



Public Health
England



Protecting and improving the nation's health

National Cancer Intelligence Network

Older people and cancer

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About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

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The intelligence networks

Public Health England operates a number of intelligence networks, which work with partners to develop world-class population health intelligence to help improve local, national and international public health systems.

National Cancer Intelligence Network

The National Cancer Intelligence Network (NCIN) is a UK-wide initiative, working to drive improvements in cancer awareness, prevention, diagnosis and clinical outcomes by improving and using the information collected about cancer patients for analysis, publication and research.

National Cardiovascular Intelligence Network

The National cardiovascular intelligence network (NCVIN) analyses information and data and turns it into meaningful timely health intelligence for commissioners, policy makers, clinicians and health professionals to improve services and outcomes.

National Child and Maternal Health Intelligence Network

The National Child and Maternal Health Intelligence Networks (NCMHIN) provides information and intelligence to improve decision-making for high quality, cost effective services. Their work supports policy makers, commissioners, managers, regulators, and other health stakeholders working on children's, young people's and maternal health.

National Mental Health Intelligence Network

The National Mental Health Intelligence Network (NMHIN) is a single shared network in partnership with key stakeholder organisations. The Network seeks to put information and intelligence into the hands of decision makers to improve mental health and wellbeing.

National End of Life Care Intelligence Network

The National End of Life Care Intelligence Network (NEoLCIN) aims to improve the collection and analysis of information related to the quality, volume and costs of care provided by the NHS, social services and the third sector to adults approaching the end of life. This intelligence will help drive improvements in the quality and productivity of services.

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Foreword

Cancer services are better than ever before. Thanks to the hard work of NHS staff and everyone involved in cancer services in England, we are diagnosing more patients before their cancer has spread and providing more effective treatments delivered by expert teams. The experience reported by patients is increasingly positive and we know more about how to support people in living well after a diagnosis of cancer.

Yet there is no room for complacency. Our outcomes are still not as positive as in some countries and, importantly, the needs of cancer patients are changing. Nearly two thirds of cancer diagnoses occur in the over 65s and one third in people aged 75 and over. By 2020 there will be nearly two million people aged 65 and over alive following a diagnosis of cancer.

Therefore we need to critically assess our cancer services to ensure that they are meeting the needs of older people – the very people most likely to need them. This report brings together what we know on older people and cancer. It shows a mixed picture.

It is important to stress that the needs of all older people are not the same. Type of cancer, socio economic status, gender and ethnicity all play a role in shaping people's needs and outcomes. Equally the needs of active older people in otherwise good health will be very different from those of people living with frailty and other health conditions. The evidence in this report suggests that, although we get a lot right, there is substantial scope for improvement for both groups.

In terms of prevention, older people appear less likely to practice some of the behaviours which would increase the risk of cancer. However, older people may also have the legacy of issues such as smoking or excess alcohol consumption, which may increase their risk. They are also more likely to be overweight or obese and less physically active. We need to support older people in reducing their risk of developing cancer and taking action to be fit for more aggressive (but more effective) cancer treatments by changing their lifestyle; it's never too late for lifestyle change – but the earlier it starts, the better.

Late diagnosis appears to be a major problem in older people. They are more likely to be diagnosed following an emergency admission, diminishing their chances of long term survival. They also experience poorer survival after diagnosis with a cancer that has already spread. Encouraging earlier diagnosis in older people should be a major priority.

Older patients are also less likely to receive active cancer treatment, be it surgery, radiotherapy or cancer drugs. In some cases, there will be good reasons for this. Frailty and other issues can reduce a person's ability to withstand treatment and can result in an unacceptable impact on quality of life. However age alone should never be a barrier to treatment. We must do more to help clinicians assess a person's suitability for treatment and, where necessary, tailor treatment options to suit a person's circumstances.

Overall, older people report a positive experience of cancer treatment and care and NHS services should be congratulated on their continued efforts to improve patient experience. In particular, they are more likely to have confidence in doctors and nurses and feel that they were treated with dignity and respect. Patient experience surveys do nonetheless also identify areas for improvement. In particular, older people are less likely to have access to a clinical nurse specialist or report being given information on side effects of treatment.

These issues are particularly concerning given that older people are more likely to have other health issues which will impact on their quality of life during and after treatment and may necessitate enhanced support.

For older people with cancer who are near the end of their life, there are substantial variations in the length of time they spend in hospital, suggesting that some areas of the country are better than others in supporting people in the community. There is substantial scope to improve both the quality and efficiency of care in this respect.

Older people are less likely to have opportunities to participate in cancer research, meaning that opportunities to develop the evidence base on how best to treat older people are missed. As an organisation with a duty to promote research and tackle inequality, the NHS should play its part in changing this.

It is now a year since I first issued a call for action on cancer and older people and I have been delighted with the response. A range of organisations have stepped up their efforts to improve the services available to older people. From the work of the Be Clear on Cancer campaigns in targeting older people to Macmillan Cancer Support's new Expert Reference Group which will develop and test interventions to improve treatment and care, we are seeing work across the pathway which I am confident will deliver significant benefits to older people affected by cancer. This report – coordinated by Public Health England's National Cancer Intelligence Network but the product of many organisations' efforts – is an important contribution which sets a baseline as we seek to improve cancer outcomes for older people.

The issues and themes identified in the report align well with those set out in NHS England's Five Year Forward View. We will ensure that actions to tailor services to the

needs of older people are at the heart of our efforts to further improve all aspects of cancer services in the coming years.

Sean Duffy
National Clinical Director for Cancer
NHS England

Acknowledgments

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The report has been produced by Lucy Irvine and Laura Harper at the National Cancer Intelligence Network, with significant input from Mike Birtwistle at Incisive Health.

Organisations that have provided substantial content and expertise include Macmillan Cancer Support, Cancer Research UK, Quality Health, Department of Health and the Geriatric Oncology Expert Reference Group. In addition, PHE colleagues from the NCIN analytical team, Knowledge and Intelligence Teams, the Health and Wellbeing Directorate, the Communications Publications teams, the National Cancer Registration Service, the Chemotherapy Intelligence Unit and the National End of Life Care Intelligence Network have also provided invaluable contributions.

The infographics have been provided by the National Cancer Equality Initiative.

Introduction and key messages

This report summarises what we know about older people and cancer, drawing together information from different sources and studies. Primarily this report defines older people as those aged 75 and over and is focused on England, however other age groups and geographies are presented and compared where it is useful to do so.ⁱ

Each chapter provides high level key messages, followed by a more comprehensive overview of the evidence and statistics. The key messages from each chapter are below.

Older people and cancer in context (Chapter 1):

- a person in England aged 75 can expect to live at least another decade
- cancer predominantly occurs in older people; nearly two thirds of cancer diagnoses occur in the over 65s and one third in people aged 75 and over
- by 2020 there will be two million people aged 65 and over alive following a diagnosis of cancer
- outcomes in older people are poorer than in other countries for some cancers
- over half of all cancer deaths occur in people aged 75 and over

THE MAJORITY OF CANCER DEATHS OCCUR IN OLDER PEOPLE



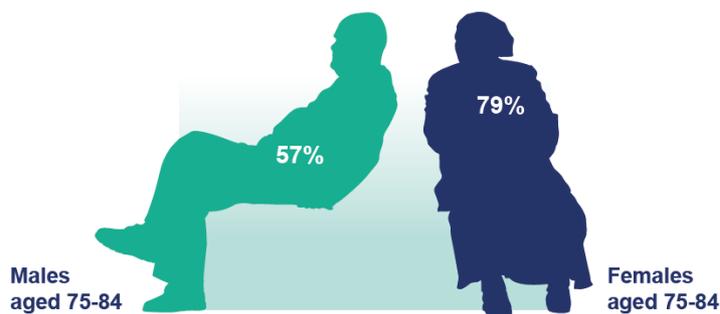
SOURCE: Mortality Statistics: Deaths Registered in England and Wales (Series DR), 2012, Office for National Statistics

ⁱ For some aspects of the report it has been necessary to present other older age groups or geographies (such as the UK) instead of the age group 75 and over and England, in response to what is available from the existing evidence/research.

Causes of cancer and their prevalence in older people (Chapter 2):

- older people could reduce their risk of developing cancer and be fit for more aggressive (but more effective) cancer treatments by changing their lifestyle; it's never too late for lifestyle change – but the earlier it starts, the better
- more than 4 in 10 of all cancer cases in the UK each year could be prevented by lifestyle changes; key factors are smoking, alcohol (both less common in older people than the adult population overall), overweight and obesity, and physical inactivity (both more common in older people than the adult population overall)

75-84 YEAR OLDS NOT MEETING PHYSICAL ACTIVITY GUIDELINES*



SOURCE: Health survey for England 2012, Health and Social Care Information Centre

* Based on not meeting UK guidelines for aerobic activity i.e. for people aged 19 and over should spend at least 150 minutes moderately intensive physical activity, in bouts of ten minutes or longer, or 75 minutes vigorous activity per week or an equivalent combination of the two

75-84 YEAR OLDS WHO ARE OVERWEIGHT OR OBESE



SOURCE: Health survey for England 2012, Health and Social Care Information Centre

Diagnosing cancer earlier in older people (Chapter 3):

- survival decreases with increasing age, in particular for people over 70. Older people with late stage tumours have substantially lower survival
- older people are more likely to be diagnosed following an emergency presentation, which is associated with poorer outcomes
- more urgent GP referrals for suspected cancer are made for older people and these referrals are more likely to result in a diagnosis of cancer
- more needs to be done to encourage older people to recognise the signs and symptoms of cancer and seek appropriate help

OLDER PEOPLE DIAGNOSED WITH ADVANCED CANCER*
HAVE WORSE SURVIVAL THAN YOUNGER PEOPLE
DIAGNOSED WITH ADVANCED CANCER

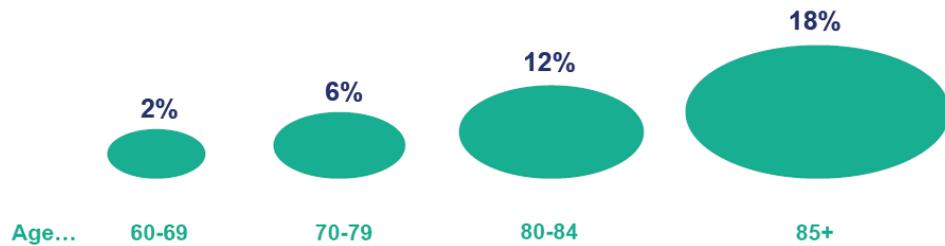


SOURCE: National Cancer Intelligence Network, PHE

* Advanced cancer is defined as stage 3 or 4 cancer

OLDER PEOPLE ARE MORE LIKELY TO BE DIAGNOSED
FOLLOWING AN EMERGENCY PRESENTATION*

Breast cancer

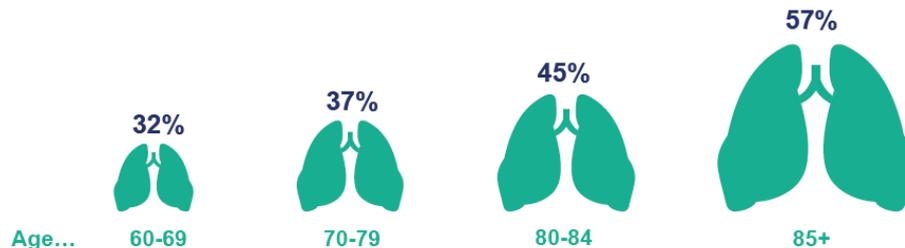


SOURCE: National Cancer Intelligence Network, PHE, Routes to Diagnosis, 2006-10

* **Emergency route** via A&E, emergency GP referral, emergency transfer, emergency consultant outpatient referral, emergency admission or attendance

OLDER PEOPLE ARE MORE LIKELY TO BE DIAGNOSED
FOLLOWING AN EMERGENCY PRESENTATION*

Lung cancer



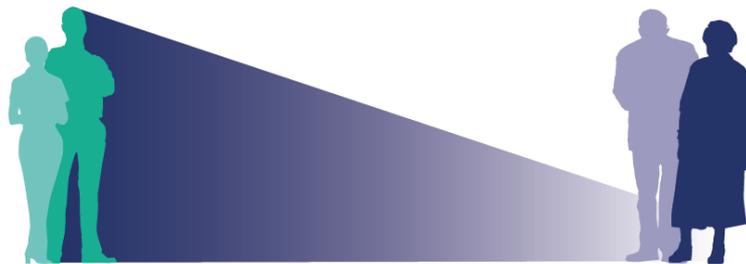
SOURCE: National Cancer Intelligence Network, PHE, Routes to Diagnosis, 2006-10

* **Emergency route** via A&E, emergency GP referral, emergency transfer, emergency consultant outpatient referral, emergency admission or attendance

Treating cancer in older people (Chapter 4):

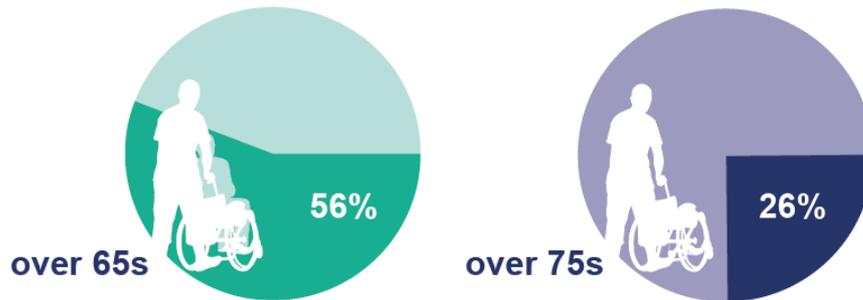
- older people are less likely to receive surgery, radiotherapy or chemotherapy treatment than younger people
- physical suitability for treatment or patient preference alone seem unlikely to fully explain the disparity in treatments
- over half of hospital admissions for cancer were for people aged 65 and over, and one quarter for people aged 75 and over
- unlike for other age groups, inpatient admissions for the 75 and over age group continue to be greater than day cases
- seven in ten inpatient hospital admissions for cancer for the 75 and overs were emergencies, compared to just over half for those aged 65 and under

OLDER PEOPLE ARE LESS LIKELY TO RECEIVE SURGERY,
RADIOTHERAPY OR CHEMOTHERAPY TREATMENT
THAN YOUNGER PEOPLE



SOURCE: National Cancer Intelligence Network, PHE data

HOSPITAL ADMISSIONS FOR CANCER



Over half of inpatient and day case admissions for cancer in 2012/13 were for people aged 65 and over and one quarter were for people aged 75 and over

SOURCE: Public Health England using Hospital Episode Statistics (HES), Copyright © 2014, re-used with the permission of The Health and Social Care Information Centre. All rights reserved

Patient experience (Chapter 5):

- in general, older people are more satisfied with treatment and care and this holds true for many aspects of cancer services
- older people are more likely to have felt they were treated with dignity and respect during cancer treatment and had greater confidence in their doctors and nurses
- however older people (76+) are also less likely to have access to a Clinical Nurse Specialist or to have been given information on the side effects of treatment

CANCER PATIENT EXPERIENCE



SOURCE: NHS England Cancer Patient Experience Survey 2014

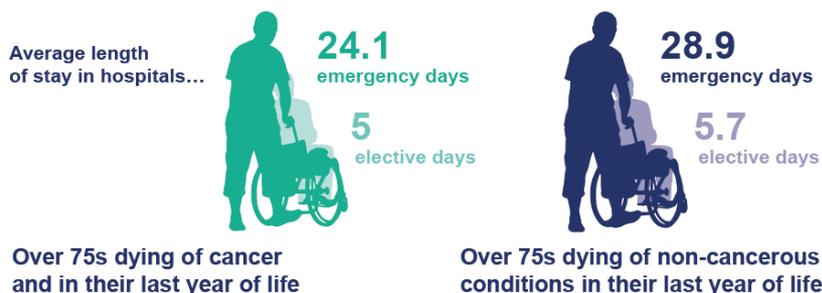
Older people living with and beyond cancer (Chapter 6):

- older people are more likely to be frail and have other health conditions that may impact upon their quality of life and affect their cancer treatment
- increasing age is associated with reduced quality of life for people after diagnosis and treatment
- the issues that affect older people after cancer are different from those affecting younger people

End of life care (Chapter 7):

- older cancer patients are more likely than younger patients to die in a care home, and are less likely to die at home or in a hospice, mirroring the pattern of deaths from all causes
- older people with cancer spend less time in hospital during their last year of life than people with other conditions
- there is substantial variation in the length of time older cancer patients spend in hospital, depending on where they live

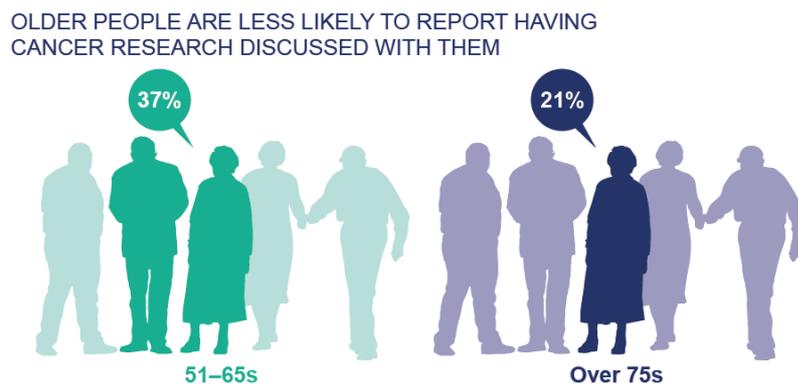
CARE NEAR THE END OF LIFE



SOURCE: National End of Life Care Intelligence Network, Public Health England

Research (Chapter 8):

- older cancer patients are less likely to have opportunities to take part in research discussed with them
- even when the opportunity to participate in research is discussed, older people are less likely to end up participating
- there is a deficit of research into different aspects of older people and cancer but it is possible to extract evidence on older people and cancer from wider studies



SOURCE: NHS England Cancer Patient Experience Survey 2014

Chapter 1: Older people and cancer in context

Key points:

- a person in England aged 75 can expect to live at least another decade
- cancer predominantly occurs in older people; nearly two thirds of cancer diagnoses occur in the over 65s and one third in people aged 75 and over
- by 2020 there will be two million people aged 65 and over alive following a diagnosis of cancer
- outcomes in older people are poorer than in other countries for some cancers
- over half of all cancer deaths occur in people aged 75 and over

For cancer services to be effective, they ought to meet the needs of the people who are most likely to use them. Much of the thinking about the organisation of cancer services was undertaken in the mid-1990s, following the publication of the Calman-Hine report.¹ Since then the demographic profile of people affected by cancer has changed; the general population is older as are the cancer patients.

