The impact of mental health support for the chronically ill on hospital utilisation: Evidence from the UK

Supporting information

Appendix Table A1: ICD-10 codes relevant to hospital service utilisation analysis

COPD ICD-10 Codes	
Name	**ICD 10 Codes**
Bronchitis, not specified as acute or chronic	J40
Simple and mucopurulent chronic bronchitis	J41
Simple chronic bronchitis	J41.0
Mucopurulent chronic bronchitis	J41.1
Mixed simple and mucopurulent chronic bronchitis	J41.8
Unspecified chronic bronchitis	J42
Emphysema	J43
MacLeod's syndrome	J43.0
Panlobular emphysema	J43.1
Centrilobular emphysema	J43.2
Other emphysema	J43.8
Emphysema, unspecified	J43.9
Other chronic obstructive pulmonary disease	J44
Chronic obstructive pulmonary disease with acute lower respiratory infection	J44.0
Chronic obstructive pulmonary disease with acute exacerbation, unspecified	J44.1
Other specified chronic obstructive pulmonary disease	J44.8
Chronic obstructive pulmonary disease, unspecified	J44.9

Diabetes ICD-10 Codes	
Name	**ICD 10 Codes**
Insulin-dependent diabetes mellitus	E10
Non-insulin-dependent diabetes mellitus	E11
Malnutrition-related diabetes mellitus	E12
Other specified diabetes mellitus	E13
Unspecified diabetes Mellitus	E14

CVD ICD-10 Codes	
Description	**ICD10 Codes**
Ischemic heart diseases	I20-I25
Pulmonary heart disease	I26-I28
Other forms of heart disease	I30-I52
Cerebrovascular diseases	I60-I69
Diseases of arteries, arterioles and capillaries	I70-I79

Notes: The list provides the ICD 10 codes which, if found in any of the patient's diagnosis fields, are used to classify them as having COPD, Diabetes and CVD respectively.

Appendix B. Comparison of treated sample with IAPT patient reported having an LTC but having no inpatient stay.

In the first instance, we compared our treated sample (n=9223 across the three LTCs) to individuals who attended IAPT in f.y. 2014 and 2015, and self-reported having an LTC (based on the IAPT dataset's Yes/No variable which does not specify what the LTC is) and who also did not have an inpatient episode. Our treated sample comprises approximately 5% of all individuals who received IAPT who self-reported as having an LTC in this time period. Overall, our treated sample are older, live in more deprived areas and have poorer mental health than the average individual who receives IAPT treatment and self-reports as having a LTC (see Appendix Tables D1 and D2). This is expected since our sample received inpatient care for their LTC and thus are individuals who are more likely to have greater severity of LTC.

Appendix Table B1: Demographic Comparison of IAPT users in the study sample and IAPT user population excluding study sample

		IAPT sample with LTC APC 1314 visits		IAPT sample without LTC APC1314 visits				
		N	%		N	%	*Chi statistic*	*p*
Gender	Male	4318	46·99	Male	311877	34·64	612	<·001
	Female	4872	53·01	Female	588496	65·36		
Index of Multiple Deprivation (IMD) Decile	1 - Most deprived	1098	12·49	1 - Most deprived	91371	10·68	56	<·001
	2	1077	12·25	2	93760	10·96		
	3	943	10·72	3	93951	10·98		
	4	965	10·97	4	92378	10·8		
	5	869	9·88	5	88414	10·34		
	6	829	9·43	6	84619	9·89		
	7	798	9·08	7	81586	9·54		
	8	777	8·84	8	79498	9·3		
	9	714	8·12	9	76752	8·97		
	10 - least deprived	723	8·22	10 - least deprived	72946	8·53		
Employment status at assessment	Employed	2231	26·29	Employed	479924	57·58	15000	<·001
	Unemployed	818	9·64	Unemployed	103510	12·42		
	Students	48	0·57	Students	47788	5·73		

	Long-term sick	1211	14·27	Long-term sick	65313	7·84		
	Homemaker	296	3·49	Homemaker	48381	5·8		
	Not seeking work	177	2·09	Not seeking work	18211	2·18		
	Voluntary work	48	0·57	Voluntary work	2912	0·35		
	Retired	3656	43·09	Retired	67494	8·1		
Ethnicity	British	7339	88·55	British	689519	84·78	1956	<·001
	Irish	99	1·19	Irish	6314	0·78		
	Any other White background	210	2·53	Any other White background	35518	4		
	White and Black Caribbean	22	0·27	White and Black Caribbean	5731	0·7		
	White and Black African	3	0·04	White and Black African	1464	0·18		
	White and Asian	16	0·19	White and Asian	2679	0		
	Any other mixed background	27	0·33	Any other mixed background	6447	0·79		
	Indian	172	2·08	Indian	14614	1·8		
	Pakistani	90	1·09	Pakistani	9663	1		
	Bangladeshi	21	0·25	Bangladeshi	2690	0·33		
	Any other Asian background	63	0·76	Any other Asian background	7342	0·9		
	Caribbean	93	1·12	Caribbean	10428	1		
	African	41	0·49	African	6799	0·84		
	Any other Black background	17	0·21	Any other Black background	3078	0·38		
	Chinese	8	0·1	Chinese	1802	0		
	Any other ethnic group	67	0·81	Any other ethnic group	9230	1·13		

Appendix Table B2: Comparisons on age and clinical measures between IAPT users study sample and IAPT user population who were recorded as having an LTC in their IAPT assessment

	Intervention sample (LTC APC 13/14) (n=9223)			IAPT sample with LTC recorded but no APC1314 visit (n=181229)				
	n	Mean	sd	n	Mean	sd	t statistic	p
Age	9223	59·79	14·74	181222	46·15	15·45	-86·51	<·0001
PHQ-9	9124	15·13	6·49	178901	15·76	6·20	9·08	<·0001
GAD-7	9126	12·76	5·58	178879	13·74	5·14	16·42	<·0001
WSAS	7780	18·01	10·69	162364	19·99	10·03	16·06	<·0001

Notes: Information attained from the IAPT national dataset. PHQ-9 = Patient Health Questionnaire 9 items, GAD-7 = Generalized Anxiety Disorder scale 7 items. WSAS = Work and Social Adjustment Scale.

Appendix C. Modelling the impact of IAPT on utilisation.

We employed a difference-in difference design that allows for the staggered timing of when each individual receives and finishes their IAPT treatment. In our 3-year data window the IAPT dummy is therefore equal to zero until the month the IAPT user receives their treatment. At this point it switches to a value of 1.

We include individual fixed effects and month*year fixed effects which permits estimation of the effects of an episode of IAPT on the probability of utilising hospital services within a specific time interval of receiving IAPT, despite users having different dates of end of IAPT treatment. The individual fixed effects control for individual time-invariant characteristics including individual IAPT provider (mechanically each individual only has one IAPT provider as we exclude individuals with more than one IAPT episode) and individual GP at time of referral, so control for prior hospital utilisation, use of IAPT prior to f.y. 2014 and service differences across IAPT providers. As the data are at monthly level there are no remaining time-varying individual characteristics in our data that we can control for.

It is possible that individual characteristics vary over the 3-year window of analysis. To the extent that these characteristics vary in response to receiving IAPT treatment the effect is correctly captured as an impact on IAPT on hospitalisation. Therefore, Equation (1) below will retrieve biased estimates of the impact of IAPT caused by the omission of time-varying characteristics, if and only if, the characteristics of the patient's receiving IAPT changed significantly for reasons that i) had nothing to do with IAPT AND ii) changed the trajectory of the treated group in a manner that did not also change the trajectory of the control group. For those in the treated group whose characteristics do change over the 3-year window for reasons other than IAPT or their utilisation trajectory, it is simply unsystematic measurement error. Standard errors are clustered at the individual patient level in the presented analyses.

Formally we estimate using pooled data of treated and controls derived during the matching process for f.y 2014, 2015 and 2016:

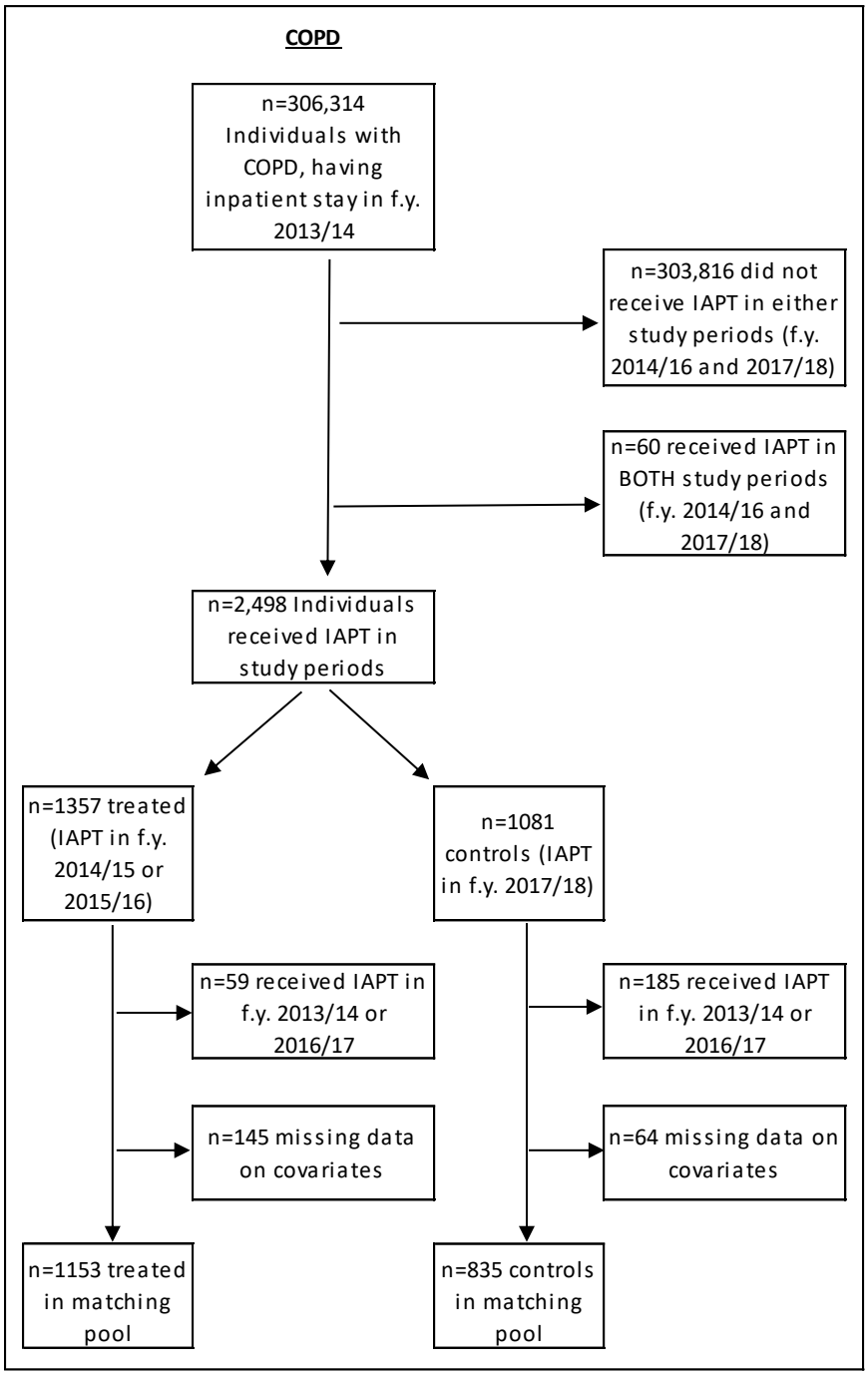
$$Use_{icst} = b_s IAPT_{it-n} + T_t \lambda_s + I_i \delta_s + e_{icst}, \quad t=1,\ldots,36 \qquad (1)$$

