



# Cancer in the UK 2019

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CANCER  
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UK

# Executive summary

Progress over the last 50 years has transformed the prospects for people diagnosed with cancer in the UK. In the 1970s, only 1 in 4 cancer patients would survive their disease for ten years or more. By 2010, this had risen to 2 in 4, and survival continues to improve today. This is due to groundbreaking research, innovative new treatments, and the tireless efforts of staff right across the NHS.

However, there is still much to be done. This report summarises the current state of cancer in the UK, recognising where progress has been made, and highlighting the challenges that we continue to face. Cancer Research UK’s ambitious vision to see 3 in 4 people with cancer survive for ten years or more by 2034 serves as a driving force, and here we set out many of the steps that we already know must be taken across the UK to achieve this.

Cancer remains the leading cause of death in the UK, and a growing and ageing population with more complex needs means incidence continues to rise at an alarming rate. By 2035, the number of new cancer cases is projected to rise to over half a million a year. 4 in 10 cancers are preventable, making efforts to reduce exposure to risk factors such as smoking and obesity crucial to tackling rising incidence.

We also see lower survival in the UK than in comparable countries around the world, and significant variation in outcomes across the UK too. To address this, it is essential to diagnose more cancers at an earlier stage through increasing awareness and screening uptake, supporting primary care and growing diagnostic capacity, and to improve survival by ensuring consistent access to optimal treatments.

Foremost among these obstacles however, is the increasingly critical shortage of staff with the right skills in our health system. Without a long-term, concerted effort to ensure we have a cancer workforce fit for the future, sustainable progress in improving outcomes will be impossible.

This report uses data provided by patients and collected by the health service and cancer registries as part of their care and support. The availability, quality and timeliness of data varies between the different nations of the UK, highlighting the vital need for continued investment in high quality data that will unlock insights that can help improve cancer services.

To continue to deliver on the huge potential that exists today to further improve cancer outcomes, we must get better at preventing cancers, diagnosing them earlier and ensuring access to optimal treatment for everyone. Together, these actions will help us beat cancer.

Michelle Mitchell, Chief Executive Officer (April 2019)

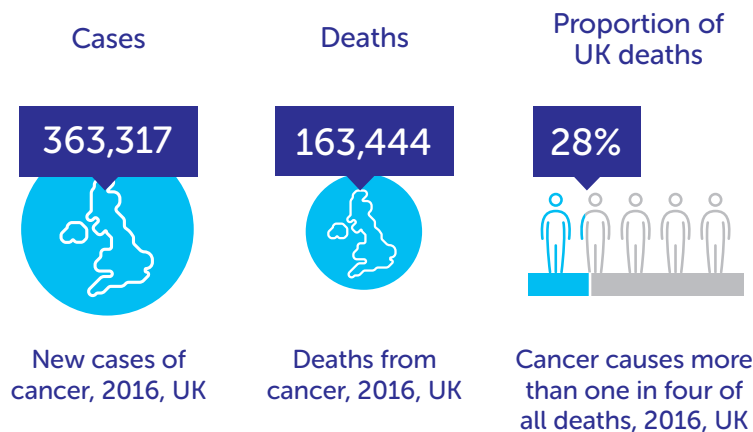
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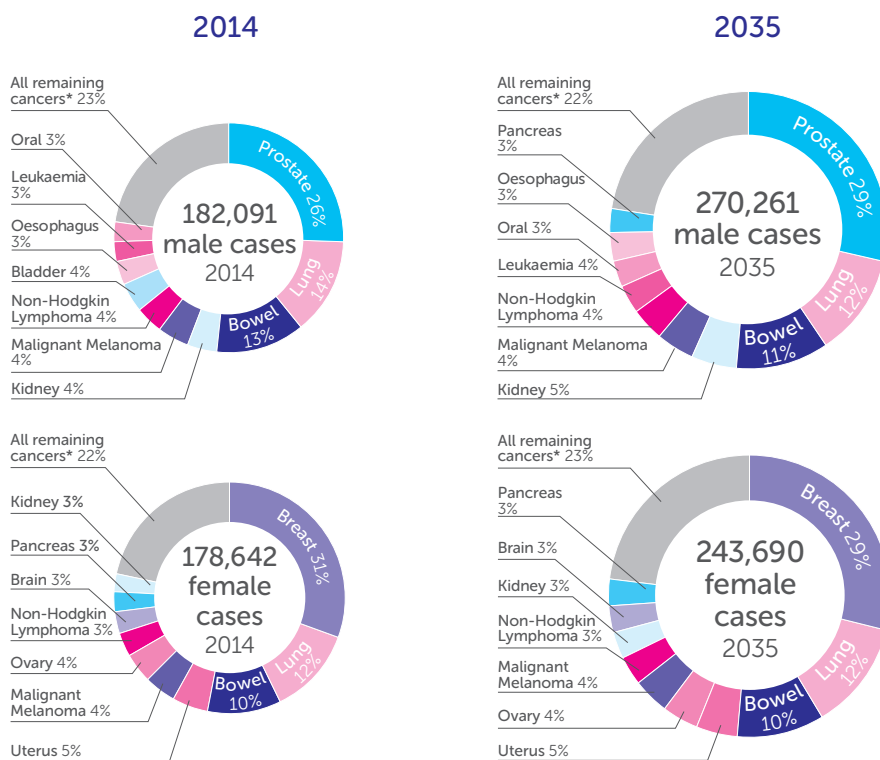
## There are more new cases of cancer every year

Cancer is the leading cause of death in the UK, above heart disease and dementia<sup>1</sup>.

Every day nearly 990 people are diagnosed with cancer, and around 450 people die from the disease<sup>2</sup>.



Incidence rates have increased by 12% since the early 1990s. Largely due to a growing and ageing population, the number of cancer cases is projected to rise by more than 40% to around 514,000 new cases per year in 2035, with a greater increase in men than women<sup>3</sup>.



\*All cancers (C00-C97 excl. C44) not otherwise individually named, plus D32-D33, D35.2-D35.4, D42-D43, and D44.3-D44.5 where Brain is not individually named.

**This increase will place an unprecedented burden on an already stretched healthcare system.**

## Cancer survival in the UK is worse than other countries

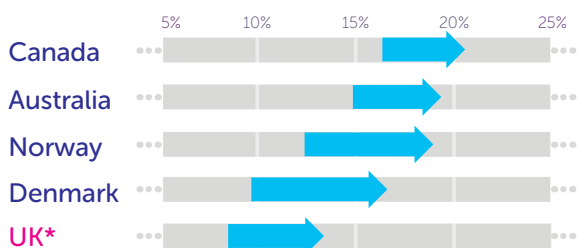
Half of people diagnosed with cancer in England and Wales survive their disease for ten years or more<sup>4</sup>. Survival varies considerably between cancer types: 98% of people with testicular cancer survive their disease for ten years or more, whereas just 1% of people with pancreatic cancer do<sup>5</sup>.

