Ethnicity and Colorectal Cancer Diagnosis in Yorkshire and The Humber (2012-2017): A report from the Yorkshire Cancer Research Bowel Cancer Improvement Programme (YCRBCIP)

Background

Our aim is to understand the ethnicity of patients diagnosed with colorectal cancer (CRC) in the Yorkshire and Humber (YCRBCIP) region as compared to England as a whole, and to identify any differences that exist in the region. This report focuses on differences in the characteristics of the populations, routes to cancer diagnosis and stage at diagnosis of CRC.

CRCs diagnosed between 2012 and 2017 are included in the report. Ethnic group was identified using the National Disease Registration Service methodology (self-report from cancer registration data, supplemented with information from Hospital Episode Statistics and other routinely collected data)[1]. In order to ensure analyses are appropriately powered, broad ethnic groupings were utilised;

- Asian
- Black
- White
- Other, mixed and multiple ethnic groups
- Unknown ethnic group

Comparative data for the whole population (the background population) was obtained from the Office for National Statistics Mid-Year population estimates 2011[2].

Individuals were classified as being from the YCRBCIP region if they underwent investigation for, or treatment of, their CRC at one of the 14 NHS Trusts within the area. Throughout this report the YCRBCIP region is compared to England as a whole.

In England as a whole, 5% of individuals with CRC had unknown ethnicity. This was slightly lower in the YCRBCIP region with <3% of individuals with unknown ethnicity. To investigate the impact of this, the method described by Delon et al[3] was used to assign the individuals with unknown ethnicity to one of the broad ethnic groups using the same proportions as seen in those with a known ethnicity. This did not significantly alter the results and, as such, this report includes unknown ethnic group as a separate category.

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[1] Fry A, White B, Nagarwalla D, *et al* Relationship between ethnicity and stage at diagnosis in England: a national analysis of six cancer sites *BMJ Open* 2023;13:e062079. doi: 10.1136/bmjopen-2022-062079

[2] Source: Annual Population Survey, Mid-year population estimates, and Census 2011 data; Office for National Statistics

[3] Delon, C., Brown, K.F., Payne, N.W.S. *et al*. Differences in cancer incidence by broad ethnic group in England, 2013–2017. *Br J Cancer* 126, 1765–1773 (2022). https://doi.org/10.1038/s41416-022-01718-5

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Due to the issues outlined above, care must be taken when interpreting the results described in this report. Where possible we have presented analyses at both the YCRBCIP and England level. For some analyses, numbers were too small to present at regional level and the results are presented for England only.

Summary of Key Findings for the YCRBCIP region

- Incidence of colorectal cancer was lower in Asian and Black ethnic groups than in the White ethnic group.
- Individuals in Asian and Black ethnic groups are diagnosed colorectal cancer at a younger age than those in the White ethnic group.
- A higher proportion of the Black and Asian ethnic groups with colorectal cancer are classified as living in socioeconomically deprived areas.
- The Asian ethnic group had the highest proportion of rectal tumours, whereas the Black ethnic group had the lowest.
- The Asian and Black ethnic groups have the highest rates of late stage and emergency diagnosis.

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Ethnicity profile of Yorkshire and the Humber

Figure 1: Ethnicity profile of England and the YCRBCIP region, background and CRC populations

Legend: ■White ■Asian ■Black ■Other, mixed and multiple ethnic groups □Unknown
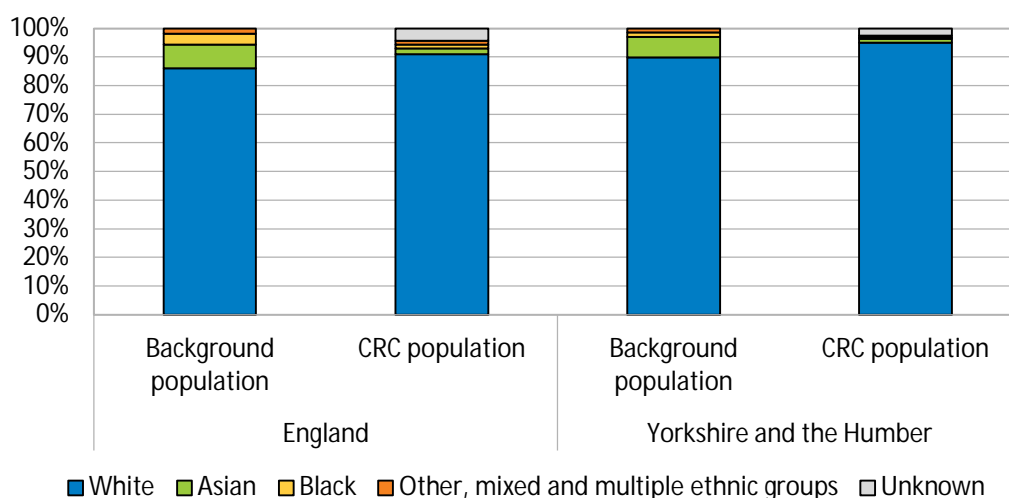
In the YCRBCIP region, 88% of the background population were classified as white, compared to 83% of the background population of England[4].

