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Unmet health care need and income-related horizontal equity in <mark>use of health care</mark> during the COVID-19 pandemic

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Abstract

Using monthly data from the *Understanding Society* (UKHLS) COVID-19 Survey we analyse the evolution of unmet need and assess how the UK health care system performed against the <mark>principle</mark> of horizontal equity in health care <mark>use</mark> during the first wave of COVID-19 wave. Unmet need was most evident for hospital care, and less pronounced for primary health services (<mark>non-emergency</mark> medical helplines, GP consultations, <mark>community</mark> pharmacist advice, over the counter medications and prescriptions). Despite this, there is no evidence that horizontal equity, with respect to income, was violated for NHS hospital outpatient and inpatient care during the first wave of the pandemic. There is evidence of pro-rich inequities in <mark>use of</mark> GP consultations, prescriptions and medical helplines at the peak of the first wave, but these were eliminated as the pandemic progressed. There are persistent pro-rich inequities for services that may relate to individuals' ability to pay (over the counter medications and advice from <mark>community pharmacists</mark>).

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1. Introduction

Were people able to use the health care services they needed during the first wave of the COVID-19 pandemic and lockdown in the UK? Were those with higher income more able to use the services they needed within the health care system? The health care system in the UK is largely funded through general taxation (Cookson *et al.*, 2016). A founding principle and duty of the NHS is to ensure equal access for equal need irrespective of age, location or ability to pay, as restated in the 2012 Health and Social Care Act[1]. To cope with the COVID-19 pandemic, the UK reallocated resources within the health and social care systems to handle COVID-19 cases. This affected their ability to meet health care need due to other health conditions, illnesses or health emergencies. During March 2020, NHS trusts redesigned their services to release capacity for COVID-19 patients by discharging thousands to free up beds and postponing planned treatments (NHS Providers, 2020).

COVID-19 originated in the city of Wuhan, China, in December 2019 and spread rapidly to become a global pandemic. The first two confirmed cases in the UK were announced on Wednesday 29 January and, then, COVID-19 spread rapidly. The closure of pubs, restaurants, gyms and other social venues was announced on Friday, 20 March followed by the first national lockdown on the 23rd of March. It was not until the 13th of May that the first easing of lockdown was announced; two subsequent lockdown easings were made by the UK government on the 1st and 15th of June with a further easing on the 4th of July[2]. Health care systems in the UK experienced significant additional pressures during this period as a result of COVID-19 admissions[3]. As an attempt to mitigate the excess demand for health care and in response to the COVID-19 pandemic, NHS England announced the establishment of seven temporary hospitals across England, with similar initiatives undertaken in Scotland[4].

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[1] UK Department of Health. Health and Social Care Act 2012: fact sheets. https://www.gov.uk/government/publications/health-and-social-care-act-2012-fact-sheets

[2] COVID-19 policy tracker. The Heath Foundation. https://www.health.org.uk/news-and-comment/charts-and-infographics/covid-19-policy-tracker (accessed 21/11/2020).

[3] UK Government patients in hospital data. https://coronavirus.data.gov.uk/details/healthcare (accessed 21/November/2020).

[4] "NHS steps up coronavirus fight with two more Nightingale Hospitals" https://www.england.nhs.uk/2020/04/nhs-steps-up-coronavirus-fight-with-two-more-nightingale-hospitals (accessed 21/November/2020).

