CENTRE FOR WORKFORCE INTELLIGENCE

Securing the future workforce supply

Gastrointestinal endoscopy workforce review

March 2017

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Executive summary

Overview

The Centre for Workforce Intelligence (CfWI) was commissioned by the Department of Health (DH) and Health Education England (HEE) to contribute qualitative and quantitative research, data analysis, and modelling to support HEE and NHS England in providing sufficient medical and non-medical gastrointestinal (GI) endoscopists to deliver GI endoscopy services.

There is a growing pressure on endoscopy services and the Department of Health (DH, 2011) and Bowel Cancer UK (Bowel Cancer UK, 2012) suggest that there will be substantial increases in demand in the future which will affect all endoscopy services.

Ensuring sufficient endoscopy capacity to meet the growing demand is a concern, and this project supports the DH drive to ensure that the NHS has the right number of trained staff available to deliver current and future demand for GI endoscopy. It will also help to improve HEE's understanding of the current GI endoscopy workforce – the outputs from the review will be used by HEE and HEE local team workforce planners to inform the commissioning of education and training and the resourcing of the GI endoscopy workforce.

This is the first review of the endoscopy workforce undertaken by the CfWI, and this report represents the most complete picture to date of the GI endoscopy workforce in England in 2015. It contains combined analysis of three national endoscopy workforce datasets described below. The data yielded, coupled with wider work will support initial modelling, allowing a degree of extrapolation of demand and supply. However, it will not answer all questions about all subcomponents of this workforce.

Endoscopists are healthcare professionals trained to carry out minimally invasive diagnostic medical procedures using an electronic camera imaging device to produce images of interior surfaces of an organ. Most endoscopic procedures are carried out at a local hospital, although some larger GP surgeries may offer procedures. Common GI endoscopy procedures are:

- oesophago-gastro-duodenoscopy (OGD), known more simply as a **gastroscopy** or upper endoscopy
- colonoscopy
- flexible sigmoidoscopy, known more simply as **flexi-sig**
- endoscopic retrograde cholangiopancreatography, known more simply as **ERCP**.

To address demand, endoscopic procedures that have traditionally been undertaken by doctors are increasingly being performed by non-medical registered practitioners, known as non-medical endoscopists (NMEs) (HEE 2015a) such as nurses, operating department practitioners (ODPs) and radiographers.

Nurse endoscopists already undertake as much of 20 per cent of the workload in an endoscopy unit, and NHS Improving Quality initiatives estimate that up to 40 per cent of low-risk, high-volume endoscopic procedures could potentially be carried out by NMEs (HEE 2015a).

The CfWI review was originally split into two phases:

- **Phase one** – to collate information and data, and analysis of available data to assess its suitability to inform the modelling of workforce.

- **Phase two** – to include horizon scanning, elicitation to quantify key uncertain variables, and modelling the current and forecast demand and supply of this workforce (subject to the quality and availability of data).

This report is a summary of phase one data analysis/findings and initial endoscopy activity analysis. As the CfWI contract with the Department of Health ended on 31 March 2016, the CfWI issued guidance to HEE to enable HEE to continue phase two.

Key findings

The CfWI carried out analysis of the:

- Joint Advisory Group on Gastrointestinal Endoscopy (JAG), global ratings scale (GRS) census April 2015 (JAG GRS, 2015)
- JAG Endoscopy Training System (JETS) data extract December 2015 (JAG JETS, 2015)
- British Society of Gastroenterology (BSG) workforce census data May 2015 (BSG, 2015).

This was supplemented with additional data from:

- Health and Social Care Information Centre (HSCIC) Hospital Episode Statistics (HES) (HSCIC, 2016a)
- NHS England Monthly Diagnostic Waiting Times and Activity (MDWTA) (NHS England, 2016)
- Cancer Research UK (CRUK).

The CfWI identified the findings and observations, outlined below.

Profiling the endoscopy workforce is recognised as a challenge because:

- there are multiple staff groups involved in endoscopy service provision, many providing endoscopy services as part of their core role
- there is a lack of data that details endoscopy activity by specialty/profession/staff group, particularly for the non-medical endoscopy workforce
- there is no single definitive source of workforce numbers, although the JAG, JETS, and the BSG together provide a rich source of workforce data
- although the JAG provides quality assurance through accreditation and collects data to help measure quality standards, it is not a workforce data collector
- similarly, the BSG collects data primarily around the gastroenterology workforce, which has a significant overlap with the endoscopy workforce, but the data collected is not mandatory and as such is only a partial picture of the whole workforce
- even though the three analysed datasets were data rich, the CfWI suspects that data gaps still exist, for example around age profile data and proportion of time spent by the endoscopy workforce providing endoscopy services
- most medical consultants who work in the independent sector are also likely to be working in the NHS, so the declared headcounts are not exclusive to the NHS and independent sectors. Furthermore, JAG data is collected by endoscopy unit, so it is likely that those NHS practitioners who work out of multiple NHS units will be counted more than once.

Key endoscopy challenges

- profiling the endoscopy workforce has been a challenge for the reasons described above
- consistent training provision for medical and non-medical endoscopists is a challenge due to insufficient training staff, increasing service delivery workload of staff, and lost training sessions

- there is a growing pressure on endoscopy services due to a recent step change in demand for GI endoscopy. The Department of Health (DH, 2011) and Bowel Cancer UK (Bowel Cancer UK, 2012) suggest that there will be a substantial increase in demand in the future
- the increasing demand and growing pressure on endoscopy services has been driven by various factors, and may not be met by the current growth in commissions in the endoscopy workforce.

Workforce

- this study identified 4,603 NHS and 1,239 independent sector practitioners undertaking endoscopy in England at the time of review
- although the actual number is unknown, most medical consultants who work in the independent sector are also likely to work in the NHS as well, so would appear in both headcount figures above
- the majority of endoscopists are gastroenterologists (40 per cent), followed by surgeons (36 per cent), doctors from other specialties (14 per cent), and nurses (8 per cent)
- medical endoscopists are predominantly men (81 per cent)
- non-medical endoscopists are predominantly women (89 per cent)
- there is a large variation of endoscopists per capita across the HEE local team regions
- there is a large variation of support staff per endoscopist across the HEE local team regions.

Training

- the review identified 3,451 practitioners currently working towards gaining JETS certification as an endoscopist
- around 82 per cent of those working towards gaining JETS certification are doctors, and around 15 per cent are nurses
- there is a large variation in endoscopy training numbers per capita across the HEE local team regions
- there is a large variation in trainee-to-trainer ratios across the HEE local team regions
- there is a variation in the proportion of lists dedicated to training across the HEE local team regions
- there is a large variation in procedures per trainee across the HEE local team regions.

Activity

According to the MDWTA data (NHS England, 2016), the total yearly number of procedures for colonoscopy, flexi-sig and gastroscopy increased by 15.9 per cent between 2011–12 and 2014–15 (December to November), at a compound annual growth rate (CAGR) of 5.3 per cent.

- the independent sector has significantly fewer procedures per endoscopist compared to the NHS
- the numbers of procedures per endoscopist across the HEE local team regions are similar overall
- GI service and GI training, accounts for over 69 per cent of all time spent by endoscopists across all endoscopy activity
- colonoscopy, dedicated endoscopic retrograde cholangiopancreatography (ERCP), bronchoscopy and flexible cystoscopy account for about 20 per cent of all time spent by endoscopists across all endoscopy activity. Note that while bronchoscopy and flexible cystoscopy are endoscopic procedures they are not GI endoscopy procedures. However, this data is captured by JAG so is reported here as a comparison.
- bowel cancer diagnoses increased by 6 per cent between 2010 and 2015 according to HES (HSCIC, 2016a)
- HES data suggests that most endoscopy activity is carried out on patients older than 35 years, and that the over-70 age group accounts for about 35 per cent of all HES recorded endoscopy procedures (HSCIC, 2016a).

Waiting times

MDWTA data (NHS England, 2016) also shows that the overall percentage of patients waiting for colonoscopy, flexi-sig and gastroscopy procedures in England, after six weeks of request for procedure, increased from an average of 3.2 per cent to an average of 6.9 per cent between 2011–12 and 2014–15 (December to November), a relative increase of 118 per cent over the period. This indicates that the service is not coping as efficiently as before.

Next steps

This report is a summary of phase one data analysis/findings and initial endoscopy activity analysis.

The outputs from phase two of this review will be used by HEE, HEE local teams and workforce planners to inform HEE's commissioning and investment plan – 2017/18 and the resourcing of the GI endoscopy workforce.

The CfWI's contract with the DH expired on 31 March 2016. The functions previously carried out by the CfWI will, in future, be delivered by DH and HEE.

1. Introduction

1.1 Background

The Centre for Workforce Intelligence (CfWI) was commissioned by the Department of Health (DH) and Health Education England (HEE) to contribute qualitative and quantitative research, data analysis, and modelling to support HEE and NHS England in providing sufficient medical and non-medical gastrointestinal (GI) endoscopists to deliver GI endoscopic services.

The purpose of this project is to undertake a workforce planning and modelling review to identify the extent of shortages of medical and non-medical GI endoscopists, assess the severity of these shortages and their impact on service delivery, and identify ways of reducing these workforce shortages, for example through evidence-based education, training, and workforce transformation. The project will:

- collect baseline GI endoscopy training and workforce data
- describe existing training pathways of GI endoscopists
- consider the factors driving the demand for, and supply of, the GI endoscopy workforce
- model current and future demand for, and supply of, the GI endoscopy workforce (the extent of the modelling will largely depend on data availability)
- provide suggestions for workforce planning, including training numbers needed to broadly balance the supply of adequately trained GI endoscopists in the medium-to-long term, looking ahead 20 years up to 2035.

This project supports the Department of Health's drive to ensure that the NHS has the right number of trained staff in England to deliver current and future demand for GI endoscopy, and will improve HEE's understanding of the current GI endoscopy workforce.

The outputs from the review will be used by HEE, HEE local teams and workforce planners to inform the commissioning of education and training and the resourcing of the GI endoscopy workforce.

This review was split into two phases:

- **Phase one** included desk research to collate information and data, analysis of available data to assess its suitability to inform the modelling of workforce demand and supply, and semi-structured interviews with a range of stakeholders and acknowledged experts in the field of GI endoscopy.
- **Phase two** will include an elicitation for critical uncertain parameters to provide the basis for quantified modelling, and modelling the current and forecast demand for, and supply of, this workforce subject to the quality and availability of data.

This report summarises phase one, in particular the current GI endoscopy workforce based on data analysis, and initial activity analysis. HEE will complete phase two in 2016/17. Findings from phase one and phase two will inform HEE's workforce planning for 2017/18.

1.2 Context

This project builds on:

- The CfWI review, on behalf of the DH and HEE, of the Shortage Occupation List (SOL) for the Migration Advisory Committee (MAC) which highlighted a need for a review of the endoscopy workforce to better understand service pressures and workforce demand and supply issues and to ensure that future supply meets the outcomes of any policy work currently being developed in this area by government (CfWI, 2015).
- The DH report, *A mandate from the Government to Health Education England: April 2015 to March 2016* (DH, 2015), which sets out plans to deliver integrated care with the focus on prevention, treatment and care over the coming years. As part of this drive, there is a need for a sufficient GI endoscopy workforce to deliver endoscopy and bowel screening services.
- HEE's *Endoscopy Capacity Update 2015*. This paper outlines the growing pressure on endoscopy services due to a recent step change in demand for GI endoscopy; the historical and current endoscopy activity is described with the predicted trend in activity until 2020. A national endoscopy workforce planning strategy is recommended to meet this challenge (HEE, 2015).
- The draft *London Endoscopy Strategy 2015*, prepared by the London Transforming Cancer Services Team (LTCST) highlights the cancer issues impacting on endoscopy services and the areas commissioners and providers need to address to prepare for the growth in demand for lower and upper GI endoscopy tests expected over the next three to five years. The work is being closely aligned with other work streams in the London cancer strategy, including screening, waiting list targets, NICE guidance and commissioning support for CCGs (LTCST, 2015).
- The Joint Advisory Group on Gastrointestinal Endoscopy (JAG) and the British Society of Gastroenterology (BSG) yearly workforce surveys/returns.
- The Cancer Research UK paper *Scoping the Future: an evaluation of endoscopy capacity across the NHS in England* (CRUK, 2015a), which identifies a number of challenges facing endoscopy services such as rising demand for endoscopy services and a lack of capacity to respond to this increasing demand, workforce issues including recruitment, retention, evening and weekend working and training and development, and issues with data availability, quality and use.
- The Cancer Research UK independent cancer taskforce report, *Achieving World-Class Cancer Outcomes, a Strategy for England 2015–2020* (CRUK, 2015b), which proposes a strategy to improve the outcomes that the NHS delivers for patients affected by cancer. The report highlights the need to implement plans to address critical workforce deficits and undertake a strategic review of future workforce needs and skills mix for cancer. Endoscopy for diagnosis was identified as one of the priority deficit areas.

1.3 Current challenges in endoscopy workforce planning

The key challenges for endoscopy workforce planning are outlined below.

Registration and regulation

NMEs have no professional body and are currently unregulated as a profession. This makes it difficult to ensure consistent professional standards, training, and accreditation.

Size of workforce

Profiling the endoscopy workforce has been a challenge for the reasons described above. However, the data yielded from the JAG, JETS and BSG datasets establishes a good estimated starting point and will allow a degree of extrapolation of future workforce supply.

Education and training:

The JAG Endoscopy Training System (JETS) provides a record of endoscopy training in upper and lower GI endoscopy, and endoscopic subspecialties. Currently, local endoscopy trainers and JAG accredited endoscopy training centres provide GI endoscopy training for all NHS medical and non-medical practitioners in the UK. However, consistent training provision is a challenge: insufficient training staff, increasing service delivery, staff workloads, and lost training sessions, are the most common reasons cited in CfWI stakeholder interviews why departments cancel, not offer, or reduce training lists in the future.

Service change

There is growing pressure on endoscopy services due to a recent step change in demand for GI endoscopy. The Department of Health (DH, 2011) and Bowel Cancer UK (Bowel Cancer UK, 2012) suggest that there will be a substantial increase in demand in the future. An increase in demand will affect every endoscopy service in the country, and ensuring sufficient endoscopy capacity to meet the growing demand, is a concern. Any future national endoscopy workforce planning strategy should take this into account to meet this challenge.

Service demand

The increasing demand and growing pressure on endoscopy services has been driven by various factors, and may not be met by the current growth in training commissions in the endoscopy workforce:

- bowel cancer screening initiatives and subsequent age extension of programmes to 75 years had a major impact on the symptomatic service in England (NCSSI, 2011)
- routine validation of surveillance waits, where large numbers of patients were inappropriately scheduled for a repeat procedure and can be taken off waiting lists or have their interval extended; more than 90 per cent of endoscopy services in England routinely validate patients on planned colonoscopy waiting lists (NCSSI, 2011)
- the increase in symptomatic awareness and referrals from symptom awareness campaigns, such as *Be Clear on Cancer* (DH, 2011)
- service improvement programmes, such as the NHS England-led programme of accelerated, coordinated and evaluated (ACE) work on early diagnosis (CRUK, 2014a)
- GP direct access diagnostic tests.
- A growing population in England.
- An ageing population, globally.

2. The endoscopy review process

2.1 Approach

The aim of phase one of this workforce review was to collect a **baseline** set of data for the GI endoscopy workforce in order to enable modelling of the current and forecast demand and supply of this workforce.

Phase one included:

- a proposed survey to collect GI endoscopy workforce information and data
- desk research to supplement the proposed survey
- desk research on current education and training
- analysis of GI endoscopy activity and waiting times data
- analysis of the survey, desk research, and activity data to assess its suitability to inform demand and supply modelling
- semi-structured interviews with a range of GI endoscopy stakeholders for an overview of current practice and issues.

Proposed survey

The CfWI developed a draft survey in conjunction with HEE managers and senior representatives from the JAG and BSG to collect a baseline set of data for the GI endoscopy workforce across England to better understand the workforce and to support long-term workforce planning.

However, as the survey questions were developed and deliberated, it became apparent that the majority of the required data and information might already be available across the existing JAG, JETS, and BSG datasets.

Development of the survey was stopped and provision of the datasets to the CfWI was authorised by the JAG and BSG, in order for the CfWI to conduct a cross-dataset analysis to determine whether the combined data would cover all relevant variables for modelling supply and demand.

CfWI analysis established that data was available for basic supply modelling variables, with the exception of the NME age profile. The analysis also showed that, while this data existed, it was not complete or consistent across the three datasets. However, the project steering group agreed that it was unlikely that the CfWI could improve on the existing data if a survey was run.

The JAG and BSG confirmed that they were open to modifying their data collection to include NME age profiles in subsequent annual collections, resulting in a more complete dataset. The project steering group accepted that this delay for a more complete dataset in this area was acceptable.

As a result, development of the survey was cancelled, and the CfWI commenced more detailed analysis of the existing datasets to:

- establish the makeup of the existing workforce
- establish the potential risks or gaps in the workforce
- assess its suitability to inform demand and supply modelling.

Desk research and semi-structured interviews

In addition to the analysis of the JAG, JETS, and BSG data, the CfWI has undertaken desk-based research and semi-structured interviews with a range of GI endoscopy stakeholders to:

- describe the existing workforce
- describe current education and training
- analyse GI endoscopy activity and waiting time data
- understand regulation and registration issues
- understand the current challenges in the GI endoscopy service
- understand private provision of GI endoscopy services
- describe other workforces that contribute to GI endoscopy provision
- draw international comparisons (that is, an overview of comparable practice in other nations, where these can be readily identified).

These are described in further detail in the relevant sections of this report. A full list of the stakeholders interviewed can be found in Appendix B.

2.2 Data sources, assumptions and exclusions

The references section lists all data and information sources used. These sources were correct as at the referenced dates, and all information in this report is based on the data as referenced. The main data sources used in this workforce review are:

- Joint Advisory Group on Gastrointestinal Endoscopy (JAG), Global Ratings Scale (GRS) census April 2015 (JAG GRS, 2015)
- JAG Endoscopy Training System (JETS) data extract December 2015 (JAG JETS, 2015)
- British Society of Gastroenterology (BSG) Workforce Census Data May 2015 (BSG, 2015)
- Health and Social Care Information Centre (HSCIC) Hospital Episode Statistics (HES) (HSCIC, 2016a)
- Monthly Diagnostic Waiting Times and Activity (MDWTA) datasets (NHS England, 2016)

There is an overlap of some of the JAG, JETS, and BSG datasets. The CfWI compared the three datasets and used the most reliable datasets in its analysis, as agreed during discussions with the three data providers. However, the JAG confirmed that data is collected at the department level so staff working in multiple NHS Trusts would be double counted. Additionally, staff working in the private sector most likely also work in the NHS.

BSG yearly workforce census

Individual consultant and specialty trainee gastroenterologists are asked to complete this census with the aim of undertaking workforce analysis on behalf of the BSG and to produce the BSG's annual workforce report. The census is not mandatory but has been established for a number of years.

The census checks the status of individual gastroenterologists' practice or training and seeks wider information about those helping to deliver any aspect of a gastroenterology and hepatology service (e.g. nurses or surgeons). Additional questions are included depending on service delivery or training issues.

