Map 6: Rate of mortality from cancer in people aged under 75 years per population by CCG

Directly standardised rate, adjusted for age and sex, 2013

Domain 1: Preventing people from dying prematurely



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Although cancer is a disease that disproportionately affects older people, it is the highest cause of death in England in people aged under 75 years¹. Cancer deaths in people under the age of 75 years are an indicator of premature mortality: that is, a large proportion of people under the age of 75 years would not be expected to die of cancer; if someone does die of cancer under the age of 75 years, it may be cause for further investigation.

Smoking is the major preventable risk factor for cancer.

Magnitude of variation

For CCGs in England, the rate of mortality from cancer in people aged under 75 years ranged from 85 to 176 per 100,000 population (2.1-fold variation). When the seven CCGs with the highest rates and the seven CCGs with the lowest rates are excluded, the range is 97–158 per 100,000 population, and the variation is 1.6-fold.

One reason for the degree of variation observed is differences in the mix of cancers that occur among local populations.

Options for action

To reduce premature mortality from cancer, commissioners need to support:

- > cancer prevention initiatives, including cancer screening programmes;
- > public awareness campaigns, such as "Be Clear on Cancer"².

Commissioners need to specify that service providers:

- participate in early diagnosis campaigns, such as the National Awareness and Early Diagnosis Initiative (NAEDI; see "Resources"), to identify early signs of cancer before the disease develops and becomes harder to treat;
- Increase the public's awareness of cancer symptoms, through participation in campaigns such as "Be Clear on Cancer"²;
- provide smoking cessation services, especially in areas of high tobacco use, comply with NICE guidance on tobacco harm reduction and smoking cessation (see "Resources"), and take opportunities to offer smoking cessation services when people present for other reasons – Making Every Contact Count³;
- > encourage participation in and improve uptake of cancer screening programmes (breast, cervical and bowel);
- > review cancer care pathways across local NHS services to ascertain whether they meet NICE and other guidance;
- compare the cancer care pathways, and the integration of systems of care for cancer, with those of CCGs that have populations with similar demographic and socio-economic characteristics, particularly the CCGs with improved outcomes (refer to NHS England's Commissioning for Value programme, as part of which it is possible to identify any CCG's ten closest peers, referred to as "Similar 10" CCGs; see "Resources").

Commissioners also need to specify that GPs:

- comply with NICE guidelines NG12 on suspected cancer (see "Resources") to minimise delay in investigation and referral for specialist treatment;
- > participate in audits of the promptness of cancer diagnosis.

RESOURCES

- Independent Cancer Taskforce. Achieving World-Class Cancer Outcomes. A Strategy For England 2015-2020. http://www.cancerresearchuk.org/sites/default/files/ achieving_world-class_cancer_outcomes_-_a_strategy_for_ england_2015-2020.pdf
- Cancer Research UK. National Awareness and Early Diagnosis Initiative (NAEDI). http://www.cancerresearchuk.org/cancerinfo/spotcancerearly/naedi/
- Cancer Research UK. Accelerate, Coordinate, Evaluate (ACE) Programme. http://www.cancerresearchuk.org/healthprofessional/early-diagnosis-activities/ace-programme
- NICE. Suspected cancer: recognition and referral. NICE guidelines [NG12]. June 2015. https://www.nice.org.uk/guidance/ng12
- > NICE pathways. Suspected cancer recognition and referral overview. http://pathways.nice.org.uk/pathways/suspected-cancer-recognition-and-referral
- NICE. Tobacco: harm-reduction approaches to smoking. NICE Guidelines [PH45]. June 2013. http://www.nice.org.uk/ guidance/ph45
- > NICE. Brief interventions and referral for smoking cessation. NICE Guidelines [PH1]. March 2006. http://www.nice.org.uk/ Guidance/PH1
- NICE. Smoking cessation services. NICE Guidelines [PH10]. February 2008. http://www.nice.org.uk/Guidance/PH10
- NICE. Smoking cessation services in secondary care: acute, maternity and mental health services. NICE Guidelines [PH48]. November 2013. http://www.nice.org.uk/guidance/ph48
- NICE. Smoking: reducing tobacco use. NICE quality standard [QS82]. March 2015. http://www.nice.org.uk/guidance/qs82
- NICE pathways. Lung cancer overview. http://pathways.nice.org.uk/pathways/lung-cancer
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- > NICE pathways. Early and locally advanced breast cancer overview. http://pathways.nice.org.uk/pathways/early-and-locallyadvanced-breast-cancer
- > NICE pathways. Advanced breast cancer overview. http://pathways.nice.org.uk/pathways/advanced-breastcancer
- > National Cancer Intelligence Network. Cancer statistics: availability and location. June 2014 update. http://www.ncin.org.uk/view?rid=2696
- Health and Social Care Information Centre. Indicator 1.9. Under 75 mortality rates from cancer. https://indicators.ic.nhs.uk/webview/ Click on Domain 1, then 1.9 Under 75 mortality rates from cancer.
- > Public Health Outcomes Framework. Regional data on premature cancer mortality. http://www.phoutcomes.info/
- > NHS England. Commissioning for Value. Scroll to the bottom of the page to find the file 'The data and methodology used to calculate the "Similar 10" CCGs', located under the heading "Commissioning for Value: Interactive Tools for CCGs – 2013 versions" and under the subheading "Download the data behind the packs and interactive tools – 2013 versions". http://www.england.nhs.uk/resources/resources-for-ccgs/ comm-for-value/

