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Primary Care and Cancer: an analysis of the impact and inequalities of the COVID-19 pandemic on patient pathways

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1 2	Primary Care and Cancer: an analysis of the impact and inequalities of the COVID-19 pandemic on patient pathways
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1	Abstract
2 3	Objectives
4 5 7 8	We explore the routes to cancer diagnosis to further undertanding of the inequality in the reduction in detection of new cancers since the start of the pandemic. We use different data sets to assess stages in the cancer pathway: primary care data for primary care consultations, routine and urgent referrals and published analysis of cancer registry data for appointments and first treatments.
9 10	Setting
11 12	Primary and cancer care
13 14	Participants
15 16 17 18 19 20	In this study we combine multiple data sets to perform a population-based cohort study on different areas of the cancer pathway. For primary care analysis, we use a random sample of 500,000 patients from the Clinical Practice Research Datalink (CPRD). Post-referral we perform a secondary data analysis on the Cancer Wait Times data and the NCRAS COVID-19 data equity pack.
21 22	Outcome measures:
23 24 25 26	Primary care: consultation, urgent cancer referral and routine referral rates, then appointments following an urgent cancer referral, and first treatments for new cancer, for all and by quintile of patient's local area Index of Multiple Deprivation.
27	Results
28 29 30 31 32 33	Primary care contacts and urgent cancer referrals fell by 12.4% (-12.6, -12.3) and 20.2% (-22.3, -18.1) respectively, while routine referrals have not recovered to pre-pandemic levels. Reductions in first treatments for newly diagnosed cancers are down 16.3% (-16.6, -15.9). The reduction in the number of two week wait referrals and first treatments for all cancer has been largest for those living in poorer areas, despite having a smaller reduction in primary care contact.
34 35	Conclusions
36 37 38 39 40	Our results further evidence the strain on primary care and the presence of the inverse care law, and the dire need to address the inequalities so sharply brought into focus by the pandemic. We need to address the disconnect between the importance we place on the role of primary care and the resources we devote to it. Key Words : Oncology, Primary Care, COVID-19
41 42	Strengths and Limitations
43 44 45 46 47 48 49 50 51 52 53 53	 This study uses multiple data sets to analyse a complex multidisciplinary cancer pathway. Due to data limitations, we innovate in drawing from different data sets to analyse the impact of the pandemic on each stage of the route to diagnosis. We use an extremely rich primary care data set containing patient level primary care activity linked to patients' local area socioeconomic indicator. Our relatively small (500,000) patient sample is collected from a nationally representative sample of primary care registered patients. The data produces results that closely mirror the rates of consultation and urgent cancer referral per patient (and their reduction) produced in publicly available national data sets.

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INTRODUCTION

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The COVID-19 pandemic has had a profound impact on UK's health system. Each part of the UK's National Health Service has been impacted in different ways, and we are still feeling many of the consequences of both the COVID-19 pandemic and the public health measures put in place to manage it (non-pharmaceutical interventions; NPI). Cancer is one of the most complicated diseases that the UK health system must manage, being responsible for over one in four UK deaths in 2019. Cancer outcomes are acutely sensitive to changes in social determinants, patient pathways and service provision. Delays in both diagnosis and treatment have significant impacts on patient outcomes(1,2). Pandemic related diagnostic delays, lack of capacity and downstream stage progression (to more advanced disease) are already being seen(3). In 10 addition, the impact of the pandemic needs to be seen in the context of an already overstretched UK cancer care system 11 12 pre-pandemic that was 'burning hot' even in normal times(4). 13

14 Primary care sits at the heart of the cancer patient pathway and is the most crucial interface for early diagnosis and 15 referral to hospital-based care, in addition to their wider support of cancer patient undergoing and post treatment. As 16 models of cancer care have involved in light of both technical advances and an ageing co-morbid population primary 17 care has become an increasingly important aspect of integrated cancer care and an expansion of GP roles in cancer 18 care(5). On average 22.5% of patients diagnosed with cancer come via primary care, but this reflects wide site-specific 19 20 variation from as little as 8.3% of breast cancer to 42% for bladder cancer(6) (Data table presented in Annex 1).

21 It is important to reflect that prior to the start of the COVID-19 pandemic primary care had seen significant declines in 22 23 overall resourcing relative to the funding of the rest of the NHS and compared to growing levels of disease burden that is 24 managed in primary care. In addition, there is growing evidence that primary care has been under greater pressure in 25 more deprived areas, with higher levels of staff turnover(7), higher levels of complex multimorbidity(8), higher numbers 26 of consultations(9) and lower levels of funding and fewer GPs per capita once levels of ill health are taken into 27 28 account(10). These pressures on primary care, and a desire to correct them, have been recognised in the NHS Long Term 29 Plan(11). 30

31 Thus, to understand the COVID-19's impact on primary care and the downstream impact on cancer outcomes we need 32 to see that the pandemic arrived when the system that was already struggling to cope. Prior to COVID-19, the central 33 role of primary care as agents of change in reducing inequalities had been the subject of much debate yet could do little 34 in the face of political avoidance of health equity(12). Primary care had become a mirror on inequalities but also subject 35 to significant pressures from these growing inequalities that had put practices in deprived populations under significant 36 37 stress. Yet despite this, equity-oriented primary care reform in England in the mid-to-late 2000s may have helped to 38 reduce socioeconomic inequality in health(13). 39

[Box]

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41 42 COVID-19 was officially declared a pandemic by the WHO on 11 March 2020, and the UK announced its first full 43 lockdown on 23rd March. In the following months UK NPI were eased, schools reopened in phases, non-essential shops 44 reopened and in August the population were encouraged to eat out. Some restrictions were re-imposed in September 45 and October, on the 5th of November 2020 a second brief national locked lasted until 2nd December. On the 6th of 46 January a third national lockdown was introduced(14). 47

48 [End box] 49

50 It is now clear that the UK experience of the pandemic was one of the worst in the world, both in terms of excess 51 mortality (both COVID-19 and non-COVID-19) and the impact of NPI (lockdowns) on both the ability of health services to 52 53 continue provide care and the impact of messaging (stay at home) on patients' timely presentation for care(15). 54 However, the overwhelming focus of impact studies on cancer care has been on hospital-based services, including diagnostics. Given primary care's central role in pathways to diagnosis and integrated cancer care, including survivorship there has been little insight around how overall changes in consultation rates impacted both routine and two week wait referrals as well as how this varied both in terms of site-specific cancers and as a consequence of socio-economic 58

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14 15 inequalities. In this study we provide the first detailed analysis of primary care activity in relation to cancer patients during the pandemic with a particular focus on inequalities.

METHODS

Study design, data sources and participants

We perform a population-based cohort study using the following three separate sources.

Primary care data – CPRD Aurum

Primary care electronic health records were obtained from the Clinical Practice Research Datalink (CPRD) database. We included patient records from 01/01/2016 to 31/01/2021. Pre-pandemic data were included to establish long-term trends and patterns of seasonality in primary care use and referrals to secondary care. Similar to recent analysis of the covid pandemic(16), our analysis focusses on comparing observed levels of activity to the expected from March 2020.

The CPRD Aurum database contains anonymised patient data from approximately 7% of the UK population and is
 broadly representative in terms of age, sex, and ethnicity(17).

19 The period of eligibility for study inclusion, which starts on the latest of the study start date (01/01/2016) or the 20 21 patient's registration to their practice. A patient's period of eligibility ends on the earliest of leaving their practice, the 22 end of data collection from their practice or their death. Primary care records from CPRD were linked to the deciled 23 index of multiple deprivation (IMD) from 2015⁽¹⁸⁾ of each patient's lower super output area (LSOA). 500,000 patients 24 were randomly sampled from the CPRD population who were eligible for linkage within the defined study period. The 25 patient records include information on consultations, patient demographic information, diagnoses, medication 26 27 prescriptions, and referrals to secondary care. 28

29 Cancer wait times data

Cancer waiting times (CWT) measure performance against the NHS Constitution Standards, as well as a number of other
 metrics. These measures are used by local and national organisations to monitor the timely delivery of services to
 patients, they are published quarterly by NHS Digitalⁱⁱ.

Cancer diagnosis by socioeconomic status - NCRAS Cancer data equity pack
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Data on cancer diagnosis by socioeconomic group was drawn from CADEAS and NCRAS which have two equity data packs presenting the latest national data on the number of urgent suspected two-week wait referrals and first definitive treatments for cancer(19). These data packs are produced based on the CWT data, with analysis from Hospital Episode Statistics (HES) and other sources outlined in their technical notes.

Outcomes

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CPRD Aurum

We define consultations in CPRD data by a set of rules developed based on two variables in the consultations fileⁱⁱⁱ
("EMIS® consultation source identifier" and "Consultation source code identifier"), combined with the type of staff that
filled in the record. This method is an adaptation of the approach taken by Carey et al 2012 for CPRD Gold data (Annex
2).

Using the observation file in CPRD Aurum, we were also able to identify where patients had influenza vaccinations. We
 look to exclude flu vaccines from our analysis on the basis that the programme was expanded in 2020/21 to achieve

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^{57 &}quot;https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/

^{58 &}lt;sup>III</sup> <u>https://cprd.com/primary-care</u> 59

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maximum uptake^{iv}. To help with the comparability of consultations in the two periods, we removed primary care appointments that included a flu vaccine.

We were able to identify vaccinations in CPRD Aurum which identifies observations related to vaccination. We then performed a string search for influenza, including notes that clearly referred to a health care professional administering a vaccine. A list of excluded terms is presented in Annex 3 with a summary of consultations including and excluding influenza vaccinations.

Referrals in CPRD are categorized into routine and "urgent cancer". Referrals from the 'referral file' are linked to patients, no additional data cleaning steps were taken in the analysis of referrals.

12 **Cancer Wait Times** 13

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The CWT data present monthly counts of patients who have been recorded as having been through each stage of the cancer diagnosis pathway that is held to a performance target (Annex 4).

16 We include in our analysis: the number of patients that receive a first appointment following an urgent referral, the total 17 18 number of patients receiving first treatments following a cancer diagnosis and the number of patients receiving first 19 treatments following an urgent cancer referral from primary care. 20

21 Cancer diagnosis by socioeconomic status - NCRAS Cancer data equity pack 22

The data show monthly counts, from January 2018 to January 2021 inclusive, broken down by tumour type and patient factors: deprivation, age, sex and ethnicity. The analysis presents the working day adjusted proportion compared to prepandemic levels.

Patient and public involvement

No patient involved

Data analysis

CPRD & CWT

34 For both our primary care data and the CWT data we perform a linear regression of each outcome over time to estimate 35 36 expected values for the post-pandemic period (end of March 2020 to end of January 2021), based on predicted values 37 from the data pre pandemic: 38

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in the case of CPRD Aurum outcomes this is weekly data from 01 January 2016 to 15 March 2020,

_ for CWT outcomes this is monthly data from October 2009 to March 2020.

42 To account for seasonality and time trends we include months as a categorical variable and time as a continuous 43 variable, the approach taken by Carr et al. (16). In the case of weekly primary care data we observe large dips in activity 44 in weeks that include bank holidays and include a categorical variable on the basis of the number of bank holidays in 45 each week (in the winter holidays in England there is always one week with two bank holidays). 46

47 When analysing primary care consultation rates by socioeconomics we adjust for population age. We do so when 48 calculating the consultation rates by IMD quintile and weighting the sample according to the European Standard 49 50 Population^v (ESP). 51

NCRAS equity data

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^{iv} https://www.england.nhs.uk/wp-content/uploads/2020/05/Letter AnnualFlu 2020-21 20200805.pdf ^v https://www.causesofdeath.org/docs/standard.pdf

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The analysis presented in the equity data pack compares new instances of first treatments in months during the pandemic (01 April 2020 – 31 Jan 2021) compared with the same months in 2019/20. The analysis includes a 95% confidence interval for the changes, based on rate ratios under an assumption that the population is the same in the pre-COVID-19 baseline and COVID-19 months. This is calculated using the exact method described in Breslow & Day 1987, pp 93-95(20). The NCRAS equity data pack shows the high levels of heterogeneity in the impact of the COVID-19 pandemic on different tumour locations^{vi}. Our presentation of these data follows the same method but presents the cumulative difference for the period from April 2020 to the end of January compared with the previous 12 months.

10 RESULTS

12 **Overall impact of the pandemic** 13

14 Before the COVID-19 pandemic and the associated NPI, there was an average of 0.086 primary care consultations per 15 person-week (03/03/2020 – 29/02/2020). This equates to 254 million appointments in primary care nationally. Primary 16 17 care consultations (Figure 1 a) dropped rapidly to a low of 0.062 appointments per person-week in the week following 18 29/03/2020, this was 66.2% lower than the predicted rate. Rates slowly recovered over the next 22 weeks and by the 19 31/08/2020 were up to 99% of the baseline. In total there were 18.7 million fewer primary care consultations in the 20 English NHS during this period. Primary care consultations again fell to below 90% of predicted levels in the third wave 21 NPI starting on 06/01/2021, by the end of that month there were a further 8.2 million fewer consultations than 22 23 expected. Between the start of the first NPI in March 2020 and the end of January 2021 there were 27.0 million fewer 24 appointments than expected. 25

26 In the year prior to the pandemic, the average rate of urgent cancer (two week wait) referral was 0.00073 per person 27 per week, equating to an estimated 2.1 million for the NHS in England (March 2019 to March 2020). Following the first 28 NPI, urgent cancer referrals from primary care (Figure 1 b) fell to a nadir of 0.00023 by 29/03/2020 (29.7% of the 29 predicted level). Urgent cancer referrals did not return to pre-pandemic baseline until the week following 23/08/2020 30 equating to 303,016 estimated lost urgent cancer referrals over this period. There was a second fall in urgent cancer 31 referrals from primary care in the winter to below 90% of the baseline following the third lockdown (around 0.00065 32 referrals per person-week). This resulted in a further estimated 91,705 fewer urgent cancer referrals than expected. 33 34 Between the start of the first NPI in March 2020 and the end of January 2021 there were 394,721 fewer urgent cancer 35 referrals than expected. 36

37 Routine referrals however have shown a different trajectory in that their rates did not recover to pre-pandemic levels 38 (Figure 1 c). As a share of predicted levels routine referrals had the greatest fall, dropping to around 16% 39 of predicted rates for three weeks from the 05/04/2020. From then to the end of January the closest it came to 40 predicted levels was 80.3% in the week flowing 13/09/2020. In January 2021 it had fallen back down to 60-70% of 41 predicted rates. In the year before March 2020 there were an average of 0.0042 routine referrals per person-week from 42 43 primary care, equivalent to an estimated 12.2 million for the NHS in England. Between the start of the first NPI in March 44 2020 and the end of January 2021 there were 4.3 million fewer routine referrals than expected. 45

⁵⁶ vi The NCRAS data equity pack is different in its count and analysis of "all tumours" compared with the Cancer Wait Times Data, this 57 is because the data are slightly different (cleaned and analysed by NCRAS). Results of our analysis with each data set are compared 58 in Annex 7. 59

Table 1a: Observed post COVID-19 primary care activity (CPRD Aurum) 15 March 2020 – 30 January 2021

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	Observed rate	Expected rate	Percentage reduction (95% CI)	Estimated # missing from England population, n
Event rate per 100,000 person months				
Consultations excl flu vaccinations	31,996	36,517	12.4% (12.3, 12.6)	26,887,014
Routine Referrals	1,046	1,772	41.1% (40.4, 41.8)	4,317,710
2 Week Wait Referrals	268.0	335.8	20.2% (18.1, 22.3)	394,721

Table 1b: Observed post COVID-19 cancer diagnostic activity (Cancer Wait Times), 01 April 2020 - 31 January 2021

15 16 17		Observed rate	Expected rate	Percentage reduction (95% CI)	Estimated # missing from England population, n
18	Event rate per 100,000 person months				
19	First consultant appointments following urgent	296.0	366.4	19.2% (19.1, 19.3)	398,192
20	referral from primary care				
21	Incidence rate per 100,000 person months				
22	First treatments for new cancer from the urgent	21.4	25.5	16.1% (15.5, 16.8)	23,270
23	primary care referral pathway				
24	First treatments for new cancer from the	1.6	3.5	53.2% (52.0, 54.3)	10,444
25	national screening pathway	. 20 7	47.4		42 622
26	First treatments for new cancer	39.7	47.4	16.3% (15.9, 16.6)	43,623
27					

28 Table 1a summarises the missing appointments and referrals for the post-pandemic period. Since the start of the 29 pandemic in March we have observed consultations rates (excluding flu vaccine appointments) that are 12.4% (C.I. 30 12.3%, 12.6%) lower than predicted by previous data: equivalent to 27 million appointments when adjusted to match 31 32 the whole England population between 02/03/2020 and 30/01/2021. The number of referrals to secondary care per 33 consultation has also fallen, with urgent cancer referrals 20.2% (C.I. 18.1%, 22.3%) and routine referrals 41.1% (C.I. 34 40.4%,41.8%) lower than expected: this is an estimated 394,721 and 4.3 million missing urgent cancer and routine 35 referrals respectively. 36

The knock-on effect of the reductions in patients' primary care appointments and referrals can be observed in the national CWT data. The number of first appointments with a cancer specialist following an urgent cancer referral has fallen by approximately the same amount as estimated for the referrals themselves: 19.2% (C.I. 19.1%, 19.3%). The number of cancer first treatments (following a diagnosis and decision to treat) was 16.3% (C.I. 15.9%, 16.6%) lower than expected, or 43,623 missing first treatments from 01/04/2020 - 31/01/2021^{vii} (graphs of observed compared with expected are presented in Annex 6).

Urgent cancer referrals by site specific cancer from 01/04/2020 until 31/01/2021 showed significant heterogeneity from
moderate reductions in urgent referrals for suspected breast (7.0% C.I. 6.6%, 7.5%) and gynaecological cancers (10.3%
C.I. 9.7%, 10.9%), to 36.9% (C.I. 36.1%, 37.8%) and 27.2% (C.I. 26.7%, 27.7%) reduction in urgent referrals for lung and
urological cancers, respectively (Figure 2). To show how pathway delays interface with reductions in cancer referrals we
also examined reductions in first treatments for the same site-specific cancers over this period (Figure 2). Breast and
urological cancers observed the greatest reduction in new first treatments: Breast fell

⁵² by 24.8% (C.I. 23.6%, 25.9%) which equates to 10,042 missing treatments and urological by 24.1% (C.I. 23.2%,

25.2%) which equates to 12,086 missing treatments. Taken together these data reflect substantial delays in both
 diagnostic and treatment phases of the patient pathway.

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 58 vii Dates for the CWT and NCRAS analysis do not line up with the CPRD analysis because the latter is conducted weekly, not monthly.
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Inequalities in cancer diagnosis outcomes in the pandemic

There are inequalities in primary care use in England, with the people who live in the poorest areas have higher rates of consultation than those in richer areas once we adjust for age. The most deprived quintile was expected to have 41,702 consultations per 100,000 person-months, 15% more than the least deprived.

Table 2: Observed post COVID-19 primary care activity (CPRD Aurum) by IMD quintile, actual and age-standardised

9				
10		22 Mar 2020 - 30 Jan 2021 (We	eeklv)	
11		Observed rate	Expected rate	Percentage reduction (95% CI)
12		Observed rate	Expected fate	referrage reduction (55% eff
13	Consultations per 100,000 person-months			
14				
15	IMD Quintile - 1 (least deprived)	32,015	37,030	13.5% (13.2, 13.9)
16	IMD Quintile - 2	32,490	37,308	12.9% (12.6, 13.3)
17	IND Quintile - 2	32,430	57,508	12.9% (12.0, 13.3)
18	IMD Quintile - 3	33,479	38,707	13.5% (13.2, 13.9)
19			,	
20	IMD Quintile - 4	32,143	36,573	12.1% (11.8, 12.5)
21				
22	IMD Quintile - 5 (most deprived)	33,361	37,062	10.0% (9.6, 10.3)
23				
24	Consultations per 100,000 person-months (Age-standardised*)		
25			26.444	
26	IMD Quintile - 1 (least deprived)	31,216	36,141	13.6% (13.3, 14.0)
27	IMD Quintile - 2	32,244	37,160	13.2% (12.9, 13.6)
28		52,244	57,100	15.270 (12.3, 13.0)
29	IMD Quintile - 3	33,886	39,382	14% (13.6, 14.3)
30				
31	IMD Quintile - 4	34,683	39,677	12.6% (12.3, 12.9)
32				
33	IMD Quintile - 5 (most deprived)	37,487	41,702	10.1% (9.8, 10.4)
34	*Age-standardisation is performed according to the	e European Standard Population (ESF	?)	

35 The reduction of consultations over the period 22/03/2020-30/01/2021 was smallest for those in most deprived areas. 36 Their reduction in consultations for the non-age-standardised figures was 10.0% (C.I. 9.6%, 10.3%), while for the least 37 deprived the reduction was 13.5% (C.I. 13.2%, 13.9%). Weekly levels of age-standardised consultations per person-week 38 39 by IMD quintile are presented in Annex 8.

41 Despite a smaller reduction in primary care contacts, we observe the largest reduction in both urgent cancer referrals 42 and first treatments for cancer for patients living in the most deprived areas. The NCRAS data equity pack presents the 43 number of urgent cancer referrals and first cancer treatments by IMD quintileviii. Figure 3 shows the reduction in urgent 44 cancer referrals and first treatments for newly diagnosed cancer by IMD quintile. 45

46 There was a greater percentage reduction in urgent cancer referrals for those living in the most deprived areas in 47 England experienced a 17.6% (C.I. 17.2%, 18.0%) reduction between 01/03/2020 and 31/01/2021 compared with the 48 same period 12 months before, while referrals for the least deprived quintile fell by proportionately less: 15.3% (C.I. 49 50 14.9%, 15.6%). This equates to a reduction of 61,469 referrals for the most deprived and 62,601 or the least: without 51 adjusting for age, the most deprive quintile had a smaller proportion of the pre-pandemic urgent cancer referrals, with 52 349,640 referrals compared to 410,293 for the least deprived quintile from April 2019 to January 2020. 53

54 At the same time, rates of new treatment for cancer for the people living in the most deprived 20% of England 55 experienced a 15.8% (C.I. 14.6%, 17.0%) reduction between 01/03/2020 and 31/01/2021 compared with the same 56

58 viii They do not age-standardise their results

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period 12 months before (6,607 missing first treatments). The reduction for the least deprived was 12.6% (C.I. 11.5%, 13.7%) which equates to 6,880 missing first treatments.

Despite having more access to primary care for patients in more deprived areas (10.1% reduction for most deprived compared to 13.6% for the least deprived), urgent cancer referrals and newly diagnosed cancers have been disrupted by the pandemic more for people living in poorer areas.

DISCUSSION

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The coronavirus SARS-CoV-2 (COVID-19) pandemic has had a profound impact on the management of patients with 10 11 cancer(21). The first national lockdown in March 2020 created a ripple of non-pharmaceutical interventions, including 12 'stay at home' orders, diminished healthcare service provision and redistribution of healthcare to COVID-19 related care 13 that has had a profound impact on cancer services(1,22). Whilst it was already known that there had been a substantial 14 reduction in the number of overall cancer-related referrals(23,24) the quantification of this had been missing. Our 15 findings, that primary care consultations in English NHS fell by 12.4% between January 2020 and January 2021 with 16 17 urgent cancer referrals even more suppressed (20.2%), reflect how profound the pathway disruptions were for cancer 18 patients. Furthermore, many cancers are picked up through the course of routine referrals from general practice for 19 non-specific symptoms. The drop in routine referrals that we found - 4.3 million – over this period will inevitably 20 translate into late-stage presentation and a substantial reduction in outcomes. This will include wider economic costs 21 due to more expensive (late stage) treatment and productivity losses due to morbidity and premature mortality. 22 23 However, the trajectory of the declines reflect not just changes to national policy in terms of NPI, but also knock-on 24 effects around public behaviour, primary care staffing, downstream reductions in diagnostics and an overall increase in 25 friction across all cancer pathways and systems. 26

This reduction in cancer pathways through primary care needs to be put in the context of wider disruptions. The suspension of national cancer screening programmes meant that circa 2 million people were not screened for cancer through national programs(26,27). Moreover, delays in cancer diagnoses and treatments have consistently been associated with poorer outcomes(1,2). The COVID-19 pandemic has also exacerbated the worst 62-day cancer waiting time targets in the last decade where 1 of 4 patients urgently referred from primary care between April 2020 and January 2021 did not receive treatment within 62 days(24).

35 In our analysis of urgent cancer referrals by site in relation to reductions seen in first treatments significant differences 36 were seen. Urological cancers (testis, renal and urothelial) have been particularly impacted with greater than 25% 37 decrease both in urgent referrals and first treatments. This suggests that outcomes will be particularly impacted in this 38 39 group. Lung, skin and lower GI (colon and rectal) also experienced significant declines in urgent referrals. Breast cancer 40 was the least impacted of all in terms of urgent referrals, but experienced a 25% reduction in first treatments, indicating 41 that cancer's reliance on screening programmes, which have suffered yet more than urgent referrals as a result of the 42 pandemic(24). Although it is likely that some cancer patients have already been 'lost' to the system i.e. died of COVID-43 19 or other non-COVID19 comorbidities, a significant number will now present with later stage disease. 44

Our findings also reflect socioeconomic inequalities with more profound decrease in urgent cancer referrals and first
 treatments for the most deprived populations, despite relatively better preservation of consultation rates. This is
 unexpected and extremely worrying, indicating greater disruption to the diagnostic pathway for patients living in more
 deprived areas, whose cancer outcomes were typically worse than their less deprived counterparts pre pandemic(28,29).

52 53 Limitations

This study uses multiple data sets to analyse a complex and disjointed pathway. We include a primary care data set that uses a relatively small (500,000) patient sample. However, the CPRD data produces results that closely mirror the rates of consultation per patient (and their reduction) produced in NHS Digital's appointments data(25). In addition, the estimated reduction in urgent cancer referrals is close to those presented in the NCRAS's analysis of their cancer registry

data (Table 1). It is not yet possible to link these data on a patient basis due to delays in data access and once possible further research would be illuminating.

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Conclusions

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Our data reflects a disruption to a complex interaction of several systemic issues that place a great deal of impetus on the role of primary care in ensuring early diagnosis of cancer. Primary care were under strain pre-pandemic, with low levels of investment creating problems(30). Particularly areas of high deprivation general practice is under-funded and under-doctored relative to need(7,8,10).

Early cancer diagnosis requires concordance of each participant and mechanism - including patients' awareness and ability to present with cancer symptoms, the ability of GPs to detect and urgently refer possible cancer cases and 10 sufficient diagnostic capacity (in terms of both workforce and equipment) to enable swift referrals and minimise delays 11 to diagnosis and treatment. 12

13 Every one of these nodes on the pathway to early diagnosis has been affected by the pandemic and the government 14 response. There are also new potential barriers to the pathway that have resulted, including decreases in health seeking 15 behaviour, many appointments being conducted remotely, changes in routine referral guidelines, changes in the 16 capacity of acute care. However, further work is required as there is currently little understanding and even less 17 evidence about how much each disruption is ultimately impacting cancer pathways. 18

19 The impact of the pandemic on cancer shown here is concerning. However, what is more concerning is the unequal and 20 21 inequitable impact on those worst off. Cancer as a disease area "magnifies what we know to be true about the totality of 22 the health care system. It exposes all its strengths and weaknesses" (31). Our results further evidence the strain on 23 primary care and the presence of the inverse care law(32), and the dire need to address the inequalities so sharply 24 brought into focus by the pandemic. We need to address the disconnect between the importance we place on the role 25 of primary care and the resources we devote to it. 26

Figure legends:

29 Figure 1: Observed vs expected primary care activity, 01 Jan 2019 – 30 January 2021 (per person-week) (CPRD Aurum 30 data) Panels: a. Consultations (excluding flu vaccinations), b. Urgent cancer (2 week wait) referrals from primary care, c. 31 32 Routine referrals from primary care

Figure 2: Change in observed vs expected first treatments for new cancer and urgent cancer referrals by tumour location 34 35 from NCRAS Cancer equity data pack (%, 01 Apr 2020 to 31 Jan 2021) 36

37 Figure 3: Percentage difference in observed and expected urgent cancer referrals and first treatments for cancer by IMD 38 quintile (01 Apr 2020 – 31 Jan 2021) 39

40 **Contributors**: Data cleaning and analysis was conducted by TW. TW conceived the study with input from the coauthors 41 and wrote the first draft. All the authors provided critical scholarly feedback on the manuscript. All the co-authors 42 approved of the final version of the manuscript. TW and RS are the guarantors. The corresponding author attests that all 43 listed authors meet authorship criteria and that no others meeting the criteria have been omitted. 44

45 Competing interests: None 46

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49 Data Availability statement: 50

51 The primary care activity data may be obtained from a third party and are not publicly available. We used de-52 identified primary care data from the Clinical Practice Research Datalink (CPRD). For more information please visit: 53 https://www.cprd.com/Data-access, enquiries can be emailed to enquiries@cprd.gov.uk. Scientific approval for this 54 study was given by the CPRD Independent Scientific Advisory Committee (ISAC). The study was approved by the 55 56 Independent Scientific Advisory Committee for CPRD research (20_143). 57

	://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/ and the NCRAS Cancer data equity
	is available at http://www.ncin.org.uk/local_cancer_intelligence/cadeas.
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Key messages

- Primary care is key part of the pathway for early cancer diagnosis through both routine and 2ww referrals
- Cancer diagnosis rates have experienced a sustained fall since the start of the COVID-19 pandemic and introduction of nonpharmaceutical interventions (NPIs) 'lockdowns'.
- The fall in urgent cancer referral is larger than the fall in primary care contacts, implying that the content of consultations has shifted away from potential cancer diagnosis.
- ancer a. on in primary cer referrals and a. mary care staff must w itey for the cancer diagnoss. is more complex. Despite having a smaller reduction in primary care contact through the pandemic, patients living in poorer areas have had larger reductions in urgent cancer referrals and first treatments for new cancer.
 - Government, patients and primary care staff must work together to catch up on missing diagnosis.
 - Resilience in primary care is key for the cancer diagnosis pathway and must be developed for future disruptions, particularly in poorer areas where care is more complex.

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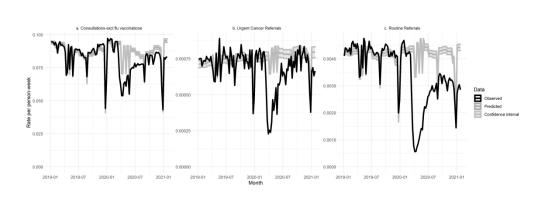
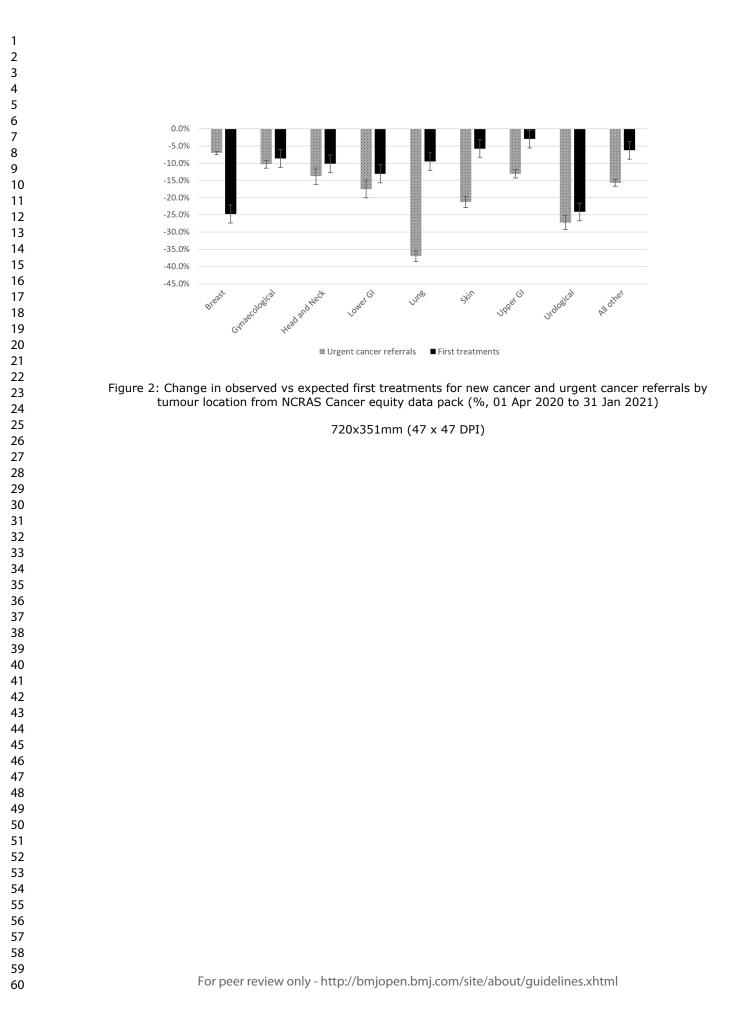
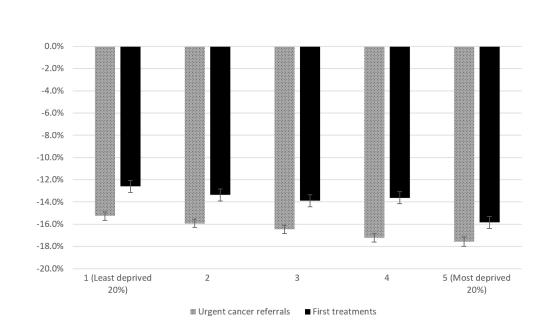


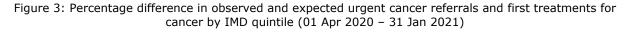
Figure 1: Observed vs expected primary care activity, 01 Jan 2019 – 30 January 2021 (per person-week) (CPRD Aurum data) Panels: a. Consultations (excluding flu vaccinations), b. Urgent cancer (2 week wait) referrals from primary care, c. Routine referrals from primary care

381x127mm (300 x 300 DPI)









698x403mm (47 x 47 DPI)

Annex 1: NCRAS Analysis of routes to diagnosis

Table 1 NCRAS analysis of route to diagnosis in 2017

				GP	Other	Inpatient			Unknow
	Count	Screen	TWW	referral	outpatient	elective	Emergency	DCO	n
	205.00		20.6						
All (excl.	305,68	6.400	38.6	22 50/	0.00/	4.000	40.00/	0.404	2.400
NMSC)	2	6.1%	%	22.5%	9.0%	1.8%	18.8%	0.1%	3.1%
-	4.05.4		61.8	42.594	0.00/	2.201	0.00/	0.000	2.200
Testis	1,854		%	13.6%	9.2%	2.3%	9.9%	0.0%	3.2%
Liberry	7 0 6 2		58.5	24.00/	F (0)	0.70/	7 40/	0.10/	2.00/
Uterus	7,862		%	24.8%	5.6%	0.7%	7.4%	0.1%	2.9%
Ducatata	41 201		53.2	20.20/	7.00/	1 20/	C 00/	0.10/	2.40/
Prostate	41,201		%	28.2%	7.0%	1.3%	6.8%	0.1%	3.4%
Dues at some som	F2 422	24.10/	48.0	0.20/	2 70/	0.20/	2 40/	0.10/	2.20/
Breast cancer	53,123	34.1%	%	8.3%	2.7%	0.2%	3.4%	0.1%	3.2%
O h	7 5 6 0		46.3	40.40/	C 00/	0.5%	10.10	0.4%	2.40/
Oesophagus	7,569		%	18.1%	6.8%	8.5%	18.1%	0.1%	2.1%
	40.005		46.1	20.40/	4.4.70/		6.004	0.4%	2.00/
Head and neck	12,865		%	28.1%	14.7%	1.4%	6.8%	0.1%	2.8%
			35.8						
Colorectal	34,825	9.9%	%	20.3%	7.0%	3.1%	21.5%	0.1%	2.3%
			32.5						
Stomach	5,142		%	21.6%	7.1%	6.3%	30.0%	0.1%	2.4%
			30.2						
Bladder	17,056		%	42.0%	12.4%	1.6%	12.0%	0.1%	1.6%
			30.1						
Kidney	9,298		%	28.9%	16.4%	1.7%	19.7%	0.1%	3.1%
			26.9						
Lung	38,906		%	23.2%	14.1%	1.6%	31.5%	0.1%	2.7%
			21.7			\mathbf{N}			
Pancreas	8,829		%	21.2%	9.8%	2.5%	41.9%	0.3%	2.7%
			17.2			9			
Liver	4,975		%	25.6%	12.7%	1.8%	37.6%	0.3%	4.7%
Haematologic			14.5						
al	7,377		%	32.2%	8.4%	2.6%	35.1%	0.1%	7.2%
Cervix	23,569	39.6%	2.7%	33.6%	8.0%	3.0%	1.9%	0.0%	11.3%
Brain	5,116		1.5%	22.1%	24.4%	2.6%	45.7%	0.1%	3.7%

Annex 2: Consultation definition

CPRD Aurum data dictionary sets out the structure of the data. Within the consultation file there are two variables one can use to identify whether a primary care contact, rather than an administrative note ("EMIS® consultation source identifier" and "Consultation source code identifier").

The EMIS consultation source identifier is the primary variable used. We include the following observations of this variable:

Acute visit, Casualty attendance, Clinic, Emergency appointment, Emergency consultation, Enterprise consultation, Face to face consultation, Follow-up/routine visit, Gp surgery, Home visit, Home visit note, Main surgery, Nursing home, Nursing home visit note, Online services message, Other, Residential home, Residential home visit note, Same day appointment, Surgery consultation, Telephone encounter, Urgent consultation, Walk-in centre, Walk-in clinic

We also include instances where EMIS consultation source identifier is "awaiting review" and the Consultation source code identifier is in the following list: **BMJ** Open

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2 3 Consultation, visit, seen in gp unit, seen in private clinic, seen in rapid access clinic at gp surgery, seen in urgent care centre, online 4 communication. 5 6 We then further exclude records on the basis of the category of staff responsible for the record. The "Job category" variable from 7 the staff file, linked by the consultation id is used. We only include as a consultation records filled out by GPs, doctors, nurses and 8 other health care professionals as defined in CPRD's numerical codes listed below: 9 GP-4, 5, 15, 24, 31, 181, 183 10 11 Dr - 1, 41, 91, 116, 119, 121, 126, 173, 177, 197 12 13 Nurse - 8, 9, 27, 33, 47, 48, 50, 55, 59, 60, 61, 111 14 15 Other healthcare professional - 2, 3, 6, 7, 10:14, 16, 17, 34:37, 42, 43, 52, 54, 58, 62:65, 68, 72, 73, 77, 80, 82, 83, 86:89, 94, 95, 97, 16 100:102, 105, 106, 112:114, 118, 122, 125, 127, 131, 135, 136, 138, 141, 142, 145, 148, 149, 154, 156, 158, 168, 185, 186, 188, 189, 17 204, 208 18 19 In Table A2.1 we present the CPRD Aurum Staff Category list. 20 In Table A2.2 we present the total number of consultations identified from 01 January 2016 to 31 January 2021, the count with each 21 combination of staff category, "EMIS® consultation source identifier" and "Consultation source code identifier" in table y we show 22 the count of records that were excluded, highlighting those that were excluded on the basis of staff category, not the consultation 23 file description variables. 24 25 Table A2.1: CPRD Aurum Staff Job Categories 26 27 1 Consultant 51 Helper/Assistant 28 2 Hospital Practitioner 52 Community Mental Health Nurse 29 **3** Clinical Medical Officer 53 Senior Administrator 30 4 General Medical Practitioner 54 Technician - Healthcare Scientists 31 5 Salaried General Practitioner 55 Associate Practitioner - Nurse 32 6 Midwife - Sister/Charge Nurse 56 Senior Manager 33 7 Midwife 57 Community Administrator 34 8 Community Practitioner 58 Associate Specialist 35 59 Student Practice Nurse 9 Community Nurse 36 10 Chiropodist/Podiatrist 60 Nurse Manager 37 11 Dietitian 61 Sister/Charge Nurse 38 12 Pharmacist 62 Psychotherapist 39 13 Clinical Psychologist 63 Osteopath 40 14 Health Care Support Worker 64 Social Care Support Worker 41 15 Associate Practitioner - General Practitioner 65 Assistant Psychologist 42 16 Counsellor 66 Officer 43 17 Phlebotomist 67 Technician - Admin & Clerical 44 18 Clerical Worker 68 Psychiatrist 45 19 Manager 69 Health Records Clerk 46 20 Analyst 70 Desktop Support Technician 47 21 System Administrator 71 Dispenser 48 22 Desktop Support Administrator 72 Clinical Assistant 49 23 System Worker 73 Practitioner 50 24 GP Registrar 74 Information Officer 51 25 Medical Student 75 Network Administrator 52 26 Other Community Health Service - Admin Clerk 76 Chaplain 53 27 Specialist Nurse Practitioner 77 Student Physiotherapist 28 Receptionist 78 Paramedic Specialist Practitioner 54 55 29 Secretary 79 Clinical Team Manager 56 30 Medical Secretary 80 Physiotherapist Specialist Practitioner 31 Sessional GP 81 Helpdesk Technician 57 32 Clinical Application Administrator 82 Radiographer 58 59 33 Nurse Consultant 83 Other Community Health Service 60 34 Physiotherapist 84 Call Operator

Page 21 of 55

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	 35 Specialist Practitioner 36 Healthcare Assistant 37 Medical Technical Officer - Pharmacy 38 Health Records Administrator 39 Helpdesk Administrator 40 Appointments Clerk 41 Senior House Officer 42 Social Worker 43 Trainee Practitioner 44 Network Technician 45 Clinical Coder 46 Medical Records Clerk 47 Staff Nurse 48 Enrolled Nurse 49 Multi Therapist 	85 Community Worker (children) 86 Paramedic Consultant 87 Associate Practitioner 88 Modern Matron 89 Asst. Clinical Medical Officer 90 Community Team Manager 91 Specialist Registrar 92 Chiropodist/Podiatrist Manager 93 Radiographer - Therapeutic, Manager 94 Optometrist 95 Assistant Practitioner 96 Community Learning Disabilities Nurse 97 Technician - Additional Clinical Services 98 Student Health Visitor 99 Interpreter
18	50 Nursery Nurse	100 Medical Technical Officer
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2 3 101 Midwife - Specialist Practitioner 4 102 Occupational Therapist 5 103 Chief Executive 6 104 Audit Manager **151 Finance Director** 7 105 Paramedic 152 Senior social worker (adults) 8 106 Physiotherapist Consultant 153 Student Midwife 9 107 Availability Monitor 154 Radiologist 10 108 Medical Laboratory Assistant 155 Ward Manager 11 109 Gateway Worker 156 Midwife - Manager 12 110 Medical Records Manager 157 Waiting List Manager 13 111 Student Nurse - Adult Branch 158 Radiographer - Diagnostic, Specialist Practitioner 14 **159 Biomedical Scientist** 15 112 Audiologist 16 113 Radiographer - Diagnostic 160 Board Level Director 17 114 Therapist 161 Non Executive Director 18 115 Student District Nurse 162 Nursing Cadet 19 116 House Officer - Post Registration 163 Porter 20 117 Speech & Language Therapist 164 Social services care manager (adults) 21 **118 Dietitian Specialist Practitioner** 165 Student Psychotherapist 22 119 Trust Grade Doctor - SHO level 166 Orthoptist 23 120 Director of Public Health 167 Clinical Director - Medical 24 121 Staff Grade 168 Approved Social Worker 25 122 Patient Welfare Officer 169 Student Community Mental Health Nurse 26 123 Occupational Therapy Specialist Practitioner 170 Other Executive Director 27 124 Technician - PS&T 171 Student Orthoptist 28 125 Chiropodist/Podiatrist Consultant 172 Childcare Co-ordinator 29 126 Trust Grade Doctor - Career Grade level 173 House Officer - Pre Registration 30 174 SODP 31 127 Student Community Practitioner 32 128 Healthcare Scientist 175 Outpatient Manager 33 129 Waiting List Clerk 176 Medical Director 34 130 Clinical Director 177 Trust Grade Doctor - Specialist Registrar level 35 131 Pre-reg Pharmacist 178 Senior Clinical Medical Officer 36 132 Mental Health Act Administrator 179 Consultant Healthcare Scientist 37 133 Ward Clerk 180 Reporting Radiographer 38 134 Support, Time, Recovery Worker 181 Locum GP 39 135 Art Therapist Specialist Practitioner 182 Researcher 40 183 Assistant GP 136 Physiotherapist Manager 41 137 Healthcare Cadet 184 Special salary scale in Public Health Medicine 42 185 Advanced Practitioner 138 Dietitian Consultant 43 186 Health Visitor 139 Orthoptist Manager 44 140 Social work assistant (mental health) 187 Dental Assistant Clinical Director 45 141 Chiropodist/Podiatrist Specialist Practitioner 188 Other Community Health Service - Social Care Worker 46 47 142 Student Technician 189 Physician Assistant 48 143 Complaints Investigator 190 Deputising Doctor 49 144 Trainee Scientist 191 Student Occupational Health Nurse 50 145 Radiographer - Diagnostic, Manager 192 Senior social worker (mental health) 51 146 Social services care manager (mental health) 193 Regional Dental Officer 52 147 Dietitian Manager 194 Trainer 53 195 Cytoscreener 148 Midwife - Consultant 54 149 Art Therapist Consultant 196 Chair 55 150 Paramedic Manager 197 Trust Grade Doctor - House Officer level 56 198 Art Therapist 57 201 Healthcare Science Assistant 199 Multi Therapist Specialist Practitioner 58 202 Social work assistant (adults) 200 Drama Therapist 59 203 Social work team manager (adults) 60

- 204 Intermediate Care worker
- 205 Student Occupational Therapist
- 206 Student Dietitian
- 207 Healthcare Science Associate
- 208 Child Protection worker
- 209 Professor
- 210 General Dental Practitioner
- 211 Student School Nurse
- 212 Occupational Therapist Consultant
- 213 Intermediate Care staff
- 214 Home help
- 215 Art, Music & Drama Student
- 216 Specialist Healthcare Scientist
- 217 Social Services information manager

Table A2.2: Number of observations by EMIS® consultation source identifier, Consultation source code identifier and Staff Job Category, with an indicator for whether it was included as a consultation: Include: 1 = Include, 0 = Exclude, "Excl. job title" = Excluded on the basis of job title.

