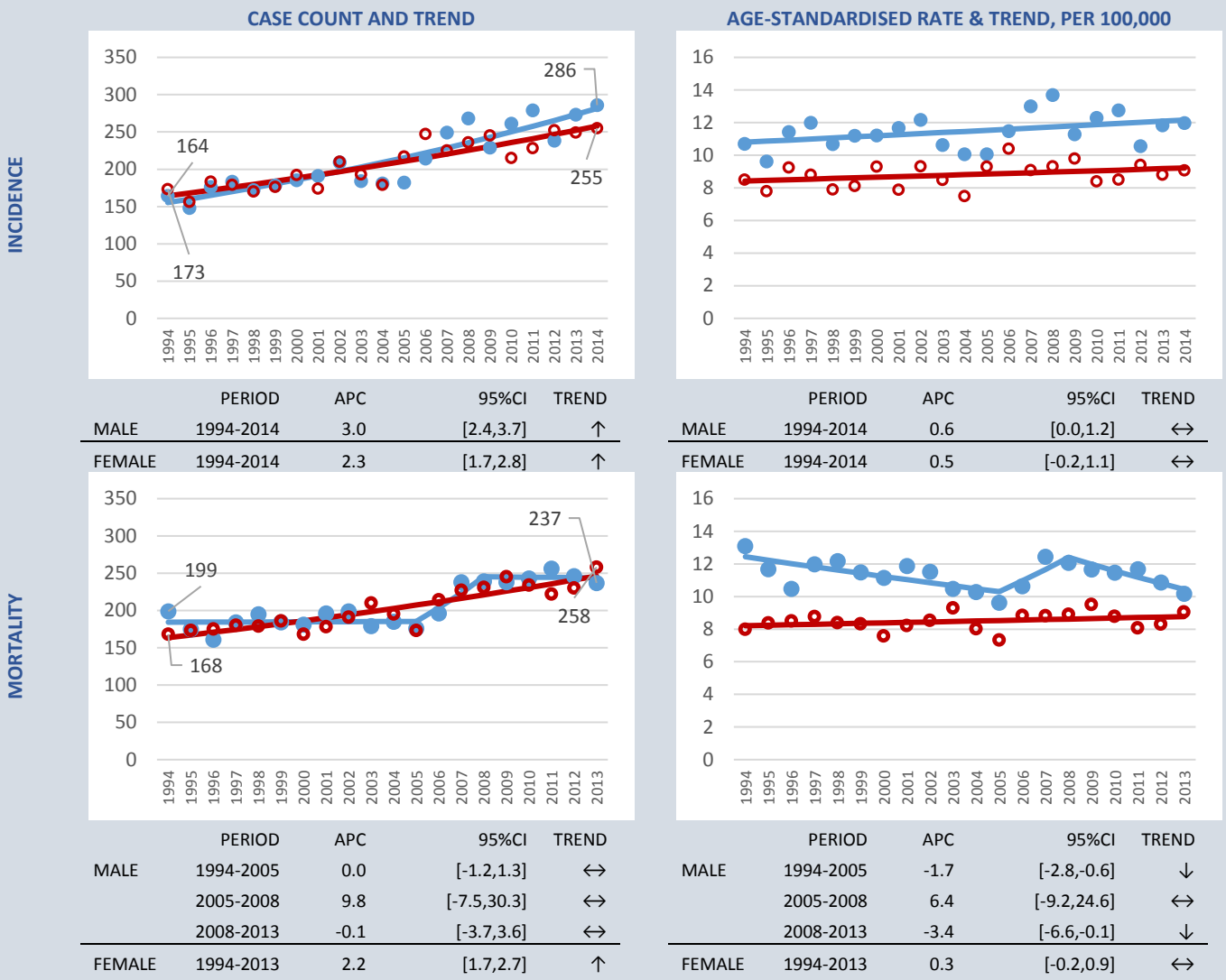
- Cases increased significantly during the full period 1994-2014
- The incidence rate increased significantly over the same period.
- Deaths increased significantly during 1994-2013.
- The mortality rate increased significantly over the same period.

Females:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period
- Deaths increased significantly during the full period 1994-2013.
- The mortality rate increased steeply and significantly over the period 1994-2006, thereafter the rate increased less steeply and non-significantly during 2006-2013.

- Risk of liver cancer is increased by alcohol consumption, exposure to aflatoxins (fungal contamination in food) and being overweight or obese. Marked increases seen in primary liver cancer rates in Ireland suggest increases in the underlying risk factors among populations here, with alcohol consumption perhaps being the most important.

Figure 4-8. Trend in incidence and mortality by sex: C25 Pancreatic cancer



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	3.0	[2.4,3.7]	↑
FEMALE	1994-2014	2.3	[1.7,2.8]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	0.6	[0.0,1.2]	↔
FEMALE	1994-2014	0.5	[-0.2,1.1]	↔

	PERIOD	APC	95%CI	TREND
MALE	1994-2005	0.0	[-1.2,1.3]	↔
	2005-2008	9.8	[-7.5,30.3]	↔
	2008-2013	-0.1	[-3.7,3.6]	↔
FEMALE	1994-2013	2.2	[1.7,2.7]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2005	-1.7	[-2.8,-0.6]	↓
	2005-2008	6.4	[-9.2,24.6]	↔
	2008-2013	-3.4	[-6.6,-0.1]	↓
FEMALE	1994-2013	0.3	[-0.2,0.9]	↔

The number of incident cases was very similar to the number of deaths throughout 1994-2014.

Males:

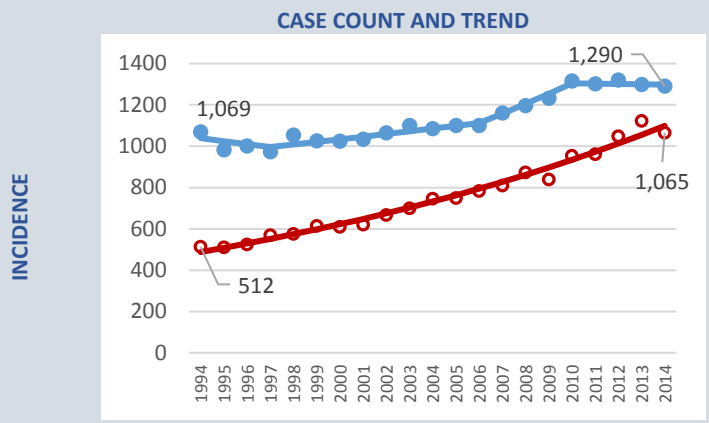
- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased modestly and non-significantly over the same period
- Deaths increased non-significantly overall, with one steeper period of increase during 2005-2008.
- The fitted mortality rate trend was complex but it was broadly static or showed a slight decline.

Females:

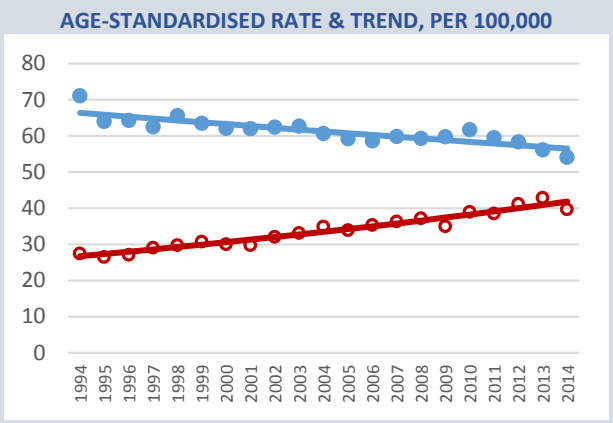
- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased non-significantly over the same period.
- Deaths increased significantly during 1994-2013.
- The mortality rate was static or increased marginally over the same period.

- Tobacco use and higher levels of body fat are associated with higher risk of pancreatic cancer. Trends in Irish incidence rates, although not clear-cut, suggest that the underlying risk may be increasing.

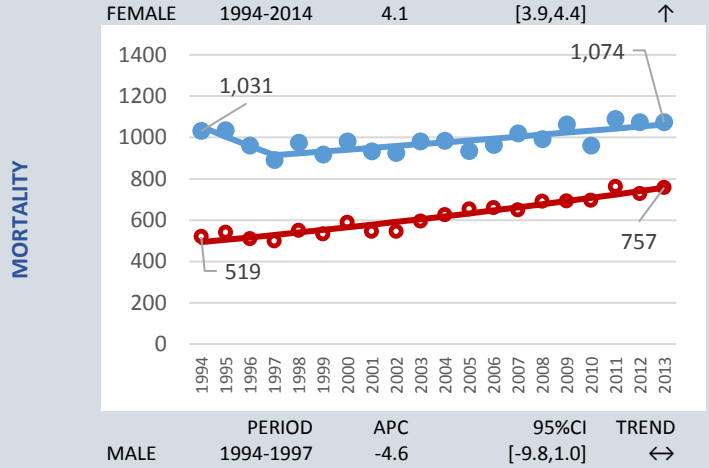
Figure 4-9. Trend in incidence and mortality by sex: C33-34 Lung & tracheal cancer



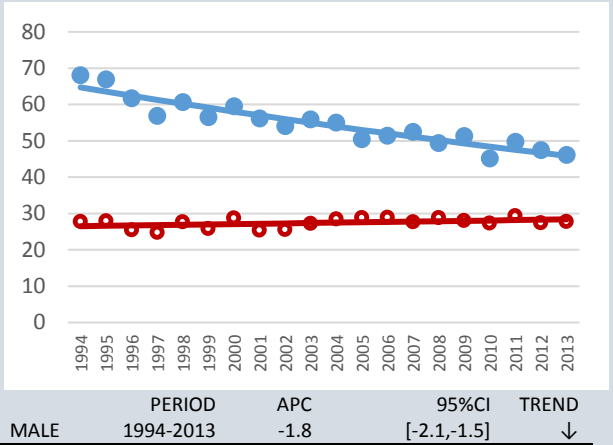
	PERIOD	APC	95%CI	TREND
MALE	1994-1997	-1.4	[-4.5,1.8]	↔
	1997-2006	1.2	[0.5,1.9]	↑
	2006-2010	4.1	[1.0,7.2]	↑
	2010-2014	-0.1	[-1.9,1.7]	↔
FEMALE	1994-2014	4.1	[3.9,4.4]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	-0.8	[-1.0,-0.6]	↓
FEMALE	1994-2014	2.3	[2.0,2.5]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-1997	-4.6	[-9.8,1.0]	↔
	1997-2013	0.9	[0.5,1.4]	↑
FEMALE	1994-2013	2.3	[1.9,2.6]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-1.8	[-2.1,-1.5]	↓
FEMALE	1994-2013	0.4	[0.0,0.7]	↑

Males:

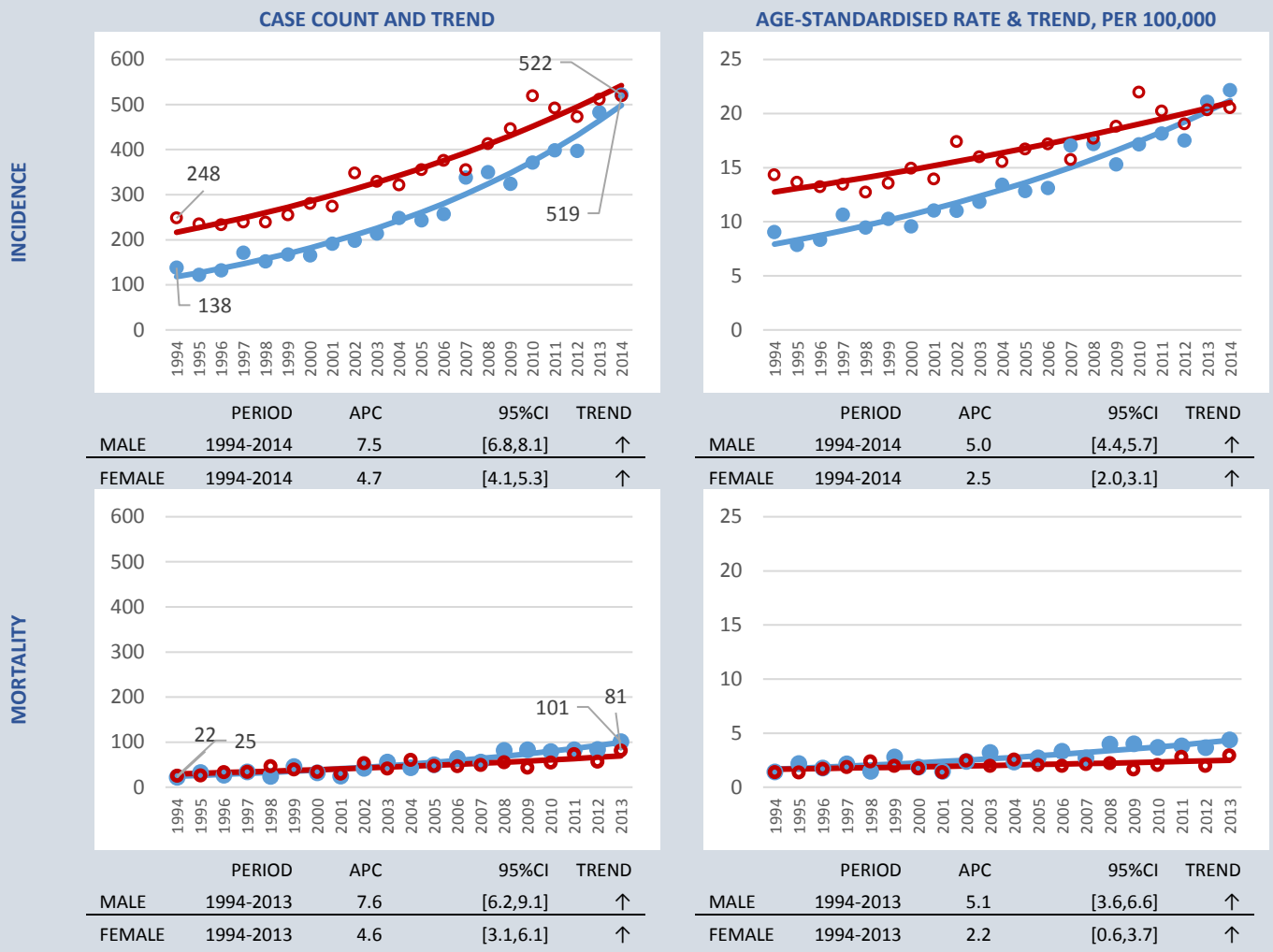
- Cases increased significantly during 1997-2006, followed by period of steeper increase during 2006-2010. Thereafter, the annual case count did not change during 2010 -2014
- The incidence rate declined significantly during the full period 1994-2014
- Deaths increased during 1997-2013, but the mortality rate declined steadily and significantly during the full period.

Females:

- Cases increased steadily and significantly during the full period 1994-2014
- The incidence rate increased steadily and significantly over the same period
- Deaths increased significantly during the full period 1994-2013, while the mortality rate increased significantly but less steeply over the same period.

- The pattern of lung cancer incidence and mortality is markedly different in males and females. Incidence rates declined in males but increased steadily in females during 1994-2014. Mortality rates declined in males but increased in females over the same period. Lung cancer rates track smoking prevalence from decades earlier. It is likely that peak smoking prevalence in Irish females occurred somewhat later than in males, as seen in other countries [12–14], and that this accounts for the contrasting trends in male and female incidence rates for lung cancer.

Figure 4-10. Trend in incidence and mortality by sex: C43 Melanoma of skin



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	7.5	[6.8,8.1]	↑
FEMALE	1994-2014	4.7	[4.1,5.3]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	5.0	[4.4,5.7]	↑
FEMALE	1994-2014	2.5	[2.0,3.1]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	7.6	[6.2,9.1]	↑
FEMALE	1994-2013	4.6	[3.1,6.1]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	5.1	[3.6,6.6]	↑
FEMALE	1994-2013	2.2	[0.6,3.7]	↑

Males:

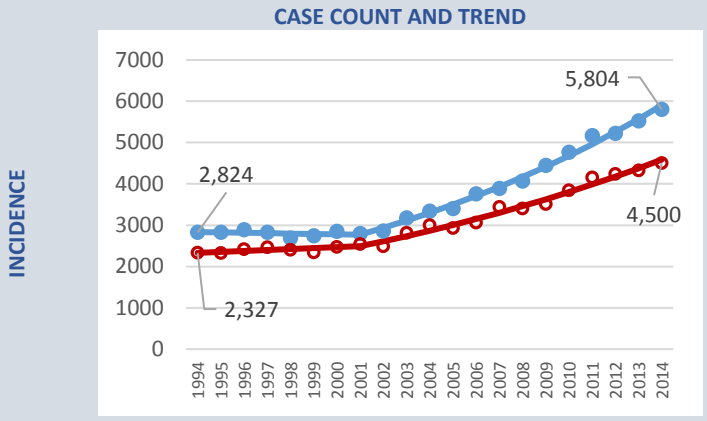
- Cases increased steadily and significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths increased significantly over the full period 1994-2013.
- The mortality rate increased significantly over the same period.

Females:

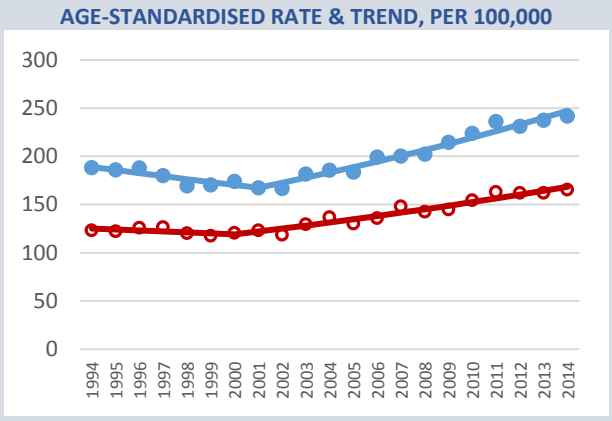
- Cases increased steadily and significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths increased significantly over the full period 1994-2013.
- The mortality rate increased significantly over the same period.

- While melanoma of the skin was more common in females overall, case counts and incidence rates for males steadily approached parity with females towards 2014.
- Trends in mortality almost exactly mirrored those in incidence, for both sexes.
- Over-exposure to ultraviolet radiation, particularly through episodic skin exposure involving severe sunburn, is the main risk factor for melanoma of the skin. Melanoma incidence is highest in more affluent populations within Ireland, and the marked increases in melanoma incidence rates in Ireland are probably associated with increases in holidaying outside Ireland.

Figure 4-11. Trend in incidence by sex: C44 Non-melanoma skin cancer



	PERIOD	APC	95%CI	TREND
MALE	1994-2001	-0.3	[-1.4,0.7]	↔
	2001-2014	6.0	[5.6,6.4]	↑
FEMALE	1994-2001	1.0	[-0.5,2.4]	↔
	2001-2014	4.8	[4.3,5.3]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-2001	-1.7	[-2.8,-0.6]	↓
	2001-2014	3.0	[2.7,3.4]	↑
FEMALE	1994-2000	-0.8	[-2.6,0.9]	↔
	2000-2014	2.5	[2.1,2.9]	↑

Males:

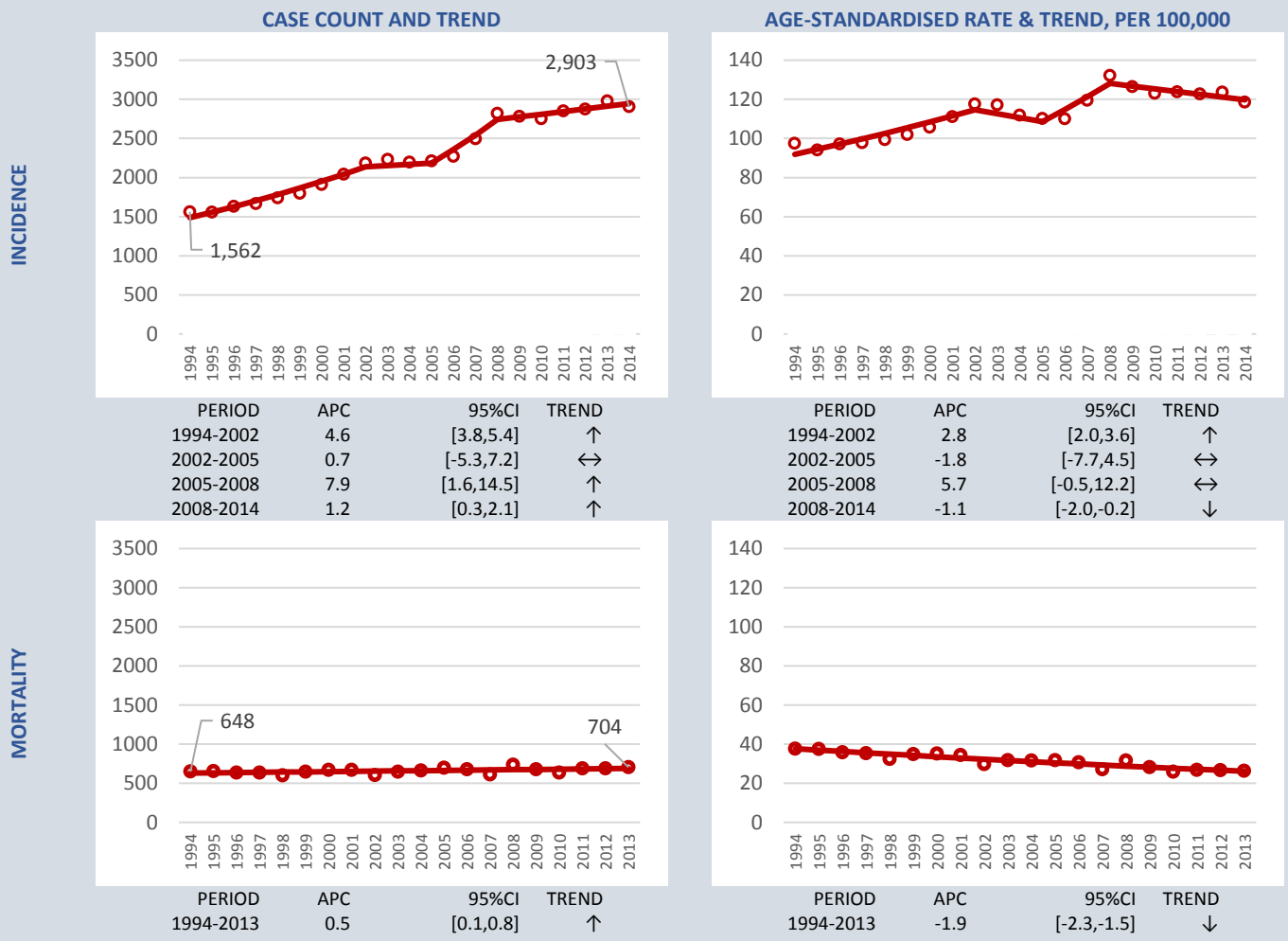
- After a static period up to 2001, cases increased significantly during 2001-2014.
- The incidence rate increased significantly over the same period

Females:

- After a static period up to 2001, cases increased significantly during 2001-2014.
- The incidence rate increased steadily and significantly during 2000-2014 after an earlier period of stability.

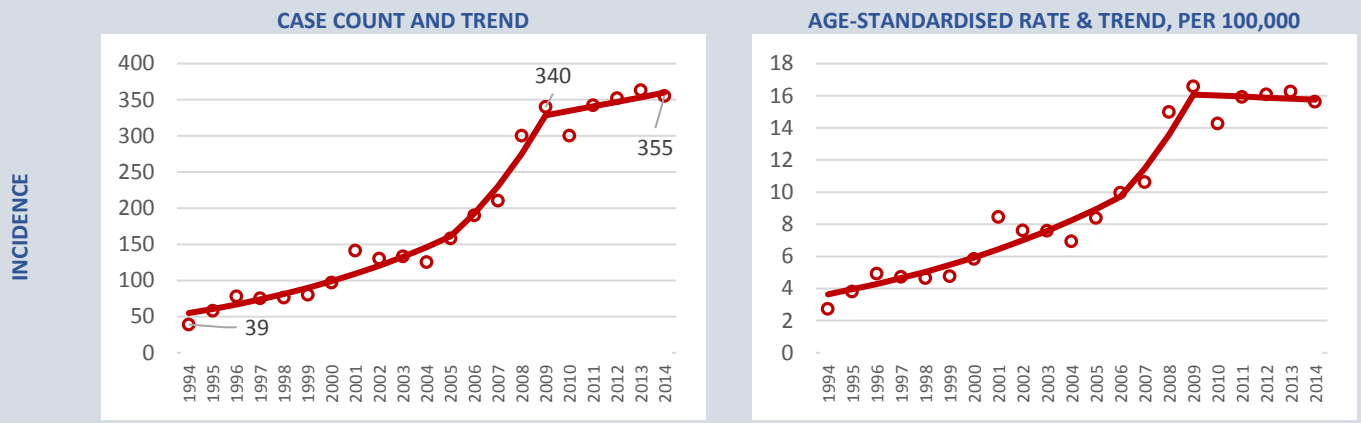
- Though very common, non-melanoma skin cancer has relatively negligible effects on mortality. Mortality data were not available for this cancer on the WHO database.
- Depending on subtype, non-melanoma skin cancers are associated with chronic (e.g. occupational) or episodic (e.g. holiday-related) overexposure to ultraviolet radiation. The more recent increases in incidence rates compared with melanoma may suggest that holiday-related exposure is now the main driving factor behind NMSC rates in Ireland, but further analysis by subtype may be informative (given that basal cell carcinomas of skin are less strongly associated than squamous cell carcinomas with chronic sun exposure).

Figure 4-12. Trend in incidence and mortality: C50 female breast cancer



- Cases increased significantly during 1994-2002, followed by a slower annual increase during 2002-2005, another steeper increase during 2005 and 2008, then a more modest increase during 2008-2014.
- The incidence rate trend shows a sustained increase during 1994-2002, followed by a period of stasis during 2002-2005, another marked though non-significant increase during 2005-2008 and a significant decrease over the period 2008-2014.
- The number of deaths increased slowly but significantly during 1994-2013, but the mortality rate declined significantly over the same period.
- In large part, the detailed incidence trend for invasive breast cancer probably reflects the introduction of the national breast screening program (BreastCheck) in the eastern half of the country from 2000 and the rest of the country by 2007. This is evident from the two peaks in incidence which followed the two roll-out phases.
- The underlying risk of breast cancer risk is strongly though not exclusively linked to lifetime exposure to oestrogen and to factors that directly or indirectly influence this. Modifiable risk factors for breast cancer include alcohol consumption and (for post-menopausal breast cancer) body fatness. Trends in other risk factors, such as not bearing children or late first pregnancy (associated with societal changes) and early menarche and late menopause (associated in part with higher-energy diets), may also be influencing trends in breast cancer incidence rates in Ireland.