The CRC population (both in England as a whole and the YCRBCIP region) contained a higher proportion of White individuals than the background population. Within the YCRBCIP region, 95% of individuals with CRC were classified as white.

The median age at which CRC is diagnosed differs across the ethnic groups (Table 1). Age is discussed in more detail on page 7 of this report.

Table 1: Median age (interquartile range shown in brackets (IQR)) of individuals diagnosed with colorectal cancer, by ethnic group

	YCRBCIP region	England
White	72 (65-80)	73 (64-81)
Asian	63 (51-75)	64 (55-75)
Black	61 (52-81)	66 (55-78)
Other, mixed and multiple	63 (50-74)	63.5 (52-76)
Unknown	72 (63-81)	71 (62-81)

To account for these differences, age standardised incidence rates were calculated for each ethnic group. The European Standard Population (ESP 2013) was used to standardise the rates, which are presented per 100,000 persons. The incidence in the Asian and Black ethnic groups is significantly below that observed in the White ethnic group, both in the YCRBCIP region and England as a whole (Table 2).

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4 Source: Annual Population Survey, Mid-year population estimates, and Census 2011 data; Office for National Statistics

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Table 2: Incidence rates of CRC in the YCRBCIP region, per 100,000 individuals (age standardised)

	YCRBCIP region		England	
	Number of cases (% of total)	Age standardised rate (EASR) (95%CI)	Number of cases (% of total)	Age standardised rate (EASR) (95%CI)
Overall	20,974	65.2 (64.4-66.0)	181,606	62.3 (62.0-62.6)
White	19,912 (94.9)	68.7 (67.8-69.7)	164,248 (90.4)	62.1 (61.8-62.3)
Asian	288 (1.4)	25.5 (22.1-28.9)	3,811 (2.1)	25.5 (24.8-26.5)
Black	106 (0.5)	35.7 (27.4-43.4)	2,724 (1.5)	42.6 (40.9-44.4)
Other, mixed & multiple	132 (0.6)	55.4 (43.6-67.2)	2,438 (1.3)	46.4 (44.1-48.1)
Unknown*	536 (2.6)	-	8,385 (4.6)	

*no population denominators were available for calculation of rates

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Ethnicity profile of the CRC population by NHS Trust

