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COMPETING INTERESTS
No authors have competing interests to declare.

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ABSTRACT

Background

The UK has poorer cancer survival than some other developed countries. UK diagnostic intervals may be longer and health service organization, which differs between UK countries could be a determining factor. The National Cancer Diagnosis Audit explored primary care cancer diagnosis in Scotland and England.

Aim

To describe cancer diagnosis in Scottish primary care and draw some comparisons with cancer diagnostic activity in England.

Design and setting

National clinical audit of cancer diagnosis in Scottish and English general practice.

Method

Participating GPs collected diagnostic pathway data on patients diagnosed in 2014 from medical records. Data were supplemented by linkage to national cancer registries. Analysis explored and compared patient characteristics, diagnostic intervals, and routes to diagnosis.

Results

7.7% of all Scottish general practices in 2017 provided data on 2,014 cancer diagnoses. 71.5% of cases presented to GPs and 37.4% were referred using the "Urgent-Suspected Cancer" route. The median primary care interval was 5 days (IQR 0-23 days) and median diagnostic interval was 30 days (IQR 13-68). Both varied by cancer-site. Diagnostic intervals were longer in the most remote patients and those with more comorbidities. The Scottish and English samples corresponded closely in key characteristics.

Conclusions

Most people diagnosed with cancer in Scotland present to a GP first. Most are referred and diagnosed quickly, with variations by cancer-site. Intervals were longest for the most remote patients. GPs in Scotland and England appear to perform equally but, in view of growing differences between health systems, future comparative audits may be informative.

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INTRODUCTION

Poorer UK cancer outcomes compared to elsewhere are attributed to longer diagnostic intervals[1-4]. The first English National Audit of Cancer Diagnosis in Primary Care undertaken in 2009/10 and published in 2011 provided new insights into cancer diagnosis, and influential outputs on primary care's role in improving cancer outcomes[5]. Consequent policy and research aims to reduce primary care cancer intervals[6]. These include referral guidelines, public education campaigns and service initiatives, such as providing general practitioners (GPs) with direct access to their patients' imaging and endoscopy results[7-9].

Evaluation, implementation and re-evaluation should underpin modern healthcare delivery[10]. In 2016-17, Cancer Research UK, together with NHS partners, the Royal College of General Practitioners (RCGP) and Macmillan Cancer Support, conducted a second National Cancer Diagnosis Audit (NCDA), this time including Scotland[11]. Scotland and England face similar challenges in providing publicly-funded health services to ageing populations. Like England, Scotland has relatively poor cancer outcomes compared to other developed nations[12,13].

The Scottish NHS is wholly devolved with some important and evolving differences in funding, organization and delivery compared to England[14,15]. For example per-capita spend on the NHS is higher in Scotland[15]. Furthermore, the Scottish Government's 2020 vision emphasises integrated health and social care, shifting the balance of care from hospitals to communities[16]. In England, clinical commissioning groups buy services for localities (including investigations like endoscopy) from competing service providers[17]. Cancer referral guidelines also increasingly differ between Scotland and England[18-20].

The NCDA is conducted to improve understanding of primary care cancer diagnosis across all constituent countries of the UK. This study was based upon the Scottish data and had two objectives. First, to describe the Scottish NCDA data and enable an understanding of how Scottish GPs are currently diagnosing cancer. The second objective was to conduct a top-line comparison with the published English NCDA data with respect to route to diagnosis, prolonged diagnostic pathway intervals and avoidable delays in primary care. This is an important question since it is currently unknown whether growing divergence between the Scottish and English NHS, as described above, is differentially affecting the relative experience of people diagnosed with cancer in the two countries,.

METHODS

Data for this study were produced and managed by the Information Services Division (ISD) Scotland, which provides health information and intelligence to support quality improvement and decision making in healthcare. Scottish participation in the NCDA was first approved following application to the Public Benefit and Privacy Panel (PBPP) of NHS Scotland, a patient advocacy panel which scrutinises applications for access to NHS Scotland health data for non-direct care.

Following PBPP authorization ISD assigned all incident cancer cases in 2014 (excluding non-melanoma skin cancer) to the patient's registered general practice at diagnosis using the Scottish Cancer Registry**.** NCDA participants were then volunteer practices which were recruited following promotion by the RCGP, Cancer Research UK, and Macmillan Cancer Support. Practices agreeing to participate in NCDA underwent a registration process which included the signing of Caldicott Data Release Forms. This allowed the practice to share data about individual patients held on electronic primary care records with ISD, to be linked there to centrally-held data from the Scottish Cancer Registry.. The approved

practice lead (usually a GP) was securely sent pre-prepared Excel data-collection forms for eligible cancer diagnoses during 2014. Practices returned de-identified forms to the ISD using secure NHS email. Forms were issued and returned between February and June 2017. Forms sought data on patient demographics including co-existing conditions, diagnostic pathways and dates and details of route to diagnosis. Participating GPs subjectively judged whether, in hindsight, they perceived "avoidable delay" in diagnosis. Participating GPs were also asked to judge if they perceived that safety-netting had been employed during the diagnostic pathway – i.e. evidence that tests and/or follow-up GP appointments had been used in the context of diagnostic uncertainty to monitor patients until sufficient evidence had accrued to support onward referral to secondary care. Stage and grade at diagnosis was pre-populated from Scottish Cancer Registry data. Residential postcodes were used to assign the relevant Scottish Index of Multiple Deprivation (SIMD) quintile to each individual cancer patient[21]. Geographical place of residence was also assigned using the Scottish Government two-fold Urban-Rural Classification category which designates individuals living in an area with a population of less than 3000 as rural, and those in a settlement with more than 300 residents as urban[22].

Key variables detailing route to diagnosis, pathway intervals, avoidable delays, investigations and safety-netting were grouped by sex, age-group, and cancer-site. Primary care-led investigations were grouped into blood, urinary, imaging, endoscopy, and other tests. The number of separate co-existing medical conditions that each participant had been diagnosed with was provided from the primary care-held medical record and was were categorised into a comorbidity count of 0, 1-2, and 3 or more. Analysis focused on two key intervals in the diagnostic pathway: primary care interval (PCI) and diagnostic interval (DI)[23] Both intervals were calculated using two dates derived from the primary care-held electronic record and the date of diagnosis recorded in the Scottish Cancer Registry.:. PCI was defined and calculated as days from date of first presentation in primary care with symptoms relevant to the final cancer diagnosis, to date of first referral from primary care. DI was defined as days from date of first relevant presentation in primary care to date of diagnosis recorded in the Scottish Cancer Registry. Interval times of <0 and >730 days were excluded to minimise the effect data errors and difficult interpretation[24]. Medians (Inter-quartile-range) are described, along with percentage of patients with a PCI or DI >60 or 90 days.

