Public Health England

Protecting and improving the nation's health

Cancer in the West Midlands

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

Corporate member of
Plain English Campaign
Committed to clearer
communication
339

SUSTAINABLE DEVELOPMENT GOALS

Contents

Executive summary

This report has been produced by Public Health England to help inform discussions across the West Midlands regarding cancer. We anticipate that it will be used by both commissioners of health services to enable more timely diagnosis and improve treatment pathways but also by local authority commissioners in terms of the wider prevention agenda.

At 600 cases per 100,000 population, cancer incidence in the West Midlands is significantly lower than the England rate of 609 per 100,000. However, the cancer mortality rate in the West Midlands is significantly higher than for England.

The data also show that cancer prevalence – the number of people living with and beyond their cancer – is growing and will continue to grow over the coming years. It is estimated that by 2030 there will be as many as 135,000 people living in the West Midlands living with and beyond cancer. This is due to a number of factors, including rising incidence related to our ageing population, but also higher rates of early diagnosis and better treatments. This is in many ways a story of success. However, the gap in overall one-year cancer survival rates between the least and most deprived quintiles in the West Midlands increased between 2005 and 2014.

Action to tackle the lifestyle-related risk factors for cancer including smoking, higher levels of alcohol use, being overweight or obese and physical inactivity is crucial. Moreover it is important to consider the correlation between population groups where these behaviours are more prevalent, and where there may be poorer screening uptake, poorer levels of symptom awareness and higher levels of deprivation.

There remains, though, significant variation in both cancer incidence and mortality rates. Being diagnosed at the earliest possible stage is critical to overall outcomes and further steps to improve patient outcomes are achievable. Some examples of behavioural change to help meet this goal include further improving screening uptake (which varies significantly at CCG and GP practice level), increasing symptom awareness among the general population and stimulating help-seeking action.

Introduction

Cancer is a heterogeneous group of diseases which can arise in any part of the body and is one of the leading causes of mortality in the UK, accounting for over 1 in 4 deaths annually[1]. After circulatory related conditions, cancer is the leading cause of death in England and Wales in those aged 75 years and over.[2] In 2014, almost 357,000 people were diagnosed with cancer in the UK, and there were over 163,000 deaths from the disease.

The most common types of cancer are breast, prostate, lung and bowel which collectively account for over half of cancer diagnoses in the UK. The peak rate of cancer arises in those aged 85 years and over. As cancer is a disease of the elderly, and people are generally living longer, by 2030, over 430,000 people are predicted to be diagnosed with cancer in the UK.[3]

Risk factors associated with an increased risk of cancer diagnosis include tobacco, obesity, poor diet, lack of physical activity and alcohol consumption. Tobacco use has been identified as the leading cause of cancer deaths. Recent research suggests that over 40% of new cancer diagnoses are preventable.[4] (See Appendix A for the Public Health Outcomes Framework definition of preventable cancers).

With around 31,000 cancers diagnosed annually in the West Midlands, approximately 12,400 could be prevented. With an average cost of cancer to the NHS of around £30,000 per patient per year[5], across the West Midlands £3,000,000,000 could be saved through tackling the risks associated with cancer, and thus preventing cancer diagnoses. In fact, during the period 2013-15, in the under-75s only, there were 20,600 deaths from cancer across the West Midlands, of which nearly 12,000 (58%) were considered preventable.[6]

As well as the costs associated with cancer treatment, a cancer diagnosis also has a direct financial impact on the individuals. Recent research estimates that four in five people with a cancer diagnosis are around £570 worse off on average due to decreased income and increased costs.[7] This impact varies enormously with age, type and stage of cancer and socio-economic status.

The aim of this report is to equip care providers and policy makers with an insight into the burden of cancer, as well as providing an overview of the extent of the identified risk factors, across the West Midlands population.

The most recent published data available at the time of writing on each subject area has been used, by searching through regularly used datasets. All data sources and the periods to which they relate are labelled throughout the document.

West Midlands demographics

Cancer is a disease of the elderly and is also attributable to several underlying lifestyle factors. This chapter describes the population characteristics of the West Midlands population to gain an insight into the age and ethnic distributions, as well as levels of deprivation.

The West Midlands general population

In 2015, the population of the West Midlands was around 5.8 million, with an average annual population growth of around 0.6% since 2001. In the same year, there were approximately 1,000,000 people in the West Midlands aged 65 and over, accounting for 18% of the West Midlands population, whereas this age category accounted for around 16% of the West Midlands population in 2001.

In 2015 50.5% of the West Midlands population were female, and 49.5% were male. The population gender distribution was very similar across all age groups with the exception of the older age categories aged 70 and over (Figure 1). Coventry was the only local authority (LA) in which there is slightly more males than females in the population; 49.6% females and 50.4% males. Across the West Midlands, the age stratification varied between local authorities; more than 20% of the population of Solihull, Worcestershire, Herefordshire, Shropshire, Staffordshire and Warwickshire were aged over 65 years, compared to the West Midlands average of 18%. Birmingham and Sandwell had populations where more than 20% were aged 0-14 years, compared to the West Midlands average of 18%.

**Figure 1: Age and sex composition of the West Midlands population, 2015**
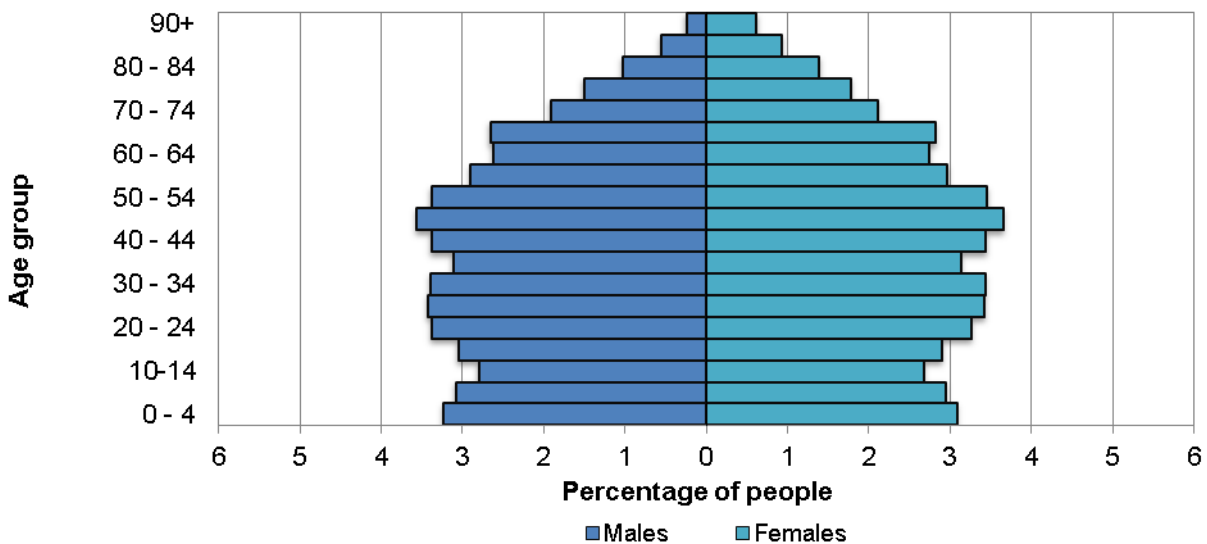
Source: ONS, analysis LKIS (WM)

The West Midlands ethnic population

Considering the broad ethnic groupings of White, Mixed, Asian or Asian British, Black or Black British, Chinese, and Other Ethnic group, White is the most common ethnicity across England (2011 census). In the West Midlands, 83% of the population are White, ranging from 58% in Birmingham to 98% in Herefordshire. In all of the local authorities, Asian or Asian British is the most common ethnic minority group (Figure 2). As White ethnicity is the most common category in all local authorities, the data for this group are suppressed in Figure 2 so more detail can be shown for smaller ethnic populations.

Figure 2: Ethnic composition of the West Midlands population, 2011
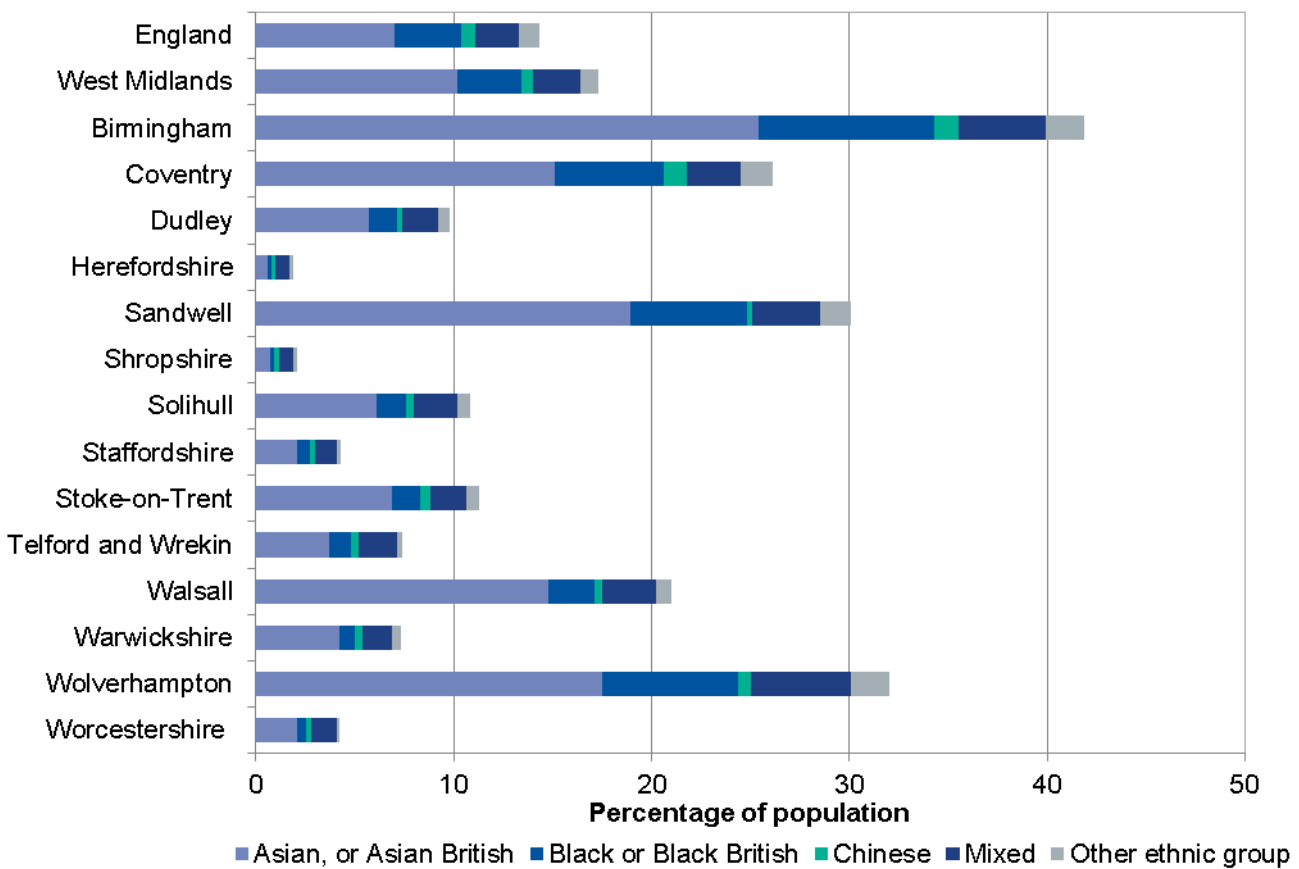
Source: ONS, analysis LKIS (WM)

In 2015, the West Midlands had a higher proportion of its population living in areas in the most deprived quintile (29%) compared to the England average (20%). Birmingham had the highest proportion of its population living in some of the most deprived neighbourhoods in England, where 57% of the population are resident in areas in the most deprived quintile. Sandwell, Stoke-on-Trent, Walsall and Wolverhampton also all have very high proportions of their population living in the most deprived areas of England (56%, 53%, 49% and 54% respectively). Levels of deprivation are much lower

in the rural counties of Herefordshire (8%), Shropshire (5%), Staffordshire (9%), Warwickshire (5%), and Worcestershire (13%) (Figure 3 and Figure 4).
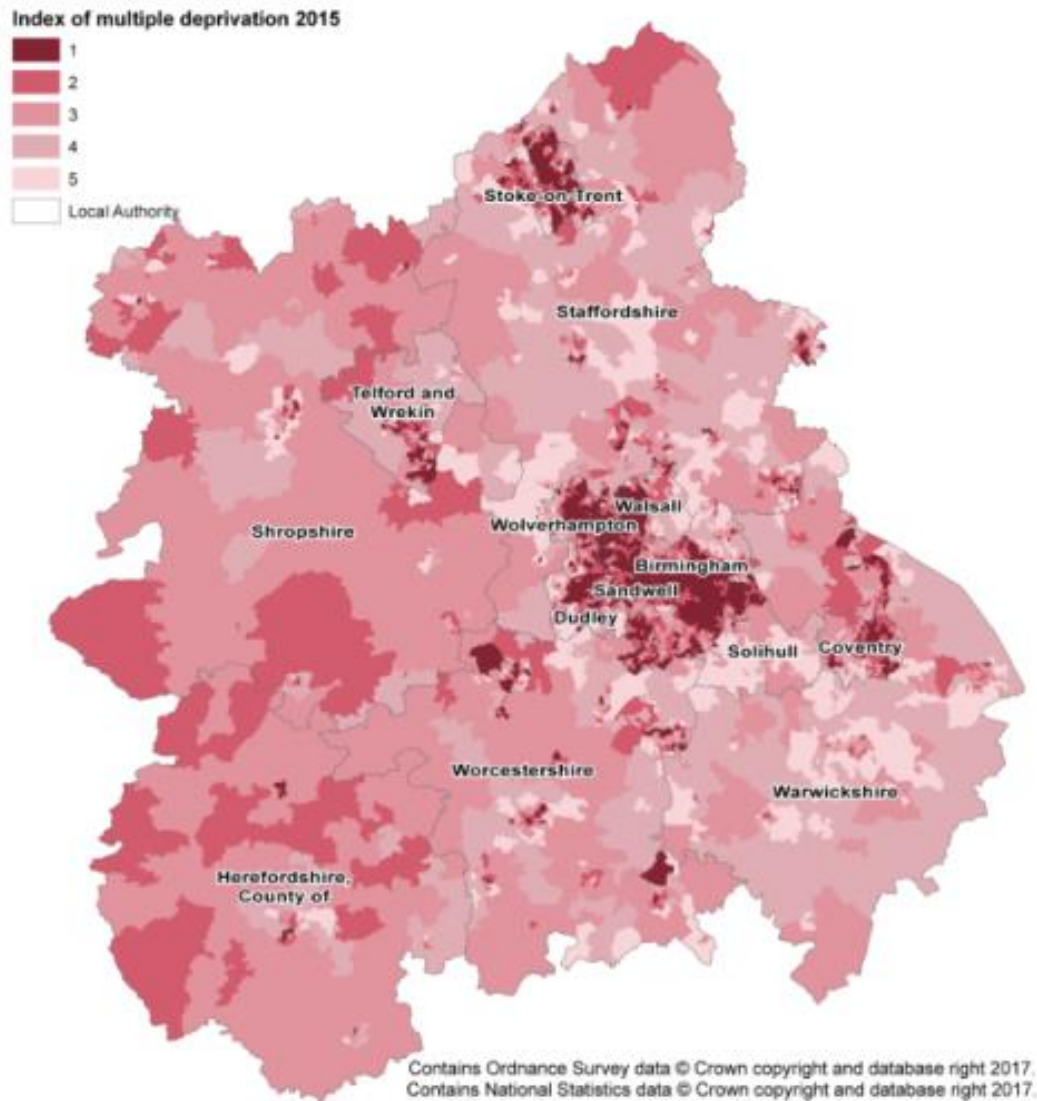
Figure 3: Deprivation composition of the West Midlands, 2015, IMD 2015
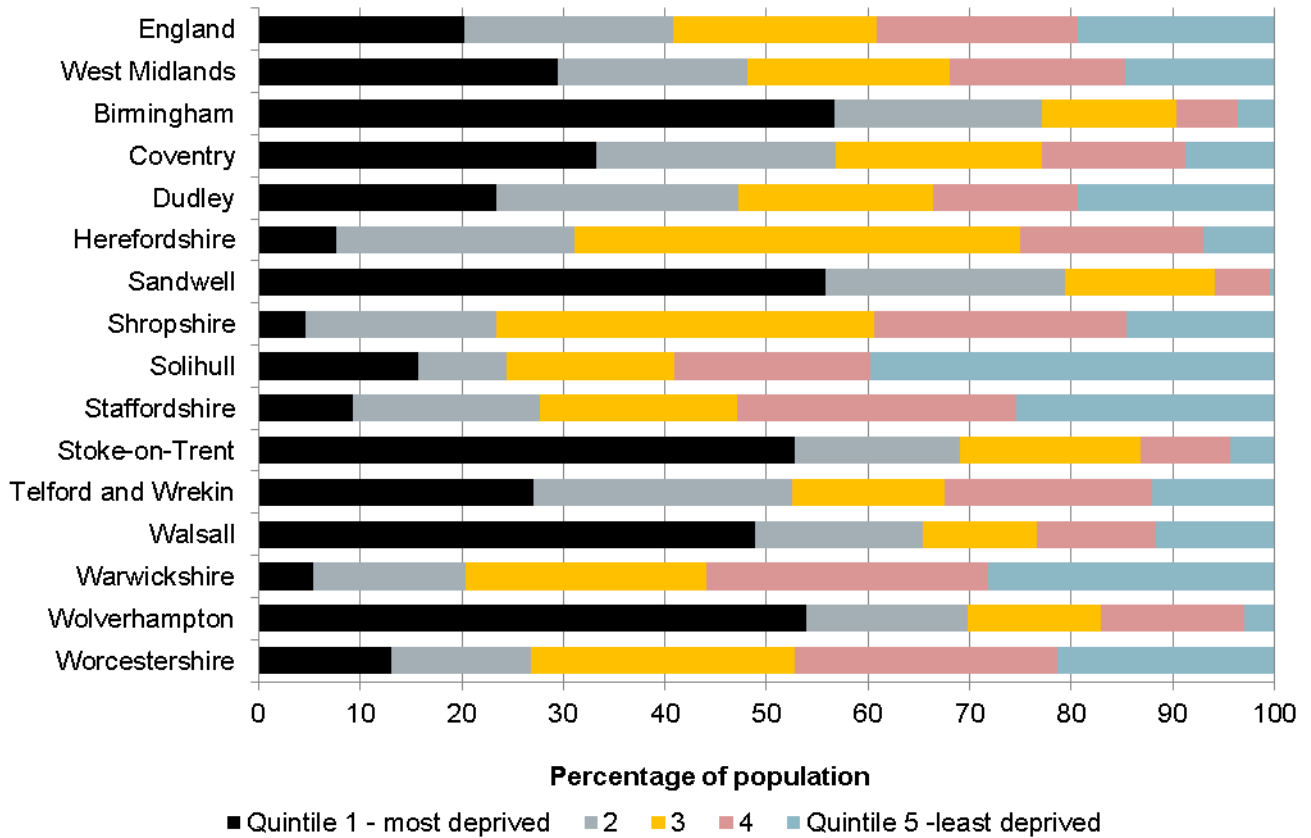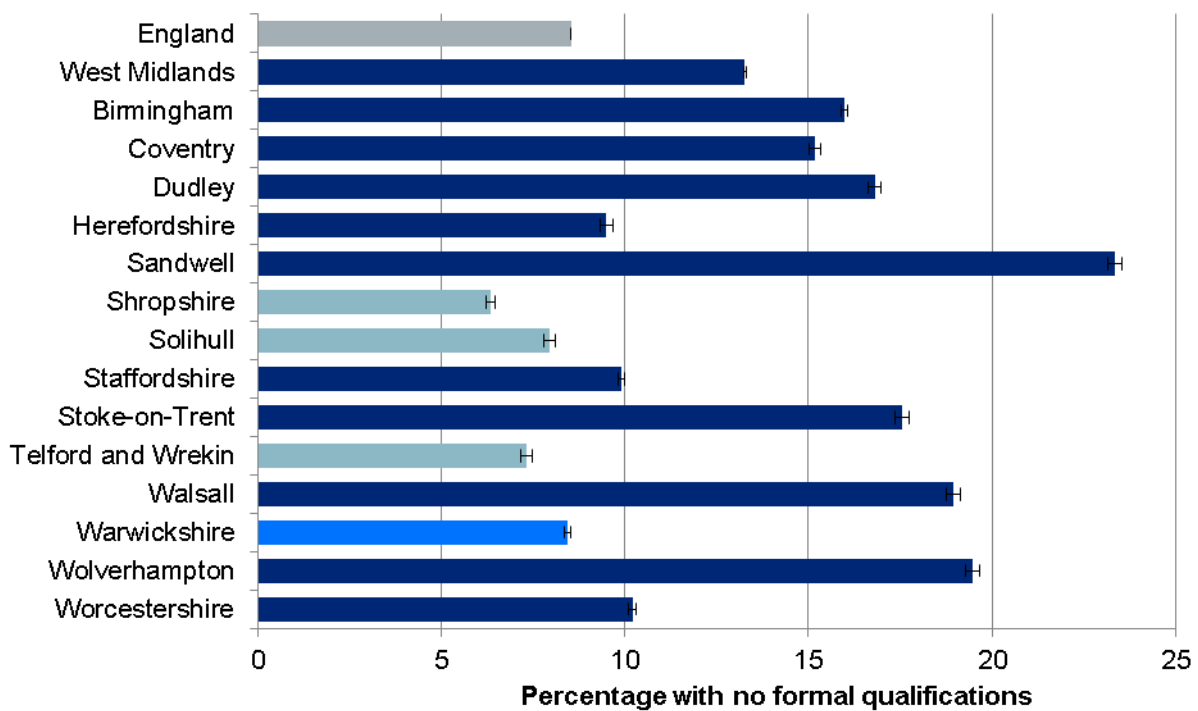
Source: ONS, analysis LKIS (WM)

