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CANCER

INTRODUCTION

Cancer is a disease in which abnormal cells divide in an uncontrolled way and eventually invade other tissues. The abnormal cells can form growths, called tumours, and spread to other parts of the body causing secondary tumours called metastases (1).

WHO'S AT RISK AND WHY?

The risk of developing cancer depends on a combination of factors; some risks cannot be changed, such as age, sex or genetic predisposition (family history) whereas 'modifiable' risks are dictated by environmental influences and individual lifestyle choices.

Modifiable risks can be controlled (prevented) or treated and addressing them is the most efficient way of reducing morbidity and mortality from a range of common conditions. It is estimated that nearly 4 out of 10 cancers (38%) could be prevented by lifestyle changes (2). For Leicester, this is equivalent to almost 500 new cancer cases every year.

NON-MODIFIABLE RISK FACTORS

AGE

The risk of developing cancer increases with age, with new cases rising steeply from age 55-59. More than a third (36%) of all cancers in the UK are diagnosed in people over the age of 75 with those aged 85 to 89 having the highest rate (3).

Cancer can occur at any age, including in children and young people (although this accounts for only around 1% of all cancers) (3). Different diagnoses tend to predominate in children with leukaemia, central nervous system tumours and lymphomas accounting for two-thirds of new cases (4).

SEX

Overall, men have a higher lifetime risk of developing cancer than women (50% vs 45% lifetime risk) (5). However, in adults aged 25-49 there are twice as many women as men with new cancer diagnoses (3).

ETHNICITY

In the UK, cancer is more common in White and Black males than in Asian males; it is more common in White females compared to Asian or Black females (6).

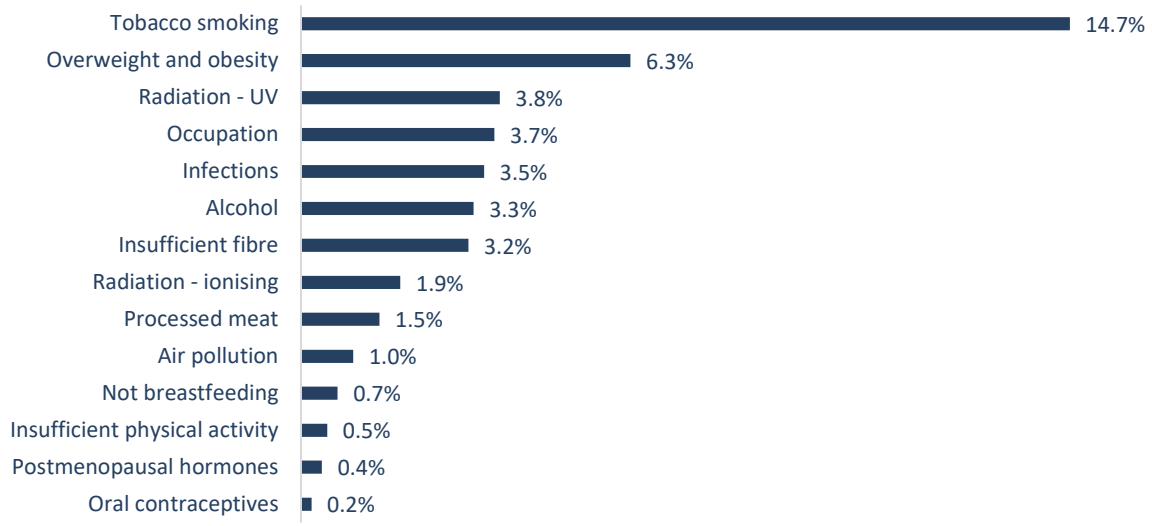
SOCIO-ECONOMIC DEPRIVATION

The age-standardised incidence rate for all cancers combined is higher in those with high levels of deprivation; this is most pronounced in smoking-related cancers, for example, laryngeal, lung and oral cancer. Conversely, rates of malignant melanoma and cancer of the breast and prostate are all higher in the least deprived (7). The net excess of cancer due to deprivation is around 16,800 new cases per year (8).

MODIFIABLE RISK FACTORS

Except for prostate cancer, most common cancers have been linked to several modifiable risk factors (9). As 38% of cancers in the UK are preventable, understanding modifiable risk factors and their role in the development of cancer is important for informing appropriate preventive action and reducing future cancer burden. Figure 1 shows the number of preventable cancer cases in the UK by modifiable risk factor (10).

Figure 1: Percentage of new cancer cases attributed to a modifiable risk factor in England (2015)



Source: Brown et al. (11)

TOBACCO SMOKING

Stopping smoking is by far the most significant way of reducing the risk of developing cancer. In the UK, one in every four cancer deaths and 15% of all cancer cases are due to tobacco consumption (12). Tobacco smoke contains over 60 harmful chemicals proven to cause cancer, both in humans and in laboratory animals (13), when subjects are exposed for long enough. In 2019/20, 14.3% of the England population were current smokers, which is

5% lower than in 2011 (14) (15). Smoking prevalence in Leicester is slightly higher at 16.0% (14).

Smoking is the most important cause of lung cancer (72% of cases) (16); other respiratory organs (throat, larynx and mouth) and more distant parts of the body (such as bowel, bladder or pancreas) can also be affected.

Lung cancer risk increases with duration of smoking, number of cigarettes smoked and young age at smoking initiation. Men who smoke 15-24 cigarettes per day have a lung cancer risk that is 26 times higher than those who have never smoked (17).

OVERWEIGHT AND OBESITY

After tobacco smoking, overweight/ obesity is the second biggest preventable cause of cancer in the UK (6.3%) (11). Association between BMI and cancer risk have been observed in numerous cancers including cancer of the colon, rectum, stomach, liver, gallbladder, pancreas, kidney, oesophagus, breast (post-menopausal and male), endometrium and ovary (18).

In obesity, alterations in sex hormone metabolism and chronic inflammation are strongly associated with cancer; there is moderate evidence that insulin/ insulin-like growth factor changes are also associated with cancer (18).

ULTRAVIOLET (UV) RADIATION

UV radiation is implicated in 3.8% of all cancers (11) and causes 86% of melanoma skin cancer in the UK (19). Intermittent sun exposure, sunburn and sunbed use increase the risk of all types of skin cancer, whilst chronic exposure is also a risk factor for non-melanoma skin cancer (19) (20).

WORKPLACE AND ENVIRONMENT

Exposure to substances, such as asbestos, mineral oils, silica or diesel engine exhaust, in the workplace have been linked to 3.8% of cancers (11). These include mesothelioma, cancer of the lung, bladder and stomach and non-melanoma skin cancer (21). Asbestos is a major workplace carcinogen causing 94% of mesothelioma in the workplace; it was banned in the 1990s, but exposure can still occur when previously placed asbestos is disturbed (22).

INFECTION

Some of the most preventable cancers are caused by infection. Kaposi sarcoma (associated with HIV-1), cervical (associated with Human papillomavirus (HPV) and anal cancer (associated with HIV-1 and HPV) are among the most preventable (11) (23). Helicobacter

pylori is an important cause of stomach cancer (24) and chronic hepatitis B and C are causes of liver cancer (23).

ALCOHOL

Heavy or regular alcohol consumption is another established cause of cancer (and accounts for about 3% of all cancer in the UK) (11). It has been linked to breast, bowel, mouth, throat, oesophageal, laryngeal and liver cancer.

The increased risk of cancer from alcohol is often compounded by other modifiable risk factors. In oesophageal cancer, the risk from alcohol intake is increased by smoking (25); in liver cancer it is increased by hepatitis infection (26).

INADEQUATE DIET

Insufficient fibre and consumption of processed meat contribute to 3.3% and 1.5% of cancer respectively (11).

There are some foods with carcinogenic potential, for example, salted fish and possibly pickled vegetables (23).

RADIATION

Radiation sources, including medical diagnostics, have been linked to less than 2% of all cancer cases (11). Rays entering the Earth's atmosphere from outer space, radioactive fallout, radon gas and other sources can also cause cell damage that leads to cancer.

AIR POLLUTION

Outdoor air pollution contains small particulate matter (PM 2.5) which has been identified as a cause of lung cancer (23). However, in most populations this risk is relatively low (contributes to 1% of all cancers) (11) when compared with the effect of smoking and it is unlikely that in the UK the exposure would be high enough to be the single cause of lung cancer in any individual. However, at a population level, its effects cannot be ignored. Outdoor pollution contains many other substances, for example, sulphur dioxide, ozone gas, carbon monoxide or polycyclic aromatic hydrocarbons, linked to developing cancer. The risk caused by air pollution needs to be weighed against benefits of physical activity and reduction of obesity.

NOT BREASTFEEDING

Breastfeeding is protective against breast cancer (22% lower risk) (27) and ovarian cancer (24-30% lower risk) (28). Not breastfeeding may account for 1.5% of cancers in women (11).

INSUFFICIENT PHYSICAL ACTIVITY

A sedentary lifestyle has been implicated in about 0.5% of cancer cases in the UK (11). It is interconnected with many of the individual-level risk factors described above, particularly diet and obesity, and risk-reduction needs to include broad lifestyle changes.

HORMONE REPLACEMENT THERAPY (HRT)

Current or recent HRT use increases the risk of breast (27) and ovarian cancer (28). HRT in endometrial cancer is more complex, with oestrogen-only therapy increasing the risk of cancer whilst combined oestrogen-progestogen therapy reduces cancer risk compared to women who have never used HRT (29).

THE LEVEL OF NEED IN THE POPULATION

The population of Leicester is comparatively young and, unless standardised appropriately, cancer rates can be expected to be lower when compared to the national average. Other demographic characteristics, such as a larger proportion of Black, Asian and Minority Ethnic (BAME) groups and deprived population, must be considered when interpreting local figures.

Of note, oral cancer incidence and mortality are significantly higher in Leicester compared with England. Additionally, 1-year survival of colorectal cancer is falling, compared to an improving national trend. These will be discussed further in subsequent sections.

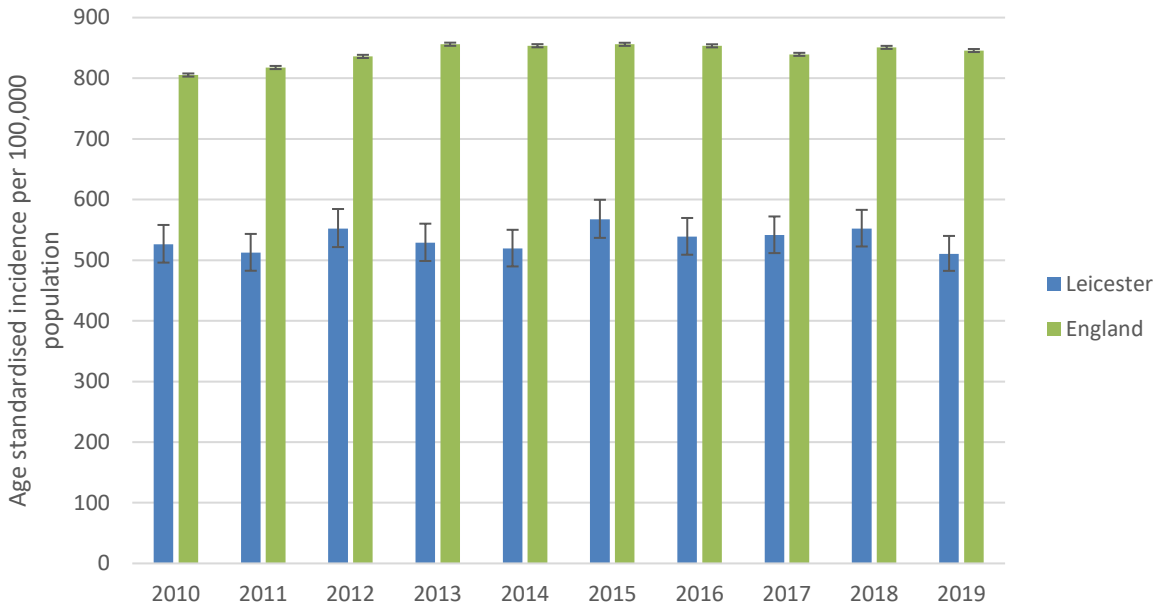
CANCER INCIDENCE AND PREVALENCE

INCIDENCE

Each year, over 1,300 people in Leicester City are diagnosed with cancer. In 2019, there were 659 new diagnoses in men and 608 in women (30).

The age-standardised incidence was 511 cases per 100,000 in 2019, which is consistent with recent years and continues to be significantly lower than in England (Figure 2).

Figure 2: Age-standardised cancer incidence in Leicester and England (2010-2019)



Source: National Disease Registration Service (30)

The four most diagnosed cancer types in Leicester in 2019 were lung, breast, colorectal and prostate cancers (table 1).

Table 1: Cancer incidence by type in Leicester (2019)

Cancer type	Number of new cancer diagnoses	Age-standardised incidence rate (per 100,000 population)	
		Female	Male
Lung	198	66.3	107.1
Breast	172	124.4	-
Colorectal	150	46.3	65.5
Prostate	144	-	134.4
All cancers	1267	453.7	542.9

Source: National Disease Registration Service (30)

For females, breast cancer was the most diagnosed cancer in Leicester, followed by lung, colorectal, uterine and ovarian cancers (figure 3). The rate and pattern of incidence is similar to that seen in England, although breast cancer incidence is significantly lower in Leicester compared with England (figure 4).

Figure 3: Incidence by cancer type in Leicester females (2019)

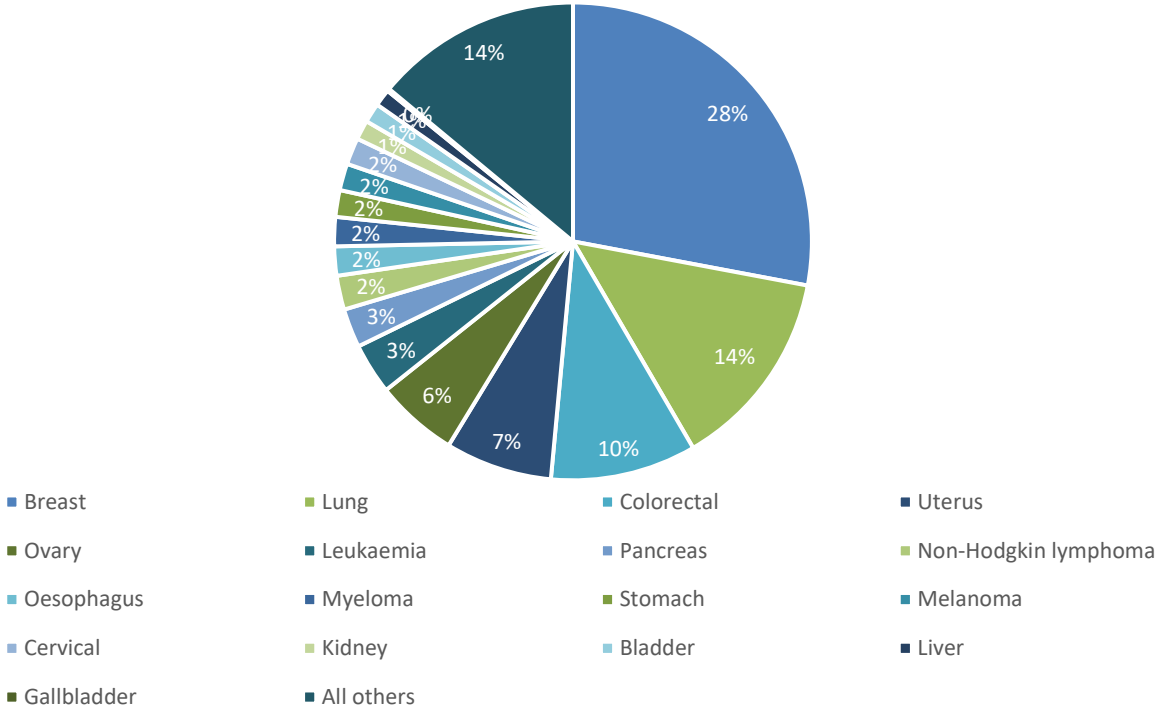
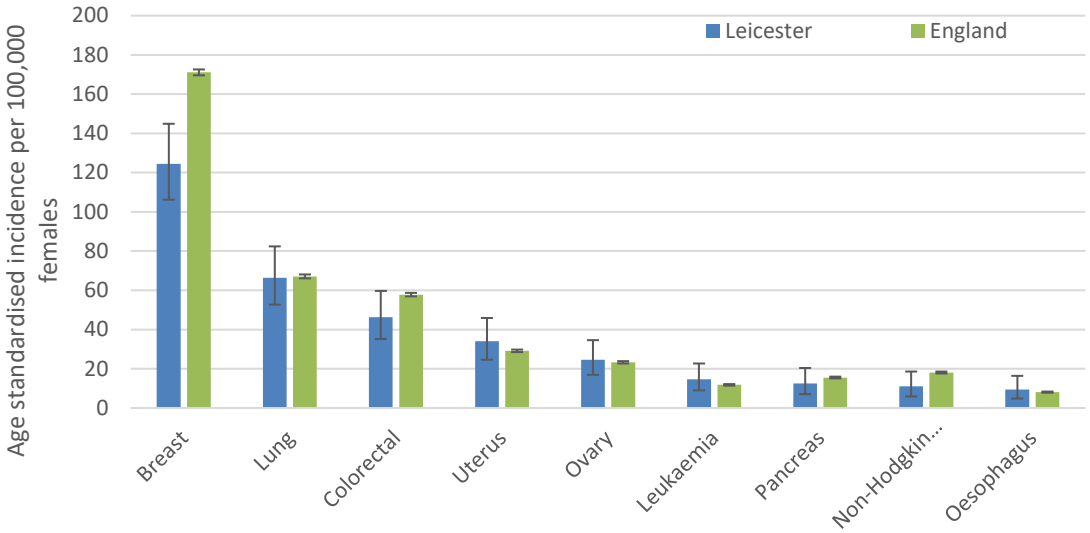


