

Supplementary materials to:

**Latent variable mixture modelling and individual treatment prediction**

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## Appendix A. Descriptives and distribution of profiles by financial year

**Table A1. Descriptive statistics of the profiles on included indicator variables.**

	Full sample	LP1 (17.6%)	LP2 (24.1%)	LP3 (3.04%)	LP4 (4.92%)	LP5 (9.58%)	LP6 (8.21%)	LP7 (9.64%)	LP8 (22.91%)
Age - Mean (SD)	37.56 (14.36)	32.67 (8.6)	29.49 (7.42)	67.85 (9.79)	66.07 (9.12)	55.02 (7.6)	39.99 (10.04)	44.03 (9.57)	28.78 (6.96)
PHQ-9 - Mean (SD)	13.8 (6.46)	5.71 (2.97)	11.41 (3.16)	4.94 (3.04)	11.09 (3.59)	18.07 (3.41)	13.66 (3.41)	23.18 (2.65)	18.98 (3.16)
GAD-7 - Mean (SD)	12.35 (5.43)	5.39 (2.63)	12.56 (3.08)	3.89 (2.49)	10.86 (3.33)	15.99 (2.87)	8.11 (2.64)	18.82 (2.25)	16.53 (2.83)
WSAS - Mean (SD)	17.17 (9.2)	8.88 (5.72)	14.66 (6.28)	6.24 (5.54)	12.01 (6.66)	18.6 (7.53)	20.96 (6.85)	31.09 (5.47)	22.49 (7.1)
Gender - n(%) female	29561 (67)	5023 (65)	7514 (71)	874 (66)	1536 (71)	2745 (65)	2044 (57)	2532 (60)	7293 (72)
Ethnic Group - n (%) Non- White	11242 (30)	1557 (24)	2097 (23)	151 (15)	277 (15)	934 (26)	1112 (36)	1503 (41)	3611 (41)
Medication prescribed - n (%) prescribed	21310 (51)	2818 (39)	3660 (37)	502 (41)	883 (45)	2502 (65)	2498 (72)	3228 (82)	5219 (54)
Welfare status - n (%) on benefits	11230 (26)	817 (11)	750 (7)	120 (9)	198 (10)	1840 (46)	1944 (54)	3181 (78)	2380 (24)
Phobia Self-rating - n (%) phobia	20992 (52)	1868 (25)	4366 (43)	239 (21)	697 (37)	2341 (64)	1792 (54)	3237 (93)	6452 (70)

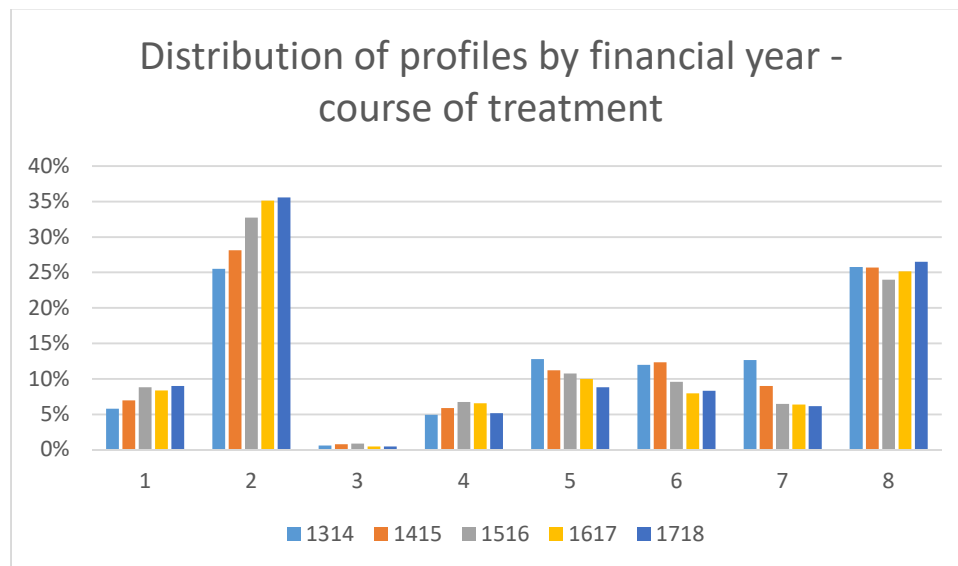
**Table A2. Distribution of patients entering treatment (1+ session) by profile & financial year.**