Figure 4: Deprivation quintiles of the West Midlands population, 2015, IMD 2015

Education in the West Midlands

With regards to the current working age population in the West Midlands (aged 16-64 years), 13% do not have any formal qualifications, significantly higher than the England average. However, these statistics vary considerably across the local authorities, from 6% in Shropshire, to 23% in Sandwell (Figure 5).[8]

Figure 5: Proportion of West Midlands working age population without formal qualifications (2015)

Source: ONS, analysis LKIS (WM)

The general health of the West Midlands population

On the whole, healthy life expectancy at birth in the West Midlands is significantly lower than the England average for both males (62.4 years, 63.4 years for England) and females (63.2 years, 64.1 years for England). There is significant variation in healthy life expectancy across the West Midlands with a range of 56.4 years in Wolverhampton to 68.0 years in Warwickshire for males, and 58.5 years in Telford and Wrekin to 68.2 years in Herefordshire for females (2013-15 data).[9]

Cancer incidence and mortality

In 2014 there were 31,260 new cancers diagnosed in the West Midlands, and 7,950 deaths from cancer (all cancers excluding non-melanoma skin cancer). Over the past 10 years incidence of all cancers has increased significantly, both in the West Midlands and England as a whole. Nearly two thirds of cancer diagnoses occur in the over 65's and one third in people aged 75 and over.[10]

In 2014 there were estimated to be nearly 89,000 people in the West Midlands either living with cancer, or beyond their diagnosis and treatment for cancer (prevalence). The number of people living with and beyond cancer is estimated to increase significantly over the next 20 years, partly because of the ageing population and increasing incidence, but also because of increasing survival from cancer. By 2030 it is estimated there will be as many as 135,000 people in the West Midlands living with and beyond cancer[a] (Figure 6).

Figure 6: Forecasts of the number of people alive after being diagnosed with invasive cancer (excluding non-melanoma skin cancer) in the preceding 5 years, West Midlands, 2005-2030
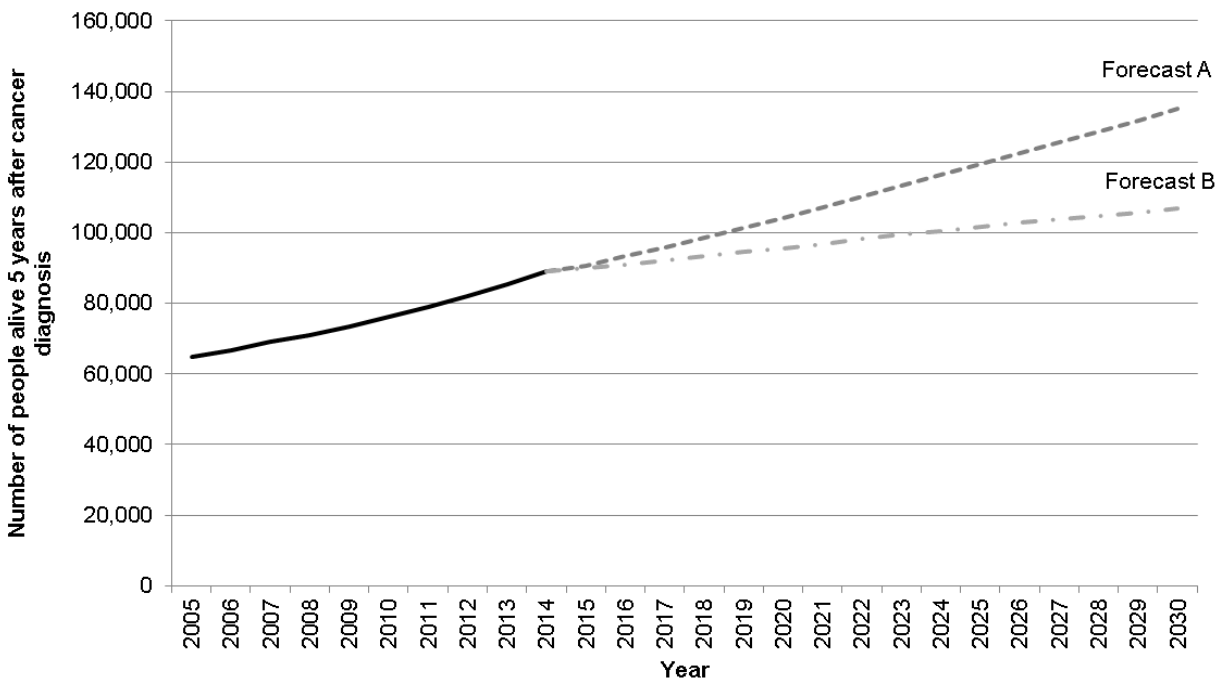
Source: The Strategy Unit, NHS Midlands and Lancashire Commissioning and Support Unit

---

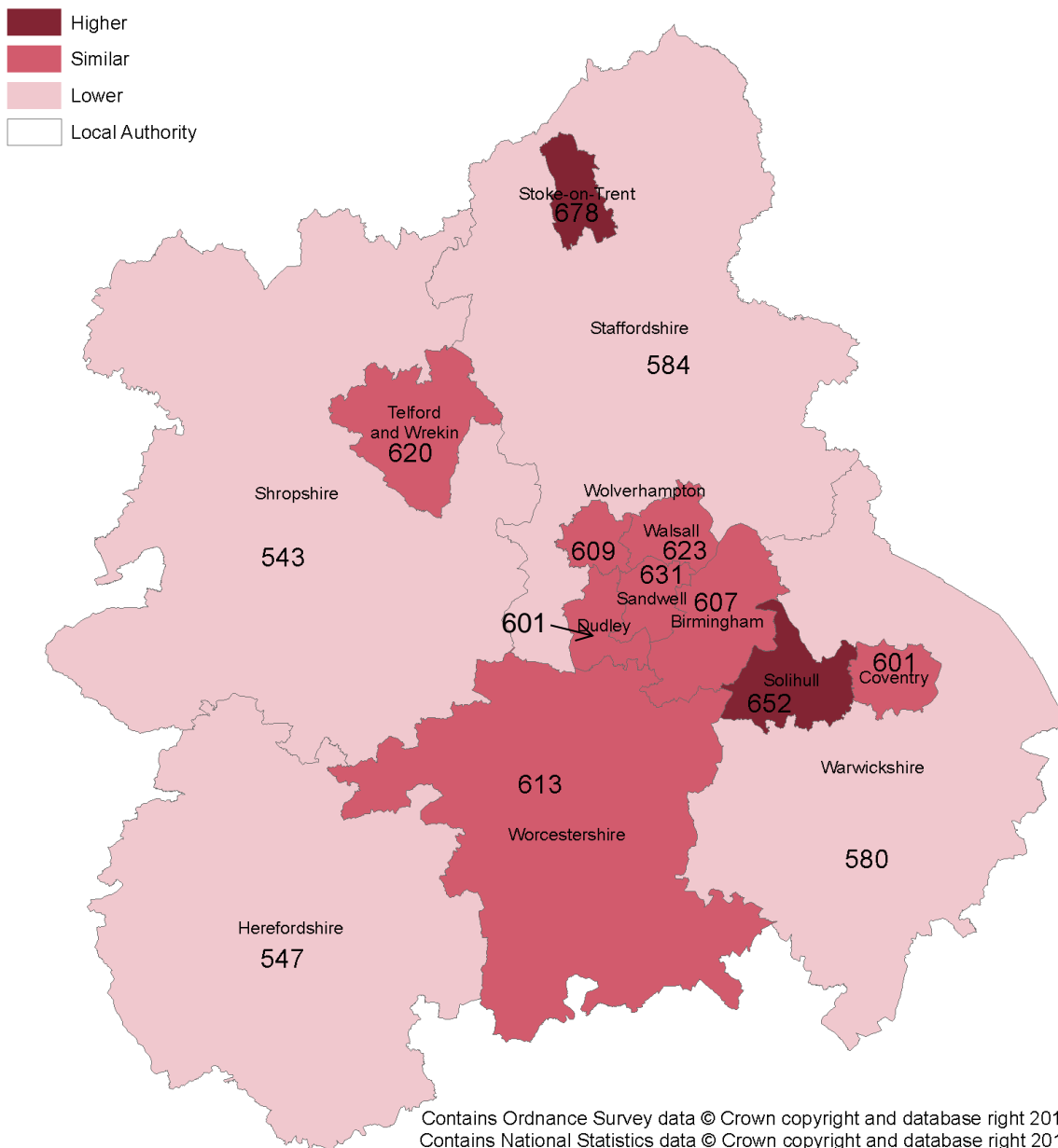[a]**Scenario A**: assumes people will continue to get and survive cancer at increasing rates in line with recent trends (except for prostate cancer), and the general population will continue to grow and age.

Scenario B: assumes people will continue to get cancer at the rate they do today, and that survival rates will remain as they are. The estimates are therefore driven by a growing and ageing population only.

The rate of cancer incidence in the West Midlands in 2014 was significantly lower than the England average at 600 new cancers per 100,000 population compared to 609 per 100,000 in England as a whole.

There is significant variation in the rate of incidence of all new cancer cases by local authority within the West Midlands from 543 cases per 100,000 population in Shropshire to 678 per 100,000 in Stoke-on-Trent (Figure 7). Stoke-on-Trent and Solihull both have significantly higher age-standardised incidence rates than England. Conversely the largely rural authorities of Herefordshire, Shropshire, Staffordshire and Warwickshire have significantly lower age-standardised incidence rates than England.

Figure 7: Age-standardised incidence rates per 100,000 population for all invasive cancers (excluding non-melanoma skin cancer) in the West Midlands local authorities, benchmarked against the England average (2014)
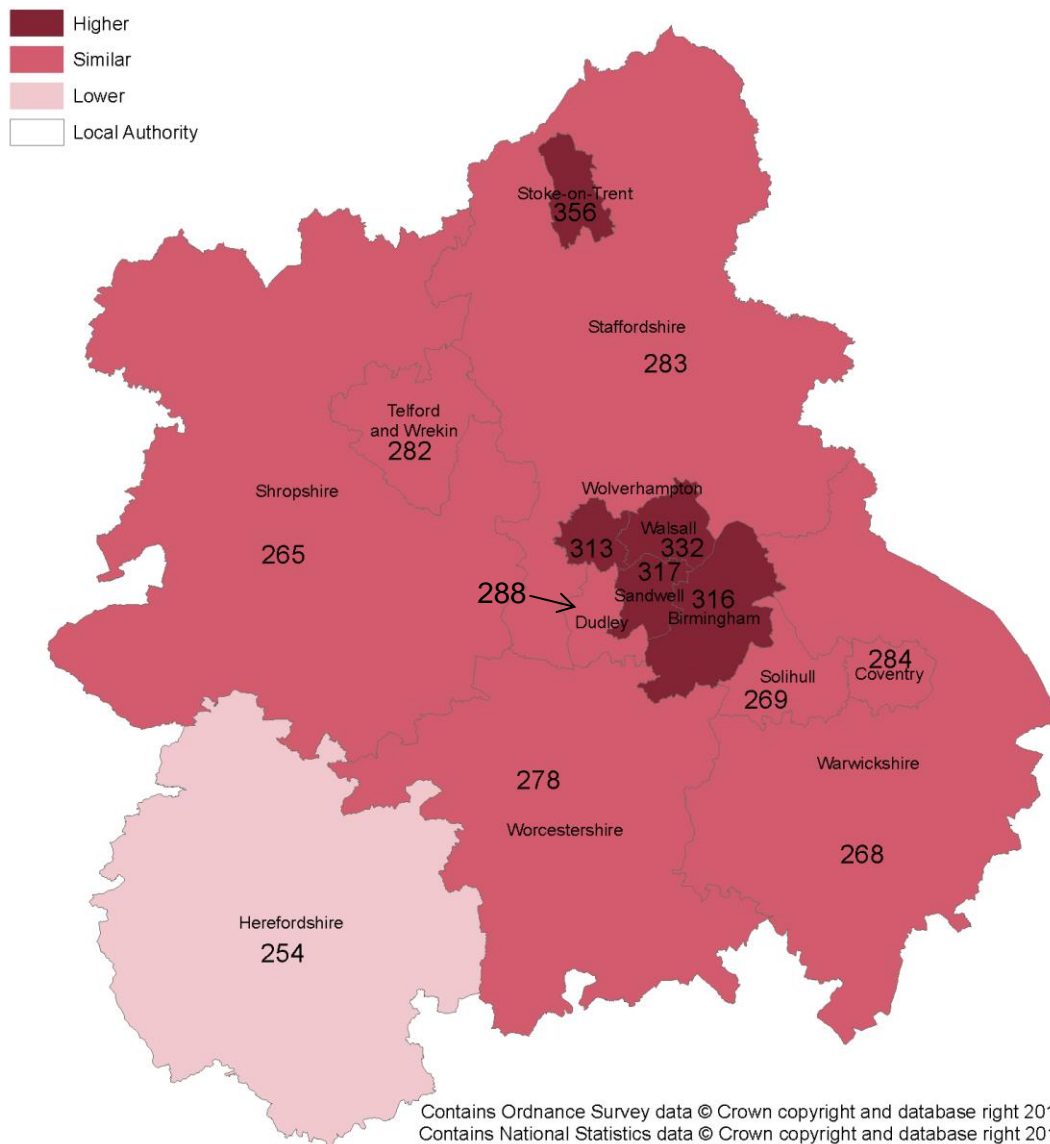

Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.

Source: National Cancer Registration Service, analysis LKIS (WM) and NCRAS

Over the last 10 years, in line with England, the mortality rate from cancer has decreased significantly in the West Midlands. However, the rate in 2014 was 291 deaths per 100,000 population, which is significantly higher than the rate for England, at 281 deaths per 100,000 population (Figure 8). Therefore, although the West Midlands all-cancer incidence rate is significantly lower than for England, the mortality rates are significantly higher.

There is also substantial variation in mortality rates within the region from 254 deaths per 100,000 population in Herefordshire to 356 deaths per 100,000 population in Stoke-on-Trent.

Figure 8: Age-standardised mortality rates (per 100,000 population) for all cancers in the West Midlands local authorities, benchmarked against the England average (2014)


Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.

Source: National Cancer Registration Service, analysis LKIS (WM) and NCRAS

13

Age-standardised mortality rates for all cancers were significantly higher than the England average in 5 of the 14 West Midlands local authorities: Birmingham (316 per 100,000 population), Sandwell (317), Stoke-on-Trent (356), Walsall (332) and Wolverhampton (313). Only Herefordshire had a significantly lower age-standardised mortality rate than England.

For women the greatest number of new cancer diagnoses were breast cancer, and for men, prostate cancer. However, the greatest number of deaths for both sexes was for lung cancer despite having fewer cases. Colorectal cancer was the third in terms of both new cases and deaths for men and women (Figure 9).