3 http://www.makingeverycontactcount.co.uk/

¹ Health & Social Care Information Centre. Cancer death rate falls nationally over last decade. http://www.hscic.gov.uk/article/5205/Cancer-death-rate-falls-nationally-over-last-decade

² Public Health England. Campaign Resource Centre. Be Clear on Cancer. https://campaigns.dh.gov.uk/category/beclearoncancer/

Map 7: Percentage of people aged 15–99 years who survived one year after being diagnosed with any cancer by CCG

Adjusted for age, sex, mix of cancers, and background mortality¹, 2012 followed up to 2013





Improving cancer survival is one of the key challenges identified in "Achieving World-Class Cancer Outcomes. A Strategy for England 2015–2020" (see "Resources"), and cancer survival has been improving for many years. Better treatment, better detection and awareness initiatives are all factors that may have contributed to this improvement. Particular gains in survival have been made for high-incidence sites for cancer such as the breast, lung and colorectum (or bowel).

Differences in one-year cancer survival are an important driver of differences in longer-term survival.² One-year survival rates in England are still lower than those in comparable countries.³ For some cancers, there is evidence that more patients in England are diagnosed at a later stage when compared with patients in other countries.⁴

In the UK in 2012, there were 161,823 deaths from cancer. In 2010/11 in England and Wales, only 50% of people survived cancer for ten years or more.⁵

In 2013, cancers of the breast, lung, prostate and colorectum accounted for more than half of all cancer deaths in England⁶: an understanding of survival for cancers at these sites will help target efforts to improve survival for all cancers. Survival for breast cancer is usually high when compared with that for all cancers, whereas survival for lung cancer is one of the lower rates.

Breast cancer is the most common cancer in England: 44,540 women were registered with the condition in 2013.⁶ The incidence rate for women is the sixth highest in Europe, and in the last ten years the incidence rate has increased by 7%.⁷ In 2012 in the UK, there were 11,716 deaths from breast cancer; it is thought that 27% of cases are preventable.⁷ In terms of survival, in 2010/11 in England and Wales, 78% of women survived for ten years or more.⁷

Lung cancer is the third most common cancer in England: 36,653 people were diagnosed with the condition in 2013.⁶ The incidence rate for men is the seventh lowest in Europe, but for women it is the seventh highest.⁸ From a peak in the late 1970s, the incidence rate for men has declined by 48%, whereas the incidence rate for women, which increased by about 45% from the mid-1970s to the late 1980s, has increased by 19% since the late 1980s.⁸ In 2012 in the UK, there were 35,371 deaths from lung cancer; it is thought that 89% of cases are preventable.⁸ In terms of survival, in 2010/11 in England and Wales, only 5% of people survived for ten years or more.⁸

Colorectal cancer is the fourth most common cancer in England: 33,765 people were diagnosed with the condition in 2013.⁶ The incidence rate for men is the twentieth highest in Europe, and for women it is the seventeenth highest.⁹ In the last ten years the incidence rate has increased by 6%.⁹ In 2012 in the UK, there were 16,187 deaths from colorectal cancer; it is thought that 54% of cases are preventable.⁹ In terms of survival, in 2010/11 in England and Wales, 57% of people survived for ten years or more.⁹

Cancers detected earlier are easier to treat, and people whose cancers are detected earlier have much better survival than people with later staged cancers.¹⁰ Some population groups are more likely to be diagnosed with later stage disease.⁴ The aim for the National Awareness and Early Diagnosis Initiative (NAEDI; see "Resources") is to promote earlier diagnosis of cancer, thereby increasing access to optimal treatment, and improving survival rates and reducing mortality from cancer, through:

- > achieving early presentation;
- > optimising clinical practice and systems;
- improving GP access to diagnostics, though the Accelerate, Coordinate, Evaluate (ACE) Programme¹¹, one aim of which is to shift diagnosis of cancer from stages 3 and 4 to stages 1 and 2 (see Maps 12–13, pages 66–69);
- > research, monitoring and evaluation.