for each of the three LTCs. Use_{icst} equals 1 if individual i in CCG c uses hospital service s in month t and 0 otherwise. T_t are set of time fixed effects that allow for common seasonal effects and time trends. Specifically, we use 36 dummy variables, one for each month of the three-year estimation period. I_i are a set of individual fixed effects. Therefore, each patient serves as their own comparison, meaning that all time-invariant factors at the patient level (e.g. age, gender, and usual provider) are adjusted for. The 'treated' dummy is absorbed into the individual fixed effect (individuals are either treated or not so this is a time-invariant factor).

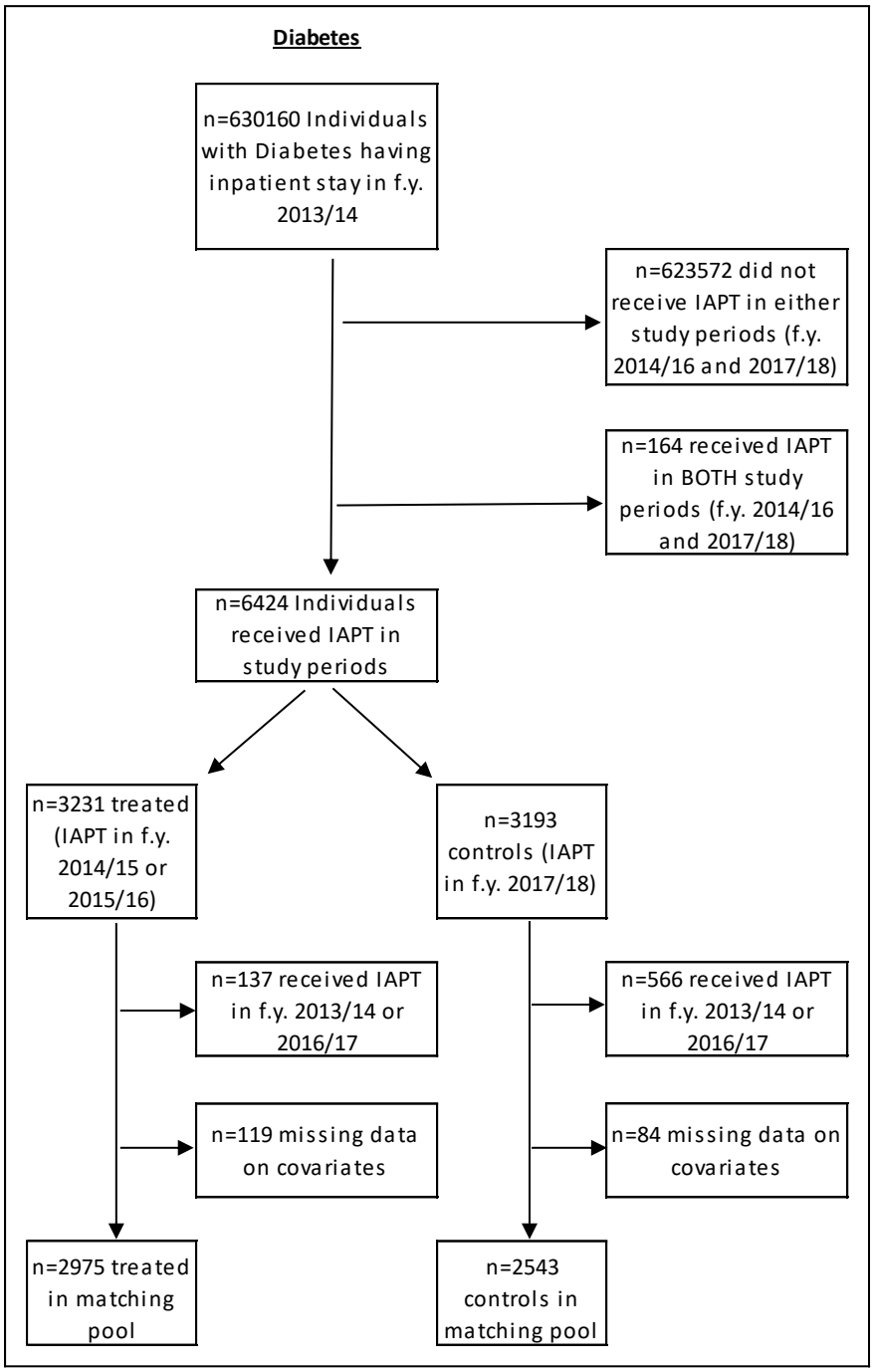
$IAPT_{it-n}$ denotes whether person i has completed IAPT treatment in month t-n. It is time-varying at the individual level. In our main analysis n was defined as 12 months, so we estimated the effect of IAPT treatment 12 months after finishing a course of treatment. A 12-month lag was chosen to allow for a longer follow up than in earlier research. It also avoids counting hospital treatments that had been scheduled before, but took place after, the start of IAPT treatment. In additional analyses we also examine hospital utilisation changes immediately after (0 months) and 6 months after the end of IAPT treatment.

Equation 1 is estimated as a linear probability model. The coefficient of interest is b_{1s}, which is the percentage point change in the probability of utilising healthcare service s 12 months following an episode of IAPT, under the assumption that had the treated not received IAPT they would have followed a similar trajectory to the control group. To ease interpretability, we evaluate this percentage point change at the average probability of utilisation for the total (treated and control) sample for f.y. 2013. This is the local average treatment effect on the treated. The estimates we retrieve relate to populations who had recently used hospital services for their LTC and had experienced one episode of IAPT treatment.

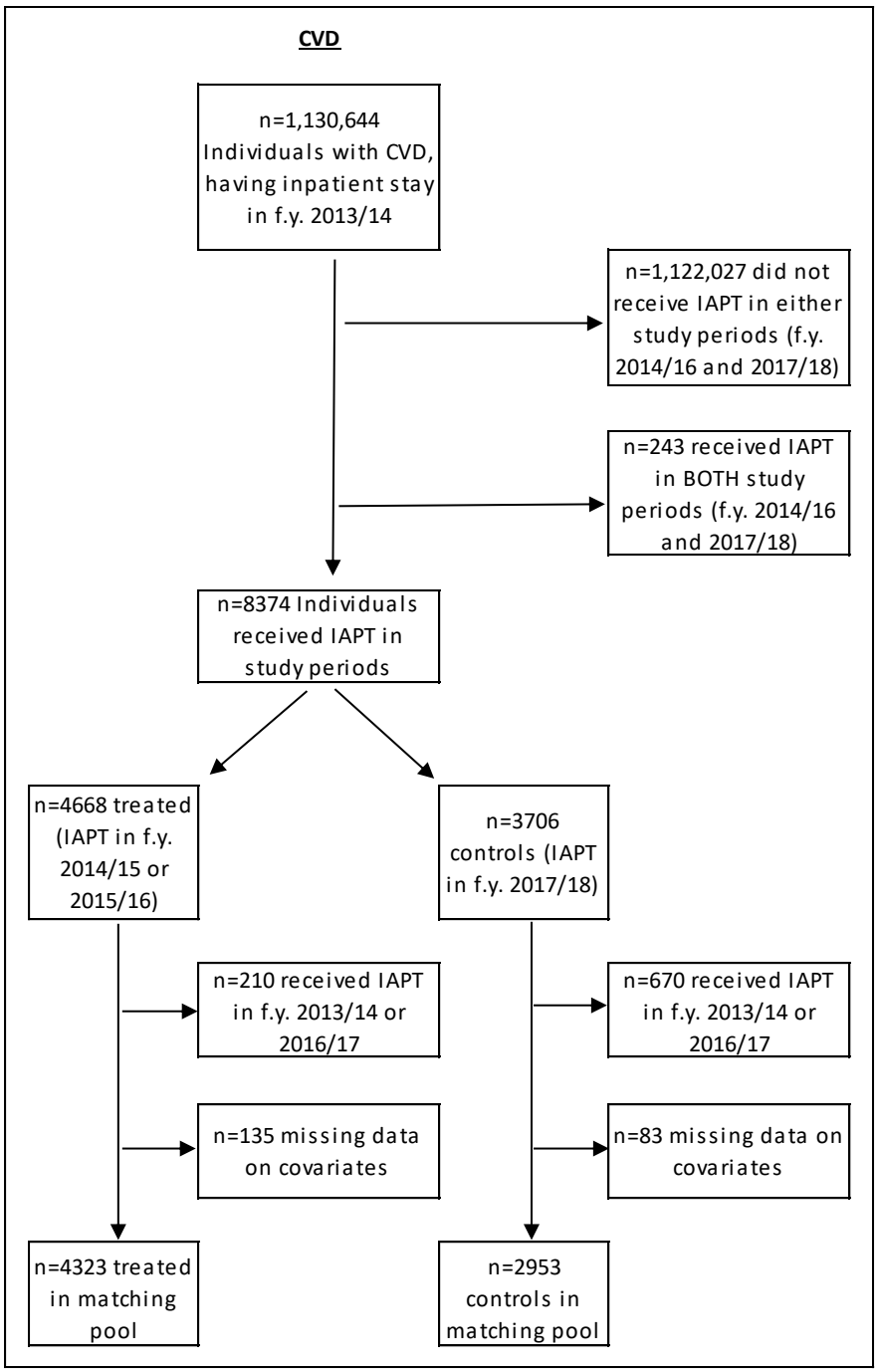
Appendix Figure C1: Participant flow diagram for COPD.