Profile	1314		1415		1516		1617		1718		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
LP1	720	16.35%	1,421	17.58%	1,847	18.32%	1,921	17.53%	1,993	17.51%	7,902	17.60%
LP2	889	20.19%	1,774	21.94%	2,479	24.59%	2,703	24.67%	2,975	26.14%	10,820	24.10%
LP3	139	3.16%	278	3.44%	377	3.74%	306	2.79%	265	2.33%	1,365	3.04%
LP4	189	4.29%	394	4.87%	529	5.25%	589	5.38%	509	4.47%	2,210	4.92%
LP5	434	9.86%	780	9.65%	971	9.63%	1,080	9.86%	1,039	9.13%	4,304	9.58%
LP6	479	10.88%	834	10.32%	814	8.07%	774	7.06%	787	6.92%	3,688	8.21%
LP7	534	12.13%	774	9.57%	933	9.26%	1,072	9.78%	1,017	8.94%	4,330	9.64%
LP8	1,019	23.14%	1,830	22.63%	2,131	21.14%	2,512	22.93%	2,794	24.55%	10,286	22.91%
<b>Total</b>	<b>4,403</b>		<b>8,085</b>		<b>10,081</b>		<b>10,957</b>		<b>11,379</b>		<b>44,905</b>	

**Table A3. Distribution of patients included in outcome analyses by profile & financial year.**

Profile	2013-14		2014-15		2015-16		2016-17		2017-18		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
LP1	109	5.77%	229	6.97%	370	8.81%	362	8.34%	431	8.98%	1,501	8.11%
LP2	482	25.53%	924	28.11%	1,375	32.73%	1,524	35.12%	1,707	35.57%	6,012	32.47%
LP3	11	0.58%	26	0.79%	37	0.88%	21	0.48%	23	0.48%	118	0.64%
LP4	93	4.93%	194	5.90%	284	6.76%	285	6.57%	247	5.15%	1,103	5.96%
LP5	241	12.76%	368	11.20%	452	10.76%	433	9.98%	423	8.81%	1,917	10.35%
LP6	226	11.97%	405	12.32%	403	9.59%	346	7.97%	400	8.34%	1,780	9.61%
LP7	239	12.66%	296	9.01%	272	6.47%	277	6.38%	295	6.15%	1,379	7.45%
LP8	487	25.79%	845	25.71%	1,008	23.99%	1,091	25.14%	1,273	26.53%	4,704	25.41%
<b>Total</b>	<b>1,888</b>		<b>3,287</b>		<b>4,201</b>		<b>4,339</b>		<b>4,799</b>		<b>18,514</b>	

**Figure A1. Distribution of profiles by financial year**



**Appendix B. Comparison of outcomes between profiles (across all interventions).**

**Table B1. Proportion of patients meeting outcomes by profile**

Profile	n	% Recovery	% Reliable Recovery	% Reliable Improvement	% Deterioration	% Attrition
LP1	1501	70.49%	48.26%	51.83%	9.33%	22.44%
LP2	6012	54.37%	51.39%	69.13%	7.52%	24.25%
LP3	118	76.27%	55.93%	58.12%	11.97%	14.42%
LP4	1103	63.92%	57.39%	68.27%	8.39%	12.82%
LP5	1917	32.24%	32.06%	67.98%	6.23%	21.10%
LP6	1780	53.03%	45.87%	56.75%	14.42%	25.90%
LP7	1379	17.69%	17.69%	57.39%	4.39%	33.00%
LP8	4704	31.97%	31.81%	70.33%	5.53%	34.97%
Total	18514	45.54%	41.49%	65.74%	7.54%	26.42%