Magnitude of variation

Map 7: One-year survival for any cancer

For CCGs in England, the percentage of people aged 15–99 years who survived one year after being diagnosed with any cancer ranged from 63.7% to 73.5% (1.2-fold variation). When the seven CCGs with the highest percentages and the seven CCGs with the lowest percentages are excluded, the range is 65.0–72.4%, and the variation is 1.1-fold.

Map 8: One-year survival for breast, lung and colorectal cancer

For CCGs in England, the percentage of people aged 15–99 years who survived one year after being diagnosed with breast, lung or colorectal cancer ranged from 64.1% to 74.7%

1 Background mortality is a phrase routinely used in cancer intelligence, and means the data have been adjusted for "expected death rates".

- 4 Cancer Research UK. NAEDI Briefing Sheet. http://www.cancerresearchuk.org/sites/default/files/health_professional_naedi_briefing_sheet.pdf
- 5 Cancer Research UK. Cancer Statistics for the UK. http://www.cancerresearchuk.org/health-professional/cancer-statistics
- 6 Office for National Statistics. Statistical Bulletin. Cancer Registration Statistics, England 2013.
- http://www.ons.gov.uk/ons/dcp171778_409714.pdf
 Cancer Research UK. Breast cancer statistics.
 http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer
- 8 Cancer Research UK. Lung cancer statistics. http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/lung-cancer
 9 Cancer Research UK. Bowel cancer statistics.

http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer 10 http://www.ncin.org.uk/view?rid=2752.

11 Cancer Research UK. ACE Programme. http://www.cancerresearchuk.org/health-professional/early-diagnosis-activities/ace-programme

² McPhail S, Johnson S, Greenberg D et al. Stage at diagnosis and early mortality from cancer in England. British Journal of Cancer 2015; 112: S108-S115. doi: 10.1038/bjc.2015.49 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4385983/

³ Coleman M et al. ICBP Module 1 Working Group. Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995—2007 (the International Cancer Benchmarking Partnership): an analysis of population-based cancer registry data. Lancet 2011; 377: 9760. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018568/

(1.2-fold variation). When the seven CCGs with the highest percentages and the seven CCGs with the lowest percentages are excluded, the range is 67.1–73.6%, and the variation is 1.1-fold.

After adjusting for age and sex, reasons for the degree of variation observed in one-year survival include differences in:

- > the stage of cancer at the time of diagnosis oneyear relative survival decreases with increasing stage at diagnosis²;
- > population health factors, such as co-morbidity with other health conditions, smoking prevalence, and general health status.

McPhail et al also found statistically significant effects in excess rate ratios for mortality within one year of diagnosis for:

- > income deprivation;
- > geographical area of residence.²

Options for action

To improve one-year survival rates, commissioners need to specify that:

- > service providers participate in early diagnosis initiatives, such as the NAEDI (see "Resources") to identify early signs of cancer before the disease develops – it is important to diagnose all cancers before they progress to stage 4, which would substantially increase one-year survival, but for lung and ovarian cancers there is a need to diagnose them at an even earlier stage²;
- ➤ GPs comply with NICE guidelines NG12 (see "Resources") on suspected cancer.

Commissioners also need to specify that service providers:

- > work to increase participation in the screening programmes for breast cancer and for bowel cancer to increase early detection of these cancers – about one-third of breast cancers are diagnosed through screening¹²;
- > take opportunities to offer smoking cessation services to reduce the risk of lung cancer when people present for other reasons – Making Every Contact Count¹³ – and comply with NICE guidance on tobacco harm reduction and smoking cessation (see "Resources").

RESOURCES

- Independent Cancer Taskforce. Achieving World-Class Cancer Outcomes. A Strategy For England 2015-2020. http://www.cancerresearchuk.org/sites/default/files/ achieving_world-class_cancer_outcomes_-_a_strategy_for_ england_2015-2020.pdf
- Cancer Research UK. National Awareness and Early Diagnosis Initiative (NAEDI). http://www.cancerresearchuk.org/cancerinfo/spotcancerearly/naedi/
- Office for National Statistics (ONS) Resources relating to cancer survival. http://ons.gov.uk/ons/taxonomy/index. html?nscl=Cancer+Survival
- > NICE. Suspected cancer: recognition and referral. NICE guidelines [NG12]. June 2015. https://www.nice.org.uk/guidance/ng12
- > NICE pathways. Suspected cancer recognition and referral overview. http://pathways.nice.org.uk/pathways/suspected-cancer-recognition-and-referral
- NICE. Breast cancer quality standard. NICE quality standard [QS12]. September 2011. http://www.nice.org.uk/guidance/qs12
- > NICE. Lung cancer. NICE quality standard [QS17]. March 2012. http://www.nice.org.uk/guidance/qs17
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- Cancer Research UK. Cancer Risk Assessment tool (RAT). http://www.cancerresearchuk.org/health-professional/ learning-and-development-tools/cancer-risk-assessmenttool-rat
- National Cancer Intelligence Network. Cancer statistics: availability and location. June 2014 update. http://www.ncin.org.uk/view?rid=2696