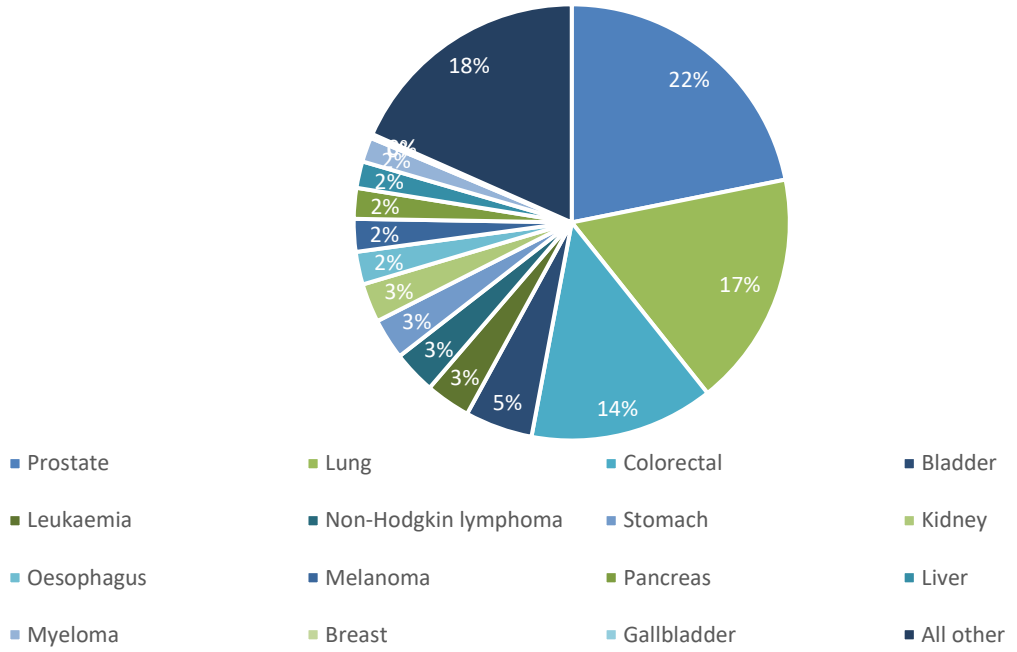
Figure 4: Age-standardised female cancer incidence in Leicester and England (2019)



Source: National Disease Registration Service (30)

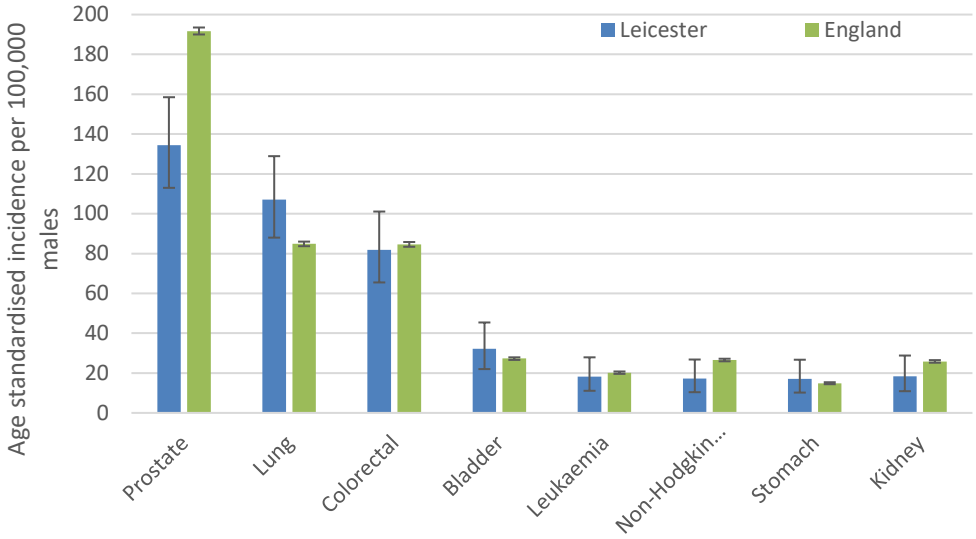
For males, prostate cancer was the most common cancer diagnosis in Leicester (figure 5). The eight most common diagnoses reflect the pattern seen in England, although there were significantly fewer cases of prostate cancer and significantly more cases of lung cancer in Leicester compared to England (figure 6).

Figure 5: Incidence by cancer type in Leicester males (2019)



Source: National Disease Registration Service (30)

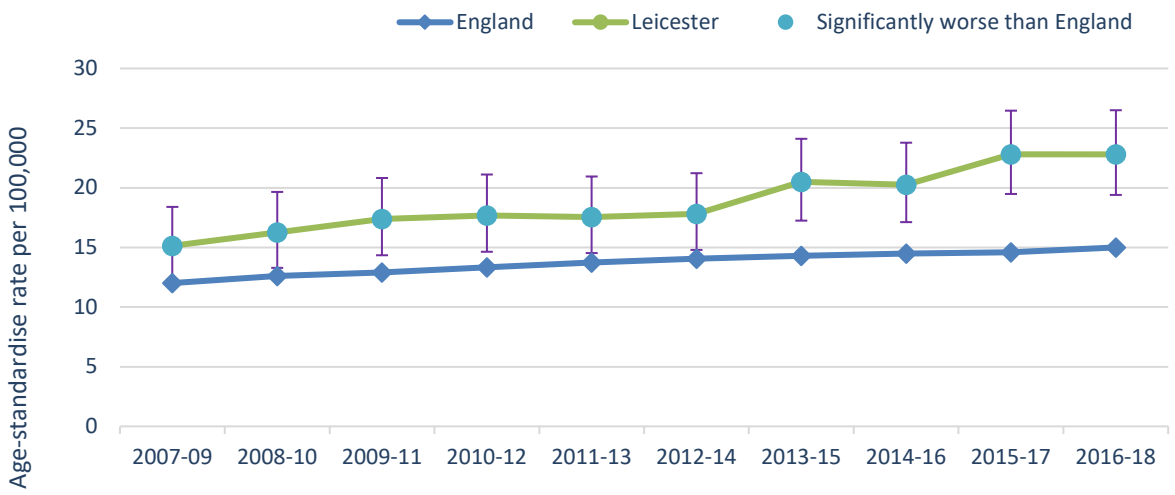
Figure 6: Age-standardised male cancer incidence in Leicester and England (2019)



Source: National Disease Registration Service (30)

Oral cancer is of particular concern in Leicester as the trend is different to that in England. The incidence is significantly higher in Leicester and is increasing at a higher rate than in England, resulting in a widening gap between them (figure 7). There are several risk factors associated with oral cancer including smoking, alcohol, chewing tobacco, betel quid or paan and human papilloma virus (31).

Figure 7: Oral cancer registrations in Leicester and England (2007-2018)



Source: Public Health England Fingertips (31)

PREVALENCE

In 2020 there were 6759 cancer patients on GP registers which amounts to a prevalence of 1.63% of the total GP registered population.

Whilst cancer incidence is higher in men (see above), cancer prevalence is 13.6% higher in women compared with men. This means there are over 900 more women living with cancer in Leicester (table 2).

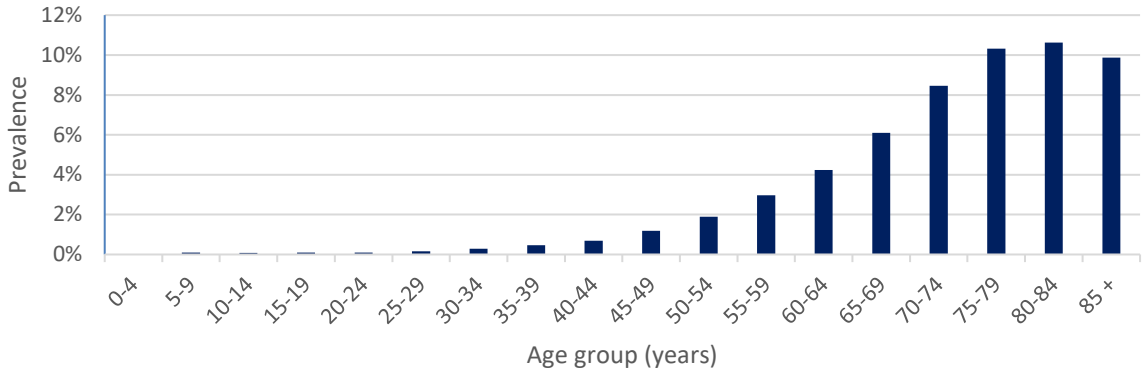
Table 2: Cancer prevalence by gender in Leicester (2020)

Gender	Number registered with cancer	Percent of registrations
Female	3838	56.8%
Male	2921	43.2%
Total	6759	-

Source: SystmOne extract, June 2020.

The prevalence of cancer increases with age and peak prevalence is in the 80-84 age group. Over 10% of this age group have a registered diagnosis of cancer (figure 8).

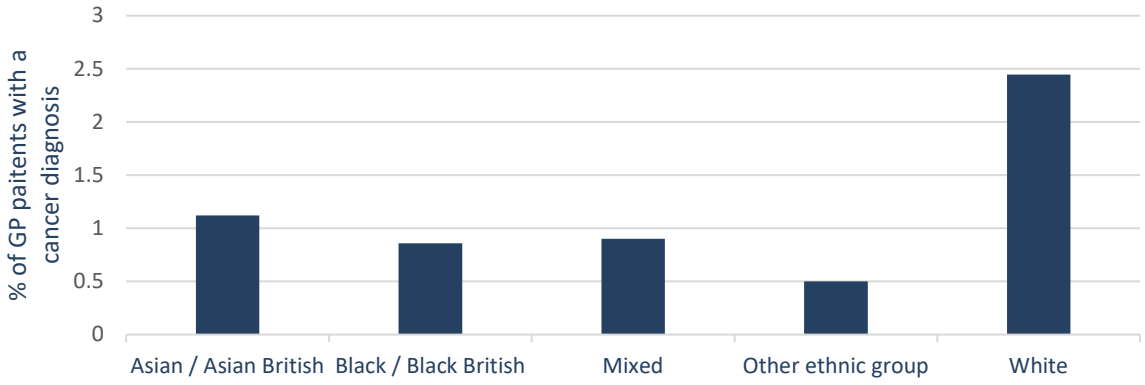
Figure 8: Cancer prevalence by age group in Leicester (2020)



Source: SystmOne extract, June 2020.

In Leicester (2018), cancer prevalence is highest in the White population with 2.4% of GP registered patients having a cancer diagnosis. Other ethnicities have much lower prevalence, with 1.1% of Asian/ Asian British and 0.9% of Black/Black British patients having a cancer diagnosis (Fig 9).

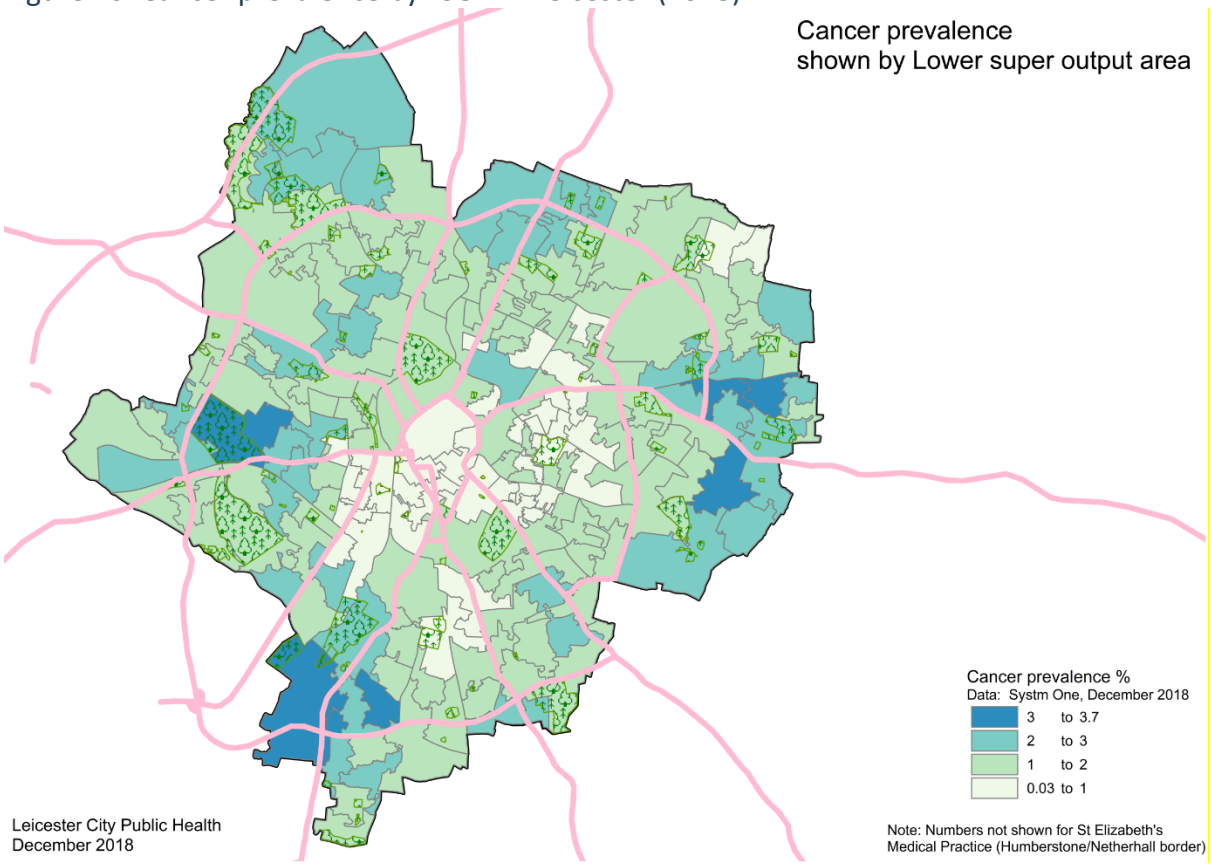
Figure 9: Cancer prevalence by ethnicity in Leicester (2018)



Source: SystmOne extract, December 2018.