**Table B2. Logistic regression analyses comparing odds of recovery between all profiles and LP4, and all profiles against LP7.**

Recovery									
	Odds ratio	p-value	95% Cis						
	LP4 = reference					LP7 = reference			
LP1	1.35	<0.001	1.14	1.59	LP1	11.11	<0.001	9.30	13.26
LP2	0.67	<0.001	0.59	0.77	LP2	5.54	<0.001	4.78	6.42
LP3	1.81	0.01	1.17	2.82	LP3	14.95	<0.001	9.57	23.36
LP5	0.27	<0.001	0.23	0.31	LP4	8.24	<0.001	6.85	9.91
LP6	0.64	<0.001	0.55	0.74	LP5	2.21	<0.001	1.87	2.62
LP7	0.12	<0.001	0.10	0.15	LP6	5.25	<0.001	4.45	6.21
LP8	0.27	<0.001	0.23	0.30	LP8	2.19	<0.001	1.88	2.54

**Table B3. Logistic regression analyses comparing odds of reliable recovery between all profiles and LP4, and all profiles against LP7.**

Reliable Recovery									
	Odds ratio	p-value	95% Cis						
	LP4 = reference					LP7 = reference			
LP1	0.69	<0.001	0.59	0.81	LP1	4.34	<0.001	3.65	5.15
LP2	0.78	<0.001	0.69	0.89	LP2	4.92	<0.001	4.24	5.70
LP3	0.94	0.761	0.64	1.38	LP3	5.90	<0.001	4.00	8.71
LP5	0.35	<0.001	0.30	0.41	LP4	6.26	<0.001	5.22	7.52
LP6	0.63	<0.001	0.54	0.73	LP5	2.20	<0.001	1.85	2.60
LP7	0.16	<0.001	0.13	0.19	LP6	3.94	<0.001	3.34	4.66
LP8	0.35	<0.001	0.30	0.40	LP8	2.17	<0.001	1.87	2.52

**Table B4. Logistic regression analyses comparing odds of reliable improvement between all profiles and LP8, and all profiles against LP1.**

Reliable improvement														
Odds ratio			p-value		95% Cis		Odds ratio			p-value		95% Cis		
LP8 = reference					LP1 = reference									
LP1	0.45	<0.001	0.40	0.51	LP2	2.08	<0.001	1.85	2.34					
LP2	0.94	0.180	0.87	1.03	LP3	1.29	0.19	0.88	1.89					
LP3	0.59	0.005	0.40	0.85	LP4	2.00	<0.001	1.70	2.36					
LP4	0.91	0.180	0.79	1.05	LP5	1.97	<0.001	1.71	2.27					
LP5	0.90	0.059	0.80	1.00	LP6	1.22	0.01	1.06	1.40					
LP6	0.55	<0.001	0.49	0.62	LP7	1.25	<0.001	1.08	1.45					
LP7	0.57	<0.001	0.50	0.64	LP8	2.20	<0.001	1.95	2.49					

**Table B5. Logistic regression analyses comparing odds of deterioration b between all profiles and LP7, and all profiles against LP6.**

