

# Changes in potential cancer indicator reporting in primary-care during the COVID-19 pandemic

Lauren J Scott (✉ [Lauren.Scott@bristol.ac.uk](mailto:Lauren.Scott@bristol.ac.uk))

University of Bristol <https://orcid.org/0000-0003-3129-5123>

Mairead Murphy

University of Bristol <https://orcid.org/0000-0002-3550-2727>

Sarah Price

University of Exeter

Rhys Lewis

One Care

Rachel Denholm

University of Bristol <https://orcid.org/0000-0002-8067-5440>

Jeremy Horwood

University of Bristol <https://orcid.org/0000-0001-7092-4960>

Chris Salisbury

University of Bristol <https://orcid.org/0000-0002-4378-3960>

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## Research Article

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# Abstract

**Background** In March 2020, the World Health Organisation declared COVID-19 a pandemic.

**Aim** To investigate how the pandemic affected presentation to primary-care with features potentially indicating cancer, and explore how reporting differed by patient characteristics and in face-to-face vs. remote consultations.

**Design and setting** Retrospective cohort study in 21 practices in South-West England.

**Methods** Potential cancer indicators were identified using pre-defined code lists for symptoms, signs, test results and diagnoses. Negative binomial regression models compared reporting of potential cancer indicators in April-July 2020 to April-July 2019. Incidence rate ratios (IRRs), 95% confidence intervals (CIs) and p-values are reported.

**Results** During April-July 2019 and 2020, respectively, 152,447/344,184 (44%) and 123,775/350,966 (35%) patients consulted, with 44,662/344,184 (13%) and 29,150/350,966 (8%) reporting a potential cancer indicator (IRR=0.65, 95%CI 0.62-0.68,  $p<0.001$ ). Reduced indicator reporting was stable across ethnicity, deprivation and shielding status, was greater in children (0-4 years IRR=0.50, 95%CI 0.46-0.55,  $p<0.001$ ; 5-17 years IRR=0.45, 95%CI 0.41-0.49,  $p<0.001$ ) and males (IRR=0.61, 95%CI 0.58-0.64), and less marked in patients with mental health conditions (IRR=0.75, 95%CI 0.72-0.79,  $p<0.001$ ). Indicator reporting dropped for GP face-to-face consultations (IRR=0.88, 95%CI 0.80-0.97,  $p=0.011$ ) and increased for remote consultations (IRR=1.22, 95%CI 1.11-1.34,  $p<0.001$ ), but despite this, remained lower in remote consulting than face-to-face in April-July 2020.

**Conclusion** Patient consulting in general, and for potential cancer indicators specifically, reduced during the first-wave of the COVID-19 pandemic. Remote consulting may be part of the reason for the reduction in reporting of potential cancer indicators, along with the reduced spreading of viral (non-cancer) infections.

## Significance

### What is already known

- Primary-care consultations reduced during UK lockdown in first-wave of the COVID-19 pandemic, and most consultations were provided remotely rather than face-to-face.
- GPs perceive that the pandemic has resulted in fewer patients consulting with potential cancer symptoms.

### What this study adds

- The proportion of patients presenting with symptoms, signs, test results or diagnoses which could indicate cancer reduced during the COVID-19 pandemic, compared to the same period last year.
- The reduction was particularly evident in children (which might indicate reductions in consultations about viral illness) and males, and less so in patients with mental health conditions.

## Introduction

In March 2020, the World Health Organisation declared COVID-19 a pandemic<sup>1</sup> and the UK went into lockdown; the public were instructed to “Stay at home, protect the NHS, and save lives”.<sup>2</sup> In order to reduce contact and the spread of the virus, primary-care providers were advised to provide all consultations remotely, unless a face-to-face consultation was urgently required.<sup>3</sup> Patients at high risk of severe COVID-19 due to age or pre-existing health conditions were advised to ‘shield’ and avoid all but essential contact.

GP and nurse consulting rates markedly dropped in April-May 2020 during the period of UK lockdown, but had largely returned to normal by July 2020,<sup>4</sup> with the majority of consultations carried out remotely (mostly via telephone). Further, there was a reduction in weekly reported incidence of asthma, intestinal infectious diseases, and upper and acute respiratory tract infections from the start of lockdown.<sup>5</sup>

There are fears that reduced consulting during the lockdown period and changes in consultation provision may have adversely impacted on cancer detection.<sup>6</sup> A Cancer Research UK survey suggested GPs perceive they are receiving fewer reports of cancer symptoms, particularly from older people, than before the pandemic.<sup>6</sup> Coupled with the temporary suspension of cancer screening services,<sup>7,8</sup> reduced symptom reporting could result in late diagnoses, increased workload for cancer services, and poorer patient outcomes.<sup>9</sup>

**Aims:** To investigate how the COVID-19 pandemic affected the number of people presenting to primary-care with symptoms, signs, test results or diagnoses which could potentially indicate cancer, and to explore how this reporting differed by patient characteristics and in face-to-face vs. remote consultations.