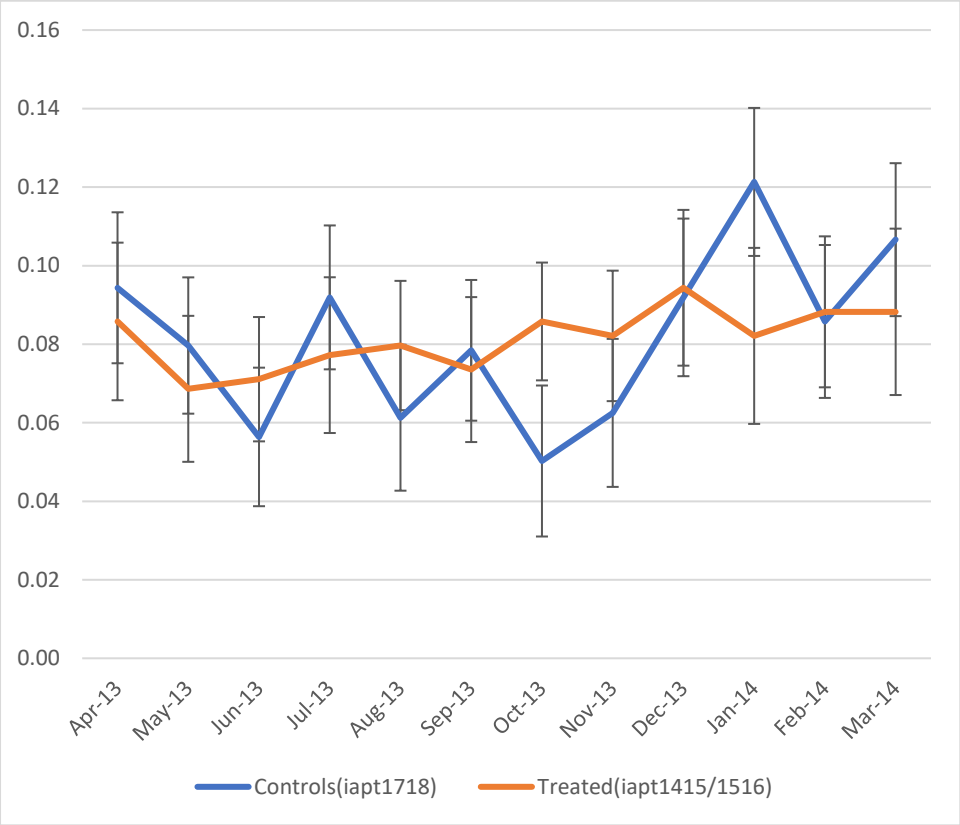
Appendix Figure C2: Participant flow diagram for Diabetes.



Appendix Figure C3: Participant flow diagram for CVD.

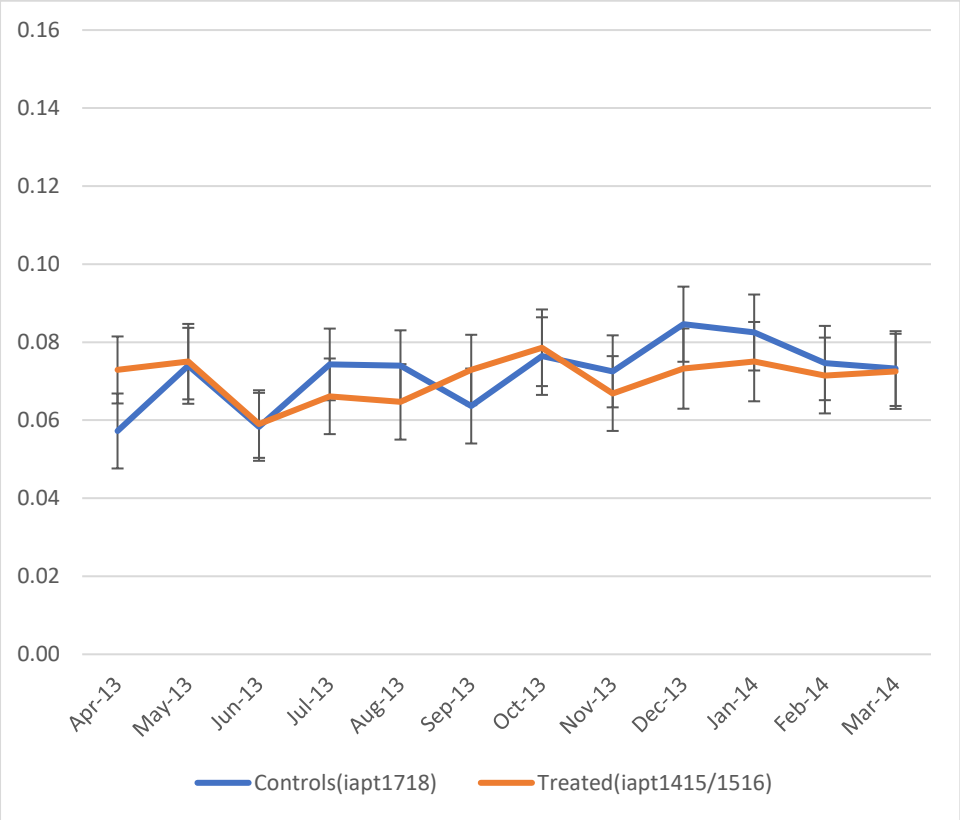


Appendix Figure D1: Exploration of COPD A&E common trends



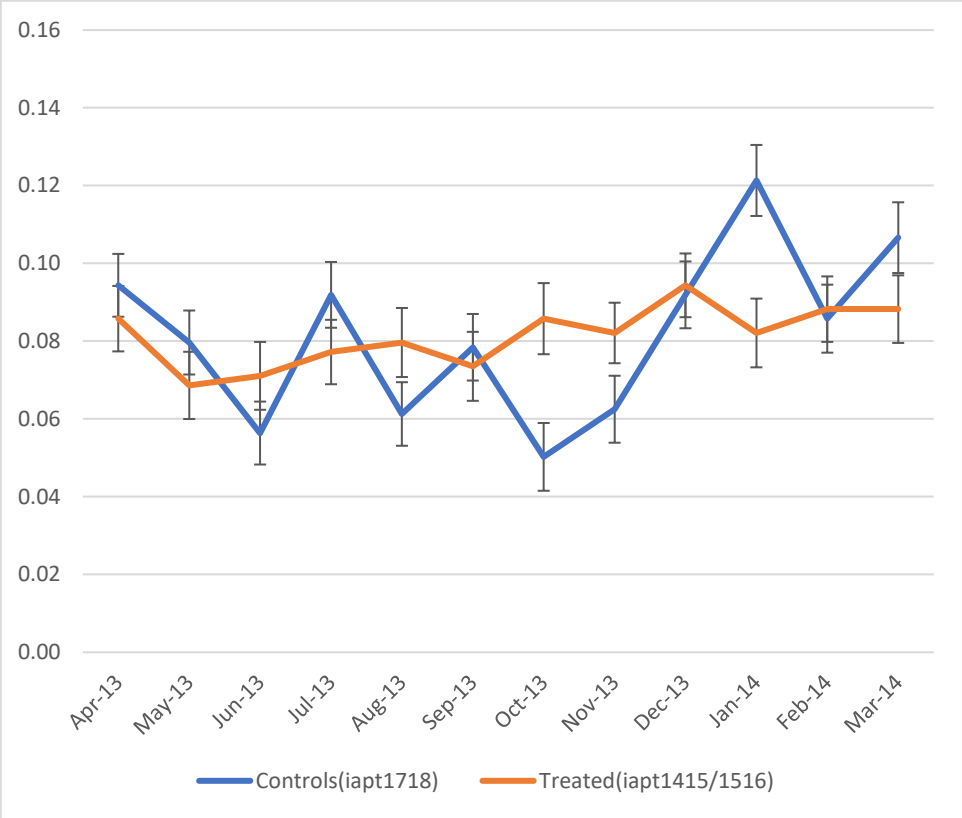
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, except in October 2013, which supports a common trends assumption.

Appendix Figure D2: Exploration of Diabetes A&E common trends



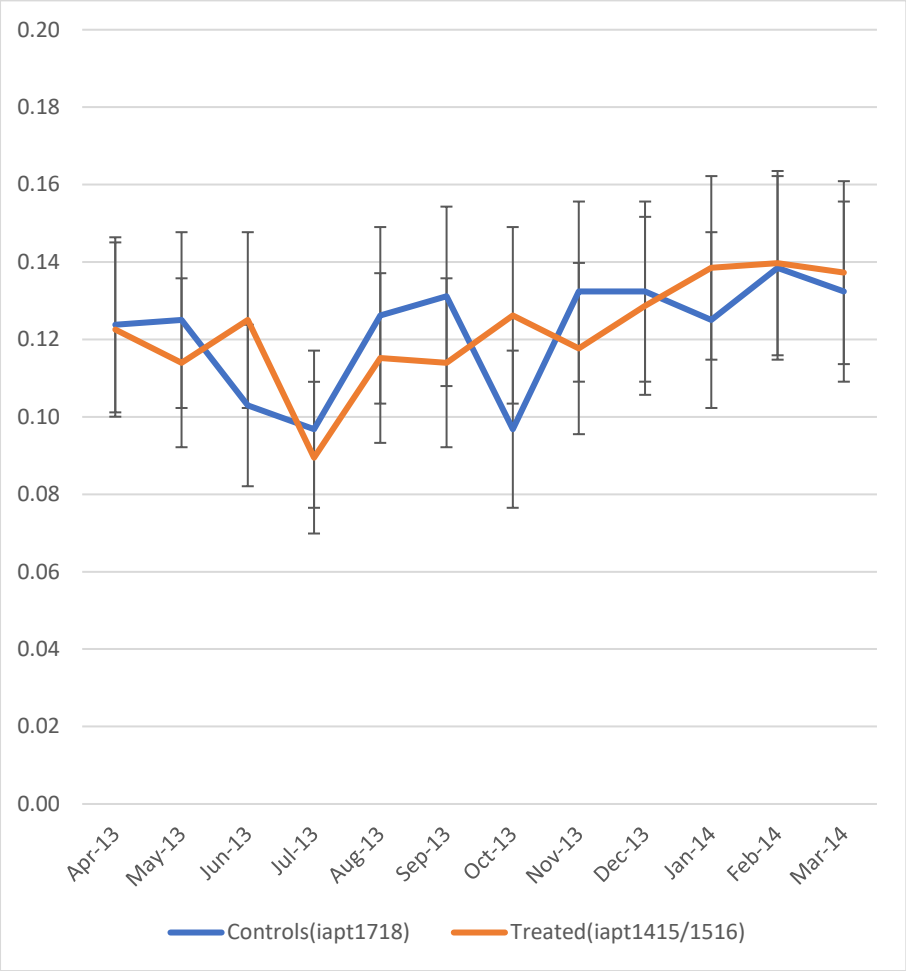
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, which supports a common trends assumption.

