





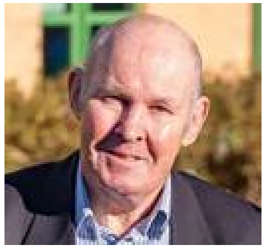


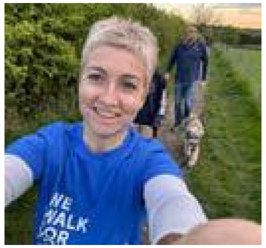
Yorkshire Cancer Research

The *White Rose* Cancer Report

Evidence from Yorkshire to inform a ***National Cancer Plan*** and **save lives** across the region and beyond

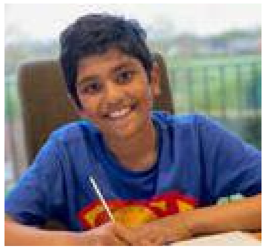




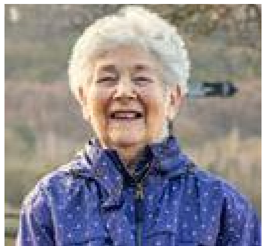













Yorkshire Cancer Research

Every *17 minutes*, someone in Yorkshire is told they have cancer

Yorkshire Cancer Research exists so that more people can live longer healthier lives, free of cancer. Thanks to supporters, the Charity has been funding research and saving lives since 1925 – in Yorkshire, and beyond.

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Foreword

In 2024, Yorkshire Cancer Research launched a campaign to ***Change Yorkshire's Cancer Story,*** calling for a well-funded, long-term national cancer strategy to significantly improve cancer outcomes in Yorkshire and beyond. This national cancer strategy is needed to prioritise early diagnosis, have a greater focus upon prevention, ensure pioneering treatment is rolled out into the community as quickly as possible and guarantee more equitable funding for research across the country.

Why did we call for this? The reasons were threefold. Firstly, Yorkshire is one of the regions hardest hit by cancer. Yorkshire consistently has worse cancer outcomes than national averages. For most of the last 20 years, Yorkshire has consistently had significantly higher cancer incidence and mortality rates compared to England. This means people in Yorkshire are more likely to be diagnosed with and die from cancer than those living in many other parts of the country. There is also significant variation in cancer outcomes between different areas of Yorkshire.

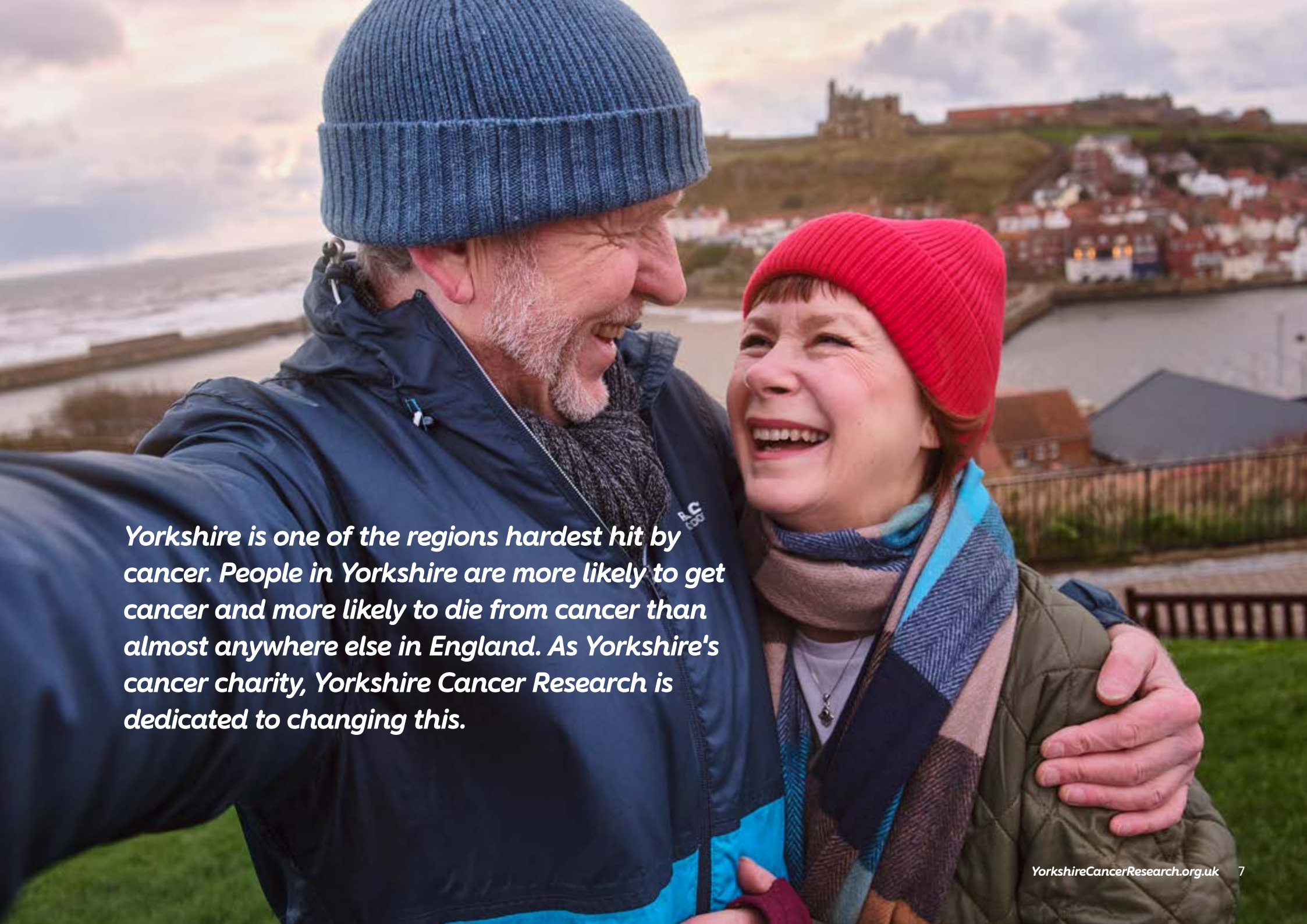
Secondly, international examples clearly demonstrate that when a country has a long-term cancer plan in place, backed by stable and reasonable levels of funding, cancer outcomes improve in a consistent and significant manner. For example, Denmark has had some of the most consistent national cancer plans in place since 2000 and has seen significantly larger increases in five-year survival than the UK. England has not had a dedicated cancer strategy since *Achieving World Class Cancer Outcomes: a strategy for cancer* was announced in 2015. In that time, cancer incidence has increased by 15% and cancer mortality has increased by 3%. Current projections suggest that by 2030, cancer incidence will increase by a further 17% and cancer mortality will increase by a further 3%.

Thirdly, as a region and a nation, we already have the knowledge and the skills to pioneer new methods of screening and treating cancer, and the ability to transform proven new research into treatment within communities. However, there is a need for clear political direction, stable funding and the right environment to deliver.

Yorkshire Cancer Research is therefore pleased the Government has committed to a National Cancer Plan, which is due to be announced in the Summer of 2025. **The Charity is now keen to ensure this plan contains specific measures which we know will make a difference to our region and beyond.** There are many recommendations across all areas of cancer care we could have made; however, this report outlines our top **four evidence-backed recommendations to ensure it is a cancer plan fit for Yorkshire - now and in the future.**

If these measures are included in the new national cancer plan, and providing the plan is well-funded, with clear procedures to assess progress, this will enable us to move considerably closer to realising our ambition of **a Yorkshire free from cancer.** We are determined to make this happen.

Dr Kathryn Scott
Chief Executive



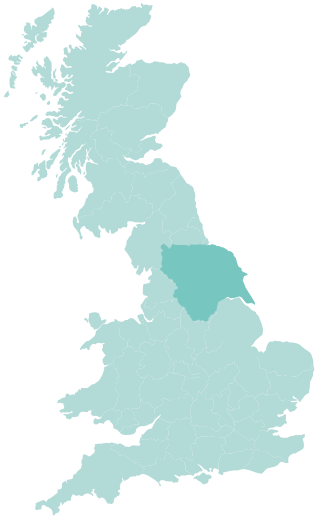
Yorkshire is one of the regions hardest hit by cancer. People in Yorkshire are more likely to get cancer and more likely to die from cancer than almost anywhere else in England. As Yorkshire's cancer charity, Yorkshire Cancer Research is dedicated to changing this.

Executive summary

There are significant disparities in cancer outcomes, prevalence of risk factors, rates of early diagnosis and the availability of high-quality treatment options across the country. These disparities often affect the most vulnerable groups, such as those in deprived areas and ethnic minorities.

Yorkshire, with its large and diverse population, faces stark inequalities both within the region and compared to the rest of the country. It consistently has worse cancer outcomes than the national average, with significant variation between different areas.

This is influenced by a number of factors including late diagnosis, high prevalence of risk factors like tobacco use, alcohol consumption and excess body weight, high levels of deprivation, as well as Yorkshire's industrial past.



Yorkshire and the Humber is the third most deprived region in England and 62% of local authorities in Yorkshire fall within the most deprived in the country. Deprivation is associated with several poor health and cancer-related factors including higher rates of cancer incidence, later stage diagnosis, emergency presentation, cancer mortality, alcohol-related cancers, low screening participation and greater prevalence of risk factors such as smoking and excess body weight.

Health risk factors in Yorkshire

Smoking prevalence

in Yorkshire	12.4%
in England	11.6%

% of adults who currently smoke

Excess body weight

in Yorkshire	65.6%
in England	64.0%

% of people who have a Body Mass Index which is overweight and above

Drinking habits

in Yorkshire	21.1%
in England	22.8%

% of people drinking more than 14 units of alcohol a week

Physical inactivity

in Yorkshire	22.5%
in England	22.6%

% of adults doing less than 30 minutes of physical activity per week

The region receives less than 5% of research funding, despite making up 8% of the population.

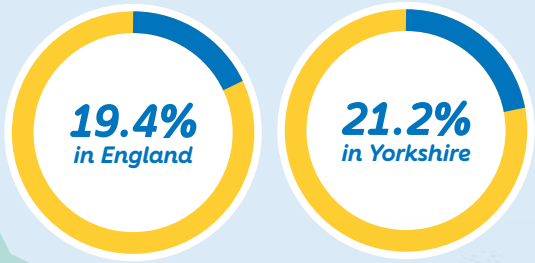
Participating in research provides access to innovative treatments and can improve patient outcomes. Research-active hospitals also benefit all patients with better treatments, diagnostics and care.

Cancer incidence rates

7 out of 13 areas in Yorkshire have higher cancer incidence rates than the national average.

Cancer mortality rates

9 out of 13 areas in Yorkshire have higher cancer mortality rates than the national average.



People living in Yorkshire are more likely to be diagnosed with cancer through an emergency route than the national average.

Emergency presentation is associated with a higher proportion of late stage diagnosis and reduces the likelihood of positive treatment outcomes.

Yorkshire is home to areas with some of the highest and lowest percentage of cancers diagnosed at an early stage. Cancers that are diagnosed sooner are often easier to treat.

Calderdale

has the ***second lowest*** percentage of early diagnosis in England.

Doncaster

has the ***eighth highest*** percentage of early diagnosis in England.

Yorkshire is home to pockets of high ethnic minority populations and rural and coastal communities.

43%

Over ***43%*** people living in Bradford reported their ethnicity to be within an ethnic minority category.

73%

73% of Ryedale's population of around 55,000 people live in a rural area.

Low health literacy in deprived, ethnic minority, rural and coastal areas affects health decisions and rural residents face longer travel times and employment pressures, delaying people from seeking help.

Summary of recommendations

Yorkshire Cancer Research tries and tests research and innovation in the real world, making the most of the diverse region in which the Charity operates to gather genuine insight. The following recommendations have been drawn directly from research funded by the Charity, considered alongside current data, to provide a compelling evidence base. Each recommendation is explored in detail in the following chapters.

Automatic enrolment into smoking cessation support at more touchpoints within the NHS

> **The National Cancer Plan should incorporate smoking cessation into as many NHS touchpoints as possible so whenever someone who smokes interacts with the NHS, they are offered the high-quality stop smoking support they need to quit. This should be set up so that within these touchpoints, people who smoke are automatically enrolled and must then actively opt-out of the scheme.**

- Neither Yorkshire nor England are on track to meet the 5% smoking prevalence target for 2030, which would require 308,363 people in Yorkshire to stop smoking.
- The National Cancer Plan should aim to increase uptake for smoking cessation support to meet this target and to reduce the gap in health outcomes between the most and least deprived deciles.
- Stop smoking support is three times more effective than quitting without support. It is therefore vital that the uptake and effectiveness of these services is optimised.
- The National Cancer Plan should commit to automatically enrolling people who smoke into smoking cessation support within a number of NHS touchpoints, such as lung screening appointments, A&E, mental health appointments, urgent cancer referrals and cancer treatment.
- Evidence from various settings indicates that people are more likely to engage with smoking cessation services and subsequently quit if it is presented as a comprehensive package with another medical appointment.
- For example, evidence from the Yorkshire Enhanced Stop Smoking study shows that providing opt-out, co-located smoking cessation services within the same appointment as lung screening is highly effective and results in high quit rates.

Sustained innovation within screening programmes

> **Screening programmes must be properly funded and continually evaluated and improved to increase uptake, effectiveness and impact on health inequalities.**

- The National Cancer Plan must deliver sustained funding, innovation and evaluation for screening programmes. There is clear evidence that screening is a highly effective way of increasing rates of early diagnosis; however, screening participation varies between groups and has recently declined for some screening programmes.
- As demonstrated by the Charity's Yorkshire Lung Screening Trial, a forerunner to the NHS Lung Cancer Screening Programme, a targeted approach can increase the proportion of lung cancers caught at an early stage and integrating new approaches into existing programmes can remove barriers to participation.

- Proper funding and innovative approaches are key to improving early diagnosis and addressing health inequalities. The National Cancer Plan should address the funding challenges facing the NHS Lung Cancer Screening Programme which could hinder rollout and conflict with the Government's prevention goals.
- The National Cancer Plan should provide clear accountability for integrating successful innovative interventions into screening programmes in a timely manner.

Multi-modal prehabilitation and rehabilitation embedded as part of standard NHS cancer care pathways

> **Everyone with cancer should be offered exercise, nutrition and wellbeing support before, during and after treatment.**

- Entering cancer treatment in poor health can severely impact survival rates and quality of life. Comprehensive, evidence-based prehabilitation improves fitness and strength, reducing the side-effects of treatment and increasing people's treatment tolerance. Rehabilitation is also key for improving recovery and quality of life, rebuilding fitness and confidence after treatment.
- The National Cancer Plan should embed multi-modal prehabilitation and rehabilitation into cancer care pathways. This should combine exercise, nutrition and wellbeing support before, during and after treatment.
- Yorkshire Cancer Research's Active Together programme provides a strong evidence base for how this can be effectively embedded into cancer pathways to shift care from hospitals into the community and improve cancer outcomes.
- The combination of the three elements in Active Together has recently been associated with 10% higher one-year survival rates, shorter hospital stays, improvements in health and wellbeing, clinically significant improvements in cardio-respiratory fitness and strength and cost savings of £366 per patient to the NHS.

Adopt the ROSE model for health research funding

> **The National Cancer Plan should take a comprehensive view of health research and adopt the Charity's ROSE model, so that funding allocations incorporate *Rapid implementation* of research in the NHS, *Optimise research* implementation to address health inequalities, include *Systematic evaluation* of research findings in real-life settings and ensure *Equitable funding* within the clinical research environment.**

- The National Cancer Plan should increase the diversity both in clinical trial recruitment and of clinical academics. A national clinical research career framework can provide a clear, financially secure pathway to becoming a clinical academic and improve the career security and research environment within the NHS.
- The benefits of participating in health research are substantial and those who receive care in research-active hospitals, even those not participating in trials, have been shown to have improved outcomes. The National Cancer Plan should expand research capacity in areas with lower output so that, no matter where people live, they can access these benefits.
- The National Cancer Plan should take a comprehensive view of health research, ensuring that funding for research, clinical trials and infrastructure is distributed equitably, prioritising areas with the highest levels of need.
- The National Cancer Plan should accelerate implementation of life-saving treatments and technologies by addressing the imbalance between clinical research investment and implementation funding.
- Research findings cannot always be rolled out first in areas with existing infrastructure; the National Cancer Plan should ensure that everywhere has the capacity to implement innovative treatments and diagnostics. Safe and effective interventions should be rolled out first in areas with highest need.
- The National Cancer Plan should support Health Innovation Networks in evaluating the impact of research innovations to ensure real-life application is safe, effective, cost-effective and avoids exacerbating existing health inequalities.

Yorkshire Cancer Research

Chapter One: *Introduction*

Yorkshire Cancer Research

Through the Charity's 100-year history, investment in world-leading research and pioneering services across Yorkshire and day-to-day interactions with people with cancer, Yorkshire Cancer Research has a unique and acute understanding of what is needed to improve cancer outcomes and reduce health inequalities for people in Yorkshire.

