

# Trends in depression & anxiety symptom severity among mental health service attendees during the COVID-19 pandemic

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## Abstract

### Background

General population surveys have shown that some groups, particularly young women experienced increased distress during nationally mandated restrictions to control the spread of COVID-19. However, there has been limited research on such trends among people with pre-existing mental health conditions, leaving mental health services ill equipped to plan for currents and future lockdowns.

### Methods

Mean weekly scores on the GAD-7 and PHQ-9 between 01/01/2020-22/06/2020 (n=9,538 individuals) for all patients of two psychological treatment services in London, were compared to mean weekly scores from the same time periods in 2017-2019 (n=37,849). The proportion of scores which were above the clinical thresholds for 'caseness' each week were compared, and scores between groups based on gender, age group, and ethnicity, were also compared.

### Results

Confirmed community transmission in the UK (26/02/2020-03/03/2020) and the announcement of the national 'lockdown' (23/03/2020) were associated with significant increases in anxiety symptom scores. 'Lockdown' was associated with a decrease in depression scores. These changes were not maintained during lockdown. Significant increases in depression and anxiety were observed at week 23, as restrictions were eased.

### Limitations

This was an exploratory analysis in two services only. Residual confounding and selection biases cannot be ruled out.

### Conclusions

Differences in the weekly average symptom scores were short-term; they did not continue throughout 'lockdown' as might have been expected, except among older people. Replication of this study in other settings and investigating the potential benefits of more regular reviews or more intensive treatments for older adults seeking support, are warranted.

## Introduction

COVID-19 has had an unprecedented impact on healthcare services worldwide. The need for mental health treatment is anticipated to rise, as is distress in those with existing mental disorders (Luykx et al., 2020). Rises may be associated with fear and uncertainty about COVID-19 as well as consequences of governmental responses to the pandemic ('lockdown'), including associated risks of loneliness, isolation, and financial pressures (Woolhandler and Himmelstein, 2020). For services and clinicians referring or treating patients with depression or anxiety disorders, understanding the impact of the pandemic on symptomatology is important in treatment planning and the clinical management of their conditions. General population surveys have shown that some groups, particularly young women experienced increased distress during 'lockdown' (Fancourt et al., 2020; Shevlin et al., 2020). However, there has been limited research on such trends among people with pre-existing mental health conditions. One of the very few studies reported that 21% of hospital outpatients experienced a deterioration in their mental health condition related to the pandemic (Zhou et al., 2020), but we could find no studies of patients attending high-volume services in primary care or community settings. As many countries face further periods of government mandated 'lockdowns' in 2021, a better understanding of how this might impact patients' mental health could inform service planning to mitigate the deleterious effects and support clinicians working with patients impacted by COVID-19. The current study explored trends in self-reported depression and anxiety symptoms for those attending UK primary care and community-based psychological treatment services each week during the first half of 2020 compared to average weekly scores over the three preceding years to track changes during the COVID-19 pandemic.

## Method

### Participants and Measures

All recorded scores on the Generalized Anxiety Disorder scale (GAD-7: a seven-item screening measure for symptoms of generalised anxiety (Spitzer et al., 2006) and the Patient Health Questionnaire (PHQ-9: a nine-item screening measure for symptoms of depression) (Kroenke et al., 2001) from 01/01/2020 to 22/06/2020 (n=9,538 individuals) were extracted from electronic health records from two psychological treatment services in London, alongside

scores from the same time periods in 2017-2019 (n=37,849). These services provide evidence-based psychological treatments for depression and anxiety disorders as part of the UK National Health Service (Clark, 2018).

#### Data Analysis

The mean GAD-7 and PHQ-9 for each calendar week between 01/01/2020 until the 22/06/2020 were compared to the mean weekly scores from January to the first week in June across 2017, 2018 and 2019, combined. Differences between the means were compared using linear regression models controlling for age, gender, and ethnicity of the patient providing each score. We also compared the proportion of scores which were above the clinical thresholds for 'caseness' ( $\geq 10$  on the PHQ-9 and  $\geq 8$  on the GAD-7) (NHS Digital, 2017); and compared scores between groups based on gender, age group, and ethnicity. These covariates were used as categorical variables with a dummy coded category for missing values to ensure all participants could be included in analyses (i.e. not lost due to list-wise deletion).