Appendix Figure D3: Exploration of CVD A&E common trends



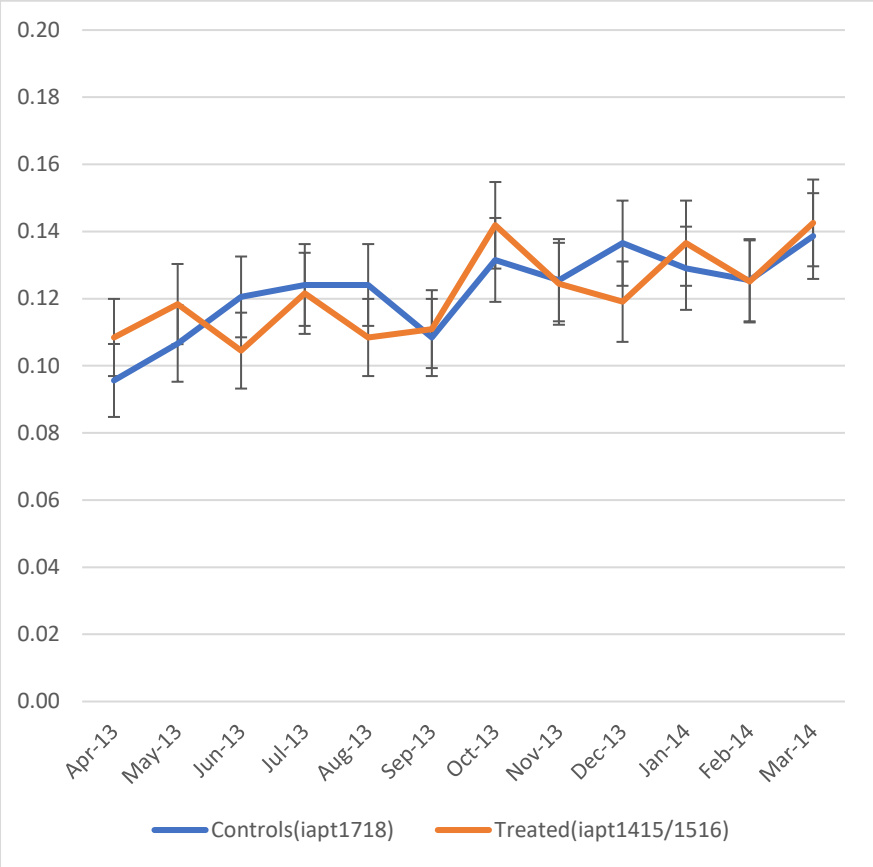
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, except in October and November 2013, as well as January 2014. We consider common trends assumption supported despite these small inconsistent deviations.

Appendix Figure D4: Exploration of COPD Inpatient Care (APC) common trends



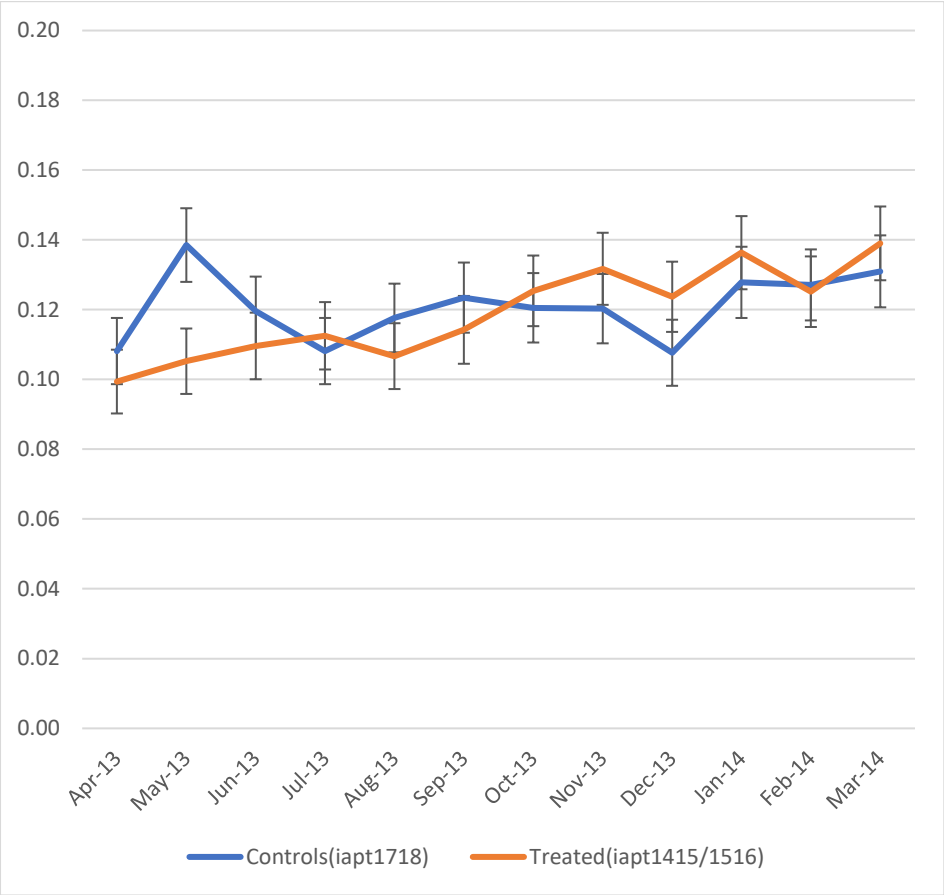
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, which supports a common trends assumption.

Appendix Figure D5: Exploration of Diabetes Inpatient Care (APC) common trends



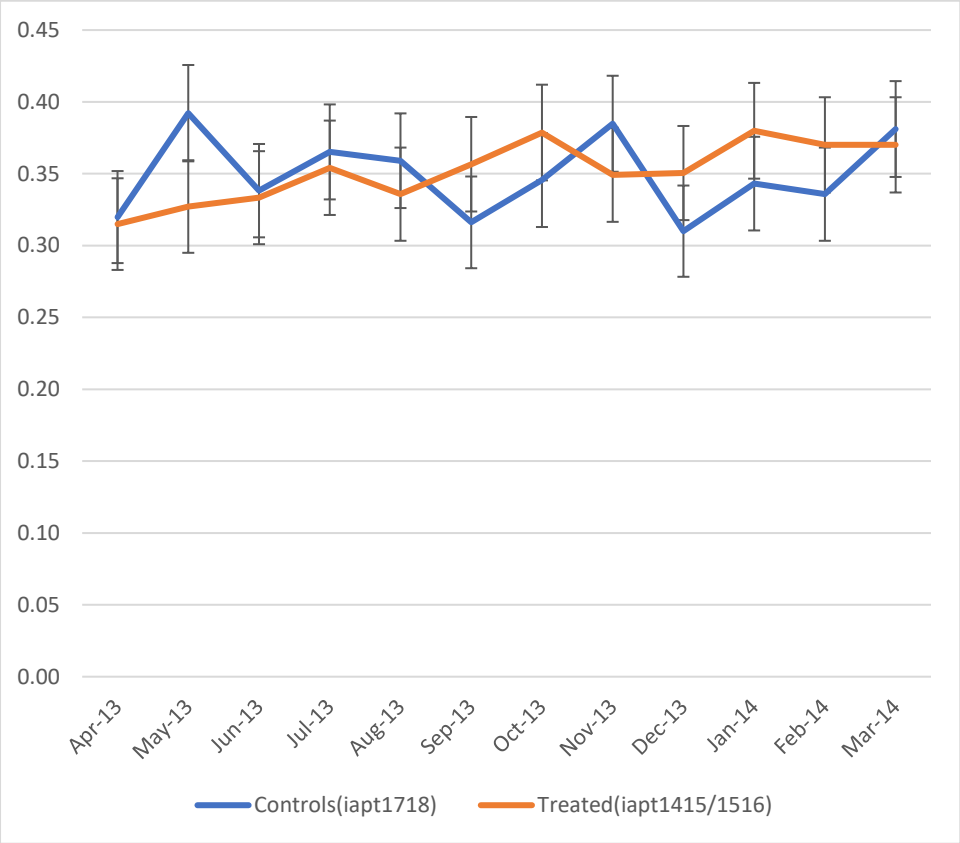
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, which supports a common trends assumption.

Appendix Figure D6: Exploration of CVD Inpatient Care (APC) common trends



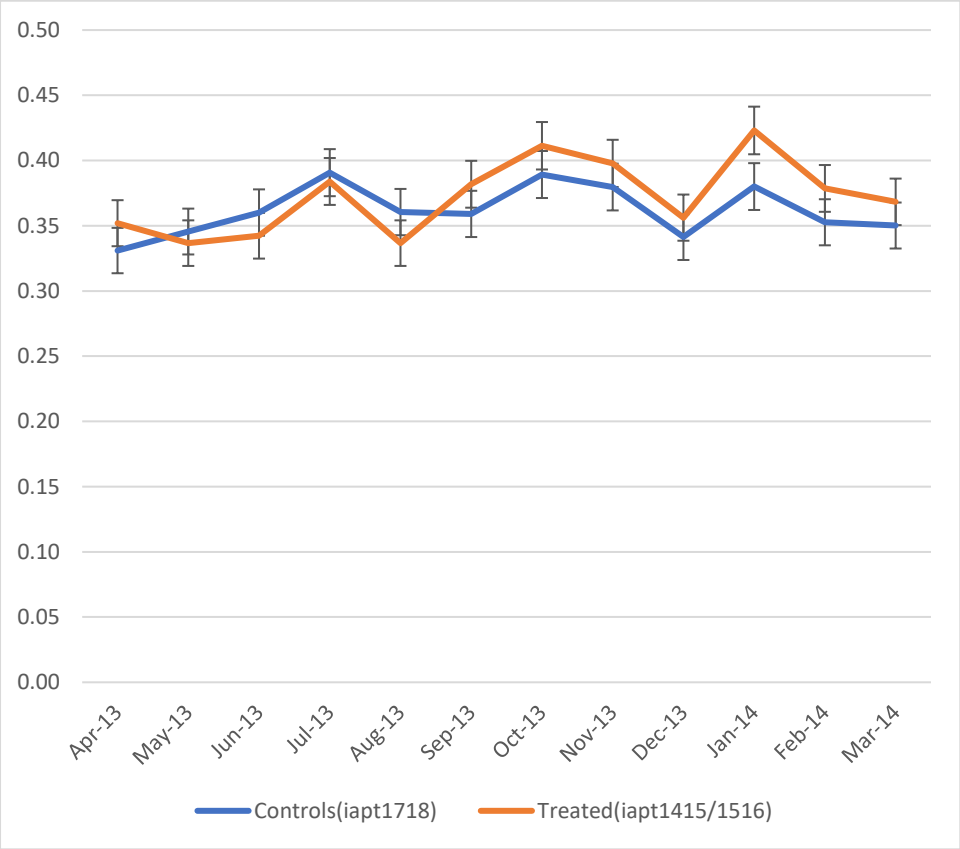
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, except at one point in May 2013, supporting a common trends assumption.