1. JAG GRS dataset

Department leads from all endoscopy services registered with JAG are invited to complete a census each April. Completion of this census is mandatory for services that are accredited or wish to apply to be accredited. The JAG sets out the census to collect information from services on a series of measures. These measures cover the entirety of the endoscopy service. In addition to this census information, in the April 2015 census, services were asked to provide additional data, the key results of which are used as part of this workforce analysis.

2. JAG JETS dataset

To support training in the UK, the JETS provides an e-portfolio which trainees use on an ongoing basis to log procedures and other information relating to their training. Data and information entered into JETS is also used by trainees to evidence that they meet the criteria which enables them to apply for JAG certification in flexible sigmoidoscopy, colonoscopy or OGD/gastroscopy.

2.3 Stakeholder engagement

Dialogue with stakeholders underpins everything the CfWI does, and helps the CfWI understand how to best provide quality intelligence and tools to support workforce planning and development in the health, public health and social care sectors. The stakeholder engagement plan is a framework, agreed with the CfWI's commissioners, for stakeholder engagement for this specific project.

The CfWI would like to thank all stakeholders for their time and contributions, without which this project would not have been be possible. Its goal was to engage with as many stakeholders as possible, alongside commissioners, gaining evidence to inform workforce planning. The CfWI endeavours to ensure that as many relevant stakeholders feed into the process as possible.

The list of stakeholders can be found in Appendix B. The key stakeholder groups and their functions are as follows:

- **Project leads/commissioners –** to ensure the final delivery to standards agreed in the work order
- **Steering group –** to ensure that the strategic direction and methodology of the CfWI's endoscopy workforce review meets the needs of senior leaders, workforce planners and service deliverers, and to ensure that the deliverables of the project are of high quality; participants include representatives from JAG, BSG, HEE, HEE local teams and the National Clinical Director for Diagnostics for NHS England
- **Key informants –** the CfWI conducted structured interviews with key informants (senior stakeholders and acknowledged experts in this field), representing NHS England, HEE local teams, higher education institutions (HEIs), royal colleges, professional bodies and advisory groups, the profession, and service providers, in order to elicit sources of information to supplement desk research.

2.4 Suitability of data to inform supply and demand modelling (phase two)

Profiling the endoscopy workforce is recognised as a challenge because:

- there are multiple staff groups involved in endoscopy service provision, many providing endoscopy services as part of their core role

- there is a lack of data that details endoscopy activity by specialty/profession/staff group, particularly for the non-medical endoscopy workforce
- there is no single definitive source of workforce numbers, although the JAG, JETS, and the BSG together provide a rich source of workforce data
- although the JAG provides quality assurance through accreditation and collects data to help measure quality standards, it is not a workforce data collector
- similarly, the BSG collects data primarily around the gastroenterology workforce, which has a significant overlap with the endoscopy workforce, but the data collected is not mandatory and as such is only a partial picture of the whole workforce
- even though the three analysed datasets were data rich, the CfWI suspects that data gaps still exist, for example around age profile data and proportion of time spent by the endoscopy workforce providing endoscopy services
- most medical consultants who work in the independent sector are also likely to be working in the NHS, so would appear in both headcount, therefore caution must be taken when interpreting the endoscopy workforce independent sector data.

The existing workforce size, makeup, and age profile will therefore be based on the data that the JAG holds for accredited services in England. Because an accurate figure for the existing workforce is one of the key factors in accurate modelling, the supply forecast for this workforce will have to be considered based on this estimated starting point. However, as most units are accredited, and JAG collects data on the number of endoscopists and staff that each unit reports, it is likely that the total number of endoscopists recorded by JAG will be close to 100 per cent of the actual number of endoscopists in England.

Nonetheless, this report represents the most complete picture to date of the GI endoscopy workforce, and the data yielded to date, coupled with the wider work in phase two, will shed new light on this workforce. It will support initial skeleton modelling as a single workforce, allowing a degree of extrapolation of demand and supply. However, it will not answer all questions about all sub-components of this workforce.

3. Current practice

3.1 Overview

Endoscopists are healthcare professionals trained to carry out minimally invasive diagnostic medical procedures using an electronic camera imaging device to produce images of interior surfaces of an organ. Most endoscopic procedures are carried out in secondary care at a local hospital, although some larger GP surgeries may offer procedures too.

Common GI endoscopy procedures are:

- oesophago-gastro-duodenoscopy (OGD), known more simply as a **gastroscopy** or upper endoscopy
- colonoscopy
- flexible sigmoidoscopy, known more simply as **flexi sig**
- endoscopic retrograde cholangiopancreatography, known more simply as **ERCP**.

Surgeons generally undertake one endoscopy programmed activity (PA) per week and physicians generally undertake two PAs per week out of an average working week of 12 PAs (Howard, 2016). The latest BSG (2015) workforce report shows that the majority of GI surgeons spend less than 10 per cent of their time doing endoscopy, and that most gastroenterologists are contracted for 11 PAs, work 12 PAs, and do two endoscopy lists per week with a participation rate of 0.96 (BSG, 2016). This means it is unlikely that they could do more endoscopy without doing less of something else (Lockett, 2016b).

The 2015 BSG workforce report also shows that the majority of gastroenterology consultants have an average of 1.35 supporting professional activities (SPAs) in their contract, which is lower than the average of 2.1 SPAs per consultant in 2014 (BSG, 2016).

HEE will investigate further in phase two of the project the PAs and SPAs of the different clinical groups contributing to endoscopy services to better inform any future supply assumptions.

To address demand, endoscopic procedures that have traditionally been carried out by medically-trained doctors such as gastroenterologists, gastrointestinal surgeons, radiologists and GPs, are increasingly being performed by other non-medical registered practitioners, known as non-medical endoscopists (NMEs). These NMEs include nurse endoscopists, nurse specialists (GI or colorectal), nurse practitioners (GI or endoscopy), operating department practitioners (ODPs), radiographers, and clinical coordinators. There is a new workforce of Physicians Associates being trained that would also be suitable for this role.

Nurse endoscopists already undertake as much as 20 per cent of the workload in an endoscopy unit, and NHS Improving Quality initiatives estimate that up to 40 per cent of low-risk, high-volume endoscopic procedures could potentially be carried out by NMEs (HEE, 2016).

Most non-medical endoscopists carry out clearly defined tasks with specific competencies and rigid boundaries:

- Nurse endoscopists work independently as autonomous and competent practitioners in performing diagnostic and therapeutic procedures.

- Nurse specialists (colorectal or gastrointestinal) and nurse practitioners (gastrointestinal or endoscopy) perform diagnostic and therapeutic gastrointestinal endoscopy as independent autonomous practitioners. They obtain informed consent from patients, administer conscious sedation/local analgesia (if they have an independent prescriber qualification otherwise the sedation has to be prescribed by a doctor), identify abnormal GI pathology, perform biopsies and therapy, photographs and complete pathology and other supplementary diagnostic tests as required. They refer to other professionals for more specialist advice as appropriate, input details of the procedure into the electronic endoscopy record, and sign off any histology post procedure (although often with the support of a consultant).
- Endoscopy nurse tasks include assisting with initial assessment, procedures, cleaning endoscopy equipment, recovering patients after procedures, providing information to patients, continuing support and follow-up. Recent development of the role includes triaging of surveillance endoscopy procedures.
- Healthcare assistants provide clinical and clerical support to the endoscopy practitioners such as patient chaperoning and preparation of equipment, including setting up, taking down and decontamination procedures.

Most nurses, however, are not independent practitioners and require supervision by a consultant who is ultimately responsible for patient care.

The NME role, particularly nursing, is intended to provide a skill mix in a multidisciplinary team. This skill mix is an important productivity consideration in endoscopy. Multidisciplinary teams work closely together, leading to:

- effectiveness of task substitution
- enhanced communication with patients
- continuity of care for patients
- opportunities for endoscopists to spend more time with patients with chronic diseases.

Since 2003, a pilot project sponsored by the *Changing Workforce Programme* (DH, 2000) has been training non-healthcare personnel to degree standard level as endoscopists. HEE, working with colleagues in the sector, is currently developing the further role, responsibilities, career pathways and regulation currently under development. Non-healthcare personnel are few in number at present, and nurses still provide the main body of non-medical endoscopists.

Histopathologists

The pan-London Endoscopy Clinical Guidelines Group (LECGG) is a task and finish group with the aim of producing recommendations for the London Cancer Commissioning Board. It has identified a lack of histopathology workforce to deal with the increasing number of samples generated by both the bowel cancer screening programme and the follow-up of symptomatic patients.

Bowel scope is having a particular impact on histopathology services. There is an expectation amongst the group of a possible increase in demand of between 25 and 50 per cent in the next four years (LECGG, 2015a and 2015b).

The group appreciates that this is only one aspect of the wider endoscopy workforce, but maintains that the service is currently under great strain to meet target turnaround times as workload increases. In view of the lag time to train a specialist histopathologist, the group would like this particular service to be considered in any ongoing endoscopy workforce discussions.

The CfWI has not analysed any data relating to this during phase one of this project, as it was not directly in scope, and suggests that this could be an area of further investigation in ongoing endoscopy workforce considerations.

3.2 Registration and regulation

The CfWI understands that endoscopy is currently a profession based on a skill set and not on a registration. This makes it difficult to ensure consistent professional standards, training, and accreditation.

Endoscopies are carried out by both NHS and private providers. The Joint Advisory Group on Gastrointestinal Endoscopy (JAG) runs an accreditation scheme for endoscopy units in the UK. The JAG operates in the Care Quality Improvement Department of the Royal College of Physicians (RCP) and was established in 1994 under the auspices of the Academy of Medical Royal Colleges (AMRC), specifically through the RCP, the Royal College of Surgeons (RCS), the Royal College of Radiology (RCR), and the Royal College of General Practitioners (RCGP).

The JAG has other key stakeholders within royal colleges in England, including the Royal College of Nursing (RCN), the Joint Royal College of Physicians Training Board (JRCPTB), and the Joint College of Higher Surgical Training (JCHST). Specialist society stakeholders include the British Society of Gastroenterology (BSG), the Association of Upper Gastrointestinal Surgeons (AUGIS), and the Association of Surgeons of Great Britain and Ireland (ASGBI). Full details can be found on the JAG website (JAG, 2015a).

The English National Endoscopy Team – part of the NHS National Endoscopy Programme (NHS, 2008) – and the JAG created the endoscopy Global Rating Scale (GRS), which sets out standards and creates a framework in which the endoscopy service can assess itself against. The GRS is a tool for quality improvement as well as quality assessment, and is now the basis upon which endoscopy units in the UK are measured for JAG certification. The GRS is underpinned by four areas, each with a number of items containing measures: clinical quality; quality of the patient experience; workforce; and training. The JAG has also created a peer-review accreditation process to ensure that GRS self-assessments are rigorous, and also to assess areas within the GRS framework, such as, decontamination and the physical infrastructure (NCSSI, 2011).

The JAG has visited and accredited the majority of NHS providers and a lower proportion of independent providers in the UK (BCUK, 2012). This has gone some way to set standards, with regular reviews and inspections. Although the majority of NHS providers (7 per cent of NHS acute hospitals have not been assessed) are engaged with the JAG accreditation process, only 48 per cent have fully met JAG criteria, and 26 per cent have been assessed but require improvement. In comparison, only 15 per cent of private providers are JAG accredited, and 74 per cent have not been assessed.

According to the Care Quality Commission (CQC) updated scope of registration (March 2015) all diagnostic procedures in endoscopy are currently regulated by the Commission. Professions with a regulatory body – such as the GMC for doctors, the NMC for nurses, and the Health and Care Professions Council (HCPC) for radiographers and ODPs – have clear codes of conduct, established standards of competence, ethics and training. However, non-medical endoscopists (NMEs) who have no professional body are at present unregulated. Such practitioners are under close supervision and their position rests with locally agreed protocols and programmes of supervision.

3.3 Challenges of endoscopy provision

The Department of Health forecasted a 10 to 15 per cent year-on-year increase in demand for endoscopies,[1] and that NHS trusts need to plan for appropriate funding in their baseline budgets to meet this. It is evident that such increased demand will inevitably place pressure on endoscopy units.

CfWI stakeholder interviews highlighted that units are utilising costly, unsustainable measures to cope with this increased demand. These include initiatives such as holding regular waiting list sessions at weekends and in the evenings, or bringing in external staff through private companies to use their facilities during these times.

Attempts to meet two-week waiting time targets for a referral and six-week targets for a diagnostic test have also been hindered due to staff shortages, lack of physical space and equipment issues. Already 25 per cent of colonoscopy providers and 21 per cent of flexible sigmoidoscopy providers have at least a quarter of their patients waiting longer than four weeks for their endoscopic procedures. Around 5 per cent of colonoscopy and flexible sigmoidoscopy patients wait longer than six weeks for their procedures (BCUK, 2012).

Stakeholder interviewees have stated that there is a challenge of quantity over quality. Increased demand has reduced the time to complete an endoscopic procedure from 10 to 15 minutes to only around five minutes. There were also concerns about staff experiencing stress and 'burnout', along with the potential for physical problems to develop, such as repetitive strain injury, as a result of increasing the extent to which staff scope patients.

One example where endoscopy services are not adequately covered is out-of-hours provision, especially in terms of acute upper gastrointestinal bleeding (AUGIB). AUGIB is a common medical emergency that has a 10 per cent hospital mortality rate. A 2007 audit found that only 52 per cent of hospitals had a formal consultant-led out-of-hours endoscopy service (NHS Improving Quality, 2014). It also reported that these hospitals had lower risk-adjusted rebleeding and mortality rates. This resulted in the development of an out-of-hours endoscopy guidance document. A more recent survey of units in England showed that 62 per cent of services are able to provide a formalised rota of endoscopy specialists seven days a week and that 56 per cent can offer acute admissions an endoscopy within 24 hours of a patient being admitted (NHS Improving Quality, 2014). However, the service is still struggling to adequately cover AUGIB and the BSG clinical services and standards committee are expected to publish a report highlighting this issue, in coming months (Lockett, 2016a).

A recent Cancer Research UK report (CRUK, 2015a) on workforce capacity calls for the joint HEE/NHS England training and development programme for non-medical endoscopists to include a robust assessment of the required number of trainees based on rising demand. The 2015 report goes on to say that similar steps should be taken to ascertain the required level of new consultant gastroenterologists, consultant GI surgeons and senior endoscopy nurses.

The CfWI suggests HEE and local commissioners give further consideration to existing initiatives to meet rising demand, including:

[1] Letter from Professor Mike Richards (former national cancer director at the Department of Health), Re: Be Clear on Cancer Campaign, 8 December 2011

- **Alternative pathways and processes**, such as supporting 'straight to test' access to endoscopy through telephone triage/pre-assessment. This would help to speed up diagnosis.
- **Increased collaboration** between endoscopy units and strengthening links at the interface between primary and secondary care. This could help to improve the quality and appropriateness of referrals.
- **Amending programmed activity allocations**. For example, if the average endoscopy PA content of consultant gastroenterologists were increased from two to three (and therefore one less PA of something else) the consultant-level endoscopy capacity would increase, reducing the requirement to train more consultants. However, the ability to do the extra endoscopies would require additional facilities and more endoscopy nurses. There would also be the opportunity cost of what activity a consultant would be giving up to do the extra PA of endoscopy activity. Note that consultants get 0.25 PA's admin time per 1 PA list, so two lists is 2.5 PAs, three lists is 3.75 PAs etc.

3.4 Private provision

Patients who need an endoscopy may choose to bypass the NHS for an independent sector treatment centre (ISTC) or a private hospital.

CfWI stakeholder interviews indicated a relatively small proportion of private provision of endoscopic services in England, due to limited GP referrals into the private sector and clinical nurse specialists input along the patient referral pathway.

There are examples of trusts previously commissioning endoscopy services from private companies in order to clear the backlog of NHS patients waiting for an endoscopy (Gloucestershire Echo, 2012). Some services are now being tendered as part of the 'any qualified provider' (AQP) initiative.

Outsourcing company Medinet is used by trusts in England, Scotland, Wales and Northern Ireland to provide service teams (including nursing staff, support technicians and surgical teams) rather than individuals to cover a variety of specialties including endoscopy (Medinet, 2016a). Endoscopy staff provided by Medinet only work weekends and out-of-hours to cover lists. The company helps trusts to meet targets, cover lists, and reduce waiting times by creating additional capacity to see outpatients, provide diagnostic services and treat day cases and inpatients requiring surgery (Medinet, 2015).

Medinet has confirmed that all the staff it recruits are NHS-trained and most, especially the consultants, are already working in the NHS. Medinet could not provide any data in terms of the most prevalent area or numbers of endoscopy staff used. The service provided is to all trusts and is an integrated part of the NHS workforce (Medinet 2016b).

3.5 International comparisons

The requirements for clinical practice vary greatly by country. In Europe, most endoscopy procedures are done by medical teams. In the United Kingdom, Ireland, New Zealand and the Netherlands, non-medical endoscopists such as nurse endoscopists are increasingly carrying out endoscopic procedures in collaborative multidisciplinary teams supported by medical staff.

Worldwide there are many variations in service and funding. In the USA more endoscopy procedures are performed than there probably should be on clinical grounds, possibly due to the fact that the practice is

private and generates income for the endoscopist (Langford, 2016). The rate of colonoscopy in the insured population in Australia is also probably excessive (i.e. 'over servicing') (NCSSI, 2011).

CfWI stakeholder interviews indicated that compared to international models, England is ahead in auditing and quality assessment of service provision through JAG and JETS, which sets acceptable standards for competence in endoscopic procedures and quality assures endoscopy units, training and services.

4. Current education and training

4.1 Training routes

Structured training programmes exist worldwide for the majority of gastrointestinal (GI) endoscopic procedures. In recent years the DH has invested heavily in improving training and, in particular, in developing robust competency frameworks and methods of assessment.

Currently all medical and non-medical practitioners undertaking GI endoscopy training, to become an NHS endoscopist, are trained by local endoscopy trainers and by JAG accredited courses run at UK-based endoscopy training centres.

The JAG Endoscopy Training System (JETS) is a booking portal for GI endoscopic training courses which provides a web-based e-portfolio to apply for JAG certification and a log book for trainees to record their endoscopic experience and demonstrate their performance, progression and competencies.

Doctors who wish to practise GI endoscopy, such as gastroenterologists and gastrointestinal surgeons (from postgraduate medical trainees through consultants), and some GPs, complete JAG-accredited programmes.

Non-medical practitioners such as nurses (of all job descriptions) and ODPs who wish to practise GI endoscopy undertake university-based endoscopic JAG-accredited training courses to qualify as non-medical endoscopists (NMEs).

Current university-based courses for NMEs try to address the educational differences between NMEs and doctors and to achieve a common core standard of knowledge in gastroenterology, anatomy, and physiology and pathology. This ensures that all endoscopists, whatever their primary discipline, complete their training in accordance with the *Guidelines for the Training, Appraisal and Assessment of Trainees in Gastrointestinal Endoscopy* (BSG, 2005).

4.2 Training lists

Lists are schedules of patients to be seen in a unit. Dedicated training sessions are scheduled in training lists and work on a points allocation system adjusted to reflect time needed by the trainee. A point equates to a unit of time. For example some units assign 15 minutes to one point and allocate one point for a gastroscopy, two for a colonoscopy, etc. This crude allocation may be adjusted for case mix and training. Many units allocate 12 points to a morning list and 10 to an afternoon list on the basis that a morning list lasts three and a half hours (210 minutes) and an afternoon list three hours (180 minutes).