As we included any PHQ-9 or GAD-7 score recorded by or sent to the services, regardless of whether they were for initial assessments, treatment sessions or final reviews, each week was treated as an independent wave of data collection. We employed no exclusion criteria on scores. Some patients will therefore have contributed to multiple weeks, but within person differences were not accounted for in analyses as the research question here related to the overall levels of distress for all patients attending at the two services each week during the study period. The mean weekly scores, beta coefficients (B), and 95% confidence intervals (CIs) are presented in eTable2. The number of referrals each week are also included for reference. Analyses were conducted in Stata16 (Stata Press, 2019). For further methodological details, see Supplementary Materials.

#### Ethical Considerations

This evaluation was completed as part of a wider service improvement project conducted in accordance with the procedures of the host institution and the NHS Trusts which operate the services (project reference: 00519-IAPT). NHS ethical approval was not required for this study (confirmed by the Health Research Authority July 2020, reference number 81/81).

## Results

Descriptive statistics of the sample are provided in Supplementary eTable1. The average weekly GAD-7 and PHQ-9 scores in the first 25 weeks of 2020 and 2017-2019 combined are presented in Figures 1a and 1b. Compared to the average weekly scores from the previous three years, there was no evidence for differences in GAD-7 2020 weekly averages until Week 9 (26/02/2020-03/03/2020; coefficient (B)=0.39, 95% confidence intervals(95%CI)= 0.01,0.78) before a spike at Week 12 (18/03/2020-24/03/2020; MD(95%CI)= 1.15(0.74,1.57) and higher scores at Week 13 (MD(95%CI)= 0.49(0.08,0.91)). These correspond to the first confirmed cases of COVID-19 in England (Week 9) and significant increases in deaths followed by the announcement of national lockdown by the government (Week 12). In comparison, there was no evidence of differences in weekly PHQ-9 scores until a decrease until Week 14, and therefore in the early weeks of 'lockdown' (MD(95%CI)= -0.51(-0.99,-0.03)).

Average GAD-7 and PHQ-9 scores during the following weeks of 'lockdown' were similar to previous years, until a significant increase around Week 23 (03/06/2020-09/06/2020; GAD-7: MD(95%CI)= 0.57(1.7-0.97); PHQ-9: MD(95%CI)= 0.49(0.03,0.95)) which corresponds to the easing of 'lockdown'; people returning to work and school. There was also a 75% decrease in referral numbers at Week 9 (n=579) compared to Week 12 (n=140) of 2020, which will have reduced the number of available symptom severity scores from weeks 12 onwards. Full comparisons are presented in Supplementary eTable2.

*[location Figure 1]*

The proportion of scores which were indicative of caseness are presented in Supplementary eTable3 and eFigure1. The trends are very similar to the average weekly scores. There was evidence that there were significantly more scores above the clinical cut-off on the GAD-7 at week 12 and week 23, and that there were significantly fewer PHQ-9 scores above the cut-off at week 14, and more at week 23. Further analysis of the 2020 scores alone indicated similar trends in GAD-7 scores between men and women, whereas PHQ-9 scores varied

more between genders week-by-week during lockdown (Figure 2). On average, younger patients reported lower scores, whereas older patients reported higher scores in the lockdown period, and patients from minority ethnic groups consistently scored higher than white ethnic patients (Figure 2).

*[location Figure 2]*

## Discussion

This exploratory analysis highlighted the brief but significant spikes in generalised anxiety in mental health service attendees following the first confirmed cases of COVID-19 nationwide and announcements of commencing and easing of 'lockdown'. The increases following lockdown might represent anxiety associated with change and uncertainty, including fears of contracting the virus and the impact of lockdown on personal finances or employment (Brooks et al., 2020; McGinty et al., 2020). Interestingly, depression scores were observed to significantly decrease during the first weeks after 'lockdown' before returning to levels similar to the previous year, but increased following the easing of restrictions. This might reflect the gain and then loss of enhanced 'community spirit' that was reported to have been experienced during 'lockdown', and rising financial pressures which may have become apparent as people returned to work or began looking for new jobs after 'lockdown' (Rutter, 2020).