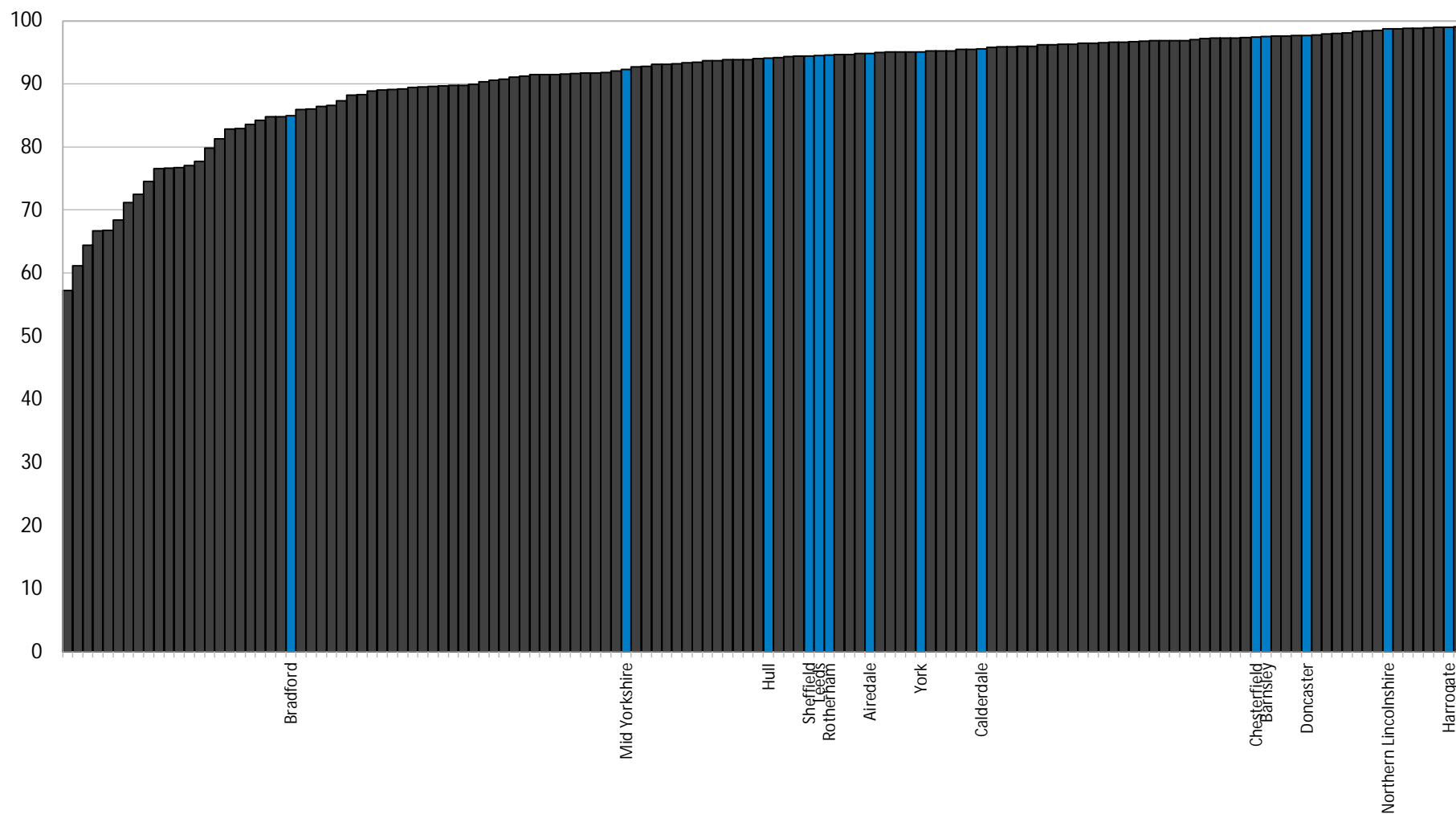Within the YCRBCIP region the CRC population was classified as follows:

- The proportion of individuals in the White ethnic group ranged from 85% at Bradford to 99% at Harrogate
- The proportion of individuals in the Asian ethnic group ranged from 9% (Bradford) to <1% (Chesterfield)
- The proportion of individuals in the Black ethnic group ranged from 2% (Leeds) to 0% (Hull & York)

Figure 2: Ethnicity profile of the CRC population by YCRBCIP NHS Trust
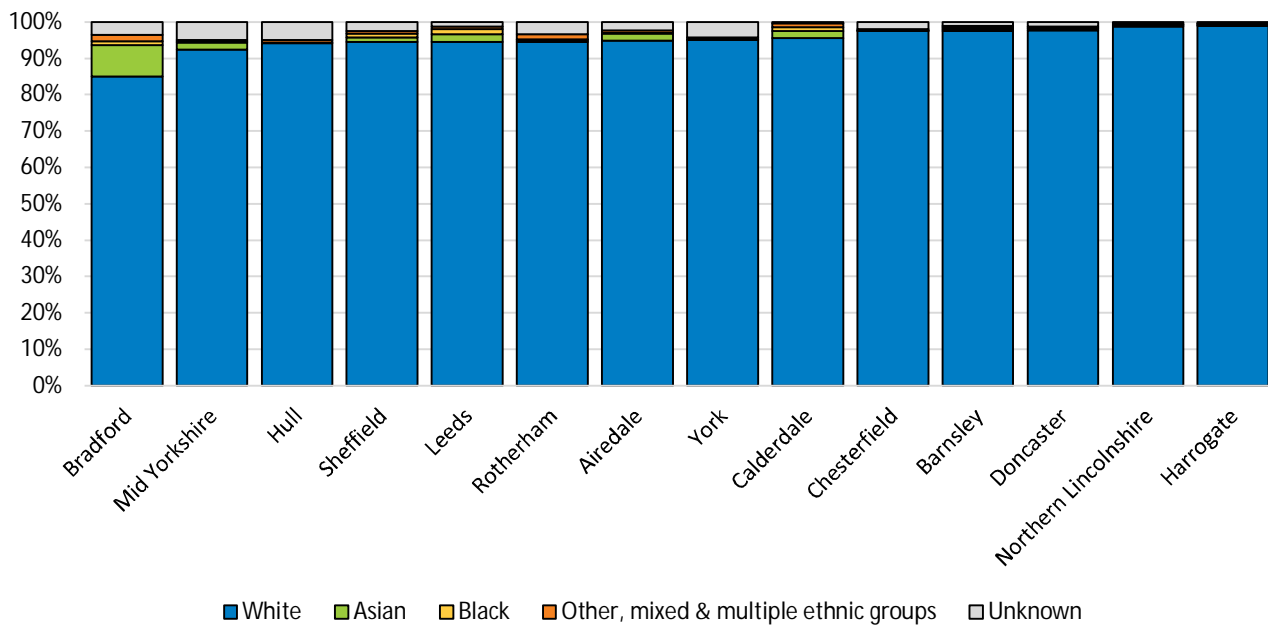
Whilst there was substantial variation in the ethnicity profile of CRC patients treated at NHS Trusts within the YCRBCIP region, over 50% of those in the Asian ethnic group were diagnosed at one of three trusts (Bradford, Leeds and Calderdale). Over 50% of those in the Black ethnic group were treated at one of two NHS Trusts (Leeds and Sheffield).