Prevalence of cancer in older people and the aging population

The population of the UK is getting older. For example in 1985, there were around 690,000 people in the UK aged 85 and over, accounting for 1% of the population. Since then the numbers have more than doubled reaching 1.4 million in 2010 (2% of the UK population). By 2035 the number of people aged 85 and over is projected to be two and half times larger than 1020, reaching approximately 3.5 million and accounting for 5% of the total population.²

The life expectancy of older people in England is also increasing. In 1980-82 men reaching the age of 75 were expected to live up to 83 and women to 85 years of age. In 2011-13, men of age 75 were expected to live to be 86 years while women could expect to live to 88.³ Around 1 in 3 babies born in 2013 can expect to live to 100.⁴

The number of older people in the UK alive following a diagnosis of cancer is also increasing and is doing so at a faster rate of any age group. In 2010, there were 1.3 million people alive aged 65 years and above who had been diagnosed with cancer at some point in their lifetime, accounting for 63% of all cancer survivors. This is predicted to increase to 2.0 million people (68%) by 2020, 2.9 million people (73%) by 2030 and

4.1 million people (77%) by 2040.ⁱⁱ By 2040, almost a quarter of people aged at least 65 will be cancer survivors.⁵

Incidence of cancer in older people

Cancer is more common in older people, with incidence increasing with age for most cancers. Nearly two thirds (64%) of cancers are diagnosed in people aged 75 and over, and more than a third (36%) are diagnosed in people aged 75 and over.⁶ In 2012 there were 102,000 newly diagnosed cases of cancer in the over 75s in England.ⁱⁱⁱ

Incidence rates for all cancers combined have increased for all of the broad age groups in Great Britain since the mid-1970s. The largest increase has been in the 75 and over age group, with European age-standardised (ASR) incidence rates increasing by 44% between 1975-1977 and 2009-2011, though the pace of increase has slowed in the last decade.⁷

The age-specific incidence rate for all cancers combined in the UK is projected to remain stable (2030 versus 2008) for 75-84 year-olds, increase by 6% for those aged 85 and over, and rise in younger people (<50) in this period.^{8 iv}

The most commonly diagnosed cancer types in men aged 75 and over in 2009-2011 were for prostate, lung, colorectal (bowel) and bladder. For women they were breast, colorectal, lung and pancreas.⁹

Cancer survival in older people

Cancer survival is a key measure of the effectiveness of healthcare systems. Survival in older people in England has improved in the past decade for many cancer types.¹⁰ Nonetheless, cancer survival decreases with age, as set out in the charts below. The lowest five-year survival is seen in 80-99 year-olds in England even though the survival calculation allows for higher mortality from other causes in the older age groups.¹¹

Poorer cancer outcomes in older people may be influenced by many factors, including more people being diagnosed with cancer that has already spread, lower rates of treatment, under-representation in clinical trials, ability to tolerate more aggressive treatments, underlying differences in tumour biology and comorbidities.

ⁱⁱ Based on projection method called "scenario 1" which assumes that specified existing incidence and survival trends would continue in the period 2009–2040 and population demographics were assumed to be dynamic based on the ONS projections.

ⁱⁱⁱ All cancers excluding non-melanoma skin cancer (ICD10 C00-97 xc44)

^{iv} Rates estimated by Cancer Research UK using smooth function age–period–cohort modelling of cancer incidence data from Great Britain 1975 to 2007 and extrapolated to 2030 and applied to UK population projections. Prostate and breast cancer projections take into account the effect of screening. Based on similar methodology used for "Mistry M, Parkin D, Ahmad A, et al. Cancer incidence in the UK: Projections to the year 2030. Br J Cancer 2011;105:1795–1803."

Figure 1: Five-year net^v survival (percentage) for males (15–99 years) diagnosed during 2006–2010 with follow-up to 2011: England, common cancers, by age and sex

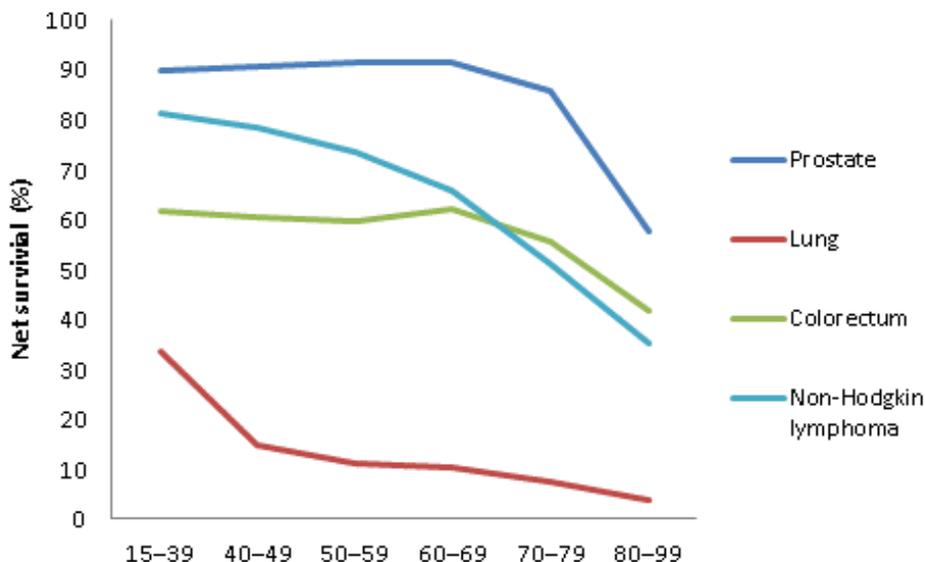
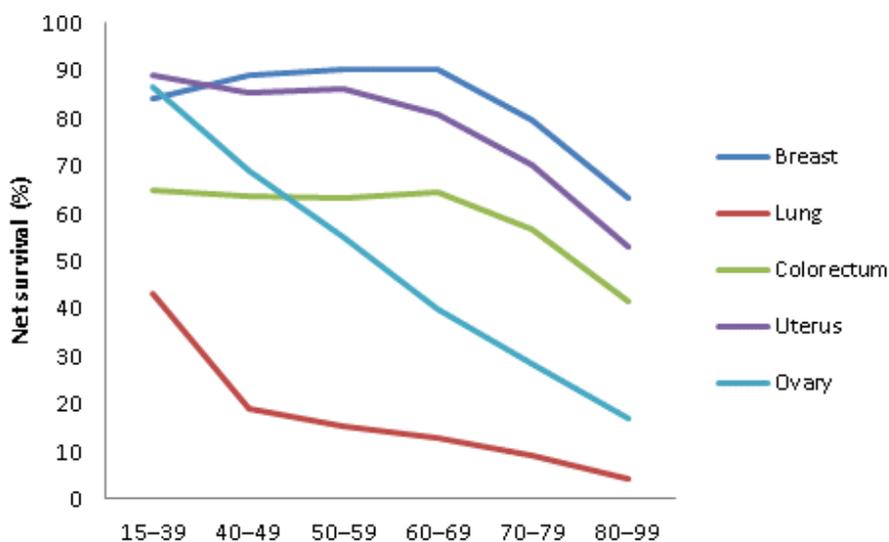


Figure 2: Five-year net survival (percentage) for females (15–99 years) diagnosed during 2006–2010 with follow-up 2011: England, common cancers, by age and sex



Source: Cancer Survival Rates - Cancer Survival in England: Patients Diagnosed, 2006–2010 and Followed up to 2011, Office for National Statistics

^v Net survival is an estimate of the probability of survival from the cancer alone. It can be interpreted as the survival of cancer patients after taking into account the background mortality that the patients would have experienced if they had not had cancer. Background mortality is derived from life tables of all-cause mortality rates in the general population. Net survival varies with age, and the age profile of cancer patients can vary with time and between geographical areas, so the estimates are age-standardised to facilitate comparison.

Survival rates for several cancer types are lower in the UK compared with other countries across Europe and the rest of the world and that gap is wider for older people (aged 65 and over¹² and 75 and over¹³) than for younger people.

For example, 5-year colorectal (bowel) cancer survival was 15% lower in UK patients aged 75 and older than the equivalent patients in Canada diagnosed between 2005 and 2007 while it was 9.5% lower for patients aged 15-44.¹⁴

Evidence shows that the differences in survival for colorectal (bowel) cancer between England and other European countries may be due to a relatively higher number of excess deaths in older patients in England in the short time after diagnosis.¹⁵

Around 4 out of 10 (42.2%) older women in the UK survive their stage 4 breast cancer for at least 1 year, compared to nearly 6 out of 10 (58.5%) in Sweden or Canada (59.1%).^{16 17}

Reasons for the survival gap between the UK and other countries, beyond differences in stage at diagnosis, may include:

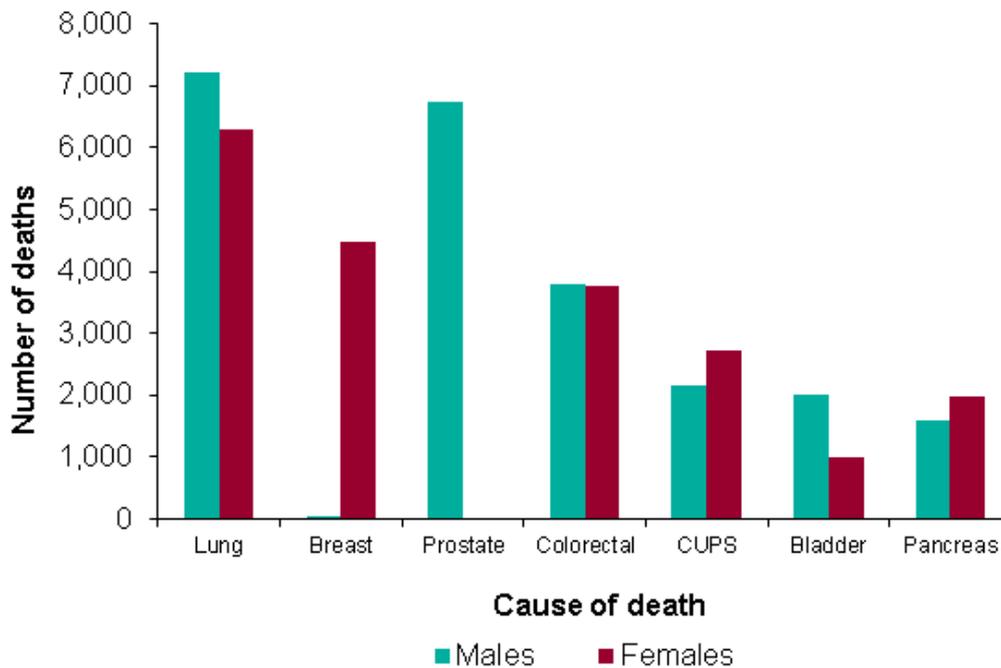
- variation in access to the best treatments
- variation in general fitness of patients (eg UK patients having more comorbidities and are potentially less fit for aggressive treatments)
- variation in the patient/diagnostic pathway (eg UK patients experiencing longer intervals between steps along their care pathway)
- inconsistencies in the data collected in each country (eg countries 'starting the clock' for survival calculations at different points in the diagnostic pathway)

Cancer mortality in older people

As with survival, mortality from cancer is an important indicator of the quality of a health system and this is reflected in the NHS Outcomes Framework. In 2012, cancer accounted for nearly 142,000 deaths in England and Wales – approximately 28% of all deaths. Over 111,500 cancer deaths occurred in people aged over 65 (78% of all cancer deaths) and over 75,000 of them (53% of all cancer deaths) occurred in people aged over 75.¹⁸

Figure 3 sets out the main cancer causes of death in the 75 and over age group in England.^{vi} There are a large proportion of deaths with prostate cancer or cancer of the unknown primary (CUPS) mentioned on the death certificates but not cited as the underlying cause. The incidence¹⁹ and survival²⁰ data for true CUPS is inconsistent with the deaths data shown here so it is likely that CUPS is being used on the death certificate to refer to a cancer diagnosis about which little is known, rather than a true unknown primary. In the case of prostate cancer there are a large group of men who die with this cancer, rather than from it. In contrast lung and pancreatic cancer are proportionally more often listed as the underlying cause of death indicating that people with these cancers are very likely to die from the disease.

Figure 3: Main cancer causes of death for those aged 75 and over, England, 2012

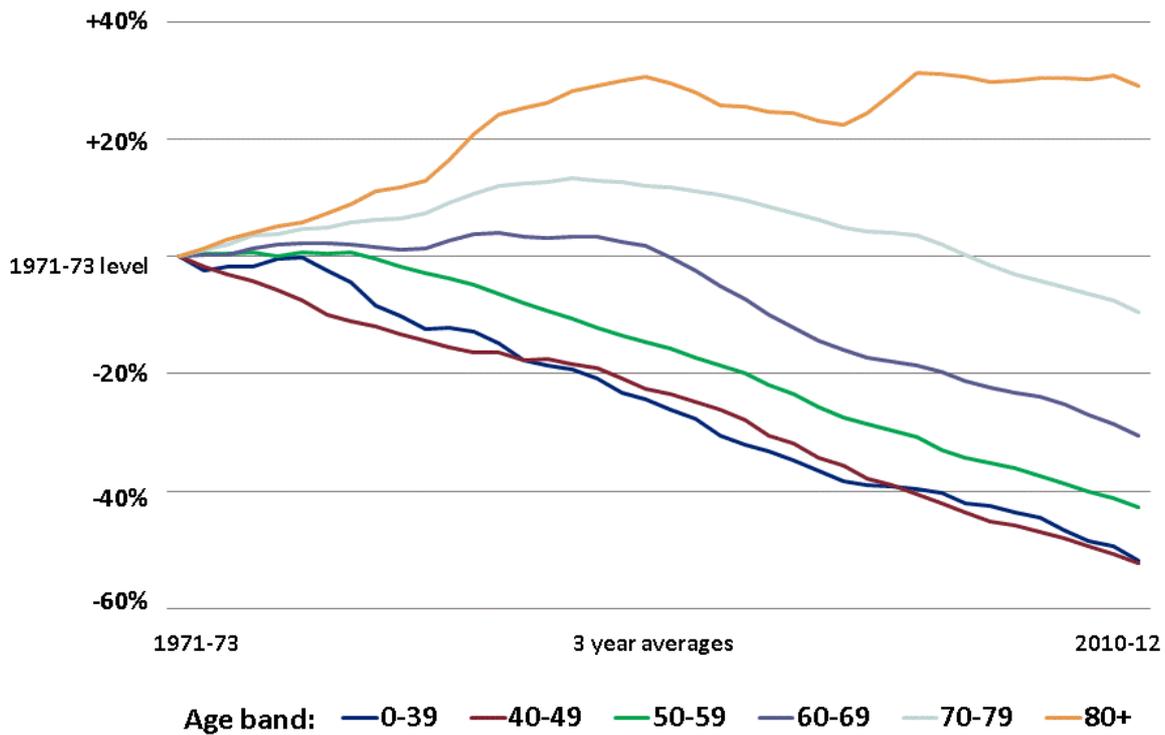


Source: National End of Life Care Intelligence Network, PHE

^{vi} Cancers can be the 'underlying' cause of death, that is: the main cause which set into motion the sequence of events leading to death, or could just be present in patients without being the direct cause of death. These cases can be identified when the cancer is mentioned on the death certificate but is not recorded as the underlying cause of death.

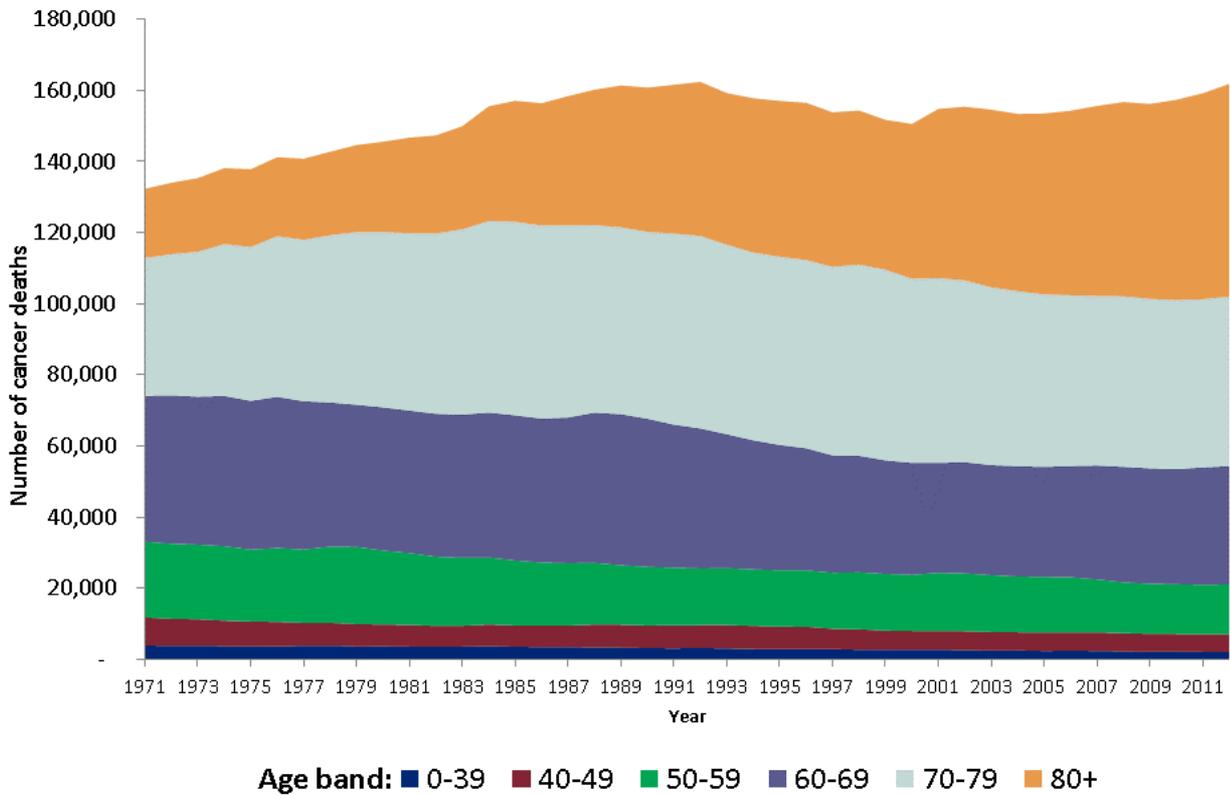
Overall mortality rates from cancer in the UK have decreased since the early 1970s due to efforts in prevention, early diagnosis and improvements in treatment of cancer. However, mortality rates have increased for the over 70s age groups.²¹

Figure 4: Change in mortality trends (age specific, age standardised), all cancers combined (C00-C97), by age group, England 1971-2012



Source: Cancer Research UK, <http://www.cancerresearchuk.org/cancer-info/cancerstats/mortality/age/>

Figure 5: Trends in the number of cancer deaths over time, all cancers combined (C00-C97), by age group, England 1971-2012



Source: Cancer Research UK, <http://www.cancerresearchuk.org/cancer-info/cancerstats/mortality/age/>

Chapter 2: Causes of cancer and their prevalence in older people

Key points:

- older people could reduce their risk of developing cancer and be fit for more aggressive (but more effective) cancer treatments by changing their lifestyle; it's never too late for lifestyle change – but the earlier it starts, the better
- more than 4 in 10 of all cancer cases in the UK each year could be prevented by lifestyle changes; key factors are smoking, alcohol (both less common in older people than the adult population overall), overweight and obesity, and physical inactivity (both more common in older people than the adult population overall)

Causes of cancer

Cancer incidence increases with age partly because older people's cells have divided more times compared with younger people's cells, so they have had more chance to develop the genetic mutations required to become cancerous. Older people's cells have also had more time exposed to carcinogens which can trigger or expedite them becoming cancerous. Ageing is not optional but exposure to carcinogens often can be.