CfWI stakeholder interviews indicated long waiting times to get onto available GI endoscopy training courses, and that trainees may be attached to a single trainer, which can result in cancellations of training lists due to the trainer's on-call commitments, annual leave and study leave. This leads to a loss in training session and, because they are difficult to backfill, insufficient opportunities for consistent and efficient training. Results of the 2014 BSG training survey highlighted that access to GI endoscopy training was limited, with 47 per cent of trainees reporting attending less than two endoscopy lists per week, and 39 per cent of trainees currently in training posts with access to less than the minimum one training list per week recommended by JAG (Chadwick & Budiha, 2015).

It is clear that the majority of GI endoscopy training is delivered during busy service lists. However, the majority of stakeholders also reported that training lists are adjusted wherever possible to meet the needs of trainees. HEE will investigate this further in phase two of the project, to better inform the supply assumptions and modelling outputs.

4.3 Qualifications

JAG is the only body in England that offers certification of trainees. This certifies that an individual has evidenced they meet the requisite standards to work independently as an endoscopist (i.e. not in training or supervised).

Whilst general training is specific to the background of the trainee (i.e. a doctor, surgeon or nurse endoscopist will have different training pathways), the JAG certification is the same regardless of trainee background.

There are also numerous additional training courses and academic qualifications. For example, there are courses for experienced endoscopists such as the Bowel Cancer Screening Programme for those who wish to act as screening endoscopist (NHS, 2010).

Below is a list of JAG endoscopy certifications. JAG certification is formal recognition that an individual has been trained in accordance with JAG. JAG-accredited course trainees should have a recognised clinical tutor for endoscopy training and fill in the necessary DOPS (Direct Observation of Procedure or Skills) assessment forms, which are available on the JETS e-portfolio. Regular DOPS formative assessments contribute to a trainee's e-portfolio as evidence of proficiency. A formal summative DOPS assessment by independent observers is required to obtain provisional JAG certification before practicing independently.

Below is a list of JAG certifications:

- flexible sigmoidoscopy
- diagnostic upper GI endoscopy
- provisional colonoscopy
- full colonoscopy
- paediatric diagnostic upper GI endoscopy
- paediatric colonoscopy.

4.4 Factors preventing increased training provision and skills and competencies required

CfWI stakeholder interviews indicated that the most common reasons why departments cancel training lists, not offer training, or plan to reduce GI endoscopy training in the future, are:

- insufficient training staff
- increasing service delivery workload of staff
- lost training sessions which are difficult to backfill.

The vast majority of GI endoscopy training is hands on; delivered in endoscopy units throughout the UK; and supervised closely by consultants and other independent trained practitioners. Therefore, the key individual in GI endoscopy training in the UK is the independent GI endoscopy trainer. However, increased service delivery workload of staff means busier service lists leading to insufficient time available for training.

Trainers are expected to maintain their knowledge and skills through a commitment to continuing medical education and professional development in GI endoscopy; they also need to be familiar with the training domain GRS, the e-Portfolio, and are encouraged to undertake the endoscopic Train the Trainers course.

Training leads and centres have vital and complementary roles in setting standards, developing training, modelling and disseminating best practice, as well as delivering high-quality courses.

Furthermore, there are trainee factors for medical trainees in terms of competing pressures of the medical/surgical on call and rest/zero days after on call. This especially affects Fridays and less so Mondays and Tuesdays.

4.5 Alternative models of training

An alternative model of training involves the concept of a 'fellowship' in specialised endoscopy training. In this, the trainee undertakes a period of either six or 12 months of intensive training with up to eight sessions of specialist endoscopy each week. These sessions can be in different types of specialist endoscopy and in different units in a network. According to the BSG, these training periods should be part of conventional postgraduate specialist training. However, these will not be universal but only applied to trainees who propose to undertake specialist endoscopy in their future career (BSG, 2007).

Structured programme of induction and training (SPRINT) for upper GI endoscopy

The Structured Programme of Induction and Training (SPRINT) is aimed at physicians, surgeons, and nurses. It aims to align a coordinated central delivery of enhanced training with local training at the trainee's base hospital, delivering the outcome of endoscopic competence in a shortened timeframe. Initial evaluation (United European Gastroenterology Week (UEG), 2015) showed the Sprint programme could halve the training time to reach JAG certification standards in Upper GI endoscopy (UGIE), and with appropriate support and access to a regular training list and organised training days, most trainees will achieve sign-off in UGIE within a nine-month period (JAG, 2015b). These results are promising for accelerated training and SPRINT has potential to be extended to other endoscopic procedures. It started as a pilot in Wales and has been extended to a couple of regions in England. However, there is currently no extra funding for the programme and it requires more endoscopy training time, so would require additional funding and resource planning to extend the programme more widely (Lockett, 2015). HEE will take this into consideration in phase two of the project to determine the potential impact on the supply assumptions and modelling outputs.

5. Current workforce

5.1 Overview

CfWI analysis identified the following key findings and observations:

- There were 4,603 (headcount) NHS and 1,239 (headcount) independent sector practitioners providing endoscopy services in England, at the time of review.
- Although the actual number is unknown, most consultants who work in the independent sector also work in the NHS so would appear in both counts above.
- The majority of endoscopists are gastroenterologists (40 per cent), followed by surgeons (36 per cent), doctors from other specialties (14 per cent), and nurses (8 per cent).
- Medical endoscopists are predominantly men (81 per cent).
- Non-medical endoscopists are predominantly women (89 per cent).
- There is a large variation of endoscopists per capita across the HEE local team regions.
- There is a large variation of support staff per endoscopist across the HEE local team regions.

It should be reiterated that most medical consultants who work in the independent sector are also likely to work in the NHS, so the declared headcounts are not exclusive to the NHS and independent sectors. Furthermore, JAG data is collected by endoscopy unit, so it is likely that those NHS practitioners who work out of multiple NHS units will be counted more than once.

5.2 Workforce by grade

There were 4,603 (headcount) NHS and 1,239 (headcount) independent sector practitioners undertaking endoscopy in around 247 organisations in England, at the time of review.

Table 1 shows the majority of NHS endoscopists (62 per cent) are consultants and primary care endoscopists. There are 2,822 (headcount) NHS consultants and primary care endoscopists working in 233 NHS organisations, and 1,191 (headcount) independent sector consultants and primary care endoscopists working in 14 independent sector organisations. Most consultants who work in the independent sector also work in the NHS, so these figures are not exclusive. A more detailed table by HEE local teams is available in Appendix A.

NMEs make up around 10 per cent of the NHS endoscopy practitioner workforce. There are around 486 NHS and 20 independent sector NMEs.

Non-consultant-grade medical endoscopists make up around 4 per cent of the NHS endoscopy practitioner workforce. There are around 210 (headcount) NHS and 7 (headcount) independent-sector non-consultant-grade medical endoscopists. There are 1,085 NHS trainees[2] who make up around 24 per cent of the NHS workforce. Training for JETS certification as an endoscopist is discussed separately in the trainee section of this report, Section 7.

[2] Please note that these practitioners are already JETS certified endoscopists but are still training in terms of their specialty/profession, and include gastroenterology specialty trainees, surgical specialty trainees, other medical trainees such as radiologists, and non-medical trainees.

Table 1: Number of endoscopy practitioners in England[3]

There are 4,603 NHS endoscopy practitioners in England.

HEE local team/ independent sector	Consultants and primary care endoscopist headcount (HC)	Non-medical endoscopists HC	Non-consultant grade medical endoscopists HC	Trainees* HC	Total	Organisations
Independent sector	1,191	20	7	21	**1,239**	14
NHS	2,822	486	210	1,085	**4,603**	233
Total	**4,013**	**506**	**217**	**1,106**	**5,842**	247
NHS percentage (excluding independent sector)	62%	10%	4%	24%	100%	

Source: JAG GRS 2015

Table 2 shows the number of endoscopists by grade and HEE local team. Consultant gastroenterologists (28 per cent) and consultant colorectal surgeons (18 per cent) comprise about 47 per cent of all NHS endoscopy grades. In the NHS, the North West HEE local team has the largest number of endoscopists and Thames Valley the least.

[3] Most medical consultants who work in the independent sector are also likely to be working in the NHS, so the declared headcounts are not exclusive to the NHS and independent sectors. Furthermore, JAG data is collected by endoscopy unit, so it is likely that those NHS practitioners who work out of multiple NHS units will be counted more than once.

Table 2: Number of endoscopists by grade and HEE local team[4]

Consultant gastroenterologists and consultant colorectal surgeons comprise about two thirds of all endoscopy grades.

HEE local team/ independent sector	Consultant gastroenterologists	Consultant colorectal surgeons	Consultant upper GI or HPB surgeons	Other consultants	Primary care endoscopists	Nurse endoscopists	Other non-medical endoscopists	Non-consultant-grade medical endoscopists	Trainees	Total	Percentage	Sites
North West	184	129	45	22	10	95	9	42	155	691	15.0%	33
Yorkshire and the Humber	165	100	62	51	9	73	7	30	154	651	14.1%	27
West Midlands	113	91	39	49	7	39	3	14	85	440	9.6%	23
East of England	121	85	35	23	9	33	2	17	108	433	9.4%	20
East Midlands	98	67	37	21	7	34	0	8	90	362	7.9%	20
North East	89	60	31	8	3	55	0	13	80	339	7.4%	19
South West	87	65	31	13	9	25	2	12	49	293	6.4%	19
Kent, Surrey and Sussex	76	67	29	5	5	21	2	18	61	284	6.2%	17
South London	81	50	23	4	3	16	1	15	91	284	6.2%	16
Wessex	64	50	21	11	8	31	2	10	47	244	5.3%	12
North West London	101	20	0	4	3	13	0	3	77	221	4.8%	10
North, Central and East London	78	40	15	2	1	11	0	2	56	205	4.5%	9
Thames Valley	40	24	11	6	5	10	2	26	32	156	3.4%	8
Total NHS	**1297**	**848**	**379**	**219**	**79**	**456**	**30**	**210**	**1085**	**4603**		**233**
Percentage (NHS)	28.2%	18.4%	8.2%	4.8%	1.7%	9.9%	0.7%	4.6%	23.6%	100%		
Independent sector	518	392	167	97	17	20	0	7	21	1239		14
Total (NHS & independent)	**1815**	**1240**	**546**	**316**	**96**	**476**	**30**	**217**	**1106**	**5842**		**247**

Source: JAG GRS 2015

5.3 Workforce by staff group

Table 3 shows that the majority of endoscopists are gastroenterologists (40 per cent), followed by surgeons (36%), doctors from other specialties (14 per cent), and nurses (8 per cent). Nurses make up just 8 per cent but undertake as much of 20 per cent of the workload in an endoscopy unit. NHS Improving Quality initiatives have estimated that up to 40 per cent of low-risk, high-volume endoscopic procedures could potentially be carried out by NMEs (HEE 2015a).

[4]Most medical consultants who work in the independent sector are also likely to be working in the NHS, so the declared headcounts are not exclusive to the NHS and independent sectors. Furthermore, JAG data is collected by endoscopy unit, so it is likely that those NHS practitioners who work out of multiple NHS units will be counted more than once.

Table 3: Endoscopists by staff type

Gastroenterologists are the largest group of endoscopists, making up 40 per cent of the workforce.

Staff Type	HC	Percentage
Gastroenterologists	1,232	40.0%
Surgeons	1,108	36.0%
Doctors from other specialties	419	13.6%
Nurses	258	8.4%
Pathologists	54	1.8%
Radiologists	10	0.3%
Sub total	**3,081**	**100.0%**
Other clinicians that contribute to endoscopy services: trainees	1,719	35.8%
Total	**4,800**	**35.8%**

Source: BSG 2015

Table 4 shows a breakdown of the nurses who carry out endoscopy sessions. A total of 60.9 per cent are listed as endoscopists, 26 per cent are listed as 'other', and 8 per cent are listed as endoscopy support.

Table 4: Nurses who carry out endoscopy sessions

Of all the nurses who carry out endoscopy sessions, 60.9 per cent are listed as endoscopists.

Field of nurse who does endoscopy	Nurse headcount	Percentage of total
Endoscopist	260	60.9%
Other	112	26.2%
Support staff	34	8.0%
Gastro	7	1.6%
IBD/IBS	6	1.4%
Colorectal	4	0.9%
GI cancer	2	0.5%
Hepatology	1	0.2%
Nutrition/dietician	1	0.2%
Total	**427**	**100.0%**

Source: BSG 2015

5.4 Workforce by gender and age profile

Tables 5 and 6 show that medical endoscopists are predominantly men (81 per cent), whereas non-medical endoscopists are predominantly women (89 per cent).

Seventy-two per cent of trainees are men, whilst 28 per cent are women. The majority of surgeons are also men (93 per cent). Nurses are the only staff group with a reverse men/women ratio at 11 per cent men and 89 per cent women. Pathologists are the most gender-balanced at 69 per cent men, 31 per cent women.

Nurses have the highest proportion of full-time staff. Nurses, pathologists, and radiologists all have a higher proportion of full-time staff than gastroenterologists or surgeons, and gastroenterologists have a higher proportion of full-time staff than surgeons.

Table 5: Medical and non-medical by gender

Medical endoscopists are predominantly men and non-medical endoscopists are predominantly women.

	Men	Women	Men %	Women %
Medical	3,308	784	81%	19%
Non-medical	25	194	11%	89%

Source: BSG 2015

Table 6: Gender of the workforce

Medical endoscopists are predominantly men and non-medical endoscopists are predominantly women.

Type	HC	Percentage	Men/women ratio		Men full time %	Women full time %
Gastroenterologists	1,232	40.0%	81%	19%	62%	52%
Surgeons	1,108	36.0%	93%	7%	45%	43%
Doctors from other specialties	419	13.6%	88%	13%	n/a	n/a
Nurses	258	8.4%	11%	89%	86%	93%
Pathologists	54	1.8%	69%	31%	81%	92%
Radiologists	10	0.3%	90%	10%	75%	100%
Sub total	**3,081**	**100%**				
Others: trainees	1,719	35.8%	72%	28%		

Source: BSG 2015

Age profile data across all three datasets is very limited and the age profile data for women is particularly poor. Only around 10 per cent of recorded male surgeons have corresponding age data, and this figure is significantly less for women. The following age profiles are therefore not a true reflection, and represent the available data only.

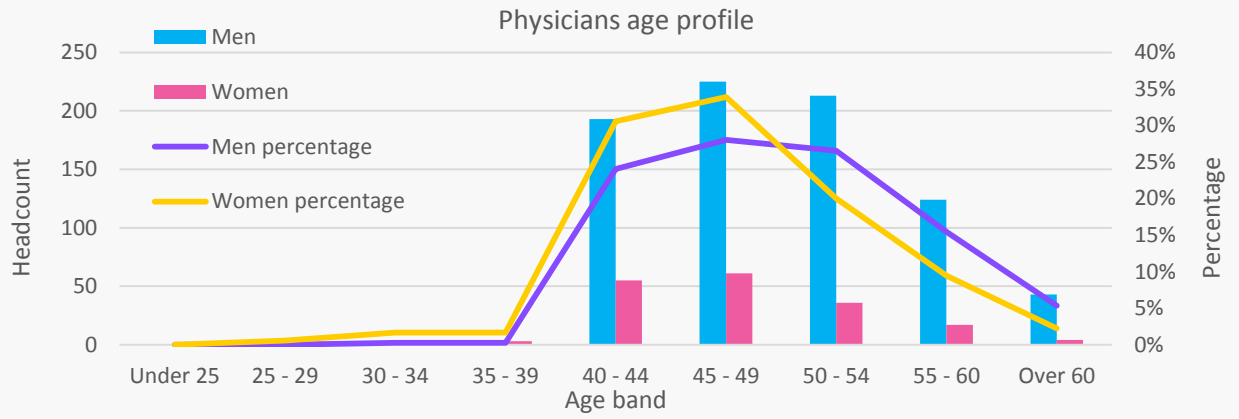
The JAG and BSG are open to modifying their data collection tools to collect this information during their next and subsequent annual collection rounds. This would most likely result in a much higher quality of age data returned.

Figures 1 and 2 show endoscopy physician and surgeon age profiles respectively, and reveal that about 70 per cent of physicians and almost all surgeons are over the age of 50. Neither the BSG nor JAG collects age profile data for NMEs.

For physicians, both genders' age profiles peak in the 45-49 age bands, and around 20 per cent of male physicians are 55 or older. The majority of surgeons (60 per cent) are men 55-60 years-old. There are only two populated age bands for women surgeons, one is 55-60 years-old and the other is over 60-years-old.

Figure 1: Endoscopy physicians age profile

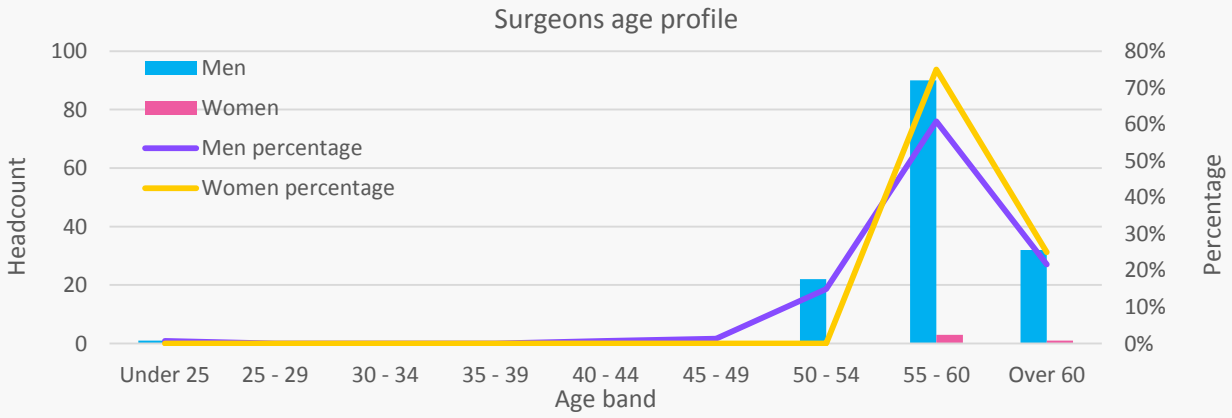
About 70 per cent of physican endoscopists are over 50.



Source: BSG 2015

Figure 2: Endoscopy surgeons age profile

Almost all surgeon endoscopists are over the age of 50.



Source: BSG 2015

5.5 Workforce by region

Table 7: Endoscopy staff per capita

There is a large variation across the regions in the number of endoscopy staff per capita.

HEE local team/ independent sector	Endoscopy staff HC	Endoscopy staff HC per 100,000 HEE local team capita	Sites
Yorkshire and the Humber	651	11.5	27
North West London	221	10.6	9
North East	339	9.4	19
North West	691	9	33
Wessex	244	8.8	16
South London	284	8.4	12
East Midlands	362	7.8	20
Thames Valley	156	7.4	8
West Midlands	440	7.4	23
East of England	433	7.1	20
South West	293	6.2	19
North, Central and East London	205	6	10
Kent, Surrey and Sussex	284	6	17
Independent sector	1239	n/a	14
Total	**5842**		**247**

Source: JAG GRS 2015

Table 7 shows there is a large variation across the regions in the number of endoscopy staff per capita. Yorkshire and the Humber has the largest, with 11.5 endoscopy staff (headcount) per 100,000 population, whilst North, Central and East London, and Kent, Surrey and Sussex have the lowest with 6 endoscopy staff (headcount) per 100,000 population each.