Figure 4-13. Trend in incidence: D05 carcinoma in situ of the breast (female)

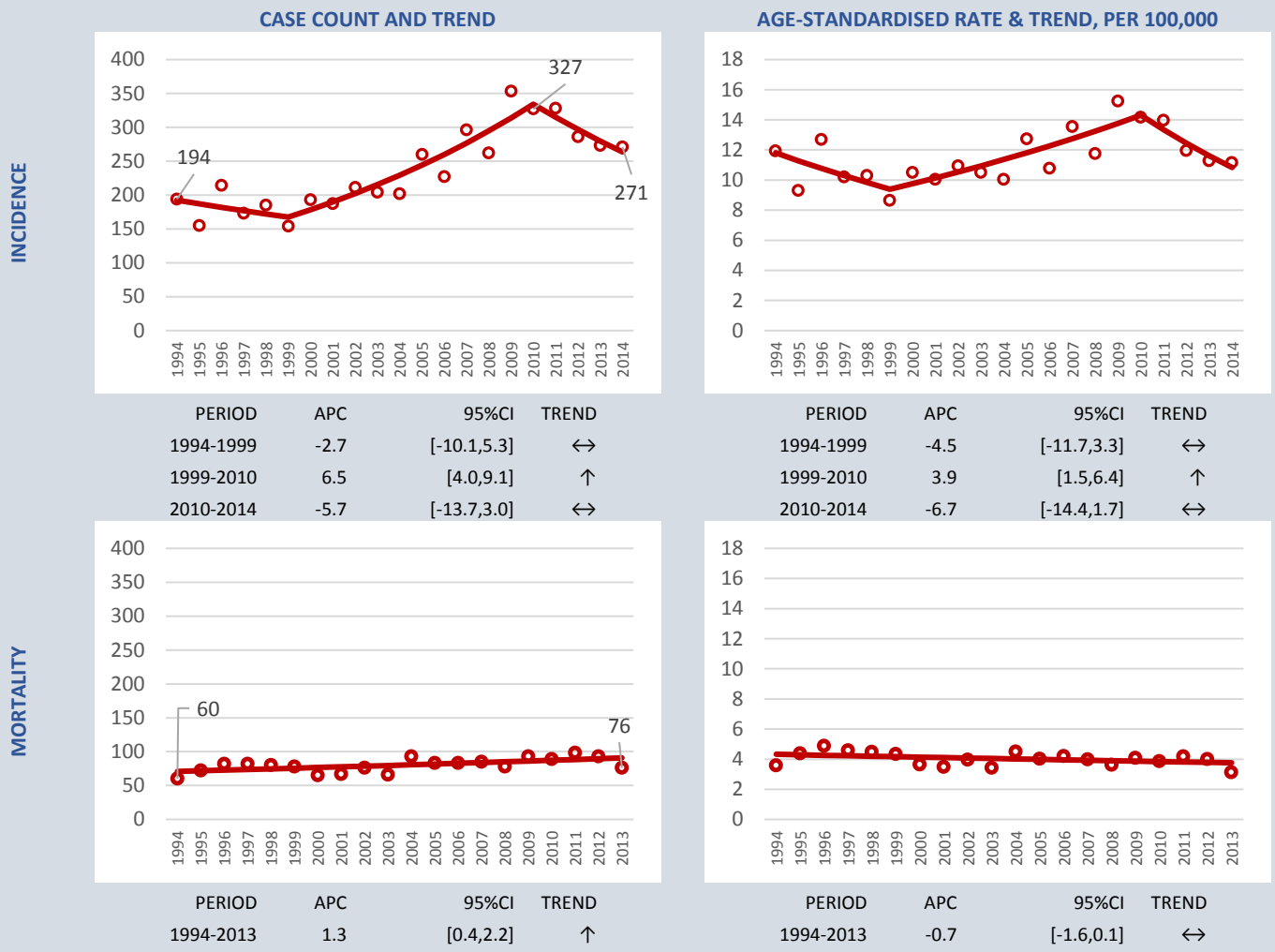


PERIOD	APC	95%CI	TREND
1994-2005	10.3	[6.8,13.9]	↑
2005-2009	19.5	[3.9,37.4]	↑
2009-2014	1.9	[-3.4,7.4]	↔

PERIOD	APC	95%CI	TREND
1994-2006	8.5	[5.6,11.5]	↑
2006-2009	18.3	[-9.5,54.6]	↔
2009-2014	-0.4	[-5.4,4.9]	↔

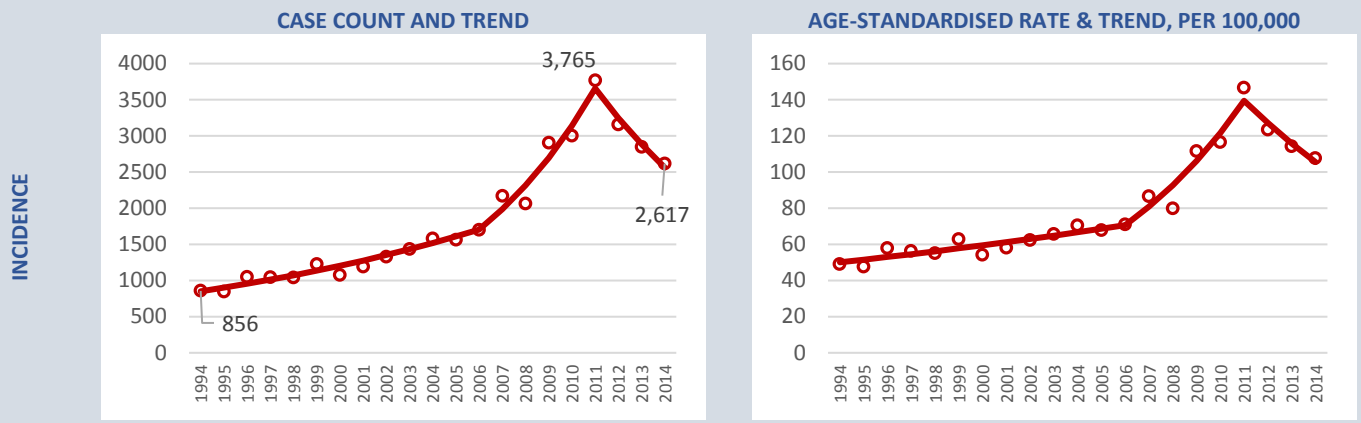
- Cases increased significantly in a step-like manner overall, with a steeper annual increase during 2005-2009, followed by a more modest increase during 2009-2014.
- The incidence rate increased significantly during 1994-2006, followed by a steeper increase during 2006-2009, then a period of stasis during 2009-2014.
- As for invasive breast cancer, but to a greater extent, the incidence trend for carcinoma in situ of the breast probably largely reflects the introduction of the national breast screening program (BreastCheck) in the eastern half of the country from 2000 and the rest of the country by 2007.

Figure 4-14. Trend in incidence and mortality: C53 Cervical cancer



- The case count declined modestly and non-significantly during 1994-1999, followed by a steep and significant increase during 1999-2010; thereafter, the case count declined non-significantly during 2010-2014.
- The incidence rate declined non-significantly from 1994 to 1999, followed by a significant increase during 1999-2010, then a non-significant decline during 2010-2014.
- Deaths increased significantly during 1994-2013, although numbers were small.
- The mortality rate was static (or showed a marginal decline) during the full period of 1994-2013.
- Exposure to cancer-causing strains of human papilloma virus (HPV) is the main (and probably necessary) risk factor for cervical cancer.
- Screening activity (including the introduction of the organised Cervical Check program from 2008 onwards) may have had some bearing on the upward trend in rates seen during 1999-2010, and the increasing incidence rate during that period may (in part) reflect increased or earlier detection of invasive cases. Increased detection of in situ carcinomas of the cervix through screening (see next figure) should, in theory, lead to a reduction in incidence of invasive cases, but it may be too early to see this effect. The apparent downward trends in case numbers and incidence rates from 2010 onwards were not statistically significant, and the validity of these trends (or the interpretation of these trends if genuine) cannot readily be assessed at present.

Figure 4-15. Trend in incidence: D06 carcinoma in situ of cervix

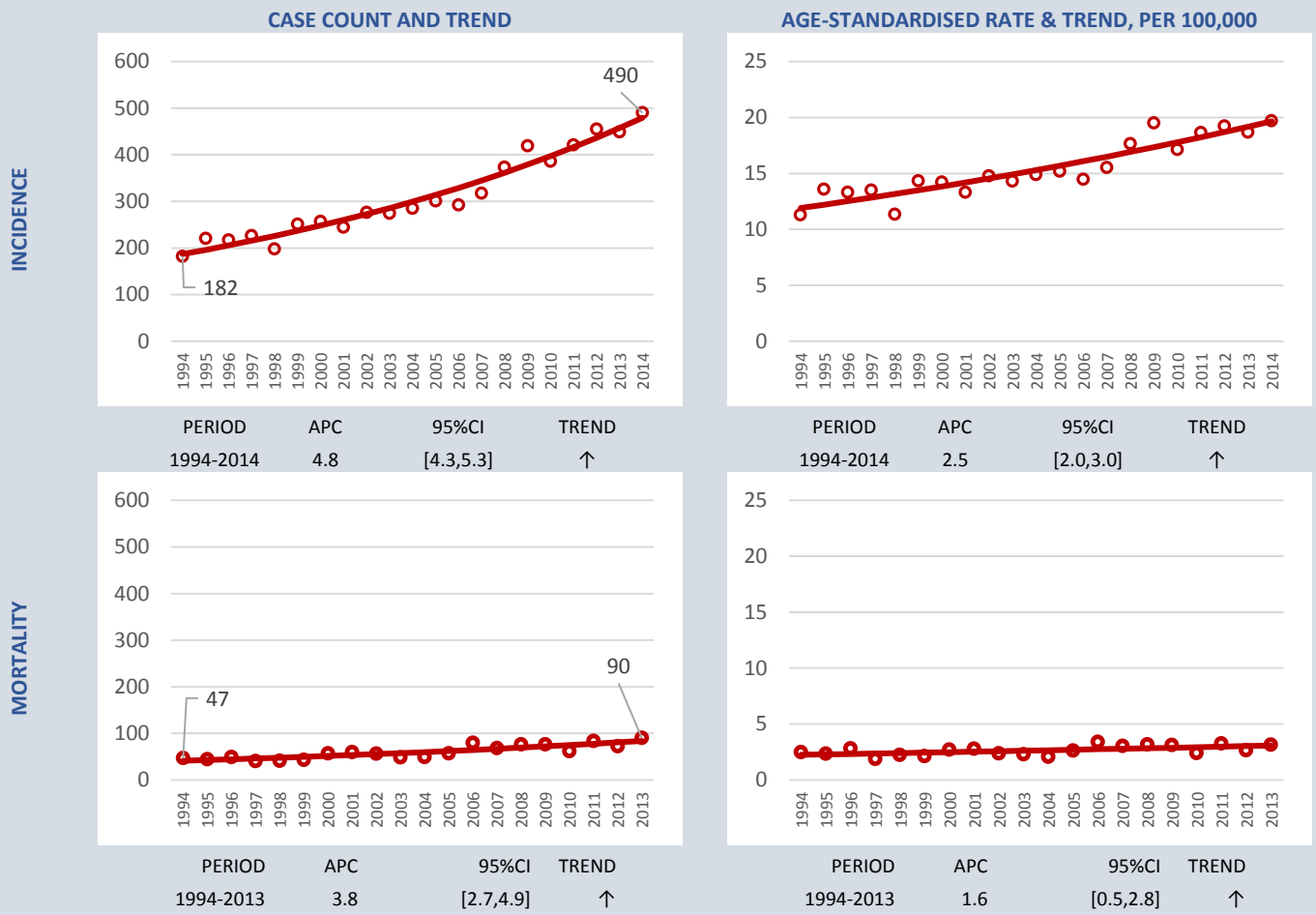


PERIOD	APC	95%CI	TREND
1994-2006	6.0	[4.4,7.6]	↑
2006-2011	16.5	[10.3,23.1]	↑
2011-2014	-11.2	[-18.1,-3.7]	↓

PERIOD	APC	95%CI	TREND
1994-2006	2.9	[1.4,4.5]	↑
2006-2011	14.6	[8.4,21.1]	↑
2011-2014	-8.9	[-16.1,-1.1]	↓

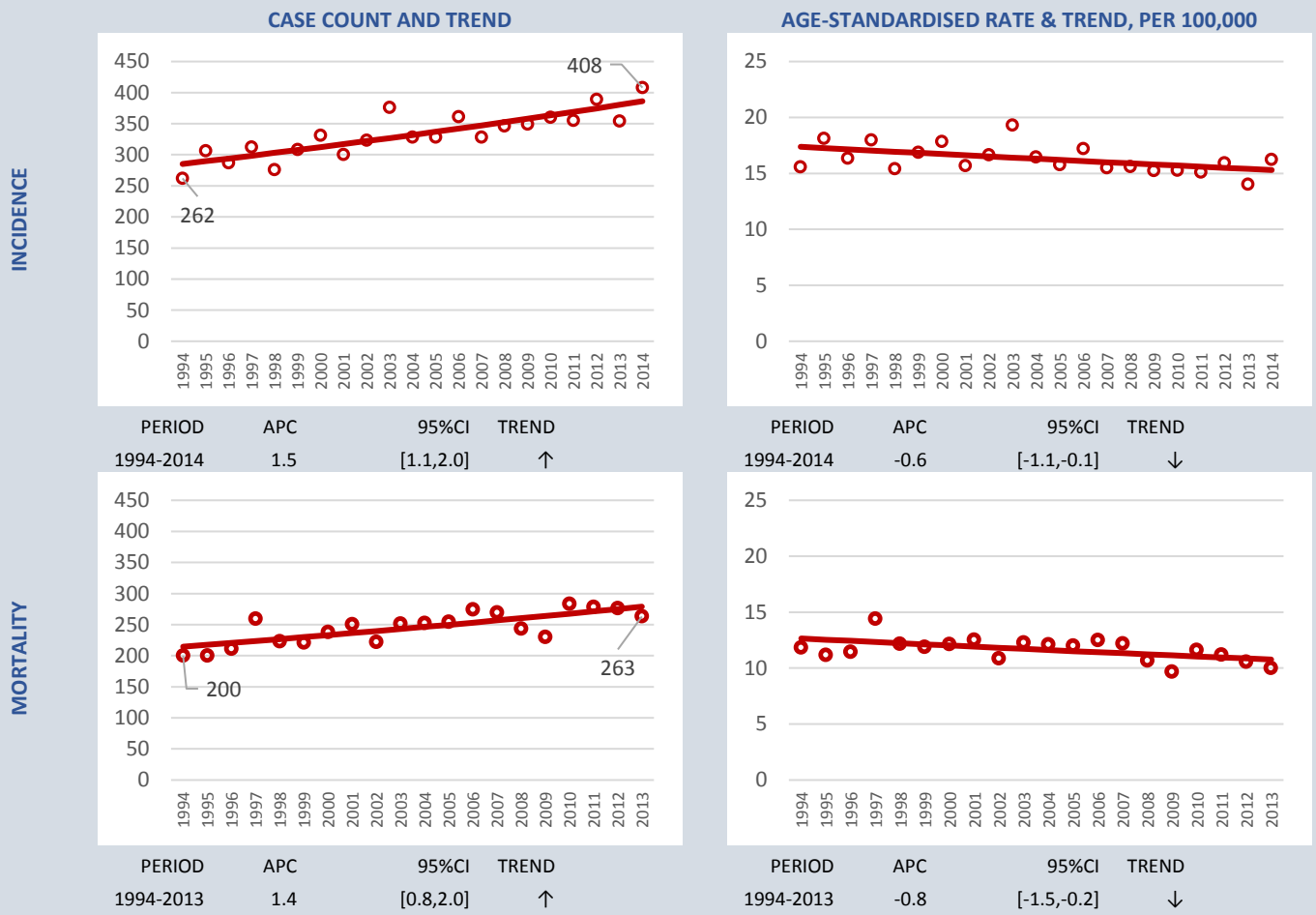
- The case count increased significantly during 1994-2006, followed by a steeper and significant increase during 2006-2011. Thereafter, the case count declined significantly during 2011-2014.
- The incidence rate increased significantly up to 2006, followed by a significant and steeper increase during 2006-2011, then by a significant decline during 2011-2014.
- The incidence rate of in situ cervical cancer increased in a two-step fashion during 1994-2011, the steeper period of increase (2006-2011) probably due to widespread introduction of screening through the CervicalCheck program (2008 onwards). The reason for the marked decline in the incidence rate during 2011-2014 is unclear, although some reduction might be expected after several rounds of screening have picked up prevalent (but previously undiagnosed) cases.

Figure 4-16. Trend in incidence and mortality: C54 Uterine cancer



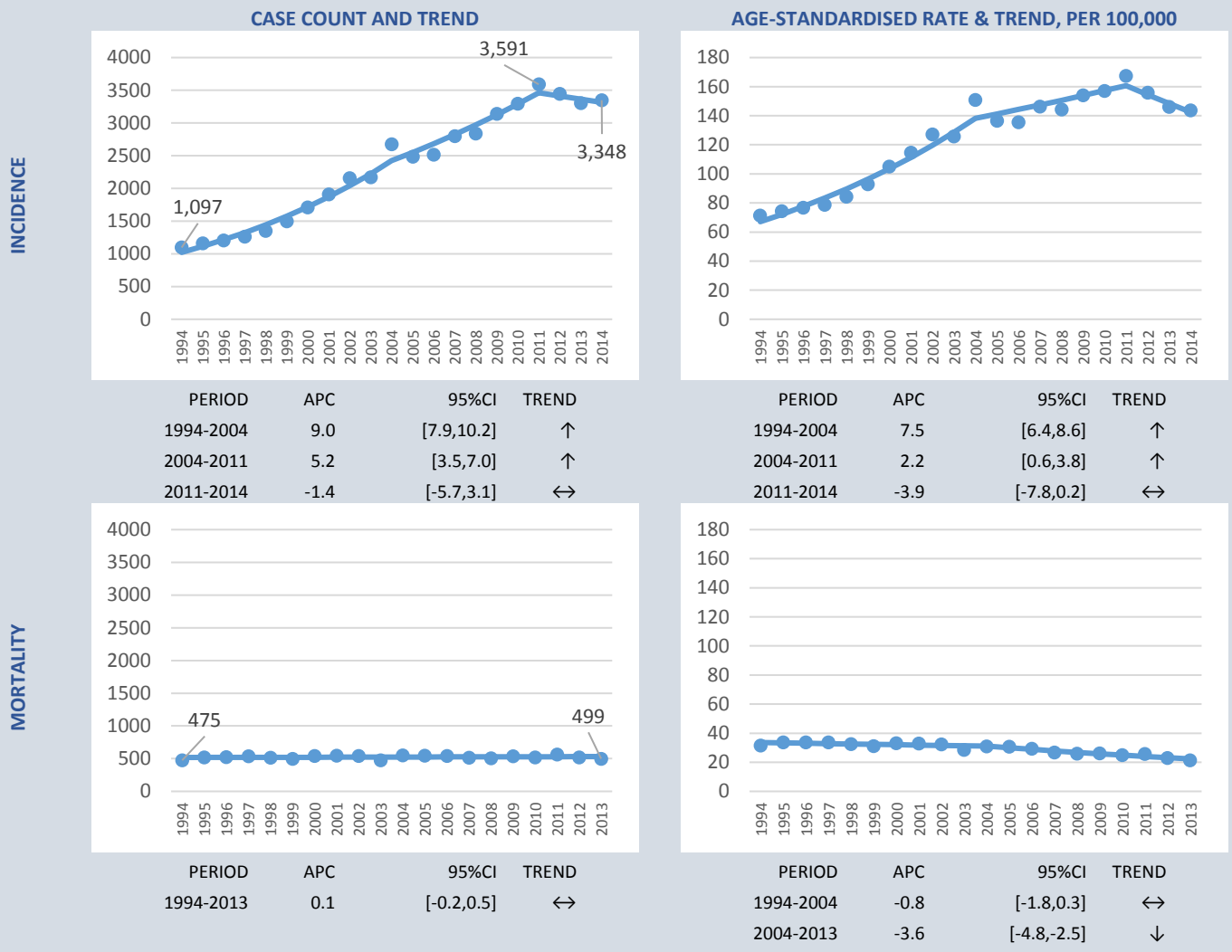
- The case count increased steeply and significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths increased significantly during the full period 1994-2013.
- The mortality rate increased significantly over the same period.
- As in breast cancer, many of the risk factors for uterine cancer concern lifetime exposure to oestrogen. Before menopause, the ovaries are the major source of the two main female hormones, oestrogen and progesterone. A shift in the balance of these hormones towards more oestrogen increases a woman's risk for developing uterine cancer. Factors that affect this balance include use of hormone-replacement therapy (progesterone-unopposed HRT — increased risk), use of the combined contraceptive pill (reduced risk), increased body fatness and low levels of physical activity (increased risk).

Figure 4-17. Trend in incidence and mortality: C56 Ovarian cancer



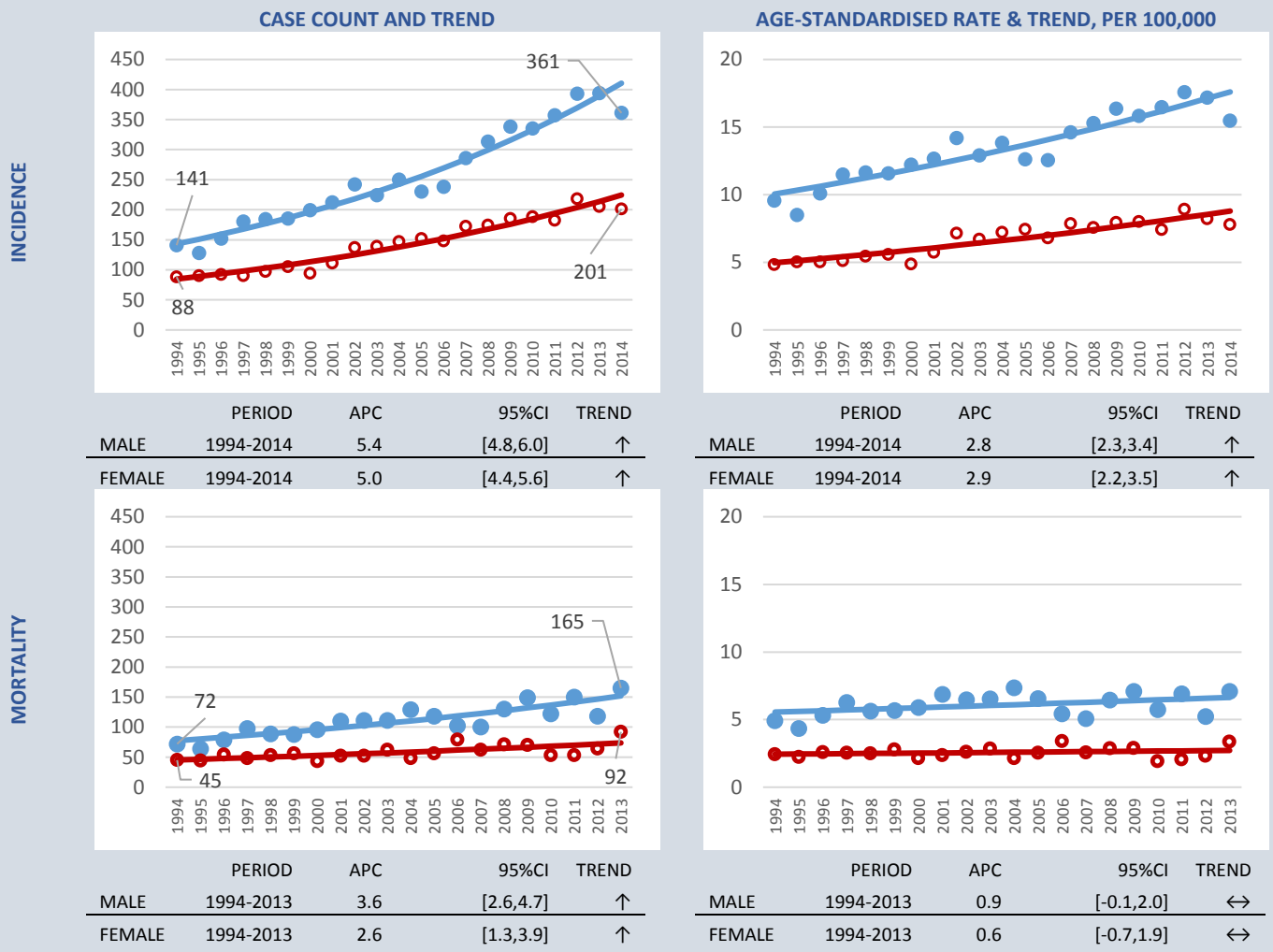
- The case count increased significantly during the full period 1994-2014.
- The incidence rate decreased modestly but significantly over the same period.
- Deaths increased significantly during the full period 1994-2013.
- The mortality rate declined significantly over the same period.
- Risk factors for ovarian cancer include obesity (high BMI; increased risk), use of HRT (progesterone unopposed HRT; increased risk), use of the combined contraceptive pill (reduced risk), multiparity (> 1 pregnancy and/or first full term pregnancy before 26; reduced risk), family history of ovarian cancer. Adult attained height appears to be a convincing cause of ovarian cancer, probably as a marker for genetic, environmental, hormonal and nutritional factors affecting growth.

Figure 4-18. Trend in incidence and mortality: C61 Prostate cancer



- The case count increased significantly and steeply during 1994-2004, followed by a lesser though significant increase during 2004-2011. Thereafter, the case count declined during 2011-2014.
- The incidence rate increased significantly and steeply during 1994-2004, followed by a lesser though significant increase during 2004-2011. Thereafter, the rate declined significantly during 2011-2014.
- The number of deaths was static during the full period 1994-2013.
- The mortality rate declined marginally during 1994-2004, followed by a significant decline during 2004-2013.
- Increasing incidence up to 2011 probably reflected large-scale PSA testing of asymptomatic men. The number of PSA tests carried out in Ireland increased five-fold between 1995 and 2004 [15].
- There is strong evidence that being overweight or obese increases the risk of being diagnosed with advanced prostate cancer, and that developmental factors in the womb, childhood and adolescence that influence growth are linked to an increased risk of prostate cancer. However, incidence trends for this cancer are so strongly influenced by PSA-testing that trends related to such underlying risk factors are difficult to establish.

Figure 4-19. Trend in incidence and mortality by sex: C64 Kidney cancer



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	5.4	[4.8,6.0]	↑
FEMALE	1994-2014	5.0	[4.4,5.6]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	2.8	[2.3,3.4]	↑
FEMALE	1994-2014	2.9	[2.2,3.5]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	3.6	[2.6,4.7]	↑
FEMALE	1994-2013	2.6	[1.3,3.9]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	0.9	[-0.1,2.0]	↔
FEMALE	1994-2013	0.6	[-0.7,1.9]	↔

Males:

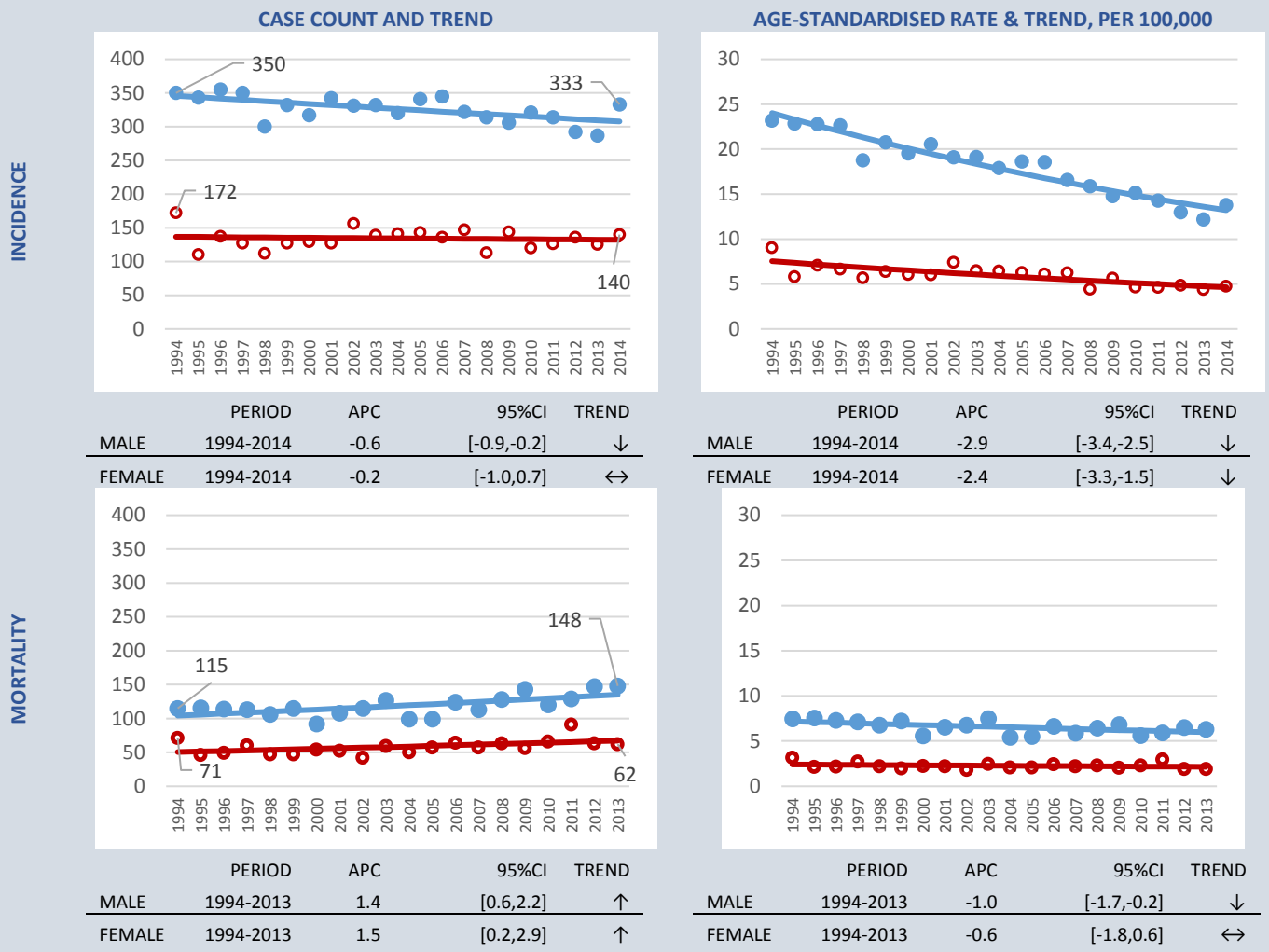
- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths increased significantly over the full period 1994-2013.
- The mortality rate was static (or showed a marginal increase) over the same period.