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Figure 3: Proportion of individuals with CRC in the White ethnic group in England, by NHS Trust (with YCRBCIP Trusts highlighted)

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Characteristics of the YCRBCIP CRC population

Age

Within the YCRBCIP region, those in the Asian and Black ethnic groups with CRC were younger than those in the White ethnic group. A higher proportion of those in the Asian (41%) and Black (45%) ethnic groups were diagnosed under the age of 60 than was observed amongst those in the White (17%) ethnic group. The median age at CRC diagnosis was lower amongst those in the Asian ethnic group (median age at diagnosis 63 IQR 51-75), and Black ethnic group (median age at diagnosis 61 IQR 52-81) than the White ethnic group (median age at diagnosis 72 IQR 65-80). The trend of diagnosis at a younger age amongst those in the Asian and Black ethnic groups compared to the White ethnic group was also observed in England as a whole (Figure 4).

Figure 4: Age at diagnosis of CRC
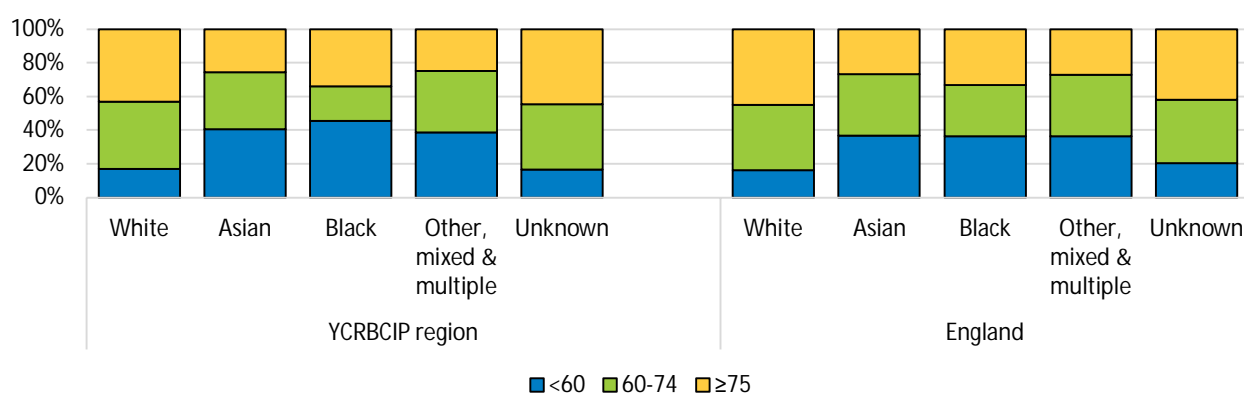
Socioeconomic status

Using an area-based measure of socioeconomic deprivation (Index of Multiple Deprivation), individuals were classed as living in areas with lower deprivation (quintiles 1-3) or higher deprivation (quintiles 4-5). Within the YCRBCIP region, a higher proportion of those in the Asian and Black ethnic groups were classified as living in more socioeconomically deprived areas (77% and 66% respectively) compared to 41% of those in the White ethnic group. This pattern was also seen in England as a whole (Figure 5).