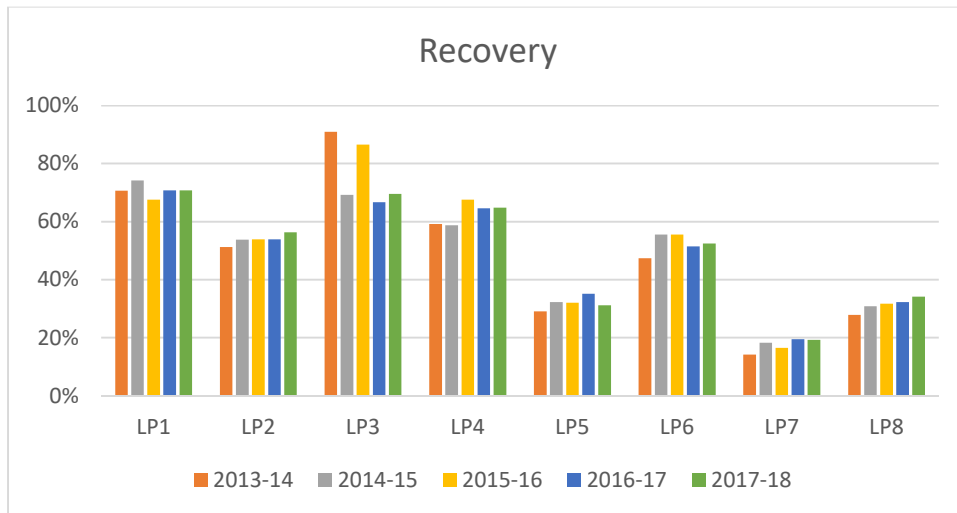
Deterioration														
Odds ratio			p-value		95% Cis		Odds ratio			p-value		95% Cis		
LP7 = reference					LP6 = reference									
LP1	2.24	<0.001	1.64	3.07	LP1	0.61	<0.001	0.49	0.76					
LP2	1.77	<0.001	1.34	2.34	LP2	0.48	<0.001	0.41	0.57					
LP3	2.96	0.001	1.60	5.48	LP3	0.81	0.463	0.45	1.43					
LP4	2.00	<0.001	1.43	2.79	LP4	0.54	<0.001	0.42	0.70					
LP5	1.45	0.023	1.05	1.99	LP5	0.39	<0.001	0.31	0.50					
LP6	3.67	<0.001	2.75	4.91	LP7	0.27	<0.001	0.20	0.36					
LP8	1.28	0.096	0.96	1.70	LP8	0.35	<0.001	0.29	0.42					

**Table B6. Logistic regression analyses comparing odds of attrition between all profiles and LP4, and all profiles against LP8.**

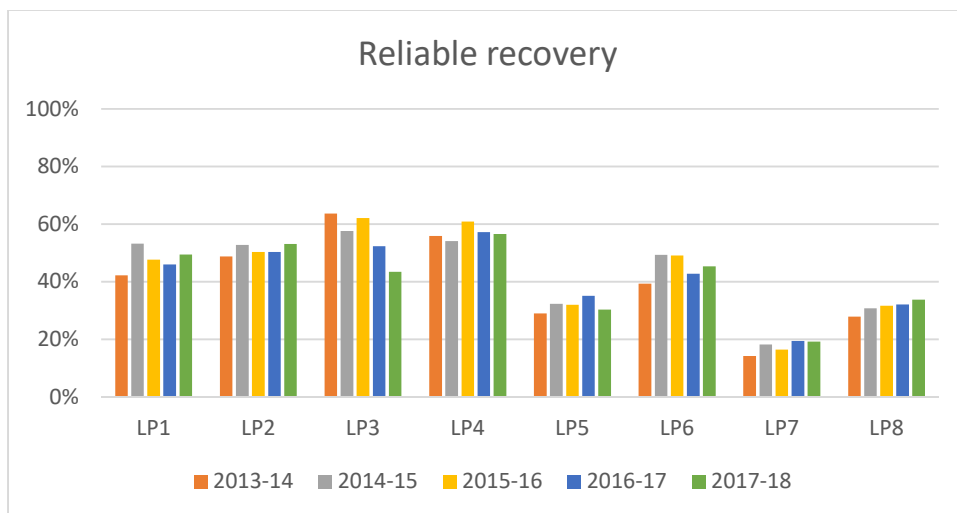
Attrition														
Odds ratio			p-value		95% Cis		Odds ratio			p-value		95% Cis		
LP4 = reference					LP8 = reference									
LP1	1.97	<0.001	1.57	2.47	LP1	0.54	<0.001	0.47	0.62					
LP2	2.18	<0.001	1.79	2.65	LP2	0.60	<0.001	0.54	0.65					
LP3	1.15	0.643	0.64	2.04	LP3	0.31	<0.001	0.18	0.54					
LP5	1.82	<0.001	1.46	2.27	LP4	0.27	<0.001	0.22	0.33					
LP6	2.38	<0.001	1.91	2.96	LP5	0.50	<0.001	0.43	0.57					
LP7	3.35	<0.001	2.67	4.20	LP6	0.65	<0.001	0.57	0.74					
LP8	3.66	<0.001	3.00	4.46	LP7	0.92	0.227	0.79	1.06					