¹² Department of Health. Improving Outcomes: A Strategy for Cancer. January 2011.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213785/dh_123394.pdf 13 http://www.makingeverycontactcount.co.uk/

Map 8: Percentage of people aged 15–99 years who survived one year after being diagnosed with breast, lung or colorectal cancer by CCG

Adjusted for age, sex, mix of cancers, and background mortality¹, 2012 followed up to 2013





Map 9A: Rate of colonoscopy procedures and flexible sigmoidoscopy procedures per population by CCG

Indirectly standardised rate, adjusted for age, sex and deprivation, 2012/13

Domain 1: Preventing people from dying prematurely



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There are several methods available for imaging the large bowel (colon), particularly in the diagnosis of cancer of the colon, including:

- > colonoscopy;
- > flexible sigmoidoscopy;
- > CT colonoscopy;
- > barium enema.

The aim of the National Awareness and Early Diagnosis Initiative (NAEDI)¹ is to improve cancer survival outcomes in England, including that for colorectal (bowel) cancer. Although not all colonic investigations are done because of the suspicion of cancer, ruling out colorectal cancer is considered the most important reason for such an investigation, particularly because early diagnosis of cancer of the colon is vital in order to improve outcomes. It was thought that investigations could be targeted at patients with specific clinical features, but studies have shown that in patients with lower GI symptoms, selecting out those to investigate gives a poor correlation with cancer, and particularly early cancer. This suggests that the overall threshold for lower GI investigation should be lowered to improve the overall diagnostic rate for colorectal cancer, and the proportion of people diagnosed early and when the cancer is curable

Colonoscopy is an investigation of the lining of the entire large bowel (colon) using an endoscope. It is sometimes referred to as "optical colonoscopy". **Flexible sigmoidoscopy** is similar to colonoscopy, but confined to an examination of the sigmoid colon (last part of the large bowel) using a flexible endoscope.

Both procedures are used to diagnose or exclude cancer of colon or to look for pre-cancerous polyps, small growths on the inner lining of the bowel or rectum. If polyps are found on examination, they are often removed. Flexible sigmoidoscopy and colonoscopy can also be used in the diagnosis of, and monitoring of treatment for, inflammatory bowel disease (IBD). About 60–70% of these procedures are performed for the diagnosis of cancer, 15–20% for the diagnosis of, and monitoring of treatment for, IBD, and 10% for other reasons. Flexible sigmoidoscopy is the preferred procedure in some clinical situations because sedation is not required, and it is quicker and carries less risk than colonoscopy.

Other countries with developed economies have higher rates of colonoscopy than the UK. In the 2011 national colonoscopy audit, Scotland and Northern Ireland had higher rates of colonoscopy than England.² Need for colonoscopy will be driven by a greater awareness of investigating symptoms that are less marked, especially in light of the recent NICE guidelines for suspected cancer (NG12; see "Resources"). It is also anticipated that increased demand (about 8 procedures per 1000 population per year), a doubling of the current rate, will be generated by the NHS Bowel Cancer Screening Programme bowel scope screening, currently being rolled out to all men and women aged 55 years; as of March 2015, 60% of screening centres were offering this test to 55-year-olds.

For the indicator shown in Map 9A, on page 58, the rates of colonoscopy procedures and flexible sigmoidoscopy procedures have been combined.

Computed tomography (CT) colonoscopy or

colonography is a relatively new radiological technique designed to image the colon. It is sometimes referred to as "virtual colonoscopy" because a CT scanner and a computer are used to generate three-dimensional images of the colon. As such, CT colonoscopy is minimally invasive because there is no need to introduce an endoscope into the colon to obtain the images, and therefore no need for the sedation of patients, although a laxative bowel preparation is sometimes still required.

CT Colonoscopy is used to investigate patients with symptoms suggestive of colorectal cancer, and has been found to be as effective as optical colonoscopy in the diagnosis of colorectal cancer.³

Unlike colonoscopy and flexible sigmoidoscopy, CT colonoscopy is less useful for the diagnosis of IBD because biopsy material is invariably required to support or refute the diagnosis, whereas a thorough cancer exclusion can follow a satisfactory CT colonoscopy.