Figure 5: Socioeconomic status
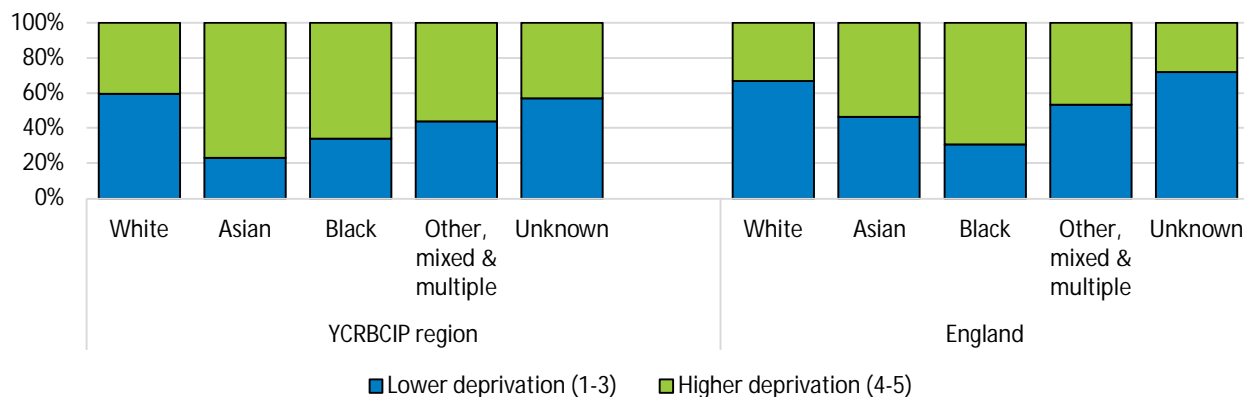
Tumour and treatment characteristics of the YCRBCIP CRC population

Tumour characteristics

The relationship between ethnicity and tumour site within the YCRBCIP region reflected that of England as a whole. Within the YCRBCIP region, those in the Asian ethnic group had the highest proportion of rectal tumours (32%) and those in the Black ethnic group had the lowest (22%) (Figure 6).

Due to small numbers, results for sub-sites within the colon are presented at the England level. Tumours of the right colon were least common amongst those in the Asian ethnic group and most common amongst those in the Black ethnic group (Figure 7). Rectal tumours were least common in the Black ethnic group and most common in the Asian ethnic group (Figure 7).
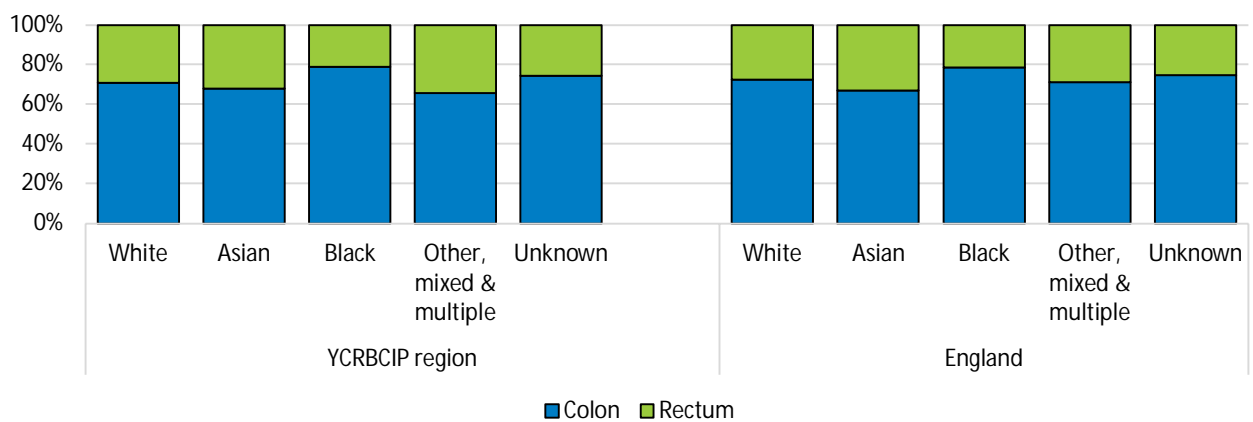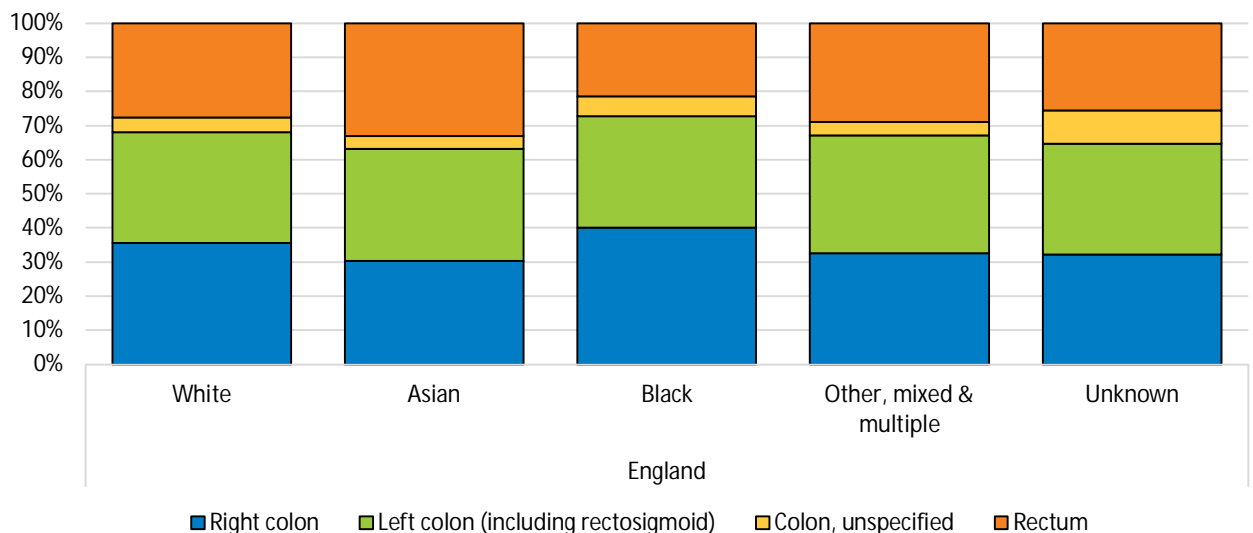
Figure 6: Tumour location by ethnic group

