# ALL CANCER (EXCLUDING NMSC)

| AVERAGE NUMBER OF CASES PER YEAR (2010-2014) | | | AVERAGE NUMBER OF DEATHS PER YEAR (2010-2014) | | |
|---|---|---|---|---|---|
| Male | Female | Both sexes | Male | Female | Both sexes |
| 4,426 | 4,393 | 8,819[1] | 2,153 | 1,965 | 4,118 |
| **FIVE-YEAR SURVIVAL (2005-2009)** | | | **22-YEAR PREVALENCE (2014)** | | |
| Male | Female | Both sexes | Male | Female | Both sexes |
| 52.3% | 55.7% | 53.6% | 24,386 | 31,335 | 55,721 |

## INCIDENCE

From 2010 to 2014, on average, there were 4,426 male and 4,393 female patients diagnosed with cancer each year excluding Non-Melanoma Skin Cancer (NMSC). There were an additional 1,946 male and 1,504 female patients diagnosed with NMSC. The lifetime risk of developing a cancer (excluding NMSC) was 1 in 3.4 for men and 1 in 3.8 for women.

### Incidence trends

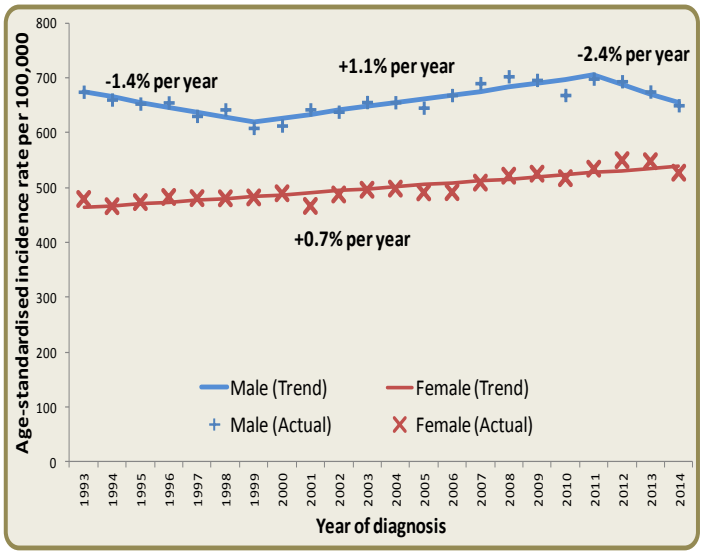
*Table 1: Incidence of cancer by sex and year of diagnosis: 2005-2014*

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male | 3,619 | 3,793 | 4,061 | 4,173 | 4,223 | 4,145 | 4,454 | 4,523 | 4,520 | 4,486 |
| Female | 3,648 | 3,699 | 3,874 | 4,049 | 4,112 | 4,123 | 4,317 | 4,503 | 4,568 | 4,454 |
| Both sexes | 7,267 | 7,492 | 7,935 | 8,222 | 8,335 | 8,268 | 8,771 | 9,026 | 9,088 | 8,940 |

Over the last ten years the number of cancer cases has increased from 3,619 among men and 3,648 among women in 2005 to 4,486 among men and 4,454 among women in 2014. This increase is largely due to an increasing number of older people in the population.

After accounting for our aging population, cancer incidence rates increased among males during 1999-2011 by an average of 1.1% per year, with evidence of a slowing from 2011-2014. From 1993-2014, female incidence rates increased steadily by an average of 0.7% per year.

*Figure 1: Trends in cancer incidence rates by sex: 1993-2014*




[1] Mean yearly incidence data for period 2010-2014 has been rounded to nearest integer, and thus some numbers in tables will not add to give the exact total.

## Incidence and age

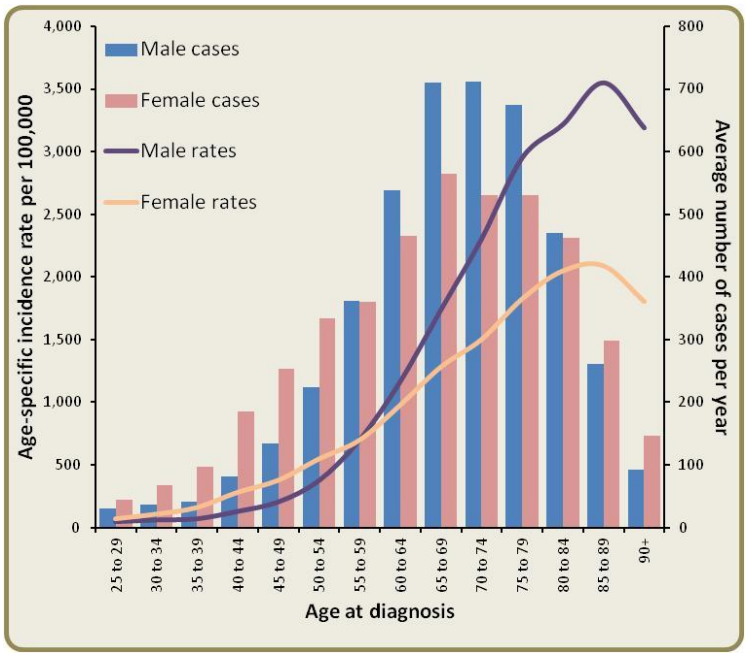
Cancer risk is strongly related to age with over 60% of cancers occurring in those aged over 65 and incidence rates greatest for those aged 80-89 in both men and women.