Include	Staff Job Category	Consultation source code identifier	EMIS consultation source identifier	Count
1	gp	gp surgery	gp surgery	3,119,080
1	nurse	gp surgery	gp surgery	1,692,606
1	gp	telephone consultation	telephone consultation	1,471,946
1	other care provider	gp surgery	gp surgery	977,067
1	nurse	telephone consultation	telephone consultation	196,665
1	gp	telephone call to a patient	telephone call to a patient	108,025
1	gp	home visit note	home visit note	83,600
1	other care provider	telephone consultation	telephone consultation	81,980
1	nurse	telephone call to a patient	telephone call to a patient	32,423
1	gp	face to face consultation	face to face consultation	25,435
1	nurse	home visit note	home visit note	24,174
1	other care provider	telephone call to a patient	telephone call to a patient	23,194
1	gp	gp surgery	surgery consultation	22,756

3	1	gp	nursing home visit note	nursing home visit note	21,357
5	1	nurse	face to face consultation	face to face consultation	17,580
5	1	gp	enterprise consultation	enterprise consultation	14,904
7	1	gp	telephone call from a patient	telephone call from a patient	13,062
3	1	gp	routine consultation	surgery consultation	11,668
€		other care			
10	1	provider	home visit note	home visit note	10,853
11 12	_		provision of general practitioner		
3	1	gp	intermediate care	gp surgery	10,441
4	1	gp	emergency consultation	emergency consultation	10,351
5	1	gp	residential home visit note	residential home visit note	9,579
6	1	other care provider	face to face consultation	face to face consultation	9,350
7		•	emergency appointment		8,687
8 9	1	gp		emergency appointment	
20	1	gp	urgent consultation	urgent consultation	8,155
21	1	gp	walk-in clinic	walk-in clinic	7,908
2	1	dr	gp surgery	gp surgery	7,654
.3	1	gp	other note	other	7,520
4	1	gp	face to face consultation	surgery consultation	6,932
.5	1	nurse	gp surgery	surgery consultation	5,318
6 7	1	gp	seen in gp unit	surgery consultation	4,687
28	1	gp	consultation via video conference	awaiting review	4,653
9	1	nurse	enterprise consultation	enterprise consultation	4,460
80		other care	provision of general practitioner		
1	1	provider	intermediate care	gp surgery	4,369
3	1	gp	clinic note	surgery consultation	3,823
4	1	nurse	residential home visit note	residential home visit note	3,612
5	1	nurse	clinic note	clinic	3,585
6	1	nurse	nursing home visit note	nursing home visit note	3,528
57	1	nurse	face to face consultation	surgery consultation	3,442
8	1	gp	online communication	awaiting review	3,410
9		other care			2.405
10 11	1	provider other care	other note	other	3,406
12	1	provider	seen in gp unit	gp surgery	2,781
13	1	gp	e-mail consultation	awaiting review	2,523
4	1	nurse	other note	other	2,449
5	1	other care			2,445
6	1	provider	gp surgery	surgery consultation	2,334
7		other care			,
.8 .9	1	provider	enterprise consultation	enterprise consultation	2,318
0		other care			
1	1	provider	telephone call from a patient	telephone call from a patient	2,211
2	1	nurse	telephone call from a patient	telephone call from a patient	2,183
3	1	gp	routine consultation	awaiting review	2,117
4	1	nurse	emergency appointment	emergency appointment	2,041
5 6	1	gp	home visit note	home visit	2,021
57	1	gp	seen in gp unit	gp surgery	1,896
8			provision of general practitioner		
i9	1	nurse	intermediate care	gp surgery	1,762

2					
3 4	1	other care provider	clinic note	clinic	1,699
5		•	clinic note		
6	1	nurse		surgery consultation	1,628
7	1	gp	clinic note	clinic	1,623
8	1	nurse	routine consultation	surgery consultation	1,578
9 10	1	nurse	seen in gp unit	surgery consultation	1,426
10	1	nurse	walk-in clinic	walk-in clinic	1,412
12	1	nurse	gp surgery	clinic	1,355
13 14	1	other care provider other care	routine consultation	other	1,303
15	1	provider	clinic note	surgery consultation	1,297
16	1	•	face to face consultation	emergency consultation	1,292
17	I	gp other care			1,292
18	1	provider	walk-in clinic	walk-in clinic	1,216
19 20	1	gp	telephone encounter	telephone encounter	1,184
20	1	gp	online communication	online services message	1,139
22	1	gp	other consultation medium used	awaiting review	1,134
23	<u> </u>	other care			1,104
24	1	provider	residential home visit note	residential home visit note	1,113
25	1	nurse	seen in gp unit	gp surgery	1,103
26 27		other care			,
27	1	provider	nursing home visit note	nursing home visit note	1,081
29		other care			
30	1	provider	face to face consultation	surgery consultation	1,045
31		other care		here and here and	1.042
32	1	provider	seen in gp unit	surgery consultation	1,043
33	1	nurse	emergency consultation	emergency consultation	1,024
34 35	1	nurse	urgent consultation	urgent consultation	959
36	1	gp	extended hours consultation	awaiting review	924
37	1	gp	routine consultation	other	922
38	1	gp	home visit note	other	835
39	1	gp	gp surgery	face to face consultation	808
40		other care			
41	1	provider	gp surgery	clinic	746
42	1	other care provider	routine consultation	surgery consultation	738
43 44	1	•	consultation via multimedia	awaiting review	734
45	Ŧ	gp	face to face consultation with	awaiting review	/ 54
46	1	gp	relative/carer	awaiting review	669
47	1	nurse	e-mail consultation	awaiting review	638
48	1	nurse	routine consultation	awaiting review	574
49	1	nurse	consultation via video conference	awaiting review	505
50 51	1	nurse	routine consultation	other	478
52	1	other care			
53	1	provider	online communication	awaiting review	473
54	1	nurse	same day appointment	same day appointment	468
55	1	gp	face to face consultation	gp surgery	461
56	1	gp	same day appointment	same day appointment	457
57	1	nurse	gp surgery	face to face consultation	455
58 59	1		telephone encounter	telephone consultation	433
60		gp			
	1	nurse	face to face consultation	emergency consultation	420

3	1	gp	group consultation	awaiting review	402
4	1	nurse	home visit note	other	402
6	1	nurse	seen in urgent care centre	awaiting review	344
7	1	gp	face to face consultation	emergency appointment	330
8	1	gp	seen in urgent care centre	awaiting review	322
9	1	nurse	telephone encounter	telephone encounter	314
10		other care	· · · ·	· ·	
11 12	1	provider	consultation via video conference	awaiting review	288
12	1	gp	telephone consultation	telephone call to a patient	287
14	1	dr	telephone consultation	telephone consultation	279
15	1	nurse	online communication	awaiting review	279
16		other care			
17	1	provider	face to face consultation	awaiting review	272
18		other care			
19 20	1	provider	home visit note	home visit	262
20	1	other care provider	routine consultation	awaiting review	260
22	1	nurse	home visit note	home visit	246
23					
24	1	gp other care	consultation via sms text message	awaiting review	244
25	1	provider	online communication	online services message	241
26		other care			
27 28	1	provider	emergency consultation	emergency consultation	235
28		other care			
30	1	provider	emergency appointment	emergency appointment	231
31	1	gp	telephone encounter	telephone call to a patient	226
32	1	gp	residential home visit note	residential home	225
33	1	gp	face to face consultation	awaiting review	224
34	1	nurse	face to face consultation	gp surgery	221
35 36		other care			
37	1	provider	gp surgery	face to face consultation	209
38	1	nurse	extended hours consultation	awaiting review	186
39			seen in rapid access clinic at gp		
40	1	gp	surgery	awaiting review	182
41	1	gp	school visit note	awaiting review	181
42	1	other care provider	telephone consultation	telephone call to a patient	179
43 44	1	nurse	face to face consultation	awaiting review	166
45			home visit note		
46	1	gp		acute visit	153
47	1	nurse other care	online communication	online services message	145
48	1	provider	group consultation	awaiting review	133
49	1	gp	seen in gp unit	awaiting review	129
50 51	1	dr	clinic note	surgery consultation	125
52	1	other care			125
53	1	provider	telephone encounter	telephone encounter	119
54		other care			
55	1	provider	extended hours consultation	awaiting review	116
56			face to face consultation with		
57	1	nurse	relative/carer	awaiting review	115
58	1	nurse	seen in gp unit	awaiting review	109
59 60	1	gp	night visit note	awaiting review	108

3 4 5 6 7 8	1	nurse	school visit note	awaiting review	
6 7 8			analia anno itation		107
78		nurse	group consultation	awaiting review	102
8	1	gp	other consultation medium used	other	99
	1	gp	children's home visit note	awaiting review	95
() I	1	gp	telephone consultation	telephone call from a patient	94
9 10	1	gp	administration note	other	91
10	1	nurse	telephone encounter	telephone call to a patient	86
12		other care			
13 —	1	provider	e-mail consultation	awaiting review	71
14	1	nurse	consultation via multimedia	awaiting review	65
15	1	gp	gp surgery	clinic	63
16	1	nurse	telephone consultation	telephone call to a patient	63
17 18		other care	face to face consultation with		
18	1	provider	relative/carer	awaiting review	62
20	1	~~	consultation via telemedicine web		C1
21	1	gp	camera	awaiting review	61
22 -	1	dr	telephone call to a patient	telephone call to a patient	60
23	1	nurse	laboratory result	clinic	55
24	1	other care provider	other consultation medium used	awaiting raviou	53
25	1	•		awaiting review	
26	1	nurse	other consultation medium used	awaiting review	51
27 28	1	nurse	district nurse visit	awaiting review	48
28	1	gp	clinic note	gp surgery	47
30		other care			45
31	1	provider other care	clinic note	gp surgery	45
32	1	provider	urgent consultation	urgent consultation	42
33	1	other care			72
34	1	provider	home visit note	other	41
35		other care			
36	1	provider	laboratory result	clinic	40
37	1	gp	laboratory result	acute visit	39
39	1	dr	home visit note	home visit note	38
40		other care			
41	1	provider	telephone encounter	telephone call to a patient	38
42	1	nurse	telephone encounter	telephone consultation	33
43		other care			
44	1	provider	consultation via sms text message	awaiting review	28
45	1	gp	walk-in clinic	walk-in centre	27
46 47 —	1	nurse	walk-in clinic	walk-in centre	27
47		other care			
49	1	provider	walk-in clinic	clinic	27
50	1	nurse	children's home visit note	awaiting review	25
51	1	gp	gp surgery	main surgery	24
52	1	nurse	residential home visit note	residential home	22
53		other care			
54	1	provider	seen in urgent care centre	awaiting review	22
55	1	nurse	night visit note	awaiting review	20
56 57		other care			
57	1	provider	children's home visit note	awaiting review	19
59		other care			
60	1	provider	consultation via multimedia	awaiting review	19

1	gp	home visit note	nursing home visit note	17
1	gp	nursing home visit note	nursing home	17
1	gp	residential home visit note	nursing home	15
	other care			
1		face to face consultation	gp surgery	14
1	other care	night visit noto	awaiting raviou	14
1	provider other care	night visit note	awaiting review	14
1		other consultation medium used	other	14
1		clinic note	gp surgery	13
1		walk-in clinic	clinic	13
1		home visit note	acute visit	10
1		consultation via sms text message	awaiting review	< 10
1	nuise	consultation via telemedicine web		(10
1	nurse	camera	awaiting review	< 10
1	dr	consultation via video conference	awaiting review	< 10
1	dr	nursing home visit note	nursing home visit note	< 10
	other care			
1	provider	home visit note	nursing home visit note	< 10
1	dr	other note	other	< 10
1	gp	telephone encounter	telephone call from a patient	< 10
1		twilight visit note	awaiting review	< 10
	other care			
1	provider	laboratory result	acute visit	< 10
1	dr	face to face consultation	face to face consultation	< 10
1	gp	home visit note	follow-up/routine visit	< 10
1	gp	other consultation medium used	casualty attendance	< 10
	other care			
1	-	home visit note	residential home visit note	< 10
1	other care provider	other note		< 10
1		home visit note	gp surgery	< 10
1	01		awaiting review	
	OM	non-consultation medication data	awaiting review	< 10
1	gp	remote consultation	awaiting review	< 10
1		third party consultation	casualty attendance	< 10
1	nurse	home visit note	follow-up/routine visit	< 10
1	nurse	telephone encounter	telephone call from a patient	< 10
1		third party consultation	casualty attendance	< 10
1	dr	enterprise consultation	enterprise consultation	< 10
1	dr	telephone call from a patient	telephone call from a patient	< 10
1	gp	district nurse visit	awaiting review	< 10
1	gp	e-mail received from patient	acute visit	< 10
1	gp	hospital outpatient report	casualty attendance	< 10
1	gp	joint consultation	awaiting review	< 10
1		pharmacy consultation	awaiting review	< 10
1		telephone call to a patient	telephone consultation	< 10
1		administration note	other	< 10
1		face to face consultation	emergency appointment	< 10
_	other care	consultation via telemedicine web		
1		camera	awaiting review	< 10

2 3	1	other care			
4	1	other care provider	face to face consultation	emergency appointment	< 10
5	-	other care			× 10
6	1	provider	face to face consultation	emergency consultation	< 10
7		other care			
8	1	provider	home visit note	acute visit	< 10
9		other care			
10 11	1	provider	pharmacy consultation	awaiting review	< 10
12	1	other care	residential here visit note	residential home	< 10
13	1	provider other care	residential home visit note	residential home	< 10
14	1	provider	telephone encounter	telephone consultation	< 10
15	1	dr	group consultation	awaiting review	< 10
16	1	dr	home visit note	acute visit	< 10
17	1		clinic note	follow-up/routine visit	< 10
18 19		gp			
20	1	gp	emergency consultation	casualty attendance	< 10
21	1	gp	home visit note seen in rapid access clinic at gp	nursing home	< 10
22	1	nurse	surgery	awaiting review	< 10
23	1	nurse	telephone consultation	telephone call from a patient	< 10
24	1		twilight visit note	awaiting review	< 10
25	1	nurse other care			< 10
26 27	1	provider	administration note	other	< 10
27 28		other care			
29	1	provider	children's home visit note	clinic	< 10
30		other care			
31	1	provider	home visit note	awaiting review	< 10
32	1	other care	tuilicht visit noto		< 10
33	1	provider	twilight visit note	awaiting review	< 10
34 35	excl. job cat		gp surgery	gp surgery	875,291
36	excl. job cat		other note	other	31,332
37	excl. job cat		telephone consultation	telephone consultation	29,455
38	excl. job cat		online communication	online services message	14,055
39	excl. job cat		telephone call to a patient	telephone call to a patient	13,935
40	aval ich act		provision of general practitioner intermediate care		0 701
41 42	excl. job cat			gp surgery	9,791
42 43	excl. job cat		telephone call from a patient	telephone call from a patient	7,098
44	excl. job cat		seen in gp unit	gp surgery	6,240
45	excl. job cat		home visit note	home visit note	4,776
46	excl. job cat		routine consultation	other	4,248
47	excl. job cat		gp surgery	surgery consultation	3,047
48	excl. job cat		home visit note	other	2,664
49 50	excl. job cat		face to face consultation	face to face consultation	2,071
50 51	excl. job cat		face to face consultation	surgery consultation	1,177
52	excl. job cat		online communication	awaiting review	1,098
53	excl. job cat		nursing home visit note	nursing home visit note	708
54	excl. job cat		routine consultation	surgery consultation	509
55	excl. job cat		consultation via video conference	awaiting review	494
56	excl. job cat		routine consultation	awaiting review	453
57	excl. job cat		enterprise consultation	enterprise consultation	398
58 59	excl. job cat		administration note	other	376
60	chen job cat				5,0
00	excl. job cat		telephone encounter	telephone encounter	376

1 2				
3	excl. job cat	home visit note	awaiting review	371
4	excl. job cat	clinic note	clinic	337
5	excl. job cat	clinic note	surgery consultation	329
6 7	excl. job cat	residential home visit note	residential home visit note	327
8	excl. job cat	face to face consultation	gp surgery	305
9	excl. job cat	face to face consultation	awaiting review	293
10	excl. job cat	home visit note	home visit	250
11 12	excl. job cat	urgent consultation	urgent consultation	240
13	excl. job cat	walk-in clinic	walk-in clinic	196
14	excl. job cat	group consultation	awaiting review	170
15	excl. job cat	seen in gp unit	surgery consultation	148
16	excl. job cat	e-mail consultation	awaiting review	145
17 18	excl. job cat	emergency consultation	emergency consultation	121
19		face to face consultation with		
20	excl. job cat	relative/carer	awaiting review	116
21	excl. job cat	consultation via multimedia	awaiting review	75
22 23	excl. job cat	seen in gp unit	awaiting review	75
23 24	excl. job cat	children's home visit note	awaiting review	63
25	excl. job cat	other note	gp surgery	54
26	excl. job cat	other consultation medium used	other	44
27	excl. job cat	other consultation medium used	awaiting review	42
28 29	excl. job cat	extended hours consultation	awaiting review	37
30	excl. job cat	gp surgery	face to face consultation	36
31	excl. job cat	emergency appointment	emergency appointment	35
32	excl. job cat	gp surgery	clinic	32
33	excl. job cat	face to face consultation	emergency consultation	25
34 35	excl. job cat	residential home visit note	residential home	23
36	excl. job cat	telephone encounter	telephone call to a patient	23
37	excl. job cat	night visit note	awaiting review	14
38	excl. job cat	home visit note	acute visit	13
39 40	excl. job cat	walk-in clinic	walk-in centre	11
40	excl. job cat	district nurse visit	awaiting review	< 10
42	excl. job cat	seen in urgent care centre	awaiting review	< 10
43	excl. job cat	twilight visit note	awaiting review	< 10
44	excl. job cat	clinic note	gp surgery	< 10
45 46	excl. job cat	laboratory result	acute visit	< 10
47	excl. job cat	telephone consultation	telephone call to a patient	< 10
48	excl. job cat	walk-in clinic	clinic	< 10
49	excl. job cat	telephone encounter	telephone call from a patient	< 10
50 51	excl. job cat	emergency consultation	casualty attendance	< 10
52	excl. job cat	pharmacy consultation	awaiting review	< 10
53	excl. job cat	third party consultation	casualty attendance	< 10
54	excl. job cat	case conference	gp surgery	< 10
55	excl. job cat	emergency consultation	awaiting review	< 10
56 57	excl. job cat	gp surgery	main surgery	< 10
57	excl. job cat	home visit note	follow-up/routine visit	< 10
59	excl. job cat	non-consultation medication data	casualty attendance	< 10
60	excl. job cat	nursing home visit note	nursing home	< 10

2 3	excl. job cat		remote consultation	awaiting review	< 10
4	excl. job cat		same day appointment	same day appointment	< 10
5	excl. job cat		school visit note	awaiting review	< 10
6 7	excl. job cat		telephone consultation	awaiting review	< 10
8	excl. job cat		telephone encounter	telephone consultation	< 10
9	excl. job cat		third party consultation	awaiting review	< 10
10	0	an	externally entered note	externally entered	3,467,397
11	0	gp	scanned document	docman	3,183,781
12 13	0				968,767
13 14	-		administration note	administration note	
15	0		cooperat desurgent	scanned document	737,843
16	-		scanned document		727,269
17	0	gp	administration note	administration note	725,612
18	0		inbound document awaiting clinical code migration to	inbound document	402,647
19 20	0		emis web	awaiting review	385,598
20	0	nurse	externally entered note	externally entered	303,830
22			awaiting clinical code migration to		
23	0	gp	emis web	awaiting review	261,627
24	0		administration note	administration	256,604
25		other care			
26 27	0	provider	scanned document	docman	255,022
28	0		externally entered note	externally entered	252,167
29	0	gp			208,462
30	0	gp	outbound referral	outbound referral	197,534
31			awaiting clinical code migration to		162.040
32 33	0	gp other care	emis web	gp surgery	162,048
33 34	0	provider	administration note	administration note	160,918
35			awaiting clinical code migration to		
36	0		emis web	third party consultation	147,374
37	0	gp	scanned document	scanned document	145,355
38			awaiting clinical code migration to		
39 40	0		emis web	gp surgery	127,041
41	0	an	awaiting clinical code migration to emis web	results recording	122,118
42	0	gp	awaiting clinical code migration to		122,110
43	0		emis web	other	121,401
44			awaiting clinical code migration to		
45 46	0	gp	emis web	surgery consultation	107,304
40 47	0		awaiting clinical code migration to		104 602
48	0		emis web	Labored de concept	104,693
49	0	gp	inbound document awaiting clinical code migration to	inbound document	102,534
50	0	nurse	emis web	awaiting review	94,158
51 52		other care	awaiting clinical code migration to		
52 53	0	provider	emis web	gp surgery	86,398
54		other care	awaiting clinical code migration to		
55	0	provider	emis web	awaiting review	85,745
56	0	nurse	administration note	administration note	84,051
57	0	gn	awaiting clinical code migration to emis web		77,585
58 59	0	gp	awaiting clinical code migration to		77,565
59 60	0	nurse	emis web	gp surgery	75,552
	·	•	- `		

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(other care provider			66,360
	other care			00,00
() provider	externally entered note	externally entered	62,81
()	externally entered note	externally entered note	61,84
		awaiting clinical code migration to	,	,
()	emis web	repeat issue	61,68
() nurse			58,01
() gp	telephone triage encounter	telephone triage encounter	50,662
(0	third party consultation	third party consultation	44,60
	other care			
() provider	scanned document	scanned document	38,34
		awaiting clinical code migration to		25.27
() nurse	emis web awaiting clinical code migration to		35,37
() nurse	emis web	surgery consultation	27,69
) gp	administration note	administration	27,39
	<u> </u>	awaiting clinical code migration to		27,33
() gp	emis web	telephone consultation	26,21
		awaiting clinical code migration to		
() gp	emis web	other	26,20
		awaiting clinical code migration to		25.62
()	emis web	scanned document	25,62
(awaiting clinical code migration to emis web	administration note	24,45
)		awaiting review	24,33
,	,	gp surgery awaiting clinical code migration to		24,33
(0	emis web	touchscreen	24,31
() gp	third party consultation	third party consultation	23,95
		awaiting clinical code migration to		
()	emis web	patientchase insert	22,51
() gp	laboratory result	results recording	22,06
() gp	externally entered note	externally entered note	20,86
		awaiting clinical code migration to		
() gp	emis web	administration note	20,72
	other care			20.45
) provider	inbound document	inbound document	20,15
() gp other care	telephone call to relative/carer	telephone call to relative/carer	19,23
() provider	awaiting clinical code migration to emis web		17,08
		awaiting clinical code migration to		17,08
(emis web	surgery consultation	15,97
		awaiting clinical code migration to		
() nurse	emis web	clinic	15,89
() gp	other note	other note	15,81
() gp	gp surgery	awaiting review	15,81
() gp	discussion with colleague	discussion with colleague	12,97
		awaiting clinical code migration to		
() gp	emis web	telephone call to a patient	11,78
()	repeat prescription	repeat issue	11,54
	other care			
() provider	administration note	administration	11,03
		awaiting clinical code migration to	athar	11.00
() nurse	emis web	other	11,00

-	0	nurse	hospital outpatient report inbound document	hospital outpatient report inbound document	10,033 9,304
	0	nurse	scanned document	scanned document	7,878
		other care	awaiting clinical code migration to		,,,,,,
	0	provider	emis web	repeat issue	7,745
			awaiting clinical code migration to		
	0	gp	emis web	outbound referral	7,402
	0	other care	and a second	a dama lla cada da da	6 70
	0	provider	externally entered note	externally entered note	6,736
	0	gp other care	telephone call from relative/carer awaiting clinical code migration to	telephone call from relative/carer	6,620
	0	provider	emis web	surgery consultation	6,514
	0	provider	awaiting clinical code migration to		0,01
	0		emis web	inbound document	6,495
	0	nurse	gp surgery	awaiting review	6,475
		other care	awaiting clinical code migration to		
	0	provider	emis web	other	6,315
	0	nurse	administration note	administration	6,285
	0		outbound referral	outbound referral	6,194
	0	nurse	telephone triage encounter	telephone triage encounter	6,074
	0	gp	clinic note	clinic note	5,834
		- OF	awaiting clinical code migration to		- /
	0	gp	emis web	repeat issue	5,803
	0	gp	non-consultation data	non-consultation data	5,552
		other care	6		
	0	provider	third party consultation	third party consultation	5,505
		other care			
	0	provider	gp surgery	awaiting review	5,332
	0	an	awaiting clinical code migration to emis web	telephone call from a patient	5,282
	0	gp nurse	externally entered note	externally entered note	5,282
-	0	gp	face to face consultation	triage	5,196
	0	nurse	telephone call to relative/carer awaiting clinical code migration to	telephone call to relative/carer	5,191
	0		emis web	mail to patient	5,178
	0		non-consultation data	non-consultation data	4,933
	0	gn	e-mail received from patient	e-mail received from patient	4,877
	0	gp nurse	outbound referral	outbound referral	4,877
		nuise			
	0		medication requested	repeat issue	4,639
	0	nurse	third party consultation awaiting clinical code migration to	third party consultation	4,605
	0	nurse	emis web	results recording	4,405
	0	nuise	awaiting clinical code migration to		-,-03
	0	gp	emis web	scanned document	4,384
	0		other note	other note	4,375
			awaiting clinical code migration to		,
	0		emis web	mjog	4,221
		other care			
	0	provider	other note	other note	4,071
	0		mail to patient	mail to patient	3,924
	_	other care	awaiting clinical code migration to		
	0	provider	emis web	clinic	3,859
1	0		e-mail received from patient	e-mail received from patient	3,632

0		awaiting clinical code migration to emis web	out of hours, non practice	3,60
0	other care provider	clinic note	clinic note	3,372
		awaiting clinical code migration to		
0	gp	emis web	home visit note	3,37
0	gp	hospital outpatient report	hospital outpatient report	3,35
0	nurse	nurse telephone triage	nurse telephone triage	3,27
0	nurse	clinic note	clinic note	3,25
0	gp	awaiting clinical code migration to emis web	clinic	3,24
0	other care provider	awaiting clinical code migration to emis web	administration note	3,04
0	provider	awaiting clinical code migration to		5,04
0	gp	emis web	third party consultation	3,03
	other care	awaiting clinical code migration to		-,
0	provider	emis web	medicine management	2,82
	other care			
0	provider	telephone call to relative/carer	telephone call to relative/carer	2,80
		awaiting clinical code migration to		
0	nurse	emis web	telephone consultation	2,78
0		awaiting clinical code migration to		2 77
0		emis web	clinic	2,77
0		laboratory result	laboratory result	2,72
0	an	awaiting clinical code migration to emis web	inbound document	2,60
	gp			
0		telephone call from relative/carer	telephone call from relative/carer	2,59
0		clinic note	clinic note	2,57
0	gp	laboratory result	laboratory result	2,51
0	other care provider	repeat proceription	report issue	2,51
0	provider	repeat prescription awaiting clinical code migration to	repeat issue	2,31
0		emis web	home of patient	2,45
0		awaiting clinical code migration to	nome of patient	2,43
0	gp	emis web	out of hours, non practice	2,36
		awaiting clinical code migration to		,
0	gp	emis web	nhs direct report	2,33
		awaiting clinical code migration to		
0		emis web	results recording	2,18
0	dr	third party consultation	third party consultation	2,14
	other care	awaiting clinical code migration to		
0	provider	emis web	third party consultation	2,09
		awaiting clinical code migration to		
0	nurse	emis web	administration note	2,07
0		administration note	patientchase insert	1,85
0		clinic note	awaiting review	1,79
0		hospital inpatient report	hospital inpatient report	1,76
0		e-mail received from patient	docman	1,75
0	nurse	other note	other note	1,70
0	nurse	non-consultation data	non-consultation data	1,68
		awaiting clinical code migration to		_,00
0	gp	emis web	referral letter	1,66
0	1	laboratory result	results recording	1,62

•		awaiting clinical code migration to		4 50
 0		emis web	non-consultation data	1,53
0	gp	awaiting clinical code migration to emis web	medicine management	1,51
0	nurse	laboratory result	results recording	1,31
 -		telephone call from relative/carer	telephone call from relative/carer	
 0	nurse			1,40
0		administration note	scanned document	1,37
 0		telephone triage encounter	telephone triage encounter	1,35
 0	gp	medication requested	awaiting review	1,34
0	nurse	discussion with colleague	discussion with colleague	1,32
0		awaiting clinical code migration to		4.24
0	gp	emis web awaiting clinical code migration to	telephone triage encounter	1,31
0	nurse	emis web	telephone call to a patient	1,24
0	other care			1,29
0	provider	non-consultation data	non-consultation data	1,23
0	gp	case conference	awaiting review	1,22
Ū	- 6P	awaiting clinical code migration to		_,
0	gp	emis web	externally entered note	1,20
0		telephone call to relative/carer	telephone call to relative/carer	1,19
		awaiting clinical code migration to		· · · ·
0	nurse	emis web	third party consultation	1,17
0	gp	e-mail sent to patient	awaiting review	1,16
0	dr	administration note	administration	1,15
0	-	other note		1,15
0		administration note		1,12
0	dr	externally entered note	externally entered	1,12
 0	u	awaiting clinical code migration to		1,11
0	gp	emis web	face to face consultation	1,11
 -	other care			,
0	provider	telephone triage encounter	telephone triage encounter	1,10
0	nurse	laboratory result	laboratory result	1,06
	other care			
0	provider	outbound referral	outbound referral	1,05
0	gp	clinic note	awaiting review	1,03
	other care			
0	provider	mail to patient	patientchase insert	1,01
0	gp	repeat prescription	awaiting review	1,00
		awaiting clinical code migration to		
 0	gp	emis web	data transferred from other system	98
•		awaiting clinical code migration to		
 0		emis web	non-consultation medication data	98
0	gn	awaiting clinical code migration to emis web	nursing home visit note	97
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 0	gp	repeat prescription awaiting clinical code migration to	repeat issue	96
0		emis web	telephone call to a patient	90
0	dr			88
 0		awaiting clinical code migration to		80
0	nurse	emis web	face to face consultation	85
	other care			
0	provider	hospital outpatient report	hospital outpatient report	82
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0		awaiting clinical code migration to emis web	gp2gp import	822
0		awaiting clinical code migration to emis web	letter from outpatients	809
0	other care provider	mail to patient	mail to patient	802
0	other care			789
0	provider	telephone call from relative/carer awaiting clinical code migration to	telephone call from relative/carer	/03
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0		awaiting clinical code migration to emis web	referral letter	75
0	other care	awaiting clinical code migration to		75
0	provider	emis web	inbound document	71
0		e-mail sent to patient	awaiting review	71
0	gp	hospital inpatient report	hospital inpatient report	71
0	nurse	awaiting clinical code migration to emis web	repeat issue	694
0	Thurse	awaiting clinical code migration to		09
0	gp	emis web	acute visit	69
		awaiting clinical code migration to		
0	gp	emis web	telephone call to relative/carer	68
0		non-consultation medication data	repeat issue	67
		awaiting clinical code migration to		
0	nurse	emis web	home visit note	67
0	other care			
0	provider	discussion with colleague	discussion with colleague	66
0		administration note	docman	66
0	gp	other note		66
0		awaiting clinical code migration to emis web	telephone consultation	65
	other care	awaiting clinical code migration to		
0	provider	emis web	scanned document	64
0		ooh report	third party consultation	63
0	gp	scanned document	externally entered	61
0	gp	medication requested	repeat issue	60
		awaiting clinical code migration to		
0	nurse	emis web	telephone triage encounter	60
0	other care provider	awaiting clinical code migration to emis web	telephone call to a patient	54
0	other care	awaiting clinical code migration to		54
0	provider	emis web	face to face consultation	53
0	dr	administration note	administration note	52
0	gp	discussion with other professional	awaiting review	51
0		administration note	awaiting review	50
0	gp other care	awaiting clinical code migration to		50
0	provider	emis web	mail to patient	50
0		ooh report	awaiting review	50
		awaiting clinical code migration to		
0	dr	emis web	gp surgery	50
0		walk-in clinic		49
0		administration note	inbound document	49
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5	0	gp	ooh report	out of hours, non practice	478
6	0	gp	mail from patient	mail from patient	473
8	0		other note	awaiting review	472
9			awaiting clinical code migration to		
10	0	gp	emis web	enterprise consultation	458
11	0	other care			455
12	0	provider	repeat prescription awaiting clinical code migration to	awaiting review	455
13 14	0	gp	emis web	discussion with colleague	451
15			awaiting clinical code migration to		
16	0		emis web	outbound referral	450
17			awaiting clinical code migration to		
18	0	gp	emis web	nursing home	447
19	0	dr	awaiting clinical code migration to emis web	awaiting review	444
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22	0	nurse	awaiting clinical code migration to	e-mail received from patient	445
23	0		emis web	data transferred from other system	442
24	0	nurse	ooh report	awaiting review	439
25	0	indise	administration note	awaiting review	436
26		other care			-30
27 28	0	provider	clinic note	awaiting review	431
20	0	gp	administration note		415
30	0	gp	administration note	scanned document	414
31			awaiting clinical code migration to		
32	0	gp	emis web	urgent consultation	404
33 34	0	other care	awaiting clinical code migration to	automolily entered note	205
34	0	provider	emis web awaiting clinical code migration to	externally entered note	385
36	0		emis web	school	384
37	0	nurse	hospital outpatient report	hospital outpatient report	380
38	0		mail to patient	patientchase insert	377
39	U		awaiting clinical code migration to		
40	0		emis web	telephone encounter	376
41	0	gp	administration note	results recording	372
43	0		discussion with colleague	discussion with colleague	368
44		other care	awaiting clinical code migration to		
45	0	provider	emis web	results recording	365
46	0		case conference	awaiting review	361
47 48	0	other care	awaiting clinical code migration to	to be the second second to the second	250
40	0	provider other care	emis web awaiting clinical code migration to	telephone consultation	350
50	0	provider	emis web	patientchase insert	345
51	0	p	sms text message sent to patient	patientchase insert	345
52	0	nurse	mail to patient	mail to patient	342
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0	provider	emis web	non-consultation data	306
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0	provider	e-mail received from patient	e-mail received from patient	292
0	other care provider	awaiting clinical code migration to emis web	non-consultation medication data	289
0	nurse	clinic note	awaiting review	286
0	dr	scanned document	scanned document	285
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0	gp	emis web	discharge details	281
0		home visit note	home of patient	277
0	nurse	awaiting clinical code migration to emis web	inbound document	276
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0	provider	hospital inpatient report	hospital inpatient report	275
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0	gp	awaiting clinical code migration to emis web	residential home visit note	266
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0	provider	administration note	awaiting review	265
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0	dr	hospital outpatient report	hospital outpatient report	256
0	gp	awaiting clinical code migration to emis web	mail to patient	249
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0		mail from patient	mail from patient	248
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0		emis web	discharge details	244
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0	nurse	emis web	mail to patient	243
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0	provider	emis web	home visit note	236
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0	dr	inbound document	inbound document	234
0	gp	awaiting clinical code migration to emis web	other note	230
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0	gp	emis web	patientchase insert	229
0	dr	awaiting clinical code migration to emis web	administration note	225
		awaiting clinical code migration to		
	1	emis web	open door surgery	222

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20 21	-				
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27	•	other care	awaiting clinical code migration to		100
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33	0	gp	emis web	clinic note	176
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35	0	provider	emis web	mjog	175
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45	0	nurse	emis web	outbound referral	159
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47	0	provider	ooh report awaiting clinical code migration to	awaiting review	156
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51		other care			
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54			awaiting clinical code migration to		
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59	0		awaiting clinical code migration to	anon door surgery	1 1 4
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	0	nurse	face to face consultation	triage	104
	-	other care	awaiting clinical code migration to		
	0	provider	emis web	acute visit	102
			awaiting clinical code migration to		
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	0	nurse	mail from patient	mail from patient	98
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	0	provider	hospital outpatient report	hospital	97
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	0	dr	emis web	nursing home visit note	96
	0		nurse telephone triage	nurse telephone triage	94
	0	nurse	hospital inpatient report	hospital inpatient report	93
		other care			
	0	provider	case conference	awaiting review	92
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17	0	provider	emis web	telephone encounter	69
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19	0	other care	awaiting clinical code migration to	tolophone call to relative (correr	CE
20	0	provider	emis web awaiting clinical code migration to	telephone call to relative/carer	65
21	0	dr	emis web	repeat issue	64
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24 25	0	provider	emis web	telephone call from a patient	64
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28	0	other care	awaiting clinical code migration to		01
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31	0	gp	non-consultation data	data transferred from other system	57
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54 35	0	gp	outbound referral	referral letter	55
36		other care			
37	0	provider	repeat prescription	medicine management	55
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40			awaiting clinical code migration to		
41	0		emis web	telephone call from relative/carer	54
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47			awaiting clinical code migration to		
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7		other care			
8	0	provider	laboratory result	results recording	30
9	0		awaiting clinical code migration to emis web	casualty attendance	30
10	0		extended hours consultation	nhs direct report	30
11	0	purco	administration note	awaiting review	29
12	0	nurse	awaiting clinical code migration to	awaiting review	29
13 14	0	nurse	emis web	letter from outpatients	29
15			awaiting clinical code migration to		
16	0	nurse	emis web	open door surgery	29
17	0	nurse	discussion with other professional	awaiting review	29
18	0	nurse	ooh report	out of hours, non practice	29
19 20	0		face to face consultation	treatment room	29
20 21	0	gp	email received from carer	awaiting review	28
22		other care	awaiting clinical code migration to		
23	0	provider	emis web	telephone triage encounter	28
24	0		administration note	touchscreen	28
25			awaiting clinical code migration to		
26	0	nurse	emis web	encompass message	27
27			awaiting clinical code migration to		27
28 29	0	nurse	emis web	nursing home	27
29 30	0		third party consultation	out of hours, non practice	27
31	0	gp	awaiting clinical code migration to emis web	follow-up/routine visit	26
32	0	other care			20
33	0	provider	emergency consultation	accident & emergency	26
34	0	gp	hospital outpatient report	nhs direct report	25
35		other care	awaiting clinical code migration to		
36 27	0	provider	emis web	telephone call from relative/carer	23
37 38		other care			
39	0	provider	outbound referral	referral letter	23
40	0		externally entered note	scanned document	23
41			multidisciplinary team meeting		
42	0	nurse	without patient	awaiting review	22
43	0		other consultation medium used	data transferred from other system	22
44	0	dr	awaiting clinical code migration to emis web	outbound referral	21
45 46			seen in influenza vaccination clinic		
40 47	0	gp	awaiting clinical code migration to	awaiting review	21
48	0	nurse	emis web	other note	21
49	0		ooh report	nhs direct report	21
50			awaiting clinical code migration to		
51	0	dr	emis web	inbound document	20
52			awaiting clinical code migration to		
53 54	0	gp	emis web	day case report	20
54 55			seen by general practitioner with		
56		other care	special interest in ear nose and		20
57	0	provider	throat disorders	data transferred from other system	20
		1	emergency consultation	accident & emergency	20
58	0		awaiting clinical code migration to	1	
58 59 60	0	gp	awaiting clinical code migration to emis web	online services message	19

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0	gp	hospital outpatient report	third party consultation	19
0	nurse	repeat prescription	awaiting review	19
0		awaiting clinical code migration to emis web	walk in centre	19
0	dr	hospital inpatient report	hospital inpatient report	18
	other care	awaiting clinical code migration to		
0	provider	emis web	residential home visit note	18
	other care			
0	provider	walk-in clinic		18
0		awaiting clinical code migration to emis web	residential home visit note	18
		awaiting clinical code migration to		
0		emis web	telephone triage encounter	18
0	dr	outbound referral	outbound referral	17
0	gp	ooh report	third party consultation	17
0	gp	other consultation medium used	nhs direct report	17
0	gp	radiology result	awaiting review	17
0	gp	telephone consultation	telephone call from relative/carer	17
	other care	awaiting clinical code migration to		
0	provider	emis web	enterprise consultation	17
	other care			
0	provider	walk-in clinic	walk in centre	17
0		administration note	referral letter	17
0	dr	other note	other note	16
	other care	awaiting clinical code migration to		
0	provider	emis web	nursing home visit note	16
0	dr	medication requested	repeat issue	15
0	other care provider	administration note	inbound document	15
	other care	awaiting clinical code migration to		
0	provider	emis web	out of hours, non practice	15
0		non-consultation data	data transferred from other system	15
	other care			
0	provider	face to face consultation	triage	15
		awaiting clinical code migration to		
0	dr	emis web	telephone call to a patient	14
0	dr	externally entered note	externally entered note	14
0	gp	hospital inpatient report	discharge details	14
		seen by general practitioner with		
		special interest in ear nose and		
0	gp	throat disorders	data transferred from other system	14
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U		awaiting clinical code migration to		¥T
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0		externally entered note		14
0	dr	telephone call to relative/carer	telephone call to relative/carer	13
y	-	awaiting clinical code migration to		
0	nurse	emis web	nhs direct report	13
		awaiting clinical code migration to		
0	nurse	emis web	out of hours, non practice	13
0		hospital inpatient note	awaiting review	13