Females:

- Cases increased steadily and significantly during the full period 1994-2014.
- The incidence rate increased steadily and significantly over the same period.
- Deaths increased significantly during the full period 1994-2013.
- The mortality rate was static (or showed a marginal increase) over the same period.

- There is strong evidence that smoking and being overweight or obese increase the risk of kidney cancer.

Figure 4-20. Trend in incidence and mortality by sex: C67 Bladder cancer



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	-0.6	[-0.9,-0.2]	↓
FEMALE	1994-2014	-0.2	[-1.0,0.7]	↔

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	-2.9	[-3.4,-2.5]	↓
FEMALE	1994-2014	-2.4	[-3.3,-1.5]	↓

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	1.4	[0.6,2.2]	↑
FEMALE	1994-2013	1.5	[0.2,2.9]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-1.0	[-1.7,-0.2]	↓
FEMALE	1994-2013	-0.6	[-1.8,0.6]	↔

Males:

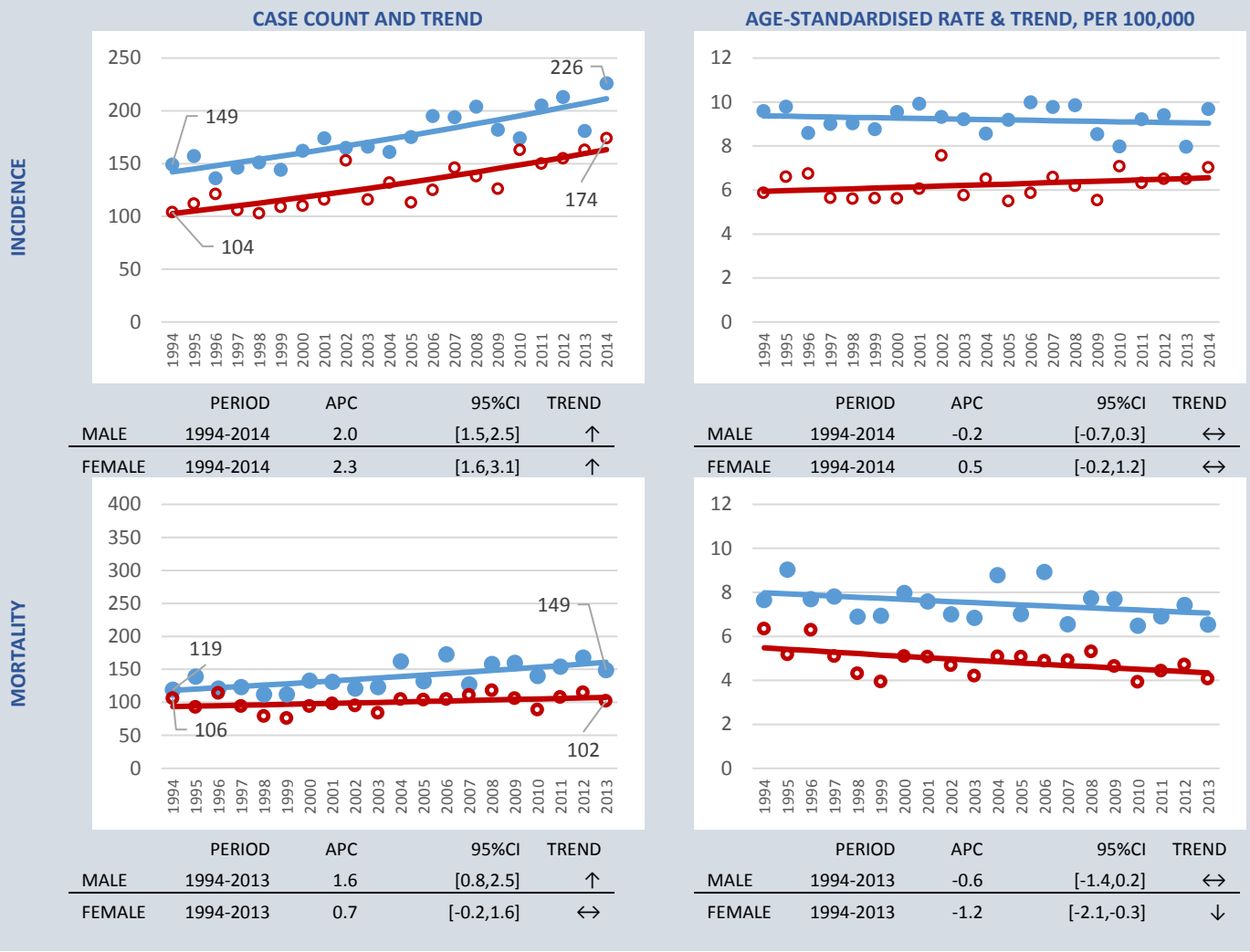
- Cases declined significantly during the full period 1994-2014.
- The incidence rate declined significantly over the same period.
- Deaths increased significantly over the full period 1994-2013.
- The mortality rate declined significantly over the same period.

Females:

- Cases declined very modestly during the full period 1994-2014.
- The incidence rate declined steadily and significantly over the same period.
- Deaths increased significantly overall during the full period 1994-2013.
- The mortality rate was static (or declined marginally) during the same period.

- An important caution regarding interpretation of bladder cancer trends is that, for both sexes, the downward trend in incidence rates is probably exaggerated by changes in diagnosis or coding (in particular, a higher proportion of bladder tumours may have been coded as non-invasive in more recent years). Although total numbers of cases coded as invasive bladder cancer fell from 522 in 1994 to 473 in 2014, numbers of bladder tumours including in situ carcinomas and tumours of uncertain behaviour actually increased from 533 cases in 1994 to 818 in 2016.
- True changes in the underlying risk of invasive bladder cancer, and the possible influence of smoking (the most important risk factor for bladder cancer) on the trends seen, are thus difficult to assess.

Figure 4-21. Trend in incidence and mortality by sex: C71-72 Brain & central nervous system cancer



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	2.0	[1.5,2.5]	↑
FEMALE	1994-2014	2.3	[1.6,3.1]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	-0.2	[-0.7,0.3]	↔
FEMALE	1994-2014	0.5	[-0.2,1.2]	↔

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	1.6	[0.8,2.5]	↑
FEMALE	1994-2013	0.7	[-0.2,1.6]	↔

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-0.6	[-1.4,0.2]	↔
FEMALE	1994-2013	-1.2	[-2.1,-0.3]	↓

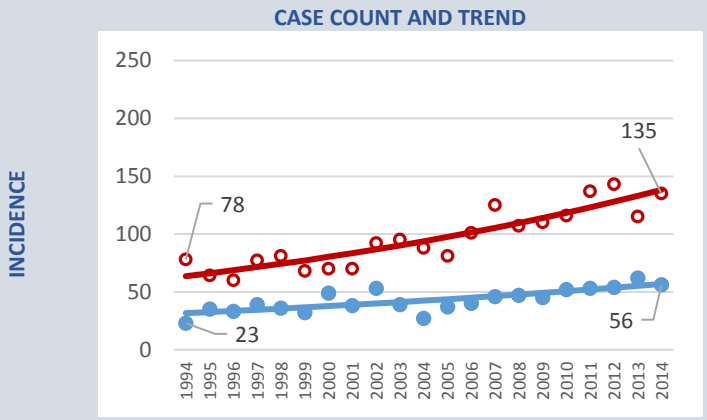
Males:

- Cases of invasive brain / CNS cancer increased significantly during the full period 1994-2014.
- The incidence rate was static over the same period.
- Deaths increased significantly over the full period 1994-2013.
- The mortality rate was static (or declined marginally) over the same period.

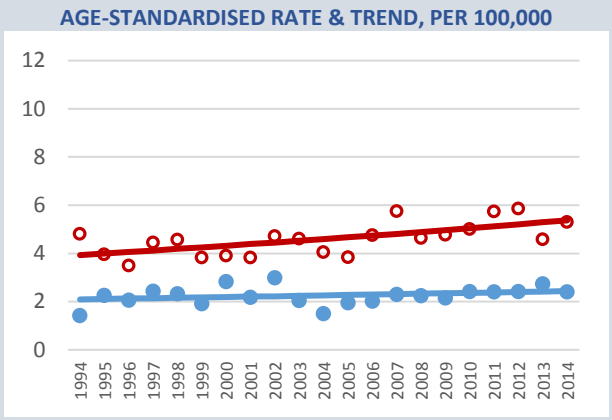
Females:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate was static over the same period.
- Numbers of deaths were static or increased marginally during the full period 1994-2013.
- The mortality rate declined significantly during the same period.
- Most brain tumours are not linked with any known risk factors and have no obvious cause. The only environmental risk factor for brain tumours is radiation exposure, e.g. in people who received radiation to the brain as children as part of their treatment for leukaemia. Most people with brain tumours do not have a family history of the disease, but in rare cases brain and spinal cord cancers are associated with familial-linked conditions.

Figure 4-22. Trend in incidence by sex: D32-D33 Benign tumours of brain & central nervous system



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	3.0	[1.8,4.2]	↑
FEMALE	1994-2014	4.0	[3.1,4.9]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	0.8	[-0.5,2.0]	↔
FEMALE	1994-2014	1.6	[0.7,2.5]	↑

Males:

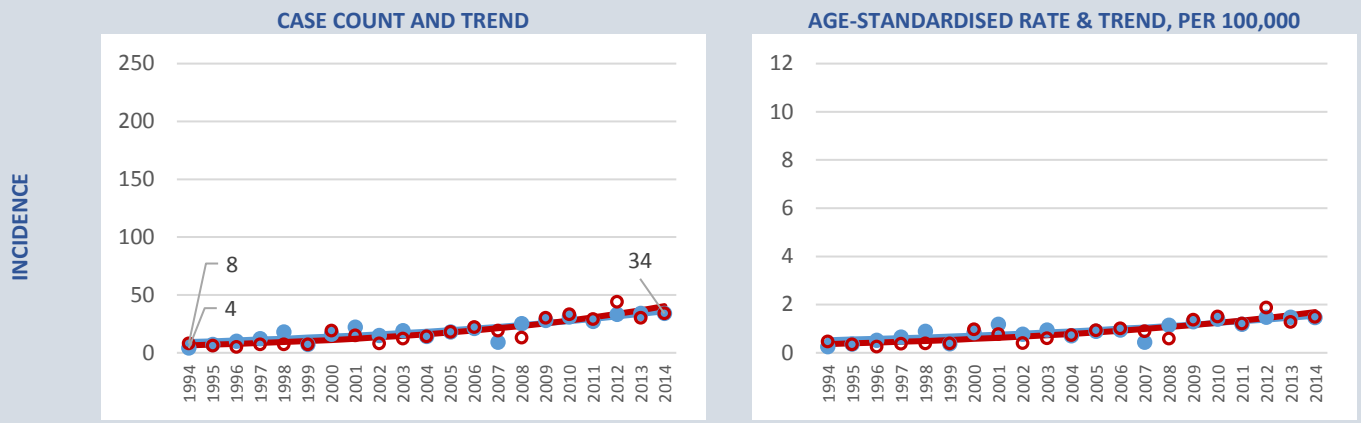
- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased marginally but non-significantly over the same period.

Females:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.

- While *invasive* malignant brain & CNS tumours were more frequent in men (Fig 3-21), *benign* brain and CNS tumours (which can also be fatal) were more common in women (Fig 3-22). No mortality data for benign brain and CNS tumours were available on the WHO mortality database.

Figure 4-23. Trend in incidence by sex: D42-D43 Tumours of uncertain behaviour of brain, meninges & CNS



SEX	PERIOD	APC	95%CI	TREND
MALE	1994-2014	7.0	[4.8,9.1]	↑
FEMALE	1994-2014	9.6	[7.2,12.1]	↑

SEX	PERIOD	APC	95%CI	TREND
MALE	1994-2014	5.6	[3.5,7.7]	↑
FEMALE	1994-2014	8.0	[5.6,10.4]	↑

Males:

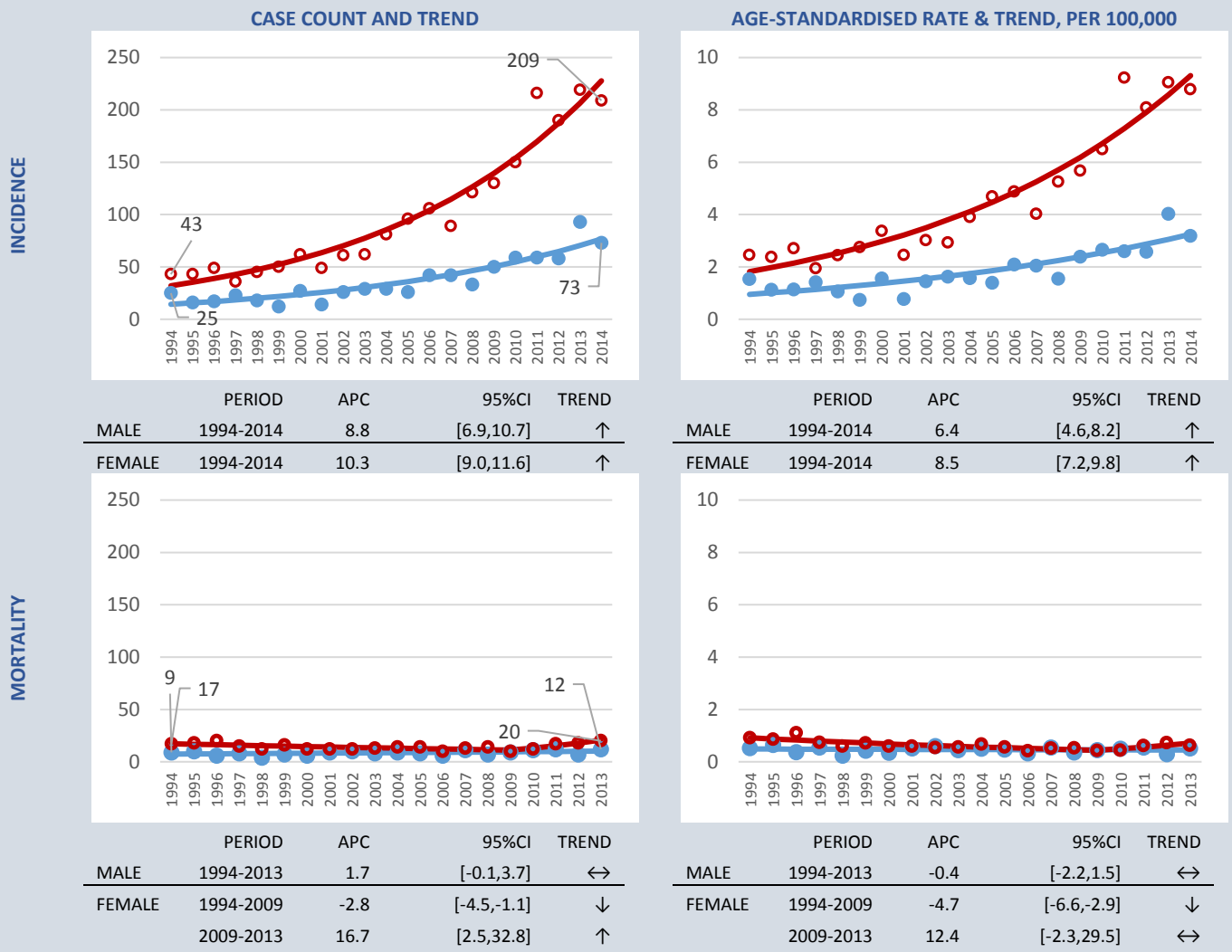
- Cases increased significantly during the full period 1994-2014, albeit with low numbers.
- The incidence rate increased significantly over the same period.

Females:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.

- Tumours of uncertain morphology for the brain, meninges and CNS are very rare, but there was a significant annual increase over the period 1994-2014. This could be an artefact of coding or diagnosis changes: for example, a proportion of brain/CNS tumours that would previously have been coded as malignant or as benign might now be appearing in the 'uncertain' category. No mortality data for this group were available on the WHO mortality database.

Figure 4-24. Trend in incidence and mortality by sex: C73 Thyroid cancer



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	8.8	[6.9,10.7]	↑
FEMALE	1994-2014	10.3	[9.0,11.6]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	6.4	[4.6,8.2]	↑
FEMALE	1994-2014	8.5	[7.2,9.8]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	1.7	[-0.1,3.7]	↔
FEMALE	1994-2009	-2.8	[-4.5,-1.1]	↓
	2009-2013	16.7	[2.5,32.8]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-0.4	[-2.2,1.5]	↔
FEMALE	1994-2009	-4.7	[-6.6,-2.9]	↓
	2009-2013	12.4	[-2.3,29.5]	↔

Males:

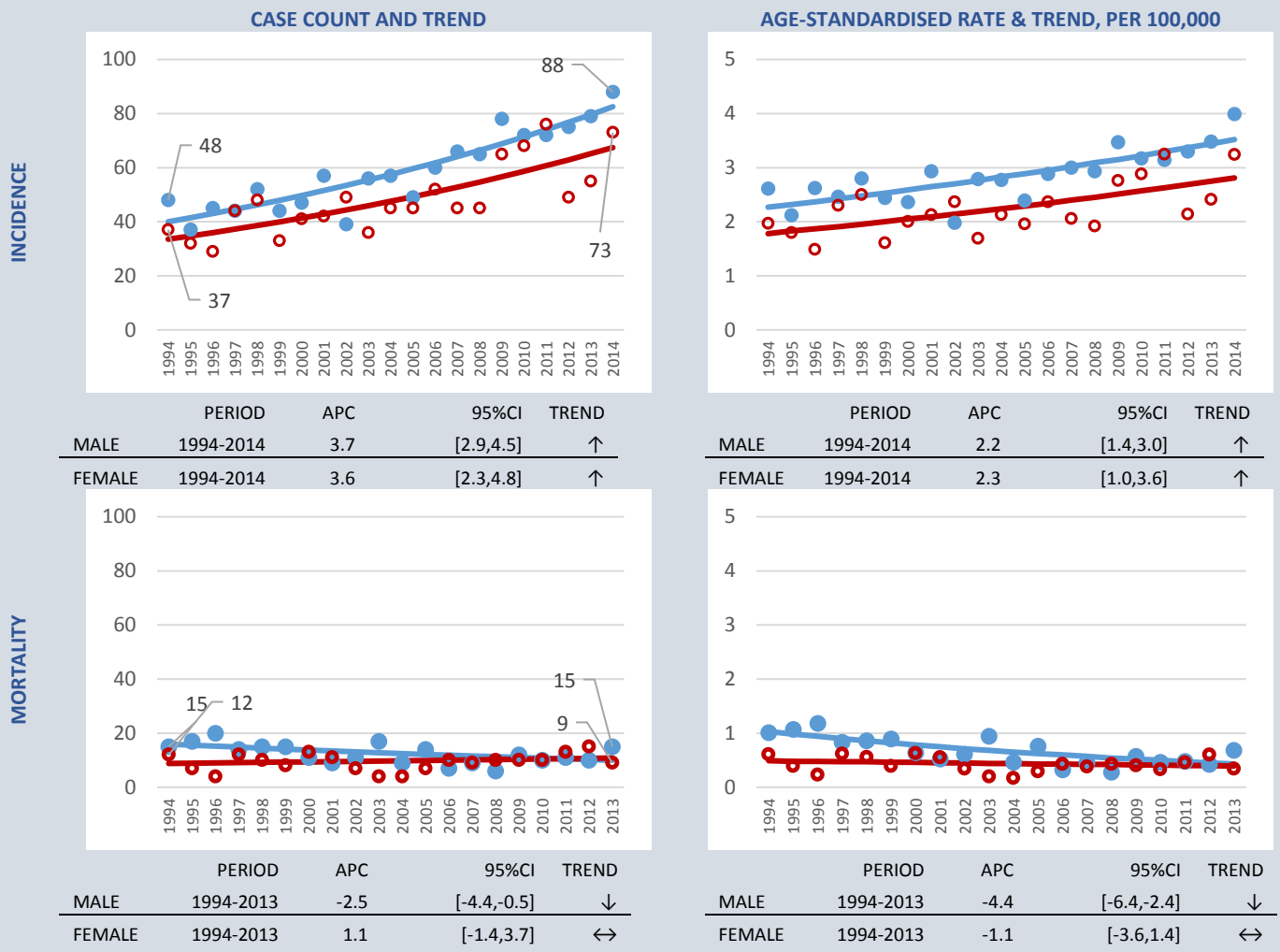
- Cases increased steeply during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths increased over the full period 1994-2013, albeit from a low base of only 9 deaths per year.
- The mortality rate was static over the full period 1994-2013.

Females:

- Cases increased steeply during the full period 1994-2014 with 2-3 times more cases overall in females relative to males.
- The incidence rate increased significantly over the same period.
- Deaths increased significantly over the period 2009-2013 after an earlier period of decrease.
- The mortality rate showed a marginal increase during 2009-2013 after an earlier period of decrease since 1994.

- Incidence trends for this cancer are likely to reflect an increase in 'incidental' detection of cancers during investigations for other thyroid-related conditions.
- Radiation exposure and having a first-degree relative (parent, brother, sister, or child) with thyroid cancer are known risk factors for thyroid cancer. Sources of radiation include certain medical treatments or diagnostic radiography procedures, and radiation fallout from power plant accidents.

Figure 4-25. Trend in incidence and mortality by sex: C81 Hodgkin lymphoma



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	3.7	[2.9,4.5]	↑
FEMALE	1994-2014	3.6	[2.3,4.8]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	2.2	[1.4,3.0]	↑
FEMALE	1994-2014	2.3	[1.0,3.6]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-2.5	[-4.4,-0.5]	↓
FEMALE	1994-2013	1.1	[-1.4,3.7]	↔

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-4.4	[-6.4,-2.4]	↓
FEMALE	1994-2013	-1.1	[-3.6,1.4]	↔

Lymphomas are a heterogeneous group of cancers of the haematopoietic system, and can broadly be classified into Hodgkin and non-Hodgkin lymphomas based on histological appearance. Hodgkin lymphoma occurs predominantly in younger persons (median age 38 during 2012-2014)

Males:

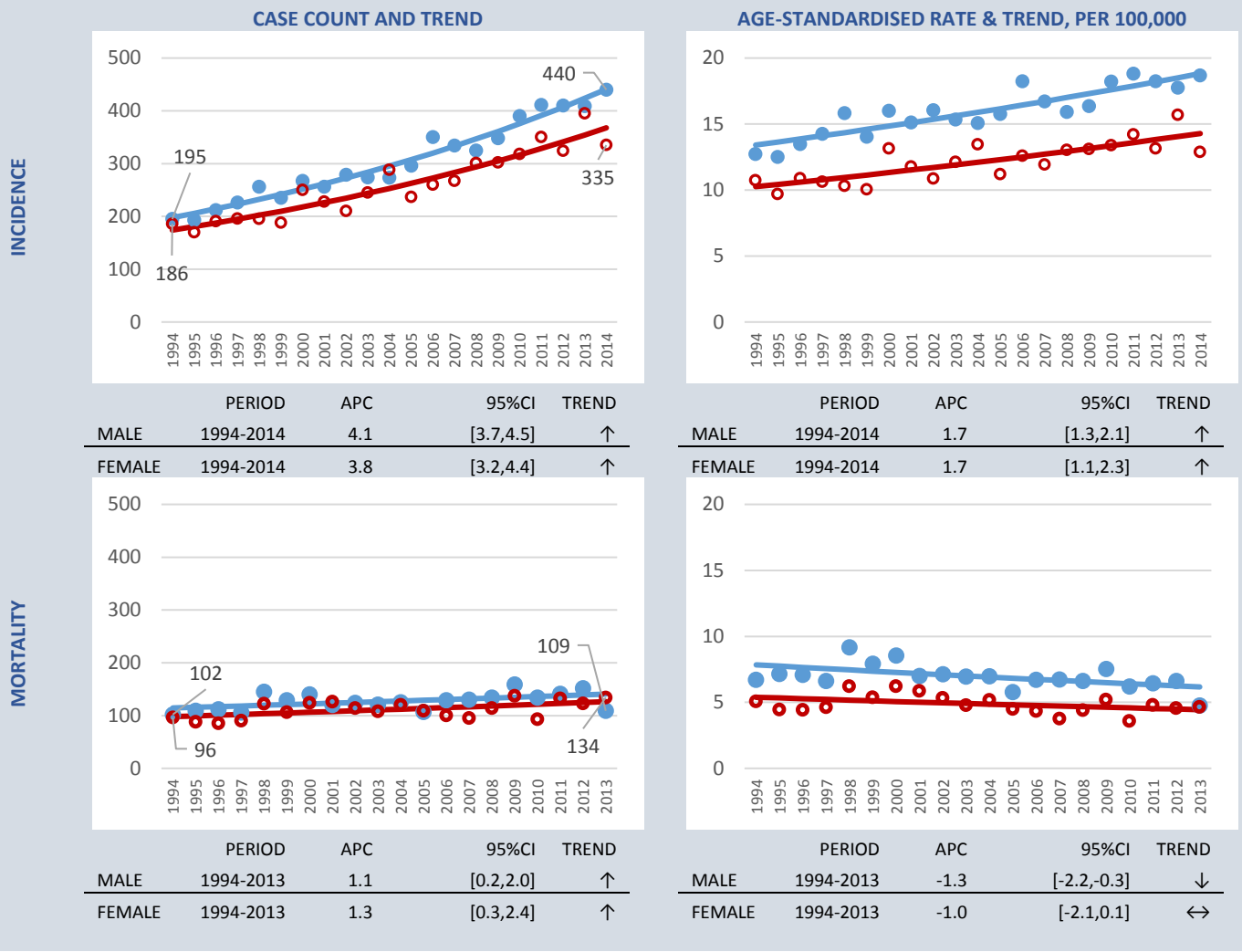
- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths declined during 1994-2013 from a low base of only 15 in 1994.
- The mortality rate decreased significantly over the full period 1994-2013.

Females:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Numbers of deaths were static during the full period 1994-2013.
- The mortality rate was static over the same period.

- In general, the risk factors for Hodgkin lymphoma are poorly known, but risk is higher among people who have had infectious mononucleosis, an infection caused by Epstein-Barr virus. Higher risk of HL among populations with higher socioeconomic status might be associated with children from more affluent families being exposed to some type of infection (such as Epstein-Barr virus) later in life than children from less affluent families.

Figure 4-26. Trend in incidence and mortality by sex: C82-85 All non-Hodgkin lymphoma



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	4.1	[3.7,4.5]	↑
FEMALE	1994-2014	3.8	[3.2,4.4]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2014	1.7	[1.3,2.1]	↑
FEMALE	1994-2014	1.7	[1.1,2.3]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	1.1	[0.2,2.0]	↑
FEMALE	1994-2013	1.3	[0.3,2.4]	↑

	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-1.3	[-2.2,-0.3]	↓
FEMALE	1994-2013	-1.0	[-2.1,0.1]	↔

Non-Hodgkin lymphoma cases are diagnosed at almost five times the frequency of Hodgkin lymphoma, and have a higher median age at diagnosis (66 years during 2012-2014).

Males:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths increased significantly during the full period 1994-2013.
- The mortality rate declined significantly over the same period.

Females:

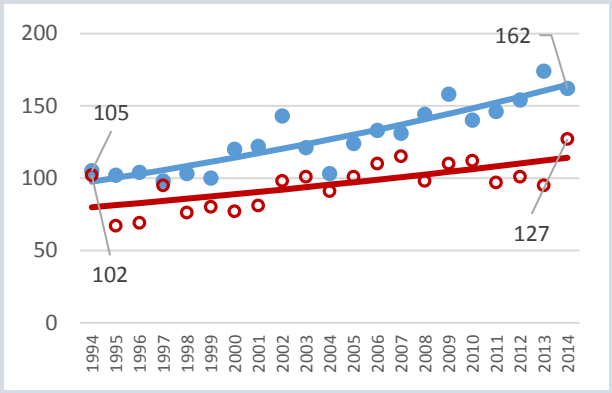
- Cases increased significantly during the full period 1994-2014.
- The incidence rate increased significantly over the same period.
- Deaths increased over the full period 1994-2013.
- The mortality rate was static or showed a marginal decline over the same period.