## Methods

### *Design and setting*

A retrospective cohort study in 21 primary-care practices in South-West England. Data were extracted for the RAPCI Study (Rapid COVID-19 intelligence to improve primary-care response), a mixed-methods study

on the rapid change to remote consulting in the initial months of the pandemic; primary results are reported elsewhere.<sup>4</sup>

### *Data*

Routinely collected and anonymised data were provided by One Care, the GP federation in Bristol, North Somerset, and South Gloucestershire. All practices use the EMIS electronic medical records system. Data included demographics (age, sex, ethnicity, and deprivation), clinical characteristics (mental health and shielding status), and all consultations and clinical codes associated with consultations, added to the system by clinical staff between February 2019 and July 2020 inclusive. All patients registered in July 2020 were included. For the analyses, April-July 2020 (i.e. the period following UK lockdown) was compared to April-July 2019.

### *Consultations*

Consultations were defined as an interaction between a patient and a GP, nurse, or paramedic working in general practice. Consultations recorded by administrators or other health care professionals, and any administrative tasks, were excluded. Remote consultations were those completed by telephone, video, or e-consultation; face-to-face consultations were in GP practices or visits to patients' homes (see appendix 1).

### *Outcomes*

Pre-existing code lists<sup>10,11</sup> were used to identify potential cancer indicators associated with a consultation. Indicators were collated from clinical features of undiagnosed cancer (symptoms, signs, abnormal test results or diagnoses) listed in the National Institute for Health and Care Excellence guidance on the recognition and referral of suspected cancer (NG12)<sup>12</sup>, using robust methods<sup>11</sup> (see appendix 1).

Individual potential cancer indicators were categorised by the percentage of patients reporting them in April-July 2019: most commonly ( $\geq 0.5\%$ ), less commonly ( $0.1\%$  to  $<0.5\%$ ), rarely ( $0.02\%$  to  $<0.1\%$ ), and very rarely reported ( $<0.02\%$ ). We separate these because the most commonly reported indicators include symptoms which often indicate minor illness rather than cancer (e.g. cough), whereas the less commonly/rarely reported indicators were more likely to be associated with cancer (e.g. weight loss, lumps and masses).

### *Explanatory variables*

Age (in July 2020) was categorised: 0-4, 5-17, 18-49, 50-69, 70-84, and 85+ years old. Deprivation quintiles were calculated using index of multiple deprivation score (IMD) deciles recorded in patient records, based on Lower Super Output Areas of residence. Ethnicity was derived by mapping descriptions from primary-care records to five categories: white, Asian, black, mixed, and other (see appendix 1). Presence of a mental health condition included severe mental illness (defined according to the Quality and Outcomes Framework rules<sup>13</sup>), diagnosed depression, or prescribed anti-depressants (excluding tricyclics) in the three months prior to July 2020. Sex and shielding status (as of July 2020) were obtained directly from primary-care records.

### *Statistical analysis*

Number and percentages of patients reporting potential cancer indicators are presented. Further, consultation rates (and percentages with indicators) are reported per 1,000 registered patients. Practice list sizes were based on July 2020 data, and adjusted to account for historic list sizes using NHS digital data<sup>14</sup> ('adjusted list size'; see appendix 1).

Changes in proportions of patients presenting (per practice) with any potential cancer indicator in April-July 2020 compared to April-July 2019 were investigated using negative binomial regression models; incidence rate ratios (IRRs) and 95% confidence intervals (CIs) are reported. Consultation year was fitted as a fixed effect, GP practice as a random effect, and adjusted practice list size (per level of covariate where appropriate) as the offset. Fixed effects for each categorical variable (age, sex, ethnicity, IMD quintile, mental health status, and shielding status), along with the interaction between each covariate and consultation year, were separately fitted to the model; interaction p-values are presented and results only presented separately for each level of a covariate if  $p < 0.05$ . Model validity was checked using standard methods; outliers which disrupted model fit were removed.

To investigate consultation provision (i.e. face-to-face vs. remote consulting), we modelled proportions of consultations with potential cancer indicators. Separate models were fitted for GPs and nurses/paramedics consultations. Negative binomial regression models were fitted with number of consultations as the outcome, a fixed effect for consultation provision and an interaction with year, GP practice as a random effect, and total numbers of consultations per practice per level of consultation provision as the offset.

For individual potential cancer indicators, unadjusted IRRs comparing April-July 2020 to 2019 are presented to help interpretation, but due to large numbers of indicators and issues with multiple testing, no modelling was performed.

Stata 15.1 was used for all data management and analyses.