The Charity currently funds £64 million of cancer research and services with the aims of improving the prevention, early diagnosis and treatment of cancer as well as tackling health inequalities across the region. Since 2015, funding from Yorkshire Cancer Research has delivered one of the world's largest lung cancer screening clinical trials, contributing to the evidence base for a recommendation of a national lung screening programme. The Charity has also enabled the roll out of integrated in-patient smoking cessation across an Integrated Care Board (ICB) ahead of the NHS Long Term Plan target date and set out a path to exploring genetic screening in the general population, which could revolutionise how families find out they are at high risk of cancer.

The Charity's size means that Yorkshire Cancer Research is neither so large that we cannot work in partnership with local hospital trusts and ICBs, nor so small that we are restricted to interacting with just one - people from every local authority in Yorkshire[i] take part in research and services funded by the Charity. The Charity's regional approach therefore enables an in-depth and wide-reaching knowledge of the needs of people with cancer across the whole of Yorkshire and strong relationships with NHS partners.

Yorkshire Cancer Research is focused upon pragmatic testing of research and innovation in the real world, making the most of the diverse region in which the Charity operates to gather genuine insight whilst creating equally genuine impact upon a region which needs support. Much of the work the Charity funds brings care out of hospitals and into the community, improving access to those who need it most.

The Charity's day-to-day work is built around ensuring people in Yorkshire not only have equal cancer outcomes to those in the rest of the country but also ensuring cancer outcomes are equal across the region. Yorkshire's diverse geography and population, spanning urban and rural areas as well as pockets of some of the most affluent and most deprived populations in the country, means there is significant variation in access to and availability of services - and therefore variation in cancer outcomes and prevalence of risk factors across the region. Thus, expertise in cancer in Yorkshire is fundamentally expertise in health inequalities.

Yorkshire Cancer Research looks around the world to see what works, bringing together national and international experts to support and lead new research and service programmes in Yorkshire, adapting them for Yorkshire's local populations and the NHS. Using this expertise as well as looking at local health data and seeking public and patient insight, Yorkshire Cancer Research has developed four specific, evidence-based recommendations for the National Cancer Plan, which are key to improving cancer outcomes for people in Yorkshire and beyond.

[i] Our definition of Yorkshire is aligned with the Yorkshire and the Humber boundary, with the exception of North and North East Lincolnshire, which are excluded from these calculations. Data for Yorkshire and the Humber may be used for indicators where smaller geographical breakdowns are not available and are labelled as such. Note that Bassetlaw is not included in the Charity's Yorkshire boundary although it is included in one of Yorkshire and The Humber's Integrated Care Systems (South Yorkshire and Bassetlaw ICS).

The current landscape

The Government has set out their mission to build an NHS fit for the future, to take the strain off the NHS and to tackle health inequalities.[1, 2]

This involves three key shifts:

- Hospitals to community
- Analogue to digital
- Sickness to prevention

The first shift aims to move care from hospitals to communities so people can more independently access services which are closer to their homes and personalised to their needs. It also aims to ensure that people are healthier so they do not have to spend as much time in hospital, reducing costs and waiting times. The second shift aims to make better use of technology to improve treatments and potentially staff retention. The third shift focuses on preventing sickness through catching illness earlier and tackling the causes of ill health as well as the symptoms. This should take pressure off the NHS and allow people to live longer, healthier lives.

As part of this mission delivery, the Government has set out its plan to reform elective care.[3] This outlines the aims for the NHS to ensure that people are prepared for surgery. Providing prehabilitation for people with cancer before surgery can ensure they are able to better tolerate treatment, reducing the number of cancellations and reducing the time people stay in hospital after surgery.

The Charity understands that the current financial pressures mean recommendations with high levels of upfront costs are likely to be long-term aims. However, this should not limit the ambition of recommendations. As experts in cancer prevention, early diagnosis, treatment, research and health inequalities, Yorkshire Cancer Research has a clear vision for Yorkshire and beyond. The Charity's recommendations range from long-term ambitions to shorter-term fixes. They are ambitious yet realistic, with robust evidence for their impact on health inequalities and economics.

Cancer data

The recommendations made throughout this report are strongly aligned with the aims of the Government, developed to help build an NHS which is fit for the future through these three shifts. However, for more care to be provided in the community, there is a need for improved quality of publicly available data. High-quality and timely data is critical to understanding and addressing issues related to cancer care in Yorkshire.

There are currently limitations with access to the timely and high-quality data required. Cancer data releases are more infrequent since the pandemic, the availability of data by local areas is diminishing and data in subjects such as cancer recurrence is not equally available for all cancer sites. There are also limited levels of data released by ethnic group or deprivation nationally and regionally. The lack of up to date, publicly available data inhibits the ability of the NHS and other organisations to implement targeted initiatives to improve health outcomes.

To move care from hospitals to community, organisations require an accurate understanding of the needs of the areas they serve. Without this, organisations must plan services and aim to fix problems in their local areas based on data that may be over five years old.

Variation between Yorkshire and England and within Yorkshire

Where someone lives should not determine whether they survive cancer or whether they develop cancer in the first place. However, within England, there are vast disparities in cancer outcomes, prevalence of risk factors, rates of early diagnosis and the availability of high-quality treatment options. This variation often leaves the most vulnerable groups worse off, with people in areas of high deprivation and ethnic minority populations often having their needs left unmet.

Yorkshire's large and diverse population and geography means there are stark inequalities both within the region and between Yorkshire and the rest of the country. Yorkshire consistently has worse cancer outcomes than the national average. There is also significant variation in cancer outcomes between different areas of Yorkshire.

Poor cancer outcomes are caused by many factors, including late diagnosis and a high prevalence of risk factors associated with cancer such as tobacco use, alcohol consumption and excess body weight. Other factors such as high levels of deprivation and Yorkshire's industrial past also play a significant role. In addition, there are disparities in terms of the treatment offered in Yorkshire hospitals compared to others across the country, and between hospitals within Yorkshire.

Yorkshire is large and diverse

Yorkshire is home to over five million people and makes up 9.1% of England's population.[4] As such a large and heterogeneous region, it is vital that the needs of Yorkshire are not overlooked. The diverse population and deep-rooted inequalities within Yorkshire make the region an ideal case study for understanding and tackling health inequalities within cancer and healthcare more generally.

Yorkshire and the Humber is the third most deprived region in England, and Yorkshire is home to some of the most deprived local authorities in the country.[5] Within Yorkshire, 8 of the 13 (62%) local authority areas fall within the most deprived in the country. The 2021 Census found that 19.8% of the Yorkshire population reported their ethnicity to be within an ethnic minority category, this was lower than the overall England figure (26.5%).[6] Finally, 16.1% of Yorkshire's population live in a rural area.[7]

As can be seen in Figure 1, Yorkshire is home to pockets of both high and low levels of rurality, deprivation and ethnic minority populations.[ii]

Yorkshire's heterogeneity means one size does not fit all. There are a large number of people living in Yorkshire who encounter significant and varied difficulties accessing care.

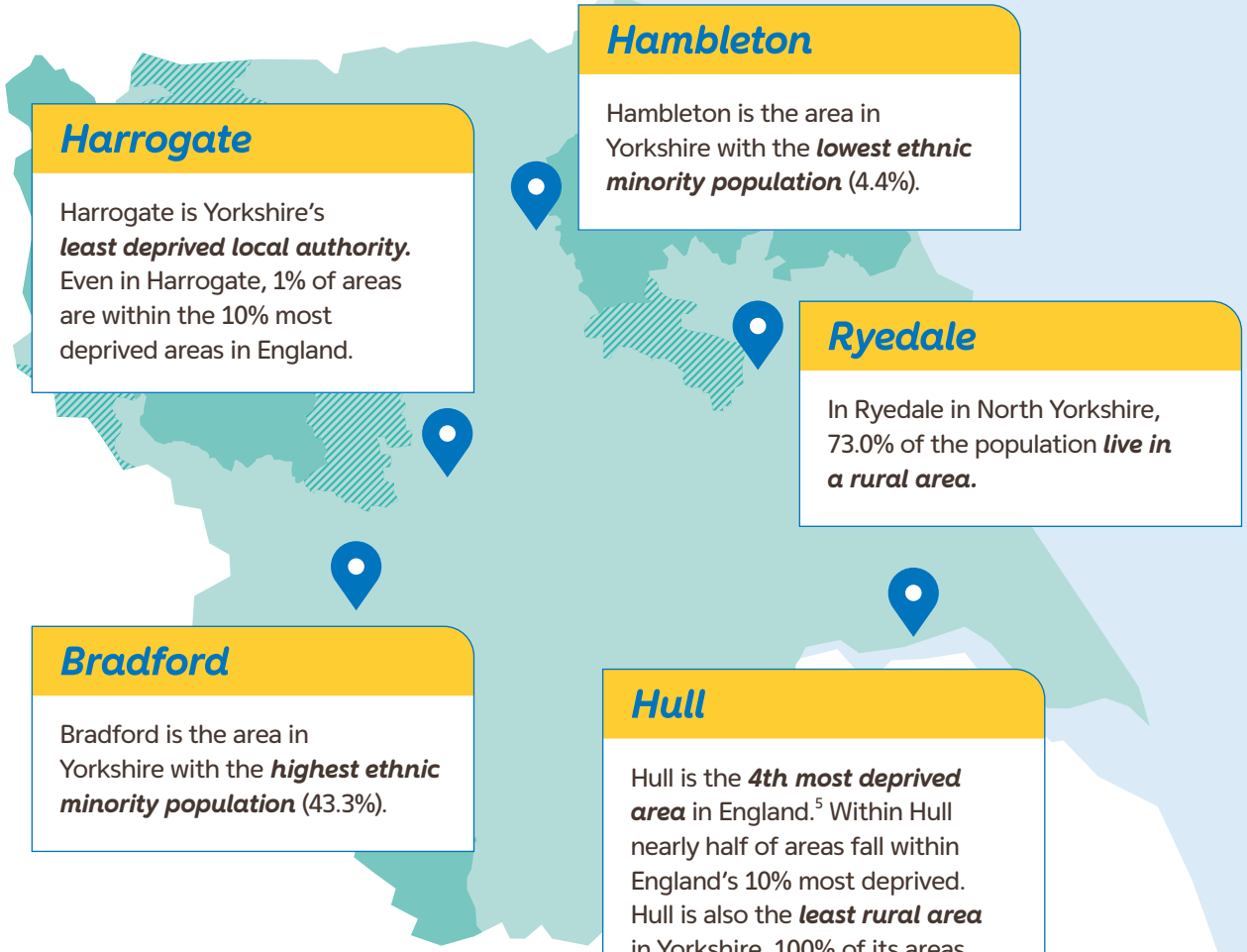
Deprivation

Deprivation is associated with several poor health and cancer-related factors including higher rates of cancer incidence, later stage diagnosis, emergency presentation, cancer mortality, alcohol-related cancers, low screening participation and greater prevalence of risk factors such as smoking and excess body weight.[iii] This could be due to a number of factors. People in deprived areas may face poorer quality of care and limited access to healthcare, influenced by factors like income, housing, environment, transport, education and work.[8] They may also have caring responsibilities or struggle to take time off work, making it harder to attend appointments. Deprivation is also linked to variation in treatment provision. Research funded by Yorkshire Cancer Research revealed that women in disadvantaged areas were 32% less likely to receive surgery and chemotherapy for ovarian cancer compared to those in affluent areas.[9] Surgery and chemotherapy are the main treatments for ovarian cancer, increasing survival rates.

[ii] Different geographies are used throughout this report due to data availability.

[iii] Excess body weight is defined as when a person's Body Mass Index is overweight and above. when excess body weight is used in this report it refers to both overweight and obesity.

Figure 1: Map of Yorkshire highlighting the areas with the highest and lowest levels of deprivation, ethnic minority population and rurality. [5-7]



Ethnic minority populations

Yorkshire's ethnic minority populations also face challenges accessing healthcare. Language barriers and cultural norms may prevent people from ethnic minority groups from reporting symptoms, especially gynaecological symptoms in women. The system also presents diagnostic barriers not faced by the White ethnic group. For instance, 8% of the White ethnic group needed to speak to a professional five or more times before diagnosis, compared to 16% of the Other ethnic minority group and 15% of the Black and Asian ethnic groups.[10]

Cancer incidence and mortality vary by ethnic group, with the White and Black ethnic groups having the highest incidence of cancer and the White group having the highest mortality rate. Variation also exists for specific cancers. For example, Black men are twice as likely to be diagnosed with and up to twice as likely to die from prostate cancers than men from the White ethnic group.[11] Some ethnic minority groups also have higher rates of external risk factors such as smoking, smokeless tobacco product use and excess body weight.

There is a strong body of evidence to suggest that ethnicity and deprivation are interlinked. Within the most deprived quintile in England, more than one in four people in the population report their ethnicity to be within an ethnic minority group (28.9%) compared to 11.5% of the least deprived decile.[6, 12] In Yorkshire, the ethnic minority population makes up 19.8% of the overall population, yet nearly one in three people (29.8%) living in the eight Yorkshire local authorities that fall within the 20% most deprived in the country are within an ethnic minority group.

People in ethnic minority groups may also encounter the barriers faced by deprived populations, in addition to the more unique barriers faced by ethnic minority populations. For example, deprived areas, coastal communities and areas with high ethnic minority populations have the lowest levels of health literacy in the country.[13] Health literacy is the ability to access and interpret information to make informed health decisions. The areas in Yorkshire with the highest levels of low health literacy are Bradford and Hull (51.8% and 50.5% respectively), these are the areas of Yorkshire with the highest ethnic minority and most deprived populations.

Rurality

People living in rural areas are less likely to survive cancer than those living in urban towns and cities. RURALLY, a study funded by Yorkshire Cancer Research, highlights the difficulties faced by people living in rural areas of North Yorkshire when experiencing early symptoms of cancer.[14] Longer travel times for those living in rural areas, combined with high levels of self-employment and employment in industries with seasonal work pressures, such as farming and tourism, meant people often delayed visiting their doctor to avoid losing working time and income.

Cancer diagnosis

Yorkshire has a higher rate of cancers diagnosed each year than England on average. In Yorkshire, 627 per 100,000 people are diagnosed with cancer each year compared to the national average of 614 per 100,000 people.[15] In Yorkshire, 7 out of 13 areas have higher cancer incidence rates than the national average. Cancer incidence rates also vary significantly across Yorkshire.

Cancers that are diagnosed sooner are often easier to treat. However, just half of cancers in Yorkshire and England are diagnosed at an early stage and, within Yorkshire, there are pockets with both high and low rates of early diagnosis. GPs play a key role in early diagnosis as they are often the first point of contact for people presenting with cancer symptoms. However, there is significant variation in the number of patients per GP within Yorkshire with some areas having some of the highest number of patients per GP in the country.[16] GPs in Kingston Upon Hull East care for an average of 3,664 patients each which is more than twice the number compared to Sheffield South East at 1,428.[17] Kingston Upon Hull East is the 20th most deprived constituency in England (of 543) and Sheffield South East the 122nd.[18]

Emergency presentation is associated with a higher proportion of late stage diagnosis and reduces the likelihood of positive treatment outcomes.[19] People in Yorkshire are consistently more likely to be diagnosed through an emergency route than the national average. All three Yorkshire ICBs sit within the five ICBs with the highest emergency presentation rates of all 42 English ICBs.

Figure 2 illustrates the variation across Yorkshire in cancer diagnosis, highlighting areas with the highest and lowest diagnosis rates and differences in early diagnosis and cancers diagnosed through an emergency route.

Figure 2: *Map of Yorkshire highlighting the areas with the highest and lowest rates of cancer incidence and proportions of cancers diagnosed at an early stage or through an emergency route.* [15, 19, 20]

Bradford

Bradford is the area with the ***lowest cancer incidence rate*** in Yorkshire at 584 per 100,000 people.

Leeds

Leeds has the ***highest cancer incidence rate*** in Yorkshire at 715 per 100,000 of people.

Hull

Hull has the ***highest percentage of cancers diagnosed through an emergency route*** in Yorkshire with more than one in four people with cancer diagnosed through an emergency route (26.0%).

Calderdale

Calderdale has the ***second lowest percentage*** of early diagnosis in England at 49.4%.