In order to compare Scottish and English NCDA data only published summary English data were available to the current analysis[24]. Thus, some simple significance tests on proportions of binary variables were possible, but continuous variables such as diagnostic intervals could not be statistically compared. Summary data on routes to diagnosis, prolonged diagnostic pathway intervals and avoidable delays in primary care were abstracted from the published paper reporting the analysis of the English NCDA[24].The relative distribution of diagnostic route, PCI and DI < 60 and 90 days, and avoidable delays were described using contingency tables with stratification for gender. The statistical significance of differences, were compared between England and Scotland using the Chi-squared test[24].

RESULTS

Participation rates and characteristics of the sample

Seventy-three Scottish general practices (7.7% of all Scottish general practices in 2017) submitted data on 2,014 cancer diagnoses (6.3% of cancers diagnosed in Scotland, 2014). The mean list size of Scottish practices participating in the NCDA was 5996 patients compared to 6171 for Scottish general practices overall. The supplementary table 5 shows the proportion of practices corresponding to each SIMD deprivation quintile and to the 2-fold and 6-fold Urban-Rural classifications based on the practices' postcode. Median age of included patients was 70 years and 50.4% were female (table 1). Of included cases 17.8% were lung cancers, 13.4% breast cancers, 11.0% prostate cancers, 9.1% colon cancers and 4.4% rectal cancers. Stage at diagnosis was available for 59.8%. Patients with white ethnicity comprised 99.2% of the sample and 98.1% were native English speakers (table 2). With respect to personal circumstances 39.4% were living alone, 11.9% lived in a care home or were housebound and 16.0% had communication difficulties (table 2). The commonest co-morbidities were hypertension (38.0%), cardiovascular disease (23.0%) and arthritis/musculoskeletal disease (18.2%) (table 2). Overall, 25.1% had no comorbidities and 21.7% had three or more. Almost a quarter (23.1%) of the sample were from the most-deprived SIMD quintile with 18.8% from the least deprived. With respect to geographical place of residence 76.4% were urban-dwelling and 23.6% were rural-dwelling, which is representative of Scotland as a whole (table 2)[25].

Presentations and referrals

Of the whole sample, 87.1% presented clinically with 71.5% presenting initially to a GP (62.9% GP surgery; 7.1% GP home visit; 1.2% GP out-of-hours service; 0.3% other primary care facility). Initial presentation at Accident and Emergency accounted for 3.7% of the sample.

The "Urgent – Suspected Cancer" (USC) referral route was used in 37.4% of cases, although there was a a marked range in the proportion of cases that had been diagnosed following a USC referral by cancer-site. For example, over 50% of breast (53.3%), oesophageal ((54.0%) and melanoma (53.2%) cases had been referred via the USC route, whereas only 20% of pancreatic, 9.5% of multiple myeloma and 12.5% of liver cancer cases had followed the USC route route. Overall 20% (n=402) of patients were diagnosed after an emergency presentation (either the patient was admitted to hospital by a GP or self-presented at an Accident and Emergency department), ranging from 69.6%, 55.4%, 49.1% and 38.6% for brain, liver, pancreatic and ovarian cancers to 5% or less for oral, breast and melanoma.

Intervals and avoidable delays

Median PCI was 5 days (IQR 0-23 days), with 11.3% of patients having a PCI longer than 60 days and 7.7% longer than 90 days (table 3a). Overall, females had a shorter median PCI than males, 2 versus 8 days. The longest median PCIs were 13.5 days for lung cancer and 15.5 days for prostate cancer. The median DI was 30 days (IQR 13-68 days) overall, 27 days for females and 34 days for males (table 3b). The median DI was longest for prostate cancer (58 days) and shortest for liver cancer (6 days). Overall 28.3% of patients had a DI longer than 60 days and 17.8% longer than 90 days. In 36.0% of renal cancer patients the DI was longer than 90 days compared to just 2.7% of breast cancer patients. The proportion of patients with PCIs and DIs beyond 60 and 90 days also appeared to be higher in those with more than three comorbidities compared to those with none or fewer.

Median PCI was 4 days for the most deprived patients compared to 5 days for the least deprived and corresponding figures for DI were 26.5 days versus 34 days. Using the Rural-Urban 2-fold classification

rural patients had a median PCI of 7 days versus 4 days for urban patients, with corresponding media DIs of 34 versus 29 days.

Overall, perceived avoidable delay was reported in 29.1% of cases ranging from 40.9% of oral cancer cases to 17.0% of pancreatic and 14.0% of liver cancer cases (table 4). There was little variation in the proportion of cases judged to have had an avoidable delay across deprivation categories, but 33.1% of rural patients versus 27.7% of urban patients were judged to have been subject to avoidable delay at some point in their pathway to diagnosis.

Investigations and safety netting

Overall 49.0% of cases had no investigations initiated in primary care, ranging from 95.1% and 83.3% of breast and melanoma cases to 19.0% of myeloma cases (table 5). In patients referred by their practice, but not at the first consultation, there was evidence of primary care safety netting recorded in the patients' notes at the index consultation in 62.3%, ranging from 85.7% and 81.5% in myeloma and pancreatic cancer to 43.2% and 27.8% for other gynaecological (cervical; vulval; vaginal, and endometrial) and melanoma (table 6).

Comparing proportions in the Scottish and English samples

A comparison of summary data from the Scottish and English NCDA samples are shown in supplementary tables S1-4.. The Scottish sample was 11.8% of the size of the English sample and comprised data from approximately 7.7% of all general practices and 6.3% of all cancers diagnosed in Scotland in 2014. The figures for the English sample were 5.0% and 5.7% respectively. Table S1 shows that the samples corresponded closely with respect to gender, age and cancer-sites. Table S2 compares key patient characteristics of the two samples, showing that cancer stage data were less complete in the Scottish sample. Most other patient characteristics were comparable. In England, 51.8% of relevant patients were referred via the 2WW pathway compared to 37.4% using the analogous USC pathway in Scotland ($p<0.001$). In both Scotland and England, the median PCI was 5 days and there were no significant differences in the proportion of patients with a PCI of more than 60 or 90 days. In Scotland, the median DI was 30 days (IQR 13-68), compared to 40 days in England (IQR 15-86). There was a significantly lower proportion of Scottish patients with a DI of more than 60 (28.3% versus 35.8%, $p<0.001$) and 90 days (17.8% versus 24.0%, $p<0.001$). Overall 29.1% of cases in Scotland were subject to avoidable delay as judged by the GP, compared to 22.0% in England, the difference being non-significant ($p=0.239$). In Scotland 3.1% of cases had an endoscopy initiated in primary care compared to 1.6% in England ($p<0.001$).

DISCUSSION

Summary of key findings

Most included Scottish patients were diagnosed following symptomatic presentation to a GP, about one-third via an "Urgent-Suspected Cancer" referral. About one-fifth were diagnosed following emergency presentation. The median PCI was 5 days with variation by cancer-site. The PCI was longest for prostate and lung cancer, and shortest for melanoma, other gynaecological and liver cancer. This likely reflects a spectrum in symptom specificity at presentation, but also that some cancers are usually diagnosed following positive tests in primary care. Further, active monitoring, with serial PSA testing, is appropriate to diagnose prostate cancer. This fact will also have contributed to the longer median PCIs and DIs for males compared to females. Higher proportions of remote patients and those

with more than three comorbidities also appeared to have PCI and DI's longer than 60 days. GP-judged avoidable delays varied by cancer-site and were more frequent in remote patients.

