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Using General Practice Patient Survey data to explore prevalence and patient uncertainty about Long Covid

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Abstract

Background: The high global burden of Long Covid (LC) has significant implications for population wellbeing, healthcare, social care and national economies.

Aim: To explore associations between patient sociodemographic and health characteristics with two outcomes: reporting having LC and expressing uncertainty about having LC, as described by general practice (GP) survey respondents.

Design and setting: Analysis of GP Patient Survey (England), a random sample of 759,149 patients aged 16yrs+ registered with a GP in England (2023).

Method: Multivariable logistic regression modelling comparing those with and without LC, and those who were unsure in relation to patient characteristics.

Results: 4.8% of respondents reported having LC, and 9.1% were unsure. Significant adjusted associations indicating higher risk of LC included age (highest odds 35-54yrs), sex (females), ethnicity (White Gypsy/Irish Traveller, mixed/multiple ethnic groups), sexual orientation (gay/lesbian or bisexual), living in a deprived area, being a carer or a parent and having a long-term condition (LTC). Those aged ≤25yrs, males, non-binary, heterosexual, not parents or carers, from other white, Indian, Bangladeshi, Chinese, Black or Arab backgrounds, former and current smokers, and with no defined LTC were more likely to be unsure about having LC compared to answering 'yes'.

Conclusion: There is an unequal distribution of LC in England, with the condition being more prevalent in minoritised and disadvantaged groups. There are also high levels of uncertainty about having LC. Improved awareness is needed amongst the general population and healthcare professionals to ensure those most vulnerable in society are identified and provided with care and support.

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Introduction

In the UK, the Office for National Statistics estimated in March 2024 that 2 million adults and children experience self-reported Long Covid (LC) (3.3% of the population), with 69% and 41% experiencing it for at least 1 and 2 years respectively and 19% reporting that LC limits their ability to undertake day to day activities 'a lot'[1]. There is also evidence of inequalities in LC prevalence, with higher prevalence associated with being female[2-9], of older or middle age[2-4, 6, 7], having a higher body mass index (BMI)[2, 3, 5, 7, 8], smoking[3, 5], and belonging to an ethnic minority group[5, 8]. Higher prevalence is also associated with greater deprivation[3-5, 9]. There is also unequal impact of the condition on people's lives[10, 11 12] and inequitable support[13, 14 15] for the condition. More research is needed to understand the extent of this inequality and the action needed to address it.

As a relatively novel condition, knowledge about LC is still in its infancy amongst researchers and healthcare professionals but there is even more lack of awareness, exacerbated by barriers and stigma, in the general population leaving unwell people unsure if they have LC[16, 17]. This high and unequal burden of illness from LC has significant implications for society in terms of the infrastructure of accessible support and treatment needed for people with LC.

The General Practice Patient Survey (GPPS) is an annual survey of people aged 16yrs+ registered with a GP in England, administered by Ipsos on behalf of NHS England[18]. Established in 2007, it asks respondents about their experience of their local GP, other local NHS services and respondents' general health. In 2022 a new question was added that asked whether respondents had Long Covid.

The aim of this study was to (1) explore prevalence of LC, (2) examine its potential sociodemographic and health characteristics and (3) explore factors associated with being unsure about having LC.

Methods

Sampling

Each year in January the GPPS is issued by post to a random sample of patients registered with a GP in England. It can be completed on paper (returned using a FREEPOST envelope), online or using a dedicated telephone helpline. Invitations and reminders are also issued by text message and the online survey is available in 14 different languages and British Sign Language. Paper copies can be requested in Braille and large print. Data is grouped by geographical and health system factors including general practice, Primary Care Network, Integrated Care System, Local Authority and NHS Region. Indices of deprivation are also available according to patient postcode and further technical detail is available online[19].

The survey is issued to approximately 2.5 million registered patients and aimed to ensure a minimum number of responses per practice and Primary Care Network (PCN) and a set confidence interval for each practice. A proportionately stratified (by age, gender and postcode) unclustered sample is drawn for each practice.[19] Patient identifiable data is not collected. It is a standalone self-reported survey that is not linked to GP patient records. The questionnaire was last significantly revised in 2021 and is available online[20]. More detail about the survey is available at https://gp-patient.co.uk/FAQ

Design

This is an analysis of cross-sectional survey data using the GPPS dataset for 2023. Permission to access and use the individual patient level survey data from 2023 was requested and granted by agreement between NHS England and the University of Southampton. Ethical approval for this analysis was granted by the University of Southampton Faculty of Medicine Ethics Committee (No.82369).

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Variables

The outcome was the response to the question 'Would you describe yourself as having "Long Covid", that is, you are still experiencing symptoms more than 12 weeks after you first had COVID-19, that are not explained by something else?'. Respondents could select 'yes', 'no', 'not sure' or 'prefer not to say'.

The exposure variables used in the analysis are listed in Tables 1 and 2. All were categorical and used as collected with the exception of smoking status. Smoking status was recorded as never, former, occasional and regular smoker; and was condensed to never, former and current smoker (regular and occasional) for analysis.

Analysis

Data was analysed using Stata v17[21]. Descriptive statistics, frequencies and proportions were calculated followed by univariable and multivariable logistic regression. The primary analysis compared those answering 'yes' and 'no' to the LC question, excluding those answering unsure or 'prefer not to say'. The same analysis comparing those answering 'not sure' and 'no' was also undertaken, as well as comparing 'not sure' and 'yes'. We conducted the latter analysis to understand the factors associated with uncertainty about having the health condition which may act as a barrier to seeking care and support.

We conducted multivariable analysis to assess the independent effects of variables given they can potentially confound each other. The multivariable analysis included age, sex, sexuality, parental/guardian status, carer status, ethnicity, patient's area of residence index of multiple deprivation (IMD) quintile (a combined index of relative deprivation based on data in seven domains)[22], religion, smoking status and having at least one defined LTC (other than LC). A new variable was created to identify respondents with at least one defined LTC. The question that asked if respondents had any LTCs could not be included as respondents with LC could have counted their LC as a LTC (the LTC variable could include the LC outcome). Work status was included as an adjustment in the analysis comparing 'yes' and 'not sure' but not included when comparing 'yes' and 'no' (work status could have been impacted by having LC).

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Results

The survey was completed by 759,149 people (28.6% response rate).