5.6 Impact of shortages in workforce on service delivery

CfWI stakeholder interviews highlighted a skills shortage in endoscopy against a backdrop of increasing demand for endoscopic services, resulting in inadequate service delivery capacity and risks to quality of delivery in terms of competency and patient safety.

Waiting time data shows a clear increase in the percentage of patients waiting for endoscopy procedures after six weeks of request for procedure between 2012 and 2015, which suggests that the service is not coping with the increased demand as efficiently as it did before.

The non-medical endoscopy workforce is being developed to meet capacity challenges and HEE has recently endorsed the development of a non-medical endoscopy competency framework, which is now in place and has supported the production of a training programme for nurse endoscopists and the intention is to offer a tender of up to four training centres in an initial pilot (HEE 2015).

Succession planning

There are multiple staff groups involved in endoscopy service provision, so research into succession planning specifically for endoscopists requires detailed engagement with all the primary workforces or staff groups such as general practitioners and gastroenterologists.

HEE will explore, in phase two of this project, the impact of succession planning on any future supply modelling assumptions.

5.7 Support staff

Support staff here includes both clinical staff such as endoscopy nurses and HCAs, as well as, administration and clerical staff. The higher bands include managers and clinical staff who run the endoscopy units. Table 8 shows that the majority of support staff (89 per cent) are grade 5 and below. The average vacancy rate for bands 5 and below is 11 per cent, compared with an average of 8 per cent for bands 6 to 8.

Table 8: Support staff

The majority of support staff are grade 5 or below.

AfC band	Staff FTE	Percentage of total	Vacancies FTE	Percentage of total	Vacancy rate
8	84.0	1%	6.0	1%	7%
7	303.6	4%	26.3	3%	9%
6	697.8	10%	55.6	7%	8%
5	3,196.4	44%	440.5	52%	14%
4	432.4	6%	26.3	3%	6%
3	1,131.5	16%	120.1	14%	11%
2	1,450.1	20%	167.5	20%	12%
Total	**7,295.7**	**100%**	**842.3**	**100%**	**12%**

Source: JAG GRS 2015

Support staff per capita

Table 9 shows that Yorkshire and the Humber has the most full-time equivalent (FTE) support staff (16.7) by HEE local team capita, while North, Central and East London has the least (7.6).

Wessex and South London have the most support staff vacancies (16 per cent) FTE per support staff FTE, while North East has the least (6 per cent).

Table 9: Support staff by HEE local team by capita

Yorkshire and the Humber has the most support staff by HEE local team capita, while North, Central and East London has the least.

HEE local team/ independent sector	Support staff FTE	Support staff FTE per 100,000 HEE local team population	Vacancies FTE	Vacancies FTE per support staff FTE	Sites
Wessex	341.4	12.3	55	0.16	16
South London	393.8	11.7	63	0.16	12
East of England	590.3	9.7	82	0.14	20
North West London	339	16.2	48	0.14	9
Kent, Surrey and Sussex	465.1	9.9	59	0.13	17
North, Central and East London	259.4	7.6	33	0.13	10
West Midlands	653.4	11	79	0.12	23
South West	460.6	9.7	56	0.12	19
East Midlands	456.1	9.9	48	0.11	20
North West	965.5	12.6	100	0.10	33
Yorkshire and the Humber	947	16.7	95	0.10	27
Thames Valley	210.3	10	18	0.09	8
North East	469.1	13.1	27	0.06	19
Independent sector	744.7	n/a	78	0.10	14
Total	**7,295.7**		**842**	**0.12**	**247**

Source: JAG GRS 2015

Support staff per endoscopist

Table 10 shows a large variation of support staff per endoscopist across the HEE local team regions. Support staff per endoscopist ranges from 0.6 FTE in North West London to 3.7 FTE in the North West.

The independent sector has more support staff per endoscopist than any HEE local team, which suggests that the independent sector uses support staff very differently to the NHS. However, it is unknown whether this figure is due to anomalies in the various survey and data recording processes.

Note that this table compares HC to FTE, which is not ideal, but the data does not allow a HC-to-HC or FTE-to-FTE analysis. The CfWI suggests further research and investigation across the regions to determine if some regions' service configurations are such that they truly have fewer support staff per endoscopist, or if there is some other explanation for the data. If demand continues to increase and there is not sufficient support staff, then pressure on endoscopists in those regions will be significantly greater.

Table 10: Support staff per endoscopist

There is a large variation of support staff per endoscopist across the HEE local team regions.

HEE local team/ independent sector	Support staff FTE	Endoscopists HC	Support staff FTE per endoscopist
North West	965.5	259	3.7
South London	393.8	124	3.2
Kent, Surrey and Sussex	465.1	149	3.1
North East	469.1	193	2.4
South West	460.6	223	2.1
East of England	590.3	325	1.8
East Midlands	456.1	272	1.7
North, Central and East London	259.4	197	1.3
West Midlands	653.4	497	1.3
Wessex	341.4	355	1
Thames Valley	210.3	244	0.9
Yorkshire and the Humber	947	1218	0.8
North West London	339	536	0.6
Independent sector	744.7	144	5.2
Total	**7,295.7**	**4736**	**1.54**

Source: JAG GRS 2015

5.8 Agency, locum and bank staff

Agency, locum and bank staff workforce data is not recorded, collated or published at a national level as a standard metric. The CfWI has not been able to obtain actual agency, locum and bank staff numbers due to the endoscopy survey being cancelled in order for the CfWI to conduct a cross-dataset analysis.

CfWI stakeholder interviews highlighted that locums and agency staff provide a flexible workforce that is available at short notice and can be brought in during times such as departmental transitional periods and/or upgrading and can be utilised in various endoscopy services. However, the general consensus is that locums and agency staff generally lack the sufficient knowledge, experience and accreditation, required for endoscopy, and tend to be expensive to hire. The majority of the interviewees indicated that outsourcing is a short-term solution which has increased over the years due to long waiting lists and staff shortages.

A number of interviewees mentioned using the company Medinet to source endoscopist and nurse endoscopists, mainly to cover weekend lists. Medinet has been working with trusts to reduce waiting times and work towards achieving their waiting time targets for more than 11 years (Medinet, 2015).

5.9 Vacancies

The JAG records support staff vacancies, and these are detailed in the support staff section of this report. However, the CfWI was unable to establish or estimate the number or relative size of endoscopist vacancies at the time of writing as none of the three datasets analysed records this information, and it appears that endoscopist specific vacancies are not recorded, collated or published at a national level as a standard metric. This is likely due to the fact that endoscopy is based on a skill set and is a service that can be offered by multiple staff groups.

This is corroborated by the HSCIC which, in response to a CfWI enquiry, stated that it is not currently possible to separately identify adverts relating only to endoscopy on HSCIC data as it is a subset of work, and that endoscopy vacancy adverts would therefore be included in the broader main specialty areas such as gastroenterology (HSCIC, 2016b).

Conversely, online adverts for endoscopists including variations such as 'endoscopy nurse', 'nurse endoscopist', 'endoscopy lead', 'endoscopy practitioner', 'staff nurse – endoscopy', and 'specialty doctor in gastroenterology and endoscopy' do appear on the NHS Jobs and other online jobsites. Furthermore, there are adverts that do not specify endoscopy in the title, such as 'consultant in gastroenterology', but are weighted towards endoscopy services in the job description. However, collating this data across all online portals would be extremely time consuming and not likely to produce a reliable national estimate of endoscopist vacancies.

HEE will explore if better intelligence is available on this, in phase two of this project to better cover this area of uncertainty.

6. Activity

6.1 Overview

The CfWI analysed the Monthly Diagnostic Waiting Times and Activity (MDWTA) datasets provided by NHS England (NHS England, 2016), and Hospital Episode Statistics (HES) (HSCIC, 2016a) datasets for year-on-year trends for endoscopic procedures/events.

The MDWTA collects activity data on colonoscopy, flexi-sigmoidoscopy, and gastroscopy. Tests carried out as part of national screening programmes are not recorded on MDWTA. However, any subsequent diagnostic procedures triggered by an abnormal screening result should be recorded, for example colonoscopies following a positive result during bowel cancer screening.

HES contain details of admissions, outpatient appointments and A&E attendances at NHS hospitals in England. However, it is an administrative dataset designed for secondary use, i.e. non-clinical purposes, and does not reflect all the activity recorded on the MDWTA. The CfWI therefore only focused on the MDWTA datasets as an indicator of total activity, and used HES data only to analyse activity by age groups.

Some of the following charts and tables include all endoscopy services as recorded by JAG, including those that may not be GI related such as bronchoscopy and flexible cystoscopy. This data is captured by JAG, so reported here as a comparison.

- The total yearly number of procedures for colonoscopy, flexi-sig, and gastroscopy increased by 15.9 per cent between 2011–12 and 2014–15 (December to November), at a compound annual growth rate (CAGR) of 5.3 per cent.
- The independent sector has significantly fewer procedures per endoscopist compared to the NHS[5].
- The numbers of procedures per endoscopist across the HEE local team regions are similar but there is some variation.
- GI service and GI training accounts for more than 69 per cent of all time spent by endoscopists across all endoscopy activity.
- Colonoscopy, dedicated ERCP, bronchoscopy, and flexible cystoscopy account for about 20 per cent of all time spent by endoscopists across all endoscopy activity.
- Bowel cancer diagnoses increased by 6 per cent between 2010 and 2015 according to HES.
- HES data suggests that most endoscopy activity is carried out on patients above the age of 35, and that the over 70 age group accounts for about 35 per cent of all HES recorded endoscopy procedures.

[5] Most medical consultants who work in the independent sector are also likely to be working in the NHS, so the declared headcounts are not exclusive to the NHS and independent sectors. Furthermore, JAG data is collected by endoscopy unit, so it is likely that those NHS practitioners who work out of multiple NHS units will be counted more than once.

6.2 Activity by procedure

Table 11 shows activity by procedure for 2013–14 in England. Upper GI (including therapeutic procedures) and colonoscopies constituted almost 72 per cent of all endoscopy procedures, and flexible sigmoidoscopies constituted 15 per cent.

Table 11: Activity by procedure

Upper GI (including therapeutic) and colonoscopy procedures were the most common in 2013-14.

Procedure type	2013-14 procedures	Percentage of total
Upper GI (including therapeutic procedures)	816,519	39.30%
Colonoscopy	676,765	32.60%
Flexible sigmoidoscopy	311,426	15.00%
Flexible cystoscopy	119,396	5.70%
ERCP	47,996	2.30%
Bronchoscopy	45,784	2.20%
151 other procedures combined	60,728	2.90%
Total	**2,078,614**	**100.00%**

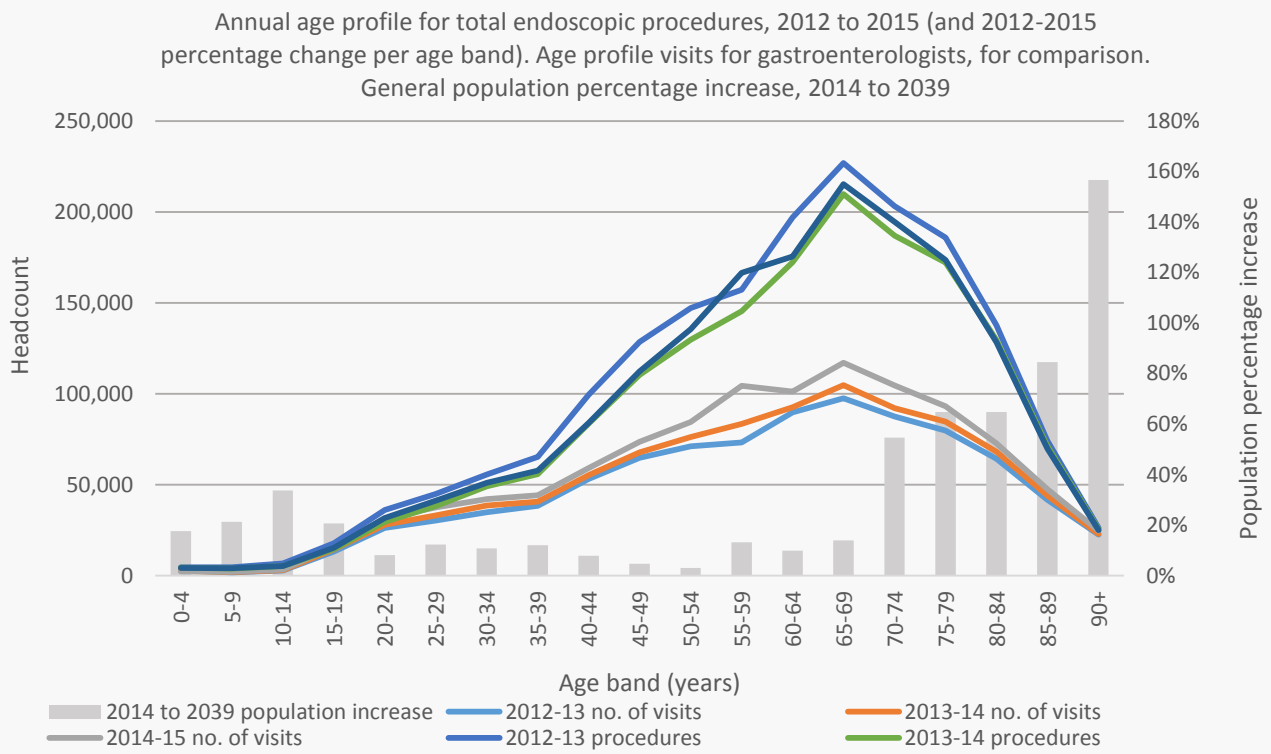
Source: JAG GRS 2015

6.3 Activity by age group

Figure 3 shows endoscopy activity by age group. This shows that most of the activity (~91 per cent) is carried out on patients above the age of 35, with a maximum in the 65-69 years age group. However, in 2014–15 there was also a small peak in the 55-59 years age group. It also shows that activity decreases sharply from 65+ years, and that although the population is growing significantly over the age of 70, the number of procedures in that age group accounts for about 35 per cent of all HES recorded procedures.

Figure 3: Endoscopy activity by age group

HES data suggests that most activity (~91 per cent) is carried out on people above the age of 35 with a maximum in the 65-69 age group.



Source: HSCIC 2016a

6.4 Increase in activity

According to the MDWTA, the total yearly number of procedures for colonoscopy, flexi-sig and gastroscopy increased by 15.9 per cent between 2011–12 and 2014–15 (December to November), at a compound annual growth rate (CAGR) of 5 per cent.

The CfWI was not able to source data showing activity by HEE local team by modality by year and suggests that this could be an area of further investigation in ongoing endoscopy workforce considerations to give a more granular view of how services are being delivered by region.

Colonoscopy

Between 2011–12 and 2014–15 the total yearly number of colonoscopies in England increased by 12.7 per cent, at a CAGR of 4.1 per cent:

- a 3.2 per cent increase in the total yearly number of **planned** colonoscopies, a CAGR of 1.0 per cent
- an 11.9 per cent increase in the total yearly number of **unscheduled** colonoscopies, a CAGR of 3.8 per cent
- a 14.7 per cent increase in the total yearly number of **waiting list (excluding planned)** colonoscopies, a CAGR of 4.7 per cent.

Flexi sigmoidoscopy

Between 2011–12 and 2014–15 the total yearly number of flexi-sig procedures in England increased by 9.6 per cent, at a CAGR of 3.1 per cent:

- an 8.2 per cent increase in the total yearly number of **planned** flexi-sig procedures, a CAGR of 2.7 per cent
- a 12.3 per cent increase in the total yearly number of **unscheduled** flexi-sig procedures, a CAGR of 3.9 per cent
- a 9.5 per cent increase in the total yearly number of **waiting list (excluding planned)** flexi-sig procedures, a CAGR of 3.1 per cent.

Gastroscopy

Between 2011–12 and 2014–15 the total yearly number of gastroscopy procedures in England increased by 20.7 per cent, at a CAGR of 6.5 per cent:

- a 9.7 per cent increase in the total yearly number of **planned** gastroscopy procedures, a CAGR of 3.1 per cent
- a 5.2 per cent increase in the total yearly number of **unscheduled** gastroscopy procedures, a CAGR of 1.7 per cent
- a 24.2 per cent increase in the total yearly number of **waiting list (excluding planned)** gastroscopy procedures, a CAGR of 7.5 per cent.

These figures show that the number of procedures in endoscopy activity for these three modalities rose between 2011–12 and 2014–15 (December to November), with the highest percentage change in gastroscopies at 20.7 per cent, just over double that of flexi-sigmoidoscopies at 9.7 per cent.

6.5 Waiting times

According to the MDWTA, the **overall** percentage of people waiting for colonoscopy, flexi-sig and gastroscopy procedures in England after six weeks of request for procedure increased from an average of 3.2 per cent to an average of 6.9 per cent between 2011–12 and 2014–15 (December to November) (NHS England, 2016), a relative increase of 118 per cent over the period. By procedure:

- the percentage of people waiting for colonoscopies increased from an average of 3.7 to 7.0 per cent, a relative increase of 89 per cent over the period
- the percentage of people waiting for flexi-sig procedures increased from an average of 3.2 to 7.2 per cent, a relative increase of 125 per cent over the period
- the percentage of people waiting for gastroscopy procedures increased from an average of 2.6 to 6.5 per cent, a relative increase of 151 per cent over the period.

If the overall percentage of patients waiting for procedures after a given period remains static then it is fair to assume that the service is coping with the increased demand as efficiently as it did before. However, these figures show a clear increase in the percentage of patients waiting for procedures after six weeks of request, and suggest that around twice as many patients, proportionally, were waiting for procedures after six weeks in 2015 than in 2012.

The CfWI was not able to source data showing waiting times by HEE local team by modality by year, and suggests that this could be an area of further investigation in ongoing endoscopy workforce considerations to give a more granular view of how services are being delivered by region.

Waiting list initiatives

Consultants can receive special waiting list initiative (WLI) payments, in addition to their basic salary, if they agree to work outside their contract. The payment is specifically to meet waiting time targets, and can be up to triple time of a consultant's basic salary. These are negotiated individually by each trust so there are no figures for how much is spent nationally (BBC, 2011; Herald Scotland 2013).

Table 12 shows the number of sites by HEE local team that utilise WLI; 84 per cent of responding sites across all HEE local teams confirmed they utilise WLI. If a trust is repeatedly using waiting list initiatives to bring queues down, it could be an indicator that a service is failing (HSJ, 2014).

The CfWI was unable to confirm whether the WLI was an ongoing or annual scheme, and to what extent WLI was being utilised, and suggests that this is investigated further in phase two of the project, to better inform ongoing waiting time investigations.