Although only 11.8% as large as the English NCDA 2014 dataset, the Scottish dataset comprised demographically similar patients drawn from a representative spread of Scottish general practices. There were statistically significant differences in the proportions of diagnostic routes used between the two countries with Scottish GPs using the urgent suspected cancer route less frequently, but appearing to have significantly easier access to endoscopic diagnostic modalities. There was also a significant difference in the proportion of English patients reported to have an overall diagnostic interval longer than 60 or 90 days. It was not possible to statistically compare PCI and DI in the two samples, although the simple observation that median PCI was identical and median DI only 10 days more in England implies that, despite differences in health service organization cancer diagnostic pathways do not meaningfully diverge between Scotland and England. Nevertheless, in view of divergence between these neighbouring healthcare systems it may be wise to make future formal comparisons.

Context with other literature

Data on 2,014 new primary cancer diagnoses throughout Scotland in 2014 are reported, approximately 6% of the total. There is striking similarity in sample composition with the, albeit larger, English NCDA sample[24]. Notably PCI, most sensitive to GP's actions, is unlikely to differ statistically. [26-28].

The proportion of English diagnoses via urgent (2WW) referrals made is significantly higher than in Scotland (USC), the difference apparently made up by more non-specific urgent referrals and emergency presentations in Scotland.[24] Of note, in 2014 when NCDA cases in both countries were diagnosed, Scottish and English GPs used different suspected cancer referral guidelines[29]. Scottish guidelines arguably, allow the consulting GP more latitude to interpret the clinical scenario presented before arriving at the decision as to whether a USC referral should be made. On the other hand the English guidelines implicitly mandated a 2WW referral when the presentational symptom signature reached an approximate 5% risk of cancer[30-32]. in 2015, in the revised English guidelines this was tightened to an explicit 3% risk of cancer[18], an approach not adopted in the revised Scottish guidelines of 2019[33]. Further, English GP practices are compared annually in PHE practice profiles, the value of which are questioned, and which are not adopted by Scottish Government[29]. Additionally, and despite well-publicised initiatives in England, it appeared that Scottish GPs reported greater direct access to key diagnostic modalities, such as endoscopies[8]. It could be important to understand how clinical commissioning affected the relative ordering of investigations by GPs in Scotland and England.

The comparison between Scotland and England used data from two national samples that can be demonstrated to be demographically similar. The analysis shows slightly longer overall diagnostic intervals in England compared to Scotland, but these cannot be statistically verified in the current dataset. An international analysis of diagnostic delay in colorectal cancer, which pooled data from several different countries, suggests prolonging diagnostic intervals by even a few days can have a negative impact on cancer outcomes[34]. Consequently, if the difference seen in diagnostic performance in this study is real it could lead to a worsening in cancer outcomes in England compared to Scotland. Equally, it is possible the differences observed are caused by systematic differences in the way in which key dates are defined and recorded between Scotland and England [35]. In either case, and given that the English and Scottish health systems are evolving differently, it makes sense to

enable contemporaneous and combined comparative analysis in future iterations of the NCDA to detect increasing differences in cancer diagnostic performance which could be clinically important.

Strengths and limitations

The methodology underpinning data collection was robust, carefully developed and consistently applied in the two countries. There were some differences in the way data were collected: via an online portal for direct data entry in England compared to secure exchange of Microsoft Excel datasheets in Scotland. It is unlikely that this difference introduced any systematic difference in the data provided. Data were handled by highly qualified data professionals in both countries, and both datasets are largely complete and were subject to high-level quality assurance and data cleaning.

Data were collected by GPs or practice staff themselves arguably, admitting bias in recording details reflecting negatively on practices. On the other hand, practices were allocated cases centrally and could not selectively disregard those where intervals had been prolonged. It is possible that the practices which chose to take part in the audit were not typical and less likely to be poor performers. Against this, the English researchers reported data demonstrating the typicality of participant practices and the Scottish practices too were drawn from a representative spread of list-size, practice location and deprivation (Supplementary table 5). Finally, the data in both samples were obtained from cancer diagnoses in a single year which raises the possibility that case-mix could affect the results[29]. It is also possible that external influences acting regionally (e.g. influenza outbreaks or staffing problems) could impact the observed results. Both facts emphasise the importance of repeated audit cycles to guide true quality improvement. Finally, this is a descriptive paper which uses high quality audit data from a representative sample of practices and patients to describe cancer primary care-based cancer diagnosis in Scotland. The conclusions and implications cannot be definitive and must be interpreted cautiously.

Implications and conclusions

Most Scottish people diagnosed with cancer present first to a GP and are referred quickly to secondary care. Intervals vary for different cancers sites, likely reflecting differential presentation and investigation within Scottish primary care. Key intervals appeared longer for the most remote patients and for those with three or more comorbidities, which will be explored in future research.

GPs in Scotland and England appear to diagnose cancer equally well. A longer median diagnostic interval in England is not statistically supported and may be an artefact of differences in data collection. Alternatively, the difference could be real, and growing differences between Scotland and England's healthcare culture and delivery could lead to significant differences in important patient outcomes in future. Consequently, regular and robust audits comparing cancer diagnosis in the UK nations should be considered.

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TABLE 1: SAMPLE COMPOSITION AND REFERRAL TYPE THAT LED MOST DIRECTLY TO THE CANCER DIAGNOSIS (n=2014)