It is noteworthy that differences in the weekly average symptom scores were short-term; they did not continue throughout 'lockdown' as might have been expected, except among older people. This study included all weekly PHQ-9 and GAD-7 scores, and made no exclusions for the types of clinical appointments patient had but several potential confounders could not be controlled for, including information on personal experiences of COVID-19 or on domestic violence (Bhavsar et al., 2020; Brooks et al., 2020). The number of referrals dropped following national lockdown which resulted in fewer new patients providing data for the analysis from weeks 12 onwards although the minimum number each week was over 500. That the increase in older people's GAD-7 and PHQ-9 scores was maintained during the lockdown in this sample, which differs from general population

findings (Fancourt et al., 2020), might highlight a sub-group of patients at particularly high-risk of increased mental distress due to pandemic.

#### Limitations

We adjusted for a number of patient characteristics but residual confounding cannot be ruled out. The analysis here was not focussed on changes in the symptom scores of individual patients throughout the weeks of 2020, and as such, controlling for other personal characteristics might have introduced other biases. For example, we might have controlled for patient's presenting problems, but as these are typically recorded at the point patients enter treatment this would also have removed variance due to the stage of each person's care within the services and therefore would not have allowed us to answer the research question here. In addition, selection biases cannot be ruled out; referrals to the services fell during 'lockdown' resulting in fewer scores being recorded. Further, this was an exploratory analysis in two London services only, replication in other services and settings is needed before generalisable conclusions can be drawn.

#### Conclusions

The UK government mandated lockdown to control the COVID-19 pandemic appears to have led to higher levels of anxiety among attendees of two primary care and community based mental health services. This peaked and fell during lockdown for most patients, although older adults recorded GAD-7 scores that were consistently higher than pre-lockdown during the study period. Older adults that attend such services might be at increased risk of deleterious outcomes during the pandemic and investigating the potential benefits of more regular reviews or more intensive treatments for these patients is warranted.

#### Declaration of interest

None to declare.