Table 1: Characteristics of the study population by Long Covid status as reported by survey participants (n=759,149)

	Yes	No	Not sure	Prefer not to say
	n (%)	n (%)	n (%)	n (%)
All respondents				
	35445 (4.8)	632748 (85.3)	67257 (9.1)	5991 (0.8)
Commissioning region				
East	3379 (4.3)	68103 (86.7)	6625 (8.4)	486 (0.6)
London	6158 (4.7)	110489 (84.2)	12859 (9.8)	1732 (1.3)
Midlands	7450 (5.1)	124690 (84.6)	13922 (9.5)	1319 (0.9)
North East	5687 (5.1)	94826 (84.9)	10408 (9.3)	800 (0.7)
North West	6095 (5.5)	93015 (84.0)	10781 (9.7)	890 (0.8)
South East	4111 (4.2)	84642 (87.3)	7728 (8.0)	519 (0.5)
South West	2565 (3.9)	56983 (88.0)	4934 (7.6)	245 (0.4)
Sex				
Female	20973 (5.1)	353888 (85.2)	37635 (9.1)	2649 (0.6)
Male	13444 (4.4)	263956 (86.1)	27246 (8.9)	2062 (0.7)
Non-binary	102 (6.5)	1214 (76.7)	224 (14.2)	42 (2.7)
Prefer to self-describe	82 (8.2)	693 (69.3)	153 (15.3)	72 (7.2)
Prefer not to say	391 (4.9)	5502 (69.4)	1104 (13.9)	937 (11.8)
Age				
16-24 years	1148 (4.4)	22183 (84.9)	2391 (9.2)	403 (1.5)
25-34 years	2759 (4.9)	47858 (84.4)	5327 (9.4)	745 (1.3)
35-44 years	5039 (5.7)	73225 (82.3)	9535 (10.7)	1171 (1.3)
45-54 years	7313 (6.2)	95929 (81.8)	12793 (10.9)	1184 (1.0)
55-64 years	9027 (5.6)	135435 (83.8)	16107 (10.0)	1079 (0.7)
65-74 years	6349 (4.1)	137287 (87.5)	12556 (8.0)	684 (0.4)
75-84 years	2946 (2.9)	92496 (90.3)	6577 (6.4)	443 (0.4)
85+ years	664 (2.5)	24716 (91.2)	1557 (5.8)	162 (0.6)
Ethnicity				
White - English, Welsh, Scottish, Northern Irish or British	25968 (4.7)	479699 (86.5)	46529 (8.4)	2260 (0.4)
White – Irish	362 (4.7)	6565 (86.0)	678 (8.9)	31 (0.4)
White - Gypsy or Irish Traveller	42 (14.6)	203 (70.5)	36 (12.5)	7 (2.4)
White - Roma	33 (5.1)	495 (76.3)	87 (13.4)	34 (5.2)
White - Any other White background	2185 (5.4)	33154 (81.4)	4692 (11.5)	683 (1.7)
Mixed or Multiple ethnic groups - White and Black Caribbean	154 (5.7)	2214 (82.6)	279 (10.4)	35 (1.3)
Mixed or Multiple ethnic groups - White and Black African	87 (5.7)	1240 (81.6)	167 (11.0)	25 (1.7)
Mixed or Multiple ethnic groups - White and Asian	209 (6.4)	2674 (81.6)	348 (10.6)	46 (1.4)
Mixed or Multiple ethnic groups - Any other Mixed or multiple ethnic background	263 (6.8)	3063 (78.8)	503 (12.9)	59 (1.5)
Asian or Asian British - Indian	1319 (4.7)	23244 (81.9)	3227 (11.4)	592 (2.1)
Asian or Asian British – Pakistani	1111 (6.4)	13483 (77.1)	2341 (13.4)	551 (3.2)
Asian or Asian British - Bangladeshi	368 (6.2)	4522 (76.6)	851 (14.4)	159 (2.7)
Asian or Asian British - Chinese	233 (4.0)	4814 (82.1)	725 (12.4)	90 (1.5)

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	Yes	No	Not sure	Prefer not to say
Asian or Asian British - Any other Asian background	707 (5.4)	10503 (80.1)	1616 (12.3)	279 (2.1)
Black, Black British, Caribbean or African - Caribbean	349 (4.3)	7007 (85.9)	704 (8.6)	100 (1.2)
Black, Black British, Caribbean or African - African	523 (2.9)	16244 (89.2)	1219 (6.7)	220 (1.2)
Black, Black British, Caribbean or African - Any other Black, Black British, Caribbean or African background	193 (4.22)	3902 (85.4)	418 (9.1)	58 (1.2)
Other ethnic group - Arab	191 (5.1)	2982 (79.2)	492 (13.1)	102 (2.7)
Any other ethnic group	707 (6.0)	9106 (77.7)	1465 (12.5)	441 (3.8)
Sexual orientation				
Heterosexual	31093 (4.7)	568277 (86.0)	58132 (8.8)	3206 (0.5)
Gay or lesbian	723 (6.5)	9267 (83.1)	1119 (10.0)	47 (0.4)
Bisexual	609 (6.8)	7310 (81.2)	990 (11.0)	93 (1.0)
Other	500 (6.5)	6164 (79.8)	868 (11.2)	197 (2.6)
I would prefer not to say	1939 (4.9)	30491 (77.1)	4916 (12.4)	2192 (5.5)
Gender identity is the same as the sex registered at birth				
Yes	34344 (4.8)	627191 (85.6)	64753 (9.0)	4543 (0.6)
No	267 (6.3)	3289 (77.9)	534 (12.6)	134 (3.2)
Prefer not to say	451 (5.3)	5626 (66.5)	1244 (14.7)	1140 (13.5)
Patient area of residence IMD quintile				
1 (most deprived)	8917 (6.0)	121888 (81.4)	16715 (11.2)	2207 (1.5)
2	7606 (5.1)	125690 (84.0)	14726 (9.8)	1589 (1.1)
3	7082 (4.7)	130237 (85.8)	13464 (8.9)	1021 (0.7)
4	6414 (4.3)	129861 (87.2)	12011 (8.1)	717 (0.5)
5 (least)	5408 (3.8)	124732 (88.5)	10300 (7.3)	452 (0.3)
Work status				
In full-time paid work (30 hours or more each week)	13777 (5.4)	213406 (84.2)	24409 (9.6)	1891 (0.8)
In part-time paid work (under 30 hours each week)	4958 (5.4)	77225 (84.1)	8955 (9.8)	667 (0.7)
In full-time education at school, college or university	657 (4.4)	12649 (85.7)	1270 (8.6)	188 (1.3)
Unemployed	1425 (5.7)	19703 (79.4)	3068 (12.4)	609 (2.5)
Permanently sick or disabled	3222 (9.3)	25998 (75.4)	4886 (14.2)	389 (1.1)
Fully retired from work	7742 (3.1)	222069 (89.8)	16725 (6.8)	873 (0.4)
Looking after the family or home	1527 (4.7)	26989 (83.3)	3472 (10.7)	404 (1.3)
Doing something else	1033 (4.9)	17284 (81.2)	2277 (10.7)	689 (3.2)
Carer				
No	24598 (4.3)	492447 (86.4)	48681 (8.5)	4502 (0.8)
1-9hrs per week	4693 (6.1)	63947 (83.0)	8121 (10.5)	331 (0.4)
10-19hrs per week	1436 (7.2)	16099 (80.6)	2296 (11.5)	150 (0.8)
20-34hrs per week	986 (7.5)	10444 (79.0)	1626 (12.3)	157 (1.2)
35-49hrs per week	832 (7.4)	8786 (78.1)	1435 (12.8)	196 (1.7)
50hrs+ per week	2107 (6.3)	27570 (82.4)	3461 (10.4)	313 (0.9)
Parent or guardian				
Yes	7760 (5.6)	114317 (82.9)	14185 (10.3)	1683 (1.2)
No	27353 (4.6)	513023 (85.9)	52426 (8.8)	4148 (0.7)
Smoking status				
Never smoker	18997 (4.5)	364068 (86.3)	35260 (8.4)	3542 (0.8)
Former smoker	11834 (5.2)	192805 (84.7)	21851 (9.6)	1129 (0.5)