Prevalence of cancer varies significantly depending on region (figure 10). Some lower super output areas (LSOAs) in the outskirts of Leicester have more than 3 times the prevalence of those in the city centre. Particularly high prevalence is noted in Aylestone, Evington, Humberstone and Western Park.

Figure 10: Cancer prevalence by LSOA in Leicester (2018)



Source: SystmOne extract, December 2020.

CANCER MORTALITY

Four of the ten leading causes of death in 2015 were cancers (lung, prostate, breast, colorectal) (32). The age-standardised death rate due to cancer in those aged under 75 was 141.7 per 100,000 population in 2017-19 in Leicester which is significantly higher than in England (129.2 per 100,000) (33). The age standardised death rate due to cancer in males living in Leicester was significantly higher than in England (165.8 compared with 143.3 per 100,000 respectively), whereas the rate in females was similar (118.6 compared to 116.1 per 100,000) (33).

The most common causes of cancer death in Leicester are lung, colorectal, breast, prostate, pancreatic and oesophageal cancers. Among these, lung cancer contributes most towards cancer mortality with the number of deaths exceeding the total number of deaths from colorectal, breast and prostate cancer combined (table 3).

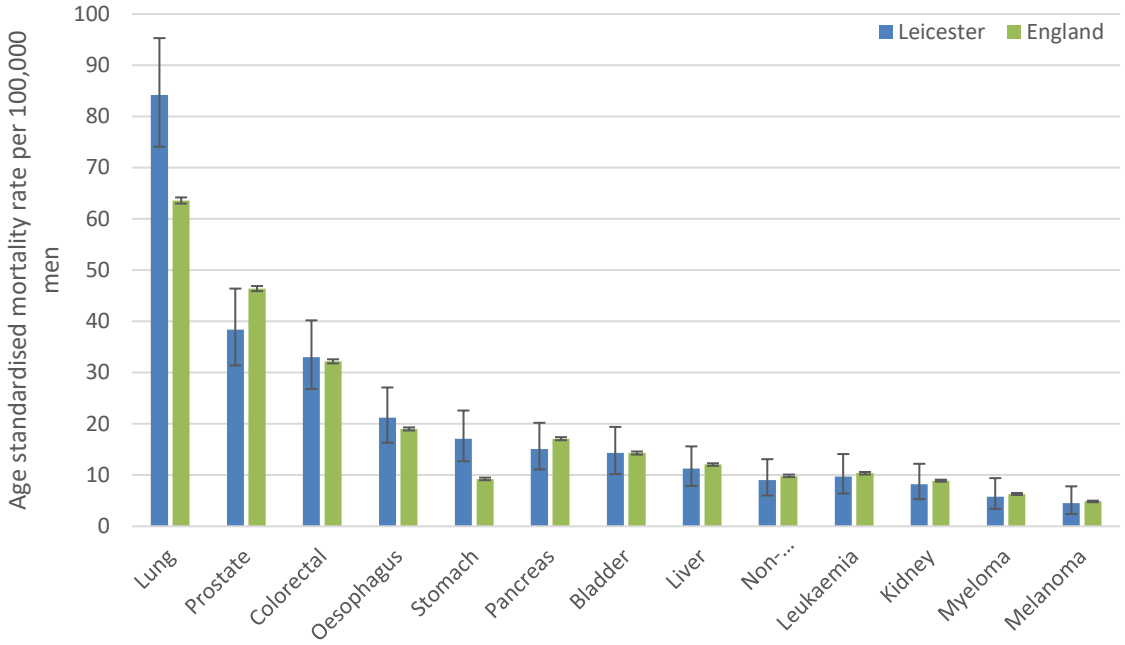
Table 3: Top six causes of cancer-related mortality in Leicester (2017-2019)

Cancer type	Number of deaths (2017-2019)	Contribution toward total cancer mortality (percent)
Lung	422	22.7%
Colorectal	180	9.7%
Breast	129	6.9%
Prostate	106	5.7%
Pancreatic	87	4.7%
Oesophageal	84	4.5%

Source: National Disease Registration Service (30)

The main causes of cancer death in men are lung, colorectal, prostate, oesophageal and stomach cancers (figure 11). Compared to England, lung cancer contributes more deaths in Leicester (25 vs 21%) as does stomach cancer (5 vs 3%). There are 4% fewer deaths caused by prostate cancers in Leicester although this is not statistically significant.

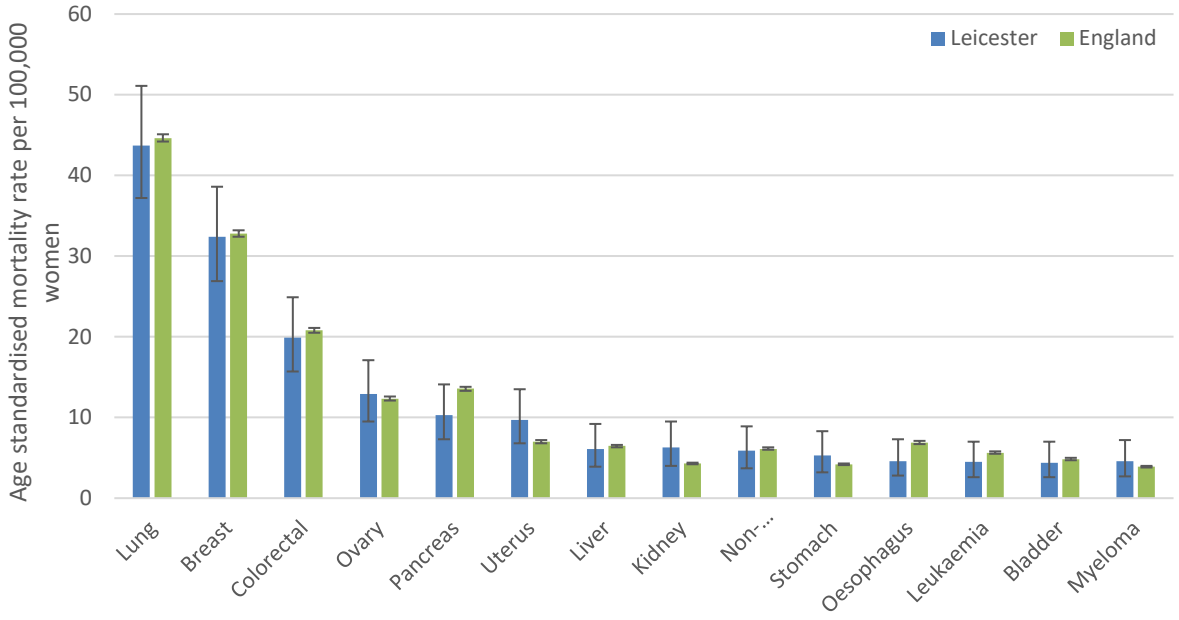
Figure 11: Cancer mortality by type in men (2017-2019)



Source: National Disease Registration Service (30)

In females, the cancers causing most deaths are lung, breast, colorectal, ovarian and pancreatic cancer. Breast cancer mortality is similar in Leicester and England, even though the incidence is lower; other cancer types have similar mortality rates in Leicester when compared to England.

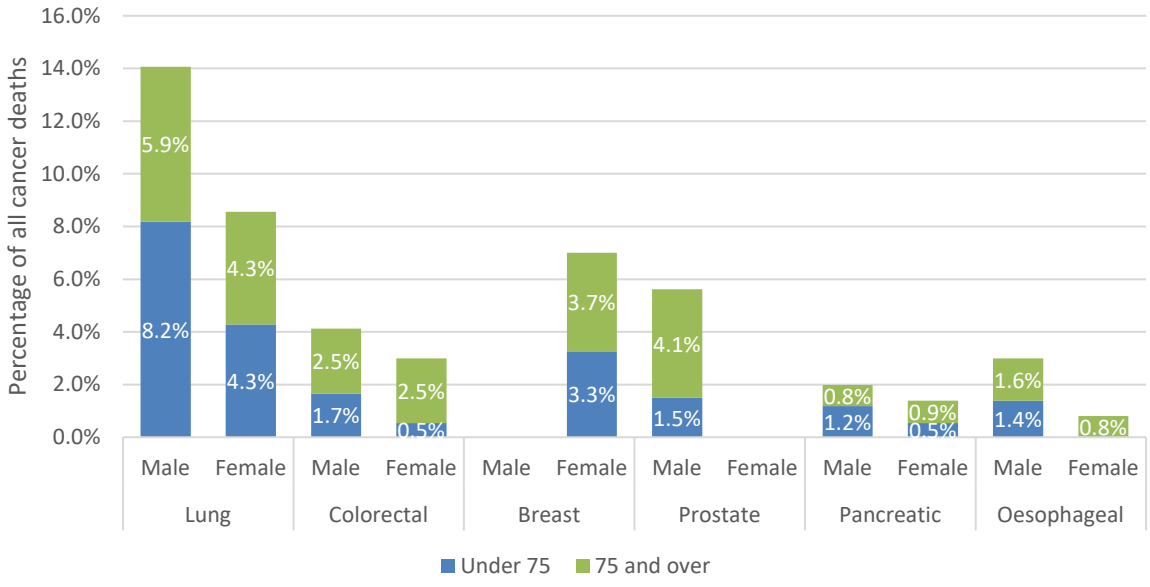
Figure 12: Cancer mortality by type in women (2017-2019)



Source: National Disease Registration Service (30)

Nationally, 45% of cancer mortality is in the under 75 population; Leicester is higher with 50.5% under 75 years of age. Lung cancer, in particular, has a high under 75 mortality (figure 13).

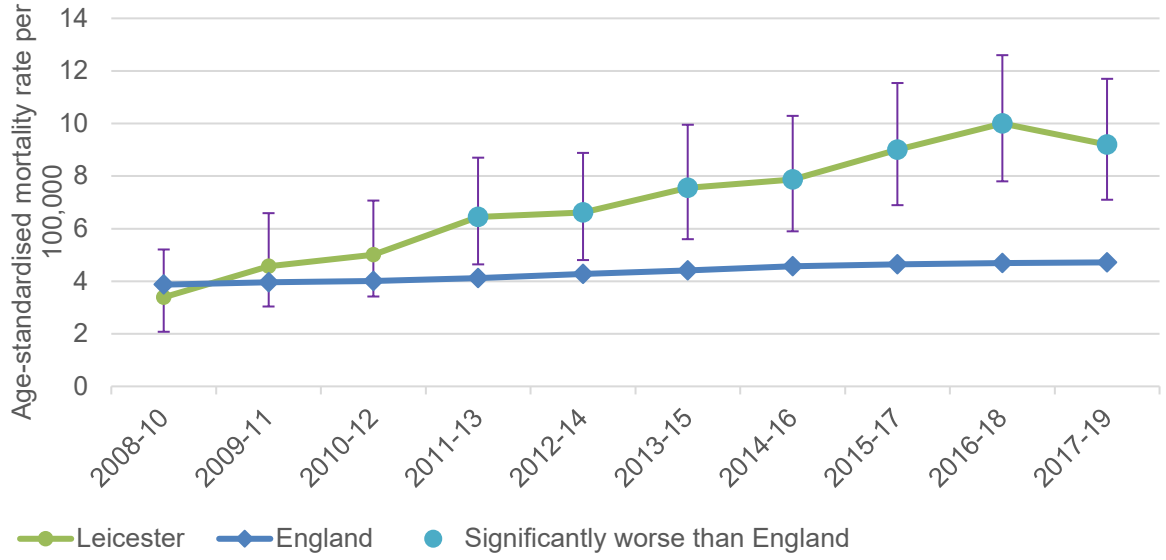
Figure 13: Cancer mortality by age and gender for the 6 most common cancers (2017-2019)



Source: Office for National Statistics (34)

Oral cancer mortality is almost twice as high in Leicester compared to England (figure 14). Whilst there is an increased incidence of oral cancer in Leicester, this may not fully explain this higher mortality rate.

Figure 14: Mortality rate from oral cancer (2008-2019)



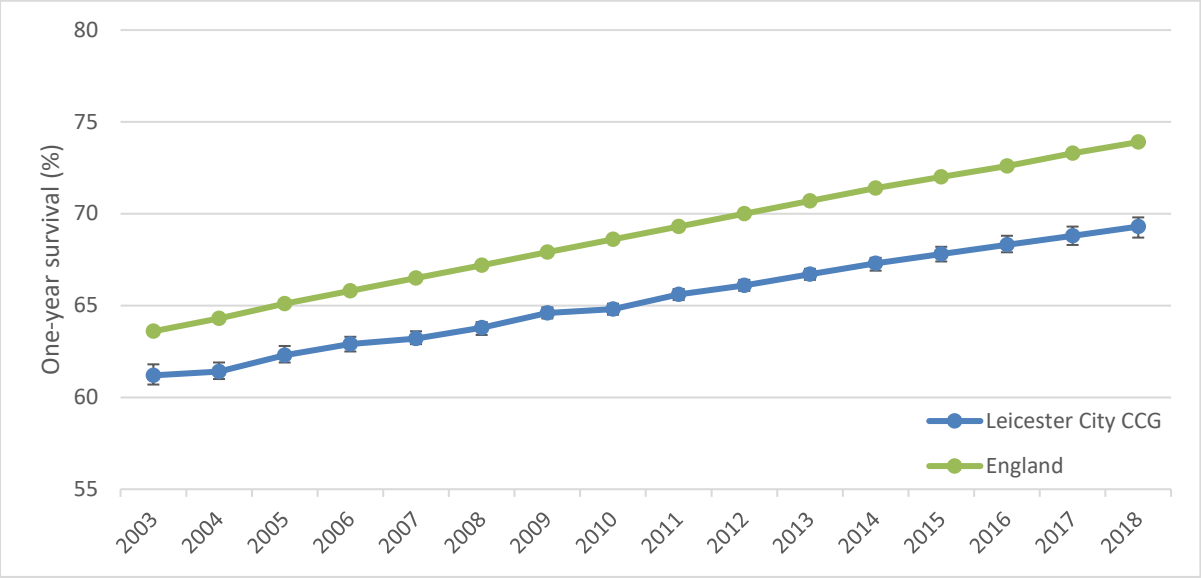
Source: Public Health England (35)

CANCER SURVIVAL

Survival is measured from the time of diagnosis to the time of death. Disease-specific survival gives an indication of how successful health services are in treating patients, as well as how early the disease was diagnosed, and are very sensitive to delays in diagnosis.

All-cancer one-year survival improved by 8% in Leicester and 10% in England between 2003 and 2018 (figure 15). As Leicester's one-year survival is improving at a slower rate than England, the gap is widening and reached a difference of 4.6% in 2018. Leicester's one-year survival of 69.3% is the second lowest of all 135 CCG areas in 2018.

Figure 15: All-cancer one-year survival, aged 15-99 years (2003-2018)

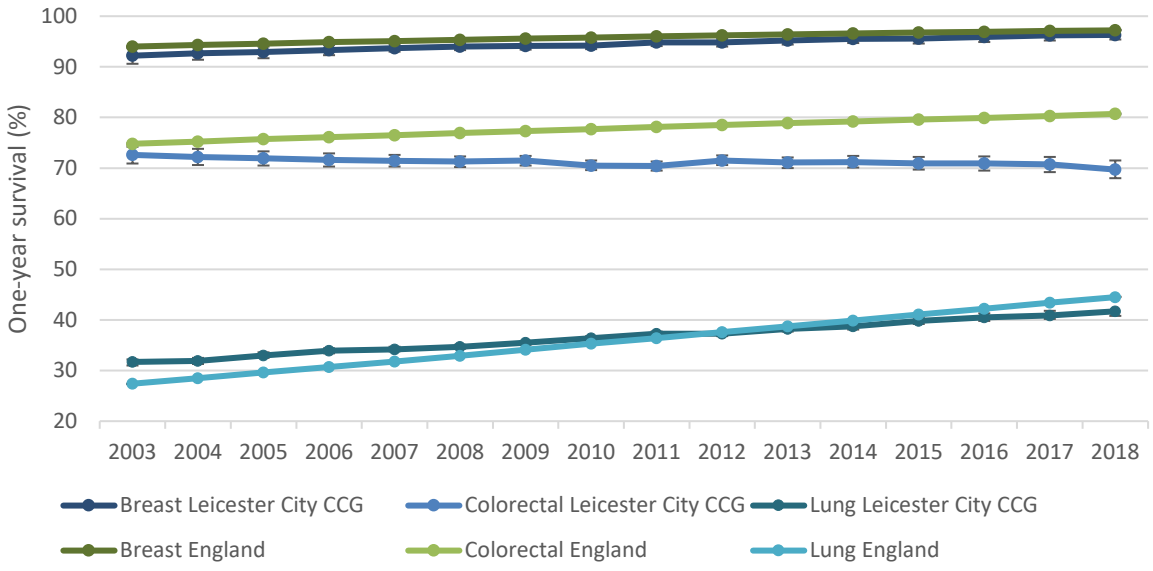


Source: Public Health England (36)

Figure 16 shows the trend for one-year survival for breast, colorectal and lung cancers for patients aged between 15-99 years. Survival has improved for breast (4.1%) and lung cancer (10%) in Leicester between 2003 and 2018; these are in keeping with the national trend.