Doncaster

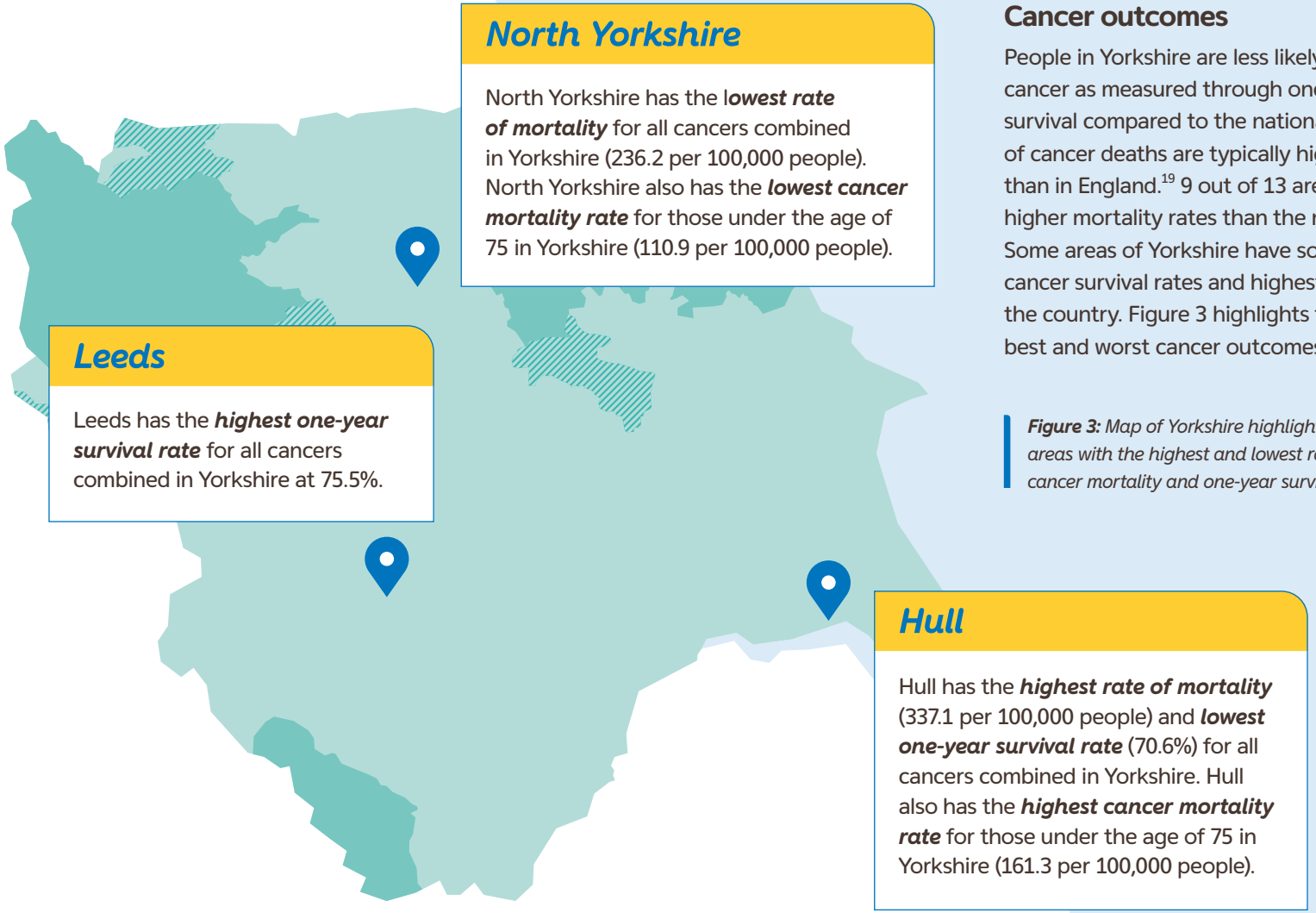
Doncaster has the ***8th highest percentage*** of early diagnosis in England, at 57.4%.

Rotherham

Rotherham has the ***lowest percentage of cancers diagnosed through an emergency route*** in Yorkshire with less than one in five diagnosed through an emergency route (18.8%).

Cancer outcomes

People in Yorkshire are less likely to survive their cancer as measured through one-year and five-year survival compared to the national average and rates of cancer deaths are typically higher in Yorkshire than in England.[19] 9 out of 13 areas in Yorkshire have higher mortality rates than the national average.[19] Some areas of Yorkshire have some of the lowest cancer survival rates and highest mortality rates in the country. Figure 3 highlights the areas with the best and worst cancer outcomes in Yorkshire.



North Yorkshire

North Yorkshire has the l***owest rate of mortality*** for all cancers combined in Yorkshire (236.2 per 100,000 people). North Yorkshire also has the ***lowest cancer mortality rate*** for those under the age of 75 in Yorkshire (110.9 per 100,000 people).

Leeds

Leeds has the ***highest one-year survival rate*** for all cancers combined in Yorkshire at 75.5%.

Hull

Hull has the ***highest rate of mortality*** (337.1 per 100,000 people) and ***lowest one-year survival rate*** (70.6%) for all cancers combined in Yorkshire. Hull also has the ***highest cancer mortality rate*** for those under the age of 75 in Yorkshire (161.3 per 100,000 people).

Figure 3: *Map of Yorkshire highlighting the areas with the highest and lowest rates of cancer mortality and one-year survival.* [19]

Hull has some of the worst cancer outcomes in Yorkshire.

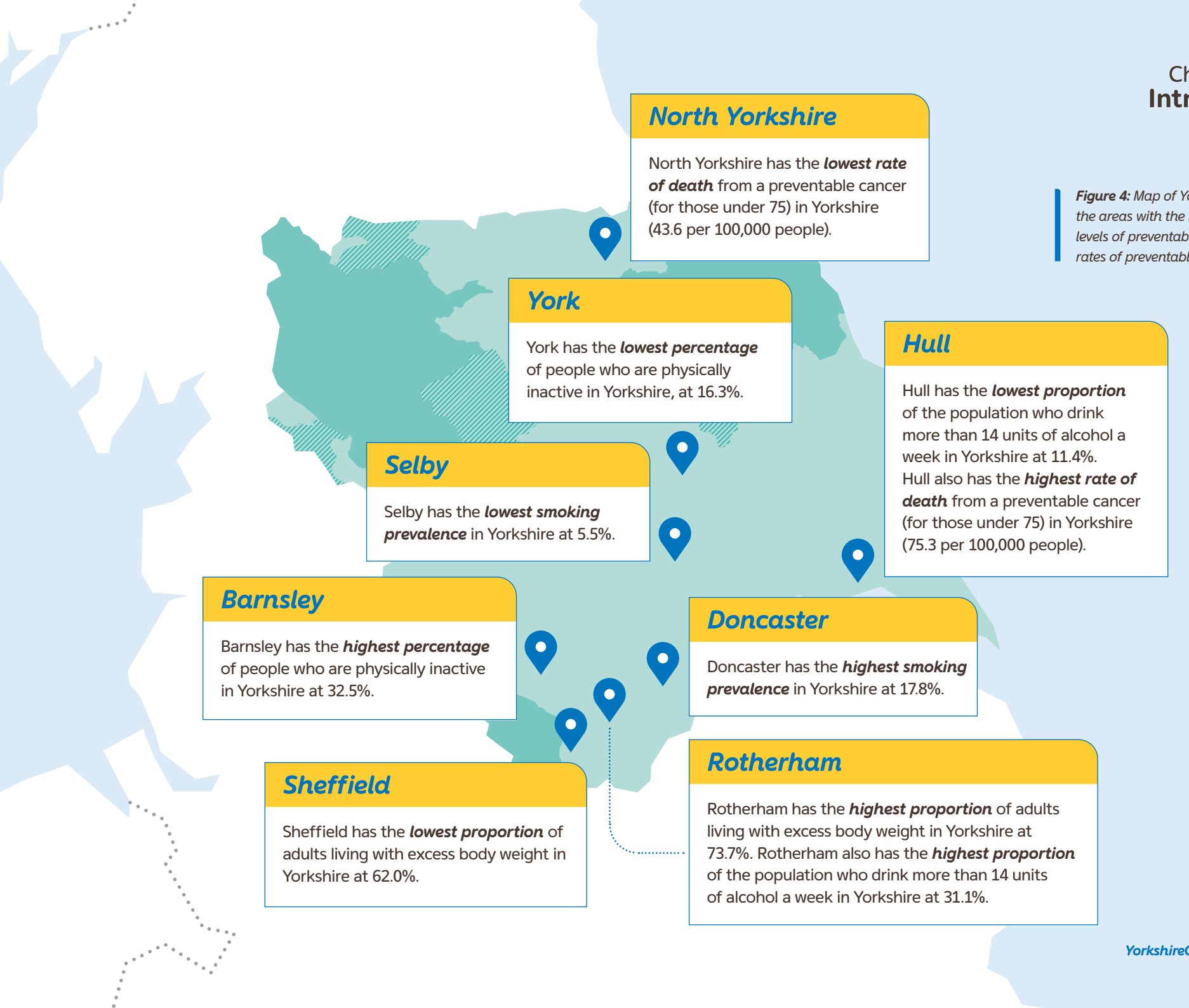
Preventable risk factors

Yorkshire has high prevalence of many preventable risk factors such as smoking, excess body weight and alcohol. For example, Yorkshire has the 2nd highest smoking rate in England (out of nine regions) with 12.4% of the adult population smoking in 2023.[21] This is higher than the national average of 11.6%. Yorkshire also consistently has a higher proportion of adults who are living with excess body weight, the second largest cause of preventable cancer.[22] Yorkshire has a similar percentage of people who are physically inactive (engaging in less than 30 minutes of physical activity per week) to England at 22.5% and 22.6% respectively.[23] However, 9 of 13 areas in Yorkshire have a higher percentage of the population who are physically inactive compared with the England average.

Figure 4 demonstrates the significant variation in levels of preventable risk factors within Yorkshire. Some of these areas have some of the highest prevalences of preventable risk factors and rates of death from a preventable cancer in England.

As well as the cancer risks incurred by preventable risk factors which are covered in the next section, high levels of preventable risk factors can reduce the likelihood of seeking help. Symptoms of comorbidities may mask cancer signs and symptoms, leading people to misattribute the symptoms to existing comorbidities. Delayed presentation to healthcare increases the risk of cancer spreading, making treatment harder and costlier. For example, smoking is linked to lung cancer, but symptoms like coughing and chest infections are also associated with COPD, causing diagnostic delays.[26] Additionally, embarrassment or shame, especially related to smoking, can delay seeking help and lung cancer diagnosis.[27] Masking of symptoms by comorbidities and internalised stigmas have both been linked to delays in lung cancer diagnosis.

Preventable risk factors are also often associated with late stage and life-threatening cancers. Lung, bowel, bladder and liver cancers are all strongly associated with preventable risk factors with 78.8% of lung cancers, 54.1% of bowel cancers, 48.6% of bladder cancers and 48.3% of liver cancers considered preventable.[28] Furthermore, in Yorkshire, 46% of stageable lung cancers, for example, are diagnosed at stage four and only 46.8% of people diagnosed with lung cancer survive after a year.[29, 30] Therefore, people in areas with high levels of preventable risk factors may be more likely to both be diagnosed with and die from cancer than areas with lower levels of preventable risk factors. Areas of deprivation often have a higher prevalence of smoking, alcohol use, excess body weight and physical inactivity, meaning these risk factors are likely to widen health inequalities.



North Yorkshire

North Yorkshire has the ***lowest rate of death*** from a preventable cancer (for those under 75) in Yorkshire (43.6 per 100,000 people).

York

York has the ***lowest percentage*** of people who are physically inactive in Yorkshire, at 16.3%.

Selby

Selby has the ***lowest smoking prevalence*** in Yorkshire at 5.5%.

Hull

Hull has the ***lowest proportion*** of the population who drink more than 14 units of alcohol a week in Yorkshire at 11.4%. Hull also has the ***highest rate of death*** from a preventable cancer (for those under 75) in Yorkshire (75.3 per 100,000 people).

Barnsley

Barnsley has the ***highest percentage*** of people who are physically inactive in Yorkshire at 32.5%.

Doncaster

Doncaster has the ***highest smoking prevalence*** in Yorkshire at 17.8%.

Sheffield

Sheffield has the ***lowest proportion*** of adults living with excess body weight in Yorkshire at 62.0%.

Rotherham

Rotherham has the ***highest proportion*** of adults living with excess body weight in Yorkshire at 73.7%. Rotherham also has the ***highest proportion*** of the population who drink more than 14 units of alcohol a week in Yorkshire at 31.1%.

Figure 4: *Map of Yorkshire highlighting the areas with the highest and lowest levels of preventable risk factors and rates of preventable cancer death.* [21-25]

Yorkshire Cancer Research

Chapter Two: *Prevention*

Background

Table 1: Preventable risk factors and their impact on people and society in Yorkshire. [21, 28, 31-38]

Risk factors	*Percentage of cancers caused by factor*	*Number of related tumour groups*	*Number of cancers in Yorkshire each year*	*Number of cancer deaths in Yorkshire each year*	*Cost to society in Yorkshire*
Tobacco	14.7%	15	4,650	3,000	£4.5bn
Excess body weight	6.3%	13	2,000	700	£6.3bn[iv]
Alcohol	3.3%	7	1,040	540	£2.5bn
Physical inactivity	1.5%	3[v]	460	260	£570.8m

[iv] This estimate is for the cost of obesity alone in Yorkshire. Excess body weight is defined as when a person's Body Mass Index is overweight and above.

[v] The American College of Sports Medicine Roundtable concluded that there was moderate evidence to link physical inactivity with increased risk of bowel, endometrial and lung cancers. The percentage of cancers caused along with the number of cancer cases and deaths in Yorkshire are estimated from data for breast and bowel cancers only.

Four in ten cancers could be prevented by changing behaviours that can cause cancer.

Yorkshire Cancer Research estimates that preventable cancers cost 6,000 lives in Yorkshire and 59,000 lives nationally a year.[31, 32] It is therefore vital that action is taken to reduce the preventable risk factors associated with cancer such as tobacco and alcohol use as well as excess body weight.

Table 1 demonstrates the substantial costs of these risk factors in Yorkshire.

Smoking

As the largest cause of preventable cancer in the country, it is unsurprising that much has been done to reduce tobacco use. Since 2011, smoking prevalence has decreased by a relative 41% in England and 43% in Yorkshire.[21] However, more needs to be done, especially for Yorkshire.

Smoking prevalence in Yorkshire is decreasing at a slower pace than the national average. Between 2022 and 2023, Yorkshire saw the second smallest decrease in the percentage of smokers, consequently widening the gap between the Yorkshire and England average smoking rates. Neither Yorkshire nor England are on track to meet the 5% smoking prevalence target for 2030, which would require 308,363 people in Yorkshire to stop smoking.[4, 21] The Charity estimates that if the trajectory of the decline in smoking rates remain consistent with current progress, Yorkshire and England will only meet the 5% target in 2043.

Stop smoking services in Yorkshire have the highest successful quit rates in England, with 65% of people seeking support successfully quitting compared to the national average of 54%. However, Yorkshire has one of the lowest uptake rates of stop smoking support in the country.[39] Low uptake rates could be due to a variety of reasons including lack of awareness, time, willingness or desire to quit and mean people do not receive the support they need.

A 2025 YouGov survey commissioned by Yorkshire Cancer Research involving 2,006 people found 45% of people living in Yorkshire think that funding for smoking cessation services should be weighted so that areas with higher smoking rates receive more funding than areas with lower smoking rates. This is slightly higher than the proportion of people in Yorkshire who think that funding should be distributed equally across the country (40%).[40]

Smoking is the single biggest cause of health inequalities and is associated with almost every indicator of deprivation and marginalisation. The more disadvantaged someone is, the more likely they are to smoke and suffer from smoking-related disease and premature death. In Yorkshire, 69.6% of people who smoke live in local authorities that fall within the most deprived 20% in England.[21]

"High-quality stop smoking support significantly increases people's chances of successfully quitting smoking and can be life changing. Every day I see the impact that stopping smoking support can have - improving people's health and wealth and allowing people to take back control of their lives. It is so important that people are given every opportunity to access this support and boost their chances of quitting for good."

Tori Douthwaite
Stop Smoking Specialist, Yorkshire Cancer Research

Prevention policy recommendation

Automatic enrolment into smoking cessation support at more touchpoints within the NHS

> **The National Cancer Plan should integrate smoking cessation into more touchpoints within the NHS, so that whenever someone who smokes interacts with the NHS, they are offered gold standard smoking cessation support as many times as possible. This should be set up so that within these touchpoints, people who smoke are automatically enrolled and must then actively opt-out of the scheme.**

Stop smoking support is the most effective method of quitting and is three times more effective than quitting without support.[41] Additionally to cancer, smoking is linked to long-term health conditions including coronary artery calcification, emphysema and premature deaths due to COPD, heart disease and stroke.[42] Quitting smoking reduces these risks, making it vital for smoking cessation services to be well-funded, high-quality and widely used.

The NHS Long Term Plan outlined that smoking cessation services should be provided for all inpatients, pregnant women and their partners, and those in long-term mental health and learning disability services by 2023/24.[43] Yorkshire Cancer Research has assisted with the delivery of this service in our region by providing funding for multiple smoking cessation programmes, including the QUIT Programme, delivered by South Yorkshire and Bassetlaw Integrated Care System in partnership with five local authorities and local Stop Smoking Services. The Charity has also funded stop smoking services for hospital patients in Leeds, delivered by five Stop Smoking Advisors working across Leeds Teaching Hospitals Trust.

The provisions in the NHS Long Term Plan should be expanded so every person who smokes is offered stop smoking support at as many touchpoints within the NHS as possible. For example:

- within lung screening appointments
- whilst people are waiting in Accident and Emergency (A&E)
- within all mental health appointments
- when people have been urgently referred with suspected cancer symptoms
- when people are awaiting or undergoing cancer treatment.