Despite improvements in recent years, cancer survival in the UK is lower than in comparable countries<sup>6,7</sup>. We don't fully understand why this is the case, but differences in stage at diagnosis and access to optimal treatments are likely to be the most important factors. The International Cancer Benchmarking Partnership (ICBP) will provide more information on these differences and help understand the drivers behind them.

There is also variation across England: survival is generally lower in the north of England than in the south<sup>8</sup>.

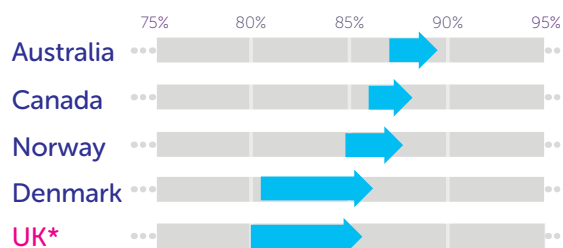
### Lung cancer

5-year survival changes, 2000-2004 to 2010-2014



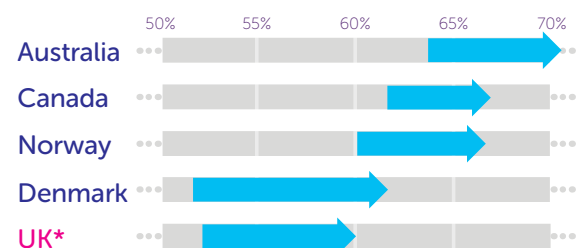
### Breast cancer

5-year survival changes, 2000-2004 to 2010-2014



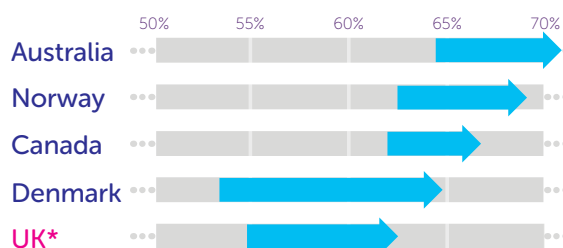
### Colon cancer

5-year survival changes, 2000-2004 to 2010-2014



### Rectal cancer

5-year survival changes, 2000-2004 to 2010-2014



\*UK includes data from England, Northern Ireland and Wales  
Source: Allemani et al (2018)

Reducing the number of cancer cases, preventing deaths and improving survival involves action across the whole pathway, from prevention through diagnosis to treatment.

Understanding the reasons why the UK's survival is poorer than comparable countries will identify where we can make the biggest difference and bring closer the day we beat cancer.

## Four in ten cancer cases in the UK can be prevented

That's more than 135,000 cases every year<sup>9</sup>. Smoking and excess bodyweight are the two largest preventable causes of cancer in the UK, but enjoying the sun safely, cutting back on alcohol, eating more fibre and less processed meat, and being more physically active also all stack the odds against cancer.

Making a change to reduce the risk of cancer



●●● Larger circles indicate more UK cancer cases

Source: Brown et al, British Journal of Cancer, 2018<sup>9</sup>

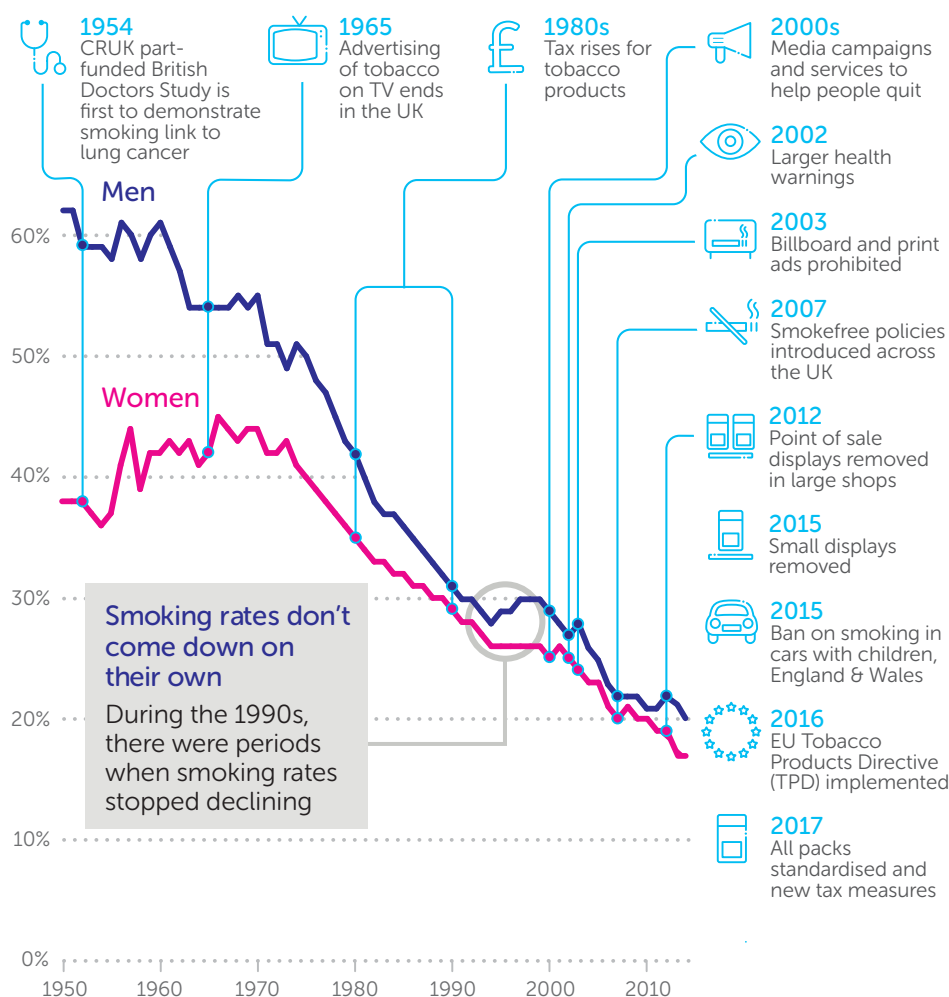
Tackling cancer through prevention requires individuals to make changes to their lives. But support from governments and health professionals is crucial to facilitate those changes.

## Smoking is still the largest cause of cancer

Smoking causes around 55,000 cases of cancer every year in the UK and is a risk factor for at least 15 cancer types<sup>9</sup>. Smoking is at its lowest recorded point at around 15% of the UK adult population<sup>10</sup>. But smoking rates don't come down on their own. The reduction in the UK from almost 50% in the 1970s to today's all-time low reflects the impact of numerous interventions. The latest, standardised (un-branded) packaging of cigarettes, was fully implemented in May 2017<sup>11</sup>.