*Table 2: Average number of cancers diagnosed per year by sex and age: 2010-2014*

| Age (years) | Male | Female | Total |
|---|---|---|---|
| 0 to 49 | 384 | 701 | 1,086 |
| 50 to 64 | 1,124 | 1,159 | 2,283 |
| 65 to 74 | 1,422 | 1,095 | 2,517 |
| 75 and over | 1,497 | 1,437 | 2,933 |
| All ages | 4,426 | 4,393 | 8,819 |

Due to rounding of yearly averages, 'All ages' may not equal the sum of age categories in tables.

*Figure 2: Incidence of cancer by age and sex: 2010-2014*




## Cancer site

Cancer can occur in many different parts of the body, some more common than others and with considerable variation between males and females. The most common cancers among males between 2010 and 2014 were prostate, colorectal, lung, lymphomas and head & neck (Fig. 3) while the most common cancers among women were breast, colorectal, lung and body of uterus (Fig. 4).

*Figure 3: The most common cancers (excluding NMSC) diagnosed in men: annual incidence 2010-2014*

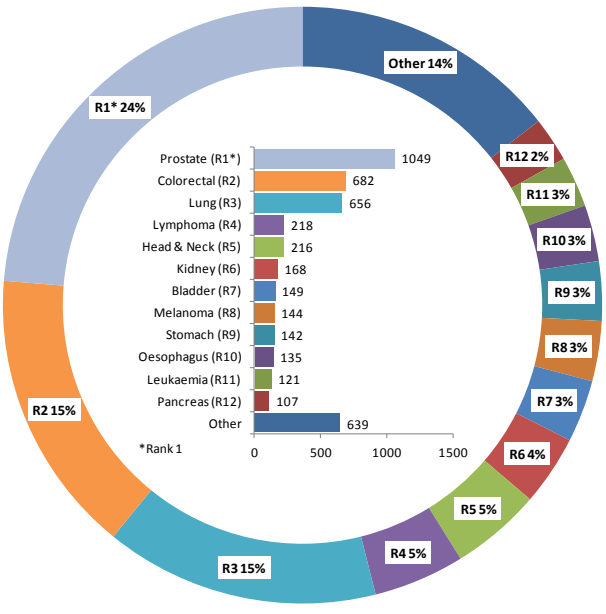
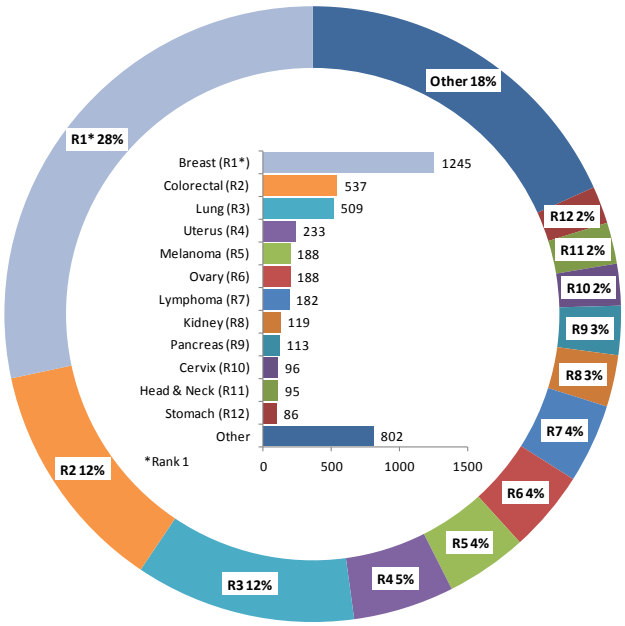



*Figure 4: The most common cancers (excluding NMSC) diagnosed in women: annual incidence 2010-2014*



## Age at diagnosis by cancer site 2010-2014

Age at diagnosis varied by cancer site. Overall the median age at diagnosis was 69 years and was higher among males (69 years) than females (68 years). In men, the median age ranged from 60 years for brain and CNS cancers to 74 years for bladder cancer. In women, the median age ranged from 40 years for cervical cancer to 76 years for stomach cancer. The most common cancers, breast cancer among females and prostate cancer among males, had a median age at diagnosis of 63 years and 70 years, respectively.