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	Yes	No	Not sure	Prefer not to say
Occasional/regular smoker	4302 (5.0)	70511 (82.5)	9506 (11.1)	1154 (1.4)
Deaf person who uses sign language				
Yes	447 (14.6)	2075 (67.7)	389 (12.7)	154 (5.0)
No	34527 (4.7)	623399 (85.5)	65998 (9.1)	5662 (0.8)
Long term conditions				
Any long-term condition*	26200 (5.8)	378567 (83.9)	44453 (9.9)	1948 (0.4)
Any long-term condition excluding LC (derived variable)	23443 (5.7)	343728 (83.9)	40632 (9.9)	1690 (0.4)
Alzheimer's disease or other cause of dementia	545 (9.2)	4922 (82.8)	444 (7.5)	32 (0.5)
Arthritis or ongoing problem with back or joints	10936 (6.4)	139453 (82.1)	18915 (11.1)	622 (0.4)
Autism or autism spectrum condition	528 (8.8)	4742 (78.7)	710 (11.8)	43 (0.7)
Blindness or partial sight	621 (5.3)	9794 (84.1)	1162 (10.0)	64 (0.6)
Breathing condition such as asthma or COPD	7757 (9.0)	66590 (77.6)	11132 (13.0)	390 (0.5)
Cancer (diagnosis or treatment in the last 5 years)	1253 (3.9)	28620 (88.0)	2543 (7.8)	94 (0.3)
Deafness or hearing loss	2981 (5.2)	48069 (84.6)	5605 (9.9)	194 (0.3)
Diabetes	4161 (5.7)	61316 (83.6)	7432 (10.1)	405 (0.6)
Heart condition such as angina or atrial fibrillation	3199 (5.8)	45937 (83.8)	5510 (10.1)	196 (0.4)
High blood pressure	8584 (5.4)	135479 (84.4)	15788 (9.8)	617 (0.4)
Kidney or liver disease	1211 (6.7)	14477 (80.6)	2159 (12.0)	115 (0.6)
Learning disability	625 (7.8)	6283 (78.5)	1004 (12.5)	95 (1.2)
Mental health condition	6332 (9.2)	52790 (76.6)	9472 (13.7)	369 (0.5)
Neurological condition such as epilepsy	922 (6.5)	11724 (82.9)	1442 (10.2)	53 (0.4)
Stroke (which affects day-to-day life)	478 (6.1)	6455 (82.3)	856 (10.9)	51 (0.7)
Another long-term condition or disability	7830 (7.8)	80496 (80.6)	11186 (11.2)	402 (0.4)
No long-term condition	*7176 (3.1)*	*208447 (88.7)*	*17565 (7.5)*	*1711 (0.7)*
Religion				
None	10477 (4.9)	184896 (86.1)	18564 (8.6)	868 (0.4)
Buddhist	290 (5.9)	3959 (81.1)	545 (11.2)	85 (1.7)
Christian	18359 (4.5)	354716 (86.6)	34526 (8.4)	2002 (0.5)
Hindu	713 (4.5)	12980 (82.6)	1741 (11.1)	281 (1.8)
Jewish	190 (4.4)	3793 (88.5)	281 (6.6)	23 (0.5)
Muslim	2457 (5.8)	33111 (78.5)	5420 (12.9)	1176 (2.8)
Sikh	377 (5.2)	5821 (80.5)	826 (11.4)	211 (2.9)
Other	883 (7.8)	8892 (78.4)	1412 (12.5)	151 (1.3)
Prefer not to say	1301 (5.4)	18609 (76.9)	3232 (13.4)	1050 (4.3)

* Presented as reported in the survey, but this may include the LC outcome

Figure 1 shows the percentage of respondents self-reporting having LC and being unsure if they have LC.

Respondents describing themselves as having LC (compared with those who answered 'No')

The percentage of respondents self-describing as having LC was 4.8% (n=35,445) (Table 1). The highest prevalence of LC was in the North West region (5.5%) and lowest in the South West (3.9%) (Table 1). 9% of people who described themselves as permanently sick or disabled had LC (Table 1). Compared to being in full-time work, people who were students, retired, looking after the family or home, or

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'doing something else' were less likely to report having LC (Table 2). People who were unemployed or permanently sick or disabled were more likely to report having LC (unadjusted 1.12, 95%CI 1.06-1.19; 1.92, 95%CI 1.84-2.00 respectively).

Of those who stated they had LC, 59.9% (n=20,973) were female. Males were less likely to report having LC compared to females (adjusted OR 0.88, 95%CI 0.86-0.90) (Table 2). 60.7% of those with LC were aged between 35 and 64yrs. Compared to those aged 16-24yrs, having LC was significantly less common in those ≥65yrs and more common in those aged 25-64yrs even after adjustment for other characteristics (Table 2). The prevalence of LC significantly increased as area deprivation increased, with living in the most deprived area quintile associated with 47% higher odds compared to the least (adjusted OR 1.47, 95%CI 1.42-1.53) (Table 2).

People who were gay/lesbian, bisexual or 'other' sexual orientations had significantly higher prevalence compared to heterosexuals (Table 2). Parents were more likely to have LC compared to non-parents, as were carers in all caring hours categories compared to non-carers (Table 2). Compared to white British ethnicity, significantly higher adjusted odds of having LC were seen in White Gypsy or Irish Traveller groups, any other White background, White and Asian and 'other' mixed or multiple ethnic groups, and 'any other ethnic group' (Table 1). All three Black as well as Chinese ethnic groups were less likely to report having LC (Table 2). Compared to having no religion, adjusted ORs of having LC were higher for Buddhist, Christian, Muslim, Sikh and 'other' religions (Table 2).

The prevalence of LC amongst current regular smokers was 4.8% (Table 1) and the proportion of people with LC who were regular or occasional smokers was 12.2% compared to 11.2% smokers among those with no LC. Compared to people who had never smoked, the adjusted OR of having LC in occasional/regular smokers was 0.96 (95%CI 0.93-1.00) and for former smokers was 1.19 (95%CI 1.16-1.22) (Table 2).