Stop Smoking Services give smokers the best chance of quitting. However, these services have been amongst the worst hit by public health funding cuts in England and the number of people accessing these services has fallen for the sixth year in a row<sup>12</sup>.

### Smoking rates decline with action



Source: Adult Smoking Habits in Great Britain. Opinions and Lifestyle Survey, ONS

**Adequate funding for Stop Smoking Services is essential to stem the tide of new cancer cases in the UK.**

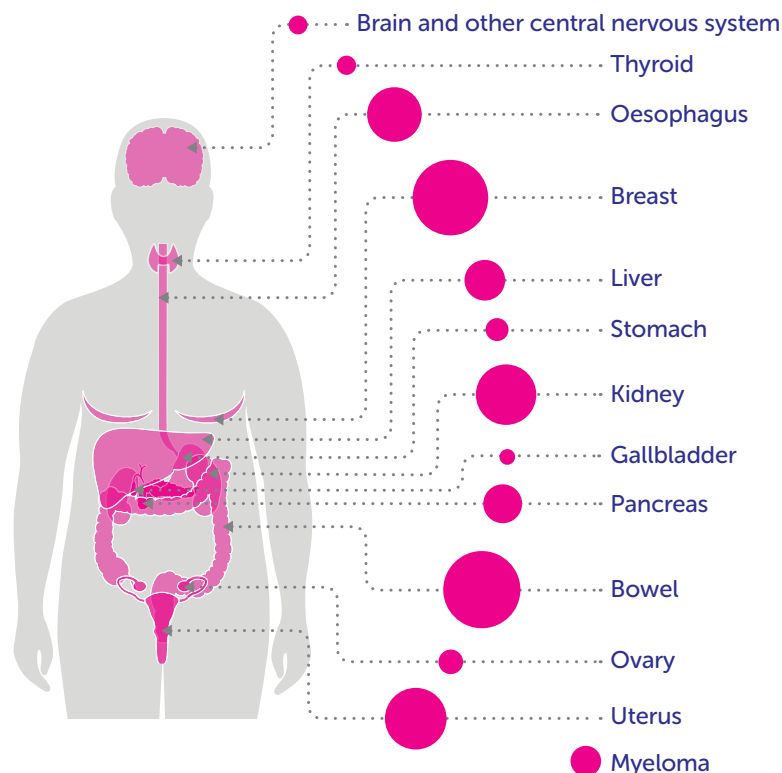
## Rising obesity levels could cause an extra 670,000 cases of cancer by 2035

Being overweight or obese causes around 23,000 cases of cancer every year in the UK, and is a risk factor for 13 different cancer types<sup>9</sup>.

Overweight and obesity prevalence is currently at its highest recorded level across the UK nations. If current trends continue, being overweight or obese could overtake smoking as the largest preventable cause of cancer in women in the next 25 years<sup>13</sup>.

There's substantial evidence that the obesity problem starts early: obese children are much more likely to become obese adults. Today, nearly a third of children aged 2 to 15 in England are overweight or obese<sup>14</sup>, and the proportion of obese children in Year 6 has risen for the fourth consecutive year<sup>15</sup>. We welcomed the Government's Childhood Obesity Plan Chapter 2, published in June 2018, which contained an ambition to halve childhood obesity rates by 2035. The Plan committed to consult on many measures we have campaigned for.

### Being overweight or obese can cause 13 types of cancer



●●● Larger circles indicate more UK cancer cases  
Source: Brown et al, British Journal of Cancer, 2018<sup>9</sup>

We need to ensure the measures promised in the Childhood Obesity Plan are implemented in their strongest forms possible.

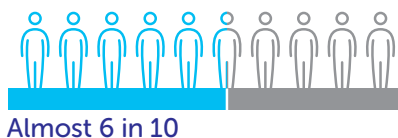
These include restrictions to remove TV junk food marketing before the 9pm watershed, similar measures online, and restricting multi-buy offers on unhealthy food and drink.

## Finding and treating cancer early saves lives

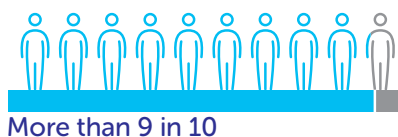
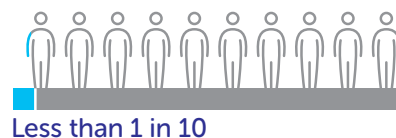
Patients diagnosed at an early stage are more likely to survive cancer<sup>16</sup>.

### Five-year survival by stage at diagnosis

#### Diagnosed at earliest stage

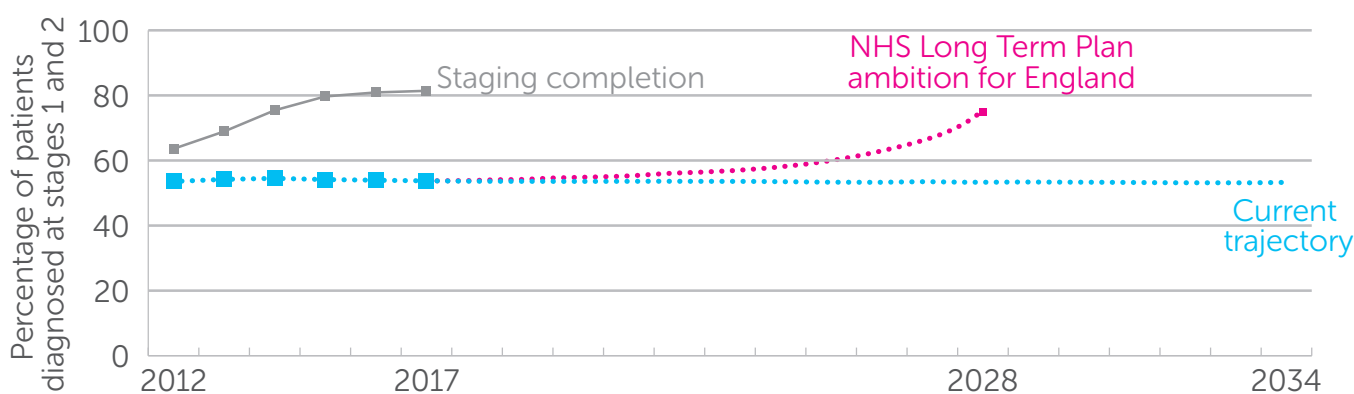


#### Diagnosed at latest stage



Earliest stage = stage 1; latest stage = stage 4.  
 Data is age-standardised net survival for adults (aged 15 to 99 years) in England in 2012-2016 followed up to 2017.  
 Source: Cancer survival in England, ONS/PHE, 2019.