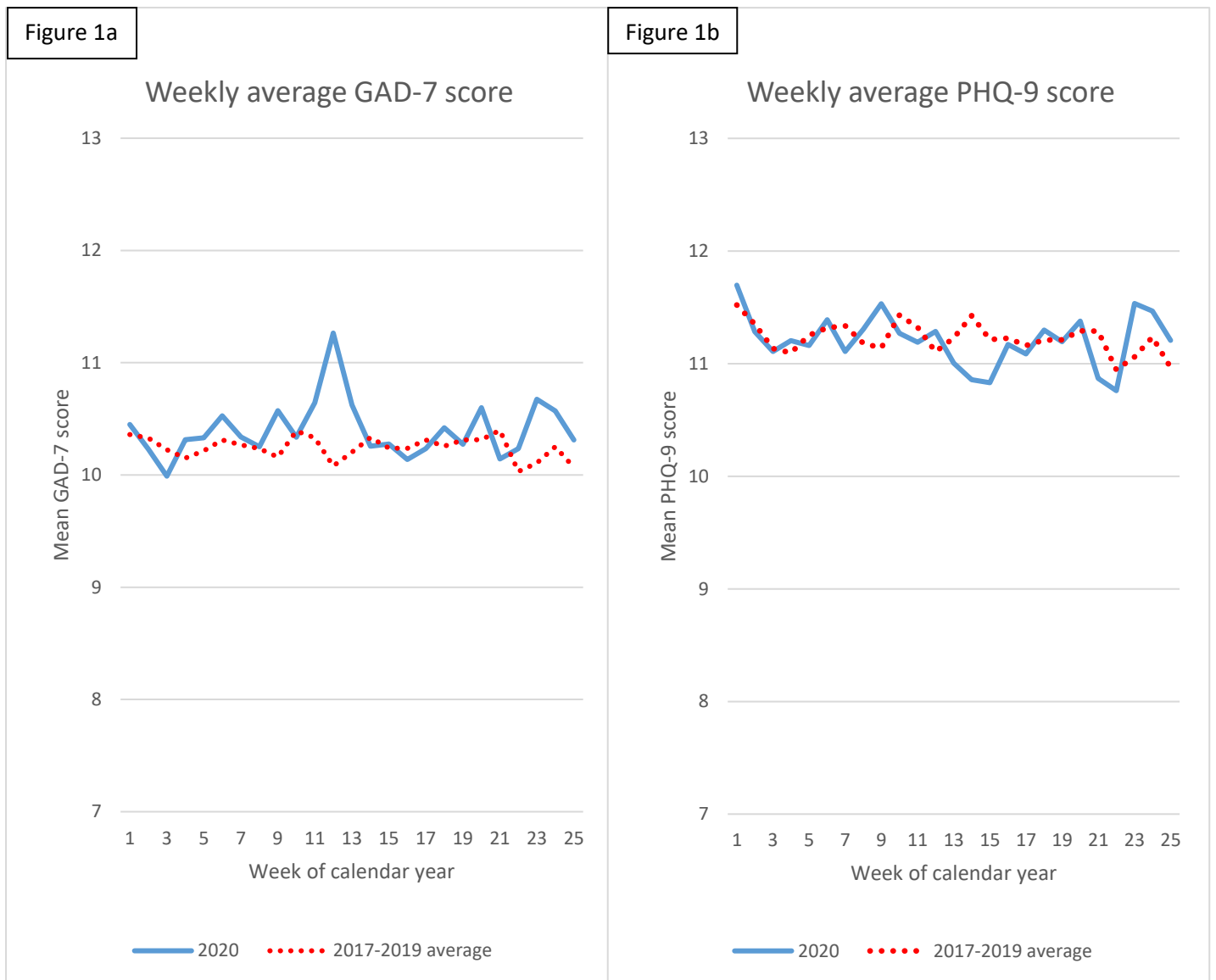
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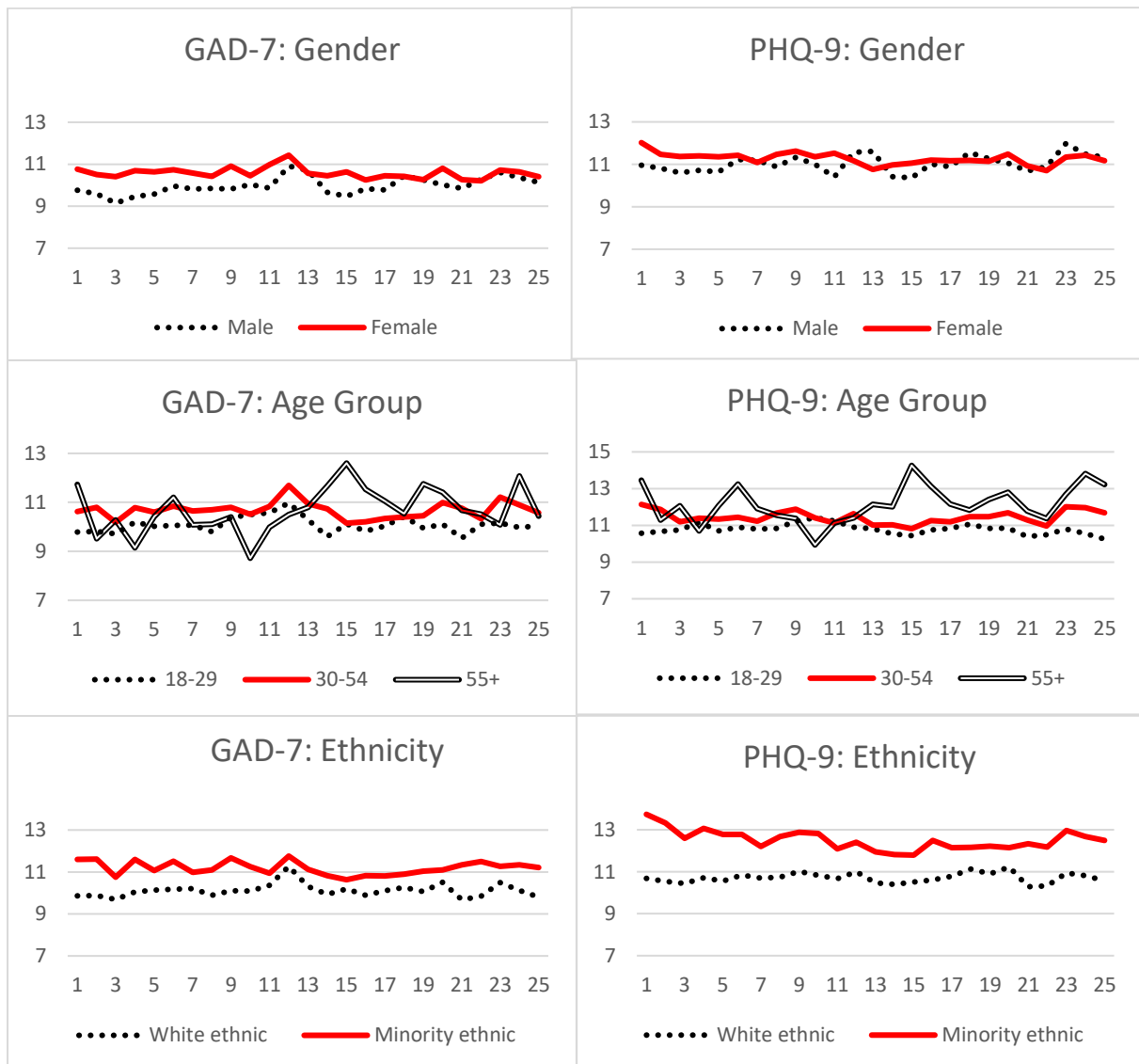