	TOTAL OF NCDA ENGLAND n(%)	TOTAL OF NCDA SCOTLAND n(%)	USC SCOTLAND n(%)	URGENT (not USC) SCOTLAND n(%)	ROUTINE SCOTLAND n(%)	SCREENING SCOTLAND n(%)	EMERGENCY SCOTLAND n(%)	TO PRIVATE CARE SCOTLAND n(%)	OTHER SCOTLAND n(%)	NOT KNOWN SCOTLAND n(%)
TOTAL	17042	2014	753 (37.4)	186 (9.2)	207 (10.3)	119 (5.9)	402 (20.0)	22 (1.1)	167 (8.3)	158 (7.8)
GENDER										
MALE	8544 (50.1)	998 (49.6)	357 (35.8)	93 (9.3)	125 (12.5)	27 (2.7)	203 (20.3)	13 (1.3)	97 (9.7)	83 (8.3)
FEMALE	8498 (49.9)	1016 (50.4)	396 (39.0)	93 (9.2)	82 (8.1)	92 (9.1)	199 (19.6)	9 (0.9)	70 (6.9)	75 (7.4)
AGE GROUP (YEARS)										
0-24	198 (1.2)	17 (0.8)	1 (5.9)	2 (11.8)	2 (11.8)	0 (9)	4 (23.5)	0 (0)	3 (17.6)	5 (29.4)
25-49	1705 (10.0)	184 (9.1)	69 (37.5)	19 (10.3)	25 (13.6)	13 (7.1)	27 (14.7)	3 (1.6)	19 (10.3)	9 (4.9)
50-64	4144 (24.3)	522 (25.9)	190 (36.4)	60 (11.5)	59 (11.3)	54 (10.3)	79 (15.1)	5 (1.0)	38 (7.3)	37 (7.1)
65-74	4877 (28.6)	564 (28.0)	226 (40.1)	42 (7.4)	63 (11.2)	41(7.3)	101 (17.9)	10 (1.8)	38 (6.7)	43 (7.6)
75-84	4213 (24.7)	520 (25.8)	198 (38.1)	45 (8.7)	43 (8.3)	10 (1.9)	24.4 (127)	4 (0.8)	49 (9.4)	44 (8.5)
>84	1905 (11.2)	207 (10.3)	69 (33.3)	18 (8.7)	15 (7.2)	1 (0.5)	64 (30.9)	0 (0)	20 (9.7)	20 (9.7)
CANCER-SITE										
Bladder	490 (2.9)	50 (2.5)	23 (46.0)	7 (14.0)	5 (10.0)	0 (0)	7 (14.0)	n<5	n<5	n<5
Brain	265 (1.6)	23 (1.1)	0 (0)	n<5	0 (0)	0 (0)	16 (69.6)	0 (0)	n<5	n<5
Breast	2714 (15.9)	270 (13.4)	144 (53.3)	19 (7.0)	13 (4.8)	63 (23.3)	5 (1.9)	n<5	14 (5.2)	9 (3.3)
Cancer of Unknown Primary	400 (2.3)	29 (1.4)	n<5	5 (17.2)	0 (0)	n<5	13 (44.8)	0 (0)	n<5	3 (10.3)
Colon	1320 (7.7)	183 (9.1)	47 (25.7)	12 (6.6)	13 (7.1)	22 (12.0)	59 (32.2)	n<5	16 (8.7)	13 (7.1)
Leukaemia	470 (2.8)	44 (2.2)	7 (15.9)	8 (18.2)	n<5	n<5	13 (29.5)	0 (0)	8 (18.2)	n<5
Liver	272 (1.6)	56 (2.8)	7 (12.5)	n<5	n<5	n<5	31 (55.4)	0 (0)	8 (14.3)	n<5
Lung[1]	2132 (12.5)	359 (17.8)	134 (37.3)	33 (9.2)	21 (5.8)	n<5	109 (30.4)	0 (0)	35 (9.7)	26 (7.2)
Lymphoma	739 (4.3)	78 (3.9)	30 (38.5)	11 (14.1)	10 (12.8)	n<5	16 (20.5)	n<5	n<5	5 (6.4)
Melanoma	836 (4.9)	79 (3.9)	42 (53.2)	10 (12.7)	17 (21.5)	n<5	n<5	0 (0)	7 (8.9)	n<5
Multiple Myeloma	272 (1.6)	21 (1.0)	n<5	0 (0)	n<5	0 (0)	7 (33.3)	0 (0)	n<5	6 (28.6)
Oesophageal	447 (2.6)	63 (3.1)	34 (54.0)	9 (14.3)	6 (9.5)	n<5	9 (14.3)	0 (0)	n<5	n<5
Oral	268 (1.6)	51 (2.5)	22 (43.1)	5 (9.8)	6 (11.8)	0 (0)	n<5	n<5	6 (11.8)	7 (13.7)
Other	1582 (9.3)	96 (4.8)	24 (25.0)	10 (10.4)	14 (14.6)	0 (0)	19 (19.8)	n<5	7 (7.3)	21 (21.9)
Other Gynae	607 (3.6)	83 (4.1)	33 (39.8)	14 (16.9)	11 (13.3)	10 (12.0)	7 (8.4)	0 (0)	n<5	6 (7.2)
Ovarian	332 (1.9)	38 (1.9)	12 (31.6)	n<5	n<5	0 (0)	14 (38.6)	n<5	n<5	n<5
Pancreatic	2130 (2.7)	55 (2.7)	11 (20.0)	n<5	n<5	n<5	27 (49.1)	0 (0)	n<5	6 (10.9)
Prostate	2130 (12.5)	222 (11.0)	95 (42.8)	17 (7.7)	56 (25.2)	n<5	15 (6.8)	6 (2.7)	14 (6.3)	18 (8.1)
Rectal[2]	648 (3.8)	88 (4.4)	41 (46.6)	7 (8.0)	9 (10.2)	13 (14.8)	6 (6.8)	n<5	10 (11.4)	n<5
Renal	557 (3.3)	71 (3.5)	23 (32.4)	5 (7.0)	5 (7.0)	n<5	13 (18.3)	n<5	13 (18.3)	9 (12.7)
Stomach	308 (1.8)	55 (2.7)	18 (32.7)	5 (9.1)	6 (10.9)	0 (0)	13 (23.6)	n<5	n<5	7 (12.7)

[1] Lung cancer cases includes ICD codes C30 and C32

[2] Rectal cancer cases includes ICD code C21

TABLE 2: Patient Characteristics

	SCOTLAND		ENGLAND	
	N	(%)	N	(%)
CANCER STAGE				
0	0	0	13	0.1
1	270	22.4	4255	32.6
2	262	21.7	2872	22.0
3	250	20.7	2412	18.5
4	423	35.1	3506	26.8
Unknown	809		3984	
ETHNICITY				
Asian	8	0.4	385	2.6
Black	0	0	156	1.1
Mixed	0	0	134	0.9
White	1824	99.2	13850	95.0
Other	7	0.4	49	0.3
Not known	66		1462	
Screening	109		1006	
LANGUAGE				
Native English speaker	1808	98.1	14251	95.3
English is not the patient's mother tongue but they are very fluent in English	27	1.5	452	3.0
English not mother tongue and patient not fluent in English	8	0.4	257	17
Not known	62		1076	
Screening	109		1006	
COMMUNICATION DIFFICULTY				
No difficulty	1481	84.0	12326	89.6
Speech impairment	14	0.8	97	0.7
Hearing impairment	100	5.7	440	3.2
Vision impairment	46	2.6	194	1.4
Learning difficulty	9	0.5	94	0.7
Language barrier	9	0.5	169	1.2
Severe longstanding mental illness	13	0.7	86	0.6
Cognitive impairment	84	4.8	495	3.6
Other	7	0.4	45	0.3
Not known	142		2276	
Screening	109			
HOUSEBOUND STATUS				
The patient is not considered housebound	1562	88.1	12997	89.0
The patient is considered housebound	174	9.8	1263	8.7
Lives in residential/nursing care home	37	2.1	340	2.3
Not known	132		1436	
Screening	109		1006	
LIVING ARRANGEMENT				
Co-habiting	993	67.2	8749	72.2
Living alone	435	29.4	2834	23.4
In residential or nursing home	50	3.4	530	4.4
Not known	427		3923	
Screening	109		1006	
NUMBER OF COMORBIDITIES				
None	422	22.3	3801	24.3
One Comorbidity	537	28.4	4721	30.2
Two Comorbidities	469	24.8	3756	24.0
Three or More Comorbidities	411	21.7	3355	21.5
Unknown	13		403	
Screening	109		1006	
TYPE OF COMORBIDITY				
No Comorbidity	422	22.3	3801	24.3
Hypertension	719	38.0	5914	37.8
Cardiovascular Disease	436	23.0	3230	20.7
Arthritis/Musculoskeletal Disease	344	18.2	2769	17.7