Figure 9: Number of new cases and deaths from cancer, West Midlands (2014)
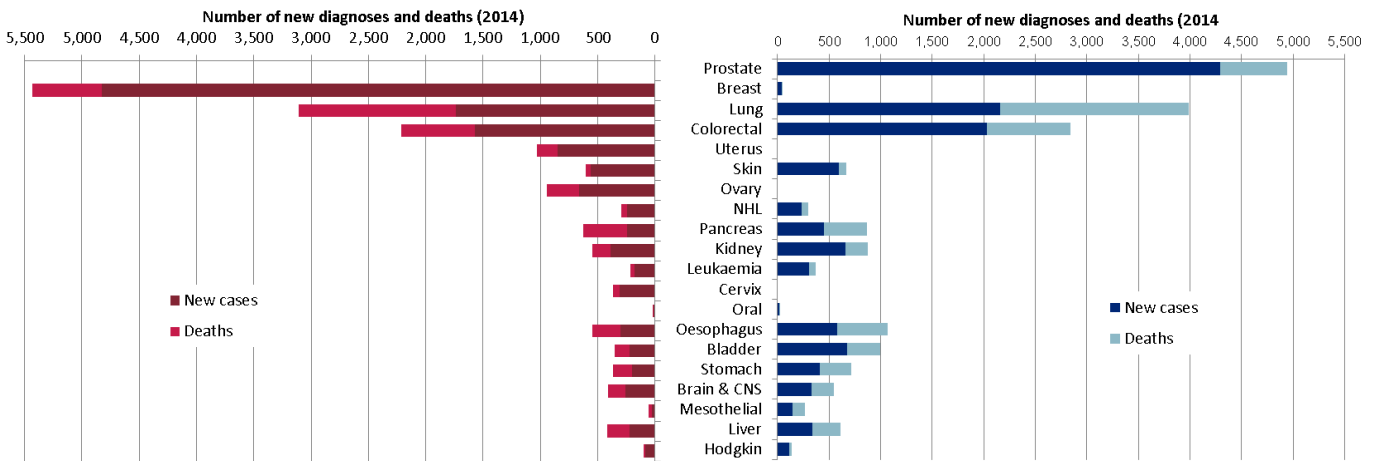
Source: National Cancer Registration Service, analysis LKIS (WM) and NCRAS

Although relatively less common, pancreatic cancer had the highest ratio of deaths compared to diagnoses: in 2014 in the West Midlands, there were fewer new diagnoses of pancreatic cancer than deaths from the disease. This may be indicative of some combination of improved treatments, earlier diagnosis or a fall in the incidence rate for pancreatic cancer.

Incidence and mortality by deprivation

For some cancer types, incidence and mortality rates are strongly associated with the level of socio-economic deprivation experienced by that area[11]. The following analyses consider the cancer types where the relationship between incidence, or mortality, and deprivation is significant.

The incidence rates of prostate cancer, breast cancer, and skin cancer were significantly higher in the least deprived groups in the West Midlands compared to the most deprived groups. However, mortality rates from these cancers, for the least deprived, are not significantly higher (Figures 10 and 11). This means that those in the most deprived groups are more likely to die from their cancer than those in the least deprived groups for these cancers.

Lung, liver and stomach cancers have significantly higher incidence rates in the most deprived groups compared to the least deprived groups for both sexes, with the rates of lung cancer incidence in the most deprived groups being more than double those of the least deprived group. Oral and pancreatic cancers had significantly higher incidence in the most deprived males, and cervical cancer had a significantly higher incidence in the most deprived females (Figures 10 and 11). There were correspondingly high mortality rates in the most deprived groups for lung, liver, stomach, oral and cervical cancers. However, there were also significantly higher mortality rates in the most deprived groups compared to the least deprived for male colorectal and oesophageal cancers and female kidney cancer.

Figure 10: Incidence of cancer in the most deprived and least deprived groups by cancer type, males and females, West Midlands, 2012 to 2014

Source: National Cancer Registration Service, analysis LKIS (WM) and NCRAS

15
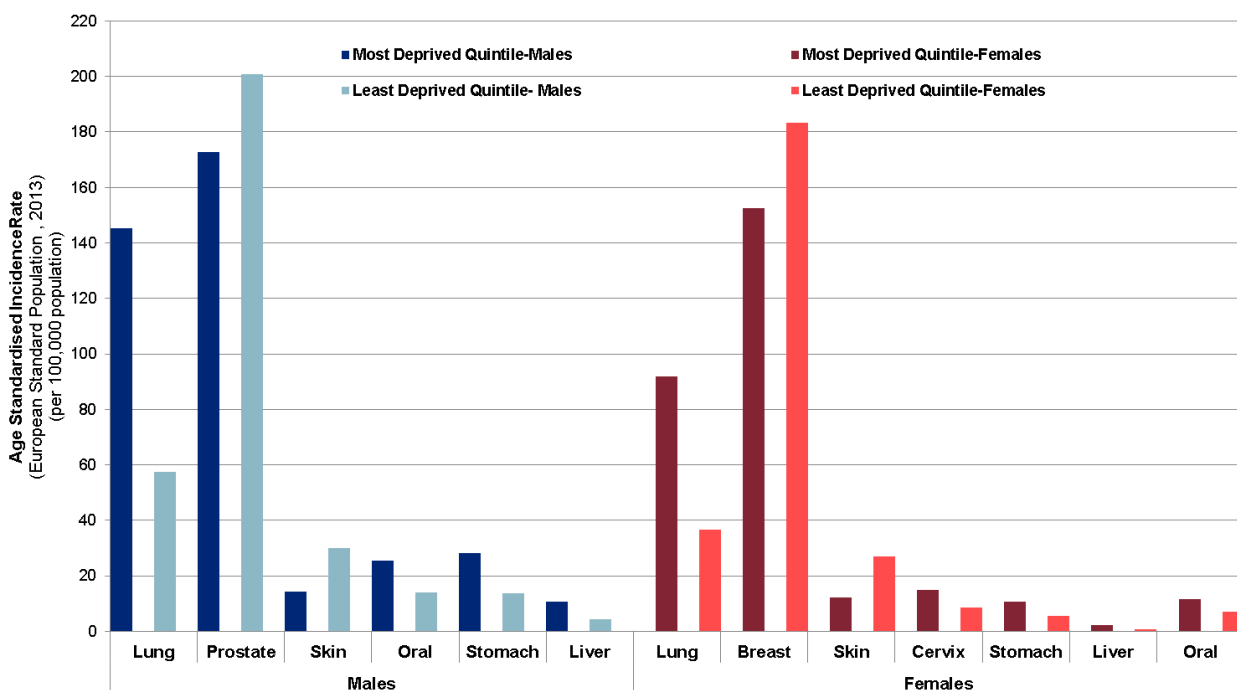
Figure 11: Mortality from cancer in the most deprived and least deprived groups by cancer type, males and females, West Midlands, 2012 to 2014
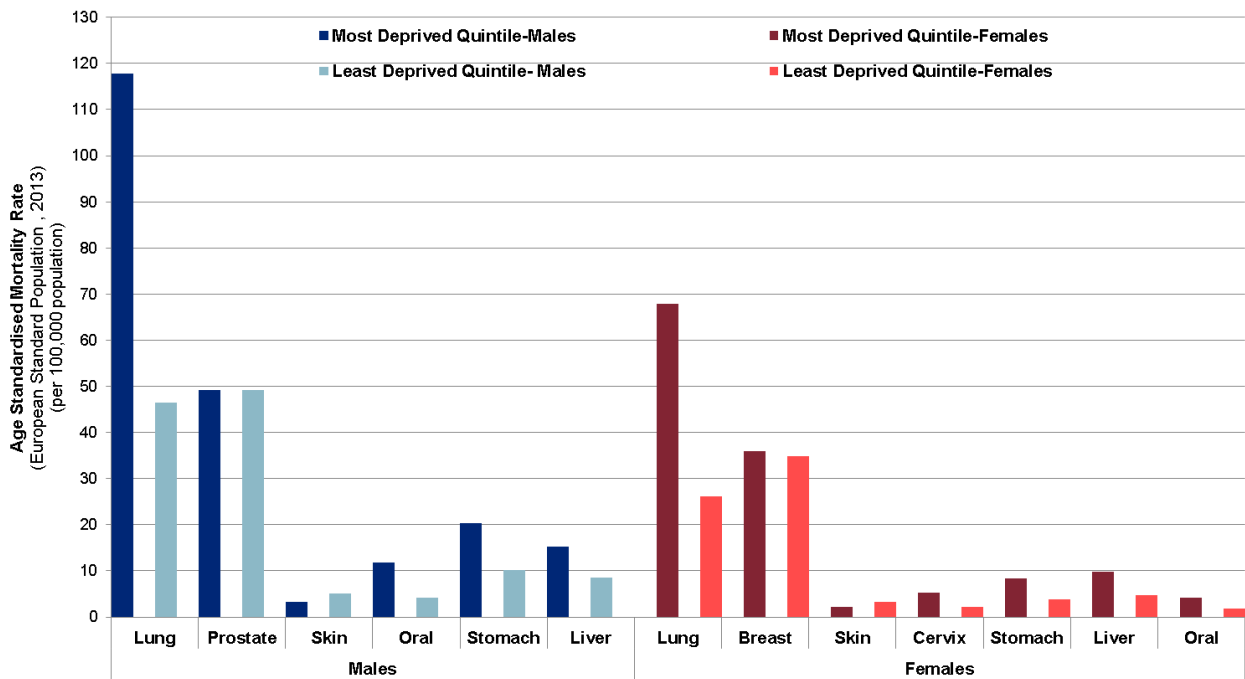
Cancers considered preventable

During the period 2013-15, in the West Midlands there were 12,000 cancer deaths in the under 75 age group which were considered preventable (see Appendix A for a list of cancers considered preventable). This equates to an age-standardised rate of 83 per 100,000 population, significantly higher than the England rate of 81 per 100,000. The mortality rate varied considerably from 65 per 100,000 in Herefordshire, to 105 per 100,000 in Stoke-on-Trent (Figure 12).

Figure 12: Under-75 mortality rate from cancers considered preventable, West Midlands local authorities, 2013-15
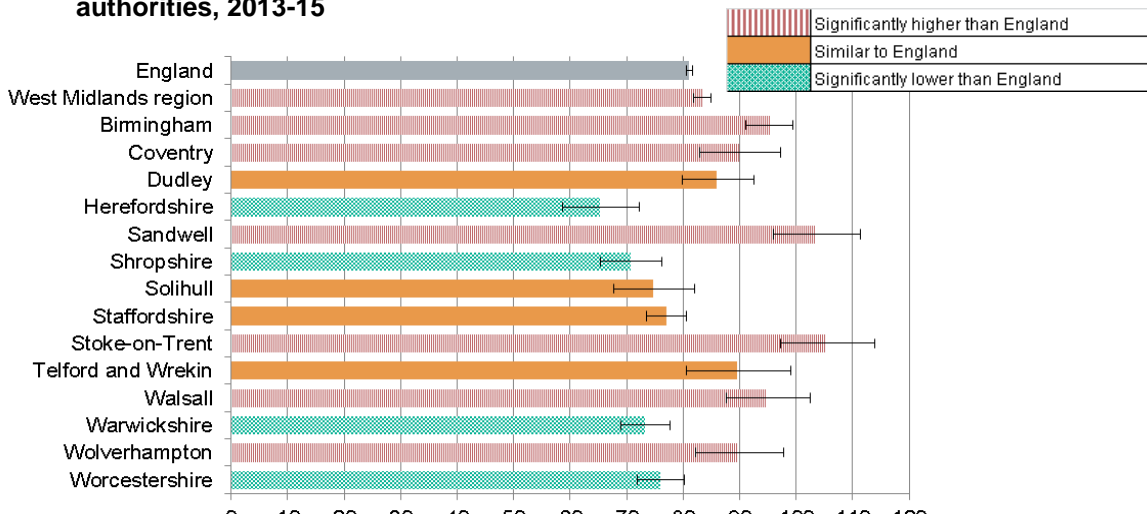
Stage at diagnosis

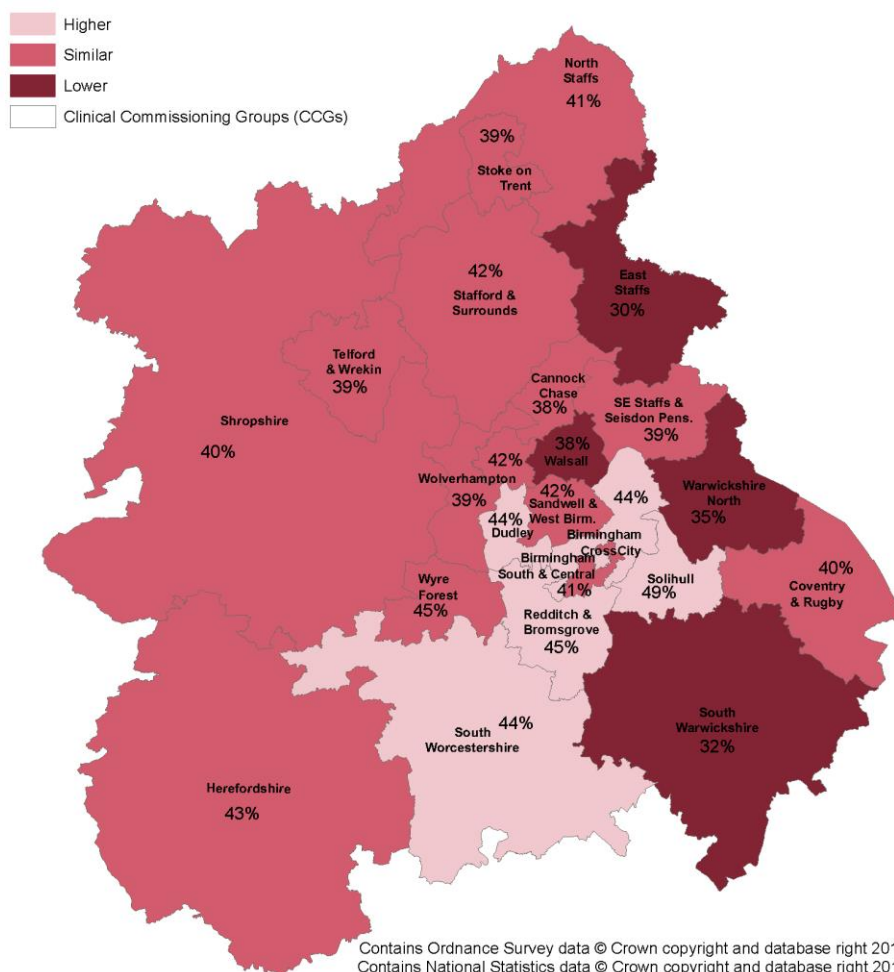The stage of a cancer is important as it helps to determine the treatments required and also indicates the severity of the disease at which a patient sought medical help. The cancer stage is constructed from three core components: the cancer size, whether the cancer has spread into local lymph nodes, and whether the cancer has spread to other (usually distant) organs in the body.[12]

In 2014, across the West Midlands, 41% of cancers were diagnosed at an early stage (stage 1 and 2) where the cancer is relatively small and has not spread to other parts of the body. However, 21% of the cancers diagnosed were stage 4 cancers, where the cancer has spread to other organs in the body.

In 2014, across the West Midlands Clinical Commissioning Groups (CCGs), around 40% of the cancers diagnosed were either stage 1 or 2. The West Midlands CCGs with the lowest proportions of cancer diagnosed at stages 1 and 2 were East Staffordshire (30%) and South Warwickshire (32%), and the highest in Solihull (49%) (Figure 13).

Figure 13: Proportion of cancer tumours diagnosed early (stages 1 & 2) in each of the West Midlands Clinical Commissioning Groups (2014)

Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.

17

However, at least 20% of cancers diagnosed were stage 4 – that is, where the cancer has spread to other distant parts of the body, with a range of 18% in Solihull to 43% in East Staffs (Figure 14).

Figure 14: Number and proportion of tumours diagnosed at stages 1 to 4, and unknown, for each West Midlands Clinical Commissioning Group, 2014
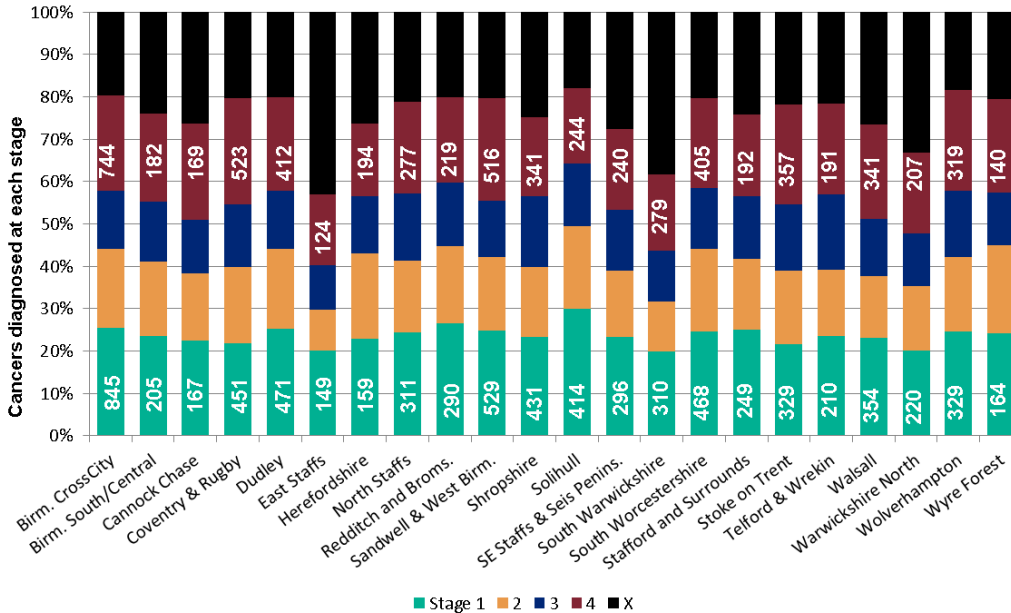
Across the West Midlands CCGs, 24% of the cancers did not have a stage recorded. This ranged from 18% in Solihull and Wolverhampton to 43% in East Staffordshire. Therefore, these statistics distort the true proportion of cancers diagnosed at each stage.