This improved survival is partly because patients diagnosed at the earliest stage have different treatment options than those diagnosed later. Many patients miss out on potentially curative treatment because they are diagnosed at a late stage of disease. In England, the Government has set an ambition for 75% of cancers to be diagnosed at stage 1 or 2 by 2028<sup>17</sup>, which is closely aligned to CRUK's ambition set in 2014.



Source: Stage Breakdown by CCG, England 2017, National Cancer Registration Analysis Service (NCRAS)

### ■ The challenge is reducing the number of cases diagnosed at a late stage.

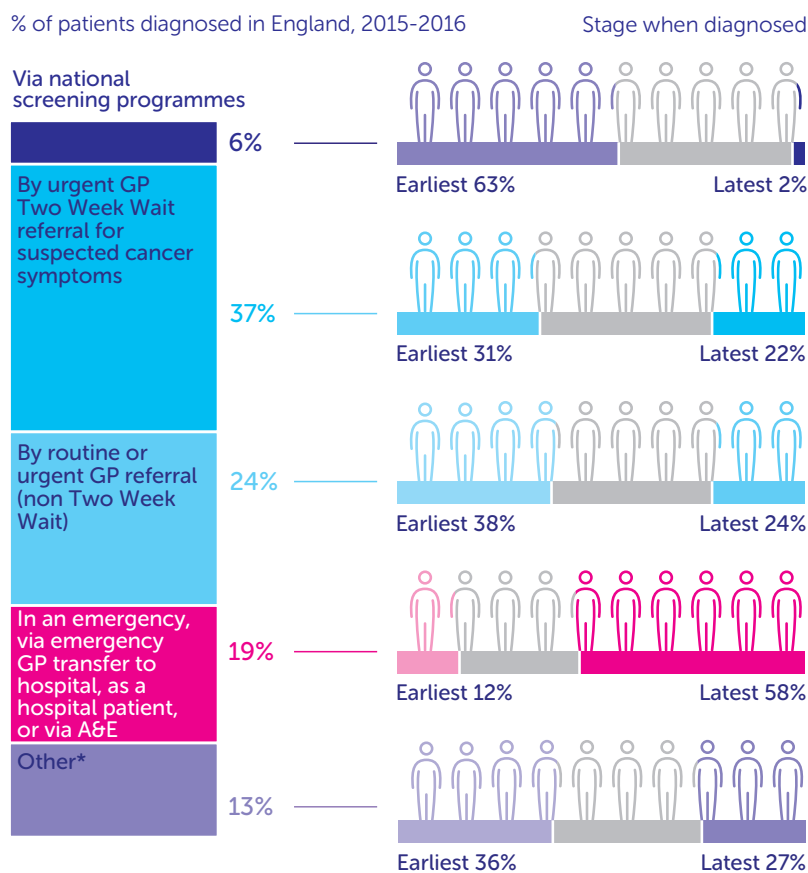
Early diagnosis is a multifaceted problem that requires a multifaceted solution. Removing barriers to screening and help-seeking, and ensuring sufficient staff and kit to conduct timely diagnostic tests are key.



## Too many patients are diagnosed as an emergency presentation

One factor influencing the stage of cancer diagnosis is when a patient presents with symptoms. A fifth of all cancers in England are diagnosed via an emergency route<sup>18</sup>. Patients diagnosed via this route are more likely to have late stage disease, which not only impacts their treatment options, but patients diagnosed via this route also report a worse experience of cancer care<sup>19</sup>. The pattern is likely to be similar in devolved nations.

### How and when cancer patients are diagnosed



Earliest = stage 1; Latest = stage 4

\*Inpatient elective, other outpatient, death certificate only, or unknown route to diagnosis

Source: Public Health England, Routes to Diagnosis 2006-2016 Workbook, data for England 2015-2016

Public Health England and Cancer Research UK, Stage by Routes to Diagnosis 2015-2016 Workbook

Most cancers are diagnosed following a visit to the GP. However, some patients see their GP multiple times before being referred for cancer tests. According to the Cancer Patient Experience survey in 2017, 5% said that they saw their GP three or four times, and 8% said that they saw their GP five or more times<sup>20</sup>.

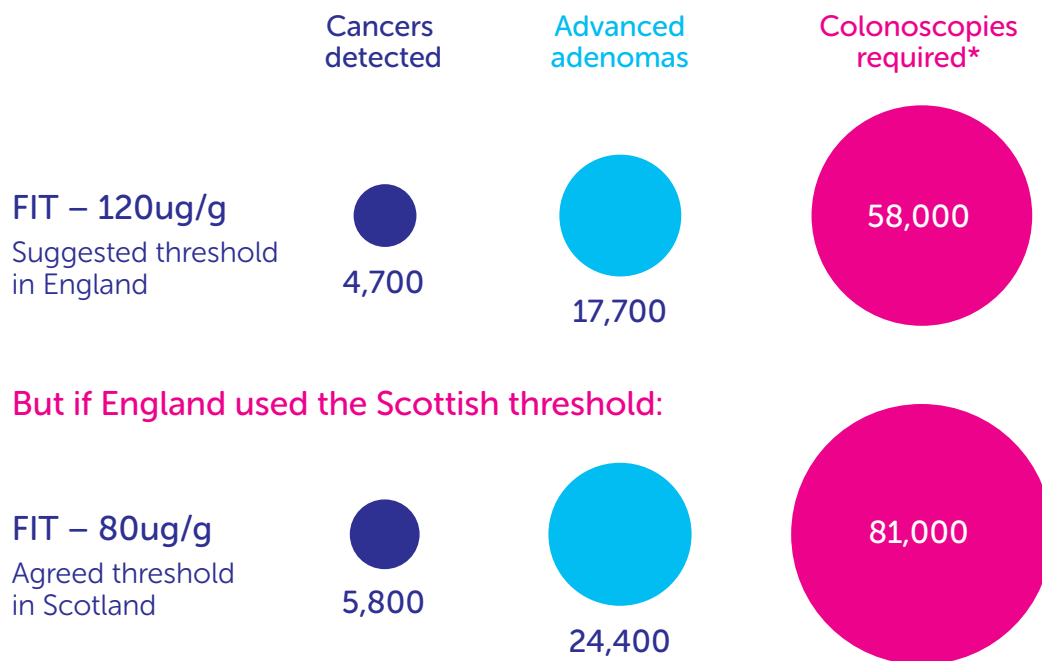
**Encouraging the public to seek help for unusual health changes, supporting primary care to be alert to the possibility of cancer in their patients, and timely referral for tests and specialist advice could help to ensure that fewer patients are diagnosed as an emergency.**

## Screening uptake could be improved

There are three national screening programmes, for bowel, breast and cervical cancer, with some variation in how they are delivered across the UK nations. Around two in three cancers diagnosed through screening are at an early stage.