More than 4 in 10 cancer cases in the UK each year could be prevented by lifestyle changes.²² The cancer risk factors perhaps key for older people – based on the most common cancer types in this population group (see chapter 1) and the factors where we have reasonable evidence on prevalence by age – are: tobacco smoking; overweight and obesity; alcohol drinking; and insufficient physical activity. Evidence for this includes:

- more than 8 in 10 lung cancers could be prevented by not smoking
- 13% of colorectal (bowel) cancers could be prevented by keeping a healthy body weight and 12% could be prevented by cutting back on alcohol
- 3% of female breast cancer cases could be prevented by keeping physically active

The figures above are based on a) the risk of cancer in people exposed to the risk factor versus those not exposed; and b) the prevalence of exposure to that risk factor in the population (allowing for a lag between risk factor exposure and cancer development).

There is little evidence on how the cancer risk associated with each factor varies with age at exposure, or the cancer risk associated with exposure at older ages. This is

partly because most studies exploring these associations look at risk factor exposure earlier in adulthood, or over too short a period to assess differences by age at exposure.

A two-way relationship between risk factor exposure and health outcomes is probable, though longitudinal studies are required to clarify this. Risk factors' impact on cancer risk may decrease with age at exposure because the exposure has less time to cause cell mutations; and/or older people may change their lifestyles (eg stop smoking and drinking) as a consequence of failing health.

Is it too late for older people to cut their cancer risk through lifestyle changes?

There are benefits of lifestyle change for the older people of today and tomorrow. There is a lag between risk factor exposure and cancer development. For example, today's lung cancer incidence trends reflect smoking prevalence trends in past decades.²³ The lag varies between risk factors and cancer types.

However, more and more people are living long enough (see chapter 1) to possibly see the health impact of lifestyle choices made during their 60s and 70s.

It's never too late to stop smoking. People who stop smoking by age 60 rather than carrying on for another 15 years may cut their risk of dying from lung cancer by age 75 by around 4-6%.²⁴

Further, many key cancer risk factors are also associated with other health problems common in older age, including heart disease and diabetes. These health problems are serious in their own right, and they may also preclude the more aggressive (but generally more effective) cancer treatments. Simply being a smoker or being overweight – with or without serious health manifestations – can in itself preclude some cancer treatments (with subsequent effects on cancer recurrence).

By helping people of all ages in the UK to live healthier lives, we can hope to reduce cancer incidence rates across the board. And as cancer incidence increases with age, this benefit could be felt most in the older age groups.

How big is the problem of unhealthy lifestyles in older people?

Evidence on the prevalence of tobacco smoking, overweight and obesity, alcohol drinking, and physical activity in the UK comes from population surveys such as the Health Survey for England, Opinions and Lifestyle Survey, and Integrated Household Survey.

These surveys generally do not have the statistical power to examine differences within older age groups by socioeconomic status, ethnicity, other health conditions etc.

Current variation by age in risk factor prevalence (see below) may not reflect past variation and current cancer incidence reflects past rather than current behaviour. Today's older people may have always smoked, drank etc the way they do now, or they may have started to smoke, drink etc less or more as they have become older. Birth cohort analyses are required to examine this, and these require long, consistent data time series, which are generally not available.

Tobacco

Overall, 19% of cancer cases in the UK each year are caused by tobacco smoking. Awareness of smoking as a cancer risk factor decreases with age, but is high across younger age groups.²⁵ Smoking is spontaneously listed as a cancer risk factor by 74% of people aged 75 and over, compared with 82% of people aged 16 and over.

Cigarette smoking rates are lower in older people compared with the adult population overall, Great Britain data shows:²⁶

- 10% of males and 9% of females aged 65 and over currently smoke cigarettes
- 21% of males and 16% of females aged 18+ currently smoke cigarettes

Among current cigarette smokers, older people smoke slightly more cigarettes per day on average compared with the adult population overall, 2012 Great Britain data shows:

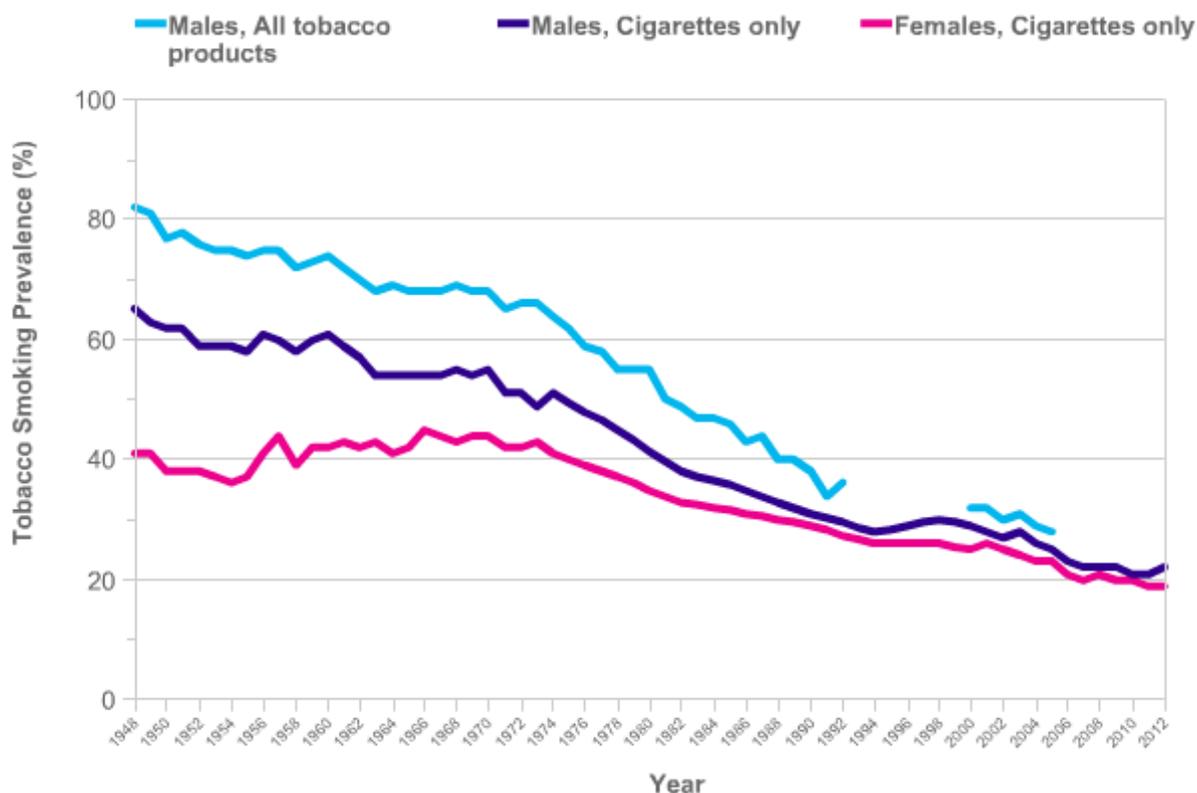
- males and females aged 60 and over smoke 14 and 12 cigarettes per day respectively, on average²⁸
- males and females aged 16+ smoke 12 and 11 cigarettes per day respectively, on average²⁸

Smoking prevalence trends show that when today's older people were adolescents and young adults smoking prevalence was much higher in males than females (Figure 6).^{27, 28,29}

These past sex differences in smoking prevalence are reflected in current sex differences in the incidence of lung cancer and other smoking-related cancers. As the sex gap in smoking prevalence has narrowed, so the sex gap in cancer incidence is expected to narrow in future (indeed this has already begun for many cancer types).³⁰

The sex gap in smoking prevalence is now much narrower than in previous decades for all age groups including older people.³¹ So efforts to reduce smoking prevalence in older people should focus on women just as much as men.

Figure 6: Smoking prevalence, adults aged 16 and over, Great Britain 1948-2012



Source: Cancer Research UK, accessed November 2014: <http://www.cancerresearchuk.org/cancer-info/cancerstats/causes/tobacco-statistics/>

NHS stop smoking services effectively help smokers to stop: quitters using prescription medication and support from a healthcare professional are around three times more likely to succeed.^{32 33} Among smokers setting a quit date with NHS stop smoking services, success rates are higher in older people compared with the overall service user population. Data from England in 2012-13 show:³⁴

- 61% of males and 57% of females aged 60 and over were successful quitters at 4 weeks
- 53% of males and 50% of females of all ages were successful quitters at 4 weeks
- 16% of NHS stop smoking service users were aged 60 and over

Overweight and obesity

Overweight and obesity cause 5% of cancer cases in the UK each year. Awareness of overweight and obesity as a cancer risk factor decreases with age (but is also low in the youngest adults) and is low across age groups.³⁵

Of people aged 75 and over, 8% spontaneously list overweight and obesity as a cancer risk factor, compared with 14% of people aged 16 and over.

Overweight and obesity rates (by body mass index) are higher in older people compared with the adult population overall (except the very old in whom rates are similar to the adult population overall), 2012 England data show:³⁶

- among males, 78% of those aged 65-74; 76% of those aged 75-84; and 59% of those aged 85+ are overweight or obese
- among females, 68% of those aged 65-74; 71% of those aged 75-84; and 58% of those aged 85+ are overweight or obese
- among individuals aged 16+, 67% of males and 57% of females are overweight or obese

Alcohol drinking

Overall, 4% of cancer cases in the UK are caused by alcohol drinking each year. Awareness of alcohol drinking as a cancer risk factor decreases with age, and is moderate across age groups. For instance, 33% of people aged 75 and over spontaneously list alcohol as a cancer risk factor, compared with 53% of people aged 16 and over.

Compared with the overall adult population, alcohol drinking rates (having drunk alcohol in the past week) are similar in older males and lower in older females, 2012 Great Britain data show:³⁷

- 63% of males and 45% of females aged 65 and over drank alcohol in the past week
- 64% of males and 52% of females aged 16+ drank alcohol in the past week

Alcohol drinking in excess of recommended daily limits (4 units for males and 3 units for females) is lower in older people compared with the adult population overall, 2012 Great Britain data show:³⁸

- 20% of males and 13% of females aged 65+ exceeded recommended alcohol limits on their heaviest drinking day in the past week
- 34% of males and 26% of females aged 16+ exceeded recommended alcohol limits on their heaviest drinking day in the past week

Physical activity

Overall, 1% of cancer cases in the UK are caused by insufficient physical activity (not meeting guideline levels, e.g doing less than 30 minutes of at least moderate activity on at least 5 days per week) each year. Awareness of low physical activity levels as a cancer risk factor decreases with age, but is fairly low across age groups.³⁹ Physical activity is spontaneously listed as a risk factor by 10% of people aged 75 and over, compared with 16% of people aged 16 and over.

Insufficient physical activity rates are higher in older people compared with the adult population overall, 2012 England data show:⁴⁰

- among males, 42% of those aged 65-74, 57% of those aged 75-84, and 89% of those aged 85 and over do not meet physical activity guidelines^{vii}
- among females, 48% of those aged 65-74; 79% of those aged 75-84; and 92% of those aged 85+ do not meet physical activity guidelines
- 33% of males and 45% of females aged 16 and over do not meet physical activity guidelines

^{vii} Based on not meeting the aerobic exercise guidelines i.e. for people aged 19 and over should spend at least 150 minutes moderately intensive physical activity, in bouts of ten minutes or longer, or 75 minutes vigorous activity per week or an equivalent combination of the two

Chapter 3: Diagnosing cancer earlier in older people

Key points:

- survival decreases with increasing age, in particular for people over 70. Older people with late stage tumours have substantially lower survival
- older people are more likely to be diagnosed following an emergency presentation, which is associated with poorer outcomes
- more urgent GP referrals for suspected cancer are made for older people and these referrals are more likely to result in a diagnosis of cancer
- more needs to be done to encourage older people to recognise the signs and symptoms of cancer and seek appropriate help

People who are diagnosed with cancer before it has spread tend to have a greater range of treatment options. Late diagnosis is associated with poorer outcomes and increased treatment costs.^{41 42} This section sets out what is known about awareness of signs and symptoms for cancer and the stage of diagnosis in older people.

Awareness of cancer signs and symptoms

Early diagnosis is partly influenced by people's awareness of the signs and symptoms of cancer, knowing if they are in a higher-risk group (for example given their age, sex or lifestyle), and understanding when and how to seek help.

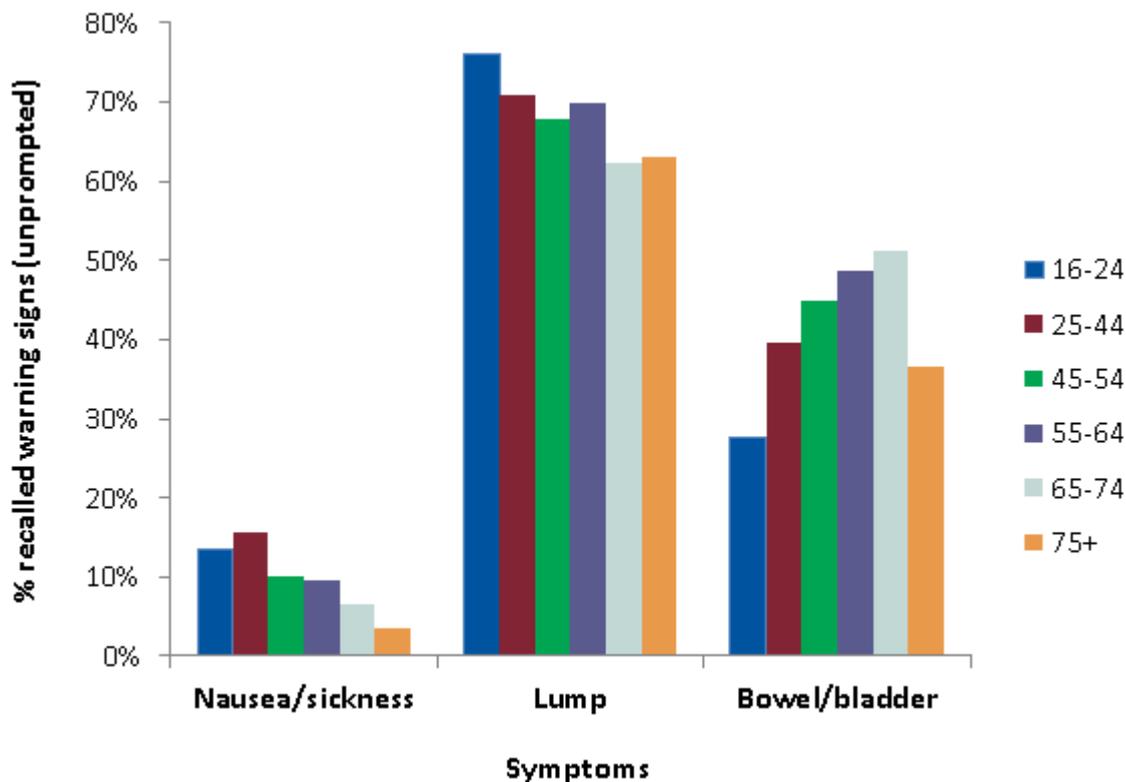
Awareness of the signs and symptoms of cancer is generally lower in older people in Great Britain. Figure 7 shows three examples of signs and symptoms of cancer by age group where awareness was lower in people aged 75 and over.^{viii 43}

The Be Clear on Cancer programme in England was developed to increase early diagnosis of cancer through raising awareness of the signs and symptoms of cancer and when to see the GP.

Full evaluation of the Be Clear on Cancer campaigns is ongoing. Overall, initial evaluation data to date suggests the campaigns are reaching their target audience, the over 50s.

^{viii} Based on the Cancer Awareness Measures 2012 survey question: "There are many warning signs and symptoms of cancer. Please name as many as you can think of?"

Figure 7: Proportion of people that recalled (unprompted) warning signs of cancer, by age, Great Britain, 2012



Source: Cancer Research UK Cancer Awareness Measure data 2012, personal communication

In general it has been found that the older audience, those over 70, have lower levels of recall and awareness of advertising messages in market research surveys.

Full evaluation of the Be Clear on Cancer campaign for breast cancer in women over 70 is ongoing and not yet complete. However, some initial interim analysis has also been undertaken to assess the number of women in the target age range self-referring into the breast cancer screening programme during the campaign period. Early preliminary results currently show that during the six weeks in February/March of 2014, when the campaign ran, a total of 21,607 women self-referred. This was compared to 9,175 women in the equivalent six week period in 2011^{ix}, when there was no campaign running. There was therefore a net increase of 12,432 self-referrals. Further detailed work will need to be undertaken to explore this finding in more detail.⁴⁴

The national breast cancer in women aged over 70 awareness campaign ran February-March 2014. There was a 67% increase in urgent GP referrals for suspected breast cancer or for breast symptoms in this target age group, compared to a smaller, 31%, increase for those aged less than 70.⁴⁵

^{ix} 2011 is used as a comparator due to there being a 3 year screening round

Findings from the pre/post awareness tracking surveys for the first national bowel campaign (which ran January-March 2012) showed that it is possible to raise awareness in older people. The over 75s saw a significantly greater increase in unprompted awareness of 'Blood in poo' as a sign of bowel cancer than the 55-74 age group; up from 15% to 33%. Though the level of awareness after the campaign was still lower in the over 75s than in the 55-74s (33% vs. 45%).⁴⁶

The first national lung campaign ran May-June 2012 and analyses suggest that it did not improve the level of unprompted awareness of cough as a sign of lung cancer in the over 75s (35% pre, 37% post) while it did in the 55-74 group (increase from 43-55%).⁴⁷

The first national 'Blood in pee' (BiP) awareness campaign (which ran October-November 2013) resulted in increases in urgent GP referrals across all age groups, with the largest percentage increases for younger age groups, specifically in the under 50s. For those aged 60-69 and particularly those aged 70-79, the national BiP campaign resulted in significant increases in the number of bladder, kidney and urological cancer diagnoses resulting from urgent GP referrals.⁴⁸

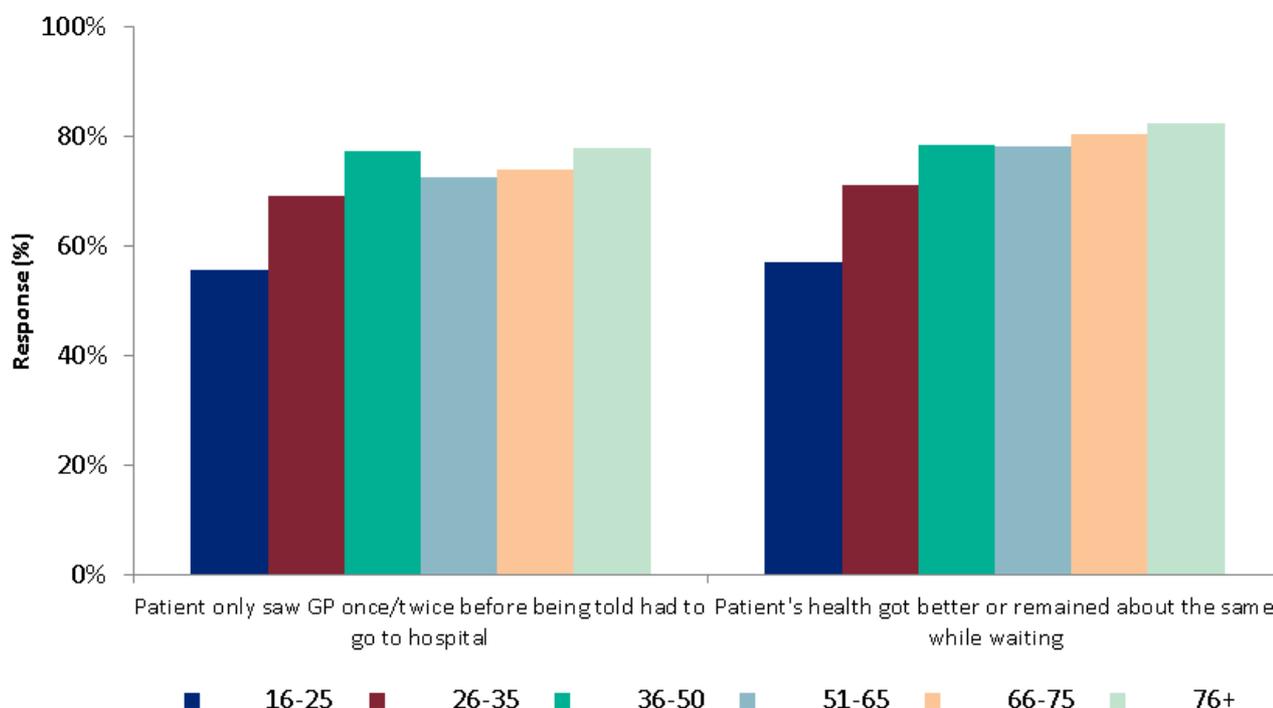
Identifying potential cancer in primary care

Once a person has sought help from their GP, it is important that primary care professionals are able to identify potential signs and symptoms and investigate and refer accordingly. Older people may have complex health needs. This can make it harder for their primary care professionals to distinguish potential cancer signs and symptoms from other health issues, and to investigate and refer appropriately.

