Cancer Research Journal
2017; 5(2): 14-19
http://www.sciencepublishinggroup.com/j/crj
doi: 10.11648/j.crj.20170502.12
ISSN: 2330-8192 (Print); ISSN: 2330-8214 (Online)

Colorectal Cancer Demographics and Survival in a London Cancer Network

Roy Gurprashad*, Adil Khan, Alex Oldman, Clare Peckitt

Department of Colorectal Surgery, Croydon University Hospital, London, United Kingdom

Email address:
gurprashad@aol.com (R. Gurprashad)
*Corresponding author

To cite this article:
Roy Gurprashad, Adil Khan, Alex Oldman, Clare Peckitt. Colorectal Cancer Demographics and Survival in a London Cancer Network. *Cancer Research Journal*. Vol. 5, No. 2, 2017, pp. 14-19. doi: 10.11648/j.crj.20170502.12

Received: June 6, 2017; **Accepted**: June 20, 2017; **Published**: July 20, 2017

Abstract: The purpose of this study was to examine whether a relationship exists between age, ethnicity, gender and survival of patients within a London Cancer Network. All patients with non metastatic colorectal cancer diagnosed and treated within the South West London Cancer Network between January 2001 and January 2006 were included for analysis. Consent was gained from all hospitals within the London Cancer Network, and data was subsequently requested from the Thames Cancer Registry. In total, 3151 patients were analysed. The results demonstrated that from 2003 there was a yearly increase in new cancer diagnosis. The ratio of male to female patients was approximately equal over the time period (51.5% male, 48.5% female). The overall mean patient age at diagnosis was 70.76 years. Asian, black and mixed race patients had better survival rates than white European patients (hazard ratios 0.96, 0.87, 0.96 respectively). Patients in the age cohort '50-59 years' had a 5 year survival rate of 57.8 months (hazard ratio 1.63), whilst the 'under 40 years' age cohort had the longest 5 year survival rate of 67.4 months. When comparing tumour sites, patients with rectosigmoid tumours had the lowest 5 year survival rate (hazard ratio 1.12), and those with rectal tumours (n=816, hazard ratio 0.88) had the longest 5 year survival rate. Median and overall survival for all patients was 38.84 months and 42.3% respectively. Surgery with neoadjuvant therapy resulted in the longest 5 year survival rate at 62.8%. Surgery alone had a 5 year survival rate of 43%. The results could be used to help design a prognostic indicator tool as a means by which to assist clinicians in providing patients with information on survival outcomes.

Keywords: Colorectal Cancer, Patient Demographics, Cancer Survival Rates

1. Introduction

Bowel cancer remains the second most common cause of cancer death in the United Kingdom (UK), accounting for 10% of all cancer deaths. In 2014 alone there were 15,903 bowel cancer deaths in the UK; equating to 44 deaths each day [1]. The treatment of colorectal cancer in the UK has been the focus of numerous policies and guidelines aimed at improving standards of care, treatment and survival rates [2-6].

Bowel cancer screening by Faecal Occult Blood (FOB) testing for men and women aged 50 to 74 was first recommended by the UK National Screening Committee in July 2003. Following the FOB screening test, an abnormal test result leads to an invitation for a discussion about a colonoscopy. There is increasing thought being given to the impact that ethnicity, age and gender influence the way in which patients initially present with suspected cancer and the degree to which they consent to diagnostic tests and treatments [7, 8, 9, 10]. It has also been suggested that racial factors play a role in colorectal cancer survival rates, although this remains disputed [8, 11].

This study is a retrospective service evaluation of patients with non metastatic colorectal cancer, identified and treated by the South West London Cancer Network. This network comprises five NHS Trusts, and serves 1.75 million people. This service evaluation aims to investigate the effects of patient demographics on colorectal cancer survival rates and attempts to establish whether there exists a relationship between the two.