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Figure 1: Average weekly GAD-7 (Figure 1a) and PHQ-9 scores (Figure 1b).



**Figure 2.** Average weekly GAD-7 and PHQ-9 scores by gender (top panel), age group (middle panel) and ethnic group (bottom panel).



# Supplementary methodological detail to:

## Trends in depression & anxiety symptom severity among mental health service attendees during the COVID-19 pandemic

The data for the current study was provided by two psychological treatment services in London. This dataset includes all self-reported depression and generalised anxiety symptom severity scores returned to the services from the 01/01/2017 to 22/06/2020. The dataset was extracted by the services on the 25/06/2020 and transferred to a secure server at the host institution on the same day. The PHQ-9 and GAD-7 scores used in this study were either completed by service users through secure online web portals or in collaboration with a clinician who entered the information onto the electronic healthcare record system. The services are mandated to collect routine outcome measurement data on depression and anxiety symptom severity, and therefore service users are expected to complete measures at initial assessments and at each treatment session or clinical contact. Requests to complete these measures are sent automatically through the electronic patient management system.

The descriptive statistics of the sample are provided in eTable 1 below. The main 'presenting problem' is used as a proxy for diagnosis in the services in order to match patients to evidence-based treatments for specific disorders. Problem descriptors were grouped into categories used in previous analyses of similar datasets, this included a small number of patients being classified as having a severe mental illness or 'other' problem for which there are no IAPT treatment protocols (Buckman et al., 2018; Saunders et al., 2019). As this dataset included all individuals, including referrals and patients who were eventually not taken on for treatment and briefly assessed only, a significant amount of individuals (45%) did not have presenting problems recorded as these are more typically recorded at the point a patient enters treatment and has completed a more thorough assessment of their needs.

**eTable1. Descriptive statistics of sample provided symptom scores**

Variable	Category	N	%
Age	18-29	20434	39.08%
	30-54	24400	46.66%
	55+	7330	14.02%
	Missing	126	0.24%
Gender	Male	16482	31.52%
	Female	35581	68.05%
	Missing	227	0.43%
Ethnicity	White	32052	61.30%
	Mixed	3476	6.65%
	Asian	4627	8.85%
	Black	4606	8.81%
	Chinese	796	1.52%

	Other	2555	4.89%
	Missing	4178	7.99%
LTC status‡	No	31999	61.20%
	Yes	14337	27.42%
	Missing	5954	11.39%
Presenting problem	Depression	13686	26.17%
	Mixed anxiety and depression	961	1.84%
	Generalised anxiety disorder (GAD)	6269	11.99%
	Obsessive-compulsive disorder (OCD)	795	1.52%
	Post-traumatic stress disorder (PTSD)	1064	2.03%
	Phobic anxiety & Panic	3216	6.15%
	Severe mental illness (SMI)	87	0.17%
	Other	2941	5.62%
	Missing	23271	44.50%
		Mean	
	Initial GAD-7 score*	12.27	5.37
	Initial PHQ-9 score*	13.64	6.35

Notes: \* Initial scores are the first PHQ-9/GAD-7 scores available for individuals. ‡ LTC status = whether the patient self-reports having a long-term physical health condition or not.

eTable2: Weekly number of referrals, average GAD-7 and PHQ-9 scores.