People in Yorkshire are largely supportive of offering smoking cessation services in a number of different settings.[40] For example, 74% of people in Yorkshire consider it acceptable to offer smoking cessation services as part of a lung screening appointment and 65% as part of any cancer screening appointment. The proportion of those who thought it would be acceptable for people who smoke to be offered smoking cessation services was higher among those who either personally smoked or who had family or friends who smoke, for almost all touchpoints which the Charity asked about in the survey.

Automatically enrolling people who smoke into smoking cessation support as part of existing appointments or waiting time means people who otherwise may not have engaged with the service due to lack of time, awareness or self-belief are more likely to engage with smoking cessation services. Smoking cessation interventions should not be delivered by the clinician of the original appointment, but, wherever possible, time should be built into the appointment so that whilst people who smoke are already present, they are given the opportunity to sit down with a qualified smoking cessation advisor. For many people who smoke, especially those who have smoked for a considerable amount of time and may have tried quitting before without success, simply handing them a leaflet or giving them brief advice to quit is not enough to encourage them to quit. Smoking cessation services

must adapt to capture attention in diverse settings. The majority of people in Yorkshire (58%) think that smoking cessation support should be provided "in person as part of another health appointment", increasing to 61% amongst those who smoked or who had close family or friends who smoked.[40] This was followed by "in person but as a separate, follow up appointment" (48%) and "through the NHS app" (39%). People under the age of 70 were more in favour of using the NHS app.

In England, over 50% of people who smoke intend to quit and yet uptake rates for smoking cessation services remain low, especially in Yorkshire.[44] Engaging people who smoke at optimal moments, like while waiting for health appointments, provides an opportunity to quit without them needing to be proactive. Below are examples of touchpoints within the NHS to engage people who smoke, though many more could be effective.

Lung screening

There is strong evidence for providing opt-out, co-located smoking cessation support within lung screening appointments. Evidence from the Yorkshire Enhanced Stop Smoking study (YESS), funded by Yorkshire Cancer Research, shows that providing opt-out, co-located smoking cessation services within the same appointment as lung screening is highly effective and results in high quit rates.[45] Yorkshire Cancer Research estimates that co-locating stop smoking support within the NHS Lung Cancer Screening Programme national roll-out could support around 15,400 people who are newly eligible for lung screening each year to quit smoking and save up to 5,500 years of life[vi], by preventing lung cancer and increasing life expectancy.[46]

Of eligible participants in the YESS study, 89.0% agreed to see an advisor on the unit and 15.0% of all eligible people self-reported quitting after four weeks. This is a higher quit rate than is seen in lung screening units that do not provide such intensive intervention. For example, the UK Lung Screening Pilot provided standard smoking cessation advice leaflets and signposted participants to existing services. At a similar time-point to the 4-week quit rate measured in the YESS study, 9.9% self-reported quitting.[47]

The co-location of the support is important and viewed by researchers as vital for maximising uptake rates as it means the additional burden of booking and attending a separate appointment is not placed on participants.[42] Trials which did not provide on-site support did not have as high levels of engagement with smoking cessation services. However, if co-location is physically impossible due to space limitations, a same-day telephone appointment is the next best option. Automatic enrolment helps smoking cessation services to capture those who may have otherwise passed up the opportunity to quit by presenting smoking cessation and lung screening as a comprehensive package rather than an optional add on.

The principles from the lung screening example can be applied to a range of settings. People are likely to accept support and subsequently quit if it is presented as a comprehensive package with another medical appointment.

Accident and Emergency

The current target waiting time in A&E is four hours and, for patients who require an admission to hospital, the median A&E waiting time is nearly six hours.[48] The Charity estimates that every month around 300,000 people attending A&E in England smoke.[49] People attending A&E are more likely to be from deprived communities and more likely to smoke than the general population, making A&E based smoking cessation interventions an important opportunity not only to reduce smoking prevalence but also to tackle health inequalities.[50]

Research shows that offering smoking cessation services in A&E is effective and well-received. Participants in trials found it a welcome distraction during their wait. The CoSTED trial found that it was highly effective to provide advice (e.g. a 15-minute session with a stop smoking advisor), an e-cigarette starter kit and an onward referral to stop smoking services to people who smoke whilst they are waiting in A&E.[51] At six months, 23.4% of those receiving this intervention had achieved sustained

[vi] The number of life years gained estimated here is based on lung cancer alone. It is likely that the life years gained are higher than this due to the preventative benefits of smoking cessation for other life-threatening diseases such as COPD, heart disease and stroke.

smoking abstinence, statistically significantly higher than the 12.9% of the control group who were simply signposted on without providing onsite support. Half of those who attended A&E and currently smoked agreed to take part, indicating the intervention is acceptable and provides a valuable opportunity to engage people who smoke who may not intend to quit.

Mental health appointments

People with mental illnesses are equally motivated to quit, yet the odds of achieving abstinence after a quit attempt are 19% lower for people with mental illnesses compared to those without.[52] While many people feel smoking offers temporary relief of some mental health symptoms, evidence shows that quitting smoking can improve mental health.[53]

The 2025 ESCAPE trial compared two groups receiving cognitive behavioural therapy (CBT) for depression or anxiety.[52] The intervention group also received 12 sessions of integrated smoking cessation support, and the control group was signposted to external smoking cessation services after their CBT treatment. This study found that offering smoking cessation alongside treatment did not affect the completion rates of the mental health intervention or harm mental health and it increased both the proportion of people who attempted to quit smoking during their treatment and the number of people who successfully quit. Uptake of services increased from 6.0% in the control group, where they were signposted on to smoking cessation services, to 20.6% in the intervention group who were provided with integrated support. Smoking abstinence rates at 6 months were 2.5 times higher than for the control group. Integrating smoking cessation support into CBT was also considered to be widely acceptable with 90% of participants who completed the intervention reporting that they were satisfied. This trial indicates that integrating smoking cessation support into cognitive behavioural therapy is feasible and acceptable, but small sample size and lack of key measures limit conclusions. Larger trials are needed to demonstrate effectiveness.

Urgent suspected cancer referral

The Faster Diagnosis Standard is an NHS target which states people should be diagnosed or have cancer ruled out within 28 days of an urgent referral for suspected symptoms of cancer or being referred through a screening programme. People who have suspected symptoms of cancer will most likely not be diagnosed with cancer, but this remains an important teachable moment. People waiting to be seen by a specialist are likely to be concerned about their health and potentially more likely to engage with stop smoking advisors than ordinarily. Whilst waiting to be seen by a specialist after seeing their GP with symptoms or as part of the initial appointment with a hospital specialist, people who smoke should be automatically enrolled for smoking cessation support with a qualified smoking cessation advisor.

Whilst awaiting or undergoing cancer treatment

While stopping smoking is extremely important for cancer prevention, it remains crucial once diagnosed with cancer.

Numerous studies have found a link between smoking status and the efficacy of cancer treatment.[54] For chemotherapy and radiotherapy, there is a significant amount of evidence that people who do not smoke respond best. Additionally, there is sufficient evidence to infer a causal relationship between continued cigarette smoking and the risk of developing a secondary cancer and increased all-cause and cancer-specific mortality.[55] This means continuing to smoke after a diagnosis of cancer could reduce the effectiveness of treatment, increase the risk of a second primary cancer developing and increase the risk of dying. It is paramount that smoking cessation services are integrated into cancer pathways so whilst waiting for treatment as well as alongside it, people who smoke are given the support they need to quit.

In Yorkshire, 57% of people think it would be acceptable to offer smoking cessation services whilst on the waiting list for cancer treatment and 56% would find it acceptable to be offered smoking cessation services before starting cancer treatment.[40] For both, this was higher (61%) amongst those who had either personally been diagnosed with cancer, or had a close friend or family member diagnosed with cancer.

Economic case

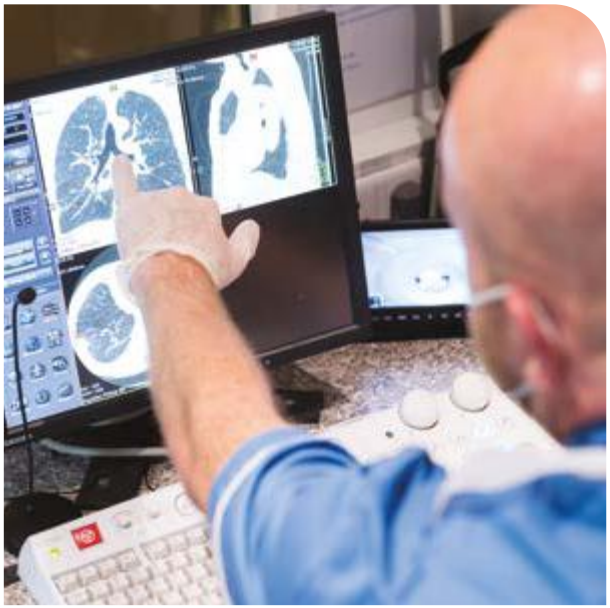
There is a strong economic case for integrating smoking cessation into as many touchpoints within the NHS as possible, due to the likelihood that this will increase uptake for smoking cessation services by engaging people who smoke who are otherwise disengaged.

Investing in smoking cessation services is one of the most cost-effective interventions that the NHS can provide. Tackling tobacco use could save England £43.7 billion a year, through increased productivity and reduced costs to the NHS and social care.[56] Revenue from cigarette and hand rolled tobacco taxation is about £6.77 billion a year nationally, significantly less than smoking costs the economy.

NHS Lung Cancer Screening Programme

York Health Economics Consortium compared the cost effectiveness of providing any smoking cessation intervention within the NHS Lung Cancer Screening Programme compared to no intervention or behavioural support alone and found all smoking cessation interventions appeared to be cost-effective.[57] They estimated that for smoking cessation initiated within the screening appointment, there is net monetary benefit to the NHS of £2,198 per person compared to onward referral to smoking cessation services. This is due to an additional 80 quality-adjusted life years (value applied to the intrinsic value of life) per 1,000 smokers and reduced workplace absenteeism. Maximising the uptake and effectiveness of smoking cessation services can both improve individual health and boost local economies, enabling people to improve their health so they can return to work.

As recommended by the Khan independent review, Action on Smoking and Health (ASH) and the All-Party Parliamentary Group (APPG) for Smoking and Health, additional funding for stop smoking services should be raised via a polluter pays levy, which would cap tobacco manufacturers' profits at 10%, in line with the manufacturing average.[42, 58] It is estimated that this could raise £700 million a year which could comfortably finance the model of integrated smoking cessation within the NHS Lung Cancer Screening Programme recommended by Yorkshire Cancer Research. The majority of the public are supportive of this measure (68%).[59]

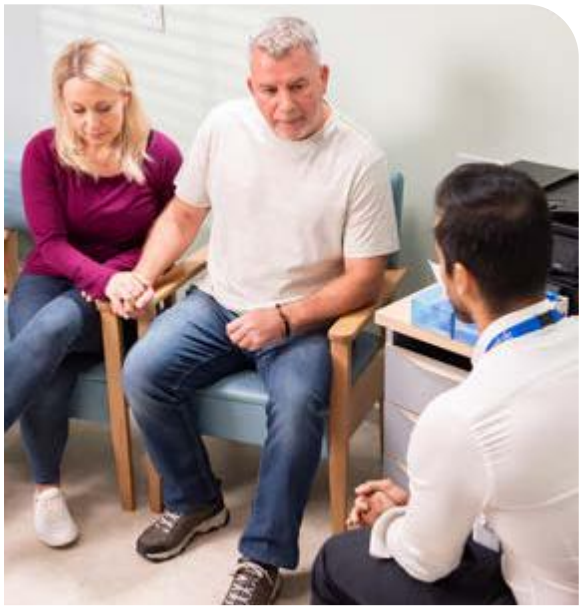


Health inequalities case

In England, the difference in life expectancy between the most and least deprived deciles is as high as ten years. Smoking accounts for approximately half of this difference.[5] Research from 2021 found that after accounting for tobacco expenditure, 500,000 extra households were below the poverty line in the UK. Of all regions in England, Yorkshire and the Humber has the largest difference between the proportion of households below the poverty line before and after spending on tobacco is taken into account. It is therefore important that effective smoking cessation strategies are in place to tackle health inequalities for people in Yorkshire and beyond.

In Yorkshire, adults working in routine and manual occupations have a smoking prevalence of 21.4%, this is nearly double the regional average of 12.4%.[21] Although the quit rate for this group is slightly higher than the Yorkshire average (66.6% vs 64.6%), there is still a third of those in routine and manual occupations who do not quit smoking following an attempt.[39]

Taking every opportunity to engage with people who smoke is key to reducing smoking rates and therefore tackling health inequalities. Integrating smoking cessation into existing pathways and appointments reduces the burden on individuals, eliminating the need for extra time or initiative to make first contact with a smoking cessation advisor. This is particularly key for adults working in routine and manual occupations compared to other occupational groups as they may have less workplace flexibility than those in managerial roles, so may find it harder to take time out of work for appointments.[60]



Geoff's experience

Geoff Rodley

Yorkshire Enhanced Stop Smoking study participant

"When it comes to Yorkshire Cancer Research, it's because of their initial idea and their commitment I'm sat here in my home, healthy, full of motivation and confidence, I can't thank them enough."

Geoff started smoking in his thirties and within months realised that he was addicted. The Yorkshire Enhanced Stop Smoking study gave him the opportunity to do something about it. Before participating in this study, Geoff had tried to quit but found that the one-to-one, ongoing support from the team was what he needed to successfully stop smoking. The smoking cessation advisors made him feel at ease, supporting and encouraging him so that he did not feel alone, and being shown the damage that had been done to his heart gave him the motivation that he needed.

Since quitting smoking with the support of the Yorkshire Enhanced Stop Smoking study, Geoff feels one hundred times better. He is no longer as tired, his cough has almost disappeared and he is saving money.

A perfect opportunity

Professor Rachael Murray

Professor of Population Health, University of Nottingham

"The National Cancer Plan is a perfect opportunity for the Government to commit to giving people who smoke the support that they need to quit at a time when they are likely most receptive to improving their health."

"I am pleased to see that Yorkshire Cancer Research are calling for the National Cancer Plan to provide dedicated funding for stop smoking support to be integrated into the NHS Lung Cancer Screening Programme. The National Cancer Plan is a perfect opportunity for the Government to commit to giving people who smoke the support that they need to quit at a time where they are likely most receptive to improving their health.

"The NHS Lung Cancer Screening Programme is an important opportunity to engage with a large number of people who smoke; therefore, we should not waste it. We know from the Yorkshire Enhanced Stop Smoking study that integrating stop smoking support into lung screening can provide high levels of uptake for stop smoking support and promising quit rates. To help tackle tobacco use and the significant costs associated with it, opt-out stop smoking support should be provided within lung screening appointments to everyone who smokes."


Yorkshire
Stop
Smoking
Study
Funded by
Yorkshire Cancer

Yorkshire Cancer Research

Chapter Three:
Early diagnosis

Background

Early stage cancer diagnoses offer more treatment options and higher survival rates compared to late stage diagnoses. For example, when lung cancer is diagnosed at an early stage, five-year survival is 62.6% and when diagnosed at a late stage is 13.5%.[61]

The Charity estimates that if the 75% early diagnosis target was met for lung cancer in Yorkshire, then each year 900 additional people would survive at least five years.

Cancers diagnosed through screening and managed routes are more likely to be caught at an early stage than those diagnosed through emergency routes:

- 25.6% of cancers diagnosed through an emergency route are early stage cancer, compared to 57.2% of those diagnosed through a managed route.[vii, 62]
- Yorkshire has a higher proportion of cancers diagnosed through an emergency route (21.2%) than England (19.4%).[19]
- Additionally, in England, 16.4% of cancers in the least deprived quintile are diagnosed through emergency routes, compared to 24.0% in the most deprived quintile, a 7.6% difference.[19]

[vii] Cancers diagnosed through a managed route to diagnosis are detected via urgent and non-urgent GP referrals as well as other outpatient and inpatient elective routes.

Spotlight

Screening

Yorkshire has a higher screening coverage for cervical, breast and bowel screening than the national average. However, in recent years the proportion of people up to date with breast and cervical cancer screening has declined, leading to more than 570,000 breast and cervical cancer screens missing.[63] There are also areas and groups within Yorkshire that have particularly low rates of screening coverage for certain screening programmes.

For most screening programmes, lower coverage rates are seen in areas that have a higher proportion of the population belonging to a minority ethnic group.[6, 63] For example, there is a strong relationship between cervical cancer screening coverage rates in the 25 to 49 age group and the proportion of minority ethnic group residents in the population. The sub-ICB with the lowest screening coverage (Bradford District and Craven, 65.1%) also has the highest minority ethnic population percentage (39.7%); the sub-ICB with the highest screening coverage (East Riding of Yorkshire, 76.9%) has the lowest minority ethnic group population percentage (5.4%).