2. Methods

All patients with non metastatic colorectal carcinoma diagnosed and treated within the South West London Cancer

Network between January 2001 and January 2006 were included for analysis. The total number of those identified using the Thames Cancer Registry was 3151. Data collected for analysis included gender, age cohort (<40, 40-49, 50-59, 60-69, 70-79, >80), ethnicity, type of colorectal tumour (as coded by ICD 10 3 and 4), and treatment modality (chemo/radiotherapy only (NA), surgery with adjuvant therapy (surgery & ADJ), surgery alone (surgery), surgery with neoadjuvant therapy and adjuvant therapy (NA+surgery+ADJ), no surgery (no surgery) and no treatment (NT)). The 5 year survival rates across these variables were then graphed and analysed.

Categorical demographic variables (ethnicity, gender, type and site of cancer) were presented as counts and percentages. Age was presented as a mean of each cohort. Overall survival rate was calculated from the date of diagnosis to the date of patient death. If the patient had not died then they were censored on 31st December 2010 with the assumption that all death information would have been available up to this date. Kaplan Meier curves were plotted for the overall cancer network by treatment, age, gender, ethnicity and tumour site (ICD10 3). Median and 5 year survival rates were displayed by identical categories. Cox regression was also performed by age, gender, ethnicity and tumour site (ICD10 3). Hazard ratios (with 95% confidence intervals) compared to baseline were reported for all other categories. A hazard ratio >1 implies the category of interest has a lower survival rate than the baseline category.

3. Results

In total, 3151 patients were analysed. The ratio of male to female patients was approximately equal over the time period (51.5% male, 48.5% female). There was an annual increase in new cancer diagnoses from 2003. The overall mean patient age at diagnosis was 70.76 years. Asian, black and mixed race patients had better survival rates than white European patients (hazard ratios 0.96, 0.87, 0.96 respectively).

The 'under 40 years' age cohort had the longest 5 year survival rate (67.4 months), whilst patients in age cohort '50-59 years' had the second longest 5 year survival rate at 57.8 months (hazard ratio 1.63 (1.00-2.64)). Compared to colonic tumours (n=1962), patients with rectosigmoid tumours (n=278) had a median survival of 28.1 months and a 5 year survival rate of 38.8 (hazard ratio 1.12 (0.96-1.30). This was the shortest survival rate. Rectal tumours n=816, (hazard ratio 0.88 (0.79-0.97) had the longest 5 year survival rate (44.1 months). Median and overall survival for all patients was 38.84 months and 42.3% respectively. Surgery with neoadjuvant therapy n= 69 (median survival 84.83 months) had the longest 5 year survival rate at 62.8%. Surgery alone n=1721 had a 5 year survival rate of 43% (median survival 39.31 months).

Overall, median and 5 year survival rate for all colorectal cancers in the London Cancer Network was 38.3 months and 42.3% respectively. Median and 5 year survival rate for patients with colonic cancer (C18) treated in the London Cancer Network was 36.2 months and 41.6% respectively. For rectal cancer (C20) the 5 year survival rate was 45.3 months and 44.1% respectively (hazard ratio 0.88 CI 0.79 – 0.97 compared to colonic cancers).