Across the UK, only around 60% of people invited to take part in bowel screening do so<sup>21</sup>. A new screening test called the faecal immunochemical test (FIT) is already in place in Scotland and is rolling out in Wales and England in 2019, and Northern Ireland have pledged to introduce FIT screening in 2020.

FIT detects human blood in stool samples, which is an early sign of bowel cancer. The test produces a numerical result of micrograms of human haemoglobin per gram of faeces (ug/g). Scotland have rolled out the test with an initial threshold of 80ug/g. Anyone over this threshold will be referred for colonoscopy. Wales and England are planning on rolling out at a threshold of 150ug/g and 120ug/g respectively. A lower threshold is more sensitive and will detect more cases of cancer and advanced adenomas (pre-cancerous growths), but requires more colonoscopies and an increased demand for pathology.



\*Additional surveillance colonoscopies will also be required.

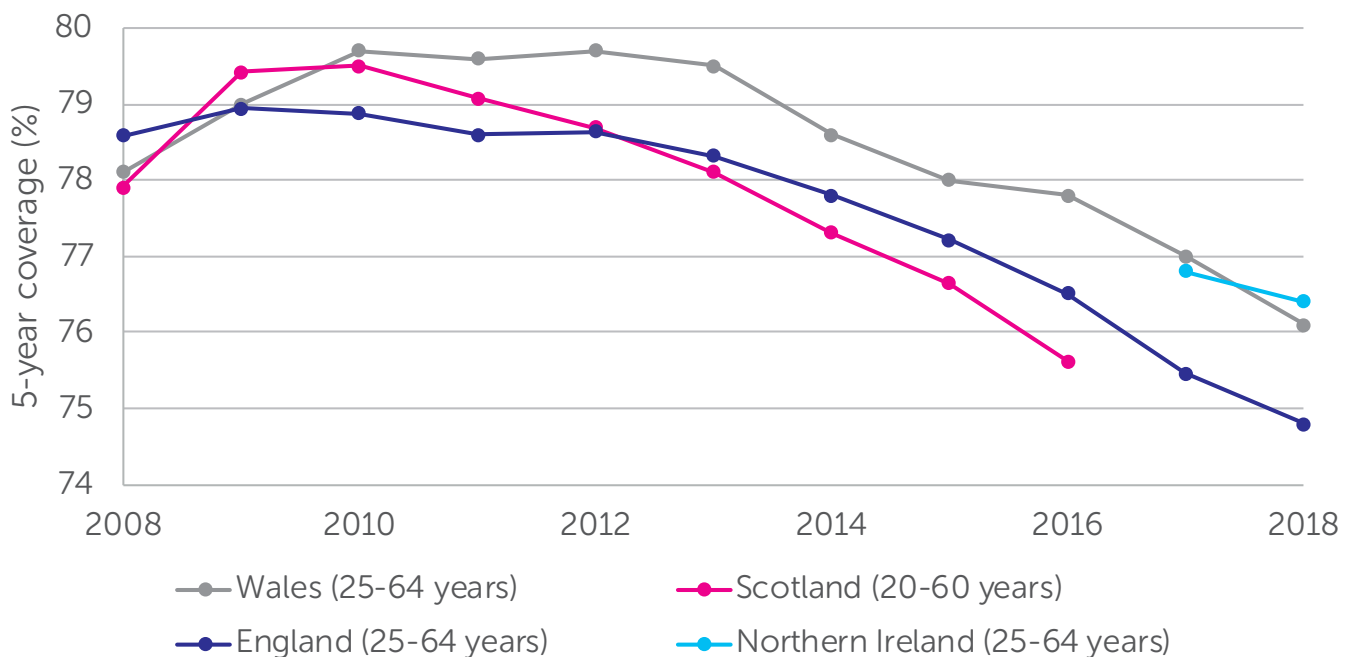
Figures shown are estimates per year for years immediately following the introduction of FIT. Figures are based on data from the England FIT pilot (Moss et al, 2016) and assume 4.5 million screening invites per year.

The introduction of FIT has been shown to improve uptake in Scotland, particularly in groups with low participation. Similar increases will be expected once the test is rolled out in England and Wales. It will be important to monitor inequalities and continue to remove barriers to participation.

**There must be a clear and resourced plan to increase colonoscopy and pathology capacity so that FIT can be made more sensitive and bowel screening improved.**

## Coverage of cervical screening is falling

A worrying trend in recent years has been the continued decline in coverage of cervical screening<sup>22</sup>. This decline is greater among under 50s, particularly in young women aged 25-29. Although the human papilloma virus (HPV) vaccine introduced in 2008 offers some protection, screening is still vital to both prevent cervical cancer and diagnose it early, particularly in women who have not been vaccinated. Using HPV testing as the first test will improve cervical screening and has already been introduced in Wales, with England and Scotland following suit by January 2020.