Barium enema is an X-ray procedure that creates images of the large intestine. During the procedure,

¹ Cancer Research UK. National Awareness and Early Diagnosis Initiative (NAEDI). http://www.cancerresearchuk.org/cancer-info/spotcancerearly/naedi/AboutNAEDI/

² Gavin DR, Valori RM, Anderson JT et al (2013) The national colonoscopy audit: a nationwide assessment of the quality and safety of colonoscopy in the UK. Gut 62; 242-249. http://www.ncbi.nlm.nih.gov/pubmed/22661458

³ Colorectal cancer: CT colonography and colonoscopy for detection — systematic review and meta-analysis. Structured abstract, DARE. Original article: Pickhardt PJ, Hassan C, Halligan S, Marmo R. Colorectal cancer: CT colonography and colonoscopy for detection — systematic review and meta-analysis. Radiology 2011; 259(2): 393-405. http://onlinelibrary.wiley.com/o/cochrane/cldare/articles/DARE-12011002875/frame.html

barium sulphate liquid and air are introduced into the bowel, following which X-rays are taken to obtain double-contrast images of the colon and rectum, which are then used to identify the following problems:

- cancerous or non-cancerous growths (also known as adenomas or polyps);
- > colorectal cancer (in the colon or rectum);
- > inflammation (ulcerative colitis and Crohn's disease);
- > diverticular disease.

Other conditions for which barium enema may be performed include:

- > blockage of the large intestine;
- intussusception, where one part of the intestine slides into another;
- > Hirschsprung's disease.

In a recent multicentre randomised controlled trial for the diagnosis of colorectal cancer or large polyps in symptomatic patients (SIGGAR), the detection rate for barium enema was 5.6% whereas that for CT colonoscopy was 7.3%.⁴ The findings of the SIGGAR trial support considerable non-controlled evidence that barium enema is an inferior test when compared with CT colonoscopy. Halligan et al suggest CT colonoscopy should be the preferred radiological test for patients with symptoms suggestive of colorectal cancer.¹

Barium enema is also inappropriate for the diagnosis of IBD because biopsy material is invariably required to support the diagnosis.

Barium enema is a useful test in a very small number of patients, particularly when it is necessary to visualise the particular shape of the colon, such as in megacolon.

Although in recent years it has become less common to perform a barium enema, it is still in use, particularly where there is a contra-indication for, or limited provision of, CT colonoscopy (see Map 10, page 62).

Magnitude of variation

Map 9A: Colonoscopy and flexible sigmoidoscopy

For CCGs in England, the rate of colonoscopy procedures and flexible sigmoidoscopy procedures ranged from

93.1 to 231.6 per 10,000 population (2.5-fold variation). When the seven CCGs with the highest rates and the seven CCGs with the lowest rates are excluded, the range is 105.5–207.0 per 10,000 population, and the variation is 2.0-fold (see Table 9.1 for 2011/12 data).⁵

Table 9.1: Rate of colonoscopy procedures and flexiblesigmoidoscopy procedures per 10,000 population byCCG for two financial years

Financial year	Range before exclusions	Fold difference before exclusions	Range after exclusions	Fold difference after exclusions
2011/12	82.0-222.4	2.7	107.4–198.2	1.8
2012/13	93 1_231 6	25	105 5-207 0	2.0

The degree of variation observed in colonoscopy procedures and flexible sigmoidoscopy procedures is similar, with a slight increase from 2011/12 to 2012/13.

Reasons for the degree of variation in the rate of colonoscopy procedures and flexible sigmoidoscopy procedures are historical, reflecting differences in:

- the number of gastro-enterologists per head of local population;
- the degree to which gastro-enterologists in any hospitals have commitments to ward work, outpatients and acute internal medicine, in addition to those in endoscopy;
- > regional cancer rates;
- the number of procedures conducted in the independent sector, which is relatively higher in the South East of England.

Possible reasons for unwarranted variation include differences in:

- > access to endoscopy provision;
- > the use of barium enema (see Map 11, pages 65–66);
- the availability of CT colonoscopy, and local protocols for its use;
- > the application of guidelines for referral;
- the professional practice of GPs and hospital clinicians;
- > local service configuration.

⁴ Halligan S, Wooldrage K, Dadswell E et al for the SIGGAR investigators (2013) Computed tomographic colonography versus barium enema for diagnosis of colorectal cancer or large polyps in symptomatic patients (SIGGAR): a multicentre randomised trial. The Lancet. Published online February 14, 2013. http://www.ncbi.nlm.nih.gov/pubmed/23414648

⁵ For 2011/12 data by PCT, see Diagnostics Atlas, Map 15A, pages 74–75, and Table 15.2, page 75 for 2009/10 data by PCT.