The survival for colorectal cancer has decreased by 2.9% between 2003 and 2018; this is opposing the national trend which has improved by 5.9% over the same time period. Leicester's colorectal cancer survival is lower now than the England average 15 years ago and the gap has reached 11%; this is the lowest survival of any CCG.

Figure 16: One-year survival for breast, colorectal and lung cancers, aged 15-99 years (2003-2018)



Source: Public Health England (36)

CURRENT SERVICES IN RELATION TO NEED

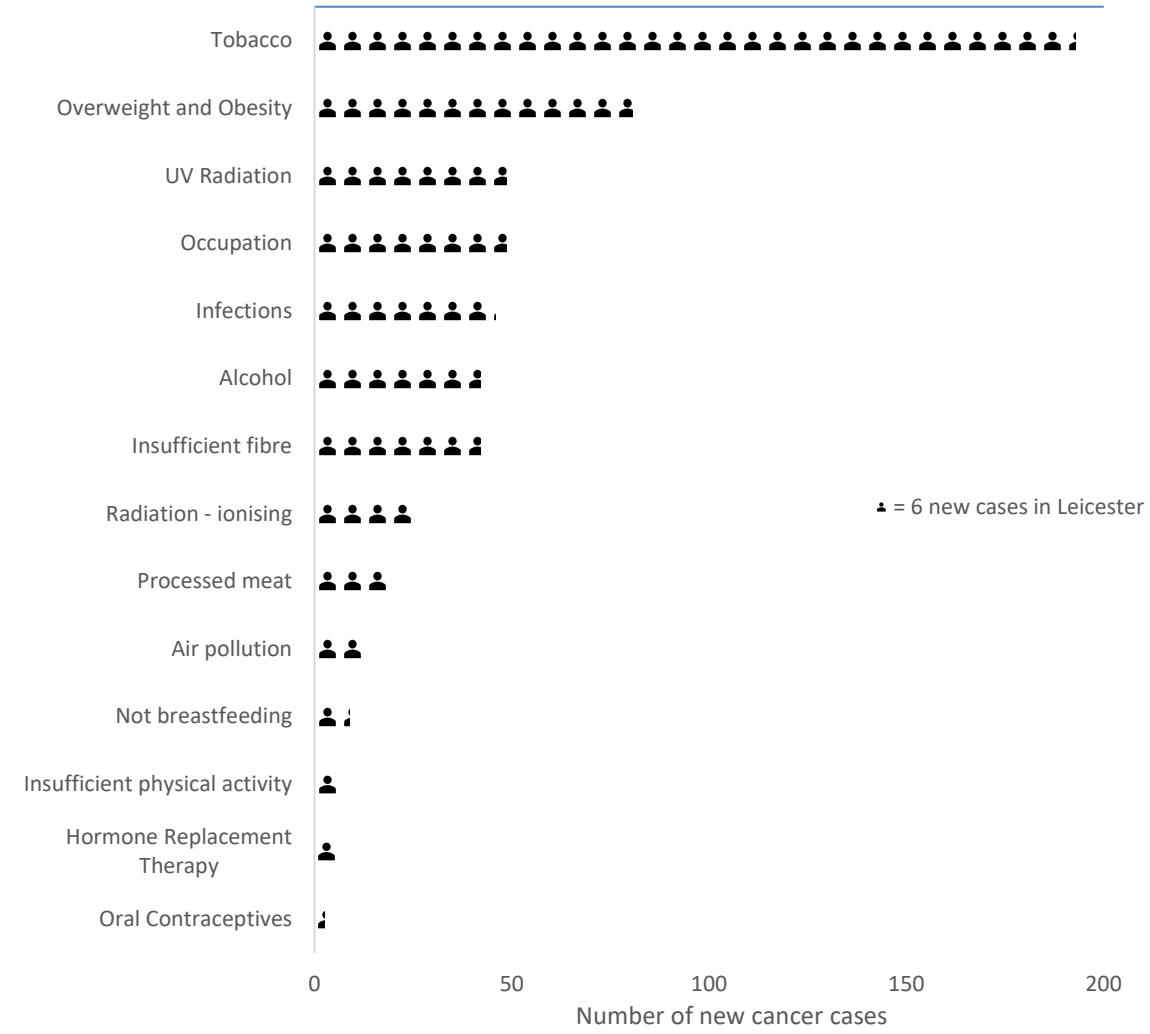
PREVENTION

Tackling modifiable risk factors associated with cancer underpins many public health initiatives including tobacco control, alcohol harm reduction and healthy living campaigns.

If modifiable risk factors were removed entirely, approximately 500 cancer cases per year would potentially be prevented in Leicester (based on the premise that 38% of cancers are preventable). Using national trends and risks, the most significant reduction in cancer incidence would be with tobacco elimination (nearly 200 cancer cases per year prevented), followed by tackling obesity (80 cases per year prevented) (figure 17).

Developing awareness of personal non-modifiable risk factors, such as family history, also has a role in prevention by increasing acceptability and demand for screening programmes.

Figure 17: Number of cancers attributable to modifiable risk factors in Leicester (2017)



Source: Adapted from Brown et al using Leicester prevalence data (11)

DETECTION AND DIAGNOSIS

For cases of cancer, the main objective is to detect the disease as early as possible, preferably before any symptoms or signs manifest, and before distant spread occurs. Both screening and early diagnosis are important in achieving this objective.

SCREENING

Screening is a method of testing apparently healthy people (i.e. those without any symptoms or signs of disease) who may be at increased risk. Screening tests are not diagnostic (i.e. do not determine whether someone has cancer) but identify individuals that have a higher risk that disease is present. For all patients with positive screening results, further diagnostic investigation is offered to confirm or exclude the condition. Screening can be opportunistic (done most often within a healthcare setting) but national screening is done on a population-wide basis, through organised and monitored programmes. Such programmes need to cover

a large enough proportion of the at-risk population, to be effective; the principal quality measures of any screening programme are its 'coverage' and 'uptake'.

Although not appropriate for all types of cancer, screening is the most effective way of identifying cancer in its earliest stages. There are NHS national screening programmes for the early detection of breast, cervical and bowel cancers.

BREAST SCREENING

The NHS Breast Screening Programme provides breast screening every three years for all women aged between 50 and 70. Breast screening uses a test known as a mammogram, to look for cancers which are too small to be detected by examination. There is currently an age extension trial in England investigating the impact of an extra mammogram at age 47-49 or 71-73. The Breast Screening Unit in Leicester is involved in this trial (37).

Between 2006 and 2016 in England, 28% of all breast cancers and 53% of those 'in situ' (an early, localized form of cancer with good prognosis) were identified through screening (38). In Leicester, 30% (95% CI 28-32%) of breast cancer is identified through screening (38).

In 2020/21, 38.8% of all eligible women in Leicester had been screened in the last 3 years, which is significantly below the national average of 61.3% (figure 18) and significantly lower than all comparator cities (figure 19). Between 2009 and 2020, the rate of screening nationally has been relatively stable at just over 70%. However, in 2020/21 there was a 10% decline in coverage (61.3%). In Leicester, screening coverage has been slowly declining since 2016/17 and had a much greater decline in coverage in 2020/21 (from 64.6% to 38.8%).

Uptake of screening (attendance within 6 months of invitation) has also been declining consistently since 2018/19 in Leicester and remains below the national average (52.9% vs 62.8% in 2020/21) (figure 20). However, uptake in Leicester is not the worst of all comparators (figure 21).

Figure 18: Females aged 50-70 years screened for breast cancer in the last 3 years, Leicester compared to England over time

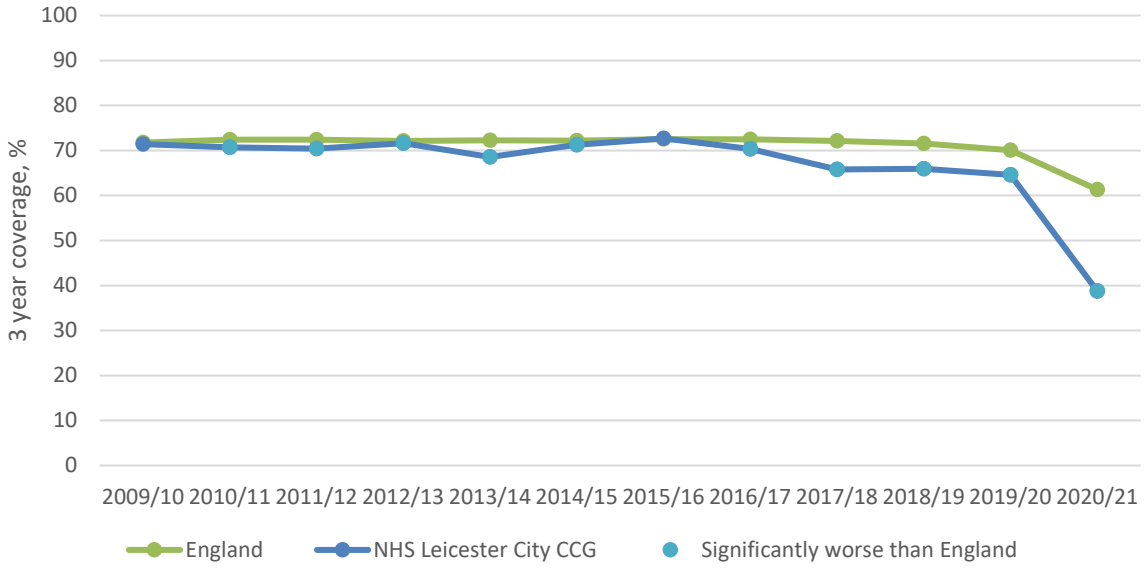


Figure 19: Females aged 50-70 years screened for breast cancer in the last 3 years, Leicester compared to peers in 2020/21

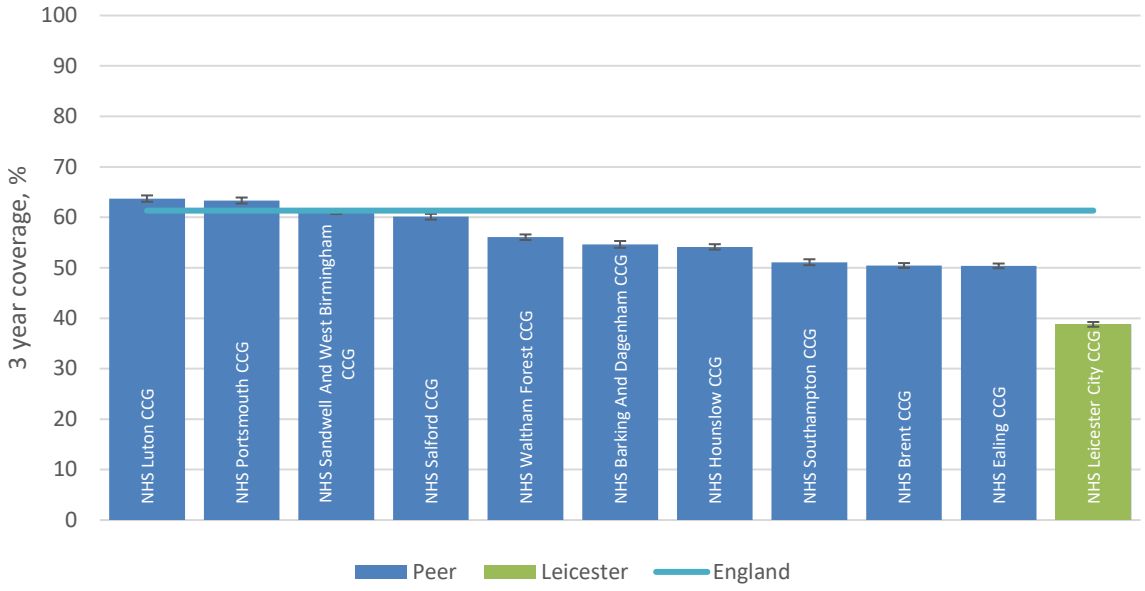
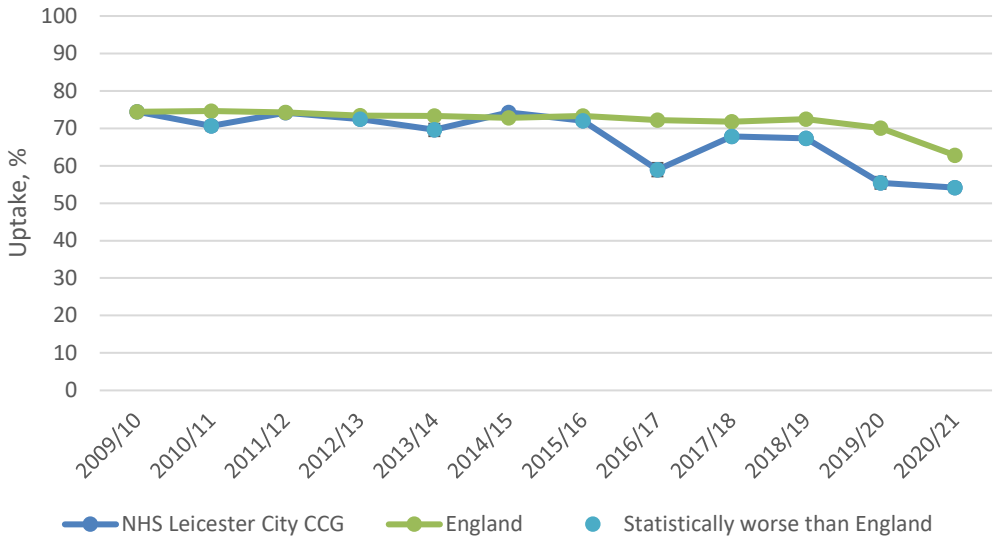
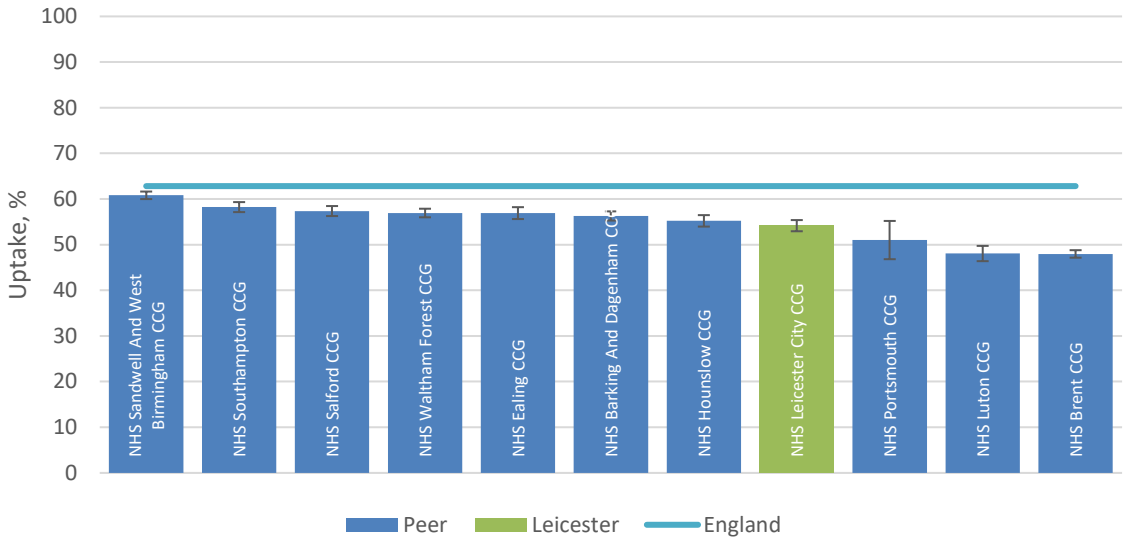