## Results

During April-July 2019, 152,447/344,184 (44%) patients consulted, and 44,662/344,184 (13%) reported a potential cancer indicator. In April-July 2020, 123,775/350,966 (35%) consulted and 29,150/350,966 (8%) reported an indicator. This comprised 1256 consultations per 1000 registered patients (with indicators reported in 17% of consultations) in April-July 2019 and 1118 consultations per 1000 patients (13% with indicators reported) in April-July 2020. Figures 1 and 2 demonstrate that patients consulting, and consultation rates, dramatically dropped in April 2020 (following UK lockdown), and while consultation rates had recovered by July 2020, the proportion of patients who consulted had not. Further, the percentage of patients and consultations reporting potential cancer indicators also dropped in April 2020; both had increased by July 2020, but neither recovered to pre-COVID levels.

Patients who consulted in 2020 were of similar sex, IMD and ethnicity to those consulting in 2019, but were more likely to have mental health conditions and be advised to shield. Further, there were proportionally fewer patients aged 5-17 years who consulted in 2020 than in 2019 (Table 1). For further details on consultation rates, see our previous paper.<sup>4</sup>

Patients reporting potential cancer indicators reduced in April-July 2020 compared to 2019 (IRR 0.65, 95% CI 0.62 to 0.68,  $p < 0.001$ ; Table 2). This reduction was stable across ethnicity (interaction  $p$ -value=0.956), IMD ( $p=0.955$ ), and shielding status ( $p=0.090$ ), but differed by age ( $p < 0.001$ ), sex ( $p=0.003$ ) and mental health status ( $p < 0.001$ ; Table 2). The reduction was most marked in children (aged 0-4 years IRR 0.50, 95% CI 0.46 to 0.55,  $p < 0.001$ ; aged 5-17 years IRR 0.45, 95% CI 0.41 to 0.49,  $p < 0.001$ ). Among adults, the greatest reduction was in patients aged 50-69 (IRR 0.64, 95% CI 0.60 to 0.68,  $p < 0.001$ ) and 70-84 years (IRR 0.64, 95% CI 0.59 to 0.69,  $p < 0.001$ ). In both years, older patients were more likely to report indicators than younger patients (Table 2). Males had a larger reduction in indicator reporting (0.61, 95% CI 0.58 to 0.64,  $p < 0.001$ ) than females (0.68, 95% CI 0.64 to 0.71,  $p < 0.001$ ; Table 2). The reduction was less pronounced in patients with mental health conditions (IRR 0.75, 95% CI 0.72 to 0.79,  $p < 0.001$ ) than without (IRR 0.63, 95% CI 0.60 to 0.65,  $p < 0.001$ ; Table 2).

Potential cancer indicator reporting differed by consultation provision for both GP and nurse/paramedic consultations (p-values <0.001 and 0.007, respectively; Table 3). Indicator reporting dropped between 2019 and 2020 for face-to-face consultations (GP IRR 0.88, 95% CI 0.80 to 0.97, p=0.011; nurse IRR 0.61, 95% CI 0.44 to 0.84, p=0.002) and increased for remote consultations (GP IRR 1.22, 95% CI 1.11 to 1.34, p<0.001; nurse IRR 1.67, 95% CI 1.16 to 2.42, p=0.006 Table 3). Despite this increase in potential cancer indicator reporting in remote consultations, reporting was still less common than in GP face-to-face consultations in both years (Table 3).

Reporting of commonly reported indicators reduced between the two periods (unadjusted IRR=0.58), with the biggest reductions in chest infections (IRR=0.22), fever (IRR=0.30) throat pain (IRR=0.40) coughs (IRR=0.44) and fatigue (IRR=0.49; Table 4). For less commonly and rarely reported indicators, the reductions were less marked (IRR=0.73 and 0.78, respectively). Lymphadenopathy (IRR=0.35), vomiting (IRR=0.42), erectile dysfunction (IRR=0.42), urinary tract infections (IRR=0.49), and night sweats (IRR=0.48) saw the largest reductions in these groups, and indicators which were similar or increased were: breast lumps (IRR=0.9), lumps excluding breast (IRR=0.98), vaginal discharge (IRR=1.02), constipation (IRR=1.06), weight loss (IRR=0.95), superior vena cava syndrome (IRR=1.09), appetite loss (IRR=1.11), and abdomen masses (IRR=1.42; Table 4).

## Discussion

### *Summary of findings*

In April 2020, following UK lockdown, the proportion of patients consulting, and those reporting potential cancer indicators, reduced substantially compared to April 2019. By July 2020, although consultation rates had returned to previous levels, the proportion of patients consulting, and the proportion reporting potential cancer indicators remained lower than the previous year. The reduction in indicator reporting was particularly evident in children and males, and less evident in patients with mental health conditions. Among adults, the greatest reduction was in patients aged 50-84. Indicator reporting increased in remote consultations in 2020 compared with 2019, and decreased in face-to-face consultations. Despite this, indicator reporting remained higher in GP face-to-face than remote consultations in 2020, suggesting the significant increase in remote consulting during the pandemic could be contributing to the reduced reporting of potential cancer indicators. Of the most commonly reported indicators, chest infections, fever, throat pain, coughs and fatigue reduced most dramatically.