Table 12: Waiting time initiatives by HEE local team

North East and Wessex have the lowest uptake of waiting time initiative

HEE local team	Percentage of respondents which use waiting list initiative	Sites
Kent, Surrey and Sussex	100%	17
West Midlands	91%	23
South London	91%	12
East Midlands	89%	20
North West London	89%	9
North, Central and East London	89%	10
Thames Valley	88%	8
North West	83%	33
Yorkshire and the Humber	81%	27
South West	75%	19
East of England	74%	20
Wessex	69%	16
North East	68%	19
	Average 84%	**Total 233**

Source: JAG GRS 2015

6.6 Bowel cancer screening

Bowel cancer is the second most common cause of cancer death in the UK, behind lung cancer (CRUK, 2012).

Cancer screening involves testing people for signs that could mean a cancer is developing, and aims to detect bowel cancer at an early stage when treatment is more likely to work. The NHS Bowel Cancer Screening Programme (BCSP) in England began in July 2006, and there are currently two main screening methods:

1. faecal occult blood testing (FOBT), which looks for hidden traces of blood in faeces, which can be a sign of bowel cancer
2. bowel scope screening, which uses an endoscope to look for early-stage cancers and pre-cancerous growths known as 'polyps,' which can be immediately removed to prevent them developing into cancer (although if they are bigger than 1cm or there are a lot of adenomatous polyps the patient is referred for a colonoscopy and the polyps will be removed during this procedure).

In England, men and women between 60 and 74 years-old take part in FOBT. The screening programme sends a FOBT kit every two years to people eligible to take part. Participants collect small faeces samples at home and return them to the screening centre using the kit provided (CRUK, 2015c).

If the test result is normal then there is no further action until the next scheduled test. If the result is unclear the participant is sent another kit to do the test again. If the result is abnormal then the participant may be asked to redo the test, or booked to see a specialist nurse at a bowel screening centre. Most participants with an abnormal result will have a colonoscopy to see whether there is a problem that needs treatment (CRUK, 2015c). These colonoscopies will be recorded on MDWTA as they are procedures triggered by screening.

In March 2015 about two thirds of screening centres began to offer bowel scope screening to 55-year-olds. FOBT testing will continue at age 60. Bowel scope screening is done by a specially trained nurse or doctor at an NHS bowel cancer screening centre. Some participants will also be offered a colonoscopy because of the type of polyps found.

In 2014 Public Health England (PHE) ran a pilot for faecal immunochemical tests (FIT) alongside FOBT. FIT is a more sensitive test than the FOBT and therefore likely to detect more cancers or pre-cancerous polyps (CRUK, 2014b).

There are already a number of acknowledged challenges facing endoscopy services in terms of rising demand and a lack of capacity to respond to this increasing demand (CRUK, 2015a). The ongoing BCSP requires increased capacity in both endoscopy and pathology services, and if the FIT test replaces FOBT there will be further demand increases on these services due to increased detection rates. New technologies such as FIT can increase cancer detection; however, there is a requirement for an adequately resourced workforce to deliver results, and this is a common concern highlighted during CfWI stakeholder interviews.

Not all sites perform bowel cancer screening colonoscopy; this is only undertaken by screening centres and their spoke sites. Additionally, not all sites that perform endoscopy undertake the full range of therapeutic procedures, in particular not all sites undertake ERCP. Table 13 shows that BCSP colonoscopy and dedicated ERCP services are only provided by about half of all sites that provide a GI service. However, it is unknown whether this is due to anomalies in the various survey and data recording processes, or is a true reflection of service provision capability (JAG GRS, 2015).

The CfWI suggests that further analysis is carried out in phase two of the project to better understand and to inform any future supply assumptions.

Table 13: BCSP colonoscopy and dedicated ECRP services by HEE local team

BCSP colonoscopy and dedicated ERCP services are only being provided by about half of all sites that provide GI service.

HEE local team/ independent sector	GI service	GI training	BCSP colonoscopy	Dedicated ERCP
West Midlands	23	18	14	15
North West	30	24	11	14
Yorkshire and the Humber	24	21	13	10
Kent, Surrey and Sussex	17	17	11	15
East of England	19	16	11	11
South West	16	13	11	9
North East	18	11	10	9
Wessex	15	12	9	8
East Midlands	13	12	8	8
South London	12	12	3	5
North, Central and East London	10	9	4	8
North West London	9	7	4	5
Thames Valley	8	9	6	4
Independent sector	14	7	3	1
Total	**228**	**188**	**118**	**122**

Source: JAG GRS 2015

Bowel cancer diagnoses

Table 14 highlights rising bowel cancer diagnoses, which increased by 6 per cent from 156,289 in 2010 to 165,690 in 2015.

Table 14: Bowel cancer diagnoses

Bowel cancer diagnoses increased by around 6 per cent between 2010 and 2015.

Year	Number of bowel cancer diagnoses	Percentage change	Number of procedures	Percentage change
2010–11	156,289	n/a	n/a	n/a
2011–12	164,199	5.10%	n/a	n/a
2012–13	163,007	-0.70%	1,819,425	-
2013–14	160,705	-1.40%	1,638,258	-10.00%
2014–15	165,690	3.10%	1,691,553	3.30%

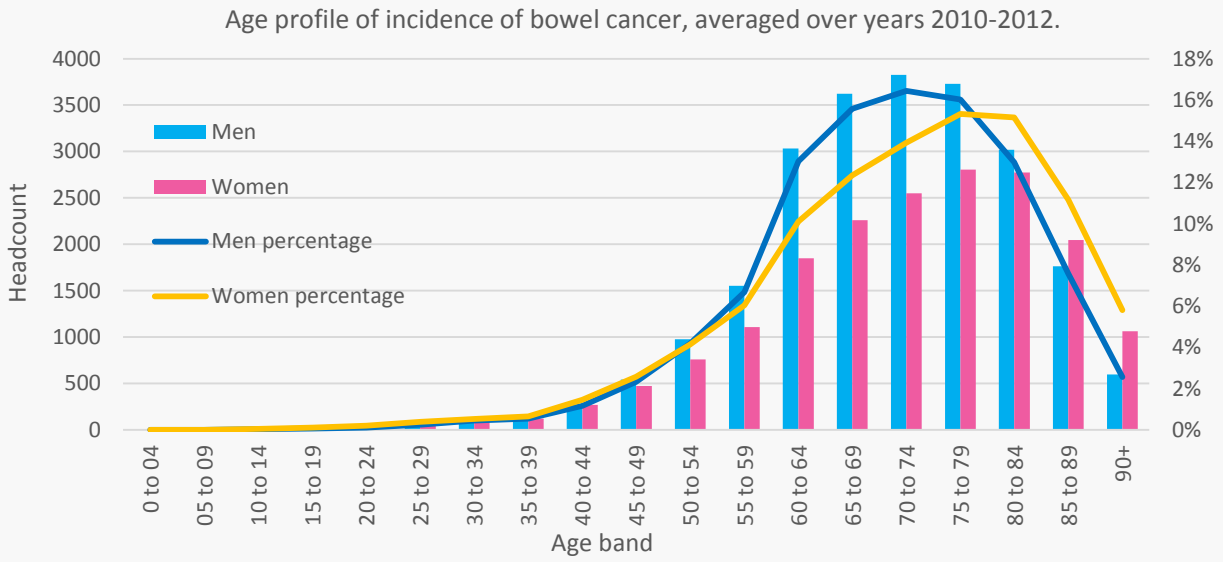
Source: HSCIC 2016a

Bowel cancer age profile

Figure 4 shows the age profile of bowel cancer incidence between 2010 and 2012. For men 70 to 74 years is the age band with the highest incidences of bowel cancer, while for women it is the 75 to 79 years age band. There are more incidents of bowel cancer in men up to age 85. The peak ages of activity are quite likely to be due to the bowel cancer screening programmes where men and women between 60 and 74 years take part in FOBT, and where screening centres are now offering bowel scope screening to 55-year-olds.

Figure 4: Bowel cancer incidence by age band

For men, 70 to 74 years is the age band with the highest incidences of bowel cancer, while for women it is the 75 to 79 years age band.



Source: HSCIC 2016a

6.7 Activity per endoscopist

Procedures per endoscopist

Table 15 shows activity per endoscopist by HEE local team in 2014. The average number of procedures per NHS endoscopist was 530. By contrast, the independent sector had significantly fewer procedures at 217 per endoscopist. North West London and Kent, Surrey and Sussex had the highest number of procedures per endoscopist compared to the rest of the NHS.

Table 15: Activity per endosopist by HEE local team in 2014

The average number of procedures per NHS endoscopist in 2014 was 530.

HEE local team/ independent sector	Standard	BCSP colonoscopy	Total	Percentage	Endoscopists Total (HC)	Average number of procedures per endoscopist
North West London	91,018	6,128	**97,146**	4.7%	**144**	675
Kent, Surrey and Sussex	127,332	8,696	**136,028**	6.5%	**207**	657
North, Central and East London	83,782	975	**84,757**	4.1%	**149**	569
East of England	160,170	9,097	**169,267**	8.1%	**309**	548
North East	117,211	6,798	**124,009**	6.0%	**229**	542
South West	121,446	6,206	**127,652**	6.1%	**244**	523
West Midlands	162,750	8,394	**171,144**	8.2%	**333**	514
Wessex	93,582	4,261	**97,843**	4.7%	**197**	497
North West	254,128	5,412	**259,540**	12.5%	**532**	488
South London	90,983	2,144	**93,127**	4.5%	**193**	483
Thames Valley	57,259	2,196	**59,455**	2.9%	**124**	479
Yorkshire and the Humber	201,729	8,223	**209,952**	10.1%	**449**	468
East Midlands	177,147	7,352	**184,499**	8.9%	**408**	452
Independent sector	262,923	1,272	**264,195**	12.7%	**1,218**	217
Total	**2,001,460**	**77,154**	**2,078,614**	100.0%	**4,736**	439
Percentage	96.3%	3.7%	100%			

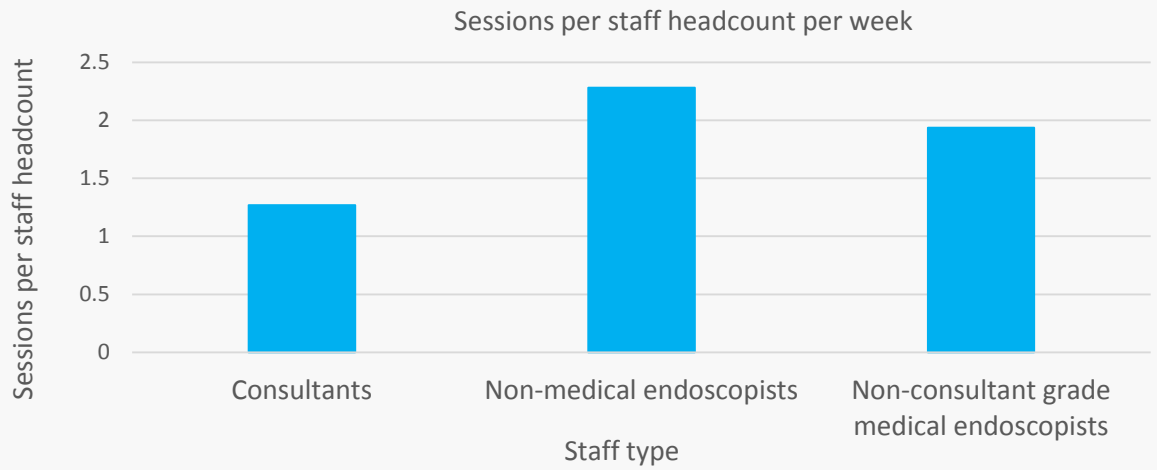
Source: JAG GRS 2015

Sessions by staff type

Figure 5 shows that non-medical endoscopists work the most endoscopy sessions per week per staff headcount, while consultants work the fewest sessions per staff headcount per week.

Figure 5: Weekly endoscopy sessions by staff type

Non-medical endoscopists do the most weekly sessions per staff headcount.



Source: JAG GRS 2015

Average number of lists per endoscopist

Table 16 shows the average number of lists per endoscopist by HEE local team. The average is 21. East of England, Wessex, and Thames Valley have the most lists per endoscopist with an average of 27. Regionally, the North East has the fewest lists per endoscopist with an average of 17. The independent sector has the lowest at 14 lists per endoscopist.

Appendix A has a breakdown of the total number of lists by HEE local team. This shows that 71 per cent of all lists are gastroenterologists or surgeon-led, and 26 per cent nurse endoscopist-led. Regionally, the North West has the most endoscopy lists and Thames Valley the fewest.

Table 16: Average number of lists per endoscopist by HEE local team, November 2014 to Nov 2015

East of England, Wessex, and Thames Valley have the most lists per endoscopist.

HEE local team/ independent sector	Gastro-enterologist	GI surgeon	No role specified	Nurse endoscopist	Radiologist	GP	CTC radiographer	Average	Percentage of lists
East of England	29	15	26	59	0	1	59	**27**	9%
Wessex	30	12	24	55	2	18	0	**27**	9%
Thames Valley	27	17	13	48	4	0	0	**27**	9%
North, Central and East London	24	15	22	103	0	0	0	**26**	9%
South West	23	15	23	42	0	25	0	**22**	8%
South London	25	13	20	34	0	8	0	**21**	7%
Kent, Surrey and Sussex	24	13	6	29	0	18	0	**20**	7%
North West	25	13	5	29	0	12	0	**20**	7%
East Midlands	25	9	20	24	5	0	0	**19**	7%
West Midlands	20	9	4	40	27	15	0	**19**	6%
Yorkshire and the Humber	19	12	20	27	4	0	0	**18**	6%
North West London	20	13	8	43	0	0	0	**18**	6%
North East	20	9	17	24	0	23	0	**17**	6%
Independent sector	8	5	0	26	0	13	0	**14**	5%
Average	**23**	**12**	**16**	**36**	**8**	**15**	**59**	**21**	100%

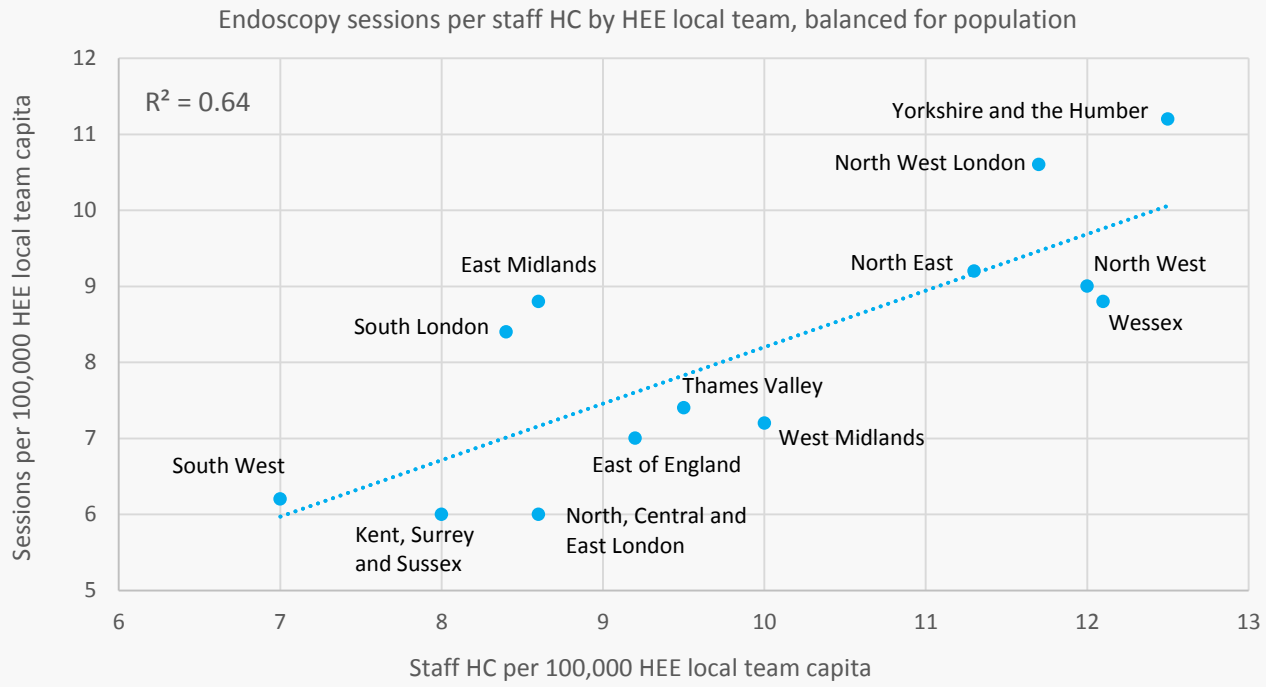
Source: JAG JETS 2015

Sessions per staff HC by HEE local team

As shown in Figure 6 (below), there is a strong positive correlation ($R^2 = 0.64$) between the number of endoscopy staff and the number of sessions. However, there are a few anomalies such as East Midlands has a relatively low number of staff for its high number of sessions, and North, Central and East London has a relatively high number of staff for its low number of sessions.

Figure 6: Endoscopy sessions per staff HC by HEE local team

There is a strong positive correlation between number of endoscopy staff and sessions.



Source: JAG GRS 2015

6.8 Activity per capita and by HEE local team

Sessions per capita by HEE local team

According to a report by Bowel Cancer UK, there are variations across HEE local team regions in the quality, rate, capacity and experience of endoscopy (BCUK 2012).

Table 17 (below) shows this variation, where Yorkshire and the Humber has the most sessions per 100,000 HEE local team capita (12.5) and the South West has the fewest sessions per capita (7).

Table 17: Endoscopy sessions per capita by HEE local team

Yorkshire and the Humber has the most sessions per capita. South West has the fewest sessions per capita.

HEE local team	Sessions	per 100,000 HEE local team capita	per 100,000 HEE local team capita over 35	Sites
Yorkshire and the Humber	709	12.5	23.7	27
Wessex	336	12.1	19.2	16
North West	920	12	22.9	33
North West London	245	11.7	24.4	9
North East	406	11.3	23.4	19
West Midlands	597	10	18.8	23
Thames Valley	199	9.5	15.3	8
East of England	558	9.2	16.6	20
North, Central and East London	293	8.6	20.6	10
East Midlands	395	8.6	14.8	20
South London	284	8.4	18.5	12
Kent, Surrey and Sussex	378	8	15.1	17
South West	332	7	11	19
Independent sector	1,015	n/a	n/a	14
Total	**6,665**			**247**

Source: JAG GRS 2015

Procedures per capita by HEE local team

Table 18 (below) shows that North West London has the highest number of procedures per million HEE local team capita. Nearby, North, Central and East London has the fourth fewest number of procedures.

Outside London, the North East has the highest number of procedures, while South West and East Midlands have the fewest. Across all HEE local team regions the majority of endoscopy procedures are upper GI at 41 per cent and colonoscopy at just under 30 per cent. However, it is far from clear why this variation exists in England.

Appendix A has a breakdown of total numbers of endoscopy procedures by HEE local team in 2014. This shows that the North West carried out the most endoscopy procedures, and Thames Valley the fewest. It also shows that the independent sector provided more procedures than the North West.

Table 18: Endoscopy procedures per capita by HEE local team

The North West London HEE local team does the most endoscopy procedures per capita.