Figure 20: Females aged 50-70 years screened for breast cancer within 6 months of invitation, Leicester compared to England over time



Source: Public Health England (62)

Figure 21: Females aged 50-70 years screened for breast cancer within 6 months of invitation, Leicester compared to peers in 2020/21



Source: Public Health England (62)

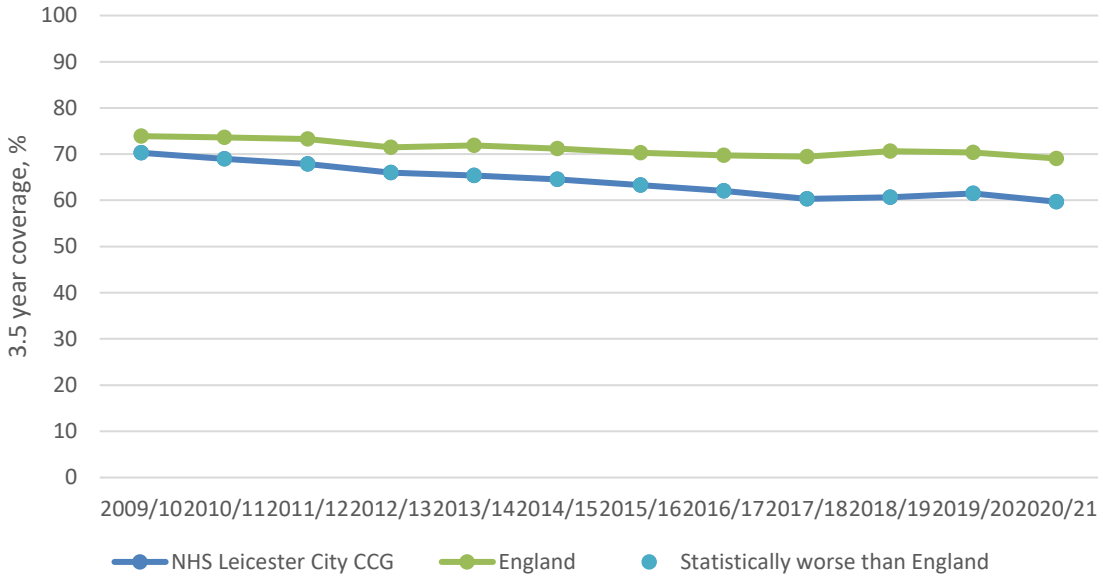
CERVICAL SCREENING

The cervical screening programme involves a cervical test (also known as a smear test) designed to determine the health of cervical cells and thus assess the risk of developing cancer. Human papillomavirus (HPV) testing is used to stratify risk of women who have borderline or low grade abnormal cell changes. Screening is offered to all women aged 25-64; 3 yearly until age 49 and 5 yearly thereafter (39).

About a quarter (28%) of cervical cancers were detected by screening between 2006 and 2016 in England and across the East Midlands (38).

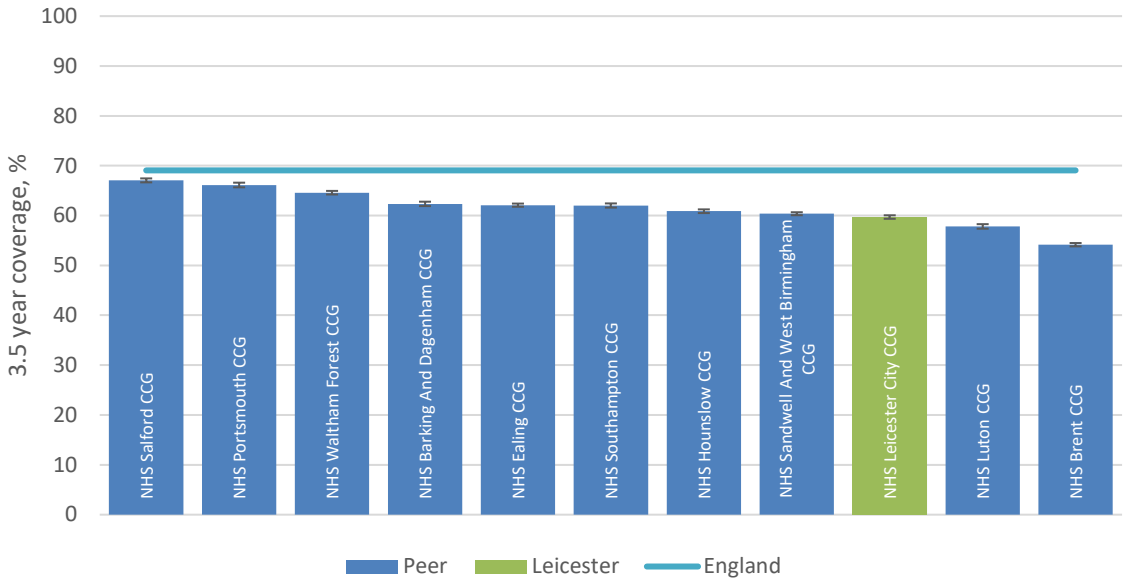
Uptake of cervical screening in England is higher in women aged 50-64 years (75.0%) compared to women aged 25-49 years (69.0%) with a similar pattern seen in Leicester (70.2% compared to 59.3%). There has been a decline in the uptake of cervical smears between 2010 and 2020 both nationally and in Leicester, however the rate of decline in Leicester is faster, with the gap widening particularly in women aged 25-49 years (Figures 22 and 24). When compared to comparators cities, Leicester has amongst the lowest cervical screen coverage in both age groups (figures 23 and 25).

Figure 22: Females aged 25-49 years screened for cervical cancer in the last 3.5 years, Leicester compared to England over time



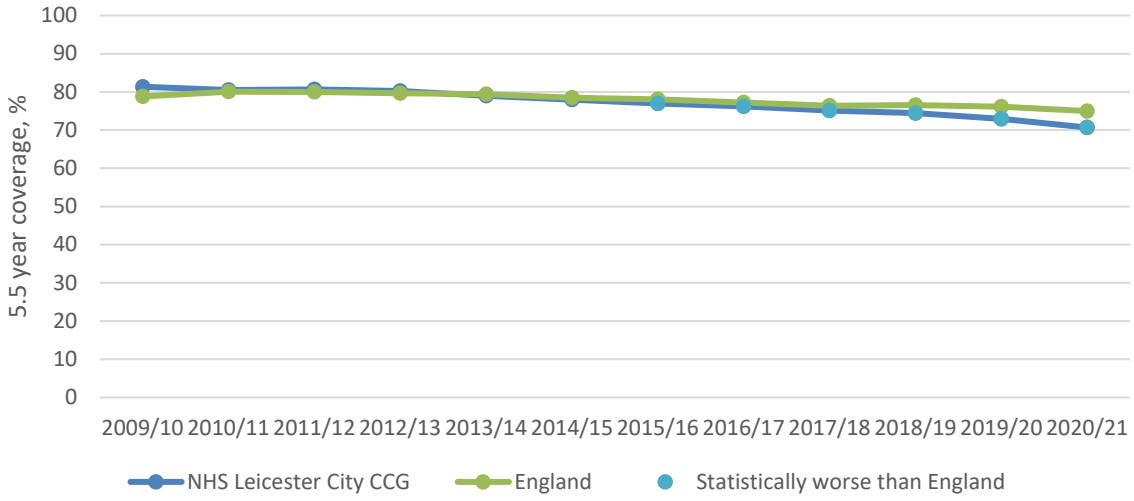
Source: Public Health England (40)

Figure 23: Females aged 25-49 years screened for cervical cancer in the last 3.5 years, Leicester compared to peers in 2020/21



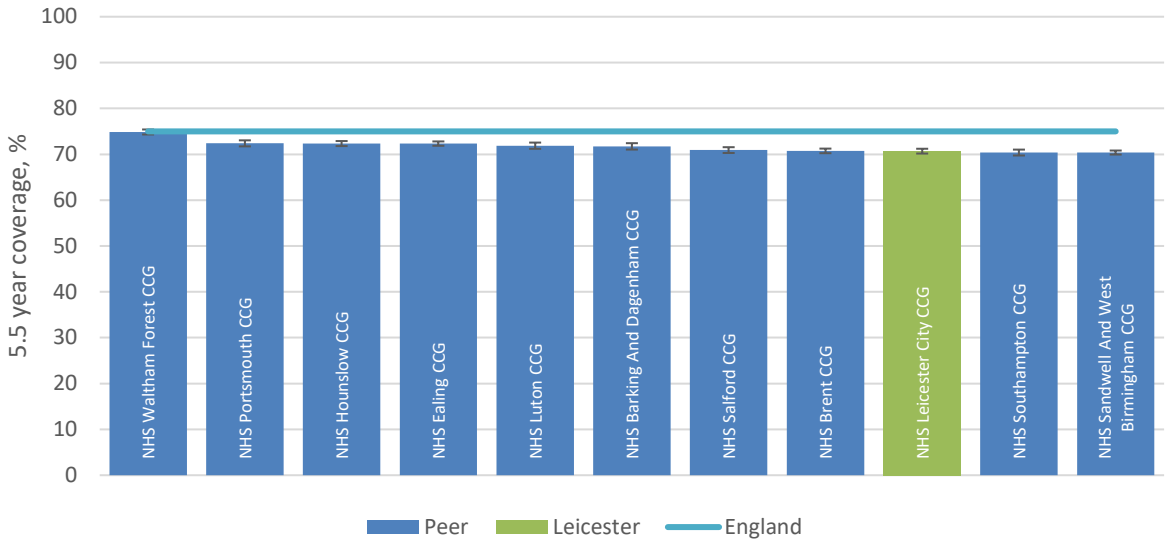
Source: Public Health England (40)

Figure 24: Females aged 50-64 years screened for cervical cancer in the last 5.5 years, Leicester compared to England over time



Source: Public Health England (40)

Figure 25: Females aged 50-64 years screened for cervical cancer in the last 5.5 years, Leicester compared to peers in 2020/21



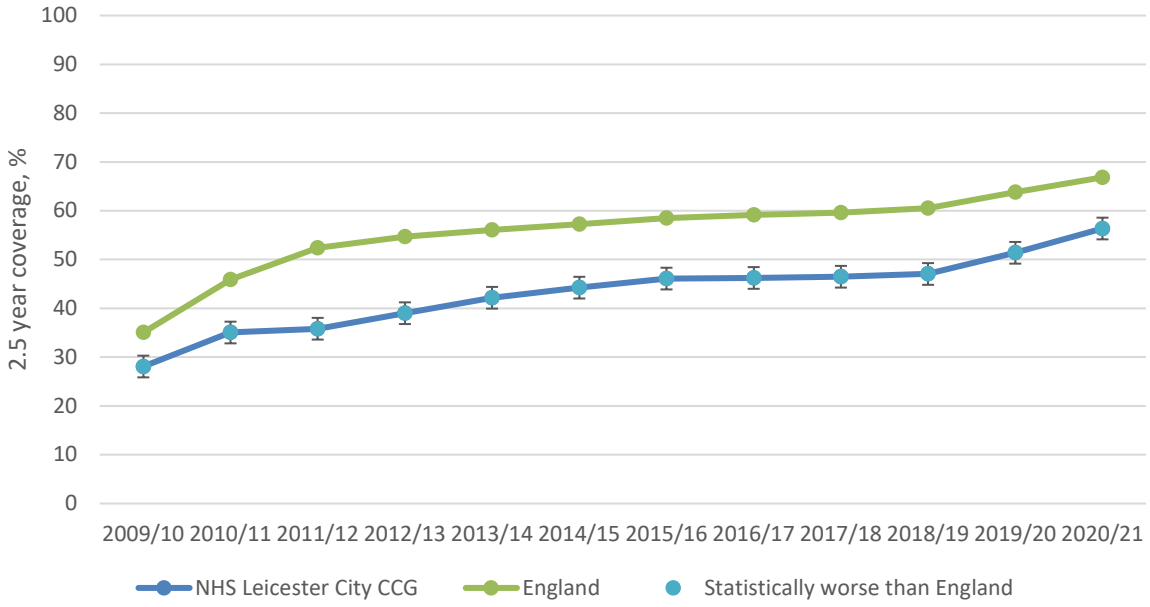
Source: Public Health England (40)

BOWEL SCREENING

The population-based screening programme to detect bowel cancer was introduced in Leicester in 2008. Bowel scope screening is offered as a one-off to everyone at age 55, a home testing kit is offered 2 yearly from age 60-74. Since June 2019, the 'faecal occult blood' (FOB) test has been replaced by the 'faecal immunochemical test' (FIT). This has the advantage of requiring one sample instead of three which, in part, aims to increase uptake (41).

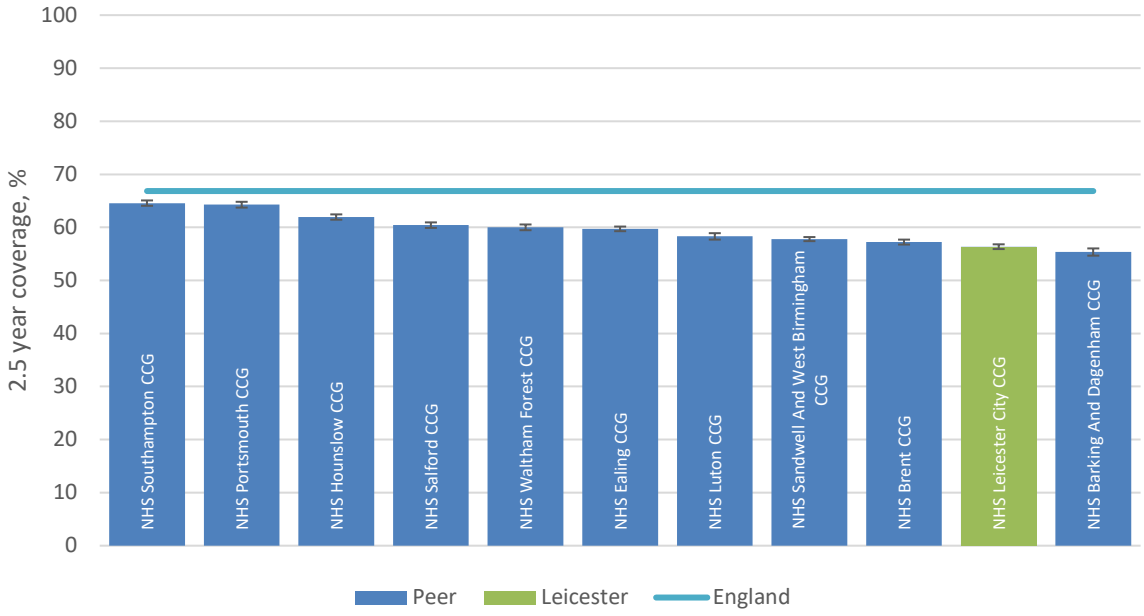
The uptake of bowel cancer screening in Leicester remains low (56.8% in 2020/21), compared with England (66.8%) (figure 26). However unlike breast and cervical screening, the trend for bowel cancer screening is rising and the gap between Leicester and England is narrowing. However, Leicester coverage remains the second lowest of comparator cities in 2020/21 (figure 27).