Understanding Society: the UK Household Longitudinal Study (UKHLS) launched a COVID-19 survey to collect information from the UKHLS participants during the coronavirus pandemic (Benzeval, *et al.*, 2020). We use questions on health care access, in the preceding four weeks, for each of the April, May, June and July COVID-19 survey waves. We provide evidence on the extent of income-related inequity in use of health care services and its evolution over the four months of the first wave and lockdown. Our paper contributes to the literature on socioeconomic inequity in health care access (e.g., Bago d'Uva *et al.*, 2009, Cookson *et al.*, 2016, van Doorslaer *et al.*, 2006) by providing evidence on the evolution of income-related inequities in health care use, for those in need of the specific services, during the first wave of the pandemic.[5]

2. Data

We use data from *UKHLS*, a longitudinal and nationally representative study of the UK. To assess income-related horizontal equity in health care use we use long-run average gross household income (up to a maximum of 9 waves) collected between UKHLS waves 1 (2009-2011) and 9 (2017-2019). To facilitate comparisons over time and between households, household income is deflated using the RPI and equivalised using the modified OECD scale (Anyaegbu, 2010). Our long-run income measure may be considered as a proxy of permanent income that is measured prior to the pandemic and is less vulnerable to temporary income variations[6].

Since April 2020, participants from the UKHLS main survey have been approached each month to complete a short web-survey during the COVID-19 pandemic. We focus on respondents with valid data on our long-run average income measure and for health service use at least once during the April, May, June or July COVID-19 Survey waves[7].

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[5] A recent study found that women and those with chronic illnesses experienced more surgical or medical appointment cancellations during the first lockdown in the UK (Topriceanu et al., 2020). However, cancellations capture only part of unmet need as they overlook the new health care needs. Moreover, the study does not focus on income-related inequity in access to health care for those in need or on the evolution of these income-related inequities over time (Topriceanu et al., 2020).

[6] Given that our income data are collected before the onset of the COVID-19 pandemic in the UK, our results on income-related inequity in health care use will not be contaminated by any COVID-related income shocks.

[7] Unlike following a balanced sample of individuals over time, this design ensures that most of the available sample (subject to our selection criteria as described above) are used at each wave.

Health services use for those with specific health care needs

Questions on access to different health care services are included in the COVID-19 Survey, for those with relevant needs for the services concerned (Benzeval, *et al.*, 2020). Specifically, these are collected monthly for those respondents that reported at least one diagnosed long-lasting health condition and/or reported currently receiving or waiting for any treatment. To further ensure that our measures of utilisation are conditioned on having a current health care need, we exclude those who, when asked "have you been able to access the NHS services you need…", reported that they "do not require" each of the health care services of interest.

Our concept of horizontal inequity is based on finding evidence of an income gradient in whether those having a need for the specific service actually received that service during the period of interest[8]. We use a set of binary variables that capture use of health care services, for those in need of those services, in the preceding four weeks for each of the April, May, June and July COVID-19 Survey waves. Sample sizes for all utilisation variables for our working sample are shown in Table B2[9].

3. Methods

Our aim is to estimate and compare levels of access to health care services for those in need of the services as well as income-related inequity in use of these services. Unmet need is measured by the prevalence of actual use of services among those defined as being in need[10]. Concentration indices (CI) are used to measure horizontal inequity in

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Table B1 (Appendix) shows very similar mean values in the health care use variables between our working sample (complete cases sample with respect each health services utilisation variable and household income, separately for each COVID-19 UKHLS wave) as opposed to when all available cases for each health services utilisation variable are used. These results suggest that item missingness should not affect our results.

[8] We do not have a measure of the intensity of need and are not able to explore issues of vertical equity in utilization across different levels of need.

[9] The exact wording of the health services utilisation questionnaire is included in Appendix A.

[10] It should be noted that in most of the existing empirical work, horizontal inequity is measured as the degree to which individuals' socioeconomic status is associated with their health services utilisation adjusted for differences in healthcare need (Cookson et al., 2016; van Doorslaer et al., 2004; van Doorslaer et al., 2006); typically, the latter are proxied using self-reported health or morbidity and regression analysis is used to condition health care use on these proxies for need. Our data allows us to take a more direct approach and, as mentioned in section 2, to directly condition the utilisation measures on having a current health care need.

use of health care services across the distribution of long-run permanent income. The CI can be calculated as:

$$CI = \frac{2 \times cov(y_i, r_i)}{\mu} \qquad (1)$$

where, y_i is healthcare utilisation for each individual, μ represents its mean value, r_i is the fractional rank of equivalised household income, and $cov(.)$ stands for the covariance.

