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Title: **Satisfaction with remote consultations in primary care during COVID-19: a population survey of UK adults**

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Abstract

Background: Mode of access to primary care changed during the COVID-19 pandemic; remote consultations became more widespread. With remote consultations likely continuing in UK primary care, it is important to understand people's perceptions of remote consultations and identify potential resulting inequalities.

Aim: To assess satisfaction with remote GP consultation in the UK during the COVID-19 pandemic and identify demographic variation in satisfaction levels.

Design and Setting: Cross-sectional survey from the second phase of a large UK-based study.

Method: 1426 adults who self-reported having sought help from their doctor in the past six months completed an online questionnaire (February-March 2021). Items included satisfaction with remote consultations and demographic variables. Associations were analysed using multivariable regression.

Results: A novel six-item scale of satisfaction with remote GP consultations had good psychometric properties. Participants with higher levels of education had significantly greater satisfaction with remote consultations than participants with mid-level (B=-0.82, 95% CI -1.41, -0.23) or those with low or no qualifications (B=-1.65, 95% CI -2.29, -1.02). People living in Wales reported significantly higher satisfaction compared with those living in Scotland (B=-1.94, 95% CI -3.11, -0.78), though caution is warranted due to small group numbers.

Conclusion: These findings can inform the use and adaptation of remote consultations in primary care. Adults with lower educational levels may need additional support to improve their experience and ensure equitable care via remote consultations.

Keywords: primary health care; general practice; remote consultations; telemedicine; telehealth; demographic factors.

How this fits in

Remote consultations became more widespread during the COVID-19 pandemic and continue to date. However, patterns of association between demographic characteristics and satisfaction with GP remote consultations during the pandemic were unclear. People with higher levels of educational qualification were found to have greater levels of satisfaction with remote GP consultations. Those with lower educational levels may benefit from further support with remote consultations.

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Introduction

Over 133,500 excess deaths occurred during the COVID-19 pandemic (March 2020 to December 2021) in England and Wales, with peaks of excess deaths occurring in April 2020 and January 2021(1). Not only was there increased workload for the NHS during the COVID-19 pandemic, the mode of delivery and therefore mode of access for patients changed, with the use of remote consultations in primary care becoming widespread(2, 3). Prior to this, remote consultations were used but evidence to support them as an alternative, in terms of both effectiveness and patient experience, was somewhat limited(4-6).

A review of pre-pandemic studies noted inequalities in use of remote primary care consultations(7). Women and younger people were more likely to use remote consultations, and people over 85 years and non-immigrants were more likely to use telephone consultations(7). There was no clear pattern of association between other demographic or socioeconomic factors and remote primary care consultation usage(7). Whilst usage does not directly inform us about satisfaction with remote consultation, it may indicate preferences in pre-pandemic times when there was a choice about face-to-face or remote consultations.

At least some elements of remote General Practitioner (GP) consulting will likely continue beyond the pandemic. It is therefore important to consider patients' experiences of remote consulting along with potential inequalities that might be exacerbated. The digital divide – the inequitable distribution of technology – has been highlighted and its negative impacts on health inequalities further fuelled by the pandemic(8). Particular sub-groups may be more impacted by the increased use of remote consultations, such as individuals with limited access to the relevant technology(3, 9) or with dementia(10). A rapid review of patients' experiences of remote primary care consultations during the pandemic(11) identified both advantages and disadvantages of remote consultations perceived by patients(11). Findings about satisfaction with and preferences for remote consultation differed between studies(11). Some studies showed positive associations between satisfaction with remote consultations and demographic factors such as younger age(12, 13), being female(14, 15), higher education(16) and better health status(17). In contrast, no

association was reported for age(15-18), gender(12, 13, 17), education(12, 17), occupation(16), income(12, 16), deprivation(15) or current health(12).

Against this backdrop, it is important to understand people's perceptions of remote consultations and identify potential inequalities. The present study therefore aimed to assess satisfaction with remote GP consultations in the UK population during the COVID-19 pandemic and explore demographic variation in satisfaction levels.