Figure 15: Number and proportion of tumours diagnosed at stages 1 to 4, and unknown, for each anatomical cancer location (West Midlands, 2014 cancer diagnoses)
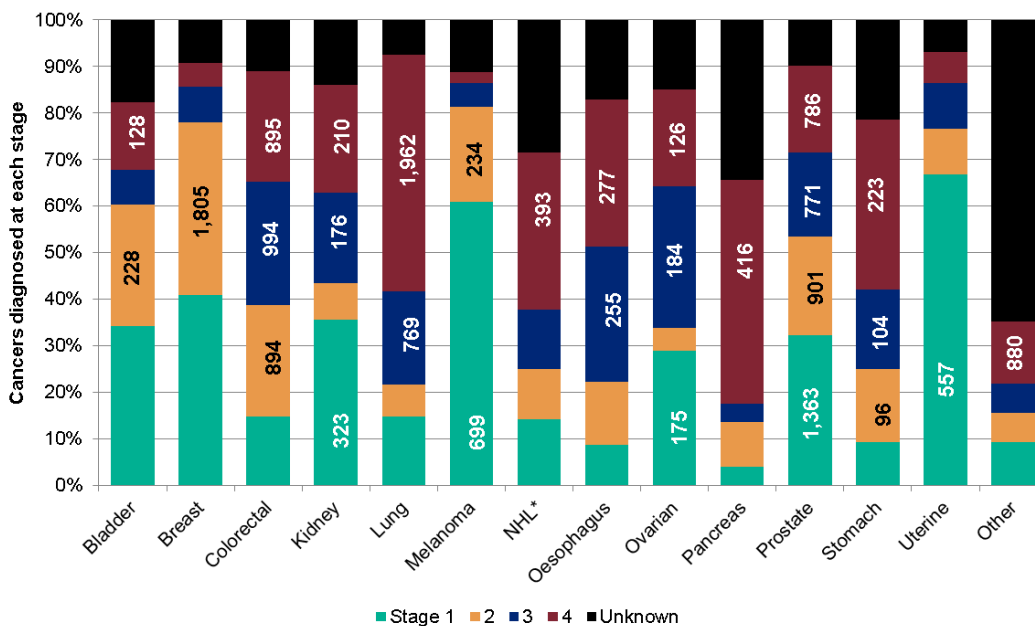
Source: National Cancer Analysis and Registration Service, analysis LKIS (WM)

*NHL: non-Hodgson lymphoma

Regarding the anatomical cancer site, cancers diagnosed at stage 4 ranged from 2% for melanoma, 48% for pancreatic cancer and 51% for lung cancer. Staging data was unknown for 34% of the pancreatic cancers (Figure 15).

Stage at diagnosis and deprivation

Across the West Midlands, there is a strong relationship between cancer stage at diagnosis and deprivation (Figure 16).

Figure 16: Proportion of tumours diagnosed at each stage within the West Midlands deprivation quintiles (2015)
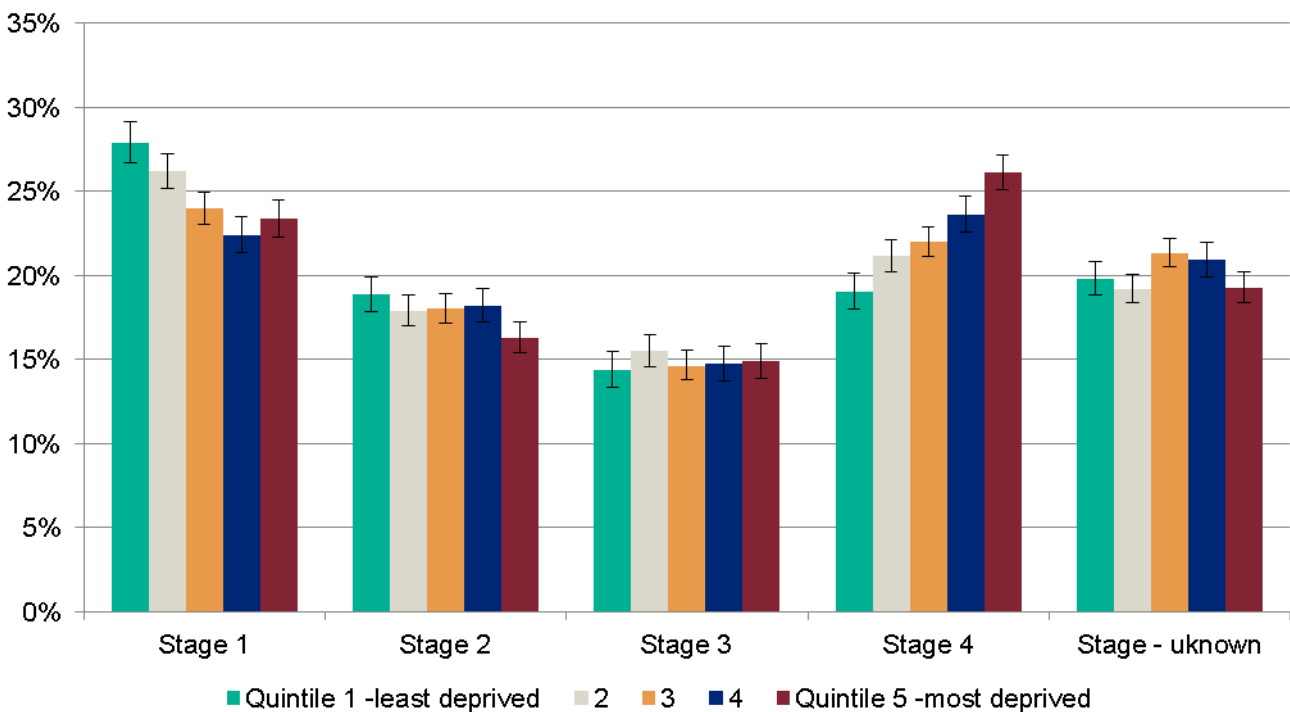
Source: National Cancer Analysis and Registration Service, analysis LKIS (WM)

Of those in the least deprived quintile, 47% of cancers diagnosed were stages 1 or 2, compared with 40% in the most deprived quintile. Conversely, 19% of cancers diagnosed in the least deprived were staged 4 compared with 26% in the most deprived. The proportion of cancers where the stage is not known was broadly consistent across all deprivation quintiles.

Survival

The overall one-year net survival rates for the most common types of cancer improved considerably between the periods 2003-2007 and 2010-2014.

However, of the most common types of cancer, lung cancer had by far the worst one-year and five-year net survival rates for both females and males. For females, between the five-year periods 2003-07 and 2010-14, there were marginal increases in one-year survival rates for breast, colorectal and lung cancers (Figure 17). The same pattern can be seen for males, although the survival rate for prostate cancer only had a marginal increase of 0.2% (Figure 18). The increases seen in lung and colorectal cancer one-year survival rates were statistically significant for both males and females.

Figure 17: Change in one-year net survival (between 2003-07 and 2010-14), one-year net survival (2010-14) and five-year net survival (2006-10) by cancer type for females in the West Midlands

Females	Breast		Colorectal		Lung	
Change in 1-year survival	↑1.0%		↑3.1%		↑7.5%	
1-year survival 2010-14		96%		77%		39%
5-year survival 2006-10		82%		56%		11%

Source: National Cancer Analysis and Registration Service, analysis LKIS (WM)

Figure 18: Change in one-year net survival (between 2003-07 and 2010-14), one-year net survival (2010-14), and five-year net survival (2006-10) by cancer type for males in the West Midlands

Males	Prostate		Colorectal		Lung	
Change in 1-year survival	↑0.2%		↑3.4%		↑6.0%	
1-year survival 2010-14		93%		79%		33%
5-year survival 2006-10		80%		56%		8%

Source: National Cancer Analysis and Registration Service, analysis LKIS (WM)

Across the West Midlands CCGs, 1-year survival rates for all cancers ranged from 65.7% for Sandwell and Birmingham, to 71.1% in South Warwickshire. The 1-year survival rates were significantly worse than the England average for 13 of the 22 West Midlands CCGs (Figure 19)[13].

Figure 19: One-year net survival rates (all cancers) in the West Midlands Clinical Commissioning Groups benchmarked against the England average, London School of Hygiene and Tropical Medicine, (2014 diagnoses), experimental statistics
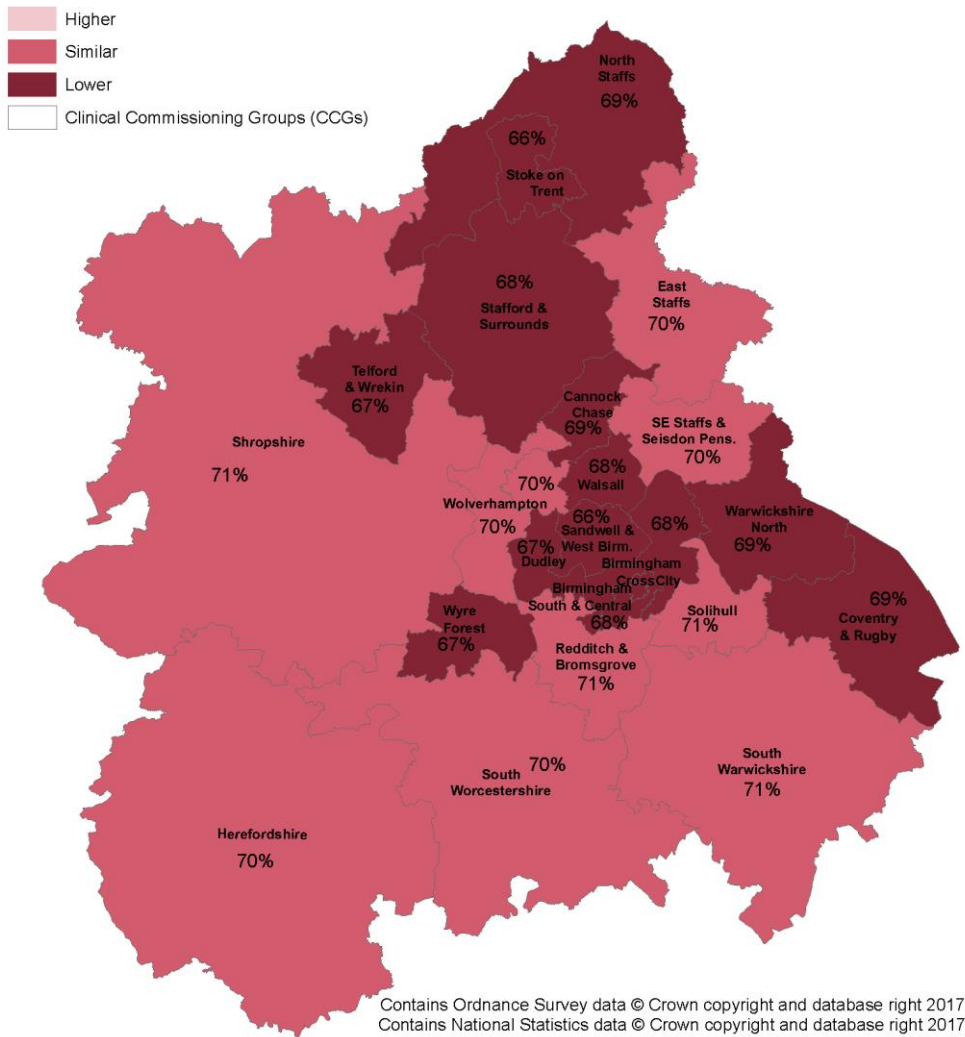
Source: London School of Hygiene and Tropical Medicine, analysis LKIS (WM)

There was significant variation across the region in the one-year survival for all three cancers:

Breast cancer ranged from 95.8% in Birmingham and Sandwell CCG to 97.9% in Shropshire CCG

Colorectal cancer ranged from 70.6% in Birmingham and Sandwell CCG to 80.4% in South Warwickshire CCG

Lung cancer ranged from 30% in South Worcestershire CCG to 39% in Birmingham South and Central CCG.

None of the areas had a one-year survival rate higher than observed for England (Figure 20).

Figure 20: West Midlands Clinical Commissioning Group one-year net survival rates benchmarked against the England average [breast, colorectal, lung; 2014 diagnoses, experimental statistics]

a) breast cancer b) colorectal cancer c) lung cancer
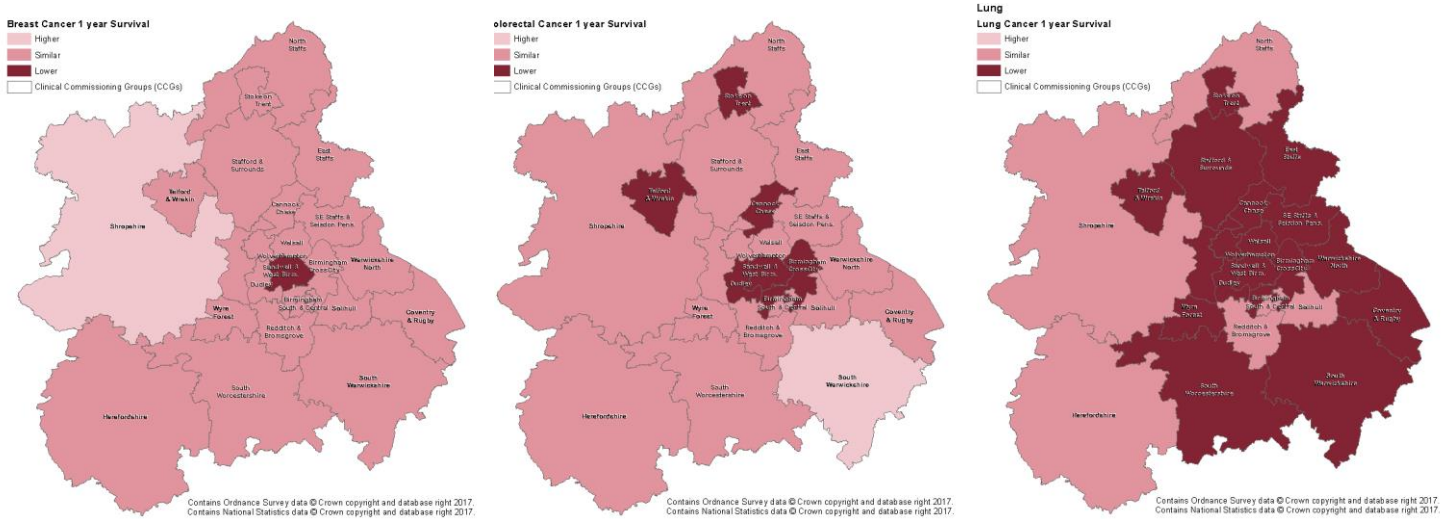
Source: London School of Hygiene and Tropical Medicine, analysis LKIS (WM)

Survival by deprivation

Across the West Midlands, there is also a strong relationship between cancer survival rates and deprivation (Figure 21).

Figure 21: One-year net survival rates at each deprivation quintile, ranging from 1 (least deprived) to 5 (most deprived) West Midlands (2014 diagnoses)
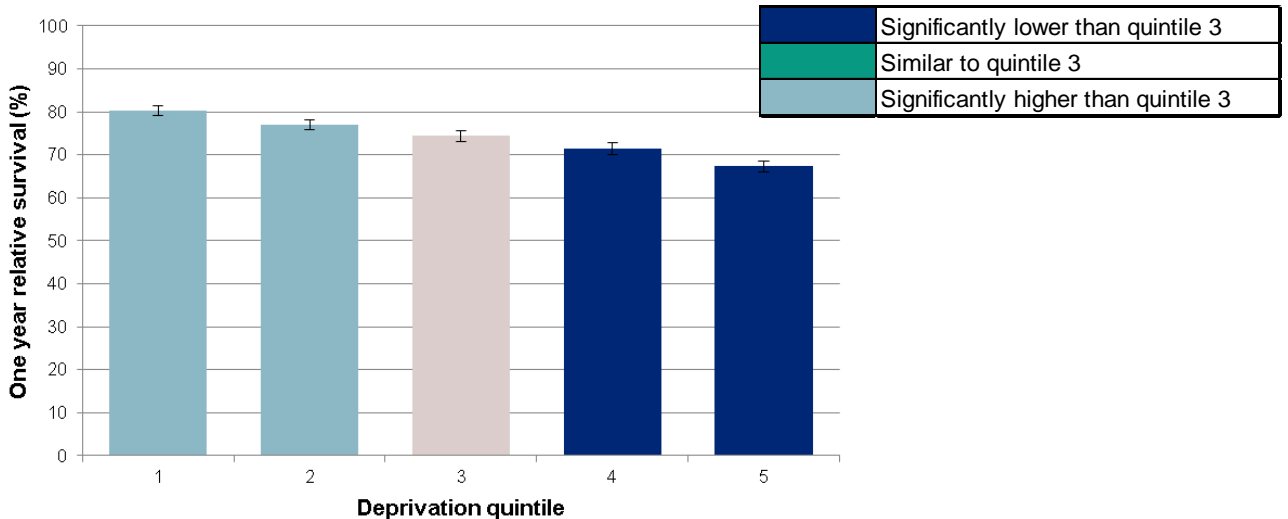
Source: National cancer registration service, analysis NCRAS and LKIS (WM)

The all-cancer one -year net survival rate was 80% in the least deprived quintile, and 77% in the second least deprived quintile. These are both significantly higher than for those in deprivation quintile 3. Conversely, compared to deprivation quintile 3, those in the two least deprived quintiles have significantly lower one-year net survival rates at 71% (deprivation quintile 4) and 67% (most deprived).

Figure 22: One-year net survival rates, least and most deprivation quintiles, West Midlands (2005-2014 diagnoses)

Over the ten-year period 2005-10 there was a marginal increase in the one-year net survival gap, from 10 years to 13 years, between the least and most deprivation quintiles in the West Midlands (Figure 22).

Lifestyle risk factors

Smoking

Smoking is by far the biggest preventable cause of cancer[14] and accounts for more than 1 in 4 UK cancer deaths and nearly 1 in 5 cancer diagnoses. Smoking causes more than 4 in 5 cases of lung cancer and increases the risk of 15 other types of cancer.

In 2014 in the West Midlands, nearly 1 in 4 people (17%) were estimated to smoke[15]; this is significantly lower than the England average (18%). Smoking rates are gradually decreasing in the West Midlands as they are nationally, although the rates in 2014 are not significantly different to those seen in 2010 (21%). There were significant differences of smoking rates across the West Midlands local authorities, ranging from 12% in Solihull to 19% in Wolverhampton (Figure 23).