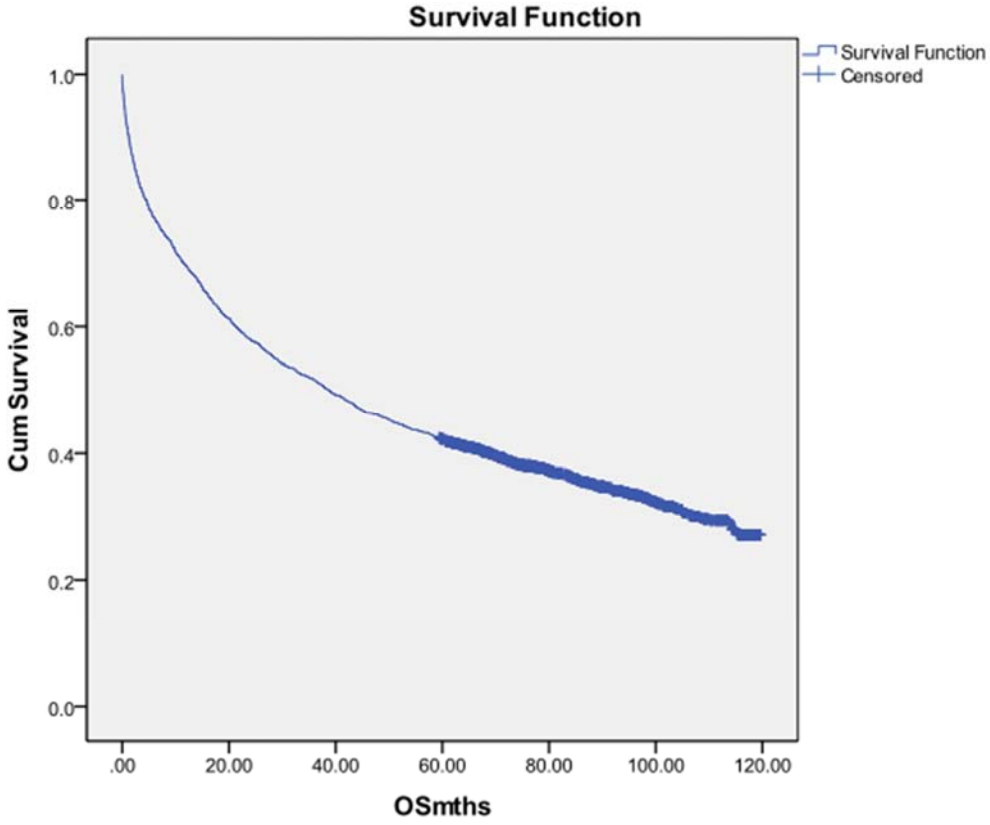

Figure 1. *Shows overall survival rate.*

Median overall survival rate = 38.84 months. 5 year survival rate = 42.3%

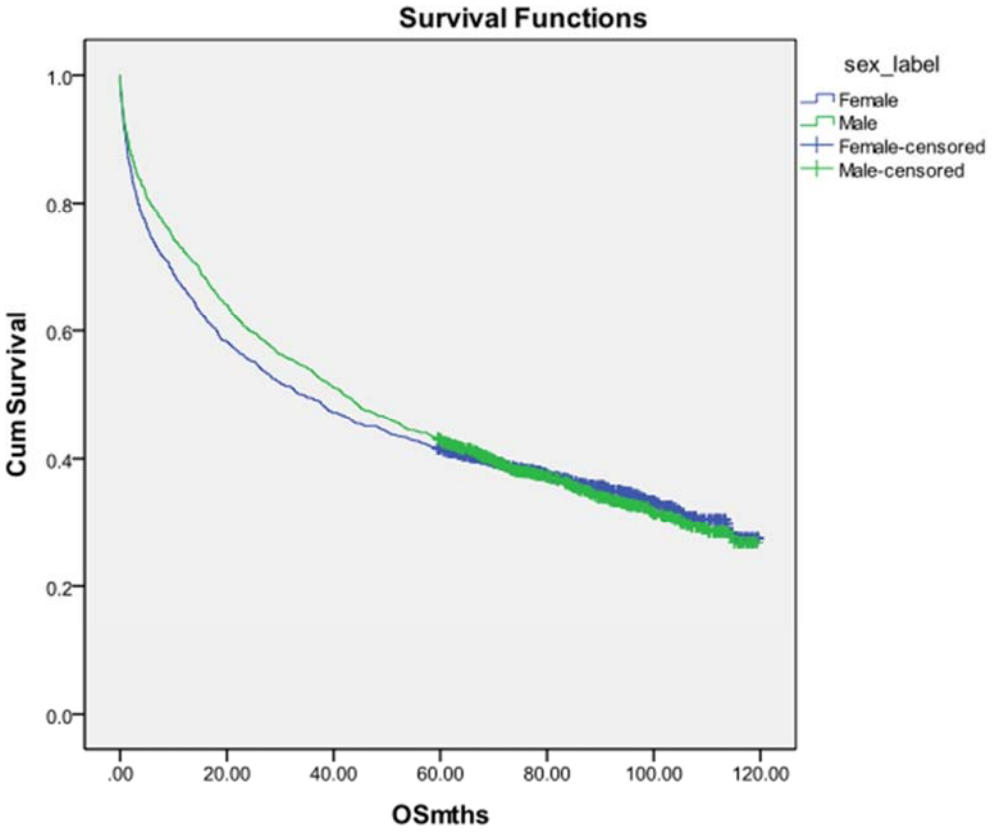

Figure 2. *Shows survival rate by gender.*

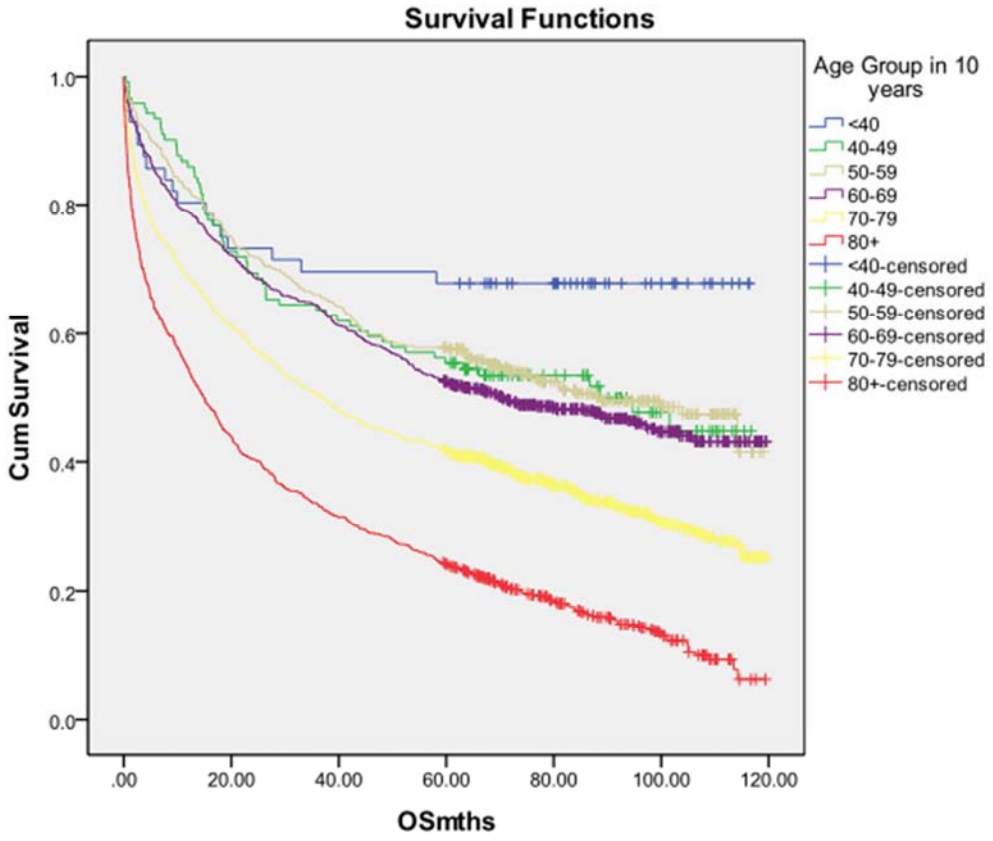

Figure 3. *Shows survival rate by age.*

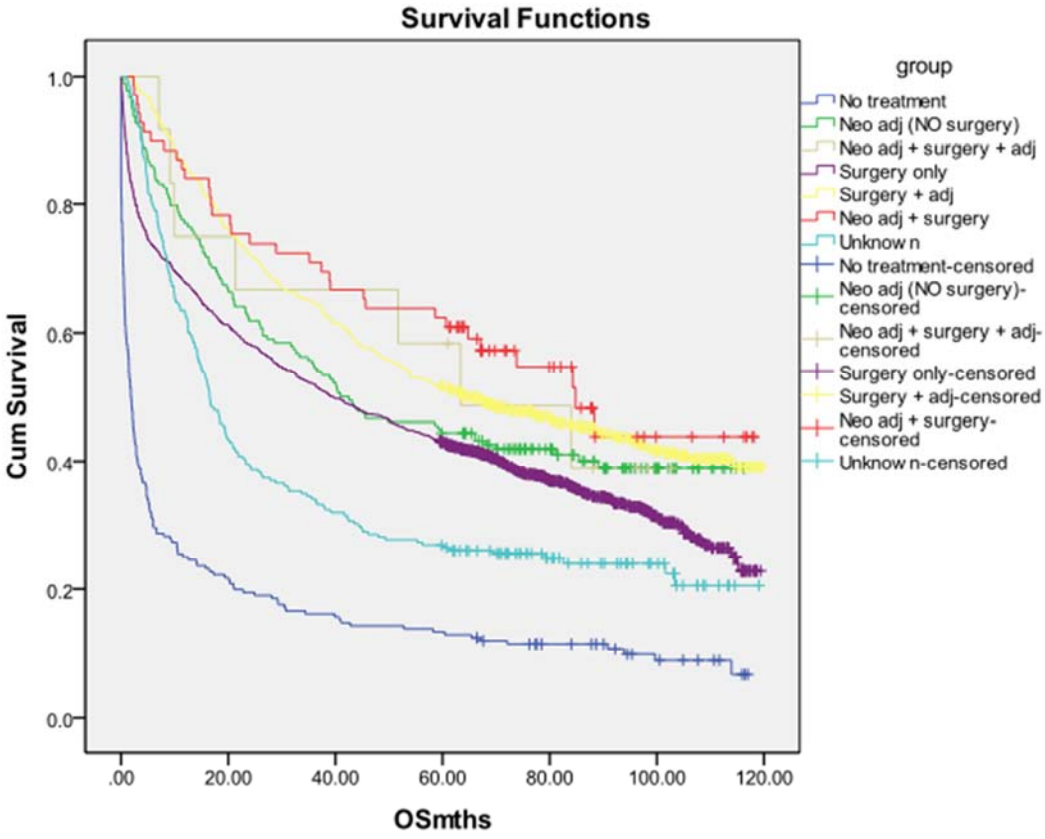

Figure 4. *Shows survival rate by treatment type.*

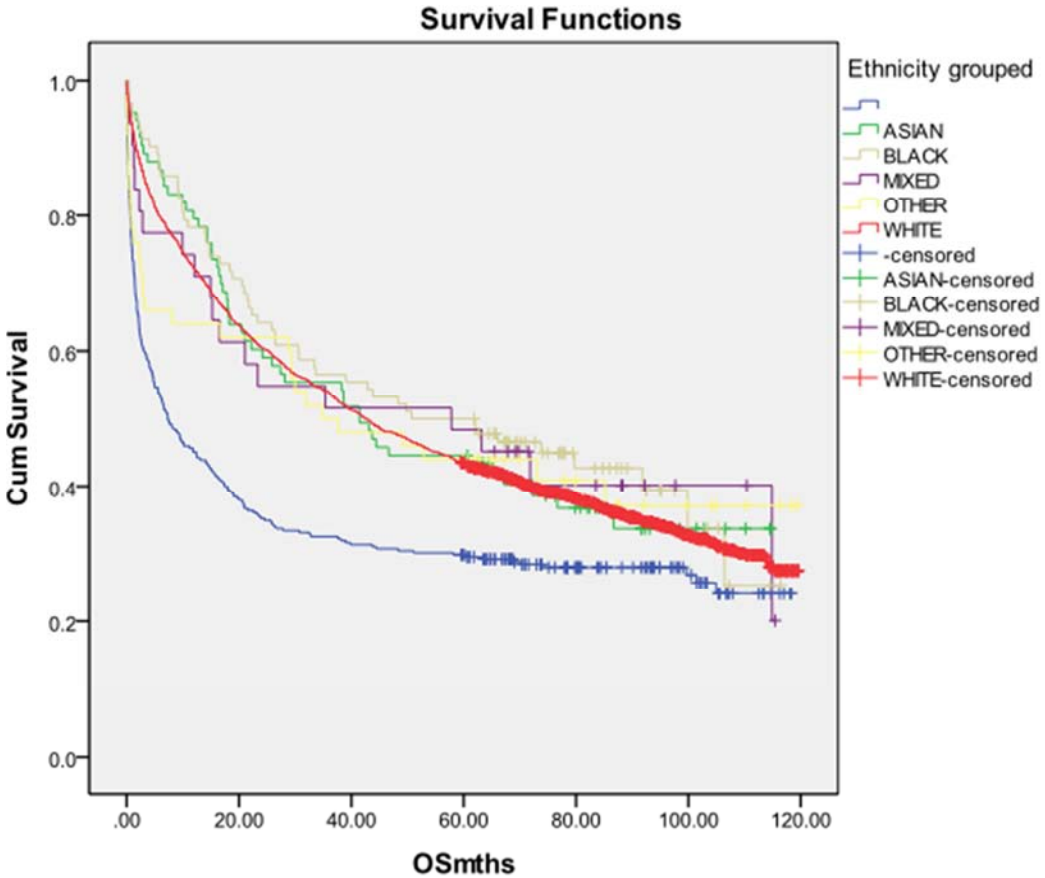

Figure 5. *Shows the survival trends by ethnicity.*

4. Discussion

This study has demonstrated the survival rates of patients with non-metastatic colorectal cancer across the South West London Cancer Network. Like all cancers, colorectal cancer remains a multi-factorial disease with multiple risk factors, such