Method

Setting and participants

Data for the present study were collected as part of a UK-based population survey conducted during the COVID-19 pandemic(19). Participants were invited to take part in the wider study in August-September 2020 (phase one) and again in February-March 2021 (phase two)(20). Two UK-based population samples were recruited to complete an online questionnaire in both phases. Recruitment for the two samples was through HealthWise Wales (HWW; a register for potential research participants) and social media for the COVID-19 Cancer Attitudes and Behaviours Study (CABS), and Dynata (an online panel provider commissioned by Cancer Research UK (CRUK)) for the COVID-19 Cancer Awareness Measure (COVID-CAM) data(19, 20). For the CABS sample, potentially under-represented groups were targeted by specific recruitment strategies(19). For the COVID-CAM sample, quotas were placed on several characteristics in order to recruit a nationally representative and ethnically diverse sample(19). Eligibility criteria included being aged 18 years and over, living in the UK and able to speak English. Questions on remote GP consultation were only included in the second phase of the wider study.

Measures

Data were recoded where appropriate to ensure that responses from both samples were comparable. Response options "prefer not to say" and "not applicable" were treated as missing.

Demographic information was collected in both surveys through a series of multiple-choice questions (Table 1). This included gender, age, ethnic background, highest educational qualification, employment status, relationship status, disability and presence of health conditions. Age was collected directly in the CABS sample, but was computed for the COVID-CAM sample using date of birth combined into ten-year categories. Participants were asked whether they had a variety of specific health conditions which were combined into one variable identifying the total number of health conditions reported.

Satisfaction with remote GP consultations was measured using seven items (see supplementary material) that were adapted from a CRUK survey(21) or developed responsively with stakeholders (via public/patient experiences and researchers' objectives) during the study and tested for acceptability with lay representatives(19, 22). Each item had response options on a 4-point Likert scale from "strongly disagree" to "strongly agree", with the additional options of "prefer not to say" and "not applicable". In the CABS sample, participants were only asked these seven items if they self-reported having sought help for a range of possible cancer symptoms (including vague/non-specific symptoms such as feeling tired all the time) during the preceding six months. In the COVID-CAM sample, participants were asked at the start of each item the extent to which they agreed with the statement if they had received advice from a GP or doctor remotely for a health concern in the last six months. Participants in the COVID-CAM sample were asked whether they had tried to contact their GP practice in the last six months and this item was used to identify the sample for analysis.

Statistical analyses

Data were analysed using SPSS v.27 and StataSE v.17. Descriptive statistics were used to characterise the individual and combined samples. Principal components analysis (PCA) with varimax rotation was used to identify the underlying factor structure of items measuring satisfaction with remote GP consultations. Items that loaded (>0.3) on the extracted components from PCA were examined for potential inclusion in the final measure and were selected based on conceptual content, strength of factor loadings, component plot and communalities. PCAs were conducted for both individual and combined samples to examine

similarity. Selected items were reverse scored where appropriate and summed to form a scale with higher values indicating greater satisfaction. The internal consistency of the factor-derived scale was assessed using Cronbach's alpha coefficient.

Frequency distributions (accompanied by percentages) for items were examined for each sample (CABS/COVID-CAM) and then combined (see Supplementary Table 1 for combined data for each item by demographic characteristics). T-tests and analysis of variance (ANOVA) (followed by post-hoc Tukey tests) were used to examine differences in mean satisfaction scores by demographic factors. Multivariable linear regression analysis was conducted, including variables that were statistically significantly associated with satisfaction in univariable analyses. Each independent variable in the multivariable regression was identified as categorical with the reference category being the group with the highest mean satisfaction score.

Results

Sample characteristics

The sample was derived from 4978 people who responded in the second phase of the wider study (response rate from first phase sample 4978/7543=66%). Of these, 1426 (28.6%) people self-reporting help-seeking from their doctor in the previous six-months were included in the present study. Just over half of the sample were male (51.8%) and the majority of participants (92.6%) were of a White ethnic background (Table 1). Most participants were aged between 55 and 74 years (52.5%), with a further 16.1% aged between 45 and 54 years. Over 40% of the sample were employed and a further 42.7% were retired. Over a third (36.9%) were educated to degree level or higher, with another third (33.9%) having further or higher education but below degree level.