Figure 23: West Midlands local authority smoking prevalence benchmarked against the England average (2015)

Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.
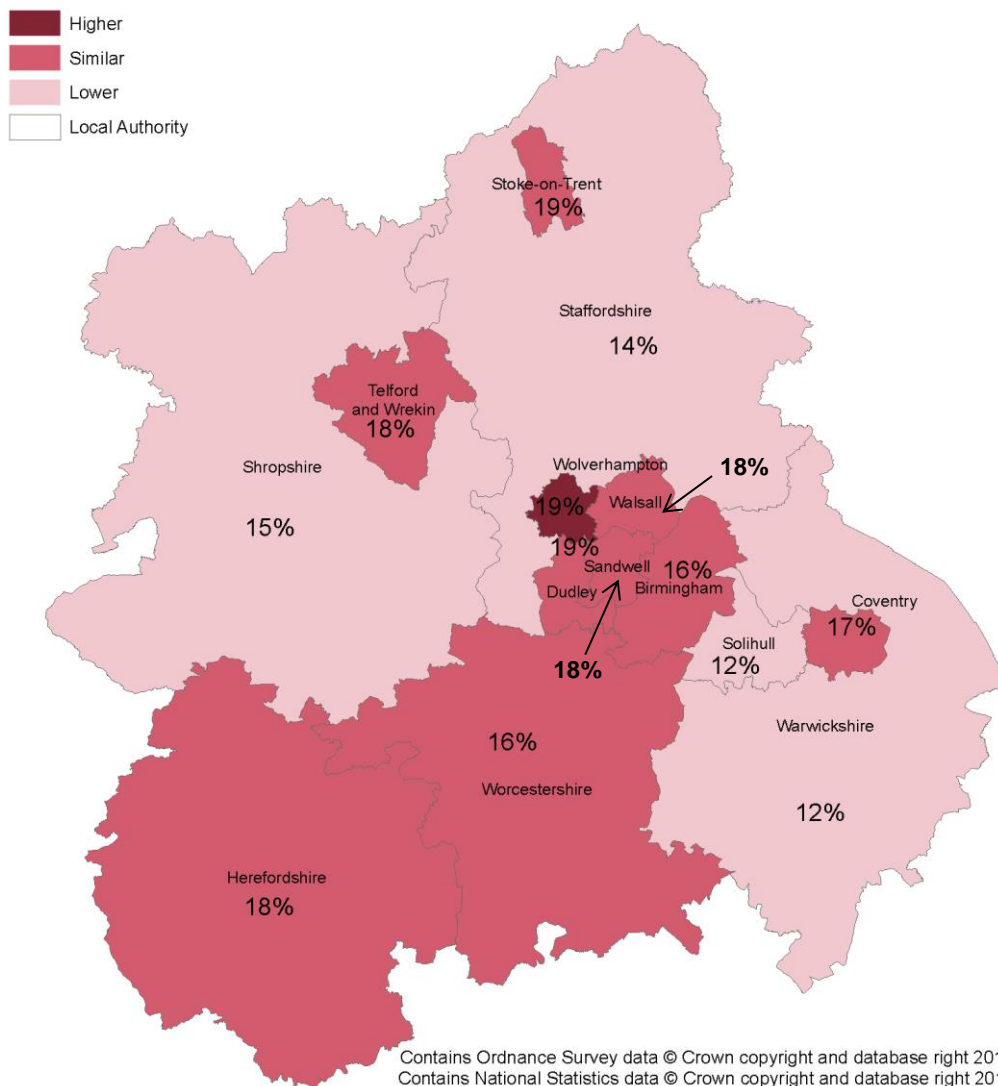
Source: annual population survey, analysis LKIS (WM)

Alcohol

Alcohol is one of the most well-established causes of cancer[4,16], yet awareness of this link among the general population has been found to be poor[17]. It has been classified as a Group 1 carcinogen since 1988[18]. Cancers of the mouth, oesophagus, colorectum, liver, larynx and breast have all been shown to be related to alcohol[19].

In 2014, the Health Survey for England[20] found that 22% of the West Midlands population aged 16 years and over were estimated to drink 21 units per week or more. This is above the recommended allowance of 14 units. Estimates of alcohol consumption are not currently available at a local level, although this information is expected in the near future.

In 2012-14 there were estimated to be over 6,000 alcohol related cancers in the West Midlands. Rates of alcohol related cancers have increased significantly since 2004-06 in the West Midlands, from 34.9 to 38.8 per 100,000 population, in line with England. There is variation in the rate of alcohol related cancers (persons) within the West Midlands with rates from 36 cancers per 100,000 population in Herefordshire compared to 43 per 100,000 in Stoke-on-Trent (Figure 24).

Figure 24: West Midlands local authority alcohol-related cancer incidence rate (per 100,000 population, 2012-2014)
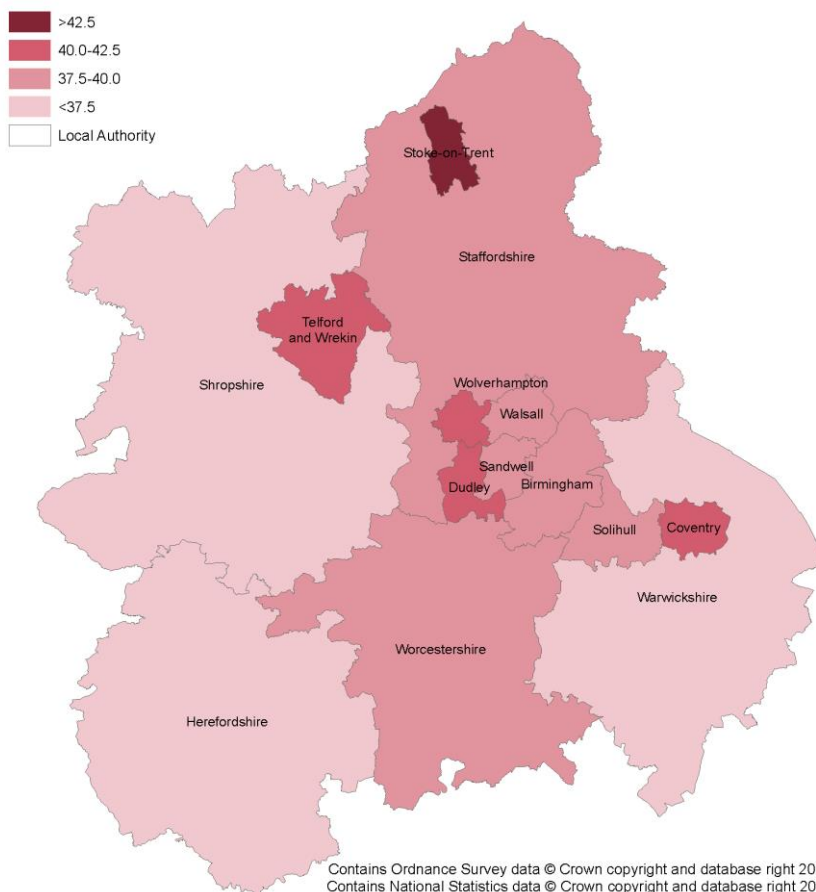
Source: health survey for England, analysis LKIS (WM)

Obesity

Obesity is defined as adults with a body mass index (BMI) greater than or equal to 25kg/m^2. It is thought that more than 1 in 20 cancers in the UK are linked to being overweight or obese[21]. Research has shown many types of cancer are more common in people who are overweight or obese. These include two of the most common types of cancer: breast and colorectal cancers and three of the most difficult to treat: pancreatic, oesophageal and gallbladder cancer.

In the West Midlands in 2012 to 2014 more than 3 in 5 adults (67%) are estimated to be overweight or obese[22], this is significantly higher than the England average (65%). Eight of the fourteen West Midlands local authorities had obesity rates significantly higher than the England average. The proportion of adults estimated to carry excess weight varied significantly across the region, from around 64% in Solihull to 71% in Telford and Wrekin (Figure 25).

Figure 25: Excess weight in adults (%), West Midlands local authorities benchmarked against the England average (2013-15)

Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.
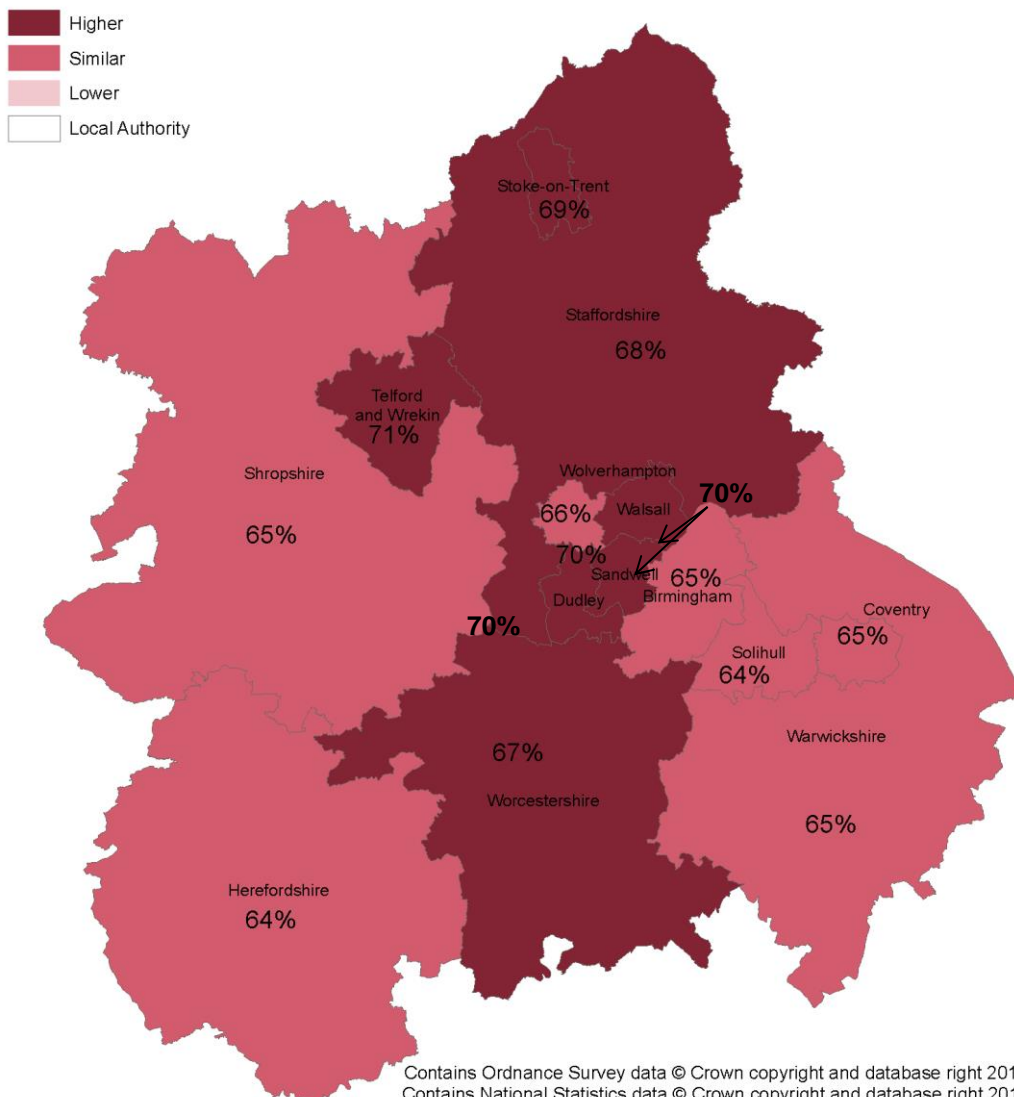
Source: active people survey, Sport England, analysis LKIS (WM)

Physical inactivity

Physical inactivity relates to the proportion of people (aged 16 years and over) who do less than 30 minutes of at least moderate intensity physical activity per week. In 'The European Health Report' in 2012[23] the World Health Organization estimated that eliminating physical inactivity would result in 22% to 33% fewer colon cancer diagnoses and 5% to 12% fewer breast cancer diagnoses.

Overall in the West Midlands almost 1 in 3 adults (31%) are estimated to be physically inactive[24]. The proportion of adults estimated to be physically inactive varies from 24% in Warwickshire to 37% in Sandwell. Six of the 14 West Midlands local authorities have physical inactivity levels significantly higher than the England average: Birmingham, Dudley, Sandwell, Stoke-on-Trent, Walsall and Wolverhampton (Figure 26).

Figure 26: Physically inactivity, West Midlands local authorities (2015), benchmarked against the England average

Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.
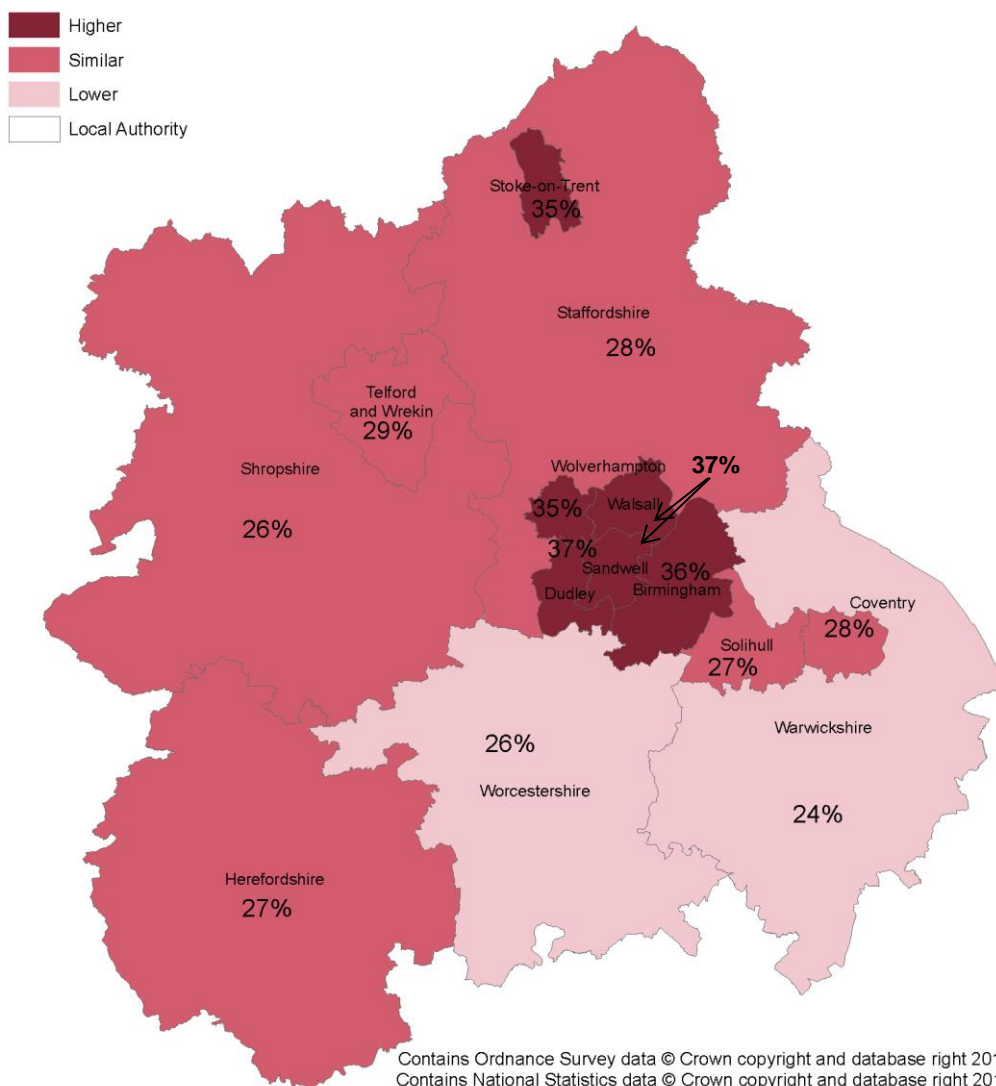
Source: active people survey, Sport England, analysis LKIS (WM)

Summary of outcomes and risk factors

The West Midlands cancer outcomes are quite closely associated with the corresponding risk factors (Figure 27). Where the West Midlands outcomes are significantly worse than for England, risk factors relating to education and excess weight also tend to be significantly worse than for England.

Figure 27: Summary West Midlands local authority cancer outcomes and risk factors (year and indicators provided)

Area	Outcomes			Risk factors				
	All cancers incidence rate (2014)	All cancers mortality rate (2014)	Alcohol related cancer incidence (2012-14)	Smoking prevalence in adults (2015)	GCSEs (5A*-C) (2014/15)	% excess weight in adults (2013-15)	No formal qualifications (2015)	Physical inactivity (2015)
West Midlands region								
Birmingham								
Coventry								
Dudley								
Herefordshire								
Sandwell								
Shropshire								
Solihull								
Staffordshire								
Stoke-on-Trent								
Telford and Wrekin								
Walsall								
Warwickshire								
Wolverhampton								
Worcestershire								

	Significantly better than England
	Similar to England
	Significantly worse than England

Screening uptake

In 2016, 72% of eligible women in the West Midlands had received cervical screening within the last three-and-a-half years or five years (dependant on age) and 72% of eligible women had received breast screening in the last three years. With regards to bowel screening, 57% of the eligible population had received bowel screening in the last two-and-a-half years. Screening coverage was significantly lower in the West Midlands than the England average for all three cancer screening programmes.[25]

The proportion of eligible women receiving their cervical screening within three-and-a-half and five years decreased by 3.5% between 2009/10 and 2015/16. This is in line with national trends.

Coverage of the bowel screening programme has improved by nearly 18% since 2009/10. However, this increase is partly due to the roll out of the bowel screening programme not being complete until the end of 2009 (Figure 28).