There was particularly high prevalence of LC amongst people who were deaf and using sign language (14.6%), and those who had Alzheimer's/dementia (9.2%), autism (8.8%), a breathing condition (9.0%), a mental health condition (9.2%) or another LTC not listed (7.8%) (Table 1). People with at least one defined LTC (which was not LC) had higher odds of having LC (adjusted OR 1.97, 95%CI 1.92-2.01).

Respondents who were 'not sure' if they would describe themselves as having LC (compared with those who answered 'Yes')

Those aged 25-74yrs were significantly less likely to say they are unsure about having LC (compared to those who answered 'yes' to having LC) than those aged 16-24yrs (Table 3). Males and non-binary people were significantly more likely to be unsure compared to females. Gay/lesbian and 'Other' sexual orientations were significantly less likely to be unsure compared to heterosexuals. Parents were less likely to be unsure compared to non-parents (adjusted OR 0.93, 95% CI 0.89-0.96), and carers less likely to be unsure compared to non-carers (Table 3).

White Gypsy or Irish Traveller were significantly less likely to be unsure that they had LC (compared to those who answered 'yes' to having LC) than White British ethnicity. 'Any other White background', Indian, Bangladeshi, Chinese, 'Any other Asian background', Black Caribbean, Black African, Arab and 'Any other ethnic group' were significantly more likely to be unsure compared to White British. There was no significant difference by level of area deprivation (IMD quintile) between those who were unsure and those who said they have LC or between those with a religion and those without.

Unemployment, working part-time, being retired, looking after the family or home, or 'doing something else' were positively linked to not being sure as opposed to saying 'yes' to have LC,

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compared with people working full-time. People who were permanently sick or disabled were less likely to be unsure (Table 3).

Compared with those who answered 'yes' to having LC, former or current smokers were significantly more likely to be unsure than people who never smoked. People with at least one defined LTC were less likely to be unsure compared to people without (Table 3).

Results comparing responses of those answering 'not sure' and 'no' are included in Table 4.

Discussion

Our analysis of this national general practice survey data found that 4.8% of respondents self-described as having LC while 9.1% were unsure whether they have it or not. There is an unequal distribution of LC in England, with the condition being more prevalent in minoritised and disadvantaged groups. There are also high levels of uncertainty about LC, with certain groups that are already disadvantaged being more likely to be uncertain if they have the condition.

Many of this study's findings support existing research on risk factors for LC, for example lower odds of having LC in males compared to females[2-9], higher odds in those of working age[2-4, 6, 7], the strong trend of increasing odds of LC with increasing deprivation[1, 3-5, 9] and higher odds for people who are unemployed[1], and who have existing health conditions[2, 5, 7]. UK studies have also found higher prevalence of LC in particular ethnic minority groups[1, 3, 5, 8] but findings have not been consistent. Lower odds were also found for people of Black ethnicity, something that has been found in other UK studies[1, 7]. Higher prevalence in people from sexual orientation minorities has also been identified in one US study[23].

In this study, there were higher odds of having LC for people who are parents and carers. This could be explained by disproportionate exposure to SARS-CoV-2 through schools and caring roles, or greater awareness of LC in these groups. The latter is supported by the reduced odds found in this study of being unsure about having LC in those groups. The impact of LC symptoms could be more noticeable due to caring roles, or the likelihood of being able to rest during the acute COVID-19 phase may have been limited (a potential factor in some LC cases[10]). There were also higher odds for people of particular faiths, even after adjusting for ethnicity, deprivation, age, gender and other potential confounding factors. However, this still may be explained by residual confounding. Odds of having LC were higher in former smokers but lower for current smokers, which is contrary to studies where smoking has been identified as a risk factor[3, 5]. However, reviews of this area recognise the variation in findings about the role of smoking in LC[24].

This study also adds new evidence about the lack of certainty people feel about whether or not they have LC. Groups who were less confident about whether they had LC included males and non-binary people, people from 'Any other white background', Indian, Bangladeshi, Chinese, 'Any other Asian background', Black Caribbean, Black African, Arab and 'Any other ethnic group', those who were working part-time, unemployed, retired, or staying at home and smokers. Those who were less likely to be unsure about having LC included those aged 24-74yrs, those who were not heterosexual, parents/guardians and carers, White Gypsy/Irish Traveller, people who were sick or disabled and people with at least one defined LTC. Those under the age of 25yrs were less confident about having LC. This could explain why most research about LC includes older people as most research uses self-identification with LC as study inclusion strategy. It could also be the case that there is wider associated stigma with having LC in younger people[17].

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Given the high burden of LC in the global population and its impact on everyday lives of individuals and the functioning of society, it is important to understand the drivers for uncertainty around LC to enable people to get the right support. Levels of uncertainty may indicate a lack of awareness of LC symptoms or confusion, or there may be an overlap in symptoms with other conditions. A lack of uncertainty in particular groups may be because a diagnosis has already been secured, indicating that some groups may be more likely than others to be successfully diagnosed, or it could be related to levels of health literacy and self-advocacy. Stigma and self-doubt can shape self-identification with LC[16, 17, 25, 26] which could be discouraging people from coming forward for diagnosis and support and there is emerging evidence that intersectional identity may compound LC stigma leading to worse outcomes for marginalised groups[16].

Strengths and Limitations

A key strength of this study is its large sample size and a national survey sample. Limitations of this study include the lack of data about severity or symptoms of LC, the timing of its onset and the COVID-19 vaccination status of respondents. In addition, interpreting survey responses about LTCs with respect to LC is problematic. LC is a long-term condition but 21.9% of people who described themselves as having LC said they did not have any LTCs. To take account of this the multivariable models in this study included a variable constructed from named LTCs as reported by respondents rather than the answer to the question 'any other LTC' to eliminate potentially including the LC outcome. A further limitation is that we cannot role reverse causality for some of the variables such as work status, hence this variable was not included in the multivariable analysis.

Conclusions

This study provides further evidence that particular population groups in England, often those minoritised and disadvantaged, are more likely to have LC. It adds new evidence that there are more people who are unsure whether they have LC than those who are confident they have it, again some from more vulnerable groups. This clearly demonstrable health inequality lends weight to the argument for diagnosis, treatment and support to be better distributed according to need[27], to avoid LC becoming another factor contributing to the widening health gap between different groups in society. Improved awareness about the condition amongst the general population and training about barriers and stigma among healthcare professionals are required to ensure people with LC can be identified and provided with the right treatment and support.