Table 1. Sample characteristics for the combined (N=1426) and individual samples (CABS N=457; COVID-CAM N=969)

Characteristic	Combined sample N (%)	CABS sample N (%)	COVID-CAM sample N (%)
Gender			
Male	738 (51.8)	253 (55.4)	485 (50.1)
Female	685 (48.0)	204 (44.6)	481 (49.6)
Other	3 (0.2)	0 (0.0)	3 (0.3)
Age			
18 – 24 years	23 (1.6)	1 (0.2)	22 (2.3)
25 – 34 years	118 (8.3)	16 (3.5)	102 (10.5)
35 – 44 years	149 (10.4)	25 (5.5)	124 (12.8)
45 – 54 years	229 (16.1)	48 (10.5)	181 (18.7)
55 – 64 years	286 (20.1)	86 (18.8)	200 (20.6)
65 – 74 years	462 (32.4)	197 (43.1)	265 (27.3)
75+ years	138 (9.7)	70 (15.3)	68 (7.0)
Other / prefer not to say	7 (0.5)	0 (0.0)	7 (0.7)
Missing	14 (1.0)	14 (3.1)	0 (0.0)
Ethnic group			
White	1321 (92.6)	441 (96.5)	880 (90.8)
Mixed/ multiple ethnic groups	23 (1.6)	7 (1.5)	16 (1.7)
Asian/ Asian British	52 (3.6)	1 (0.2)	51 (5.3)
Black/ African/ Caribbean/ Black British	14 (1.0)	1 (0.2)	13 (1.3)
Other ethnic group	13 (0.9)	4 (0.9)	9 (0.9)
Prefer not to say	3 (0.2)	3 (0.7)	0 (0.0)
Highest educational qualification			
Degree or higher degree	526 (36.9)	206 (45.1)	320 (33.0)
Higher education qualification below degree level	220 (15.4)	90 (19.7)	130 (13.4)
A-levels or Highers	214 (15.0)	39 (8.5)	175 (18.1)
ONC/ BTEC	49 (3.4)	16 (3.5)	33 (3.4)
O Level or GCSE equivalent (Grade A-C/ 9-4)	240 (16.8)	55 (12.0)	185 (19.1)
O Level or GCSE equivalent (Grade D-G/ 3-1)	70 (4.9)	6 (1.3)	64 (6.6)
Still studying	6 (0.4)	1 (0.2)	5 (0.5)
No formal qualifications	75 (5.3)	32 (7.0)	43 (4.4)
Other	19 (1.3)	8 (1.8)	11 (1.1)
Prefer not to say	7 (0.5)	4 (0.9)	3 (0.3)
Occupational status			
Employed full-time	389 (27.3)	72 (15.8)	317 (32.7)
Employed part-time	156 (10.9)	41 (9.0)	115 (11.9)
Self-employed	83 (5.8)	20 (4.4)	63 (6.5)
Retired	609 (42.7)	277 (60.6)	332 (34.3)
Unemployed	50 (3.5)	8 (1.8)	42 (4.3)
Full-time homemaker	45 (3.2)	5 (1.1)	40 (4.1)
Disabled/ too ill to work	76 (5.3)	29 (6.3)	47 (4.9)
Still studying	14 (1.0)	4 (0.9)	10 (1.0)
Prefer not to say	4 (0.3)	1 (0.2)	3 (0.3)
Relationship status			
Married	797 (55.9)	270 (59.1)	527 (54.4)
In a relationship	172 (12.1)	50 (10.9)	122 (12.6)