Additionally, in England for cervical, breast and bowel cancer screening programmes, the least deprived quintile has continuously had higher screening coverage rates than the most deprived quintile.[63, 64] The difference is currently largest for cervical screening (between ages 25 to 49), where the coverage in the least deprived quintile is an absolute 9.4% higher than the most deprived.

As of March 2024, more than 800,000 cancer screens were missed in Yorkshire across cervical, breast and bowel screening and neither Yorkshire nor England were meeting all efficiency or optimal targets. The Charity estimates that achieving optimal targets in Yorkshire across the remaining programmes would lead to more than 150 lives saved, more than 250 cancers prevented and thousands more years of life to live.

Reasons for variation in screening access are complex. Cultural factors such as stigma and religious belief may impact someone's likelihood of attending screening.[65] Other personal factors also apply, such as levels of knowledge, fear or embarrassment which may lead to variation in how much people prioritise screening. Moreover, the screening appointment itself may not be accessible for certain groups, it may be too far away to access without a car, or there may be communication barriers discouraging people from attending.

Screening access is a priority for a large proportion of people in Yorkshire.[40] 50% of people living in Yorkshire who had been invited for cancer screening think that access to cancer screening services in Yorkshire needs to be improved, 40% are not sure and just 10% think that screening access in Yorkshire does not need to improve. Younger people are more likely to think that access to screening services in Yorkshire needs to be improved at 66% in the 18 to 29 age group compared to 50% in the 70+ age group. A slightly larger proportion of people living in Yorkshire think that access to screening services in rural areas needs to be improved (54%).

Early diagnosis policy recommendation

Sustained innovation within screening programmes

Screening is the route to diagnosis which catches the highest proportion of early stage cancers, but it diagnoses the fewest overall. This is especially concerning for bowel cancer, which has a long-established screening programme yet only 11% of bowel cancers are found through screening and still more than 20% are found through an emergency route.[19] Simply introducing a screening programme for a cancer site is therefore insufficient. The National Cancer Plan should ensure that screening programmes are (a) properly funded and (b) continually evaluated and improved, integrating innovative developments which improve the uptake, effectiveness and impact on health inequalities.

Funding for innovative screening programmes

Innovative screening interventions can increase participation in screening programmes across different groups. For example, the NHS Lung Cancer Screening Programme takes the innovative approach of providing targeted lung screens for people with a history of smoking on mobile units, bringing screening into communities to reduce the burden on individuals by reducing how far people have to travel. Just 11% of people in Yorkshire are willing to travel more than 60 minutes for a cancer screening appointment.[40] 46% of people were only willing to travel up to 30 minutes. People from an ethnic minority group are less likely to be willing to travel more than 30 minutes to attend a cancer screening appointment than those in the white ethnic group. 63% of respondents from an ethnic minority group said that they were willing to travel 30 minutes or less compared to 52% of white respondents. Bringing screening into communities could therefore be key for people living in Yorkshire, especially those in ethnic minority groups.

Evidence from the Yorkshire Lung Screening Trial (YLST), funded by Yorkshire Cancer Research, contributed to the National Screening Committee's recommendation for a NHS Lung Cancer Screening Programme.[66] Of the lung cancers detected in the YLST, 80% were found at an early stage, rising to 88% in the trial's second round of screening. When detected at stage one, 68% of people with lung cancer live beyond five years, compared to 9% of those diagnosed at stage four.

The *National Lung Cancer Audit State of the Nation 2025* report indicates that this innovative approach has been effective.[67] In 2023, rates of diagnosis through an emergency presentation were lower (30.9%) than the previous year (33.5%) and rates of early diagnosis were higher at 36.7% compared to 30.5% in 2021. The National Lung Cancer Audit suggests that the improvement in early diagnosis rates is likely to reflect the roll out of the NHS Targeted Lung Health Check Programme and subsequent introduction of the NHS Lung Cancer Screening Programme as well as other early diagnosis initiatives and recommends services maximise the uptake of lung screening for people aged 55 to 74 who are at high risk of lung cancer.

However, the NHS Lung Cancer Screening Programme has not received sufficient funding for the next year of rollout, cutting the number of people who can participate. This conflicts with the Government's prevention goals. The Charity estimates that if rolled out across the eligible population in the next five years, 144,000 people in Yorkshire would receive their first lung scan, with the potential to find thousands of lung cancers at an early stage, saving many lives. However, without sufficient funding to hit planned trajectories, it is

unclear whether the NHS Lung Cancer Screening Programme can be rolled out everywhere by 2029. Clarity on the future of lung cancer screening beyond 2029 is required and must be set out in the National Cancer Plan. The Charity understands that funding is stretched but holds that allocations should be prioritised according to local need and that the programme requires multi-year funding commitments to ensure planned trajectories can be achieved.

Continued innovation

Researchers and the National Screening Committee can work together to ensure that new screening programmes are adopted as soon as possible. When developing IMProVE, a prostate cancer screening trial funded by Yorkshire Cancer Research, researchers engaged with the National Screening Committee to ensure the trial design was appropriate to inform future evidence gathering and related recommendations on prostate cancer screening. The National Screening Committee should proactively seek to work with researchers at the development stages of trials so once evidence is presented to the committee, all the information required is readily available.

The National Screening Committee should continue to regularly evaluate research developments to ensure innovation within screening programmes can be incorporated in a timely manner. However, to allow for the swift implementation of innovation within screening programmes, the National Screening Committee may need to innovate itself, ensuring system constraints do not hold back innovation. The National Screening Committee must have the power to be reactive to new information and open to evidence.

Since the announcement of the NHS Lung Cancer Screening Programme, there have been several research developments which could be incorporated into the programme to enhance its effectiveness. For example, ongoing research should seek to optimise the eligibility criteria for lung cancer screening to maximise the clinical benefit of screening. This might include iterations to the current risk prediction models and should also consider the implications of altering the current thresholds based on cost-effectiveness analysis. It may be cost-effective to screen at a lower risk threshold thus increasing the number of cancers diagnosed and lives saved.

Additionally, evidence from the Charity's Yorkshire Kidney Screening Trial confirmed that combining screening for lung and kidney cancers, for both of which smoking is a risk factor, could help identify undiagnosed cases of kidney cancer. Of the kidney cancers identified in this trial, 90% were found to be Stage 1. If treated at an early stage, the cancer is often treatable, however around six in ten people in Yorkshire will have no symptoms. As evidence is developed, it should be promptly considered and, if found to be effective, safe and cost-effective, integrated as swiftly as possible into programmes.

Continued innovation within the cervical cancer screening programme is needed to help the Government achieve its commitment to eradicating cervical cancer by 2040. Cervical screening varies significantly between different socioeconomic groups and coverage has recently declined. At-home human papillomavirus (HPV) tests can boost participation by allowing women to self-sample with swab or urine tests at home, addressing barriers like inconvenience and embarrassment. The YouScreen trial demonstrates this could increase participation by up to 7.4%.[68] Additionally, the Catch-up Screen clinical trial funded by Yorkshire Cancer Research suggests that offering women aged 60 to 79 at-home urine tests (to find HPV) could increase screening coverage.[69] The trial includes people who are likely to have missed out on HPV testing if they attended their last screening before 2019, or if they did not attend their last test after 2019. Preliminary findings indicate that half of the women aged 60 to 64 who missed their last screening accepted the at-home test offer.

Economic case

Adequate funding and innovation in screening programmes are crucial for improving coverage and early diagnosis rates, which saves lives and reduces costs. Research shows that treatment for people with cancer who are diagnosed at an early stage is two to four times less expensive than those who are diagnosed at later stages.[70] Specifically, increasing screening participation saves money. According to a 2024 report supported by Breast Cancer Now, increasing breast cancer screening uptake to 80% from 2019 rates would save between £96 million and £111 million by 2034; this figure will likely be higher considering breast screening participation has declined in recent years.[71] Although screening has large initial costs, there are still net savings despite increasing the number of people who are diagnosed with cancer. This is largely due to more people being diagnosed at an early stage which often requires less complicated and costly treatment.

Cutting the funding for the NHS Lung Cancer Screening Programme could incur higher costs due to additional late stage diagnosis in those who miss out on screening. Lung cancer is estimated to account for 15% of all cancer costs in Europe, this is a higher proportion than any other cancer site.[72] This is largely because lung cancer causes significant productivity losses through premature deaths and lost working days, accounting for 32% of all cancer-related productivity losses in Europe. These costs could be significantly reduced by shifting the staging profile of lung cancer. If more lung cancers were found at an early stage, it would enable more people to remain in work and return to work earlier. Given its effectiveness in early cancer detection, the NHS Lung Cancer Screening Programme should be a key priority.

Health inequalities case

Innovation within screening programmes is vital for reducing health inequalities. Currently, people in the most deprived decile are more likely to be diagnosed at a late stage than those in the least deprived decile and there is significant variation in screening coverage between different groups.

Innovation can potentially reduce these inequalities by evaluating the impact of interventions on different groups and ensuring screening programmes are continuously improved, so they are as accessible and widely available as possible. At-home testing for cervical cancer, for example, reduces the burden on the individual, meaning women can take part without needing time away from work or caring responsibilities.

The Charity estimates that if the entire eligible cohort in England had the same screening coverages as the least deprived population, this would result in an additional 1.5 million screens across all programmes.[5] In turn, this could mean an additional 3,547 cancers could be diagnosed early, 1,588 cancers prevented and 1,181 lives saved.[73]

David's experience

David Sutcliffe

Yorkshire Lung Screening Trial participant

"I was completely recovered in a matter of weeks. Thanks to my cancer screening, I was there for my granddaughter's first day of school and got to drop her off in her new uniform. I am so grateful for the Yorkshire Lung Screening Trial gifting me the opportunity to see my grandchildren grow up and experience those precious, priceless moments."

Retired milkman David Sutcliffe from Leeds had always lived an active lifestyle. From his twenties, he frequently played golf, cycled and hiked with his friends in the Yorkshire Dales.

Despite leading an active lifestyle, David had smoked in his youth. In July 2019, he participated in the Yorkshire Lung Screening Trial. His initial scan was clear, but a subsequent scan in 2022 revealed a small nodule in his left lung. Although potentially harmless, David opted for keyhole surgery to remove the nodule, which turned out to be stage-one lung cancer. However, the surgery had been a success and fortunately, there was no spread of cancer in the lymph nodes. Thanks to early detection and prompt treatment, David is cancer-free.

Important data

Professor Mat Callister

Consultant in Respiratory Medicine, Leeds Teaching Hospitals NHS Trust

"Without the involvement of thousands of people across Leeds who signed up to be part of the trial, we would not have been able to share this important data. It's because of their willingness to be involved in research that we have been able to contribute to a clear model for how lung screening should be introduced across the country."

"I strongly commend this comprehensive document from Yorkshire Cancer Research highlighting key recommendations from the Charity for inclusion in the National Cancer Plan. Yorkshire Cancer Research has provided huge funding support for research into cancer prevention and early diagnosis within the region, and I am delighted that they have made a strong case for prioritising these two components at a national level. Whilst recent advances in systemic treatment are to be welcomed, it is through cancer prevention and earlier diagnosis that we will achieve the greatest impact on reducing cancer deaths and increasing life years gained as a result."

Yorkshire Cancer Research

Chapter Four: *Treatment*

Background

Cancer treatment has significantly improved in the last 20 years. The development of more targeted chemotherapy treatments and the increased understanding of immunotherapy has significantly improved survival for some cancers. However, cancer treatment still puts a huge burden on people with cancer and their families, physically, emotionally and financially.

Despite improvements in treatment options, where you live often determines the quality and variety of treatment options available to you. For example, Yorkshire Cancer Research funds the Bowel Cancer Improvement Programme (BCIP) which has found variation in both the provision and practice of perioperative care for colorectal cancer in Yorkshire.[74] 97% of people in Yorkshire think that no matter where in Yorkshire people live, they should receive the same healthcare options if they have the same healthcare needs.[40]

There is also significant variation across the country in travel distances for cancer treatment such as radiotherapy. Yorkshire has three radiotherapy centres serving over one million people each, requiring many to travel over an hour for treatment. Despite making up 8% of the UK population, Yorkshire has only 5% of the UK's radiotherapy centres. Furthermore, in Yorkshire a larger proportion of people with cancer are treated with radiotherapy than nationally.[75]

There are also delays in receiving radiotherapy in Yorkshire. In 2024, only 71% of people began their radiotherapy treatment within 31 days of diagnosis.[76] This is much lower than the national average of 88% and Hull (one of the lowest performing areas in the country) fell even further behind with 59% of people beginning radiotherapy within 31 days of diagnosis in 2024.

Figure 5 shows the three radiotherapy sites in Yorkshire. In Yorkshire, just 34% of people are willing to travel more than 60 minutes to attend cancer treatment (e.g. surgery, radiotherapy or chemotherapy) meaning 66% of people in Yorkshire are only willing to travel 60 minutes or less to attend cancer treatment. Of these, 30% were only willing to travel less than 30 minutes.[40] Longer travel times for cancer treatment could be a particular issue for people from lower socioeconomic backgrounds, 33% of the C2DE socioeconomic group are only willing to travel 30 minutes or less for cancer treatment compared to 28% of the ABC1 group.[viii]

Figure 5: *Map of Yorkshire showing the three radiotherapy sites in the region.*

Whilst the Charity recognises it is not feasible for every centre to be specialist in every area of treatment, it is important that innovative treatments are not all condensed in certain areas. Otherwise, the burden of travelling for high quality and varied treatment options persistently falls on the same people, resulting in pockets of the country which are isolated from accessible, high-quality treatment options.

[viii] ABC1 and C2DE are classifications of social grade or socioeconomic status. The ABC1 group combines the groups AB, higher and intermediate managerial, administrative and professional occupations and C1, supervisory, clerical, and junior managerial, administrative and professional occupations. The C2DE group combines the groups C2, skilled manual occupations, and DE, semi-skilled and unskilled manual occupations; unemployed and lowest grade occupations.[77]

Spotlight

Prehabilitation and rehabilitation

Traditionally people with cancer were told they should rest up. However, there is growing evidence highlighting the substantial benefits of exercising before, during and after cancer treatment.

Exercise after a diagnosis of cancer is safe and can reduce the risk of death by up to 44% and recurrence by up to 66%, as well as providing a range of wider benefits.[78, 79] Exercising before cancer treatment (prehabilitation) can help people prepare for treatment, improving fitness and expanding treatment options.[80] During treatment, exercise can help alleviate common side effects such as anxiety and fatigue, help people tolerate higher doses of treatment and complete treatment cycles.[81] Exercise after treatment (rehabilitation) aids recovery, improves people's ability to do day-to-day activities and enhances quality of life as well as helping to instil life-long healthy behaviours.[81]

Despite the clear benefits of exercise for people with cancer, specialist exercise services are not routinely available for people with cancer, with just 9% of hospitals in the UK offering exercise-based cancer rehabilitation services.[82] A 2023 YouGov survey commissioned by Yorkshire Cancer Research involving 500 people living with and beyond cancer in Yorkshire found 5% reported taking part in a specialised cancer exercise programme following their cancer diagnosis and 74% said their healthcare team did not discuss exercise with them following diagnosis.[83]

The 2025/2026 Cancer Alliance planning packs state that Cancer Alliances should plan for the delivery of prehabilitation interventions and increase the levels of physical activity across cancer pathways, and the Government's elective reform plan has made it clear that prehabilitation for people with cancer is a key priority. However, the benefits of exercise are strengthened if rehabilitation is offered too, aiding recovery and reducing the side effects of treatment.

The inclusion in the Cancer Alliance planning packs and the elective reform plan are welcomed by the Charity. However, there remain significant gaps in delivery across the country. There is a need for more comprehensive provision so that everyone who receives a cancer diagnosis can access a specialist exercise service not only before cancer treatment but also during and after.

[ix] Active Together is funded by Yorkshire Cancer Research, designed by Sheffield Hallam University's Advanced Wellbeing Research Centre, and delivered in partnership with the NHS across Yorkshire.

Treatment policy recommendation

Multi-modal prehabilitation and rehabilitation embedded as part of standard NHS cancer care pathways

The National Cancer Plan should embed prehabilitation and rehabilitation into cancer care pathways. This should be comprehensive, evidence-based and aligned to best practice.

Multi-modal prehabilitation and rehabilitation combines evidence-based exercise, nutrition and wellbeing support both before, during and after treatment. All three elements are essential and should be provided by qualified professionals who are trained to deliver services for people with cancer.

The exercise component improves fitness and strength levels to reduce the side effects of treatment and rebuild strength and confidence after treatment. Sending a link to an exercise video or signposting to gym classes is not enough; exercise services for people with cancer should be personalised to individual needs and delivered by cancer exercise specialists.

The nutritional component helps to stabilise the individual so they are better able to tolerate treatment, and psychological support enables people who are struggling due to their psychological distress to engage with the service and/or their treatment.[84]

Each element complements the other to ensure participants feel the full benefit of the service and that healthy behaviours developed in the programme are long-term and sustainable. Multi-modal prehabilitation and rehabilitation provides tailored behaviour change techniques across all three components, each reinforcing the efficacy of the other.