Erreygers and Van Ourti (2011) highlight that the measurement scale and boundedness of the outcome of interest have implications for the properties of the CI. For bounded variables, Wagstaff (2005) and Erreygers (2009) have suggested two alterative normalizations of the CI. Following Erreygers and Van Ourti (2011) and given that our health care utilisation measures are binary variables, we present results based on the Erreygers' (2009) corrected concentration index (CCI). The CCI is proportional to the absolute concentration index:

$$CCI = 4 \times \mu \times CI \qquad (2)$$

We also present CIs based on Wagstaff's normalisation in the Appendix[11]. Positive (negative) values indicate the presence of pro-rich (pro-poor) inequity in the access to health services, as our utilisation measures condition on having healthcare need[12]. Our analyses account for sample weights to ensure our results are nationally representativeness. These sample weights are created by adjusting the UKHLS published weights to account for non-response at the COVID-19 UKHLS waves[13].

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[11] Both the Erreygers and the Wagstaff index have the mirror property: the magnitude of the indices for measures of health care use (that equal 1 if a service is used and 0 otherwise) are equal in magnitude, but of the opposite sign, to indices for measures of unmet need (that equal 1 if the service is not used and 0 otherwise). So a pro-rich gradient in use, for those of health care need, translates into a pro-poor gradient in unmet need.

[12] The literature on horizontal equity in health care uses indices that capture the association between health care and income rank, often using concentration indexes to quantify inequity. It should be noted that no causal inference is implied by these measures. The fractional rank of long-run income is used as a proxy for socioeconomic position and will reflect other factors that are associated with income.

[13] Previous research has shown that the COVID-19 UKHLS waves are nationally representative as well as the main waves of the UKHLS panel study (Davillas and Jones, 2021).

4. Results

Table 1 shows that the levels of unmet need shortly after the introduction of the first lockdown (on 23rd March) were largest for inpatient and outpatient care, while much lower levels of unmet need are evident for non-emergency medical helplines, GP consultations, community pharmacist advice, purchase of over the counter medications and use of prescription medicines. These results show a more pronounced impact on secondary care versus primary care services during the peak of the first wave. For example, in the April wave (late March-April reference period), only 33% of those who needed inpatient care managed to access those services; however, 98% of respondents reported that they had access to prescription medicines. Unmet need became less evident during the May, June and July waves. For example, outpatient consultations increased from 47% in April to 63% in the June UKHLS wave, following the easing of the lockdown. About 70% of those who needed outpatient care had access to it in the July wave, after the complete easing of the first lockdown on 4th July.

Table 1. Mean health services utilisation, conditional on need, over the first COVID-19 wave in the UK.

Reference period	April wave Late March-April	May wave Late April-3 June	June wave June-1 July	July wave Late June - July
GP	0.734	0.792	0.845	0.864
Outpatient	0.469	0.552	0.634	0.704
Inpatient	0.325	0.338	0.421	0.511
Prescription medicine	0.978	0.984	0.986	0.987
Medical helpline	0.647	0.671	0.727	0.797
Pharmacist advice	0.756	0.778	0.807	0.863
Over the counter medication	0.926	0.946	0.963	0.974

Note: Sample weights are accounted for.