**Appendix C. Proportion of patients reporting outcomes of interest by financial year.**

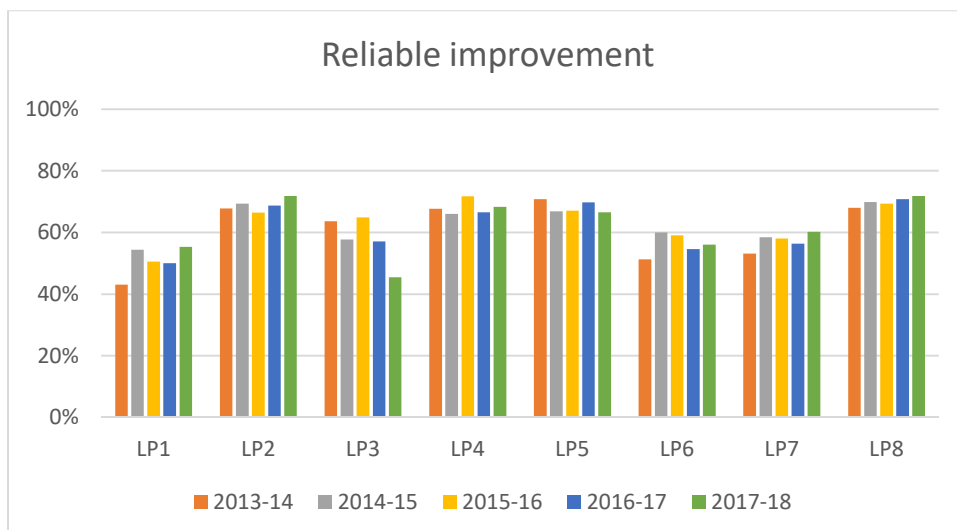
**Figure C1. Proportion of patients in recovery across profiles by financial year.**



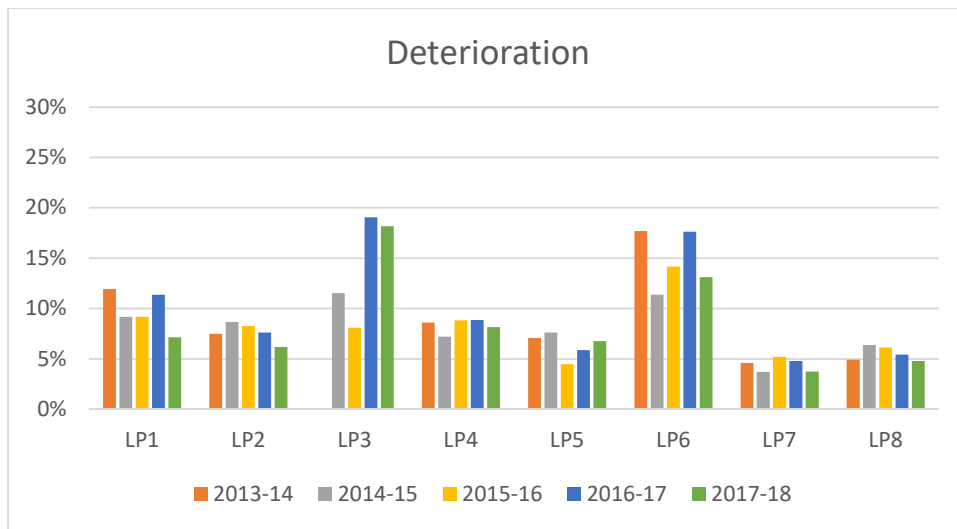
**Figure C2. Proportion of patients reporting reliable recovery across profiles by financial year.**