Figure 26: Persons aged 60-74 years screened for bowel cancer in last 2.5 years, Leicester compared to England over time



Source: Public Health England (42)

Figure 27: Persons aged 60-74 years screened for bowel cancer in last 2.5 years, Leicester compared to peers in 2020/21



Source: Public Health England (42)

The low coverage in Leicester may be influenced by a number of factors, including high deprivation of the local population. In 2021 the uptake in the most deprived deciles in England was 10% lower than those in the least deprived decile (57.5% vs. 68.3%) (42).

Only 8% of colorectal cancers in England between 2006-2016 were detected through screening, Leicester is lower at 5% (95% CI: 4-7%) (38); there have been approximately 1600 bowel cancer diagnoses in Leicester City between 2008 and 2019, which amounts to approximately 80 cases detected through screening since the beginning of the programme (30).

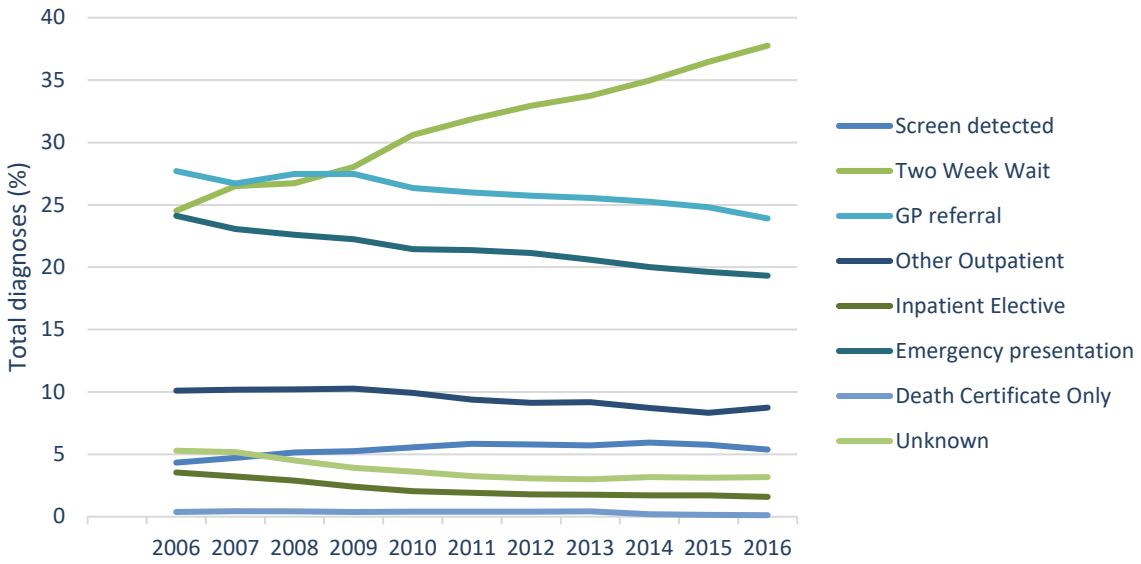
OTHER ROUTES TO DIAGNOSIS

Despite the undoubted potential of screening programmes to pick up cancer in its pre-clinical stages, the national data for 2006-2016 indicate that only about 5% of all cancer cases are diagnosed through screening (38). For the remaining 95% of cancer cases, the objective is to encourage early referral, diagnosis and treatment to ensure best possible outcomes.

ELECTIVE REFERRALS – THE 'MANAGED ROUTE'

Patients presenting with symptoms suggestive of cancer should be referred by their GPs to a specialist urgently (within 2 weeks). There are now well established national evidence-based guidelines and performance targets for this referral pathway in the NHS, as it increases the likelihood of an early diagnosis (43). The Two Week Wait pathway is identifying steadily more cancers, with a 12% rise between 2006 and 2016; this pathway now identifies 38% of all cancers. Other GP referrals diagnose 25% of cases and emergency presentation identify a further 19%; both of these routes to diagnosis are gradually declining over time (figure 28).

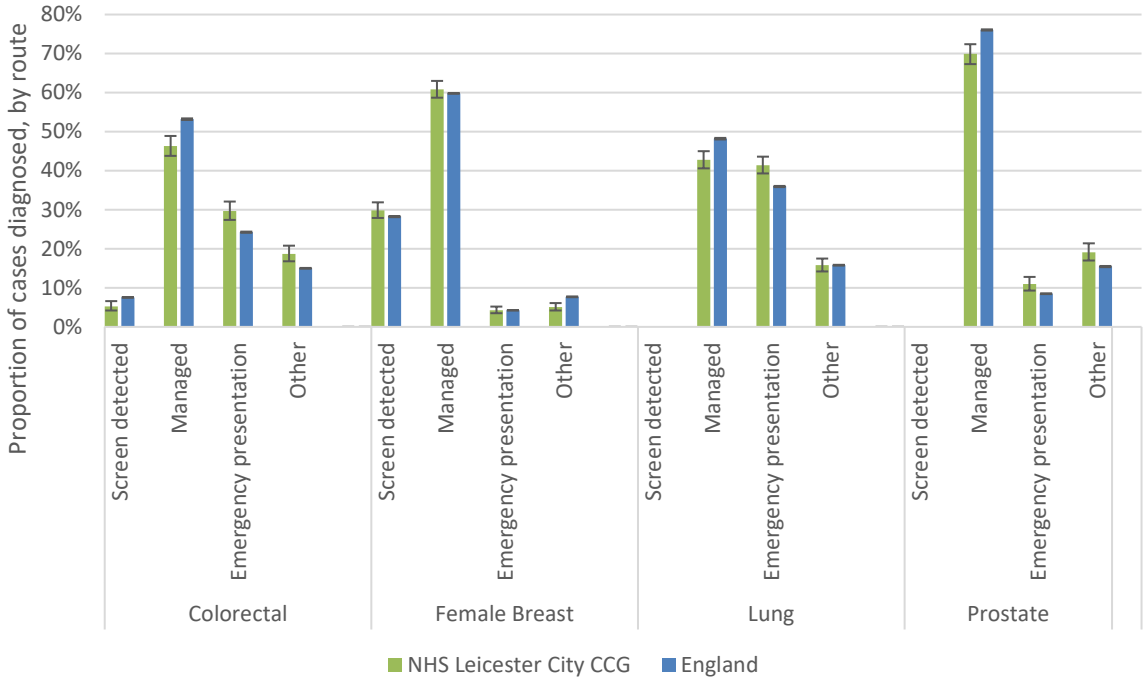
Figure 28: Route to diagnosis in England, 2006-2016



Source: National Cancer Registration and Analysis Service (44)

Between 2006 and 2016, Leicester City had a smaller proportion of colorectal, lung and prostate cases diagnosed by screening (where applicable) and managed routes and a higher proportion of cases diagnosed by emergency presentation compared to England. Female breast cancer, however, had a similar proportion of cases diagnosed by screening, managed route and emergency presentation compared to England (figure 29).

Figure 29: Route of diagnosis for colorectal, female breast, lung and prostate cancer in Leicester compared to England, 2006-2016



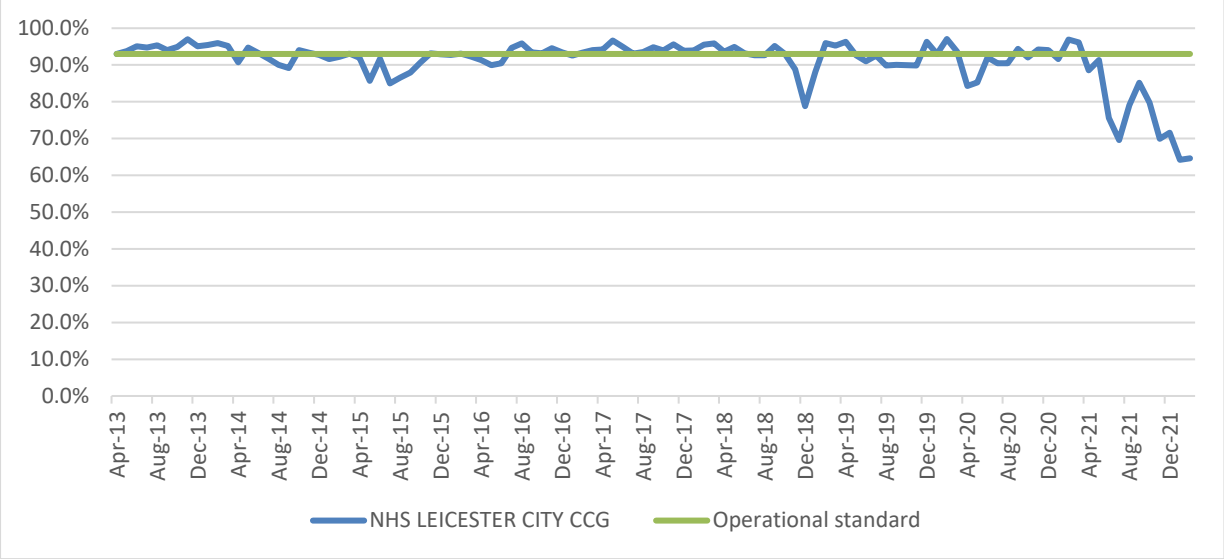
Source: National Cancer Registration and Analysis Service (44)

TWO WEEK WAIT

The number of two-week wait referrals are lower in Leicester compared to England (2496 vs 3484 per 100,000 in the last 5 years – 2016/17 to 20/21), however, this rate is not age-standardised and so could be explained by the younger population within Leicester (45). Leicester has a lower proportion of these referrals resulting in a diagnosis of cancer (conversion rate: 6.0% vs 7.1%) (45).

The proportion of referrals that are seen within the two-week window have typically met the operational standard of 93%. However, since March 2021 this proportion has significantly dropped to approximately 65% (figure 30).

Figure 30: Percentage of GP urgent referrals seen by a consultant within two weeks



Source: NHS England (46)

EMERGENCY PRESENTATION

Almost a fifth (19%) of all cancer patients diagnosed in England 2016 were referred as emergency presentations (38).

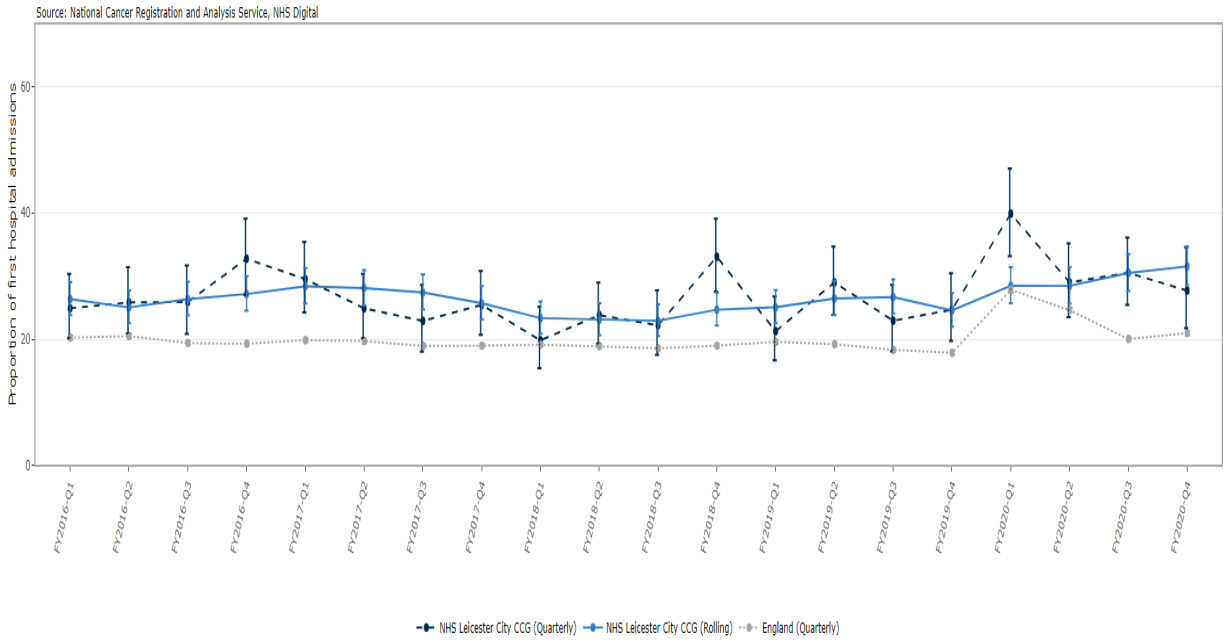
For the majority of cancers, emergency presentation correlates with poor prognosis, as these patients tend to be in later stages of the disease, with limited therapeutic options. The one-year survival figures for England between 2012 and 2016 indicate that cancers picked up in screening have very good one-year survival rates, two-week wait diagnoses also have high survival rates but those who are diagnosed following emergency presentation have significantly worse outcomes (table 4). Emergency admissions as method of cancer presentation are higher in Leicester compared with England (figure 31).

Table 4: one-year survival by cancer type and mode of presentation in England

	Presentation		
	Screening	Two week wait	Emergency
Breast cancer	Data not available	97.6%	58.9%
Cervical cancer	99.2%	83.8%	49.4%
Colorectal cancer	97.5%	83.3%	50.8%
Lung cancer	N/A	47.3%	16.6%
Prostate cancer	N/A	98.6%	66.1%

Source: Routes to diagnosis (38)

Figure 31: Proportion of first hospital admissions that are emergencies in Leicester compared with England (2016-2020)

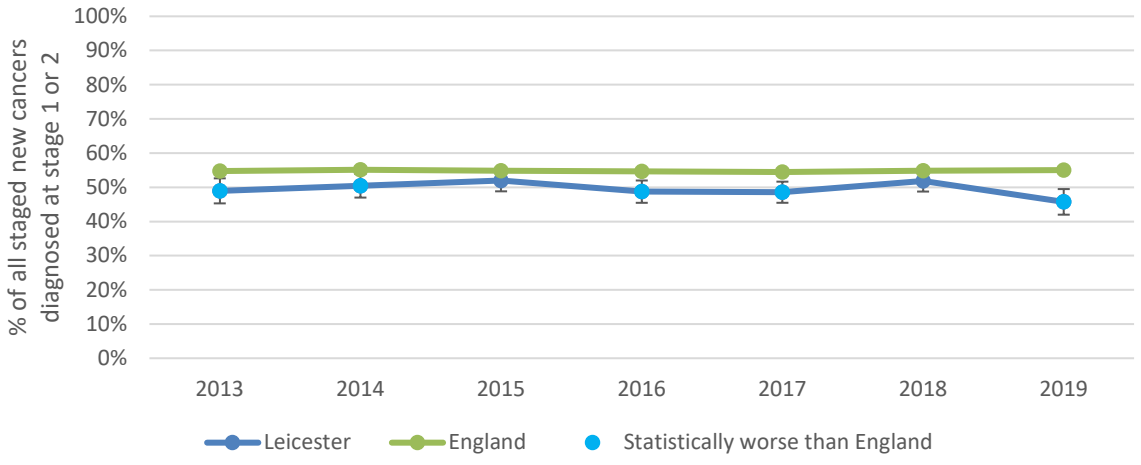


Source: National Cancer Registration and Analysis Service (46)

STAGING

In Leicester, the proportion of cancers diagnosed in stages I or II is about half of all cancers but remains statistically lower than England. In 2019 the proportion of new diagnoses at stage 1 or 2 fell to 45.7% (figure 32).