### *Strengths and limitations*

To our knowledge, this is the first papers to assess the effect of the COVID-19 pandemic on potential cancer symptom reporting in UK primary-care. The analysis is based on a comprehensive list of potential cancer indicators, used in previous research.<sup>10,11</sup> Our analysis included large numbers of patients (>350,000) from a diverse range of backgrounds, and as changes due to the pandemic have affected the whole country, findings are likely to be generalisable across England. Except for ethnicity, missing patient characteristics data were low. There are several limitations which pertain to the recording of potential cancer indicators. Firstly, some symptoms and signs may have been reported in free text rather than using clinical codes,<sup>15</sup> or may have been recorded in administration notes not associated with consultations. This may have resulted in systematic under-reporting of potential cancer indicators; however, this is likely to be similar in both years so should not affect the comparative findings. A further limitation was that new SNOMED CT codes added since the changeover from Read codes to SNOMED were not in our pre-defined lists, an issue which would affect April-July 2020 but not 2019; however, we checked this for common indicators cough and back pain, and found new codes were rarely used.

### *Comparison with other literature*

Few other studies have looked at the content of primary-care consultations following UK lockdown. One analysis of primary-care data from a deprived urban population, found that diagnoses of common conditions decreased substantially between March and May 2020, suggesting patients may have undiagnosed conditions resulting from changes in access post-lockdown.<sup>16</sup> Further, data from the Royal College of General Practitioners research and surveillance centre showed a marked reduction in weekly reported incidence of asthma, intestinal infectious diseases, and upper and acute respiratory tract infections from week 12 of 2020.<sup>5</sup> Our study adds to these findings for cancer-specific indicators.

Cancer screening programmes, estimated to account for about 5% of cancer diagnoses, were suspended in the wake of the pandemic,<sup>7</sup> making symptom-based diagnosis more important. UK lockdown could have affected symptom-based reporting via the move to remote consulting, as research suggests telephone and video consultations result in fewer problems being identified than face-to-face consultations.<sup>17</sup> Lockdown could also have influenced patients to only contact primary-care if they thought their problem was serious, which is likely reflected in the reduced proportion of patients consulting found in our study.

Early in the pandemic, GPs predicted patients with well-recognised red-flag symptoms, such as a new lump or rectal bleeding, would continue to present to primary-care, but vaguer cancer symptoms such as fatigue, change in bowel habit, and weight loss might be dismissed by patients as trivial and not presented to primary-care.<sup>7</sup> This was supported by our findings, which show that common symptoms reduced more substantially than less common ones, and reporting of indicators such as weight loss and lumps were maintained. Many of the more common symptoms (such as chest infections and sore throats) will be attributable to causes such as viral infections, rather than cancer. This is likely the reason for the larger reduction of indicators observed in children, as the closure of schools and nurseries will have reduced the infection rate for viral illnesses. A recent survey from Cancer Research UK suggested GPs are particularly worried about older people not consulting with potential cancer symptoms compared to before the pandemic.<sup>6</sup> This was partly supported by our findings; among adults, we noted the largest drop in 50 to 84-year olds, but patients aged 85+ had less of a reduction than this group, perhaps indicating the success of increased focus on this groups by GPs during the pandemic.<sup>4</sup> In 2015-2017, over 50% of cancers were in people aged 70+ but only 0.2% in children aged 0-4,<sup>18</sup> so GPs concerns being focused on the older age groups is not surprising.

### *Implications for policy and practice*

Findings suggest that patients are less likely to report potential cancer indicators than before the COVID-19 pandemic, particularly for more common symptoms such as fever and coughs. In the context of repeated lockdowns, it is therefore important that the general-public (particularly men and adults aged 50-84) are advised to still consult with primary-care for persistent symptoms. Further, GPs and nurses should be encouraged to ask more probing questions during remote consulting, as they could miss symptoms which may have previously been picked up from non-verbal cues and possibly a more open discussion face-to-face.

## **Declarations**

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**Ethical approval:** This study received ethical approval from the University of Bristol Faculty of Health Sciences Research Ethics Committee (ID 103166), and Health Research Authority approval (IRAS project ID 282541; REC reference 20/HRA/2070). The study was sponsored by the University of Bristol.

**Competing interests:** The authors declare that they have no competing interests

**Data sharing:** Potential cancer indicator codes lists are available from the authors on request.

**Transparency statement:** All authors affirm that the manuscript is an honest, accurate, and transparent account of the study being reported, that no important aspects of the study have been omitted, and that any discrepancies from the study as originally planned have been explained.