2 3		I			
4	0		repeat prescription	awaiting review	13
5	0	gp	other note	encompass message	12
6			awaiting clinical code migration to		12
7	0	nurse	emis web	hospital outpatient report	12
8	0	other care provider	awaiting clinical code migration to emis web	accident & emergency	12
9	0	nurse	other note	encompass message	11
10					
11 12	0	nurse other care	repeat prescription	repeat issue	11
13	0	provider	seen in influenza vaccination clinic	awaiting review	11
14		P	awaiting clinical code migration to		
15	0		emis web	discussion with colleague	11
16			awaiting clinical code migration to		
17	0		emis web	hospital outpatient consultation	11
18 19	0		awaiting clinical code migration to emis web	walk-in clinic	11
20	0		non-consultation medication data	medicine management	11
21			provision of general practitioner		
22	0		intermediate care	awaiting review	10
23 24	0	dr	clinic note	awaiting review	< 10
25		other care			
26	0	provider	ooh report	out of hours centre	< 10
27	0		administration note	non-consultation data	< 10
28	0		clinic note	nhs direct report	< 10
29	0		telephone follow-up	awaiting review	< 10
30	0	gp	administration note	clinic note	< 10
31 32	0	gp	progress report	awaiting review	< 10
33			awaiting clinical code migration to		
34	0	nurse	emis web	acute visit	< 10
35		other care	multidisciplinary team meeting		10
36	0	provider	without patient	awaiting review	< 10
37	0		administration note	other note	< 10
38	0	dr	awaiting clinical code migration to emis web	home visit note	< 10
39 40	-				
40 41	0	gp	hospital inpatient note	day case report	< 10
42	0	gp	inbound document awaiting clinical code migration to	discharge details	< 10
43	0	nurse	emis web	follow-up/routine visit	< 10
44		other care	awaiting clinical code migration to		
45	0	provider	emis web	discharge details	< 10
46			awaiting clinical code migration to		
47 48	0		emis web	enterprise consultation	< 10
49	0		awaiting clinical code migration to emis web	nursing home visit note	< 10
50	0		email received from carer	awaiting review	< 10
51 52	0		ooh report	out of hours, practice	< 10
52 53	0		other note	data transferred from other system	< 10
54	0		outbound referral	referral letter	< 10
55	0		radiology result	awaiting review	< 10
56	0	dr			
57			gp surgery	awaiting review	< 10
58	0	gp	routine consultation	repeat issue	< 10
59 60	0	nurse	email received from carer	awaiting review	< 10
00	0	nurse	non-consultation data	data transferred from other system	< 10

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0	nurse	scanned document	docman	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	home of patient	< 10
	other care			
0	provider	hospital outpatient report	letter from outpatients	< 10
0	dr	discussion with colleague	discussion with colleague	< 10
0	gp	administration note	discussion with colleague	< 10
		awaiting clinical code migration to		
0	gp	emis web	out of hours, practice	< 10
0	gp	clinic note	out of hours, non practice	< 10
0	gp	ooh report	out of hours, practice	< 10
0	gp	seen in diabetic clinic	awaiting review	< 10
0	gp	sms text message sent to patient	awaiting review	< 10
0	nurse	administration note	discussion with colleague	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	nursing home	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	online services message	< 10
		awaiting clinical code migration to		
0		emis web	bulk operation	< 10
0		non-consultation data	touchscreen	< 10
0	al.a	awaiting clinical code migration to		. 40
0	dr	emis web awaiting clinical code migration to	hospital outpatient report	< 1(
0	dr	emis web	other	< 10
•		awaiting clinical code migration to		. 10
0	dr	emis web	third party consultation	< 10
0	dr	clinic note	clinic note	< 10
0	dr	non-consultation data	non-consultation data	< 10
<u> </u>		awaiting clinical code migration to		. 10
0	gp	emis web	hospital inpatient report	< 10
0	gp	clinic note	community clinic	< 10
0	nurse	administration note	non-consultation data	< 10
_		awaiting clinical code migration to		-
0	nurse	emis web	non-consultation medication data	< 10
	other care			
0	provider	externally entered note	data transferred from other system	< 10
	other care			
0	provider	gp surgery		< 10
0	other care	ath an easter	no formal lattan	. 10
0	provider	other note awaiting clinical code migration to	referral letter	< 10
0		emis web	nurseries/playgroup	< 10
0		hospital outpatient report	third party consultation	< 10
-				
0	gp	nurse telephone triage awaiting clinical code migration to	nurse telephone triage	< 10
0	dr	emis web	discussion with colleague	< 10
0		awaiting clinical code migration to		11
0	dr	emis web	medicine management	< 10
5	-	awaiting clinical code migration to		. 10
0	dr	emis web	residential home visit note	< 10
0	dr	e-mail received from patient	e-mail received from patient	< 10
		- <u>'</u>	· · · · · ·	

	0	gp	awaiting clinical code migration to emis web	walk-in centre	< 10
-	0	gp	extended hours consultation	out of hours, non practice	< 10
-	0		externally entered note		< 10
	0	gp	other consultation medium used	other note	< 10
-		gp			
5 –	0	gp	telephone consultation awaiting clinical code migration to	telephone call to relative/carer	< 10
1	0	nurse	emis web	telephone encounter	< 10
2	0	nurse	medication requested	awaiting review	< 10
3	0	nurse	telephone follow-up	awaiting review	< 10
4 - 5 -		other care	awaiting clinical code migration to		
5	0	provider	emis web	e-mail received from patient	< 10
7		other care	awaiting clinical code migration to		
3 –	0	provider	emis web	mail from patient	< 10
9	0	other care provider	awaiting clinical code migration to emis web	out of hours, practice	< 10
ך כ	0	other care			< 10
1	0	provider	other note	data transferred from other system	< 10
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3 4 —	0		emis web	day case report	< 10
5			awaiting clinical code migration to		
5 –	0		emis web	encompass message	< 10
7	0		e-mail encounter to carer	awaiting review	< 10
3	0		walk-in clinic	walk in centre	< 10
9			awaiting clinical code migration to		
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2	0	dr	emis web	other note	< 10
3 4	0	dr	e-mail sent to patient	awaiting review	< 10
5 –	0	gp	email received from third party	awaiting review	< 10
5	0	gp	hospital inpatient note	awaiting review	< 10
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3	0	gp	other note	third party consultation	< 10
9	0	gp	telephone encounter	telephone call to relative/carer	< 10
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	0	nurse	administration note	referral letter	< 10
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23 455 73	0 0 0	nurse nurse nurse	awaiting clinical code migration to emis web seen in asthma clinic	referral letter urgent consultation awaiting review	< 10 < 10
23 455 55 76666666 _	0 0 0	nurse nurse nurse nurse nurse	awaiting clinical code migration to emis webseen in asthma clinicseen in hospital ward	referral letter urgent consultation awaiting review awaiting review	< 10 < 10 < 10
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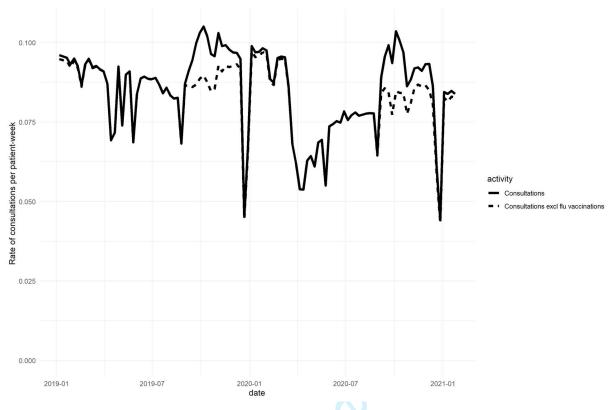
C	other care provider	awaiting clinical code migration to emis web	encompass message	< 1
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C	provider	seen in diabetic clinic	awaiting review	< 1
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		awaiting clinical code migration to		
C	gp	emis web	walk-in clinic	< 2
C	gp	non-consultation medication data	non-consultation medication data	< 1
C		other consultation medium used	referral letter	< 1
C		other note	non-consultation data	< 1
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0		seen in baby clinic	awaiting review	<1
0	81	telephone encounter	telephone call from relative/carer	<1
0		administration note	clinic note	< 1
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C	nurse	emis web	patientchase insert	< 1
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0		extended hours consultation	out of hours, non practice	
C		externally entered note	data transferred from other system	< 2
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C	nurse	hospital inpatient note	awaiting review	< 1
C	nurse	ooh report	out of hours, practice	< 1
C	nurse	other consultation medium used	data transferred from other system	< 2
C	nurse	other note	data transferred from other system	< 2
C	nurse	other note	referral letter	< 1
C	nurse	outbound referral	referral letter	< 2
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Annex 3: a list of terms excluded to help identify true vaccinations in the data

Figure A3.1 Consultation rates including and excluding influenza vaccine in CPRD Aurum data, 01 Jan 2019 – 30 Jan 2021



A list of terms excluded to help identify flu vaccinations in the data

We excluded observations in the data that the data provider identified as relating to vaccines. We then searched for the words flu and influenza in the medical term and excluded those that also contained the following words:

Letter, decline, consent, needs, request, missed, invite, needed, required, status, immunity, immune, advised, due, contact tracing, required, education, booked, up to date, did not attend, contraindicated, not indicated, invitation, history of, can be, indication, has flu vaccination at, reason for, other healthcare provider, given by pharmacist, recommend.

Annex 4: NHS targets for cancer wait times

		0	perational standard		
Maximum two	Receipt of urgent referral for suspected cancer to first outpatient atte	ndance	93%		
weeks from	Receipt of referral of any patient with breast symptoms (where cancer not suspected) to first hospital assessment				
Maximum 28 days from	Receipt of two week wait referral for suspected cancer, receipt of urg a cancer screening programme (breast, bowel, cervical), and receipt o referral of any patient with breast symptoms (where cancer not suspe date the patient is informed of a diagnosis or ruling out of cancer	f two week wa			
	Decision to treat to first definitive treatment		96%		
Maximum one month (31 days)	Decision to treat/earliest clinically appropriate date to start of second or subsequent treatment(s) for all cancer patients including	surgery drug	94%		
from:	those diagnosed with a recurrence where the subsequent treatment is:	treatment radiotherapy	98% / 94%		
Maximum two	Urgent referral for suspected cancer to first treatment (62-day classic		85%		
months (62 days) from:	Urgent referral from a NHS Cancer Screening Programme (breast, cerv for suspected cancer to first treatment	vical or bowel)	90%		

Annex 5: Patient demographics and person-time and total numbers of observed activity in CPRD Aurum sample

Table A5.1: Patient demographics in CPRD Aurum sample as at 22 March 2020

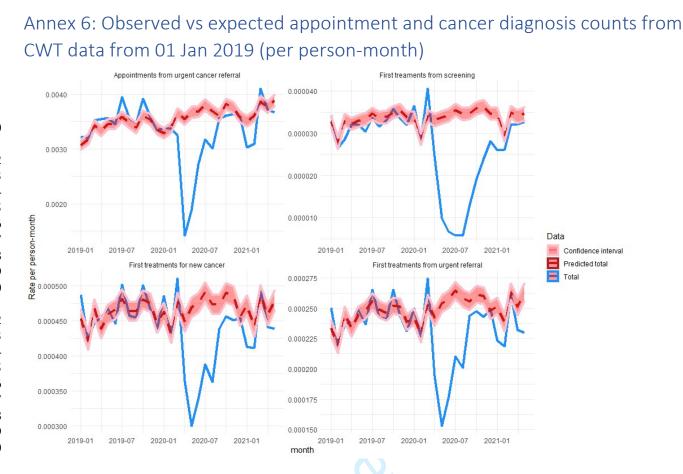
	Patient count as at 22 I	
	n	%
All	375,501	
Female	187,509	49.9%
Male	187,992	50.1%
Under 11	39,611	10.5%
11 to 19	43,406	11.6%
20 to 49	157,962	42.1%
50 to 69	87,482	23.3%
70 and older	47,040	12.5%
IMD Quintile - 1	78,759	21.0%
IMD Quintile - 2	73,046	19.5%
IMD Quintile - 3	71,840	19.1%
IMD Quintile - 4	77,545	20.7%
IMD Quintile - 5 IMD not	74,020	19.7%
recorded	291	0.1%

Table A5.2: Person time (weeks) and total primary care activity analysed - CPRD Aurum

4 5		3 January 2016	5 - 21March 2	2020*		22 March 202	20 - 29 Janu	ary 2021	
5 6 7		Patient-time (weeks)	100,000 person- months	Activity count	Observed rate per 100,000 person-months	Patient- time (weeks)	100,000 person- months	Activity count	Observed rate per 100,000 person-months
8 9 0	Consultations excl flu vaccinations	78,868,977	185.03	6,703,553	36,230	16,701,707	38.07	1,247,981	32,779
1	Routine Referrals	78,868,977	185.03	312,422	1,688	16,701,707	38.07	40,744	1,070
2 3	2 Week Wait Referrals	78,868,977	185.03	38,905	210.3	16,701,707	38.07	10,235	268.8

*The pre-pandemic period consists of 220 weeks and 51.61 months, the post pandemic period is 45 weeks and 10.26 months





Annex 7: Comparing Cancer Wait Times counts for referrals and first treatments with the NCRAS data equity pack

CADEAS and NCRAS have produced two equity data packs presenting the latest national data on the number of urgent suspected two-week wait referrals and first definitive treatments for cancer. These data packs are produced on the basis of the Cancer Wait Times data, with analysis from Hospital Episode Statistics (HES) and other sources outlined in their technical notes.

"Any differences between treatment volumes in the published official statistics and the volumes presented in this pack are because:

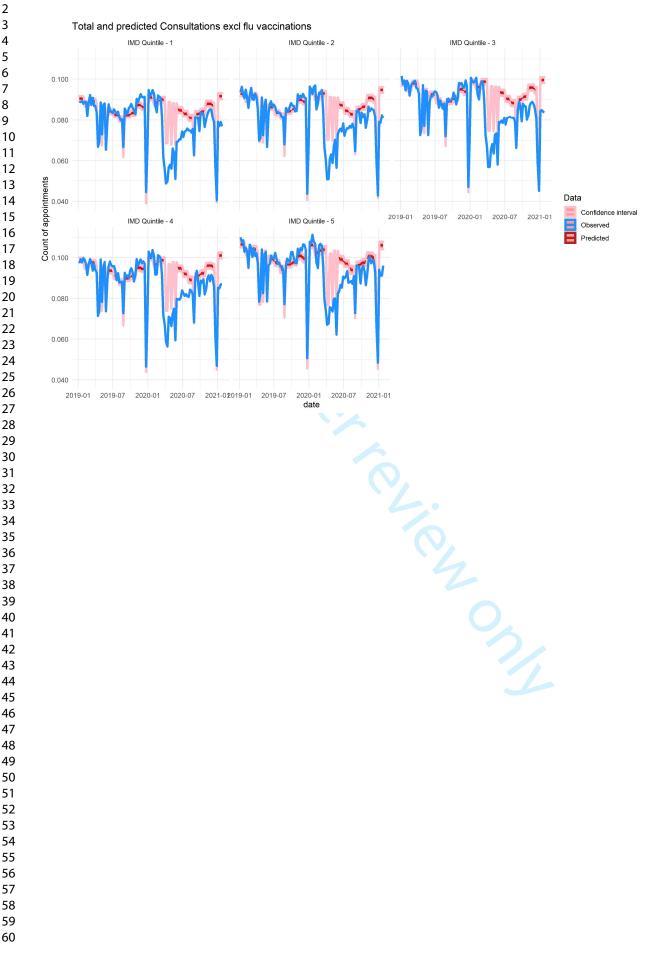
Data was extracted from the CWT system at a slightly different time.

- Data included here is based on England residents only.

Additional logic has been applied to remove treatments where some of the information required for this equity analysis is missing or there are potential data quality issues, for example cases with a mismatch between the suspected cancer referral type and sex (eg. gynaecological cancer treatments for men, testicular cancer treatments for women), and suspected cancer referral type and age (eg. suspected children's cancer for patients aged 20 and over)." – NCRAS Cancer data equity pack technical notes. Available: <u>http://www.ncin.org.uk/local_cancer_intelligence/cadeas</u>

		•	- 31 Jan 2021					
		First treatme	ents for new ca		Urgent cancer referrals			
		Observed	Expected	Percentage change (95% CI)	Observed	Expected	Percentage change (95 CI)	
Canc	er wait times data							
	All	224,323	267,946	-16.3% (-16.6, -15.9)	1,673,775	2,071,967	-19.2% (-19.3, -19.1)	
NCR/ pack	AS data equity							
	All	219,410	254,436	-13.8% (-14.3, -13.3)	1,658,309	1,984,489	-16.4% (-16.6, -16.3)	
	Breast	30,488	40,530	-24.8% (-25.9, -23.6)	337,582	363,139	-7% (-7.5, -6.6)	
	Gynaecological	11,281	12,344	-8.6% (-10.9, -6.2)	158,723	176,985	-10.3% (-10.9, -9.7)	
	Head and Neck	8,892	9,901	-10.2% (-12.7, -7.6)	163,668	189,837	-13.8% (-14.4, -13.2)	
	Lower GI	23,507	27,056	-13.1% (-14.6, -11.6)	302,369	366,677	-17.5% (-17.9, -17.1)	
	Lung	24,796	27,409	-9.5% (-11.1, -8.0)	33,830	53,641	-36.9% (-37.8, -36.1)	
	Skin	40,977	43,475	-5.7% (-7.0, -4.5)	338,172	429,802	-21.3% (-21.7, -21.0)	
	Upper GI	17,059	17,586	-3% (-5.0, -0.9)	141,720	163,013	-13.1% (-13.7, -12.4)	
	Urological	37,970	50,056	-24.1% (-25.2, -23.1)	134,389	184,642	-27.2% (-27.7, -26.7)	
	All other	24,441	26,080	-6.3% (-7.9, -4.6)	47,856	56,753	-15.7% (-16.7, -14.6)	

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Pag No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or	2
		the abstract	
		(b) Provide in the abstract an informative and balanced summary of what	2
		was done and what was found	
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of	4
	, C	recruitment, exposure, follow-up, and data collection	
Participants	6	(a) Cohort study—Give the eligibility criteria, and the sources and	4
	0	methods of selection of participants. Describe methods of follow-up	.
		<i>Case-control study</i> —Give the eligibility criteria, and the sources and	
		methods of case ascertainment and control selection. Give the rationale	
		for the choice of cases and controls	
		<i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and	
		methods of selection of participants	
		(b) Cohort study—For matched studies, give matching criteria and	
		number of exposed and unexposed	
		<i>Case-control study</i> —For matched studies, give matching criteria and the	
		number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders,	4/5
		and effect modifiers. Give diagnostic criteria, if applicable	
Data sources/	8*	For each variable of interest, give sources of data and details of methods	4/5
measurement		of assessment (measurement). Describe comparability of assessment	
		methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	5/6
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If	4-6
		applicable, describe which groupings were chosen and why	
Statistical methods	12	(<i>a</i>) Describe all statistical methods, including those used to control for	5/6
		confounding	
		(b) Describe any methods used to examine subgroups and interactions	5/6
		(c) Explain how missing data were addressed	4-6
		(<i>d</i>) Cohort study—If applicable, explain how loss to follow-up was	N/2
		addressed	
		<i>Case-control study</i> —If applicable, explain how matching of cases and	
		controls was addressed	
		controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	

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Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially	4/5
		eligible, examined for eligibility, confirmed eligible, included in the study,	
		completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and	6-8
data		information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of interest	6-8
		(c) Cohort study—Summarise follow-up time (eg, average and total amount)	N/A
Outcome data	15*	Cohort study-Report numbers of outcome events or summary measures over time	6/7
		Case-control study—Report numbers in each exposure category, or summary	N/A
		measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	N/A
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and	6-8
		their precision (eg, 95% confidence interval). Make clear which confounders were	
		adjusted for and why they were included	
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a	N/A
		meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and	6-8
		sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or	9/10
		imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations,	10
		multiplicity of analyses, results from similar studies, and other relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	9/10
Other informati	on	0	
Funding	22	Give the source of funding and the role of the funders for the present study and, if	1
÷		applicable, for the original study on which the present article is based	

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Primary Care and Cancer: an analysis of the impact and inequalities of the COVID-19 pandemic on patient pathways

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Primary Subject Heading :	Oncology
Secondary Subject Heading:	General practice / Family practice
Keywords:	ONCOLOGY, PRIMARY CARE, COVID-19





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1 2	Primary Care and Cancer: an analysis of the impact and inequalities of the COVID-19 pandemic on patient pathways
3 4	Authors: Toby Watt ^{1,2} , Richard Sullivan ³ and Ajay Aggarwal ⁴
5 6 7 8 9 10 11 12 13 14	 The Health Foundation, 8 Salisbury Sq., London, UK, Department of Public Health, Environments and Society, London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London, UK School of Cancer and Pharmaceutical Sciences, King's College London, London, UK; Institute of Cancer Policy, King's College London, London, UK; Department of Oncology, Guy's and St Thomas' NHS Foundation Trust, London, UK. Department of Health Services Research and Policy, London School of Hygiene & Tropical Medicine, London, UK; Institute of Cancer Policy, King's College London, London, UK; Department of Oncology, Guy's and St Thomas' NHS Foundation Trust, London, UK.
15 16 17 18	Corresponding author: Toby Watt, toby.watt@health.org.uk Word count: 4,584
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1	Abstract
2 3	Objectives
4 5 6 7 8	We explore the routes to cancer diagnosis to further undertanding of the inequality in the reduction in detection of new cancers since the start of the pandemic. We use different data sets to assess stages in the cancer pathway: primary care data for primary care consultations, routine and urgent referrals and published analysis of cancer registry data for appointments and first treatments.
9 10	Setting
11 12	Primary and cancer care
13 14	Participants
15 16 17 18 19 20	In this study we combine multiple data sets to perform a population-based cohort study on different areas of the cancer pathway. For primary care analysis, we use a random sample of 500,000 patients from the Clinical Practice Research Datalink (CPRD). Post-referral we perform a secondary data analysis on the Cancer Wait Times data and the National Cancer Registry Analysis Service (NCRAS) COVID-19 data equity pack.
21	Outcome measures:
22 23 24 25 26	Primary care: consultation, urgent cancer referral and routine referral rates, then appointments following an urgent cancer referral, and first treatments for new cancer, for all and by quintile of patient's local area Index of Multiple Deprivation.
27	Results
28 29 30 31 32 33 34	Primary care contacts and urgent cancer referrals fell by 12.4% (12.3 to 12.6; 95% CI) and 20.2% (18.1 to 22.3; 95% CI) respectively, while routine referrals have not recovered to pre-pandemic levels. Reductions in first treatments for newly diagnosed cancers are down 16.3% (15.9 to 16.6; 95% CI). The reduction in the number of two week wait referrals and first treatments for all cancer has been largest for those living in poorer areas, despite having a smaller reduction in primary care contact.
35 36	Conclusions
37 38 39 40	Our results further evidence the strain on primary care and the presence of the inverse care law, and the dire need to address the inequalities so sharply brought into focus by the pandemic. We need to address the disconnect between the importance we place on the role of primary care and the resources we devote to it.
41 42	Key Words: Oncology, Primary Care, COVID-19
43 44	Strengths and Limitations
45 46 47 48 49 50 51 52 53 54 55 56 57 58	 This study draws from multiple data sets along the complex, multidisciplinary cancer pathway. We use a rich primary care data set containing patient level primary care activity linked to patients' local area socioeconomic indicator. Our primary care patient sample is relatively small (500,000 active patients from January 2016 to January 2021), however the data produces results that closely mirror the rates of consultation and urgent cancer referral per patient produced in publicly available national data sets.
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INTRODUCTION

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The COVID-19 pandemic has had a profound impact on UK's health system. Each part of the UK's National Health Service has been impacted in different ways, and we are still feeling many of the consequences of both the COVID-19 pandemic and the public health measures put in place to manage it (non-pharmaceutical interventions; NPI). Cancer is one of the most complicated diseases that the UK health system must manage, being responsible for over one in four UK deaths in 2019. Cancer outcomes are acutely sensitive to changes in social determinants, patient pathways and service provision. Delays in both diagnosis and treatment have significant impacts on patient outcomes(1,2). Pandemic related diagnostic delays, lack of capacity and downstream stage progression (to more advanced disease) are already being seen(3). In 10 addition, the impact of the pandemic needs to be seen in the context of an already overstretched UK cancer care system 11 12 pre-pandemic that was 'burning hot' even in normal times(4). 13

14 Primary care sits at the heart of the cancer patient pathway and is the most crucial interface for early diagnosis and 15 referral to hospital-based care, in addition to their wider support of cancer patient undergoing and post treatment. As 16 models of cancer care have involved in light of both technical advances and an ageing co-morbid population primary 17 care has become an increasingly important aspect of integrated cancer care and an expansion of General Practitioner 18 (GP) roles in cancer care(5). On average 22.5% of patients diagnosed with cancer are referred to oncology diagnostic 19 20 services from primary care, but this reflects wide site-specific variation from as little as 8.3% of breast cancer to 42% for 21 bladder cancer(6). 22

23 It is important to reflect that prior to the start of the COVID-19 pandemic primary care had seen significant declines in 24 overall resourcing relative to the funding of the rest of the NHS and compared to growing levels of disease burden that is 25 managed in primary care. In addition, there is growing evidence that primary care has been under greater pressure in 26 more deprived areas, with higher levels of staff turnover(7), higher levels of complex multimorbidity(8), higher numbers 27 of consultations(9) and lower levels of funding and fewer GPs per capita once levels of ill health are taken into 28 29 account(10). These pressures on primary care, and a desire to correct them, have been recognised in the NHS Long Term 30 Plan(11). 31

32 Thus, to understand the COVID-19's impact on primary care and the downstream impact on cancer outcomes we need 33 to see that the pandemic arrived when the system that was already struggling to cope. Prior to COVID-19, the central 34 role of primary care as agents of change in reducing inequalities had been the subject of much debate yet could do little 35 in the face of political avoidance of health equity(12). Primary care had become a mirror on inequalities but also subject 36 37 to significant pressures from these growing inequalities that had put practices in deprived populations under significant 38 stress. Yet despite this, equity-oriented primary care reform in England in the mid-to-late 2000s may have helped to 39 reduce socioeconomic inequality in health(13). 40

[Box]

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43 COVID-19 was officially declared a pandemic by the WHO on 11 March 2020, and the UK announced its first full 44 lockdown on 23rd March. In the following months UK NPI were eased, schools reopened in phases, non-essential shops 45 reopened and in August the population were encouraged to eat out. Some restrictions were re-imposed in September 46 and October, on the 5th of November 2020 a second brief national locked lasted until 2nd December. On the 6th of 47 48 January a third national lockdown was introduced(14). 49

[End box] 50

51 It is now clear that the UK experience of the pandemic was one of the worst in the world, both in terms of excess 52 53 mortality (both COVID-19 and non-COVID-19) and the impact of NPI (lockdowns) on both the ability of health services to 54 continue provide care and the impact of messaging (stay at home) on patients' timely presentation for care(15). 55 However, the overwhelming focus of impact studies on cancer care has been on hospital-based services, including 56 diagnostics. Given primary care's central role in pathways to diagnosis and integrated cancer care, including survivorship 57 there has been little insight around how overall changes in consultation rates impacted both routine and two week wait 58 59 referrals as well as how this varied both in terms of site-specific cancers and as a consequence of socio-economic For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

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inequalities. This study aimed to analyse the socioeconomic inequalities in the impact of NPI measures taken in response to COVID-19 on consultations and routine and urgent cancer referrals in primary care and cancer diagnosis in secondary care.

METHODS

Study design, data sources and participants

We perform a population-based cohort study using the following three separate sources.

Primary care data – CPRD Aurum

Primary care electronic health records were obtained from the Clinical Practice Research Datalink Aurum database
 (henceforth CPRD). We included patient records from 01 January 2016 to 31 January 2021. Pre-pandemic data were
 included to establish long-term trends and patterns of seasonality in primary care use and referrals to secondary care.
 Similar to recent analysis of the COVID-19 pandemic(16), our analysis focusses on comparing observed levels of activity
 to the expected following the introduction of NPI in England in March 2020.

CPRD contains anonymised patient primary care data from approximately 7% of the UK population and is broadly
 representative in terms of age, sex, and ethnicity(17). The patient records include information on consultations, patient
 demographic information, diagnoses, medication prescriptions, and referrals to secondary care.

The period of eligibility for study inclusion, which starts on the latest of the study start date (01/01/2016) or the patient's registration to their practice. A patient's period of eligibility ends on the earliest of leaving their practice, the end of data collection from their practice or their death. Primary care records from CPRD were linked to the deciled index of multiple deprivation (IMD) from 2015ⁱ(18) of each patient's lower layer super output area (LSOAⁱⁱ). 500,000 patients were randomly sampled from the CPRD population in England who were eligible for linkage within the defined study period.

Cancer wait times data

Cancer waiting times (CWT) measure performance against the NHS Constitution Standards, recording the number of
 patients screened, referred to oncology specialists, diagnosed and treated for cancer. These measures are used by local
 and national organisations to monitor the timely delivery of services to patients, they are published quarterly by NHS
 Digitalⁱⁱⁱ.

Cancer diagnosis by socioeconomic status - NCRAS Cancer equity data

Data on cancer diagnosis by socioeconomic group was drawn from CADEAS and National Cancer Registry Analysis
 Service (NCRAS) which have two published data sets(19), presenting the latest national data on:

i. The number of urgent suspected two-week wait referrals^{iv} and,

- ii. First definitive treatments for cancer^v.
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51 ⁱⁱ Geographic areas in England and Wales that are built from groups of contiguous Output Areas and have been automatically 52 generated to be as consistent in population size as possible, and typically contain from four to six Output Areas. The Minimum

- population is 1000 and the mean is 1500. For more details visit:
- https://datadictionary.nhs.uk/nhs_business_definitions/lower_layer_super_output_area.html#:~:text=Lower%20Layer%20Super%2
 0Output%20Areas,statistics%20in%20England%20And%20Wales.

 <sup>49 ————
 50 &</sup>lt;sup>i</sup> https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

⁵⁶ iii https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/

⁵⁷ iv http://www.ncin.org.uk/view?rid=4346 (accessed on 24 January 2022)

^{58 &}lt;u>http://www.ncin.org.uk/view?rid=4347</u> (accessed on 24 January 2022) 59

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These data packs are produced based on the CWT data, with analysis from Hospital Episode Statistics (HES) and other sources outlined in their technical notes (further details in Annex 1).

Study Outcomes

Primary care consultations

We define consultations in CPRD data by a set of rules developed based on two variables in the consultations file^{vi} ("EMIS® consultation source identifier" and "Consultation source code identifier")^{vii}. In line with the approach taken by Carey et al 2012 for CPRD Gold data, we use a combination of the consultation code and the category of the record to identify consultations (details in Annex 2).

Using the observation file in CPRD Aurum, we were also able to identify where patients had influenza vaccinations. We look to exclude flu vaccines from our analysis on the basis that the programme was expanded in 2020/21 to achieve maximum uptake^{viii}. To help with the comparability of consultations in the two periods, we removed primary care appointments that included a flu vaccine.

<u>Referrals from primary care: routine and urgent cancer</u>

Referrals in CPRD are categorized into routine and "urgent cancer". Referrals from the 'referral file' are linked to patients, no additional data cleaning steps were taken in the analysis of referrals.

3 <u>First appointment following an urgent referral</u>

The CWT data present monthly counts of patients in England who have been recorded as receiving a first appointment following an urgent referral from primary care. The CWT data record this because the NHS have a 2-week performance target (Annex 3).

The NCRAS cancer equity data contain monthly counts in England of appointments following an urgent cancer referral
 broken down by tumour type and by deprivation according to patient's place of residence.

First treatment following a cancer diagnosis

The CWT data present monthly counts of patients in England who have been recorded as receiving a first treatment for a new cancer diagnosis. The CWT data record this because the NHS have a 31-day performance target (Annex 3).

The NCRAS cancer equity data contain monthly counts in England of first treatments for new cancer broken down by tumour type and by deprivation according to patient's place of residence.

Patient and public involvement

No patients involved

Data analysis

CPRD & CWT

For both CPRD and CWT we separate the data into two, before and after the introduction of the first NPI.

⁵⁵ vi https://cprd.com/primary-care

vii These variables contain strings that categorise the patient record input and are selected by the staff member completing the record.
record.

⁵⁸ viii <u>https://www.england.nhs.uk/wp-content/uploads/2020/05/Letter_AnnualFlu_2020-21_20200805.pdf</u>

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Our analysis of CPRD primary care is conducted weekly and split into two periods before and after the introduction of NPI on March 23rd 2020 (pre-NPI data is from 03 January 2016 to 21 March 2020, our post-NPI onset data is 22 March 2020 to 30 January 2021).

4 CWT data is reported monthly, our pre-NPI data is therefore from 01 October 2009 to 31 March 2020, our post-NPI 5 onset period is 01 April 2020 to 31 January 2021. 6

7 We perform a linear regression of consultations, urgent and routine referrals from CPRD data and appointments 8 following an urgent cancer referral and first treatments from CWT data over time to estimate expected values for the 9 10 post-NPI onset period, based on predicted values from the data pre-NPI. To account for seasonality and time trends we 11 include months as a categorical variable and time as a continuous variable, the approach taken by Carr et al. (16). In the 12 case of weekly primary care data, we observe large dips in activity in weeks that include bank holidays and include a 13 categorical variable on the basis of the number of bank holidays in each week (in the winter holidays in England there is 14 always one week with two bank holidays). Our primary care activity rates are presented per 100,000 patient-months^{ix}. 15 16 When analysing primary care consultation rates by socioeconomics we adjust for population age. We do so when 17 calculating the consultation rates by IMD quintile and weighting the sample according to the European Standard 18 Population^x (ESP). 19

20 NCRAS equity data

22 The analysis presented in the equity data pack compares new instances of first treatments in months during the 23 pandemic (01 April 2020 – 31 Jan 2021) compared with the same months in 2019/20. The analysis includes a 95% 24 confidence interval for the changes, based on rate ratios under an assumption that the population is the same in the 25 pre-COVID-19 baseline and COVID-19 months. This is calculated using the exact method described in Breslow & Day 26 27 1987, pp 93-95(20). The NCRAS equity data pack shows the high levels of heterogeneity in the impact of the COVID-19 28 pandemic on different tumour locations. The NCRAS data equity pack is different in its count and analysis of "all 29 tumours" compared with the Cancer Wait Times Data, this is because the data are slightly different (cleaned and 30 analysed by NCRAS – details in Annex 1). Results of our analysis with each data set are compared in Annex 4. Our 31 presentation of these data follows the same method but presents the cumulative difference for the period from April 32 33 2020 to the end of January compared with the previous 12 months. 34

RESULTS

37 **Overall impact of the pandemic** 38

39 In the calendar year of 2019, before the COVID-19 pandemic and the associated NPI, there was an average of 39,127 40 primary care consultations per 100,000 patient-months. This equates to 4.70 attended appointments per registered 41 patient, or an estimated 266 million appointments in primary care nationally in 2019^{xi}. 42

43 Primary care consultations (Figure 1 a) dropped rapidly to a low of 26,919 consultations per 100,000 patient-months in 44 the week following 29 March 2020, this was 66.0% lower than the predicted rate. Rates slowly recovered over the next 45 24 weeks and by 05 September 2020 were up to 99% of the baseline. In total there were an estimated 19.7 million (19.5 46 47 to 20.0; 95% CI) fewer primary care consultations in the English NHS during this period. Primary care

48 consultations again fell to below 90% of predicted levels in the third wave NPI starting on 06 January 2021, by the end of 49 January 2021 there were a further 6.4 million fewer consultations than expected. Between the start of the first NPI in 50

⁵⁴ ^{ix} We adjust the weekly rates per active patient in our sample to 100,000 patient-months: Weekly rate per registered patient in 55 sample x 100,000 x (52/12)

⁵⁶ ^x https://www.causesofdeath.org/docs/standard.pdf

⁵⁷ xⁱ For comparison the NHS national appointments data recorded 272 million attended appointments in primary care in 2019. Found 58 here: https://digital.nhs.uk/data-and-information/publications/statistical/appointments-in-general-practice/march-2021 59

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March 2020 and the end of January 2021 there were an estimated 26.1 million (25.7 to 26.5; 95% CI) fewer appointments than expected (Table 1a).

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In 2019, the average rate of urgent cancer (two week wait) referral was 314 per 100,000 patient-months, equating to an estimated 2.12 million for the NHS in England. Following the first NPI, urgent cancer referrals from primary care (Figure 1 b) fell to a nadir of 86 per 100,000 patient-months by 29 March 2020 (29.7% of the predicted level). Urgent cancer referrals did not return to pre-pandemic baseline until the week following 23 August 2020 equating to 317,000 (280,000 to 356,000; 95% CI) estimated lost urgent cancer referrals over this period. There was a second fall in urgent cancer referrals from primary care in the winter to below 90% of the baseline following the third lockdown (164 referrals per 10 100,000 patient-months in the week beginning 27 December 2021). This resulted in a further estimated 91,705 fewer 11 urgent cancer referrals than expected. Between the start of the first NPI in March 2020 and the end of January 2021 12 there were 395,000 (344,000 to 446,000; 95% CI) fewer urgent cancer referrals than expected (Table 1a). 13

15 Routine referrals however have shown a different trajectory in that their rates did not recover to pre-pandemic levels 16 (Figure 1 c). As a share of predicted levels routine referrals had the greatest fall, dropping to 16.1% of predicted rates 17 in the week from 19 April 2020. From then to the end of January the closest it came to predicted levels was 80.3% in the 18 week flowing 13 September 2020. For the four weeks in January 2021, it had fallen back down to 60-70% of predicted 19 rates. In 2019 there were an average of 1,801 routine referrals per 100,000 patient-months from primary care, 20 equivalent to an estimated 12.2 million for the NHS in England. Between the start of the first NPI in March 2020 and the 21 end of January 2021 there were 4.33 million (4.21 to 4.46; 95% CI) fewer routine referrals than expected (Table 1a). 22 23

Patient demographics and patient-time and total numbers of observed consultations and routine and urgent referrals in our CPRD sample are presented in Annex 5.

Table 1a: Observed post COVID-19 primary care activity (CPRD Aurum) 22 March 2020 – 30 January 2021

29 30 31		Observed rate	Expected rate	Percentage reduction (95% CI)	Estimated # missing from England population, to 3 significant digits (95% CI)
32	Event rate per 100,000 patient-months			x	
33					26,100,000
34	Consultations	34,201	38,684	11.6% (11.4, 11.7)	(25,700,000, 26,500,000)
35					
36					4,330,000
37	Routine Referrals	1,067	1,812	41.1% (40.4, 41.8)	(4,210,000, 4,460,000)
38					005 000
39	2 Week Wait Referrals	269	226	20.20/ (10.1.22.2)	395,000
40	2 Week Wait Referrais	268	336	20.2% (18.1, 22.3)	(344,000, 446,000)
41					
42					

Table 1b: Observed post COVID-19 cancer diagnostic activity (Cancer Wait Times), 01 April 2020 - 31 January 2021

47 48 49		Observed rate	Expected rate	Percentage reduction (95% CI)	Estimated # missing from England population, to 3 significant digits (95% CI)
50 51 52	Event rate per 100,000 patient-months First consultant appointments following urgent referral from primary care	296	366	19.2% (19.1, 19.3)	398,000 (395,000, 401,000)
53 54 55	Incidence rate per 100,000 patient-months First treatments for new cancer from the urgent primary care referral pathway	21.4	25.5	16.1% (15.5, 16.8)	23,300 (22,200, 24,400)
55 56 57	First treatments for new cancer from the national screening pathway	1.63 39.7	3.47 47.4	53.2% (52, 54.3) 16.3% (15.9, 16.6)	10,400 (10,000, 10,900) 43,600
58 59	First treatments for new cancer			, <i>,</i> ,	(42,500, 44,700)

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Table 1a summarises the missing appointments and referrals for the post-pandemic period. Since the start of the pandemic in March we have observed consultations rates that are 11.6% (11.4 to 11.7; 95% CI) lower than predicted by previous data. The number of referrals to secondary care per consultation has also fallen, with urgent cancer referrals 20.2% (18.1 to 22.3; 95% CI) and routine referrals 41.1% (40.4 to 41.8; 95% CI) lower than expected.

The knock-on effect of the reductions in patients' primary care appointments and referrals can be observed in the
national CWT data. The number of first appointments with a cancer specialist following an urgent cancer referral has
fallen by approximately the same amount as estimated for the referrals themselves: 19.2% (19.1 to 19.3; 95% Cl). The
number of cancer first treatments (following a diagnosis and decision to treat) was 16.3% (15.9 to 16.6; 95% Cl) lower
than expected, or 43,600 (42,500 to 44,700; 95% Cl) missing first treatments from 01 April 2020 - 31 January 2021^{xii}
(graphs of observed compared with expected are presented in Annex 6).

13 Urgent cancer referrals by site specific cancer from 01 April 2020 until 31 January 2021 showed significant heterogeneity 14 from moderate reductions in urgent referrals for suspected breast (7.0%; 95% CI 6.6 to 7.5) and gynaecological cancers 15 (10.3%; 95% CI 9.7 to 10.9) and greater reductions for lung (36.9%; 95% CI36.1 to 37.8) and urological (27.2%; 95% CI 16 17 26.7 to 27.7) cancers (Figure 2, further details in Annex 4, Table A4.1). To show how pathway delays interface with 18 reductions in cancer referrals we also examined reductions in first treatments for the same site-specific cancers over this 19 period (Figure 2). Breast and urological cancers observed the greatest reduction in new first treatments: Breast fell 20 by 24.8% (23.6 to 25.9; 95% CI) which equates to 10,000 missing treatments and urological by 24.1% (23.2 to 25.2; 95% 21 CI) which equates to 12,100 missing treatments. Taken together these data reflect substantial delays in both diagnostic 22 and treatment phases of the patient pathway. 23

Inequalities in cancer diagnosis outcomes in the pandemic

There are inequalities in primary care use in England, with the people who live in the poorest areas have higher rates of consultation than those in richer areas once we adjust for age. The most deprived quintile was expected to have 43,184 consultations per 100,000 patient-months (Table 2), 15% more than the least deprived.