Single/never married	214 (15.0)	39 (8.5)	175 (18.1)
Divorced or separated	158 (11.1)	56 (12.3)	102 (10.5)
Widowed	80 (5.6)	39 (8.5)	41 (4.2)
Prefer not to say	5 (0.4)	3 (0.7)	2 (0.2)
Number of health problems*			
None	797 (55.9)	211 (46.2)	586 (60.5)
1	358 (25.1)	121 (26.5)	237 (24.5)
2	136 (9.5)	56 (12.3)	80 (8.3)
3	72 (5.0)	29 (6.3)	43 (4.4)
4	35 (2.5)	18 (3.9)	17 (1.8)
5-9◊	28 (2.0)	22 (4.8)	6 (0.6)
Disability			
No	1022 (71.7)	298 (65.2)	724 (74.7)
Yes	366 (25.7)	148 (32.4)	218 (22.5)
Don't know	29 (2.0)	9 (2.0)	20 (2.1)
Prefer not to say	9 (0.6)	2 (0.4)	7 (0.7)
Country of residence			
England	844 (59.2)	15 (3.3)	829 (85.6)
Wales	480 (33.7)	440 (96.3)	40 (4.1)
Scotland	73 (5.1)	2 (0.4)	71 (7.3)
Northern Ireland	21 (1.5)	0 (0.0)	21 (2.2)
Prefer not to say	8 (0.6)	0 (0.0)	8 (0.8)

*Participants were given a list: arthritis, cancer, circulation problems, chest problems, depression, diabetes, heart problems, high blood pressure, kidney problems, stroke, other.

◊Data combined for ease of presentation.

Principal components analysis of satisfaction with remote GP consulting items

The results of PCA indicated an initial two-component solution with eigenvalues greater than 1 (Kaiser's criterion) accounting for 66.6% of the total variance (component 1: 51.2%, component 2: 15.4%). After varimax rotation, six out of seven items loaded (>0.3) onto component 1, two of which loaded onto both components (>0.3) but primarily onto component 1 (Supplementary Table 2). Examination of the component plot showed that the only item that loaded exclusively (>0.3) onto component 2 ("*In the future I would like to be offered the choice of a face-to-face consultation or remote consultation*") appeared distinct from the others. Removing this item improved the internal consistency (α=0.855; n=1147 complete cases) and PCA showed that 58.4% of the total variance was explained by the one component solution (Table 2). The six remaining items fitted reasonably well together as a measure of satisfaction based on consideration of the factor loadings (all >0.6) and communalities (all but one >0.5) as well as conceptual issues. Results were similar when conducting PCA in the two individual samples (Supplementary Tables 3-6). Items were summed (reverse scoring where appropriate) to create a six-item satisfaction with remote GP consultations scale, with a total possible score range of 6 to 24 (higher scores indicating

higher satisfaction). The scale was approximately normally distributed with a mean of 15.4 (SD=4.29; range 6-24). Mean satisfaction scores were similar in the two individual samples (CABS mean=15.86, SD=4.23; COVID-CAM mean=15.22, SD=4.30).

Table 2. Final PCA of satisfaction with remote GP consulting items (N=1147)

	Component 1 factor loadings	Communalities
Remote GP consultation allowed my health concerns to be adequately addressed	0.839	0.704
Remote GP consultations are more convenient for me compared with attending face to face	0.823	0.677
I feel comfortable discussing my health concerns via remote GP consultation	0.788	0.621
Remote GP consultations make me feel safer from coronavirus compared with attending face to face	0.739	0.546
I do not want remote GP consultations to continue after COVID-19	-0.733	0.538
I am concerned that remote GP consultations may result in the wrong decision being made about my care	-0.644	0.415

Associations between satisfaction with remote GP consultations and demographic factors

Satisfaction with remote GP consultations was statistically significantly associated with age (p=0.002), highest educational qualification (p<0.001), occupational status (p<0.001) and country of residence (p=0.038) (Table 3). Specifically, post-hoc tests showed that those aged 35 to 44 years were more satisfied with remote GP consultations than those who were aged 65 to 74 years (p=0.005). Satisfaction with remote GP consultations increased with increasing level of education (all p<0.03). Those who were employed were more satisfied with remote GP consultations than those who were retired (p<0.001). Participants living in Wales reported greater satisfaction than those living in Scotland (p=0.02).