Figure 7: Tumour site by ethnic group, in England

Route to CRC diagnosis by ethnic group

Two week wait (TWW)

Within the YCRBCIP region and within England as a whole, TWW diagnoses accounted for the majority of CRC diagnoses in the White, Asian and Black ethnic groups (Figure 8).

Emergency diagnosis

The proportion of cases diagnosed as an emergency (i.e. through presentation at A&E) was 23%, 28% and 31% in White, Asian and Black ethnic groups respectively. The same pattern was observed for England as a whole, but the proportion of emergency diagnoses was lower (14%, 21% and 27% in White, Asian and Black ethnic groups respectively) (Figure 8).

Figure 8: Rates of route to diagnosis, by ethnic group
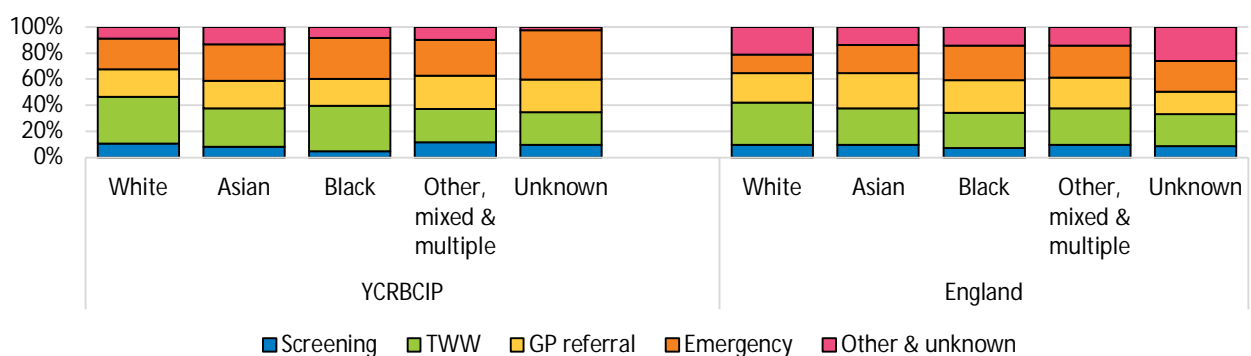
Screening

Screening was the least common route to diagnosis in all ethnic groups. Screen detected cancers accounted for 5% of CRC diagnoses in the Black ethnic groups, 8% in the Asian ethnic group and 11% of the White ethnic group in the YCRBCIP region (Figure 8).

Amongst those between the ages of 60 and 74, 25% of individuals in the White ethnic group were diagnosed via screening, compared to 23% of the Asian and Black ethnic groups (Figure 9). Screening accounted for a comparable proportion of diagnoses amongst the Asian and White ethnic groups in England as a whole (24%) (Figure 9).