- As with Hodgkin lymphoma, risk factors for NHL have not been well established, but some types of infection seem to increase the risk.

Figure 4-27. Trend in incidence and mortality by sex: C90 Multiple myeloma & malignant plasma cell neoplasms

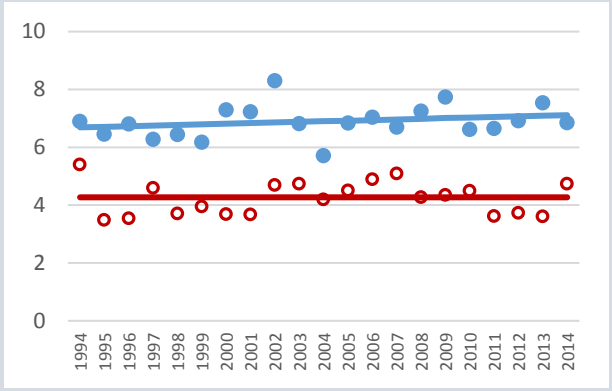
INCIDENCE

CASE COUNT AND TREND



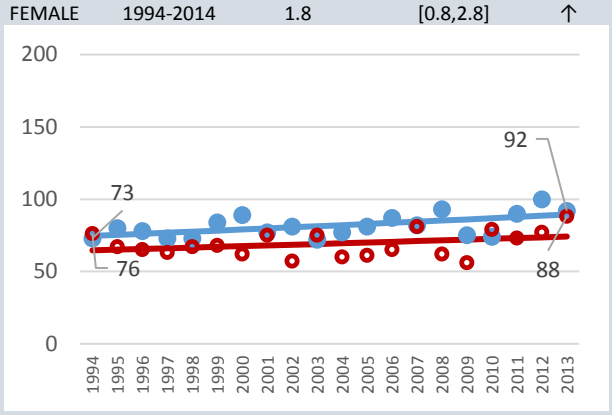
SEX	PERIOD	APC	95%CI	TREND
MALE	1994-2014	2.6	[2.0,3.3]	↑
FEMALE	1994-2014	1.8	[0.8,2.8]	↑

AGE-STANDARDISED RATE & TREND, PER 100,000

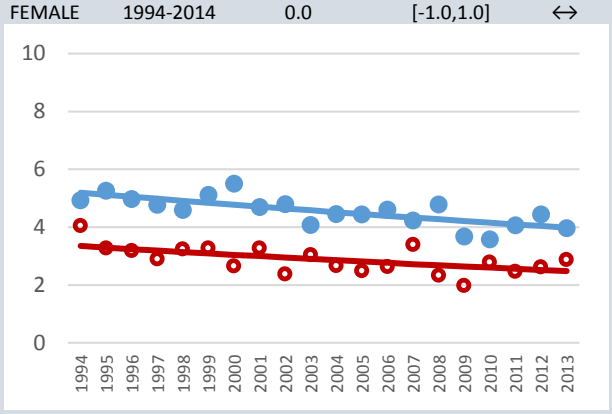


SEX	PERIOD	APC	95%CI	TREND
MALE	1994-2014	0.3	[-0.3,0.9]	↔
FEMALE	1994-2014	0.0	[-1.0,1.0]	↔

MORTALITY



	PERIOD	APC	95%CI	TREND
MALE	1994-2013	1.0	[0.3,1.6]	↑
FEMALE	1994-2013	0.7	[-0.2,1.7]	↔



	PERIOD	APC	95%CI	TREND
MALE	1994-2013	-1.4	[-2.0,-0.8]	↓
FEMALE	1994-2013	-1.6	[-2.6,-0.5]	↓

Multiple myeloma is a cancer of plasma cells (immunoglobulin-producing B-lymphocytes), where abnormal plasma cells accumulate in the bone marrow and interfere with haematopoiesis.

Males:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate was static over the same period.
- Deaths increased significantly during the full period 1994-2013.
- The mortality rate declined significantly over the same period.

Females:

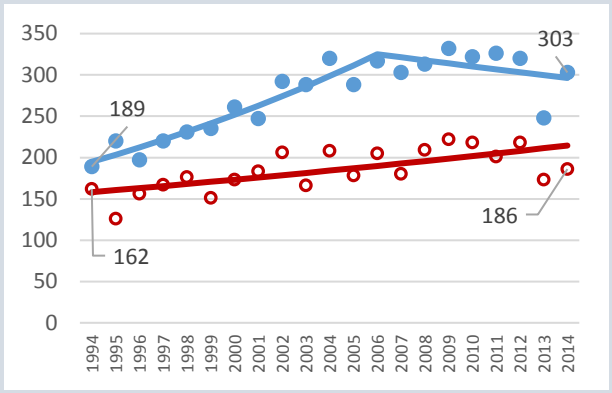
- Cases increased significantly during the full period 1994-2014.
- The incidence rate was static over the same period.
- Deaths increased marginally over the full period 1994-2013.
- The mortality rate declined significantly over the same period.

- The risk factors for multiple myeloma are poorly understood.

Figure 4-28. Trend in incidence and mortality by sex: C91-95 Leukaemia (all sub-classifications combined)

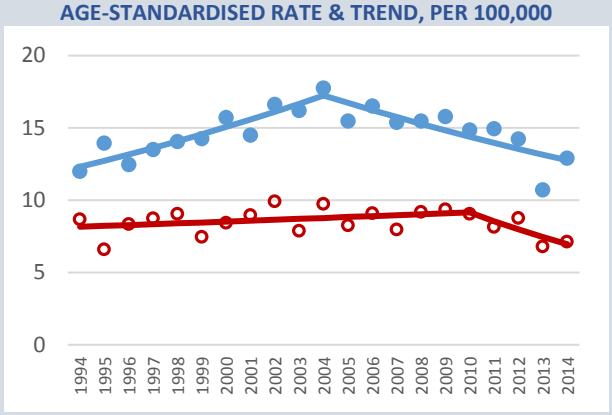
INCIDENCE

CASE COUNT AND TREND



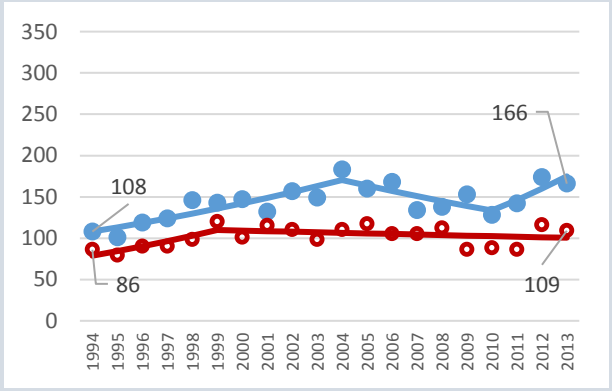
	PERIOD	APC	95%CI	TREND
MALE	1994-2006	4.4	[3.0,5.8]	↑
	2006-2014	-1.1	[-3.3,1.1]	↔
FEMALE	1994-2014	1.5	[0.7,2.4]	↑

AGE-STANDARDISED RATE & TREND, PER 100,000

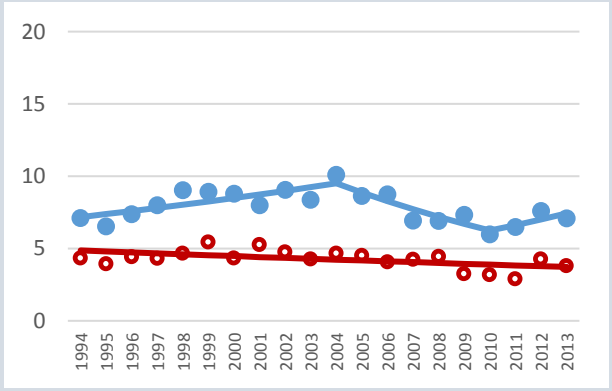


	PERIOD	APC	95%CI	TREND
MALE	1994-2004	3.4	[1.6,5.3]	↑
	2004-2014	-3.0	[-4.5,-1.4]	↓
FEMALE	1994-2010	0.7	[-0.4,1.8]	↔
	2010-2014	-6.7	[-14.4,1.8]	↔

MORTALITY



	PERIOD	APC	95%CI	TREND
MALE	1994-2004	4.7	[2.4,7.0]	↑
	2004-2010	-4.0	[-9.3,1.6]	↔
	2010-2013	9.4	[-3.7,24.3]	↔
FEMALE	1994-1999	6.9	[-0.4,14.7]	↔
	1999-2013	-0.6	[-2.0,0.7]	↔



	PERIOD	APC	95%CI	TREND
MALE	1994-2004	2.9	[0.7,5.1]	↑
	2004-2010	-6.8	[-11.7,-1.5]	↓
	2010-2013	6.0	[-6.2,19.8]	↔
FEMALE	1994-2013	-1.4	[-2.5,-0.3]	↓

Males:

- The case count increased significantly during 1994-2006, thereafter it declined non-significantly during 2006-2014.
- The incidence rate increased during 1994-2004 and then declined significantly during 2004-2014.
- Deaths showed a complex trend (significant increase 1994-2004 then periods of non-significant decline and increase).
- The mortality rate increased significantly during 1994-2004, followed by a significant decline during 2004-2010 then a non-significant increase during 2010-2014.

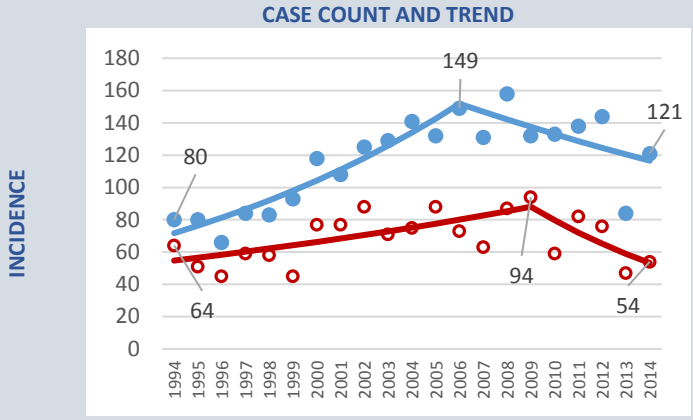
Females:

- Cases increased significantly during the full period 1994-2014.
- The incidence rate was static (or showed a marginal increase) over the period 1994-2010, followed by a non-significant decline during 2010-2014, later than the decline seen for males.
- Deaths increased marginally during 1994-1999 followed by a marginal decline during 1999-2013.
- The mortality rate declined significantly during 1994-2013.

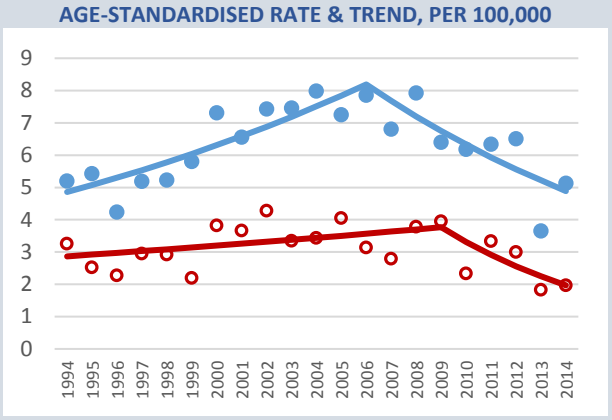
- Risk factors for leukaemia are poorly understood, but some of the strongest evidence is for an influence of smoking and exposure to certain chemicals (e.g. benzene) on risk of acute myeloid leukaemia.

- Trends in mortality rates showed some similarities to those in incidence rates, but possible artefactual influences on the leukaemia incidence trends are explored below, by reference to a specific subtype (CLL).

Figure 4-29. Trend in incidence by sex: C911 Chronic lymphocytic leukaemia (CLL)

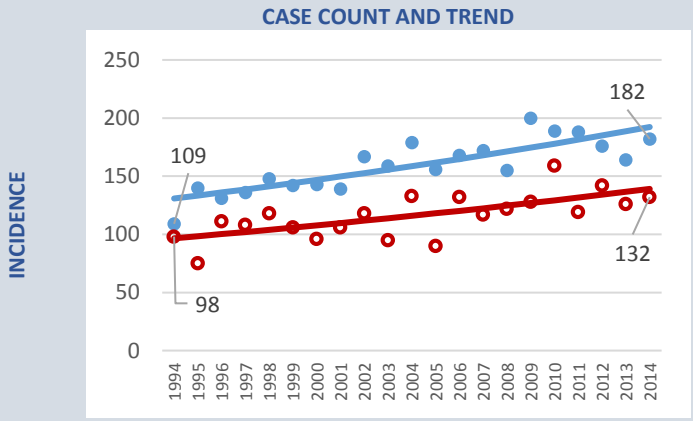


	PERIOD	APC	95%CI	TREND
MALE	1994-2006	6.5	[4.0,8.9]	↑
	2006-2014	-3.3	[-6.9,0.5]	↔
FEMALE	1994-2009	3.2	[0.8,5.7]	↑
	2009-2014	-9.6	[-20.7,3.2]	↔

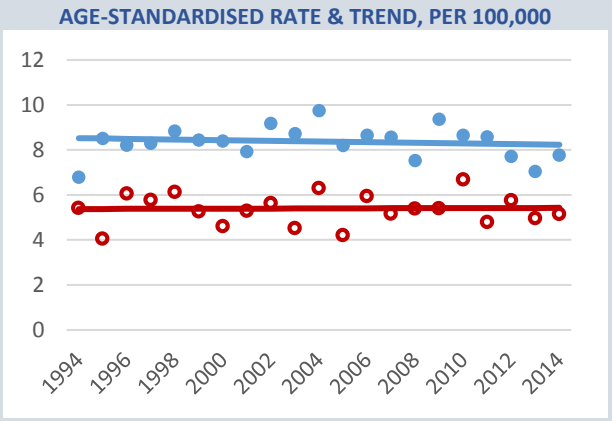


	PERIOD	APC	95%CI	TREND
MALE	1994-2006	4.5	[2.0,7.0]	↑
	2006-2014	-6.2	[-9.8,-2.5]	↓
FEMALE	1994-2009	1.8	[-0.6,4.4]	↔
	2009-2014	-12.2	[-23.5,0.9]	↔

Figure 4-30. Trend in incidence by sex: C91-95 Leukaemia excluding C911 Chronic lymphocytic leukaemia (CLL)



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	1.9	[1.3,2.6]	↑
FEMALE	1994-2014	1.8	[0.9,2.8]	↑



	PERIOD	APC	95%CI	TREND
MALE	1994-2014	-0.2	[-0.8,0.5]	↔
FEMALE	1994-2014	0.1	[-0.9,1.0]	↔

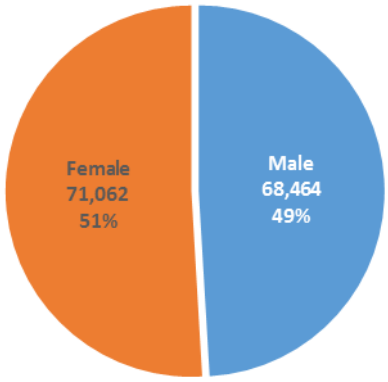
- Chronic lymphocytic leukaemia (CLL), which accounted for 41% of registered leukaemia cases in 1994 and 36% in 2014, showed evidence of a recent decrease in case counts and incidence rate for both sexes (Figure 4-29).
- If CLL cases were excluded, case counts of other leukaemias showed increases throughout 1994-2014 and incidence rates remained static, in both sexes.
- Trends shown by leukaemias as a whole (in particular, recent declines in incidence) therefore appeared to be heavily influenced by trends in CLL.
- Whether this reflects a real decline in CLL, or a failure in case ascertainment somewhere along the diagnostic pathway, remains to be confirmed. However, it is possible that an increase in outpatient or GP-initiated diagnosis of CLL in recent years may have resulted in under-registration of CLL, and efforts are currently underway to remedy this.

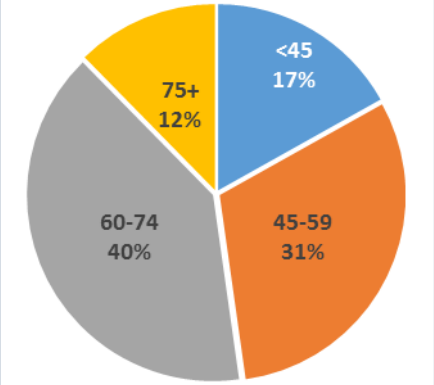
5. PREVALENCE: NUMBERS OF CANCER SURVIVORS

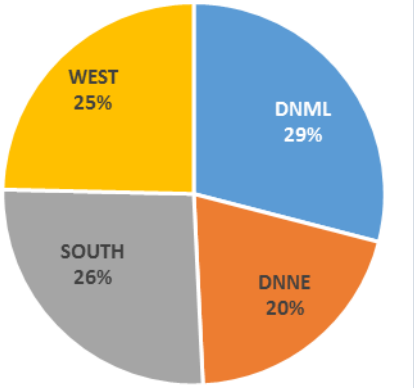
For the purposes of this report cancer ***prevalence*** was defined as the number of cancer survivors that were alive on 31st December 2014. This is the date to which follow-up of all registered cancer patients (through matching of registrations to death certificates) is currently complete.

Total prevalence could not be estimated as information on patients diagnosed before 1994 (the first year of national cancer registration in Ireland) was not available. However, ***period prevalence*** for 1994-2014 was defined as the number of cancer survivors who had at least one invasive cancer (other than non-melanoma skin cancer) diagnosed during 1994-2014 who were still alive on 31st December 2014. Period prevalence for shorter diagnosis periods was also defined for some analyses.

Figure 5-1. Summary characteristics of 139,526 cancer survivors* in Ireland on 31st December 2014







SEX	incidence	alive	%
females	153,662	71,062	46
males	168,520	68,464	41
all	322,182	139,526	43

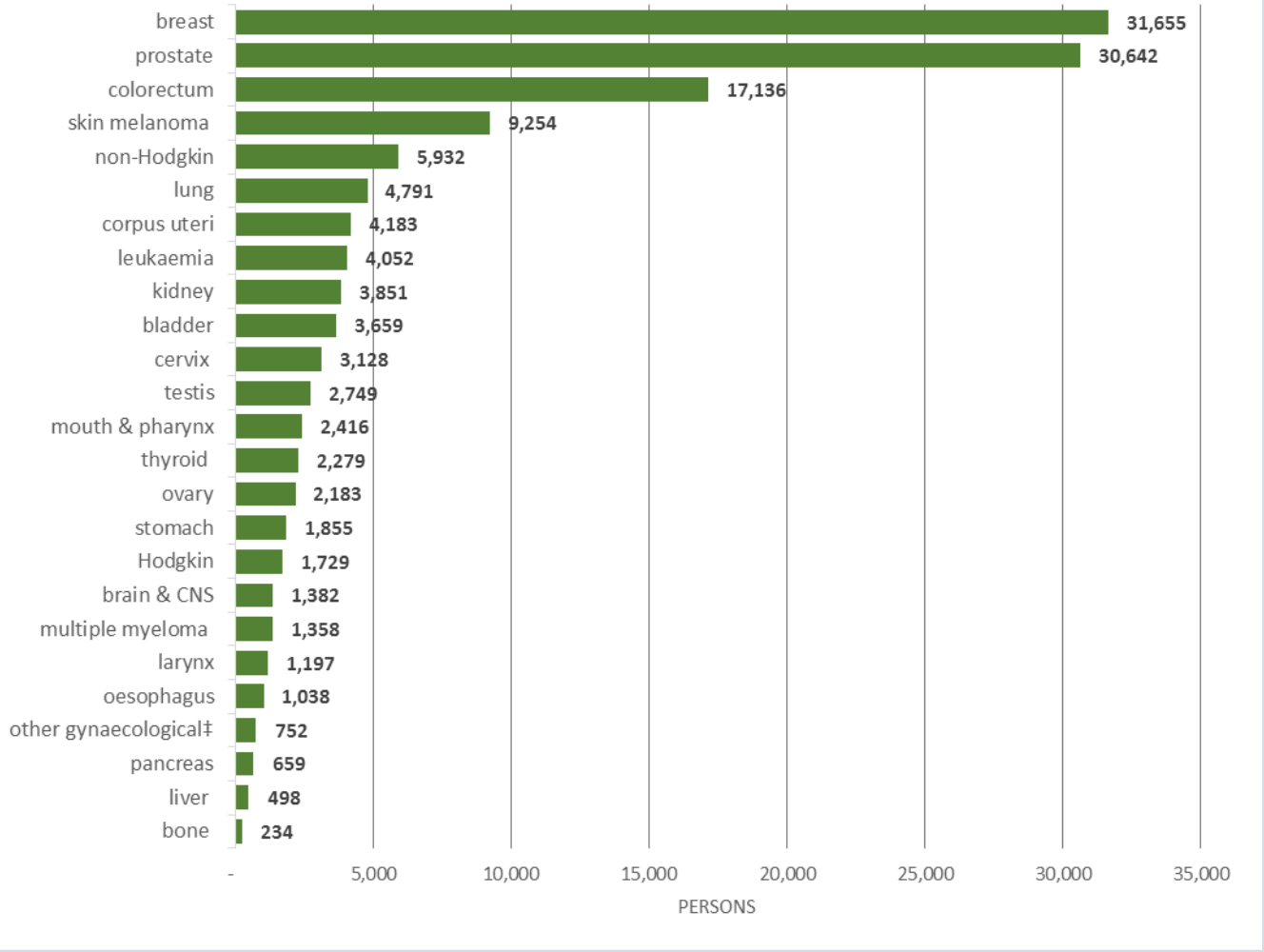
AGE[a]	incidence	alive	%
<45	31,504	23,562	75
45-59	70,232	43,072	61
60-74	127,946	55,667	44
75+	92,500	17,225	19

HSE AREA[b]	incidence	alive	%
DNML	90,461	40,512	45
DNNE	65,085	28,184	43
SOUTH	85,682	36,458	43
WEST	80,954	34,372	42

*C00-C43, C45-C96 all invasive cancers, excluding NMSC diagnosed 1994-2014, counting only the first invasive cancer per patient.
[a]Age at diagnosis. [b]HSE area of residence at diagnosis, DNML (Dublin mid Leinster), DNNE (Dublin north-east).

- During 1994-2014, a total of 322,182 persons (153,662 females and 168,520 males) were diagnosed with invasive cancer (Figure 5-1).
- Of these, 139,526 patients were still alive at the end of 2014, representing the period prevalence of cancer survivors for 1994-2014.
- This represents 46% of all females and 41% of males diagnosed with cancer since 1994, or 3% of the total Irish population of 4.6 million in 2014.
- There were marginally more female cancer survivors (51% of total) than males (49%).
- 52% of cancer survivors were over 60 years, 17% were less than 45 years at the time of their first cancer diagnosis.
- Of the four HSE areas, Dublin/Mid-Leinster held the highest proportion of cancer survivors (29%). However HSE West and HSE South combined held marginally more survivors (51%) than the two eastern regions combined
- 139,526 is a conservative estimate of total cancer prevalence, as it excludes relatively small numbers of other cancer survivors who were diagnosed more than 21 years ago, before NCR data collection began. Total prevalence is likely to exceed 150,000 cancer survivors, and an estimate of this number will be presented in 2017. A breakdown of cancer prevalence by cancer site is presented below (Figures 5-2 and, by cancer site and sex, Figure 5-3).

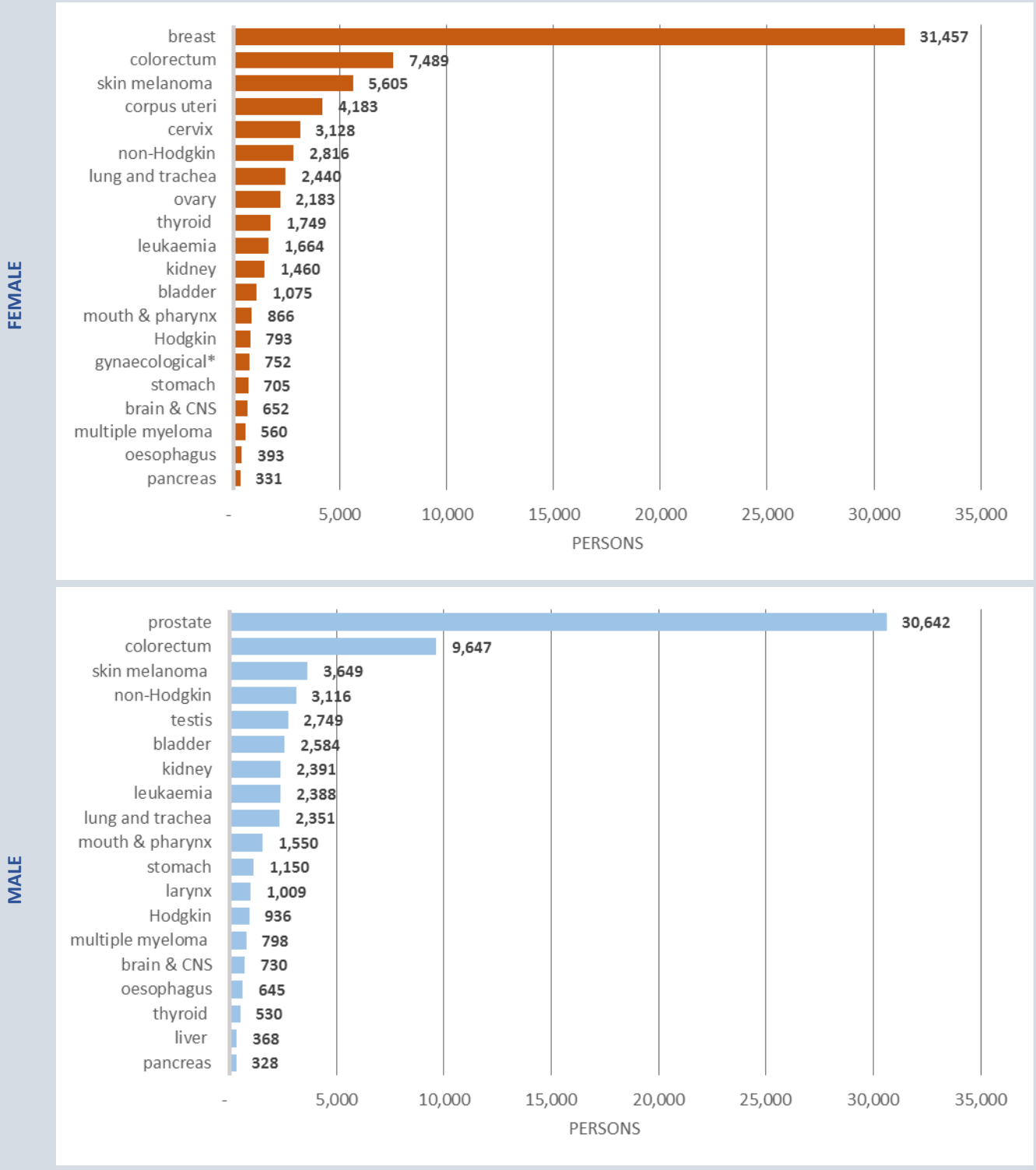
Figure 5-2. Site-specific cancer prevalence: number of cancer survivors on 31st December 2014, males and females combined, for the most common cancers (excluding NMSC)



Each patient is counted once for each specific type of cancer they have survived, i.e. some patients are included as survivors of more than one cancer type. Not all cancer sites are shown.
‡Other gynaecological: vulva, vagina, placenta and uterus NOS.

- The number of survivors of a given cancer type is related to its incidence rate, its median age at diagnosis and its survival prospects. Rare, high-fatality cancers diagnosed in the elderly comprise only a small proportion of cancer survivors. Conversely, common cancers diagnosed in younger persons with good survival prospects will tend to predominate in the prevalent cancer population.
- Overall, the top six most common cancers in the prevalent cancer population were: breast cancer (previously diagnosed in 23% of all cancer survivors), prostate (22%), colorectal (12%), skin melanoma (7%), non-Hodgkin lymphoma (4%) and lung cancer (3%) (Figure 5-2). These percentages are not mutually exclusive, as some cancer survivors had survived more than one type of cancer.
- Less common, high-fatality cancers such as liver, pancreatic, oesophageal and stomach cancers and multiple myeloma and stomach cancer together comprise only 4% of the prevalent population.