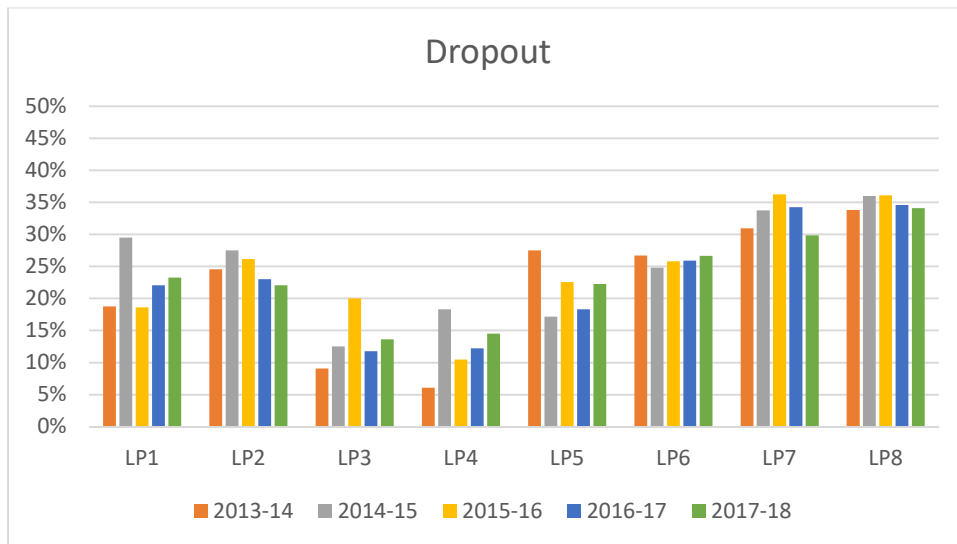
**Figure C3. Proportion of patients reporting reliable improvement across profiles by financial year.**



**Figure C4. Proportion of patients reporting deterioration across profiles by financial year.**



**Figure C5. Proportion of patients dropping out across profiles by financial year.**



**Appendix D. Comparison of outcomes by profiles for patients receiving LI vs HI psychological interventions.**

**Table D1: Number of patients receiving intensity of IAPT treatment by profile.**

Profile	LI only		HI only		Received both		Total
	n	%	N	%	n	%	
LP1	304	20.25%	510	33.98%	687	45.77%	1501
LP2	1283	21.34%	1968	32.73%	2761	45.92%	6012
LP3	33	27.97%	50	42.37%	35	29.66%	118
LP4	228	20.67%	468	42.43%	407	36.90%	1103
LP5	408	21.28%	766	39.96%	743	38.76%	1917
LP6	444	24.94%	613	34.44%	723	40.62%	1780
LP7	214	15.52%	642	46.56%	523	37.93%	1379
LP8	926	19.69%	1716	36.48%	2062	43.84%	4704
Total	3840	20.74%	6733	36.37%	7941	42.89%	18514