Around 8 in 10 cancer patients in England aged 76 and older reported only seeing their GP once or twice before receiving a referral to the hospital. Younger patients, especially the 16-25s, visited their GP more frequently before an appropriate referral was made, with less than 6 in 10 seeing their GP only once or twice before this action was taken.⁴⁹

In 2013/14, urgent GP referral rates for any suspected cancer (two week wait referrals) were highest for people aged 75 and over.⁵⁰ For all ages, the referral rate was 2,522 referrals per 100,000 population compared with a referral rate of 7,410 referrals per 100,000 people aged 75 and over. This is to be expected given the higher levels of cancer diagnosis in this age group. The referral rate for people aged 85 and above was slightly lower at 7,050 referrals per 100,000 people.

Figure 8: Early diagnosis related questions, by age group, National Cancer Patient Experience Survey, England 2014



Source: National Cancer Patient Experience Survey 2014, England

Similar patterns were seen for the common referral types of suspected lung, lower GI and skin cancers. However, for suspected breast cancer, the referral rate peaked for those aged 35-49, at 900 referrals per 100,000 people, probably reflecting the impact of screening for those aged between 50 and 70. In comparison there were 537 referrals per 100,000 people aged 75 and over.

For older people, these urgent referrals for suspected cancer were more likely to result in a diagnosis of cancer. The 'conversion rate' (the percentage of urgent GP referrals for suspected cancer resulting in a diagnosis of cancer, here excluding non-melanoma skin cancers) was 13% for people aged 75 and over, compared to 4% for people aged 35-49.

Route to diagnosis⁵¹

The Routes to Diagnosis study^x for England works backwards using routinely collected data to examine the sequence of events leading to a cancer diagnosis. Each diagnosis is linked to 1 of 8 possible routes: screening, two week wait, GP referral, other

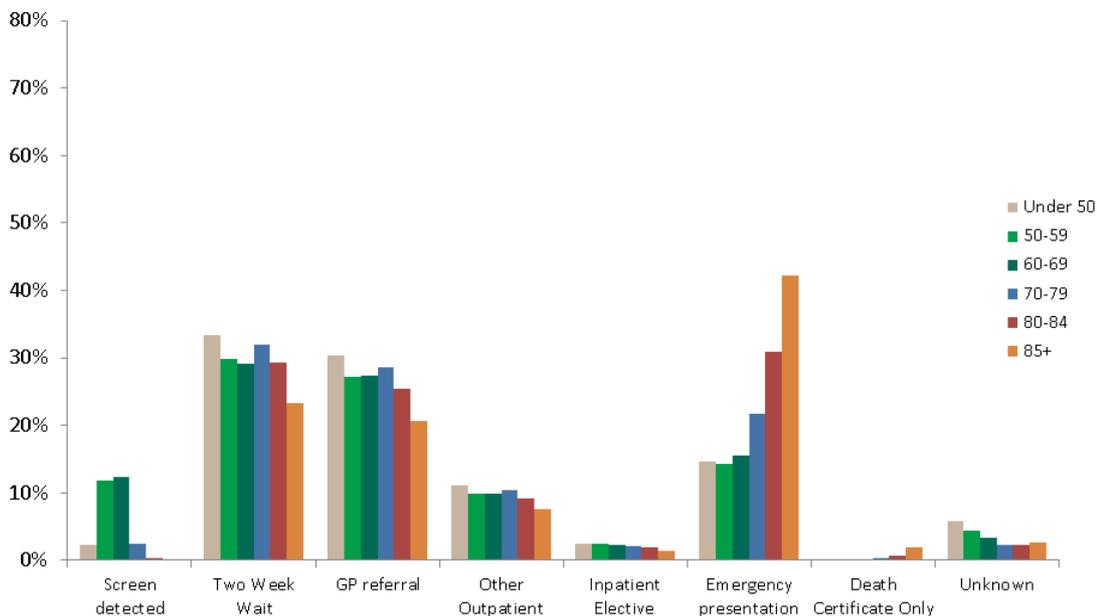
^x All patients who were diagnosed with malignant neoplasms and selected benign and in-situ tumours between 2006 and 2010 are included in the latest study

outpatient, inpatient elective, emergency presentation, death certificate only and unknown.

It is desirable for patients to be diagnosed as early as possible. This generally means following a routine referral or an urgent GP referral for suspected cancer (also known as ‘two week wait referral’, ensuring that most receive a specialist appointment within two weeks) or following screening (which may mean their cancer is detected before they show symptoms). There are three screening programmes in England - cervical, breast and colorectal (bowel). The programmes do not cover older age groups because the evidence indicates that screening is not appropriate for these age groups. However although routine recall for breast screening ends at 70 (women) and 74 (men and women) for bowel screening, patients can self-refer after these points.

Conversely, diagnosis following an emergency presentation often suggests that a person’s cancer may have already spread.^{55,56} The proportion of cancers diagnosed in England after an emergency presentation increases with age, with 43% of all cancers in those aged 85 and over in 2006-2010 diagnosed after an emergency presentation compared with 15% of cancers in those aged 50-59 (Figure 9).

Figure 9: Percentage of diagnoses by route and age band, all malignant neoplasms (excluding NMSC), 2006-2010, England



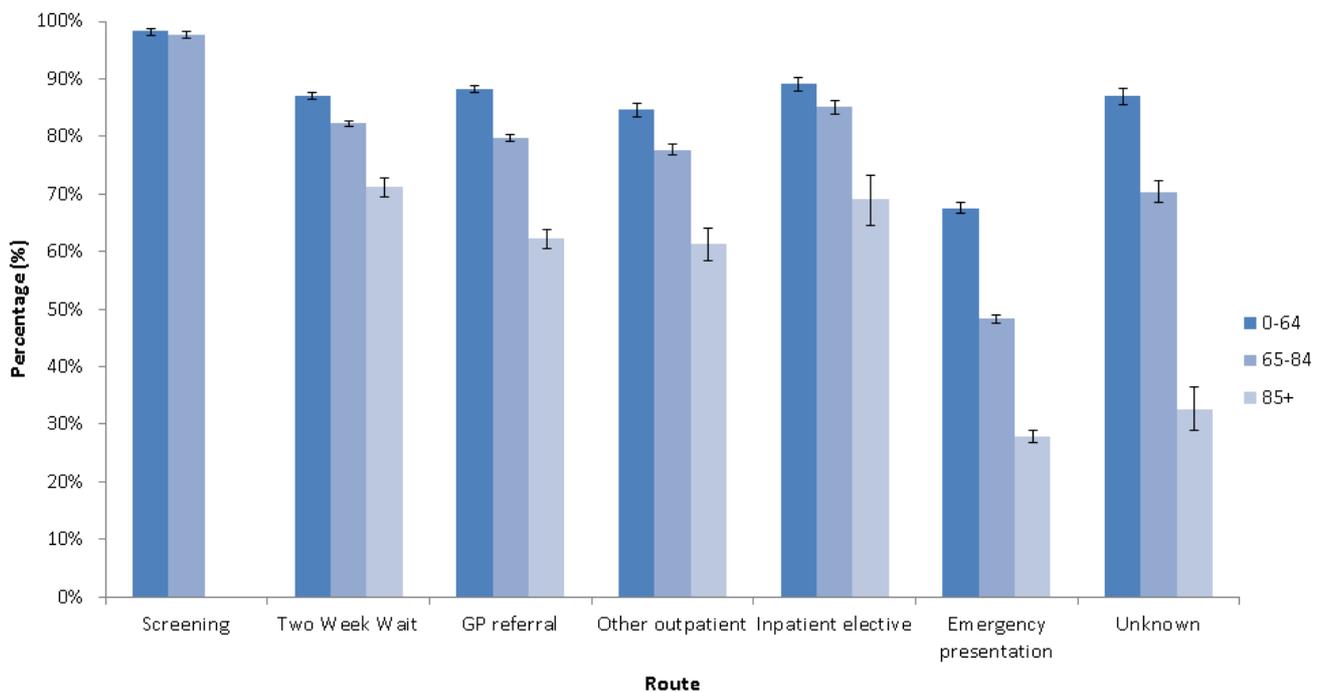
Source: Routes to Diagnosis 2006-2010 in England, National Cancer Intelligence Network, PHE

Encouragingly, the proportion of people (all ages) and older people diagnosed following an emergency presentation has decreased over time, and the proportion diagnosed following a two week wait referral has increased. Between 2006 and 2010, the proportion of older patients diagnosed following an emergency presentation decreased:

- for 70-79 year olds, from 25-22%
- for 80-84 year olds, from 34-31%
- for those aged 85 and over, from 43-42%

Diagnosis following an emergency presentation is associated with significantly poorer survival, particularly for older people, as set out in Figure 10.

Figure 10: 12-month relative survival estimates by presentation route and age band, colorectal (bowel) cancer, 2006-2010, England



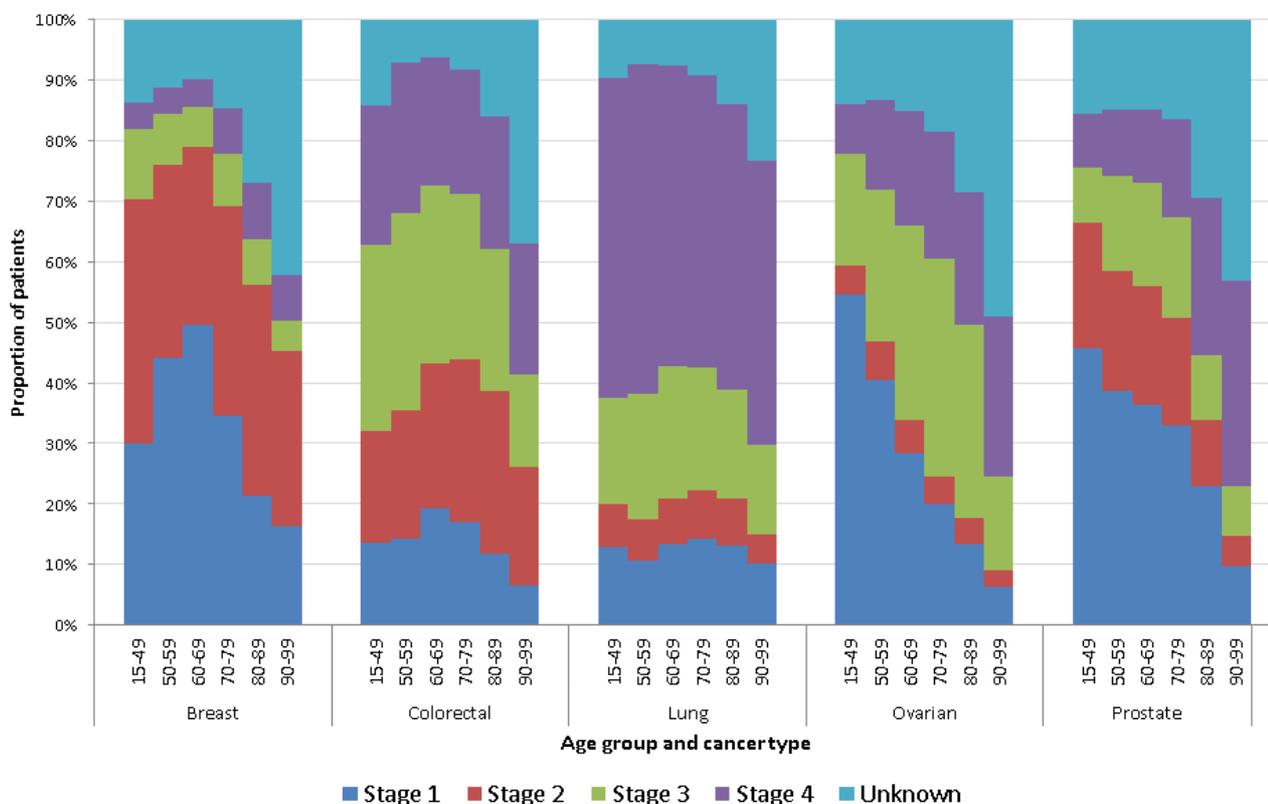
Source: Routes to Diagnosis 2006-2010 in England, National Cancer Intelligence Network, PHE

Stage of diagnosis

All age groups have poorer survival for cancers diagnosed at an advanced stage. However, the decline in outcomes is particularly stark for older age groups. For example, both men and women in England in the 70-79 age group who were diagnosed with stage 1 colorectal (bowel) cancer have 1-year survival of 99% whereas survival was 43% and 40% respectively for men and women in the same age group diagnosed with stage 4 bowel cancer. Comparatively, survival for men and women aged 15-59 diagnosed with stage 4 bowel cancer is 58% and 63%, respectively.⁵²

Age was strongly associated with the stage of diagnosis for many cancers, although the extent and nature of the association varied, as set out figure 11.

Figure 11: Proportion of patients diagnosed by stage with age group and cancer type, England, 2012



Source: Cancer diagnosis by stage 2012 in England, National Cancer Intelligence Network, PHE

The impact of cancer screening is seen for breast and colorectal (bowel) cancer, where there was a peak in early stage (stage 1 or 2) diagnoses in the 60-69 screening age group. For prostate and ovarian cancer, the proportion of people diagnosed at an early stage reduces as age increases. For lung cancer, there was a limited association between age and stage.

For all cancers, the proportion with unknown stage at diagnosis was higher in the older age groups, particularly for those aged 80-89 or 90-99. The reasons for this require further exploration, but are likely to include a combination of the following:

- older people are more likely than younger people to present with very advanced cancer and die soon after presentation
- it may be clinically inappropriate to stage cancers in some older people, for example due to comorbidities, general frailty, or lack of fitness for treatment or other reasons
- some patients will be deemed not fit enough for any active treatment and so staging may be viewed as unnecessary

Chapter 4: Treating cancer in older people

Key points:

- older people are less likely to receive surgery, radiotherapy or chemotherapy treatment than younger people
- physical suitability for treatment or patient preference alone seem unlikely to fully explain the disparity in treatments
- over half of hospital admissions for cancer were for people aged 65 and over, and one quarter for people aged 75 and over
- unlike for other age groups, inpatient admissions for cancer for the 75 and over age group continue to be greater than day cases
- seven in ten inpatient hospital admissions for cancer for the 75 and overs were emergencies, compared to just over half for those aged 65 and under

Once a person has been diagnosed with cancer, it is important that they receive prompt access to high quality treatment, to maximise their chances of achieving a positive outcome, both in terms of survival and quality of life.

In cancer, more intense treatment is often associated with better and longer-term survival. However, it can also be associated with side effects that can affect a patient's quality of life and their health. It is therefore important that decisions about what treatment is appropriate are weighed carefully, taking into account both a patient's health status and their preferences.

These decisions can be particularly complex in older people. Increasing age may be associated with other clinical factors, such as frailty and other medical conditions, which may reduce the ability of a patient to withstand cancer treatment.

Patients may receive a range of different types of cancer treatment. Surgery remains the primary form of treatment for most cancers and still cures⁵³ more cancers than any other treatment modality. Radiotherapy has an important role in the treatment of many different forms of cancer. For some cancers radiotherapy may be the main form of treatment; for other cancers, radiotherapy may be used alongside surgery or chemotherapy. Chemotherapy is used to cure some forms of cancer (for example blood cancers) and can also be used to shrink tumours ahead of surgery; this can be a treatment to reduce the risk of recurrence after surgery or to help slow or reverse the progression of the disease, alleviating symptoms and extending a patient's life.

It is important that cancer patients receive appropriate treatment if a positive outcome is to be achieved. Decisions about treatment require careful balancing of the potential benefits and side effects. This chapter explores what is known about cancer treatment and older people.

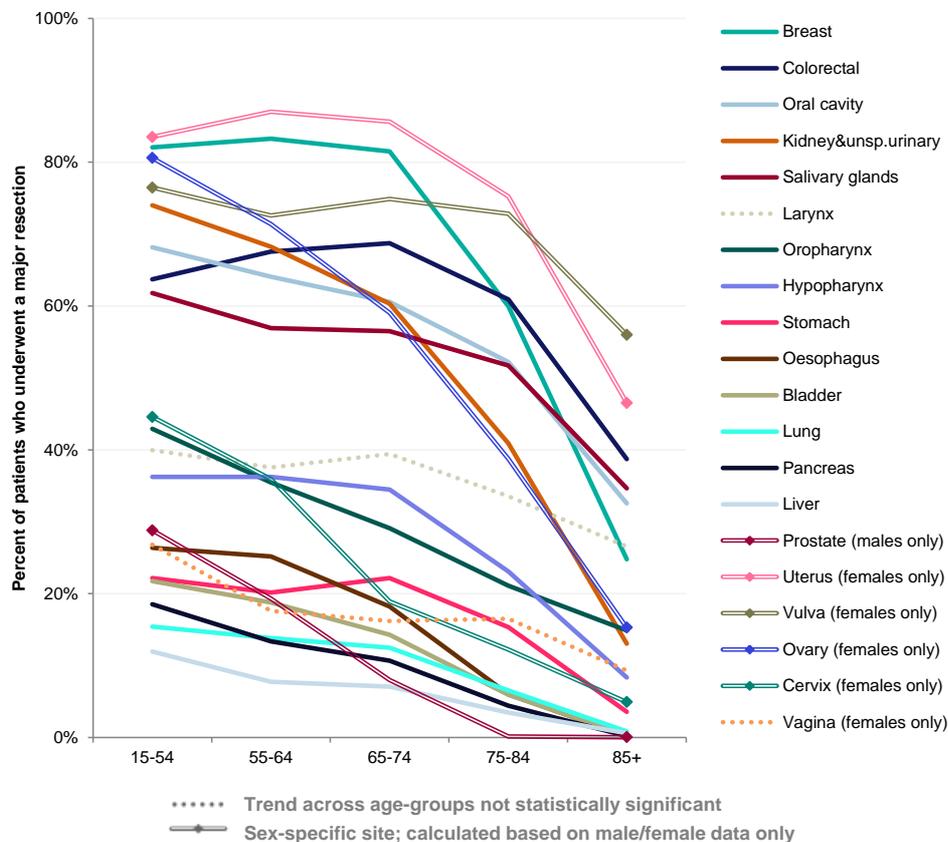
Evidence suggests that older patients may be undertreated and that their outcomes may be poorer as a result. Older people are less likely to receive radical surgery than younger people, and radiotherapy is used less often in elderly patients. Several studies suggest that differences in treatment partly explain poorer survival in older people with certain cancers.⁵⁴

Evidence also suggests older people are less likely to receive intensive investigation and treatment and are more likely to be admitted as emergencies.⁵⁵

Surgery*

For all types of cancer where surgery is appropriate, there is a clear decrease in the proportion of patients who receive major surgery as age increases, as set out below.⁵⁶

Figure 12: Percentage of resections by cancer type and age group, 2006-2010, England (excluding 0-14 year olds and DCO) – corrected version***



Source: Major resections by cancer site, in England; 2006-2010, National Cancer Intelligence Network, PHE

* Data reviewed and reissued June 2015

** Death Certificate Only: records based solely on cause of death statement of death certificate

Uterine cancer has the highest overall resection rate with 81% of patients undergoing surgical resections, followed by breast cancer (74%) and then cancer of the vulva (71%). This is then followed by cancer of the colorectum (bowel), oral cavity, kidney (including unspecified urinary sites) and salivary glands, with all four sites seeing resection rates of over 50%. Lung cancers, as well as those of the pancreas and liver, have an overall resection rate of less than 10%.