Figure 5-3. Site-specific cancer prevalence: number of cancer survivors on 31st December 2014, by sex, for the most common cancers (excluding NMSC)

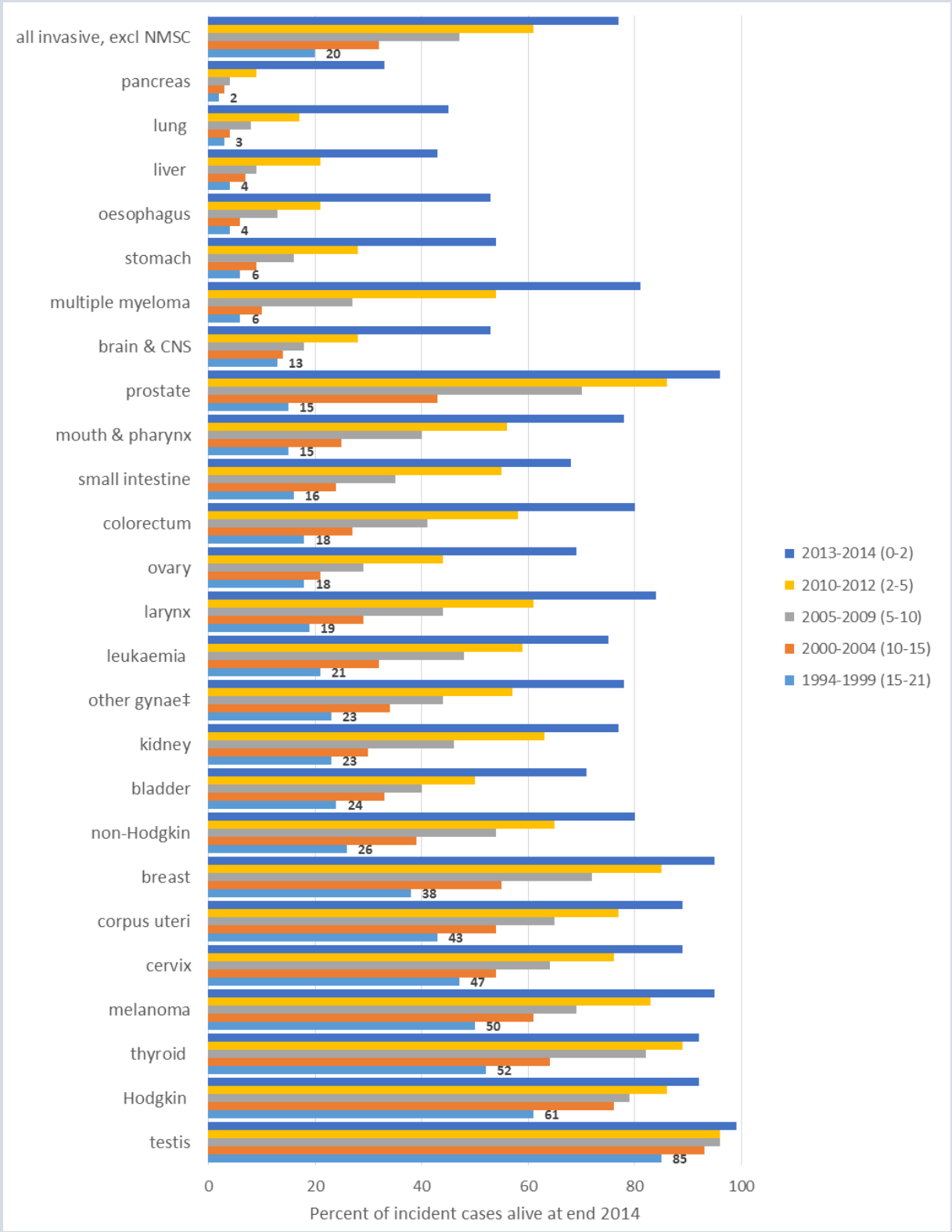


Each patient is counted once for each specific type of cancer they have survived, i.e. some patients are included as survivors of more than one cancer type. Not all cancer sites are shown.
*Other gynaecological: vulva, vagina, placenta and uterus NOS.

- The top five most common prevalent cancers in females were: breast cancer (previously diagnosed in 44% of all female cancer survivors), colorectal cancer (11%), skin melanoma (8%), uterine (6%) and cervical cancer (4%). Again, it should be noted that these percentages are not mutually exclusive, as some cancer survivors had survived more than one type of cancer.
- The top five most common prevalent cancers in males were prostate cancer (45% of all male cancer survivors), colorectal cancer (14%), skin melanoma (5%), non-Hodgkin lymphoma (5%) and testicular cancer (4%).

One way of looking at cancer prevalence is to consider the proportion of patients from consecutive diagnosis periods still alive at the end of 2014, for each cancer (Figure 5-4). This approach illustrates how age at diagnosis, survivability and cancer type interact to shape the prevalent population. Generally, the height of the bars reflects the relative survivability for each cancer, or conversely (short bars) their relative lethality.

Figure 5-4. Percentage of incident cases alive at 31/12/2014 for five discrete diagnosis periods, by site

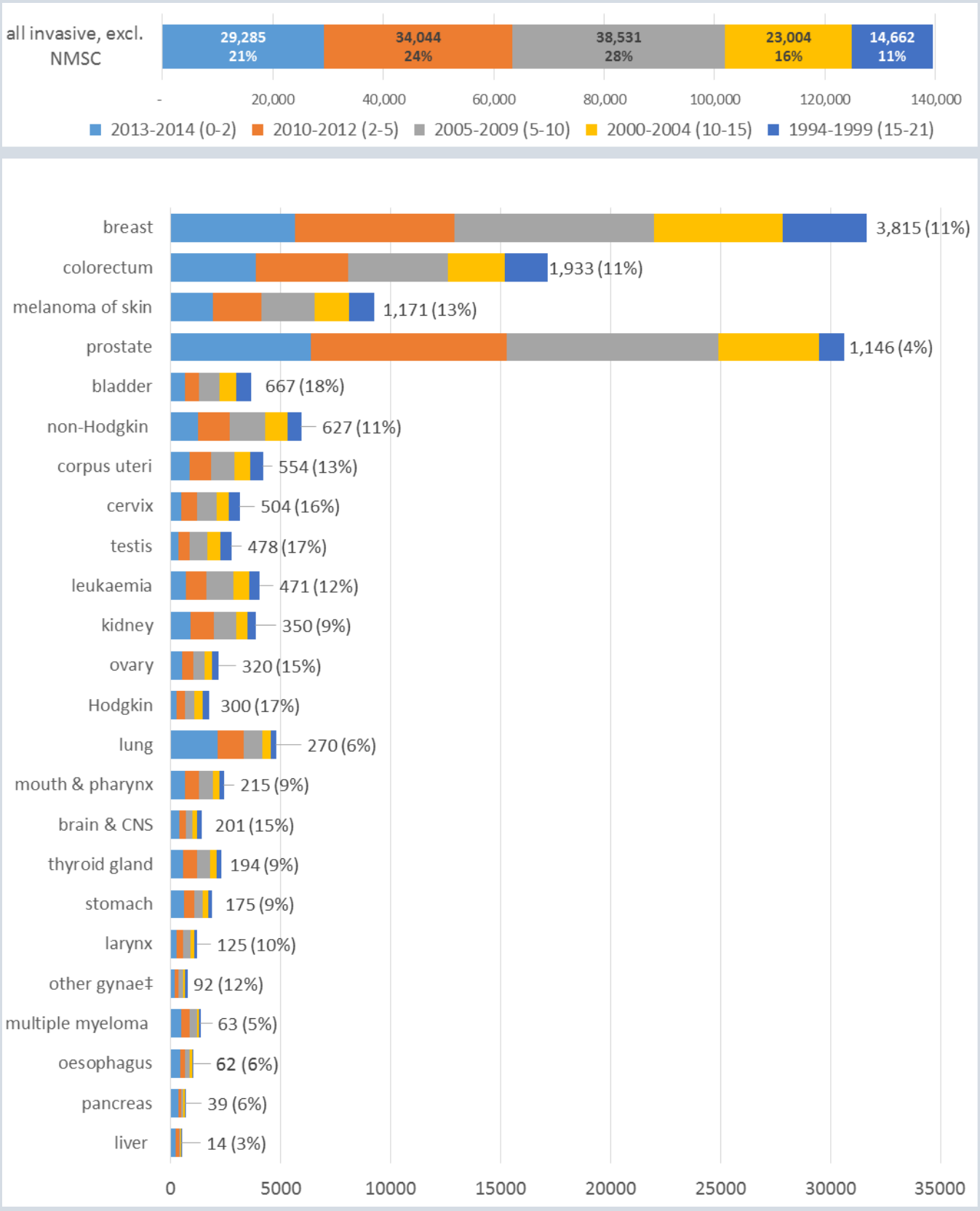


The legend represents the diagnosis period e.g. 2013-2014 (0-2) refers to the period up to 2 years before 31/12/2014.
Displayed percentages refer to the proportion of cases alive for each cancer type diagnosed during 1994-1999.
‡Other gynae: vulva, vagina, placenta and uterus NOS. Each patient is counted once for each specific type of cancer they have survived, i.e. some patients are included as survivors of more than one cancer type. Sorted on the percentage alive for the period 1994-1999.

- For all cancers combined (excl. NMSC), almost 80% of those diagnosed in the latest period 2013-2014 (0-2 years before 31/12/2014) were alive, compared with 61% of those diagnosed 2010-2012 (within 2-5 years of 31/12/2014), compared to 47% of those diagnosed during 2005-2009 (5-10 years before 31/12/2014), and 32% of those diagnosed 2000-2004 (10-15 years before 31/12/2014). Finally, only 20% of those diagnosed during the earliest period 1994-1999 (>15 years before 31/12/2014) were still alive.
- Pancreatic cancer was the 9th most common incident cancer overall (Fig 2-2). Of those diagnosed 0-2 years before 31/12/2014, only 33% remained alive. Of those diagnosed 2-5 years before 31/12/2014, only 9% remained alive. Of those diagnosed >15 years before 31/12/2014, only 2% remained alive.
- Lung cancer was the 4th most common cancer overall (Fig 2-2). Of those diagnosed 0-2 years before 31/12/2014, only 45% remained alive. Of those diagnosed 2-5 years before 31/12/2014, only 17% remained alive. Of those diagnosed >15 years before 31/12/2014, only 3% remained alive.
- Primary liver cancer is rare. Of those diagnosed 0-2 years before 31/12/2014, only 43% remained alive. Of those diagnosed 2-5 years before 31/12/2014 only 21% remained alive. Of those diagnosed >15 years before 31/12/2014, only 4% remained alive.
- Oesophageal and stomach cancer were the 13th and 8th most common incident cancers diagnosed overall (Fig 2-2). Of those diagnosed >15 years before 31/12/2014, only 4% and 6% remained alive respectively.
- Multiple myeloma is a relatively rare tumour mostly confined to the elderly. Of those diagnosed 0-2 years before 31/12/2014, 81% remained alive, which was relatively high. However, of those diagnosed >15 years before 31/12/2014, only 6% remained alive, in part reflecting the high median age at diagnosis for this cancer influencing overall mortality in the earlier diagnostic periods.
- Prostate cancer was the most common cancer overall with a high median age at diagnosis (Fig 2-2). Of those diagnosed 0-2 years before 31/12/2014, 96% remained alive. However, of those diagnosed >15 years before 31/12/2014, only 6% remained alive, again probably due to the high median age at diagnosis for this cancer influencing overall mortality in the earlier diagnostic periods.
- At the other end of the spectrum, testicular cancer is relatively uncommon and tends to occur in younger men. Of those diagnosed 0-2 years before 31/12/2014, 99% were alive. Of those diagnosed >15 years before 31/12/2014, 85% were alive which illustrates the excellent survival prospects, combined with younger age at diagnosis, for this cancer compared to most other cancers (Figure 5-4).

Persons diagnosed in earlier years, especially if diagnosed with a rare or relatively lethal cancer (e.g. pancreatic cancer) or at an older age, were less likely to form part of the overall prevalent cancer population (Figure 5-5).

Figure 5-5. Numbers of cancer survivors at 31/12/2014, by diagnosis period



Counting only the first invasive cancer per patient. The legend represents diagnosis period, e.g. 2013-2014 (0-2) refers to the period up to 2 years before 31/12/2014. Sorted on displayed number of cases for each site diagnosed during 1994-1999 (>15 years before 31/12/2014), e.g. only 39 living persons were diagnosed with pancreatic cancer as far back as 1994-1999, or 6% (39/659) of all known pancreatic cancer survivors.
Other gynae‡: vulva, vagina, placenta and uterus NOS.

- Patients diagnosed during 1994-1999 (15-21 years before 31/12/2014) comprised the smallest group of cancer survivors (14,662 of 139,526, 11%), as might be expected due to the elapsed time since diagnosis (upper panel, Fig. 5-5).
- 101,860 patients diagnosed during 2005-2014 (up to 10 years before 31/12/2014) comprised the majority (73%) of the prevalent population.
- 63,329 patients diagnosed during 2010-2014 (up to 5 years prior to 31/12/2014) made up 45% of the prevalent population; this group can be considered broadly equivalent to persons undergoing initial treatment or follow-up clinical surveillance.
- The 29,285 patients diagnosed during 2013-2014 made up 21% of the prevalent population, and in broad terms comprise the group in the intensive treatment phase and beginning of follow-up (upper panel, Fig. 5-5).

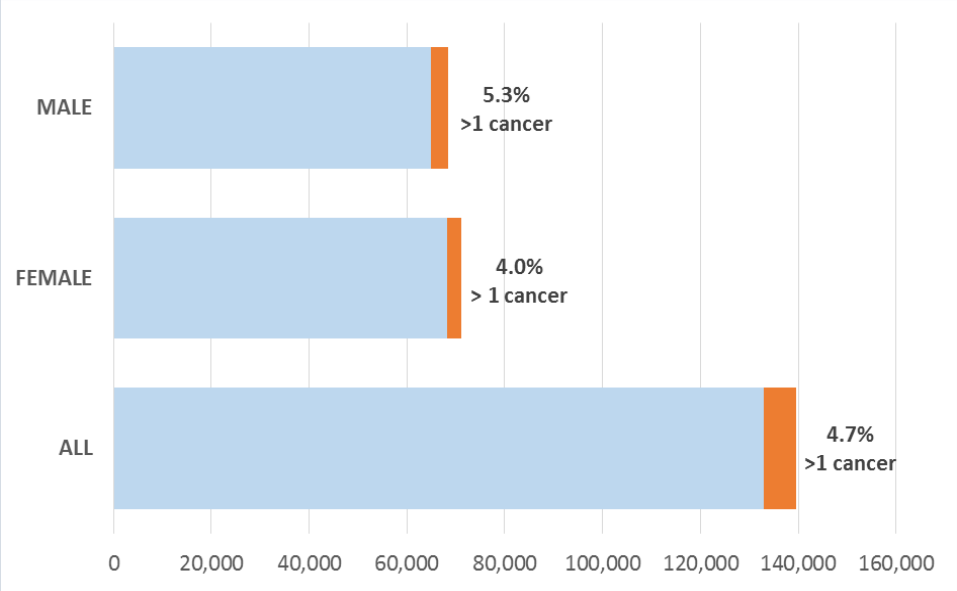
The breakdown by diagnosis period for each individual cancer (lower panel Fig. 5-5) varies from that observed in the overall picture (upper panel Fig. 4-5) and illustrates how cancer type, survival prospects and average age of diagnosis influence the make-up of the cancer survivor population. Looking specifically at cancer survivors from >15 years ago (from 1994-1999):

- Breast cancer, the most prevalent cancer overall, has relatively good survival prospects; as might be expected, the largest number of cancer survivors diagnosed during the earliest period (1994-1999): were breast cancer survivors (3,815, or 11% of 31,655 breast cancer survivors).
- Colorectal cancer, the third most prevalent cancer, has moderately good survival prospects and comprised the second highest number of survivors from 1994-1999 (1,933, or 11% of 17,136 colorectal cancer survivors).
- Melanoma, the fourth most prevalent cancer, has relatively good survival prospects and comprised the third highest number of survivors from 1994-1999 (1,171, or 13% of 9,254 melanoma survivors).
- Prostate cancer, the second most prevalent cancer overall, has fairly good survival prospects, although they were markedly less men surviving from the earliest period due older age at diagnosis (median 66y); the fourth highest number of survivors from 1994-1999 were prostate cancer patients (1,146, or 4% of 30,462 prostate cancer survivors).
- Bladder cancer, the fifth most prevalent cancer, also has fairly good survival prospects, and comprised the fifth highest number of survivors from this earliest period (667, or 18% of 3,659 bladder cancer survivors). Of all the prevalent cancers, bladder cancer has the highest proportion of long term survivors (followed by testis (17%), and Hodgkin lymphoma (17%), although this may be over-estimated because of coding issues (non-invasive bladder tumours miscoded as invasive).
- At the other end of the spectrum, pancreas is an uncommon cancer with poor survival prospects. Not surprisingly, it made up only a small proportion of the prevalent cancer population; 352 (53%) were diagnosed within 2 years before 31/12/2014 and only 39 (6%) were diagnosed more than 15 years in the past.
- Similarly, even though lung cancer was the sixth most prevalent cancer, only 270 (6%) of all lung cancer survivors were diagnosed in the earliest period (lower panel Fig. 5-5).

Although many cancer survivors can be considered cured or disease-free, some may experience recurrences of their original cancer, metastatic spread to other body sites, or further primaries of the same body site (e.g. bladder), or may have health conditions related to their previous cancer treatment. Other survivors may go on to be diagnosed with other, different primary cancers, sometimes because of common risk factors (e.g. smoking) across different cancer types, sometimes related to previous cancer treatment, and sometimes by chance (especially in longer-term survivors).

Figure 5-6 and Table 5-1 (below) summarises for cancer survivors the proportion of patients who have been diagnosed with more than one cancer in a different body system e.g. colon cancer subsequent to breast cancer. This is a somewhat different scenario to patients who may have had multiple sequential tumours of the same type or recurrences of the original cancer. Where different cancers are involved, the patient may undergo very different treatment and follow-up protocols, and the healthcare resources involved and psychosocial or other impacts on the survivor, are likely to be substantial.

Figure 5-6. Numbers of cancer survivors at 31st December 2014, by sex, showing the proportion diagnosed with primary cancers of more than one body site during 1994-2014



SEX	PREVALENCE 31/12/2014
males	68,464
females	71,062
all	139,526

Top portion of graph bars (orange) represent the percentage of survivors diagnosed with more than one cancer (excluding recurrence, metastases, multiple tumours at the same body site, or NMSC)

- Of the prevalent population on 31/12/2014, 6,520 (4.7%) had been diagnosed with more than one distinct cancer type since 1994 (5.3% of males, 4.0% of females).
- Inclusion of all second or subsequent primaries (including those of the same site) would increase this only slightly, to 4.9%.

Table 5-1. Numbers of cancer survivors at 31st December 2014, by sex, diagnosed with more than one cancer at a different body site during 1994-2014

MALES			FEMALES			MALES AND FEMALES		
site	**>1 other cancer**	**%**	**site**	**>1 other cancer**	**%**	**site**	**>1 other cancer**	**%**
bladder	292	12.1%	small intestine	12	7.7%	bladder	345	10.1%
kidney	184	8.6%	ovary	149	7.3%	larynx	95	8.4%
larynx	82	8.6%	larynx	13	7.3%	ovary	149	7.3%
mouth & pharynx	112	7.7%	corpus uteri	277	7.1%	kidney	248	7.1%
breast	14	7.7%	other gynaecological†	43	6.2%	corpus uteri	277	7.0%
colorectum	618	6.9%	stomach	36	5.4%	other gynaecological†	43	6.7%
stomach	72	6.8%	bladder	53	5.1%	mouth & pharynx	148	6.4%
small intestine	13	5.7%	kidney	64	4.8%	stomach	108	6.2%
lymphoma	210	5.5%	colorectum	337	4.7%	colorectum	955	6.0%
other	211	5.5%	lymphoma	165	4.7%	small intestine	25	5.3%
oesophagus	32	5.4%	oesophagus	17	4.6%	lymphoma	375	5.2%
skin melanoma	177	5.2%	other	134	4.5%	other	345	5.1%
lung	101	4.9%	mouth & pharynx	36	4.4%	oesophagus	49	5.1%
leukaemia	108	4.8%	skin melanoma	232	4.3%	skin melanoma	409	4.7%
thyroid	21	4.5%	pancreas	13	4.2%	prostate	1,306	4.4%
prostate	1,306	4.4%	lung	84	3.9%	lung	185	4.3%
liver	13	4.0%	multiple myeloma	18	3.4%	leukaemia	157	4.1%
multiple myeloma	26	3.5%	breast	985	3.2%	multiple myeloma	44	3.5%
bone	3	2.3%	leukaemia	49	3.1%	pancreas	18	3.4%
mesothelioma	1	2.3%	bone	3	3.1%	liver	15	3.3%
testis	48	1.8%	cervix uteri	93	3.0%	breast	999	3.2%
pancreas	5	1.7%	thyroid	42	2.5%	cervix uteri	93	3.1%
brain and CNS	6	0.8%	liver	2	1.6%	thyroid	63	3.0%
			brain and CNS	8	1.3%	bone	6	2.6%
			mesothelioma	0	0.0%	mesothelioma	1	1.9%
						testis	48	1.8%
						brain and CNS	14	1.0%
Total	**3,655**	**5.3%**	**Total**	**2,865**	**4.0%**	**Total**	**6,520**	**4.7%**

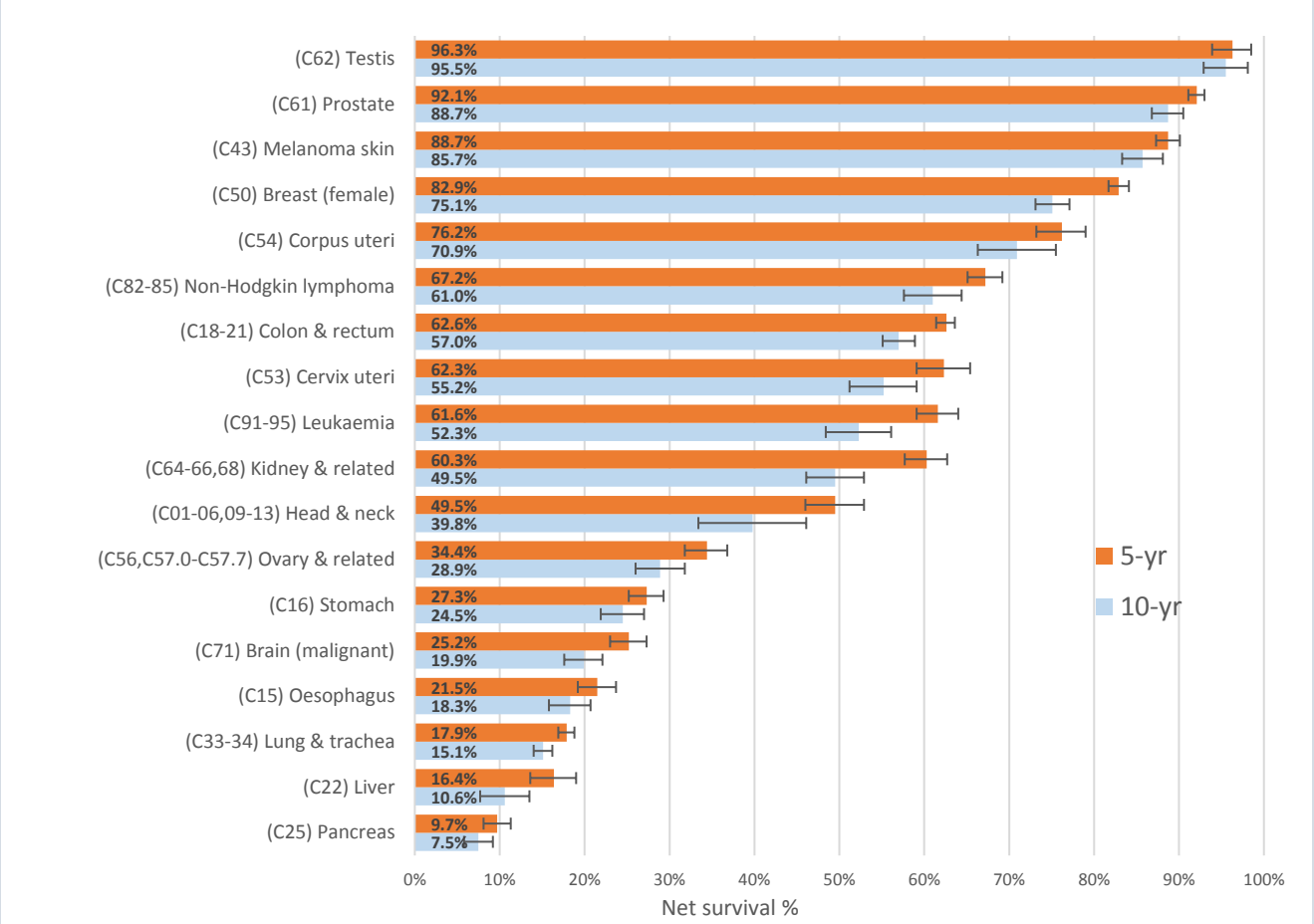
Selecting on first cancer diagnosed and counting other cancers diagnosed at differerent body site(s) thereafter up to end of 2014
†Other gynaecological: vulva, vagina, placenta and uterus NOS
'>1 other cancer' represents the number of persons with that cancer also diagnosed with a primary cancer cancer (excluding NMSC) at another body site on a subsequent (or the same) date.
The percentage represents the proportion that that number represents of all cancer survivors whose first cancer was at a given site.
Example: 292 (12% of) survivors of bladder cancer in males were also diagnosed with of at least one other cancer at a differerent body site, typically occurring in other sites sharing the same risk factors as bladder cancer (e.g. kidney cancer).

- While cancer of the bladder was uncommon, 10% of the total number of survivors of this cancer also had at least one other cancer at another body site.
- A high proportion (8.4%) of survivors of laryngeal cancer also experienced diagnoses of other cancers, mostly of nearby body systems (e.g. lung, oesophagus and mouth/pharynx – details of other cancers not shown).
- Of the most common cancers in the prevalent population, 955 colorectal cancer survivors, or 6% of all colorectal cancer survivors, had diagnoses of other primary cancers.
- 1,306 prostate cancer survivors, or 4.4% of all prostate cancer survivors, had other cancer diagnoses, such as bladder cancer.
- 999 breast cancer survivors, or 3.2% of all breast cancer survivors, also had other cancer diagnoses.

6. SURVIVAL

Net survival estimates to five years and ten years are presented here for cancer as a whole (excluding non-melanoma skin cancer) and for the most frequent cancers (Figures 6-1 to 6-5). Ten-year estimates have not been published formally by the NCR previously. Net survival is calculated by comparing the observed survival of patients with the expected survival of persons of the same age and sex in the general population. It represents the cumulative probability of a patient surviving a given time in the hypothetical situation in which the disease of interest is the only possible cause of death, i.e. survival having controlled for other possible causes of death [16]. Actual (observed) survival will generally be lower than net survival, especially in older age-groups, reflecting deaths from other causes, although for high-fatality cancers and in younger age-groups most deaths among cancer patients will be related to the cancer (Figures 6-6 to 6-9).