Yorkshire Cancer Research's pioneering Active Together[ix] service has provided evidence-based exercise, nutrition and psychological support for more than 2,000 people with cancer, both before treatment (prehabilitation) and after (rehabilitation). The Charity is in the process of expanding Active Together to thousands more people with cancer across Yorkshire, focusing on areas of greatest need. In collaboration with Sheffield Hallam University, NHS trusts and local leisure providers, Active Together services are operating in Sheffield, Barnsley, Doncaster, Rotherham, Wakefield, Pontefract and Dewsbury, while a new service around Airedale is currently in the planning phase. A brand-new centre in Hull will provide a hub for Active Together in East Yorkshire within this business year and the Charity also runs a service from its head office centre in Harrogate. This growing region-wide approach is bringing this vital cancer treatment directly into as many communities as possible.

Research from the service in Sheffield (the first Active Together site) demonstrates the vital role of prehabilitation and rehabilitation when integrated into cancer care pathways. Evaluation results from the first two years of operating demonstrate Active Together Sheffield is associated with an overall 10% improvement in survival for people with bowel, lung and upper gastrointestinal cancers.[84] Researchers recorded a one-year survival rate of 95% for people taking part in the programme, compared to 85% for people who did not. In addition, 97% of participants reported improvements in their health and wellbeing, feeling more empowered and in control of their health.

Active Together participants entered treatment stronger and fitter. This meant they had a better chance of tolerating surgery, spent less time in hospital, had reduced side effects of treatment and recovered more quickly, reducing the physical and emotional toll of cancer treatment. Additionally, Active Together's psychological support was found to have a beneficial impact on anxiety levels. The multi-modal approach therefore not only reduces the emotional and physical toll of cancer treatment but also shifts care from the hospital into community settings.

Economic case

Investing in multi-modal prehabilitation and rehabilitation provides good value for taxpayers' money as it can save NHS resources. The evaluation of Active Together Sheffield found that the programme saved the NHS £366.36 per patient by reducing the amount of time they needed to spend recovering in hospital after surgery, with upper gastrointestinal patients who participated in Active Together spending half a day less in critical care than those who did not take part in the programme.[84] The Charity estimates that if Active Together was rolled out to everyone in England with bowel, lung and upper gastrointestinal cancer this would free up 12,600 bed days annually. It is also estimated that providing exercise, nutritional advice and psychological support to all people diagnosed with cancer before, during and after treatment could save the NHS more than £100 million over five years if implemented nationwide.

There are also likely to be wider cost-saving effects of the service, including earlier return to work and reduced demand on primary care for co-morbidities, although these were not explored in the Active Together Sheffield evaluation. Furthermore, Active Together has now rolled out to more cancer sites and future evaluations will continue to assess the benefits. Enabling people to recover from their cancer treatment more quickly can strengthen the local economy, especially in the most deprived areas. It is therefore vital that barriers to effective recovery from cancer treatment are removed. Areas of deprivation often have more people who are out of work due to long-term illness than more affluent areas. For example, Hull and Doncaster, two of the most deprived areas in Yorkshire, have particularly high proportions of people who are out of work due to long-term illness (39.8% and 35.4% respectively) compared to York which is relatively affluent (21.5%).[85]

Health inequalities case

Health services should remove barriers to care, ensuring everyone can access and benefit from services. Active Together has been developed so as many people as possible can access the vital benefits of the service.

Whilst different Trusts across Yorkshire are at different stages of rolling out Active Together, the service is now embedded within tumour site pathways of high need based on local data. Once diagnosed with cancer, people are referred to Active Together. To avoid unconscious referral bias, Active Together operates under the policy of universal referrals. Clinicians refer all those who are eligible, rather than just those who clinicians think would benefit from the service.

Active Together also takes a strong personalised care approach. The service aims to be as flexible to individual needs as possible, centring care around participants' lives rather than the other way around, providing support online or face-to-face, and with interpreters if needed.

Evaluation found that despite having higher levels of referrals from deprived areas, acceptance rates in Sheffield were around 10 to 15% lower in the most deprived areas compared to the least deprived areas.[84] Therefore, Active Together continually tries to improve access for different groups, operating in various settings, including community venues to bring the service as close to those who need it as possible.

Education on the value of exercise and nutritional support alongside psychological support fosters long-term behavioural change. This is particularly important for people in deprived areas. Access to regular exercise is a privilege as it requires time and often money. Gym memberships and sports attire can be costly and opening hours for gyms and sports classes may be difficult to attend if you work long hours or have caring responsibilities.

In Yorkshire, some of the most deprived areas are those with the highest levels of physical inactivity and the most affluent areas have much lower levels of physical inactivity.[23] For example, in York, 16.3% of adults are physically inactive compared to 32.5% in Barnsley and 30.1% in Hull. In York 1% of people live within the most deprived 10% nationally compared to 22% in Barnsley and 45% in Hull. It is therefore important that all efforts are made to ensure people from deprived areas can attend.

Karen's experience

Karen Nile

Active Together member

"What makes this programme so special is how it creates a complete support network - physical, nutritional and emotional. When you've had such massive surgery, you're thinking on an hour-by-hour basis. Having a team that truly sees you as an individual and understands exactly where you are in your recovery journey is invaluable.

"The collaboration between the NHS, Yorkshire Cancer Research and Sheffield Hallam University is brilliant - it feels like something you'd have to pay for privately in other countries. I want to do everything I can to raise awareness so others can benefit from this incredible programme."

Active Together

Karen Nile, 50, from Sheffield, was diagnosed with bowel cancer in March 2023. Up to that point she led a busy life, working full time and filling her free time with woodland walks, visits to art galleries and museums, and regular walks along the beaches of North Wales. Within days of her diagnosis, she was referred to Active Together to prepare for major surgery scheduled for two months later.

Karen received comprehensive support tailored specifically to her lifestyle and work commitments. Karen's recovery programme was highly personalised to suit her preferences and needs. Instead of gym workouts, she was provided with an exercise plan around her love of woodland walking, combining cardio with gentler activity in an environment where she felt comfortable.

Throughout her six months of chemotherapy, the Active Together team provided continuous support through regular contact, face-to-face assessments, and practical help. They also monitored her mental wellbeing and referred her for talking therapy when she needed it.

Best possible outcomes

Professor Rob Copeland

Director of the Advanced Wellbeing Research Centre, Sheffield Hallam University

"Integrating specialist exercise, nutritional and wellbeing support into cancer pathways can help increase treatment tolerance, reduce side effects of treatment and contribute to improvements in quality of life and survival."

"The National Cancer Plan should aim for the best possible outcomes for people with cancer. I am therefore delighted that Yorkshire Cancer Research are calling for multi-modal prehabilitation and rehabilitation to be included in the National Cancer Plan as a model of best practice. Integrating specialist exercise, nutritional and wellbeing support into cancer pathways, through services like Active Together, can help increase treatment tolerance, reduce side effects of treatment and contribute to improvements in quality of life and survival. Active Together also demonstrates that these interventions save the NHS money. To transform outcomes for people with a cancer diagnosis, including interventions like Active Together in the National Cancer Plan is essential."

Yorkshire Cancer Research

Chapter Five: *Research*

Background

Taking part in research allows people to access innovative treatments, technologies and techniques and can positively impact patient outcomes. For example, bowel cancer patients treated in NHS hospital trusts with high levels of research participation had improved survival outcomes in the first year after diagnosis.[86] Moreover, research-active hospitals show benefits for others receiving care there, regardless of if they are taking part in research.[87] This is thought to be due to benefits arising from a research-active environment such as better access to new treatments, improved diagnostic tools and enhanced levels of patient care. When research participation was sustained over a longer period, there was an in improvement in five-year survival outcomes of 3.8%. Furthermore, hospitals that conduct medical research have better staff retention, which is crucial at a time when the NHS is chronically understaffed.

However, there are significant discrepancies in the regional distribution of wider health research funding, meaning the benefits of taking part in research are not equitably distributed. According to a report published by the Medical Research Council in 2023, London receives the highest proportion of UK funding (32%), followed by the South East (16%) and East of England (13%), while Yorkshire receives 5%.[88] This is despite Yorkshire making up 8% of the UK population and London making up 13%. A 2025 YouGov survey of people living in Yorkshire found those from the ABC1 socioeconomic group are both more likely to be aware of the benefits of participating in research and clinical trials and more willing to travel further to access clinical trials than the C2DE group.[40] This, combined with the lack of local research opportunities, means that potentially people in the ABC1 socioeconomic group in Yorkshire are more likely to have the knowledge, understanding and knowledge as well as the time and means to travel required to access research and clinical trials.

The outstanding quality of clinical trials conducted in Yorkshire is evidenced by the success rate of Yorkshire-based research applications to UK Research and Innovation. In 2023/24, 24% of applications were successful compared to 18% in London.[89] However, the value of Yorkshire-based applications in 2023/24 was £320 million, compared with over £1 billion in London.[19] The Northern Health Science Alliance argue this is a result of a lack of infrastructure funding to support a wider research ecosystem in the north, which deepens existing regional inequalities.[90]

Spotlight

FOxTROT 2 and 3

Yorkshire Cancer Research brings together national and international experts to lead pioneering research which makes a lasting impact in Yorkshire and beyond. The Charity funds the world-leading clinical trials FOxTROT 2 and FOxTROT 3, which test the effect of chemotherapy before surgery for bowel cancer. They follow FOxTROT 1, the pioneering international study which successfully demonstrated that six weeks of neoadjuvant chemotherapy (chemotherapy before surgery) was associated with a 28% reduction in bowel cancer recurrence within two years, compared with immediate progression to cancer surgery. This is now a standard treatment option for some people with bowel cancer.[91]

FOxTROT 2 and 3 develop this successful treatment approach further, by optimising the use of neoadjuvant chemotherapy for specific populations. FOxTROT 2 will evaluate if gentler neoadjuvant chemotherapy is effective in frailer adults with bowel cancer.[92] FOxTROT 3 will assess if more intensive neoadjuvant chemotherapy is more effective in fitter adults. By building upon a proven, evidence-based approach to treatment, the research findings can quickly be incorporated into clinical practice and further advance the treatment of bowel cancer.

Funding large-scale clinical trials in Yorkshire brings expert researchers to the region. The trial is led by Professor Jenny Seligmann at the University of Leeds, whilst Co-Chief Investigator Professor Dion Morton is based at the University of Birmingham. They are leading clinical academics on the subject of bowel cancer who manage a large and established team of expert researchers from across the UK. Recruitment to FOxTROT 2 and 3 is being led out of Yorkshire, with additional trial sites across England, Scotland and Wales. FOxTROT 2 is an international clinical trial with recruitment sites now open in France and India, illustrating the potential for research based in Yorkshire to have a global impact.

Yorkshire Cancer Research's funding of FOxTROT 2 and 3 has acted as a catalyst for the expansion of the FOxTROT research platform, which currently spans five clinical trials. The platform has now attracted significant industry investment from major pharmaceutical companies including GlaxoSmithKline. Investing in the advancement of a proven, evidence-based treatment approach has therefore supported the development of a wider research ecosystem based in Yorkshire.

By building upon a proven, evidence-based approach to treatment, the research findings can quickly be incorporated into clinical practice and further advance the treatment of bowel cancer.

Research policy recommendation

Adopt the ROSE model for health research funding

> **The National Cancer Plan should take a comprehensive view of health research and adopt the Charity's ROSE model, so that funding allocations incorporate *Rapid implementation* of research in the NHS, *Optimise research* implementation to address health inequalities, include *Systematic evaluation* of research findings in real-life settings and ensure *Equitable funding* within the clinical research environment.**

A reformed health research funding system

63% of people in Yorkshire think that health research funding should be distributed across the country according to population, compared to 19% of people in Yorkshire who think that health research should be concentrated in certain areas to create centres of academic excellence, with the remaining (18%) not agreeing with either statement.[40]

To maximise the impact of health research, the Government should reform the research funding system, to improve patient access to clinical trials nationwide and increase the diversity of clinical trial recruitment. To facilitate the expansion of research capacity in areas with lower levels of research output, increased infrastructure investment and a reformed clinical academic career pathway are essential.

A recent report by UK Research and Innovation (UKRI) proposes the establishment of a national clinical research career framework.[93] This would provide a clear, financially secure pathway to becoming a clinical academic from the beginning of a clinical career. This approach would help to address the challenges facing clinical research, improving career security whilst developing a more supportive and flexible research environment within the NHS.

The National Cancer Plan should support the establishment of a national clinical research career framework. Within this framework, there should be a commitment to increase the number of clinical academic posts within Yorkshire, across the clinical research career pathway.

The National Cancer Plan should also commit to balancing regional investment in research infrastructure funding, so that the Yorkshire research environment has the capacity to deliver high-quality clinical research on a greater scale. Despite generally having lower levels of local need, southern Combined Authorities are awarded significantly more in research infrastructure funding. This includes buildings, equipment and the research support staff required to deliver clinical trials. In 2022, the Greater London Authority was awarded £302,925,217 in research infrastructure funding, whereas the three combined authorities in Yorkshire received £15,601,964.[90] The Greater London Authority received £34.42 per person in research infrastructure funding, compared to £2.68 per person in the West Yorkshire Combined Authority. Of the combined authorities that had research infrastructure funding, West Yorkshire had the lowest level of research infrastructure funding per head.

The creation of new life sciences institutes in the North would attract further research expertise and external investment to the region. For example, the Northern Health Science Alliance is proposing the establishment of the Institute for Preventative Health Research, which would identify and scale research innovation in the North, to improve health outcomes and drive economic growth.[94]

Swifter implementation

Innovation is needed to bring care from hospital to community and to modernise treatments and services to shift the NHS from analogue to digital. Whilst the findings of some trials are implemented at a

significantly faster pace, on average it currently takes 17 years for research findings to be implemented in clinical practice.[95, 96] Life-saving treatments and technologies should be made available to those who need them as soon as possible.

There is a significant imbalance between the investment in clinical research by Government bodies such as the National Institute for Health and Care Research (NIHR), and the formal funding for the implementation of research findings within the NHS. The NHS Health Innovation Network supports the implementation of research in the NHS at pace and scale, by connecting healthcare providers, academia and industry. In the fiscal year 2025/26, the fifteen regional Health Innovation Networks will collectively receive approximately £52 million as core funding.

This imbalance between the investment in clinical research and funding for research implementation should be addressed to ensure innovative research reaches as many people with cancer as possible. To do this, the National Cancer Plan should establish clear responsibility and accountability for the delivery of innovative treatments and diagnostics in the NHS. The NHS should prioritise implementation funding around the three strategic shifts in the 10-Year Health Plan.[97] To deliver upon these priorities, there should be alignment of implementation funding between key Government organisations. Implementation funding should be committed to for multiple years, to maximise return on investment.

For the benefits of clinical research to reach those that need it most, interventions which have been demonstrated by research to be safe and effective should be rolled out in a timely manner, prioritising the areas with the highest levels of patient need. Currently, the areas with existing capacity and equipment are generally those where innovations are first implemented but this approach can exacerbate existing health inequalities with some areas falling behind. 69% of people in Yorkshire agree that research findings should be first rolled out in areas which have the highest patient need, even when this may need investment in new equipment or capacity compared to 12% of people in Yorkshire who think that research findings should be first rolled out in areas that already have the right equipment and capacity, but the patient need might be lower.[40] The remaining (19%) did not agree with either statement.

Continuous evaluation

As emphasised by the APPG on Medical Research, research findings should be continuously evaluated, to ensure their real-life application is safe, effective, cost-effective and does not exacerbate existing health inequalities.[98]

One of the key strategic goals of Health Innovation Networks is to coordinate and deliver evaluation of innovations, to be used by National Institute for Health and Care Excellence (NICE), regulators and commissioners in decision making and guidance. Increased funding of organisations with evaluative functions could increase the capacity to deliver high-quality evaluations of interventions at pace, particularly in areas with higher levels of ill-health. The National Cancer Plan must support relevant organisations including Health Innovation Networks to evaluate the impact of the latest research innovations in real-world settings.

To improve the impact of research on cancer outcomes and health inequalities, Yorkshire Cancer Research recommends the following model for health research funding is applied:

R	**Rapid implementation** of research in the NHS
O	**Optimise research** implementation to address health inequalities
S	**Systematic evaluation** of research findings in real-life settings
E	**Equitable funding** within the clinical research environment.

Economic case

Investing in health research has significant benefits for the regional and national economy, as well as people's health. Between 2016 and 2019, clinical research supported by the NIHR generated an estimated £8 billion in gross value added to the economy and approximately 47,000 full time equivalent jobs.[99] Research also positively impacts the NHS, generating £355 million for the NHS in 2018/19. Health research can support the Government to deliver upon its national mission for economic growth.

Cancer research has significant benefits for the regional and national economy as well as people's health. Every £1 invested in cancer research generates £2.80 of economic benefit.[100] In 2020/21, £1.8 billion investment in cancer research resulted in over £5 billion of total economic impact, with 47,000 jobs in cancer research resulting in £3.6 billion of gross value added to the UK economy. The health benefits which result from cancer research investment also positively impact the economy. Research investment in 2020/21 resulted in an estimated 22,730 additional quality adjusted life years, which has a societal value of approximately £1.4 billion.