as lifestyle choices (particularly exercise, diet and weight) and access to healthcare, each playing a role [1, 9, 11, 17]. The results outlined above suggest that age, gender, ethnicity and tumour site may be implicated in determining prognosis, specifically with regard to survival rates.

From the analysis, there was no significant difference in survival outcome between genders, with females having a slightly lower 5 year survival rate of 41.5% in comparison to males, with 43%. This is in keeping with similar studies [1, 9].

The chances of being diagnosed with colorectal cancer increase after the age of 40 years [9]. It then rises again after the age of 50 years with more than 90% of colorectal cancer cases occurring in people aged 50 years or older. The incidence rate is more than fifty times higher in persons aged 60 to 79 years than in those younger than 40 years. However, colorectal cancer appears to be increasing among younger people. It is reported that in the United States, colorectal cancer is now the second most commonly diagnosed cancer among men and women aged 20 to 49 years [8]. This may well be a trend that will be seen in the UK. Improved cancer survival rates are seen in the under 40 age group, and are enhanced further if they are physically fit [1, 9, 11]. This corresponded with the findings in this study, which demonstrated the median and overall survival rate for the under 40 age group to be 94.7 months and 67.4% respectively. This group of patients therefore had longer survival by comparison to Cancer Research UK data which cites 5 year survival in the under 40 age group to be 61% for males and 65% for females. It is likely that the success of this group is attributed to a combination of early diagnosis and a good response to treatment. It is accepted that this small cohort may not be comparable to the national dataset and hence the better result. Comparing the remaining age cohorts to the Cancer Research UK data, cohorts '40-49, 50-59, 60-69, 70-79 and >80' all showed lower 5 year survival rates compared to national data published by Cancer Research UK. Possible reasons for this discrepancy are again multi-factorial and can be understood by looking at patient characteristics, namely co-morbidities and wider demographics including socioeconomic characteristics.