Table 2 presents CCI indexes of income-related inequity in health services utilisation, conditional on need[14]. Table 2 reveals that, despite the high levels of unmet need for these services, the CCI indices for inpatient and outpatient hospital care are not statistically different from zero throughout the period from April to July and are consistent with the principle of horizontal equity with respect to income. For primary

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[14] The corresponding results for measures of unmet need are presented in Table B3, Appendix. As expected, given that the CCI satisfies the mirror property, the results in Table B3 are identical in magnitude to those presented at Table 2, albeit of the opposite sign to reflect that the former (Table B3) focuses on unmet need as opposed to utilisation in Table 2.

care, Table 2 does show systematic pro-rich inequity in GP consultations in April. But it is notable that these inequities diminished as the response to the pandemic progressed[15]. Similar results are also observed for prescription medicines and for the use of medical helpline services (i.e., NHS 111 or NHS 24 is Scotland). On the other hand, pro-rich inequity in over the counter medications persists over time, although with variations in levels across waves. Pro-rich inequity is also observed for accessing advice from a community pharmacist, with the results statistically significant at the 10% level in the first two waves of data (p-values: 0.080, 0.054)[16].

Table 2. CCI measure of income-related inequity in health services utilisation, conditional on need.

	April wave	May wave	June wave	July wave
GP	0.053***	0.016	0.038**	-0.002
	(0.016)	(0.017)	(0.016)	(0.015)
Outpatient	-0.016	0.042	-0.001	-0.011
	(0.024)	(0.026)	(0.026)	(0.025)
Inpatient	0.055	0.035	0.031	-0.001
	(0.037)	(0.039)	(0.041)	(0.044)
Prescription medicine	0.015***	0.011***	0.006	0.006
	(0.004)	(0.004)	(0.004)	(0.004)
Medical helpline	0.075**	0.101**	0.014	0.004
	(0.038)	(0.042)	(0.044)	(0.041)
Pharmacist advice	0.042*	0.051*	0.033	0.065***
	(0.025)	(0.027)	(0.026)	(0.024)
Over the counter medication	0.057***	0.064***	0.049***	0.055***
	(0.011)	(0.010)	(0.010)	(0.009)

Notes: Sample weights are accounted for. Standard errors are in parentheses.
*p<0.10;**p<0.05;***p<0.01.

Analysis that restricts the sample to those diagnosed with specific health conditions further confirms the absence of systematic income-related inequities in inpatient and outpatient hospital care (Table B6, Appendix). As in the case of the full sample, there is however some evidence of systematic pro-rich inequity in GP consultations for those diagnosed with cardiovascular conditions and arthritis, with these inequities reducing as the first wave of the pandemic progressed.

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[15] Of particular interest, it should be noted that our conclusions on income-related inequities in GP, inpatient and outpatient care remain unchanged (although the CCI are lower in magnitude), when we exclude those individuals who decided not to seek/postpone health care despite their need during the pandemic (Table B5). We believe, however, that these cases do represent unmet health care need, as defined in the main results of the paper.

[16] Results based on Wagstaff's normalisation of the CI show comparable patterns for all the utilisation variables and across waves (Table B4, Appendix).

Finally, one may argue that respondents who, despite their needs, did not seek help or who postponed health care during the first two months of the COVID-19 outbreak may have been excluded from our sample in the June and July waves (if they responded using the "not required" category in the health care use questions). The survey questionnaire (Appendix A) allows us to undertake a sensitivity analysis to explore the robustness of our results to this possibility for the utilisation of GPs, outpatient, inpatient, medical helpline and pharmacist advice (but not for prescription medicine and over the counter medications). Specifically, we recode the "not required" responses for the June or July waves to measure unmet need for those who reported that they did not seek help or postponed health care use, despite their needs, at the April or May waves. Results based on this reclassification (Table B7, Appendix) are practically identical to the corresponding results in Table 2, suggesting that our analysis is not contaminated by this potential for reporting bias.

5. Conclusions

Using data from the UKHLS COVID-19 Survey we explore the evolution of unmet health care need during the first wave of the COVID-19 pandemic. Levels of unmet need were most pronounced for inpatient and outpatient hospital care but less evident for the other health care services examined. Our evidence reflects administrative data releases showing a reduction in emergency and non-COVID related admissions during this period, while online GP consultation initiatives seem to have met demand more effectively (NHS Providers, 2020; Thorlby *et al.*, 2020). Unmet need peaked at the peak of the pandemic in April and then declined as the impact of the pandemic became less severe and lockdown measures were eased.