Figure 6-1 Estimates of 5-year and 10-year net survival (age-standardised) for invasive cancers in Ireland, 2010-2014

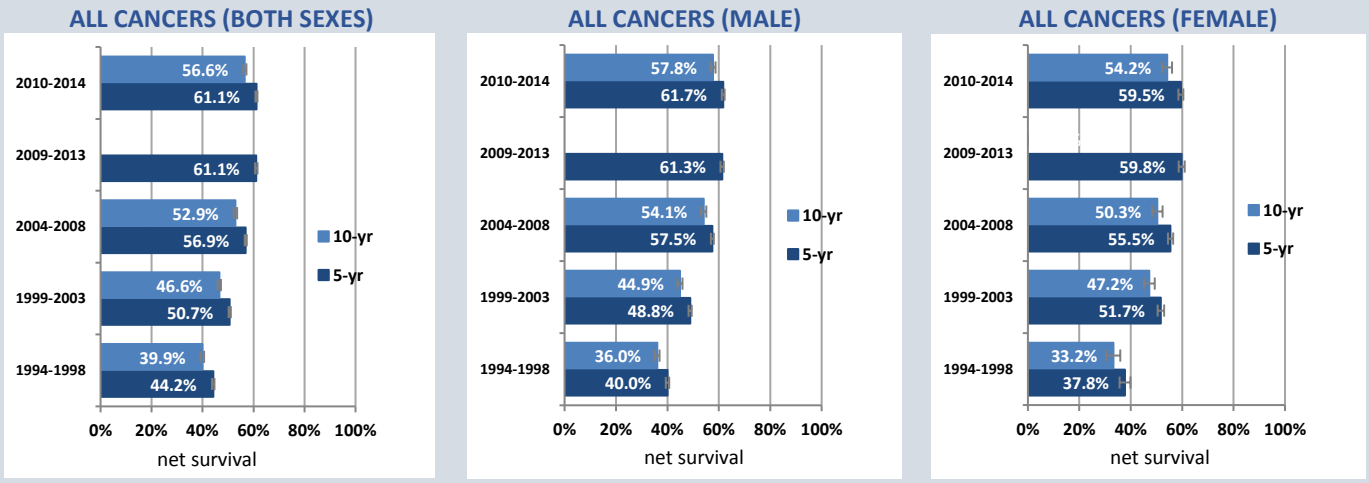


'Hybrid' estimates are presented here for the follow-up period 2010-2014, representing survival of one-year to five-year survival for cases diagnosed in 2013 back to 2009 supplemented by longer-term follow-up survival estimates of patients diagnosed pre-2009 using methods of Dickman *et al.* [16].
Survival for all ages 15-99 is standardised to the standard populations recommended by Corazziari et al. (2004); the age-groups used differ for prostate cancer, and greater weighting is given to younger patients for melanoma, reflecting differences in typical age-structure of patient populations for these cancers) [17]. 95% confidence intervals are shown

- The cancer sites with the highest estimated 10-year net survival were testis (96%), prostate (89%), skin melanoma (86%) and breast (75%).
- The cancer sites with the lowest 10-year survival were pancreas (<8%), liver (11%), lung (15%) and oesophagus (18%).
- Survival for specific age-groups is summarised in Appendix IV.

Survival trends for cancer as a whole and colorectal, lung, breast and prostate cancers are summarised in Figures 6-2 to 6-5 below, and age-specific estimates of net and observed survival are compared for the same cancers in Figures 6-6 to 6-9.

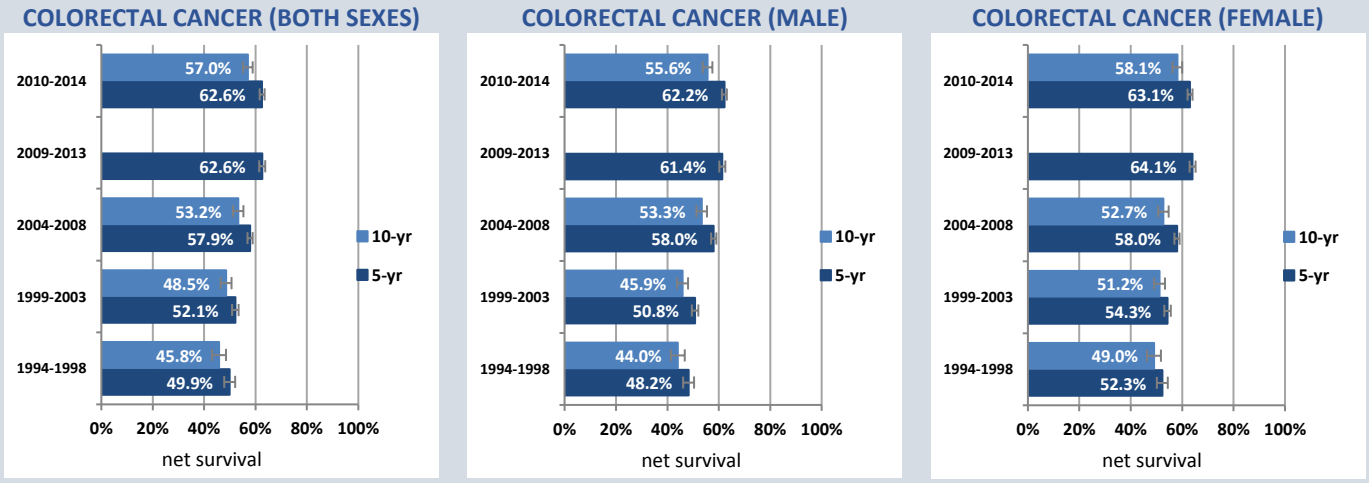
Figure 6-2. Age-standardised 5-year and 10-year net survival (with 95% confidence intervals) for all cancers excluding NMSC, by diagnosis period



'Hybrid' estimate for 2010-2014 [16]

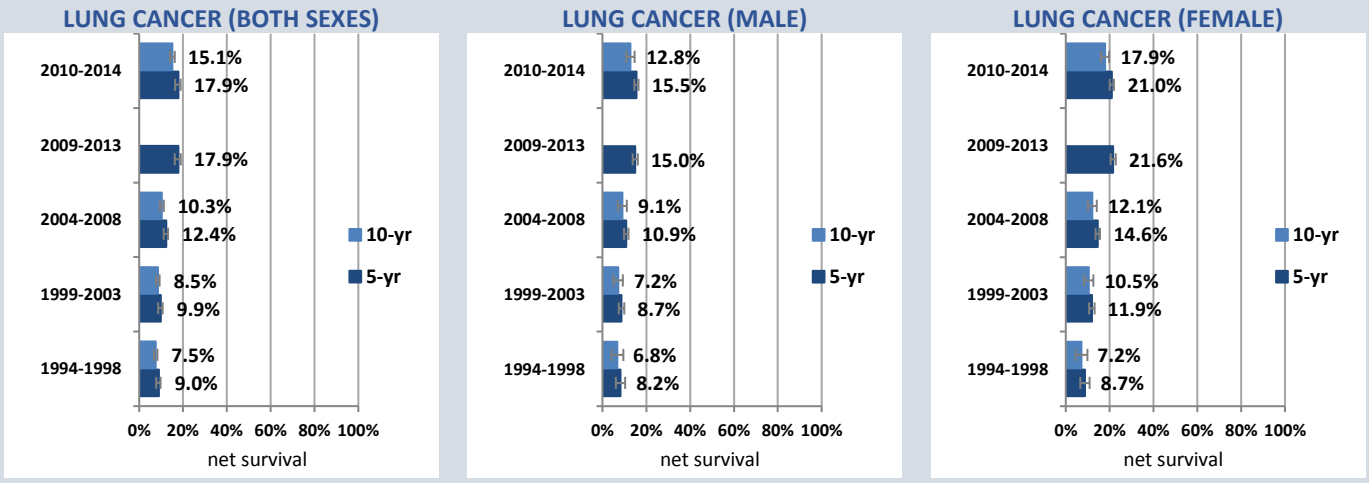
- Five-year net survival for cancers as a whole (excluding non-melanoma skin cancers) increased from 44% for patients diagnosed during 1994-1998 to 61% for those diagnosed during 2009-2013, for male and female patients combined.
- Ten-year survival increased from 40% (1994-1998) to 53% (2004-2008); sufficient follow-up is not yet available for the 2009-2013 cohort, but a 'current' estimate of 57% ten-year survival is available for the 2010-2014 follow-up period (taking account of all patients alive in the most recent years).
- Males and females showed similar patterns of survival improvement over time, although net survival averaged slightly higher among males than females throughout (reflecting differences in cancer types involved and the higher average age of females compared with males in the oldest age-group, 75+ years).

Figure 6-3. Age-standardised 5-year and 10-year net survival (with 95% confidence intervals) for colorectal cancer, by diagnosis period



- Five-year net survival from colorectal cancer increased from 50% during 1994-1998 to 63% during 2009-2013.
- Ten-year survival increased from 46% (1994-1998) to 53% (2004-2008), and the most recent estimate is 57%, based on all patients followed up during 2010-2014.
- Males and females showed similar improvements over time, although net survival from colorectal cancers averaged slightly higher among females in most periods.

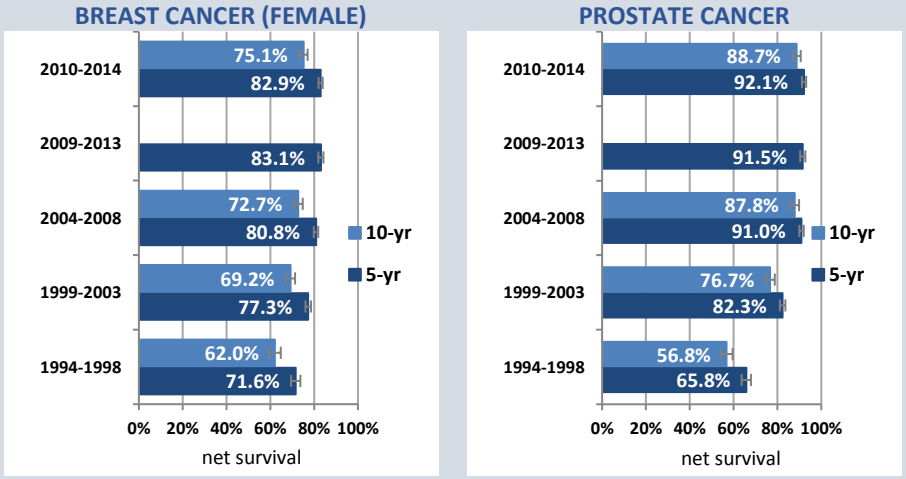
Figure 6-4. Age-standardised 5-year and 10-year net survival (with 95% confidence intervals) for lung cancer, by diagnosis period



Cancer of the trachea is included

- Five-year net survival from lung cancer approximately doubled from 9% during 1994-1998 to 18% during 2009-2013.
- Ten-year survival increased from 7.5% (1994-1998) to 10% (2004-2008), and the most recent estimate is 15%, based on all patients followed up during 2010-2014.
- Both males and females showed improvements over time, but improvements seem to have been more marked among female lung cancer patients, whose average survival has been markedly higher than that of males after 1999.

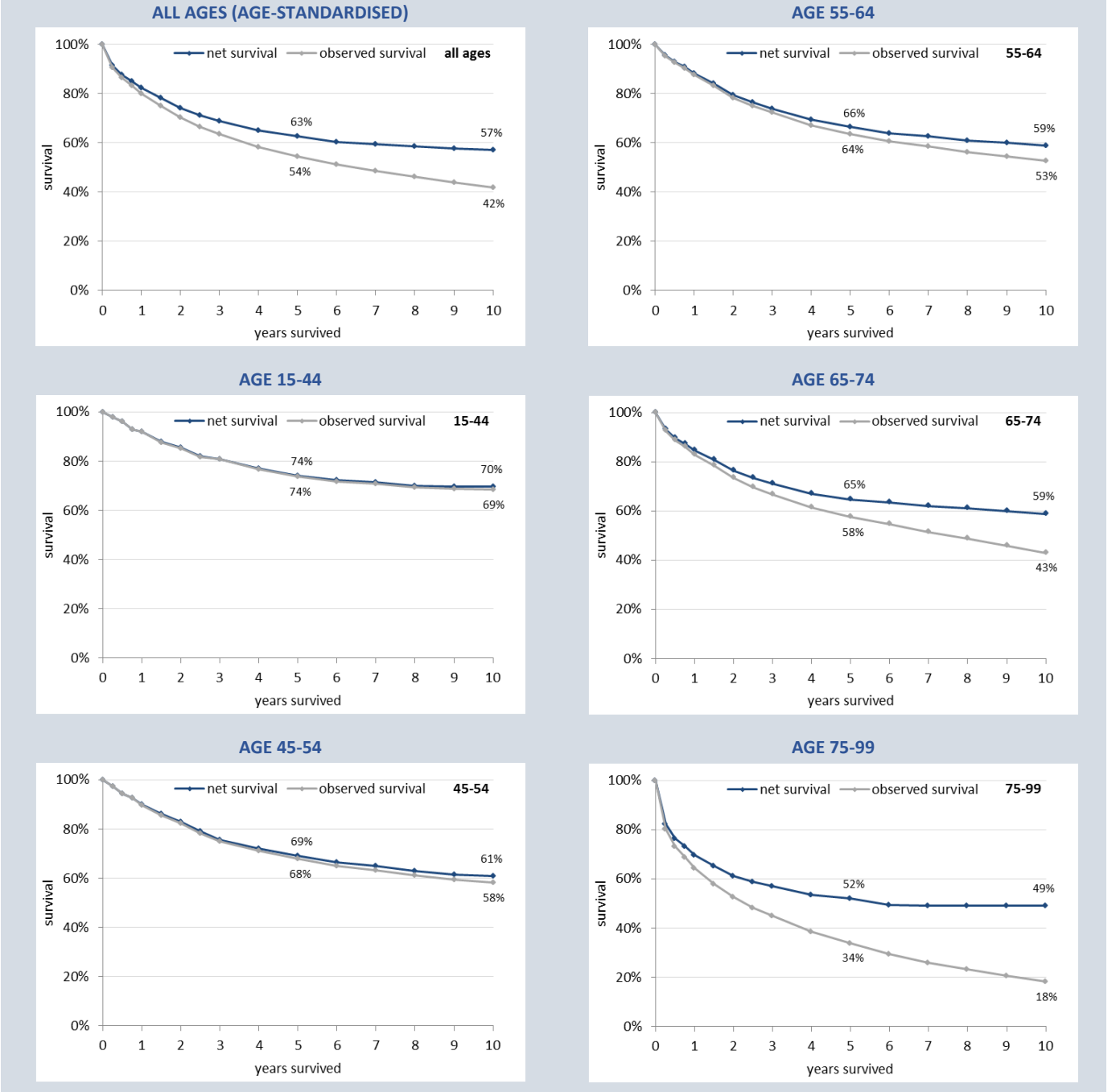
Figure 6-5. Age-standardised 5-year and 10-year net survival for breast and prostate cancer, by diagnosis period



- Five-year net survival from female breast cancer increased from 72% during 1994-1998 to 83% during 2009-2013. Ten-year survival increased from 62% (1994-1998) to 73% (2004-2008) and an estimated 75% for 2010-2014.
- Five-year net survival from prostate cancer increased markedly, from 66% during 1994-1998 to 92% during 2009-2013. Ten-year survival increased from 57% (1994-1998) to 88% (2004-2008), and the most recent estimate is 89%, based on all patients followed up during 2010-2014. However, improvements seen are partly related to increased detection of sub-clinical cancers by PSA testing which can produce an artificial increase in average survival time (lead-time bias).
- Both breast and prostate cancers show evidence of a recent slowing down in the rate of survival improvement.

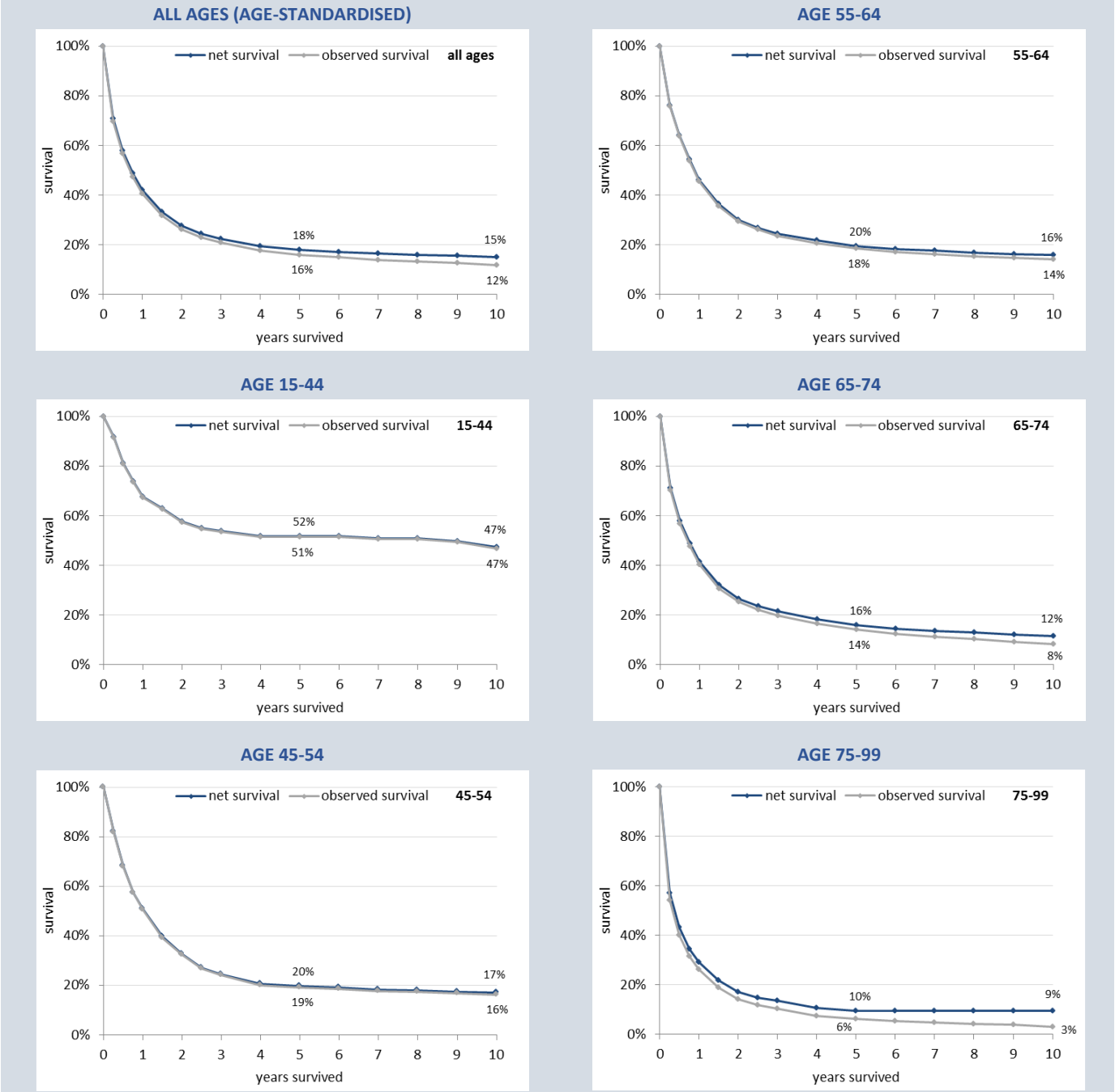
Although net survival or relative survival is a standard measure of survival likelihood for cancer patients, the actual (observed) survival of patients will also reflect the general risk of death among persons of the same age and sex. In younger cancer patients, most of the risk of death is associated with the cancer, but in older patients there is also substantial risk of death from other causes. Thus there can be a substantial difference between net survival and observed survival for older patients, particularly for less fatal cancers. The graphs below illustrate this for the four most important cancer types.

Figure 6-6. Comparison of net survival and observed survival, by age: colorectal cancer, 2010-2014



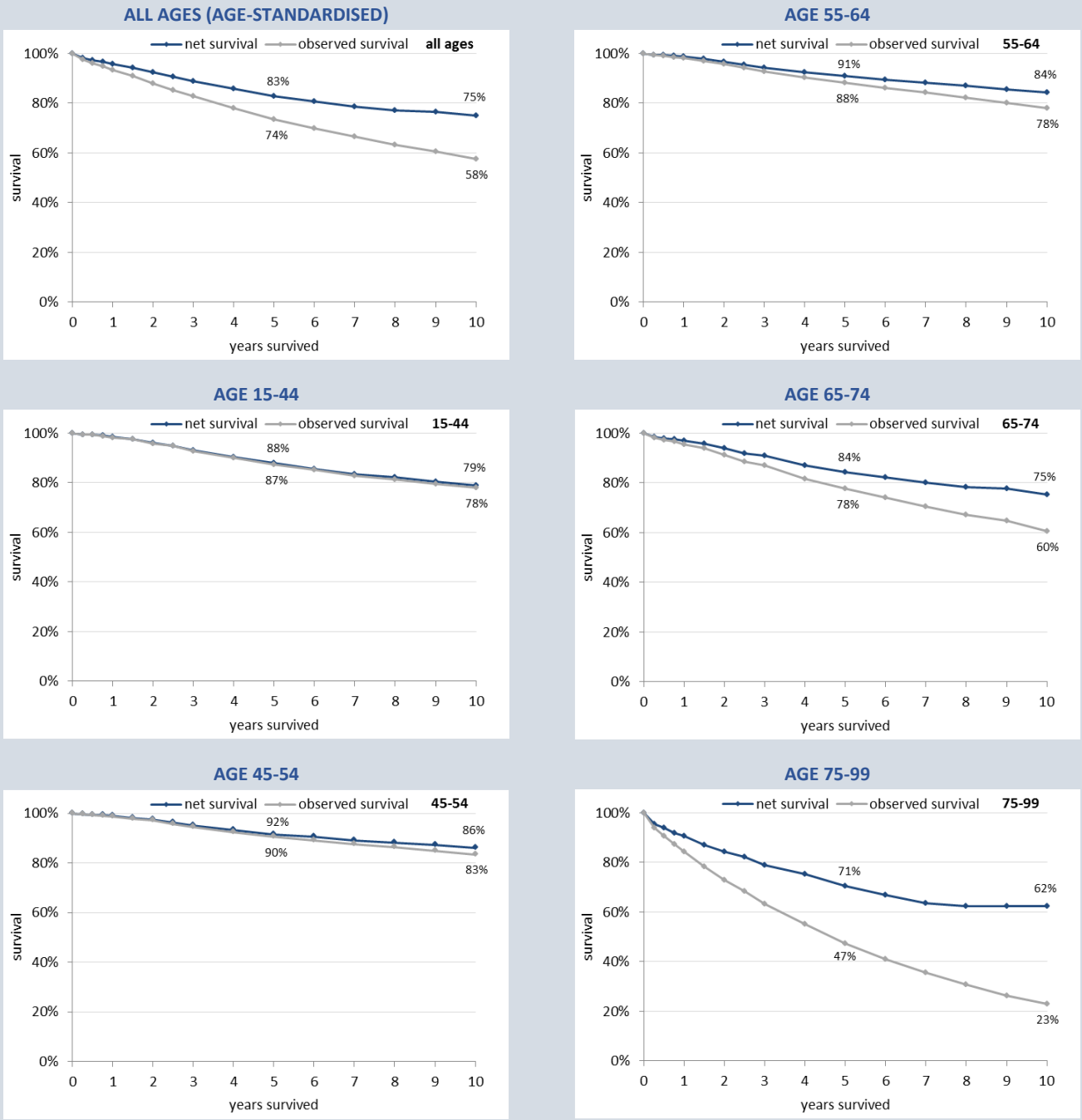
- For colorectal cancer patients, most of the mortality risk is associated with the cancer, but in the oldest group (75+ years) a substantial proportion of total deaths among patients are associated with other mortality causes. In this group, 52% five-year net survival implies that, on average, 48% of patients would be expected to die from their cancer within five years (if other causes of death did not apply) but, in fact, 66% of patients die within five years (34% observed survival), including deaths from other causes.

Figure 6-7. Comparison of net survival and observed survival, by age: lung cancer, 2010-2014



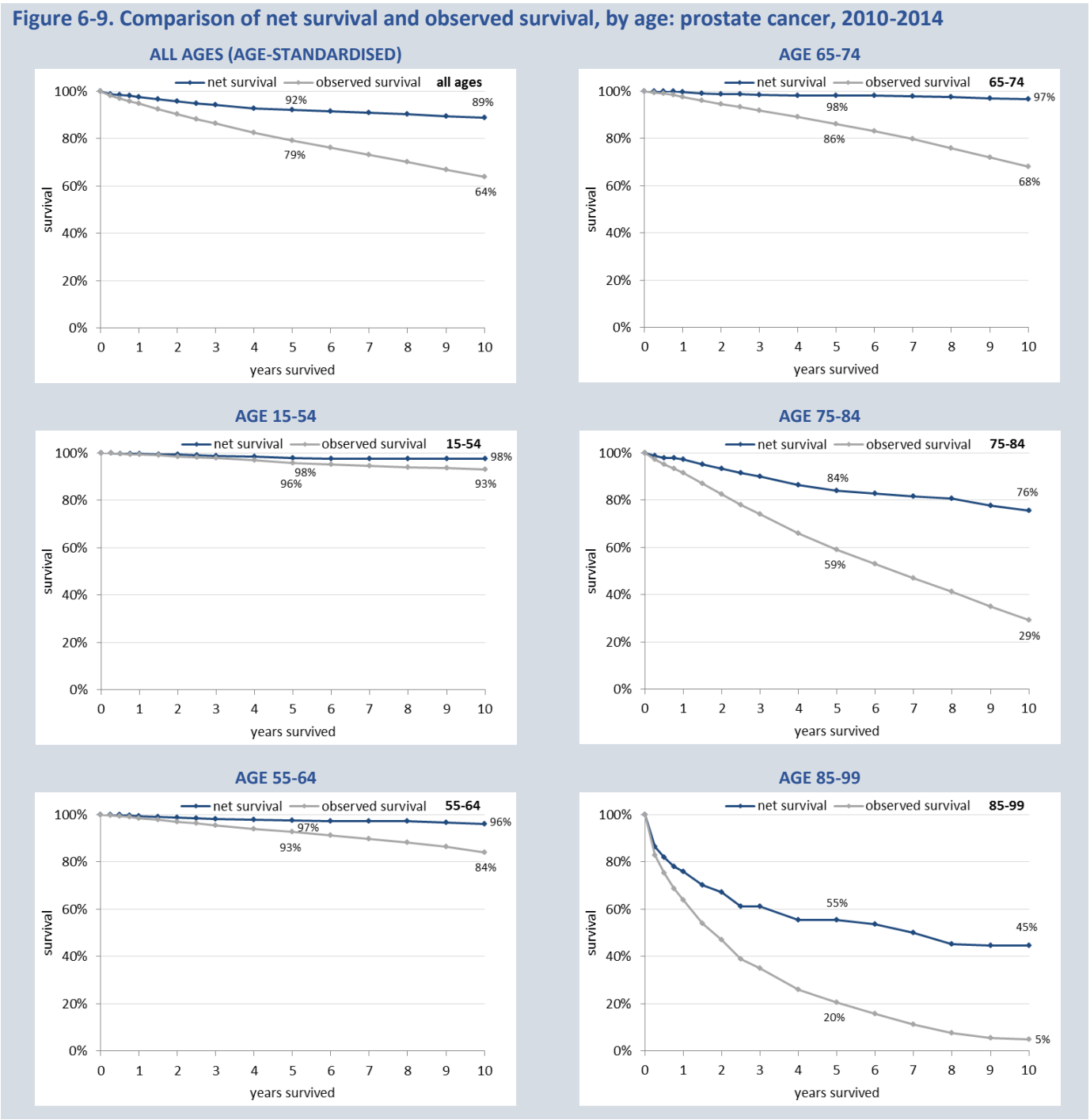
- For lung cancer patients, a higher proportion of their mortality risk is associated with the cancer, and even in the oldest group (75+ years) only a small proportion of total deaths among patients are associated with other mortality causes. In this group, 10% five-year net survival implies that, on average, 90% of patients would be expected to die from their cancer within five years (if other causes of death did not apply) – in fact, 94% of patients die within five years (6% observed survival), including deaths from other causes.

Figure 6-8. Comparison of net survival and observed survival, by age: female breast cancer, 2010-2014



- For breast cancer patients, although most of the mortality risk is still associated with the cancer, a higher proportion of deaths are associated with other causes than is the case with colorectal or (especially) lung cancer. In the oldest group (75+ years), 71% five-year net survival implies that 29% of patients would be expected to die from their cancer within five years (if other causes of death did not apply) but, on average, 53% of patients die within five years (47% observed survival), including deaths from other causes.

Figure 6-9. Comparison of net survival and observed survival, by age: prostate cancer, 2010-2014



- For prostate cancer patients, an even higher proportion of deaths are associated with other causes than is the case for breast cancer. In the second oldest group (75-84 years), 84% five-year net survival implies that 16% of patients would be expected to die from their cancer within five years (if other causes of death did not apply) but, on average, 41% of patients die within five years (59% observed survival), including deaths from other causes. For the very oldest patients (age 85+), other causes of death become even more important.

- In summary, more than half of the deaths (within five years) among prostate cancer patients aged 75 years or more may be attributable to non-cancer causes – compared with <50% of deaths for breast cancer patients, <30% of deaths for colorectal cancer patients but only about 5% of deaths for lung cancer patients of a similar age.
- Thus, for cancers of, on average, lower fatality, a high proportion of elderly patients may die with (rather than from) their cancer.