Table 2: Observed post COVID-19 primary care activity (CPRD Aurum) by IMD quintile, actual and age-standardised

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33		22 Mar 2020 - 30 Jan 2021 (Weekly)			
34		Observed rate	Expected rate	Percentage reduction (95% CI)	
35 36	Consultations per 100,000 patient-mont	hs			
,0 87	IMD Quintile - 1 (least deprived)	33,8	313 38,601	12.4% (12.1, 12.7)	
8	IMD Quintile - 2	34,2	169 38,793	11.9% (11.6, 12.3)	
9	IMD Quintile - 3	35,0	069 40,127	12.6% (12.3, 12.9)	
0	IMD Quintile - 4	33,4	194 37,793	11.4% (11, 11.7)	
1 2	IMD Quintile - 5 (most deprived)	34,5	561 38,212	9.6% (9.2, 9.9)	
3	Consultations per 100,000 patient-mont	hs (Age-standardised*)			
4 5	IMD Quintile - 1 (least deprived)	32,9	927 37,636	5 12.5% (12.2 <i>,</i> 12.8)	
6	IMD Quintile - 2	33,9	916 38,647	12.2% (11.9, 12.6)	
7	IMD Quintile - 3	35,5	535 40,870) 13.1% (12.7, 13.4)	
8	IMD Quintile - 4	36,2	271 41,148	11.9% (11.5, 12.2)	
9	IMD Quintile - 5 (most deprived)	38,9	997 43,184	9.7% (9.4, 10)	
50	*Age-standardisation is performed according to the European Standard Population (ESP)				

*Age-standardisation is performed according to the European Standard Population (ESP)
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The reduction of consultations over the period 22 March 2020-30 January 2021 was smallest for those in most deprived areas. Their reduction in consultations for the non-age-standardised figures was 9.6% (9.2 to 9.9), while for the least

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⁵⁸ xii Dates for the CWT and NCRAS analysis do not line up with the CPRD analysis because the latter is conducted weekly, not monthly.

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deprived the reduction was 12.4% (13.2 to 13.9; 95% CI) (Table 2). Weekly levels of age-standardised consultations per 100,000 patient-months by IMD quintile are presented in Annex 7.

Despite a smaller reduction in primary care contacts, we observe the largest reduction in both urgent cancer referrals and first treatments for cancer for patients living in the most deprived areas. The NCRAS data equity pack presents the number of urgent cancer referrals and first cancer treatments by IMD quintile^{xiii}. Figure 3 shows the reduction in urgent cancer referrals and first treatments for newly diagnosed cancer by IMD quintile.

There was a greater percentage reduction in urgent cancer referrals for those living in the most deprived areas in England, who experienced a 17.6% (17.2 to 18.0; 95% CI) reduction between 01 April 2020 and 31 January 2021 compared with the same period 12 months before, while referrals for the least deprived quintile fell by proportionately less: 15.3% (14.9 to 15.6; 95% CI). This equates to a reduction of 61,500 referrals for the most deprived and 62,600 or the least: without adjusting for age, the most deprive quintile had a smaller proportion of the pre-pandemic urgent cancer referrals, with 350,000 referrals compared to 410,000 for the least deprived quintile from April 2019 to January 2020.

At the same time, rates of new treatment for cancer for the people living in the most deprived 20% of England experienced a 15.8% (14.6 to 17.0; 95% Cl) reduction between 01 April 2020 and 31 January 2021 compared with the same period 12 months before (6,610 missing first treatments). The reduction for the least deprived was 12.6% (11.5 to 13.7; 95% Cl) which equates to 6,880 missing first treatments.

Despite having more access to primary care for patients in more deprived areas (9.7% reduction for most deprived compared to 12.5% for the least deprived), urgent cancer referrals and newly diagnosed cancers have been disrupted by the pandemic more for people living in poorer areas.

DISCUSSION

The coronavirus SARS-CoV-2 (COVID-19) pandemic has had a profound impact on the management of patients with cancer(21). The first national lockdown in March 2020 created a ripple of non-pharmaceutical interventions, including 'stay at home' orders, diminished healthcare service provision and redistribution of healthcare to COVID-19 related care that has had a profound impact on cancer services(1,22).

There are also new potential barriers to the pathway that have resulted and may exacerbate these findings. For example, decreases in health seeking behaviour due to fear of acquiring covid-19 infection through interactions with health care settings, increasing use of remote consultations(23), changes in routine referral guidelines(24), as well as changes in the capacity of acute care. The backlog for routine diagnostic services is a particular concern given that approximately 40% of cancer are diagnosed through this route(25).

Similar issues have also been identified within other high-income country health systems. Primary care providers in eight European countries experienced similar issues in how to rapidly transform services in the wake to COVID-19(26). A study in Sweden found an almost identical percentage reduction in primary care consultations (12%) as a results of the pandemic(27). Our results don't appear to be unique to England: while different countries can have different routes to diagnosis(28), different countries with different systems also observed disruptions to cancer pathways(29–32).

Whilst it was already known that there had been a substantial reduction in the number of overall cancer-related referrals(30,31) the quantification of this had been missing. Our findings, that primary care consultations in English NHS fell by 12.4% between January 2020 and January 2021 with urgent cancer referrals even more suppressed (20.2%), reflect how profound the pathway disruptions were for cancer patients. Furthermore, many cancers are picked up through the course of routine referrals from general practice for non-specific symptoms. The drop in routine referrals that we found (4.3 million, over this period) will inevitably translate into late-stage presentation and a substantial

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⁵⁸ xiii They do not age-standardise their results

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reduction in outcomes. This will include wider economic costs due to more expensive, late-stage treatment and productivity losses due to morbidity and premature mortality. However, the trajectory of the declines reflect not just changes to national policy in terms of NPI, but also knock-on effects around public behaviour, primary care staffing, downstream reductions in diagnostics and an overall increase in friction across all cancer pathways and systems.

This reduction in cancer pathways through primary care needs to be put in the context of wider disruptions. The
 suspension of national cancer screening programmes meant that around 2 million people were not screened for cancer
 through national programs(32,33). Moreover, delays in cancer diagnoses and treatments have consistently been
 associated with poorer outcomes(1,2). The COVID-19 pandemic has also exacerbated the worst 62-day cancer waiting
 time targets in the last decade where 1 of 4 patients urgently referred from primary care between April 2020 and
 January 2021 did not receive treatment within 62 days(31).

13 In our analysis of urgent cancer referrals by site in relation to reductions seen in first treatments significant differences 14 were seen. Urological cancers (testis, renal, prostate and urothelial) have been particularly impacted with greater than 15 16 25% decrease both in urgent referrals and first treatments. This suggests that outcomes will be particularly impacted in 17 this group. Lung, skin and lower GI (colon and rectal) cancer also experienced significant declines in urgent referrals. 18 Breast cancer was the least impacted of all in terms of urgent referrals but experienced a 25% reduction in first 19 treatments. This highlights how much breast cancer diagnosis relies on screening programmes, which have suffered 20 badly as a result of the pandemic(31). Although it is likely that some cancer patients have already been 'lost' to the 21 22 system i.e. died of COVID-19 or other non-COVID-19 comorbidities, a significant number will now present with later 23 stage disease. 24

25 Our findings also reflect socioeconomic inequalities with more profound decrease in urgent cancer referrals and first 26 treatments for the most deprived populations, despite relatively better preservation of consultation rates. This is 27 unexpected and extremely worrying, indicating greater disruption to the diagnostic pathway for patients living in more 28 deprived areas, whose cancer outcomes were typically worse than their less deprived counterparts pre-29 30 pandemic(34,35). Resilience in primary care is key for the cancer diagnosis pathway and must be developed. We know 31 that there are challenges associated with resourcing health services in poorer areas (the inverse care law(36)), resulting 32 in fewer resources per head of sick patient(10) and shorter consultation times(37). Further research should focus on 33 understanding to what extent complex morbidity, which is greater in poorer areas(8,38), contributes to the disruption of 34 the cancer diagnostic pathway. Greater understanding would help health systems better prepare for the kind of 35 36 disruption we have seen as a result of COVID-19. 37

38 Limitations

This study uses multiple data sets to analyse a complex and disjointed pathway. We include a primary care data set that uses a relatively small (500,000) patient sample. However, the CPRD data produces results that closely mirror the rates of consultation per patient (and their reduction) produced in NHS Digital's appointments data(39). In addition, the estimated reduction in urgent cancer referrals is close to those presented in the NCRAS's analysis of their cancer registry data (Table 1a & Table 1b). It is not yet possible to link these data on a patient basis due to delays in data access and once possible further research would be illuminating.

47 48 **Conclusions**

Our data reflects a disruption to a complex interaction of several systemic issues that place a great deal of impetus on
 the role of primary care in ensuring early diagnosis of cancer. Primary care was already under strain pre-pandemic, with
 low levels of investment and workforce deficits(40). Particularly in areas of high deprivation, general practice is under funded and under staffed relative to need(7,8,10).

Early cancer diagnosis requires concordance of each participant and mechanism - including patients' awareness and
 ability to present with cancer symptoms, the ability of GPs to detect and urgently refer possible cancer cases and
 sufficient diagnostic capacity (in terms of both workforce and equipment) to enable swift referrals and minimise delays
 to diagnosis and treatment. Every one of these nodes on the pathway to early diagnosis has been affected by the
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The impact of the pandemic on cancer diagnosis and time to treatment shown here is very serious. However, what is , part une syste. une presence o. une tracer and the rest more concerning is the unequal and inequitable impact on those worst off. Cancer as a disease area "magnifies what we know to be true about the totality of the health care system. It exposes all its strengths and weaknesses"(41). Our results further evidence the strain on primary care, the presence of the inverse care law(36), and the dire need to address the inequalities so sharply brought into focus by the pandemic. We need to address the disconnect between the importance we place on the role of primary care in cancer care and the resources we devote to it.

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Figure legends:

- Figure 1: Observed vs expected primary care activity, 01 Jan 2019 – 30 January 2021 (per 100,000 patient-months) (CPRD Aurum data) Panels: a. Consultations, b. Urgent cancer (2 week wait) referrals from primary care, c. Routine
- referrals from primary care
- Figure 2: Percentage difference between observed and expected first treatments for new cancer and urgent cancer referrals by tumour location from NCRAS Cancer equity data pack (%, 01 Apr 2020 to 31 Jan 2021)
- Figure 3: Percentage difference between observed and expected urgent cancer referrals and first treatments for cancer by IMD quintile (01 Apr 2020 – 31 Jan 2021)
- **Contributors**: Data cleaning and analysis was conducted by TW. TW conceived the study with input from the coauthors and wrote the first draft. All the authors provided critical scholarly feedback on the manuscript. All the co-authors approved of the final version of the manuscript. TW and RS are the guarantors. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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Data Availability statement:

The primary care activity data may be obtained from a third party and are not publicly available. We used de-identified primary care data from the Clinical Practice Research Datalink (CPRD). For more information please visit: https://www.cprd.com/Data-access, enquiries can be emailed to enquiries@cprd.gov.uk. Scientific approval for this study was given by the CPRD Independent Scientific Advisory Committee (ISAC). The study was approved by the Independent Scientific Advisory Committee for CPRD research (20 143). The data is provided by patients and collected by the NHS as part of their care and support.

Other data sources are available in a public, open access repository: Cancer Wait Times at

https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/ and the NCRAS Cancer data equity pack is available at http://www.ncin.org.uk/local cancer intelligence/cadeas.

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Key messages

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- Primary care is key part of the pathway for early cancer diagnosis through both routine and 2ww referrals
- Cancer diagnosis rates have experienced a sustained fall since the start of the COVID-19 pandemic and introduction of nonpharmaceutical interventions (NPIs) 'lockdowns'.
- The fall in urgent cancer referral is larger than the fall in primary care contacts, implying that the content of consultations has shifted away from potential cancer diagnosis.
- Despite having a smaller reduction in primary care contact through the pandemic, patients living in poorer areas have had larger reductions in urgent cancer referrals and first treatments for new cancer.
- Government, patients and primary care staff must work together to catch up on missing diagnosis.
 - Resilience in primary care is key for the cancer diagnosis pathway and must be developed for future disruptions, particularly in poorer areas where care is more complex.

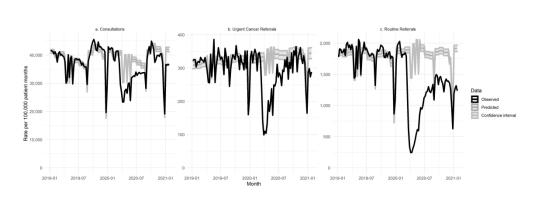
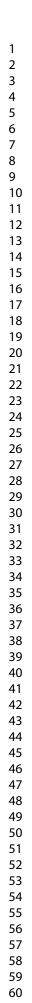


Figure 1: Observed vs expected primary care activity, 01 Jan 2019 – 30 January 2021 (per 100,000 patientmonths) (CPRD Aurum data) Panels: a. Consultations, b. Urgent cancer (2 week wait) referrals from primary care, c. Routine referrals from primary care

381x127mm (300 x 300 DPI)

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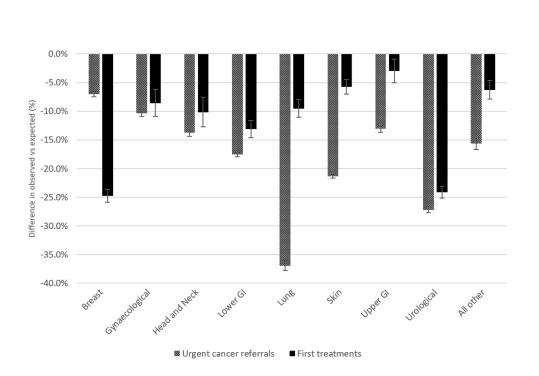


Figure 2: Percentage difference between observed and expected first treatments for new cancer and urgent cancer referrals by tumour location from NCRAS Cancer equity data pack (%, 01 Apr 2020 to 31 Jan 2021)

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Page 19 of 54	
$ 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\ 22 \\ 23 \\ 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 30 \\ 31 \\ 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ 44 \\ 45 \\ 46 \\ 47 \\ 48 \\ 49 \\ 50 \\ 51 \\ 52 \\ 53 \\ 54 \\ 55 \\ 56 \\ 57 \\ 58 \\ 59 \\ 60 $	0. -2. () 9006. -3. -10. -12. -14. -16. -20. Figure 3: Percenta

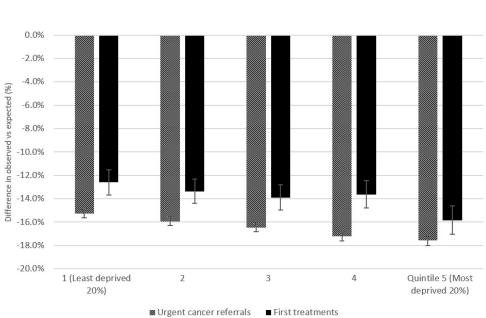
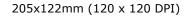


Figure 3: Percentage difference between observed and expected urgent cancer referrals and first treatments for cancer by IMD quintile (01 Apr 2020 – 31 Jan 2021)



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Annex 1: NCRAS data equity pack, technical notes

CADEAS and NCRAS have produced two equity data packs presenting the latest national data on the number of urgent suspected two-week wait referrals and first definitive treatments for cancer. These data packs are produced on the basis of the Cancer Wait Times data, with analysis from Hospital Episode Statistics (HES) and other sources outlined in their technical notes.

"Any differences between treatment volumes in the published official statistics and the volumes presented in this pack are because:

- Data was extracted from the CWT system at a slightly different time.
- Data included here is based on England residents only.

Additional logic has been applied to remove treatments where some of the information required for this equity analysis is missing or there are potential data quality issues, for example cases with a mismatch between the suspected cancer referral type and sex (eg. gynaecological cancer treatments for men, testicular cancer treatments for women), and suspected cancer referral type and age (eg. suspected children's cancer for patients aged 20 and over)." – NCRAS Cancer data equity pack technical notes, final tab within the downloaded spreadsheet. Available under "Links to data": http://www.ncin.org.uk/local cancer intelligence/cadeas as at 26/01/2022

Annex 2: Consultation definition

CPRD Aurum data dictionary sets out the structure of the data. Within the consultation file there are two variables one can use to identify whether a primary care contact, rather than an administrative note ("EMIS® consultation source identifier" and "Consultation source code identifier").

The EMIS consultation source identifier is the primary variable used. We include the following observations of this variable:

Acute visit, Casualty attendance, Clinic, Emergency appointment, Emergency consultation, Enterprise consultation, Face to face consultation, Follow-up/routine visit, Gp surgery, Home visit, Home visit note, Main surgery, Nursing home, Nursing home visit note, Online services message, Other, Residential home, Residential home visit note, Same day appointment, Surgery consultation, Telephone encounter, Urgent consultation, Walk-in centre, Walk-in clinic

We also include instances where EMIS consultation source identifier is "awaiting review" and the Consultation source code identifier is in the following list:

Consultation, visit, seen in gp unit, seen in private clinic, seen in rapid access clinic at gp surgery, seen in urgent care centre, online communication.

We then further exclude records on the basis of the category of staff responsible for the record. The "Job category" variable from the staff file, linked by the consultation id is used. We only include as a consultation records filled out by GPs, doctors, nurses and other health care professionals as defined in CPRD's numerical codes listed below:

GP-4, 5, 15, 24, 31, 181, 183

Dr - 1, 41, 91, 116, 119, 121, 126, 173, 177, 197

Nurse – 8, 9, 27, 33, 47, 48, 50, 55, 59, 60, 61, 111

Other healthcare professional - 2, 3, 6, 7, 10:14, 16, 17, 34:37, 42, 43, 52, 54, 58, 62:65, 68, 72, 73, 77, 80, 82, 83, 86:89, 94, 95, 97, 100:102, 105, 106, 112:114, 118, 122, 125, 127, 131, 135, 136, 138, 141, 142, 145, 148, 149, 154, 156, 158, 168, 185, 186, 188, 189, 204, 208

In Table A2.1 we present the CPRD Aurum Staff Category list.

In Table A2.2 we present the total number of consultations identified from 01 January 2016 to 31 January 2021, the count with each combination of staff category, "EMIS® consultation source identifier" and "Consultation source code identifier" in Table A2.2 we show the count of records that were excluded, highlighting those that were excluded on the basis of staff category, not the consultation file description variables.

2	
3	Table A2.1: CPRD Aurum Staff Job Categories
4	
5	1 Consultant
6	2 Hospital Practitioner
7	3 Clinical Medical Officer
8	4 General Medical Practitioner
9	5 Salaried General Practitioner
10	6 Midwife - Sister/Charge Nurse
11	7 Midwife
12	8 Community Practitioner
13	9 Community Nurse
14	10 Chiropodist/Podiatrist
15	11 Dietitian
16	12 Pharmacist
	13 Clinical Psychologist
17	14 Health Care Support Worker
18	15 Associate Practitioner - General Practitioner
19	16 Counsellor
20	17 Phlebotomist
21	18 Clerical Worker
22	
23	19 Manager
24	20 Analyst
25	21 System Administrator
26	22 Desktop Support Administrator
27	23 System Worker
28	24 GP Registrar
29	25 Medical Student
30	26 Other Community Health Service - Admin Clerk
31	27 Specialist Nurse Practitioner
32	28 Receptionist
33	29 Secretary
34	30 Medical Secretary
35	31 Sessional GP
36	32 Clinical Application Administrator
37	33 Nurse Consultant
38	34 Physiotherapist
	35 Specialist Practitioner
39	36 Healthcare Assistant
40	37 Medical Technical Officer - Pharmacy
41	38 Health Records Administrator
42	39 Helpdesk Administrator
43	40 Appointments Clerk
44	41 Senior House Officer
45	42 Social Worker
46	43 Trainee Practitioner
47	44 Network Technician
48	45 Clinical Coder
49	46 Medical Records Clerk
50	47 Staff Nurse
51	47 Starr Nurse 48 Enrolled Nurse
52	
53	49 Multi Therapist
54	50 Nursery Nurse
55	
56	
57	
58	
50	

51 Helper/Assistant 52 Community Mental Health Nurse 53 Senior Administrator 54 Technician - Healthcare Scientists 55 Associate Practitioner - Nurse 56 Senior Manager 57 Community Administrator 58 Associate Specialist 59 Student Practice Nurse 60 Nurse Manager 61 Sister/Charge Nurse 62 Psychotherapist 63 Osteopath 64 Social Care Support Worker 65 Assistant Psychologist 66 Officer 67 Technician - Admin & Clerical 68 Psychiatrist 69 Health Records Clerk 70 Desktop Support Technician 71 Dispenser 72 Clinical Assistant 73 Practitioner 74 Information Officer 75 Network Administrator 76 Chaplain 77 Student Physiotherapist 78 Paramedic Specialist Practitioner 79 Clinical Team Manager 80 Physiotherapist Specialist Practitioner 81 Helpdesk Technician 82 Radiographer 83 Other Community Health Service 84 Call Operator 85 Community Worker (children) 86 Paramedic Consultant 87 Associate Practitioner 88 Modern Matron 89 Asst. Clinical Medical Officer 90 Community Team Manager 91 Specialist Registrar 92 Chiropodist/Podiatrist Manager 93 Radiographer - Therapeutic, Manager 94 Optometrist 95 Assistant Practitioner 96 Community Learning Disabilities Nurse 97 Technician - Additional Clinical Services 98 Student Health Visitor 99 Interpreter

100 Medical Technical Officer

- 58 59
- 60

2 3 101 Midwife - Specialist Practitioner 4 102 Occupational Therapist 5 103 Chief Executive 6 104 Audit Manager **151 Finance Director** 7 105 Paramedic 152 Senior social worker (adults) 8 106 Physiotherapist Consultant 153 Student Midwife 9 107 Availability Monitor 154 Radiologist 10 108 Medical Laboratory Assistant 155 Ward Manager 11 109 Gateway Worker 156 Midwife - Manager 12 110 Medical Records Manager 157 Waiting List Manager 13 111 Student Nurse - Adult Branch 158 Radiographer - Diagnostic, Specialist Practitioner 14 112 Audiologist **159 Biomedical Scientist** 15 16 113 Radiographer - Diagnostic 160 Board Level Director 17 114 Therapist 161 Non Executive Director 18 115 Student District Nurse 162 Nursing Cadet 19 116 House Officer - Post Registration 163 Porter 20 117 Speech & Language Therapist 164 Social services care manager (adults) 21 **118 Dietitian Specialist Practitioner** 165 Student Psychotherapist 22 119 Trust Grade Doctor - SHO level 166 Orthoptist 23 120 Director of Public Health 167 Clinical Director - Medical 24 121 Staff Grade 168 Approved Social Worker 25 122 Patient Welfare Officer 169 Student Community Mental Health Nurse 26 123 Occupational Therapy Specialist Practitioner 170 Other Executive Director 27 124 Technician - PS&T 171 Student Orthoptist 28 125 Chiropodist/Podiatrist Consultant 172 Childcare Co-ordinator 29 126 Trust Grade Doctor - Career Grade level 173 House Officer - Pre Registration 30 174 SODP 31 127 Student Community Practitioner 32 128 Healthcare Scientist 175 Outpatient Manager 33 129 Waiting List Clerk 176 Medical Director 34 130 Clinical Director 177 Trust Grade Doctor - Specialist Registrar level 35 131 Pre-reg Pharmacist 178 Senior Clinical Medical Officer 36 132 Mental Health Act Administrator 179 Consultant Healthcare Scientist 37 133 Ward Clerk 180 Reporting Radiographer 38 134 Support, Time, Recovery Worker 181 Locum GP 39 135 Art Therapist Specialist Practitioner 182 Researcher 40 183 Assistant GP 136 Physiotherapist Manager 41 137 Healthcare Cadet 184 Special salary scale in Public Health Medicine 42 185 Advanced Practitioner 138 Dietitian Consultant 43 186 Health Visitor 139 Orthoptist Manager 44 140 Social work assistant (mental health) 187 Dental Assistant Clinical Director 45 141 Chiropodist/Podiatrist Specialist Practitioner 188 Other Community Health Service - Social Care Worker 46 47 142 Student Technician 189 Physician Assistant 48 143 Complaints Investigator 190 Deputising Doctor 49 144 Trainee Scientist 191 Student Occupational Health Nurse 50 145 Radiographer - Diagnostic, Manager 192 Senior social worker (mental health) 51 146 Social services care manager (mental health) 193 Regional Dental Officer 52 147 Dietitian Manager 194 Trainer 53 195 Cytoscreener 148 Midwife - Consultant 54 149 Art Therapist Consultant 196 Chair 55 150 Paramedic Manager 197 Trust Grade Doctor - House Officer level 56 198 Art Therapist 57 201 Healthcare Science Assistant 199 Multi Therapist Specialist Practitioner 58 202 Social work assistant (adults) 200 Drama Therapist 59 203 Social work team manager (adults) 60

- 204 Intermediate Care worker
- 205 Student Occupational Therapist
- 206 Student Dietitian
- 207 Healthcare Science Associate
- 208 Child Protection worker
- 209 Professor
- 210 General Dental Practitioner
- 211 Student School Nurse
- 212 Occupational Therapist Consultant
- 213 Intermediate Care staff
- 214 Home help
- 215 Art, Music & Drama Student
- 216 Specialist Healthcare Scientist
- 217 Social Services information manager

Table A2.2: Number of observations by EMIS® consultation source identifier, Consultation source code identifier and Staff Job Category, with an indicator for whether it was included as a consultation: Include: 1 = Include, 0 = Exclude, "Excl. job title" = Excluded on the basis of job title.

Include	Staff Job Category	Consultation source code identifier	EMIS consultation source identifier	Count
1	gp	gp surgery	gp surgery	3,119,080
1	nurse	gp surgery	gp surgery	1,692,606
1	gp	telephone consultation	telephone consultation	1,471,946
1	other care provider	gp surgery	gp surgery	977,067
1	nurse	telephone consultation	telephone consultation	196,665
1	gp	telephone call to a patient	telephone call to a patient	108,025
1	gp	home visit note	home visit note	83,600
1	other care provider	telephone consultation	telephone consultation	81,980
1	nurse	telephone call to a patient	telephone call to a patient	32,423
1	gp	face to face consultation	face to face consultation	25,435
1	nurse	home visit note	home visit note	24,174
1	other care provider	telephone call to a patient	telephone call to a patient	23,194
1	gp	gp surgery	surgery consultation	22,756

3	1	gp	nursing home visit note	nursing home visit note	21,357
5	1	nurse	face to face consultation	face to face consultation	17,580
5	1	gp	enterprise consultation	enterprise consultation	14,904
7	1	gp	telephone call from a patient	telephone call from a patient	13,062
3	1	gp	routine consultation	surgery consultation	11,668
)		other care			
0	1	provider	home visit note	home visit note	10,853
1 2	_		provision of general practitioner		
3	1	gp	intermediate care	gp surgery	10,441
4	1	gp	emergency consultation	emergency consultation	10,351
5	1	gp	residential home visit note	residential home visit note	9,579
6	1	other care provider	face to face consultation	face to face consultation	9,350
7		•			8,687
8 9	1	gp	emergency appointment	emergency appointment	
9 10	1	gp	urgent consultation	urgent consultation	8,155
1	1	gp	walk-in clinic	walk-in clinic	7,908
2	1	dr	gp surgery	gp surgery	7,654
.3	1	gp	other note	other	7,520
.4	1	gp	face to face consultation	surgery consultation	6,932
.5	1	nurse	gp surgery	surgery consultation	5,318
6 7	1	gp	seen in gp unit	surgery consultation	4,687
28	1	gp	consultation via video conference	awaiting review	4,653
9	1	nurse	enterprise consultation	enterprise consultation	4,460
0		other care	provision of general practitioner		
1	1	provider	intermediate care	gp surgery	4,369
2	1	gp	clinic note	surgery consultation	3,823
3	1	nurse	residential home visit note	residential home visit note	3,612
5	1	nurse	clinic note	clinic	3,585
6	1	nurse	nursing home visit note	nursing home visit note	3,528
7	1	nurse	face to face consultation	surgery consultation	3,442
8	1	gp	online communication	awaiting review	3,410
9	1	other care	ather pate	athor	2.400
0 1	1	provider other care	other note	other	3,406
2	1	provider	seen in gp unit	gp surgery	2,781
3	1	gp	e-mail consultation	awaiting review	2,523
4	1	nurse	other note	other	2,449
5		other care			2,443
6	1	provider	gp surgery	surgery consultation	2,334
.7		other care			
.9	1	provider	enterprise consultation	enterprise consultation	2,318
0		other care			
1 -	1	provider	telephone call from a patient	telephone call from a patient	2,211
2	1	nurse	telephone call from a patient	telephone call from a patient	2,183
3	1	gp	routine consultation	awaiting review	2,117
4	1	nurse	emergency appointment	emergency appointment	2,041
5 6	1	gp	home visit note	home visit	2,021
57 —	1	gp	seen in gp unit	gp surgery	1,896
58	-		provision of general practitioner		
i9	1	nurse	intermediate care	gp surgery	1,762

2		1	I	I	1 1
3	1	other care provider	clinic note	clinic	1,699
5	1	nurse	clinic note	surgery consultation	1,628
6	1	gp	clinic note	clinic	1,623
7	1	nurse	routine consultation	surgery consultation	1,578
8	1	nurse	seen in gp unit	surgery consultation	1,426
10	1	nurse	walk-in clinic	walk-in clinic	1,420
11	1			clinic	1,355
12	1	nurse other care	gp surgery		1,555
13	1	provider	routine consultation	other	1,303
14		other care			
15 16	1	provider	clinic note	surgery consultation	1,297
17	1	gp	face to face consultation	emergency consultation	1,292
18		other care			1.245
19	1	provider	walk-in clinic	walk-in clinic	1,216
20	1	gp	telephone encounter	telephone encounter	1,184
21 22	1	gp	online communication	online services message	1,139
22	1	gp	other consultation medium used	awaiting review	1,134
24	1	other care provider	residential home visit note	residential home visit note	1,113
25	1	nurse	seen in gp unit		1,103
26	1	other care		gp surgery	1,105
27	1	provider	nursing home visit note	nursing home visit note	1,081
28 29		other care			
30	1	•	face to face consultation	surgery consultation	1,045
31		other care			
32	1	provider	seen in gp unit	surgery consultation	1,043
33	1	nurse	emergency consultation	emergency consultation	1,024
34	1	nurse	urgent consultation	urgent consultation	959
35 36	1	gp	extended hours consultation	awaiting review	924
37	1	gp	routine consultation	other	922
38	1	gp	home visit note	other	835
39	1	gp	gp surgery	face to face consultation	808
40	1	other care provider			740
41 42	1	other care	gp surgery	clinic	746
42	1	provider	routine consultation	surgery consultation	738
44	1	gp	consultation via multimedia	awaiting review	734
45			face to face consultation with		
46	1	gp	relative/carer	awaiting review	669
47	1	nurse	e-mail consultation	awaiting review	638
48 49	1	nurse	routine consultation	awaiting review	574
50	1	nurse	consultation via video conference	awaiting review	505
51	1	nurse	routine consultation	other	478
52		other care			
53	1	provider	online communication	awaiting review	473
54	1	nurse	same day appointment	same day appointment	468
55 56	1	gp	face to face consultation	gp surgery	461
50	1	gp	same day appointment	same day appointment	457
58	1	nurse	gp surgery	face to face consultation	455
59	1	gp	telephone encounter	telephone consultation	429
60	1	nurse	face to face consultation	emergency consultation	420
L					•

3	1	gp	group consultation	awaiting review	402
4	1	nurse	home visit note	other	402
6	1	nurse	seen in urgent care centre	awaiting review	344
7	1	gp	face to face consultation	emergency appointment	330
8	1	gp	seen in urgent care centre	awaiting review	322
9	1	nurse	telephone encounter	telephone encounter	314
10		other care	·		
11 12	1	provider	consultation via video conference	awaiting review	288
12	1	gp	telephone consultation	telephone call to a patient	287
14	1	dr	telephone consultation	telephone consultation	279
15	1	nurse	online communication	awaiting review	279
16		other care			
17	1	provider	face to face consultation	awaiting review	272
18		other care			
19 20	1	provider	home visit note	home visit	262
20	1	other care provider	routine consultation	awaiting review	260
22	1	nurse	home visit note	home visit	246
23					
24	1	gp other care	consultation via sms text message	awaiting review	244
25	1	provider	online communication	online services message	241
26		other care			
27	1	provider	emergency consultation	emergency consultation	235
28 29		other care			
30	1	provider	emergency appointment	emergency appointment	231
31	1	gp	telephone encounter	telephone call to a patient	226
32	1	gp	residential home visit note	residential home	225
33	1	gp	face to face consultation	awaiting review	224
34	1	nurse	face to face consultation	gp surgery	221
35 36		other care			
37	1	provider	gp surgery	face to face consultation	209
38	1	nurse	extended hours consultation	awaiting review	186
39	_		seen in rapid access clinic at gp		
40	1	gp	surgery	awaiting review	182
41	1	gp	school visit note	awaiting review	181
42	1	other care provider	telephone consultation	telephone call to a patient	179
43 44			face to face consultation		166
45	1	nurse		awaiting review	
46	1	gp	home visit note	acute visit	153
47	1	nurse other care	online communication	online services message	145
48	1	provider	group consultation	awaiting review	133
49	1	gp	seen in gp unit	awaiting review	129
50	1	dr	clinic note	surgery consultation	125
51 52	1	other care			125
53	1	provider	telephone encounter	telephone encounter	119
54		other care	· ·		
55	1	provider	extended hours consultation	awaiting review	116
56			face to face consultation with		
57	1	nurse	relative/carer	awaiting review	115
58	1	nurse	seen in gp unit	awaiting review	109
59 60	1	gp	night visit note	awaiting review	108

2 3	1	nurse	school visit note	awaiting review	107
4					
5	1	nurse	group consultation	awaiting review	102
6	1	gp	other consultation medium used	other	99
7	1	gp	children's home visit note	awaiting review	95
8	1	gp	telephone consultation	telephone call from a patient	94
9 10	1	gp	administration note	other	91
11	1	nurse	telephone encounter	telephone call to a patient	86
12		other care			
13	1	provider	e-mail consultation	awaiting review	71
14	1	nurse	consultation via multimedia	awaiting review	65
15	1	gp	gp surgery	clinic	63
16	1	nurse	telephone consultation	telephone call to a patient	63
17 18		other care	face to face consultation with		
10	1	provider	relative/carer	awaiting review	62
20	1	~~	consultation via telemedicine web	augiting raviou	C1
21	1	gp	camera	awaiting review	61
22	1	dr	telephone call to a patient	telephone call to a patient	60
23	1	nurse	laboratory result	clinic	55
24	1	other care provider	other consultation medium used	awaiting raviou	53
25	1			awaiting review	
26	1	nurse	other consultation medium used	awaiting review	51
27 28	1	nurse	district nurse visit	awaiting review	48
20	1	gp	clinic note	gp surgery	47
30	4	other care			45
31	1	provider other care	clinic note	gp surgery	45
32	1	provider	urgent consultation	urgent consultation	42
33		other care			
34	1	provider	home visit note	other	41
35		other care		$\mathbf{N}_{\mathbf{A}}$	
36 27	1	provider	laboratory result	clinic	40
37 38	1	gp	laboratory result	acute visit	39
39	1	dr	home visit note	home visit note	38
40		other care			
41	1	provider	telephone encounter	telephone call to a patient	38
42	1	nurse	telephone encounter	telephone consultation	33
43		other care			
44	1	provider	consultation via sms text message	awaiting review	28
45	1	gp	walk-in clinic	walk-in centre	27
46	1	nurse	walk-in clinic	walk-in centre	27
47 48		other care			
40	1	provider	walk-in clinic	clinic	27
50	1	nurse	children's home visit note	awaiting review	25
51	1	gp	gp surgery	main surgery	24
52	1	nurse	residential home visit note	residential home	22
53		other care			
54	1	provider	seen in urgent care centre	awaiting review	22
55	1	nurse	night visit note	awaiting review	20
56		other care			
57 58	1	provider	children's home visit note	awaiting review	19
58 59		other care			
60	1	provider	consultation via multimedia	awaiting review	19

1	gp	home visit note	nursing home visit note	17
1	gp	nursing home visit note	nursing home	17
1	gp	residential home visit note	nursing home	15
	other care			
1	provider	face to face consultation	gp surgery	14
1	other care provider	night visit note	awaiting raviow	14
1	other care		awaiting review	14
1	provider	other consultation medium used	other	14
1	nurse	clinic note	gp surgery	13
1	nurse	walk-in clinic	clinic	13
1	nurse	home visit note	acute visit	10
1	nurse	consultation via sms text message	awaiting review	< 10
		consultation via telemedicine web		
1	nurse	camera	awaiting review	< 10
1	dr	consultation via video conference	awaiting review	< 10
1	dr	nursing home visit note	nursing home visit note	< 10
	other care			
1	provider	home visit note	nursing home visit note	< 10
1	dr	other note	other	< 10
1	gp	telephone encounter	telephone call from a patient	< 10
1	gp	twilight visit note	awaiting review	< 10
1	other care	laboratory result	acute visit	< 10
1	provider	laboratory result		
1	dr	face to face consultation	face to face consultation	< 10
1	gp	home visit note	follow-up/routine visit	< 10
1	gp other care	other consultation medium used	casualty attendance	< 10
1	provider	home visit note	residential home visit note	< 10
	other care			
1	provider	other note	gp surgery	< 10
1	gp	home visit note	awaiting review	< 10
1	gp	non-consultation medication data	awaiting review	< 10
1	gp	remote consultation	awaiting review	< 10
1	gp	third party consultation	casualty attendance	< 10
1	nurse	home visit note	follow-up/routine visit	< 10
1	nurse	telephone encounter	telephone call from a patient	< 10
1	nurse	third party consultation	casualty attendance	< 10
1	dr	enterprise consultation	enterprise consultation	< 10
1	dr	telephone call from a patient	telephone call from a patient	< 10
1	gp	district nurse visit	awaiting review	< 10
1	gp	e-mail received from patient	acute visit	< 10
1	gp	hospital outpatient report	casualty attendance	< 10
1	gp	joint consultation	awaiting review	< 10
1	gp	pharmacy consultation	awaiting review	< 10
1	gp	telephone call to a patient	telephone consultation	< 10
1	nurse	administration note	other	< 10
1	nurse	face to face consultation	emergency appointment	< 10
±	other care	consultation via telemedicine web		
1	provider	camera	awaiting review	< 10

3		other care			
4	1	provider	face to face consultation	emergency appointment	< 10
5		other care			
6	1	provider	face to face consultation	emergency consultation	< 10
7		other care			
8	1	provider	home visit note	acute visit	< 10
10	1	other care	nhormony consultation		< 10
11	1	provider other care	pharmacy consultation	awaiting review	< 10
12	1	provider	residential home visit note	residential home	< 10
13		other care			
14	1	provider	telephone encounter	telephone consultation	< 10
15	1	dr	group consultation	awaiting review	< 10
16 17	1	dr	home visit note	acute visit	< 10
18	1	gp	clinic note	follow-up/routine visit	< 10
19	1	gp	emergency consultation	casualty attendance	< 10
20	1	gp	home visit note	nursing home	< 10
21		0F	seen in rapid access clinic at gp		
22	1	nurse	surgery	awaiting review	< 10
23	1	nurse	telephone consultation	telephone call from a patient	< 10
24 25	1	nurse	twilight visit note	awaiting review	< 10
26		other care			
27	1	provider	administration note	other	< 10
28		other care			
29	1	provider	children's home visit note	clinic	< 10
30	1	other care	home visit note	awaiting review	< 10
31	1	provider other care		awaiting review	< 10
32 33	1	provider	twilight visit note	awaiting review	< 10
	excl. job cat		gp surgery	gp surgery	875,291
	excl. job cat		other note	other	31,332
36	excl. job cat		telephone consultation	telephone consultation	29,455
3/	excl. job cat		online communication	online services message	14,055
30	excl. job cat		telephone call to a patient	telephone call to a patient	13,935
39 <u>6</u> 40			provision of general practitioner		13,935
	excl. job cat		intermediate care	gp surgery	9,791
	excl. job cat		telephone call from a patient	telephone call from a patient	7,098
4.2	excl. job cat		seen in gp unit	gp surgery	6,240
44	excl. job cat		home visit note	home visit note	4,776
45	excl. job cat		routine consultation	other	4,248
40	excl. job cat		gp surgery	surgery consultation	3,047
	excl. job cat		home visit note	other	2,664
40	excl. job cat		face to face consultation	face to face consultation	2,071
50	-				
51	excl. job cat		face to face consultation	surgery consultation	1,177
J2 -	excl. job cat		online communication	awaiting review	1,098
	excl. job cat		nursing home visit note	nursing home visit note	708
E E	excl. job cat		routine consultation	surgery consultation	509
56	excl. job cat		consultation via video conference	awaiting review	494
57	excl. job cat		routine consultation	awaiting review	453
	excl. job cat		enterprise consultation	enterprise consultation	398
1	excl. job cat		administration note	other	376
59 e				telephone encounter	

1 2				
3	excl. job cat	home visit note	awaiting review	371
4	excl. job cat	clinic note	clinic	337
5	excl. job cat	clinic note	surgery consultation	329
6 7	excl. job cat	residential home visit note	residential home visit note	327
8	excl. job cat	face to face consultation	gp surgery	305
9	excl. job cat	face to face consultation	awaiting review	293
10	excl. job cat	home visit note	home visit	250
11 12	excl. job cat	urgent consultation	urgent consultation	240
12	excl. job cat	walk-in clinic	walk-in clinic	196
14	excl. job cat	group consultation	awaiting review	170
15	excl. job cat	seen in gp unit	surgery consultation	148
16	excl. job cat	e-mail consultation	awaiting review	145
17	excl. job cat	emergency consultation	emergency consultation	143
18 19		face to face consultation with		
20	excl. job cat	relative/carer	awaiting review	116
21	excl. job cat	consultation via multimedia	awaiting review	75
22	excl. job cat	seen in gp unit	awaiting review	75
23 24	excl. job cat	children's home visit note	awaiting review	63
24 25	excl. job cat	other note	gp surgery	54
26	excl. job cat	other consultation medium used	other	44
27	excl. job cat	other consultation medium used	awaiting review	42
28	excl. job cat	extended hours consultation	awaiting review	37
29 30	excl. job cat	gp surgery	face to face consultation	36
30 31	excl. job cat	emergency appointment	emergency appointment	35
32	excl. job cat	gp surgery	clinic	32
33	excl. job cat	face to face consultation	emergency consultation	25
34	excl. job cat	residential home visit note	residential home	23
35 36	excl. job cat	telephone encounter	telephone call to a patient	23
30 37	excl. job cat	night visit note	awaiting review	14
38	excl. job cat	home visit note	acute visit	13
39	excl. job cat	walk-in clinic	walk-in centre	11
40	excl. job cat	district nurse visit	awaiting review	< 10
41 42	excl. job cat	seen in urgent care centre	awaiting review	< 10
42 43	excl. job cat	twilight visit note	awaiting review	< 10
44	excl. job cat	clinic note	gp surgery	< 10
45	excl. job cat	laboratory result	acute visit	< 10
46	excl. job cat	telephone consultation	telephone call to a patient	< 10
47 48	excl. job cat	walk-in clinic	clinic	< 10
40 49	excl. job cat	telephone encounter	telephone call from a patient	< 10
50	excl. job cat	emergency consultation	casualty attendance	< 10
51	excl. job cat	pharmacy consultation	awaiting review	< 10
52	excl. job cat	third party consultation	casualty attendance	< 10
53 54	excl. job cat	case conference	gp surgery	< 10
54 55	excl. job cat	emergency consultation	awaiting review	< 10
56	excl. job cat	gp surgery	main surgery	< 10
57	excl. job cat	home visit note	follow-up/routine visit	< 10
58	excl. job cat	non-consultation medication data	casualty attendance	< 10
59 60	excl. job cat	nursing home visit note	nursing home	< 10
00	· · · ·			