Diabetes	257	13.6	2463	15.8
Chronic Obstructive Pulmonary Disease	295	15.6	2342	15.0
Previous Cancer	193	10.2	1763	11.3
Cerebrovascular Disease	163	8.1	1083	6.9
Cognitive Impairment	99	4.9	688	4.4
Severe Longstanding Mental Illness	50	2.6	385	2.5
Longstanding Physical Disability	29	1.5	257	1.6
Other Comorbidity	453	23.8	3094	19.9
Not Known	13		403	
Screening	109		1006	
REGIONAL CANCER NETWORK				
North	682	35.8		
West	1013	53.2		
South East	210	11.0		
Screening	109			
SIMD[22]				
1 (Most Deprived)	441	23.1		
2	351	18.4		
3	323	17.0		
4	431	22.6		
5 (Least Deprived)	359	18.8		
Screening	109			
URBAN-RURAL 6-FOLD CLASSIFICATION				
Large Urban Area	742	39.0		
Other Urban Area	446	23.4		
Accessible Small Town	194	10.2		
Remote Small Town	73	3.8		
Accessible Rural Area	214	11.2		
Remote Rural Area	236	12.4		
Screening	109			
URBAN-RURAL 2-FOLD CLASSIFICATION				
Urban	1455	76.4		
Rural	450	23.6		
Screening	109			

Table 3a: Distribution of primary care interval by patient characteristics and cancer diagnosis groups[1]

	N	25th centile, days	Median, days	75th centile, days	% >60 days	% > 90 days
TOTAL	1314	0	5	23	11.3	7.7
GENDER						
Male	656	0.75	8	28	12.3	8.2
Female	658	0	2	19	10.2	7.1
AGE GROUP (YEARS)						
0-24	7	0	33	56	n<5	n<5
25-49	122	0	1	22.5	8.9	5.6
50-64	330	0	4	26	12.3	9.3
65-74	374	0	7	27	12.0	8.5
75-84	348	0	7	22	11.2	6.3
>84	127	0	3	16	8.7	6.3
CANCER-SITE						
Bladder	37	1	9	34.5	n<5	n<5
Brain	7	0	10	49	n<5	0
Breast	172	0	0	2	n<5	n<5
Cancer of Unknown Primary	17	1.5	12	41	n<5	n<5
Colon	97	0	5	20.5	12.2	9.2
Leukaemia	27	1	10	48	n<5	n<5
Liver	31	0	2	7	0	0
Lung	222	1	13.5	41	17.6	9.5
Lymphoma	62	0	6.5	27	11.3	n<5
Melanoma	65	0	1	5.5	n<5	n<5
Multiple Myeloma	10	0.75	12	57.75	n<5	n<5
Oesophageal	55	0	7	25	12.7	10.9
Oral	34	0	3.5	22.25	n<5	n<5
Other	56	0	4	24	12.5	n<5
Other Gynae	56	0	2	17.75	10.2	n<5
Ovarian	23	0	13	39	n<5	0
Pancreatic	35	0	4	54	n<5	n<5
Prostate	160	6	15.5	41.75	13.8	11.9
Rectal	65	0.5	4	23.5	10.8	10.8
Renal	36	0	2.5	24.5	n<5	n<5
Stomach	41	0	6	24	14.6	14.6
NUMBER OF COMORBIDITIES						
None	326	0	3	24.5	10.4	7.7
One Comorbidity	376	0	4	19	9.6	6.6
Two Comorbidities	329	0	6	23	10.3	5.5
Three of More Comorbidities	277	1	7	32.5	15.9	11.9
REGIONAL CANCER NETWORK						
North	493	0	7	34	14.0	8.3

West	682	0	4	20	9.2	6.7
South East	133	0	6	28.5	12.0	10.5
SIMD[22]						
1 (Most Deprived)	284	0	4	19	9.8	8.0
2	239	0	5	23	10.0	6.3
3	224	1	6	27	10.2	7.6
4	312	0	6	26	13.4	7.3
5 (Least Deprived)	249	0	5	27	12.4	9.2
URBAN-RURAL 6-FOLD CLASSIFICATION						
Large Urban Area	501	0	3	21	10.9	8.3
Other Urban Area	290	0	4	20	9.3	4.8
Accessible Small Town	145	1	8	32.5	12.3	8.2
Remote Small Town	46	0.75	5.5	24.0	10.9	n<5
Accessible Rural Area	156	0	7	24	9.6	7.0
Remote Rural Area	170	0	7	33.25	16.5	11.8
URBAN-RURAL 2-FOLD CLASSIFICATION						
Urban	982	0	4	22	10.6	7.1
Rural	326	0	7	30	13.1	9.5

[1]The primary care interval is restricted to 0-730 days with 40 cases being excluded as out with these limits. Patients with screen detected cancer are excluded. Primary care interval is available for patients where relevant valid dates are added.

Table 3b: Distribution of diagnostic interval by patient characteristics and cancer diagnosis groups[1]

	N	25th centile, days	Median, days	75th centile, days	% >60 days	% > 90 days
TOTAL	1572	13	30	68	28.3	17.8
GENDER						
Male	788	13	34	74	31.5	19.3
Female	776	13	27	61	25.1	16.3
AGE GROUP (YEARS)						
0-24	11	0	16	78	n<5	n<5
25-49	150	13,75	28	56.25	23.7	12.5
50-64	388	13	32.5	73.75	30.8	20.8
65-74	442	14	32	78.25	32.4	20.2
75-84	407	13	30	63	25.5	16.2
>84	166	7.5	24	54.25	22.3	13.3
CANCER-SITE						
Bladder	43	26	47	63	27.9	11.6
Brain	16	0	6	58	n<5	n<5
Breast	187	14	21	29	5.9	2.7
Cancer of Unknown Primary	22	1.75	14.5	48.25	18.2	n<5
Colon	130	8.75	36	70.5	32.1	22.1
Leukaemia	35	1	16	41	17.1	n<5
Liver	41	1	6	20	16.3	n<5
Lung	286	13	33	74.25	28.6	19.2
Lymphoma	71	17	34	71	32.4	18.3
Melanoma	72	13.25	28.5	49.75	19.4	12.5
Multiple Myeloma	14	8.75	25	84.5	n<5	n<5
Oesophageal	57	17	26	58.5	22.8	17.5
Oral	41	13.5	35	80.5	36.6	19.5
Other	72	13.25	30.5	66.75	30.6	16.7
Other Gynae	60	13.25	28.5	49.75	31.7	19.0
Ovarian	32	10.75	30	53.75	18.8	n<5
Pancreatic	45	1	7	88	28.9	24.4
Prostate	175	26	58	93	48.0	28.6
Rectal	69	17.5	36	70.5	34.8	18.8
Renal	50	12.5	43.5	110.5	46.0	36.0
Stomach	46	18.5	42	99	37.0	26.1
NUMBER OF COMORBIDITIES						
None	383	13	29	66	28.5	17.0
One Comorbidity	451	12	28	60	23.9	16.0
Two Comorbidities	393	13	30	71	28.2	16.0
Three of More Comorbidities	337	13	33	86	34.4	23.7
REGIONAL CANCER NETWORK						
North	578	14	34	81.25	32.6	21.0