7. METHODS

The National Cancer Registry was established by the Minister for Health in 1991. It has been collecting comprehensive cancer information for the Republic of Ireland since 1994. The information collected is used in research into the causes of cancer, in education and information programmes, and in the planning of cancer services to deliver the best cancer care to the whole population. Completeness of case ascertainment at five years after diagnosis is estimated to be at least 98% [18].

Incidence data are collected and coded by the NCR according to the ICDO3 classification (including translation from ICDO2 codes for older data) [19]. For convenience, cancer types are specified or grouped in this report under ICD10-type codes, but these do not correspond to 'strict' ICD10 codes as some neoplasms classed as non-invasive / non-malignant under ICD10 (e.g. myelodysplastic syndrome, ICD10 D46) are now considered fully malignant under ICDO3. For such cases, the nearest equivalent malignant ICD10 code or subheading is used (thus polycythaemia, myelodysplastic syndromes and chronic myeloproliferative diseases have been included under C96, rather than D45-D47).

Age-, sex- and cause-specific deaths attributable to cancer were downloaded from the WHO website for years 1994 to 2013 [3]. At the time of compilation of this report, deaths for 2014 (by year of death) were not available. For selected sites, an update of the mortality trends presented in the 1994-2012 NCR report [1] are presented.

Table 7-1. Comparison of the 1976 ESP and the 2013 ESP population structures

1976 ESP		2013 ESP	
age band	**weight per 100,000**	**age band**	**weight per 100,000**
<1	1600	<1	1000
01-04	6400	01-04	4000
05-09	7000	05-09	5500
10-14	7000	10-14	5500
15-19	7000	15-19	5500
20-24	7000	20-24	6000
25-29	7000	25-29	6000
30-34	7000	30-34	6500
35-39	7000	35-39	7000
40-44	7000	40-44	7000
45-49	7000	45-49	7000
50-54	7000	50-54	7000
55-59	6000	55-59	6500
60-64	5000	60-64	6000
65-69	4000	65-69	5500
70-74	3000	70-74	5000
75-79	2000	75-79	4000
80-84	1000	80-84	2500
85+	1000	85-89	1500
		90-94	800
		95+	200
Total	**100,000**	**Total**	**100,000**

Source: EUROSTAT [20]

The age-standardised (ASR) rate is the annual rate of newly diagnosed cases (or deaths) in a given population (and year), expressed per 100,000 persons (usually males and females separately), weighted by the age-structure of a defined 'standard' population, to allow meaningful comparisons between different countries over time [21]. By convention for European cancer registries, age-standardised rates for incidence and mortality were weighted by the European standard population (ESP) as defined in 1976 [4]. However, this report also presents incidence rates weighted by the 2013 ESP proposed by EUROSTAT to more accurately reflect the demographic age shift in the European population since 1976 [20]. The 2013 ESP is a better reflection of the current population structure than the ESP of 1976. The 2013 ESP gives older ages a greater weight than the 1976 ESP and also, while the 1976 ESP has only one upper age band of 85+ years, the 2013 ESP contains age bands of 85-89, 90-94 and 95+. Like most cancer registries, by convention the NCR pools case-counts and population weights for age categories '<1 year' and '01-04 years' (Table 7-1).

Annual percentage changes (APC) of incidence/mortality over time (incidence 1994-2014/mortality 1994-2013) were estimated with the Joinpoint regression program, using annual age-standardised rates and their standard errors as inputs [8][9]. The same break point constraints for trend were applied to rates calculated using the 1976 ESP and 2013 ESP. Default constraints were used with Joinpoint; a maximum of three trend break points where allowed over the 21 year period from 1994-2014, and only after four consecutive years inclusive, and four years from either end of the year range (inclusive).

Survival figures presented in this report use net survival, an 'improved' version of relative survival taking better account of competing mortality risks and allowing greater comparability between different populations or age-groups. Net survival represents the cumulative probability of a patient surviving a given time in the hypothetical situation in which the disease of interest is the only possible cause of death, i.e. survival having controlled for other possible cause of death [16]. (This involves comparison of observed survival with the expected survival of persons of the same age and gender in the general population, as for relative survival). Net survival was calculated using the 'strs' command in STATA with an adjustment to obtain the Pohar-Perme estimate. All survival estimates were age-standardised to the International Cancer Survival Standards (ICSS) [17].

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APPENDIX I: SUMMARY TABLE - CANCER INCIDENCE: ANNUAL AVERAGE 2012-2014

ICD10* cancer site (INCIDENCE)	MALES						FEMALES						ALL		
N# Average annual number of cases 2012-2014 rounded to nearest integer ASR‡ Age-standardised rate/100,000- weighted by ESP~ 1976 and 2013 Risk† Cumulative risk (%) to age 75 years ESP~ European Standard Population	N#	% all invasive	% all invasive excl. NMSC	ASR‡ ESP~ 1976	ASR‡ ESP 2013	Risk† 75Y	N#	% all invasive	% all invasive excl. NMSC	ASR‡ ESP 1976	ASR‡ ESP 2013	Risk† 75Y	N#	% all invasive	% all invasive excl. NMSC
C00-96 all invasive cancers	16,618	100%		720.0	1,119.0	44.09	14,054	100%		547.6	794.5	35.21	30,672	100%	
C00-43, C45-96 all invasive cancers, excluding NMSC	11,101	66.8%	100%	483.3	730.6	33.37	9,703	69.0%	100%	384.5	540.6	26.63	20,804	67.8%	100%
C00-D48 all registered tumours	18,330			793.9	1,233.3	47.26	19,261			754.5	1,032.8	44.59	37,591		
D00-48 all non-invasive tumours**	1,712			73.9	114.4	5.66	5,207			206.9	238.3	14.47	6,919		
C00 lip	19	0.1%	0.2%	0.8	1.3	0.06	5	<0.1%	0.1%	0.2	0.3	0.01	24	0.1%	0.1%
C01 base of tongue	28	0.2%	0.3%	1.3	1.6	0.11	8	0.1%	0.1%	0.4	0.4	0.03	36	0.1%	0.2%
C02 other and unspecified parts of tongue	46	0.3%	0.4%	2.1	2.7	0.19	27	0.2%	0.3%	1.1	1.5	0.09	73	0.2%	0.4%
C03 gum	13	0.1%	0.1%	0.6	0.8	0.05	6	<0.1%	0.1%	0.3	0.3	0.02	19	0.1%	0.1%
C04 floor of mouth	27	0.2%	0.2%	1.2	1.5	0.11	7	<0.1%	0.1%	0.3	0.4	0.03	34	0.1%	0.2%
C05 palate	14	0.1%	0.1%	0.6	0.8	0.05	7	<0.1%	0.1%	0.3	0.4	0.02	20	0.1%	0.1%
C06 other and unspecified parts of mouth	14	0.1%	0.1%	0.6	1.0	0.05	14	0.1%	0.1%	0.6	0.8	0.04	28	0.1%	0.1%
C07 parotid gland	24	0.1%	0.2%	1.0	1.6	0.08	12	0.1%	0.1%	0.5	0.6	0.03	35	0.1%	0.2%
C08 other and unspecified major salivary glands	4	<0.1%	<0.1%	0.2	0.3	0.02	3	<0.1%	<0.1%	0.1	0.1	0.01	7	<0.1%	<0.1%
C09 tonsil	42	0.3%	0.4%	1.9	2.3	0.16	13	0.1%	0.1%	0.5	0.7	0.05	54	0.2%	0.3%
C10 oropharynx	19	0.1%	0.2%	0.9	1.1	0.08	5	<0.1%	0.1%	0.2	0.3	0.02	24	0.1%	0.1%
C11 nasopharynx	11	0.1%	0.1%	0.5	0.6	0.04	5	<0.1%	0.1%	0.2	0.3	0.02	16	0.1%	0.1%
C12 pyriform sinus	26	0.2%	0.2%	1.1	1.6	0.10	3	<0.1%	<0.1%	0.1	0.2	0.01	29	0.1%	0.1%
C13 hypopharynx	15	0.1%	0.1%	0.7	0.9	0.06	4	<0.1%	<0.1%	0.2	0.3	0.01	20	0.1%	0.1%
C14 other and ill-defined sites of lip, oral cavity/pharynx	13	0.1%	0.1%	0.6	0.7	0.05	4	<0.1%	<0.1%	0.2	0.2	0.01	17	0.1%	0.1%
C01-14 mouth & pharynx	297	1.8%	2.7%	13.2	17.6	1.16	118	0.8%	1.2%	4.8	6.4	0.40	414	1.3%	2.0%
C15 oesophagus	251	1.5%	2.3%	10.9	17.2	0.91	137	1.0%	1.4%	4.9	8.3	0.35	387	1.3%	1.9%
C16 stomach	361	2.2%	3.3%	15.5	25.2	1.19	204	1.5%	2.1%	7.5	12.0	0.56	565	1.8%	2.7%
C17 small intestine	52	0.3%	0.5%	2.3	3.4	0.19	36	0.3%	0.4%	1.4	2.0	0.11	88	0.3%	0.4%
C18 colon	908	5.5%	8.2%	39.0	64.5	2.89	723	5.1%	7.5%	26.8	42.7	2.02	1,631	5.3%	7.8%
C19 rectosigmoid junction	109	0.7%	1.0%	4.7	7.2	0.41	64	0.5%	0.7%	2.4	3.7	0.21	173	0.6%	0.8%
C20 rectum	459	2.8%	4.1%	20.0	30.5	1.67	226	1.6%	2.3%	8.9	12.9	0.71	685	2.2%	3.3%
C21 anus and anal canal	19	0.1%	0.2%	0.8	1.2	0.07	29	0.2%	0.3%	1.2	1.7	0.09	49	0.2%	0.2%
C19-20 rectosigmoid junction and rectum	568	3.4%	5.1%	24.7	37.7	2.07	290	2.1%	3.0%	11.3	16.6	0.92	858	2.8%	4.1%
C18-20 colorectum	1,476	8.9%	13.3%	63.8	102.2	4.91	1,013	7.2%	10.4%	38.1	59.3	2.92	2,489	8.1%	12.0%
C18-21 colorectum and anus	1,495	9.0%	13.5%	64.6	103.4	4.97	1,043	7.4%	10.7%	39.3	60.9	3.01	2,538	8.3%	12.2%
C22 liver and intrahepatic bile ducts	191	1.1%	1.7%	8.2	12.8	0.66	73	0.5%	0.8%	2.7	4.3	0.20	264	0.9%	1.3%
C23 gallbladder	18	0.1%	0.2%	0.8	1.5	0.04	46	0.3%	0.5%	1.6	2.8	0.11	64	0.2%	0.3%
C24 other and unspecified parts of biliary tract	63	0.4%	0.6%	2.7	4.5	0.20	60	0.4%	0.6%	2.1	3.6	0.14	123	0.4%	0.6%
C25 pancreas	266	1.6%	2.4%	11.5	18.9	0.90	252	1.8%	2.6%	9.1	15.2	0.67	518	1.7%	2.5%
C26 other and ill-defined digestive organs	15	0.1%	0.1%	0.6	1.1	0.04	18	0.1%	0.2%	0.6	1.1	0.03	33	0.1%	0.2%
C30 nasal cavity and middle ear	7	<0.1%	0.1%	0.3	0.4	0.03	8	0.1%	0.1%	0.3	0.5	0.03	15	<0.1%	0.1%
C31 accessory sinuses	7	<0.1%	0.1%	0.3	0.5	0.02	6	<0.1%	0.1%	0.3	0.3	0.03	13	<0.1%	0.1%
C32 larynx	137	0.8%	1.2%	6.0	8.9	0.52	26	0.2%	0.3%	1.1	1.5	0.10	164	0.5%	0.8%
C33 trachea	2	<0.1%	<0.1%	0.1	0.1	<0.01	1	<0.1%	<0.1%	-	-	<0.01	3	<0.1%	<0.1%
C34 bronchus and lung	1,301	7.8%	11.7%	56.1	91.7	4.39	1,077	7.7%	11.1%	41.2	64.6	3.43	2,378	7.8%	11.4%
C33-34 bronchus, lung and trachea	1,303	7.8%	11.7%	56.2	91.8	4.39	1,078	7.7%	11.1%	41.2	64.7	3.43	2,381	7.8%	11.4%
C37 thymus	3	<0.1%	<0.1%	0.1	0.2	0.01	6	<0.1%	0.1%	0.2	0.3	0.02	9	<0.1%	<0.1%

ICD10* cancer site (INCIDENCE)	MALES						FEMALES						ALL		
N# Average annual number of cases 2012-2014 rounded to nearest integer ASR‡ Age-standardised rate/100,000- weighted by ESP~ 1976 and 2013 Risk† Cumulative risk (%) to age 75 years ESP~ European Standard Population	N#	% all invasive	% all invasive excl. NMSC	ASR‡ ESP~ 1976	ASR‡ ESP 2013	Risk† 75Y	N#	% all invasive	% all invasive excl. NMSC	ASR‡ ESP 1976	ASR‡ ESP 2013	Risk† 75Y	N#	% all invasive	% all invasive excl. NMSC
C38 heart, mediastinum and pleura	8	<0.1%	0.1%	0.4	0.6	0.02	4	<0.1%	<0.1%	0.2	0.2	0.01	12	<0.1%	0.1%
C39 other and ill-defined sites in the respiratory system	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
C40 bone and articular cartilage of limbs	11	0.1%	0.1%	0.5	0.5	0.04	11	0.1%	0.1%	0.5	0.5	0.04	22	0.1%	0.1%
C41 bone and articular cartilage of other and unspecified sites	9	0.1%	0.1%	0.4	0.5	0.03	7	<0.1%	0.1%	0.3	0.3	0.03	16	0.1%	0.1%
C43 malignant melanoma of skin	467	2.8%	4.2%	20.2	29.8	1.53	501	3.6%	5.2%	20.0	26.6	1.56	968	3.2%	4.7%
C44 other neoplasms of skin	5,517	33.2%		236.7	388.3	16.10	4,351	31.0%		163.1	253.9	11.70	9,868	32.2%	
C45 mesothelioma	39	0.2%	0.4%	1.7	2.8	0.15	5	<0.1%	0.1%	0.2	0.3	0.02	45	0.1%	0.2%
C46 Kaposi sarcoma	9	0.1%	0.1%	0.4	0.4	0.03	1	<0.1%	<0.1%	-	-	0.01	10	<0.1%	<0.1%
C47 peripheral nerves and autonomic nervous system	2	<0.1%	<0.1%	0.1	0.1	0.01	1	<0.1%	<0.1%	0.1	-	0.01	4	<0.1%	<0.1%
C48 retroperitoneum and peritoneum	6	<0.1%	0.1%	0.3	0.4	0.02	19	0.1%	0.2%	0.7	1.1	0.06	25	0.1%	0.1%
C49 other connective and soft tissue	69	0.4%	0.6%	3.0	4.3	0.22	49	0.3%	0.5%	2.0	2.6	0.15	118	0.4%	0.6%
C50 breast	29	0.2%	0.3%	1.2	2.0	0.11	2,919	20.8%	30.1%	121.6	156.4	9.52	2,947	9.6%	14.2%
C51 vulva							51	0.4%	0.5%	2.0	2.9	0.16	51	0.2%	0.2%
C52 vagina							14	0.1%	0.1%	0.5	0.8	0.03	14	<0.1%	0.1%
C53 cervix uteri							277	2.0%	2.9%	11.5	12.7	0.89	277	0.9%	1.3%
C54 corpus uteri							465	3.3%	4.8%	19.2	26.4	1.69	465	1.5%	2.2%
C55 uterus, part unspecified							21	0.1%	0.2%	0.9	1.2	0.07	21	0.1%	0.1%
C56 ovary							384	2.7%	4.0%	15.4	21.5	1.24	384	1.3%	1.8%
C57 other and unspecified female genital organs							15	0.1%	0.2%	0.6	0.9	0.05	15	<0.1%	0.1%
C58 placenta							2	<0.1%	<0.1%	0.1	0.1	<0.01	2	<0.1%	<0.1%
C51-52,55,57,58 other gynaecological neoplasms							103	0.7%	1.1%	4.1	5.8	0.32	103	0.3%	0.5%
C60 penis	35	0.2%	0.3%	1.5	2.4	0.10							35	0.1%	0.2%
C61 prostate	3,364	20.2%	30.3%	148.4	214.5	13.34							3,364	11.0%	16.2%
C62 testis	172	1.0%	1.5%	7.3	7.0	0.53							172	0.6%	0.8%
C63 other and unspecified male genital organs	4	<0.1%	<0.1%	0.2	0.3	0.01							4	<0.1%	<0.1%
C64 kidney, except renal pelvis	383	2.3%	3.5%	16.7	23.8	1.34	208	1.5%	2.1%	8.3	11.8	0.70	591	1.9%	2.8%
C65 renal pelvis	15	0.1%	0.1%	0.6	1.1	0.04	9	0.1%	0.1%	0.3	0.5	0.03	24	0.1%	0.1%
C66 ureter	16	0.1%	0.1%	0.7	1.2	0.06	8	0.1%	0.1%	0.3	0.5	0.02	24	0.1%	0.1%
C67 bladder	304	1.8%	2.7%	13.0	23.0	0.91	134	1.0%	1.4%	4.7	8.1	0.30	438	1.4%	2.1%
C68 other and unspecified urinary organs	3	<0.1%	<0.1%	0.1	0.2	0.01	2	<0.1%	<0.1%	0.1	0.1	<0.01	5	<0.1%	<0.1%
C69 eye and adnexa	31	0.2%	0.3%	1.4	1.8	0.11	24	0.2%	0.2%	0.9	1.2	0.08	55	0.2%	0.3%
C70 meninges	3	<0.1%	<0.1%	0.1	0.1	0.01	6	<0.1%	0.1%	0.2	0.3	0.01	8	<0.1%	<0.1%
C71 brain	200	1.2%	1.8%	8.7	11.5	0.73	156	1.1%	1.6%	6.3	8.1	0.51	356	1.2%	1.7%
C72 spinal cord, cranial nerves and other parts of CNS	6	<0.1%	0.1%	0.3	0.3	0.02	8	0.1%	0.1%	0.3	0.3	0.02	14	<0.1%	0.1%
C71-72 brain and spinal cord	207	1.2%	1.9%	9.0	11.8	0.75	164	1.2%	1.7%	6.7	8.4	0.53	371	1.2%	1.8%
C73 thyroid gland	75	0.5%	0.7%	3.3	4.0	0.25	206	1.5%	2.1%	8.6	9.7	0.69	281	0.9%	1.4%
C74 adrenal gland	8	<0.1%	0.1%	0.3	0.4	0.03	8	0.1%	0.1%	0.3	0.3	0.02	15	<0.1%	0.1%
C75 other endocrine glands and related structures	7	<0.1%	0.1%	0.3	0.4	0.02	7	<0.1%	0.1%	0.3	0.4	0.02	14	<0.1%	0.1%
C76 other and ill-defined sites	8	<0.1%	0.1%	0.4	0.6	0.03	17	0.1%	0.2%	0.6	1.0	0.04	25	0.1%	0.1%
C77 secondary and unspecified lymph nodes	2	<0.1%	<0.1%	0.1	0.2	0.01	2	<0.1%	<0.1%	0.1	0.1	0.01	5	<0.1%	<0.1%
C80 neoplasm without specification of site	191	1.1%	1.7%	8.2	14.3	0.56	214	1.5%	2.2%	7.4	12.9	0.46	405	1.3%	1.9%
C81 Hodgkin's disease	81	0.5%	0.7%	3.6	3.9	0.29	59	0.4%	0.6%	2.6	2.7	0.20	140	0.5%	0.7%
C82 follicular [nodular] non-Hodgkin's lymphoma	90	0.5%	0.8%	4.0	5.2	0.35	103	0.7%	1.1%	4.3	5.7	0.39	193	0.6%	0.9%
C83 diffuse non-Hodgkin's lymphoma	199	1.2%	1.8%	8.6	12.9	0.66	148	1.1%	1.5%	5.8	8.5	0.47	347	1.1%	1.7%
C84 Peripheral and cutaneous T-cell lymphomas	39	0.2%	0.4%	1.7	2.3	0.14	25	0.2%	0.3%	1.0	1.4	0.10	64	0.2%	0.3%
C85 other and unspecified types of non-Hodgkin lymphoma	92	0.6%	0.8%	3.9	6.3	0.31	75	0.5%	0.8%	2.8	4.4	0.23	167	0.5%	0.8%
C82-85 all non-Hodgkin lymphoma	420	2.5%	3.8%	18.2	26.6	1.46	351	2.5%	3.6%	13.9	20.1	1.18	771	2.5%	3.7%
C81-85 lymphoma (total)	500	3.0%	4.5%	21.8	30.5	1.74	410	2.9%	4.2%	16.5	22.8	1.38	911	3.0%	4.4%

ICD10* cancer site (INCIDENCE)	MALES						FEMALES						ALL		
N# Average annual number of cases 2012-2014 rounded to nearest integer ASR‡ Age-standardised rate/100,000- weighted by ESP~ 1976 and 2013 Risk† Cumulative risk (%) to age 75 years ESP~ European Standard Population	N#	% all invasive	% all invasive excl. NMSC	ASR‡ ESP~ 1976	ASR‡ ESP 2013	Risk† 75Y	N#	% all invasive	% all invasive excl. NMSC	ASR‡ ESP 1976	ASR‡ ESP 2013	Risk† 75Y	N#	% all invasive	% all invasive excl. NMSC
C88 immunoproliferative diseases	10	0.1%	0.1%	0.4	0.8	0.04	4	<0.1%	<0.1%	0.1	0.2	0.01	14	<0.1%	0.1%
C90 multiple myeloma	163	1.0%	1.5%	7.1	11.2	0.54	108	0.8%	1.1%	4.0	6.4	0.31	271	0.9%	1.3%
C91 lymphoid leukaemia	165	1.0%	1.5%	7.2	10.3	0.57	101	0.7%	1.0%	4.1	5.2	0.32	266	0.9%	1.3%
C92 myeloid leukaemia	97	0.6%	0.9%	4.2	6.4	0.28	73	0.5%	0.8%	2.9	4.0	0.24	171	0.6%	0.8%
C93 monocytic leukaemia	2	<0.1%	<0.1%	0.1	0.1	0.01	1	<0.1%	<0.1%	-	-	0.01	2	<0.1%	<0.1%
C94 other leukaemias of specified cell type	6	<0.1%	0.1%	0.3	0.4	0.02	3	<0.1%	<0.1%	0.1	0.1	0.01	9	<0.1%	<0.1%
C95 leukaemia of unspecified cell type	20	0.1%	0.2%	0.9	1.6	0.04	15	0.1%	0.2%	0.4	0.8	0.02	35	0.1%	0.2%
C91-95 Leukaemia (total)	290	1.7%	2.6%	12.6	18.9	0.91	192	1.4%	2.0%	7.6	10.1	0.59	483	1.6%	2.3%
C96 other and unspecified lymphoid and haematopoietic	175	1.1%	1.6%	7.6	12.3	0.55	122	0.9%	1.3%	4.6	7.0	0.37	297	1.0%	1.4%
D00 carcinoma in situ of oral cavity, oesophagus and stomach	12			0.5	0.7	0.05	9			0.3	0.5	0.02	21		
D01 carcinoma in situ of other and unspecified digestive organs	18			0.8	1.1	0.07	15			0.6	0.8	0.05	33		
D02 carcinoma in situ of middle ear and respiratory system	13			0.5	0.8	0.04	10			0.4	0.5	0.04	22		
D03 melanoma in situ	269			11.6	17.3	0.92	301			12.1	16.7	1.01	570		
D04 carcinoma in situ of skin	758			32.6	53.3	2.54	1,067			38.8	65.3	2.96	1,825		
D05 carcinoma in situ of breast	1			0.1	0.1	<0.01	357			16.0	18.2	1.31	358		
D06 carcinoma in situ of cervix uteri							2,873			115.1	106.5	7.95	2,873		
D07 carcinoma in situ of other and unspecified genital organs	72			3.2	4.2	0.31	45			1.9	2.1	0.15	117		
D09 carcinoma in situ of other and unspecified sites	58			2.5	4.0	0.20	18			0.7	1.1	0.07	76		
D32 benign neoplasm of meninges	37			1.6	2.5	0.11	112			4.5	6.2	0.37	149		
D33 benign neoplasm of brain and other parts of CNS	20			0.9	1.0	0.08	19			0.8	1.0	0.06	39		
D32-33 benign neoplasm of meninges, brain & CNS	57			2.5	3.5	0.19	131			5.2	7.1	0.43	188		
D35 benign neoplasm of intracranial endocrine glands	47			2.1	2.6	0.15	40			1.7	1.9	0.14	87		
D37 neoplasm of uncertain/unknown behaviour of oral cavity and digestive organs	30			1.3	1.9	0.11	29			1.2	1.6	0.10	59		
D38 neoplasm of uncertain/unknown behaviour of middle ear and respiratory	5			0.2	0.3	0.02	4			0.2	0.3	0.01	10		
D39 neoplasm of uncertain/unknown behaviour of female genital organs							85			3.6	4.0	0.28	86		
D40 neoplasm of uncertain/unknown behaviour of male genital organs	2			0.1	0.1	<0.01							2		
D41 neoplasm of uncertain/unknown behaviour of urinary organs	194			8.4	13.1	0.65	69			2.7	4.0	0.22	263		
D42 neoplasm of uncertain/unknown behaviour of meninges	9			0.4	0.4	0.03	10			0.4	0.5	0.03	18		
D43 neoplasm of uncertain/unknown behaviour of brain and CNS	25			1.1	1.1	0.08	26			1.1	1.1	0.08	51		
D42-43 neoplasm of uncertain/unknown meninges, brain & CNS	34			1.5	1.5	0.11	36			1.5	1.6	0.11	70		
D44 neoplasm of uncertain/unknown behaviour of endocrine glands	12			0.5	0.6	0.04	13			0.6	0.6	0.05	25		
D47 other neoplasm of uncertain/unknown behaviour of haematopoietic tissue	69			3.0	5.1	0.20	55			2.2	3.3	0.18	125		
D48 neoplasm of uncertain/unknown behaviour of other and unspecified sites	58			2.5	3.9	0.17	46			2.0	2.1	0.15	104		
C71-72, D32-33, D42-43 invasive , benign, uncertain, brain & CNS	298			13.0	16.8	1.04	331			13.5	17.1	1.07	629		

*Incidence figures for C00-C96 and C96 presented in this report include polycythaemia vera, myelodysplastic syndromes and chronic myeloproliferative disease, considered malignant in ICDO3 but previously classed as uncertain behaviour (and previously coded under ICD10 codes D45-D47).

** D00-D48 tumours in this report exclude polycythaemia vera, myelodysplastic syndromes and chronic myeloproliferative disease (see note above).