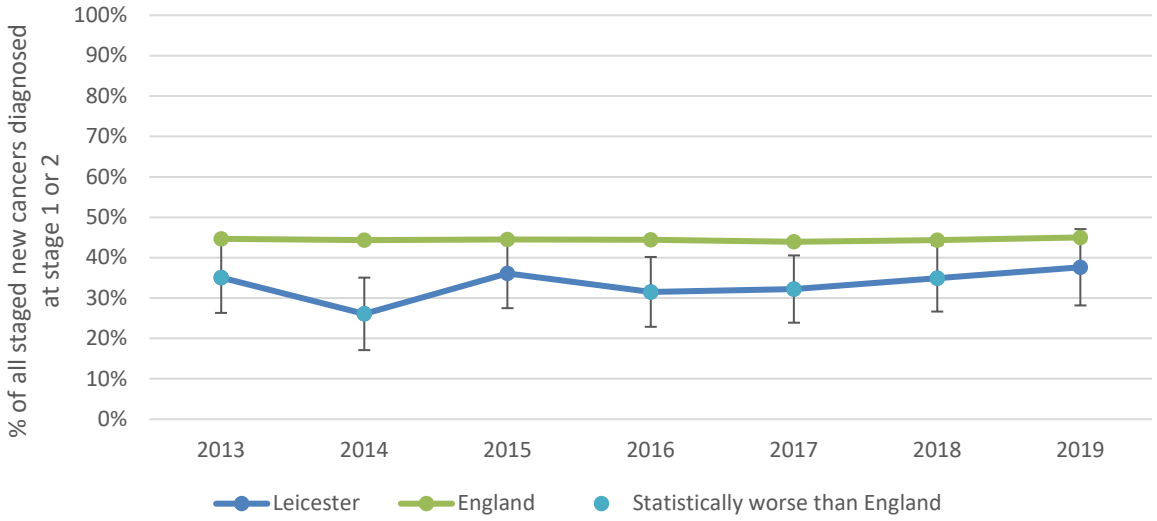
Figure 32: Percentage of new cancer cases diagnosed at early stage (stage 1 and 2) between 2013 and 2019



Source: National Disease Registration Service (48)

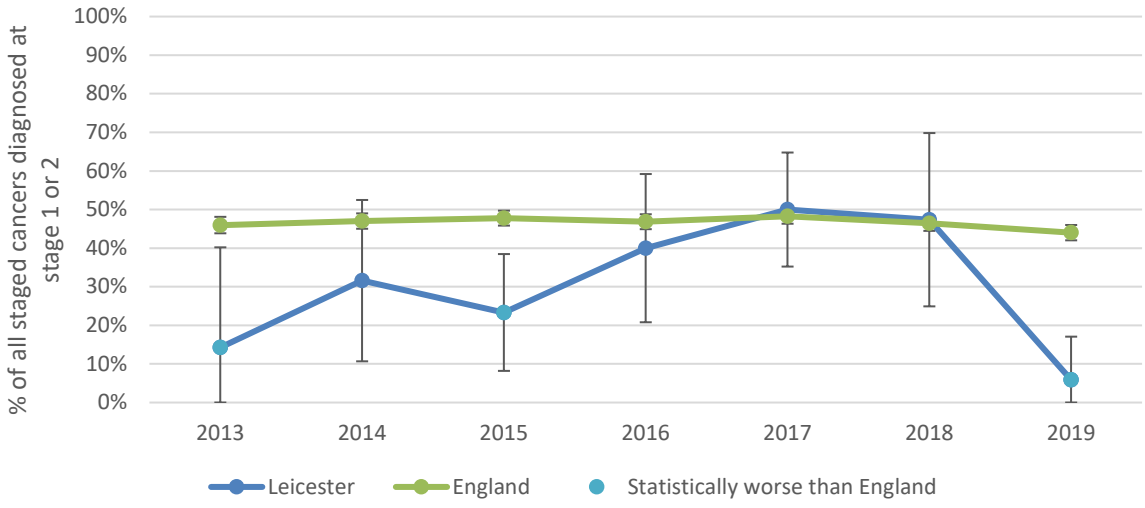
Both colorectal and oral cancer in Leicester tend to have fewer diagnoses at stage 1 and 2 compared to England (figures 33 and 34), which may in part explain worse one-year survival and mortality respectively for these cancer types in Leicester. In 2019, the proportion of oral cancer diagnosed in stage 1 or 2 fell dramatically to less than 10% of all diagnoses.

Figure 33: Percentage of new colorectal cancer cases diagnosed at early stage (stage 1 and 2) between 2013 and 2019



Source: National Disease Registration Service (48)

Figure 34: Percentage of new oral cancer cases diagnosed at early stage (stage 1 and 2) between 2013 and 2019

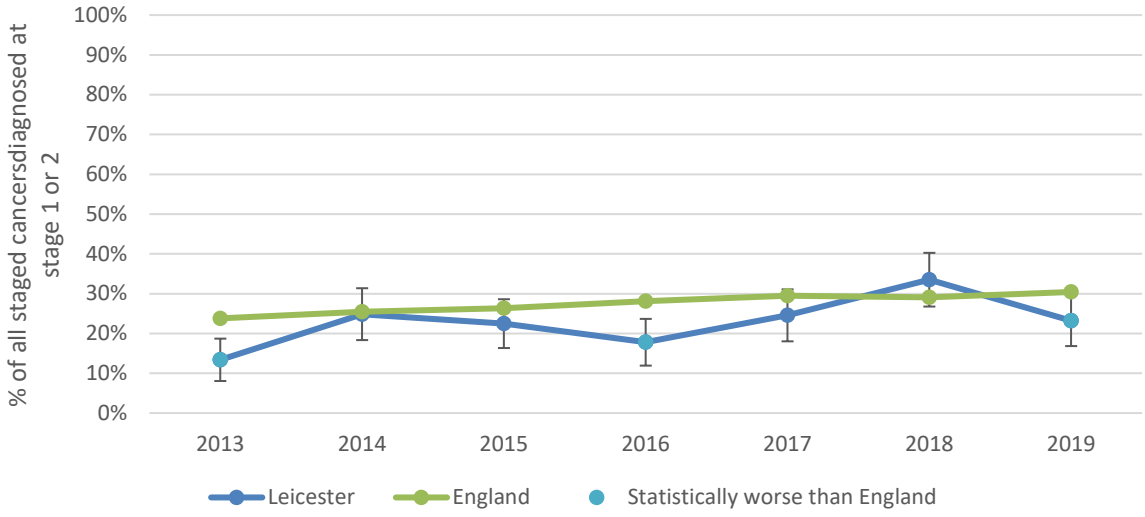


Source: National Disease Registration Service (48)

Lung and stomach cancer (which have higher than average mortality in Leicester males) do not appear to be significantly different to England in terms of stage at diagnosis (figures 35

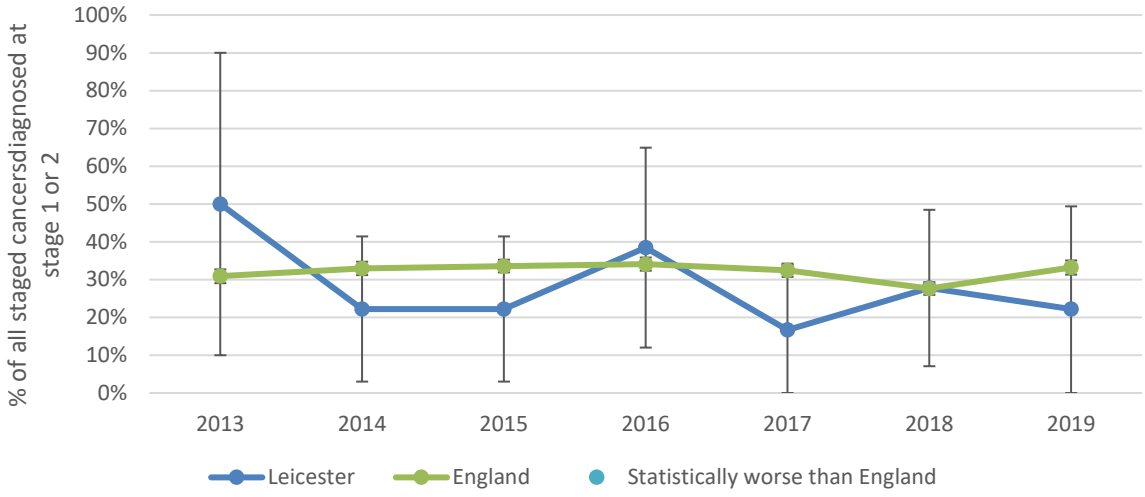
and 36). Stage at diagnosis for breast cancer does not appear to differ significantly between Leicester and England (figure 37).

Figure 35: Percentage of new lung cancer cases diagnosed at early stage (stage 1 and 2) between 2013 and 2019



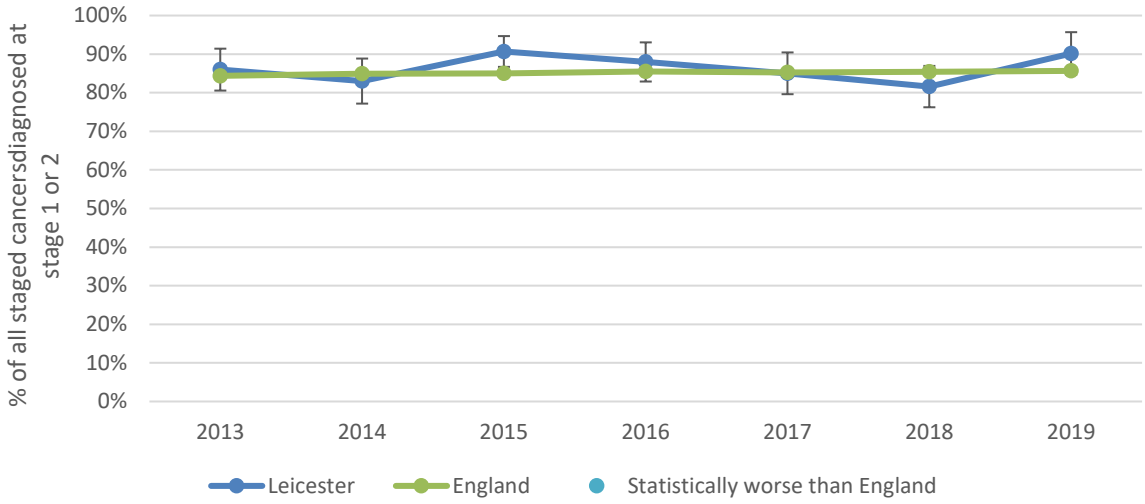
Source: National Disease Registration Service (48)

Figure 36: Percentage of new stomach cancer cases diagnosed at early stage (stage 1 and 2) between 2013 and 2019



Source: National Disease Registration Service (48)

Figure 37: Percentage of new breast cancer cases diagnosed at early stage (stage 1 and 2) between 2013 and 2019



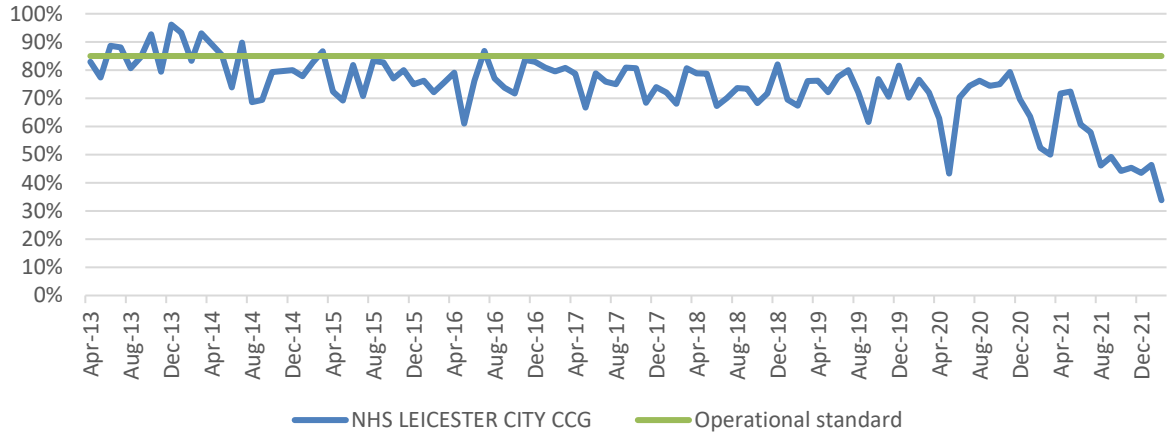
Source: National Disease Registration Service (48)

TREATMENT

Depending on the type of cancer, patients have a number of treatment options, including surgery, radiotherapy, variants of chemotherapy, as well as other treatments. Treatment, regardless of modality, should be initiated within 62 days of an urgent GP referral or national screening and within 31 days of decision to treat.

Leicester has typically sat below the operational standard of 85% of individuals having a 62 day wait (or less) from GP urgent referral to first treatment. Over the course of the pandemic the proportion has reduced further to 40-50% since August 2021 (figure 38).

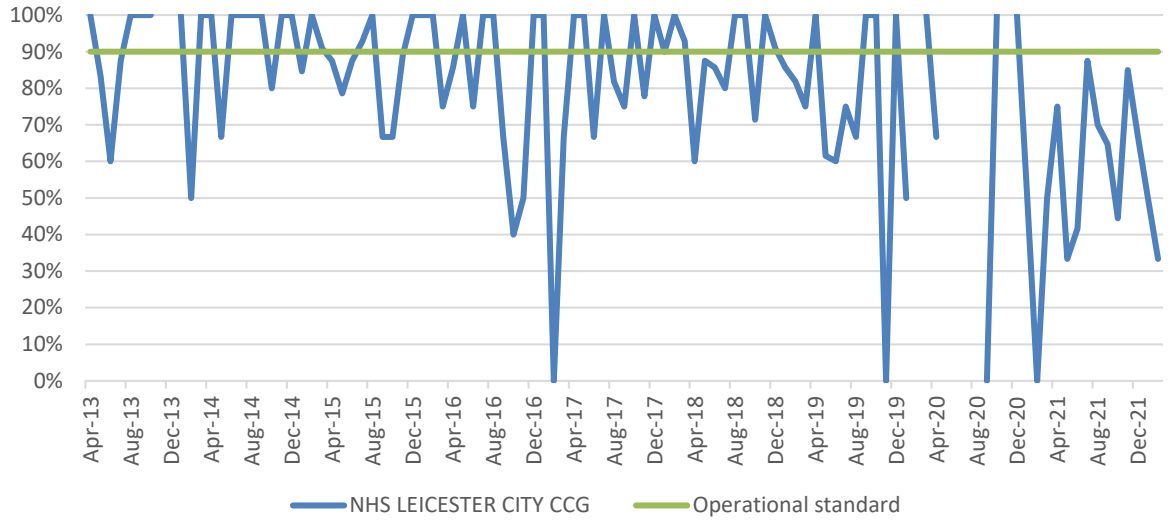
Figure 38: Percentage of cancer cases receiving treatment within 62 days of urgent GP referral



Source: NHS England (48)

Similar delays can be seen when looking at 62 day waits from screening to first treatment: Leicester has been consistently below the operational standard since January 2021 (figure 39).

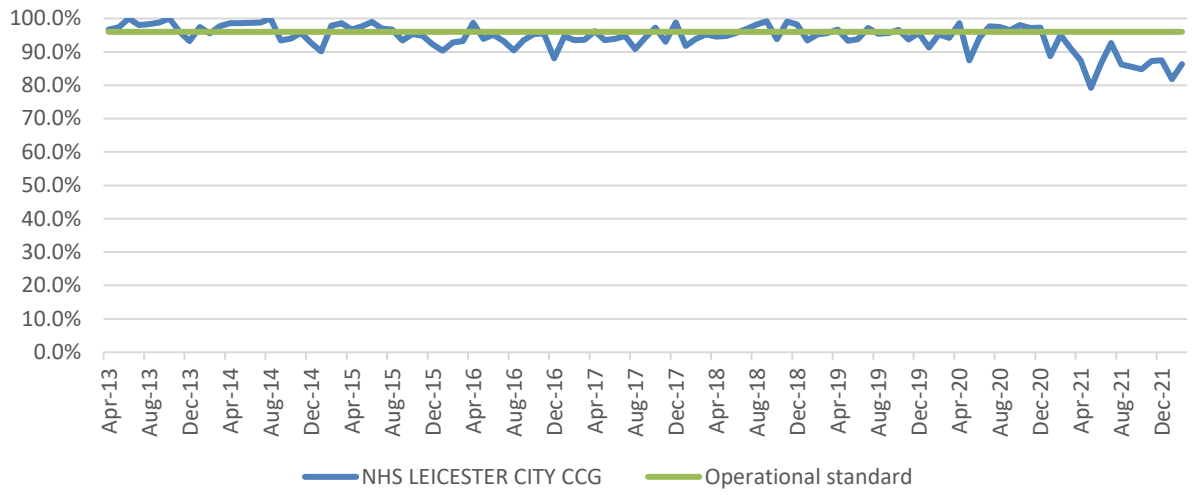
Figure 39: Percentage of cancer cases receiving treatment within 62 days of screening



Source: NHS England (48)

The 31-day target from decision to treat to first treatment has typically been on or around the national standard of 96%, however, since January 2021 fewer cases are receiving treatment within this timeframe with only 87% of cases receiving treatment within one month in February 2022 (figure 40).