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Figure 1: Prevalence of self-reported Long Covid and uncertainty, GP Patient Survey 2023

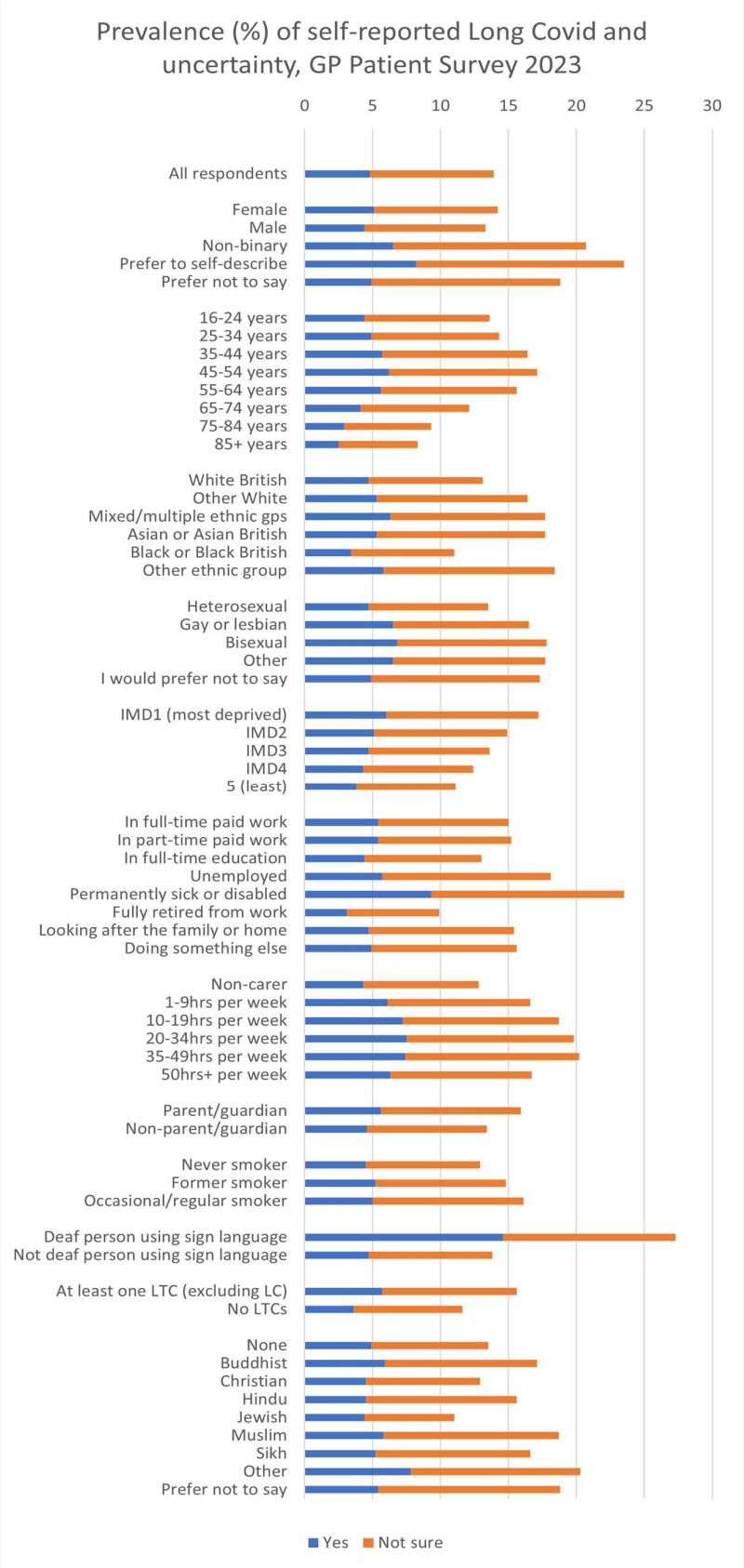

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Table 2: Odds of reporting having Long Covid compared to not having Long Covid (yes vs no) using General Practice Patient Survey data (2023)

	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
Age								
16-24yrs	ref				ref			
25-34yrs	1.114	1.040	1.196	0.003	1.071	0.995	1.153	0.068
35-44yrs	1.330	1.245	1.420	<0.0001	1.216	1.133	1.306	<0.0001
45-54yrs	1.473	1.382	1.570	<0.0001	1.232	1.151	1.318	<0.0001
55-64yrs	1.288	1.209	1.372	<0.0001	1.008	0.942	1.078	0.819
65-74yrs	0.894	0.838	0.953	0.001	0.662	0.617	0.709	<0.0001
75-84yrs	0.615	0.574	0.660	<0.0001	0.429	0.398	0.463	<0.0001
85+yrs	0.519	0.471	0.572	<0.0001	0.339	0.304	0.378	<0.0001
Sex								
Female	ref				ref			
Male	0.859	0.841	0.879	<0.0001	0.879	0.859	0.900	<0.0001
Non-binary	1.418	1.15	1.736	0.001	0.904	0.722	1.130	0.375
Prefer to self-describe	1.997	1.587	2.511	<0.0001	1.451	1.134	1.856	0.003
Prefer not to say	1.199	1.081	1.330	0.001	0.998	0.889	1.121	0.974
Sexual orientation								
Heterosexual	ref				ref			
Gay or lesbian	1.426	1.320	1.539	<0.0001	1.203	1.110	1.303	<0.0001
Bisexual	1.523	1.401	1.655	<0.0001	1.193	1.092	1.303	<0.0001
Other	1.483	1.352	1.625	<0.0001	1.212	1.096	1.339	<0.0001
I would prefer not to say	1.162	1.109	1.219	<0.0001	0.990	0.937	1.046	0.714
Gender identity is the same as the sex registered at birth								
Yes	ref				NA			
No	1.459	1.287	1.653	<0.0001				
Prefer not to say	1.441	1.308	1.587	<0.0001				
Parent								
No	ref				ref			
Yes	1.273	1.240	1.307	<0.0001	1.058	1.024	1.093	0.001
Carer								
No	ref							
1-9hrs per week	1.469	1.423,	1.517	<0.0001	1.387	1.341	1.434	<0.0001
10-19hrs	1.786	1.689	1.888	<0.0001	1.612	1.522	1.707	<0.0001
20-34hrs	1.890	1.768	2.020	<0.0001	1.651	1.540	1.769	<0.0001
35-49hrs	1.896	1.764	2.038	<0.0001	1.538	1.426	1.658	<0.0001
50hrs+	1.530	1.461	1.602	<0.0001	1.434	1.367	1.505	<0.0001
Ethnicity								
White - English, Welsh, Scottish, Northern Irish or British	ref				ref			
White – Irish	1.019	0.916	1.133	0.735	1.060	0.949	1.183	0.302