For secondary care (hospital outpatient and inpatient care) there is no evidence of the principle of horizontal equity, with respect to income, being violated throughout the first wave of COVID-19. Although the UKHLS data does not allow comparisons to the pre-COVID period, our evidence on horizontal equity in health care use during the first wave of the pandemic are of particular interest given the high level of unmet need that is documented and the overall COVID-19-related pressures on the hospital system. Our

results suggest that during a period of high unmet need when secondary care providers had to ration care in response to the pandemic, income-related horizontal inequity in the use of that care is not evident.

On the other hand, there is some evidence of systematic pro-rich inequity in access to GP consultations, prescriptions and medical helplines. These inequities diminished as the pandemic progressed towards July 2020. In a publicly funded health care system, one of the sources of pro-rich inequity in access to health care may be that low-income individuals are heavily time-constrained, due to harsher employment (and living) arrangements, and may be more constrained in seeking health care (Cookson et al., 2016). This may be particularly relevant to services such as GP consultations and non-emergency medical helplines[17], where those who are heavily time-constrained may be less able to wait for treatment. However, as the UK response to the pandemic progressed, implementation of the furlough scheme and the large media focus on health-related issues may have mitigated the time constraints and encouraged more active seeking for care, potentially explaining our results on reduced inequities for these health care services as the UK response to the pandemic progressed. Turning to those health care services, such as over the counter medications, where access may be linked to individuals' ability to pay, our evidence of the presence of persistent pro-rich inequities during the COVID-19 outbreak is to be expected.

Overall, our results suggest that, despite the rationing of care and high levels of unmet need, the principle of horizontal equity with respect to income was not violated for NHS secondary care during the first wave of the COVID-19 pandemic in the UK.

References

Anyaegbu, G. (2010). Using the OECD equivalence scale in taxes and benefits analysis. *Economic & Labour Market Review*, 4(1), 49-54.

Bago d'Uva, T. B., Jones, A. M., Van Doorslaer, E. (2009). Measurement of horizontal inequity in health care utilisation using European panel data. *Journal of Health Economics*, *28*(2), 280-289.

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[17] Note that both NHS 111 and NHS 24, that are covered by the COVID-19 UKHLS questionnaire and used in our study, are not emergency services (such as 999). These services provide care support day and night, mental health support, as well as additional health and dental support when GP practices or dentists are closed.

Benzeval, M., Booker, C., Burton, J., Crossley, T.F., Jäckle, A., Kumari, M., Read B. (2020) Understanding Society COVID-19 Survey April Briefing Note: Health and Caring, ISER, University of Essex.

Cookson, R., Propper, C., Asaria, M., Raine, R. (2016). Socio-economic inequalities in health care in England. *Fiscal Studies*, *37*(3-4), 371-403.

Davillas, A., Jones, A. (2021). The first wave of the COVID-19 pandemic and its impact on socioeconomic inequality in psychological distress in the UK. No. 14057. Institute of Labor Economics (IZA), Bonn.

Erreygers, G. (2009). Correcting the concentration index. *Journal of Health Economics*, *28*(2), 504-515.

Erreygers, G., Van Ourti, T. (2011). Measuring socioeconomic inequality in health, health care and health financing by means of rank-dependent indices: a recipe for good practice. *Journal of Health Economics*, *30*(4), 685-694.

NHS Providers (2020). Confronting coronavirus in the NHS: the story so far. NHS Providers, April 2020. https://nhsproviders.org/media/689450/confronting-coronavirus-in-the-nhs.pdf

Thorlby, R., Tinson, A., Kraindler, J. (2020). COVID-19: Five dimensions of impact. The Health Foundation, London. https://www.health.org.uk/news-and-comment/blogs/covid-19-five-dimensions-of-impact

Topriceanu, C. C., Wong, A., Moon, J. C., Hughes, A., ...&, Captur, G. (2020). Inequality in access to health and care services during lockdown. Findings from the COVID-19 survey in five UK national longitudinal studies. medRxiv. https://doi.org/10.1101/2020.09.12.20191973

Van Doorslaer, E., Koolman, X., Jones, A.M. (2004). Explaining income-related inequalities in doctor utilisation in Europe. *Health Economics*, 13(7), 629-647.