*Figure 5: The median age of male cancer patients by cancer site*

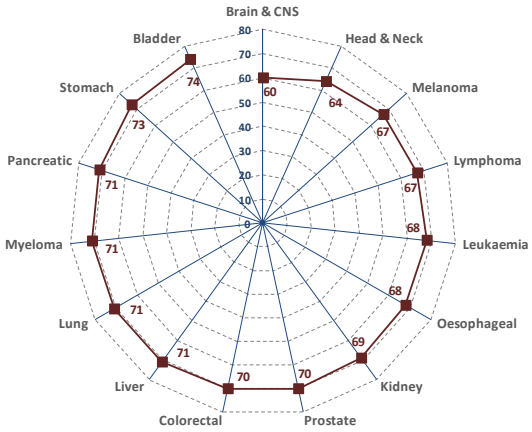
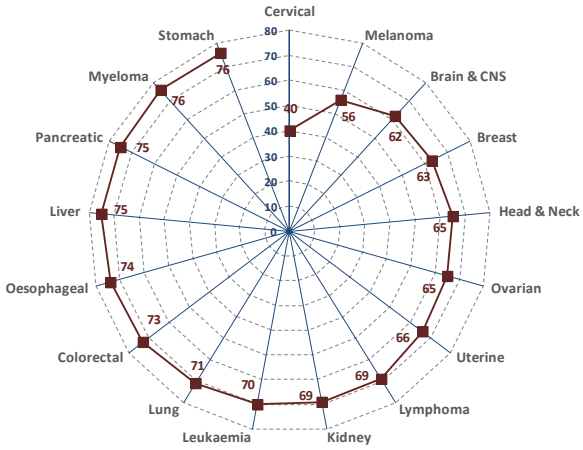


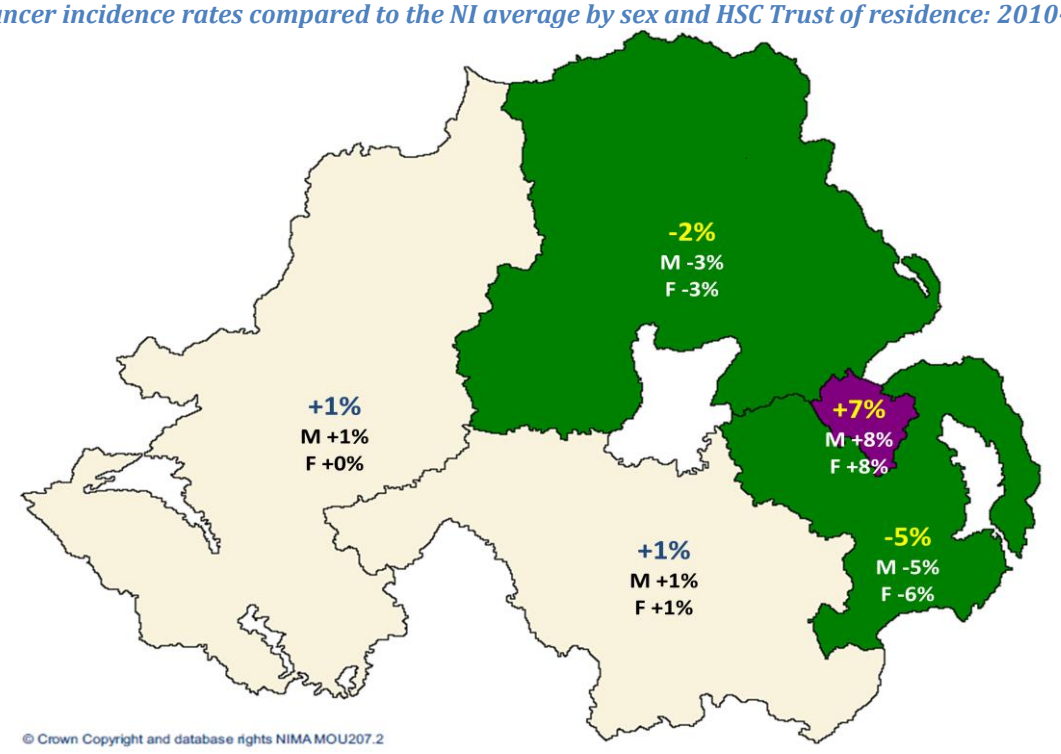

*Figure 6: The median age of female cancer patients by cancer site*




## Incidence by Trust area

Incidence rates of cancer (excluding NMSC) in 2010-2014 were 7% higher among people living in Belfast HSCT area than the NI average. Rates were lower than the NI average for those living in the Northern and South-Eastern Trust area.