**Dissemination declaration:** Results will not be disseminated to study participants as they were not directly involved or consented into the study and it would therefore not be appropriate.

**Contributions of authors:** LS, MM, RD, JH, and CS contributed to the conception and design of the study, SP provided the potential cancer indicator code lists and interpretation of these, RL extracted the data, MM lead the project administration, and LS performed the analysis and drafted the manuscript. All authors contributed to the organisation and conduct of the study, the interpretation of study data and results, and critiqued the manuscript for important intellectual content.

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## Tables

**Table 1: Characteristics of registered and consulting patients in participating practices**

	All patients registered in July 2020 (N=350,966)		Patients consulting in April-July 2019 (N=152,447)		Patients consulting in April-July 2020 (N=123,775)	
	n	%	n	%	n	%
Age						
0-4 years	18,685	5.3%	8,511	5.6%	7,669	6.2%
5-17 years	46,822	13.3%	13,796	9.0%	8,549	6.9%
18-49 years	158,993	45.3%	60,886	39.9%	51,243	41.4%
50-69 years	77,952	22.2%	38,595	25.3%	30,963	25.0%
70-84 years	35,875	10.2%	23,461	15.4%	19,109	15.4%
85+ years	12,639	3.6%	7,198	4.7%	6,242	5.0%
Sex						
Male	175,952	50.1%	63,905	41.9%	50,539	40.8%
Female	175,009	49.9%	88,539	58.1%	73,233	59.2%
<i>Missing</i>	<i>5</i>		<i>3</i>		<i>3</i>	
IMD quintile						
1 (most deprived)	71,378	20.4%	31,263	20.6%	26,124	21.2%
2	55,002	15.7%	22,760	15.0%	19,007	15.4%
3	53,129	15.2%	22,920	15.1%	18,365	14.9%
4	73,119	20.9%	31,603	20.8%	25,510	20.7%
5 (least deprived)	96,608	27.7%	43,274	28.5%	34,263	27.8%
<i>Missing</i>	<i>1,730</i>		<i>627</i>		<i>506</i>	
Ethnicity*						
White	228,624	88.2%	104,309	89.2%	85,064	89.3%
Asian	11,774	4.5%	4,703	4.0%	3,760	3.9%
Black	12,234	4.7%	5,354	4.6%	4,300	4.5%
Mixed	5,368	2.1%	2,146	1.8%	1,781	1.9%
Other	1,210	0.5%	392	0.3%	352	0.4%
<i>Missing</i>	<i>91,756</i>		<i>35,543</i>		<i>28,518</i>	

Mental health (MH) status						
No MH conditions	318,329	90.7%	129,744	85.1%	102,015	82.4%
1+ MH condition	32,637	9.3%	22,703	14.9%	21,760	17.6%
Shielding status						
Not advised to shield	337,758	96.2%	142,476	93.5%	113,343	91.6%
Advised to shield	13,208	3.8%	9,971	6.5%	10,432	8.4%

\*White includes British, white British, mixed British, and other white background. Black includes African, Caribbean, Somali and black British. Asian includes Indian, British Indian, Pakistani, Chinese, and other Asian background. Mixed includes white and black Caribbean, white and Asian, white and African, other mixed white, and other mixed background. Other includes, Turkish, Arab, Iranian, other ethnic non-mixed, and any other group. See appendix 1 for further details.

**Table 2: Patients with any potential cancer indicator reported in April-July 2020 compared to 2019**

	April-July 2019		April-July 2020		Change in proportion of patients with potential cancer indicators (2020 vs. 2019)		
	(n=344,184)		(n=350,966)		IRR	95% CI	p-value
	n	% <sup>a</sup>	n	% <sup>a</sup>			
Overall	44,662	13%	29,150	8%	0.65	0.62 to 0.68	<0.001
By Age							<0.001 <sup>b</sup>
0-4 years	2,393	13%	1,199	6%	0.50	0.46 to 0.55	<0.001
5-17 years	3,486	8%	1,595	3%	0.45	0.41 to 0.49	<0.001
18-49 years	17,531	11%	12,527	8%	0.71	0.67 to 0.76	<0.001
50-69 years	11,615	15%	7,451	10%	0.64	0.60 to 0.68	<0.001
70-84 years	7,396	21%	4,779	13%	0.64	0.59 to 0.69	<0.001
85+ years	2,241	18%	1,599	13%	0.69	0.63 to 0.76	<0.001
By Sex							0.003 <sup>b</sup>
Male	18,019	10%	11,072	6%	0.61	0.58 to 0.64	<0.001
Female	26,643	16%	18,078	10%	0.68	0.64 to 0.71	<0.001
By Ethnicity <sup>c</sup>							0.956 <sup>b</sup>
White	30,354	14%	20,051	9%			
Asian	1,782	15%	1,147	10%			
Black	2,002	17%	1,363	11%			
Mixed	629	12%	401	7%			
Other	141	12%	94	8%			
By IMD quintile							0.955 <sup>b</sup>
1 (most deprived)	10,314	15%	6,943	10%			
2	7,088	13%	4,701	9%			
3	6,628	13%	4,303	8%			
4	9,247	13%	5,965	8%			
5 (least deprived)	11,168	12%	7,091	7%			
By Mental health status							<0.001 <sup>b</sup>