Van Doorslaer, E., Masseria, C., Koolman, X. (2006). Inequalities in access to medical care by income in developed countries. *Cmaj*, *174*(2), 177-183.

Wagstaff, A. (2005). The bounds of the concentration index when the variable of interest is binary, with an application to immunization inequality. *Health Economics*, 14(4), 429-432.

Appendix A: UKHLS COVID-19 survey questionnaire for the variables used in our analysis.

nhsnowgp [Use of NHS now for condition – GP]
Universe: Ask if not completed a previous monthly survey, and reported at least one health condition or currently having/waiting for treatment, or if completed a previous survey and reported at least one health condition in a previous or the current monthly survey, or currently having or waiting for treatment.
Source: UKHLS covid-19 survey
Text: Thinking about your situation now, have you been able to access the NHS services you need to help manage your condition(s) over the last 4 weeks?
GP or primary care practice staff?
1. Yes, in person
2. Yes, online or by phone only
3. No, not able to access
4. No, decided not to seek help at this time
5. Not required

nhsnowpm [Use of NHS for condition – prescription meds]
Universe: Ask if not completed a previous monthly survey, and reported at least one health condition or currently having/waiting for treatment, or if completed a previous survey and reported at least one health condition in a previous or the current monthly survey, or currently having or waiting for treatment.
Source: UKHLS covid-19 survey
Text: Still thinking about your situation now, have you been able to access the NHS services you need…
Prescription medicine?
1. Yes
2. No
3. Not required

nhsnowop [Use of NHS for condition – outpatients]
Universe: Ask if not completed a previous monthly survey, and reported at least one health condition or currently having/waiting for treatment, or if completed a previous survey and reported at least one health condition in a previous or the current monthly survey, or currently having or waiting for treatment.
Source: UKHLS covid-19 survey
Text: Have you been able to access the NHS services you need…
Hospital or clinic outpatient?
1. Yes, in person
2. Yes, online or by phone only
3. No, postponed or cancelled by NHS
4. No, I postponed or cancelled
5. No, different treatment provided
6. Not required

nhsnowip [Use of NHS for condition – inpatients]
Universe: Ask if not completed a previous monthly survey, and reported at least one health condition or currently having/waiting for treatment, or if completed a previous survey and reported at least one health condition in a previous or the current monthly survey, or currently having or waiting for treatment.

Source: UKHLS covid-19 survey
Text: Still thinking about your situation now, have you been able to access the NHS services you need…
Hospital or clinic inpatient?
1. Yes
2. No, postponed or cancelled by NHS
3. No, I postponed or cancelled
4. No, different treatment provided
5. Not required

nhsnow111 [Use of NHS now for condition – NHS111]
Universe; Ask if not completed a previous monthly survey, and reported at least one health condition or currently having/waiting for treatment, or if completed a previous survey and reported at least one health condition in a previous or the current monthly survey, or currently having or waiting for treatment.
Source: UKHLS covid-19 survey
Text: Have you been able to access the NHS services you need…
NHS 111 in England, Wales and Northern Ireland or NHS 24 in Scotland?
1. Yes
2. No, not able to access
3. No, I decided not to seek help at this time
4. Not required

chscnowpharm [Use of CH&SC now for condition – pharmacists]
Universe: Ask if not completed a previous monthly survey, and reported at least one health condition or currently having/waiting for treatment, or if completed a previous survey and reported at least one health condition in a previous or the current monthly survey, or currently having or waiting for treatment.
Source: UKHLS covid-19 survey
Text: Thinking about your situation now, have you been able to access the community health and social care services and support you need to help manage your condition(s) over the last 4 weeks?
Local pharmacists for advice?
1. Yes, in person
2. Yes, online or by phone only
3. No, not able to access
4. No, decided not to seek help at this time
5. Not required