Figure 28: Screening uptake in East Midlands in 2015/16 and change in screening uptake 2009/10 to 2015/16[25]

	Cervical		Breast		Bowel	
Change in screening attendance	↓ -3.5%		↔ 0.0%		↑ 17.5%	
2015/16 screening coverage		72%		72%		57%

Source: Health and Social Care Information Centre/Public Health England, Sport England, analysis LKIS (WM)

Overall, 72% of women had been screened for breast cancer in the West Midlands in 2015/16 (three year coverage). There was significant variation in breast cancer screening coverage across the region from 66% in Birmingham South & Central, and Sandwell & West Birmingham to 78% in Shropshire, North Staffordshire and Redditch & Bromsgrove (Figure 29). Across the West Midlands, screening uptake was better than the national average in 8 of the 22 CCGs and worse in 9 of the CCGs. Data was not available for NHS Warwickshire North CCG.[25]

Figure 29: Females aged 50-70, screened for breast cancer in last 36 months (three-year coverage, %) West Midlands, 2015/16. Data benchmarked against England average [25]
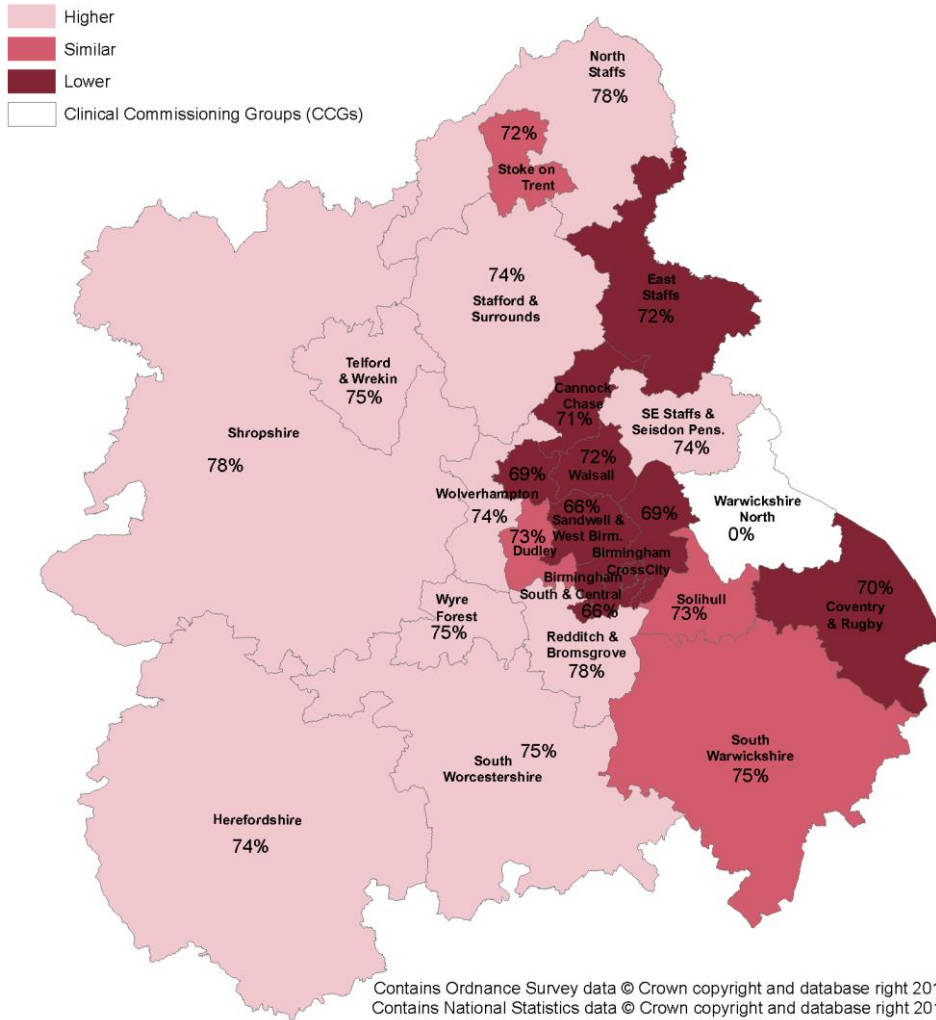
Source: Health and Social Care Information Centre/Public Health England, Sport England, analysis LKIS (WM)

A similar picture is seen for bowel screening coverage. Overall coverage for the West Midlands was 57%, but this varied significantly from 44% in Birmingham South & Central to 63% in South Warwickshire (Figure 30). Across the West Midlands, screening uptake was significantly higher than the national average of 58% in 11 of the CCGs and significantly worse in 8. [25]

Figure 30: Persons aged 60-69, screened for bowel cancer in last 30 months (2.5 year coverage, %), West Midlands, 2015/16. Data benchmarked against England average [25]
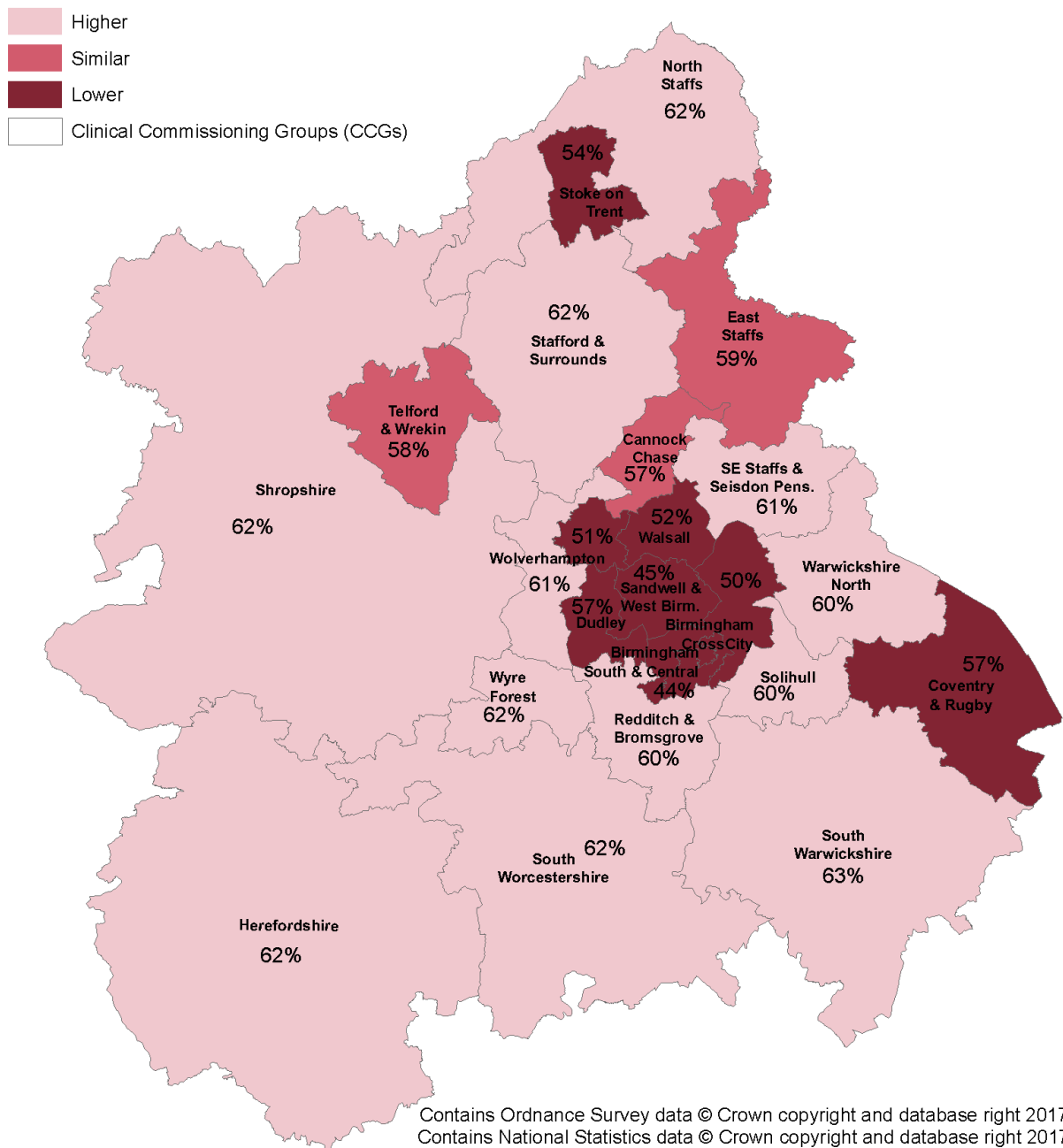
Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.

Source: Health and Social Care Information Centre/Public Health England, Sport England, analysis LKIS (WM)

There was also significant variation in terms of cervical cancer screening uptake. The average for the West Midlands is 72% and varies from 65% in Birmingham South & Central to 77% in Shropshire (Figure 31). Across the West Midlands, screening uptake was higher than the national average in 14 CCGs, and significantly worse in 8.17

Figure 31: Females aged 25-64, attending cervical screening within target period (3.5 or 5.5 year coverage, %), West Midlands, 2015/16 [25]
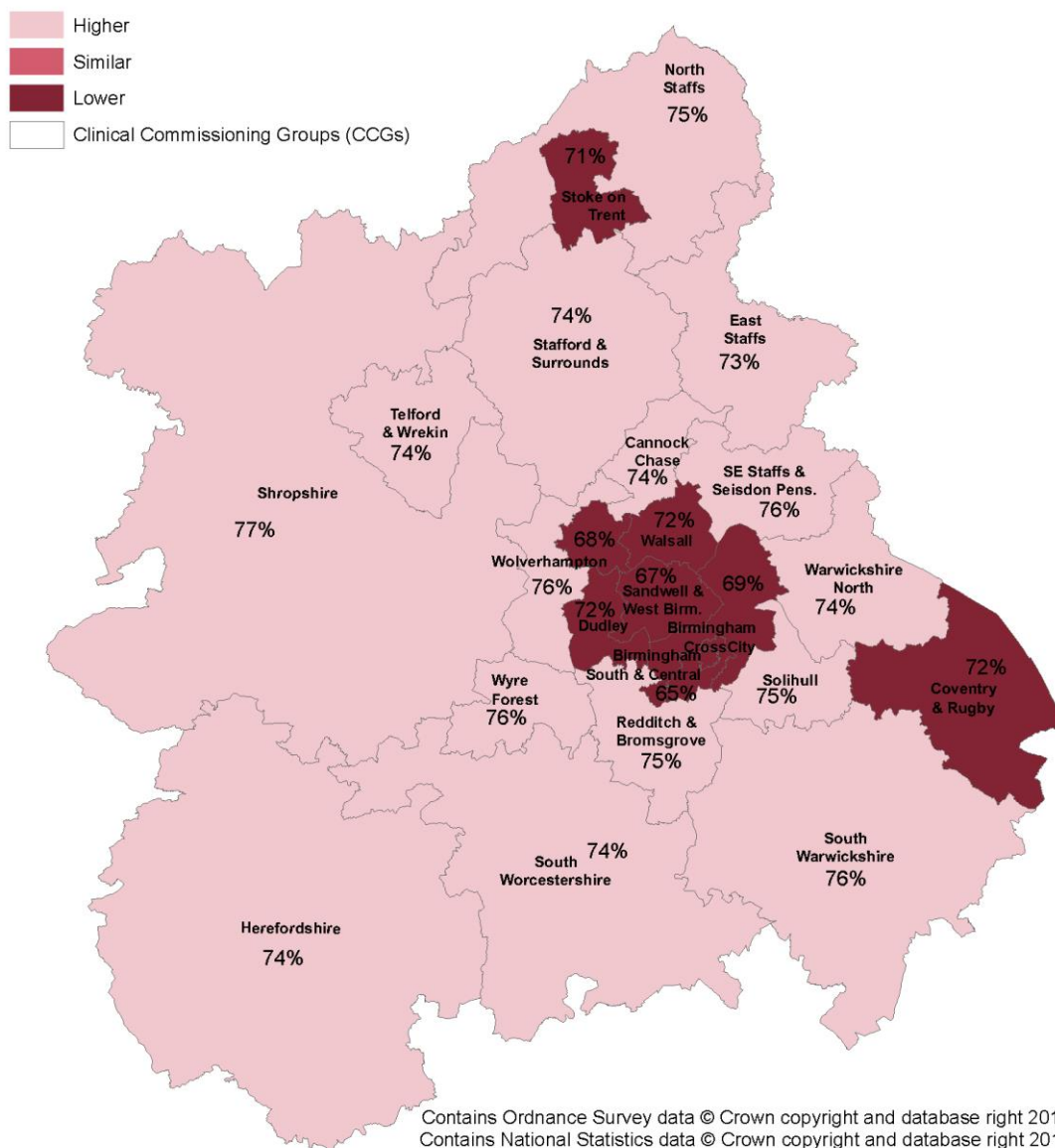
Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.

Source: Health and Social Care Information Centre/Public Health England, Sport England, analysis LKIS (WM)

Cancer waiting times performance data

The cancer waiting times dataset was first introduced in 2002 and is now seen as an indicator of the quality of cancer diagnosis, treatment and care. Delivering timely cancer pathways is crucial as, although cancer survival rates are improving, it is still one of the leading causes of death in the country, and there are disparities in two week referrals across the country.[26]

Across the West Midlands during quarter 3 of 2016-17, 94% of patients were seen within two weeks, that is, two-week wait for first outpatient appointment for those referred urgently with suspected cancer. There was wide variation in the proportion of cancer patients seen within 14 days of GP urgent referral, from 86% in Wyre Forest CCG to 97% for Warwickshire CCG (Figure 32). The low figure seen for Wyre Forest, South Worcestershire (87%) and Redditch and Bromsgrove (88%) require further investigation.

Figure 32: Proportion of cancer patients seen within 14 days of GP referral, West Midlands Clinical Commissioning Groups (2016/17, Quarter 3)
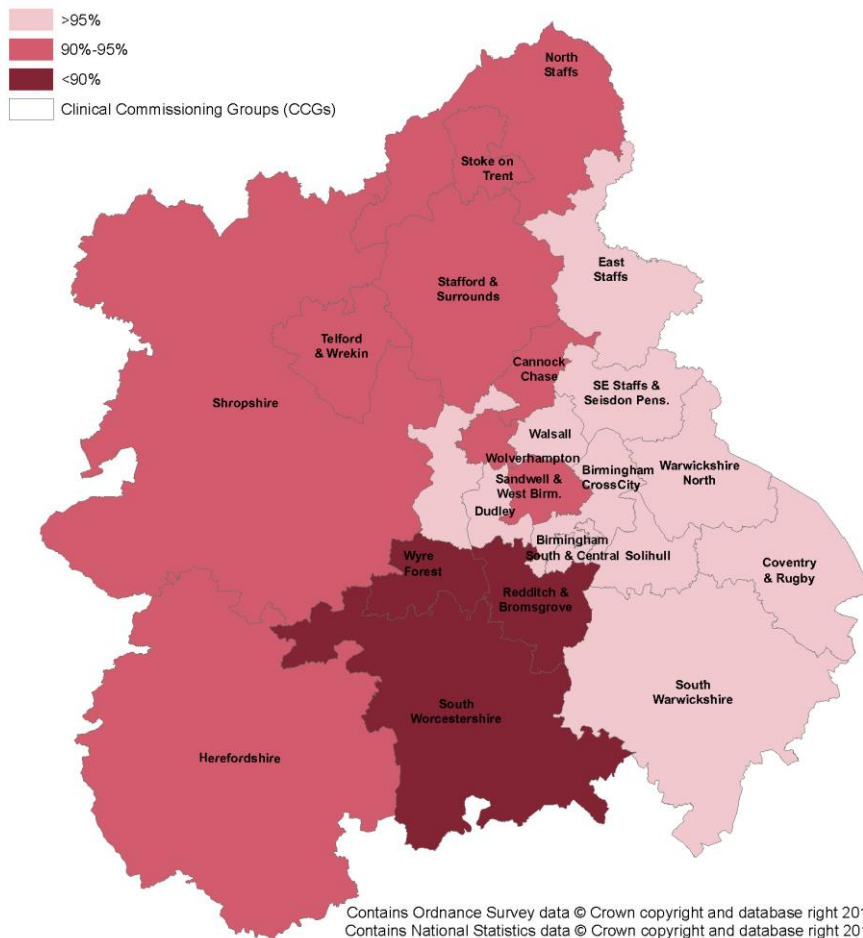
Source:NHS England, analysis LKIS (WM)

The cancer waiting times data is updated on a quarter basis. So far, for the year 2016/17, the proportion of patients seen within 14 days of GP referral were consistently below the national average in Herefordshire, Redditch and Bromsgrove, South Worcestershire and Wyre Forest CCGs (Figure 33).

Figure 33: Proportion of suspected cancer patients seen within 14 days of GP referral, West Midlands Clinical Commissioning Groups [2016/17, Quarters 1 to 3], benchmarked against the England average

		Birm. CrossCity	Birm. South/Central	Cannock Chase	Coventry & Rugby	Dudley	East Staffs.	Herefordshire	North Staffs.	Redditch and Broms.	Sandwell & West Brom.	Shropshire	Solihull	SE Staffs. & Seis Peninss.	South Warwickshire	South Worcestershire	Stafford and Surrounds	Stoke on Trent	Telford & Wrekin	Walsall	Warwickshire North	Wolverhampton	Wyre Forest
2016/17	Q1	95%	96%	93%	97%	95%	95%	84%	94%	65%	96%	93%	94%	94%	94%	59%	92%	94%	96%	96%	96%	93%	59%
	Q2	96%	95%	94%	95%	94%	97%	90%	94%	77%	94%	94%	97%	96%	95%	72%	94%	91%	93%	96%	95%	94%	67%
	Q3	96%	96%	94%	96%	96%	97%	94%	95%	88%	95%	93%	97%	96%	96%	87%	93%	93%	95%	97%	97%	93%	86%

Source:NHS England, analysis LKIS (WM)

Across the West Midlands, 98% of people with a confirmed case of cancer received their first definitive treatment within 31 days of decision to treat. There was wide variation across the West Midlands CCGs in the proportion of patients treated within 31 days (Figure 34).

Figure 34: Proportion of cancer patients treated within 31 days of decision to treat, West Midlands Clinical Commissioning Groups, 2016/17, Quarter 3

Contains Ordnance Survey data © Crown copyright and database right 2017.
Contains National Statistics data © Crown copyright and database right 2017.