2 3	excl. job cat		remote consultation	awaiting review	< 10
4	excl. job cat		same day appointment	same day appointment	< 10
5	excl. job cat		school visit note	awaiting review	< 10
6 7	excl. job cat		telephone consultation	awaiting review	< 10
8	excl. job cat		telephone encounter	telephone consultation	< 10
9					
10	excl. job cat		third party consultation	awaiting review	< 10
11	0	gp	externally entered note	externally entered	3,467,397
12	0		scanned document	docman	3,183,781
13	0		administration note	administration note	968,767
14 15	0				737,843
16	0		scanned document	scanned document	727,269
17	0	gp	administration note	administration note	725,612
18	0		inbound document	inbound document	402,647
19			awaiting clinical code migration to		
20	0		emis web	awaiting review	385,598
21	0	nurse	externally entered note	externally entered	303,830
22 23			awaiting clinical code migration to		264 627
25 24	0	gp	emis web	awaiting review	261,627
25	0		administration note	administration	256,604
26	0	other care provider	scanned document	docman	255,022
27	0	provider			
28			externally entered note	externally entered	252,167
29	0	gp			208,462
30	0	gp	outbound referral	outbound referral	197,534
31 32	0	gp	awaiting clinical code migration to emis web	gp surgery	162,048
33	0	other care			102,040
34	0	provider	administration note	administration note	160,918
35			awaiting clinical code migration to		
36	0		emis web	third party consultation	147,374
37	0	gp	scanned document	scanned document	145,355
38			awaiting clinical code migration to		
39 40	0		emis web	gp surgery	127,041
41	0	G 10	awaiting clinical code migration to		122 110
42	0	gp	emis web awaiting clinical code migration to	results recording	122,118
43	0		emis web	other	121,401
44			awaiting clinical code migration to		
45	0	gp	emis web	surgery consultation	107,304
46 47			awaiting clinical code migration to		
47 48	0		emis web		104,693
49	0	gp	inbound document	inbound document	102,534
50			awaiting clinical code migration to		0.1.150
51	0	nurse	emis web	awaiting review	94,158
52	0	other care provider	awaiting clinical code migration to emis web	an curaen.	86,398
53	0	other care	awaiting clinical code migration to	gp surgery	00,398
54	0	provider	emis web	awaiting review	85,745
55 56	0	nurse	administration note	administration note	84,051
57			awaiting clinical code migration to		_ ,
58	0	gp	emis web		77,585
59			awaiting clinical code migration to		
60	0	nurse	emis web	gp surgery	75,552

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0	other care provider			66,36
0	other care			00,30
0	provider	externally entered note	externally entered	62,81
0	provider	externally entered note	externally entered note	61,84
0		awaiting clinical code migration to		01,84
0		emis web	repeat issue	61,68
0	nurse			58,01
0	gp	telephone triage encounter	telephone triage encounter	50,66
0	01	third party consultation	third party consultation	44,60
	other care			11,00
0	provider	scanned document	scanned document	38,34
		awaiting clinical code migration to		
0	nurse	emis web		35,37
		awaiting clinical code migration to		
0	nurse	emis web	surgery consultation	27,69
0	gp	administration note	administration	27,39
0		awaiting clinical code migration to	to be the second second to the second	26.24
0	gp	emis web	telephone consultation	26,21
0	gn	awaiting clinical code migration to emis web	other	26,20
0	gp	awaiting clinical code migration to		20,20
0		emis web	scanned document	25,62
		awaiting clinical code migration to		,
0		emis web	administration note	24,45
0		gp surgery	awaiting review	24,33
		awaiting clinical code migration to		
0		emis web	touchscreen	24,31
0	gp	third party consultation	third party consultation	23,95
		awaiting clinical code migration to		
0		emis web	patientchase insert	22,51
0	gp	laboratory result	results recording	22,06
0	gp	externally entered note	externally entered note	20,86
•		awaiting clinical code migration to		
0	gp other care	emis web	administration note	20,72
0	provider	inbound document	inbound document	20,15
0		telephone call to relative/carer	telephone call to relative/carer	19,23
0	gp other care	awaiting clinical code migration to		19,23
0	provider	emis web		17,08
-	p	awaiting clinical code migration to		
0		emis web	surgery consultation	15,97
		awaiting clinical code migration to		
0	nurse	emis web	clinic	15,89
0	gp	other note	other note	15,81
0	gp	gp surgery	awaiting review	15,81
0	gp	discussion with colleague	discussion with colleague	12,97
		awaiting clinical code migration to		
0	gp	emis web	telephone call to a patient	11,78
0		repeat prescription	repeat issue	11,54
	other care			
0	provider	administration note	administration	11,03
		awaiting clinical code migration to		
0	nurse	emis web	other	11,00

0		hospital outpatient report	hospital outpatient report	10,033
0	nurse	inbound document	inbound document	9,304
0	nurse	scanned document	scanned document	7,878
	other care	awaiting clinical code migration to		
0	provider	emis web	repeat issue	7,745
		awaiting clinical code migration to		
0	gp	emis web	outbound referral	7,402
0	other care provider	externally entered note	externally entered note	6,736
0	•	telephone call from relative/carer	telephone call from relative/carer	6,626
0	gp other care	awaiting clinical code migration to		0,020
0	provider	emis web	surgery consultation	6,514
	provider	awaiting clinical code migration to		0,011
0		emis web	inbound document	6,495
0	nurse	gp surgery	awaiting review	6,475
Ū	other care	awaiting clinical code migration to		0,0
0	provider	emis web	other	6,315
0	nurse	administration note	administration	6,285
0		outbound referral	outbound referral	6,194
0	nurse	telephone triage encounter	telephone triage encounter	6,074
0		clinic note		
0	gp	awaiting clinical code migration to	clinic note	5,834
0	gp	emis web	repeat issue	5,803
0		non-consultation data	non-consultation data	5,552
0	gp other care			5,552
0	provider	third party consultation	third party consultation	5,505
-	other care			-,
0	provider	gp surgery	awaiting review	5,332
		awaiting clinical code migration to		
0	gp	emis web	telephone call from a patient	5,282
0	nurse	externally entered note	externally entered note	5,251
0	gp	face to face consultation	triage	5,196
0	nurse	telephone call to relative/carer	telephone call to relative/carer	5,191
		awaiting clinical code migration to		
0		emis web	mail to patient	5,178
0		non-consultation data	non-consultation data	4,933
0	gp	e-mail received from patient	e-mail received from patient	4,877
0	nurse	outbound referral	outbound referral	4,787
0		medication requested	repeat issue	4,639
0	nurse	third party consultation	third party consultation	4,605
0	nuise	awaiting clinical code migration to		4,005
0	nurse	emis web	results recording	4,405
		awaiting clinical code migration to		
0	gp	emis web	scanned document	4,384
0		other note	other note	4,375
		awaiting clinical code migration to		
0		emis web	mjog	4,221
	other care			
0	provider	other note	other note	4,071
0		mail to patient	mail to patient	3,924
	other care	awaiting clinical code migration to		
0	provider	emis web	clinic	3,859
0		e-mail received from patient	e-mail received from patient	3,632

0		awaiting clinical code migration to emis web	out of hours, non practice	3,60
0	other care provider	clinic note	clinic note	3,37
		awaiting clinical code migration to		
0	gp	emis web	home visit note	3,37
0	gp	hospital outpatient report	hospital outpatient report	3,35
0	nurse	nurse telephone triage	nurse telephone triage	3,27
0	nurse	clinic note	clinic note	3,25
		awaiting clinical code migration to		
0	gp	emis web	clinic	3,24
	other care	awaiting clinical code migration to		
0	provider	emis web	administration note	3,04
0		awaiting clinical code migration to		2.02
0	gp other care	emis web awaiting clinical code migration to	third party consultation	3,03
0		emis web	medicine management	2,82
	other care			2,02
0		telephone call to relative/carer	telephone call to relative/carer	2,80
		awaiting clinical code migration to		,
0	nurse	emis web	telephone consultation	2,78
		awaiting clinical code migration to		
0		emis web	clinic	2,77
0		laboratory result	laboratory result	2,72
		awaiting clinical code migration to		
0	gp	emis web	inbound document	2,60
0		telephone call from relative/carer	telephone call from relative/carer	2,59
0	1	clinic note	clinic note	2,57
0	gp	laboratory result	 laboratory result 	2,51
	other care			
0	provider	repeat prescription	repeat issue	2,51
0		awaiting clinical code migration to	how of actions	2.45
0		emis web awaiting clinical code migration to	home of patient	2,45
0	gp	emis web	out of hours, non practice	2,36
	6P	awaiting clinical code migration to		2,00
0	gp	emis web	nhs direct report	2,33
		awaiting clinical code migration to		
0		emis web	results recording	2,18
0	dr	third party consultation	third party consultation	2,14
	other care	awaiting clinical code migration to		
0	provider	emis web	third party consultation	2,09
		awaiting clinical code migration to		
0		emis web	administration note	2,07
0		administration note	patientchase insert	1,85
0		clinic note	awaiting review	1,79
0		hospital inpatient report	hospital inpatient report	1,76
0		e-mail received from patient	docman	1,75
0	nurse	other note	other note	1,70
0	nurse	non-consultation data	non-consultation data	1,68
		awaiting clinical code migration to		_,00
0	gp	emis web	referral letter	1,66
0		laboratory result	results recording	1,62

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3 4	0		awaiting clinical code migration to emis web	non-consultation data	1 507
5	0		awaiting clinical code migration to		1,537
6	0	gp	emis web	medicine management	1,510
7	0	nurse	laboratory result	results recording	1,464
8	0	nurse	telephone call from relative/carer	telephone call from relative/carer	1,404
9	-	nurse			
10	0		administration note	scanned document	1,373
11 12	0		telephone triage encounter	telephone triage encounter	1,353
12	0	gp	medication requested	awaiting review	1,347
14	0	nurse	discussion with colleague	discussion with colleague	1,329
15	0	~~	awaiting clinical code migration to	talanhana triaga angguntar	1 212
16	0	gp	emis web awaiting clinical code migration to	telephone triage encounter	1,313
17	0	nurse	emis web	telephone call to a patient	1,243
18		other care			
19 20	0	provider	non-consultation data	non-consultation data	1,239
20 21	0	gp	case conference	awaiting review	1,225
22			awaiting clinical code migration to		
23	0	gp	emis web	externally entered note	1,206
24	0		telephone call to relative/carer	telephone call to relative/carer	1,191
25			awaiting clinical code migration to		
26	0	nurse	emis web	third party consultation	1,170
27	0	gp	e-mail sent to patient	awaiting review	1,162
28	0	dr	administration note	administration	1,159
29 30	0		other note		1,156
31	0		administration note		1,120
32	0	dr	externally entered note	externally entered	1,113
33			awaiting clinical code migration to		
34	0	gp	emis web	face to face consultation	1,112
35		other care			
36	0	provider	telephone triage encounter	telephone triage encounter	1,107
37	0	nurse	laboratory result	laboratory result	1,064
38 39		other care			
40	0	provider	outbound referral	outbound referral	1,052
41	0	gp	clinic note	awaiting review	1,030
42		other care			1 010
43	0	provider	mail to patient	patientchase insert	1,019
44	0	gp	repeat prescription	awaiting review	1,003
45	0	gn	awaiting clinical code migration to emis web	data transferred from other system	983
46	0	gp	awaiting clinical code migration to		505
47 48	0		emis web	non-consultation medication data	980
48 49			awaiting clinical code migration to		
50	0	gp	emis web	nursing home visit note	971
51	0	gp	repeat prescription	repeat issue	964
52			awaiting clinical code migration to		
53	0		emis web	telephone call to a patient	901
54	0	dr			885
55			awaiting clinical code migration to		
56 57	0	nurse	emis web	face to face consultation	853
57 58		other care			000
59	0	provider	hospital outpatient report	hospital outpatient report	828
	0	1	clinic note	community clinic	823

0		awaiting clinical code migration to emis web	gp2gp import	82
		awaiting clinical code migration to		
0		emis web	letter from outpatients	80
	other care			
0	provider	mail to patient	mail to patient	80
	other care			
0	provider	telephone call from relative/carer	telephone call from relative/carer	78
0		awaiting clinical code migration to emis web	externally entered note	76
		awaiting clinical code migration to		
0		emis web	referral letter	75
0	other care	awaiting clinical code migration to	in hours of all an unserver	74
0	provider	emis web	inbound document	71
0		e-mail sent to patient	awaiting review	71
0	gp	hospital inpatient report	hospital inpatient report	71
0	nurse	awaiting clinical code migration to emis web	repeat issue	69
		awaiting clinical code migration to		
0	gp	emis web	acute visit	69
		awaiting clinical code migration to		
0	gp	emis web	telephone call to relative/carer	68
0		non-consultation medication data	repeat issue	67
0		awaiting clinical code migration to		
0	nurse	emis web	home visit note	67
0	other care provider	discussion with colloague	discussion with colleague	66
	provider	discussion with colleague		
0		administration note	docman	66
0	gp	other note		66
0		awaiting clinical code migration to emis web	telephone consultation	65
	other care	awaiting clinical code migration to		
0	provider	emis web	scanned document	64
0		ooh report	third party consultation	63
0	gp	scanned document	externally entered	61
0	gp	medication requested	repeat issue	60
		awaiting clinical code migration to		
0	nurse	emis web	telephone triage encounter	60
	other care	awaiting clinical code migration to		
0	provider	emis web	telephone call to a patient	54
•	other care	awaiting clinical code migration to		
0	provider	emis web	face to face consultation	53
0	dr	administration note	administration note	52
0	gp	discussion with other professional	awaiting review	51
0	gp	administration note	awaiting review	50
	other care	awaiting clinical code migration to		
0	provider	emis web	mail to patient	50
0		ooh report	awaiting review	50
_		awaiting clinical code migration to		
0	dr	emis web	gp surgery	50
0		walk-in clinic		49
0		administration note	inbound document	49
0		routine consultation	repeat issue	48

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2 3		I			
4	0		awaiting clinical code migration to emis web	telephone call from a patient	486
5	0	gp	ooh report	out of hours, non practice	478
6 7	0	gp	mail from patient	mail from patient	473
8	0		other note	awaiting review	472
9			awaiting clinical code migration to		
10	0	gp	emis web	enterprise consultation	458
11		other care			
12	0	provider	repeat prescription	awaiting review	455
13 14	0	gp	awaiting clinical code migration to emis web	discussion with colleague	451
15		5P	awaiting clinical code migration to		101
16	0		emis web	outbound referral	450
17			awaiting clinical code migration to		
18	0	gp	emis web	nursing home	447
19			awaiting clinical code migration to		
20	0	dr	emis web	awaiting review	444
21 22	0	nurse	e-mail received from patient	e-mail received from patient	443
22	0		awaiting clinical code migration to emis web	data transferred from other system	442
24					
25	0	nurse	ooh report	awaiting review	439
26	0	other care	administration note	awaiting review	436
27	0	provider	clinic note	awaiting review	431
28	0		administration note		415
29 30	0	gp	administration note	scanned document	415
31	0	gp	awaiting clinical code migration to		414
32	0	gp	emis web	urgent consultation	404
33		other care	awaiting clinical code migration to		
34	0	provider	emis web	externally entered note	385
35			awaiting clinical code migration to		
36	0		emis web	school	384
37 38	0	nurse	hospital outpatient report	hospital outpatient report	380
39	0		mail to patient	patientchase insert	377
40	0		awaiting clinical code migration to		270
41	0		emis web	telephone encounter	376
42	0	gp	administration note	results recording	372
43	0	other care	discussion with colleague	discussion with colleague	368
44 45	0	provider	awaiting clinical code migration to emis web	results recording	365
45	0	provider	case conference	awaiting review	361
47	0	other care	awaiting clinical code migration to	awaiting review	501
48	0	provider	emis web	telephone consultation	350
49		other care	awaiting clinical code migration to		
50	0	provider	emis web	patientchase insert	345
51	0		sms text message sent to patient	patientchase insert	345
52 53	0	nurse	mail to patient	mail to patient	342
53 - 54			awaiting clinical code migration to		
55 -	0		emis web	hospital outpatient report	336
56	0		gp surgery		315
57	0	gp	ooh report	nhs direct report	314
58	0	gp	administration note	referral letter	313
59 60			awaiting clinical code migration to		
00	0	dr	emis web		310

0	gp	awaiting clinical code migration to emis web	telephone call from relative/carer	310
0	gp	awaiting clinical code migration to emis web	non-consultation data	309
0	nurse	awaiting clinical code migration to emis web	telephone call from a patient	309
	other care	awaiting clinical code migration to		
0	provider	emis web	non-consultation data	306
	other care			
0	provider	e-mail received from patient	e-mail received from patient	292
0	other care provider	awaiting clinical code migration to emis web	non-consultation medication data	289
0	nurse	clinic note	awaiting review	286
0	dr	scanned document	scanned document	285
0		ooh report	out of hours, non practice	283
0	other care provider	laboratory result	laboratory result	282
		awaiting clinical code migration to		204
0	gp	emis web	discharge details	281
0		home visit note	home of patient	277
0	nurse	awaiting clinical code migration to emis web	inbound document	276
	other care			
0	provider	hospital inpatient report	hospital inpatient report	275
0	gp	mail to patient	mail to patient	270
0	gp	awaiting clinical code migration to emis web	residential home visit note	266
	other care			
0	provider	administration note awaiting clinical code migration to	awaiting review	265
0		emis web	acute visit	263
0		walk-in clinic	awaiting review	260
-	dr			
0	dr	hospital outpatient report awaiting clinical code migration to	hospital outpatient report	256
0	gp	emis web	mail to patient	249
0		administration note	mjog 🚺	248
0		mail from patient	mail from patient	248
0	gp	awaiting clinical code migration to emis web	letter from outpatients	247
	6P	awaiting clinical code migration to		
0		emis web	discharge details	244
0		awaiting clinical code migration to		242
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0	other care	awaiting clinical code migration to	home visit note	226
	provider	emis web		236
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0	dr	emis web	administration note	225
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0	nurse	face to face consultation	triage	104
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0	nurse	emis web	telephone call from relative/carer	100
0		extended hours consultation	out of hours, non practice	100
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	other care			
0	provider	hospital outpatient report	hospital	97
0	dr	awaiting clinical code migration to	nursing home visit note	00
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	other care			
0	provider	case conference	awaiting review	92
0		provision of general practitioner		01
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0	gp	walk-in clinic		91
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	other care			
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9	0	gp	ooh report	awaiting review	70
10	0	gp	weekly care home ward round	awaiting review	70
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12	0		emis web	medicine management	70
13		other care	awaiting clinical code migration to		
14 15	0	provider	emis web	open door surgery	69
16		other care	awaiting clinical code migration to	televitere en	CO
17	0	provider	emis web	telephone encounter	69
18	0		medication requested	awaiting review	68
19	0	other care	awaiting clinical code migration to	tolophone call to relative (correr	CT.
20	0	provider	emis web awaiting clinical code migration to	telephone call to relative/carer	65
21	0	dr	emis web	repeat issue	64
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26	0	gp	clinic note	nhs direct report	62
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31	0	gp	non-consultation data	data transferred from other system	57
32		68	awaiting clinical code migration to		
33 34	0	nurse	emis web	enterprise consultation	57
54 35	0	gp	outbound referral	referral letter	55
36		other care			
37	0	provider	repeat prescription	medicine management	55
38	0	nurse	seen in influenza vaccination clinic	awaiting review	54
39	0		administration note	results recording	54
40			awaiting clinical code migration to		
41	0		emis web	telephone call from relative/carer	54
42			awaiting clinical code migration to		
43 44	0	gp	emis web	hospital outpatient report	53
45	0	gp	gp surgery		53
46	0	gp	third party consultation	out of hours, non practice	51
47			awaiting clinical code migration to		
48	0		emis web	telephone call to relative/carer	51
49	0		clinic note	out of hours, non practice	51
50	0		face to face consultation	primary care centre	51
51			awaiting clinical code migration to		
52 53	0	gp	emis web	laboratory result	50
55 54	0	nurse	non-consultation medication data	repeat issue	48
55			awaiting clinical code migration to	ather note	40
56	0		emis web	other note	48
57	0		face to face consultation	triage	48
58	0	gp	progress report	nhs direct report	47
		othor caro			
59 60	0	other care provider	ooh report	nhs direct report	47

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0	nurse	awaiting clinical code migration to emis web	non-consultation data	46
		awaiting clinical code migration to		
0		emis web	nursing home	46
		awaiting clinical code migration to		
0	gp	emis web	mail from patient	45
		awaiting clinical code migration to		
0	nurse	emis web	discussion with colleague	45
		awaiting clinical code migration to		
0		emis web	e-mail received from patient	45
		awaiting clinical code migration to		
0	nurse	emis web	medicine management	43
0	nurse	medication requested	repeat issue	42
0	dr	mail to patient	mail to patient	4(
		awaiting clinical code migration to		
0	gp	emis web	encompass message	39
0	gp	other note	data transferred from other system	39
		awaiting clinical code migration to		
0	nurse	emis web	clinic note	39
		awaiting clinical code migration to		
0	nurse	emis web	laboratory result	39
	other care	awaiting clinical code migration to		
0	provider	emis web	other note	39
	other care			
0	provider	medication requested	repeat issue	3
0	gp	administration note	non-consultation data	37
	other care			
0	provider	mail from patient	mail from patient	37
		awaiting clinical code migration to		
0	dr	emis web	results recording	36
		awaiting clinical code migration to 🥖		
0	gp	emis web	e-mail received from patient	36
0		awaiting clinical code migration to	Long H. Co. and the	24
0	nurse	emis web	walk-in centre	30
0	other care provider	awaiting clinical code migration to emis web	gp2gp import	30
	provider			
0		administration note	mail to patient	30
0	~~	awaiting clinical code migration to emis web	home of notiont	3!
0	gp	awaiting clinical code migration to	home of patient	5
0	gp	emis web	casualty attendance	34
0	gp	inbound document	letter from outpatients	34
0	other care provider	awaiting clinical code migration to emis web	outbound referral	34
0	other care			
0	provider	extended hours consultation	out of hours, non practice	34
0	provider	awaiting clinical code migration to		
0	gn	emis web	telephone encounter	33
0	gp			33
	gp	seen in hospital ward	awaiting review	
0		other note	non-consultation data	3
0	nurse	other note	awaiting review	3
	other care	awaiting clinical code migration to		
0	provider	emis web	discussion with colleague	32
0	1	discussion with other professional	awaiting review	32

2 3 4	0		multidisciplinary team meeting without patient	awaiting review	32
5	0		children's home visit note		31
6		other care			
7	0	provider	laboratory result	results recording	30
8 9	0		awaiting clinical code migration to emis web	casualty attendance	30
10	0		extended hours consultation	nhs direct report	30
11 12	0	nurse	administration note	awaiting review	29
13 14	0	nurse	awaiting clinical code migration to emis web	letter from outpatients	29
15	0	nurse	awaiting clinical code migration to emis web	open door surgery	29
16 17	0		discussion with other professional		29
18		nurse		awaiting review	
19	0	nurse	ooh report	out of hours, non practice	29
20	0		face to face consultation	treatment room	29
21	0	gp	email received from carer	awaiting review	28
22	0	other care provider	awaiting clinical code migration to emis web	telephone triage encounter	28
23 24	0	provider	administration note	touchscreen	28
24	0		awaiting clinical code migration to		20
26	0	nurse	emis web	encompass message	27
27			awaiting clinical code migration to		
28	0	nurse	emis web	nursing home	27
29	0		third party consultation	out of hours, non practice	27
30			awaiting clinical code migration to		
31	0	gp	emis web	follow-up/routine visit	26
32 33	0	other care			20
34	0	provider	emergency consultation	accident & emergency	26
35	0	gp	hospital outpatient report	nhs direct report	25
36	0	other care provider	awaiting clinical code migration to emis web	telephone call from relative/carer	23
37		other care			
38 39	0	provider	outbound referral	referral letter	23
40	0		externally entered note	scanned document	23
41			multidisciplinary team meeting		
42	0	nurse	without patient	awaiting review	22
43	0		other consultation medium used	data transferred from other system	22
44			awaiting clinical code migration to		
45	0	dr	emis web	outbound referral	21
46	0	gp	seen in influenza vaccination clinic	awaiting review	21
47 48	0	2.172.0	awaiting clinical code migration to	other note	21
49	0	nurse	emis web	other note	21
50	0		ooh report	nhs direct report	21
51 52	0	dr	awaiting clinical code migration to emis web	inbound document	20
53	0	gp	awaiting clinical code migration to emis web	day case report	20
54		<u> </u>	seen by general practitioner with	,	
55		other care	special interest in ear nose and		
56	0	provider	throat disorders	data transferred from other system	20
57 58	0		emergency consultation	accident & emergency	20
58 59			awaiting clinical code migration to		
	0	gp	emis web	online services message	19

0	gp	hospital outpatient report	third party consultation	19
0	nurse	repeat prescription	awaiting review	19
0		awaiting clinical code migration to emis web	walk in centre	19
0	dr	hospital inpatient report	hospital inpatient report	18
0	other care	awaiting clinical code migration to		10
0	provider	emis web	residential home visit note	18
	other care			
0	provider	walk-in clinic		18
		awaiting clinical code migration to		
0		emis web	residential home visit note	18
		awaiting clinical code migration to		
0		emis web	telephone triage encounter	18
0	dr	outbound referral	outbound referral	17
0	gp	ooh report	third party consultation	17
0	gp	other consultation medium used	nhs direct report	17
0	gp	radiology result	awaiting review	17
0	gp	telephone consultation	telephone call from relative/carer	17
0	other care	awaiting clinical code migration to		17
0	provider	emis web	enterprise consultation	17
	other care			
0	provider	walk-in clinic	walk in centre	17
0		administration note	referral letter	17
0	dr	other note	other note	16
0	other care	awaiting clinical code migration to		1(
0	provider	emis web	nursing home visit note	16
0	dr	medication requested	repeat issue	15
0	other care	medication requested		15
0	provider	administration note	inbound document	15
-	other care	awaiting clinical code migration to		
0	provider	emis web	out of hours, non practice	15
0		non-consultation data	data transferred from other system	15
	other care			
0	provider	face to face consultation	triage	15
		awaiting clinical code migration to		
0	dr	emis web	telephone call to a patient	14
0	dr	externally entered note	externally entered note	14
0	gp	hospital inpatient report	discharge details	14
		seen by general practitioner with		
		special interest in ear nose and		
0	gp	throat disorders	data transferred from other system	14
	other care			
0	provider	administration note	scanned document	14
	other care			
0	provider	discussion with other professional	awaiting review	14
0		awaiting clinical code migration to		
0		emis web	out of hours, practice	14
0		externally entered note		14
0	dr	telephone call to relative/carer	telephone call to relative/carer	13
		awaiting clinical code migration to		
0	nurse	emis web	nhs direct report	13
0	DURGO	awaiting clinical code migration to	out of hours non-prosting	
0	nurse	emis web	out of hours, non practice	13
0		hospital inpatient note	awaiting review	13

2 3		I			
4	0		repeat prescription	awaiting review	13
5	0	gp	other note	encompass message	12
6			awaiting clinical code migration to		12
7	0	nurse	emis web	hospital outpatient report	12
8	0	other care provider	awaiting clinical code migration to emis web	accident & emergency	12
9	0	nurse	other note	encompass message	11
10				- · · ·	
11 12	0	nurse other care	repeat prescription	repeat issue	11
13	0	provider	seen in influenza vaccination clinic	awaiting review	11
14		P	awaiting clinical code migration to		
15	0		emis web	discussion with colleague	11
16			awaiting clinical code migration to		
17	0		emis web	hospital outpatient consultation	11
18 19	0		awaiting clinical code migration to emis web	walk-in clinic	11
20	0		non-consultation medication data	medicine management	11
21			provision of general practitioner		
22	0		intermediate care	awaiting review	10
23 24	0	dr	clinic note	awaiting review	< 10
25		other care			
26	0	provider	ooh report	out of hours centre	< 10
27	0		administration note	non-consultation data	< 10
28	0		clinic note	nhs direct report	< 10
29	0		telephone follow-up	awaiting review	< 10
30	0	gp	administration note	clinic note	< 10
31 32	0	gp	progress report	awaiting review	< 10
32 33			awaiting clinical code migration to		
34	0	nurse	emis web	acute visit	< 10
35		other care	multidisciplinary team meeting		
36	0	provider	without patient	awaiting review	< 10
37	0		administration note	other note	< 10
38	0	dr	awaiting clinical code migration to emis web	home visit note	< 10
39 40	-				
40 41	0	gp	hospital inpatient note	day case report	< 10
42	0	gp	inbound document awaiting clinical code migration to	discharge details	< 10
43	0	nurse	emis web	follow-up/routine visit	< 10
44		other care	awaiting clinical code migration to		. 10
45	0	provider	emis web	discharge details	< 10
46			awaiting clinical code migration to		
47	0		emis web	enterprise consultation	< 10
48 49	0		awaiting clinical code migration to emis web	nursing home visit note	< 10
50	0		email received from carer	awaiting review	< 10
51 52	0		ooh report	out of hours, practice	< 10
52 53	0		other note	data transferred from other system	< 10
54	0		outbound referral	referral letter	< 10
55	0		radiology result	awaiting review	< 10
56	0	dr			
57			gp surgery	awaiting review	< 10
58	0	gp	routine consultation	repeat issue	< 10
59 60	0	nurse	email received from carer	awaiting review	< 10
00	0	nurse	non-consultation data	data transferred from other system	< 10

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0	nurse	scanned document	docman	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	home of patient	< 10
	other care			
0	provider	hospital outpatient report	letter from outpatients	< 10
0	dr	discussion with colleague	discussion with colleague	< 10
0	gp	administration note	discussion with colleague	< 10
0		awaiting clinical code migration to	aut of house section	. 10
0	gp	emis web	out of hours, practice	< 10
0	gp	clinic note	out of hours, non practice	< 10
0	gp	ooh report	out of hours, practice	< 10
0	gp	seen in diabetic clinic	awaiting review	< 10
0	gp	sms text message sent to patient	awaiting review	< 10
0	nurse	administration note	discussion with colleague	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	nursing home	< 10
0	other care	awaiting clinical code migration to	Provide the second s	
0	provider	emis web	online services message	< 10
0		awaiting clinical code migration to emis web	bulk operation	< 10
0		non-consultation data	touchscreen	< 10
0		awaiting clinical code migration to		< 10
0	dr	emis web	hospital outpatient report	< 10
		awaiting clinical code migration to		
0	dr	emis web	other	< 10
		awaiting clinical code migration to		
0	dr	emis web	third party consultation	< 10
0	dr	clinic note	clinic note	< 10
0	dr	non-consultation data	non-consultation data	< 10
		awaiting clinical code migration to		
0	gp	emis web	hospital inpatient report	< 10
0	gp	clinic note	community clinic	< 10
0	nurse	administration note	non-consultation data	< 10
		awaiting clinical code migration to		
0	nurse	emis web	non-consultation medication data	< 10
	other care			
0	provider	externally entered note	data transferred from other system	< 10
0	other care provider	gp surgery		< 10
0	other care			× 10
0	provider	other note	referral letter	< 10
	-	awaiting clinical code migration to		
0		emis web	nurseries/playgroup	< 10
0		hospital outpatient report	third party consultation	< 10
0	gp	nurse telephone triage	nurse telephone triage	< 10
		awaiting clinical code migration to		
0	dr	emis web	discussion with colleague	< 10
		awaiting clinical code migration to		
0	dr	emis web	medicine management	< 10
-	.	awaiting clinical code migration to		
0	dr	emis web	residential home visit note	< 10
0	dr	e-mail received from patient	e-mail received from patient	< 10
0	dr	telephone call from relative/carer	telephone call from relative/carer	< 10

3					
			awaiting clinical code migration to		
4 5	0	gp	emis web	walk-in centre	< 10
6	0	gp	extended hours consultation	out of hours, non practice	< 10
7	0	gp	externally entered note		< 10
8	0	gp	other consultation medium used	other note	< 10
9	0	gp	telephone consultation	telephone call to relative/carer	< 10
10			awaiting clinical code migration to		. 10
11 12	0	nurse	emis web	telephone encounter	< 10
13	0	nurse	medication requested	awaiting review	< 10
14	0	nurse other care	telephone follow-up awaiting clinical code migration to	awaiting review	< 10
15	0	provider	emis web	e-mail received from patient	< 10
16		other care	awaiting clinical code migration to		. 10
17	0	provider	emis web	mail from patient	< 10
18 19		other care	awaiting clinical code migration to		
20	0	provider	emis web	out of hours, practice	< 10
21		other care			. 10
22	0	provider	other note awaiting clinical code migration to	data transferred from other system	< 10
23	0		emis web	day case report	< 10
24			awaiting clinical code migration to		. 10
25 26	0		emis web	encompass message	< 10
20	0		e-mail encounter to carer	awaiting review	< 10
28	0		walk-in clinic	walk in centre	< 10
29			awaiting clinical code migration to		
30	0	dr	emis web	non-consultation data	< 10
31			awaiting clinical code migration to		
32	0	dr	emis web	other note	< 10
33	∩				
	0	dr	e-mail sent to patient	awaiting review	< 10
34	0	dr gp	email received from third party	awaiting review	< 10
34 35	0	gp	email received from third party	awaiting review	< 10
34 35 36 37 38	0 0	gp gp	email received from third party hospital inpatient note	awaiting review awaiting review	< 10 < 10
34 35 36 37 38 39	0 0 0	gp gp gp	email received from third party hospital inpatient note night visit note	awaiting review awaiting review night visit	< 10 < 10 < 10
34 35 36 37 38 39 40	0 0 0	gp gp gp gp	email received from third party hospital inpatient note night visit note other note	awaiting reviewawaiting reviewnight visitthird party consultation	< 10 < 10 < 10 < 10
34 35 36 37 38 39 40 41	0 0 0 0	gp gp gp gp gp	email received from third partyhospital inpatient notenight visit noteother notetelephone encounter	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carer	<10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40	0 0 0 0 0 0	gp gp gp gp gp gp	email received from third partyhospital inpatient notenight visit noteother notetelephone encountertelephone follow-upadministration noteawaiting clinical code migration to	awaiting review awaiting review night visit third party consultation telephone call to relative/carer awaiting review referral letter	<10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42	0 0 0 0 0	gp gp gp gp gp gp	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultation	<10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45	0 0 0 0 0 0	gp gp gp gp gp gp nurse	email received from third partyhospital inpatient notenight visit noteother notetelephone encountertelephone follow-upadministration noteawaiting clinical code migration to	awaiting review awaiting review night visit third party consultation telephone call to relative/carer awaiting review referral letter	<10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46	0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultation	<10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47	0 0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse nurse nurse nurse	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting review	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse nurse nurse nurse other care	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic seen in hospital ward telephone consultation	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewawaiting reviewawaiting reviewawaiting review	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic seen in hospital ward	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewawaiting review	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	0 0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider other care	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic seen in hospital ward telephone consultation	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewother note	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52	0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider	email received from third partyhospital inpatient notenight visit noteother notetelephone encountertelephone follow-upadministration noteawaiting clinical code migration toemis webseen in asthma clinicseen in hospital wardtelephone consultation	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewawaiting reviewawaiting reviewawaiting review	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53	0 0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider other care	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic seen in hospital ward telephone consultation	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewother note	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider other care provider other care	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic seen in hospital ward telephone consultation administration note	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewother notereferral letter	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider other care provider other care provider other care provider	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic seen in hospital ward telephone consultation administration note administration note administration note administration note	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewother notereferral letter	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider other care provider other care provider other care provider other care provider	email received from third partyhospital inpatient notenight visit noteother notetelephone encountertelephone follow-upadministration noteawaiting clinical code migration toemis webseen in asthma clinicseen in hospital wardtelephone consultationadministration noteadministration note	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewother notereferral letterreferral letter	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider other care provider other care provider other care provider other care provider other care provider	email received from third party hospital inpatient note night visit note other note telephone encounter telephone follow-up administration note awaiting clinical code migration to emis web seen in asthma clinic seen in hospital ward telephone consultation administration note administration note	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewother notereferral letter	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 51 52 53 54 55 56 57	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	gp gp gp gp gp gp nurse nurse nurse nurse nurse nurse other care provider other care provider other care provider other care provider other care provider	email received from third partyhospital inpatient notenight visit noteother notetelephone encountertelephone follow-upadministration noteawaiting clinical code migration toemis webseen in asthma clinicseen in hospital wardtelephone consultationadministration noteadministration note	awaiting reviewawaiting reviewnight visitthird party consultationtelephone call to relative/carerawaiting reviewreferral letterurgent consultationawaiting reviewawaiting reviewawaiting reviewother notereferral letterreferral letter	<10 <10 <10 <10 <10 <10 <10 <10 <10 <10

0	other care provider	awaiting clinical code migration to emis web	encompass message	< 10
	other care			
0	provider	clinic note	nhs direct report	< 10
0	other care provider	seen in diabetic clinic	awaiting review	< 10
0	provider	awaiting clinical code migration to		< 10
0		emis web	other report	< 10
0		child in need meeting	awaiting review	< 10
0		hospital inpatient report	hospital inpatient	< 10
0		progress report	nhs direct report	< 10
0		repeat prescription	non-consultation medication data	< 10
0		weekly care home ward round	awaiting review	< 10
		awaiting clinical code migration to		
0	dr	emis web	non-consultation medication data	< 10
		awaiting clinical code migration to		
0	dr	emis web	telephone call from a patient	< 10
0	dr	awaiting clinical code migration to emis web	telephone call from relative/carer	< 10
0		awaiting clinical code migration to		< 10
0	dr	emis web	telephone call to relative/carer	< 10
		awaiting clinical code migration to		
0	gp	emis web	night visit , practice	< 10
		awaiting clinical code migration to		
0	gp	emis web	walk-in clinic	< 10
0	gp	non-consultation medication data	non-consultation medication data	< 10
0	gp	other consultation medium used	referral letter	< 10
0	gp	other note	non-consultation data	< 10
0	gp	other note	non-consultation medication data	< 10
0	gp	seen in baby clinic 🥏	awaiting review	< 10
0	gp	telephone encounter	telephone call from relative/carer	< 10
0	nurse	administration note	clinic note	< 10
0	nurse	administration note	laboratory result	< 10
		awaiting clinical code migration to		
0	nurse	emis web awaiting clinical code migration to	casualty attendance	< 10
0	nurse	emis web	patientchase insert	< 10
0	nurse	clinic note	community clinic	< 10
0		extended hours consultation	out of hours, non practice	< 10
0	nurse	externally entered note	data transferred from other system	< 10
0		first attendance face to face	awaiting review	< 10
-	nurse			
0	nurse	hospital inpatient note	awaiting review	< 10
0	nurse	ooh report	out of hours, practice	< 10
0		other consultation medium used	data transferred from other system	< 10
0	nurse	other note	data transferred from other system	< 10
0	nurse	other note	referral letter	< 10
0	nurse	outbound referral	referral letter	< 10
0	nurse	patient initiated enc. nos	awaiting review	< 10
0	nurse	telephone consultation	telephone call from relative/carer	< 10
0	nurse	telephone encounter	telephone call to relative/carer	< 10
0	nurse	weekly care home ward round	awaiting review	< 10

19 of 54		BMJ Open		
1	1			
	other care			
0) provider other care	administration note awaiting clinical code migration to	mail to patient	<
0		emis web	hospital inpatient report	<
	other care	awaiting clinical code migration to		
c		emis web	hospital outpatient report	<
	other care	awaiting clinical code migration to		
0) provider	emis web	laboratory result	<
	other care			
0		clinic note	community clinic	<
	other care	first attandance face to face		
0) provider other care	first attendance face to face	awaiting review	<
0		inbound referral	awaiting review	<
	other care			
0		non-consultation data	data transferred from other system	<
	other care			
0	-	ooh report	out of hours, non practice	<
	other care			
0) provider	telephone encounter	awaiting review	<
		awaiting clinical code migration to		
0)	emis web awaiting clinical code migration to	follow-up/routine visit	<
0	,	emis web	letter	<
	<u> </u>	awaiting clinical code migration to		```
0)	emis web	minor injuries unit	<
		awaiting clinical code migration to		
0)	emis web	secretary	<
0)	email received from third party	awaiting review	<
C)	gp surgery	non-consultation data	<
0)	hospital inpatient report	awaiting review	<
()	hospital inpatient report	discharge details	<
		multidisciplinary team meeting with		
C)	patient	awaiting review	<
(c)	night visit note	night visit, local rota	<
		provision of general practitioner		
0)	intermediate care	gp2gp import	<
0)	telephone triage encounter	nhs direct report	<
0)	third party consultation	third party	<
	other care			
0) provider	nurse telephone triage	nurse telephone triage	<

Annex 3: NHS targets for cancer wait times

		Operation	nal standard			
Maximum two	Receipt of urgent referral for suspected cancer to first outpatient attendance					
weeks from	Receipt of referral of any patient with breast symptoms (where cance to first hospital assessment	r not suspected)	93%			
Maximum 28 days from	Receipt of two week wait referral for suspected cancer, receipt of urg a cancer screening programme (breast, bowel, cervical), and receipt o referral of any patient with breast symptoms (where cancer not suspe- date the patient is informed of a diagnosis or submarked by a start of appear.	f two week wait	75.0/			
	date the patient is informed of a diagnosis or ruling out of cancer Decision to treat to first definitive treatment		75% 96%			
Maximum one month (31 days)	Decision to treat/earliest clinically appropriate date to start of second or subsequent treatment(s) for all cancer patients including	surgery drug	94%			
from:	those diagnosed with a recurrence where the subsequent treatment	treatment	98%			
	is:	radiotherapy	94%			
Maximum two	Urgent referral for suspected cancer to first treatment (62-day classic		85%			
months (62 days) from:	Urgent referral from a NHS Cancer Screening Programme (breast, cerv for suspected cancer to first treatment	vical or bowel)	90%			

Annex 4: Comparing Cancer Wait Times counts for referrals and first treatments with the NCRAS data equity pack

Table A4.1: Comparing Cancer Wait Times counts for referrals and first treatments with the NCRAS data equity pack

)		01 Apr 2020	- 31 Jan 2021				
)		First treatme	ents for new ca	ncer	Urgent cancer	referrals	
<u>)</u> }		Observed	Expected	Percentage change (95% CI)	Observed	Expected	Percentage change (95% CI)
F 5	Cancer wait times data						
, ,	All	224,323	267,946	-16.3% (-16.6, -15.9)	1,673,775	2,071,967	-19.2% (-19.3, -19.1)
}))	NCRAS data equity pack						
,	All	219,410	254,436	-13.8% (-14.3, -13.3)	1,658,309	1,984,489	-16.4% (-16.6, -16.3)
-	Breast	30,488	40,530	-24.8% (-25.9, -23.6)	337,582	363,139	-7% (-7.5, -6.6)
5	Gynaecological	11,281	12,344	-8.6% (-10.9, -6.2)	158,723 🧠	176,985	-10.3% (-10.9, -9.7)
) 7	Head and Neck	8,892	9,901	-10.2% (-12.7, -7.6)	163,668	189,837	-13.8% (-14.4, -13.2)
3	Lower GI	23,507	27,056	-13.1% (-14.6, -11.6)	302,369	366,677	-17.5% (-17.9, -17.1)
)	Lung	24,796	27,409	-9.5% (-11.1, -8.0)	33,830	53,641	-36.9% (-37.8, -36.1)
2	Skin	40,977	43,475	-5.7% (-7.0, -4.5)	338,172	429,802	-21.3% (-21.7, -21.0)
} 	Upper GI	17,059	17,586	-3% (-5.0, -0.9)	141,720	163,013	-13.1% (-13.7, -12.4)
5	Urological	37,970	50,056	-24.1% (-25.2, -23.1)	134,389	184,642	-27.2% (-27.7, -26.7)
7	All other	24,441	26,080	-6.3% (-7.9, -4.6)	47,856	56,753	-15.7% (-16.7, -14.6)
,							