Appendix Figure D7: Exploration of COPD Outpatient Use (OPA) common trends



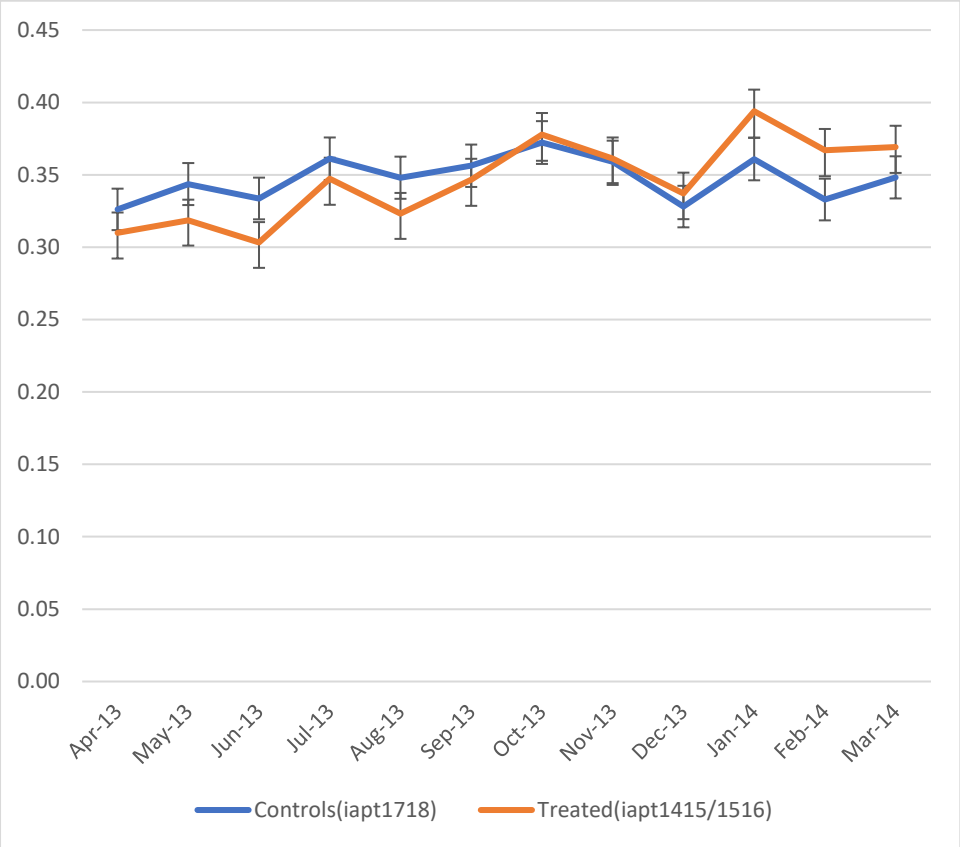
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, which supports a common trends assumption.

Appendix Figure D8: Diabetes Outpatient Use (OPA) common trends exploration



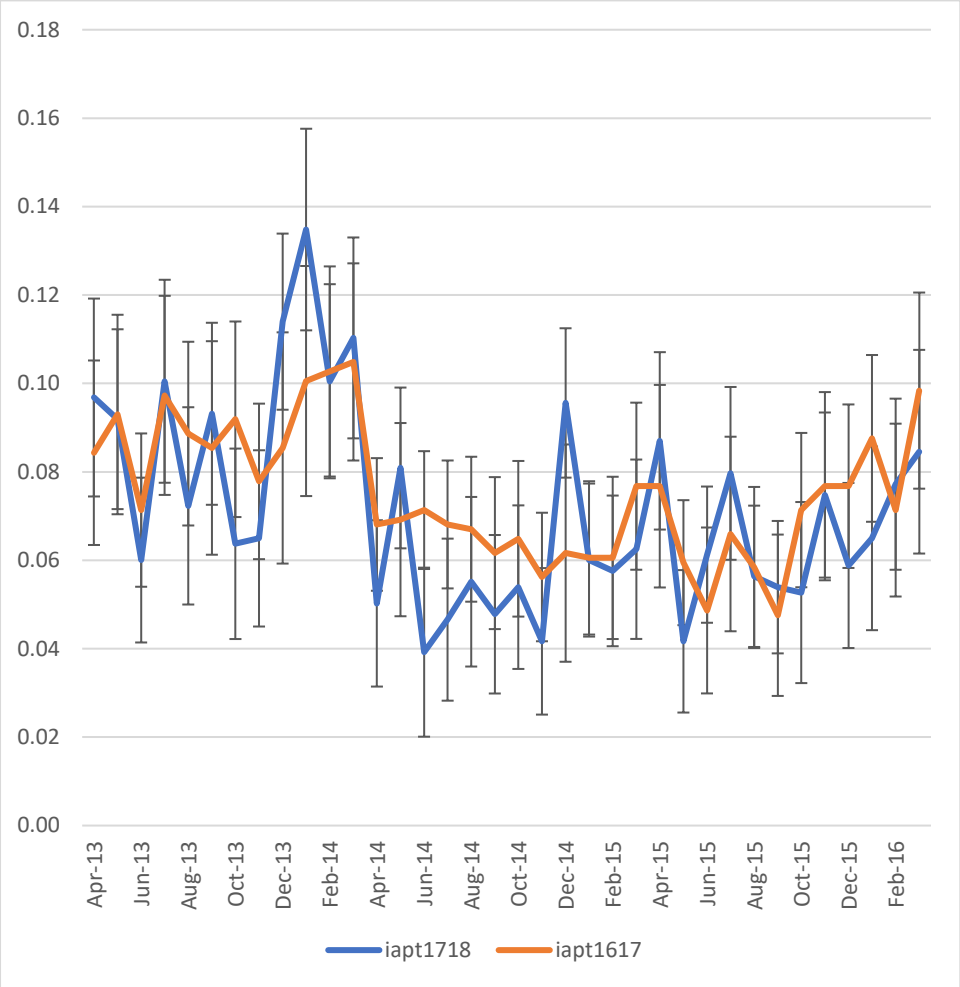
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, which supports a common trends assumption.

Appendix Figure D9: CVD Outpatient Use (OPA) common trends exploration



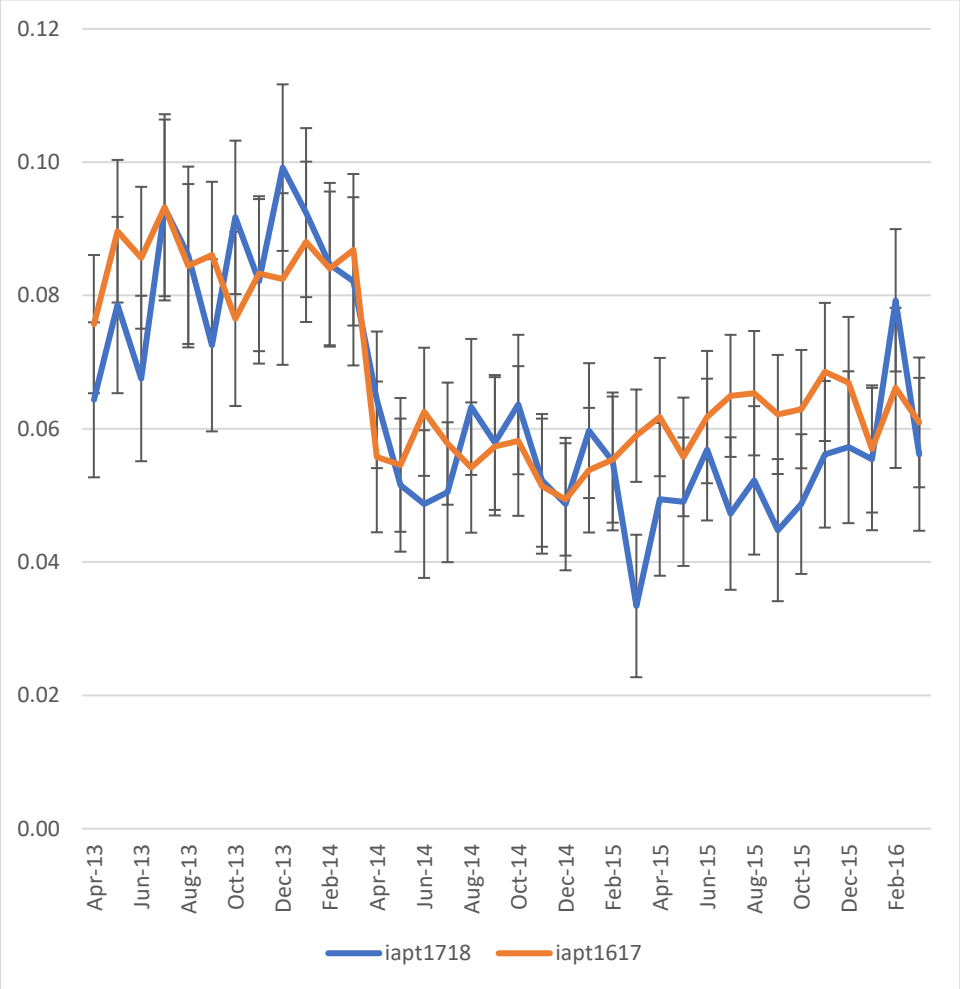
Notes: This is a comparison of those treated with IAPT in 14/15 or 15/16, compared to those who received IAPT in 17/18. We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable consist differences between the two groups, which supports a common trends assumption.