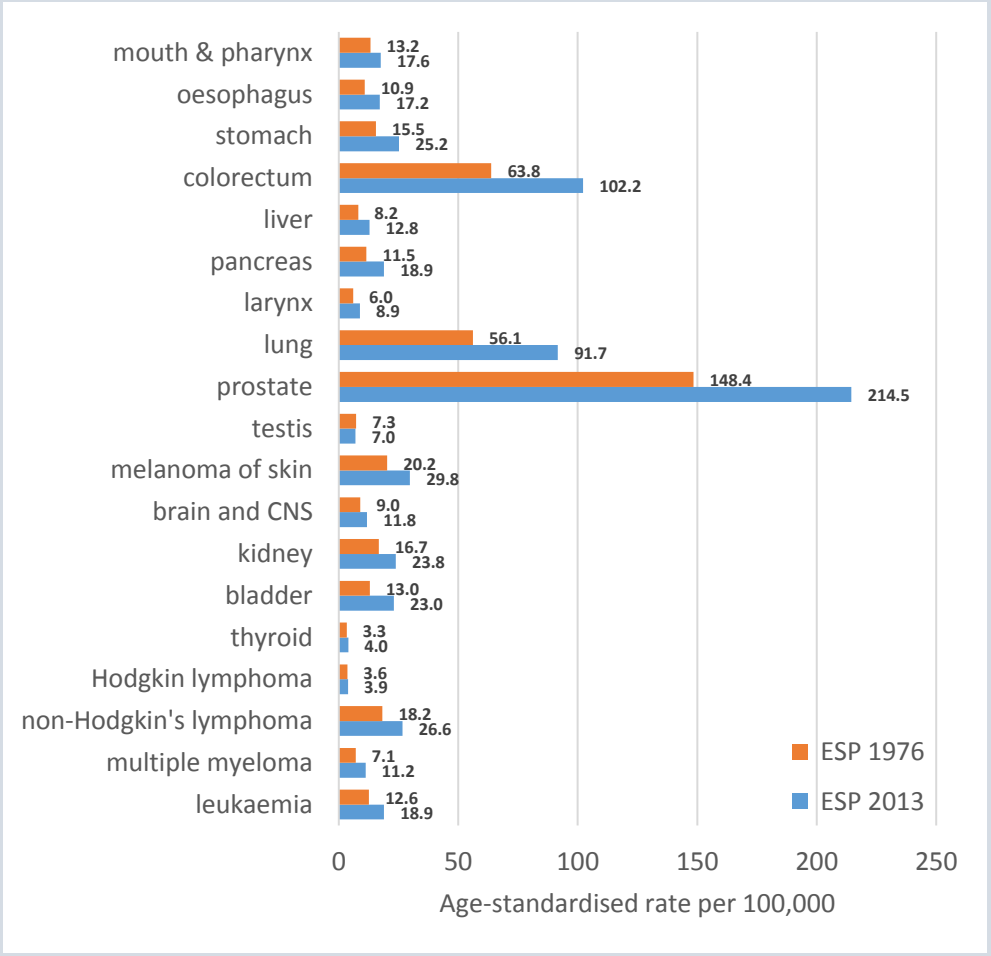
APPENDIX II: SUMMARY TABLE - CANCER DEATHS: ANNUAL AVERAGE 2011-2013

ICD10 cancer site (MORTALITY‡)	MALES				FEMALES				ALL	
N#: Average annual number of deaths 2011-2012 rounded to nearest integer ASR‡: Age-standardised rate/100,000 - weighted by European Standard Population (ESP~) of 1976 Risk†: Cumulative risk of death (%) due to listed cancer up to age 75 years	N#	% of all cancer deaths	ASR‡ ESP~ 1976	Risk† 75Y %	N#	% of all cancer deaths	ASR‡ ESP 1976	Risk† 75Y %	N#	% of all cancer deaths
C00-96 all cancers	4,590	100.0%	203.56	12.7	4,065	100.0%	149.20	10.1	8,655	100.0%
C00-96/C33-34 all cancers but lung & trachea	3,511	76.5%	155.82	9.5	3,317	81.6%	121.05	8.1	6,828	78.9%
C00-14 mouth & pharynx	117	2.5%	5.27	0.4	48	1.2%	1.82	0.1	165	1.9%
C00-15,C32 mouth, pharynx, larynx and oesophagus	411	9.0%	18.44	1.5	185	4.6%	6.66	0.5	597	6.9%
C11 nasopharynx	7	0.1%	0.31	<0.1	3	0.1%	0.13	<0.1	10	0.1%
C15 oesophagus	240	5.2%	10.72	0.8	129	3.2%	4.52	0.3	369	4.3%
C16 stomach	193	4.2%	8.59	0.6	119	2.9%	4.17	0.3	313	3.6%
C18 colon	290	6.3%	12.89	0.8	247	6.1%	8.30	0.5	537	6.2%
C19-21 rectum and anus	305	6.6%	13.49	0.9	177	4.3%	6.45	0.4	481	5.6%
C18-21 colon, rectum and anus	594	12.9%	26.37	1.7	424	10.4%	14.75	0.9	1,018	11.8%
C17-21 intestine	605	13.2%	26.84	1.7	436	10.7%	15.18	1.0	1,041	12.0%
C22 liver	157	3.4%	6.95	0.5	111	2.7%	3.87	0.2	268	3.1%
C22-24 liver and biliary passages	176	3.8%	7.78	0.6	142	3.5%	4.96	0.3	318	3.7%
C23-24 gallbladder	19	0.4%	0.84	<0.1	31	0.8%	1.09	0.1	50	0.6%
C25 pancreas	246	5.4%	10.90	0.8	237	5.8%	8.48	0.6	483	5.6%
C32 larynx	55	1.2%	2.45	0.2	8	0.2%	0.33	<0.1	63	0.7%
C33-34 lung	1,079	23.5%	47.74	3.5	749	18.4%	28.15	2.1	1,827	21.1%
C43 melanoma of skin	89	1.9%	3.96	0.3	70	1.7%	2.56	0.2	159	1.8%
C45 mesothelioma	33	0.7%	1.43	0.1	4	0.1%	0.16	<0.1	37	0.4%
C50 breast					694	17.1%	26.55	2.0	694	8.0%
C53 cervix uteri					89	2.2%	3.77	0.3	89	1.0%
C53-55 uterus					195	4.8%	7.66	0.6	195	2.3%
C54 corpus uteri					82	2.0%	3.01	0.2	82	0.9%
C56 ovary					272	6.7%	10.58	0.8	272	3.1%
C61 prostate	527	11.5%	23.39	1.0					527	6.1%
C62 testis	7	0.2%	0.30	<0.1					7	0.1%
C64 kidney	144	3.1%	6.41	0.5	70	1.7%	2.58	0.2	214	2.5%
C67 bladder	141	3.1%	6.24	0.3	72	1.8%	2.24	0.1	213	2.5%
C70-72 brain & CNS	157	3.4%	6.96	0.6	108	2.7%	4.40	0.4	265	3.1%
C73 thyroid	10	0.2%	0.45	<0.1	18	0.5%	0.66	<0.1	29	0.3%
C81 Hodgkin lymphoma	12	0.3%	0.53	<0.1	12	0.3%	0.47	<0.1	24	0.3%
C82-85 non-Hodgkin lymphoma	134	2.9%	5.94	0.3	130	3.2%	4.66	0.3	264	3.0%
C90 multiple myeloma	94	2.0%	4.15	0.3	79	2.0%	2.65	0.2	173	2.0%
C91-95 leukaemia	161	3.5%	7.05	0.4	104	2.6%	3.65	0.2	264	3.1%

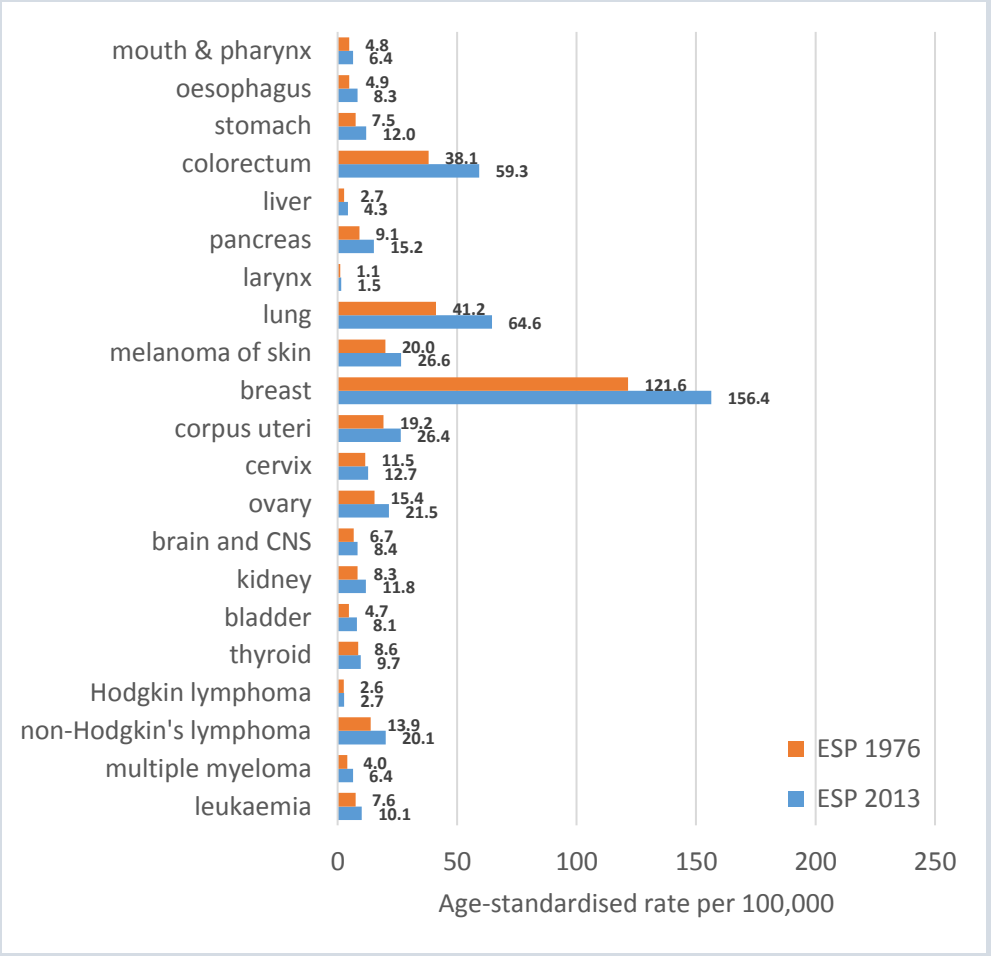
‡Data abstracted from the WHO mortality database [3]

APPENDIX III: COMPARISON OF INCIDENCE RATES FOR 2012-2014 USING 1976 AND 2013 EUROPEAN STANDARD POPULATION WEIGHTS

MALES



FEMALES



Comparison of incidence rates standardised using the 'old' (1976) and 'new' (2013) European standard populations

The age-standardised (ASR) rate for any specified disease is the annual rate of newly diagnosed cases (or deaths) in a given population (and year), expressed per 100,000 persons, weighted by the age-structure of a defined 'standard' population in order to allow meaningful comparisons between different European countries or over time.

By convention for European cancer registries, age-standardised rates for incidence and mortality are typically weighted by the European standard population (ESP) as defined in 1976 [4]. However, in this report (Appendix I and III) the NCR has also presented rates weighted by the 2013 ESP proposed by EUROSTAT to more accurately reflect the demographic age shift in the European population since 1976 [20]. The 2013 ESP is a better reflection of the current population structure than the ESP of 1976, and gives older ages a greater weight than the 1976 ESP (see Methods section).

In general, incidence rates for cancer sites during 2012-2014 tended to be higher when calculated using the more recent age weights (ESP 2013). This is more apparent for cancer sites with older median age of incidence, e.g. bladder cancer (74 years), which tended to have a much greater relative difference in rates between the ESP 1976 and ESP 2013 calculations than cancers with a lower median age at diagnosis, e.g. Hodgkin lymphoma (38 years).

The NCR will continue to publish incidence rates using the 1976 standard population but with rates also provided based on the 2013 standard, both in published reports and (when the necessary programming has been completed) on the NCR website. For this report we were not able to provide mortality rates using the 2013 ESP age weights because the WHO mortality statistics were only available in the conventional 18 category age bands.

APPENDIX IV: PREVALENCE OF INVASIVE CANCER (EXCLUDING NMSC) AT THE END OF 2014 – NUMBERS OF CANCER SURVIVORS BY DIAGNOSIS PERIOD

	Diagnosis period (years since diagnosis) and % of cancer survivors who were diagnosed in each period											
Cancer site & ICD10 code	**1994-2014**		**2013-2014**		**2010-2012**		**2005-2009**		**2000-2004**		**1994-1999**	
	(0-21]	**%**	**(0-<2]**	**%**	**(2-<5]**	**%**	**(5-<10]**	**%**	**(10-<15]**	**%**	**(>15]**	**%**
C00-43, C45-96 all invasive	139,526	100.0%	29,285	21%	34,044	24%	38,531	28%	23,004	16%	14,662	11%
C50 breast	31,655	100.0%	5,639	18%	7,266	23%	9,063	29%	5,872	19%	3,815	12%
C61 prostate	30,642	100.0%	6,380	21%	8,906	29%	9,614	31%	4,596	15%	1,146	4%
C18-20 colorectum	17,136	100.0%	3,862	23%	4,199	25%	4,524	26%	2,618	15%	1,933	11%
C43 melanoma of skin	9,254	100.0%	1,922	21%	2,211	24%	2,390	26%	1,560	17%	1,171	13%
C82-85 non-Hodgkin	5,932	100.0%	1,251	21%	1,432	24%	1,621	27%	1,001	17%	627	11%
C33-34 lung	4,791	100.0%	2,136	45%	1,183	25%	823	17%	379	8%	270	6%
C54 corpus uteri	4,183	100.0%	831	20%	976	23%	1,100	26%	722	17%	554	13%
C91-95 leukaemia	4,052	100.0%	680	17%	946	23%	1,215	30%	740	18%	471	12%
C64 kidney	3,851	100.0%	898	23%	1,048	27%	1,021	27%	534	14%	350	9%
C67 bladder	3,659	100.0%	629	17%	656	18%	931	25%	776	21%	667	18%
C53 cervix uteri	3,128	100.0%	480	15%	712	23%	890	28%	542	17%	504	16%
C62 testis	2,749	100.0%	329	12%	512	19%	833	30%	597	22%	478	17%
C01-14 mouth & pharynx	2,416	100.0%	646	27%	642	27%	610	25%	303	13%	215	9%
C73 thyroid gland	2,279	100.0%	549	24%	654	29%	600	26%	282	12%	194	9%
C56 ovary	2,183	100.0%	527	24%	489	22%	495	23%	352	16%	320	15%
C16 stomach	1,855	100.0%	614	33%	461	25%	388	21%	217	12%	175	9%
C81 Hodgkin lymphoma	1,729	100.0%	270	16%	354	20%	448	26%	357	21%	300	17%
C71-72 brain and spinal cord	1,382	100.0%	395	29%	292	21%	287	21%	207	15%	201	15%
C90 multiple myeloma	1,358	100.0%	449	33%	404	30%	332	24%	110	8%	63	5%
C32 larynx	1,197	100.0%	270	23%	304	25%	314	26%	184	15%	125	10%
C15 oesophagus	1,038	100.0%	412	40%	232	22%	227	22%	105	10%	62	6%
C51-52,55,57,58 gynaecological	752	100.0%	156	21%	179	24%	205	27%	120	16%	92	12%
C25 pancreas	659	100.0%	352	53%	129	20%	92	14%	47	7%	39	6%
C22 liver	498	100.0%	232	47%	136	27%	76	15%	40	8%	14	3%
C17 small intestine	432	100.0%	123	28%	120	28%	97	22%	58	13%	34	8%
C40 bone	234	100.0%	36	15%	46	20%	48	21%	53	23%	51	22%
C45 mesothelioma	59	100.0%	37	63%	12	20%	3	5%	2	3%	5	8%

APPENDIX V: PREVALENCE OF INVASIVE CANCER (EXCLUDING NMSC) – PERCENTAGE OF PATIENTS DIAGNOSED IN EACH PERIOD WHO WERE STILL ALIVE AT THE END OF 2014

	Diagnosis period (years since diagnosis) and % of incident cases in each period still alive at 31/12/2014											
Cancer site & ICD10 code	**1994-2014**		**2013-2014**		**2010-2012**		**2005-2009**		**2000-2004**		**1994-1999**	
	(0-21]	**alive %**	**(0-<2]**	**alive %**	**(2-<5]**	**alive %**	**(5-<10]**	**alive %**	**(10-<15]**	**alive %**	**(>15]**	**alive %**
C00-43, C45-96 all invasive cancers	139,526	43	29,285	77	34,044	61	38,531	47	23,004	32	14,662	20
C62 testis	2,749	94	329	99	512	96	833	96	597	93	478	85
C81 Hodgkin lymphoma	1,729	77	270	92	354	86	448	79	357	76	300	61
C73 thyroid	2,279	79	549	92	654	89	600	82	282	64	194	52
C43 melanoma of skin	9,254	71	1,922	95	2,211	83	2,390	69	1,560	61	1,171	50
C53 cervix uteri	3,128	63	480	89	712	76	890	64	542	54	504	47
C54 corpus uteri	4,183	64	831	89	976	77	1,100	65	722	54	554	43
C40 bone	234	58	36	88	46	66	48	60	53	56	51	43
C50 breast	31,655	66	5,639	95	7,266	85	9,063	72	5,872	55	3,815	38
C82-C85 non-Hodgkin lymphoma	5,932	50	1,251	80	1,432	65	1,621	54	1,001	39	627	26
C67 bladder	3,659	38	629	71	656	50	931	40	776	33	667	24
C64 kidney	3,851	46	898	77	1,048	63	1,021	46	534	30	350	23
C51-52,55,57,58 gynaecological	752	43	156	78	179	57	205	44	120	34	92	23
C91-95 Leukaemia	4,052	42	680	75	946	59	1,215	48	740	32	471	21
C32 larynx	1,197	42	270	84	304	61	314	44	184	29	125	19
C18-20 colorectum	17,136	40	3,862	80	4,199	58	4,524	41	2,618	27	1,933	18
C56 ovary	2,183	31	527	69	489	44	495	29	352	21	320	18
C17 small intestine	432	38	123	68	120	55	97	35	58	24	34	16
C61 prostate	30,642	63	6,380	96	8,906	86	9,614	70	4,596	43	1,146	15
C01-14 mouth & pharynx	2,416	39	646	78	642	56	610	40	303	25	215	15
C71-72 brain and spinal cord	1,382	22	395	53	292	28	287	18	207	14	201	13
C16 stomach	1,855	18	614	54	461	28	388	16	217	9	175	6
C90 multiple myelomas	1,358	29	449	81	404	54	332	27	110	10	63	6
C45 mesothelioma	59	10	37	45	12	10	3	2	2	2	5	5
C15 oesophagus	1,038	15	412	53	232	21	227	13	105	6	62	4
C22 liver	498	16	232	43	136	21	76	9	40	7	14	4
C33-34 lung	4,791	12	2,136	45	1,183	17	823	8	379	4	270	3
C25 pancreas	659	8	352	33	129	9	92	4	47	3	39	2

APPENDIX VI: 5-YEAR AND 10-YEAR NET SURVIVAL – OVERALL (AGE-STANDARDISED) AND BY AGE-GROUP

Cancer		5-yr net survival (with 95% CI[2])						10-yr net survival (with 95% CI)					
(ICD10 code)	Sex	All ages[1]	15-44	45-54	55-64	65-74	75-99	All ages	15-44	45-54	55-64	65-74	75-99
All cancers ex NMSC[3]	All	**61.1%**	82.8%	75.6%	69.9%	62.6%	41.6%	**56.6%**	77.7%	70.2%	64.5%	57.2%	39.0%
(C00-C43,45-97)		**60.7-61.5%**	81.9-83.5%	74.7-76.3%	69.2-70.5%	61.8-63.2%	40.6-42.5%	**55.9-57.1%**	76.6-78.6%	69.1-71.0%	63.6-65.2%	56.2-58.1%	37.1-40.7%
All cancers ex NMSC	Male	**61.7%**	79.0%	69.2%	69.7%	66.2%	43.7%	**57.8%**	75.5%	64.3%	64.8%	61.8%	41.1%
(C00-C43,45-97)		**61.1-62.2%**	77.4-80.4%	67.8-70.5%	68.7-70.5%	65.2-67.0%	42.3-44.9%	**56.8-58.7%**	73.8-77.0%	62.6-65.8%	63.7-65.9%	60.5-63.0%	38.3-43.8%
All ex NMSC	Female	**59.5%**	85.0%	79.9%	70.2%	56.5%	39.3%	**54.2%**	78.8%	74.2%	64.1%	49.7%	36.6%
(C00-C43,45-97)		**58.9-60.0%**	83.9-85.9%	78.8-80.8%	69.2-71.1%	55.3-57.6%	38.0-40.6%	**53.3-54.9%**	77.6-80.0%	72.9-75.3%	62.9-65.2%	48.3-51.0%	34.3-38.7%
Head & neck[4]	All	**49.5%**	81.6%	60.2%	56.7%	47.7%	33.4%	**39.8%**	77.2%	51.6%	46.5%	38.6%	21.7%
(C01-06,09-13)		**46.0-52.9%**	73.2-87.5%	54.1-65.7%	51.5-61.4%	41.5-53.6%	24.4-42.6%	**33.4-46.1%**	67.8-84.1%	44.9-57.8%	40.4-52.3%	31.4-45.6%	6.2-43.1%
Oesophagus	All	**21.5%**	31.9%	32.1%	26.4%	23.7%	8.4%	**18.3%**	23.7%	26.2%	23.0%	19.9%	8.4%
(C15)		**19.2-23.7%**	19.2-45.1%	24.6-39.7%	21.8-31.2%	19.6-27.9%	5.9-11.5%	**15.8-20.7%**	12.3-37.1%	18.9-33.9%	18.2-28.0%	14.8-25.4%	5.7-11.7%
Stomach	All	**27.3%**	37.1%	32.5%	29.9%	31.3%	16.8%	**24.5%**	35.8%	28.2%	28.6%	28.4%	13.0%
(C16)		**25.2-29.3%**	28.7-45.4%	26.0-39.1%	25.5-34.3%	27.5-35.1%	13.5-20.2%	**21.9-27.0%**	27.3-44.3%	21.7-34.9%	24.0-33.2%	23.7-33.2%	8.2-18.8%
Colon & rectum	All	**62.6%**	74.2%	69.0%	66.4%	64.7%	52.0%	**57.0%**	69.6%	60.8%	58.9%	58.9%	49.1%
(C18-21)		**61.4-63.6%**	69.8-78.0%	66.0-71.7%	64.2-68.3%	62.6-66.6%	49.4-54.3%	**55.1-58.9%**	64.7-73.8%	57.4-63.8%	56.4-61.2%	56.2-61.3%	43.5-54.4%
Liver	All	**16.4%**	34.3%	19.6%	21.4%	14.4%	8.6%	**10.6%**	25.8%	15.0%	12.8%	11.8%	2.1%
(C22)		**13.6-19.0%**	21.8-47.1%	11.9-28.6%	15.8-27.5%	9.8-19.8%	4.9-13.6%	**7.7-13.5%**	10.7-43.9%	8.0-24.0%	7.7-19.3%	6.9-18.1%	0.1-10.1%
Pancreas	All	**9.7%**	27.3%	14.2%	11.1%	8.4%	4.0%	**7.5%**	27.3%	10.6%	7.0%	6.6%	2.7%
(C25)		**8.1-11.3%**	14.8-41.2%	9.4-19.9%	8.1-14.5%	6.2-11.0%	2.5-5.8%	**5.8-9.2%**	14.8-41.2%	6.2-16.3%	3.8-11.4%	4.3-9.6%	1.2-5.1%
Lung & trachea	All	**17.9%**	51.8%	19.7%	19.6%	16.1%	9.6%	**15.1%**	47.3%	17.2%	16.0%	11.6%	9.4%
(C33-34)		**16.9-18.8%**	44.0-59.0%	16.7-22.8%	17.7-21.3%	14.6-17.5%	8.2-11.0%	**14.0-16.2%**	38.9-55.2%	14.2-20.2%	14.1-17.8%	10.0-13.2%	7.5-11.5%
Melanoma skin	All	**88.7%**	92.3%	90.9%	89.4%	88.3%	78.6%	**85.7%**	89.6%	86.1%	85.0%	87.1%	76.7%
(C43)		**87.3-90.1%**	90.2-93.9%	88.0-93.1%	86.3-91.8%	84.5-91.1%	71.3-84.1%	**83.3-88.1%**	87.1-91.5%	82.2-89.2%	80.8-88.3%	80.7-91.4%	60.7-86.8%
Breast	Female	**82.9%**	87.9%	91.6%	90.9%	84.2%	70.5%	**75.1%**	79.0%	86.1%	84.2%	75.3%	62.4%
(C50)		**81.7-84.1%**	86.2-89.3%	90.5-92.5%	89.7-91.9%	82.2-86.0%	66.8-73.8%	**73.1-77.1%**	76.9-80.9%	84.6-87.3%	82.5-85.7%	72.3-77.9%	55.7-68.2%
Cervix uteri	Female	**62.3%**	85.3%	74.2%	60.4%	45.4%	28.9%	**55.2%**	80.0%	66.8%	50.0%	37.9%	24.3%
(C53)		**59.1-65.4%**	82.5-87.6%	68.6-78.8%	53.5-66.5%	34.9-55.3%	17.9-40.6%	**51.2-59.1%**	76.5-82.9%	60.5-72.2%	42.0-57.3%	26.6-49.0%	9.7-42.3%
Corpus uteri	Female	**76.2%**	84.9%	91.4%	84.4%	79.1%	58.3%	**70.9%**	83.5%	87.1%	81.4%	77.1%	46.7%
(C54)		**73.2-79.0%**	74.1-91.4%	87.1-94.2%	80.9-87.2%	74.4-83.0%	49.5-66.1%	**66.3-75.5%**	72.4-90.4%	81.5-91.0%	77.1-85.0%	70.5-82.3%	32.1-59.9%
Ovary & related	Female	**34.4%**	69.0%	56.7%	40.0%	29.3%	17.4%	**28.9%**	59.5%	48.8%	32.5%	22.8%	16.7%
(C56,C57.0-C57.7)		**31.8-36.8%**	61.4-75.2%	50.3-62.5%	35.0-44.7%	24.5-34.2%	12.8-22.5%	**26.0-31.8%**	51.5-66.5%	42.3-54.8%	27.6-37.4%	17.9-27.9%	10.4-24.2%
Testis[5]	Male	**96.3%**	98.1%	96.8%	84.5%	-	-	**95.5%**	97.8%	96.8%	80.7%	-	-
(C62)		**93.9-98.5%**	96.6-98.9%	89.6-99.0%	56.9-95.0%			**92.9-98.1%**	96.0-98.7%	89.6-99.0%	52.6-93.0%		
Kidney & related	All	**60.3%**	79.0%	75.4%	66.5%	62.3%	42.5%	**49.5%**	71.7%	71.6%	58.6%	50.6%	26.8%
(C64-66,68)		**57.7-62.7%**	72.7-83.9%	70.3-79.7%	62.3-70.3%	57.6-66.5%	36.3-48.4%	**46.1-52.9%**	64.2-77.8%	65.6-76.6%	53.5-63.3%	44.4-56.4%	18.4-35.8%
Brain (malignant)	All	**25.2%**	59.2%	26.5%	10.1%	6.6%	4.8%	**19.9%**	45.1%	21.8%	8.5%	5.4%	4.8%
(C71)		**23.0-27.3%**	53.4-64.4%	20.2-33.0%	6.9-14.0%	3.9-10.1%	2.2-8.9%	**17.6-22.1%**	39.0-50.9%	15.9-28.2%	5.4-12.4%	2.7-9.5%	2.1-9.1%
Non-Hodgkin lymphoma	All	**67.2%**	86.9%	85.4%	77.5%	69.9%	44.0%	**61.0%**	85.0%	78.8%	70.0%	59.5%	42.4%
(C82-85)		**65.1-69.2%**	83.0-89.9%	81.6-88.4%	73.8-80.7%	65.9-73.5%	38.7-49.1%	**57.6-64.4%**	80.7-88.3%	74.0-82.7%	65.3-74.0%	54.0-64.5%	32.6-51.7%
Leukaemia	All	**61.6%**	71.4%	80.6%	75.0%	59.8%	42.5%	**52.3%**	66.4%	72.9%	65.8%	45.0%	37.0%
(C91-95)		**59.1-64.0%**	65.5-76.4%	74.7-85.3%	70.1-79.2%	54.8-64.3%	36.8-47.9%	**48.4-56.1%**	60.2-71.8%	66.0-78.5%	59.9-70.9%	39.2-50.4%	26.2-47.6%
		All ages	**15-54**	**55-64**	**65-74**	**75-84**	**85-99**	**All ages**	**15-54**	**55-64**	**65-74**	**75-84**	**85-99**
Prostate	Male	**92.1%**	97.8%	97.5%	98.1%	84.1%	55.4%	**88.7%**	97.6%	96.0%	96.7%	75.6%	44.5%
(C61)		**91.1-93.0%**	96.2-98.7%	96.5-98.1%	96.7-98.9%	81.0-86.7%	45.3-64.2%	**86.8-90.5%**	94.7-98.6%	94.2-97.1%	93.9-98.2%	69.7-80.4%	21.5-59.9%

[1] 5-year and 10-year net survival (age-standardised for ages 15-99 combined and age-specific survival) for invasive cancers in Ireland: 2010-2014 (cases diagnosed or followed-up during this period) survival for all ages 15-99 is standardised to the standard populations recommended by Corazziari et al. (2004). The age-groups used differ for prostate cancer, giving greater weighting to older patients, while greater weighting is given to younger patients for melanoma [17]

[2] 95% confidence interval. [3] Non-melanoma skin cancer.

[4] Head & neck cancer definition here is the one used by EUROCARE, which excludes lip, salivary glands and unspecified subsites.

[5] Only ages 15-64 are included, by international convention, in age-standardised estimates of testicular cancer survival.