*Figure 7: Cancer incidence rates compared to the NI average by sex and HSC Trust of residence: 2010-2014*




*Significantly higher than average*

*Significantly lower than average*

## Incidence by deprivation

Some geographical variation is due to a relationship between cancer and socio-economic deprivation. Cancer incidence is higher in the most deprived communities in Northern Ireland though this varies significantly by cancer site. Incidence of cancer of the head & neck, oesophagus, stomach, lung, liver, pancreas, male-colorectal, bladder and cervix are higher in more deprived areas while incidence of melanoma, non-melanoma skin and prostate cancer are higher in the least deprived communities.

*Figure 8: All cancer incidence rates compared to the NI average by sex and deprivation quintile: 2010-2014*

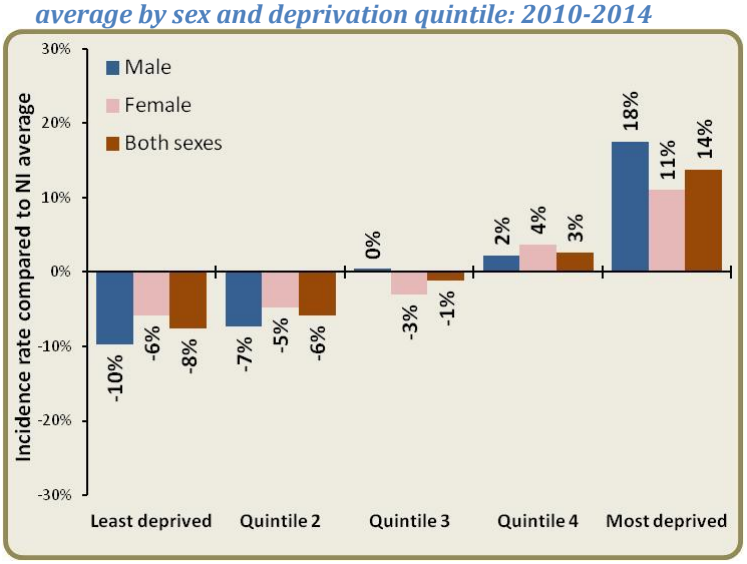



*Table 3: The relationship between cancer incidence rates and socio-economic deprivation*

| Incidence rates higher in deprived than affluent areas | No significant relationship | Incidence rates higher in affluent than deprived areas |
|---|---|---|
| Head & neck, oesophagus, stomach, lung, liver, pancreas, male-colorectal, bladder, cervix | Uterus, Ovary, Testes, Leukaemia | Melanoma, Non-melanoma skin, Prostate |

# SURVIVAL

## Overall survival

The net survival was 70.1% at one year, and 54.3% at five years for patients diagnosed in 2005 to 2009.

*Table 4: Five-year survival by sex: patients diagnosed 2005-2009*

| Time since diagnosis | Diagnosed 2005-2009 | | |
|---|---|---|---|
| | Male | Female | Both sexes |
| 6 months | 76.8% | 77.7% | 77.4% |
| 1 year | 68.9% | 71.0% | 70.1% |
| 5 years | 52.3% | 55.7% | 54.3% |

## Survival Trends

Five-year survival from cancer has improved when we compare patients diagnosed from 1993 to 1999 to those diagnosed from 2005 to 2009; increasing from 37.3% to 52.3% for men and from 47.8% to 55.7% for women.

*Table 6: Five-year survival by period of diagnosis and sex*

| Period of diagnosis | Male | Female | Both sexes |
|---|---|---|---|
| 1993-1999 | 37.3% | 47.8% | 43.0% |
| 2000-2004 | 45.4% | 52.0% | 49.1% |
| 2005-2009 | 52.3% | 55.7% | 54.3% |

### Survival and cancer site

Survival varied by cancer site with estimates of five-year (age-standardised) net survival for male patients diagnosed 2005-2009 ranging from 5.8% for pancreatic cancer to 98.8% for testicular cancer. Among females five-year (age-standardised) net survival ranged from 5.3% for pancreatic cancer to 92.5% for malignant melanoma. Comparisons of five-year survival for patients diagnosed 2005-2009 to those diagnosed 1993-1999 show survival improvements for most cancers in males and females. Three of the four most common cancers showed strong improvement.