Week of calendar year	Number of referrals		GAD-7 Scores								PHQ-9 Scores							
	2020	2017-2019	2017-2019			2020					2017-2019			2020				
			N	Mean	SD	N	Mean	SD	B	95% CIs	N	Mean	SD	N	Mean	SD	B	95% CIs
1	456	331	1887	10.36	5.72	648	10.45	5.57	0.04	(-0.46;0.55)	1887	11.52	6.54	649	11.70	6.68	0.14	(-0.44;0.72)
2	500	447	3538	10.33	5.58	1011	10.23	5.59	-0.12	(-0.51;0.27)	3544	11.35	6.38	1011	11.28	6.27	-0.08	(-0.53;0.36)
3	577	423	3460	10.23	5.66	1044	9.99	5.45	-0.24	(-0.63;0.14)	3465	11.14	6.41	1044	11.11	6.29	-0.06	(-0.5;0.38)
4	590	428	3644	10.15	5.53	1094	10.32	5.48	0.15	(-0.22;0.52)	3651	11.10	6.39	1094	11.20	6.27	0.08	(-0.34;0.51)
5	638	436	3510	10.22	5.56	1084	10.33	5.52	0.08	(-0.3;0.46)	3513	11.25	6.50	1086	11.16	6.33	-0.12	(-0.55;0.32)
6	597	471	3417	10.31	5.54	1114	10.53	5.53	0.21	(-0.17;0.58)	3423	11.32	6.39	1114	11.39	6.50	0.07	(-0.36;0.5)
7	531	432	3303	10.27	5.65	1041	10.34	5.45	0.07	(-0.32;0.46)	3304	11.34	6.49	1042	11.11	6.24	-0.23	(-0.67;0.22)
8	558	407	3407	10.24	5.55	949	10.25	5.44	-0.01	(-0.41;0.38)	3416	11.18	6.36	953	11.31	6.23	0.09	(-0.36;0.54)
9	579	423	3309	10.16	5.61	1033	10.57	5.48	0.39	(0;0.78)	3315	11.14	6.53	1034	11.53	6.26	0.36	(-0.09;0.82)
10	474	450	3475	10.39	5.59	1002	10.34	5.43	-0.08	(-0.47;0.31)	3480	11.43	6.42	999	11.27	6.40	-0.19	(-0.64;0.26)
11	294	465	3521	10.33	5.59	908	10.64	5.62	0.34	(-0.07;0.75)	3525	11.32	6.48	908	11.19	6.44	-0.08	(-0.55;0.39)
12	140	446	3525	10.08	5.53	840	11.26	5.53	1.15	(0.74;1.57)	3540	11.11	6.36	845	11.29	6.40	0.14	(-0.34;0.62)
13	155	401	2909	10.20	5.47	856	10.63	5.40	0.49	(0.08;0.91)	2911	11.23	6.38	859	11.00	6.27	-0.13	(-0.61;0.36)
14	148	412	3032	10.33	5.55	893	10.26	5.26	-0.02	(-0.43;0.39)	3035	11.43	6.54	893	10.86	6.15	-0.51	(-0.99;-0.03)
15	133	406	3096	10.24	5.45	538	10.28	5.37	0.09	(-0.41;0.59)	3097	11.21	6.31	539	10.83	6.31	-0.26	(-0.84;0.31)
16	171	329	2633	10.24	5.49	801	10.14	5.21	-0.07	(-0.5;0.36)	2634	11.23	6.40	802	11.17	6.07	-0.01	(-0.51;0.49)
17	209	462	3236	10.31	5.59	872	10.23	5.40	-0.10	(-0.51;0.32)	3236	11.16	6.47	873	11.09	6.13	-0.09	(-0.57;0.39)
18	251	402	3079	10.26	5.59	903	10.42	5.17	0.09	(-0.32;0.5)	3084	11.21	6.47	906	11.30	5.96	0.06	(-0.42;0.53)
19	231	446	3535	10.31	5.50	785	10.27	5.32	-0.01	(-0.44;0.41)	3537	11.21	6.30	784	11.19	6.02	0.06	(-0.43;0.55)
20	237	473	3755	10.32	5.59	875	10.60	5.40	0.32	(-0.08;0.73)	3763	11.29	6.47	876	11.38	6.01	0.20	(-0.27;0.67)
21	198	423	3369	10.40	5.46	723	10.14	5.21	-0.21	(-0.65;0.22)	3371	11.29	6.34	723	10.87	5.83	-0.34	(-0.85;0.16)
22	241	392	2852	10.03	5.43	932	10.23	5.39	0.22	(-0.18;0.62)	2854	10.95	6.29	933	10.76	6.03	-0.14	(-0.61;0.32)
23	290	409	3565	10.11	5.52	906	10.68	5.44	0.57	(0.17;0.97)	3568	11.06	6.37	908	11.53	6.22	0.49	(0.03;0.95)
24	304	429	3480	10.25	5.52	789	10.57	5.46	0.38	(-0.04;0.81)	3485	11.24	6.45	789	11.47	6.24	0.34	(-0.16;0.83)
25	250	399	3542	10.07	5.67	514	10.31	5.60	0.26	(-0.27;0.78)	3551	10.97	6.40	516	11.21	6.45	0.26	(-0.33;0.85)