An equitable health research funding system could drive regional economic growth. In Yorkshire, 29.8% of people are economically inactive and are out of work due to long-term sickness.[85] Increased research activity in Yorkshire could result in a healthier, more productive workforce and in turn attracting additional investment in research and innovation. The Northern Health Science Alliance has found that reducing the gap in health outcomes between North and South could generate an additional £13.2 billion in gross value added to the UK economy.[101] Health research can play a pivotal role in this process.

Investment in cancer research creates highly skilled roles in research and development, adding significant value to regional economies, including Yorkshire. In 2020/21, the UK average full time salary in cancer research and development was approximately 52% higher than the average salary for the Yorkshire and the Humber region.[100] Increased investment in cancer research can therefore drive economic growth in Yorkshire and across the regions of the UK.

Health inequalities case

Addressing regional disparities in research funding can help to reduce health inequalities in Yorkshire and beyond. Health research which involves under-served groups can support the development of tailored policy interventions which reduce health inequalities.

Yorkshire Cancer Research funds clinical research which seeks to address health inequalities, through targeted interventions in groups which are known to have worse cancer outcomes.

It is important that recruitment to clinical trials is representative of the population who experiences that cancer, to ensure interventions are effective across diverse groups. Research shows that there are significant inequalities in trial participation for people from an ethnic minority background and for those who live in more deprived areas.[102, 103]

A scientific workforce from diverse backgrounds can more effectively research and address health inequalities. The University of York programme GenerationResearch offers paid research experience to students, with the aim of widening access to research careers. At least 50% of participants are from backgrounds which are underrepresented in science. The programme supports students to gain valuable experience in research, whilst also enabling them to develop significant experience and connections within academia, ahead of further academic study. Crucially, the paid element of the programme provides students who could not otherwise afford to complete a research internship with the opportunity to do so.

For research to have the greatest impact, its findings must be implemented in areas of the greatest need. Often, clinical research is delivered and implemented in areas where the required infrastructure is already established. These areas tend to be more affluent. As a result, this can lead to trial populations not being representative of our diverse society and the findings of research not reaching those who live in communities where cancer rates are higher. Research findings must be accessible to all, including those from under-served groups.

Following implementation, interventions require continuous evaluation. This can help to ensure new interventions are not exacerbating existing health inequalities.

"Early and authentic exposure of undergraduate clinicians and healthcare professionals to clinical research is crucial to building the science workforce of the future. However, these experiences are often less accessible to UK home students from underrepresented and diverse backgrounds, leading to loss of potential talent. The Yorkshire-led GenerationResearch programme is an exemplar in tackling these issues by breaking down financial and social barriers, making paid opportunities accessible to students regardless of background. The timely implementation of the findings of this report is essential to drive momentum and stop the loss of talent that is currently being faced."

Dr Jillian Barlow
Founder and Director, GenerationResearch

Bill's experience

Bill Hall

FOxTROT 3 participant

"The developments in surgical technique and chemotherapy since I started my career have been quite extraordinary."

Bill Hall, a 72-year-old locum doctor from York, was diagnosed with stage 3 bowel cancer in January 2024. Bill didn't want his nearly 50-year medical career to come to an end just yet, but knew he had to pause work to focus on his cancer treatment.

He chose to participate in the FOxTROT 3 clinical trial, funded by Yorkshire Cancer Research, which involved receiving chemotherapy before and after surgery. This approach significantly reduced the size of his tumour, allowing for a less invasive surgery with no complications.

Bill is now having six-monthly appointments to hopefully confirm the cancer has not returned. Having recently been deemed fit for work, he is looking forward to supporting people with their health for a couple more years before he retires. Bill's experience highlights the importance of clinical trials in advancing cancer treatment and helping future patients.

Substantial benefits

Professor Jenny Seligmann

Consultant Medical Oncologist and Senior Lecturer, University of Leeds

"It is crucial that research investment is not concentrated in certain areas. It shouldn't be the case that only those who live near or can afford to travel to centralised centres of research excellence should be able to participate."

"It is crucial that research investment is not concentrated in certain areas. Regional research investment brings researchers into the region and acts as a catalyst for further investment. The FOxTROT trials are an excellent example of this. There are people on the trial team who would not otherwise have brought their skills to the region and the initial investment has led to substantial investment from the pharmaceutical industry. Additionally, participating in clinical trials can have substantial benefits to the individual. It shouldn't be the case that only those who live near or can afford to travel to centralised centres of research excellence should be able to participate.

"I therefore am thankful that Yorkshire Cancer Research are calling for action on this issue, so that the economic and health benefits of regional research can be felt across the country."

"The chemotherapy before my surgery made the tumour much smaller and the surrounding tissue easier to remove. As a result, the procedure was done through keyhole surgery, assisted by a robot, leaving minimal damage and no complications. The post-surgery chemotherapy was very successful, and I was surprised at how quickly I was able to focus on getting back to normal life."

Bill Hall
FOxTROT 3 participant

Yorkshire Cancer Research

Chapter Six: *Impact of recommendations*

	Recommendation	People supported [x]	Life years gained [xi]
Prevention	Automatic enrolment into smoking cessation at lung screening	15,400	5,500
	Automatic enrolment into smoking cessation at A&E	15,750	4,500
	Automatic enrolment into smoking cessation within CBT (mental health)	6,480	1,851
	Automatic enrolment into smoking cessation through urgent suspected referral for cancer	18,556	5,301
	Automatic enrolment into smoking cessation while awaiting cancer treatment	3,726	1,064
	Total prevention	***59,912***	***18,217***
Early diagnosis	Funding for innovative programmes	101,550	17,581
	Continued innovation (adding kidney screening to lung screening)	145,918	595
	Continued innovation (at-home cervical screening)	325,540	6,135
	Total early diagnosis	***573,008***	***24,311***
Treatment	Everyone offered exercise following a cancer diagnosis	73,788	65,435
	Total early diagnosis	***73,788***	***65,435***
	Total	***706,709***	***107,962***

The Charity estimates that for the recommendations outlined in Chapters Two to Four, the impact shown to the left will be seen annually across England.

This includes an estimate of the potential life years gained that could be seen if the recommendations were implemented. The life years gained reflect cancer-related benefits only, and in some cases, such as for prevented cancers through smoking cessation which accounts for only lung cancers prevented, the full cancer-related benefits are not included, largely due to evidence and data availability. Therefore, the potential number of life years gained would be much larger if other health-related benefits were taken into consideration.

[x] For prevention this reflects those who quit smoking, for early diagnosis it is the additional number who have a screen, for treatment this is the estimated number of people who would complete an exercise programme following a cancer diagnosis.

[xi] Life years gained is how the Charity measures the impact of projects across all areas of strategic focus. It refers to the number of estimated additional years lived by an individual as a result of a health intervention.

Conclusion

The National Cancer Plan is a critical moment for people with cancer in Yorkshire and beyond. It is a vital opportunity for organisations and individuals to have their voices heard, united by the cause of developing a cancer strategy that makes a meaningful difference to outcomes and experiences now and making the hope of a future free from cancer happen.

The recommendations made in this report outline a big and bold vision, setting out specific ways in which cancer prevention, early diagnosis, treatment and research can be improved significantly. The Charity understands that not all our recommendations are quick fixes, but it is important the Government invests in long-term solutions. The recommendations presented in this report embrace innovation, have longevity, embed addressing health inequalities throughout and are economically strong, making them crucial steps on the road to building an NHS fit for the future.

A key theme throughout this report has been the need for continuous evaluation so that interventions benefit people with cancer as effectively as possible. It is also important that once the National Cancer Plan itself is developed, the recommendations are regularly evaluated in the context of a changing national and international cancer landscape.

The *National Cancer Plan* should:

1. **Commit to automatically enrolling people who smoke into smoking cessation support within as many touchpoints in the NHS as possible.**
2. **Enable sustained innovation within screening programmes.**
3. **Embed multi-modal prehabilitation and rehabilitation as part of standard cancer care pathways.**
4. **Adopt the ROSE model for health research funding.**

Yorkshire Cancer Research holds that if these four evidence-based recommendations are implemented in full, they will be significant in ensuring that England becomes a global leader in cancer outcomes. Ultimately, they will give people living in Yorkshire and beyond more life to live, and work towards the Charity's ambition of a Yorkshire free from cancer.

The recommendations presented in this report embrace innovation, have longevity, embed addressing health inequalities throughout and are economically strong, making them crucial steps on the road to building an NHS fit for the future.

References

1. Street PMsOD. ***Build an NHS Fit for the Future.*** 2024. Accessed: 17/04/2025. Available from: ***https://www.gov.uk/missions/nhs***
2. Government issues rallying cry to the nation to help fix NHS [press release]. 2024.
3. Department of Health and Social Care, NHS England. ***Reforming elective care for patients.*** 2025. Accessed: 12/03/2025. Available from: ***https://www.england.nhs.uk/wp-content/uploads/2023/04/reforming-elective-care-for-patients.pdf***
4. Office for National Statistics. ***Population estimates for England and Wales: mid-2023.*** 2024. Accessed: 01/11/2024. Available from: ***https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationestimatesforenglandandwales/mid2023***
5. Fingertips. ***Public Health Outcomes Framework.*** 2025. Accessed: 12/03/2025. Available from: ***https://fingertips.phe.org.uk/profile/public-health-outcomes-framework***
6. Office for National Statistics. ***Ethnic group, England and Wales: Census 2021.*** 2022. Accessed: 29/01/2024. Available from: ***https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/bulletins/ethnicgroupenglandandwales/census2021***
7. Office for National Statistics. ***Lower layer Super Output Area population estimates (supporting information).*** 2024. Accessed: 04/06/2025 Available from: ***https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/lowersuperoutputareamidyearpopulationestimates***
8. Fund TK. ***Health inequalities in a nutshell.*** 2024. Accessed: 24/02/2025. Available from: ***https://www.kingsfund.org.uk/insight-and-analysis/data-and-charts/health-inequalities-nutshell***
9. Pickwell-Smith BA, Paton LW, Soyiri I, Lind M, Macleod U. ***Are there inequalities in ovarian cancer diagnosis and treatment in England?*** A population-based study. Cancer Epidemiology. 2025;96:102778.
10. NHS. ***National Cancer Patient Experience Survey 2023.*** 2024. Accessed: 30/10/2024. Available from: ***https://www.ncpes.co.uk/latest-results/***
11. Delon C, Brown KF, Payne NWS, Kotrotsios Y, Vernon S, Shelton J. ***Differences in cancer incidence by broad ethnic group in England, 2013-2017.*** British Journal of Cancer. 2022;126(12):1765-73.
12. Ministry of Housing CaLG. ***People living in deprived neighbourhoods.*** 2020. Accessed: 24/04/2025. Available from: ***https://www.ethnicity-facts-figures.service.gov.uk/uk-population-by-ethnicity/demographics/people-living-in-deprived-neighbourhoods/latest/***
13. University of Southampton. ***Health Literacy: Prevalence Estimates for Local Authorities.*** 2021. Accessed: 24/04/2025. Available from: ***https://healthliteracy.geodata.uk/***
14. Dobson C, Deane J, Macdonald S, Murchie P, Ellwood C, Angell L, et al. Barriers to Early Presentation amongst ***Rural Residents Experiencing Symptoms of Colorectal Cancer: A Qualitative Interview Study.*** Cancers. 2022;15(1).
15. NHS Digital. ***Cancer Registration Statistics, England, 2022.*** 2024. Accessed: 21/02/2025. Available from: ***https://digital.nhs.uk/data-and-information/publications/statistical/cancer-registration-statistics/england-2022#:~:text=There%20were%20346%2C217%20new%20cancer,breast%2C%20lung%2C%20or%20bowel.***
16. Royal College of General Practitioners. ***GPs in deprived areas responsible for almost 2,500 patients per head.*** 2024. Accessed: 16/01/2025. Available from: ***https://www.rcgp.org.uk/News/research-statement-conference-2024***
17. Royal College of General Practicioners. ***GPs in deprived areas - Request for Yorkshire data.*** 2024.
18. House of Commons Library. ***Constituency data: Indices of deprivation.*** 2024. Accessed: 04/06/2025 Available from: ***https://commonslibrary.parliament.uk/constituency-data-indices-of-deprivation/***
19. National Disease Registration Service. ***Routes to Diagnosis.*** 2024. Accessed: 13/03/2025. Available from: ***https://digital.nhs.uk/ndrs/data/data-outputs/cancer-data-hub/cancer-routes-to-diagnosis***
20. NHS Digital. ***Case-mix adjusted percentage of cancers diagnosed at stages 1 and 2 by sub-ICB in England, 2021.*** 2023. Accessed: 26/01/2024. Available from: ***https://digital.nhs.uk/data-and-information/publications/statistical/case-mix-adjusted-percentage-of-cancers-diagnosed-at-stages-1-and-2-in-england/2021***
21. Fingertips. ***Smoking Profile.*** 2025. Accessed: 14/03/2025. Available from: ***https://fingertips.phe.org.uk/profile/tobacco-control***
22. Fingertips. ***Obesity Profile.*** 2024. Accessed: 30/10/2024. Available from: ***https://fingertips.phe.org.uk/profile/national-child-measurement-programme***
23. Fingertips. ***Physical Activity.*** 2024. Accessed: 07/08/2024. Available from: ***https://fingertips.phe.org.uk/profile/physical-activity***
24. Fingertips. ***Alcohol Profile.*** 2024. Accessed: 04/06/2025 Available from: ***https://fingertips.phe.org.uk/profile/local-alcohol-profiles***
25. Fingertips. ***Mortality Profile.*** 2024. Accessed: 04/06/2025. Available from: ***https://fingertips.phe.org.uk/profile/mortality-profile***
26. Rogers I, Cooper M, Memon A, Forbes L, van Marwijk H, Ford E. ***The effect of comorbidities on diagnostic interval for lung cancer in England: a cohort study using electronic health record data.*** British Journal of Cancer. 2024;131(7):1147-57.
27. Luberto CM, Hyland KA, Streck JM, Temel B, Park ER. ***Stigmatic and Sympathetic Attitudes Toward Cancer Patients Who Smoke: A Qualitative Analysis of an Online Discussion Board Forum.*** Nicotine Tob Res. 2016;18(12):2194-201.
28. Brown KF, Rumgay H, Dunlop C, Ryan M, Quartly F, Cox A, et al. ***The fraction of cancer attributable to modifiable risk factors in England, Wales, Scotland, Northern Ireland, and the United Kingdom in 2015.*** British Journal of Cancer. 2018;118(8):1130-41.
29. National Disease Registration Service. ***Stage at diagnosis.*** 2025. Accessed: 25/04/2025. Available from: ***https://digital.nhs.uk/ndrs/data/data-outputs/cancer-data-hub/cancer-stage-at-diagnosis#release-schedule***
30. National Disease Registration Service. ***Index of Cancer Survival.*** 2019. Accessed: 25/04/2025. Available from: ***https://nhsd-ndrs.shinyapps.io/index_of_cancer_survival/***
31. Institute for Health Metrics and Evaluation. ***GBD compare.*** 2021. Accessed: 03/03/2025. Available from: ***https://vizhub.healthdata.org/gbd-compare/***
32. Nomis. ***Mortality statistics - underlying cause, sex and age.*** 2023. Accessed: 29/01/2024. Available from: ***https://www.nomisweb.co.uk/query/construct/summary.asp? reset=yes&mode=construct&dataset=161&version=0&anal=1&initsel=***
33. Institute of Alcohol Studies. ***Economy.*** 2024. Accessed: 24/04/2025. Available from: ***https://www.ias.org.uk/factsheet/economy/***
34. Office for National Statistics. ***Estimates of the population for the UK, England, Wales, Scotland, and Northern Ireland.*** 2024. Accessed: 13/01/2024. Available from: ***https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland***
35. Frontier Economics. ***Updated estimates of the cost of obesity and overweightness.*** 2023. Accessed: 20/03/2025. Available from: ***https://assets.ctfassets.net/75ila1cntaeh/2GSXP7mDl3RrjP1xilyxbH/a539a326c5654e9fa36ed03c585d2928/Frontier_Economics_-_Updated_estimates_of_the_cost_of_obesity_and_overweightness_2023.pdf***
36. Ellis L, Milne RL, Moore MM, Bigby KJ, Sinclair C, Brenner DR, et al. ***Estimating cancers attributable to physical inactivity in Australia.*** Journal of Science and Medicine in Sport. 2024;27(3):149-53.
37. Minihan AK, Patel AV, Flanders WD, Sauer AG, Jemal A, Islami F. ***Proportion of Cancer Cases Attributable to Physical Inactivity by US State, 2013-2016.*** Medicine and Science in Sports and Exercise. 2022;54(3):417-23.
38. Public Health England. ***Everybody active, every day: framework for physical activity.*** 2014. Accessed: 24/04/2025. Available from: ***https://www.gov.uk/government/publications/everybody-active-every-day-a-framework-to-embed-physical-activity-into-daily-life***

39. NHS Digital. ***Statistics on NHS Stop Smoking Services in England - April 2023 to March 2024 (Q4, Annual).*** 2024. Accessed: 05/11/2024. Available from: ***https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-nhs-stop-smoking-services-in-england/april-2023-to-march-2024-q4-annual***

40. YouGov. ***Survey by YouGov on behalf of Yorkshire Cancer Research.*** 2025. Total sample size was 2006 adults. Fieldwork was undertaken between 16th April - 29th April 2025. The survey was carried out online and is representative of Yorkshire resident aged 18+

41. National Centre for Smoking Cessation and Training. ***Stop smoking services: increased chances of quitting.*** 2019. Accessed: 04/06/2025. Available from: ***https://www.ncsct.co.uk/publications/Stop_smoking_services_impact_on_quitting***

42. Professor Rachael Murray ND, Hazel Cheeseman ***The role of smoking cessation services within the Targeted Lung Health Checks programme.*** 2022. Accessed: 30/09/24. Available from: ***https://ash.org.uk/resources/view/the-role-of-smoking-cessation-services-within-the-targeted-lung-health-checks-programme***

43. Parallel Parliament. ***Smoking: Health Services. 2023.*** Accessed: 03/12/2024. Available from: ***https://www.parallelparliament.co.uk/question/602/smoking-health-services***

44. Office for National Statistics. ***Adult smoking habits in the UK: 2023.*** 2024. Accessed: 15/10/2024. Available from: ***https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/bulletins/adultsmokinghabitsingreatbritain/2023***

45. Murray RL, Alexandris P, Baldwin D, Brain K, Britton J, Crosbie PAJ, et al. ***Uptake and 4-week quit rates from an opt-out co-located smoking cessation service delivered alongside community-based low-dose computed tomography screening within the Yorkshire Lung Screening Trial.*** European Respiratory Journal. 2024;63(4):2301768.