Thousands of 2014 procedures per million HEE local team capita											
HEE local team	**Upper GI (including therapeutic procedures)**	**Colonoscopy**	**Flexible sigmoidoscopy**	**Flexible cystoscopy**	**ERCP**	**Bronchoscopy**	**151 other procedures combined**	**Total**	**Percentage**	**2014 procedures**	**Sites**
North West London	20.2	17	8.2	0.3	1.7	1.8	1.9	**51.1**	11.4%	97,146	9
North East	19.7	13.4	7.3	3.4	1.2	1.5	0.7	**47.1**	10.5%	141,354	19
Yorkshire and the Humber	18.4	13.5	6.1	2.5	1	0.8	1.5	**43.7**	9.8%	236,150	26
North West	16.4	9.6	6.4	1.8	1	1	0.7	**36.8**	8.2%	257,888	33
Kent, Surrey and Sussex	14.3	10.8	6.2	1.9	0.9	0.7	0.7	**35.3**	7.9%	141,329	16
Wessex	14.3	10.2	5.1	2.7	0.9	0.6	1.1	**34.9**	7.8%	97,843	16
West Midlands	13.2	8.5	5.3	2.4	0.8	0.9	1.9	**32.9**	7.4%	184,383	23
South London	12.9	9.8	4.1	1.8	0.8	0.7	1.1	**31**	6.9%	93,127	12
East of England	11.9	9.3	4.9	2.6	0.7	0.8	0.8	**31**	6.9%	179,555	20
North, Central and East London	12.3	8.8	3.5	0.6	0.8	0.7	0.6	**27.3**	6.1%	84,757	10
Thames Valley	10.6	8.2	4.9	0.8	0.7	0.4	0.4	**25.9**	5.8%	59,455	8
South West	10.2	7.7	4.2	1.5	0.8	0.6	0.5	**25.5**	5.7%	127,652	19
East Midlands	9.4	7.2	3.9	2.3	0.8	0.7	0.6	**25**	5.6%	113,780	20
Independent sector	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**	n/a	264,195	15
Total	**183.7**	**133.9**	**70**	**24.6**	**11.9**	**11.3**	**12.3**	**447.7**	**100.0%**	**2,078,614**	**246**
Percentage	41.0%	29.9%	15.6%	5.5%	2.7%	2.5%	2.7%	100.0%			

Source: JAG GRS 2015

Endoscopy hours per capita by HEE local team

Table 19 (below) shows an average of 415 hours of endoscopy are spent per million HEE local team capita. The North East (10.4 per cent) and Kent, Surrey and Sussex (10.1 per cent) spend the most hours per capita on endoscopy. Five of the 13 local team regions spend more time than the average.

Appendix A has a breakdown of total numbers of hours spent on endoscopy services by HEE local team. This shows that the North West spends the most hours on endoscopy services, and Thames Valley the fewest.

GI service and training accounts for more than 69 per cent of all time spent by endoscopists across all endoscopy activity. BCSP colonoscopy, dedicated ERCP, bronchoscopy, and flexible cystoscopy account for about 20 per cent of all time spent by endoscopists across all endoscopy activity.

Table 19: Endoscopy hours per capita by HEE local team

An average of 415 hours of endoscopy are spent per million capita.

Hours per million HEE local team capita									
HEE local team	**GI service**	**GI training**	**BCSP colonoscopy**	**Dedicated ERCP**	**Bronchoscopy**	**Flexible cystoscopy**	**6 other services combined**	**Total**	**Percentage**
North East	321.9	47.3	32.5	27.2	23.8	22.0	39.3	**514.1**	10.4%
Kent, Surrey and Sussex	299.6	55.3	36.0	28.3	20.4	16.2	44.4	**500.2**	10.1%
Wessex	284.6	33.4	29.3	28.4	27.0	28.4	44.2	**475.2**	9.6%
North West London	211.4	80.4	34.5	29.7	33.9	1.3	56.7	**448.0**	9.1%
South London	261.3	71.7	8.7	22.5	13.0	10.6	36.7	**424.3**	8.6%
West Midlands	216.0	38.3	18.4	24.0	24.3	25.3	37.8	**384.2**	7.8%
North West	239.6	44.6	14.7	20.4	19.4	17.8	27.4	**383.8**	7.8%
Yorkshire and the Humber	227.5	29.3	17.1	13.3	14.7	15.9	31.8	**349.7**	7.1%
Thames Valley	221.5	35.7	28.5	11.5	7.5	9.6	22.8	**337.1**	6.8%
East of England	157.2	61.2	23.9	16.9	16.1	19.9	20.4	**315.7**	6.4%
North, Central and East London	134.8	54.4	12.4	22.7	17.3	7.3	37.9	**286.8**	5.8%
East Midlands	126.2	18.8	15.9	18.1	15.6	14.3	65.9	**274.8**	5.6%
South West	135.5	17.5	19.6	14.1	15.1	9.4	38.0	**249.0**	5.0%
Independent sector	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**	n/a
Total	**2,837.2**	**587.7**	**291.5**	**276.9**	**248.3**	**197.9**	**503.3**	**4,942.8**	**100%**
Percentage	57.4%	11.9%	5.9%	5.6%	5.0%	4.0%	10.2%	100%	

Source: JAG GRS 2015

Service hours per capita

Table 20 (below) shows the North East spends the most amount of GI service hours per million HEE local team capita (322) whereas the East Midlands spends the least (126). The average number of hours spent per million per capita is 251.

Table 20: Service hours per capita per HEE local team

North East spends the most amount of GI service time per capita.

HEE local team	GI service hours per million HEE local team capita	Percentage	Sites
North East	322	11.3%	19
Kent, Surrey and Sussex	300	10.6%	17
Wessex	285	10.0%	16
North West London	211	7.5%	9
South London	261	9.2%	12
West Midlands	216	7.6%	23
North West	240	8.4%	33
Yorkshire and the Humber	228	8.0%	27
Thames Valley	222	7.8%	8
East of England	157	5.5%	20
North, Central and East London	135	4.8%	10
East Midlands	126	4.4%	20
South West	136	4.8%	18
Independent Sector	n/a	n/a	15
Total	**2,837**	**100.0%**	**247**

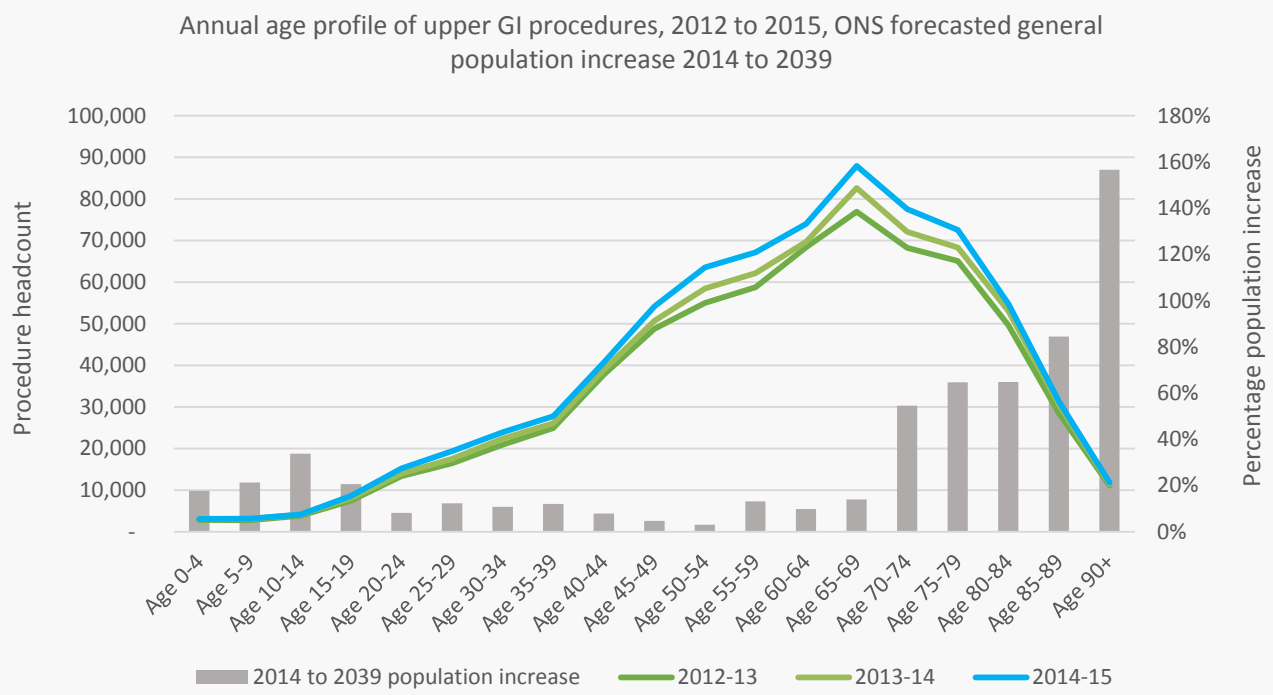
Source: JAG GRS 2015

6.9 Upper GI activity by age group

Figure 7 (below) shows that the peak age band for upper GI procedures remained at 65 to 69 years between 2012–13 and 2014–15.

Figure 7: Upper GI activity by age group

The peak age band for upper GI procedures remains at 65 to 69 years.



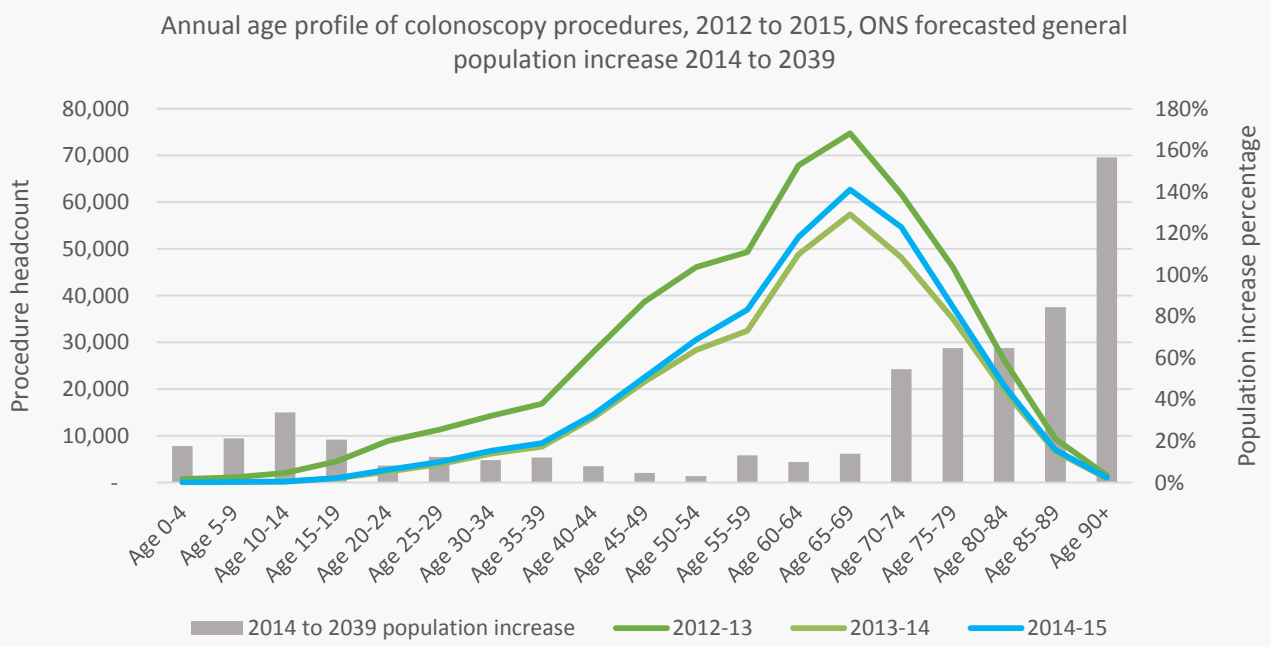
Source: HSCIC 2016a

6.10 Colonoscopy activity by age group

Figure 8 (below) shows that the peak age band for colonoscopy procedures remained at 65 to 69 years between 2012–13 and 2014–15.

Figure 8: Colonoscopy activity by age group

The peak age band for colonoscopy procedures remains at 65 to 69 years.



Source: HSCIC 2016a

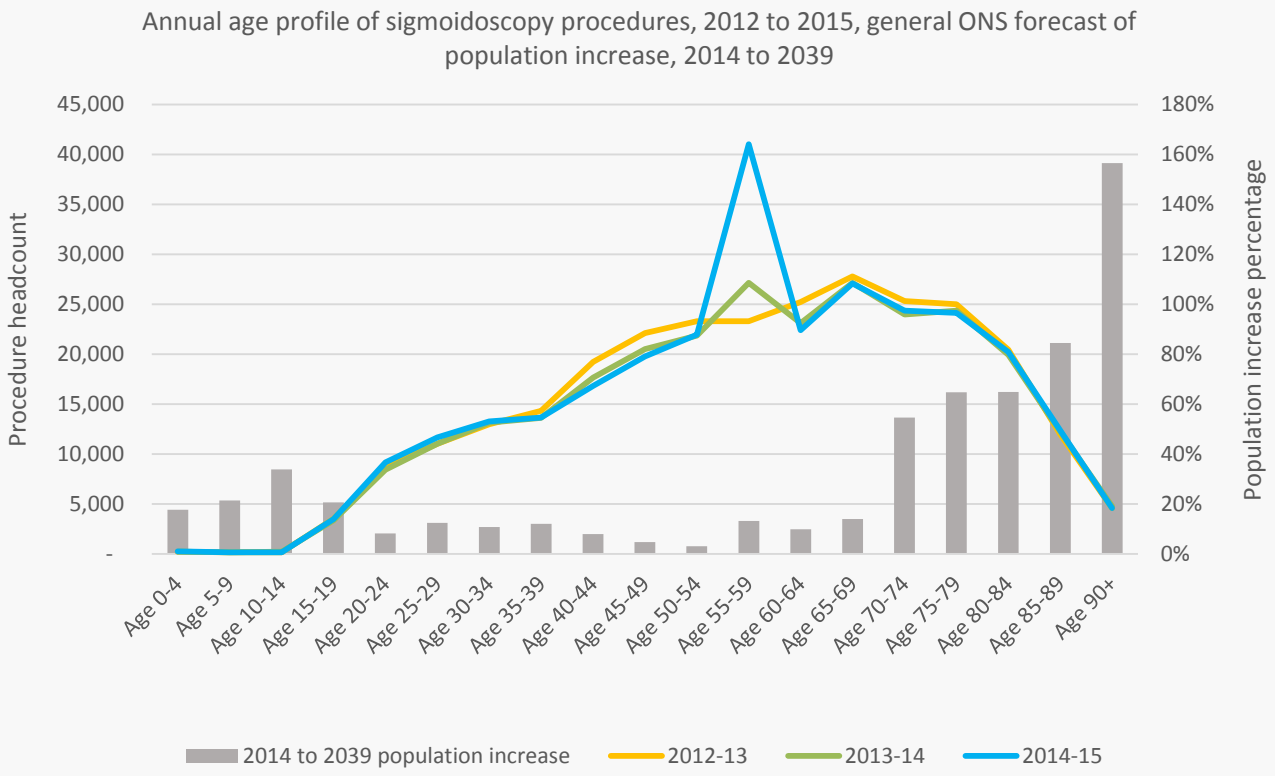
6.11 Sigmoidoscopy activity by age group

Figure 9 shows that the peak age band for sigmoidoscopies changed to 55-59 in 2014-15, from 65-69 over the previous two years. This spike is unexplained, but in 2013-14 there was also a similar but smaller spike in the 55-59 age band. It is a possibility that this is a result of the role out of bowel scope at age 55 years.

The CfWI suggests that further analysis is carried out in phase two of the project to better understand this anomaly. If it is a trend then it will likely have an impact on future demand, and will have to be quantified and considered in future demand and supply modelling.

Figure 9: Sigmoidoscopy activity by age group

The peak age band for sigmoidoscopies changed to 55-59 years in 2014-15, from 65-69 years over the previous two years.



Source: HSCIC 2016a

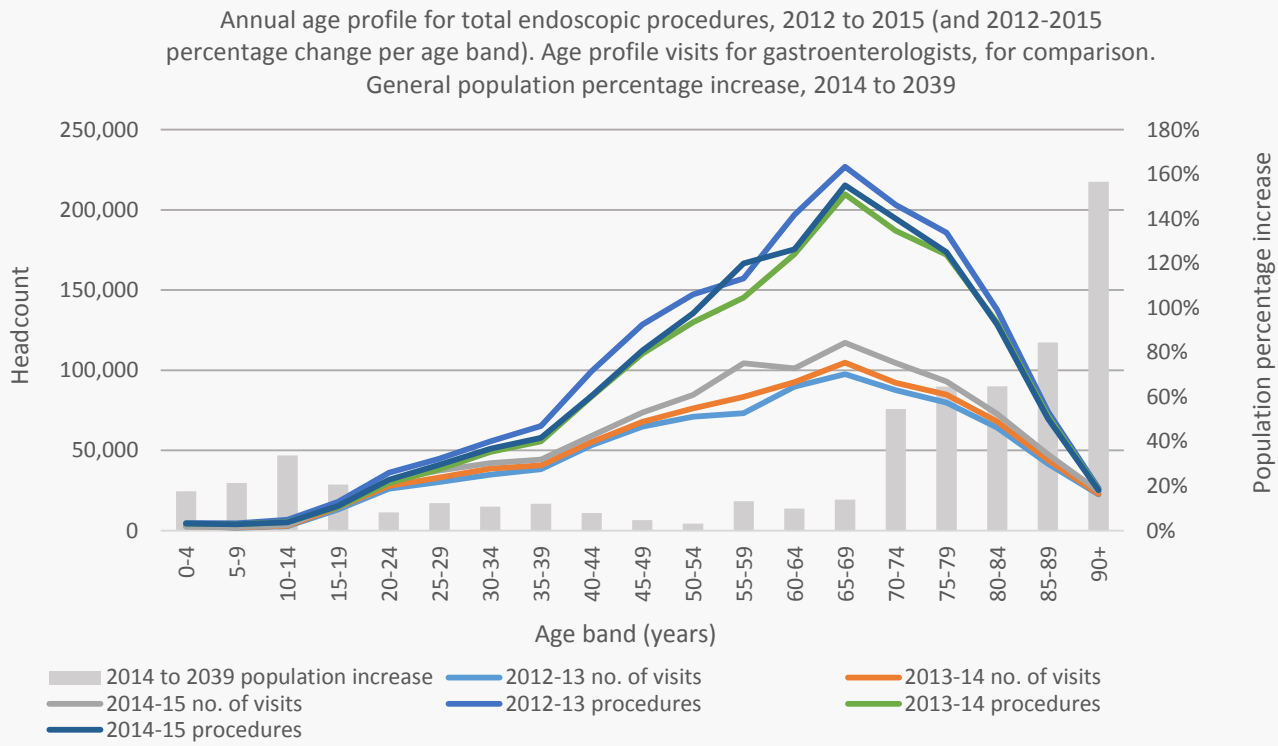
6.12 Gastroenterology consultations by age profile (admitted patients)

As shown in Figure 10 (below) there are around two endoscopy procedures for every one visit to a gastroenterologist by patients in the 65 to 69 years age band. The peak age band for endoscopy procedures remains 65 to 69 years, although there has been an increase in the 55 to 59 years age band since 2012.

This data is from Hospital Episode Statistics, Admitted Patient Care for England, and should mainly be used for the age profiles of the patients rather than as an estimate of the activity trends as the data for endoscopy in HES is not reliable in this regards. Please see the MDWTA dataset instead.