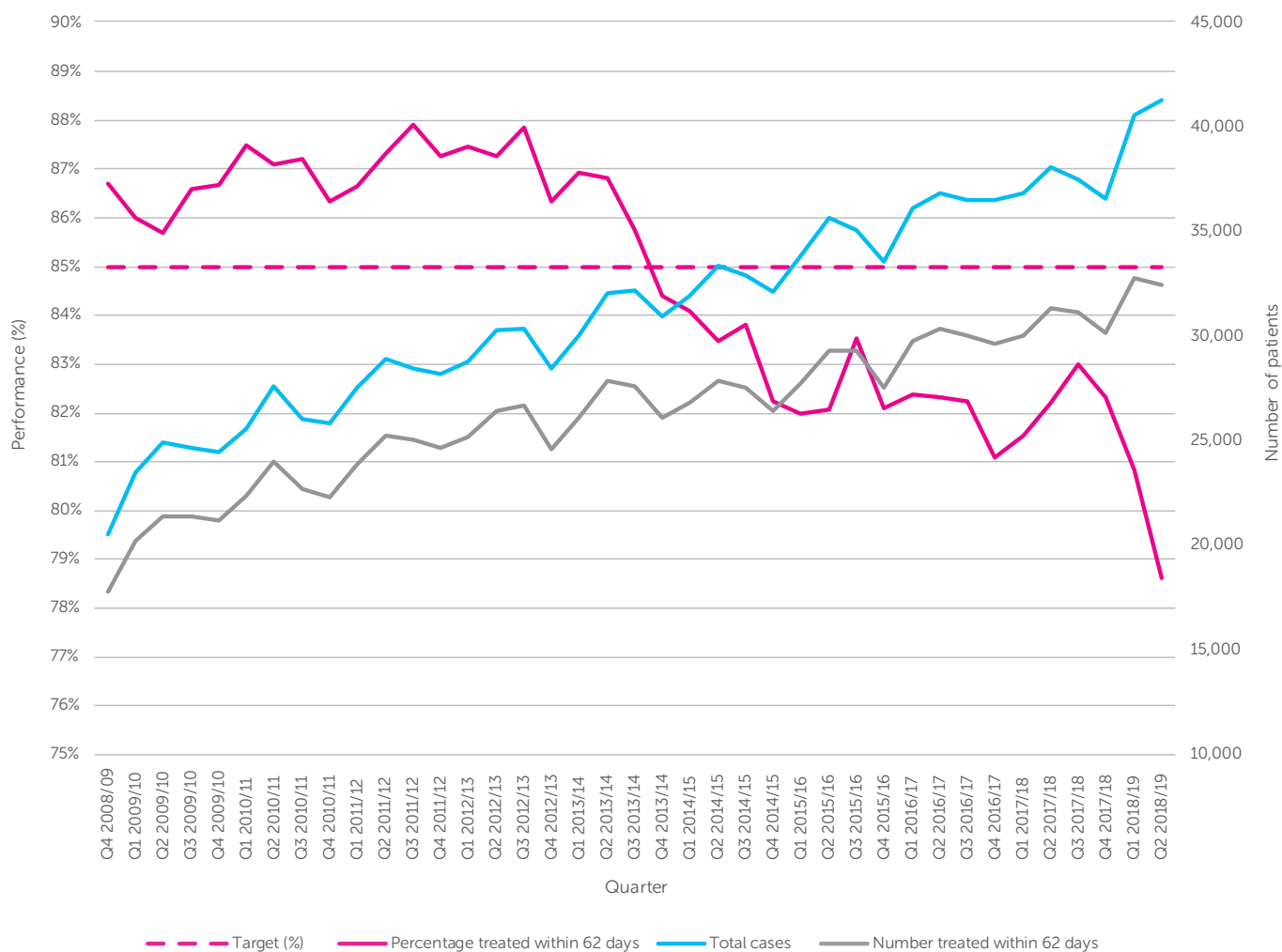
There was a change to the age range of cervical screening in Scotland in 2016, so data post-2016 are not comparable to the previous trend and have not been included.

**National bodies should support evidence-led activity to address barriers to screening participation and reduce inequalities in all cancer screening programmes. Improvements to screening programmes must be brought in on time and with enough diagnostic capacity.**

## The healthcare system is struggling to keep up with current demand...

Across the UK, official cancer waiting times measure two or three time intervals: two weeks, 31 days and 62 days. In England, the 62 day wait currently states that 85% of people with an urgent GP referral for suspected cancer should begin their first definitive treatment within two months.

This target has been consistently missed since early 2014, and is currently around 79%. However, the number of patients being treated within waiting times targets has increased over this period, as there has been a rise in the number of people being diagnosed with cancer via this route<sup>23</sup>. While Scotland, Wales and Northern Ireland all use different measures for their 62 and 31 day targets, performance trends have been very similar to those in England.



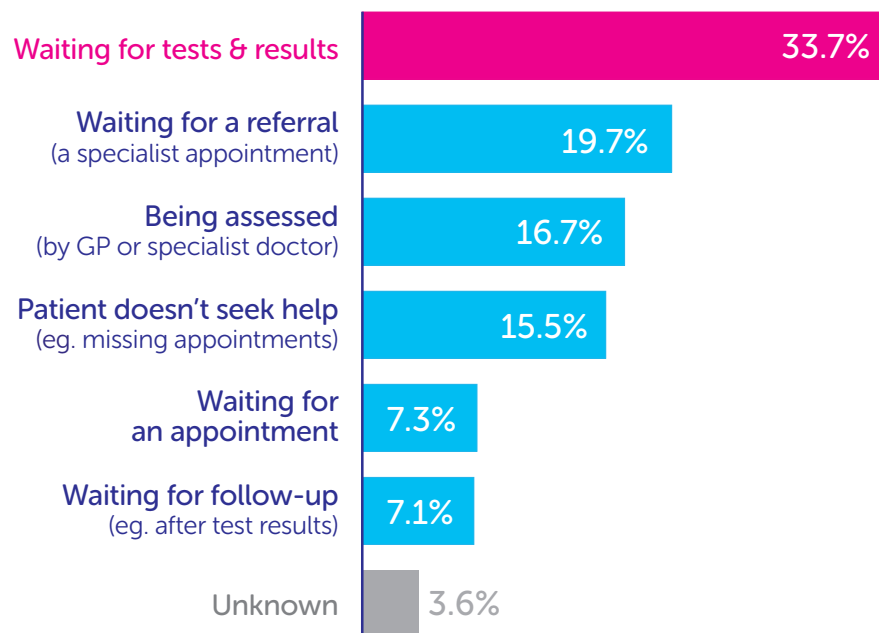
These targets act as a barometer for cancer services – addressing underpinning capacity shortages in diagnostic services are essential. Meeting these targets is also important for securing a better experience for patients during an anxious time.

## ...because cancer services are short-staffed

According to recent analysis of the National Cancer Diagnosis Audit, GPs report that most patients (78%) in England don't suffer avoidable delays in getting their cancer diagnosis. But where delays occur, one in three were due to waiting for tests and results<sup>24</sup>.

When might avoidable delays happen in cancer diagnosis?

GPs considered delays to happen to patients when...



Source: National Cancer Diagnosis Audit, 2017. Data for patients diagnosed in 2014.