Annex 5: Patient demographics and person-time and total numbers of observed activity in CPRD Aurum sample

Table A5.1: Patient demographics in CPRD Aurum sample as at 22 March 2020

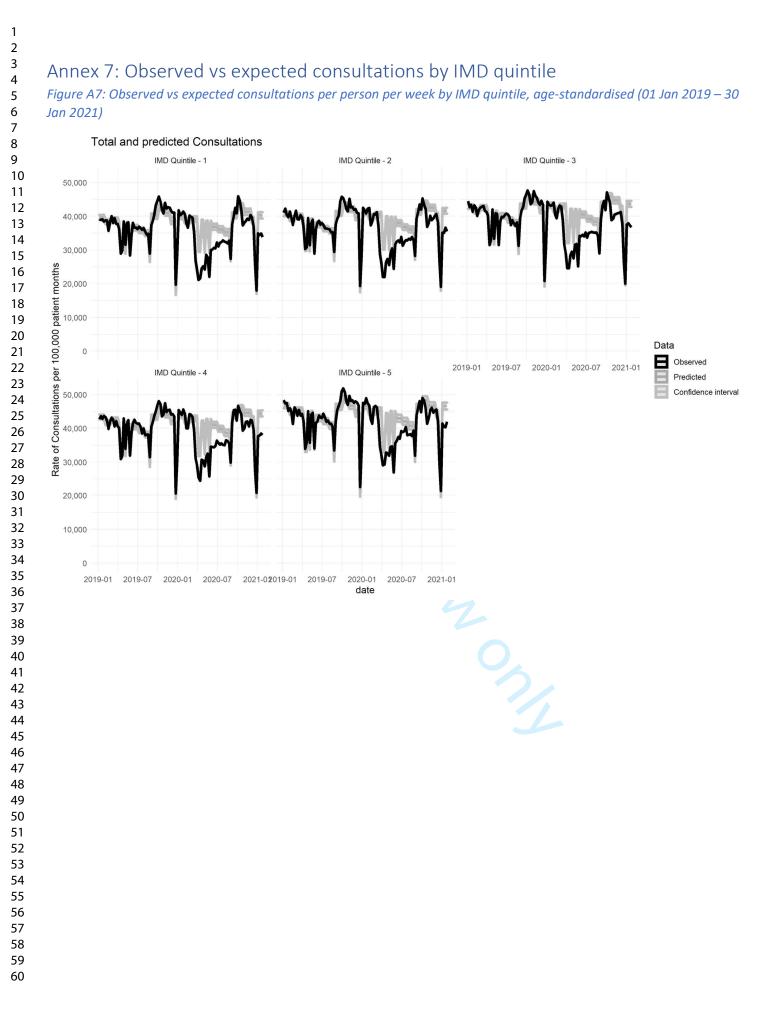
	n %			
All	375,501			
Female	187,509	49.9%		
Male	187,992	50.1%		
Under 11	39,611	10.5%		
11 to 19	43,406	11.6%		
20 to 49	157,962	42.1%		
50 to 69	87,482	23.3%		
70 and older	47,040	12.5%		
IMD Quintile - 1	78,759	21.0%		
IMD Quintile - 2	73,046	19.5%		
IMD Quintile - 3	71,840	19.1%		
IMD Quintile - 4	77,545	20.7%		
IMD Quintile - 5 IMD not	74,020	19.7%		
recorded	291	0.1%		

Table A5.2: Person time (weeks) and total primary care activity analysed - CPRD Aurum

4										
5		3 January 2016	5 - 21March	2020*		22 March 20	20 - 30 Janu	ary 2021		
6		Patient-time	100,000 person-	Activity	Observed rate per 100,000	Patient- time	100,000 person-	Activity	Observed rate per 100,000	
7		(weeks)	months	count	person-months	(weeks)	months	count	person-months	
8	Consultations excl flu	(WEEKS)	months	count	person months	(WCCK3)	montins	count	person months	
9	vaccinations	78,868,977	181.44	6,912,079	38,095	16,701,707	38.19	1,306,206	34,201	
1	Routine Referrals	78,868,977	181.44	312,422	1,722	16,701,707	38.19	40,744	1,067	
2										
3	2 Week Wait Referrals	78,868,977	181.44	38,905	214	16,701,707	38.19	10,235	268	

*The pre-pandemic period consists of 220 weeks or 51.61 months, the post pandemic period is 45 weeks or 10.29 months





STROBE Statement-checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Pag No
Title and abstract	1	(<i>a</i>) Indicate the study's design with a commonly used term in the title or the abstract	2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction		was done and what was found	
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of	4
		recruitment, exposure, follow-up, and data collection	
Participants	6	(<i>a</i>) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i> —Give the eligibility criteria, and the sources and	4
		methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls	
		<i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants	
		(b) Cohort study—For matched studies, give matching criteria and number of exposed and unexposed	
		<i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4/5
Data sources/	8*	For each variable of interest, give sources of data and details of methods	4/5
measurement		of assessment (measurement). Describe comparability of assessment methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	5/6
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4-6
Statistical methods	12	(<i>a</i>) Describe all statistical methods, including those used to control for confounding	5/6
		(b) Describe any methods used to examine subgroups and interactions	5/6
		(c) Explain how missing data were addressed	4-6
		(<i>d</i>) Cohort study—If applicable, explain how loss to follow-up was addressed	N//
		<i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed	
		<i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	
		(<u>e</u>) Describe any sensitivity analyses	4-6

Continued on next page

Participants	13*	(a) Report numbers of individuals at each stage of study-eg numbers potentially	
		eligible, examined for eligibility, confirmed eligible, included in the study,	
		completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and	
data		information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) Cohort study—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	Cohort study—Report numbers of outcome events or summary measures over time	
		Case-control study-Report numbers in each exposure category, or summary	
		measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and	
		their precision (eg, 95% confidence interval). Make clear which confounders were	
		adjusted for and why they were included	
		(b) Report category boundaries when continuous variables were categorized	
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a	
		meaningful time period	
Other analyses	17	Report other analyses done-eg analyses of subgroups and interactions, and	
		sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or	
		imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations,	
		multiplicity of analyses, results from similar studies, and other relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	
Other informati	on		
Funding	22	Give the source of funding and the role of the funders for the present study and, if	
			1

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Primary Care and Cancer: an analysis of the impact and inequalities of the COVID-19 pandemic on patient pathways

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Primary Subject Heading :	Oncology
Secondary Subject Heading:	General practice / Family practice
Keywords:	ONCOLOGY, PRIMARY CARE, COVID-19





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1 2	Primary Care and Cancer: an analysis of the impact and inequalities of the COVID-19 pandemic on patient pathways
3 4	Authors: Toby Watt ^{1,2} , Richard Sullivan³ and Ajay Aggarwal₄
5 6 7 8 9 10 11 12 13 14	 The Health Foundation, 8 Salisbury Sq., London, UK, Department of Public Health, Environments and Society, London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London, UK School of Cancer and Pharmaceutical Sciences, King's College London, London, UK; Institute of Cancer Policy, King's College London, London, UK; Department of Oncology, Guy's and St Thomas' NHS Foundation Trust, London, UK. Department of Health Services Research and Policy, London School of Hygiene & Tropical Medicine, London, UK; Institute of Cancer Policy, King's College London, London, UK; Department of Oncology, Guy's and St Thomas' NHS Foundation Trust, London, UK.
15 16	Corresponding author: Toby Watt, toby.watt@health.org.uk
$\begin{array}{c} 17\\ 18\\ 19\\ 20\\ 21\\ 22\\ 23\\ 24\\ 25\\ 26\\ 27\\ 28\\ 29\\ 30\\ 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 9\\ 50\\ 51\\ 52\\ 53\\ 54\\ \end{array}$	Corresponding author: Toby Watt, toby.watt@health.org.uk Word count: 4,817
55 56	
57 58	
59 60	For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

Page	5 бі 55 Вій Орен
1	Abstract
2 3	Objectives
4 5 6 7 8	We explore the routes to cancer diagnosis to further undertanding of the inequality in the reduction in detection of new cancers since the start of the pandemic. We use different data sets to assess stages in the cancer pathway: primary care data for primary care consultations, routine and urgent referrals and published analysis of cancer registry data for appointments and first treatments.
9 10	Setting
11 12	Primary and cancer care
13 14	Participants
15 16 17 18 19	In this study we combine multiple data sets to perform a population-based cohort study on different areas of the cancer pathway. For primary care analysis, we use a random sample of 500,000 patients from the Clinical Practice Research Datalink (CPRD). Post-referral we perform a secondary data analysis on the Cancer Wait Times data and the National Cancer Registry Analysis Service (NCRAS) COVID-19 data equity pack.
20 21	Outcome measures:
22 23 24 25	Primary care: consultation, urgent cancer referral and routine referral rates, then appointments following an urgent cancer referral, and first treatments for new cancer, for all and by quintile of patient's local area Index of Multiple Deprivation.
26 27	Results
28 29 30 31 32 33 34	Primary care contacts and urgent cancer referrals fell by 12.4% (12.3 to 12.6; 95% CI) and 20.2% (18.1 to 22.3; 95% CI) respectively, while routine referrals have not recovered to pre-pandemic levels. Reductions in first treatments for newly diagnosed cancers are down 16.3% (15.9 to 16.6; 95% CI). The reduction in the number of two week wait referrals and first treatments for all cancer has been largest for those living in poorer areas, despite having a smaller reduction in primary care contact.
35 36	Conclusions
37 38 39 40	Our results further evidence the strain on primary care and the presence of the inverse care law, and the dire need to address the inequalities so sharply brought into focus by the pandemic. We need to address the disconnect between the importance we place on the role of primary care and the resources we devote to it.
41 42	Key Words: Oncology, Primary Care, COVID-19
43 44	Strengths and Limitations
45 46 47 48 49 50 51 52 53 54 55 56	 This study draws from multiple data sets along the complex, multidisciplinary cancer pathway. We use a rich primary care data set containing patient level primary care activity linked to patients' local area socioeconomic indicator. Our primary care patient sample is relatively small (500,000 active patients from January 2016 to January 2021), however the data produces results that closely mirror the rates of consultation and urgent cancer referral per patient produced in publicly available national data sets.
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INTRODUCTION

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The COVID-19 pandemic has had a profound impact on UK's health system. Each part of the UK's National Health Service has been impacted in different ways, and we are still feeling many of the consequences of both the COVID-19 pandemic and the public health measures put in place to manage it (non-pharmaceutical interventions; NPI). Cancer is one of the most complicated diseases that the UK health system must manage, being responsible for over one in four UK deaths in 2019. Cancer outcomes are acutely sensitive to changes in social determinants, patient pathways and service provision. Delays in both diagnosis and treatment have significant impacts on patient outcomes(1,2). Pandemic related diagnostic delays, lack of capacity and downstream stage progression (to more advanced disease) are already being seen(3). In 10 addition, the impact of the pandemic needs to be seen in the context of an already overstretched UK cancer care system 11 12 pre-pandemic that was 'burning hot' even in normal times(4). 13

14 Primary care sits at the heart of the cancer patient pathway and is the most crucial interface for early diagnosis and 15 referral to hospital-based care, in addition to their wider support of cancer patient undergoing and post treatment. As 16 models of cancer care have evolved in light of both technical advances and an ageing co-morbid population primary care 17 has become an increasingly important aspect of integrated cancer care and an expansion of General Practitioner (GP) 18 roles in cancer care(5). On average 22.5% of patients diagnosed with cancer are referred to oncology diagnostic services 19 20 from primary care, but this reflects wide site-specific variation from as little as 8.3% of breast cancer to 42% for bladder 21 cancer(6). 22

23 It is important to reflect that prior to the start of the COVID-19 pandemic primary care had seen significant declines in 24 overall resourcing relative to the funding of the rest of the NHS and compared to growing levels of disease burden that is 25 managed in primary care. In addition, there is growing evidence that primary care has been under greater pressure in 26 more deprived areas, with higher levels of staff turnover(7), higher levels of complex multimorbidity(8), higher numbers 27 of consultations(9) and lower levels of funding and fewer GPs per capita once levels of ill health are taken into 28 29 account(10). These pressures on primary care, and a desire to correct them, have been recognised in the NHS Long Term 30 Plan(11). 31

32 Thus, to understand the COVID-19's impact on primary care and the downstream impact on cancer outcomes we need 33 to see that the pandemic arrived when the system that was already struggling to cope. Prior to COVID-19, the central 34 role of primary care as agents of change in reducing inequalities had been the subject of much debate yet could do little 35 in the face of political avoidance of health equity(12). Primary care had become a mirror on inequalities but also subject 36 37 to significant pressures from these growing inequalities that had put practices in deprived populations under significant 38 stress. Yet despite this, equity-oriented primary care reform in England in the mid-to-late 2000s may have helped to 39 reduce socioeconomic inequality in health(13). 40

[Box]

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43 COVID-19 was officially declared a pandemic by the WHO on 11 March 2020, and the UK announced its first full 44 lockdown on 23rd March. In the following months UK NPI were eased, schools reopened in phases, non-essential shops 45 reopened and in August the population were encouraged to eat out. Some restrictions were re-imposed in September 46 and October, on the 5th of November 2020 a second brief national locked lasted until 2nd December. On the 6th of 47 48 January a third national lockdown was introduced(14). 49

[End box] 50

51 It is now clear that the UK experience of the pandemic was one of the worst in the world, both in terms of excess 52 53 mortality (both COVID-19 and non-COVID-19) and the impact of NPI (lockdowns) on both the ability of health services to 54 continue provide care and the impact of messaging (stay at home) on patients' timely presentation for care(15). 55 However, the overwhelming focus of impact studies on cancer care has been on hospital-based services, including 56 diagnostics. Given primary care's central role in pathways to diagnosis and integrated cancer care, including survivorship 57 there has been little insight around how overall changes in consultation rates impacted both routine and two week wait 58 59 referrals as well as how this varied both in terms of site-specific cancers and as a consequence of socio-economic For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

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inequalities. This study aimed to analyse the socioeconomic inequalities in the impact of NPI measures taken in response to COVID-19 on consultations and routine and urgent cancer referrals in primary care and cancer diagnosis in secondary care.

METHODS

Study design, data sources and participants

We perform a population-based cohort study using the following three separate sources.

Primary care data – CPRD Aurum

Primary care electronic health records were obtained from the Clinical Practice Research Datalink Aurum database
 (henceforth CPRD). We included patient records from 01 January 2016 to 31 January 2021. Pre-pandemic data were
 included to establish long-term trends and patterns of seasonality in primary care use and referrals to secondary care.
 Similar to recent analysis of the COVID-19 pandemic(16), our analysis focusses on comparing observed levels of activity
 to the expected following the introduction of NPI in England in March 2020.

CPRD contains anonymised patient primary care data from approximately 7% of the UK population and is broadly
 representative in terms of age, sex, and ethnicity(17). The patient records include information on consultations, patient
 demographic information, diagnoses, medication prescriptions, and referrals to secondary care.

The period of eligibility for study inclusion, which starts on the latest of the study start date (01/01/2016) or the patient's registration to their practice. A patient's period of eligibility ends on the earliest of leaving their practice, the end of data collection from their practice or their death. Primary care records from CPRD were linked to the deciled index of multiple deprivation (IMD) from 2015ⁱ(18) of each patient's lower layer super output area (LSOAⁱⁱ). 500,000 patients were randomly sampled from the CPRD population in England who were eligible for linkage within the defined study period.

Cancer wait times data

Cancer waiting times (CWT) measure performance against the NHS Constitution Standards, recording the number of
 patients screened, referred to oncology specialists, diagnosed and treated for cancer. These measures are used by local
 and national organisations to monitor the timely delivery of services to patients, they are published quarterly by NHS
 Digitalⁱⁱⁱ.

Cancer diagnosis by socioeconomic status - NCRAS Cancer equity data

Data on cancer diagnosis by socioeconomic group was drawn from CADEAS and National Cancer Registry Analysis
 Service (NCRAS) which have two published data sets(19), presenting the latest national data on:

i. The number of urgent suspected two-week wait referrals^{iv} and,

- ii. First definitive treatments for cancer^v.
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ⁱⁱ Geographic areas in England and Wales that are built from groups of contiguous Output Areas and have been automatically
 generated to be as consistent in population size as possible, and typically contain from four to six Output Areas. The Minimum

- population is 1000 and the mean is 1500. For more details visit:
- https://datadictionary.nhs.uk/nhs_business_definitions/lower_layer_super_output_area.html#:~:text=Lower%20Layer%20Super%2
 0Output%20Areas,statistics%20in%20England%20And%20Wales.

 <sup>49
 50 &</sup>lt;sup>i</sup> https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

⁵⁶ iii https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/

⁵⁷ iv http://www.ncin.org.uk/view?rid=4346 (accessed on 24 January 2022)

^{58 &}lt;u>http://www.ncin.org.uk/view?rid=4347</u> (accessed on 24 January 2022) 59

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These data packs are produced based on the CWT data, with analysis from Hospital Episode Statistics (HES) and other sources outlined in their technical notes (further details in Annex 1).

Study Outcomes

Primary care consultations

We define consultations in CPRD data by a set of rules developed based on two variables in the consultations file^{vi} ("EMIS® consultation source identifier" and "Consultation source code identifier")^{vii}. In line with the approach taken by Carey et al 2012 for CPRD Gold data, we use a combination of the consultation code and the category of the record to identify consultations (details in Annex 2).

Using the observation file in CPRD Aurum, we were also able to identify where patients had influenza vaccinations. We look to exclude flu vaccines from our analysis on the basis that the programme was expanded in 2020/21 to achieve maximum uptake^{viii}. To help with the comparability of consultations in the two periods, we removed primary care appointments that included a flu vaccine.

<u>Referrals from primary care: routine and urgent cancer</u>

Referrals in CPRD are categorized into routine and "urgent cancer". Referrals from the 'referral file' are linked to patients, no additional data cleaning steps were taken in the analysis of referrals.

3 <u>First appointment following an urgent referral</u>

The CWT data present monthly counts of patients in England who have been recorded as receiving a first appointment following an urgent referral from primary care. The CWT data record this because the NHS have a 2-week performance target (Annex 3).

The NCRAS cancer equity data contain monthly counts in England of appointments following an urgent cancer referral
 broken down by tumour type and by deprivation according to patient's place of residence.

First treatment following a cancer diagnosis

The CWT data present monthly counts of patients in England who have been recorded as receiving a first treatment for a new cancer diagnosis. The CWT data record this because the NHS have a 31-day performance target (Annex 3).

The NCRAS cancer equity data contain monthly counts in England of first treatments for new cancer broken down by tumour type and by deprivation according to patient's place of residence.

Patient and public involvement

No patients involved

Data analysis

CPRD & CWT

For both CPRD and CWT we separate the data into two, before and after the introduction of the first NPI.

⁵⁵ vi <u>https://cprd.com/primary-care</u>

vii These variables contain strings that categorise the patient record input and are selected by the staff member completing the record.
record.

⁵⁸ viii <u>https://www.england.nhs.uk/wp-content/uploads/2020/05/Letter_AnnualFlu_2020-21_20200805.pdf</u>

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Our analysis of CPRD primary care is conducted weekly and split into two periods before and after the introduction of NPI on March 23rd 2020 (pre-NPI data is from 03 January 2016 to 21 March 2020, our post-NPI onset data is 22 March 2020 to 30 January 2021).

4 CWT data is reported monthly, our pre-NPI data is therefore from 01 October 2009 to 31 March 2020, our post-NPI 5 onset period is 01 April 2020 to 31 January 2021. 6

7 We perform a linear regression of consultations, urgent and routine referrals from CPRD data and appointments 8 following an urgent cancer referral and first treatments from CWT data over time to estimate expected values for the 9 10 post-NPI onset period, based on predicted values from the data pre-NPI. To account for seasonality and time trends we 11 include months as a categorical variable and time as a continuous variable, the approach taken by Carr et al. (16). In the 12 case of weekly primary care data, we observe large dips in activity in weeks that include bank holidays and include a 13 categorical variable on the basis of the number of bank holidays in each week (in the winter holidays in England there is 14 always one week with two bank holidays). Our primary care activity rates are presented per 100,000 patient-months^{ix}. 15 16 When analysing primary care consultation rates by socioeconomics we adjust for population age. We do so when 17 calculating the consultation rates by IMD quintile and weighting the sample according to the European Standard 18 Population^x (ESP). 19

20 NCRAS equity data

22 The analysis presented in the equity data pack compares new instances of first treatments in months during the 23 pandemic (01 April 2020 – 31 Jan 2021) compared with the same months in 2019/20. The analysis includes a 95% 24 confidence interval for the changes, based on rate ratios under an assumption that the population is the same in the 25 pre-COVID-19 baseline and COVID-19 months. This is calculated using the exact method described in Breslow & Day 26 27 1987, pp 93-95(20). The NCRAS equity data pack shows the high levels of heterogeneity in the impact of the COVID-19 28 pandemic on different tumour locations. The NCRAS data equity pack is different in its count and analysis of "all 29 tumours" compared with the Cancer Wait Times Data, this is because the data are slightly different (cleaned and 30 analysed by NCRAS – details in Annex 1). Results of our analysis with each data set are compared in Annex 4. Our 31 presentation of these data follows the same method but presents the cumulative difference for the period from April 32 33 2020 to the end of January compared with the previous 12 months. 34

RESULTS

37 **Overall impact of the pandemic** 38

39 In the calendar year of 2019, before the COVID-19 pandemic and the associated NPI, there was an average of 39,127 40 primary care consultations per 100,000 patient-months. This equates to 4.70 attended appointments per registered 41 patient, or an estimated 266 million appointments in primary care nationally in 2019^{xi}. 42

43 Primary care consultations (Figure 1 a) dropped rapidly to a low of 26,919 consultations per 100,000 patient-months in 44 the week following 29 March 2020, this was 66.0% lower than the predicted rate. Rates slowly recovered over the next 45 24 weeks and by 05 September 2020 were up to 99% of the baseline. In total there were an estimated 19.7 million (19.5 46 47 to 20.0; 95% CI) fewer primary care consultations in the English NHS during this period. Primary care

48 consultations again fell to below 90% of predicted levels in the third wave NPI starting on 06 January 2021, by the end of 49 January 2021 there were a further 6.4 million fewer consultations than expected. Between the start of the first NPI in 50

⁵⁴ ^{ix} We adjust the weekly rates per active patient in our sample to 100,000 patient-months: Weekly rate per registered patient in 55 sample x 100,000 x (52/12)

⁵⁶ ^x https://www.causesofdeath.org/docs/standard.pdf

⁵⁷ xⁱ For comparison the NHS national appointments data recorded 272 million attended appointments in primary care in 2019. Found 58 here: https://digital.nhs.uk/data-and-information/publications/statistical/appointments-in-general-practice/march-2021 59

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March 2020 and the end of January 2021 there were an estimated 26.1 million (25.7 to 26.5; 95% CI) fewer appointments than expected (Table 1a).

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In 2019, the average rate of urgent cancer (two week wait) referral was 314 per 100,000 patient-months, equating to an estimated 2.12 million for the NHS in England. Following the first NPI, urgent cancer referrals from primary care (Figure 1 b) fell to a nadir of 86 per 100,000 patient-months by 29 March 2020 (29.7% of the predicted level). Urgent cancer referrals did not return to pre-pandemic baseline until the week following 23 August 2020 equating to 317,000 (280,000 to 356,000; 95% CI) estimated lost urgent cancer referrals over this period. There was a second fall in urgent cancer referrals from primary care in the winter to below 90% of the baseline following the third lockdown (164 referrals per 10 100,000 patient-months in the week beginning 27 December 2021). This resulted in a further estimated 91,705 fewer 11 urgent cancer referrals than expected. Between the start of the first NPI in March 2020 and the end of January 2021 12 there were 395,000 (344,000 to 446,000; 95% CI) fewer urgent cancer referrals than expected (Table 1a). 13

15 Routine referrals however have shown a different trajectory in that their rates did not recover to pre-pandemic levels 16 (Figure 1 c). As a share of predicted levels routine referrals had the greatest fall, dropping to 16.1% of predicted rates 17 in the week from 19 April 2020. From then to the end of January the closest it came to predicted levels was 80.3% in the 18 week flowing 13 September 2020. For the four weeks in January 2021, it had fallen back down to 60-70% of predicted 19 rates. In 2019 there were an average of 1,801 routine referrals per 100,000 patient-months from primary care, 20 equivalent to an estimated 12.2 million for the NHS in England. Between the start of the first NPI in March 2020 and the 21 end of January 2021 there were 4.33 million (4.21 to 4.46; 95% CI) fewer routine referrals than expected (Table 1a). 22 23

Patient demographics and patient-time and total numbers of observed consultations and routine and urgent referrals in our CPRD sample are presented in Annex 5.

Table 1a: Observed post COVID-19 primary care activity (CPRD Aurum) 22 March 2020 – 30 January 2021

29 30 31		Observed rate	Expected rate	Percentage reduction (95% CI)	Estimated # missing from England population, to 3 significant digits (95% CI)
32	Event rate per 100,000 patient-months			x	
33					26,100,000
34	Consultations	34,201	38,684	11.6% (11.4, 11.7)	(25,700,000, 26,500,000)
35					
36					4,330,000
37	Routine Referrals	1,067	1,812	41.1% (40.4, 41.8)	(4,210,000, 4,460,000)
38					005 000
39	2 Week Wait Referrals	269	226	20.20/ (10.1.22.2)	395,000
40	2 Week Wait Referrais	268	336	20.2% (18.1, 22.3)	(344,000, 446,000)
41					
42					

45 Table 1b: Observed post COVID-19 cancer diagnostic activity (Cancer Wait Times), 01 April 2020 - 31 January 2021 46

47 48 49		Observed rate	Expected rate	Percentage reduction (95% CI)	Estimated # missing from England population, to 3 significant digits (95% CI)
50 51 52	Event rate per 100,000 patient-months First consultant appointments following urgent referral from primary care	296	366	19.2% (19.1, 19.3)	398,000 (395,000, 401,000)
53 54 55	Incidence rate per 100,000 patient-months First treatments for new cancer from the urgent primary care referral pathway	21.4	25.5	16.1% (15.5, 16.8)	23,300 (22,200, 24,400)
55 56 57	First treatments for new cancer from the national screening pathway	1.63 39.7	3.47 47.4	53.2% (52, 54.3) 16.3% (15.9, 16.6)	10,400 (10,000, 10,900) 43,600
58 59	First treatments for new cancer				(42,500, 44,700)

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Table 1a summarises the missing appointments and referrals for the post-pandemic period. Since the start of the pandemic in March we have observed consultations rates that are 11.6% (11.4 to 11.7; 95% CI) lower than predicted by previous data. The number of referrals to secondary care per consultation has also fallen, with urgent cancer referrals 20.2% (18.1 to 22.3; 95% CI) and routine referrals 41.1% (40.4 to 41.8; 95% CI) lower than expected.

The knock-on effect of the reductions in patients' primary care appointments and referrals can be observed in the
national CWT data. The number of first appointments with a cancer specialist following an urgent cancer referral has
fallen by approximately the same amount as estimated for the referrals themselves: 19.2% (19.1 to 19.3; 95% Cl). The
number of cancer first treatments (following a diagnosis and decision to treat) was 16.3% (15.9 to 16.6; 95% Cl) lower
than expected, or 43,600 (42,500 to 44,700; 95% Cl) missing first treatments from 01 April 2020 - 31 January 2021^{xii}
(graphs of observed compared with expected are presented in Annex 6).

13 Urgent cancer referrals by site specific cancer from 01 April 2020 until 31 January 2021 showed significant heterogeneity 14 from moderate reductions in urgent referrals for suspected breast (7.0%; 95% CI 6.6 to 7.5) and gynaecological cancers 15 (10.3%; 95% CI 9.7 to 10.9) and greater reductions for lung (36.9%; 95% CI36.1 to 37.8) and urological (27.2%; 95% CI 16 17 26.7 to 27.7) cancers (Figure 2, further details in Annex 4, Table A4.1). To show how pathway delays interface with 18 reductions in cancer referrals we also examined reductions in first treatments for the same site-specific cancers over this 19 period (Figure 2). Breast and urological cancers observed the greatest reduction in new first treatments: Breast fell 20 by 24.8% (23.6 to 25.9; 95% CI) which equates to 10,000 missing treatments and urological by 24.1% (23.2 to 25.2; 95% 21 CI) which equates to 12,100 missing treatments. Taken together these data reflect substantial delays in both diagnostic 22 and treatment phases of the patient pathway. 23

Inequalities in cancer diagnosis outcomes in the pandemic

There are inequalities in primary care use in England, with the people who live in the poorest areas have higher rates of consultation than those in richer areas once we adjust for age. The most deprived quintile was expected to have 43,184 consultations per 100,000 patient-months (Table 2), 15% more than the least deprived.

31 Table 2: Observed post COVID-19 primary care activity (CPRD Aurum) by IMD quintile, actual and age-standardised

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33		22 Mar 2020 - 30 Jan 2021 (V	Veekly)	
34		Observed rate	Expected rate	Percentage reduction (95% CI)
35 36	Consultations per 100,000 patient-months			
37	IMD Quintile - 1 (least deprived)	33,813	38,601	12.4% (12.1, 12.7)
38	IMD Quintile - 2	34,169	38,793	11.9% (11.6, 12.3)
39	IMD Quintile - 3	35,069	40,127	12.6% (12.3, 12.9)
40	IMD Quintile - 4	33,494	37,793	11.4% (11, 11.7)
41 42	IMD Quintile - 5 (most deprived)	34,561	38,212	9.6% (9.2, 9.9)
43	Consultations per 100,000 patient-months	(Age-standardised*)		
44 45	IMD Quintile - 1 (least deprived)	32,927	37,636	12.5% (12.2, 12.8)
46	IMD Quintile - 2	33,916	38,647	12.2% (11.9, 12.6)
47	IMD Quintile - 3	35,535	40,870	13.1% (12.7, 13.4)
48	IMD Quintile - 4	36,271	41,148	11.9% (11.5, 12.2)
49 50	IMD Quintile - 5 (most deprived)	38,997	43,184	9.7% (9.4, 10)
50	*Age-standardisation is performed according to th	e European Standard Population (E.	SP)	

*Age-standardisation is performed according to the European Standard Population (ESP)
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The reduction of consultations over the period 22 March 2020-30 January 2021 was smallest for those in most deprived areas. Their reduction in consultations for the non-age-standardised figures was 9.6% (9.2 to 9.9), while for the least

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58 xii Dates for the CWT and NCRAS analysis do not line up with the CPRD analysis because the latter is conducted weekly, not monthly.
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deprived the reduction was 12.4% (13.2 to 13.9; 95% CI) (Table 2). Weekly levels of age-standardised consultations per 100,000 patient-months by IMD quintile are presented in Annex 7.

Despite a smaller reduction in primary care contacts, we observe the largest reduction in both urgent cancer referrals and first treatments for cancer for patients living in the most deprived areas. The NCRAS data equity pack presents the number of urgent cancer referrals and first cancer treatments by IMD quintile^{xiii}. Figure 3 shows the reduction in urgent cancer referrals and first treatments for newly diagnosed cancer by IMD quintile.

There was a greater percentage reduction in urgent cancer referrals for those living in the most deprived areas in England, who experienced a 17.6% (17.2 to 18.0; 95% CI) reduction between 01 April 2020 and 31 January 2021 compared with the same period 12 months before, while referrals for the least deprived quintile fell by proportionately less: 15.3% (14.9 to 15.6; 95% CI). This equates to a reduction of 61,500 referrals for the most deprived and 62,600 or the least: without adjusting for age, the most deprive quintile had a smaller proportion of the pre-pandemic urgent cancer referrals, with 350,000 referrals compared to 410,000 for the least deprived quintile from April 2019 to January 2020.

At the same time, rates of new treatment for cancer for the people living in the most deprived 20% of England experienced a 15.8% (14.6 to 17.0; 95% CI) reduction between 01 April 2020 and 31 January 2021 compared with the same period 12 months before (6,610 missing first treatments). The reduction for the least deprived was 12.6% (11.5 to 13.7; 95% CI) which equates to 6,880 missing first treatments.

Despite having more access to primary care for patients in more deprived areas (9.7% reduction for most deprived compared to 12.5% for the least deprived), urgent cancer referrals and newly diagnosed cancers have been disrupted by the pandemic more for people living in poorer areas.

DISCUSSION

The coronavirus SARS-CoV-2 (COVID-19) pandemic has had a profound impact on the management of patients with cancer(21). The first national lockdown in March 2020 created a ripple of non-pharmaceutical interventions, including 'stay at home' orders, diminished healthcare service provision and redistribution of healthcare to COVID-19 related care that has had a profound impact on cancer services(1,22).

There are also new potential barriers to the pathway that have resulted and may exacerbate these findings. For example, decreases in health seeking behaviour due to fear of acquiring COVID-19 infection through interactions with health care settings, increasing use of remote consultations(23), changes in routine referral guidelines(24), as well as changes in the capacity of acute care. The backlog for routine diagnostic services is a particular concern given that approximately 40% of cancer are diagnosed through this route(25).

Similar issues have also been identified within the health systems of other high-income countries. Primary care providers in eight European countries experienced similar issues in how to rapidly transform services in the wake to COVID-19(26). A study in Sweden found an almost identical percentage reduction in primary care consultations (12%) as a results of the pandemic(27), in Norway there was a 24% reduction in cancer referrals(28), the Netherlands had a 26% reduction in non-skin cancer diagnoses(29) and in Belgium there was a 44% reduction in diagnosis of invasive tumours in the first wave of the pandemic(30). Our results don't appear to be unique to England: while different countries can have different routes to diagnosis(31), many countries also observed disruptions to cancer pathways(32–35).

Whilst it was already known that there had been a substantial reduction in the number of overall cancer-related
 referrals(36,37) the quantification of this had been missing. Our findings, that primary care consultations in English NHS
 fell by 12.4% between January 2020 and January 2021 with urgent cancer referrals even more suppressed (20.2%),
 reflect how profound the pathway disruptions were for cancer patients. Furthermore, many cancers are picked up

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xⁱⁱⁱ They do not age-standardise their results

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through the course of routine referrals from general practice for non-specific symptoms. The drop in routine referrals that we found (4.3 million, over this period) will inevitably translate into late-stage presentation and a substantial reduction in outcomes. This will include wider economic costs due to more expensive, late-stage treatment and productivity losses due to morbidity and premature mortality. However, the trajectory of the declines reflect not just changes to national policy in terms of NPI, but also knock-on effects around public behaviour, primary care staffing, downstream reductions in diagnostics and an overall increase in friction across all cancer pathways and systems.

This reduction in cancer pathways through primary care needs to be put in the context of wider disruptions. The suspension of national cancer screening programmes meant that around 2 million people were not screened for cancer through national programs(38,39). Moreover, delays in cancer diagnoses and treatments have consistently been associated with poorer outcomes(1,2). The COVID-19 pandemic has also exacerbated the worst 62-day cancer waiting time targets in the last decade where 1 of 4 patients urgently referred from primary care between April 2020 and January 2021 did not receive treatment within 62 days(37).

In our analysis of urgent cancer referrals by site in relation to reductions seen in first treatments significant differences were seen, which is also reflected in the international evidence. Urological cancers (testis, renal, prostate and urothelial) have been particularly impacted with greater than 25% decrease both in urgent referrals and first treatments. This suggests that outcomes will be particularly impacted in this group. Lung, skin and lower GI (colon and rectal) cancer also experienced significant declines in urgent referrals, in the Netherlands there was a 60% reduction in skin cancer diagnosis during the first wave(29).

24 Breast cancer was the least impacted of all in terms of urgent referrals but experienced a 25% reduction in first 25 treatments. This highlights how much breast cancer diagnosisrelies on screening programmes which have suffered 26 badly as a result of the pandemic, in England(37) and internationally(40). In England, head and neck cancers (HNC) in 27 saw a 10.2% (7.6 to 12.7; 95% CI) reduction in diagnosis, while studies in other geographies showed wide differences in 28 the measures impacts of the pandemic on HNC: a study in Ontario, Canada found no evidence of a reduction in head and 29 30 neck cancer diagnosis following an initial drop in the 6 weeks following lockdown(41), a clinic in Italy had just a 3.7% 31 reduction in HNC(42), a 14% reduction in Belgium(30), a clinic in California showed a 22% reduction(43) and a Cancer 32 Centre in the North of England reported a 33% reduction in NHC cases(44). There is further international evidence of the 33 impact of COVID-19 on interventions down the pathway, with reductions in radical cancer surgeries in two major cancer 34 hubs in England and Italy(45). 35

Differences in systems, populations and NPI from the pandemic present high levels of complexity in tackling the
 recovery at both a national and local level. Although it is possible that, in many countries, some cancer patients have
 already been 'lost' to the system i.e. died of COVID-19 or other non-COVID-19 comorbidities, a significant number will
 now present with later stage disease, creating further pressure on acute cancer care.

Our findings also reflect socioeconomic inequalities, with more profound decrease in urgent cancer referrals and first
 treatments for the most deprived populations despite relatively better preservation of consultation rates. This is
 unexpected and extremely worrying, indicating greater disruption to the diagnostic pathway for patients living in more
 deprived areas, whose cancer outcomes were typically worse than their less deprived counterparts pre-

pandemic(46,47). Resilience in primary care is key for the cancer diagnosis pathway and must be developed. We know
 that there are challenges associated with resourcing health services in poorer areas (the inverse care law(48)), resulting
 in fewer resources per head of sick patient(10) and shorter consultation times(49). Further research should focus on
 understanding to what extent complex morbidity, which is greater in poorer areas(8,50), contributes to the disruption of
 the cancer diagnostic pathway. Greater understanding would help health systems better prepare for the kind of
 disruption we have seen as a result of COVID-19.

55 Limitations

This study uses multiple data sets to analyse a complex and disjointed pathway. We include a primary care data set that
 uses a relatively small (500,000) patient sample. However, the CPRD data produces results that closely mirror the rates

of consultation per patient (and their reduction) produced in NHS Digital's appointments data(51). In addition, the estimated reduction in urgent cancer referrals is close to those presented in the NCRAS's analysis of their cancer registry data (Table 1a & Table 1b). It is not yet possible to link these data on a patient basis due to delays in data access and once possible further research would be illuminating.

Conclusions

Our data reflects a disruption to a complex interaction of several systemic issues that place a great deal of impetus on the role of primary care in ensuring early diagnosis of cancer. Primary care was already under strain pre-pandemic, with low levels of investment and workforce deficits(52). Particularly in areas of high deprivation, general practice is underfunded and under staffed relative to need(7,8,10).

Early cancer diagnosis requires concordance of each participant and mechanism - including patients' awareness and ability to present with cancer symptoms, the ability of GPs to detect and urgently refer possible cancer cases and sufficient diagnostic capacity (in terms of both workforce and equipment) to enable swift referrals and minimise delays to diagnosis and treatment. Every one of these nodes on the pathway to early diagnosis has been affected by the pandemic and the national policy response. However, further work is required as there is currently little understanding and even less evidence about how much each disruption is ultimately impacting cancer pathways.

The impact of the pandemic on cancer diagnosis and time to treatment shown here is very serious. However, what is more concerning is the unequal and inequitable impact on those worst off. Cancer as a disease area "magnifies what we know to be true about the totality of the health care system. It exposes all its strengths and weaknesses"(53). Our results further evidence the strain on primary care, the presence of the inverse care law(48), and the dire need to address the inequalities so sharply brought into focus by the pandemic. We need to address the disconnect between the importance we place on the role of primary care in cancer care and the resources we devote to it.

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Figure legends:

- Figure 1: Observed vs expected primary care activity, 01 Jan 2019 30 January 2021 (per 100,000 patient-months)
- (CPRD Aurum data) Panels: a. Consultations, b. Urgent cancer (2 week wait) referrals from primary care, c. Routine
 referrals from primary care
- Figure 2: Percentage difference between observed and expected first treatments for new cancer and urgent cancer
 referrals by tumour location from NCRAS Cancer equity data pack (%, 01 Apr 2020 to 31 Jan 2021)
- Figure 3: Percentage difference between observed and expected urgent cancer referrals and first treatments for cancer
 by IMD quintile (01 Apr 2020 31 Jan 2021)
- Contributors: TW, RS and AA designed the study. Data acquisition, cleaning and analysis was conducted by TW on the Health Foundation's secure date environment. TW wrote the manuscript in the first instance. TW, RS and AA interpreted the data and substantially reviewed the draft manuscript. All authors approved the final version of the manuscript. TW and RS are the guarantors. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Competing interests: None

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Ethics approval: CPRD collect data for research use. We did not require ethical approval however, scientific approval for this study was given by the CPRD Independent Scientific Advisory Committee (ISAC). The study was approved by the Independent Scientific Advisory Committee for CPRD research (20 143). No additional ethics approval was required for this study.

Data Availability statement:

The primary care activity data may be obtained from a third party and are not publicly available. We used de identified primary care data from the Clinical Practice Research Datalink (CPRD). For more information please visit:
 https://www.cprd.com/Data-access, enquiries can be emailed to enquiries@cprd.gov.uk. Scientific approval for this
 study was given by the CPRD Independent Scientific Advisory Committee (ISAC). The study was approved by the
 Independent Scientific Advisory Committee for CPRD research (20 143). The data is provided by patients and collected
 by the NHS as part of their care and support.

Other data sources are available in a public, open access repository: Cancer Wait Times at

https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/ and the NCRAS Cancer data equity
 pack is available at http://www.ncin.org.uk/local_cancer_intelligence/cadeas.

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Key	messages
	Primary care is key part of the pathway for early cancer diagnosis through both routine and 2ww referrals Cancer diagnosis rates have experienced a sustained fall since the start of the COVID-19 pandemic and introduction of non- pharmaceutical interventions (NPIs) lockdowns'. The fail in urgent cancer referral is larger than the fall in primary care contacts, implying that the content of consultations as shifted away from potential cancer diagnosis. Despite having a smaller reduction in primary care contact through the pandemic, patients living in poorer areas have had larger reductions in urgent cancer referrals and first treatments for new cancer. Government, patients and primary care staff must work together to catch up on missing diagnosis. Resilience in primary care is key for the cancer diagnosis pathway and must be developed for future disruptions, particularly in poorer areas where care is more complex.