Multivariable analysis including age, education, occupation and country of residence explained 5% of the variance in satisfaction ($F_{(13, 1086)}$=4.759, p<.001) (Table 3). When adjusting for the other factors, highest education and country of residence were significantly associated with satisfaction. Those educated to degree level or above had significantly higher satisfaction scores than those with mid-level qualifications (p=0.006) and those with no or low-level qualifications (p<0.001). People residing in Wales had significantly higher satisfaction scores than those residing in Scotland (p=0.001). Overall, age was not associated with satisfaction with remote GP consultations, although the initial

difference in satisfaction between those aged 35 to 44 years and those aged 65 to 74 years (p=0.02) was still evident.

Table 3. Univariable and multivariable associations between satisfaction with remote GP consultations and demographic factors

		Univariable analyses		Multivariable analyses			
Characteristic	**N**	**Mean (SD)**	**test statistic, p value**	**B**	**95% CI**		**Overall p value**
Gender							
Male	591	15.3 (4.2)	$t_{(1143)}$ = -0.86, p=0.389				
Female	554	15.5 (4.3)					
Age							
18 – 24 years	21	16.2 (3.6)	$F^{‡}_{(6, 206.1)}$= 3.51, p=0.002	-0.13	-2.17	1.90	0.31
25 – 34 years	100	16.1 (4.0)		-0.31	-1.41	0.80	
35 – 44 years	125	16.4 (3.9)		reference			
45 – 54 years	175	15.4 (4.4)		-0.77	-1.74	0.21	
55 – 64 years	226	15.7 (4.3)		-0.55	-1.50	0.40	
65 – 74 years	377	14.8 (4.4)		**-1.40**	**-2.53**	**-0.27**	
75+ years	107	15.0 (3.9)		-1.23	-2.58	0.12	
Ethnic group							
White	1062	15.4 (4.3)	$t_{(1142)}$ = -1.61, p=0.108				
Ethnic minorities[§]	82	16.1 (4.3)					
Highest educational qualification							
Degree or higher degree	434	16.3 (4.1)	$F_{(2, 1122)}$= 17.42, p<0.001	reference			<0.001
Mid-level qualifications[§]	388	15.3 (4.2)		**-0.82**	**-1.41**	**-0.23**	
No or low qualifications	303	14.4 (4.4)		**-1.65**	**-2.29**	**-1.02**	
Occupational status							
Employed	506	16.0 (4.2)	$F_{(2, 1141)}$= 7.66, p<0.001	reference			0.50
Retired	489	14.9 (4.3)		-0.27	-1.12	0.59	
Not employed[†]	149	15.1 (4.5)		-0.45	-1.26	0.35	
Relationship status							
Married/in a relationship	801	15.4 (4.3)	$F_{(2, 1142)}$= 0.64, p=0.525				
Single/never married	164	15.6 (4.1)					
Divorced/separated/widowed	180	15.1 (4.5)					
Health problems[*]							
No health problems	632	15.6 (4.3)	$t_{(1145)}$ = 1.61, p=0.108				
At least one health problem	515	15.2 (4.3)					
Disability							
No	832	15.5 (4.2)	$t_{(469.8)}$ = 1.14, p=0.254				

Yes	288	15.2 (4.5)					
Country of residence							
England	684	15.4 (4.2)	$F_{(3, 1136)}$= 2.86, p=0.038	-0.52	-1.09	0.05	0.009
Wales	377	15.7 (4.3)		reference			
Scotland	59	14.0 (3.9)		**-1.94**	**-3.11**	**-0.78**	
Northern Ireland	20	15.4 (5.1)		-0.90	-2.81	1.01	

CI=Confidence Interval; SD=Standard deviation.

[$] Includes any 'mixed/multiple ethnic groups', 'Asian/Asian British', 'black/African/Caribbean/black British', 'other ethnic group'.

[§] Includes 'Higher education qualification below degree level', 'ONC/ BTEC', 'A-levels or Highers'.

† Includes 'unemployed', 'still studying', 'full-time home maker', 'disabled/ too ill to work'.