Map 9B: Ratio of colonoscopy procedures to flexible sigmoidoscopy procedures by CCG 2012/13





Map 10: Rate of computed tomography (CT) colonoscopy procedures per population by CCG

Indirectly standardised rate, adjusted for age, sex and deprivation, 2013/14





Map 9B: Ratio of colonoscopy to flexible sigmoidoscopy

For CCGs in England, the ratio of colonoscopy procedures to flexible sigmoidoscopy procedures ranged from 0.45 to 11.58 (25.5-fold variation). When the seven CCGs with the highest ratios and the seven CCGs with the lowest ratios are excluded, the range is 0.75–3.74 per 10,000 population, and the variation is 5.0-fold (see Table 9.2 for 2011/12 data).⁶

Table 9.2: Ratio of colonoscopy procedures toflexible sigmoidoscopy procedures by CCG fortwo financial years

Financial year	Range before exclusions	Fold difference before exclusions	Range after exclusions ³	Fold difference after exclusions
2011/12	0.4–10.5	24	0.7–3.3	4.9
2012/13	0.5–11.6	25	0.7–3.7	5

The degree of variation observed in the ratio of colonoscopy to flexible sigmoidoscopy has remained similar, with a slight increase from 2011/12 to 2012/13.

Map 10: CT colonoscopy

For CCGs in England, the rate of CT colonoscopy procedures ranged from 0.0 to 58.8 per 10,000 population.⁷ When the seven CCGs with the highest rates and the seven CCGs with the lowest rates are excluded, the range is 0.4–30.7 per 10,000 population, and the variation is 79.3-fold.⁸

Reasons for the degree of variation observed in the rate of CT colonoscopy are differences in:

- > access to CT colonoscopy;
- the availability of CT scanners capable of producing CT colonoscopy images;
- the availability of radiologists skilled in interpreting CT colonoscopy scans;
- training opportunities for radiologists in CT colonoscopy;
- the use of barium enema (see Map 11, pages 65–66) to image the colon in people with suspected colorectal cancer.

Map 11: Barium enema

For CCGs in England, the rate of barium enema procedures ranged from 1.2 to 1341 per 100,000 population (1076-fold variation).⁹ When the seven CCGs with the highest rates and the seven CCGs with the lowest rates are excluded, the range is 3.0–356 per 100,000 population, and the variation is 119.5-fold.¹⁰

The principal reason for the degree of variation observed in the rates of barium enema is insufficient capacity for, and therefore insufficient access to, CT colonoscopy, colonoscopy, and flexible sigmoidoscopy.

Options for action

For the improved diagnosis of colorectal cancer, commissioners need to specify that service providers:

- review current levels of access to CT colonoscopy, colonoscopy, and flexible sigmoidoscopy to ensure that clinicians responsible for referrals for suspected colorectal cancer no longer use barium enema to image the colon when it is best practice not to do so;
- develop local referral guidelines for colonoscopy, flexible sigmoidoscopy and CT colonoscopy, including a consideration of "Straight to Test" services;
- calculate, on the basis of local referral guidelines, the demand for colonoscopy, flexible sigmoidoscopy and CT colonoscopy to inform planning for capacity.

To support the effective use of CT colonoscopy:

- Health Education England (HEE) and the Centre for Workforce Intelligence (CFWI) need to address the shortage of radiologists nationally;
- local service providers need to ensure there are training opportunities for radiologists in the interpretation of CT colonoscopy scans, and that CT equipment is of adequate capacity.

If, despite adequate provision for CT colonoscopy and colonoscopy in relation to need in the local population, there is still demand for barium enema, commissioners need to specify that service providers:

- > investigate the reasons for this;
- > take action to stop inappropriate requests for this test.

⁶ For 2009/10 and 2011/12 data by PCT, see Diagnostics Atlas, Table 15.4, page 78.

⁷ Data from four CCGs have been removed due to small numbers.

⁸ For April–November 2012 data by PCT, see Diagnostics Atlas, Map 16, pages 80–81.

⁹ Data from 13 CCGs have been removed due to small numbers.

¹⁰ For April–November 2012 data by PCT, per weighted population, see Diagnostics Atlas, Map 17, pages 82–82.

With respect to the provision and management of endoscopy services overall, commissioners need to review with service providers and bowel surgeons:

- the referral rate for flexible sigmoidoscopy and colonoscopy in relation to local population needs;
- > local service configuration.

The Joint Advisory Group (JAG) on GI endoscopy has developed a Productivity & Planning Assessment Tool (PPAT; see "Resources") for endoscopy services and commissioners. It provides a checklist of objectives that the most productive endoscopy services apply systematically to ensure endoscopy resource is used appropriately and efficiently. To ensure effective planning, JAG recommends that commissioners require local services to use the PPAT.