**Table D2. Proportion of patients reporting recovery following LI or HI interventions**

Profile	LI			HI			Comparison			p-value
	Recovered	Total	%	Recovered	Total	%	Odds Ratio HI vs LI	Lower 95% CI	Upper 95% CI	
LP1	328	478	68.62%	338	476	71.01%	1.120	0.849	1.477	0.422
LP2	993	1903	52.18%	1025	1900	53.95%	1.074	0.945	1.219	0.275
LP3	8	11	72.73%	8	11	72.73%	1.000	0.153	6.531	1.000
LP4	241	366	65.85%	235	366	64.21%	0.930	0.687	1.261	0.642
LP5	211	701	30.10%	212	701	30.24%	1.007	0.801	1.265	0.954
LP6	290	580	50.00%	293	580	50.52%	1.021	0.811	1.285	0.86
LP7	64	571	11.21%	91	571	15.94%	1.502	1.066	2.117	0.02
LP8	395	1608	24.56%	493	1608	30.66%	1.358	1.162	1.586	<0.001

**Table D3. Proportion of patients reporting reliable recovery following LI or HI interventions**

Profile	LI			HI			Comparison			p-value
	Reliable recovery	Total	%	Reliable recovery	Total	%	Odds Ratio HI vs LI	Lower 95% CI	Upper 95% CI	
LP1	206	478	43.10%	225	471	47.77%	1.208	0.935	1.560	0.148
LP2	941	1903	49.45%	942	1882	50.05%	1.024	0.902	1.164	0.71
LP3	8	11	72.73%	6	11	54.55%	0.450	0.076	2.669	0.379
LP4	231	366	63.11%	210	366	57.38%	0.787	0.585	1.058	0.113
LP5	211	701	30.10%	208	697	29.84%	0.988	0.786	1.242	0.916
LP6	261	580	45.00%	250	580	43.10%	0.926	0.734	1.168	0.515
LP7	64	571	11.21%	91	571	15.94%	1.502	1.066	2.117	0.02
LP8	395	1608	24.56%	484	1599	30.27%	1.333	1.141	1.558	<0.001



**Table D4. Proportion of patients reporting reliable improvement following LI or HI interventions**

Profile	LI			HI			Comparison			
	Reliable improvement	Total	%	Reliable improvement	Total	%	Odds Ratio HI vs LI	Lower 95% CI	Upper 95% CI	p-value
LP1	208	478	43.51%	238	458	51.97%	1.404	1.086	1.817	0.01
LP2	1242	1886	65.85%	1274	1864	68.35%	1.120	0.977	1.283	0.104
LP3	8	11	72.73%	6	11	54.55%	0.450	0.076	2.669	0.379
LP4	281	366	76.78%	244	366	66.67%	0.605	0.437	0.838	0.002
LP5	474	701	67.62%	463	698	66.33%	0.944	0.755	1.179	0.609
LP6	326	580	56.21%	311	578	53.81%	0.908	0.720	1.144	0.412
LP7	268	571	46.94%	327	570	57.37%	1.521	1.204	1.922	<0.001
LP8	1112	1608	69.15%	1069	1596	66.98%	0.905	0.780	1.050	0.187

**Table D5. Proportion of patients reporting clinical deterioration following LI or HI interventions**

Profile	LI			HI			Comparison			
	Deterioration	Total	%	Deterioration	Total	%	Odds Ratio HI vs LI	Lower 95% CI	Upper 95% CI	p-value
LP1	43	478	9.00%	41	456	8.99%	0.999	0.638	1.565	0.998
LP2	139	1885	7.37%	137	1839	7.45%	1.011	0.791	1.292	0.93
LP3	0	11	0.00%	2	11	18.18%	n/a	n/a	n/a	n/a
LP4	31	366	8.47%	35	364	9.62%	1.150	0.693	1.908	0.59
LP5	55	701	7.85%	48	691	6.95%	0.877	0.586	1.311	0.522
LP6	103	580	17.76%	79	578	13.67%	0.733	0.533	1.009	0.056
LP7	26	571	4.55%	26	566	4.59%	1.009	0.579	1.761	0.974
LP8	101	1608	6.28%	86	1575	5.46%	0.862	0.641	1.159	0.325

## **Appendix E. Comparison of outcomes by profiles for patients receiving CBT vs Counselling.**

Note: LP3 has been excluded from analyses due to small sample size.