West	826	13	28	60.25	24.9	14.7
South East	160	15	36	81.25	30.6	22.5
SIMD[22]						
1 (Most Deprived)	352	10.25	26.5	63	26.0	17.2
2	295	14	30	70	28.7	16.9
3	261	11	27	65	26.2	17.9
4	356	14	32	78	31.6	19.3
5 (Least Deprived)	300	15	34	68.75	28.6	17.6
URBAN-RURAL 6-FOLD CLASSIFICATION						
Large Urban Area	594	12	29	67	27.8	17.8
Other Urban Area	372	13	28	64	26.2	15.5
Accessible Small Town	165	15	31	64	27.7	18.7
Remote Small Town	53	12	24	67.5	29.6	14.8
Accessible Rural Area	186	13.75	30	61	25.1	16.0
Remote Rural Area	194	14.75	35.5	87	37.1	24.2
URBAN-RURAL 2-FOLD CLASSIFICATION						
Urban	1184	13	29	66	27.4	17.0
Rural	380	14	34	75.5	31.2	20.2

[1]The diagnostic interval is restricted to 0-730 days with 61 cases being excluded as out with these limits. Patients with screen detected cancer are excluded. Diagnostic interval is available for patients where relevant valid dates are added.

TABLE 4: Avoidable Delays (n=1669)[1]

	AVOIDABLE DELAY n(%)	NOT KNOWN n
TOTAL	485 (29.1)	236
GENDER		
Male	254 (29.9)	124
Female	231 (28.2)	112
AGE GROUP (YEARS)		
0-24	3 (27.3)	6
25-49	49 (30.6)	15
50-64	115 (28.0)	57
65-74	148 (32.5)	72
75-84	123 (27.3)	60
>84	47 (26.0)	26
CANCER-SITE		
Bladder	13 (27.7)	3
Brain	3 (17.6)	6
Breast	30 (15.2)	12
Cancer of Unknown Primary	5 (25.0)	9
Colon	60 (43.8)	21
Leukaemia	7 (17.9)	5
Liver	7 (14.0)	6
Lung	95 (30.8)	51
Lymphoma	16 (23.2)	9
Melanoma	18 (24.0)	4
Multiple Myeloma	4 (22.2)	3
Oesophageal	17 (28.8)	4
Oral	18 (40.9)	7
Other	19 (25.7)	22
Other Gynae	25 (39.1)	11
Ovarian	12 (38.7)	7
Pancreatic	8 (17.0)	8
Prostate	67 (34.0)	25
Rectal	27 (38.0)	2
Renal	19 (32.2)	12
Stomach	15 (32.6)	9
NUMBER OF COMORBIDITIES		
None	99 (25.1)	81
One Comorbidity	129 (27.4)	66
Two Comorbidities	135 (32.3)	51
Three of More Comorbidities	120 (31.7)	33
REGIONAL CANCER NETWORK		
North	173 (28.7)	79
West	261 (29.0)	112
South East	51 (30.9)	45
SIMD[22]		
1 (Most Deprived)	121 (32.3)	66
2	83 (27.1)	45
3	77 (27.4)	42
4	110 (28.4)	44
5 (Least Deprived)	94 (29.4)	39
URBAN-RURAL 6-FOLD CLASSIFICATION		
Large Urban Area	188 (29.3)	101
Other Urban Area	81 (21.3)	65
Accessible Small Town	59 (33.3)	17
Remote Small Town	20 (35.7)	17
Accessible Rural Area	57 (28.2)	12
Remote Rural Area	80 (37.7)	24
URBAN-RURAL 2-FOLD CLASSIFICATION		
Urban	348 (27.7)	200
Rural	137 (33.1)	36

[1]n=1669, removing 109 screen detected and 236 “not known” cases

Table 5: Number of primary care-led investigations ordered by the GP as part of the diagnostic assessment prior to referral (n=1954)[1]

			Percentage of patients investigated by test type				
	No Investigations (n%)	**Not known n**	**Blood tests n(%)**	**Urinary Tests n(%)**	**Imaging (n%)**	**Endoscopy n(%)**	**Other n(%)**
TOTAL	958 (49.0)	60	704 (36)	40 (2.0)	391 (20.0)	60 (3.1)	74 (3.8)
GENDER							
Male	384 (39.8)	32	409 (42.3)	28 (2.9)	208 (21.5)	32 (3.3)	48 (5.0)
Female	574 (58.1)	28	295 (29.9)	12 (1.2)	183 (18.5)	28 (2.8)	26 (2.6)
AGE GROUP (YEARS)							
0-24	8 (53.3)	2	1 (6.7)	0 (0)	5 (33.3)	0 (0)	0 (0)
25-49	113 (63.5)	6	36 (20.2)	4 (2.2)	25 (14.0)	5 (2.8)	14 (7.9)
50-64	265 (52.6)	18	165 (32.7)	10 (2.0)	103 (20.4)	17 (3.4)	19 (3.8)
65-74	235 (43.0)	17	222 (40.6)	8 (1.5)	126 (23.0)	17 (3.1)	19 (3.5)
75-84	235 (46.2)	11	205 (40.3)	15 (2.9)	102 (20.0)	17 (3.3)	16 (3.1)
>84	102 (50.7)	6	75 (37.3)	3 (1.5)	30 (14.9)	4 (2.0)	6 (3.0)
CANCER-SITE							
Bladder	19 (38.8)	1	22 (44.9)	9 (18.4)	3 (6.1)	1 (2.0)	9 (18.4)
Brain	13 (59.1)	1	6 (27.3)	0 (0)	1 (4.5)	1 (4.5)	0 (0)
Breast	250 (95.1)	7	7 (2.7)	0 (0)	5 (1.9)	0 (0)	2 (0.8)
Cancer of Unknown Primary	13 (44.8)	0	13 (448)	0 (0)	6 (20.7)	1 (3.4)	1 (3.4)
Colon	87 (49.4)	7	83 (47.2)	1 (0.6)	17 (9.7)	11 (6.3)	4 (2.3)
Leukaemia	17 (38.6)	0	26 (59.1)	0 (0)	5 (11.4)	0 (0)	0 (0)
Liver	26 (48.1)	2	25 (46.3)	0 (0)	10 (18.5)	2 (3.7)	1 (1.9)
Lung	134 (38.5)	11	123 (35.3)	2 (0.6)	179 (51.4)	5 (5.4)	8 (2.3)
Lymphoma	28 (37.8)	4	39 952.7)	0 (0)	22 (29.7)	3 (4.1)	3 (4.1)
Melanoma	65 (83.3)	1	3 (3.8)	0 (0)	1 (1.3)	0 (0)	0 (0)
Multiple Myeloma	4 (19.0)	0	13 (61.9)	1 (4.8)	4 (19.0)	0 (0)	0 (0)
Oesophageal	29 (47.5)	2	28 (45.9)	0 (0)	6 (9.8)	10 (16.4)	1 (1.6)
Oral	37 (72.5)	0	11 (21.6)	0 (0)	6 (11.8)	0 (0)	2 (3.9)
Other	28 (31.1)	6	30 (33.3)	3 (3.3)	34 (37.8)	1 (1.1)	3 (3.3)
Other Gynae	47 (58.8)	3	17 (21.3)	4 (5.0)	13 (16.3)	2 (2.5)	7 (8.8)
Ovarian	11 (31.4)	3	15 (42.9)	0 (0)	13 (37.1)	0 (0)	0 (0)
Pancreatic	20 (37.0)	1	31 (57.4)	0 (0)	15 (27.8)	3 (5.6)	0 (0)
Prostate	45 (21.0)	8	114 (53.3)	15 (7.0)	21 (9.8)	2 (0.9)	11 (5.1)
Rectal	38 (43.2)	0	41 (46.6)	0 (0)	8 (9.1)	11 (12.5)	5 (5.7)
Renal	32 (45.7)	1	25 (35.7)	5 (7.1)	15 (21.4)	0 (0)	6 (8.6)
Stomach	15 (28.3)	2	32 (60.4)	0 (0)	7 (13.2)	7 (13.2)	2 (3.8)
NUMBER OF COMORBIDITIES							
None	237 (48.0)	18	146 (29.6)	8 (1.6)	88 (17.8)	26 (5.3)	23 (4.7)
One Comorbidity	282 (51.1)	21	208 (37.7)	12 (2.2)	112 (20.3)	10 (1.8)	20 (3.6)
Two Comorbidities	237 (49.4)	12	179 (37.3)	9 (1.9)	97 (20.2)	15 (3.1)	21 (4.4)
Three of More Comorbidities	196 (46.8)	5	169 (40.3)	11 (2.6)	92 (22.0)	9 (2.1)	10 (2.4)