Figure 9: Proportion of individuals aged 60-74 at the time of CRC diagnosis who were diagnosed via screening, by ethnic group
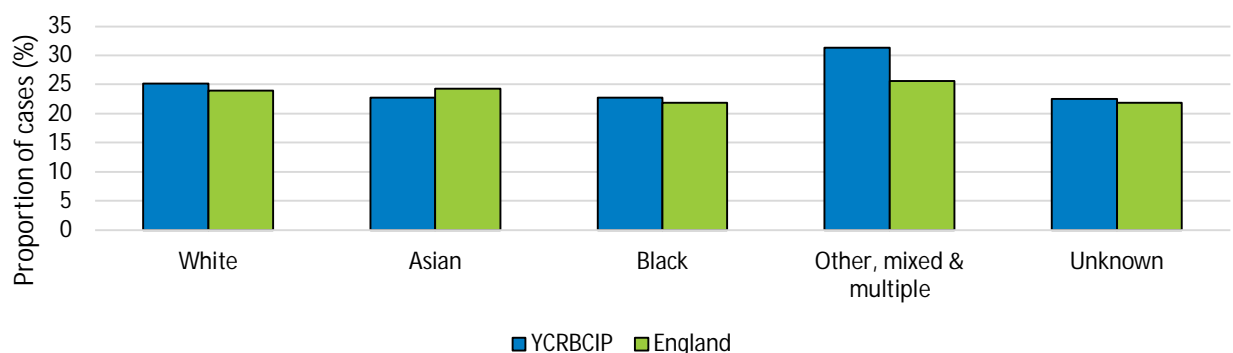
Stage at CRC diagnosis by ethnic group

Trends in stage at diagnosis by ethnic group in the YCRBCIP region reflected those observed in England as a whole.

Early stage (I-II)

Within the YCRBCIP region, 41% of white, 39% of Asian and 36% of Black ethnic groups were diagnosed with stage I or II CRC (Figure 10).

Locally advanced (III)

Locally advanced disease (stage III) accounted for 33% of all diagnoses amongst the Asian ethnic group in the YCRBCIP region, 31% of diagnoses amongst the Black ethnic group and 28% of diagnoses in the White ethnic group (Figure 10).
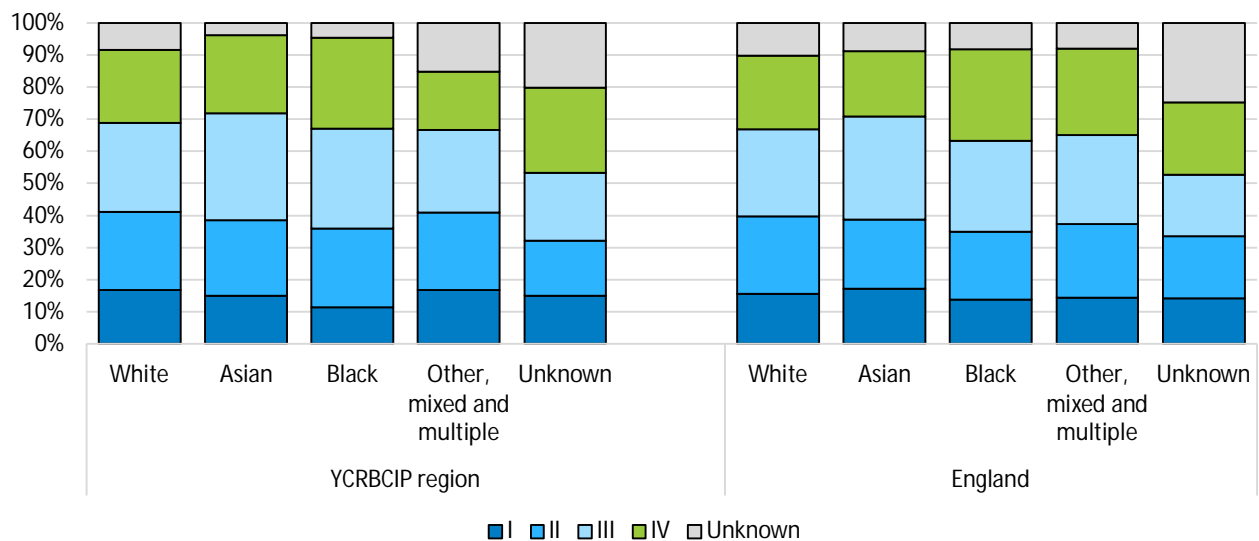
Late stage (IV)

Asian and Black ethnic groups had the highest rate of late-stage diagnosis within the YCRBCIP region (24% and 28% respectively) (Figure 10).

Unknown stage

Asian and Black ethnic groups had the lowest proportion of unknown stage disease in the YCRBCIP region (4% and 5% respectively) (Figure 10).