Appendix Figure D10: Exploration of COPD A&E common trends (2016/17 comparison)



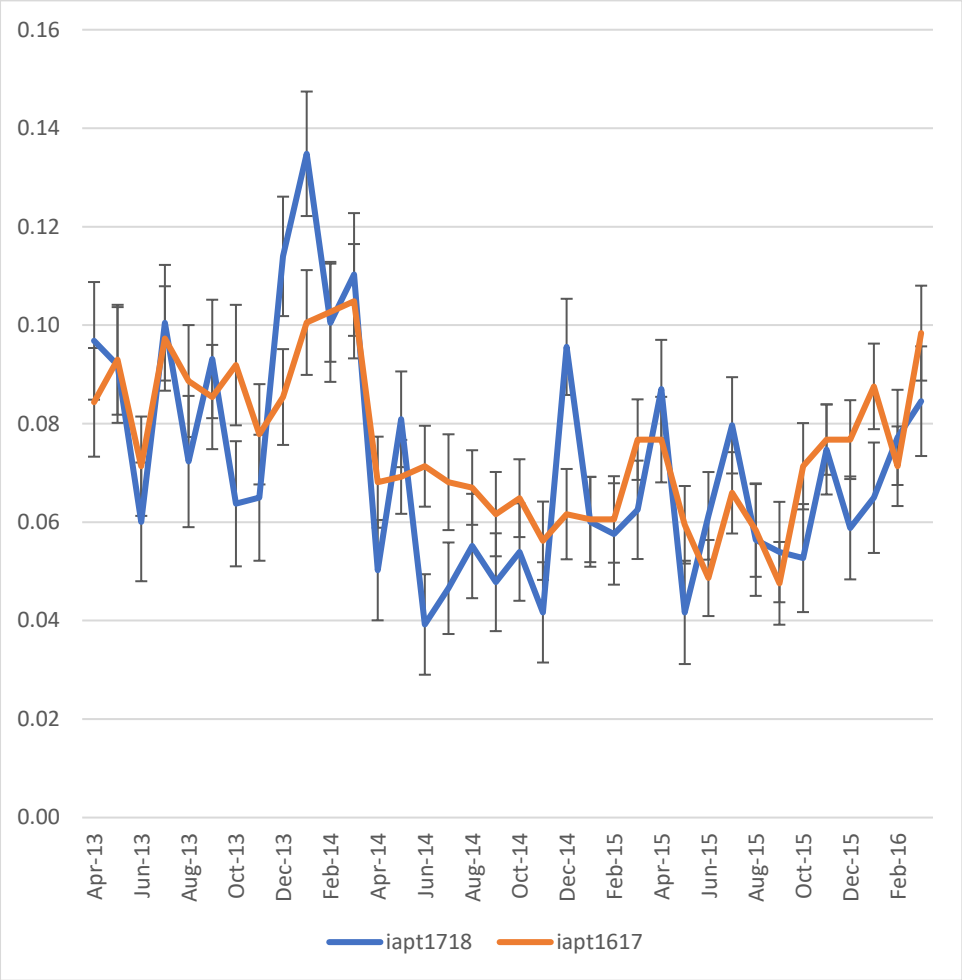
Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. We note that the higher levels of utilisation in 13/14 is explained by the fact that the people we are studying all had in-patient visits in 13/14, and a significant proportion would have been admitted via A&E. The graph above illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D11: Exploration of Diabetes A&E common trends (2016/17 comparison)



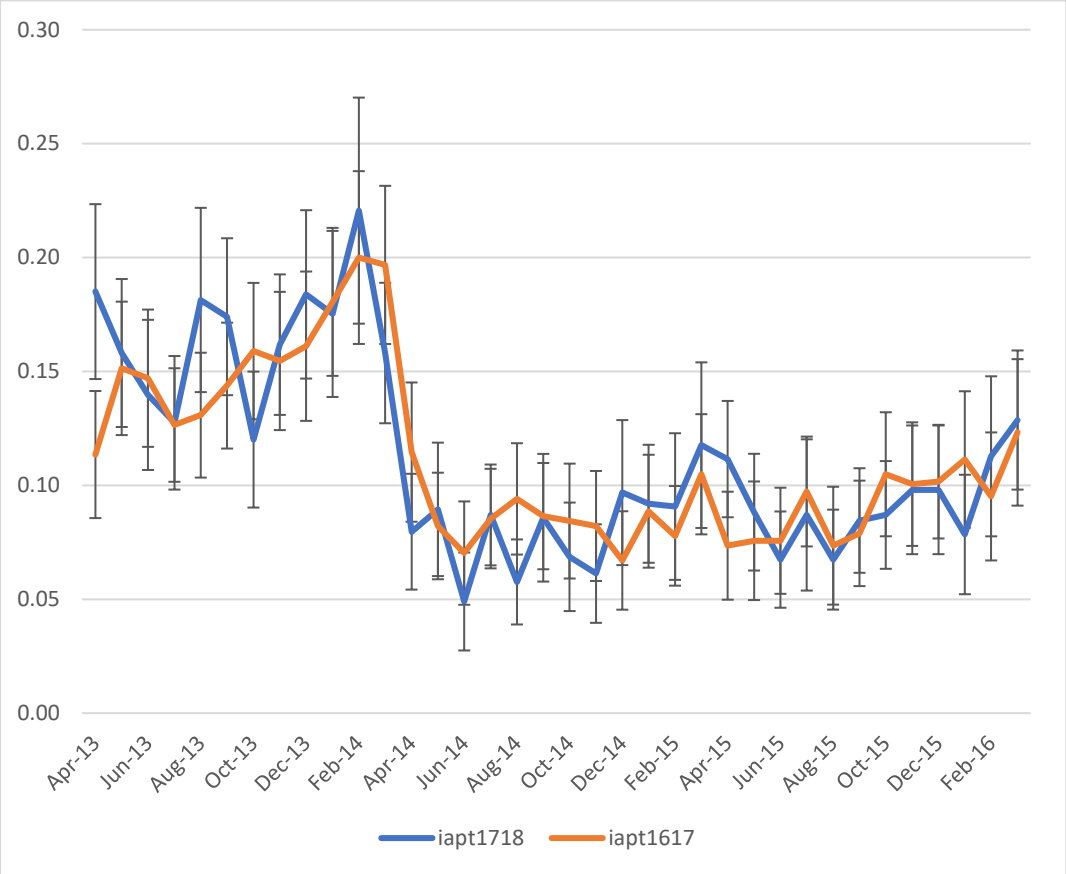
Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. We note that the higher levels of utilisation in 13/14 is explained by the fact that the people we are studying all had in-patient visits in 13/14, and a significant proportion would have been admitted via A&E. The graph above illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D12: Exploration of CVD A&E common trends (2016/17 comparison)



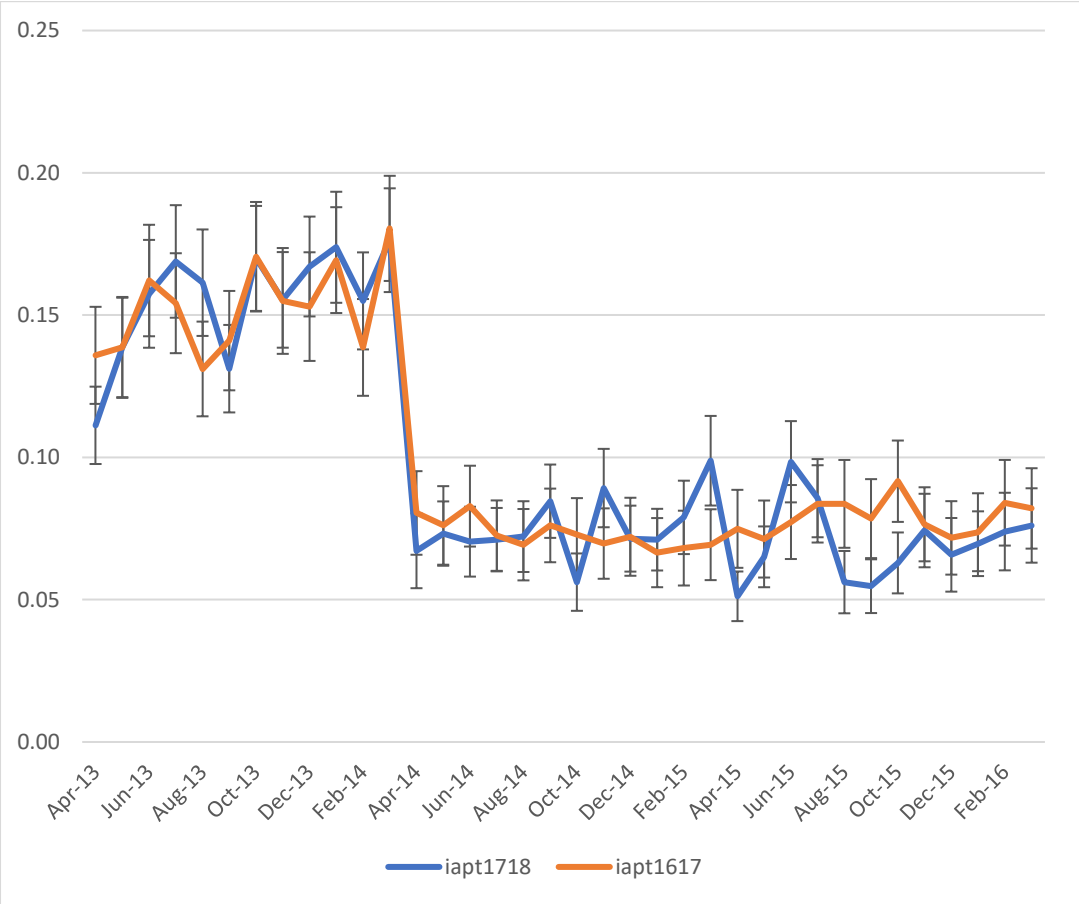
Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. We note that the higher levels of utilisation in 13/14 is explained by the fact that the people we are studying all had in-patient visits in 13/14, and a significant proportion would have been admitted via A&E. The graph above illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D13: Exploration of COPD Inpatient Care (APC) common trends (2016/17 comparison)