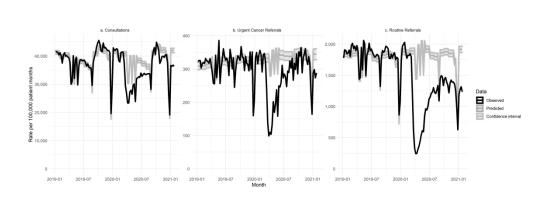
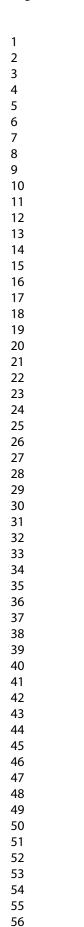


Figure 1: Observed vs expected primary care activity, 01 Jan 2019 – 30 January 2021 (per 100,000 patientmonths) (CPRD Aurum data) Panels: a. Consultations, b. Urgent cancer (2 week wait) referrals from primary care, c. Routine referrals from primary care

381x127mm (300 x 300 DPI)



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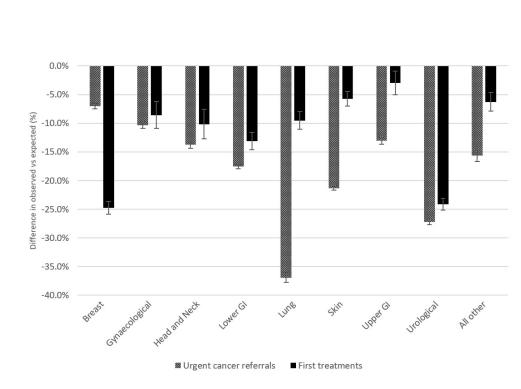


Figure 2: Percentage difference between observed and expected first treatments for new cancer and urgent cancer referrals by tumour location from NCRAS Cancer equity data pack (%, 01 Apr 2020 to 31 Jan 2021)

233x150mm (120 x 120 DPI)

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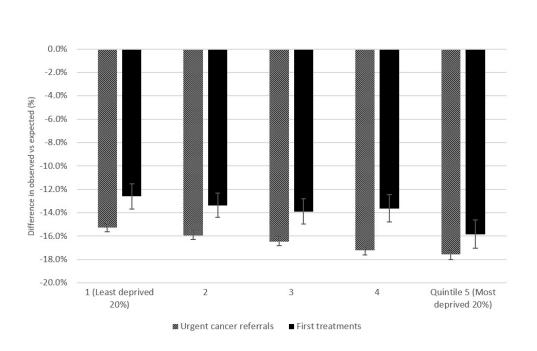


Figure 3: Percentage difference between observed and expected urgent cancer referrals and first treatments for cancer by IMD quintile (01 Apr 2020 – 31 Jan 2021)

205x122mm (120 x 120 DPI)

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5	Annex 1: NCRAS data equity pack, technical notes
6 7 8 9 10	CADEAS and NCRAS have produced two equity data packs presenting the latest national data on the number of urgent suspected two-week wait referrals and first definitive treatments for cancer. These data packs are produced on the basis of the Cancer Wait Times data, with analysis from Hospital Episode Statistics (HES) and other sources outlined in their technical notes.
11 12 13 14	 "Any differences between treatment volumes in the published official statistics and the volumes presented in this pack are because: Data was extracted from the CWT system at a slightly different time. Data included here is based on England residents only. Additional logic has been applied to remove treatments where some of the information required for this equity analysis
15	is missing or there are potential data quality issues, for example cases with a mismatch between the suspected cancer
16	
17 18	referral type and sex (eg. gynaecological cancer treatments for men, testicular cancer treatments for women), and suspected cancer referral type and age (eg. suspected children's cancer for patients aged 20 and over)." – NCRAS Cancer
19	data equity pack technical notes, final tab within the downloaded spreadsheet. Available under "Links to data":
20 21	http://www.ncin.org.uk/local_cancer_intelligence/cadeas_as at 26/01/2022
22 23	Annex 2: Consultation definition
24	CPRD Aurum data dictionary sets out the structure of the data. Within the consultation file there are two variables one can use to
25	identify whether a primary care contact, rather than an administrative note ("EMIS® consultation source identifier" and
26	"Consultation source code identifier").
27 28	The EMIS consultation source identifier is the primary variable used. We include the following observations of this variable:
29 30 31 32 33	Acute visit, Casualty attendance, Clinic, Emergency appointment, Emergency consultation, Enterprise consultation, Face to face consultation, Follow-up/routine visit, Gp surgery, Home visit, Home visit note, Main surgery, Nursing home, Nursing home visit note, Online services message, Other, Residential home, Residential home visit note, Same day appointment, Surgery consultation, Telephone encounter, Urgent consultation, Walk-in centre, Walk-in clinic
34 35 36	We also include instances where EMIS consultation source identifier is "awaiting review" and the Consultation source code identifier is in the following list:
37 38	Consultation, visit, seen in gp unit, seen in private clinic, seen in rapid access clinic at gp surgery, seen in urgent care centre, online communication.
39 40 41 42	We then further exclude records on the basis of the category of staff responsible for the record. The " <u>Job category</u> " variable from the staff file, linked by the consultation id is used. We only include as a consultation records filled out by GPs, doctors, nurses and other health care professionals as defined in CPRD's numerical codes listed below:
43 44	GP – 4, 5, 15, 24, 31, 181, 183
45 46	Dr – 1, 41, 91, 116, 119, 121, 126, 173, 177, 197
47 48	Nurse – 8, 9, 27, 33, 47, 48, 50, 55, 59, 60, 61, 111
49 50 51	Other healthcare professional - 2, 3, 6, 7, 10:14, 16, 17, 34:37, 42, 43, 52, 54, 58, 62:65, 68, 72, 73, 77, 80, 82, 83, 86:89, 94, 95, 97, 100:102, 105, 106, 112:114, 118, 122, 125, 127, 131, 135, 136, 138, 141, 142, 145, 148, 149, 154, 156, 158, 168, 185, 186, 188, 189, 204, 208
52 53	In Table A2.1 we present the CPRD Aurum Staff Category list.
54 55 56 57 58 59 60	In Table A2.2 we present the total number of consultations identified from 01 January 2016 to 31 January 2021, the count with each combination of staff category, "EMIS® consultation source identifier" and "Consultation source code identifier" in Table A2.2 we show the count of records that were excluded, highlighting those that were excluded on the basis of staff category, not the consultation file description variables.
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3	Table A2.1: CPRD Aurum Staff Job Categories
4	
5	1 Consultant
6	2 Hospital Practitioner
7	3 Clinical Medical Officer
8	4 General Medical Practitioner
9	5 Salaried General Practitioner
10	6 Midwife - Sister/Charge Nurse
11	7 Midwife
12	8 Community Practitioner
12	9 Community Nurse
	10 Chiropodist/Podiatrist
14	11 Dietitian
15	12 Pharmacist
16	13 Clinical Psychologist
17	14 Health Care Support Worker
18	15 Associate Practitioner - General Practitioner
19	16 Counsellor
20	17 Phlebotomist
21	18 Clerical Worker
22	
23	19 Manager
24	20 Analyst
25	21 System Administrator 22 Desktop Support Administrator
26	23 System Worker
27	
28	24 GP Registrar 25 Medical Student
29	26 Other Community Health Service - Admin Clerk
30	27 Specialist Nurse Practitioner
31	28 Receptionist
32	29 Secretary
33	30 Medical Secretary
34	31 Sessional GP
35	32 Clinical Application Administrator
36	33 Nurse Consultant
37	34 Physiotherapist
38	35 Specialist Practitioner
39	36 Healthcare Assistant
40	37 Medical Technical Officer - Pharmacy
41	38 Health Records Administrator
42	39 Helpdesk Administrator
43	40 Appointments Clerk
44	41 Senior House Officer
45	42 Social Worker
46	43 Trainee Practitioner
47	44 Network Technician
48	45 Clinical Coder
49	46 Medical Records Clerk
50	47 Staff Nurse
51	48 Enrolled Nurse
52	49 Multi Therapist
53	50 Nursery Nurse
54	So realisely realise
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51 Helper/Assistant 52 Community Mental Health Nurse 53 Senior Administrator 54 Technician - Healthcare Scientists 55 Associate Practitioner - Nurse 56 Senior Manager 57 Community Administrator 58 Associate Specialist 59 Student Practice Nurse 60 Nurse Manager 61 Sister/Charge Nurse 62 Psychotherapist 63 Osteopath 64 Social Care Support Worker 65 Assistant Psychologist 66 Officer 67 Technician - Admin & Clerical 68 Psychiatrist 69 Health Records Clerk 70 Desktop Support Technician 71 Dispenser 72 Clinical Assistant 73 Practitioner 74 Information Officer 75 Network Administrator 76 Chaplain 77 Student Physiotherapist 78 Paramedic Specialist Practitioner 79 Clinical Team Manager 80 Physiotherapist Specialist Practitioner 81 Helpdesk Technician 82 Radiographer 83 Other Community Health Service 84 Call Operator 85 Community Worker (children) 86 Paramedic Consultant 87 Associate Practitioner 88 Modern Matron 89 Asst. Clinical Medical Officer 90 Community Team Manager 91 Specialist Registrar 92 Chiropodist/Podiatrist Manager 93 Radiographer - Therapeutic, Manager 94 Optometrist 95 Assistant Practitioner 96 Community Learning Disabilities Nurse 97 Technician - Additional Clinical Services 98 Student Health Visitor 99 Interpreter 100 Medical Technical Officer

2	
3	101 Midwife Specialist Practitionar
4	101 Midwife - Specialist Practitioner
5	102 Occupational Therapist 103 Chief Executive
6	105 Chief Executive 104 Audit Manager
7	104 Audit Manager 105 Paramedic
8	
9	106 Physiotherapist Consultant
10	107 Availability Monitor
11	108 Medical Laboratory Assistant
12	109 Gateway Worker
13	110 Medical Records Manager
14	111 Student Nurse - Adult Branch
15	112 Audiologist
16 17	113 Radiographer - Diagnostic
17	114 Therapist
10	115 Student District Nurse
20	116 House Officer - Post Registration
21	117 Speech & Language Therapist
22	118 Dietitian Specialist Practitioner
23	119 Trust Grade Doctor - SHO level
24	120 Director of Public Health
25	121 Staff Grade
26	122 Patient Welfare Officer
27	123 Occupational Therapy Specialist Practitioner
28	124 Technician - PS&T
29	125 Chiropodist/Podiatrist Consultant
30	126 Trust Grade Doctor - Career Grade level
31	127 Student Community Practitioner
32	128 Healthcare Scientist
33	129 Waiting List Clerk
34	130 Clinical Director
35	131 Pre-reg Pharmacist
36 37	132 Mental Health Act Administrator
38	133 Ward Clerk
39	134 Support, Time, Recovery Worker
40	135 Art Therapist Specialist Practitioner
41	136 Physiotherapist Manager
42	137 Healthcare Cadet
43	138 Dietitian Consultant
44	139 Orthoptist Manager
45	140 Social work assistant (mental health)
46	141 Chiropodist/Podiatrist Specialist Practitioner
47	142 Student Technician
48	143 Complaints Investigator
49	144 Trainee Scientist
50	145 Radiographer - Diagnostic, Manager
51	146 Social services care manager (mental health)
52	147 Dietitian Manager
53	148 Midwife - Consultant
54	149 Art Therapist Consultant
55	150 Paramedic Manager
56 57	-
57 58	201 Healthcare Science Assistant
58 59	202 Social work assistant (adults)
59 60	203 Social work team manager (adults)
00	

151 Finance Director 152 Senior social worker (adults) 153 Student Midwife 154 Radiologist 155 Ward Manager 156 Midwife - Manager 157 Waiting List Manager 158 Radiographer - Diagnostic, Specialist Practitioner **159 Biomedical Scientist** 160 Board Level Director 161 Non Executive Director 162 Nursing Cadet 163 Porter 164 Social services care manager (adults) 165 Student Psychotherapist 166 Orthoptist 167 Clinical Director - Medical 168 Approved Social Worker 169 Student Community Mental Health Nurse 170 Other Executive Director 171 Student Orthoptist 172 Childcare Co-ordinator 173 House Officer - Pre Registration 174 SODP 175 Outpatient Manager 176 Medical Director 177 Trust Grade Doctor - Specialist Registrar level 178 Senior Clinical Medical Officer 179 Consultant Healthcare Scientist 180 Reporting Radiographer 181 Locum GP 182 Researcher 183 Assistant GP 184 Special salary scale in Public Health Medicine 185 Advanced Practitioner 186 Health Visitor 187 Dental Assistant Clinical Director 188 Other Community Health Service - Social Care Worker 189 Physician Assistant 190 Deputising Doctor 191 Student Occupational Health Nurse 192 Senior social worker (mental health) 193 Regional Dental Officer 194 Trainer 195 Cytoscreener 196 Chair 197 Trust Grade Doctor - House Officer level 198 Art Therapist 199 Multi Therapist Specialist Practitioner 200 Drama Therapist

- 204 Intermediate Care worker
- 205 Student Occupational Therapist
- 206 Student Dietitian
- 207 Healthcare Science Associate
- 208 Child Protection worker
- 209 Professor

- 210 General Dental Practitioner
- 211 Student School Nurse
- 212 Occupational Therapist Consultant
- 213 Intermediate Care staff
- 214 Home help
- 215 Art, Music & Drama Student
- 216 Specialist Healthcare Scientist
- 217 Social Services information manager

Table A2.2: Number of observations by EMIS® consultation source identifier, Consultation source code identifier and Staff Job Category, with an indicator for whether it was included as a consultation: Include: 1 = Include, 0 = Exclude, "Excl. job title" = Excluded on the basis of job title.

Include	Staff Job Category	Consultation source code identifier	EMIS consultation source identifier	Count
1	gp	gp surgery	gp surgery	3,119,080
1	nurse	gp surgery	gp surgery	1,692,606
1	gp	telephone consultation	telephone consultation	1,471,946
1	other care provider	gp surgery	gp surgery	977,067
1	nurse	telephone consultation	telephone consultation	196,665
1	gp	telephone call to a patient	telephone call to a patient	108,025
1	gp	home visit note	home visit note	83,600
1	other care provider	telephone consultation	telephone consultation	81,980
1	nurse	telephone call to a patient	telephone call to a patient	32,423
1	gp	face to face consultation	face to face consultation	25,435
1	nurse	home visit note	home visit note	24,174
1	other care provider	telephone call to a patient	telephone call to a patient	23,194
1	gp	gp surgery	surgery consultation	22,756

1	gp	nursing home visit note	nursing home visit note	21,357
1	nurse	face to face consultation	face to face consultation	17,580
1	gp	enterprise consultation	enterprise consultation	14,904
1	gp	telephone call from a patient	telephone call from a patient	13,062
1	gp	routine consultation	surgery consultation	11,668
	other care			
1	provider	home visit note	home visit note	10,853
		provision of general practitioner		
1	gp	intermediate care	gp surgery	10,441
1	gp	emergency consultation	emergency consultation	10,351
 1	gp	residential home visit note	residential home visit note	9,579
1	other care		face to face consultation	0.250
1	provider	face to face consultation	face to face consultation	9,350
1	gp	emergency appointment	emergency appointment	8,687
 1	gp	urgent consultation	urgent consultation	8,155
1	gp	walk-in clinic	walk-in clinic	7,908
 1	dr	gp surgery	gp surgery	7,654
1	gp	other note	other	7,520
1	gp	face to face consultation	surgery consultation	6,932
1	nurse	gp surgery	surgery consultation	5,318
1	gp	seen in gp unit	surgery consultation	4,687
1	gp	consultation via video conference	awaiting review	4,653
1	nurse	enterprise consultation	enterprise consultation	4,460
	other care	provision of general practitioner		
1	provider	intermediate care	gp surgery	4,369
1	gp	clinic note	surgery consultation	3,823
1	nurse	residential home visit note	residential home visit note	3,612
1	nurse	clinic note	clinic	3,585
1	nurse	nursing home visit note	nursing home visit note	3,528
1	nurse	face to face consultation	surgery consultation	3,442
1	gp	online communication	awaiting review	3,410
	other care			
1	provider	other note	other	3,406
	other care			
1	provider	seen in gp unit	gp surgery	2,781
1	gp	e-mail consultation	awaiting review	2,523
1	nurse	other note	other	2,449
4	other care			2.224
 1	provider other care	gp surgery	surgery consultation	2,334
1	provider	enterprise consultation	enterprise consultation	2,318
	other care			2,010
1	provider	telephone call from a patient	telephone call from a patient	2,211
1	nurse	telephone call from a patient	telephone call from a patient	2,183
1	gp	routine consultation	awaiting review	2,117
1	nurse	emergency appointment	emergency appointment	2,041
1	gp	home visit note	home visit	2,021
1		seen in gp unit		1,896
T	gp	provision of general practitioner	gp surgery	1,890
1	nurse	intermediate care	gp surgery	1,762

2					
3		other care			
4 5	1	provider	clinic note	clinic	1,699
5 6	1	nurse	clinic note	surgery consultation	1,628
7	1	gp	clinic note	clinic	1,623
8	1	nurse	routine consultation	surgery consultation	1,578
9	1	nurse	seen in gp unit	surgery consultation	1,426
10	1	nurse	walk-in clinic	walk-in clinic	1,412
11	1	nurse	gp surgery	clinic	1,355
12 13		other care			
14	1	provider	routine consultation	other	1,303
15	1	other care provider	clinic note	surgery consultation	1 207
16	1			surgery consultation	1,297
17	1	gp other care	face to face consultation	emergency consultation	1,292
18	1	provider	walk-in clinic	walk-in clinic	1,216
19 20	1	gp	telephone encounter	telephone encounter	1,184
20	1	gp	online communication	online services message	1,139
22	1	gp	other consultation medium used	awaiting review	1,134
23		other care	other consultation median used		1,134
24	1	provider	residential home visit note	residential home visit note	1,113
25	1	nurse	seen in gp unit	gp surgery	1,103
26 27		other care			
27	1	provider	nursing home visit note	nursing home visit note	1,081
29		other care			
30	1	provider	face to face consultation	surgery consultation	1,045
31	1	other care provider	seen in gp unit	surgery consultation	1,043
32	1	nurse	emergency consultation	emergency consultation	1,043
33 34	1	nurse	urgent consultation	urgent consultation	959
35	1		extended hours consultation	awaiting review	939
36		gp	routine consultation	other	924
37	1	gp			
38	1	gp	home visit note	other	835
39	1	gp other care	gp surgery	face to face consultation	808
40 41	1	provider	gp surgery	clinic	746
42		other care			
43	1	provider	routine consultation	surgery consultation	738
44	1	gp	consultation via multimedia	awaiting review	734
45			face to face consultation with		
46	1	gp	relative/carer	awaiting review	669
47 48	1	nurse	e-mail consultation	awaiting review	638
40	1	nurse	routine consultation	awaiting review	574
50	1	nurse	consultation via video conference	awaiting review	505
51	1	nurse	routine consultation	other	478
52		other care			
53	1	provider	online communication	awaiting review	473
54 55	1	nurse	same day appointment	same day appointment	468
55 56	1	gp	face to face consultation	gp surgery	461
57	1	gp	same day appointment	same day appointment	457
58	1	nurse	gp surgery	face to face consultation	455
59	1	gp	telephone encounter	telephone consultation	429
60	1	nurse	face to face consultation	emergency consultation	420

3	1	gp	group consultation	awaiting review	402
4	1	nurse	home visit note	other	402
5 6	1	nurse	seen in urgent care centre	awaiting review	344
7	1	gp	face to face consultation	emergency appointment	330
8	1	gp	seen in urgent care centre	awaiting review	322
9	1	nurse	telephone encounter	telephone encounter	314
10	-	other care			
11	1	provider	consultation via video conference	awaiting review	288
12 13	1	gp	telephone consultation	telephone call to a patient	287
14	1	dr	telephone consultation	telephone consultation	279
15	1	nurse	online communication	awaiting review	279
16		other care			
17	1	provider	face to face consultation	awaiting review	272
18		other care			
19 20	1	provider other care	home visit note	home visit	262
20	1	provider	routine consultation	awaiting review	260
22	1	nurse	home visit note	home visit	246
23	1		consultation via sms text message	awaiting review	240
24	1	gp other care	consultation via sins text message		244
25	1	provider	online communication	online services message	241
26		other care		Ŭ	
27	1	provider	emergency consultation	emergency consultation	235
29		other care			
30	1	provider	emergency appointment	emergency appointment	231
31	1	gp	telephone encounter	telephone call to a patient	226
32	1	gp	residential home visit note	residential home	225
33	1	gp	face to face consultation	awaiting review	224
34 35	1	nurse	face to face consultation	gp surgery	221
36		other care			
37	1	provider	gp surgery	face to face consultation	209
38	1	nurse	extended hours consultation	awaiting review	186
39	1	gp	seen in rapid access clinic at gp surgery	awaiting review	182
40	1	gp	school visit note	awaiting review	182
41 42	1	other care			101
43	1	provider	telephone consultation	telephone call to a patient	179
44	1	nurse	face to face consultation	awaiting review	166
45	1	gp	home visit note	acute visit	153
46	1	nurse	online communication	online services message	145
47	-	other care			
48 49	1	provider	group consultation	awaiting review	133
49 50	1	gp	seen in gp unit	awaiting review	129
51	1	dr	clinic note	surgery consultation	125
52		other care			
53	1	provider	telephone encounter	telephone encounter	119
54		other care			
55	1	provider	extended hours consultation face to face consultation with	awaiting review	116
56 57	1	nurse	relative/carer	awaiting review	115
58	1	nurse	seen in gp unit	awaiting review	119
59			night visit note	awaiting review	109
60	1	gp	וווצווג אוזוג ווטנפ	awaiting ieview	108

2 3	4				407
4	1	nurse	school visit note	awaiting review	107
5 –	1	nurse	group consultation	awaiting review	102
6	1	gp	other consultation medium used	other	99
7	1	gp	children's home visit note	awaiting review	95
8	1	gp	telephone consultation	telephone call from a patient	94
9 10	1	gp	administration note	other	91
11 -	1	nurse	telephone encounter	telephone call to a patient	86
12		other care			
13 –	1	provider	e-mail consultation	awaiting review	71
14	1	nurse	consultation via multimedia	awaiting review	65
15	1	gp	gp surgery	clinic	63
16 17	1	nurse	telephone consultation	telephone call to a patient	63
17		other care	face to face consultation with		
19	1	provider	relative/carer consultation via telemedicine web	awaiting review	62
20	1	gp	camera	awaiting review	61
21	1	dr	telephone call to a patient	telephone call to a patient	60
22 -	1		laboratory result		55
23	1	nurse other care		clinic	22
24	1	provider	other consultation medium used	awaiting review	53
25 26	1	nurse	other consultation medium used	awaiting review	51
20	1	nurse	district nurse visit	awaiting review	48
28	1		clinic note		47
29	1	gp other care		gp surgery	47
30	1	provider	clinic note	gp surgery	45
31		other care			
32	1	provider	urgent consultation	urgent consultation	42
33 34		other care			
35	1	provider	home visit note	other	41
36	1	other care provider	laboratory result	clinic	40
37		-		acute visit	39
38 –	1	gp	laboratory result		
39	1	dr other care	home visit note	home visit note	38
40 41	1	provider	telephone encounter	telephone call to a patient	38
41	1	nurse	telephone encounter	telephone consultation	33
43		other care			
44	1	provider	consultation via sms text message	awaiting review	28
45	1	gp	walk-in clinic	walk-in centre	27
46	1	nurse	walk-in clinic	walk-in centre	27
47		other care			
48 49 -	1	provider	walk-in clinic	clinic	27
50	1	nurse	children's home visit note	awaiting review	25
51	1	gp	gp surgery	main surgery	24
52	1	nurse	residential home visit note	residential home	22
53		other care			
54	1	provider	seen in urgent care centre	awaiting review	22
55	1	nurse	night visit note	awaiting review	20
56 57		other care			
58	1	provider	children's home visit note	awaiting review	19
59	1	other care provider	consultation via multimedia	awaiting roview	10
60 L	1	provider		awaiting review	19

2 3	1	gp	home visit note	nursing home visit note	17
4	1	gp	nursing home visit note	nursing home	17
5	1	gp	residential home visit note	nursing home	15
6 7		other care			10
8	1	provider	face to face consultation	gp surgery	14
9		other care			
10	1	provider	night visit note	awaiting review	14
11		other care			
12	1	provider	other consultation medium used	other	14
13	1	nurse	clinic note	gp surgery	13
14 15	1	nurse	walk-in clinic	clinic	13
16	1	nurse	home visit note	acute visit	10
17	1	nurse	consultation via sms text message	awaiting review	< 10
18			consultation via telemedicine web		
19	1	nurse	camera	awaiting review	< 10
20	1	dr	consultation via video conference	awaiting review	< 10
21	1	dr	nursing home visit note	nursing home visit note	< 10
22	_	other care			
23 24	1	provider	home visit note	nursing home visit note	< 10
24	1	dr	other note	other	< 10
26	1	gp	telephone encounter	telephone call from a patient	< 10
27	1	gp	twilight visit note 🔨	awaiting review	< 10
28	_	other care			
29	1	provider	laboratory result	acute visit	< 10
30	1	dr	face to face consultation	face to face consultation	< 10
31	1	gp	home visit note	follow-up/routine visit	< 10
32 33	1	gp	other consultation medium used	casualty attendance	< 10
34	_	other care			
35	1	provider	home visit note	residential home visit note	< 10
36	1	other care provider	other note	gp surgery	< 10
37	1	•	home visit note	awaiting review	< 10
38 —		gp			
39	1	gp	non-consultation medication data	awaiting review	< 10
40 41	1	gp	remote consultation	awaiting review	< 10
41	1	gp	third party consultation	casualty attendance	< 10
43	1	nurse	home visit note	follow-up/routine visit	< 10
44	1	nurse	telephone encounter	telephone call from a patient	< 10
45	1	nurse	third party consultation	casualty attendance	< 10
46	1	dr	enterprise consultation	enterprise consultation	< 10
47	1	dr	telephone call from a patient	telephone call from a patient	< 10
48	1	gp	district nurse visit	awaiting review	< 10
49 50	1	gp	e-mail received from patient	acute visit	< 10
50	1	gp	hospital outpatient report	casualty attendance	< 10
52	1	gp	joint consultation	awaiting review	< 10
53	1	gp	pharmacy consultation	awaiting review	< 10
54	1		telephone call to a patient	telephone consultation	< 10
55		gp	administration note	other	< 10
56	1	nurse			
57 58	1	nurse other care	face to face consultation consultation via telemedicine web	emergency appointment	< 10
58 59	1	provider	camera	awaiting review	< 10
60	-				

1 2					
3		other care		1	
4	1	provider	face to face consultation	emergency appointment	< 10
5		other care			
6	1	provider	face to face consultation	emergency consultation	< 10
7		other care			
8 9	1	provider	home visit note	acute visit	< 10
10	1	other care provider	pharmacy consultation	awaiting review	< 10
11	1	other care			< 10
12	1	provider	residential home visit note	residential home	< 10
13		other care			
14	1	provider	telephone encounter	telephone consultation	< 10
15	1	dr	group consultation	awaiting review	< 10
16 17	1	dr	home visit note	acute visit	< 10
18	1	gp	clinic note	follow-up/routine visit	< 10
19	1	gp	emergency consultation	casualty attendance	< 10
20	1	gp	home visit note	nursing home	< 10
21			seen in rapid access clinic at gp		
22	1	nurse	surgery	awaiting review	< 10
23	1	nurse	telephone consultation	telephone call from a patient	< 10
24 25	1	nurse	twilight visit note	awaiting review	< 10
26		other care			
27	1	provider	administration note	other	< 10
28		other care			
29	1	provider	children's home visit note	clinic	< 10
30		other care			. 10
31	1	provider other care	home visit note	awaiting review	< 10
32 33	1	provider	twilight visit note	awaiting review	< 10
33 34	excl. job cat	protider	gp surgery	gp surgery	875,291
35	excl. job cat		other note	other	31,332
36	excl. job cat		telephone consultation	telephone consultation	29,455
37	excl. job cat		online communication	online services message	14,055
38	-				
39	excl. job cat		telephone call to a patient provision of general practitioner	telephone call to a patient	13,935
40 41	excl. job cat		intermediate care	gp surgery	9,791
42	excl. job cat		telephone call from a patient	telephone call from a patient	7,098
43	excl. job cat		seen in gp unit		6,240
44	excl. job cat		home visit note	gp surgery home visit note	4,776
45	-				
46	excl. job cat		routine consultation	other	4,248
47	excl. job cat		gp surgery	surgery consultation	3,047
48 49	excl. job cat		home visit note	other	2,664
49 50	excl. job cat		face to face consultation	face to face consultation	2,071
51	excl. job cat		face to face consultation	surgery consultation	1,177
52	excl. job cat		online communication	awaiting review	1,098
53	excl. job cat		nursing home visit note	nursing home visit note	708
54	excl. job cat		routine consultation	surgery consultation	509
55	excl. job cat		consultation via video conference	awaiting review	494
56	excl. job cat		routine consultation	awaiting review	453
57 58	excl. job cat		enterprise consultation	enterprise consultation	398
58 59	excl. job cat		administration note	other	376
60	excl. job cat		telephone encounter	telephone encounter	376
		1			3,0

1 2				
3	excl. job cat	home visit note	awaiting review	371
4	excl. job cat	clinic note	clinic	337
5 6	excl. job cat	clinic note	surgery consultation	329
7	excl. job cat	residential home visit note	residential home visit note	327
8	excl. job cat	face to face consultation	gp surgery	305
9	excl. job cat	face to face consultation	awaiting review	293
10	excl. job cat	home visit note	home visit	250
11 12	excl. job cat	urgent consultation	urgent consultation	240
13	excl. job cat	walk-in clinic	walk-in clinic	196
14	excl. job cat	group consultation	awaiting review	170
15	excl. job cat	seen in gp unit	surgery consultation	148
16 17	excl. job cat	e-mail consultation	awaiting review	145
18	excl. job cat	emergency consultation	emergency consultation	121
19 20	excl. job cat	face to face consultation with relative/carer	awaiting review	116
21	excl. job cat	consultation via multimedia	awaiting review	75
22	excl. job cat	seen in gp unit	awaiting review	75
23 24	excl. job cat	children's home visit note	awaiting review	63
24 25	excl. job cat	other note	gp surgery	54
26	excl. job cat	other consultation medium used	other	44
27	excl. job cat	other consultation medium used	awaiting review	42
28	excl. job cat	extended hours consultation	awaiting review	37
29 30	excl. job cat	gp surgery	face to face consultation	36
31	excl. job cat	emergency appointment	emergency appointment	35
32	excl. job cat	gp surgery	clinic	32
33	excl. job cat	face to face consultation	emergency consultation	25
34 25	excl. job cat	residential home visit note 🧹	residential home	23
35 36	excl. job cat	telephone encounter	telephone call to a patient	23
37	excl. job cat	night visit note	awaiting review	14
38	excl. job cat	home visit note	acute visit	13
39	excl. job cat	walk-in clinic	walk-in centre	11
40 41	excl. job cat	district nurse visit	awaiting review	< 10
42	excl. job cat	seen in urgent care centre	awaiting review	< 10
43	excl. job cat	twilight visit note	awaiting review	< 10
44	excl. job cat	clinic note	gp surgery	< 10
45 46	excl. job cat	laboratory result	acute visit	< 10
46 47	excl. job cat	telephone consultation	telephone call to a patient	< 10
48	excl. job cat	walk-in clinic	clinic	< 10
49	excl. job cat	telephone encounter	telephone call from a patient	< 10
50	excl. job cat	emergency consultation	casualty attendance	< 10
51 52	excl. job cat	pharmacy consultation	awaiting review	< 10
52 53	excl. job cat	third party consultation	casualty attendance	< 10
54	excl. job cat	case conference	gp surgery	< 10
55	excl. job cat	emergency consultation	awaiting review	< 10
56	excl. job cat	gp surgery	main surgery	< 10
57 58	excl. job cat	home visit note	follow-up/routine visit	< 10
58 59	excl. job cat	non-consultation medication data	casualty attendance	< 10
60	excl. job cat	nursing home visit note	nursing home	< 10

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3 4	excl. job cat		remote consultation	awaiting review	< 10
5	excl. job cat		same day appointment	same day appointment	< 10
6	excl. job cat		school visit note	awaiting review	< 10
7	excl. job cat		telephone consultation	awaiting review	< 10
8	excl. job cat		telephone encounter	telephone consultation	< 10
9	excl. job cat		third party consultation	awaiting review	< 10
10 11	0	gp	externally entered note	externally entered	3,467,397
12	0		scanned document	docman	3,183,781
13	0		administration note	administration note	968,767
14	0				737,843
15	0		scanned document	scanned document	727,269
16	0	gp	administration note	administration note	725,612
17 18	0	01	inbound document	inbound document	402,647
10 19			awaiting clinical code migration to		402,047
20	0		emis web	awaiting review	385,598
21	0	nurse	externally entered note	externally entered	303,830
22			awaiting clinical code migration to		
23	0	gp	emis web	awaiting review	261,627
24	0		administration note	administration	256,604
25 26		other care			
20	0	provider	scanned document	docman	255,022
28	0		externally entered note	externally entered	252,167
29	0	gp			208,462
30	0	gp	outbound referral	outbound referral	197,534
31			awaiting clinical code migration to		
32	0	gp	emis web	gp surgery	162,048
33 34	0	other care provider	administration note	administration note	160,918
35		provider	awaiting clinical code migration to		100,510
36	0		emis web	third party consultation	147,374
37	0	gp	scanned document	scanned document	145,355
38			awaiting clinical code migration to		
39	0		emis web	gp surgery	127,041
40 41			awaiting clinical code migration to		
41	0	gp	emis web	results recording	122,118
43	0		awaiting clinical code migration to emis web	other	121,401
44			awaiting clinical code migration to	other	121,401
45	0	gp	emis web	surgery consultation	107,304
46			awaiting clinical code migration to		
47	0		emis web		104,693
48 49	0	gp	inbound document	inbound document	102,534
50			awaiting clinical code migration to		
51	0	nurse	emis web	awaiting review	94,158
52	0	other care	awaiting clinical code migration to emis web		96,209
53	0	provider other care	awaiting clinical code migration to	gp surgery	86,398
54	0	provider	emis web	awaiting review	85,745
55 56	0	nurse	administration note	administration note	84,051
56 57	<u>_</u>		awaiting clinical code migration to		
58	0	gp	emis web		77,585
59			awaiting clinical code migration to		
60	0	nurse	emis web	gp surgery	75,552

	other care			
0	provider			66,36
0	other care provider	externally entered note	externally entered	62.91
	provider	externally entered note		62,81
0		externally entered note awaiting clinical code migration to	externally entered note	61,84
0		emis web	repeat issue	61,68
0	nurse			58,01
0	gp	telephone triage encounter	telephone triage encounter	50,66
 0	58	third party consultation	third party consultation	44,60
	other care			11,00
0	provider	scanned document	scanned document	38,34
		awaiting clinical code migration to		
0	nurse	emis web		35,37
		awaiting clinical code migration to		
 0	nurse	emis web	surgery consultation	27,69
0	gp	administration note	administration	27,39
0		awaiting clinical code migration to		26.24
 0	gp	emis web awaiting clinical code migration to	telephone consultation	26,21
0	gp	emis web	other	26,20
0	82	awaiting clinical code migration to		20,20
0		emis web	scanned document	25,62
		awaiting clinical code migration to		
0		emis web	administration note	24,45
0		gp surgery	awaiting review	24,33
		awaiting clinical code migration to		
 0		emis web	touchscreen	24,31
0	gp	third party consultation	third party consultation	23,95
		awaiting clinical code migration to		
0		emis web	patientchase insert	22,51
 0	gp	laboratory result	results recording	22,06
 0	gp	externally entered note	externally entered note	20,86
0		awaiting clinical code migration to		20.77
 0	gp athar care	emis web	administration note	20,72
0	other care provider	inbound document	inbound document	20,15
0		telephone call to relative/carer	telephone call to relative/carer	19,23
 0	gp other care	awaiting clinical code migration to		19,23
0	provider	emis web		17,08
 -		awaiting clinical code migration to		,
0		emis web	surgery consultation	15,97
		awaiting clinical code migration to		
 0	nurse	emis web	clinic	15,89
0	gp	other note	other note	15,81
0	gp	gp surgery	awaiting review	15,81
0	gp	discussion with colleague	discussion with colleague	12,97
		awaiting clinical code migration to		
0	gp	emis web	telephone call to a patient	11,78
0		repeat prescription	repeat issue	11,54
	other care			
0	provider	administration note	administration	11,03
~		awaiting clinical code migration to	athan	
0	nurse	emis web	other	11,00

0		hospital outpatient report	hospital outpatient report	10,033
0	nurse	inbound document	inbound document	9,304
0	nurse	scanned document	scanned document	7,878
0	other care provider	awaiting clinical code migration to emis web	repeat issue	7,745
		awaiting clinical code migration to		
0	gp	emis web	outbound referral	7,402
0	other care			C 720
0	provider	externally entered note	externally entered note	6,736
0	gp other care	telephone call from relative/carer awaiting clinical code migration to	telephone call from relative/carer	6,626
0	provider	emis web	surgery consultation	6,514
		awaiting clinical code migration to		
0		emis web	inbound document	6,495
0	nurse	gp surgery	awaiting review	6,475
0	other care provider	awaiting clinical code migration to emis web	other	6,315
0	nurse	administration note	administration	6,285
0		outbound referral	outbound referral	6,194
0	nurse	telephone triage encounter	telephone triage encounter	6,074
0	gp	clinic note	clinic note	5,834
-		awaiting clinical code migration to		
0	gp	emis web	repeat issue	5,803
0	gp	non-consultation data	non-consultation data	5,552
	other care	6		
0	provider	third party consultation	third party consultation	5,505
	other care			
0	provider	gp surgery awaiting clinical code migration to	awaiting review	5,332
0	gp	emis web	telephone call from a patient	5,282
0	nurse	externally entered note	externally entered note	5,251
0		face to face consultation	triage	5,196
0	gp	telephone call to relative/carer	telephone call to relative/carer	5,190
0	nurse	awaiting clinical code migration to		5,191
0		emis web	mail to patient	5,178
0		non-consultation data	non-consultation data	4,933
0	gp	e-mail received from patient	e-mail received from patient	4,877
0	nurse	outbound referral	outbound referral	4,787
0	nurse	medication requested	repeat issue	4,639
				-
0	nurse	third party consultation awaiting clinical code migration to	third party consultation	4,605
0	nurse	emis web	results recording	4,405
-		awaiting clinical code migration to		.,
0	gp	emis web	scanned document	4,384
0		other note	other note	4,375
		awaiting clinical code migration to		
		emis web	mjog	4,221
0	other care			
		other note	other note	4,071
0	provider			
		mail to patient	mail to patient	3,924
0	provider other care provider		mail to patient	3,924 3,859

0		awaiting clinical code migration to	out of hours non-practice	2 60
0	other care	emis web	out of hours, non practice	3,60
0	provider	clinic note	clinic note	3,37
	provider	awaiting clinical code migration to		
0	gp	emis web	home visit note	3,3
0	gp	hospital outpatient report	hospital outpatient report	3,3
0	nurse	nurse telephone triage	nurse telephone triage	3,2
0	nurse	clinic note	clinic note	3,2
		awaiting clinical code migration to		
0	gp	emis web	clinic	3,2
	other care	awaiting clinical code migration to		
0	provider	emis web	administration note	3,04
0		awaiting clinical code migration to		2.0
0	gp other care	emis web awaiting clinical code migration to	third party consultation	3,0
0	provider	emis web	medicine management	2,82
	other care			2,0
0	provider	telephone call to relative/carer	telephone call to relative/carer	2,8
	•	awaiting clinical code migration to		
0	nurse	emis web	telephone consultation	2,7
		awaiting clinical code migration to		
0		emis web	clinic	2,7
0		laboratory result	laboratory result	2,7
		awaiting clinical code migration to		
 0	gp	emis web	inbound document	2,6
 0		telephone call from relative/carer	telephone call from relative/carer	2,5
 0		clinic note	clinic note	2,5
0	gp	laboratory result	laboratory result	2,5
	other care			
0	provider	repeat prescription	repeat issue	2,5
0		awaiting clinical code migration to emis web	home of patient	2.4
0		awaiting clinical code migration to	nome of patient	2,4
0	gp	emis web	out of hours, non practice	2,30
	8P	awaiting clinical code migration to		
0	gp	emis web	nhs direct report	2,3
		awaiting clinical code migration to		
0		emis web	results recording	2,13
0	dr	third party consultation	third party consultation	2,1
	other care	awaiting clinical code migration to		
 0	provider	emis web	third party consultation	2,09
0		awaiting clinical code migration to		2.0
0	nurse	emis web	administration note	2,0
0		administration note	patientchase insert	1,8
 0		clinic note	awaiting review	1,7
0		hospital inpatient report	hospital inpatient report	1,7
0		e-mail received from patient	docman	1,7
0	nurse	other note	other note	1,7
0	nurse	non-consultation data	non-consultation data	1,6
		awaiting clinical code migration to		
0	gp	emis web	referral letter	1,6
0		laboratory result	results recording	1,62

2					
3 4	0		awaiting clinical code migration to emis web	non-consultation data	1,537
5 6	0	gp	awaiting clinical code migration to emis web	medicine management	1,510
7	0	nurse	laboratory result	results recording	1,464
8	0	nurse	telephone call from relative/carer	telephone call from relative/carer	1,401
9	0		administration note	scanned document	1,373
11	0		telephone triage encounter	telephone triage encounter	1,353
12	0	gp	medication requested	awaiting review	1,347
13	0	nurse	discussion with colleague	discussion with colleague	1,329
14		narse	awaiting clinical code migration to		1,020
15	0	gp	emis web	telephone triage encounter	1,313
16			awaiting clinical code migration to		
18	0	nurse	emis web	telephone call to a patient	1,243
19		other care			4 220
20	0	provider	non-consultation data	non-consultation data	1,239
21	0	gp	case conference	awaiting review	1,225
22	0	an a	awaiting clinical code migration to emis web	externally entered note	1,206
23	0	gp	telephone call to relative/carer	telephone call to relative/carer	1,200
24 25	0		awaiting clinical code migration to	telephone call to relative/carer	1,191
25	0	nurse	emis web	third party consultation	1,170
27	0	gp	e-mail sent to patient	awaiting review	1,162
28	0	dr	administration note	administration	1,159
29	0		other note		1,156
30 — 31 _	0		administration note		1,120
32	0	dr	externally entered note	externally entered	1,113
33			awaiting clinical code migration to		·
34	0	gp	emis web	face to face consultation	1,112
35		other care			
36	0	provider	telephone triage encounter	telephone triage encounter	1,107
37 38	0	nurse	laboratory result	laboratory result	1,064
39	0	other care provider	outbound referral	outbound referral	1,052
40	0	•	clinic note		
41	0	gp other care		awaiting review	1,030
42	0	provider	mail to patient	patientchase insert	1,019
43	0	gp	repeat prescription	awaiting review	1,003
44 — 45	-		awaiting clinical code migration to		,
46	0	gp	emis web	data transferred from other system	983
47			awaiting clinical code migration to		
48	0		emis web	non-consultation medication data	980
49	0	~~	awaiting clinical code migration to	nursing homo visit noto	071
50	0	gp	emis web	nursing home visit note	971
51 52	0	gp	repeat prescription awaiting clinical code migration to	repeat issue	964
53	0		emis web	telephone call to a patient	901
54	0	dr			885
55	0	**1	awaiting clinical code migration to		
56	0	nurse	emis web	face to face consultation	853
57		other care			
58 59	0	provider	hospital outpatient report	hospital outpatient report	828
60	0		clinic note	community clinic	823