No MH conditions	37,354	12%	23,603	7%	0.63	0.60 to 0.65	<0.001
1+ MH condition	7,308	23%	5,547	17%	0.75	0.72 to 0.79	<0.001
By Shielding status							0.090 <sup>b</sup>
Not advised to shield	40,661	12%	26,376	8%			
Advised to shield	4,001	31%	2,774	21%			

IRR=incidence rate ratio. CI=Confidence interval. MH=Mental health.

IRRs and corresponding 95% CIs and p-values are from negative binomial models.

<sup>a</sup> Percentages are calculated out of all patients in each category.

<sup>b</sup> P-values presented on the blue rows are the p-values for the interaction between year and the given characteristic; incidence rate ratios only presented by each level of a characteristic if this p<0.05.

<sup>c</sup> White includes British, white British, mixed British, and other white background. Black includes African, Caribbean, Somali and black British. Asian includes Indian, British Indian, Pakistani, Chinese, and other Asian background. Mixed includes white and black Caribbean, white and Asian, white and African, other mixed white, and other mixed background. Other includes, Turkish, Arab, Iranian, other ethnic non-mixed, and any other group. See appendix 1 for further details.

**Table 3: Consultations (per 1000 patients) with potential cancer indicators reported in April-July 2020 compared to 2019**

	April-July 2019		April-July 2020		Change in rates of consultations with potential cancer indicators (2020 vs. 2019)		
	n	% <sup>a</sup>	n	% <sup>a</sup>	IRR	95% CI	p-value
<b>GP CONSULTATIONS</b>							
Overall	171.5	19%	128.3	16%	0.81	0.77 to 0.86	<0.001
By consultation provision							<0.001 <sup>b</sup>
Face-to-face	134.2	22%	19.1	18%	0.88	0.80 to 0.97	0.011
Remote	37.3	14%	109.2	15%	1.22	1.11 to 1.34	<0.001
<b>NURSE/PARAMEDIC CONSULTATIONS</b>							
Overall	36.7	10%	20.9	7%	0.72	0.57 to 0.92	0.007
By consultation provision							<0.001 <sup>b</sup>
Face-to-face	34.4	10%	10.2	6%	0.61	0.44 to 0.84	0.002
Remote	2.3	8%	10.7	9%	1.67	1.16 to 2.42	0.006

IRR=incidence rate ratio. CI=Confidence interval. IRRs and corresponding 95% CIs and p-values from negative binomial models.

<sup>a</sup> Percentages are calculated out of all consultations in each category.

<sup>b</sup> P-values presented on the blue rows are the p-values for the interaction between year and consultation provision.

**Table 4: Patients with individual potential cancer indicator reported in April-July 2020 compared to 2019**

	April-July 2019 (N=344,184)		April-July 2020 (N=350,966)		
	n	%	n	%	IRR
Any potential cancer indicator	44,662	12.98%	29,150	8.31%	0.64
Most commonly reported indicators ( $\geq 0.5\%$ of patients in 2019)					
<i>Any commonly reported indicator</i>	<i>32,705</i>	<i>9.50%</i>	<i>19,270</i>	<i>5.49%</i>	<i>0.58</i>
Chest infection	2,188	0.64%	502	0.14%	0.22
Fever	3,193	0.93%	988	0.28%	0.30
Pain in throat (e.g. tonsillitis)	1,861	0.54%	768	0.22%	0.40
Cough	5,722	1.66%	2,547	0.73%	0.44
Fatigue	2,865	0.83%	1,424	0.41%	0.49
Diarrhoea	2,204	0.64%	1,225	0.35%	0.55
Pain in shoulder	1,987	0.58%	1,222	0.35%	0.60
Pain in abdomen	4,704	1.37%	3,192	0.91%	0.67
Back pain/backache	5,107	1.48%	3,599	1.03%	0.69
Lower urinary tract symptoms	2,184	0.63%	1,660	0.47%	0.75
Shortness of breath	2,822	0.82%	2,155	0.61%	0.75
Pain in chest	2,147	0.62%	1,662	0.47%	0.76
Gynaecological abnormalities (e.g. menstrual disorders)	1,823	0.53%	1,535	0.44%	0.83
Less commonly reported indicators (0.1% - $< 0.5\%$ of patients in 2019)					
<i>Any less commonly reported indicator</i>	<i>16,556</i>	<i>4.81%</i>	<i>12,332</i>	<i>3.51%</i>	<i>0.73</i>
Lymphadenopathy	572	0.17%	206	0.06%	0.35
Vomiting	1,149	0.33%	489	0.14%	0.42
Erectile dysfunction	482	0.14%	208	0.06%	0.42
Urinary tract infection	1,230	0.36%	610	0.17%	0.49
Bruising	368	0.11%	205	0.06%	0.55
Irritable Bowel Syndrome	580	0.17%	336	0.10%	0.57
Iron deficiency/anaemia	772	0.22%	455	0.13%	0.58
Non-visible haematuria	1,518	0.44%	927	0.26%	0.60