[*] Participants were given a list: arthritis, cancer, circulation problems, chest problems, depression, diabetes, heart problems, high blood pressure, kidney problems, stroke, other.

[‡] Asymptotically F distributed. Welch test reported due to heterogeneity of variances.

Discussion

Summary

We conducted a UK population survey of satisfaction with remote GP consultations during the COVID-19 pandemic. The six-item satisfaction scale had good internal consistency and was approximately normally distributed. Higher educational level and residence in Wales (compared with Scotland) were associated with higher satisfaction.

Strengths and limitations

This study was based on a large UK sample. While there was good representation from England and Wales, representation from Northern Ireland and Scotland was limited. Therefore, the results pertaining to the country of residence should be interpreted with caution. There was also limited representation of young adults (18-24 years) and individuals from ethnic minority groups.

The different framing of the satisfaction questions in the two samples may have influenced the results. Firstly, participants in the COVID-CAM sample had received advice remotely, whereas those from the CABS sample were not asked to indicate whether they had actually had a remote consultation and may therefore have been responding hypothetically. However, questionnaires were completed around a year into the pandemic, thus all participants were likely to have experienced remote consulting. Secondly, the type of health problems were different - any health concerns or specific (potential cancer) symptoms - and it is possible that satisfaction may vary depending on these. The association between type of health problem and satisfaction was not examined in the present study.

The satisfaction scale items refer generically to remote consultation, which may include synchronous (e.g., telephone) and asynchronous (e.g., email) modes. While this was intended to reflect the varied usage of remote consultations in UK primary care, our study was not designed to assess potential differences in satisfaction by remote consulting mode.

Satisfaction with remote GP consultations was not measured in the first phase of the wider study(19) thus changes in satisfaction during the pandemic could not be assessed. However,

this study provides a benchmark for levels of satisfaction in the UK population during the pandemic. The overall and sub-group satisfaction scores were close to the scale mid-point, suggesting potential for improvement for all groups.

Comparison with other literature

Consistent with the present findings, higher education was associated with higher satisfaction with telephone consultations for antenatal care provided during the pandemic(16). However, two other studies have not found an association between education and satisfaction with remote consultations(12, 17); both had well educated samples, so there was perhaps not enough variation to observe an effect. Two pre-pandemic studies from a review(7) broadly supported an association between higher educational level and use of technology(23, 24). This is also consistent with the digital divide(8). Technological capability and satisfaction with remote consultations may be inter-related, though this was not assessed within the present study. Those with higher levels of education may have both better access to and knowledge of using technology for remote consultations leading them to feel more confident in its use, resulting in higher levels of both use and satisfaction.

Studies exploring demographic variation in satisfaction with remote primary care consultations during the COVID-19 pandemic have used a variety of satisfaction measures, often using single items(11-15, 18). Those which used multi-item measures of satisfaction do not appear to have included factors specific to COVID-19(16, 17). Inclusion of pandemic-related items is important because they may reflect the impact of the context (i.e., a pandemic) on how people perceive their satisfaction with remote consultations.

Implications for research and/or practice

We developed a robust measure of satisfaction with remote GP consultations that would benefit from further psychometric testing (e.g., test re-test reliability) and scale validation in different groups and settings. Testing the scale in settings using specific modes of remote consultation (e.g., email, eConsults, telephone) would be useful to both assess the psychometric properties of the generic scale items and explore associations with

demographic characteristics. Two scale items were specific to the COVID-19 pandemic but could be adapted and tested in other healthcare contexts, for example participants could be asked about feeling safe from catching communicable diseases.