The scale of the reduction in resections^{xi} by age varies by cancer type; for example:

- Ovarian cancer saw the biggest drop in resection rates with age where nearly 81% aged 15-54 underwent a major resection, compared to just under 39% aged 75-84 and 15% of patients aged 85 and over
- this was followed by kidney cancer which saw a drop in resection rates between the youngest (15-54) and oldest (85+) age-groups from 74% to 13% respectively
- this was followed by breast cancer, with 82% of patients aged 15-54 undergoing a resection compared to 25% for those aged 85 and over
- colorectal (bowel) cancer resection rates of the first four age-groups (15-54, 55-64, 65-74, 75-84) exceeded 60%, whereas they were less than 40% for the oldest (85+)
- for cervical cancer patients, the percentage ranged from 45% among 15-54 year-olds to 5% for the oldest age-group (85+)

Although the overall picture indicates that fewer older patients undergo major resections, for some cancers there may be good clinical reasons for surgery rates to be lower. For example, decisions on kidney cancer resections may be affected by other chronic conditions such as high blood pressure; ovarian resections can be very invasive procedures requiring stays in intensive care units and patients need to be able to recover from such surgery; older prostate cancer patients rarely undergo a major resection as their tumours tend to be much less aggressive and post-operative side-effects can be substantial.

Radiotherapy

Radiotherapy treatment data^{xii} has been linked to cancer registrations to examine trends between age groups. All new diagnoses of cancer (all malignant neoplasms, excluding C44) in 2011 in England are shown in figure 13 along with patients who received radiotherapy up to 6 months after diagnosis.^{xiii 57}

The proportion of cases treated with radiotherapy peaks for childhood cancer, falls in younger persons then rises to another broader peak of around 25% for persons in their

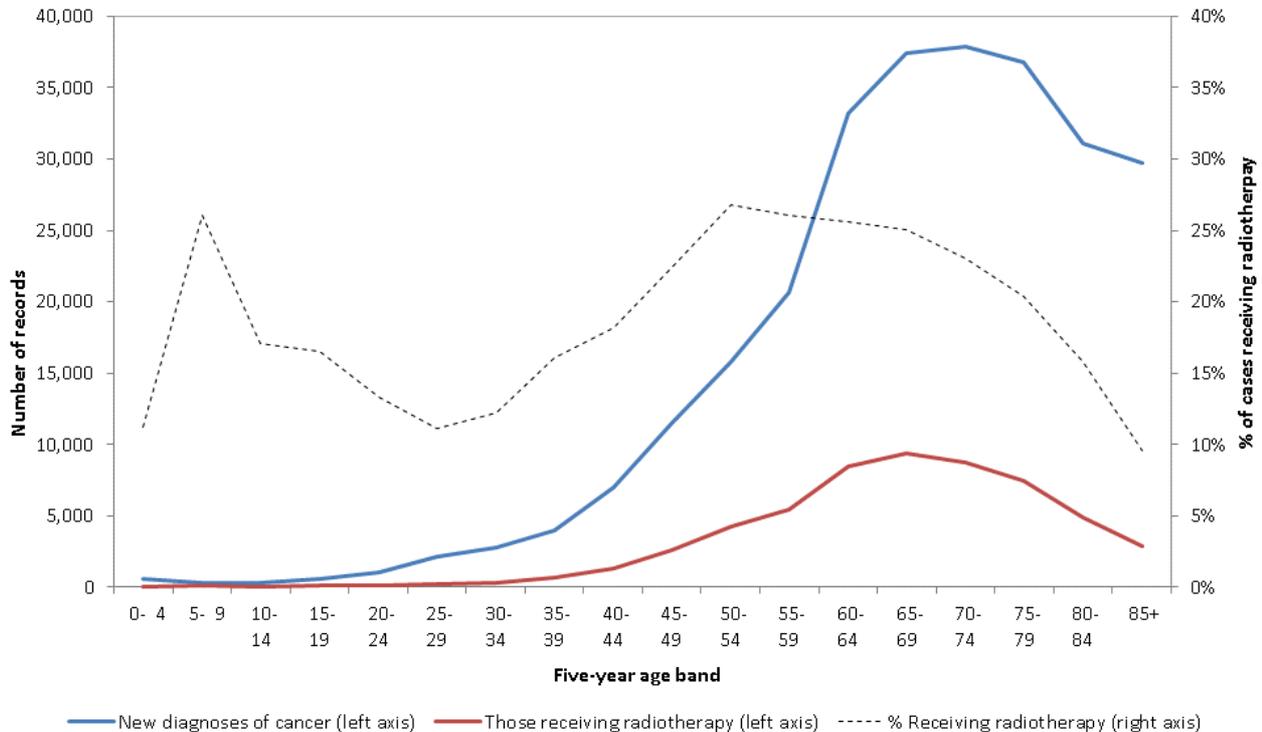
^{xi} This is not adjusted for stage of disease

^{xii} These radiotherapy treatments are a mixture of those with curative and palliative intent

^{xiii} Treatments up to 1 month before diagnosis were also matched to allow for uncertainty in the recording of diagnosis date.

50s and 60s. It then declines again for persons in their 70s, 80s and older to around 10% in persons aged 85 and over.

Figure 13: New diagnoses of cancer and those receiving radiotherapy up to 6 months after diagnosis, all malignant neoplasms (excluding NMSC), 2011, persons, England



Source: CAS accessed November 2014, National Cancer Intelligence Network, PHE

Caution should be used when interpreting these data as linkages between radiotherapy and cancer registration data are new and still exploratory. The variation may also be influenced by several factors not explored here, including variation in case-mix (both by sex and tumour type) between age groups. There may also be sound clinical reasons why older patients are less likely to receive radiotherapy. Finally, the data are linked at person level and not by individual tumour, so a single treatment may be counted against multiple independent tumours.

Cancer drugs

In 2013, the NCIN National Cancer Equalities Initiative (NCEI) and NHS England published a report using evidence from the Systemic Anti-Cancer Therapy (SACT) dataset showing that older people⁵⁸ are less likely to receive chemotherapy or cancer drug treatment.^{xiv} The data presented here update the analyses presented in that report and confirm the pattern.⁵⁹

^{xiv} Curative group includes adjuvant, neo-adjuvant and curative intent of treatment

By comparing the age profile for the numbers of patients receiving chemotherapy with the age profile of cancer incidence, it is possible to develop a picture of whether particular age groups are more or less likely to receive chemotherapy.^{xv} Although incidence is not an exact comparison as many patients will receive chemotherapy to treat recurrence of cancer many years after their initial diagnosis, it is considered to be a useful proxy to show the similarities and differences in age patterns.

For breast, colorectal (bowel) and lung cancer patients in England, there is a notable reduction of all three cancer sites in the number of patients receiving chemotherapy from around the age of 70. For some cancers the reduction appears to start at an earlier age.

The stage of cancer for which chemotherapy treatment was provided also varies by age and cancer type.

For breast cancer, treatment for early stage cancer is the dominant form until patients reach their 70s, when the balance between chemotherapy use between early stage and advanced stage is more even. This suggests that the reduction of use in early stage treatment – which is intended to add to the prospects of cure – is a major reason for the overall decline in chemotherapy once people reach their 70s.

^{xv} Whereas we can have reasonable confidence in the data within SACT we are dependent on individual hospital trusts confirming that all data on systemic therapy has been uploaded. On some occasions we have identified deficiencies in this process and It is therefore much more difficult to be certain that we do have complete data uploaded and that the data on utilisation of chemotherapy at population level are completely accurate.

Figure 14: Diagnoses of breast cancer (2012) and the number of breast cancer patients given at least one course of chemotherapy (2013-14), by age group, England

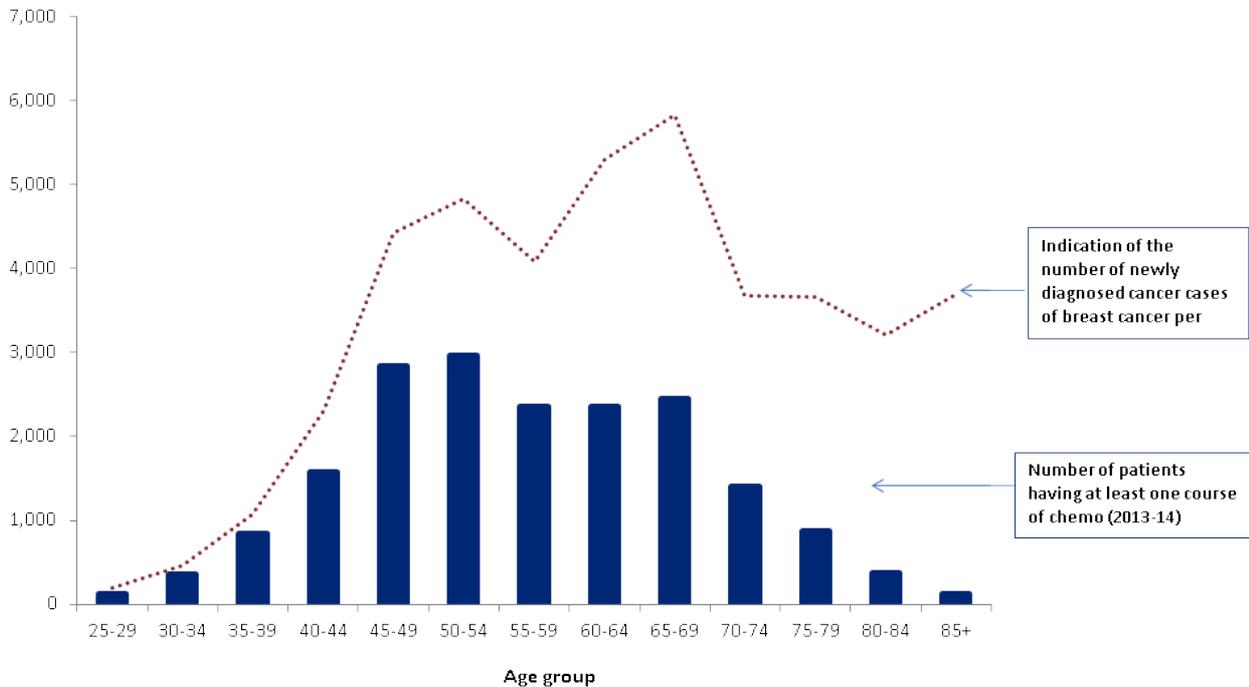


Figure 15: Diagnoses of colorectal cancer (2012) and the number of colorectal cancer patients given at least one course of chemotherapy (2013-14), by age group, England

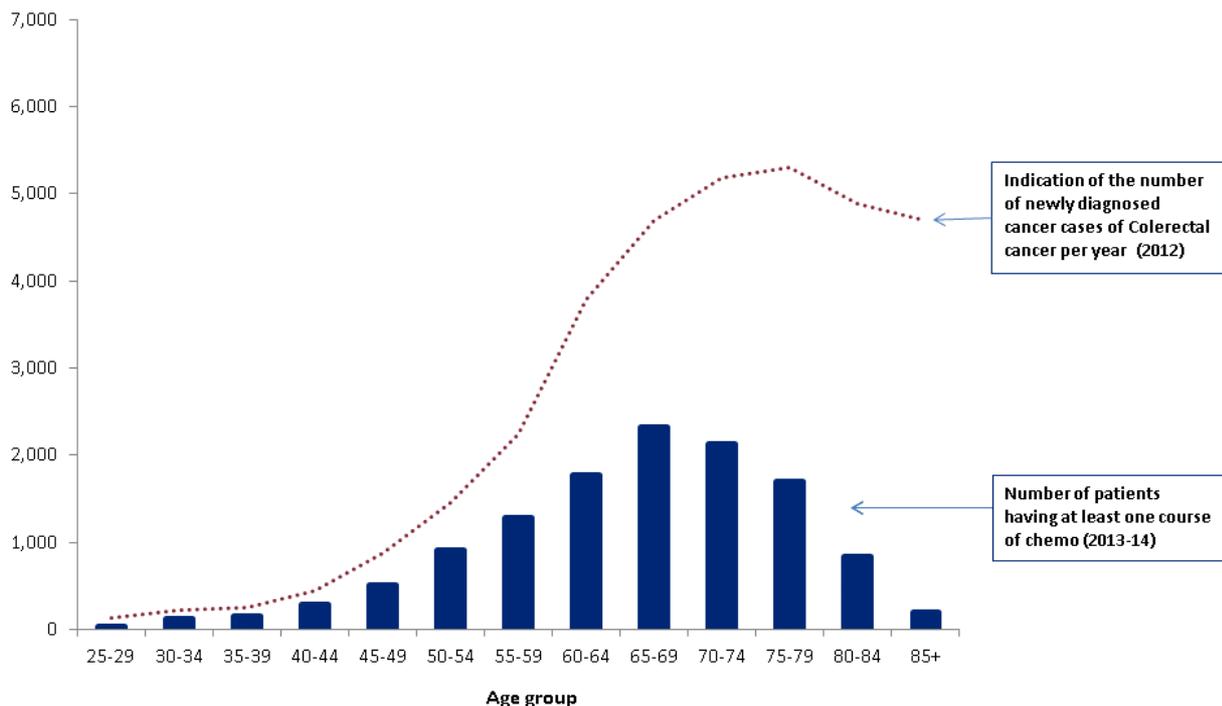
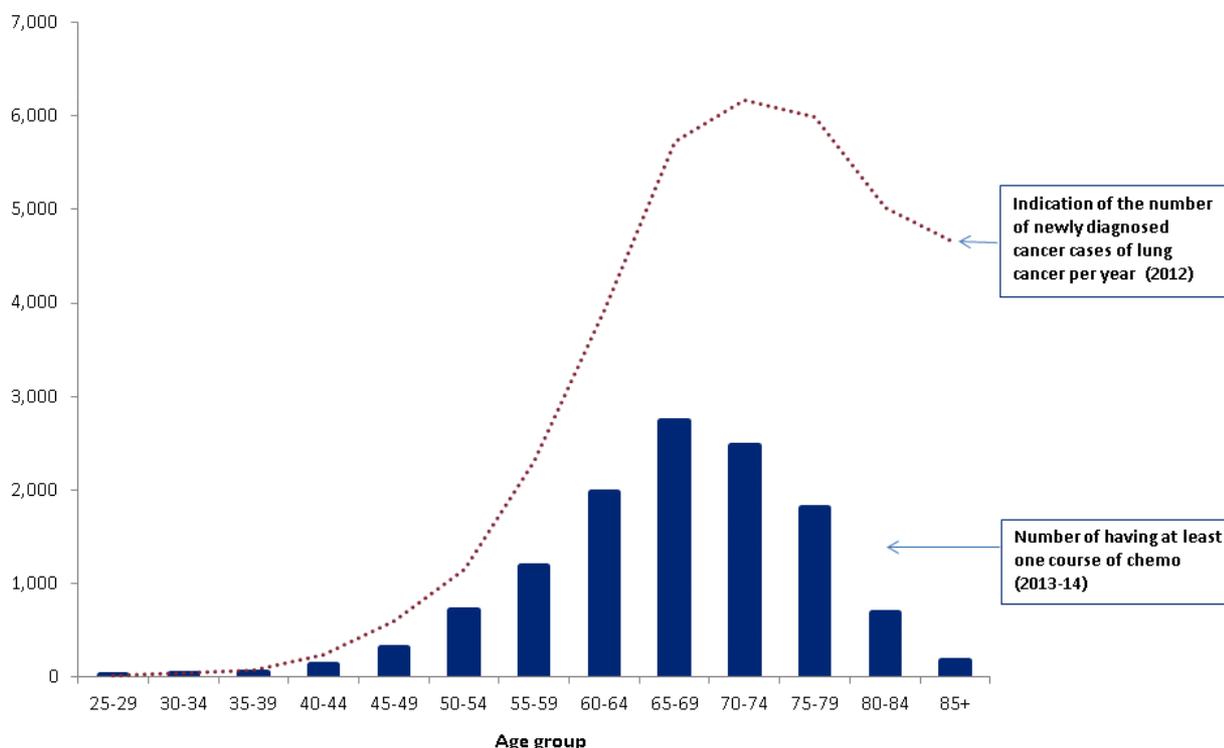


Figure 16: Diagnoses from lung cancer (2012) and the number of lung cancer patients given at least one course of chemotherapy (2013-14) - England



There is more of a balance between the use of chemotherapy for early stage and advanced stage disease for colorectal (bowel) cancer than there is for breast cancer, although treatment for early stage bowel cancer constitutes the majority in all age groups up to seventy. For patients in their 70s and older, the split is broadly equal.

Unlike breast and colorectal (bowel) cancer, the vast majority of chemotherapy is provided to lung cancer patients with advanced disease. This reflects both the use of chemotherapy in the lung cancer pathway and the fact that many lung cancers are not diagnosed until they are very advanced.