*Table 7: Five-year age-standardised net survival of patients diagnosed 2005-2009 compared to patients diagnosed 1993-1999 by site*

| | 1993-1999 | | 2005-2009 | |
|---|---|---|---|---|
| Site (ICD10 code[1]) | Male | Female | Male | Female |
| All Cancers excluding NMSC (C00-C43,C45-C97) | 37.3% | 47.8% | 52.3% | 55.7% |
| Bladder (C67) | 60.4% | 48.4% | 59.1% | 48.5% |
| Brain and other CNS (C70-C72,C75.1-C75.3) | 16.3% | 22.0% | 23.7% | 24.6% |
| Breast (C50) | - | 75.0% | - | 80.9% |
| Cervix (C53) | - | 57.8% | - | 65.9% |
| Childhood cancer (C00-C97,ex C44) | 72.8%[3] | 74.4%[3] | 73.8%[3] | 86.3[3] |
| Colon (C18) | 50.3% | 51.3% | 55.3% | 57.3% |
| Colorectal (C18-C20) | 49.2% | 50.3% | 55.3% | 57.5% |
| Head and Neck (C00-C14; C30-C32) | 52.6% | 49.5% | 55.4% | 56.2% |
| Hodgkin Lymphoma (C81) | 75.3%[3] | 79.6%[3] | 83.2%[3] | 75.0%[3] |
| Kidney (C64-C66,C68) | 48.4% | 50.7% | 56.7% | 53.7% |
| Leukaemia (C91-C95) | 33.3% | 33.6% | 48.5% | 49.6% |
| Lip, Oral Cavity & Pharynx (C00-C14) | 46.5% | 43.7% | 51.0% | 54.2% |
| Liver & Intrahepatic Bile Ducts (C22-C24) | 4.5% | 5.6% | 6.3% | 8.0% |
| Lung, Bronchus & Trachea (C33-C34) | 8.0% | 9.8% | 10.0% | 11.4% |
| Lymphoma (C81-C86) | 44.9% | 49.1% | 61.2% | 66.5% |
| Malignant Melanoma (C43) | 84.4% | 91.1% | 88.0% | 92.5% |
| Multiple Myeloma (C90) | 26.2% | 34.8% | 50.2% | 53.3% |
| Non-Hodgkin Lymphoma (C82-C85) | 42.6% | 47.7% | 59.5% | 66.9% |
| Non-Invasive Brain (D32,D33.0-D33.4,D35.2-D35.4,D42,D43.0-D43.4,D44.3-D44.5) | 79.3% | 78.9% | 84.0% | 89.1% |
| Oesophagus (C15) | 8.9% | 16.8% | 18.0% | 16.8% |
| Ovary (C56) | - | 36.8% | - | 37.2% |
| Pancreas (C25) | 3.0% | 2.8% | 5.8% | 5.3% |
| Prostate (C61) | 60.4% | - | 87.6% | - |
| Rectum and Anus (C19-C21) | 47.6% | 47.2% | 56.8% | 57.9% |
| Stomach (C16) | 15.6% | 17.1% | 17.8% | 23.4% |
| Testis (C62) | 94.5[3] | - | 98.8[3] | - |
| Unknown primary (C76-C80) | 5.9% | 9.9% | 10.8% | 10.9% |
| Uterus body (endometrium) (C54-C55) | - | 65.6% | - | 77.7% |

1 The classification of different tumours codes see: International Statistical Classification of Diseases and Related Health Problem to cancer types, e.g. lung is done using ICD10 codes. For a listing and explanation of ICD10 topography or site s, Tenth Revision, World Health Organisation, Geneva. Or view online at http://apps.who.int/classifications/icd10/browse/2010/en#/II

2 Not-applicable

3 Survival estimate is not age-standardised because of small numbers of patients diagnosed in the period

## MORTALITY

Mortality statistics are provided by the Northern Ireland General Registrar's Office. In 2010-2014 there were on average 2,153 male and 1,965 female deaths from malignant cancer each year. The most common cause of cancer death among males was lung cancer followed by prostate cancer and colorectal cancer (Fig. 9), while among women the most common cause of cancer death was lung cancer followed by breast cancer (Fig. 10).

***Figure 9: The most common cancer deaths in men: average annual deaths 2010-2014.*** *Kidney, multiple myeloma, mesothelioma, and malignant melanoma included in 'other'.*