chscnowotcm [Use of CH&SC now for condition – otc meds]
Universe: Ask if not completed a previous monthly survey, and reported at least one health condition or currently having/waiting for treatment, or if completed a previous survey and reported at least one health condition in a previous or the current monthly survey, or currently having or waiting for treatment.
Source: UKHLS covid-19 survey
Text: Still thinking about your situation now, have you been able to access the community health and social care services and support you need…
Over the counter medications?
1. Yes
2. No
3. Not required

Appendix B: Additional Results

Table B1. Mean values for the health services utilization, conditional on need, separately for the full and our working samples.

	Full samples†		Working samples††	
	Mean	Sample size	Mean	Sample size
Panel A: April COVID-19 Wave				
GP	0.731	4,216	0.734	4,120
Outpatient	0.471	2,701	0.469	2,646
Inpatient	0.326	1,023	0.325	1,007
Prescription medicine	0.977	6,734	0.978	6,598
Medical helpline	0.655	1,081	0.649	1,055
Pharmacist advice	0.757	1,970	0.757	1,937
Over the counter medication	0.926	3,289	0.926	3,212
Panel B: July COVID-19 Wave				
GP	0.865	3,091	0.864	3,045
Outpatient	0.706	2,043	0.704	2,015
Inpatient	0.513	805	0.511	794
Prescription medicine	0.987	5,355	0.987	5,268
Medical helpline	0.800	618	0.797	608
Pharmacist advice	0.865	1,208	0.863	1,194
Over the counter medication	0.973	2,162	0.974	2,122

Notes: Sample weights are accounted for.
† Full samples contain all available cases for each health service utilisation variable, separately for each COVID-19 UKHLS wave.
†† Working samples are the complete case samples with respect to each health service utilisation variable and household income (long-run pre-COVID income from UKHLS waves 1-9), separately for each COVID-19 UKHLS wave.

Table B2. Sample size for the health services utilisation variables conditional on those of health care need across the COVID-19 UKHLS waves.

		April	May	June	July
GP					
	Sample size	4,120	3,551	3,299	3,045
Outpatient					
	Sample size	2,646	2,269	2,175	2,015
Inpatient					
	Sample size	1,007	901	883	794
Prescription medicine					
	Sample size	6,598	5,870	5,570	5,268
Medical helpline					
	Sample size	1,057	774	658	608
Pharmacist advice					
	Sample size	1,939	1,488	1,345	1,194
Over the counter medication					
	Sample size	3,212	2,415	2,239	2,122

Notes: Missing data for our long-run income measure are excluded from our analysis sample.

Table B3. CCI measure of income-related inequity in unmet health care utilisation.

	April wave	May wave	June wave	July wave
GP	-0.053***	-0.016	-0.038**	0.002
	(0.016)	(0.017)	(0.016)	(0.015)
Outpatient	0.016	-0.042	0.001	0.011
	(0.024)	(0.026)	(0.026)	(0.025)
Inpatient	-0.055	-0.035	-0.031	0.001
	(0.037)	(0.039)	(0.041)	(0.044)
Prescription medicine	-0.015***	-0.011***	-0.006	-0.006
	(0.004)	(0.004)	(0.004)	(0.004)
Medical helpline	-0.075**	-0.101**	-0.014	-0.004
	(0.038)	(0.042)	(0.044)	(0.041)
Pharmacist advice	-0.042*	-0.051*	-0.033	-0.065***
	(0.025)	(0.027)	(0.026)	(0.024)
Over the counter medication	-0.057***	-0.064***	-0.049***	-0.055***
	(0.011)	(0.010)	(0.010)	(0.009)

Notes: Sample weights are accounted for. Standard errors are in parentheses.
*p<0.10;**p<0.05;***p<0.01.