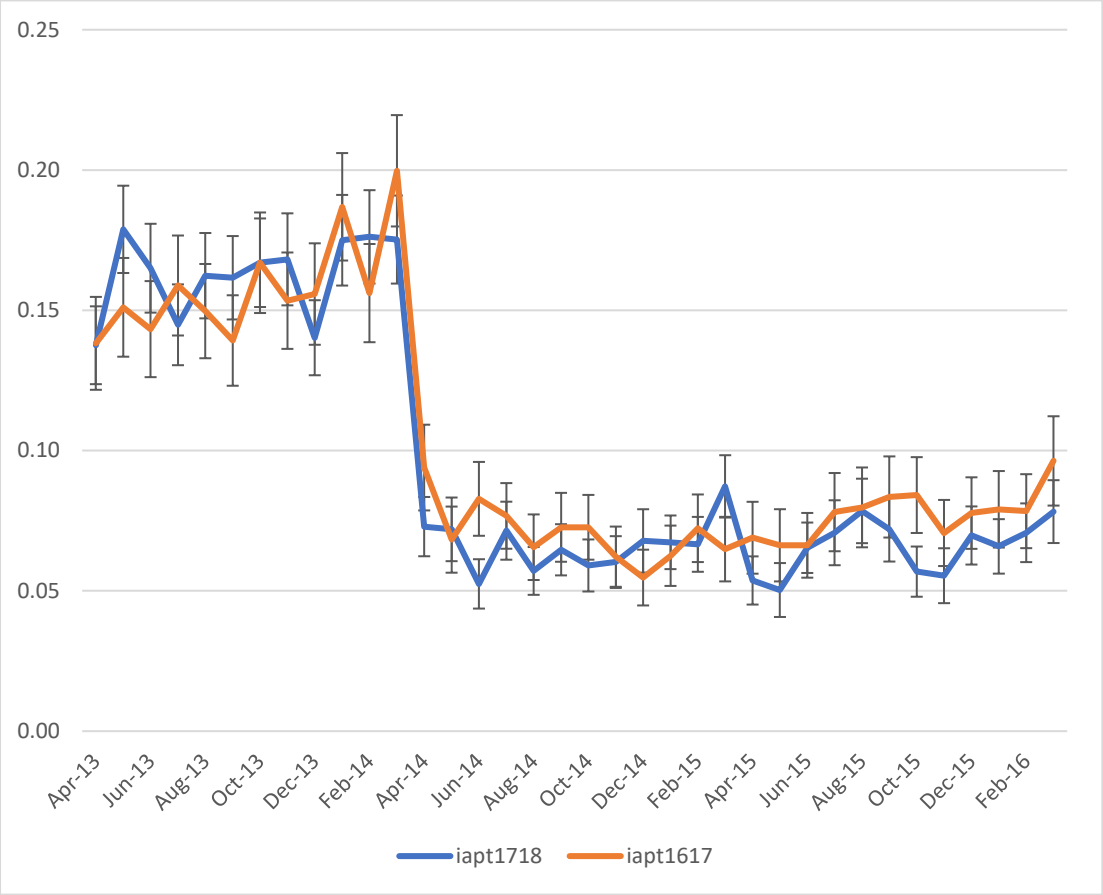
Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. We note that the higher levels of utilisation in 13/14 is explained by the fact that the people we are studying all had in-patient visits in 13/14, and mechanically this is reflected in the graph above. The graph above also illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D14: Exploration of Diabetes Inpatient Care (APC) common trends (2016/17 comparison)



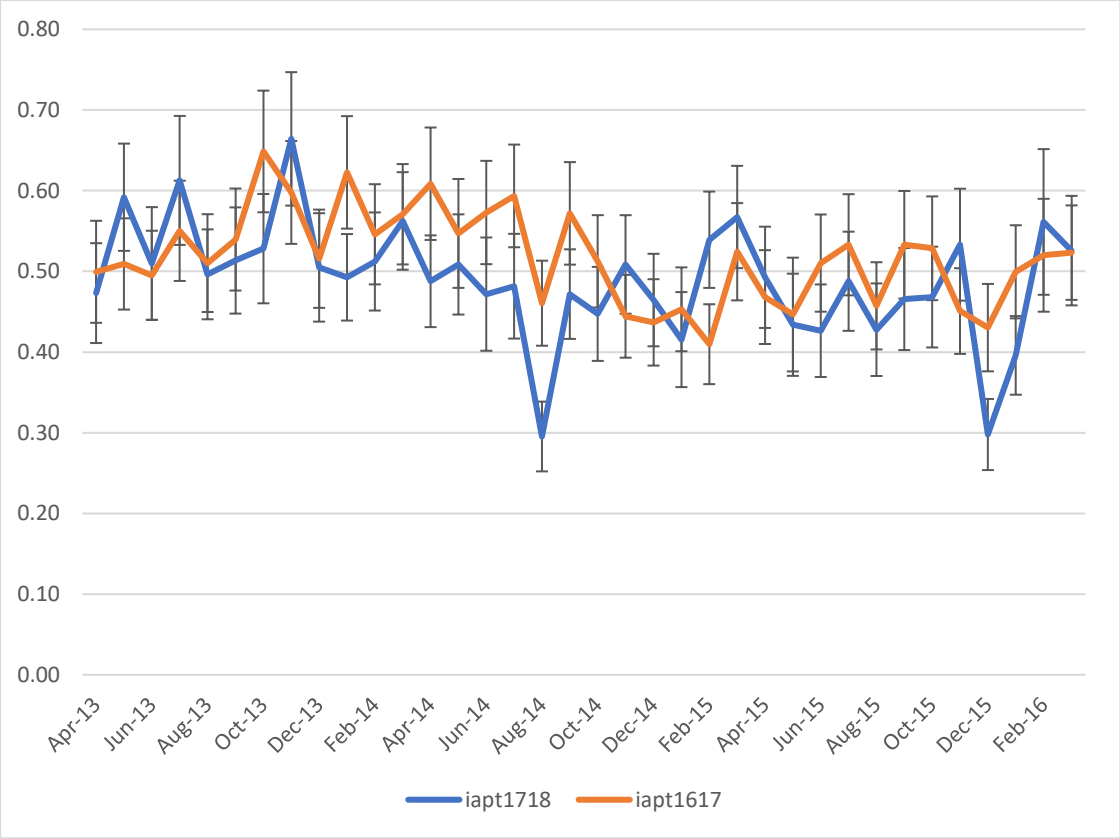
Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. We note that the higher levels of utilisation in 13/14 is explained by the fact that the people we are studying all had in-patient visits in 13/14, and mechanically this is reflected in the graph above. The graph above also illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D15: Exploration of CVD Inpatient Care (APC) common trends (2016/17 comparison)



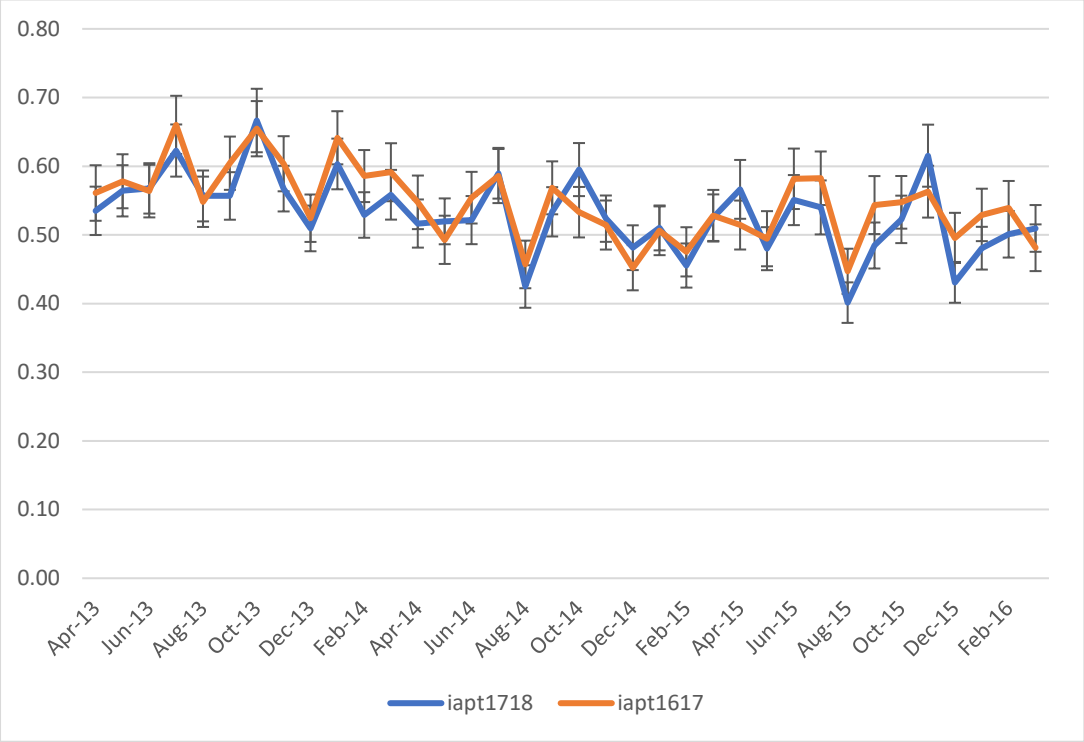
Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. We note that the higher levels of utilisation in 13/14 is explained by the fact that the people we are studying all had in-patient visits in 13/14, and mechanically this is reflected in the graph above. The graph above also illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D16: Exploration of COPD Outpatient Use (OPA) common trends (2016/17 comparison)