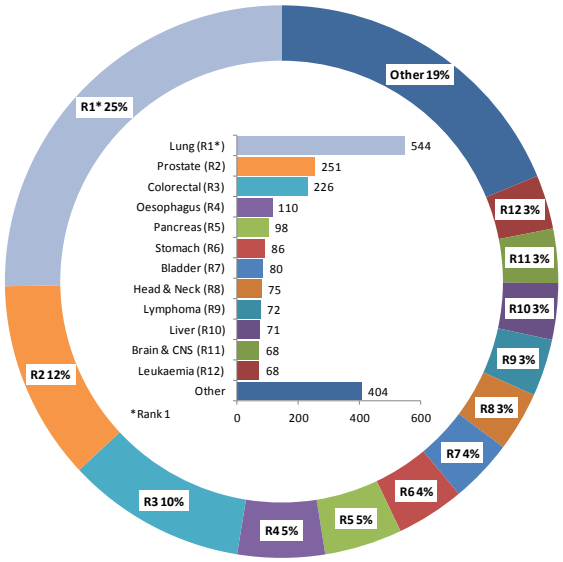
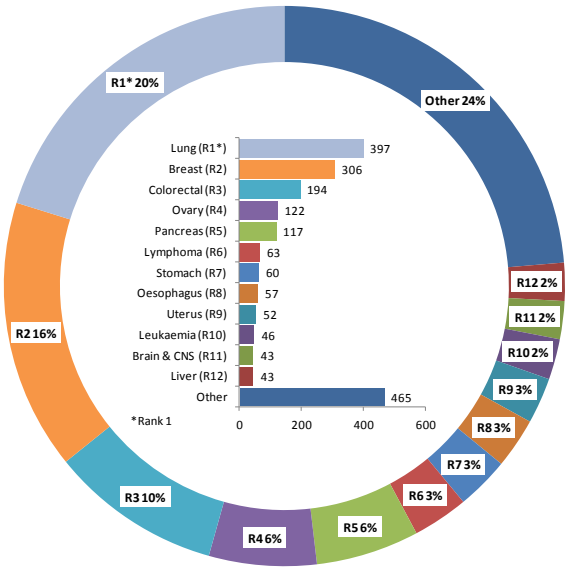



***Figure 10: The most common cancer deaths in women: average annual deaths 2010-2014.*** *Liver, bladder, multiple myeloma, head and neck, cervix, malignant melanoma included in 'other'.*

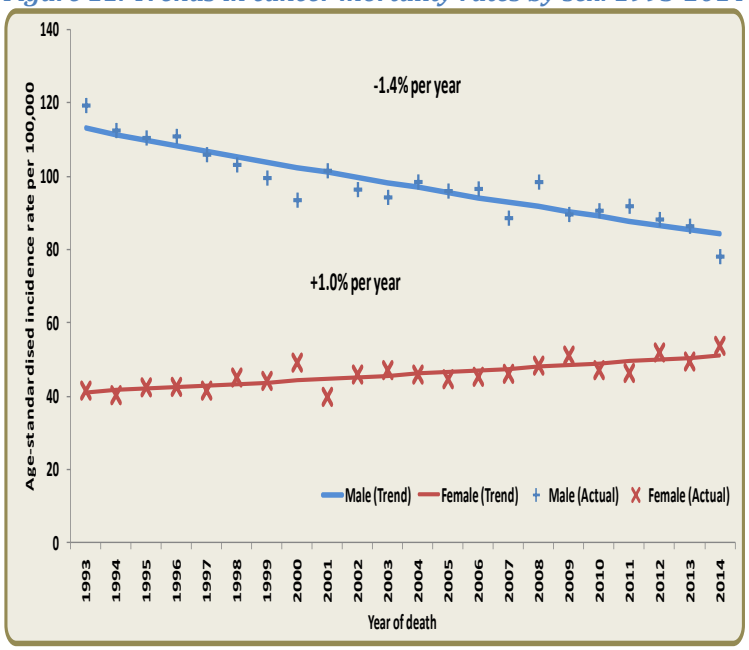



### Mortality trends

Over the ten years to 2014 the number of cancer deaths increased from 1,907 among men and 1,819 among women in 2005 to 2,164 among men and 2,085 among women in 2014.

When adjusted for age and population change, cancer mortality rates during 1993-2014 decreased per year by 1.0% in males, and 0.5% in females. Trends in cancer death varied by cancer site. Among men, mortality rates decreased for lung, prostate and colorectal cancer. Among women, mortality rates have increased for lung but decreased for breast and colorectal cancer.

***Figure 11: Trends in cancer mortality rates by sex: 1993-2014***



## PREVALENCE

At the end of 2014 there were 55,721 people living in NI who had been diagnosed with cancer within the previous twenty-two years (Table 8). Of these, 43.8% were male, 46.1% were aged 70 and over and 11.4% had been diagnosed in the previous year.