It is important to acknowledge that there may well be good clinical reasons why older people are less likely to be given chemotherapy, including:

- the perceived physical ability of older patients to withstand chemotherapy may be less, meaning that more patients are not deemed eligible for treatment
- older patients may choose not to proceed with chemotherapy treatment, having assessed the benefits versus the toxicities and the practical implications for their quality of life
- there is a lack of evidence from prospective trials that supports the use of chemotherapy in older patients as trial eligibility criteria often exclude such patients

- older people affected by breast cancer may be more likely to be prescribed hormonal/endocrine treatments to manage the risk of recurrence
- adjuvant chemotherapy often confers a small and longer term survival benefit which may be seen as being less relevant when the expected actuarial survival of the very elderly will need to be taken in to account

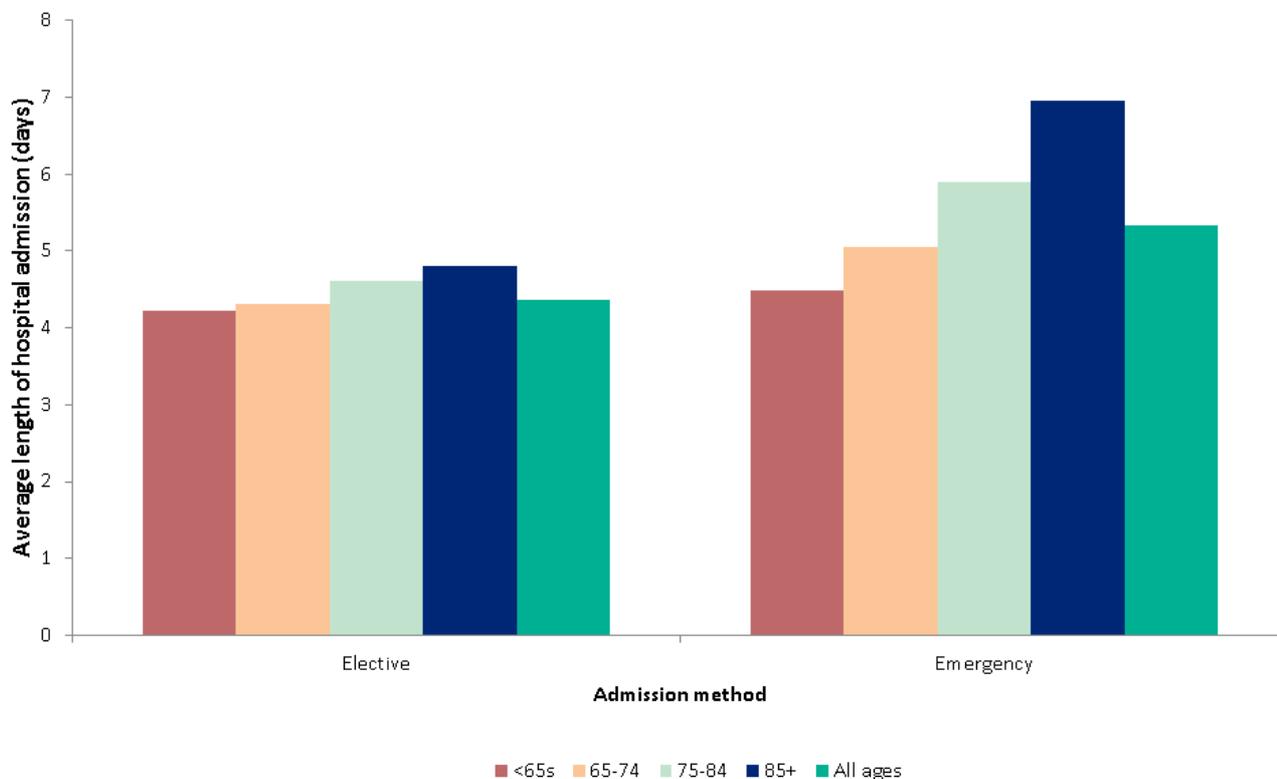
However, it may also be that the clinical decision about whether or not to give chemotherapy is sometimes being determined by chronological age rather than performance status ['biological age'] of the patient.

Hospital admissions and time in hospital^{60,xvi}

Overall the number of hospital bed days for cancer in England has decreased 19% (4.9 to 3.9 million) from 2003/4 to 2012/13, with the smallest decrease for the most elderly (85+).

The average length of episode for elective and emergency admissions for cancer increases with age. The longest episodes are for older people who are admitted as an emergency (Figure 17).

Figure 17: Average length of episode^{xvii} over time, by age group, England 2003-2004 to 2012-2013

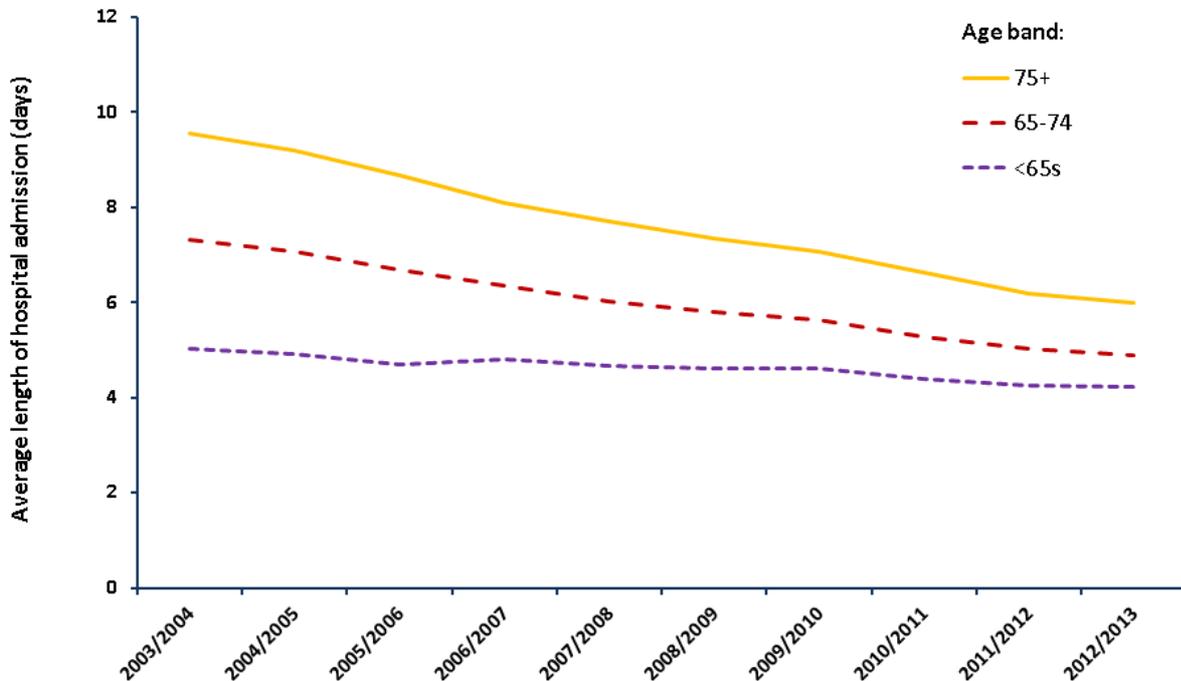


Source: Public Health England, analysis uses Hospital Episode Statistics (HES). Copyright © 2014, Re-used with the permission of The Health and Social Care Information Centre. All rights reserved.

^{xvi} Please note this section is based on the number of episodes. An episode is defined as a continuous period of admitted patient care under one consultant within one healthcare provider. Episodes are counted against the year in which they end. Please note that the figures do not represent the number of different patients, as a person may have more than one episode of care within the same stay in hospital or within different stays in the same year

^{xvii} Elective and emergency admissions only

Figure 18: Average length of episode over time, by age group, England 2003-2004 to 2012-2013



Source: Public Health England, analysis uses Hospital Episode Statistics (HES)
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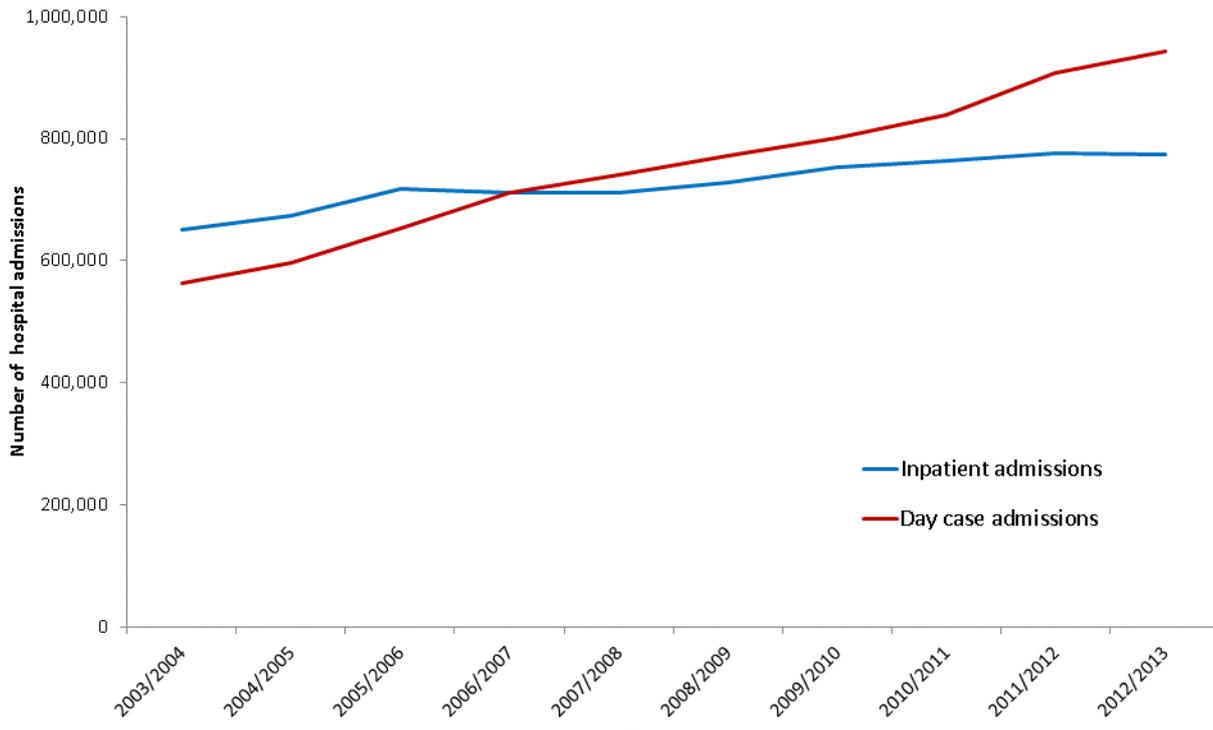
Over half of inpatient and day case admissions for cancer in 2012/13 were for people aged 65 and over, and about one quarter were for people aged 75 and over.⁶¹ Overall, the number of admissions increased between 2003/4 and 2012/13 by 41%. This increase was higher (51%) for those aged 75 and over, and lower (28%) for those aged 65 and under.

For all ages over the last decade, the number of day case admissions has increased at a faster rate than inpatient admissions (67% vs 19% between 2003/4 and 2012/13). Since 2007/8, there have been more day cases than inpatient admissions for cancer overall. However this pattern does not hold for the 75 and over age group, for which inpatient admissions are still higher than day case admissions (Figures 19 and 20).

The rate of increase in admissions is greater among those aged 75 and over compared to younger age groups. Day cases and inpatient admissions increased by 108% and 25% respectively for the 75 and overs, compared to increases of only 45% and 10% for the under 65s.

There were around 774,000 inpatient admissions for cancer in 2012/3, of which 60% were emergency admission and 38% were elective.^{xviii} For those aged 75 and over, 70% were emergency admissions and 28% were elective. This compares to 52% and 46% for those aged 65 and under.

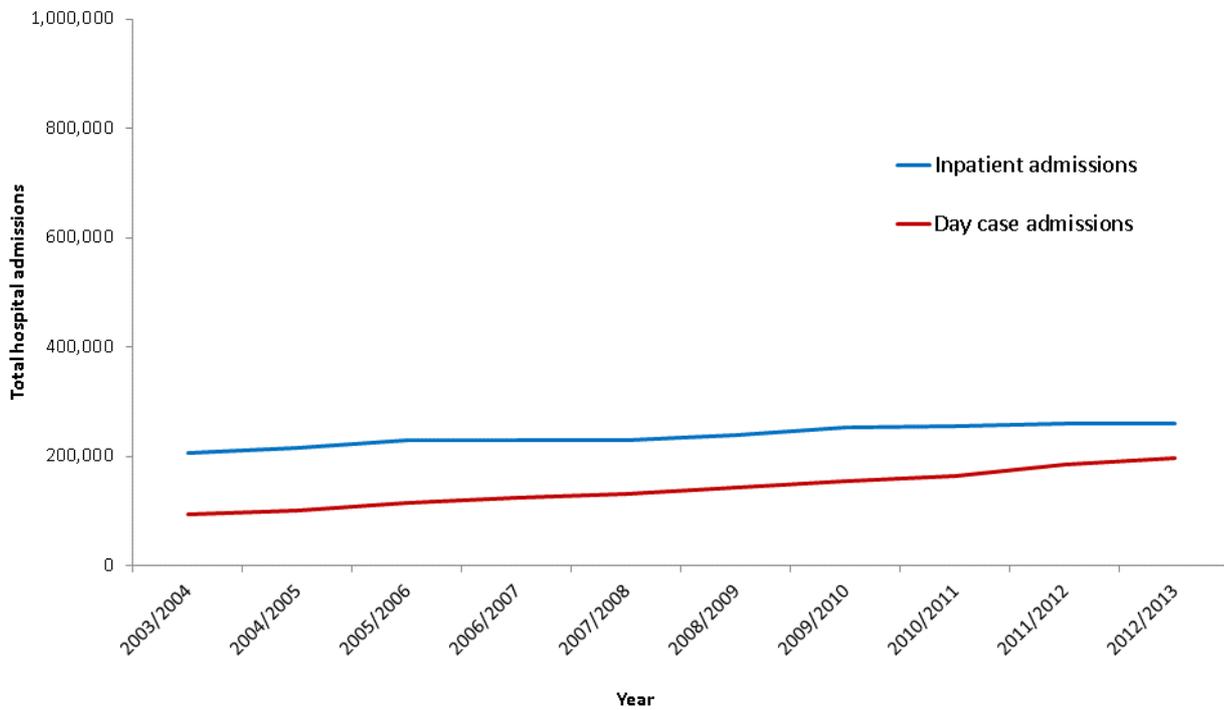
Figure 19: Number of hospital admissions for all ages, England 2003-2004 to 2012-2013



Source: Public Health England, analysis uses Hospital Episode Statistics (HES), Copyright © 2014, Re-used with the permission of The Health and Social Care Information Centre. All rights reserved.

^{xviii} The remaining 2% are for 'Other admissions'

Figure 20: Number of hospital admissions for those aged 75 and over, England 2003-2004 to 2012-2013



Source: Public Health England, analysis uses Hospital Episode Statistics (HES). Copyright © 2014, Re-used with the permission of The Health and Social Care Information Centre. All rights reserved.

Chapter 5: Patient experience

Key points:

- in general, older people are more satisfied with treatment and care and this holds true for many aspects of cancer services
- older people are more likely to have felt they were treated with dignity and respect during cancer treatment and had greater confidence in their doctors and nurses
- however older people (76+) are also less likely to have access to a Clinical Nurse Specialist or to have been given information on the side effects of treatment

A person's experience of the treatment and care they receive can be as important as the physical outcomes of this treatment. The NHS England Cancer Patient Experience Survey (CPES) provides an in-depth annual snapshot of the experience of cancer patients. Since 2010, there have been over 278,000 respondents to the CPES who were on active treatment at the time of data capture, although some respondents may have been surveyed on more than one occasion owing to cancer recurrence or continuing treatment.⁶² This chapter examines the experience and care reported by older people.

Generally there is a consistent pattern to patient experience by age. For most survey questions the youngest age group (16-25) is the least positive and positivity increases with age with a slight dip in the oldest age groups (76+). This replicates other findings from the national patient surveys in different settings (eg primary care, hospital inpatients and mental health).

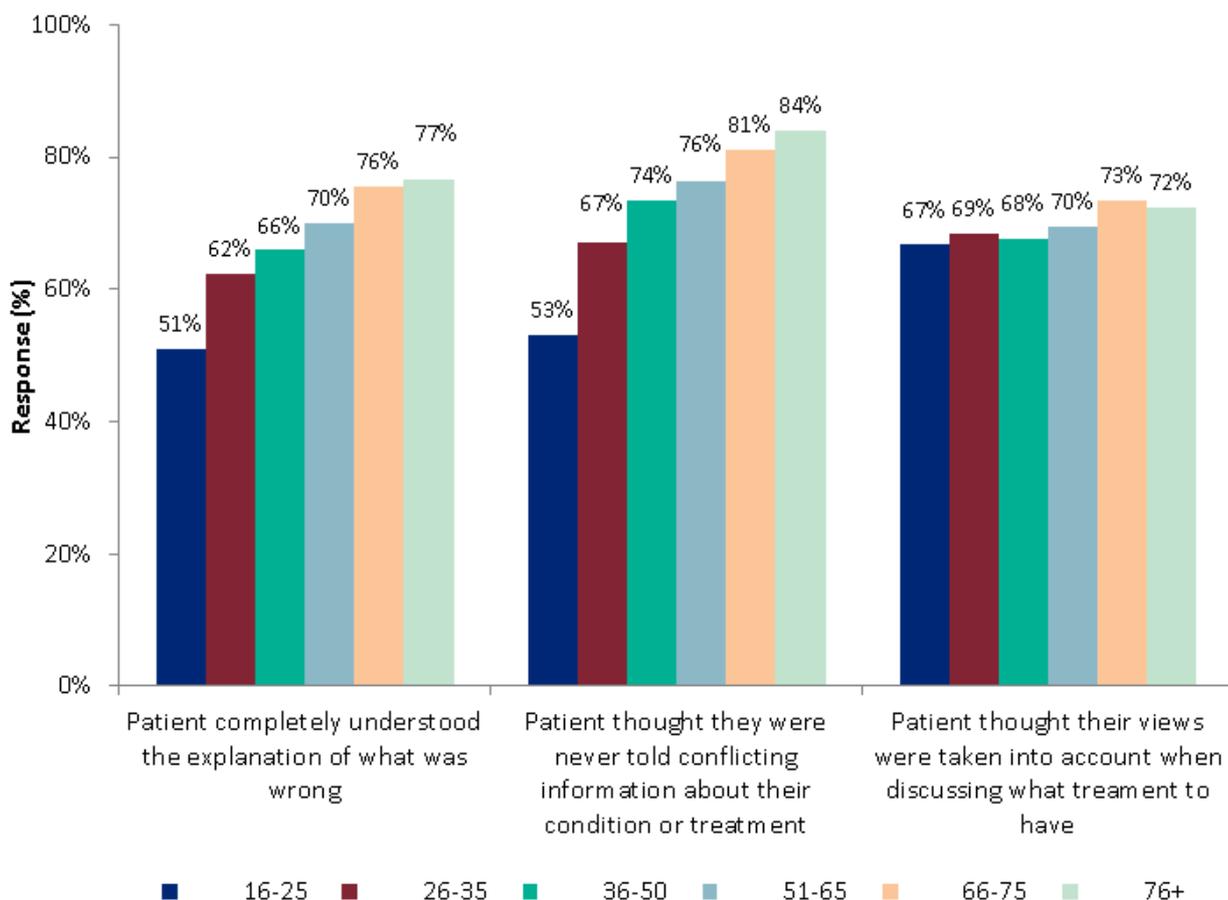
It is not clear why older patients should be, on most issues related to the NHS, more positive than younger ones. It is possible that older patients may be more accepting of the authority of professionals, and will in most cases have more experience of the way in which the healthcare system works than younger patients who may be in hospital for the first time as adults. However, it is established that on issues where their experience is poor, older patients are ready to report poorer quality experience, such as that on the availability of Clinical Nurse Specialists.

When compared to other age groups, older people (66-75 and 76+) in England report most positively on their experience for the following aspects of care:⁶³

- being treated with respect and dignity by the doctors and nurses and other hospital staff. Most of those aged 66-75 (86%) and those aged 76+ (87%) felt they were treated with dignity and respect; this compares to 80% for those aged 36-50, which was the lowest proportion.