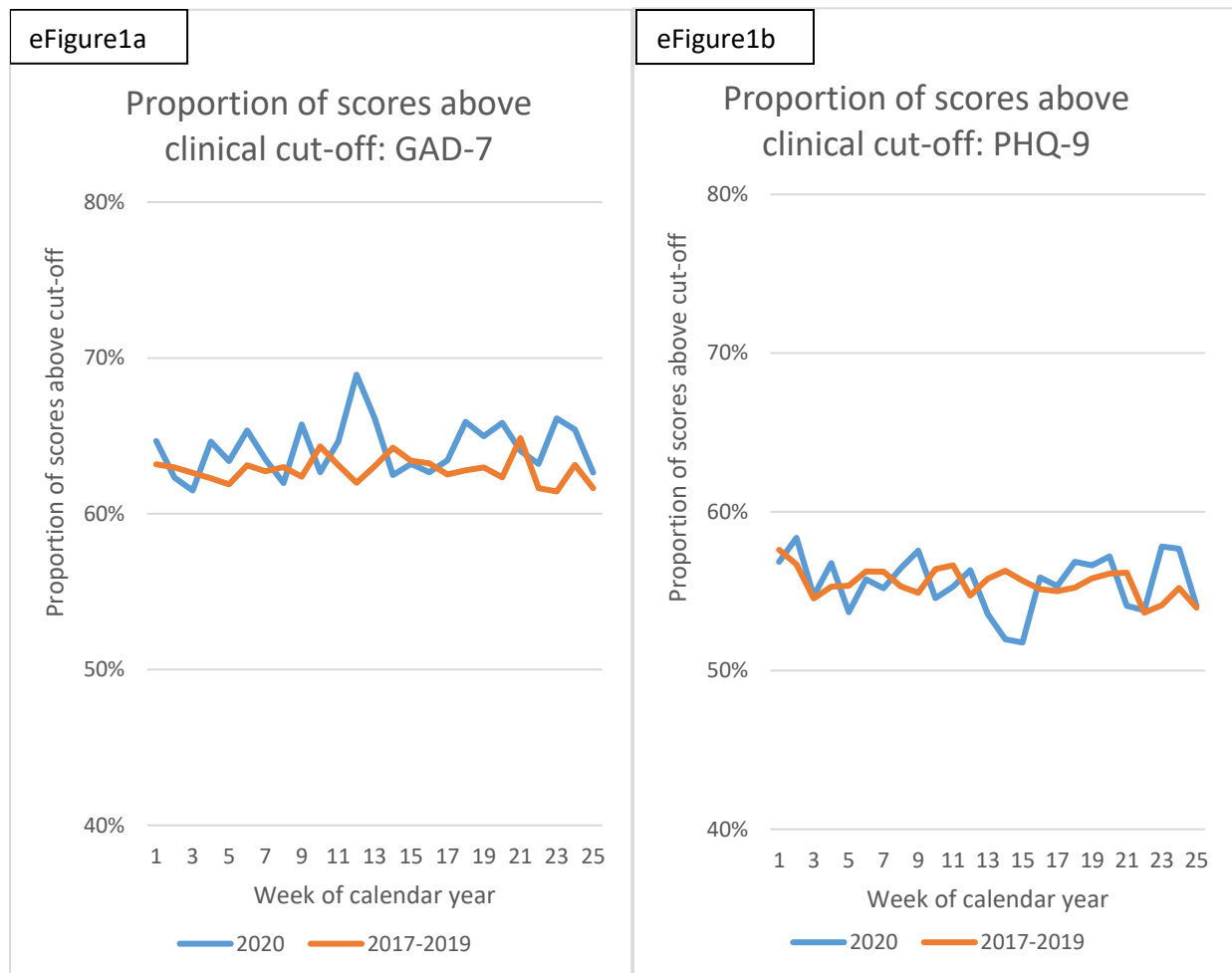
Notes: N is the number of observations providing data each week. Beta-coefficients (B) and 95% confidence intervals (95% CIs) from linear regression models controlling for age, gender and ethnicity.

eTable3: Weekly proportion scoring above clinical cut-offs on the GAD-7 and PHQ-9.