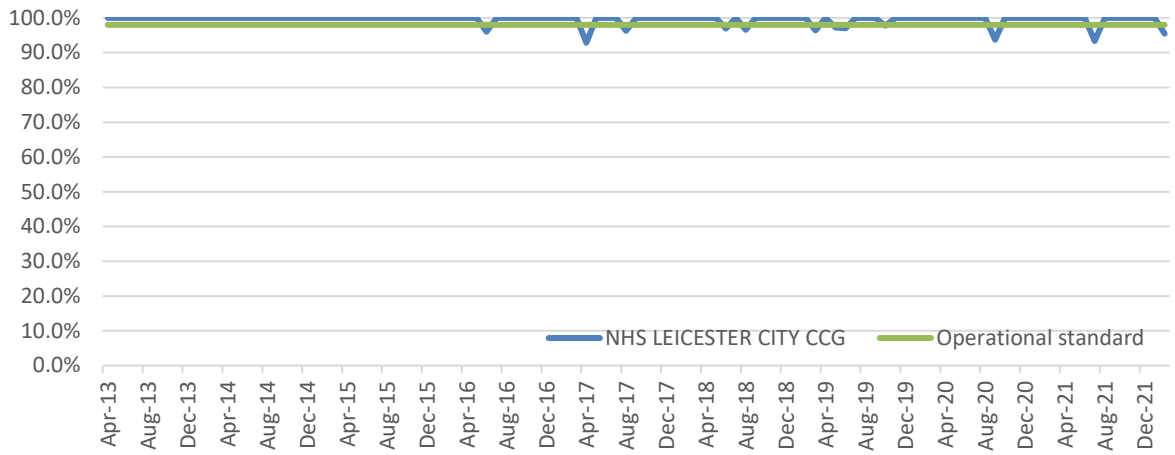
Figure 40: Percentage of cancer cases receiving treatment within 31 days of decision to treat (2013 to 2022)



Source: NHS England (48)

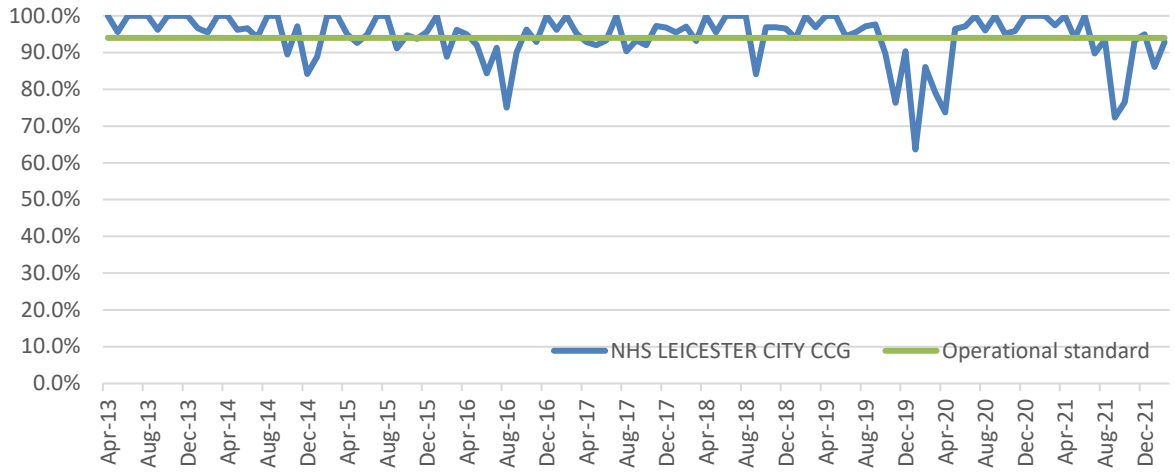
Figures 41-43 demonstrate 31 day wait times for the different treatment modalities in Leicester; whilst drug therapy generally meets operational standards, both radiotherapy and surgery have shown some recent delays, with surgery particularly affected over the past two years.

Figure 41: Percentage of cancer cases receiving anti-cancer drug treatment within 31 days of decision to treat



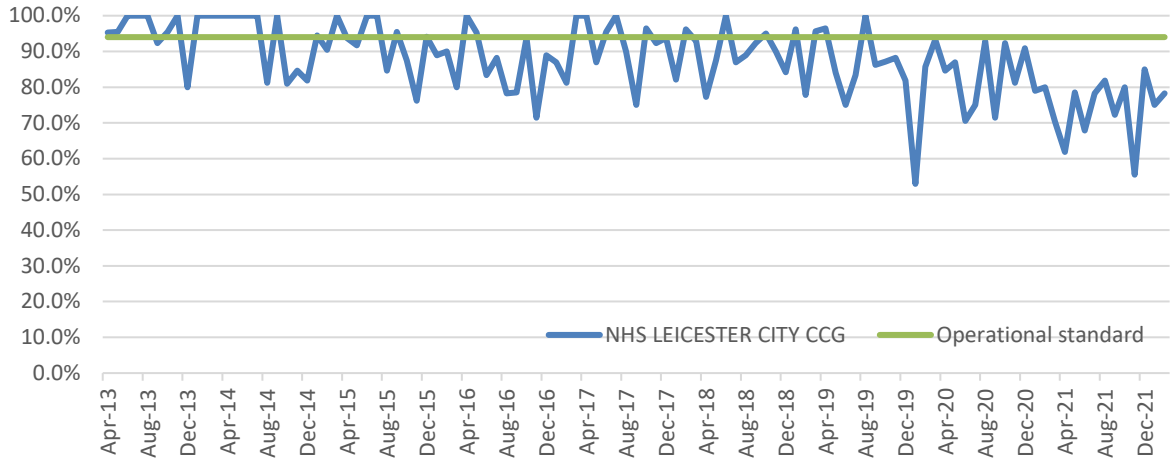
Source: NHS England (46)

Figure 42: Percentage of cancer cases receiving radiotherapy treatment within 31 days of decision to treat



Source: NHS England (46)

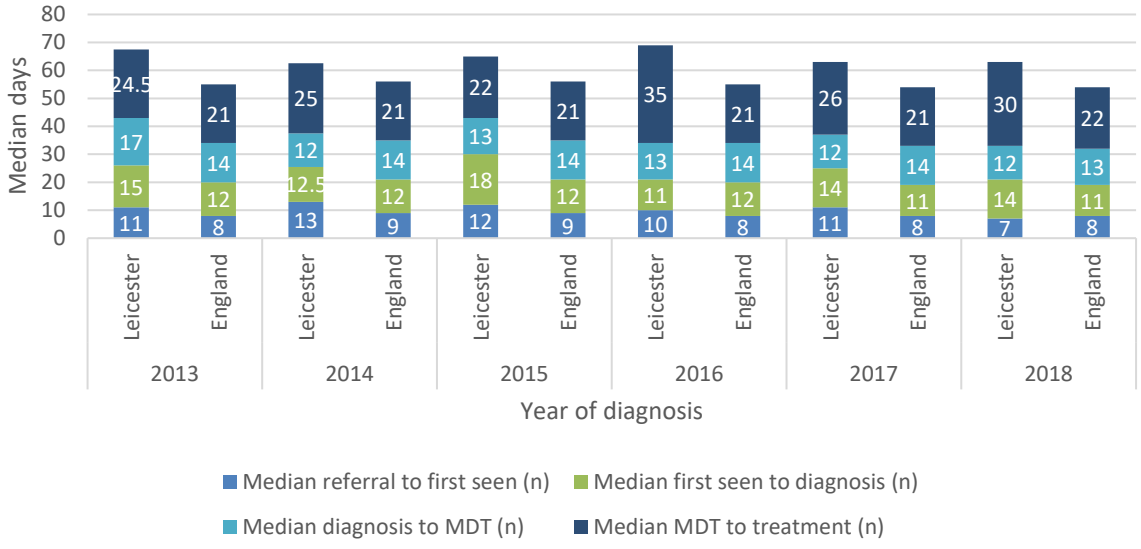
Figure 43: Percentage of cancer cases receiving surgical treatment within 31 days of decision to treat



Source: NHS England (46)

Delays to treatment can occur at several stages along the pathway including from referral to first seen, first seen to diagnosis, diagnosis to MDT and MDT to treatment. In 2018, the median time between referral and first being seen for colorectal cancer was 7 days compared to 8 days nationally (see figure 44). However, the median time between MDT and treatment was 8 days higher than in England (30 days vs 22 days respectively).

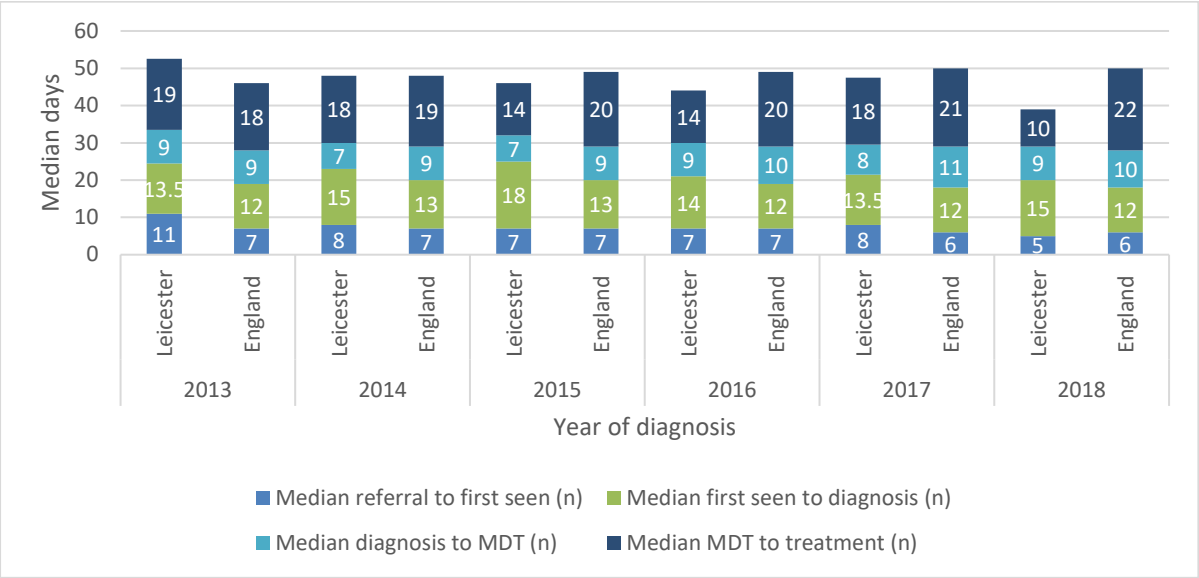
Figure 44: Median days from referral to treatment in colorectal cancer in Leicester and England, 2013-2018



Source: National Cancer Registration and Analysis Service (46)

England Lung cancer median times from referral to treatment are similar to England, although time from first seen to diagnosis is somewhat longer in Leicester (15 vs 12 days in 2018). Median time from MDT to treatment was 12 days shorter in Leicester compared to England in 2018 (figure 45).

Figure 45: Median days from referral to treatment in lung cancer in Leicester and England, 2013-2018



Source: National Cancer Registration and Analysis Service (46)

PROJECTED SERVICES USE AND OUTCOMES IN 3-5 YEARS AND 5-10 YEARS

Based on the current general practice cancer registration rate (1.58%) and population projections (51), the projected number of people with cancer is likely to grow by over 200 between 2020 and 2030 (Table 5).

Table 5: Cancer prevalence projections, 2020 to 2030

	Prevalence Mar 2019	2020	2025	2030
Cancer (all ages)	1.58%	5729	5845	5973

Source: Quality Outcomes Framework 2018/19, Office for National Statistics for clinical commissioning groups and NHS regions

UNMET NEEDS AND SERVICE GAPS

HIGH OVERALL MORTALITY AND LOW COLORECTAL CANCER SURVIVAL

Despite Leicester's lower cancer incidence compared to England, cancer mortality in those aged under 75 is above the English average; this is primarily due to a higher mortality rate in men in Leicester compared to those in England, whereas the mortality rate in women is statistically similar in Leicester compared to England. Higher mortality rates are seen in male lung, stomach and oral cancers, and in female oral cancer. Colorectal cancer survival is worsening in Leicester compared to an overall improvement in England.

DELAYED DIAGNOSIS

Overall, presentation at early stage (stage 1 and 2) is below the England average; both oral and colorectal cancers tend to present at later stages of disease in Leicester compared to England which may partially explain their worse mortality and survival respectively. The same is not seen for lung, breast or stomach cancer.

Similarly, for colorectal, lung and prostate cancer, fewer cases were diagnosed via screening (when applicable) and the managed route, and more cases were identified via emergency presentation.

Over the pandemic the proportion of individuals who are successfully seen within two weeks via the 'two-week wait' pathway has significantly reduced which may contribute to additional delayed diagnoses.

LOW UPTAKE OF SCREENING

Screening uptake for breast, cervical (particularly in 25–49-year-olds) and bowel cancer are all significantly lower in Leicester than the English average, with both breast and cervical screen uptake declining in recent years.

DELAYED TREATMENT

Over the pandemic, delays in initiating treatment have become more common; delays are particularly seen with surgical treatment although there have also been intermittent delays in radiotherapy treatment initiation.

SPECIFIC CANCERS OF INTEREST

COLORECTAL CANCER

In Leicester, colorectal cancer incidence and mortality are similar to the national average, however, one year survival is lower than the national average and is worsening over time. Possible contributing factors include:

- Bowel screening uptake is lower than England and all its ONS comparators
- Fewer cancers are diagnosed via screening or the managed route, and more are diagnosed via emergency presentation compared with England
- Fewer cancers are diagnosed at stages 1 and 2 compared to England
- Median time from first seen to treatment is higher in Leicester compared to England, with the biggest difference seen in the median time from MDT to treatment.

ORAL CANCER

In Leicester, oral cancer incidence and mortality are significantly higher than in England. Possible contributing factors include:

- Fewer cancers are diagnosed at stages 1 and 2 compared to England
- Median time from first seen to treatment data is not available

LUNG CANCER

In Leicester, lung cancer incidence and mortality in men are significantly higher than in England. Possible contributing factors include:

- Fewer cancers are diagnosed via the managed route, and more are diagnosed via emergency presentation compared with England

STOMACH CANCER

In Leicester, stomach cancer mortality in men is significantly higher than in England. No contributing factors were identified from the data available. It was not possible to compare routes of diagnosis or median time of referral to treatment due to lack of data availability.

RECOMMENDATIONS FOR CONSIDERATION BY COMMISSIONERS

Commissioners are recommended to consider:

- Continued work with lifestyle services to reduce modifiable risk factors within the population
- Targeted action to improve coverage of all cancer screening programmes. Areas to consider include:
    - Understanding local patterns of inequality in uptake and targeted action to increase coverage
    - Understanding recent trends in reduced breast and cervical screening uptake to guide further action
- Promoting cancer symptom awareness to encourage early presentation, particularly of colorectal and oral cancers
- Further investigation of recent trends in delays to treatment
- Working with health services to improve pathways of referral, particularly urgent elective referrals
- Continued work with health colleagues to improve time from first seen to treatment of colorectal cancer
- Further work to understand routes of diagnosis and pathways to treatment for stomach and oral cancers to better understand the cause of high mortality for these conditions.

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