Change in bowel habit	346	0.10%	218	0.06%	0.62
Proteinuria	1,072	0.31%	687	0.20%	0.63
Mass in neck	400	0.12%	257	0.07%	0.63
Haematuria	1,401	0.41%	904	0.26%	0.63
Pain in breast	478	0.14%	320	0.09%	0.66
Pruritus	651	0.19%	488	0.14%	0.74
Dysuria	474	0.14%	362	0.10%	0.75
Compressed trachea	1,156	0.34%	903	0.26%	0.77
Pain in pelvis	963	0.28%	770	0.22%	0.78
Dyspepsia	1,068	0.31%	858	0.24%	0.79
Recurring infections	562	0.16%	463	0.13%	0.81
Nausea	380	0.11%	324	0.09%	0.84
Rectal bleeding	744	0.22%	656	0.19%	0.86
Reflux	1,128	0.33%	1,020	0.29%	0.89
Lump in breast	697	0.20%	639	0.18%	0.90
Lump (excluding breast)	1,014	0.29%	1,012	0.29%	0.98
Vaginal discharge	754	0.22%	781	0.22%	1.02
Constipation	1,254	0.36%	1,351	0.38%	1.06
Rarely reported indicators (0.02% - <0.1% of patients in 2019)					
<i>Any rarely reported indicator</i>	<i>2,575</i>	<i>0.75%</i>	<i>2,052</i>	<i>0.58%</i>	<i>0.78</i>
Night sweats	133	0.04%	65	0.02%	0.48
Hoarseness of voice	163	0.05%	87	0.02%	0.52
Haemoptysis	94	0.03%	51	0.01%	0.53
Pain in testis	251	0.07%	170	0.05%	0.66
Pain in bones	213	0.06%	147	0.04%	0.68
Prostate specific antigen raised/abnormal	175	0.05%	123	0.04%	0.69
Postmenopausal bleeding	147	0.04%	106	0.03%	0.71
Distension of abdomen	292	0.08%	232	0.07%	0.78
Dysphagia	277	0.08%	222	0.06%	0.79

Mass in testis	247	0.07%	209	0.06%	0.83
Weight loss	314	0.09%	304	0.09%	0.95
Superior vena cava syndrome	81	0.02%	90	0.03%	1.09
Appetite loss	115	0.03%	130	0.04%	1.11
Mass in abdomen	111	0.03%	161	0.05%	1.42
Very rarely reported indicators (<0.02% of patients in 2019)					
<i>Any very rarely reported indicator*</i>	<i>458</i>	<i>0.13%</i>	<i>342</i>	<i>0.10%</i>	<i>0.73</i>

IRR=Incidence rate ratio.

Note. Indicators are ordered from largest to smallest reduction (by IRR) within each commonality grouping. These figures only include indicators coded in routinely collected records using SNOMED codes. In some cases, GPs/nurses may enter symptoms in free text, and/or only code their diagnosis, which may lead to under-reporting here; this under-recording is likely to be similar in both years.

\* Very rare indicators affecting <0.02% of patients (69 individuals) in April-July 2019 included Limp/ gait abnormalities, Testis swelling/abnormalities, Haematemesis, Possible bone and soft tissue sarcoma symptoms (e.g. abnormal x-ray), Mass in thyroid, Nipple discharge, Abnormal chest x-ray, Chest/breathing abnormalities, Ulceration of vulva, Jaundice and 20 additional indicators with incidence < 20 patients in April-July 2019.