2					
3			awaiting clinical code migration to		
4	0		emis web	gp2gp import	822
5			awaiting clinical code migration to		
6	0		emis web	letter from outpatients	809
7		other care			
8	0	provider	mail to patient	mail to patient	801
9 10		other care			
10	0	provider	telephone call from relative/carer	telephone call from relative/carer	789
12	0		awaiting clinical code migration to	automoliu antorod nota	700
13	0		emis web awaiting clinical code migration to	externally entered note	769
14	0		emis web	referral letter	751
15	0	other care	awaiting clinical code migration to		/51
16	0	provider	emis web	inbound document	719
17	0	provider	e-mail sent to patient		713
18	-			awaiting review	
19	0	gp	hospital inpatient report	hospital inpatient report	710
20			awaiting clinical code migration to		604
21	0	nurse	emis web	repeat issue	694
22	0	an	awaiting clinical code migration to emis web	acute visit	693
23	0	gp	awaiting clinical code migration to		095
24	0	gn	emis web	telephone call to relative/carer	680
25		gp			
26	0		non-consultation medication data	repeat issue	679
27 28	0	nurse	awaiting clinical code migration to emis web	home visit note	672
20 29	0	other care		nome visit note	072
30	0	provider	discussion with colleague	discussion with colleague	665
31	-	provider			
32	0		administration note	docman	665
33	0	gp	other note		661
34			awaiting clinical code migration to		656
35	0		emis web	telephone consultation	656
36	0	other care provider	awaiting clinical code migration to emis web	scanned document	642
37	-	provider			
38	0		ooh report	third party consultation	637
39	0	gp	scanned document	externally entered	619
40	0	gp	medication requested	repeat issue	606
41			awaiting clinical code migration to		
42	0	nurse	emis web	telephone triage encounter	602
43		other care	awaiting clinical code migration to		
44	0	provider	emis web	telephone call to a patient	541
45	_	other care	awaiting clinical code migration to		
46 47	0	provider	emis web	face to face consultation	534
47 48	0	dr	administration note	administration note	525
40 49	0	gp	discussion with other professional	awaiting review	514
49 50	0	gp	administration note	awaiting review	509
51		other care	awaiting clinical code migration to	-	
52	0	provider	emis web	mail to patient	507
53	0		ooh report	awaiting review	504
54			awaiting clinical code migration to	Ŭ Ŭ	
55	0	dr	emis web	gp surgery	501
56	0		walk-in clinic		495
57	0		administration note	inbound document	493
58					
59	0		routine consultation	repeat issue	488
60					

0		awaiting clinical code migration to emis web	telephone call from a patient	486
0	gp	ooh report	out of hours, non practice	478
0	gp	mail from patient	mail from patient	473
0		other note	awaiting review	472
		awaiting clinical code migration to		
0	gp	emis web	enterprise consultation	458
	other care			
0	provider	repeat prescription	awaiting review	455
		awaiting clinical code migration to		
0	gp	emis web	discussion with colleague	451
0		awaiting clinical code migration to emis web	outbound referral	450
0		awaiting clinical code migration to		430
0	gp	emis web	nursing home	447
	64	awaiting clinical code migration to		,
0	dr	emis web	awaiting review	444
0	nurse	e-mail received from patient	e-mail received from patient	443
-		awaiting clinical code migration to		
0		emis web	data transferred from other system	442
0	nurse	ooh report	awaiting review	439
0		administration note	awaiting review	436
	other care			100
0	provider	clinic note	awaiting review	431
0	gp	administration note		415
0	gp	administration note	scanned document	414
0	52	awaiting clinical code migration to		717
0	gp	emis web	urgent consultation	404
	other care	awaiting clinical code migration to		
0	provider	emis web	externally entered note	385
		awaiting clinical code migration to		
0		emis web	school	384
0	nurse	hospital outpatient report	hospital outpatient report	380
0		mail to patient	patientchase insert	377
		awaiting clinical code migration to		
0		emis web	telephone encounter	376
0	gp	administration note	results recording	372
0		discussion with colleague	discussion with colleague	368
	other care	awaiting clinical code migration to		
0	provider	emis web	results recording	365
0		case conference	awaiting review	361
	other care	awaiting clinical code migration to		
0	provider	emis web	telephone consultation	350
	other care	awaiting clinical code migration to		
0	provider	emis web	patientchase insert	345
0		sms text message sent to patient	patientchase insert	345
0	nurse	mail to patient	mail to patient	342
		awaiting clinical code migration to		
0		emis web	hospital outpatient report	336
0		gp surgery		315
0	gp	ooh report	nhs direct report	314
0	gp	administration note	referral letter	313
		awaiting clinical code migration to		
0	dr	emis web		310

2		1			
3 4	0	gp	awaiting clinical code migration to emis web	telephone call from relative/carer	310
5 6	0	gp	awaiting clinical code migration to emis web	non-consultation data	309
7 8	0	nurse	awaiting clinical code migration to emis web	telephone call from a patient	309
9		other care	awaiting clinical code migration to		
10	0	provider	emis web	non-consultation data	306
11		other care			
12 13	0	provider	e-mail received from patient	e-mail received from patient	292
14	0	other care provider	awaiting clinical code migration to emis web	non-consultation medication data	289
15	0	nurse	clinic note	awaiting review	285
16	0	dr	scanned document	scanned document	285
17	0		ooh report	out of hours, non practice	283
18 19	0	other care	Uniteport		205
20	0	provider	laboratory result	laboratory result	282
21			awaiting clinical code migration to		
22	0	gp	emis web	discharge details	281
23	0		home visit note	home of patient	277
24 25			awaiting clinical code migration to		276
25	0	nurse other care	emis web	inbound document	276
27	0	provider	hospital inpatient report	hospital inpatient report	275
28	0	gp	mail to patient	mail to patient	270
29	0	68	awaiting clinical code migration to		270
30	0	gp	emis web	residential home visit note	266
31 32		other care			
33	0	provider	administration note	awaiting review	265
34	0		awaiting clinical code migration to emis web	acute visit	263
35	0		walk-in clinic		260
36	0	dr		awaiting review	
37 38	0	dr	hospital outpatient report awaiting clinical code migration to	hospital outpatient report	256
39	0	gp	emis web	mail to patient	249
40	0		administration note	mjog	248
41	0		mail from patient	mail from patient	248
42			awaiting clinical code migration to		
43 44	0	gp	emis web	letter from outpatients	247
44	0		awaiting clinical code migration to	d'ach anns data la	244
46	0		emis web awaiting clinical code migration to	discharge details	244
47	0	nurse	emis web	mail to patient	243
48		other care	awaiting clinical code migration to		210
49	0	provider	emis web	home visit note	236
50 51	0	gp	home visit note	results recording	235
52	0	dr	inbound document	inbound document	234
53			awaiting clinical code migration to		
54	0	gp	emis web	other note	230
55	^	an	awaiting clinical code migration to	nationtchase insert	220
56	0	gp	emis web awaiting clinical code migration to	patientchase insert	229
57	0	dr	emis web	administration note	225
58					-
58 59			awaiting clinical code migration to		

0		awaiting clinical code migration to emis web	nhs direct report	22
0	other care provider	awaiting clinical code migration to emis web	touchscreen	21
0	gp	scanned document	docman	21
		awaiting clinical code migration to		
0	nurse	emis web	nursing home visit note	21
0	nurse	administration note		20
		awaiting clinical code migration to		
0	nurse	emis web	externally entered note	20
		awaiting clinical code migration to		
0		emis web	laboratory result	19
0		hospital outpatient report	hospital	19
	other care			
0	provider	non-consultation medication data	repeat issue	19
	other care	awaiting clinical code migration to		
0	provider	emis web	referral letter	19
0	nurse	e-mail sent to patient	awaiting review	19
		awaiting clinical code migration to		
0	nurse	emis web	referral letter	19
		awaiting clinical code migration to		
0	dr	emis web	telephone consultation	18
0	nurse	case conference	awaiting review	18
	other care	awaiting clinical code migration to		
0	provider	emis web	data transferred from other system	18
		multidisciplinary team meeting		
0	gp	without patient	awaiting review	17
		awaiting clinical code migration to		
0	gp	emis web	clinic note	17
	other care	awaiting clinical code migration to		
0	provider	emis web	mjog	17
		awaiting clinical code migration to		4.6
0		emis web	hospital inpatient report	16
0		awaiting clinical code migration to	hama visit nota	10
0		emis web awaiting clinical code migration to	home visit note	16
0		emis web	online services message	16
0	other care		onnine services message	10
0	provider	administration note		16
0	provider	awaiting clinical code migration to		10
0	nurse	emis web	outbound referral	15
<u> </u>	other care			
0	provider	ooh report	awaiting review	15
	•	awaiting clinical code migration to		
0	gp	emis web	non-consultation medication data	15
		awaiting clinical code migration to		
0	nurse	emis web	telephone call to relative/carer	15
	other care			
0	provider	other note	awaiting review	14
		awaiting clinical code migration to		
 0	dr	emis web	surgery consultation	14
		awaiting clinical code migration to		
0	nurse	emis web	scanned document	14
 0	gp	administration note	repeat issue	14
		awaiting clinical code migration to		
0		emis web	open door surgery	14

2 3 4	0	other care provider	awaiting clinical code migration to emis web	clinic note	140
5	0	provider	inbound referral	awaiting review	138
6	0		awaiting clinical code migration to		138
7	0		emis web	clinic note	133
8			awaiting clinical code migration to		
9	0		emis web	face to face consultation	129
10		other care			
11 12	0	provider	non-consultation medication data	non-consultation medication data	124
12			awaiting clinical code migration to		
14	0	nurse	emis web	residential home visit note	122
15			awaiting clinical code migration to		
16	0	nurse	emis web	data transferred from other system	121
17	0	other care provider	e-mail sent to patient	awaiting review	121
18	-			outbound referral	
19	0	gp	administration note		118
20	0	nurse	other note		117
21	0	nurco	awaiting clinical code migration to emis web	nurse telephone triage	116
22 23	0	nurse	awaiting clinical code migration to	nurse telephone triage	110
23 24	0		emis web	accident & emergency	116
25	0	gp	other consultation medium used	data transferred from other system	109
26	0		non-consultation medication data	non-consultation medication data	108
27	0	nurse	face to face consultation	triage	104
28	0	other care	awaiting clinical code migration to		104
29	0	provider	emis web	acute visit	102
30 31		•	awaiting clinical code migration to		
32	0	nurse	emis web	telephone call from relative/carer	100
33	0		extended hours consultation	out of hours, non practice	100
34	0	nurse	mail from patient	mail from patient	98
35		other care			
36	0	provider	hospital outpatient report	hospital	97
37			awaiting clinical code migration to	4	
38	0	dr	emis web	nursing home visit note	96
39	0		nurse telephone triage	nurse telephone triage	94
40	0	nurse	hospital inpatient report	hospital inpatient report	93
41 42		other care			
43	0	provider	case conference	awaiting review	92
44	_		provision of general practitioner		
45	0	gp	intermediate care	awaiting review	91
46	0	gp	walk-in clinic		91
47	0		hospital outpatient report	letter from outpatients	91
48		other care			
49	0	provider	other note		89
50	0	gp	administration note	other note	87
51 52		other care			05
53	0	provider	medication requested	awaiting review	85
54	0	dr	laboratory result	results recording	84
55			awaiting clinical code migration to	mail from notiont	0.4
56	0		emis web awaiting clinical code migration to	mail from patient	84
57	0		emis web	health centre	80
58	0	gn	administration note	inbound document	76
59	0	gp			
60	U	gp	other note	awaiting review	76

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2					
3	0	nurse	walk-in clinic		76
4 5	0		other note	non-consultation medication data	76
6		other care	awaiting clinical code migration to		
7	0	provider	emis web	nhs direct report	73
8	0		administration note	repeat issue	73
9	0	gp	ooh report	awaiting review	70
10	0	gp	weekly care home ward round	awaiting review	70
11			awaiting clinical code migration to		
12 13	0		emis web	medicine management	70
14	0	other care	awaiting clinical code migration to		60
15	0	provider other care	emis web awaiting clinical code migration to	open door surgery	69
16	0	provider	emis web	telephone encounter	69
17	0		medication requested	awaiting review	68
18		other care	awaiting clinical code migration to		
19	0	provider	emis web	telephone call to relative/carer	65
20 21			awaiting clinical code migration to		
22	0	dr	emis web	repeat issue	64
23	0	gp	non-consultation medication data	repeat issue	64
24		other care	awaiting clinical code migration to		
25	0	provider	emis web	telephone call from a patient	64
26	0	gp	clinic note	nhs direct report	62
27	0	gp	non-consultation medication data	medicine management	61
28 29	0	other care	awaiting clinical code migration to		C1
30	0	provider	emis web	letter from outpatients	61
31	0	gp	hospital outpatient report	letter from outpatients	60
32	0	gp	non-consultation data	data transferred from other system	57
33	0	nurse	awaiting clinical code migration to emis web	enterprise consultation	57
34	0	gp	outbound referral	referral letter	55
35 36	0	other care			55
37	0	provider	repeat prescription	medicine management	55
38	0	nurse	seen in influenza vaccination clinic	awaiting review	54
39	0		administration note	results recording	54
40			awaiting clinical code migration to		
41	0		emis web	telephone call from relative/carer	54
42 43			awaiting clinical code migration to		
43	0	gp	emis web	hospital outpatient report	53
45	0	gp	gp surgery		53
46	0	gp	third party consultation	out of hours, non practice	51
47	0		awaiting clinical code migration to		F1
48	0		emis web	telephone call to relative/carer	51
49	0		clinic note	out of hours, non practice	51
50 51	0		face to face consultation	primary care centre	51
52	0	gp	awaiting clinical code migration to emis web	laboratory result	50
53	0	nurse	non-consultation medication data	repeat issue	48
54	0	nuise	awaiting clinical code migration to		40
55	0		emis web	other note	48
56	0		face to face consultation	triage	48
57	0	gp	progress report	nhs direct report	47
58 59	5	other care			····
60	0	provider	ooh report	nhs direct report	47

	0	nurse	awaiting clinical code migration to emis web	non-consultation data	4
	0		awaiting clinical code migration to emis web	nursing home	4
Ī	0	gp	awaiting clinical code migration to emis web	mail from patient	4
f		04	awaiting clinical code migration to		
+	0	nurse	emis web awaiting clinical code migration to	discussion with colleague	4
	0		emis web	e-mail received from patient	2
Ī		awaiting clinical code migration to			
ł	0	0 nurse emis web		medicine management	· · · · ·
ł	0	nurse dr	medication requested mail to patient	repeat issue mail to patient	
F	0		awaiting clinical code migration to		
	0	gp	emis web	encompass message	
	0	gp	other note	data transferred from other system	
	0	nurco	awaiting clinical code migration to emis web	clinic poto	
ł	0	nurse	awaiting clinical code migration to	clinic note	
	0	nurse	emis web	laboratory result	
		other care	awaiting clinical code migration to		
ŀ	0	provider	emis web	other note	
	0	other care provider	medication requested	repeat issue	
ŀ	0	gp	administration note	non-consultation data	
t	<u></u>	other care			
	0	provider	mail from patient	mail from patient	
	0	4.	awaiting clinical code migration to		
ł	0	dr	emis web awaiting clinical code migration to	results recording	
	0	gp	emis web	e-mail received from patient	
Ī			awaiting clinical code migration to		
ļ	0	nurse	emis web	walk-in centre	
	0	other care provider	awaiting clinical code migration to emis web	an 2 an import	
ł	0	provider		gp2gp import mail to patient	
ł	0		administration note awaiting clinical code migration to		
	0	gp	emis web	home of patient	
			awaiting clinical code migration to		
ŀ	0	gp	emis web	casualty attendance	
ļ	0	gp	inbound document	letter from outpatients	
	0	other care provider	awaiting clinical code migration to emis web	outbound referral	
ł	0	other care			
	0	provider	extended hours consultation	out of hours, non practice	
Ī		-	awaiting clinical code migration to		
ļ	0	gp	emis web	telephone encounter	
ļ	0	gp	seen in hospital ward	awaiting review	
ļ	0		other note	non-consultation data	
ļ	0	nurse	other note	awaiting review	
	0	other care	awaiting clinical code migration to	discussion with colleague	
Ē	0	provider	emis web	discussion with colleague	
L	0		discussion with other professional	awaiting review	

0	multidisciplinary team meeting without patient	awaiting review	32
0	children's home visit note		31
other care			
 0 provider	laboratory result	results recording	30
	awaiting clinical code migration to		20
0	emis web	casualty attendance	30
0	extended hours consultation	nhs direct report	30
 0 nurse	administration note	awaiting review	29
0 nurse	awaiting clinical code migration to emis web	letter from outpatients	29
	awaiting clinical code migration to		20
0 nurse	emis web	open door surgery	29
 0 nurse	discussion with other professional	awaiting review	29
0 nurse	ooh report	out of hours, non practice	29
0	face to face consultation	treatment room	29
0 gp	email received from carer	awaiting review	28
other care	awaiting clinical code migration to		
0 provider	emis web	telephone triage encounter	28
 0	administration note	touchscreen	28
	awaiting clinical code migration to		
 0 nurse	emis web	encompass message	27
	awaiting clinical code migration to		27
 0 nurse	emis web	nursing home	27
 0	third party consultation	out of hours, non practice	27
0 gp other care	awaiting clinical code migration to emis web	follow-up/routine visit	26
0 provider	emergency consultation	accident & emergency	26
0 gp	hospital outpatient report	nhs direct report	25
other care	awaiting clinical code migration to		
0 provider	emis web	telephone call from relative/carer	23
other care 0 provider	outbound referral	referral letter	23
0	externally entered note	scanned document	23
	multidisciplinary team meeting		
0 nurse	without patient	awaiting review	22
0	other consultation medium used	data transferred from other system	22
0 dr	awaiting clinical code migration to emis web	outbound referral	21
0 gp	seen in influenza vaccination clinic	awaiting review	21
- or	awaiting clinical code migration to		12
0 nurse	emis web	other note	21
0	ooh report	nhs direct report	21
-	awaiting clinical code migration to		
0 dr	emis web	inbound document	20
0 gp	awaiting clinical code migration to emis web	day case report	20
	seen by general practitioner with		-
other care	special interest in ear nose and		
 0 provider	throat disorders	data transferred from other system	20
0	emergency consultation	accident & emergency	20
	awaiting clinical code migration to		
	•		

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	0 gp	hospital outpatient report	third party consultation	19
	0 nurse	repeat prescription	awaiting review	19
		awaiting clinical code migration to		
	0	emis web	walk in centre	19
	0 dr	hospital inpatient report	hospital inpatient report	18
	other care 0 provider	awaiting clinical code migration to emis web	residential home visit note	18
	other care			10
	0 provider	walk-in clinic		18
		awaiting clinical code migration to		
	0	emis web	residential home visit note	18
		awaiting clinical code migration to		10
	0	emis web	telephone triage encounter	18
	0 dr	outbound referral	outbound referral	17
	0 gp	ooh report	third party consultation	17
	0 gp	other consultation medium used	nhs direct report	17
	0 gp	radiology result	awaiting review	17
	0 gp	telephone consultation	telephone call from relative/carer	17
	other care 0 provider	awaiting clinical code migration to emis web	enterprise consultation	17
	other care	enns web		17
	0 provider	walk-in clinic	walk in centre	17
	0	administration note	referral letter	17
	0 dr	other note	other note	16
	other care	awaiting clinical code migration to		
	0 provider	emis web	nursing home visit note	16
	0 dr	medication requested	repeat issue	15
	other care			
	0 provider	administration note	inbound document	15
	other care 0 provider	awaiting clinical code migration to emis web	out of hours, non practice	15
	0	non-consultation data	data transferred from other system	15
	other care			15
	0 provider	face to face consultation	triage	15
	•	awaiting clinical code migration to		
	0 dr	emis web	telephone call to a patient	14
	0 dr	externally entered note	externally entered note	14
	0 gp	hospital inpatient report	discharge details	14
		seen by general practitioner with		
		special interest in ear nose and		
	0 gp other care	throat disorders	data transferred from other system	14
	0 provider	administration note	scanned document	14
	other care			14
	0 provider	discussion with other professional	awaiting review	14
		awaiting clinical code migration to		
	0	emis web	out of hours, practice	14
	0	externally entered note		14
	0 dr	telephone call to relative/carer	telephone call to relative/carer	13
		awaiting clinical code migration to		
	0 nurse	emis web	nhs direct report	13
	0 nurse	awaiting clinical code migration to emis web	out of hours, non practice	13
		hospital inpatient note	awaiting review	13

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0		repeat prescription	awaiting review	13
0	gp	other note	encompass message	12
0	nurse	awaiting clinical code migration to emis web	hospital outpatient report	12
0	other care provider	awaiting clinical code migration to emis web	accident & emergency	12
0	nurse	other note	encompass message	11
0	nurse	repeat prescription	repeat issue	11
0	other care provider	seen in influenza vaccination clinic	awaiting review	11
0		awaiting clinical code migration to emis web	discussion with colleague	11
		awaiting clinical code migration to		
0		emis web	hospital outpatient consultation	11
0		awaiting clinical code migration to emis web	walk-in clinic	11
0		non-consultation medication data	medicine management	11
		provision of general practitioner		40
0	<u> </u>	intermediate care	awaiting review	10
0	dr other care	clinic note	awaiting review	< 10
0	provider	ooh report	out of hours centre	< 10
0	provider	administration note	non-consultation data	< 10
0		clinic note	nhs direct report	< 10
0		telephone follow-up	awaiting review	< 10
0	gn	administration note	clinic note	< 10
0	gp	progress report	awaiting review	< 10
0	gp nurse	awaiting clinical code migration to emis web	acute visit	< 10
	other care	multidisciplinary team meeting		
0	provider	without patient	awaiting review	< 10
0		administration note awaiting clinical code migration to	other note	< 10
0		emis web	home visit note	< 10
0		hospital inpatient note	day case report	< 10
0	gp	inbound document	discharge details	< 10
0	nurse	awaiting clinical code migration to emis web	follow-up/routine visit	< 10
0	other care	awaiting clinical code migration to emis web	discharge details	< 10
		awaiting clinical code migration to		
0		emis web	enterprise consultation	< 10
0		awaiting clinical code migration to emis web	nursing home visit note	< 10
0		email received from carer	awaiting review	< 10
0		ooh report	out of hours, practice	< 10
0		other note	data transferred from other system	< 10
0		outbound referral	referral letter	< 10
0		radiology result	awaiting review	< 10
0	dr	gp surgery	awaiting review	< 10
0	gp	routine consultation	repeat issue	< 10
0	٥٣			
0	nurse	email received from carer	awaiting review	< 10

2					
3	0	nurse	scanned document	docman	< 10
4		other care	awaiting clinical code migration to		
5 6	0	provider	emis web	home of patient	< 10
7		other care			. 10
8	0	provider	hospital outpatient report	letter from outpatients	< 10
9	0	dr	discussion with colleague	discussion with colleague	< 10
10	0	gp	administration note awaiting clinical code migration to	discussion with colleague	< 10
11	0	gn	emis web	out of hours, practice	< 10
12 13	0	gp	clinic note	out of hours, non practice	< 10
14		gp			
15	0	gp	ooh report	out of hours, practice	< 10
16	0	gp	seen in diabetic clinic	awaiting review	< 10
17	0	gp	sms text message sent to patient	awaiting review	< 10
18	0	nurse	administration note	discussion with colleague	< 10
19	0	other care	awaiting clinical code migration to emis web	nurring home	< 10
20 21	0	provider other care	awaiting clinical code migration to	nursing home	< 10
21	0	provider	emis web	online services message	< 10
23		protidei	awaiting clinical code migration to		
24	0		emis web	bulk operation	< 10
25	0		non-consultation data	touchscreen	< 10
26			awaiting clinical code migration to		
27	0	dr	emis web	hospital outpatient report	< 10
28 29			awaiting clinical code migration to		
29 30	0	dr	emis web	other	< 10
31	0	dr	awaiting clinical code migration to emis web	third party consultation	< 10
32	0	dr	clinic note	clinic note	< 10
33	0	dr	non-consultation data	non-consultation data	< 10
34	0	u	awaiting clinical code migration to		< 10
35	0	gp	emis web	hospital inpatient report	< 10
36 37	0	gp	clinic note	community clinic	< 10
38	0	nurse	administration note	non-consultation data	< 10
39			awaiting clinical code migration to		
40	0	nurse	emis web	non-consultation medication data	< 10
41		other care			
42	0	provider	externally entered note	data transferred from other system	< 10
43 44		other care			. 10
44 45	0	provider other care	gp surgery		< 10
46	0	provider	other note	referral letter	< 10
47			awaiting clinical code migration to		
48	0		emis web	nurseries/playgroup	< 10
49	0		hospital outpatient report	third party consultation	< 10
50	0	gp	nurse telephone triage	nurse telephone triage	< 10
51 52			awaiting clinical code migration to		
53	0	dr	emis web	discussion with colleague	< 10
54			awaiting clinical code migration to		
55	0	dr	emis web	medicine management	< 10
56	0	dr	awaiting clinical code migration to emis web	residential home visit note	< 10
57	0	dr	e-mail received from patient	e-mail received from patient	< 10
58 59	0	dr	telephone call from relative/carer	telephone call from relative/carer	
59 60	0	นเ	I telephone call from relative/carer		< 10

0	gp	awaiting clinical code migration to emis web	walk-in centre	< 10
0	gp	extended hours consultation	out of hours, non practice	< 10
0	gp	externally entered note		< 10
0		other consultation medium used	other note	< 10
	gp			
0	gp	telephone consultation awaiting clinical code migration to	telephone call to relative/carer	< 10
0	nurse	emis web	telephone encounter	< 10
0	0 nurse medication requested awaiting review		awaiting review	< 10
0	nurse	telephone follow-up	awaiting review	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	e-mail received from patient	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	mail from patient	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	out of hours, practice	< 10
	other care	other pote	data transforred from other system	< 10
0	provider	other note	data transferred from other system	< 10
0		awaiting clinical code migration to emis web	day case report	< 10
0		awaiting clinical code migration to		< 10
0		emis web	encompass message	< 10
0		e-mail encounter to carer	awaiting review	< 10
0		walk-in clinic	walk in centre	< 10
0		awaiting clinical code migration to	wark in centre	< 10
0	dr	emis web	non-consultation data	< 10
		awaiting clinical code migration to		
0	dr	emis web	other note	< 10
0	dr	e-mail sent to patient	awaiting review	< 10
0	gp	email received from third party	awaiting review	< 10
0	gp	hospital inpatient note	awaiting review	< 10
0	gp	night visit note	night visit	< 10
0	gp	other note	third party consultation	< 10
0	gp	telephone encounter	telephone call to relative/carer	< 10
0	gp	telephone follow-up	awaiting review	< 10
_				
0	nurse	administration note awaiting clinical code migration to	referral letter	< 10
0	nurse	emis web	urgent consultation	< 10
0	nurse	seen in asthma clinic	awaiting review	< 10
0	nurse	seen in hospital ward	awaiting review	< 10
0				
0	nurse other care	telephone consultation	telephone call to relative/carer	< 10
0	provider	administration note	other note	< 10
	other care			. 10
0	provider	administration note	referral letter	< 10
	other care			
0	provider	administration note	repeat issue	< 10
	other care			
0	provider	administration note	results recording	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	casualty attendance	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	diabetic clinic	< 10

	0	other care provider	awaiting clinical code migration to emis web	encompass message	< 10
	0	other care provider	clinic note	nhs direct report	< 10
	0	other care	seen in diabetic clinic	awaiting review	< 10
0	0		awaiting clinical code migration to emis web	other report	< 10
1	0		child in need meeting		< 10
2	-		v	awaiting review hospital inpatient	< 10
3	0			nhs direct report	< 10
4 5				non-consultation medication data	< 10
6	0		weekly care home ward round	awaiting review	< 10
7	0		awaiting clinical code migration to		< 10
8	0	dr	emis web	non-consultation medication data	< 10
9 0	0	dr	awaiting clinical code migration to emis web	telephone call from a patient	< 10
1			awaiting clinical code migration to		
2 3	0	dr	emis web	telephone call from relative/carer	< 10
4			awaiting clinical code migration to		
5	0	dr	emis web awaiting clinical code migration to	telephone call to relative/carer	< 10
6	0	gp	emis web	night visit , practice	< 10
7	0	88	awaiting clinical code migration to		- 20
8	0	gp	emis web	walk-in clinic	< 10
9	0	gp	non-consultation medication data	non-consultation medication data	< 10
1	0	gp	other consultation medium used	referral letter	< 10
2	0	gp	other note	non-consultation data	< 10
3	0	gp	other note	non-consultation medication data	< 10
4	0	gp	seen in baby clinic	awaiting review	< 10
5	0	gp	telephone encounter	telephone call from relative/carer	< 10
7	0	nurse	administration note	clinic note	< 10
8	0	nurse	administration note	laboratory result	< 10
9	0	nurse	awaiting clinical code migration to emis web	casualty attendance	< 10
1			awaiting clinical code migration to		
2	0	nurse	emis web	patientchase insert	< 10
4	0	nurse	clinic note	community clinic	< 10
5 —	0	nurse	extended hours consultation	out of hours, non practice	< 10
6	0	nurse	externally entered note	data transferred from other system	< 10
7	0	nurse	first attendance face to face	awaiting review	< 10
8	0	nurse	hospital inpatient note	awaiting review	< 10
9	0	nurse	ooh report	out of hours, practice	< 10
1	0	nurse	other consultation medium used	data transferred from other system	< 10
2	0	nurse	other note	data transferred from other system	< 10
3	0	nurse	other note	referral letter	< 10
4	0	nurse	outbound referral	referral letter	< 10
5	0	nurse	patient initiated enc. nos	awaiting review	< 10
6 7	0	nurse	telephone consultation	telephone call from relative/carer	< 10
8	0	nurse	telephone encounter	telephone call to relative/carer	< 10
			weekly care home ward round	awaiting review	< 10

	other care			
0	provider	administration note	mail to patient	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	hospital inpatient report	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	hospital outpatient report	< 10
	other care	awaiting clinical code migration to		
0	provider	emis web	laboratory result	< 10
	other care			
0	provider	clinic note	community clinic	< 10
	other care			
0	provider	first attendance face to face	awaiting review	< 10
	other care			
0	provider	inbound referral	awaiting review	< 10
	other care			
0	provider	non-consultation data	data transferred from other system	< 10
	other care			
0	provider	ooh report	out of hours, non practice	< 10
	other care			
0	provider	telephone encounter	awaiting review	< 10
		awaiting clinical code migration to		
0		emis web	follow-up/routine visit	< 10
		awaiting clinical code migration to		
0		emis web	letter	< 10
		awaiting clinical code migration to		
0		emis web	minor injuries unit	< 10
		awaiting clinical code migration to		. 10
0		emis web	secretary	< 10
0		email received from third party	awaiting review	< 10
0		gp surgery	non-consultation data	< 10
0		hospital inpatient report	awaiting review	< 10
0		hospital inpatient report	discharge details	< 10
		multidisciplinary team meeting with		
0		patient	awaiting review	< 10
0		night visit note	night visit, local rota	< 10
0		provision of general practitioner		< 10
0		intermediate care	gp2gp import	< 10
0		telephone triage encounter	nhs direct report	< 10
0		third party consultation	third party	< 10
0	other care			< 10

Annex 3: NHS targets for cancer wait times

		Operatio	nal standard		
Maximum two	Receipt of urgent referral for suspected cancer to first outpatient atte	ndance	93%		
weeks from	Receipt of referral of any patient with breast symptoms (where cancer not suspected) to first hospital assessment				
Maximum 28 days from	Receipt of two week wait referral for suspected cancer, receipt of urga a cancer screening programme (breast, bowel, cervical), and receipt o referral of any patient with breast symptoms (where cancer not suspe date the patient is informed of a diagnosis or ruling out of cancer	f two week wait	75%		
	Decision to treat to first definitive treatment		96%		
Maximum one month (31 days) from:	Decision to treat/earliest clinically appropriate date to start of second or subsequent treatment(s) for all cancer patients including those diagnosed with a recurrence where the subsequent treatment	surgery drug treatment	94% 98%		
	is:	radiotherapy	98%		
Maximum two	Urgent referral for suspected cancer to first treatment (62-day classic))	85%		
months (62 days) from:	Urgent referral from a NHS Cancer Screening Programme (breast, cerv for suspected cancer to first treatment	rical or bowel)	90%		

Annex 4: Comparing Cancer Wait Times counts for referrals and first treatments with the NCRAS data equity pack

Table A4.1: Comparing Cancer Wait Times counts for referrals and first treatments with the NCRAS data equity pack

)		01 Apr 2020	- 31 Jan 2021				
)		First treatme	ents for new ca	ncer	Urgent cancer	referrals	
1 <u>2</u> 3		Observed	Expected	Percentage change (95% CI)	Observed	Expected	Percentage change (95% CI)
1 5	Cancer wait times data						
5 7	All	224,323	267,946	-16.3% (-16.6, -15.9)	1,673,775	2,071,967	-19.2% (-19.3, -19.1)
3 9)	NCRAS data equity pack						
 >	All	219,410	254,436	-13.8% (-14.3, -13.3)	1,658,309	1,984,489	-16.4% (-16.6, -16.3)
3	Breast	30,488	40,530	-24.8% (-25.9, -23.6)	337,582	363,139	-7% (-7.5, -6.6)
+ 5	Gynaecological	11,281	12,344	-8.6% (-10.9, -6.2)	158,723 🔷	176,985	-10.3% (-10.9, -9.7)
5 7	Head and Neck	8,892	9,901	-10.2% (-12.7, -7.6)	163,668	189,837	-13.8% (-14.4, -13.2)
3	Lower GI	23,507	27,056	-13.1% (-14.6, -11.6)	302,369	366,677	-17.5% (-17.9, -17.1)
)	Lung	24,796	27,409	-9.5% (-11.1, -8.0)	33,830	53,641	-36.9% (-37.8, -36.1)
2	Skin	40,977	43,475	-5.7% (-7.0, -4.5)	338,172	429,802	-21.3% (-21.7, -21.0)
s 1	Upper GI	17,059	17,586	-3% (-5.0, -0.9)	141,720	163,013	-13.1% (-13.7, -12.4)
5	Urological	37,970	50,056	-24.1% (-25.2, -23.1)	134,389	184,642	-27.2% (-27.7, -26.7)
7 3	All other	24,441	26,080	-6.3% (-7.9, -4.6)	47,856	56,753	-15.7% (-16.7, -14.6)

Annex 5: Patient demographics and person-time and total numbers of observed activity in CPRD Aurum sample

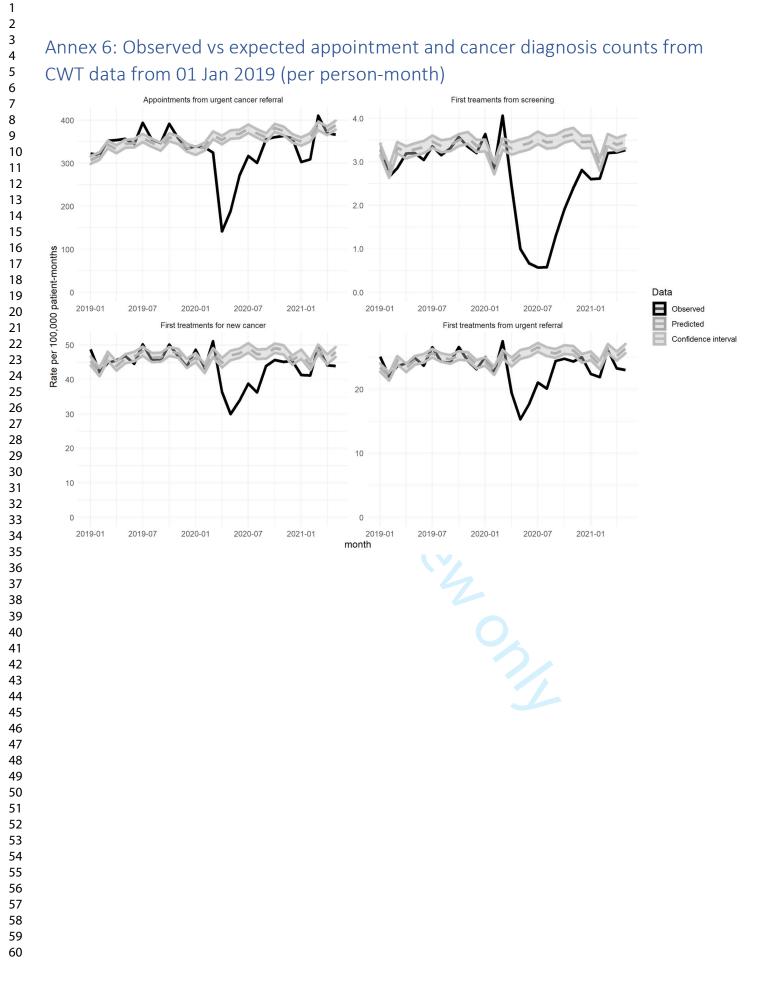
Table A5.1: Patient demographics in CPRD Aurum sample as at 22 March 2020

	Patient count as at 22 March 2020				
	n	%			
All	375,501				
Female	187,509	49.9%			
Male	187,992	50.1%			
Under 11	39,611	10.5%			
11 to 19	43,406	11.6%			
20 to 49	157,962	42.1%			
50 to 69	87,482	23.3%			
70 and older	47,040	12.5%			
IMD Quintile - 1	78,759	21.0%			
IMD Quintile - 2	73,046	19.5%			
IMD Quintile - 3	71,840	19.1%			
IMD Quintile - 4	77,545	20.7%			
IMD Quintile - 5	74,020	19.7%			
IMD not	201	0.10			
recorded	291	0.1%			

Table A5.2: Person time (weeks) and total primary care activity analysed - CPRD Aurum

4										
5		3 January 2016	5 - 21March	2020*		22 March 202	20 - 30 Janu	ary 2021		_
6		Dationst times	100,000	A	Observed rate	Patient-	100,000	A	Observed rate	•
7		Patient-time	person-	Activity	per 100,000	time	person-	Activity	per 100,000	
8	Consultations excl flu	(weeks)	months	count	person-months	(weeks)	months	count	person-months	
9 0	vaccinations	78,868,977	181.44	6,912,079	38,095	16,701,707	38.19	1,306,206	34,201	
1	Routine Referrals	78,868,977	181.44	312,422	1,722	16,701,707	38.19	40,744	1,067	
2										
3	2 Week Wait Referrals	78,868,977	181.44	38,905	214	16,701,707	38.19	10,235	268	

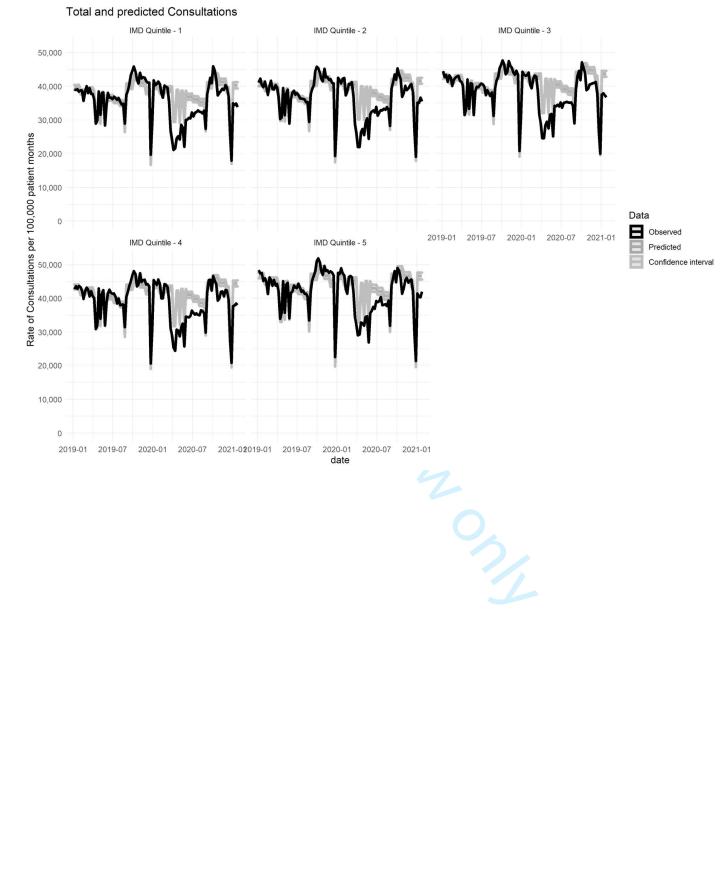
*The pre-pandemic period consists of 220 weeks or 51.61 months, the post pandemic period is 45 weeks or 10.29 months



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Annex 7: Observed vs expected consultations by IMD quintile

Figure A7: Observed vs expected consultations per person per week by IMD quintile, age-standardised (01 Jan 2019 – 30 Jan 2021)



STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Pag No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or	2
		the abstract	
		(b) Provide in the abstract an informative and balanced summary of what	2
		was done and what was found	
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of	4
	, C	recruitment, exposure, follow-up, and data collection	.
Participants	6	(a) Cohort study—Give the eligibility criteria, and the sources and	4
- and pulles	Ū	methods of selection of participants. Describe methods of follow-up	'
		<i>Case-control study</i> —Give the eligibility criteria, and the sources and	
		methods of case ascertainment and control selection. Give the rationale	
		for the choice of cases and controls	
		<i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and	
		methods of selection of participants	
		(b) Cohort study—For matched studies, give matching criteria and	
		number of exposed and unexposed	
		<i>Case-control study</i> —For matched studies, give matching criteria and the	
		number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders,	4/5
		and effect modifiers. Give diagnostic criteria, if applicable	
Data sources/	8*	For each variable of interest, give sources of data and details of methods	4/5
measurement		of assessment (measurement). Describe comparability of assessment	
		methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	5/6
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If	4-6
		applicable, describe which groupings were chosen and why	
Statistical methods	12	(<i>a</i>) Describe all statistical methods, including those used to control for	5/6
		confounding	
		(b) Describe any methods used to examine subgroups and interactions	5/6
		(c) Explain how missing data were addressed	4-6
		(<i>d</i>) Cohort study—If applicable, explain how loss to follow-up was	N/2
		addressed	
		<i>Case-control study</i> —If applicable, explain how matching of cases and	
		controls was addressed	
			1
		<i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	

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Results			1
Participants	13*	(a) Report numbers of individuals at each stage of study-eg numbers potentially	4/5
		eligible, examined for eligibility, confirmed eligible, included in the study,	
		completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and	6-8
data		information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of interest	6-8
		(c) Cohort study—Summarise follow-up time (eg, average and total amount)	N/A
Outcome data	15*	Cohort study—Report numbers of outcome events or summary measures over time	6/7
		Case-control study-Report numbers in each exposure category, or summary	N/A
		measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	N/A
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and	6-8
		their precision (eg, 95% confidence interval). Make clear which confounders were	
		adjusted for and why they were included	
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a	N/A
		meaningful time period	
Other analyses	17	Report other analyses done-eg analyses of subgroups and interactions, and	6-8
		sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or	9/10
		imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations,	10
		multiplicity of analyses, results from similar studies, and other relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	9/10
Other informati	ion		
Funding	22	Give the source of funding and the role of the funders for the present study and, if	1
-		applicable, for the original study on which the present article is based	

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.