It is imperative to understand how people, particularly those with lower levels of education, can be better supported in remote consultations to improve their satisfaction. Further research to understand the behavioural and social factors (e.g., access to and usage of technology) underpinning the association with education is needed. UK-wide studies exploring the possible association between country of residence and satisfaction may be beneficial. If confirmed, it will be important to understand whether this reflects variation in health service provision in the devolved UK nations. Despite initial associations, age and occupational status were not overall significantly associated with satisfaction in the multivariable analyses, suggesting they were correlated with other factors. Multivariable exploration of the association with age in other samples will be useful, particularly given the mixed findings in previous studies(12, 13, 15-18). Given the limited representation of those from ethnic minority groups in the present study, further exploration of satisfaction with remote GP consultations by ethnic background would be useful. Only a small proportion of the variation in satisfaction (5%) was explained by demographic factors, suggesting further exploration of unmeasured factors is warranted. This may include factors such as the type and severity of the health problem and relationship with the clinician(15, 25-27), as well as mode of remote consultation (e.g., email, eConsults, telephone).

The present findings can be used to inform the use and adaptation of remote consultations in primary care for particular sub-groups of the population. Individuals with lower levels of education may need further support with remote consultations in primary care to improve their satisfaction or indeed be offered face-to-face consultations if a feasible alternative. This will be vital to ensure equitable satisfaction with consultations and to mitigate potential inequalities in access to primary healthcare services.

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References

1. Office for National Statistics. Excess deaths in England and Wales: March 2020 to December 2021. Number of excess deaths, including deaths due to coronavirus (COVID-19) and due to other causes Including breakdowns by age, sex and geography; 2022. [accessed 14 Jun 2023] Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/excessdeathsinenglandandwales/march2020todecember2021.
2. Murphy M, Scott LJ, Salisbury C, et al. Implementation of remote consulting in UK primary care following the COVID-19 pandemic: a mixed-methods longitudinal study. Br J Gen Pract. 2021;71(704):e166-e77. doi: 10.3399/BJGP.2020.0948
3. Khan N, Jones D, Grice A, et al. A brave new world: the new normal for general practice after the COVID-19 pandemic. BJGP Open. 2020;4(3) doi: 10.3399/bjgpopen20X101103
4. Downes MJ, Mervin MC, Byrnes JM, Scuffham PA. Telephone consultations for general practice: a systematic review. Syst Rev. 2017;6(1):128. doi: 10.1186/s13643-017-0529-0
5. Mold F, Hendy J, Lai YL, de Lusignan S. Electronic Consultation in Primary Care Between Providers and Patients: Systematic Review. JMIR Med Inform. 2019;7(4):e13042. doi: 10.2196/13042
6. Thiyagarajan A, Grant C, Griffiths F, Atherton H. Exploring patients' and clinicians' experiences of video consultations in primary care: a systematic scoping review. BJGP Open. 2020;4(1) doi: 10.3399/bjgpopen20X101020
7. Parker RF, Figures EL, Paddison CA, et al. Inequalities in general practice remote consultations: a systematic review. BJGP Open. 2021;5(3) doi: 10.3399/BJGPO.2021.0040
8. Watts G. COVID-19 and the digital divide in the UK. Lancet Digit Health. 2020;2(8):e395-e6. doi: 10.1016/S2589-7500(20)30169-2
9. Jones D, Neal RD, Duffy SRG, et al. Impact of the COVID-19 pandemic on the symptomatic diagnosis of cancer: the view from primary care. Lancet Oncol. 2020;21(6):748-50. doi: 10.1016/S1470-2045(20)30242-4
10. Tuijt R, Frost R, Wilcock J, et al. Life under lockdown and social restrictions - the experiences of people living with dementia and their carers during the COVID-19 pandemic in England. BMC Geriatr. 2021;21(1):301. doi: 10.1186/s12877-021-02257-z
11. Verma P, Kerrison R. Patients' and physicians' experiences with remote consultations in primary care during the COVID-19 pandemic: a multi-method rapid review of the literature. BJGP Open. 2022 doi: 10.3399/BJGPO.2021.0192
12. Orrange S, Patel A, Mack WJ, Cassetta J. Patient Satisfaction and Trust in Telemedicine During the COVID-19 Pandemic: Retrospective Observational Study. JMIR Hum Factors. 2021;8(2):e28589. doi: 10.2196/28589
13. Rockler Meurling C, Adell E, Wolff M, et al. Telemedicine in Swedish primary health care - a web-based survey exploring patient satisfaction. BMC Health Serv Res. 2023;23(1):129. doi: 10.1186/s12913-023-09133-z
14. Vosburg RW, Robinson KA. Telemedicine in Primary Care During the COVID-19 Pandemic: Provider and Patient Satisfaction Examined. Telemed J E Health. 2022;28(2):167-75. doi: 10.1089/tmj.2021.0174
15. Curtis M, Duncan R, Jing M, et al. "Not a perfect situation, but..." A single-practice survey of patient experience of phone consultations during COVID-19 Alert Level 4 in New Zealand. N Z Med J. 2021;134(1544):35-48.
16. Wali R, Alhakami A, Alsafari N. Evaluating the level of patient satisfaction with telehealth antenatal care during the COVID-19 pandemic at King Abdul-Aziz Medical City, Primary Health Care Center, Specialized Polyclinic. Womens Health (Lond). 2022;18:17455057221104659. doi: 10.1177/17455057221104659
17. Jannati N, Nakhaee N, Yazdi-Feyzabadi V, Tjondronegoro D. A cross-sectional online survey on patients' satisfaction using store-and-forward voice and text messaging teleconsultation service