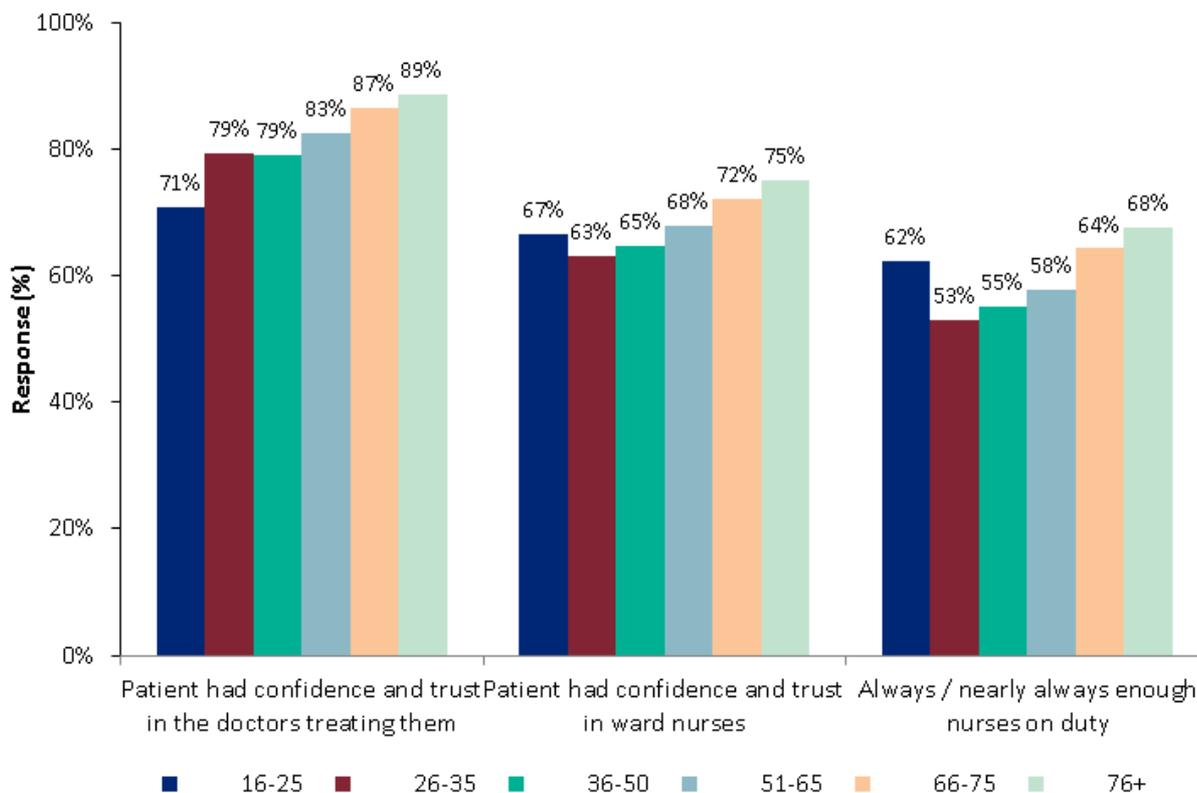
- most likely to never feel like they were treated as ‘a set of cancer symptoms’, rather than a whole person; 86% of people aged 76 and over report never feeling treated like a set of cancer symptoms. The lowest proportion was for those aged 36-50 (75%).
- confidence and trust in their doctors and nurses. For example nearly 90% of patients aged 76 and over have the most confidence and trust in the doctors treating them, compared to 71% of the youngest age group (16-25). The oldest age groups were also the most positive about their ward nurses (75%).
- explanations provided to them about their condition and treatment and their understanding of this. 77% of patients aged 76 and over said they completely understood the explanation they received about what was wrong; this compares to 51% of those aged 16-25.

Figure 21: Information to patients on their condition and treatment, by age group, England, 2014



Source: Selected questions from the National Cancer Patient Experience Survey 2014, England

Figure 22: Patient confidence and trust in their doctors and nurses, by age group, England, 2014

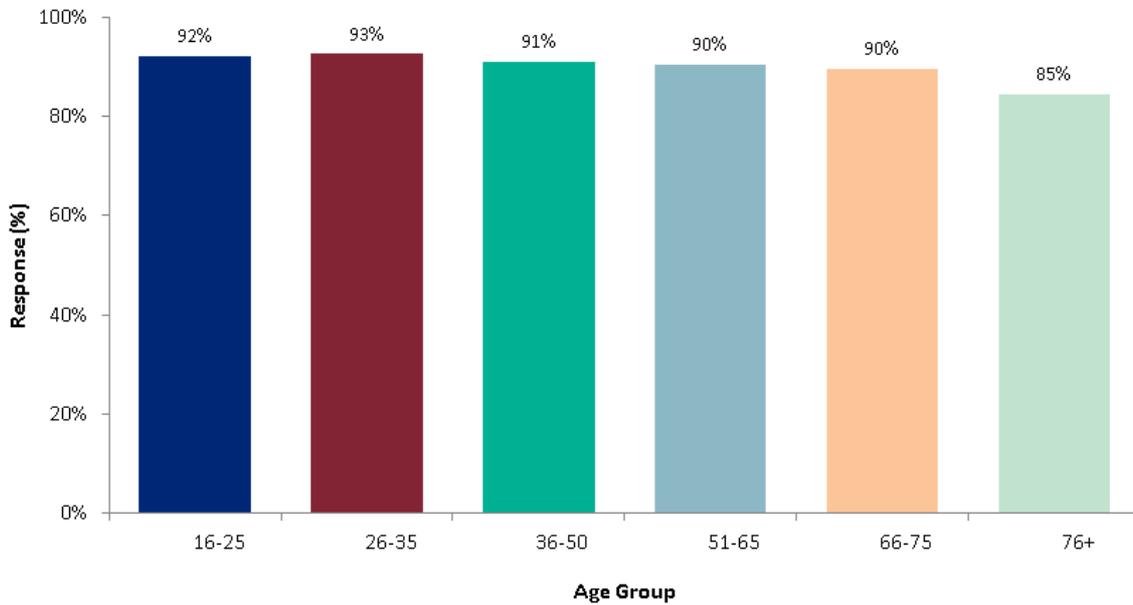


Source: Selected questions from the National Cancer Patient Experience Survey 2014, England

However, the pattern is by no means uniform and the issues on which older people report least positively can offer some important insights as to how services could be tailored to better support the needs of older people. For example older people are:

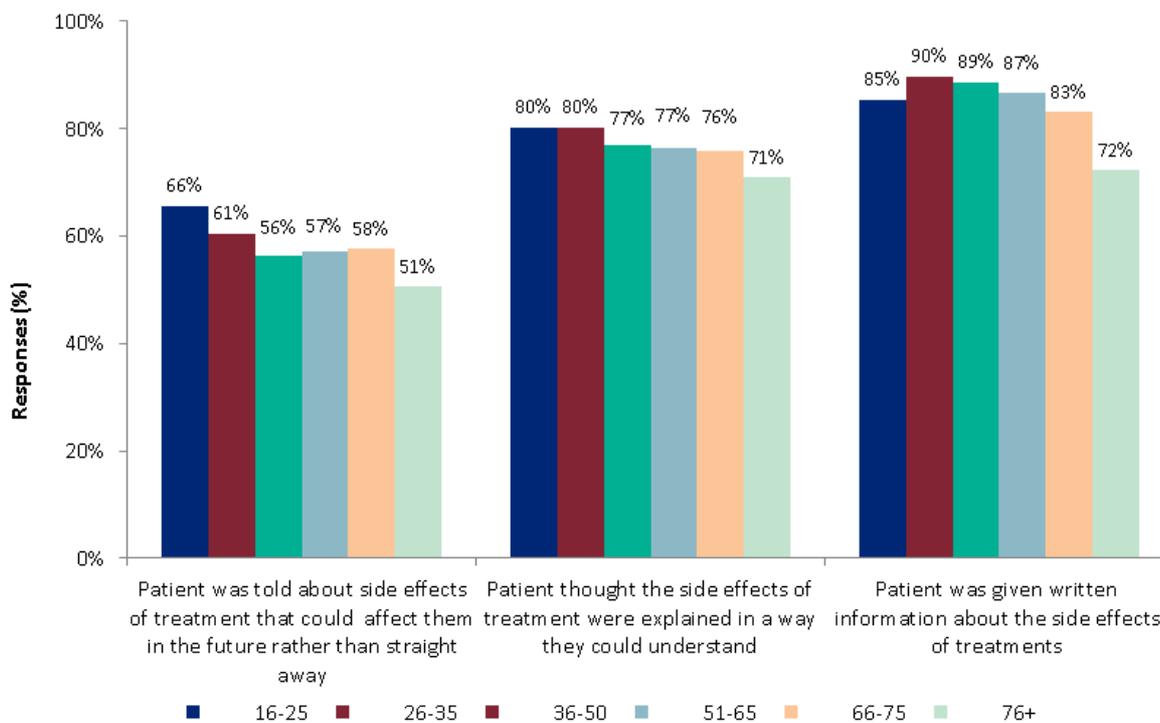
- less likely to report they were given a name of their Clinical Nurse Specialist (CNS) in charge of their care: 85% of patients aged 76 and over were given a name of their CNS, compared to 92% aged 16-25
- less likely to be given information about treatment side effects: only half of patients aged 76 and over were told about side effects of treatment that could affect them in the future rather than straight away, which compares to 66% of those aged 16-25

Figure 23: Patient given the name of the CNS in charge of their care, by age group, England, 2014



Source: Selected questions from the National Cancer Patient Experience Survey 2014, England

Figure 24: Information to patients on the side effects of treatment, by age group, England, 2014



Source: Selected questions from the National Cancer Patient Experience Survey 2014, England

These issues are particularly concerning given that side effects are more likely to be a problem for older people receiving cancer treatment and that older people are more likely to have multiple health conditions, meaning that their care will need to be coordinated across a range of different specialisms.

It has now been clearly established that there is a strong association between good information given to patients about their condition and treatment, and better health status and health gain reported by patients after an operation. In particular, a study undertaken by Quality Health on behalf of the East Midlands PCTs and SHA covering over 10,000 patient respondents in orthopaedic and general surgery found that higher scores on patient experience domains were strongly associated with higher health gains as measured by the Oxford Hip and Knee scores and EQ5D. A 10% better score given on patient experience questions was associated with a 3% better score on health outcomes, with the question most strongly associated in this way being high trust and confidence in doctors and high quality communications from them to the patient.

In addition, a 10% better patient experience score was associated with a 20% lower likelihood of reporting complications.

Although this large study was undertaken in orthopaedic and general elective surgery there is no reason to suggest that a similar pattern would not occur in cancer.⁶⁴

Chapter 6: Older people living with and beyond cancer

Key points:

- older people are more likely to be frail and have other health conditions which may impact upon their quality of life and affect their cancer treatment
- increasing age is associated with reduced quality of life for people after diagnosis and treatment
- the issues which affect older people after cancer are different from those affecting younger people

Effective cancer treatment should be about maintaining and improving a person's quality of life as well as extending it. Managing cancer in older people can require a careful balance between these goals, which are not always aligned. This chapter explores the evidence on helping older people live well with and beyond cancer. Many of the findings presented in it will also be of relevance to decisions about initial treatment.

All cancer survivors (and not just older survivors) have greater health needs than the general population. The vast majority (90%) of cancer survivors have visited their GP and 45% visited a specialist doctor in the last 12 months. This compares with 68% and 15% of the wider population.⁶⁵

Frailty

Understanding frailty can play an important part in tailoring cancer treatment and support. Frailty is a state of vulnerability that can affect a person's ability to recover from poor health. People with higher frailty levels will be more affected by a health concern than people with lower levels of frailty.⁶⁶

Frailty levels increase with age. A substantial proportion of people older than 85 years are estimated to be frail, and these people have a substantially increased risk of falls, disability, long-term care and death.^{67 68 69}

Other health conditions

Macmillan's Routes from Diagnosis⁷⁰ analysis of breast, lung, prostate and brain/central nervous system cancer patients' outcomes and hospital activity in

England^{xix} counts morbidities^{xx} recorded after diagnosis and how they vary with age. The percentage of people who are free of post-diagnosis morbidities declines with age for all 4 cancers combined and for each cancer separately:

- the proportion for all four cancers combined ranges from 42% among 18-24 year olds to 27% in people aged 75 and over
- the differences are largest among people living with breast cancer (from 41% in 18-64 year olds to 16% of those aged 75+)
- the differences are smallest among people living with prostate cancer (from 47% in 18-64 year olds to 35% of those aged 75+)

The percentage of people who were living with multiple post-diagnosis inpatient morbidities increased with age for all four cancers combined and separately.

^{xix} 84,535 patients diagnosed in 2003/4

^{xx} Based on inpatient hospital records (HES) only

Quality of life of cancer survivors

Evidence suggests that there is a lack of information and knowledge given to older patients and carers regarding their follow-on care.⁷¹

Cancer and its treatment can adversely impact on a person's quality of life. Many people with cancer experience short-term physical side effects during cancer treatment and usually these will resolve naturally within a few months. However, some will experience long-term or late-onset 'consequences of treatment': the wide range of physical and psychosocial changes that reduce quality of life after cancer and its treatment, however long ago that treatment might have been given.⁷²

The Department of Health commissioned a pilot survey to collect patient reported outcome measures (PROMs) from cancer survivors in England^{xxi} up to five years after their initial diagnosis; this can tell us more about issues which cancer survivors may face. Although quality of life tends to improve over time after treatment, some problems persist for long periods. Alongside disease status (whether or not a patient was in remission), older age and the existence of other conditions were associated with poorer quality of life.

The concerns of people living with and beyond cancer vary with age. For example, younger people (16-50 year olds) are more concerned about appearance and body image and have greater fear about death and dying than older cancer survivors (aged 76+). Older people (aged 76+) are more likely than younger people (16-50 year olds) to report difficulties with mobility, undertaking their usual activities and undertaking domestic chores.⁷³

^{xxi} Department of Health. Quality of life of cancer survivors in England. 2012. Results are based on responses of 3,300 people between 1 and 5 years from diagnosis with breast, colorectal or prostate cancer or non-Hodgkin lymphoma (NHL) from three participating cancer registries (West Midlands, East of England and Thames). It should be noted that people aged 85+ were less likely to respond than other age groups.

Chapter 7: End of life care

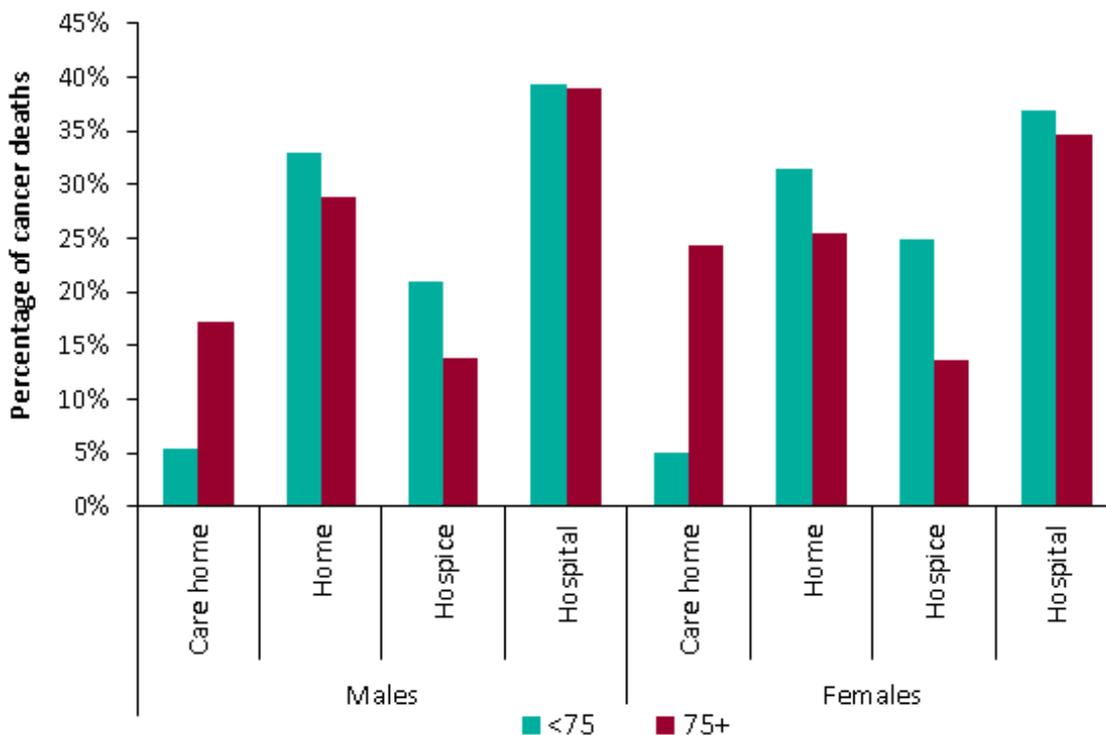
Key points:

- older patients with cancer are more likely than younger patients to die in a care home, and are less likely to die at home or in a hospice, mirroring the pattern of deaths from all causes
- older people with cancer spend less time in hospital during their last year of life than people with other conditions
- there is substantial variation in the length of time older cancer patients spend in hospital near the end of their life, depending on where they live

Place of death⁷⁴

The majority of people dying from cancer die in hospital, but there are differences between those aged 75 and over and younger people. For both men and women people aged 75 and over are more likely to die in a care home rather than at home or in a hospice. Women aged 75 and over are slightly less likely to die in hospital while there is no difference for men.

Figure 27: Place of death for those dying of all cancers, England 2012



Source: National End of Life Care Intelligence Network, PHE

Enabling people to stay in their preferred place of care is a feature of good end of life care. For most people the preferred place of care is at home or in a community setting.⁷⁵

On average, people aged 75 and over who die from their cancer spend less time in hospital in the last year of life than those who have a cancer diagnosis but die of another cause. This is true for both elective and emergency admissions.

Those dying from cancer had fewer emergency admissions; fewer elective admissions; and shorter length of stay for emergency admissions than those dying from other causes. The average length of stay in the last year of life for those dying of cancer was 24.1 emergency days and 5 elective days, compared to 28.9 emergency days and 5.7 elective days for those dying from other causes.

The average number of emergency admissions in the last year of life for people aged 75 and over dying of cancer was 2.1 per person, compared to 2.4 for people with non-cancer deaths. The average number of elective admissions was 3.4 and 4.3 respectively.

Those dying of cancer aged 75 and over spend on average 10% of their time in the last six months of life as an inpatient/day case; this equates to 18 days. There is substantial variation between Clinical Commissioning Groups (CCGs): the proportion of the last six months of life spent in hospital varies between 2% (4 days) and 16% (30 days). This suggests that those dying of cancer could potentially have weeks more of their life in their home or a community setting if the CCGs with the longest stays in hospital could reduce numbers of admissions and length of stay.

Chapter 8: Research

Key points:

- older cancer patients are less likely to have opportunities to take part in research discussed with them
- even when the opportunity to participate in research is discussed, older people are less likely to end up participating
- there is a deficit of research into different aspects of older people and cancer but it is possible to extract evidence on older people and cancer from wider studies

Research plays a vital role in improving cancer outcomes, enabling us to take steps to prevent cancer, encourage earlier diagnosis, develop more effective treatments with fewer side effects and better support people living with and dying from cancer. The NHS has a duty to promote research and reduce inequalities; therefore encouraging research into older people and cancer should be a priority. This chapter sets out what is known about research in older people affected by cancer.