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	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
White - Gypsy or Irish Traveller	3.822	2.741	5.329	<0.0001	2.452	1.697	3.544	<0.0001
White - Roma	1.232	0.866	1.752	0.247	1.024	0.701	1.495	0.903
White - Any other White background	1.217	1.164	1.274	<0.0001	1.096	1.044	1.150	<0.0001
Mixed or Multiple ethnic groups - White and Black Caribbean	1.285	1.091	1.514	0.003	1.033	0.872	1.222	0.708
Mixed or Multiple ethnic groups - White and Black African	1.296	1.042	1.611	0.020	1.031	0.820	1.297	0.791
Mixed or Multiple ethnic groups - White and Asian	1.444	1.254	1.663	<0.0001	1.278	1.104	1.481	0.001
Mixed or Multiple ethnic groups - Any other Mixed or multiple ethnic background	1.586	1.398	1.800	<0.0001	1.274	1.116	1.454	<0.0001
Asian or Asian British - Indian	1.048	0.990	1.110	0.104	0.939	0.855	1.031	0.185
Asian or Asian British – Pakistani	1.522	1.430	1.620	<0.0001	1.077	0.975	1.189	0.146
Asian or Asian British - Bangladeshi	1.503	1.350	1.673	<0.0001	1.037	0.907	1.186	0.590
Asian or Asian British – Chinese	0.894	0.783	1.020	0.097	0.864	0.751	0.994	0.041
Asian or Asian British - Any other Asian background	1.243	1.151	1.343	<0.0001	1.061	0.971	1.160	0.189
Black, Black British, Caribbean or African - Caribbean	0.920	0.826	1.025	0.131	0.758	0.677	0.849	<0.0001
Black, Black British, Caribbean or African – African	0.595	0.545	0.649	<0.0001	0.470	0.428	0.517	<0.0001

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	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
Black, Black British, Caribbean or African - Any other Black, Black British, Caribbean or African background	0.914	0.790	1.056	0.223	0.748	0.644	0.870	<0.0001
Other ethnic group - Arab	1.183	1.022	1.370	0.025	0.879	0.743	1.041	0.136
Any other ethnic group	1.434	1.327	1.530	<0.0001	1.154	1.057	1.260	0.001
Patient IMD quintile								
1 (most deprived)	1.687	1.630	1.747	<0.0001	1.470	1.416	1.526	<0.0001
2	1.396	1.347	1.446	<0.0001	1.283	1.236	1.333	<0.0001
3	1.254	1.210	1.300	<0.0001	1.198	1.154	1.244	<0.0001
4	1.139	1.098	1.182	<0.0001	1.106	1.065	1.150	<0.0001
5 (least)	ref							
Work status								
In full-time paid work (30 hours or more each week)	ref				NA			
In part-time paid work (under 30 hours each week)	0.994	0.962	1.028	0.746				
In full-time education at school, college or university	0.805	0.742	0.872	<0.0001				
Unemployed	1.120	1.059	1.185	<0.0001				
Permanently sick or disabled	1.920	1.844	2.000	<0.0001				
Fully retired from work	0.540	0.525	0.556	<0.0001				
Looking after the family or home	0.876	0.830	0.925	<0.0001				
Doing something else	0.926	0.867	0.988	0.020				
Religion								
None	ref				ref			
Buddhist	1.293	1.146	1.459	0.001	1.260	1.104	1.438	0.001
Christian	0.913	0.891	0.936	<0.0001	1.051	1.024	1.080	<0.0001
Hindu	0.969	0.897	1.048	0.434	1.091	0.975	1.221	0.128
Jewish	0.884	0.763	1.024	0.100	0.980	0.836	1.149	0.805
Muslim	1.310	1.251	1.370	<0.0001	1.191	1.099	1.291	<0.0001
Sikh	1.143	1.028	1.271	0.013	1.279	1.110	1.474	0.001

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	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
Other	1.752	1.631	1.883	<0.0001	1.538	1.425	1.659	<0.0001
Prefer not to say	1.234	1.162	1.310	<0.0001	1.246	1.166	1.332	<0.0001
Smoking								
Never smoked	ref				ref			
Former smoker	1.176	1.149	1.204	<0.0001	1.190	1.160	1.221	<0.0001
Occasional or regular smoker	1.169	1.130	1.210	<0.0001	0.959	0.925	0.995	0.024
Deaf person who uses sign language								
No	ref				NA			
Yes	3.890	3.510	4.311	<0.0001				
At least one Long Term Condition (excluding LC)								
No	ref				ref			
Yes	1.642	1.606	1.680	<0.0001	1.965	1.916	2.014	<0.0001

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Table 3: Odds of being uncertain about having Long Covid compared to reporting having Long Covid (not sure vs yes) using General Practice Patient Survey data (2023)

	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
Age								
16-24yrs	ref				ref			
25-34yrs	0.927	0.852	1.008	0.077	0.876	0.793	0.967	0.009
35-44yrs	0.909	0.840	0.982	0.016	0.868	0.788	0.957	0.005
45-54yrs	0.840	0.778	0.906	<0.0001	0.850	0.774	0.935	0.001
55-64yrs	0.857	0.795	0.923	<0.0001	0.884	0.805	0.971	0.010
65-74yrs	0.950	0.880	1.025	0.185	0.882	0.796	0.977	0.016
75-84yrs	1.072	0.987	1.164	0.100	0.999	0.892	1.118	0.981
85+yrs	1.126	1.004	1.263	0.043	1.097	0.947	1.271	0.216
Sex								
Female	ref				ref			
Male	1.129	1.100	1.160	<0.0001	1.134	1.101	1.167	<0.0001
Non-binary	1.224	0.968	1.548	0.092	1.394	1.077	1.805	0.012
Prefer to self-describe	1.040	0.795	1.360	0.776	1.035	0.775	1.382	0.815
Prefer not to say	1.573	1.400	1.768	<0.0001	1.285	1.126	1.466	<0.0001
Sexual orientation								
Heterosexual	ref				ref			
Gay or lesbian	0.828	0.753	0.910	<0.0001	0.854	0.773	0.943	0.002
Bisexual	0.869	0.785	0.963	0.007	0.892	0.801	0.995	0.040
Other	0.929	0.831	1.037	0.190	0.877	0.776	0.991	0.035
I would prefer not to say	1.356	1.284	1.432	<0.0001	1.186	1.113	1.264	<0.0001
Gender identity is the same as the sex registered at birth								
Yes	ref				NA			
No	1.061	0.915	1.229	0.433				
Prefer not to say	1.463	1.313	1.631	<0.0001				
Parent								
No	ref				ref			
Yes	0.954	0.924	0.984	0.003	0.926	0.890	0.964	<0.0001
Carer								
No	ref				ref			
1-9hrs per week	0.874	0.841	0.909	<0.0001	0.916	0.879	0.954	<0.0001
10-19hrs	0.808	0.755	0.864	<0.0001	0.822	0.766	0.883	<0.0001
20-34hrs	0.833	0.769	0.903	<0.0001	0.829	0.761	0.902	<0.0001
35-49hrs	0.872	0.799	0.951	0.002	0.885	0.807	0.971	<0.0001
50hrs+	0.830	0.785	0.878	<0.0001	0.823	0.775	0.875	<0.0001
Ethnicity								
White - English, Welsh, Scottish, Northern Irish or British	ref				ref			
White – Irish	1.045	0.919	1.189	0.499	0.993	0.867	1.137	0.919