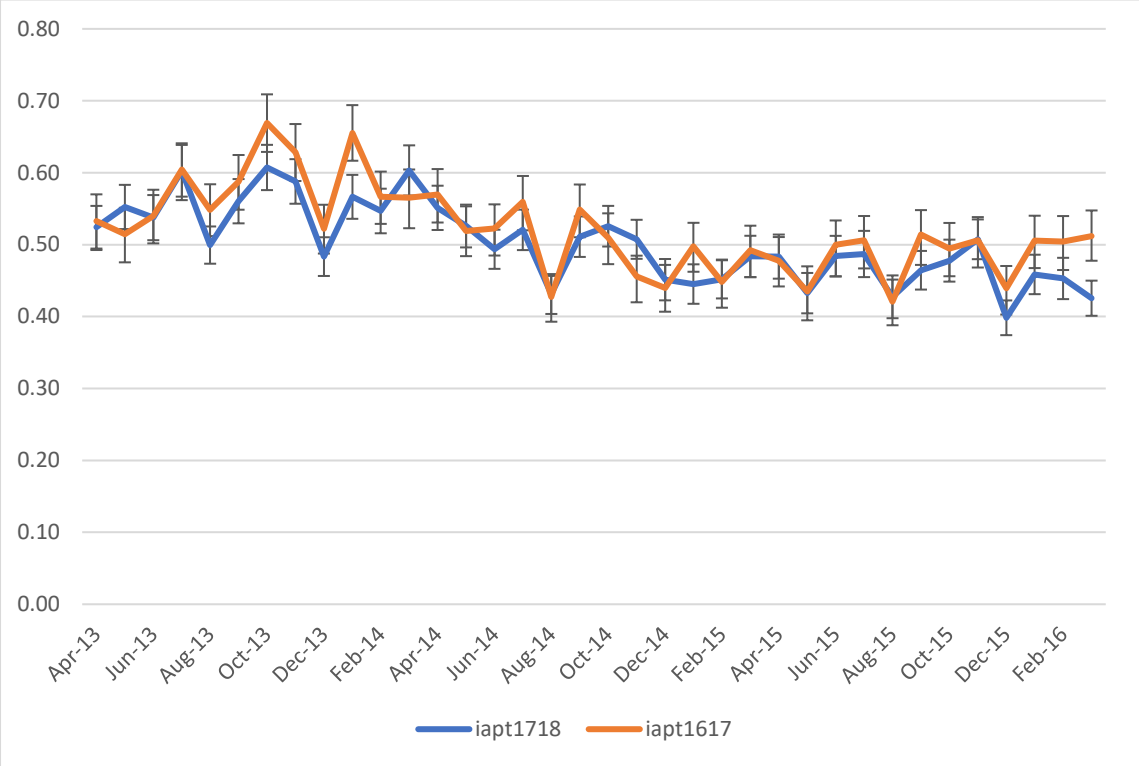
Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D17: Diabetes Outpatient Use (OPA) common trends exploration (2016/17 comparison)



Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Figure D18: CVD Outpatient Use (OPA) common trends exploration (2016/17 comparison)



Notes: This is a comparison of those treated with IAPT in 16/17 (we omitted this group in the present analysis given treatment is defined as having IAPT in 14/15 or 15/16 only) to the controls that are utilised in this work (those who received IAPT in 17/18). We assumed throughout our analysis that the rationing of IAPT was 'as if' random. If this claim is true these two groups should exhibit the same trend in utilisation of the three hospital service types prior to IAPT treatment. The graph above illustrates no notable differences between the two groups, which supports a common trends assumption.

Appendix Table E1: Comparison of matched treated and control samples on matching variables (COPD)

		Controls		Treated			
		mean	**sd**	**mean**	**sd**	**t**	**p-value**
Age		62.29	10.66	62.03	11.29	-0.48	0.629
Comorbidities (ICD)		3.75	2.37	3.83	2.41	0.70	0.482
ER use (f.y.2013)		1.10	1.20	1.11	1.29	0.18	0.858
Outpatient use (f.y.2013)		6.46	5.36	6.48	5.57	0.07	0.942
Inpatient use (f.y.2013)		1.94	1.49	2.01	1.49	1.00	0.319
		Controls		**Treated**			
		n	**%**	**n**	**%**	**Chi-Sq**	**p-value**
Gender	Male	327	40.07%	342	41.91%	0.57	0.45
	Female	489	59.93%	474	58.09%		
IMD Decile	1	150	18.38%	149	18.26%	7.74	0.56
	2	90	11.03%	109	13.36%		
	3	115	14.09%	91	11.15%		
	4	108	13.24%	101	12.38%		
	5	81	9.93%	79	9.68%		
	6	65	7.97%	73	8.95%		
	7	70	8.58%	66	8.09%		
	8	61	7.48%	59	7.23%		
	9	45	5.51%	45	5.51%		
	10	31	3.80%	44	5.39%		

Notes: ER = Emergency Room; f.y. = Fiscal Year; IMD = Index of Multiple Deprivation.

Appendix Table E2: Comparison of matched treated and control samples on matching variables (Diabetes)

		Controls		Treated			
		mean	sd	mean	sd	t	p-value
Age		56.06	13.46	56.09	13.99	0.09	0.931
Comorbidities (ICD)		3.98	2.70	3.99	2.69	0.01	0.988
ER use (f.y.2013)		0.99	1.22	0.99	1.24	-0.27	0.786
Outpatient use (f.y.2013)		6.84	5.95	7.06	6.15	1.41	0.159
Inpatient use (f.y.2013)		1.83	1.48	1.81	1.31	-0.68	0.497
		Controls		Treated			
		n	%	n	%	Chi-Sq	p-value
Gender	Male	1341	47.67%	1286	45.72%	2.16	0.142
	Female	1472	52.33%	1527	54.28%		
IMD Decile	1	340	12.09%	341	12.12%	10.70	0.297
	2	395	14.04%	360	12.80%		
	3	362	12.87%	331	11.77%		
	4	331	11.77%	345	12.26%		
	5	303	10.77%	279	9.92%		
	6	279	9.92%	282	10.02%		
	7	215	7.64%	264	9.38%		
	8	214	7.61%	214	7.61%		
	9	180	6.40%	203	7.22%		
	10	194	6.90%	194	6.90%		

Notes: ER = Emergency Room; f.y. = Fiscal Year; IMD = Index of Multiple Deprivation.

Appendix Table E3: Comparison of matched treated and control samples on matching variables (CVD)

		Controls		Treated			
		mean	sd	mean	sd	t	p-value
Age		60.13	13.63	60.25	14.51	0.38	0.703
Comorbidities (ICD)		4.00	2.52	3.96	2.50	-0.80	0.427
ER use (f.y.2013)		1.21	1.36	1.18	1.30	-0.86	0.389
Outpatient use (f.y.2013)		6.67	5.95	6.60	5.99	-0.52	0.606
Inpatient use (f.y.2013)		1.91	1.32	1.97	1.40	2.07	0.038
		Controls		Treated			
		n	%	n	%	Chi-Sq	p-value
Gender	Male	2092	50.84%	2126	51.66%	0.5622	0.453
	Female	2023	49.16%	1989	48.34%		
IMD Decile	1	473	11.49%	451	10.96%	15.6	0.076
	2	426	10.35%	434	10.55%		
	3	408	9.91%	413	10.04%		
	4	458	11.13%	421	10.23%		
	5	381	9.26%	439	10.67%		
	6	415	10.09%	412	10.01%		
	7	350	8.51%	374	9.09%		
	8	342	8.31%	387	9.40%		
	9	405	9.84%	396	9.62%		
	10	457	11.11%	388	9.43%		

Notes: ER = Emergency Room; f.y. = Fiscal Year; IMD = Index of Multiple Deprivation.

Appendix Table F1: Estimated change in the probability of utilisation after IAPT treatment

	Mean monthly use in sample	Estimated change in the probability of use (evaluated at the mean)		
Long Term Condition = COPD				
		0 Months after IAPT	6 Months after IAPT	12 Months after IAPT
A&E	0.058	-16.70%	-23.20%**	-18.97%*
Outpatient	0.31	-6.20%	-10.20%**	-13.55%**
Inpatient (All episodes)	0.063	-7.40%	-15.90%	-19.05%
Inpatient (elective stays)	0.035	-12.20%	-8.90%	-21.50%*
Inpatient (non-elective stays)	0.03	-5.50%	-23.70%*	-11.70%
N		1239		
Long Term Condition = Diabetes				
		0 Months after IAPT	6 Months after IAPT	12 Months after IAPT
A&E	0.055	-15.60%**	-23.60%***	-21.82%***
Outpatient	0.328	-6.30%**	-7.00%***	-9.76%***
Inpatient (All episodes)	0.062	-9.60%*	-12.50%*	-9.68%
Inpatient (elective stays)	0.038	-7.90%	-3.90%	0.40%
Inpatient (non-elective stays)	0.025	-16.30%*	-28.50%***	-27.00%**
N		4172		
Long Term Condition = CVD				
		0 Months after IAPT	6 Months after IAPT	12 Months after IAPT
A&E	0.058	-23.20%***	-26.20%***	-27.59%***
Outpatient	0.301	-9.10%***	-12.00%***	-11.63%***
Inpatient (All episodes)	0.051	-14.30%**	-18.50%***	-21.57%***
Inpatient (elective stays)	0.029	-6.40%	-7.40%	-13.40%*
Inpatient (non-elective stays)	0.024	-25.80%***	-33.00%***	-27.90%***
N		5900		

Notes: * p<0.05; ** p<0.01; *** p<0.001

Table G.1: Robustness Analysis for COPD

	Control group: Have LTC in f.y. 2013, but never receive IAPT		Control group: Receive IAPT in f.y. 2017, model include no fixed effects	
Long Term Condition = COPD				
	Estimated percentage point change in use after IAPT treatment	Reduction in probability of use evaluated at the mean	Estimated percentage point change in use after IAPT treatment	Reduction in probability of use evaluated at the mean
A&E	-0.002	-3.10%	-0.01*	-17.27%
Outpatient	-0.01	-2.81%	-0.04*	-11.41%
Inpatient (All episodes)	-0.01*	-11.26%	-0.01*	-15.60%
Long Term Condition = Diabetes				
	Estimated percentage point change in use after IAPT treatment	Reduction in probability of use evaluated at the mean	Estimated percentage point change in use after IAPT treatment	Reduction in probability of use evaluated at the mean
A&E	-0.003	-4.50%	-0.004*	-6.18%
Outpatient	-0.01*	-3.01%	-0.03*	-9.27%
Inpatient (All episodes)	0.002	3.99%	-0.003	-4.73%
Long Term Condition = CVD				
	Estimated percentage point change in use after IAPT treatment	Reduction in probability of use evaluated at the mean	Estimated percentage point change in use after IAPT treatment	Reduction in probability of use evaluated at the mean
A&E	-0.006*	-10.34%	-0.01*	-17.24%
Outpatient	-0.004	-1.33%	-0.037*	-12.29%
Inpatient (All episodes)	-0.002	-3.92%	-0.009*	-17.65%

Notes: * p<0.05. The left hand columns present estimates for an alternative control group, individuals who also have an inpatient stay for the f.y. 2013 but never receive IAPT in the study period. The right hand columns present estimates for the same control group as presented in the main manuscript, but models do not include fixed effects. All estimates are 12-months after IAPT.

Appendix Table H.1. Length of Stay (LOS) Estimates

	Coefficient	p-value
COPD	-0.49 (-1.09;0.12)	0.116
Diabetes	-0.16 (-0.37;0.05)	0.138
CVD	-0.25 (-0.43;-0.06)	0.01

Notes: Estimate for length of inpatient stay. 95% CIs presented in brackets.