46. Yorkshire Cancer Research. ***Stop smoking support alongside lung screening could save lives.*** 2024. Accessed: 12/11/2024. Available from: ***https://www.yorkshirecancerresearch.org.uk/news/stop-smoking-support-alongside-lung-screening-could-save-lives***

47. Brain K, Carter B, Lifford KJ, Burke O, Devaraj A, Baldwin DR, et al. ***Impact of low-dose CT screening on smoking cessation among high-risk participants in the UK Lung Cancer Screening Trial.*** Thorax. 2017;72(10):912-8.

48. Nuffield Trust. ***A&E waiting times.*** 2025. Accessed:04/06/2025. Available from: ***https://www.nuffieldtrust.org.uk/resource/a-e-waiting-times***

49. England N. ***A&E Attendances and Emergency Admissions.*** 2025. Accessed: 24/04/2025. Available from: ***https://www.england.nhs.uk/statistics/statistical-work-areas/ae-waiting-times-and-activity/***

50. Office for National Statistics. ***Inequalities in Accident and Emergency department attendance, England: March 2021 to March 2022.*** 2022. Accessed: 24/04/2025. Available from: ***https://cy.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthcaresystem/articles/inequalitiesinaccidentandemergencydepartmentattendanceengland/march2021tomarch2022***

51. Pope I, Clark LV, Clark A, Ward E, Belderson P, Stirling S, et al. ***Cessation of Smoking Trial in the Emergency Department (COSTED): a multicentre randomised controlled trial.*** Emergency Medicine Journal. 2024;41(5):276-82.

52. Taylor GMJ, Sawyer K, Jacobsen P, Freeman TP, Blackwell A, Daryan S, et al. ***intEgrating Smoking Cessation treatment As part of usual Psychological care for dEpression and anxiety (ESCAPE):*** A randomised and controlled, multi-centre, acceptability and feasibility trial with nested qualitative methods. Addiction. 2025;120(5):922-36.

53. Wu AD, Gao M, Aveyard P, Taylor G. ***Smoking Cessation and Changes in Anxiety and Depression in Adults With and Without Psychiatric Disorders.*** JAMA Network Open. 2023;6(5):e2316111-e.

54. Chellappan S. ***Smoking Cessation after Cancer Diagnosis and Enhanced Therapy Response: Mechanisms and Significance.*** Current Oncology (Toronto, Ont). 2022;29(12):9956-69.

55. U.S. Department of Health and Human Services. ***2014 Surgeon General's Report: The Health Consequences of Smoking—50 Years of Progress.*** 2014. Accessed: 04/10/2024. Available from: ***https://www.ncbi.nlm.nih.gov/books/NBK179276/***

56. Health AoSa. ***ASH Ready Reckoner January 2025.*** 2025. Accessed: 27/01/2025. Available from: ***https://ashresources.shinyapps.io/ready_reckoner/***

57. Evison M, Naylor R, Malcolm R, Holmes H, Taylor M, Murray RL, et al. ***Health economic model to evaluate the cost-effectiveness of smoking cessation services integrated within lung cancer screening.*** medRxiv. 2024:2024.11.27.24318039.

58. All Party Parliamentary Group on Smoking and Health. ***APPG on Smoking and Health Manifesto for a Smokefree Future.*** 2023. Accessed: 04/06/2025 Available from: ***https://ash.org.uk/uploads/APPG-on-Smoking-and-Health-Manifesto-for-a-Smokefree-Future-2023.pdf?v=1699520107***

59. Harry Quilter-Pinner SA, Dr George Dibb, Carsten Jung, Henry Parkes. ***Bookkeepers or changemakers? Understanding the chancellor's choices ahead of the budget.*** 21/10/2024. Accessed: 25/10/2024. Available from: ***https://www.ippr.org/articles/bookkeepers-or-changemakers-understanding-the-chancellors-choices-ahead-of-the-budget***

60. McLean S, Gee M, Booth A, Salway S, Nancarrow S, Cobb M, et al. ***Health Services and Delivery Research. Targeting the Use of Reminders and Notifications for Uptake by Populations (TURNUP): a systematic review and evidence synthesis***. Southampton (UK)2014.

61. NHS Digital. ***Cancer Survival in England, cancers diagnosed 2016 to 2020, followed up to 2021.*** 2023. Accessed: 14/03/2025. Available from: ***https://digital.nhs.uk/data-and-information/publications/statistical/cancer-survival-in-england/cancers-diagnosed-2016-to-2020-followed-up-to-2021***

62. National Cancer Registration and Analysis Service. ***Routes to Diagnosis of cancer by stage, 2012-2013.*** 2015. Accessed: 18/12/2024. Available from: ***Available on request from Yorkshire Cancer Research***

63. Fingertips. ***National General Practice Profiles. 2024.*** Accessed: 04/06/2025 Available from: ***https://fingertips.phe.org.uk/profile/general-practice***

64. Ministry of Housing Communities and Local Government. ***English indices of deprivation 2019.*** 2019. Accessed: 29/01/2024. Available from: ***https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019***

65. Applied Research Collaboration North East and North Cumbria. ***Factors influencing cervical screening uptake in some groups of women. 2022.*** Accessed: 24/04/2025. Available from: ***https://arc-nenc.nihr.ac.uk/evidence/cervical-screening/***

66. Yorkshire Cancer Research. ***600,000 people in Yorkshire will be eligible for life-saving lung health checks.*** 2024. Accessed: 04/06/2025. Available from: ***https://www.yorkshirecancerresearch.org.uk/news/600-000-people-in-yorkshire-will-be-eligible-for-life-saving-lung-health-checks***

67. Audit NLC. ***NLCA State of the Nation 2025.*** 2025. Accessed: 14/04/2025. Available from: ***https://www.lungcanceraudit.org.uk/reports-publications/nlca-state-of-the-nation-2025/***

68. Lim AWW, Deats K, Gambell J, Lawrence A, Lei J, Lyons M, et al. ***Opportunistic offering of self-sampling to non-attenders within the English cervical screening programme: a pragmatic, multicentre, implementation feasibility trial with randomly allocated cluster intervention start dates (YouScreen).*** eClinicalMedicine. 2024;73.

69. Research YC. ***At-home HPV tests could help screen 104,000 more women for cervical cancer in Yorkshire.*** 2025. Accessed: 24/04/2025. Available from: ***https://www.yorkshirecancerresearch.org.uk/news/at-home-hpv-tests-could-help-screen-104-000-more-women-for-cervical-cancer-in-yorkshire***

70. World Health Organization. ***Early cancer diagnosis saves lives, cuts treatment costs.*** 2017. Accessed: 24/04/2025. Available from: ***https://www.who.int/news/item/03-02-2017-early-cancer-diagnosis-saves-lives-cuts-treatment-costs#:~:text=For%20example%2C%20studies%20in%20high,cancer%20at%20more%20advanced%20stages.***

71. Breast Cancer Now. ***The Cost of Breast Cancer: Modelling the economic impact to the UK.*** 2024. Accessed: 24/04/2025. Available from: ***https://demos.co.uk/wp-content/uploads/2024/01/Cost-of-Breast-Cancer-Report.pdf***

72. The Lung Ambition Alliance. ***Lung cancer screening: the cost of inaction.*** 2021. Accessed: 24/04/2025. Available from: ***https://www.healthpolicypartnership.com/app/uploads/Lung-cancer-screening-the-cost-of-inaction.pdf***

73. Yorkshire Cancer Research. ***Models used to estimate the impact of screening programmes on cancers diagnosed, lives saved and life years gained.*** 2024. Accessed: 29/01/2024.

74. Taylor JC, Rossington H, George R, Alderson SL, Quirke P, Thomas C, et al. ***Variation in perioperative practice in elective colorectal cancer surgery: opportunities for quality improvement.*** Discov Oncol. 2025;16(1):473.

75. National Disease Registration Service. ***Cancer treatments.*** 2024. Accessed: 18/12/2024. Available from: ***https://digital.nhs.uk/ndrs/data/data-outputs/cancer-data-hub/cancer-treatments***

76. NHS England. ***Cancer Waiting Times.*** 2025. Accessed: 13/03/2025. Available from: ***https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/***

77. Office for National Statistics. ***Approximated Social Grade data.*** 2023. Accessed: 09/05/2025. Available from: ***https://www.ons.gov.uk/census/aboutcensus/censusproducts/approximatedsocialgradedata***

78. Cormie P, Zopf EM, Zhang X, Schmitz KH. ***The Impact of Exercise on Cancer Mortality, Recurrence, and Treatment-Related Adverse Effects.*** Epidemiologic Reviews. 2017;39(1):71-92.

79. Akdeniz N, Kaplan MA, Kucukoner M, Urakci Z, Lacin S, Ceylan EH, et al. ***The effect of exercise on disease-free survival and overall survival in patients with breast cancer.*** Irish Journal of Medical Science. 2022;191(4):1587-97.

80. Liu Z, Qiu T, Pei L, Zhang Y, Xu L, Cui Y, et al. ***Two-Week Multimodal Prehabilitation Program Improves Perioperative Functional Capability in Patients Undergoing Thoracoscopic Lobectomy for Lung Cancer: A Randomized Controlled Trial. Anesthesia and Analgesia.*** 2020;131(3):840-9.

81. Campbell KL, Winters-Stone KM, Wiskemann J, May AM, Schwartz AL, Courneya KS, et al. ***Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable.*** Medicine and Science in Sports and Exercise. 2019;51(11):2375-90.

82. Humphreys L, Myers A, Frith G, Thelwell M, Pickering K, Mills GH, et al. ***The Development of a Multi-Modal Cancer Rehabilitation (Including Prehabilitation) Service in Sheffield, UK: Designing the Active Together Service.*** Healthcare (Basel). 2024;12(7).

83. Research YC. ***Exercise following a cancer diagnosis: Giving people in Yorkshire more life to live.*** 2023. Accessed: 04/06/2025 Available from: ***https://www.yorkshirecancerresearch.org.uk/about-us/what-we-do/policy-reports#article-content-exercise-and-cancer***

84. Sheffield Hallam University. ***Active Together Service Evaluation.*** 2024. Accessed: 23/01/2025. Available from: ***https://www.shu.ac.uk/advanced-wellbeing-research-centre/projects/active-together***

85. Office for National Statistics. ***Local Authority Profile.*** 2024. Accessed: 13/01/2025. Available from: ***https://www.nomisweb.co.uk/reports/lmp/la/contents.aspx***

86. Downing A, Morris EJ, Corrigan N, Sebag-Montefiore D, Finan PJ, Thomas JD, et al. ***High hospital research participation and improved colorectal cancer survival outcomes: a population-based study.*** Gut. 2017;66(1):89-96.

87. NHS England. ***Maximising the benefits of research: Guidance for integrated care systems.*** 2023. Accessed: 04/06/2025 Available from: ***https://www.england.nhs.uk/long-read/maximising-the-benefits-of-research/***

88. UK Clinical Research Collaboration 2023. ***UK Health Research Analysis 2022.*** 2023. Accessed: 04/06/2025 Available from: ***https://hrcsonline.net/wp-content/uploads/2024/04/UK_Health_Research_Analysis_Report_2022_web_v1-1-postpub.pdf***

89. UK Research and Innovation. ***Investment and Outputs Data: 2023-24.*** 2024. Accessed: 09/04/2025. Available from: ***https://www.ukri.org/wp-content/uploads/2024/07/UKRI-170125-InvestmentsOutputsData2023To2024.pdf***

90. Alliance NHS. ***NHSA Analysis of the UK Clinical Research Landscape in 2022.*** 2023. Accessed: 08/04/2025. Available from: ***https://www.thenhsa.co.uk/app/uploads/2024/02/2022-Health-data-analysis.pdf***

91. Morton D, Seymour M, Magill L, Handley K, Glasbey J, Glimelius B, et al. ***Preoperative Chemotherapy for Operable Colon Cancer: Mature Results of an International Randomized Controlled Trial.*** Journal of Clinical Oncology. 2023;41(8):1541-52.

92. International Standard Randomised Controlled Trial Number. ***A trial assessing preoperative chemotherapy in patients with locally advanced but operable colon cancer.*** 2021. Accessed: 25/04/2025. Available from: ***https://www.isrctn.com/ISRCTN83842641?q=&filters=funderName:Yorkshire%20Cancer%20Research&sort=&offset=5&totalResults=26&page=1&pageSize=10***

93. Medical Research Council. ***Clinical researchers in the United Kingdom: Reversing the decline to improve population health and promote economic growth.*** 2025. Accessed: 13/03/2025. Available from: ***https://www.ukri.org/publications/clinical-researchers-in-the-uk-reversing-the-decline/***

94. Proposals for a new institute to tackle ill health in the North announced [press release]. 2025.

95. Morris ZS, Wooding S, Grant J. ***The answer is 17 years, what is the question: understanding time lags in translational research.*** Journal of the Royal Society of Medicine. 2011;104(12):510-20.

96. Rubin R. ***It Takes an Average of 17 Years for Evidence to Change Practice-the Burgeoning Field of Implementation Science Seeks to Speed Things Up.*** JAMA. 2023;329(16):1333-6.

97. NHS England. ***The Innovation Ecosystem Programme – how the UK can lead the way globally in health gains and life sciences powered growth.*** 2024. Accessed: 04/04/2025. Available from: ***https://www.england.nhs.uk/long-read/the-innovation-ecosystem-programme/#4-recommendations-of-the-innovation-ecosystem-programme***

98. All Party Parliamentary Group on Medical Research. ***Why Medical Research is a Crucial Tool for Change.*** 2023. Accessed: 16/04/2025. Available from: ***https://www.amrc.org.uk/Handlers/Download.ashx?IDMF=455298b8-fc5d-4eb5-99a7-23da2c690489***

99. National Institute for Health and Care Research. ***New report highlights how NIHR support for clinical research benefits the UK economy and NHS.*** 2019. Accessed: 04/06/2025 Available from: ***https://www.nihr.ac.uk/news/new-report-highlights-how-nihr-support-clinical-research-benefits-uk-economy-and-nhs#:~:text=It%20shows%20that%20over%20this,FTE)%20jobs%20for%20the%20UK.***

100. PA Consulting., Cancer Research UK. ***Understanding the economic value of cancer research.*** 2022. Accessed: 09/04/2025. Available from: ***https://www.cancerresearchuk.org/sites/default/files/economic_value_of_cancer_research_-_cruk_full_report_29-06.pdf***

101. Northern Health Science Alliance. ***Health for Wealth: Building a Healthier Northern Powerhouse for UK Productivity.*** 2018. Accessed: 16/04/2025. Available from: ***https://www.thenhsa.co.uk/app/uploads/2018/11/NHSA-REPORT-FINAL.pdf***

102. Smart A, Harrison E. ***The under-representation of minority ethnic groups in UK medical research.*** Ethnicity and Health. 2017;22(1):65-82.

103. Bower P, Grigoroglou C, Anselmi L, Kontopantelis E, Sutton M, Ashworth M, et al. ***Is health research undertaken where the burden of disease is greatest? Observational study of geographical inequalities in recruitment to research in England 2013–2018.*** BMC Medicine. 2020;18(1):133.

Thank you








Yorkshire Cancer Research

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