**Table E1. Proportion of patients reporting recovery following CBT or Counselling**

Profile	CBT			Counselling			Comparison			
	Recovered	Total	%	Recovered	Total	%	Odds Ratio Counselling vs CBT	Lower 95% CI	Upper 95% CI	p-value
LP1	40	54	74.07%	42	54	77.78%	1.225	0.506	2.966	0.653
LP2	188	311	60.45%	176	312	56.41%	0.847	0.615	1.165	0.306
LP4	140	178	78.65%	104	178	58.43%	0.381	0.239	0.608	<0.001
LP5	103	271	38.01%	67	271	24.72%	0.536	0.370	0.775	0.001
LP6	46	112	41.07%	55	112	49.11%	1.384	0.816	2.348	0.227
LP7	35	171	20.47%	25	171	14.62%	0.665	0.379	1.169	0.157
LP8	104	252	41.27%	77	252	30.56%	0.626	0.434	0.904	0.012

**Table E2. Proportion of patients reporting reliable recovery following CBT or Counselling**

Profile	CBT			Counselling			Comparison			
	Reliable recovery	Total	%	Reliable recovery	Total	%	Odds Ratio Counselling vs CBT	Lower 95% CI	Upper 95% CI	p-value
LP1	27	53	50.94%	30	54	55.56%	1.204	0.563	2.575	0.633
LP2	168	308	54.55%	169	312	54.17%	0.985	0.718	1.351	0.925
LP4	124	178	69.66%	95	178	53.37%	0.498	0.323	0.770	0.002
LP5	98	266	36.84%	67	271	24.72%	0.563	0.388	0.817	0.002
LP6	44	112	39.29%	50	112	44.64%	1.246	0.732	2.121	0.417
LP7	35	171	20.47%	25	171	14.62%	0.665	0.379	1.169	0.157
LP8	102	250	40.80%	77	252	30.56%	0.638	0.442	0.922	0.017

**Table E3. Proportion of patients reporting reliable improvement following CBT or Counselling**

Profile	CBT			Counselling			Comparison			
	Reliable improvement	Total	%	Reliable improvement	Total	%	Odds Ratio Counselling vs CBT	Lower 95% CI	Upper 95% CI	p-value
LP1	29	53	54.72%	31	54	57.41%	1.115	0.520	2.394	0.779
LP2	217	302	71.85%	222	312	71.15%	0.966	0.681	1.372	0.848
LP4	133	178	74.72%	114	178	64.04%	0.603	0.382	0.951	0.03
LP5	207	271	76.38%	167	271	61.62%	0.496	0.342	0.720	<0.001
LP6	65	112	58.04%	64	112	57.14%	0.964	0.567	1.638	0.892
LP7	108	170	63.53%	112	171	65.50%	1.090	0.699	1.698	0.704
LP8	177	249	71.08%	168	252	66.67%	0.814	0.557	1.188	0.286

**Table E4. Proportion of patients reporting clinical deterioration following CBT or Counselling**

Profile	CBT			Counselling			Comparison			
	Deterioration	Total	%	Deterioration	Total	%	Odds Ratio Counselling vs CBT	Lower 95% CI	Upper 95% CI	p-value
LP1	4	53	7.55%	7	54	12.96%	1.824	0.501	6.641	0.362
LP2	21	302	6.95%	24	312	7.69%	1.115	0.607	2.049	0.726
LP4	7	176	3.98%	20	178	11.24%	3.056	1.258	7.424	0.014
LP5	11	258	4.26%	22	271	8.12%	1.984	0.942	4.178	0.071
LP6	20	112	17.86%	18	112	16.07%	0.881	0.438	1.771	0.722
LP7	2	169	1.18%	6	171	3.51%	3.036	0.604	15.262	0.178
LP8	6	246	2.44%	13	252	5.16%	2.176	0.813	5.819	0.121