*Table 8: Number of people living with cancer at the end of 2014 who were diagnosed within the past twenty-two years by time since diagnosis*

| Sex | Age at end of 2014 | Time since diagnosis | | | | 22-year Prevalence |
|---|---|---|---|---|---|---|
| | | 0-1 year | 1-5 years | 5-10 years | 10-22 years | |
| Male | 0-69 | 1,767 | 4,385 | 3,037 | 2,579 | 11,768 |
| | 70+ | 1,395 | 3,972 | 3,772 | 3,479 | 12618 |
| | All ages | 3,162 | 8,357 | 6,809 | 6,058 | 24386 |
| Female | 0-69 | 2,004 | 5,957 | 4,995 | 5,305 | 18,261 |
| | 70+ | 1,167 | 3,531 | 3,017 | 5,359 | 13,074 |
| | All ages | 3,171 | 9,488 | 8,012 | 10,664 | 31,335 |
| Both sexes | 0-69 | 3,771 | 10,342 | 8,032 | 7,884 | 30,029 |
| | 70+ | 2,562 | 7,503 | 6,789 | 8,838 | 25,692 |
| | All ages | 6,333 | 17,845 | 14,821 | 16,722 | 55,721 |

Among men, prostate cancer was the most prevalent cancer accounting for 36% of total prevalence (Fig. 12). This was followed by colorectal cancer (18%) and lymphoma (7%). Among women, breast cancer (45%) was most prevalent followed by colorectal cancer (12%) and body of uterus (7%) (Fig. 13).

*Figure 12: The number of male cancer patients alive on 31st December 2014 diagnosed since 1993 (22-year prevalence) by cancer site*

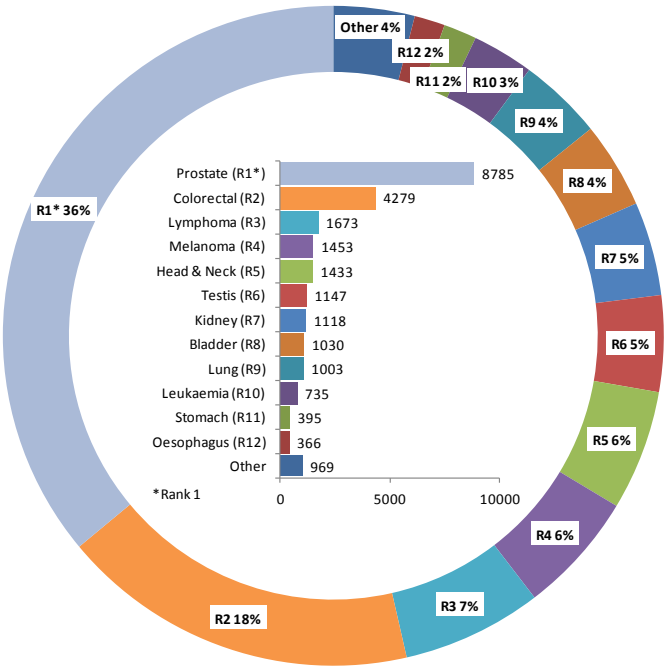
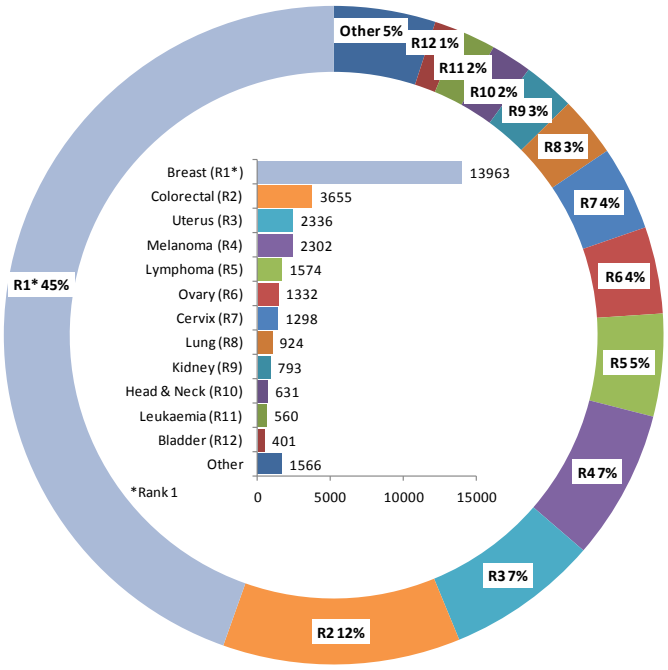



*Figure 13: The number of female cancer patients alive on 31st December 2014 diagnosed since 1993 (20-year prevalence) by cancer site*



## Background notes

**ICD10 Topography Codes**
The classification of tumour sites is carried out using ICD10 codes. For a listing and explanation of ICD10 topography or site codes see: International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, World Health Organisation, Geneva. Or view online at http://apps.who.int/classifications/icd10/browse/2010/en#/II

**Age Standardised Incidence Rate**
An age-standardised incidence rate per 100,000 persons is an estimate of the incidence rate if that population had a standard population age structure. Eighteen or nineteen age-group specific incidence rates are weighted by standard weights of the Standard Population, and summed to give the age-standardised rate. Commonly used Standard Populations (with number of age groups) are the 1976 European Standard Population (18), 2013 European Standard Population (19), and the World Standard Population (18). Standardising to a common Standard Population allows comparisons of incidence rates to be made between different time periods and geographic areas.