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	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
White - Gypsy or Irish Traveller	0.478	0.306	0.747	0.001	0.508	0.310	0.831	0.007
White - Roma	1.471	0.985	2.197	0.059	1.354	0.880	2.082	0.168
White - Any other White background	1.198	1.137	1.264	<0.0001	1.195	1.128	1.265	<0.0001
Mixed or Multiple ethnic groups - White and Black Caribbean	1.011	0.830	1.232	0.913	1.025	0.836	1.258	0.810
Mixed or Multiple ethnic groups - White and Black African	1.071	0.826	1.389	0.603	1.083	0.823	1.426	0.568
Mixed or Multiple ethnic groups - White and Asian	0.929	0.782	1.104	0.404	0.884	0.737	1.061	0.186
Mixed or Multiple ethnic groups - Any other Mixed or multiple ethnic background	1.067	0.919	1.240	0.394	1.102	0.941	1.291	0.226
Asian or Asian British - Indian	1.365	1.278	1.458	<0.0001	1.304	1.169	1.454	<0.0001
Asian or Asian British – Pakistani	1.176	1.093	1.265	<0.0001	1.118	0.995	1.256	0.061
Asian or Asian British - Bangladeshi	1.291	1.141	1.460	<0.0001	1.224	1.048	1.430	0.011
Asian or Asian British – Chinese	1.737	1.497	2.014	<0.0001	1.752	1.495	2.053	<0.0001
Asian or Asian British - Any other Asian background	1.276	1.166	1.395	<0.0001	1.266	1.140	1.405	<0.0001
Black, Black British, Caribbean or African - Caribbean	1.126	0.989	1.281	0.072	1.169	1.019	1.340	0.026
Black, Black British, Caribbean or African – African	1.301	1.173	1.443	<0.0001	1.351	1.207	1.513	<0.0001

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	Unadjusted				Adjusted			
	Odds ratio	**95% CI lower**	**95% CI upper**	**p**	**Odds ratio**	**95% CI lower**	**95% CI upper**	**p**
Black, Black British, Caribbean or African - Any other Black, Black British, Caribbean or African background	1.209	1.019	1.435	0.030	1.172	0.979	1.404	0.084
Other ethnic group - Arab	1.438	1.216	1.700	<0.0001	1.461	1.203	1.775	<0.0001
Any other ethnic group	1.156	1.056	1.267	0.002	1.126	1.014	1.250	0.026
Patient IMD quintile								
1 (most deprived)	0.984	0.944	1.026	0.455	0.971	0.927	1.016	0.200
2	1.017	0.974	1.061	0.454	0.993	0.948	1.040	0.765
3	0.998	0.956	1.043	0.936	0.989	0.945	1.036	0.642
4	0.983	0.940	1.028	0.458	0.987	0.942	1.035	0.586
5 (least)	ref				ref			
Work status								
In full-time paid work (30 hours or more each week)	ref				ref			
In part-time paid work (under 30 hours each week)	1.019	0.979	1.062	0.351	1.085	1.039	1.133	<0.0001
In full-time education at school, college or university	1.091	0.991	1.202	0.077	0.917	0.816	1.031	0.146
Unemployed	1.215	1.137	1.298	<0.0001	1.181	1.100	1.268	<0.0001
Permanently sick or disabled	0.856	0.815	0.899	<0.0001	0.937	0.887	0.990	0.020
Fully retired from work	1.219	1.178	1.262	<0.0001	1.281	1.213	1.354	<0.0001
Looking after the family or home	1.283	1.204	1.368	<0.0001	1.391	1.297	1.491	<0.0001
Doing something else	1.244	1.153	1.343	<0.0001	1.243	1.146	1.348	<0.0001
Religion								
None	ref				ref			
Buddhist	1.061	0.918	1.225	0.425	0.919	0.783	1.079	0.301
Christian	1.061	1.030	1.094	<0.0001	1.023	0.989	1.057	0.185
Hindu	1.378	1.259	1.508	<0.0001	1.082	0.949	1.234	0.238
Jewish	0.835	0.693	1.005	0.056	0.832	0.680	1.017	0.072
Muslim	1.245	1.180	1.313	<0.0001	1.036	0.943	1.139	0.461
Sikh	1.237	1.092	1.400	0.001	0.968	0.820	1.144	0.706

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	Unadjusted				Adjusted			
	Odds ratio	**95% CI lower**	**95% CI upper**	**p**	**Odds ratio**	**95% CI lower**	**95% CI upper**	**p**
Other	0.902	0.827	0.985	0.021	0.890	0.811	0.978	0.015
Prefer not to say	1.402	1.309	1.502	<0.0001	1.215	1.125	1.313	<0.0001
Smoking								
Never smoked	ref				ref			
Former smoker	0.995	0.967	1.024	0.721	1.053	1.020	1.086	0.001
Occasional or regular smoker	1.191	1.144	1.239	<0.0001	1.274	1.220	1.330	<0.0001
Deaf person who uses sign language								
Yes	ref				NA			
No	2.196	1.916	2.518	<0.0001				
At least one Long Term Condition (excluding LC)								
No	ref				ref			
Yes	0.781	0.761	0.803	<0.0001	0.764	0.741	0.788	<0.0001

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Table 4: Odds of being uncertain about having Long Covid compared to not having Long Covid (not sure vs no) using General Practice Patient Survey data (2023)