Figure 10: Gastroenterology consultations by age profile

There are around two endoscopy procedures for every visit to a gastroenterologist in the 65 to 69 age band.

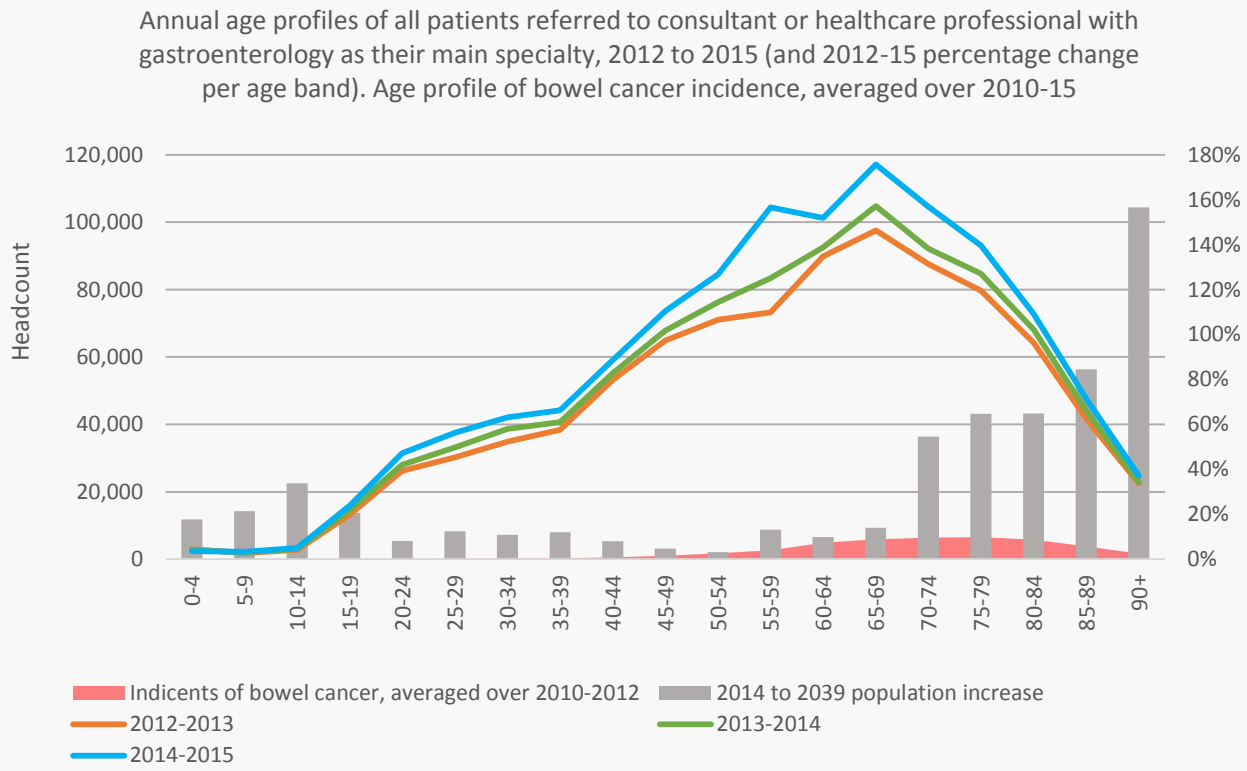


Source: HSCIC 2016a

Figure 11 shows that the number of annual visits to a gastroenterologist across most age bands increased from 2012 to 2015. The 55 to 59 years age band had the biggest increase at 43 per cent, and the peak age band remains as 65 to 69 years.

Figure 11: Annual visits to a gastroenterologist by age band

The number of visits to a gastroenterologist across most age bands increased from 2012 to 2015.



Source: HSCIC 2016a, CRUK 2016

Table 21 shows that visits to gastroenterologists increased by 18.5 per cent from 2012 to 2015.

Table 21: Inpatient episodes with a consultant with gastroenterology as their main specialty

Visits to gastroenterologists increased by 18.5 per cent from 2012 to 2015.

Year	Gastroenterology consultant episodes	Percentage change
2012-13	899,492	-
2013-14	959,742	**6.70%**
2014-15	1,065,913	**11.10%**
	Overall	**18.50%**

Source: HSCIC 2016a

The data cover all patients who are referred to a doctor with gastroenterology as their main specialty, so patients with GIM problems, for example, may count towards this number.

7. Trainees

7.1 Overview

- There were 3,451 practitioners working towards gaining JETS certification as an endoscopist at the time of review.
- Around 82 per cent of those working towards gaining JETS certification are doctors, and around 15 per cent are nurses/non-medical trainees.
- There is a large variation in endoscopy training numbers per capita across the HEE local team regions.
- There is a large variation in trainee-to-trainer ratios across HEE local team regions.
- There is a variation in the proportion of lists dedicated to training across HEE local team regions.
- There is a large variation in procedures per trainee across HEE local team regions.

7.2 Numbers in training

Total trainees

Table 22 shows there were 3,451 practitioners working towards gaining JETS certification as an endoscopist at the time of review. Around 82 per cent of these are doctors, and around 15 per cent are nurses/non-medical trainees.

North West has the most trainees at around 14 per cent of the total. Thames Valley has the fewest trainees (apart from the independent sector) at around 3 per cent of the total.

Table 22: Total endoscopy trainees

There are 3,451 endoscopy trainees working towards gaining certification.

HEE local team	Gastroenterologist	GI surgeon	No role specified	Nurse/non-medical endoscopist	Radiologist	GP	CTC radiographer	Total	Percentage	Sites
East Midlands	177	126	9	57	4	1	0	374	10.80%	19
East of England	122	111	5	38	0	1	1	278	8.10%	19
Kent, Surrey and Sussex	88	94	2	31	0	1	0	216	6.30%	20
North East	95	81	10	41	0	1	0	228	6.60%	17
North West	174	189	6	98	0	5	0	472	13.70%	37
North West London	125	50	8	6	0	0	0	189	5.50%	11
North, Central and East London	104	42	4	9	0	0	0	159	4.60%	12
South London	103	83	11	12	0	1	0	210	6.10%	9
South West	75	99	7	36	0	3	0	220	6.40%	18
Thames Valley	44	39	3	19	1	0	0	106	3.10%	8
Wessex	59	65	7	31	1	3	0	166	4.80%	11
West Midlands	186	154	9	73	2	1	0	425	12.30%	24
Yorkshire and the Humber	161	135	8	65	3	0	0	372	10.80%	25
Independent sector	13	9	0	12	0	2	0	36	1.00%	4
Total	**1,526**	**1,277**	**89**	**528**	**11**	**19**	**1**	**3,451**	**100.00%**	**234**
Percentage	44.20%	37.00%	2.60%	15.30%	0.30%	0.60%	0.00%	100.00%		

Source: JAG JETS 2015

Trainees per capita

As shown in Table 23 there are also variations regionally between HEE local teams for the numbers in training per capita, where for example North West London has the most trainees per capita at around 12 per cent of total, over double that of South West with around 5 per cent of total.

Table 23: Trainees per million HEE local team capita

North West London has the most trainees per capita at around 12 per cent of total.

HEE local team	Gastroenterologist	GI surgeon	No role specified	Nurse/non-medical endoscopist	Radiologist	GP	Total	Percentage	Sites
North West London	66	26	4	3	0	0	99	11.8%	11
North East	34	29	3	15	0	0	81	9.6%	17
East Midlands	36	26	2	12	1	0	77	9.1%	19
West Midlands	33	28	2	13	0	0	76	9.0%	24
Yorkshire and the Humber	30	25	1	12	1	0	69	8.2%	25
South London	33	26	4	4	0	0	68	8.0%	9
North West	26	27	1	14	0	1	68	8.1%	37
Wessex	21	23	3	11	0	1	59	7.0%	11
Kent, Surrey and Sussex	23	25	1	8	0	0	56	6.6%	20
North, Central and East London	34	14	1	3	0	0	51	6.1%	12
East of England	21	19	1	7	0	0	48	5.7%	19
Thames Valley	19	17	1	8	0	0	46	5.5%	8
South West	15	20	1	7	0	1	44	5.2%	18
Total	**390**	**304**	**25**	**117**	**3**	**4**	**843**	**100%**	**230**
Percentage	46.3%	36.1%	3.0%	13.8%	0.3%	0.5%	100%		

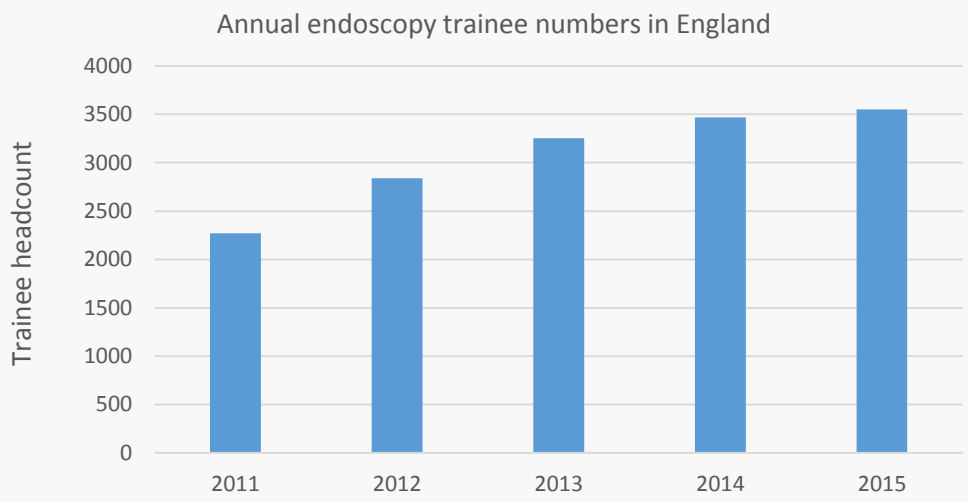
Source: JAG JETS 2015

Increase in trainees 2011 to 2015

Figure 12 shows the steady increase in the yearly number of trainees in England, from 2,270 in 2011 to 3,551 in 2015. Note that the trainee data was updated in March 2016 to capture the final 2015 trainee figures (JAG JETS, 2016), so these figures are slightly different to those as at the time of initial overall data analysis for this review. This represents a 56.4 per cent increase over the period, a compound annual growth rate (CAGR) of 11.8 per cent, and an annual average change of 14.1 per cent.

Figure 12: Number of trainees in England, 2011 - 15

There has been a steady increase in the number of trainees in England since 2011, but the rate of increase has slowed between 2014 and 2015.



Source: JAG JETS 2016

Table 24 shows the increase in trainee numbers in England by HEE local team from 2011 to 2015. Thames Valley had the largest percentage increase of HEE local teams, at 112 per cent over the period. However, it should be noted that it had the lowest number of trainees of HEE local teams in 2011. The other HEE local teams varied between increases of 21 per cent (South West) and 78 per cent (West Midlands) over the period, with an overall HEE local team average of 55 per cent.

Table 24: Increase in number of trainees by HEE local team, 2011 - 2015

Thames Valley had the largest percentage increase in number of trainees of all HEE local teams.

HEE local team	2011	2012	2013	2014	2015	% change 2011-2015
East Midlands	244	284	327	353	385	58%
East of England	193	258	280	283	289	50%
Yorkshire and the Humber	275	347	357	399	381	39%
Wessex	105	130	152	154	178	70%
Thames Valley	51	68	91	107	108	112%
North West London	119	159	189	212	192	61%
South London	133	169	206	214	223	68%
North, Central and East London	104	139	156	166	160	54%
Kent, Surrey and Sussex	159	187	230	233	238	50%
North East	150	188	214	222	226	51%
North West	296	371	431	470	466	57%
West Midlands	243	297	360	395	432	78%
South West	193	235	251	247	234	21%
Independent sector	5	7	8	14	39	680%
Total (excluding independent sector)	**2,265**	**2,832**	**3,244**	**3,455**	**3,512**	**55%**
Total (including independent sector)	**2,270**	**2,839**	**3,252**	**3,469**	**3,551**	**56%**

Source: JAG JETS 2016

7.3 JAG certificates issued by type and year

Anyone trained before the JETS system went live would not be expected to achieve current JAG certification. Similarly, anyone trained outside the UK would be asked to demonstrate competence to the trust employing them, rather than to have a JAG certificate. Table 25 shows an overview of the number of JAG certificates issued between 2011 and 2015. HEE will take this into account in phase two of the project, to better inform the supply assumptions.

Table 25: JAG certificates issued by type and year, 2011 to 2015

The majority of certificates were issued for OGD (upper GI).

Modality	2011	2012	2013	2014	2015	Total
Colonoscopy (full)	3	36	92	78	107	316
Colonoscopy (provisional)	25	131	177	191	224	748
Flexi-sig	1	11	16	35	34	97
OGD (Upper GI)	50	189	248	198	245	930
Total	**79**	**367**	**533**	**502**	**610**	**2091**

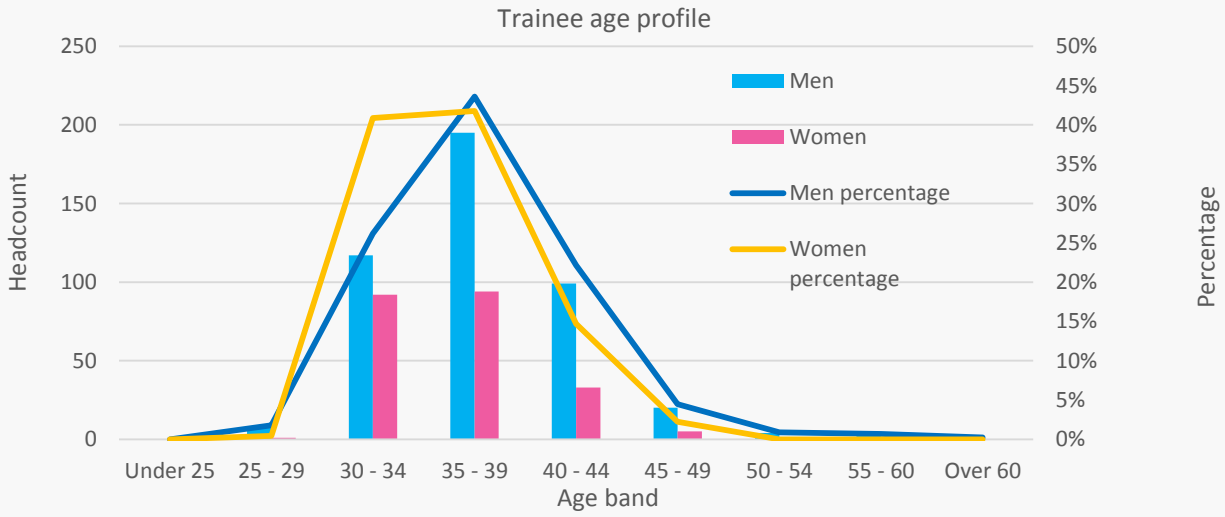
Source: JAG JETS 2015

7.4 Trainee age profile

Figure 13 shows that 66 per cent of all men and 57 per cent of all women trainees are 35-44 years-old. Twenty-six per cent of all men and 41 per cent of all women trainees are 30-34 years-old. Women trainees are generally younger, with around twice the percentage in their 30s as men. Please note that this age profile is incomplete as not all respondents provided age data.

Figure 13: Trainee age profile

More than 86 per cent of trainees are aged 35-44 years.



Source: BSG 2015

7.5 Trainee-to-trainer ratio

Table 26 shows that the average number of trainees per trainer, by HEE local team, is 0.39. The South London local team has the highest trainee-to-trainer ratio and the South West the lowest.

Table 26: Trainee-to-trainer ratio by HEE local team

The average number of trainees per trainer is 1.28.

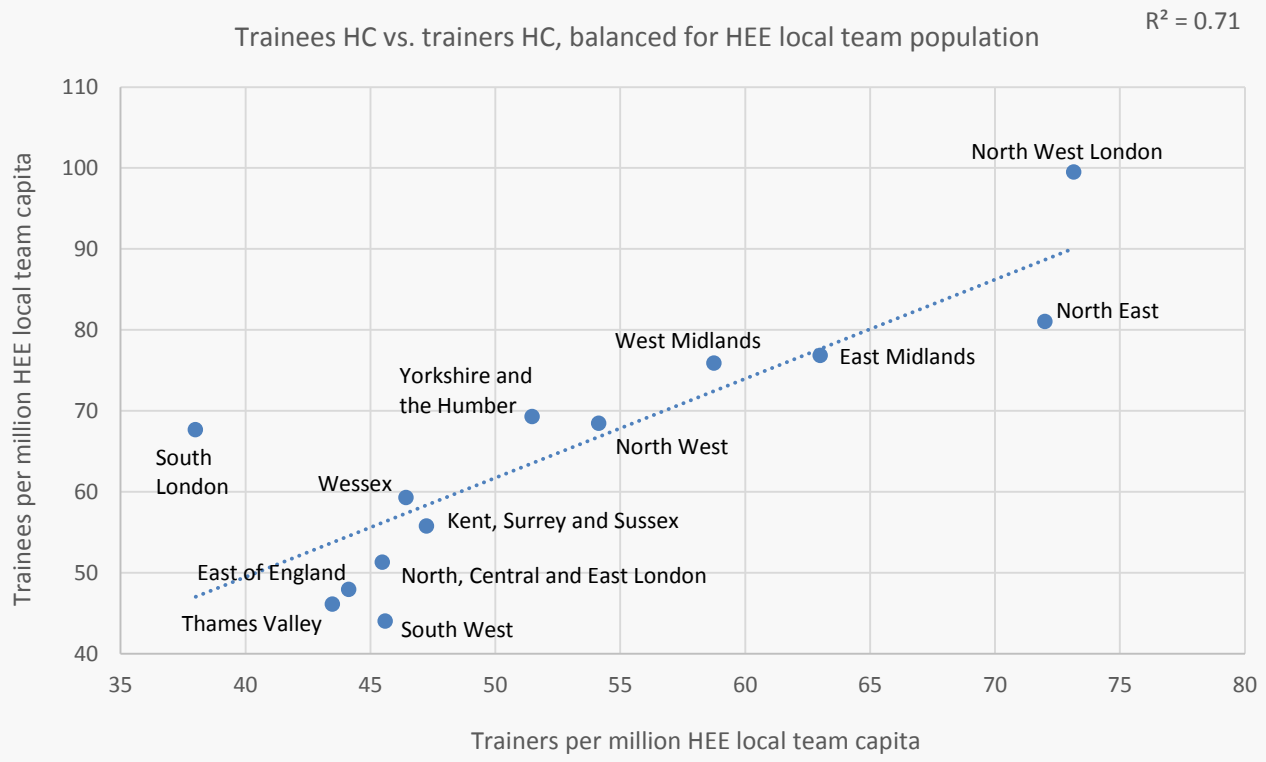
HEE local team	Trainees (JAG)	Trainers (JETS)	Trainees per trainer
South London	203	114	1.78
North West London	189	139	1.36
Yorkshire and the Humber	374	278	1.35
West Midlands	425	329	1.29
Wessex	166	130	1.28
North West	479	379	1.26
East Midlands	350	287	1.22
Kent, Surrey and Sussex	223	189	1.18
North, Central and East London	159	141	1.13
North East	243	216	1.13
East of England	278	256	1.09
Thames Valley	106	100	1.06
South West	220	228	0.96
Independent sector	36	31	1.16
Total	**3,451**	**2,817**	**Average 1.28**

Source: JAG GRS 2015, JAG JETS 2015

Figure 14 shows a strong positive correlation ($R^2 = 0.71$) between the headcount of trainees per capita and the headcount of trainers per capita. This graph shows that as the number of trainers per HEE local team population increases so does the number of trainees per HEE local team population. However, there are a few anomalies such as South London, which has a low number of trainers relative to its number of trainees, and the South West, which has a low number of trainees relative to its number of trainers.