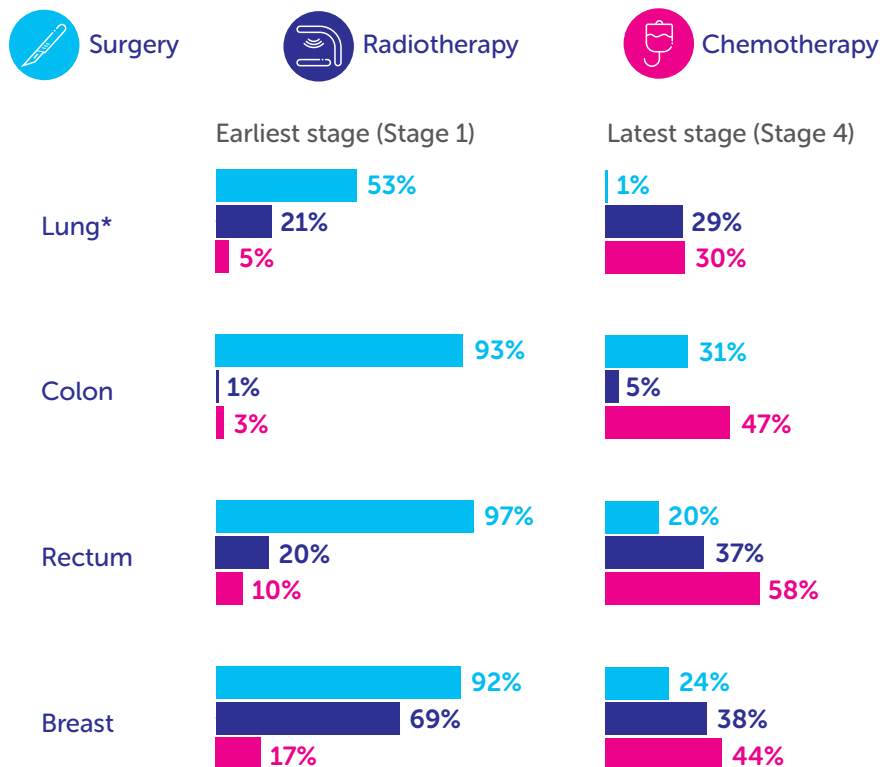
As cancer incidence increases and we drive for earlier diagnosis, more people are referred for tests every year and we need enough trained and employed staff to meet this demand. Across the UK there are significant vacancies across key diagnostic professions such as radiologists, endoscopists and pathologists. It is vital that these shortages are addressed. In England, local organisations including Cancer Alliances and Sustainability and Transformation Partnerships are responsible for delivering Health Education England's phase one workforce plan, which promises over 5,000 extra staff by 2021. But with 500,000 people expected to be diagnosed with cancer by 2035, it is essential that every UK nation has a long-term plan to increase staff numbers to meet this demand and diagnose more cancers at an early stage.

■ More staff will be needed to meet future diagnostic demand.

## Treatment regimens vary by cancer type

Alongside early diagnosis, ensuring access to optimal treatment is essential for improving cancer outcomes. Surgery, radiotherapy and chemotherapy are the mainstays of cancer treatment. Between 2013 and 2015 in England, surgery to remove the tumour was the most commonly used primary treatment. However, treatment regimens vary widely between different cancer types. For example, surgery rates for early stage lung cancer are 53% compared to 9% for early stage rectal cancer<sup>25</sup>.

Patients in England diagnosed early are more likely to have surgery than chemotherapy. The pattern for radiotherapy varies by cancer.



\*Non-small cell only

Source: Public Health England/Cancer Research UK

The proportion of patients receiving radiotherapy as a first line treatment varies greatly by cancer site. This reflects the fact that radiotherapy can be used in various ways depending on the location of the tumour and stage at diagnosis.

These data have the potential to help us understand whether patients are getting the most appropriate treatments for them, and to monitor the impact of changes in standards of care.

## There is geographic variation in treatment access

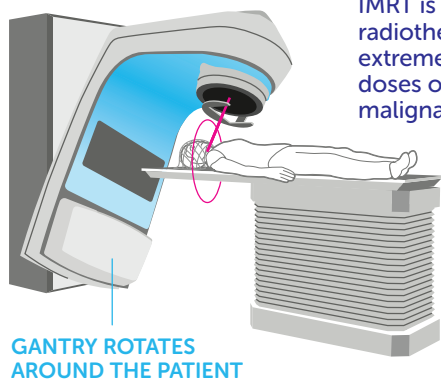
There is evidence to suggest that not all patients are getting the best possible treatment for their cancer. The national cancer audits provide a wealth of information on the cancer care provision for lung, bowel, oesophago-gastric and prostate cancer patients. All show regional variation in the provision of cancer treatment. For example:

- For lung cancer, the proportion of patients who underwent surgery varied significantly between hospitals, as did the proportion of patients who received chemotherapy<sup>26</sup>.
- For bowel cancer the use of laparoscopic surgery varied widely between hospitals and there was considerable national variation in the administration of post-operative chemotherapy<sup>27</sup>.
- Variation across specialist multidisciplinary teams (MDTs) in the proportion of men with locally advanced prostate cancer who do not receive radical treatment ranges from 34% to 84%<sup>28</sup>.

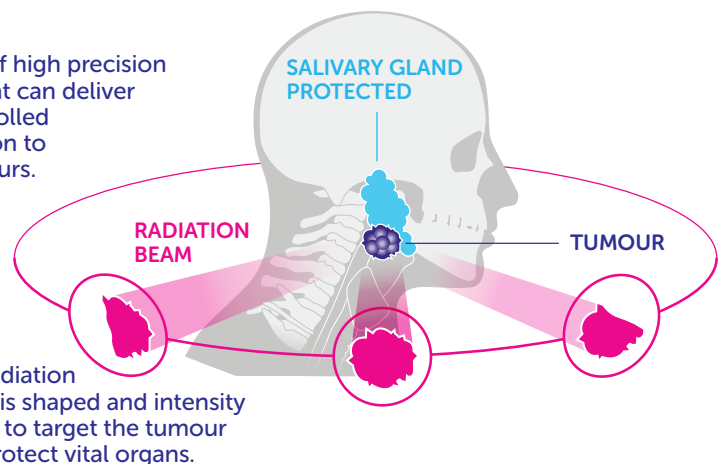
Some of this variability may represent differences in patient demographics and/or data completeness, but the data suggest there may be considerable variation in standards of care between organisations. There is also variation in access to advanced forms of radiotherapy. However, it is not yet certain whether this variation is unwarranted, as the "ideal" proportion will vary based on the different cancer types and stage of cancer. Initially, intensity modulated radiation therapy (IMRT) was used to treat mainly head and neck cancer and prostate cancer, and an interim access target of 24% (of patients receiving radiotherapy to be given inverse-planned IMRT) was set in 2009. After significant Government investment, this has improved and 44% of patients treated with curative intent are now getting IMRT<sup>29</sup>. However, there is still more to be done, as the Radiotherapy Board estimate roughly 50% of radiotherapy given with curative intent should be IMRT<sup>30</sup>, and there is variation ranging from 23% to 69% across CCGs in England<sup>29</sup>.

**We need to better understand the causes of this variation in order to tackle it: data on treatments should be collected, analysed and published regularly.**

### Intensity modulated radiation therapy (IMRT): what are the benefits?



IMRT is a form of high precision radiotherapy that can deliver extremely controlled doses of radiation to malignant tumours.