The cancer waiting times data is updated on a quarterly basis. The proportion of patients treated within 31 days within each of the CCGs was consistently below the national average across the three quarters in Stoke-on-Trent (Figure 35).
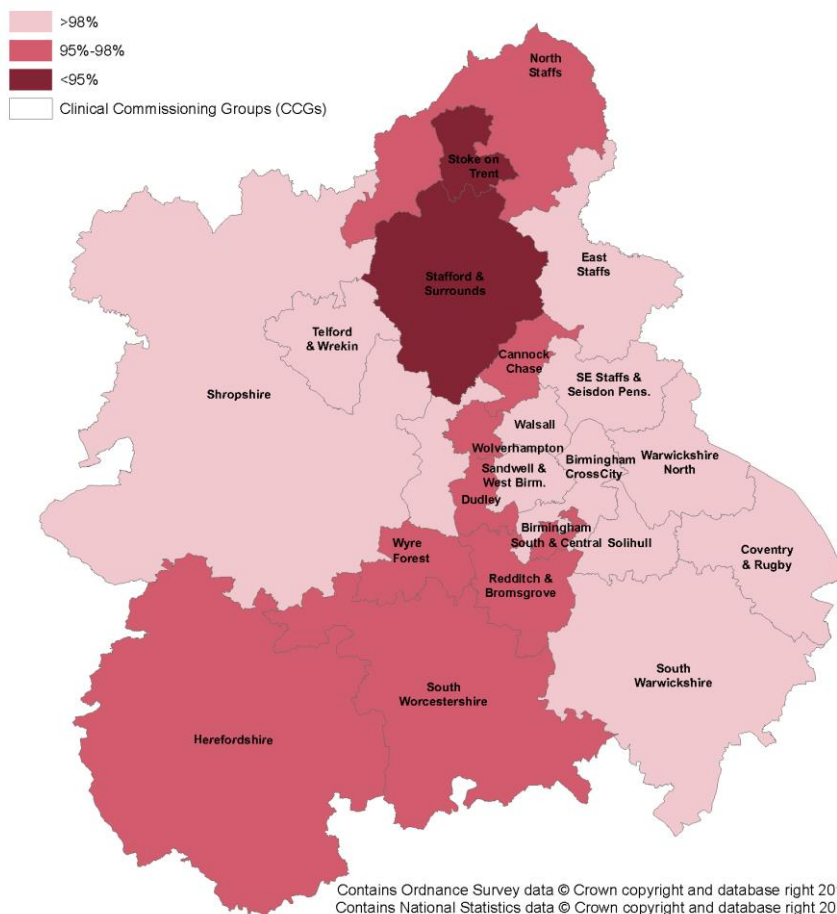
Figure 35: Proportion of cancer patients treated within 31 days of decision to treat, West Midlands Clinical Commissioning Groups (2016/17, Quarters 1 to 3)

		Birm. CrossCity	Birm. South/Central	Cannock Chase	Coventry & Rugby	Dudley	East Staffs.	Herefordshire	North Staffs.	Redditch and Broms.	Sandwell & West Brom.	Shropshire	Solihull	SE Staffs. & Seis Peninss.	South Warwickshire	South Worcestershire	Stafford and Surrounds	Stoke on Trent	Telford & Wrekin	Walsall	Warwickshire North	Wolverhampton	Wyre Forest
2016/17	Q1	99%	99%	97%	99%	99%	99%	97%	97%	97%	96%	98%	99%	98%	98%	98%	98%	94%	98%	98%	99%	98%	93%
	Q2	98%	100%	97%	99%	98%	98%	97%	95%	98%	98%	99%	99%	97%	99%	98%	99%	94%	98%	98%	100%	97%	98%
	Q3	99%	97%	98%	99%	97%	99%	96%	96%	97%	98%	99%	99%	98%	99%	96%	95%	94%	99.5%	99%	100%	98%	97%

Source:NHS England, analysis LKIS (WM)

How people are diagnosed with cancer

A patients route to diagnosis is based on an algorithm which determines how cancer was diagnosed based on multiple datasets.[27] In the published algorithm there are eight possible routes to diagnosis: screen detected, two week wait, emergency presentation, GP referral, inpatient or outpatient elective, from death certificate, and unknown. The most recent routes to diagnosis data is available for patients diagnosed with their cancer between 2006 and 2013.

In this chapter, the proportion of patients who were diagnosed following screen detected, two week wait, GP referral and emergency presentation are given for breast, prostate, colorectal and lung cancer diagnoses in the West Midlands in 2013. The corresponding one-year survival rates, and the proportion diagnosed at an early stage are given for England for 2013.

Between 2006-2013, approximately half of the people (51%) diagnosed with breast cancer were following the two week wait process. One-year survival rates for this group of people were 97%, compared to 100% for people diagnosed through the screening programme. Conversely, 4% of people were diagnosed with breast cancer following emergency presentation and one-year survival rates for this cohort of people were exceptionally low at 53%. People diagnosed following the screen detected route are more likely to be caught at an early stage (87%) compared to those diagnosed following an emergency admission (15%) (Figure 36).

Figure 36: Breast cancer proportion of diagnoses by route in the West Midlands, 2006-2013 and one-year survival in England, 2013

Breast	Screen detected		Two Week wait		GP Referral		Emergency presentation	
% diagnosed by route		29%		51%		11%		4%
% diagnosed at early stage		87%		69%		57%		15%
1-year survival		100%		97%		93%		53%

The majority of prostate cancers (44%) are diagnosed following a GP referral, while 35% are diagnosed following the two week wait process. One-year survival is again very good for these groups (98% for both routes). A relatively small proportion were diagnosed following an emergency presentation (6%) and one-year survival rates for this group are exceptionally low at 53%. There are also significant differences in those diagnosed at an early stage, ranging from 58% for those diagnosed following a GP referral to 17% for those diagnosed following an emergency admission (Figure 37).

Figure 37: Prostate cancer proportion of diagnoses by route in the West Midlands, 2013 and one-year survival in England, 2013

Prostate	Two Week Wait		GP Referral		Emergency Presentation	
% diagnosed by route		35%		44%		6%
% diagnosed at early stage		45%		58%		17%
1-year survival		98%		98%		57%

For colorectal cancer between 2006 and 2013, 29% of patients in the West Midlands were diagnosed through the two week wait route, and 25% were diagnosed following a GP referral. One-year survival for screen detected colorectal cancer is 97% compared 82% for those diagnosed following the two week wait route. This is likely to be due to screen detection finding early stage cancers which may not be symptomatic and therefore would not have been diagnosed through any other route.

Almost a quarter (24%) of colorectal cancer patients in the West Midlands were diagnosed through an emergency route and their one-year survival is almost half that of those patients diagnosed through screening (49%) (Figure 38).

Figure 38: Colorectal cancer proportion of diagnoses by route in the West Midlands, 2013 and one-year survival in England, 2013

Colorectal	Screen detected		Two Week wait		GP Referral		Emergency presentation	
% diagnosed by route		7%		29%		25%		24%
% diagnosed at early stage		59%		41%		43%		26%
1-year survival		97%		82%		80%		49%

Source: National Cancer Registration and Analysis Service

For lung cancer, 34% of patients in the West Midlands were diagnosed following an emergency presentation. Regardless of the how patients were diagnosed, the proportion captured at an early stage is very low, ranging from 28% for those diagnosed following a GP referral to 11% for those diagnosed following an emergency presentation. One-year survival rates for lung cancer are also poor ranging from 43% for those diagnosed following the two-week wait route, to 13% for those diagnosed following an emergency presentation (Figure 39). The correlation between emergency presentation and poor one-year survival rates provide and indicator for the extent of late diagnoses in the population.[27]

Figure 39: Lung cancer proportion of diagnoses by route in the West Midlands, 2013 and one-year survival in England, 2013

Lung	Two Week Wait		GP Referral		Emergency Presentation	
% diagnosed by route		23%		25%		34%
% diagnosed at early stage		22%		28%		11%
1-year survival		43%		41%		13%

Source: National Cancer Registration and Analysis Service

These analyses demonstrate the routes to diagnosis for patients diagnosed with the most common cancers in the West Midlands, and also show the proportion diagnosed late, and the corresponding one-year survival rates for England on the whole. However, further analyses are required to understand the demographics of people who are diagnosed with stage III and IV cancers in the West Midlands, in order to establish whether it is particular age groups, areas of deprivation or ethnicities which should be targeted.

Cancer patient experience survey

The National Cancer Patient Experience Survey has been undertaken since 2010 and designed to monitor progress in the field of cancer care. More importantly, the results of the survey are of huge benefit to commissioners and providers of cancer care for improving the overall cancer patient treatment journey.[28]

The questionnaire, since 2015, consists of 59 questions relating to patient experience, with the final question asking respondents to rate their overall cancer care on a scale of 0-10.

The results of the questionnaire are available nationally, and for each clinical commissioning group.

The average overall cancer care score across the West Midlands ranged from 8.51 for Dudley CCG to 9.00 for Warwickshire North CCG (Figure 40). However, the average scores varied significantly depending on the type of cancer.

Figure 40: Average overall patient satisfaction scores [unadjusted], West Midlands Clinical Commissioning Groups, 2015
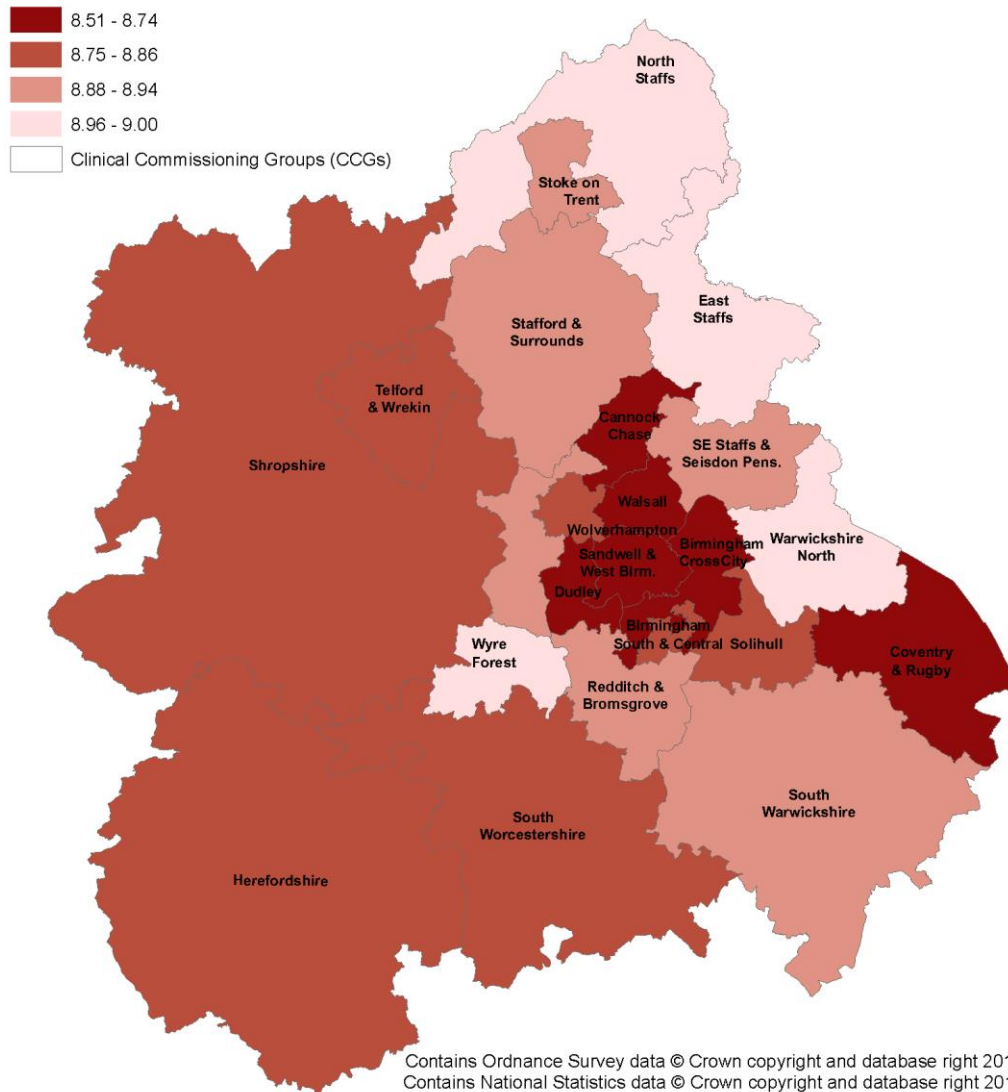
Source: Quality Health, analysis LKIS (WM)

From the available data, the lowest average score was for prostate cancer in the Walsall CCG, and the highest average score was for urological cancers in Sandwell and West Birmingham CCG (Table 1).

Table 1: Average patient satisfaction scores for most common cancers, West Midlands Clinical Commissioning Groups, 2015 (Question 59: "Overall, how would you rate your care?" from a range of 1 (lowest) to 10 (highest)

Clinical Commissioning Group	Breast	Colorectal	Gynaecological	Haematological	Lung	Prostate	Upper gastro	Urological	Overall
Birmingham CrossCity	8.51	8.57	8.83	9.07	8.36	8.71	8.32	8.40	8.74
Birmingham South & Central	8.48	*	*	*	*	*	*	*	8.84
Cannock Chase	7.93	8.42	*	8.65	*	*	*	*	8.57
Coventry & Rugby	8.88		8.31	8.94	*	8.28	8.46	8.26	8.70
Dudley	8.54	8.23	8.30	8.21	8.61	8.38	8.42	8.31	8.51
East Staffs	8.63	8.63	*	9.07	*	*	*	8.33	8.96
Herefordshire	8.76	8.72	*	9.17	*	8.44	*	8.29	8.80
North Staffs	8.93	8.84	8.52	9.18	8.61	*	*	8.51	8.99
Redditch & Bromsgrove	8.81	8.74	*	8.79	*	*	*	8.96	8.91
Sandwell & West Birm.	8.42	8.50	8.18	8.72	*	8.45	9.05	9.23	8.72
Shropshire	8.66	8.85	8.64	9.02	8.29	8.86	*	8.50	8.85
Solihull	8.72	8.81	*	8.96	*	*	*	8.85	8.85
SE Staffs & Seisdon Pens.	8.81	8.89	8.23	8.90	*	8.76	*	8.80	8.90
South Warwickshire	9.04	9.13	8.92	8.95	7.95	*	*	8.67	8.94
South Worcestershire	8.78	8.74	*	9.05	8.56	8.74	*	8.18	8.86
Stafford & Surrounds	8.53	8.72	*	8.79	*	*	*	8.60	8.88
Stoke on Trent	9.13	8.32	8.60	8.92	8.93	*	*	8.70	8.91
Telford & Wrekin	8.53	8.90	*	8.57	*	8.87	*	*	8.86
Walsall	8.53	8.40	8.63	8.95	*	7.88	*	8.29	8.65
Warwickshire North	9.07	9.09	*	8.83	*	*	*	8.41	9.00
Wolverhampton	8.46	8.52	7.91	8.61	*	8.54	8.83	*	8.75
Wyre Forest	8.87	8.92	*	8.78	*	8.58	*	*	8.96
National	*8.77*	*8.68*	*8.69*	*8.84*	*8.65*	*8.62*	*8.57*	*8.54*	*

Source: Quality Health, analysis LKIS (WM)

Place of death

Reviewing data across the entire patient pathway is extremely important as a holistic approach is needed to improve outcomes. This includes looking at prevention efforts, through diagnosis and treatment to end of life care.

Commissioned by Dying Matters, NatCen Social Research interviewed 2,145 adults in Britain on their attitudes to dying as part of the 2012 British Social Attitudes survey. The survey found that although 70% of the public say they are comfortable talking about death, most have not discussed their end of life wishes or put plans in place. Of the people asked, only 7% said they would prefer to die in hospital, compared to two-thirds (67%) who would prefer to die at home.[29]

Between 2012 and 2014, across the West Midlands, fewer than 30% of patients died at a private home while a further 8% died in a nursing or care home, which may also be

considered their home. Nearly 40% of cancer patients died in hospital. Around 11% of cancer patients in the West Midlands died in a hospice (Figure 41).

Figure 41: Place of death for cancer patients in the West Midlands, 2012 to 2014 vs. preference from British Social Attitudes survey, 2012
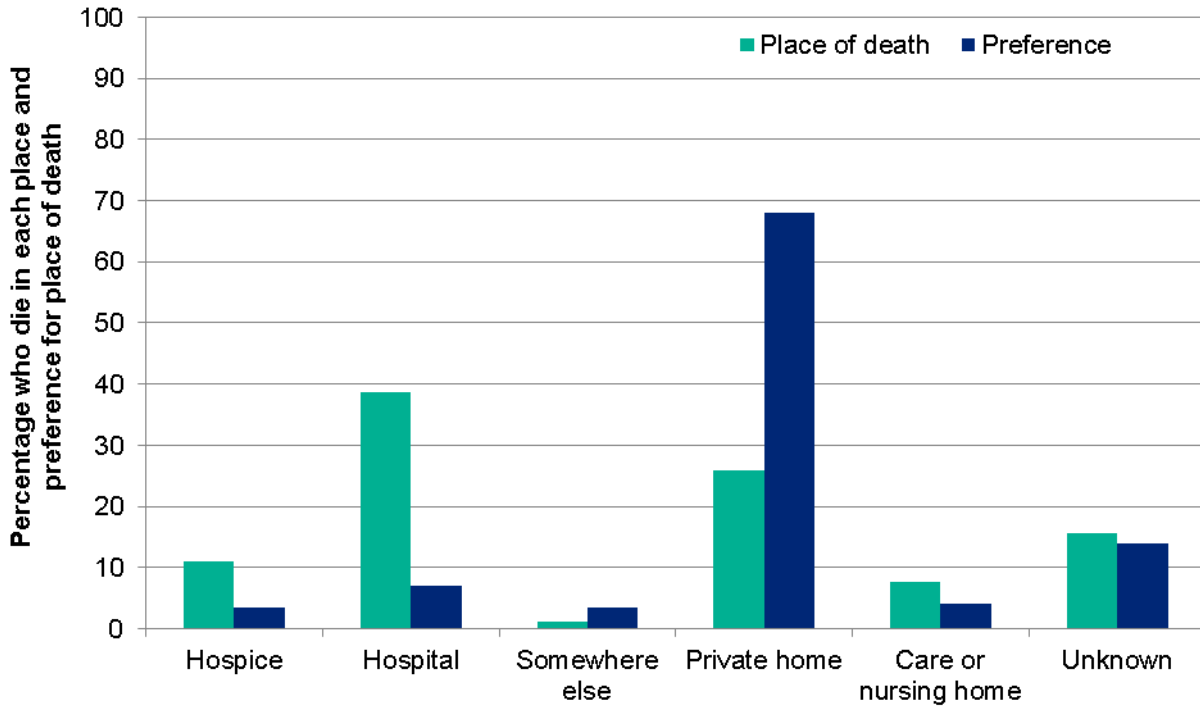
There remain many other factors that can influence patient experience during end of life care, and therefore the above information only paints a small part of the picture. Acknowledging this fact, in July 2016 the government published a set of commitments in response to the review of choice in end of life care[30]. The response also included intent to publish benchmarking information on quality and choice in end of life care.

Clinical context

Cancer is a leading cause of morbidity and mortality which impacts not only the individual but the entire family. Our aim is to achieve the best possible outcomes for this patient group and reduce inequalities in provision of care and health outcomes across the region.

It is evident that the need for those living with cancer or beyond their diagnosis and treatment is going to continue to increase because of increasing incidence, greater survival and ageing population. It is important to ensure that appropriate services are in place to meet the needs of this patient group in terms of direct clinical care and to meet their needs beyond their diagnosis

and treatment including psychological support, rehabilitation and palliative care. Equally important would be to focus on ensuring that effective services are in place for early screening for cancer and preventative services which target risk factors for cancer such as smoking, alcohol and obesity.