The Global Rating Scale (GRS; see "Resources") is a tool that enables provider units to assess whether the service is patient-centred, and it includes dimensions for quality and safety, and customer care. Applying the "Appropriateness" item reassures commissioners that referrals are vetted against best practice.

Although colonoscopy and flexible sigmoidoscopy are high-value interventions, the clinical progression of upper gastro-intestinal cancers is such that even with increased use of upper gastro-intestinal endoscopy, the likelihood of detecting a curable cancer is less than that for lower gastro-intestinal cancer. Commissioners together with service providers need to consider the totality of resources used for endoscopy procedures to achieve optimal value for individual patients and the population.

RESOURCES

- NHS Bowel Cancer Screening Programme (2012) Guidelines for the use of imaging in the NHS Bowel Cancer Screening Programme. 2nd edition. NHSBCSP No 5. November 2012. http://www.cancerscreening.nhs.uk/bowel/ publications/nhsbcsp05.pdf
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Map 11: Rate of barium enema procedures per population by CCG

2013/14





Map 12: Percentage of all cancer diagnoses that were made at stage 1 or stage 2 by CCG

2013





Staging describes the size of a cancer, and how far it has spread.¹ Most types of cancer have four stages, numbered from 1 to 4.

- > In stage 1, the cancer is relatively small and contained within the organ it started in;
- In stage 2, the cancer has not started to spread into surrounding tissue but the tumour is larger than in stage 1; sometimes, cancer cells may have spread into lymph nodes close to the tumour, but this depends on the particular type of cancer;
- In stage 3, the cancer is larger, may have started to spread into surrounding tissues and cancer cells are present in the lymph nodes in the area.
- In stage 4, the cancer has spread from where it started to another body organ, also referred to as secondary or metastatic cancer.¹

Staging is important because it determines the nature and type of treatment needed: if a cancer is stage 1, treatment with curative intent is usually possible, but, if the cancer is stage 3 or 4 and has spread, only palliative care might be possible. Thus, people whose cancers are detected earlier have much higher survival than people with later staged cancers²; later stages of cancer have poorer outcomes. More than two-thirds of breast cancers present at stages 1 or 2, whereas more than two-thirds of lung cancers present at stages 3 or 4.³ In addition, some population groups are more likely to be diagnosed with later stage disease.³

The aim for the National Awareness and Early Diagnosis Initiative (NAEDI; see "Resources") is to promote earlier diagnosis of cancer, thereby increasing access to optimal treatment, and improving survival rates and reducing mortality from cancer, through:

- > achieving early presentation;
- > optimising clinical practice and systems;
- improving GP access to diagnostics, though the Accelerate, Coordinate, Evaluate (ACE) Programme⁴, one aim of which is to shift diagnosis of cancer from late to stages 1 and 2;
- > research, monitoring and evaluation.

The "Accelerate, Coordinate, Evaluate" (ACE) Programme⁴ is building on service and pathway development activity in England to improve early diagnosis and inform commissioning in the future.

To assess the impact of early diagnosis initiatives, screening programmes and improvements in healthcare, it is necessary to have accurate and complete information on the stage of a cancer at diagnosis. The quality of staging data has improved greatly in recent years; In 2013, data were over 80% complete for a basket of ten of the more common cancers, and 82% complete for colorectal cancers. The missing data, however, are not evenly spread and contribute to the geographic variation of cancers reported to be early stage.

In England, colorectal cancer is the fourth most common cancer, after breast, prostate, and lung cancer. In 2013, 33,765 people were diagnosed with the condition.⁵

More than 80% of colorectal cancers are diagnosed in people aged 60 years and over. Apart from age, risk factors for colorectal cancer include:

- > a family history;
- > diet low in fibre;
- > physical inactivity;
- > alcohol consumption;
- > obesity;
- > ulcerative colitis and Crohn's disease.

About 20% of patients present as emergencies with actual or impending bowel obstruction⁶, and have a markedly worse outcome. A reduction in the proportion of patients presenting as an emergency will be a good indicator that the overall stage of diagnosis is improving.

Magnitude of variation

Map 12: All cancers diagnosed at stages 1 and 2

For CCGs in England, the percentage of all cancer diagnoses that were made at stage 1 or stage 2 ranged from 22.7% to 60.8% (2.7-fold variation). When the seven CCGs with the highest percentages and the seven CCGs with the lowest percentages are excluded, the range is 29.6–56.0%, and the variation is 1.9-fold.

These data must be interpreted with some caution because the denominator includes all cancers, irrespective of whether they are staged.