during the COVID-19 pandemic. Int J Med Inform. 2021;151:104474. doi: 10.1016/j.ijmedinf.2021.104474
18. Volcy J, Smith W, Mills K, et al. Assessment of Patient and Provider Satisfaction With the Change to Telehealth From In-Person Visits at an Academic Safety Net Institution During the COVID-19 Pandemic. J Am Board Fam Med. 2021;34(Suppl):S71-S6. doi: 10.3122/jabfm.2021.S1.200393
19. Quinn-Scoggins HD, Cannings-John R, Moriarty Y, et al. Cancer symptom experience and help-seeking behaviour during the COVID-19 pandemic in the UK: a cross-sectional population survey. BMJ Open. 2021;11(9):e053095. doi: 10.1136/bmjopen-2021-053095
20. Anyanwu P, Moriarty Y, McCutchan G, et al. Health behaviour change among UK adults during the pandemic: findings from the COVID-19 cancer attitudes and behaviours study. BMC Public Health. 2022;22(1):1437. doi: 10.1186/s12889-022-13870-x
21. Cancer Research UK's Cancer Patient Survey. CRUK's second survey studying the impact of COVID-19 on cancer patients in the UK. 2021 [accessed 13 Jan 2023]. Available from: https://www.cancerresearchuk.org/sites/default/files/cancer-stats/cruk_patient_survey/cruk_patient_survey_0.pdf
22. Cancer Research UK. The Cancer Awareness Measure. [accessed 15 Dec 2022]. Available from: https://www.cancerresearchuk.org/health-professional/awareness-and-prevention/the-cancer-awareness-measures-cam#can_i_use_the_cam4
23. Bertelsen P, Stub Petersen L. Danish Citizens and General Practitioners' Use of ICT for their Mutual Communication. Stud Health Technol Inform. 2015;216:376-9.
24. Beckjord EB, Finney Rutten LJ, Squiers L, et al. Use of the internet to communicate with health care providers in the United States: estimates from the 2003 and 2005 Health Information National Trends Surveys (HINTS). J Med Internet Res. 2007;9(3):e20. doi: 10.2196/jmir.9.3.e20
25. Imlach F, McKinlay E, Middleton L, et al. Telehealth consultations in general practice during a pandemic lockdown: survey and interviews on patient experiences and preferences. BMC Fam Pract. 2020;21(1):269. doi: 10.1186/s12875-020-01336-1
26. Gilchrist V, Nervik K, Ellenbecker C, et al. Patients' View of Their Primary Care Telemedicine During the COVID-19 Pandemic and Implications for Future Integration: A Multimethod Study. WMJ. 2022;121(3):181-8.
27. Javanparast S, Roeger L, Kwok Y, Reed RL. The experience of Australian general practice patients at high risk of poor health outcomes with telehealth during the COVID-19 pandemic: a qualitative study. BMC Fam Pract. 2021;22(1):69. doi: 10.1186/s12875-021-01408-w