This network evaluation has shown that 81% (n=2550) of the patients treated in the Network were white European. Analysis of the overall survival rate by ethnic group revealed that black patients (n=92) had a 5 year survival rate of 50%. This contradicts many earlier reports, in particular, studies in America where African American patients are reported to present late to clinicians, leading to an overall reduction in survival compared to white patients [12]. In the Network, 29.3% of the tumours in black patients were rectal cancer (C20) and 28.3% of the cancers (C18.0-18.3) were right sided; caecum to hepatic flexure. Compared to white patients, rectal cancers made up 26% and exactly 26% were right sided cancers (by same code). These results show no significant differences in the distribution of right sided and rectal cancers between black and white European patients. This would indicate that current screening methods and diagnostics are appropriate for both groups. This study does show that black patients had the best overall 5 year survival rate (50%), followed by mixed (48.4%), Asian (44.6%) other (44.0%) and white patients (43.4%). Despite the racial diversity within the Network, there is evidence of uneven loading across it. This could be a reflection of socioeconomic differences amongst patients which in turn influences outcomes and survival rates when treating all types of cancers [13, 14]. Other similar studies have reported that black patients have far worse outcomes [11] often due to higher obesity rates and poor diet. Although obesity was not considered here, these results would infer otherwise. Interestingly the mixed ethnic grouping had a better 5 year survival rate at 48.4% (second to black patients) which may infer that genetic mixing alters tumour biology compared to same race parentage.

Colorectal cancer survival is highly dependent upon stage of disease at diagnosis. Some studies report survival ranges from 90% at 5 years for cancers detected at the localized stage; 70% for regional; to 10% for people diagnosed with distant metastatic cancer. It is well documented that the earlier the stage at diagnosis, the higher the chance of survival. Since the 1960s, colorectal cancer survival at all stages has increased substantially. The relative improvement in 5 year survival rates over this period, and in overall survival rates, has been better in countries with high life expectancy and good access to modern specialised health care. However, enormous disparities in colorectal cancer survival rates exist globally and even within regions. This variation is not easily explained, but most of the marked global and regional disparity in survival rates is likely due to differences in access to diagnostic and treatment services.

Overall survival rates for each cancer coded by ICD10_4 showed that descending colon tumours (C18.6) had the best 5 year prognosis with a survival rate of 59.8% at 5 years. This may be attributed to the earlier presentation of these tumours compared to more proximal splenic flexure tumours (C18.5) which have the poorest 5 year survival at a rate of 31.7%.

As would be expected, patients where no treatment is recorded had the worst 5 year survival rate of 14.4%. Those patients who had surgery only had a 5 year survival of 43%. Surgery combined with neoadjuvant therapy only or surgery combined with both neoadjuvant and adjuvant therapy had striking results. Both these groups had a 5 year survival rate of 62.8% and 58.3% respectively. Interestingly, patients who had chemoradiotherapy only (charted as neoadjuvant only) had a better 5 year survival of 44.4% compared to surgery alone, 43%. It is not possible to compare these groups as there are far too many variables to consider. It does however act as an indicator of outcome performance. The therapies

can be seen to prolong life in combination with surgery.

It is possible that individuals within the 40-49 years age cohort are presenting later than expected to clinicians due to a failure to act upon red-flag symptoms. Studies have shown that younger patients present with more advanced disease [1, 8, 15]. Further research into the factors affecting patient compliance with government bowel cancer awareness campaigns could help understand this health-compliance relationship. Currently, bright red rectal bleeding is investigated by flexible sigmoidoscopy, which only visualises the sigmoid colon and rectum. Given the prognosis reported in this age group, a more thorough colonoscopic evaluation may be appropriate.

It is likely that the under 40 years age cohort is made up mostly of those patients with a strong genetic predisposition to colorectal cancer. This group is often identified early and therefore called for screening at an early age, resulting in a better response to treatment in the event of cancer detection.