¹ Cancer Research UK. Stages of cancer. http://www.cancerresearchuk.org/about-cancer/what-is-cancer/stages-of-cancer

² http://www.ncin.org.uk/view?rid=2752.

³ McPhail S, Johnson S, Greenberg D et al. Stage at diagnosis and early mortality from cancer in England. British Journal of Cancer 2015; 112: S108-S115. doi: 10.1038/bjc.2015.49 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4385983/

⁴ Cancer Research UK. ACE Programme. http://www.cancerresearchuk.org/health-professional/early-diagnosis-activities/ace-programme

⁵ Office for National Statistics. Statistical Bulletin. Cancer Registration Statistics, England 2013. http://www.ons.gov.uk/ons/dcp171778_409714.pdf

⁶ Health and Social Care Information Centre. National Bowel Cancer Audit Report - 2014. http://www.hscic.gov.uk/catalogue/PUB16021

Map 13: Colorectal cancer diagnosed at stages 1 and 2

For CCGs in England, the percentage of new cases of colorectal cancer that were diagnosed at stage 1 or stage 2 ranged from 13.5% to 54.4% (4.0-fold variation). When the seven CCGs with the highest percentages and the seven CCGs with the lowest percentages are excluded, the range is 17.1–48.2%, and the variation is 2.8-fold.

These data must be interpreted with some caution because the denominator includes all colorectal cancers, irrespective of whether they are staged; for 2013, 82% of data returns for colorectal cancer showed staging data.

For both indicators, one reason for the degree of variation observed is differences in the completeness of staging data among different localities, which will directly affect the observed proportion of early-stage cancers.⁷ As data-collection processes are harmonised, these differences in the level of completion of staging data across the country will be eradicated.

Other reasons for variation include differences in:

- > patients' awareness of and response to symptoms;
- > access to diagnostic services;
- > timely referral of patients;
- > mix of cancers diagnosed in local populations.

Options for action

All cancers (Map 12)

To improve the percentage of cancers diagnosed at stage 1 or stage 2, commissioners need to specify that:

- service providers participate in early diagnosis initiatives, such as the NAEDI (see "Resources") to identify early signs of cancer before the disease develops;
- service providers work to increase participation in the screening programmes for breast cancer and cervical cancer to improve the early detection of these cancers;
- GPs comply with NICE guidelines NG12 (see "Resources") on suspected cancer.

Colorectal cancer (Map 13)

Commissioners need to consider commissioning different pathways for people with new colorectal symptoms who have a low risk of cancer (but not a no-cancer risk), which include a straight-to-test process. Commissioners need to specify that service providers:

> comply with NICE guidance on the diagnosis and management of colorectal cancer (CG131; see "Resources"), which should help to reduce variation in diagnostic rates and the stages at which colorectal cancer is diagnosed; work towards achieving NICE quality standard QS20 for colorectal cancer (see "Resources").

Primary care service providers need to encourage participation in the NHS Bowel Cancer Screening Programme⁸, which will help to increase early detection. Screening is offered every two years to all men and women aged 60–74 years. In addition, NHS Bowel Scope Screening⁹, flexible sigmoidoscopic screening of the left colon (see Maps 9A and 9B, pages 58–64), the commonest site for colorectal cancer, is being offered to people at the age of 55 years: by March 2015, 60% of centres were offering bowel scope screening (secondwave roll-out), and by December 2016 all screening centres are scheduled to offer bowel scope screening.

RESOURCES

- Independent Cancer Taskforce. Achieving World-Class Cancer Outcomes. A Strategy For England 2015-2020. http://www.cancerresearchuk.org/sites/default/ files/achieving_world-class_cancer_outcomes_-_a_ strategy_for_england_2015-2020.pdf
- Cancer Research UK. NAEDI. http://www.cancerresearchuk.org/cancer-info/ spotcancerearly/naedi/
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- Quality statement 2: Staging (colon cancer). http://www.nice.org.uk/guidance/QS20/chapter/ Quality-statement-2-Staging-colon-cancer
- Quality statement 3: Staging (rectal cancer). http://www.nice.org.uk/guidance/qs20/chapter/ Quality-statement-3-Staging-rectal-cancer
- NICE pathways. Colorectal cancer overview. http:// pathways.nice.org.uk/pathways/colorectal-cancer

⁷ NCIN. Interpreting geographic variation by cancer stage. http://www.ncin.org.uk/publications/data_briefings/ interpreting_geographic_variation_in_cancer_stage

⁸ http://www.cancerscreening.nhs.uk/bowel/

⁹ http://www.cancerscreening.nhs.uk/bowel/bowel-scopescreening.html

Map 13: Percentage of new cases of colorectal cancer that were diagnosed at stage 1 or stage 2 by CCG ²⁰¹³