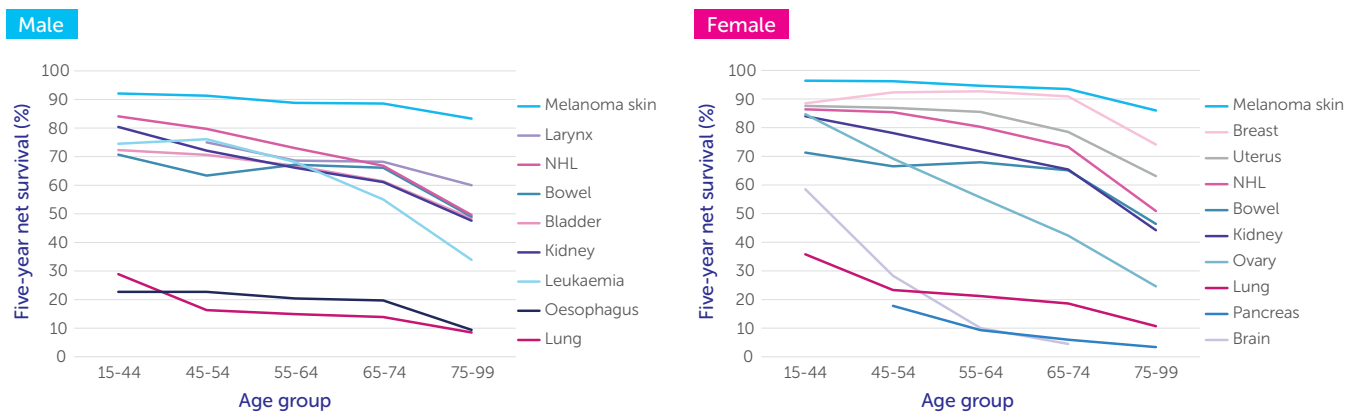
The radiation beam is shaped and intensity varied to target the tumour and protect vital organs.

## And age-related inequalities in treatment access

There is evidence that there are age-related inequalities in access to many cancer treatments. A report by the National Cancer Information Network (NCIN) and CRUK found that across 20 cancer sites, older patients were less likely to have major surgical resections<sup>31</sup>. It has also been reported that the use of chemotherapy declines with age in several types of cancer<sup>32</sup>.

Some of the variation in access to treatment can be accounted for by patients choosing not to pursue active treatment. This could be because they are simply too unwell or because, for example, they are prioritising maintaining a good quality of life over lengthening their life.

However, there may also be some who are not being offered curative treatment that could benefit them, because assumptions have been made about their fitness based on their age. In contrast, we also heard anecdotally that some feel pressured by their clinicians to undergo intensive curative treatment.



Brain is only malignant neoplasm of brain, bowel includes anus, NHL excludes 'other specified types of T/NK-cell lymphoma', ovary includes 'other specified female genital organs', larynx included as a proxy for head and neck and prostate not shown because of different age groups in the data.

Five-year net survival (%), for men and women (aged 15 to 99 years) diagnosed between 2011 and 2015: England, 10 most common cancers, by age

Source: Office for National Statistics and Public Health England

**To get this balance right, treatment decisions must consistently be shaped around each person's individual situation, and wider use of geriatric assessment tools across the NHS.**

For further information and for our full list of recommendations, please refer to our recent report on treating and caring for an ageing population<sup>33</sup>.



## Can the workforce cope with increasing treatment demand?

On top of the diagnosis challenge, the NHS is also facing staffing issues among those who treat cancer patients. While staff numbers in treatment teams are increasing, this doesn't match the growing number of cancers being diagnosed each year. In a recent survey of healthcare staff, nearly three in four people (73%) said staffing shortages in treatment teams were affecting treatment and patient care<sup>34</sup>.

The recently published workforce plan from Health Education England promises 243 extra oncologists and 1,560 extra therapeutic radiographers by 2021. As with the boost to diagnostic staff, these extra people to treat patients will go some way to filling the gaps in England. We must now see similar commitment to train more treatment staff in the other UK nations to ensure that patients across the UK are able to receive the best treatments available, and robust planning to ensure we have the right capacity in the future.

■ **More staff will be needed in the future to deal with increasing demand.**

## Data saves lives

This work uses data provided by patients and collected by the health service and cancer registries in each UK nation as part of their care and support.

By analysing and interpreting data from across the cancer pathway, we can identify where improvements could be made for patients. To do this we need access to complete, up-to-date information, including patient data. As a condition of that access, we apply effective safeguards to maintain the confidentiality and anonymity of patient data, consistently, transparently and rigorously.

The routine collection of data on diagnosis, treatment and outcomes for every patient is invaluable in tackling the disease and improving survival. You can read more about how we use patient data in our series of case studies on our website<sup>35</sup>. A new health data sharing opt-out was implemented in England in 2018, alongside the General Data Protection Regulation (GDPR). Ongoing communication of these changes must be carefully managed to ensure that patients are better informed, are willing to give their data to help others, and access to cancer data continues.



**“This report shows just what can be learnt from putting together our own individual bits of data. I feel the best way I can repay some of the great treatment I’ve had is by encouraging my data to be used in things like this to help drive forward future healthcare and health research.”**

John Marsh, Patient Representative, CRUK Involvement Network



**“Since my own treatment many years ago, I am particularly struck by the way in which cancer clinicians and researchers have improved the use of patient data to support research and patient care. Patients expect that the information they provide and is gathered during their treatment will be used ethically to make a difference to others in the future.”**

Derek Stewart OBE, Patient Representative, CRUK Involvement Network

## Research is beating cancer

Improved outcomes for cancer patients have been underpinned by life-saving research. A supportive environment for research into the prevention, early diagnosis and treatment of cancer is vital to accelerate progress further.

Cancer Research UK is the world's largest independent cancer charity dedicated to saving lives through research and we support research into all aspects of cancer. Funding and support for cancer research in the UK comes from a variety of sources including investment from Government which provides the foundations on which charities and industry can invest.

The Government has an ambition to increase the amount of money the UK spends on research to 2.4% of GDP and there is recognition that research is of critical importance to health services. Support from the Government provides essential infrastructure needed for research to take place in UK universities and hospitals and facilitates the training of our scientists and clinicians. This includes underlying "basic" research that tests a scientist's original idea, clinical studies that test safety and effectiveness, right through to adoption in the NHS.

### Improving the state of the nation

Preventing cancer by reducing exposure to risk factors, diagnosing cancers earlier through awareness, screening, primary care and diagnostic capacity, and improving survival by ensuring consistent access to optimal treatments, together, will help us to beat cancer.

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**Cancer Research UK (CRUK)** is the world's largest independent cancer charity dedicated to saving lives through research. It supports research into all aspects of cancer and this is achieved through the work of over 4,000 scientists, doctors and nurses. In 2016/17, we spent £432 million on research in institutes, hospitals and universities across the UK. We receive no funding from the Government for our research and are dependent on fundraising with the public. Cancer Research UK wants to accelerate progress so that 3 in 4 people survive their cancer for 10 years or more by 2034.

Compiled by the Cancer Intelligence team, Cancer Research UK  
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