## Figures

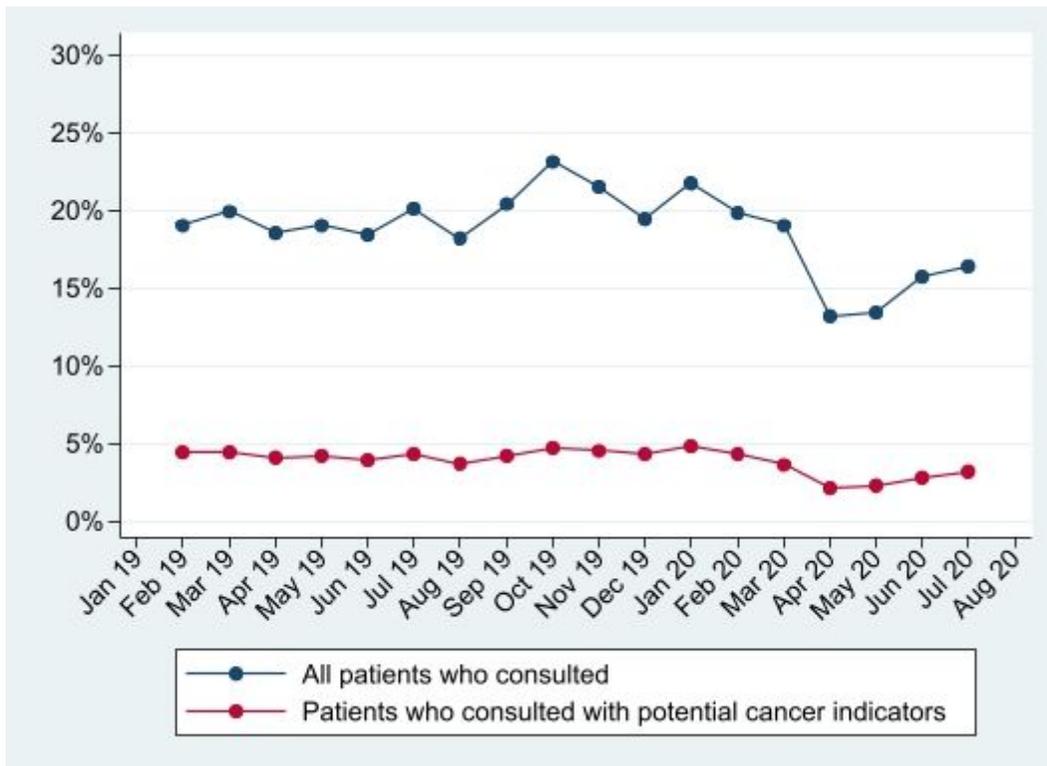


Figure 1

Percentage of patients who consulted per month and the percentage of patients who reported potential cancer indicators within a consultation

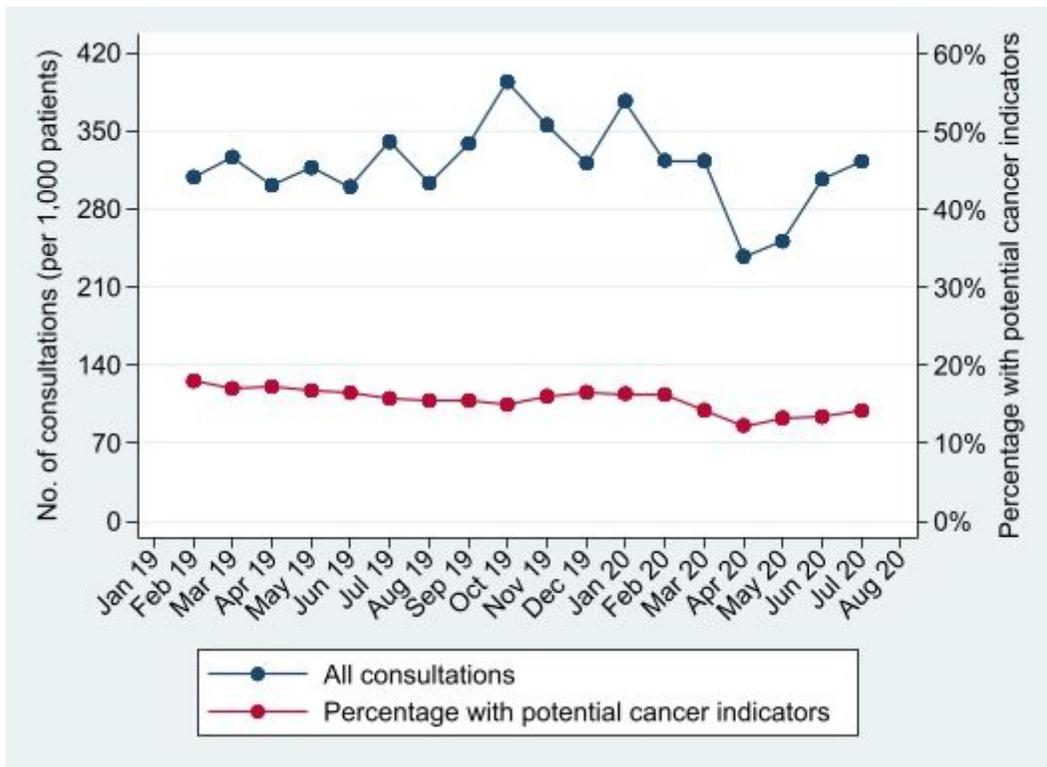


Figure 2

Consultations (per 1,000 patients) per month and the percentage of these consultations where potential cancer indicators were reported

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Appendix1.docx](#)