Table B4. Wagstaff index of income-related inequity

	April wave	May wave	June wave	July wave
GP	0.067***	0.024	0.072**	-0.005
	(0.022)	(0.026)	(0.030)	(0.033)
Outpatient	-0.016	0.042	-0.002	-0.012
	(0.024)	(0.026)	(0.027)	(0.030)
Inpatient	0.062	0.039	0.031	-0.001
	(0.042)	(0.044)	(0.042)	(0.044)
Prescription medicine	0.171***	0.170***	0.105	0.115
	(0.052)	(0.064)	(0.072)	(0.076)
Medical helpline	0.082**	0.114**	0.018	0.007
	(0.041)	(0.048)	(0.055)	(0.063)
Pharmacist advice	0.057*	0.073*	0.053	0.138***
	(0.033)	(0.039)	(0.043)	(0.052)
Over the counter medication	0.207***	0.315***	0.339***	0.537***
	(0.042)	(0.056)	(0.068)	(0.083)

Note: Standard errors are in parentheses. Sample weights are accounted for.
*p<0.10; ** p<0.05; ***p<0.01.

Table B5. CCI measure of income-related inequity in health services utilisation after excluding those who decided not to seek/postpone health care despite their need.

	April wave	May wave	June wave	July wave
GP	0.038***	0.005	0.012	0.014
	(0.012)	(0.011)	(0.010)	(0.011)
Outpatient	-0.009	0.026	0.008	-0.013
	(0.025)	(0.027)	(0.026)	(0.025)
Inpatient	0.052	0.031	0.023	-0.011
	(0.039)	(0.042)	(0.043)	(0.045)

Notes: Sample weights are accounted for. Standard errors are in parenthesis.
*p<0.10;**p<0.05;***p<0.01.

Table B6. CCI measures of income-related inequity in selected health services utilisation measures, conditional on specific diagnoses: cardio-vascular, respiratory or arthritis.

	April wave	May wave	June wave	July wave
Panel A: Cardio-vascular chronic conditions				
GP	0.040	0.063**	0.034	0.008
	(0.030)	(0.028)	(0.024)	(0.024)
Outpatient	-0.045	0.076	0.047	0.062
	(0.046)	(0.047)	(0.045)	(0.043)
Inpatient	0.056	0.074	0.087	0.121
	(0.067)	(0.068)	(0.071)	(0.075)
Panel B: Respiratory chronic conditions				
GP	0.057	0.061	0.040	0.034
	(0.039)	(0.039)	(0.035)	(0.034)
Outpatient	-0.005	0.071	0.045	-0.023
	(0.060)	(0.063)	(0.061)	(0.059)
Inpatient	0.060	0.059	0.046	0.010
	(0.087)	(0.088)	(0.097)	(0.110)
Panel C: Arthritis				
GP	0.107***	0.045	0.066*	0.036
	(0.039)	(0.037)	(0.035)	(0.032)
Outpatient	-0.065	0.002	-0.007	-0.039
	(0.052)	(0.053)	(0.054)	(0.052)
Inpatient	0.086	-0.025	0.013	-0.001
	(0.071)	(0.068)	(0.078)	(0.082)

Notes: Sample weights are accounted for. Standard errors are in parentheses.
*p<0.10;**p<0.05;***p<0.01.

Table B7. CCI measure of income-related inequity in health services utilisation, conditional on need: sensitivity analysis for reporting behaviour.

	June wave	July wave
GP	0.040**	-0.001
	(0.016)	(0.016)
Outpatient	0.001	-0.012
	(0.026)	(0.025)
Inpatient	0.033	0.003
	(0.040)	(0.044)
Medical helpline	0.014	0.007
	(0.044)	(0.041)
Pharmacist advice	0.043	0.063**
	(0.027)	(0.024)

Notes: Sample weights are accounted for. Standard errors are in parentheses.
*p<0.10;**p<0.05;***p<0.01.