Figure 14: Trainees and trainers by HEE local team

There is a strong positive correlation between the headcount of trainees per capita and the headcount of trainers per capita.



Source: JAG JETS 2015

7.6 Trainers per capita

Table 27 (below) shows that North West London has the most trainers per capita, followed closely by North East and East Midlands. East of England, Thames Valley and South London have the fewest trainers per capita.

Table 27: Trainers per million HEE local team capita

North West London has the most trainers per capita, followed by North East and East Midlands.

HEE local team	Gastroenterologist	GI surgeon	No role specified	Nurse/non-medical endoscopist	GP	Total	Percentage	Sites
North West London	49	12	5	6	0	73	10.7%	11
North East	34	19	4	15	0	72	10.6%	17
East Midlands	28	23	4	8	0	63	9.2%	18
West Midlands	32	16	5	5	0	59	8.6%	24
North West	26	17	2	8	0	54	7.9%	37
Yorkshire and the Humber	23	17	4	8	0	51	7.5%	25
Kent, Surrey and Sussex	24	16	3	4	0	47	6.9%	20
Wessex	24	14	4	5	0	46	6.8%	10
North, Central and East London	30	9	4	2	0	45	6.7%	11
South West	24	14	4	2	0	45	6.6%	15
East of England	23	15	2	3	1	44	6.4%	19
Thames Valley	26	14	2	2	0	43	6.4%	8
South London	22	12	1	2	0	38	5.6%	9
Total	**365**	**199**	**45**	**70**	**2**	**682**	**100%**	**224**
Percentage	53.6%	29.2%	6.6%	10.3%	0.4%	100%		

Source: JAG JETS 2015

8. Training activity

8.1 Procedures by trainee and trainer

Table 28 shows that the average number of training procedures per trainee is 87. The HEE local team for East of England has the highest number of procedures per trainee (121) whereas the North East has the lowest (69).

Table 28 also shows the percentage difference in the number of procedures per trainee between an HEE local team and the national average. For example the North East shows -21 per cent meaning that they offer trainees fewer procedures per year than the national average (only 69 training procedures compared to 87).

Table 28: Training procedures per trainee

The average number of training procedures per trainee is 87.

HEE local team	Trainee count	Training procedures	Procedures per trainees	% difference from national average number of procedures per trainee
East of England	278	33,719	121	39%
Wessex	166	18,734	113	29%
Thames Valley	106	10,707	101	16%
South West	220	22,142	101	15%
North, Central and East London	159	15,801	99	14%
South London	203	18,240	90	3%
Kent, Surrey and Sussex	223	19,522	88	0%
West Midlands	425	36,550	86	-1%
East Midlands	350	28,358	81	-7%
North West	479	38,313	80	-8%
Yorkshire and the Humber	374	27,014	72	-17%
North West London	189	13,321	70	-19%
North East	243	16,762	69	-21%
Independent sector	36	2,050	57	-35%
Total	**3,451**	**301,233**	**87**	**0%**

Source: JAG GRS 2015, JAG JETS 2015

Table 29 shows the total number of procedures per trainee for 2014. Note that this is different to the number of training procedures per trainee. Apart from the independent sector, the East of England HEE local team carried out the highest number of procedures per trainee, and East Midlands the lowest.

Table 29: Procedures per trainee

East of England carries out the highest number of procedures per trainee.

HEE local team	Trainees (JETS)	2014 procedures (JAG)	Procedures per trainee	Percentage
East of England	278	179,555	646	9.20%
Kent, Surrey and Sussex	223	141,329	634	9.00%
Yorkshire and the Humber	374	236,150	631	9.00%
Wessex	166	97,843	589	8.40%
North East	243	141,354	582	8.30%
South West	220	127,652	580	8.30%
Thames Valley	106	59,455	561	8.00%
North West	479	257,888	538	7.70%
North, Central and East London	159	84,757	533	7.60%
North West London	189	97,146	514	7.30%
South London	203	93,127	459	6.50%
West Midlands	425	184,383	434	6.20%
East Midlands	350	113,780	325	4.60%
NHS Total	**3,415**	**1,814,419**	**7,026**	**100%**
Independent sector	36	264,195	7,339	
Total	**3,451**	**2,078,614**	**21,392**	

Source: JAG JETS 2015, JAG GRS 2015

Table 30 shows the total number of procedures per trainer in 2014. Note that this is different to the number of training procedures. Apart from the independent sector, Yorkshire and the Humber carried out the highest number of procedures per trainer, and East Midlands the lowest.

Table 30: Procedures per trainer

Yorkshire and the Humber carries out the highest number of procedures per trainer.

HEE local team	Trainers (JETS)	2014 procedures (JAG)	Procedures per trainer	Percentage
Yorkshire and the Humber	278	236,150	849	9.90%
South London	114	93,127	817	9.50%
Wessex	130	97,843	753	8.70%
Kent, Surrey and Sussex	189	141,329	748	8.70%
East of England	256	179,555	701	8.10%
North West London	139	97,146	699	8.10%
North West	379	257,888	680	7.90%
North East	216	141,354	654	7.60%
North, Central and East London	141	84,757	601	7.00%
Thames Valley	100	59,455	595	6.90%
West Midlands	329	184,383	560	6.50%
South West	228	127,652	560	6.50%
East Midlands	287	113,780	396	4.60%
NHS Total	**2,786**	**1,814,419**	**8,613**	**100%**
Independent sector	31	264,195	8,522	
Total	**2,817**	**2,078,614**	**17,137**	

Source: JAG JETS 2015, JAG GRS 2015

8.2 Sessions per training session

Table 31 shows that as at April 2015 in terms of sessions for all procedures, the East Midlands (9.2) and South West (8.1) schedule the most service sessions per scheduled training session.

Table 31: Sessions per training session

The East Midlands and South West schedule the most service sessions per scheduled training session.

HEE local team	Total sessions per training session	Sites
East Midlands	9.2	20
South West	8.1	18
Yorkshire and the Humber	7.3	27
Thames Valley	6.9	8
Kent, Surrey and Sussex	6.6	17
Wessex	6.3	16
North West	6.2	33
North East	5.8	19
West Midlands	5.6	23
South London	4.3	12
North West London	4.2	9
North, Central and East London	4.1	10
East of England	4	20
Independent sector	n/a	15
Total		**247**

Source: JAG GRS 2015

8.3 Training lists

As shown in Table 32 the picture for training lists is very similar to that of service lists. The North West has the most endoscopy training lists (6,114). Apart from the independent sector, Thames Valley has the fewest endoscopy training lists (1,883). Seventy-three per cent of training lists are consultant-led and almost a quarter are nurse-led.

Table 32: Endoscopy training lists

73 per cent of training lists are consultant-led and almost a quarter are nurse-led.

HEE local team	Gastroenterologist	GI surgeon	No role specified	Nurse/non-medical endoscopist	Radiologist	GP	CTC Radiographer	All roles
North West	2,748	1,532	29	1,793	0	12	0	**6,114**
East of England	2,256	1,098	65	1,121	0	1	59	**4,600**
West Midlands	2,251	953	38	1,005	29	15	0	**4,291**
Yorkshire and the Humber	1,896	1,025	157	912	12	0	0	**4,002**
East Midlands	2,103	862	60	698	21	0	0	**3,744**
North, Central and East London	2,014	496	38	613	0	0	0	**3,161**
Kent, Surrey and Sussex	1,452	666	12	716	0	18	0	**2,864**
South West	990	805	122	793	0	50	0	**2,760**
North East	1,147	662	158	572	0	22	0	**2,561**
Wessex	992	493	158	855	2	8	0	**2,508**
North West London	1,657	510	67	146	0	0	0	**2,380**
South London	1,205	631	111	348	0	8	0	**2,303**
Thames Valley	782	419	38	640	4	0	0	**1,883**
Independent sector	33	30	0	132	0	25	0	**220**
Total	**21,526**	**10,182**	**1,053**	**10,344**	**68**	**159**	**59**	**43,391**
Percentage	50%	23%	2%	24%	0%	0%	0%	100%

Source: JAG JETS 2015

Table 33 shows that as at April 2015 West Midlands dedicates the lowest percentage of its lists to training (53 per cent), whilst the two North London HEE local teams dedicate the highest percentage of their lists to training. North, Central and East London dedicates 75 per cent and North West London dedicates 69 per cent.

Table 33: Percentage of lists dedicated to training

North, Central and East London dedicates 75 per cent of its lists to training.

HEE local team	Gastroenterologist %	GI surgeon %	No role specified %	Nurse/non-medical endoscopist %	Radiologist %	GP %	CTC radiographer %	Total %	Sites
North, Central and East London	79	77	44	66	0	0	0	**75**	12
North West London	66	81	100	57	0	0	0	**69**	11
Thames Valley	65	63	95	70	100	0	0	**67**	8
Kent, Surrey and Sussex	66	51	100	79	0	100	0	**65**	20
North East	57	82	93	54	0	96	0	**63**	17
North West	62	63	94	64	0	17	0	**62**	37
East of England	65	66	49	50	0	100	100	**61**	19
Yorkshire and the Humber	61	62	100	52	100	0	0	**60**	25
South West	57	55	76	52	0	66	0	**56**	18
East Midlands	51	80	34	53	100	0	0	**55**	19
Wessex	55	61	95	50	100	15	0	**55**	11
South London	47	63	50	85	0	100	0	**55**	9
West Midlands	61	72	95	35	54	100	0	**53**	24
Independent sector	31	65	0	42	0	100	0	**45**	4
Total	**60**	**66**	**72**	**54**	**73**	**55**	**100**	**60**	**234**

Source: JAG JETS 2015

8.4 Training procedures per capita

Table 34 shows that as at April 2015 North West London carries out the most training procedures per HEE local team capita, and South West and Thames Valley the fewest.

Table 34: Training procedures per million HEE local team capita

North West London carries out the most training procedures per HEE local team capita.

HEE local team	Flexi Sig	Colonoscopy	OGD	ERCP	Total	Percentage	Sites
North West London	1,336	2,381	3,236	57	**7,011**	10%	11
Wessex	1,983	2,107	2,453	148	**6,691**	9%	11
West Midlands	1,262	1,827	3,325	113	**6,527**	9%	24
East Midlands	1,024	2,159	2,867	176	**6,226**	8%	19
South London	1,019	2,220	2,734	106	**6,080**	8%	9
East of England	1,326	1,764	2,659	64	**5,814**	8%	19
North East	964	1,917	2,563	144	**5,587**	8%	17
North West	962	1,831	2,530	150	**5,473**	7%	37
North, Central and East London	732	1,759	2,545	62	**5,097**	7%	12
Yorkshire and the Humber	944	1,722	2,257	80	**5,003**	7%	25
Kent, Surrey and Sussex	1,030	1,664	2,131	56	**4,881**	7%	20
Thames Valley	1,339	1,501	1,787	27	**4,655**	6%	8
South West	946	1,435	2,013	35	**4,428**	6%	4
Total	**14,866**	**24,287**	**33,101**	**1,219**	**73,472**	**100%**	**216**
Percentage	20%	33%	45%	2%	100%		

Source: JAG JETS 2015

Appendix A: Data on endoscopy services by HEE local team

Table A1 shows the number of endoscopy practitioners in England by HEE local team as at April 2015.

Table A1: Number of endoscopy practitioners in England by HEE local team

There are 4,603 NHS and 1,239 independent-sector endoscopy practitioners in England.

HEE local team	Consultants HC	Non-medical endoscopists	Non-consultant-grade medical endoscopists HC	Trainee HC	Total	Sites
East Midlands	230	34	21	119	404	20
East of England	273	35	15	102	425	20
Kent, Surrey and Sussex	182	23	16	61	282	17
North East	191	55	11	75	332	19
North West	390	104	42	159	695	33
North West London	128	13	3	77	221	9
North, Central and East London	136	11	2	56	205	10
South London	161	17	15	91	284	12
South West	205	27	12	49	293	19
Thames Valley	86	12	26	32	156	8
Wessex	154	33	10	47	244	16
West Midlands	299	42	10	78	429	23
Yorkshire and the Humber	387	80	27	139	633	27
Independent sector	1,191	20	7	21	1,239	14
Total	**4,013**	**506**	**217**	**1,106**	**5,842**	**247**

Source: JAG GRS 2015

Table A2 shows the breakdown of the total number of hours spent on endoscopy services by HEE local team. This shows that the North West spends the most hours on endoscopy services, and Thames Valley the fewest.

Table A2: Raw data - hours per service

The North West spends the most hours on endoscopy services.

HEE local team	GI service	GI training	BCSP colonoscopy	Dedicated ERCP	Bronchoscopy	Flexible cystoscopy	Dedicated GI bleed/ inpatient	BCSP Bowel scope	Dedicated EUS	Advanced lower GI therapy	Advanced upper GI therapy	Hysteroscopy	No list	Total hours
North West	1,728	323	118	135	133	149	54	24	37	48	30	0	3	**2,779**
East Midlands	1,014	154	94	134	105	96	184	56	62	32	37	0	3	**1,969**
Kent, Surrey and Sussex	1,151	221	144	113	82	65	67	45	35	23	9	0	3	**1,956**
West Midlands	1,106	187	90	114	125	142	38	48	53	32	12	8	1	**1,954**
East of England	859	341	139	92	92	99	16	41	27	14	21	0	0	**1,739**
Yorkshire and the Humber	1,073	132	88	69	68	72	32	20	29	30	3	28	6	**1,646**
Wessex	797	94	82	80	76	80	30	18	22	31	17	7	18	**1,348**
North East	837	132	80	67	67	41	0	48	19	15	19	0	0	**1,323**
South London	784	215	26	68	39	32	9	12	34	22	34	0	0	**1,273**
South West	677	88	98	70	76	47	40	40	30	46	29	5	5	**1,250**
North, Central and East London	418	169	39	70	54	23	21	15	23	28	25	6	3	**892**
North West London	402	153	66	57	65	3	0	30	32	28	18	0	0	**851**
Thames Valley	510	82	66	27	17	22	3	14	9	8	18	2	3	**778**
Independent sector	2,048	41	37	18	6	97	56	12	6	25	44	14	24	**2,426**
Total	**13,401**	**2,328**	**1,164**	**1,112**	**1,001**	**965**	**548**	**422**	**416**	**379**	**313**	**69**	**66**	**22,184**

Source: JAG GRS 2015

Table A3 is a breakdown of the total number of lists by HEE local team. This shows that 71 per cent of all lists are gastroenterologist or surgeon-led, and 26 per cent nurse endoscopist-led. Regionally, the North West has the most endoscopy lists and Thames Valley the fewest.

Table A3: All endoscopy lists

71 per cent of all lists are gastroenterologist or surgeon-led with 26 per cent being nurse endoscopist-led.

HEE local team	Gastro-enterologist	GI surgeon	No role specified	Nurse endoscopist	Radiologist	GP	CTC radiographer	All roles
North West	4,458	2,437	31	2,810	0	69	0	9,805
West Midlands	3,713	1,331	40	2,906	54	15	0	8,059
East of England	3,495	1,676	132	2,228	0	1	59	7,591
East Midlands	4,163	1,076	177	1,315	21	0	0	6,752
Yorkshire and the Humber	3,133	1,655	157	1,761	12	0	0	6,718
South West	1,725	1,452	160	1,526	0	76	0	4,939
Wessex	1,792	810	167	1,695	2	55	0	4,521
Kent, Surrey and Sussex	2,189	1,295	12	912	0	18	0	4,426
North, Central and East London	2,543	648	86	925	0	0	0	4,202
South London	2,549	1,001	220	410	0	8	0	4,188
North East	2,015	810	169	1,054	0	23	0	4,071
North West London	2,522	627	67	257	0	0	0	3,473
Thames Valley	1,208	667	40	910	4	0	0	2,829
Independent sector	105	46	0	317	0	25	0	493
Total	**35,610**	**15,531**	**1,458**	**19,026**	**93**	**290**	**59**	**72,067**
Percentage	49%	22%	2%	26%	0%	0%	0%	100%

Source: JAG JETS 2015

Table A4 shows the total number of colonoscopy procedures by HEE local team in 2014. This shows that the North West carried out the most procedures and Thames Valley the fewest. It also shows that the independent sector carried out more procedures than the North West.

Table A4: All colonoscopy procedures by HEE local team and independent sector, 2014

North West carried out the most colonoscopy procedures, and Thames Valley the fewest.

HEE local team/ independent sector	Standard	BCSP	Total	Percentage
North West	251,553	6,335	257,888	12.40%
Yorkshire and the Humber	227,700	8,450	236,150	11.40%
West Midlands	175,636	8,747	184,383	8.90%
East of England	170,458	9,097	179,555	8.60%
Kent, Surrey and Sussex	132,633	8,696	141,329	6.80%
North East	134,171	7,183	141,354	6.80%
South West	121,446	6,206	127,652	6.10%
East Midlands	108,316	5,464	113,780	5.50%
North West London	91,018	6,128	97,146	4.70%
Wessex	93,582	4,261	97,843	4.70%
South London	90,983	2,144	93,127	4.50%
North, Central and East London	83,782	975	84,757	4.10%
Thames Valley	57,259	2,196	59,455	2.90%
Independent sector	262,923	1,272	264,195	12.70%
Total	**2,001,460**	**77,154**	**2,078,614**	**100%**
Percentage	96.30%	3.70%	100%	

Source: JAG GRS 2015

Appendix B: Stakeholder involvement

The CfWI sought input from a wide range of health professionals as part of this project. The following individuals participated in one or more of the following: as members of the project steering group, professional advisors, stakeholder interview participants, providers of data/information, consultative meetings/teleconferences, and general correspondence regarding this project. We would like to thank them for their time and contributions.

Name	Representing	Steering group
Anita Garvey	Health Education England	
Terry Hobbs	Health Education England	•
Donna Sidonio	Health Education England	•
John Stock	Health Education England	
Tabitha Mufti	Department of Health	
Cris Scotter	Department of Health	
Nancy Cook	Health Education East Midlands	•
Erika Denton	NHS England	•
Christopher Howard	CfWI - Centre for Workforce Intelligence, professional advisor	•
John Stebbing	UK Joint Advisory Group on GI Endoscopy	•
Raphael Broughton	UK Joint Advisory Group on GI Endoscopy	•
Melanie Lockett	British Society of Gastroenterology	•
Irene Dunkley	British Society of Gastroenterology	•
Harriet Watson	HEE Non-medical endoscopist training pilot	
Caroline Waterfield	NHS Employers	
Liz Jones	NHS England, South East commissioning support unit (CSU)	
Tanis Hand	Royal College of Nursing	
Helen Griffiths	Royal College of Nursing	
Nicholas Carroll	Royal College of Radiologists	
Richard Gardner	British Society of Gastroenterology	
Howard Ellison	British Society of Gastroenterology	

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