REGIONAL CANCER NETWORK							
North	305 (42.8)	6	323 (45.4)	12 (1.7)	155 (21.8)	18 (2.5)	35 (4.9)
West	543 (52.6)	46	319 (30.9)	27 (2.6)	201 (19.5)	35 (3.4)	34 (3.3)
South East	110 (52.6)	8	62 (29.7)	1 (0.5)	35 (16.7)	7 (3.3)	5 (2.4)
SIMD[22]							
1 (Most Deprived)	231 (52.4)	23	123 (27.9)	15 (3.4)	92 (20.9)	21 (4.8)	12 (2.7)
2	181 (50.0)	12	136 (37.6)	4 (1.1)	75 (20.7)	6 (1.7)	9 (2.5)
3	163 (49.4)	10	115 (34.8)	5 (1.5)	73 (22.1)	9 (2.7)	12 (3.6)
4	200 (45.1)	9	183 (41.3)	11 (2.5)	87 (19.6)	12 (2.7)	22 (5.0)
5 (Least Deprived)	183 (48.4)	6	147 (38.9)	5 (1.3)	64 (16.9)	12 (3.2)	19 (5.0)
URBAN-RURAL 6-FOLD CLASSIFICATION							
Large Urban Area	395 (52.5)	28	246 (32.7)	19 (2.5)	139 (18.5)	24 (3.2)	16 (2.1)
Other Urban Area	224 (49.1)	18	157 (34.4)	5 (1.1)	103 (22.6)	16 (3.5)	18 (3.9)
Accessible Small Town	98 (47.6)	1	69 (33.5)	5 (2.4)	33 (16.0)	4 (1.9)	12 (5.8)
Remote Small Town	33 (44.0)	2	32 (42.7)	1 (1.3)	15 (20.0)	2 (2.7)	5 (6.7)
Accessible Rural Area	98 (45.4)	8	92 (42.6)	4 (1.9)	47 (21.8)	7 (3.2)	5 (2.3)
Remote Rural Area	110 (44.2)	3	108 (43.4)	6 (2.4)	54 (21.7)	7 (2.8)	18 (7.2)
URBAN-RURAL 2-FOLD CLASSIFICATION							
Urban	750 (50.4)	49	504 (33.8)	30 (2.0)	290 (19.5)	46 (3.1)	51 (3.4)
Rural	208 (44.7)	11	200 (43.0)	10 (2.2)	101 (21.7)	14 (3.0)	23 (4.9)

[1]n=1954 excluding 60 unknowns. Each patient could have > 1 investigation. Number of investigations include Inapplicable and screening patients.

TABLE 6: Evidence of safety netting for patients presenting in primary care (n=1452)[1]

	YES n (%)	INAPPLICABLE n	NOT KNOWN n
TOTAL	535 (62.3)	429	164
GENDER			63
Male	278 (62.9)	203	81
Female	257 (61.6)	226	
AGE GROUP (YEARS)			
0-24	3 (100)	3	2
25-49	41 (57.7)	45	19
50-64	128 (60.1)	106	41
65-74	153 (61.2)	117	47
75-84	161 (68.2)	103	38
>84	49 (57.0)	55	17
CANCER-SITE			
Bladder	20 (62.5)	5	5
Brain	5 (100)	3	0
Breast	38 (47.5)	82	16
Cancer of Unknown Primary	11 (68.8)	4	1
Colon	47 (56.6)	25	10
Leukaemia	8 (66.7)	12	0
Liver	9 (75.0)	14	7
Lung	112 (64.7)	54	33
Lymphoma	28 (73.7)	16	7
Melanoma	10 (27.8)	15	8
Multiple Myeloma	6 (85.7)	0	5
Oesophageal	25 (75.8)	16	7
Oral	11 (61.1)	14	4
Other	22 (66.7)	25	9
Other Gynae	16 (43.2)	17	8
Ovarian	9 (69.2)	12	5
Pancreatic	22 (81.5)	11	5
Prostate	71 (64.5)	54	12
Rectal	29 (64.4)	20	9
Renal	17 (70.8)	11	5
Stomach	19 (76.0)	9	8
NUMBER OF COMORBIDITIES			
None	132 (65.7)	109	46
One Comorbidity	133 (56.6)	134	43
Two Comorbidities	139 (62.6)	108	33
Three of More Comorbidities	129 (64.8)	73	42
REGIONAL CANCER NETWORK			
North	191 (65.6)	200	43
West	296 (59.3)	178	91
South East	48 (69.6)	51	30
SIMD[22]			
1 (Most Deprived)	121 (62.4)	84	4.8
2	104 (62.7)	68	34
3	86 (67.7)	86	25
4	116 (58.6)	105	32
5 (Least Deprived)	108 (62.1)	86	25
URBAN-RURAL 6-FOLD CLASSIFICATION			
Large Urban Area	190 (62.9)	170	82
Other Urban Area	140 (65.4)	88	40
Accessible Small Town	56 (57.1)	44	11
Remote Small Town	21 (100)	27	2
Accessible Rural Area	63 (58.3)	49	15
Remote Rural Area	65 (56.0)	51	13
URBAN-RURAL 2-FOLD CLASSIFICATION			
Urban	407 (64.1)	329	136
Rural	128 (57.1)	100	28