The management of >80 years age cohort is a difficult question given the findings. 858 patients in this group were treated at an average cost of £21984.50/patient (including diagnosis, average cost of rectal or colonic cancer treatment and follow up). The total cost for this group is £18,862,701 (see York Consortium Report [16]). Given that only 24.1% of these patients are alive at 5 years, an important question to ask is whether treatment of this patient group within the Network is cost effective. It certainly would be unethical to restrict treatment in this group, however patient selection may need to be stringent to ensure that patients in this group have the best quality of life post treatment.

5. Conclusion

Survival from colorectal cancer is multi-factorial. The incidence of this disease is increasing and affecting younger patients. Although demographics may play a role in the development, diagnosis and treatment of colorectal cancer, there is no substitute for a healthy balanced diet, regular exercise and maintenance of a healthy weight. The established UK screening program coupled with early therapeutic intervention could potentially reduce the morbidity and mortality associated with colorectal cancer. The results discussed in this study make a case for the current screening program in the UK to be adjusted in order to capture the younger population with cancer. Further guidelines, as set out for those with a genetic predisposition to colorectal cancer, may assist the younger population in both diagnosis and management.

References

[1] Cancer Research UK (http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer; Last Accessed May 2017.

[2] Department of Health (1997) Guidance on Commissioning Cancer Services. Improving Outcomes in Colorectal Cancer. The Manual. London: Department of Health.

[3] Calman – Hine Report (1995) A Report by the Expert Advisory Group on Cancer to the Chief Medical Officers of England and Wales. A Policy Framework for Commissioning Cancer Services The Calman – Hine Report. London: Department of Health.

[4] Morris, E., Haward, R. A., Gilthorpe, M. S., Craigs, C. & Forman, D. (2006) The impact of the Calman-Hine report on the processes and outcomes of care for Yorkshire's colorectal cancer patients. *British Journal of Cancer*, 95, 979–985.

[5] Association of Coloproctology of Great Britain and Ireland (2007) *Guidelines for the Management of Colorectal Cancer*, 3rd edn. Avail- able at: http://www.acpgbi.org.uk/resources/guidelines (last accessed 7 June 2010).

[6] Department of Health (2007) *Manual of Cancer Service Standards*. Available at: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4066453.pdf (last accessed May 2012).

[7] Department of Health (2000). *The NHS Plan. A plan for investment, a plan for reform*. London: The Stationery Office.

[8] Rho YS, et al. (2017)"Comparing Clinical Characteristics and Outcomes of Young-onset and Late-onset Colorectal Cancer; An International Collaborative Study" Clin. Colorectal Cancer 2017.

[9] American Cancer Society, Atlanta. "Colorectal Cancer Facts and Figures 2011-2013" www.cancer.org - American Cancer Society, 2017; 7.

[10] Hargreaves MK. Baquet C. Gamshadzahi A, Diet, nutritional status, and cancer risk in Arnerican Blacks, *Nutr Cancer* 1989; 12: l-2.

[11] R. Williams, et al. Colorectal Cancer in African Americans: An Update. *Clin Trans Gastroenterol*. 2016 Jul; 7 (7): e185.

[12] Mayberry RM, Coates RJ, Hill HA. Determinants of black white differences in colon survival. *J Natl Cancer Inst* 1995. 87: 1686-93.

[13] Mostafa G, Mathews BD, Norton HJ, Kercher KW, Sing RF, Heniford BT. (2004). Influence of Demographics on Colorectal Cancer. *The American Surgeon*. 2004, 70 (3): 259-264.

[14] Kiefe CI. Race/ethnicity and cancer survival, *JAMA* 2002; 287: 2138-9.

[15] Bhandari A, et al. Colorectal cancer is a leading cause of cancer incidence and mortality among adults younger than 50 years in the USA: a SEER-based analysis with comparison to other young-onset cancers. *J Investing Med* 2016; 0: 1-5.

[16] York Health Economics Consortium. Bowel cancer services: costs and benefits. York: York Health Economics Consortium; 2007.

[17] Chan AT, Giovannucci EL. Primary Prevention of Colorectal Cancer. *Gastroenterology* Jun 2010; 138 (6); 2029-2043 e2010.