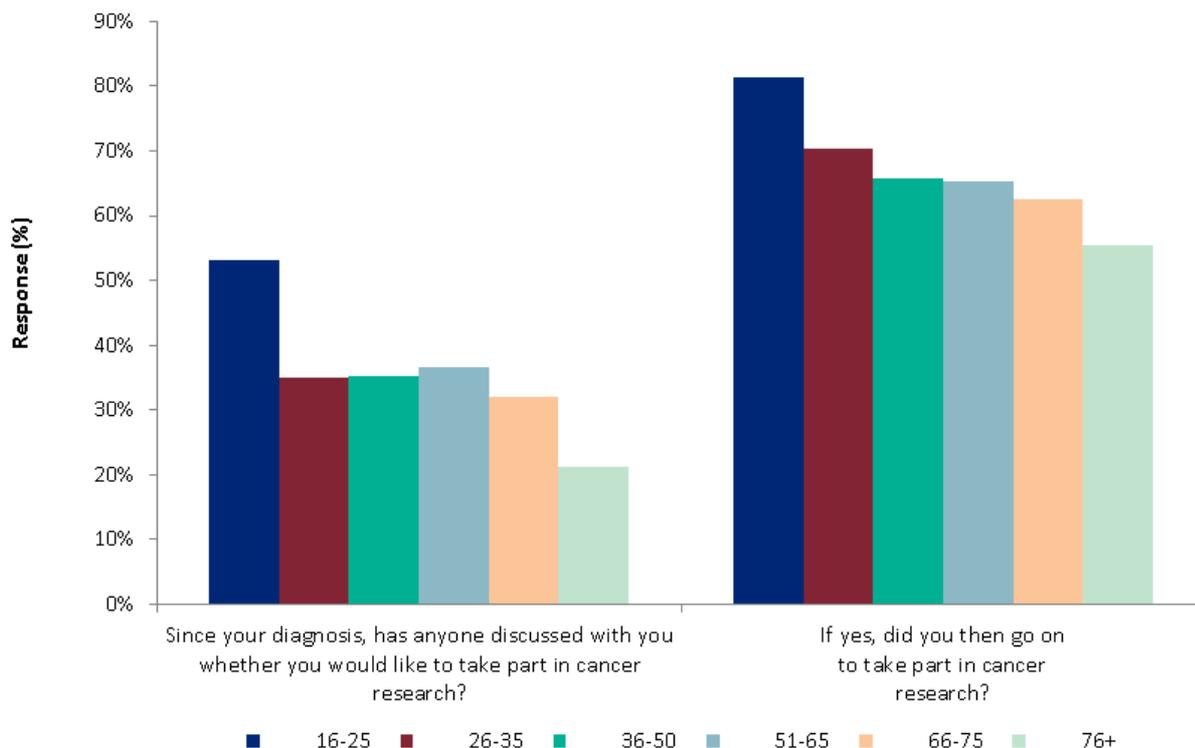
Participation

Evidence from the NHS England Cancer Patient Experience Survey⁷⁶ shows that older people are less likely to have cancer research discussed with them. Among the over 75s, just over 1 in 5 (21%) patients report having research discussed with them, compared to nearly 2 in 5 (37%) of the 51 to 65 age group.

Older people are also less likely to go on to participate in research. Of those who had research discussed with them, 55% of the over 75s participate compared to 65% for the 51 to 65s.

Part of the reason for lower levels of discussion and participation may be fewer relevant trials. In the past many clinical trials excluded people on the grounds of their age, imposing upper age limits. Although these have largely been removed, criteria relating to fitness and/or frailty and prior treatment can act as barriers to participation.

Figure 28: Patients attitudes towards cancer research, by age group, England 2014



Source: Selected questions from the NHS England National Cancer Patient Experience Survey 2014

There is a need to design trials that better reflect the characteristics of the populations affected by cancer. Research opportunities include:

- examining whether cancers and treatments behave differently on older people
- designing outcome measures in trials which better reflect the needs and goals of older people
- different approaches to treatment, including minimally invasive techniques and approaches designed to limit side effects

It is also possible to extract evidence on the effectiveness and tolerability of treatments in older people from wider trials. For example, in order to better understand the evidence on the clinical effectiveness and tolerability of treating older people with cancer drugs, the National Cancer Equality Initiative and the Pharmaceutical Oncology Initiative has commissioned the Liverpool Reviews and Implementation Group to undertake systematic reviews for breast cancer and kidney cancer, with further studies for colorectal (bowel) cancer, chronic myeloid leukaemia, non-Hodgkin lymphoma and lung cancer to follow. These studies have been supplemented by work from the Haematological Malignancy Research Network which analysed data on the outcomes achieved in treating older people with a range of blood cancers in routine NHS practice.

A summary of these studies is being published alongside this report, showing that:

- treatment outcomes for older people are comparable to those for younger people
- relatively fit older people can safely tolerate anti-cancer therapies
- however the treatment of older people generally comes with a risk of more serious adverse events
- early discontinuation of treatment or dose modification are more common in older people

The review identifies the importance of making greater use of Comprehensive Geriatric Assessment and age-specific quality of life measures in future clinical trials.

Applying cancer intelligence

The cancer community in England is well placed to make use of the extensive data collected on cancer services to generate high quality intelligence on cancer and older people. Examples within this report span the entire cancer pathway, enabling us to better understand the challenges faced in preventing cancer in older people, encouraging early diagnosis, ensuring people receive the most appropriate treatments for them, as well as promoting a positive experience of treatment and care, and offering high quality support for people living with and beyond cancer.

This progress is only possible because of continued investment in cancer intelligence and through ongoing cooperation and partnership between the many different organisations with an interest in collecting cancer data and improving cancer intelligence.

References

¹ The Calman-Hine report; A policy framework for commissioning cancer services : A report by the Expert Advisory Group on Cancer to the Chief Medical Officers of England and Wales, 1995, Departments of Health for England and Wales.

² Measuring National Well-being, Social Trends 42 – Population, Office for National Statistics http://www.ons.gov.uk/ons/dcp171766_224403.pdf

³ National Life Tables, United Kingdom, 2011-2013, Office for National Statistics <http://www.ons.gov.uk/ons/rel/lifetables/national-life-tables/2011-2013/stb-uk-2011-2013.html>

⁴ Office for National Statistics <http://www.ons.gov.uk/ons/rel/lifetables/historic-and-projected-data-from-the-period-and-cohort-life-tables/2012-based/sty-babies-living-to-100.html>

⁵ Maddams J et al, Projections of cancer prevalence in the United Kingdom, 2010–2040, British Journal for Cancer. Sep 25, 2012; 107(7): 1195–1202 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3461160/>

-
- ⁶ Cancer Registrations statistics 2012, Office for National Statistics
<http://www.ons.gov.uk/ons/rel/vsob1/cancer-statistics-registrations--england--series-mb1-/no-43--2012/index.html>
- ⁷ CancerStats, Cancer Research UK <http://www.cancerresearchuk.org/cancer-info/cancerstats/incidence/age/>
- ⁸ Cancer Research UK, personal communication
- ⁹ CancerStats, Cancer Research UK <http://www.cancerresearchuk.org/cancer-info/cancerstats/incidence/age/>
- ¹⁰ Cancer Survival Statistics, Office for National Statistics
- ¹¹ Cancer Survival Rates - Cancer Survival in England: Patients Diagnosed, 2006–2010 and Followed up to 2011, Office for National Statistics, <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-277733>
- ¹² Coleman et al, Cancer survival in Australia, Canada, Denmark, Norway, Sweden and the UK, 1995-2007 (the International Benchmarking Partnership): an analysis of population-based cancer registry data (2011), *Lancet* 2011; 377;127-138
- ¹³ De Angelis et al, Cancer survival in Europe 1999-2007 by country and age: results of EURO CARE--5-a population-based study, *Lancet Oncol* 2014; 15:23-34
- ¹⁴ Coleman et al, Cancer survival in Australia, Canada, Denmark, Norway, Sweden and the UK, 1995-2007 (the International Benchmarking Partnership): an analysis of population-based cancer registry data (2011), *Lancet* 2011; 377;127-138
- ¹⁵ Morris EJ et al, A population-based comparison of the survival of patients with colorectal cancer in England, Norway and Sweden between 1996 and 2004, *Gut*. 2011 Aug; 60(8):1087-93 <http://www.ncbi.nlm.nih.gov/pubmed/21303917>
- ¹⁶ Walters, S et al, Breast cancer survival and stage at diagnosis in Australia, Canada, Denmark, Norway, Sweden and the UK, 2000-2007: a population-based study, *British Journal of Cancer* 2013
- ¹⁷ Maringe C et al, Stage at diagnosis and ovarian cancer survival: Evidence from the International Cancer Benchmarking Partnership. *Gynecol Oncol*. 2012; 127:75-82
- ¹⁸ Mortality Statistics: Deaths Registered in England and Wales (Series DR), 2012, Office for National Statistics <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-325289>
- ¹⁹ National Cancer Intelligence Network, PHE, <http://www.ncin.org.uk/view?rid=2645>
- ²⁰ Cancer of unknown primary statistics,
<http://www.cancerresearchuk.org/cancer-info/cancerstats/types/cancer-of-unknown-primary/?script=true>
- ²¹ CancerStats, Cancer Research UK, <http://www.cancerresearchuk.org/cancer-info/cancerstats/mortality/age/>
- ²² Preventable cancers, Cancer Research UK
<http://publications.cancerresearchuk.org/publicationformat/formatposter/preventablein-depth.html>
- ²³ CancerStats, Cancer Research UK, <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/lung/incidence/>
- ²⁴ Peto R, Darby S, Deo H, et al. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies, *BMJ* 2000;321(7257):323-29.
- ²⁵ Cancer Research UK Cancer Awareness Measure data 2012, personal communication

-
- ²⁶ Opinions and Lifestyle Survey, Smoking Habits Among Adults, 2012, Office for National Statistics <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-315987>
- ²⁷ Opinions and Lifestyle Survey, Office for National Statistics. Accessed April 2014.
- ²⁸ General Lifestyle Survey, 2011, Office for National Statistics. Accessed April 2014.
- ²⁹ PN Lee Statistics and Computing Ltd. International Smoking Statistics Web Edition. Available from: <http://www.pnlee.co.uk/ISS.htm>. Accessed April 2014
- ³⁰ CancerStats, Cancer Research UK, <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/lung/incidence/>
- ³¹ Current Smoking Prevalence: by Occupation, UK, January to December 2013, Office for National Statistics <http://www.ons.gov.uk/ons/rel/integrated-household-survey/integrated-household-survey/january-to-december-2013/stb-intergrated-household.html#tab-Smoking-Prevalence>
- ³² Kotz D, Brown J, West R, Prospective cohort study of the effectiveness of smoking cessation treatments used in the “real world”. Mayo Clinic proceedings. 2014;89(10):1360–7 <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4194355&tool=pmcentrez&rendertype=abstract>. Accessed October 16, 2014.
- ³³ Kotz D, Brown J, West R. “Real-world” effectiveness of smoking cessation treatments: a population study. Addicton. 2013.
- ³⁴ Statistics on NHS Stop Smoking Services, England - April 2012 to March 2013, Health and Social Care Information Centre <http://www.hscic.gov.uk/catalogue/PUB12228>
- ³⁵ Cancer Research UK Cancer Awareness Measure data 2012, personal communication
- ³⁶ Adult anthropometric measures, overweight and obesity, Health Survey for England – 2012, Health and Social Care Information Centre <http://www.hscic.gov.uk/catalogue/PUB13218/HSE2012-Ch10-Adult-BMI.pdf>
- ³⁷ Opinions and Lifestyle Survey, Drinking Habits Among Adults, 2012, Office for National Statistics <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-331342>
- ³⁸ Opinions and Lifestyle Survey, Drinking Habits Among Adults, 2012, Office for National Statistics <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-331342>
- ³⁹ Cancer Research UK Cancer Awareness Measure data 2012, Great Britain, personal communication
- ⁴⁰ Physical activity in adults, Health survey for England 2012, HCSIC, <http://www.hscic.gov.uk/catalogue/PUB13218/HSE2012-Ch2-Phys-act-adults.pdf>
- ⁴¹ Improving outcomes – a strategy for cancer, January 2011, Department of Health,
- ⁴² Saving lives, averting costs - An analysis of the financial implications of achieving earlier diagnosis of colorectal, lung and ovarian cancer, Incisive Health, September 2014
- ⁴³ Cancer Research UK Cancer Awareness Measure data 2012, Great Britain, personal communication
- ⁴⁴ Department of Health
- ⁴⁵ Be Clear on Cancer Evaluation Team, Public Health England, , Be Clear on Cancer campaign, Department of Health
- ⁴⁶ Cancer Research UK, Public Health England, Be Clear on Cancer campaign, Department of Health

⁴⁷ Cancer Research UK, Public Health England, Be Clear on Cancer campaign, Department of Health

⁴⁸ Be Clear on Cancer Evaluation Team, Public Health England, Be Clear on Cancer campaign, Department of Health

⁴⁹ Methodology and Data Tables Supplement, National Cancer Patient Experience Survey, 2014, Quality Health, Department of Health <https://www.quality-health.co.uk/resources/surveys/national-cancer-experience-survey/2014-national-cancer-patient-experience-survey/2014-national-cancer-patient-experience-survey-national-reports/686-2014-national-cancer-patient-experience-survey-methodology-and-data-tables/file>

⁵⁰ Public Health England, using data from the National Cancer Waiting Times Monitoring Dataset, 2013/14, provided by NHS England

⁵¹ Routes to Diagnosis 2006-2010, National Cancer Intelligence Network, Public Health England http://www.ncin.org.uk/publications/routes_to_diagnosis

⁵² Cancer survival by stage of diagnosis, National Cancer Intelligence, Survival by stage 2012, October 2014 http://www.ncin.org.uk/publications/survival_by_stage

⁵³ Cancer Reform Strategy, Department for Health, 2007

<http://www.nhs.uk/NHSEngland/NSF/Documents/Cancer%20Reform%20Strategy.pdf>

⁵⁴ Foot C, et al/The Kings Fund. How to improve cancer survival: explaining England's relatively poor rates. 2011. http://www.kingsfund.org.uk/publications/cancer_survival.html (accessed September 2014)

⁵⁵ Growth Negligence: Older people's experience of cancer care, Macmillan Cancer Support. http://www.macmillan.org.uk/Documents/AboutUs/Health_professionals/OlderPeoplesProject/Growth_Negligence.pdf

⁵⁶ NHS treated cancer patients receiving major surgical resection, National Cancer Intelligence Network, Public Health England

⁵⁷ NCIN analysis created for the report using data held in the Cancer Analysis System. Cancer registration data was provided by PHE's NCRS and Radiotherapy by NATCANSAT

⁵⁸ Are older people receiving cancer drugs? An analysis of patterns in cancer drug delivery according to the age of patient NHS England and NCEI-POI, 2013 <http://www.england.nhs.uk/wp-content/uploads/2013/12/old-people-rec-cancer-drugs.pdf>

⁵⁹ Public Health England and the Chemotherapy Intelligence Unit, accessed September 2014; Cancer incidence figures based Cancer Registrations statistics 2012, Office for National Statistics <http://www.ons.gov.uk/ons/rel/vsob1/cancer-statistics-registrations--england--series-mb1-/no--43--2012/index.html>

⁶⁰ Public Health England using Hospital Episode Statistics (HES)

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⁶¹ Public Health England using Hospital Episode Statistics (HES)

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⁶² NHS England Cancer Patient Experience Survey, Methodology and Data Tables Supplement, Quality Health, Department of Health September 2014 <http://www.quality-health.co.uk/resources/surveys/national-cancer-experience-survey/2014-national-cancer-patient-experience-survey/2014-national-cancer-patient-experience-survey-national-reports/686-2014-national-cancer-patient-experience-survey-methodology-and-data-tables/file>

⁶³ 2010 National Survey Report, NHS England Cancer Patient Experience, Department of Health – Quality Health Survey, <http://www.quality-health.co.uk/resources/surveys/national->

cancer-experience-survey/2010-national-cancer-patient-experience-survey/308-2010-national-cancer-patient-experience-survey-programme-national-report/file

⁶⁴ Black N et al, Relationship between patient reported experience (PREMs) and patient reported outcomes (PROMs) in elective surgery *BMJ Qual Saf* 2014, 0:1-9

⁶⁵ Assessment and care planning, National Cancer Survivorship Initiative.

<http://www.ncsi.org.uk/what-we-are-doing/assessment-care-planning/>

⁶⁶ Clegg A et al, Frailty in Elderly People, Volume 381, Issue 9868, 2–8 March 2013, Pages 752–762 <http://www.sciencedirect.com/science/article/pii/S0140673612621679>

⁶⁷ Clegg A et al, Frailty in Elderly People, Volume 381, Issue 9868, 2–8 March 2013, Pages 752–762 <http://www.sciencedirect.com/science/article/pii/S0140673612621679>

⁶⁸ X Song, A Mitnitski, K Rockwood Prevalence and 10-year outcomes of frailty in older adults in relation to deficit accumulation *J Am Geriatr Soc*, 58 (2010), pp. 681–687

⁶⁹ LP Fried, CM Tangen, J Walston, et al. Frailty in older adults: evidence for a phenotype *J Gerontol A Biol Sci Med Sci*, 56 (2001), pp. M146–M156

⁷⁰ Analysis by Macmillan Cancer Support of Routes from Diagnosis (RfD) data in conjunction with Monitor Deloitte. For more about RfD, see Macmillan Cancer Support (2014), Routes from Diagnosis: the most detailed map of cancer survivorship yet www.macmillan.org.uk/Documents/AboutUs/Research/Researchandevaluationreports/Routes-from-diagnosis-report.pdf

⁷¹ BRAP/Macmillan Cancer Support. Walking into the unknown – Survivors and carers speak out on discrimination and inequality in cancer care services. 2011.

⁷² Throwing light on the consequences of cancer and its treatment, Macmillan Cancer Support http://www.ncsi.org.uk/wp-content/uploads/MAC14312_CoT_Throwing-light_report_FINAL.pdf

⁷³ Quality of Life of Cancer Survivors in England, Report on a pilot survey using Patient Reported Outcome Measures (PROMS), Department of Health – Quality Health, 2012 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267042/9284-TSO-2900701-PROMS-1.pdf

⁷⁴ National End of Life Care Intelligence Network, Public Health England http://www.endoflifecare-intelligence.org.uk/resources/publications/variations_in_place_of_death

⁷⁵ Time to choose, Making choice at the end of life a reality Macmillan Cancer Support <http://www.macmillan.org.uk/Documents/GetInvolved/Campaigns/Endoflife/TimeToChoose.pdf>

⁷⁶ NHS England Cancer Patient Experience Survey, Methodology and Data Tables Supplement, Quality Health Department of Health September 2014 <http://www.quality-health.co.uk/resources/surveys/national-cancer-experience-survey/2014-national-cancer-patient-experience-survey/2014-national-cancer-patient-experience-survey-national-reports/686-2014-national-cancer-patient-experience-survey-methodology-and-data-tables/file>