	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
Age								
16-24yrs	ref				ref			
25-34yrs	1.033	0.982	1.087	0.215	0.998	0.947	1.053	0.954
35-44yrs	1.208	1.152	1.267	<0.0001	1.117	1.061	1.176	<0.0001
45-54yrs	1.237	1.182	1.296	<0.0001	1.102	1.049	1.157	<0.0001
55-64yrs	1.103	1.055	1.154	<0.0001	0.964	0.919	1.012	0.136
65-74yrs	0.849	0.810	0.888	<0.0001	0.719	0.685	0.756	<0.0001
75-84yrs	0.660	0.628	0.693	<0.0001	0.549	0.521	0.580	<0.0001
85+yrs	0.584	0.547	0.625	<0.0001	0.479	0.445	0.516	<0.0001
Sex								
Female	ref				ref			
Male	0.971	0.955	0.987	<0.0001	0.972	0.956	0.989	0.002
Non-binary	1.735	1.504	2.002	<0.0001	1.282	1.102	1.493	0.001
Prefer to self-describe	2.076	1.742	2.474	<0.0001	1.463	1.215	1.762	<0.0001
Prefer not to say	1.887	1.767	2.015	<0.0001	1.266	1.175	1.363	<0.0001
Sexual orientation								
Heterosexual								
Gay or lesbian	1.180	1.109	1.257	<0.0001	1.029	0.964	1.098	0.389
Bisexual	1.324	1.238	1.416	<0.0001	1.062	0.990	1.140	0.093
Other	1.377	1.282	1.048	<0.0001	1.078	0.997	1.165	0.058
I would prefer not to say	1.576	1.528	1.626	<0.0001	1.195	1.152	1.240	<0.0001
Gender identity is the same as the sex registered at birth								
Yes	ref				NA			
No	1.548	1.412	1.696	<0.0001				
Prefer not to say	2.108	1.981	2.242	<0.0001				
Parent								
No	ref				ref			
Yes	1.214	1.191	1.238	<0.0001	0.992	0.968	1.017	0.546
Carer								
No	ref				ref			
1-9hrs per week	1.285	1.253	1.317	<0.0001	1.285	1.252	1.318	<0.0001
10-19hrs	1.443	1.380	1.509	<0.0001	1.341	1.280	1.405	<0.0001
20-34hrs	1.575	1.493	1.661	<0.0001	1.413	1.337	1.494	<0.0001
35-49hrs	1.652	1.561	1.748	<0.0001	1.435	1.354	1.522	<0.0001
50hrs+	1.270	1.224	1.317	<0.0001	1.253	1.207	1.302	<0.0001
Ethnicity								
White - English, Welsh, Scottish, Northern Irish or British	ref				ref			
White – Irish	1.065	0.983	1.153	0.123	1.031	0.948	1.121	0.478

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	Unadjusted				Adjusted			
	Odds ratio	95% CI lower	95% CI upper	p	Odds ratio	95% CI lower	95% CI upper	p
White - Gypsy or Irish Traveller	1.828	1.283	2.606	0.001	1.255	0.858	1.835	0.242
White - Roma	1.812	1.443	2.276	<0.0001	1.467	1.154	1.866	0.002
White - Any other White background	1.459	1.413	1.507	<0.0001	1.296	1.252	1.341	<0.0001
Mixed or Multiple ethnic groups - White and Black Caribbean	1.299	1.147	1.472	<0.0001	1.061	0.932	1.208	0.369
Mixed or Multiple ethnic groups - White and Black African	1.388	1.181	1.632	<0.0001	1.123	0.947	1.332	0.182
Mixed or Multiple ethnic groups - White and Asian	1.342	1.199	1.501	<0.0001	1.118	0.992	1.260	0.068
Mixed or Multiple ethnic groups - Any other Mixed or multiple ethnic background	1.693	1.540	1.861	<0.0001	1.407	1.275	1.552	<0.0001
Asian or Asian British - Indian	1.431	1.378	1.487	<0.0001	1.248	1.170	1.330	<0.0001
Asian or Asian British – Pakistani	1.790	1.711	1.872	<0.0001	1.250	1.165	1.342	<0.0001
Asian or Asian British - Bangladeshi	1.940	1.802	2.089	<0.0001	1.320	1.203	1.449	<0.0001
Asian or Asian British – Chinese	1.553	1.435	1.680	<0.0001	1.579	1.454	1.716	<0.0001
Asian or Asian British - Any other Asian background	1.586	1.504	1.673	<0.0001	1.354	1.273	1.440	<0.0001
Black, Black British, Caribbean or African - Caribbean	1.036	0.958	1.120	0.377	0.873	0.804	0.948	0.001
Black, Black British, Caribbean or African – African	0.774	0.729	0.821	<0.0001	0.639	0.600	0.682	<0.0001

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	Unadjusted				Adjusted			
	Odds ratio	**95% CI lower**	**95% CI upper**	**p**	**Odds ratio**	**95% CI lower**	**95% CI upper**	**p**
Black, Black British, Caribbean or African - Any other Black, Black British, Caribbean or African background	1.104	0.998	1.222	0.055	0.889	0.799	0.990	0.032
Other ethnic group - Arab	1.701	1.546	1.872	<0.0001	1.285	1.151	1.434	<0.0001
Any other ethnic group	1.659	1.568	1.754	<0.0001	1.310	1.230	1.396	<0.0001
Patient IMD quintile								
1 (most deprived)	1.661	1.618	1.704	<0.0001	1.388	1.349	1.427	<0.0001
2	1.419	1.382	1.457	<0.0001	1.250	1.216	1.286	<0.0001
3	1.252	1.219	1.286	<0.0001	1.166	1.134	1.199	<0.0001
4	1.120	1.090	1.151	<0.0001	1.083	1.053	1.115	<0.0001
5 (least)	ref				ref			
Work status								
In full-time paid work (30 hours or more each week)	ref				NA			
In part-time paid work (under 30 hours each week)	1.014	0.988	1.040	0.293				
In full-time education at school, college or university	0.878	0.827	0.931	<0.0001				
Unemployed	1.361	1.308	1.417	<0.0001				
Permanently sick or disabled	1.643	1.589	1.699	<0.0001				
Fully retired from work	0.658	0.645	0.672	<0.0001				
Looking after the family or home	1.125	1.083	1.168	<0.0001				
Doing something else	1.152	1.100	1.206	<0.0001				
Religion								
None	ref				ref			
Buddhist	1.371	1.252	1.501	<0.0001	1.121	1.015	1.238	0.024
Christian	0.969	0.951	0.988	0.001	1.076	1.054	1.098	<0.0001
Hindu	1.336	1.268	1.408	<0.0001	1.153	1.067	1.244	<0.0001
Jewish	0.738	0.653	0.834	<0.0001	0.826	0.727	0.939	0.004
Muslim	1.630	1.578	1.684	<0.0001	1.245	1.176	1.317	<0.0001
Sikh	1.413	1.312	1.523	<0.0001	1.217	1.103	1.343	<0.0001

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	Unadjusted				Adjusted			
	Odds ratio	**95% CI lower**	**95% CI upper**	**p**	**Odds ratio**	**95% CI lower**	**95% CI upper**	**p**
Other	1.582	1.492	1.676	<0.0001	1.377	1.295	1.463	<0.0001
Prefer not to say	1.730	1.662	1.801	<0.0001	1.517	1.449	1.587	<0.0001
Smoking								
Never smoked	ref				ref			
Former smoker	1.170	1.150	1.191	<0.0001	1.257	1.232	1.281	<0.0001
Occasional or regular smoker	1.392	1.359	1.426	<0.0001	1.218	1.187	1.250	<0.0001
Deaf person who uses sign language								
Yes	ref				NA			
No	0.565	0.507	0.629	<0.0001				
At least one Long Term Condition (excluding LC)								
No	ref				ref			
Yes	1.283	1.263	1.304	<0.0001	1.485	1.458	1.512	<0.0001

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