Week of calendar year	<u>GAD-7 Above Cut-off</u>							<u>PHQ-9 Scores</u>						
	<u>2020</u>			<u>2017-2019</u>				<u>2020</u>			<u>2017-2019</u>			
	N = Above cut off	Total N	%	N = Above cut off	Total N	%	p-value	N = Above cut off	Total N	%	N = Above cut off	Total N	%	p-value
1	419	648	65%	1192	1887	63%	0.496	369	649	57%	1087	1887	58%	0.740
2	630	1011	62%	2228	3538	63%	0.702	590	1011	58%	2009	3544	57%	0.344
3	642	1044	61%	2167	3460	63%	0.507	571	1044	55%	1890	3465	55%	0.933
4	707	1094	65%	2269	3644	62%	0.157	621	1094	57%	2018	3651	55%	0.384
5	687	1084	63%	2172	3510	62%	0.374	583	1086	54%	1944	3513	55%	0.338
6	728	1114	65%	2157	3417	63%	0.180	621	1114	56%	1925	3423	56%	0.774
7	661	1041	63%	2072	3303	63%	0.656	575	1042	55%	1858	3304	56%	0.551
8	588	949	62%	2146	3407	63%	0.562	538	953	56%	1889	3416	55%	0.526
9	679	1033	66%	2064	3309	62%	0.051	595	1034	58%	1820	3315	55%	0.136
10	628	1002	63%	2235	3475	64%	0.340	545	999	55%	1962	3480	56%	0.306
11	587	908	65%	2222	3521	63%	0.390	502	908	55%	1996	3525	57%	0.469
12	579	840	69%	2185	3525	62%	<0.001	476	845	56%	1937	3540	55%	0.397
13	566	856	66%	1834	2909	63%	0.100	460	859	54%	1624	2911	56%	0.246
14	558	893	62%	1948	3032	64%	0.335	464	893	52%	1708	3035	56%	0.023
15	340	538	63%	1963	3096	63%	0.927	279	539	52%	1724	3097	56%	0.093
16	502	801	63%	1665	2633	63%	0.772	448	802	56%	1452	2634	55%	0.714
17	553	872	63%	2023	3236	63%	0.625	483	873	55%	1780	3236	55%	0.866
18	595	903	66%	1933	3079	63%	0.088	515	906	57%	1703	3084	55%	0.387
19	510	785	65%	2226	3535	63%	0.293	444	784	57%	1974	3537	56%	0.675
20	576	875	66%	2341	3755	62%	0.054	501	876	57%	2111	3763	56%	0.557
21	463	723	64%	2185	3369	65%	0.676	391	723	54%	1893	3371	56%	0.308
22	589	932	63%	1758	2852	62%	0.395	502	933	54%	1531	2854	54%	0.932
23	599	906	66%	2190	3565	61%	0.009	525	908	58%	1931	3568	54%	0.045
24	516	789	65%	2197	3480	63%	0.232	455	789	58%	1924	3485	55%	0.209
25	322	514	63%	2183	3542	62%	0.658	279	516	54%	1916	3551	54%	0.962

Note: N is the number of observations providing data each week. P-values from Chi-Square test of independence.

In addition to comparing average scores on both the GAD-7 and PHQ-9, we also compared the proportion of individuals scoring above the clinical threshold on both measures for each week in 2020 to the proportion over the previous three years. The cut-off used for the PHQ-9 was scores  $\geq 10$ , and the cut-off on the GAD-7 was  $\geq 8$ , these are the thresholds used by the services, all other IAPT services nationally, and those reported by the originators of each scale. The proportion of individuals above the clinical threshold on each measure is presented in eTable3 above, with the trends in the number of individuals meeting caseness presented in eFigure1a and 1b below.



*eFigure1: The proportion of scores above clinical cut-offs on the GAD-7 (eFigure 1a) and the PHQ-9 (eFigure 1b) per week*



**References**

- Buckman, J.E.J., Naismith, I., Saunders, R., Morrison, T., Linke, S., Leibowitz, J., Pilling, S., 2018. The Impact of Alcohol Use on Drop-out and Psychological Treatment Outcomes in Improving Access to Psychological Therapies Services: an Audit. *Behav. Cogn. Psychother.* 46, 513–527. <https://doi.org/10.1017/S1352465817000819>
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