**Standardised Incidence Ratio (SIR)**
The ratio of the number of cases observed in a given population to the number of cases expected if the age-groups specific rates of a reference population were operative. This statistic is often used to compare if smaller geographic units (e.g. Trust areas) incidence rates differ from the national incidence rates, (e.g. Northern Ireland in these statistics), which is taken as the reference. An SIR of 100% indicates no difference.

**Confidence Intervals (CI)**
Confidence intervals are a measure of the precision of a statistic (e.g. lung cancer incidence rate). Typically, when incidence is low, precision is poorer and confidence intervals will be wider. As a general rule, when comparing statistics (e.g. cervical cancer incidence rate in year 2012 vs year 2013), if the confidence interval around one statistic overlaps with the interval around another, it is unlikely that there is any real difference between the two.

**Lifetime risk**
Lifetime risk is estimated as the cumulative risk of getting cancer up to age 75 (life expectancy for a typical person) using the age-specific cancer incidence rates according to this formula: cumulative risk=1 - exp(-sum(rates from age 1-74)). This method was proposed by Day (Day, 1987. Cumulative rates and cumulative risk. In Cancer Incidence in Five Continents, Muir C, Waterhouse J, Mack T, Powell J, Whelan S [eds] vol. V, pp 787-789. International Agency for Research on Cancer. IARC Scientific Publications No. 88: Lyon), and represents the lifetime risk of developing cancer when competing risks are ignored. Although this is currently the standard statistic for estimating lifetime risk of developing cancer, there are other methods which employ death information to address competing risk (see: Sasieni PD, Shelton J, Ormiston-Smith N, Thomson CS, Silcocks PB, 2011. What is the lifetime risk of developing cancer?: the effect of adjusting for multiple primaries. Bristish Journal of Cancer 105, 460-465). The odds of developing the disease before age 75 is the inverse of the cumulative risk.

**Geographic Areas**
Geographic areas are assigned based on a patient's postcode of usual residence at diagnosis using the Central Postcode Directory (CPD) produced by the NI Statistics and Research Agency (available at www.nisra.gov.uk)

**Deprivation Quintiles**
Super output areas (SOA), or 897 census output areas of NI, are assigned to each patient based on their postcode of usual residence at diagnosis. The patient is then assigned, through its SOA, to a socio-economic deprivation quintile based on the SOA's 2010 Income domain of the Multiple Deprivation Measure. The 2010 Multiple Deprivation Measure is available from the NI Statistics and Research Agency (www.nisra.gov.uk)

### Prevalence of patients who have had a diagnosis of cancer

Prevalence is the number of cancer-diagnosed patients who are alive in the population on a specific date, e.g. 31st December 2013. If the Registry is recently established, there will be patients in the population diagnosed prior to establishment who were not registered by the Registry; hence the prevalence will be underestimated, and more so in good-prognosis cancers. An 'x'-year prevalence, e.g. 20-year prevalence, is defined as the number of patients that were diagnosed in a `x'-year period (prior to a time point) and alive at that time point. 'x'-year prevalence can be used between registries of differing ages to measure the survivorship associated with a certain type of cancer. Age in the prevalence table refers to the age of patients on the 31st December 2013, not age at cancer diagnosis.

### Net Survival

Net Survival is an estimate of survival where the effect on survival of background population mortality rates has been removed. As background population mortality rates, as presented in a life table, are a good approximation to the non-cancer related death rates among cancer patients, the net survival represents the [theoretical] survival of cancer patients if they could only die from cancer-related causes. Net survival is suitable for comparison of survival between different time periods and populations, as the confounding effect of non-cancer death rates is removed. Age-standardised net survival estimates are the estimates that would occur if that population [of cancer patients] had a standard population age structure. Five age-group specific survival estimates are weighted by standard weights, and summed to give the age-standardised survival estimate. The age groups and weights used here are those defined by EUROCARE, an international study group that compares cancer survival among European countries (Corazziari I, Quinn M, Capocaccia R, 2004. Standard cancer patient population for age standardising survival ratio. European Journal of Cancer 40: 2307-2316). The weights reflect the age-structure of cancer patients and can differ between cancer sites. Due to small numbers in NI for many cancer sites, the two youngest age-groups have been combined, as well as their weights, in the estimation of age-standardised net survival.

### Mortality

Information relating to cancer mortality is sourced from GRONI and is based upon the date on which death occurs. Results may thus differ slightly than those produced by the Northern Ireland Statistics and Research Agency (NISRA), which produces deaths data based upon the date on which the death is registered with GRO.