[1]n=1452 excluding 164 “not knowns” and 429 inapplicable including 109 screening cases

SUPPLEMENTARY TABLE 1: Sample composition and referral type that led most directly to the cancer diagnosis by country and gender

	TOTAL OF NCDA n(%)	USC/2WW n(%)	URGENT (not USC) n(%)	ROUTINE n(%)	SCREENING n(%)	EMERGENCY n(%)	TO PRIVATE CARE n(%)	OTHER n(%)	NOT KNOWN n(%)
TOTAL									
SCOTLAND	2014	753 (37.4)	186 (9.2)	207 (10.3)	119 (5.9)	402 (20.0)	22 (1.1)	167 (8.3)	158 (7.8)
ENGLAND	17042	8820 (51.8)	745 (4.4)	1346 (7.9)	1237 (7.3)	2818 (16.5)	315 (1.8)	1004 (5.9)	757 (4.4)
		p<0.001	**p<0.001**	**p<0.001**	p=0.073	**p<0.001**	**p=0.030**	**p<0.001**	
GENDER									
MALE (SCOTLAND)	998 (49.6)	357 (35.8)	93 (9.3)	125 (12.5)	27 (2.7)	203 (20.3)	13 (1.3)	97 (9.7)	83 (8.3)
MALE (ENGLAND)	8544 (50.1)	4482 (52.5)	436 (5.1)	829 (9.7)	145 (1.7)	1474 (17.3)	187 (2.2)	549 (6.4)	442 (5.2)
FEMALE (SCOTLAND)	1016 (50.4)	396 (39.0)	93 (9.2)	82 (8.1)	92 (9.1)	199 (19.6)	9 (0.9)	70 (6.9)	75 (7.4)
FEMALE (ENGLAND)	8498 (49.9)	4338 (51.0)	309 (3.6)	517 (6.1)	1092 (12.9)	1344 (15.8)	128 (1.5)	455 (5.4)	315 (3.7)

SUPPLEMENTARY TABLE 2: Distribution of Primary Care Interval (PCI) and Diagnostic Interval (DI) by country and gender

PRIMARY CARE INTERVAL						
	N	**25th centile, days**	**Median, days**	**75th centile, days**	**% >60 days**	**% > 90 days**
TOTAL						
SCOTLAND	1314	0	5	23	12.3	8.2
ENGLAND	10493	0	5	27	12.5	9.2
					p=0.214	P=0.477
GENDER						
MALE (SCOTLAND)	656	0.75	8	28	12.3	8.2
MALE (ENGLAND)	5478	0	8	30	13.7	9.2
FEMALE (SCOTLAND)	658	0	2	19	10.2	7.1
FEMALE (ENGLAND)	5015	0	1	21	11.2	7.3
DIAGNOSTIC INTERVAL						
	N	**25th centile, days**	**Median, days**	**75th centile, days**	**% >60 days**	**% > 90 days**
TOTAL						
SCOTLAND	1572	13	30	68	28.3	17.8
ENGLAND	12929	15	40	86	35.8	24.0
					p<0.001	**p<0.001**
GENDER						
MALE (SCOTLAND)	788	13	34	74	31.5	19.3
MALE (ENGLAND)	6768	21	47	96	39.9	26.6
FEMALE (SCOTLAND)	776	13	27	61	25.1	16.3
FEMALE (ENGLAND)	6161	13	31	77	31.3	21.2

SUPPLEMENTARY TABLE 3: Avoidable delays by country and gender

	AVOIDABLE DELAY n(%)	NOT KNOWN n
TOTAL		
SCOTLAND	485 (29.1)	236
ENGLAND	3380 (22.0)	1673
	p=0.239	
GENDER		
MALE (SCOTLAND)	251 (26.1)	124
MALE (ENGLAND)	1839 (24.0)	897
FEMALE (SCOTLAND)	231 (24.8)	112
FEMALE (ENGLAND)	1541 (20.0)	776

SUPPLEMENTARY TABLE 4: Comparison of GP-led Investigations by country and gender

			Percentage of patients investigated by test type				
	No Investigations (n%)	**Not known n**	**Blood tests n(%)**	**Urinary Tests n(%)**	**Imaging (n%)**	**Endoscopy n(%)**	**Other n(%)**
TOTAL							
SCOTLAND	958 (49.0)	60	704 (36.0)	40 (2.0)	391 (20.0)	60 (3.1)	74 (3.8)
ENGLAND	9160 (54.6)	280	5795 (34.6)	212 (1.3)	3289 (19.6)	267 (1.6)	446 (2.7)
	p<0.001		p=0.210	**p=0.006**	p=0.705	**p<0.001**	**p=0.005**
GENDER							
MALE (SCOTLAND)	384 (39.8)	32	409 (42.3)	28 (2.9)	208 (21.5)	32 (3.3)	48 (5.0)
MALE (ENGLAND)	3662 (43.7)	156	3773 (45.0)	152 (1.8)	1780 (21.2)	139 (1.7)	250 (3.0)
FEMALE (SCOTLAND)	574 (58.1)	28	295 (29.9)	12 (1.2)	183 (18.5)	28 (2.8)	26 (2.6)
FEMALE (ENGLAND)	5498 (65.7)	124	2022 (24.1)	60 (0.7)	1509 (18.0)	128 (1.5)	196 (2.3)

SUPPLEMENTARY TABLE 5: CHARACTERISTICS OF 77 PARTICIPATING GENERAL PRACTICES

Practice Characteristic	**n(%)**
SIMD Deprivation Category	
SIMD 1 (Most Deprived)	20 (26.3)
SIMD 2	21 (27.3)
SIMD 3	10 (13.0)
SIMD 4	16 (20.8)
SIMD 5 (Least Deprived)	10 (13.0)
Urban Rural – 2 Fold Classification	
Urban	57 (74.0)
Rural	20 (26.0)
Urban Rural – 6 Fold Classification	
Large Urban Area	26 (33.8)
Other Urban Area	19 (24.7)
Accessible Small Towns	7 (9.1)
Remote Small Towns	5 (6.5)
Accessible Rural Areas	3 (3.9)
Remote Rural Areas	22.1)
Mean List Size (SD)	5996.2 (4684.6)*
Median List Size (IQR)	4741 (2774-8618)

***Scottish Average List Size (2019) is 6171 patients (available at https://www.isdscotland.org/Health-Topics/General-Practice/Publications/data-tables2017.asp).**