Cancer incidence and mortality

The all-cancer incidence rates are significantly lower in the West Midlands compared to England though the mortality rates are higher. This would need to be explored in light of other factors such as ethnicity, deprivation and case mix but potentially highlights the need for effective services to ensure early detection of cancer, timely institution of treatment and adequate follow up.

It is not surprising that breast and prostate cancer make up the majority of new diagnoses, however despite a national decline in lung cancer incidence there is still a high mortality burden associated with a lung cancer diagnosis. In particular there appears to be a significant socioeconomic inequality associated with lung cancer with far higher incidence and mortality being seen in the most deprived socioeconomic quintiles compared with the least deprived. This is likely to be reflective of smoking prevalence in those quintiles. The incidence rates of prostate, breast and skin cancers is higher in the least deprived groups compared to the most deprived groups; however, the mortality rates are not significantly higher. The increased incidence rates in the least deprived set is likely to be a result of better awareness, seeking medical help earlier, better access to diagnostic and medical facilities; the mortality rates in the more deprived population being higher resulting due to greater lifestyle risk factors (smoking, alcohol, obesity), poor access to healthcare and poor compliance.

This inequality is seen again in the stage of cancer at diagnosis, with a greater likelihood of being diagnosed with an early stage cancer if you're in the least deprived 2 socioeconomic quintiles, and a greater likelihood of being diagnosed with a late stage cancer if you're in the most deprived 2 quintiles. This means that not only are you more likely to develop cancer if you're in the most deprived socioeconomic quintile, but that once detected cancers in these groups are less likely to be treatable. This socioeconomic inequality has an impact on one year survival rates – the trend has been largely flat since 2005, but the one-year survival gap between the most and least deprived socioeconomic quintiles has widened slightly from 10% to 13%. There is clear need for work to be undertaken to reduce the impact of socioeconomic deprivation on cancer incidence and mortality.

Survival

Lung cancer has the worst one- and five-year survival for both males and females. There is evidence of a significant increase in 1 year survival for lung and colorectal cancer for both males and females. However, there is significant variation across the region in the one year survival rates for all three common cancers and there is a need to

investigate and address this. This could potentially be a due to effect of factors such as variations in clinical factors such as protocols and practices; patient factors such as case mix, lifestyle risk factors or ethnicity; system factors which may affect provision and accessibility to services, and other factors including language and cultural factors.

Lifestyle risk factors

In terms of preventable risk factors smoking prevalence continues to decline, which has likely contributed to the falling incidence of lung cancer. There is however significant variation across the region in terms of smoking rates which needs to be investigated and addressed. There may be useful learning lessons from areas with lower rates and sharing information and practices may be helpful.

High alcohol consumption in the West Midlands is potentially contributing to an increase in alcohol related cancers[30]. There is some evidence to suggest a lack of awareness of the link between alcohol and cancer, which may need to be addressed[31]. There is also a need to address the regional variation in alcohol related cancers.

There are a significantly higher proportion of overweight and obese people in the West Midland along with low levels of physical activity. It is likely that in the coming years that unless preventative action is taken that, although we will see a decline in preventable cancers linked to smoking, there will be a significant increase in cancers associated with alcohol and obesity. Once again the burden of excess alcohol consumption, low physical activity and increased overweight and obesity prevalence are disproportionately carried by those in the most deprived socioeconomic quintiles.

Screening uptake

Early detection and treatment of cancer is essential for reducing mortality. Consequently maintaining high uptake of national cancer screening programmes is a significant part of preventative work with many areas in the west of the West Midlands achieving higher uptake than the England average. However, there is clear need for targeted work across Birmingham, Stoke-on-Trent and Coventry as these areas are below the England average on all screening programmes. Furthermore service capacity must be ensured in areas where 14 day referral targets or 31 day treatment targets are particularly low. There is a need to investigate reasons for local variation for screening uptake rates, waiting times and routes of diagnosis; service reviews and sharing of information, practices and strategies between regions.

Patient experience

It has been noted that, although end of life care in the UK is rated the best in the world[32] not everyone receives a high standard of care. Although we are lacking detailed data on our population's experiences of end of life care it is worth noting that the preferred place of death for most people is in their own home. But it has been seen that most people reach the end of their life in hospital. Unfortunately, as many as 30% of people who died

in hospital had an experience that was rated by their family or carers as being "fair" or "poor". We must work effectively with and influence our partners to improve the end of life care experiences for people living in the West Midlands.

West Midlands cancer policy/context

This report highlights the need to ensure coordinated action across the West Midlands to address the current variation in prevention of new cancers, earlier diagnosis and treatment pathways to improve survival. The challenge associated with this is that there are many organisations responsible for commissioning the various different aspects of the whole patient pathway including: local authorities influencing the wider determinants of health and life style services, clinical commissioning groups commissioning hospitals for the diagnosis and treatment of cancer and NHS England commissioning the specialised services. However, there are also opportunities that exist to facilitate the collaboration and coordination of action for example through the West Midlands Cancer Alliance support by the clinical networks, STPs and the evolving work of the Combined Authority. We hope that this report helps inform discussions between partners to enable cancer service prevention and provision across the West Midlands to be transformed into services that meet the needs of all of the residents of the region.

References

1 Cancer Research UK, Cancer mortality for all cancers combined. Available at:
   http://www.cancerresearchuk.org/health-professional/cancer-statistics/mortality/all-cancers-combined [Accessed: January 16th 2017]

2 Office for National Statistics: Deaths by cause, persons aged 75+, England and Wales, deaths registered 2001 to 2015. Available at:
   https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/adhocs/006480deathsbycausepersonsaged75englandandwalesdeathsregistered2001to2015 [Accessed: 16th January 2017]

3 Mistry, M., Parkin, D. M., Ahmad, A.S., Sasieni, P. (2011) Cancer incidence in the United Kingdom: projections to the year 2030, *British Journal of Cancer*, 105: 1795-1803. Available at:
   https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3242594/ [Accessed: 16th January 2017]

4 Parkin DM, Boyd L, Walker LC. (2011) The fraction of cancer attributable to lifestyle and environmental factors in the UK in 2010. Summary and conclusions. *British Journal of Cancer,* 2011; 105: S2:S77-S81. Available at:
   https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3252065/ [Accessed: 16th January 2017]

5 NHS (2011), Cancer survival rates "threatened by rising cost". Available at:
   http://www.nhs.uk/news/2011/12December/Pages/cancer-treatment-cost-may-increase.aspx, [Accessed: 21st March 2017]

6 Public Health England, Public Health Profiles. Available at:
   http://fingertips.phe.org.uk/search/cancer#page/3/gid/1/pat/6/par/E12000005/ati/102/are/E08000025/iid/40501/age/163/sex/4 [Accessed: 16th January 2017]

7 Macmillan, [2016], Cancers Hidden Price Tag. Available at:
   http://www.macmillan.org.uk/documents/getinvolved/campaigns/costofcancer/cancers-hidden-price-tag-report-england.pdf [Accessed: 16th January 2017]

8 Office for National Statistics, Annual population survey (data obtained from Nomisweb
   https://www.nomisweb.co.uk/) [Accessed: 16th January 2017]

9 Public Health Outcomes Framework. Available at:
   http://www.phoutcomes.info/public-health-outcomes-framework#page/0/gid/1000049/pat/6/par/E12000005/ati/102/are/E08000025 [Accessed: 16th January 2017]

10 Cancer Research UK, Cancer incidence by age. Available at:
    http://www.cancerresearchuk.org/health-professional/cancer-statistics/incidence/age#heading-Zero [Accessed: 16th January 2017]

11 National Cancer Intelligence Network (2014) Cancer by deprivation in England. Available at:
    http://www.ncin.org.uk/about_ncin/cancer_by_deprivation_in_england [Accessed: 16th January 2017]

12 Cancer Research UK (2014) Stages of cancer. Available at:
    http://www.cancerresearchuk.org/about-cancer/what-is-cancer/stages-of-cancer [Accessed: 16th January 2017]

13 ONS, 1-year cancer survival by clinical commissioning group in England, with 95% confidence intervals. Available at:
    https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/datasets/table10to161yearcancersurvivalbyclinicalcommissioninggroupinenglandwith95confidenceintervals [Accessed: 21st March 2017]

14 World Health Organisation (2007), "IARC Monographs on the Evaluation of Carcinogenic Risks to Humans" (Volume 89). Available at: https://monographs.iarc.fr/ENG/recentpub/mono89.pdf [Accessed: 21st March 2017]

    The 16 types of cancer associated with smoking (source: the International Agency for Research on Cancer (IARC)) – 1) Oral cavity, 2) Nasal cavity and paranasal sinuses, 3) Pharynx, 4) Larynx, 5) Oesophagus, 6) Lung, 7) Stomach, 8) Liver, 9) Pancreas, 10) Kidney, 11) Ureter, 12) Bladder, 13) Ovary, 14) Cervix, 15) Colorectal (bowel), 16) Myeloid leukaemia

15 Smoking prevalence data taken from Local Tobacco Control profiles. Available at: http://www.tobaccoprofiles.info/ [Accessed: March 2017]

16 Connor, J. (2016). Alcohol consumption as a cause of cancer. *Addiction*. 1360-0443. Available at: http://dx.doi.org/10.1111/add.13477 [Accessed 20th July 2016]

17 Buykx P, Li J, Gavens L, Lovatt M, Gomes de Matos E, Holmes J, Hooper L & Meier P (2015) An investigation of public knowledge of the link between alcohol and cancer. University of Sheffield and Cancer Research UK. Available at: http://www.cancerresearchuk.org/sites/default/files/an_investigation_of_public_knowledge_of_the_link_between_alcohol_and_cancer_buykx_et_al.pdf [Accessed: 21st March 2017]

18 IARC, IARC Monographs on the evaluation of carcinogenic risks to humans. Volume 44 Alcohol drinking. 1988. Available at: http://monographs.iarc.fr/ENG/Monographs/vol44/index.php [Accessed: 21st March 2017]

19 Local Alcohol Profiles for England (LAPE). Available at: http://www.lape.org.uk/ [Accessed: 21st March 2017]

20 NHS (2016) Health survey for England. Available at: http://content.digital.nhs.uk/catalogue/PUB19295 [Accessed: 21st March 2017]

21 Cancer Research UK. Available at: http://www.cancerresearchuk.org/about-cancer/causes-of-cancer/bodyweight-and-cancer/how-being-overweight-causes-cancer [Accessed: 21st March 2017]

22 The Information Centre for health and social care (2010). "Statistics on obesity, physical activity and diet: England, 2010". Available at: http://content.digital.nhs.uk/catalogue/PUB00206/obes-phys-acti-diet-eng-2010-rep.pdf [Accessed: 21st March 2017]
Classifications: overweight – BMI 25 to 30kg/m^2, obese – BMI>30KG/M^2

23 WHO: The European Health Report 2002. Available at: http://www.euro.who.int/__data/assets/pdf_file/0007/98296/E76907.pdf [Accessed: 21st March 2017]

24 The number of respondents aged 16 and over, with valid responses to questions on physical activity, doing less than 30 "equivalent" minutes of at least moderate intensity physical activity per week in bouts of 10 minutes or more in the previous 28 days. Source: Active People Survey, Sport England. Available at: https://www.sportengland.org/research/about-our-research/active-people-survey/ [Accessed: 21st March 2017]

25 Public Health Profiles. Available at: http://fingertips.phe.org.uk/search/cancer%20screening#page/0/gid/1/pat/6/par/E12000005/ati/19/are/E08000025 [Accessed: 21st March 2017]

26 NHS. Delivering cancer waiting times. Available at: https://www.england.nhs.uk/wp-content/uploads/2015/03/delivering-cancer-wait-times.pdf [Accessed: 21st March 2017]

27 Elliss-Brookes, L., McPhail, S., Ives, A. et al (2012). Routes to diagnosis for cancer – determining the patient journey using multiple routine data sets. *British Journal of Cancer*; 107, 1220-1226. Available at: http://www.nature.com/bjc/journal/v107/n8/abs/bjc2012408a.html [Accessed: 21st March 2017]

28 Quality Health (2016) National Cancer Patient Experience Survey 2015. Available at: https://www.quality-health.co.uk/surveys/national-cancer-patient-experience-survey [Accessed: 21st March 2017]

29 Public Health England: What we know now, new information collated by the National End of Life Care Intelligence Network. Available at: http://www.endoflifecare-intelligence.org.uk/resources/publications/what_we_know_now_2013 [Accessed: 21st March 2017]

30 Bhala, N., Bhopal, R., Brock, A., Griffiths, C., Wild, S. (2009) Alcohol-related and hepatocellular cancer deaths by country of birth in England and Wales: analysis of mortality and census data. *Journal of Public Health;* 31 (2): 250-257

31 Gulland, A. (2016). People lack awareness of link between alcohol and cancer, survey finds. *BMJ*; 353 Available at https://doi.org/10.1136/bmj.i1881 [Accessed 4th July 2017]

32 Department of Health (2016) "Our Commitment to you for end of life care: The Government Response to the Review of Choice in End of Life Care". Available at: http://endoflifecampaign.org/wp-content/uploads/2017/02/choice-response.pdf [Accessed 21st March 2017]

Further resources

Cancer data: Incidence and mortality for all cancer types by CCG (publically available) - www.cancerdata.nhs.uk

Cancer stats: Incidence and mortality for all cancer types by CCG, LA, SCN and Region, plus cancer survival for main sites by Region (requires N3 connection and login) - https://nww.cancerstats.nhs.uk/

Local cancer intelligence: Summary cancer statistics for CCGs including incidence, mortality, prevalence, all cancer survival and patient experience survey (publically available) - http://lci.cancertoolkit.co.uk/

Cancer prevalence statistics by local area: Cancer prevalence statistics by Strategic Clinical Network, Clinical Commissioning Group and Local Authority for England - http://www.ncin.org.uk/about_ncin/segmentation

Cancer services fingertips tool: Practice and CCG level data including screening uptake, 2 week wait referral information and numbers of emergency presentations (publically available) - http://fingertips.phe.org.uk/profile/cancerservices

Local health: interactive maps and reports at small area level, including CCG, LA but also MSOA and ward. Various indicators including cancer incidence, and deaths from cancer - www.localhealth.org.uk/

ONS survival data: 1- and 5-year survival by Area Team for breast, lung, cervical, colon, stomach and oesophageal cancers - http://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/cancersurvivalbynhsenglandareateamadultsdiagnosed/2014-12-16

ONS survival data: 1-year cancer survival for all cancers combined, three cancers combined, and for breast, colorectal, and lung cancer - http://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/indexofcancersurvivalforclinicalcommissioninggroupsinengland/adultsdiagnosed19982013andfollowedupto2014

Staging information: stage breakdown by CCG for 10 main cancer sites, and survival by stage analysis at England level for 9 of these sites - http://www.ncin.org.uk/publications/survival_by_stage

Routes to diagnosis of cancer: Analysis of routes to diagnosis of cancer - workbook (b) contains a regional breakdown by Strategic Clinical Network and Clinical Commission Group - http://www.ncin.org.uk/publications/routes_to_diagnosis

Local Alcohol Profiles for England – includes numerous indicators around alcohol related harm, including indicators on alcohol related cancers - http://fingertips.phe.org.uk/profile/local-alcohol-profiles

Site specific information: detailed analysis of specific sites, generally national level - http://www.ncin.org.uk/cancer_type_and_topic_specific_work/

CCG profiles: These are profiles created by the local cancer intelligence service to create a quick summary of key points on cancer for each CCG. The profiles benchmark each CCG with its 10 most similar CCGs to give a picture of how that area compares for a number of indicators. If you would like a report for your CCG please email the contact for your local region - http://www.ncin.org.uk/local_cancer_intelligence/local_cancer_intelligence

Cancer definitions and glossary

ASR: age-standardised rate

CCG: clinical commissioning group

CNS: Central Nervous System

HCPH: health care public health

Incidence: the rate of occurrence of new cases of a particular disease in a population

Living with and beyond cancer: this describes the experience of people who have been diagnosed with cancer, who are undergoing treatment or who have finished their treatment

LKIS: local knowledge and intelligence service

Mortality: the rate of deaths from a particular disease in a population

NCRAS: national cancer registration and analysis service

NHL: non-Hodgkin lymphoma

ONS: office for nation statistics

Prevalence: cancer prevalence is a term used for the number of people who have been diagnosed with cancer in the past and who are still alive on a given date. The date used in the analysis here is 31 December 2010[30].

Quintile: any of five equal groups into which a population can be divided according to the distribution of values of a particular variable (in this instance deprivation)

SCN: strategic clinical network

Stage: Staging is a way of describing the size of a cancer and how far it has grown and whether it has spread to other parts of the body

STP: sustainability transformation plan

Authors and contact

This report was compiled and written by:

Matthew Francis, Principal Analyst, Local Knowledge and Intelligence Service West Midlands
Christopher Lawrence, Public Health Analyst (Cancer), National Cancer Registration and Analysis Service
Dr Kwok Wong, Senior Cancer Analyst, National Cancer Registration and Analysis Service
Sam Dunn, Public Health Intelligence Analyst, Local Knowledge and Intelligence Service West Midlands
John Broggio, Principal Analyst, National Cancer Registration and Analysis Service
Catherine Bray, Public Health Intelligence Analyst, Local Knowledge and Intelligence Service West Midlands
Dr Helen Carter, Deputy Director, Public Health England West Midlands
Dr Matt Tyrer, Public Health Registrar, Public Health England West Midlands
Geetinder Kaur, Public Health England West Midlands

Acknowledgements

Appendix A

ICD-10 codes for cancers considered preventable

ICD10 Code	Description
C00	Malignant neoplasm of lip
C02	Malignant neoplasm of other and unspecified parts of tongue
C03	Malignant neoplasm of gum
C04	Malignant neoplasm of floor of mouth
C05	Malignant neoplasm of palate
C06	Malignant neoplasm of other and unspecified parts of mouth
C08	Malignant neoplasm of other and unspecified major salivary glands
C09	Malignant neoplasm of tonsil
C10	Malignant neoplasm of oropharynx
C11	Malignant neoplasm of nasopharynx
C13	Malignant neoplasm of hypopharynx
C14	Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx
C15	Malignant neoplasm of oesophagus
C16	Malignant neoplasm of stomach
C18	Malignant neoplasm of colon
C21	Malignant neoplasm of anus and anal canal
C22	Malignant neoplasm of liver and intrahepatic bile ducts
C34	Malignant neoplasm of bronchus and lung
C43	Malignant melanoma of skin
C45	Mesothelioma
C50	Malignant neoplasm of breast
C53	Malignant neoplasm of cervix uteri