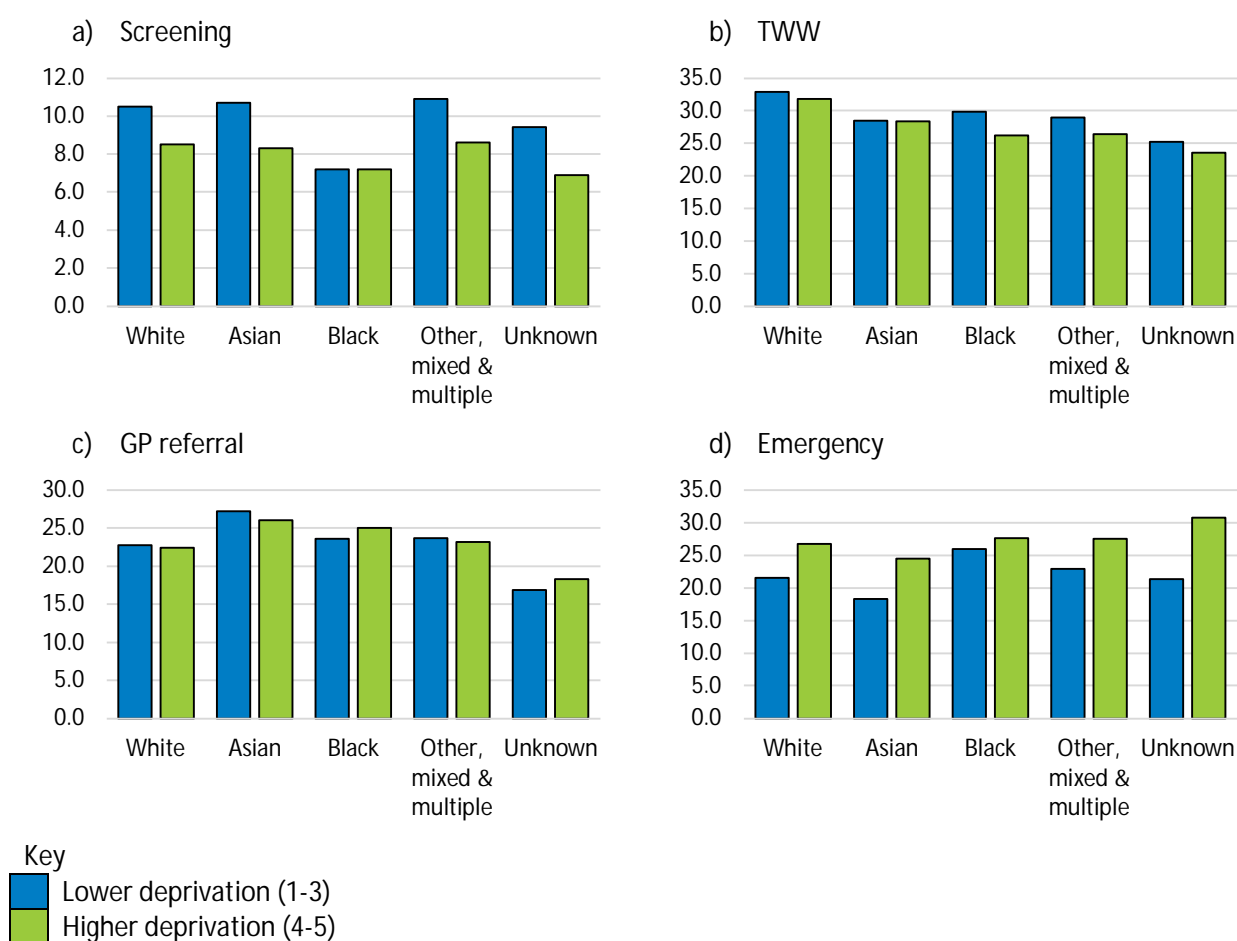Figure 10: Stage at diagnosis by ethnic group

Ethnicity and socioeconomic deprivation

Due to the strong relationship between socioeconomic status and ethnicity, further analyses have been undertaken to investigate the impact of these factors on route to cancer diagnosis and stage of disease. As before, these analyses use an area-based measure of deprivation. Due to small numbers the results are presented for the whole of England.

Route to diagnosis

Across all ethnic groups other than Black, lower proportions of CRC were diagnosed through screening in those living in the most deprived areas. Levels of emergency diagnoses were higher in those living in the most deprived areas, and this was seen in all ethnic groups.

Figure 11: Route to CRC diagnosis in England, by ethnic group and socioeconomic status

Key
Lower deprivation (1-3)
Higher deprivation (4-5)

Stage at diagnosis

The proportion of cancers diagnosed at an early stage was slightly higher in those living in the least deprived areas and this was seen across all ethnic groups. Correspondingly, higher proportions of late and unknown stage at diagnosis were observed in those living in the most deprived areas, but differences were small (e.g. <2% difference amongst the Asian ethnic group and <1% amongst the Black ethnic group for late-stage diagnosis).

Figure 12: Stage at CRC diagnosis in England, by ethnic group and socioeconomic status

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