

## **Supplementary Tables 1-9**

Emotions and behaviors of child and adolescent psychiatric patients during the COVID-19 pandemic

C Laurent-Levinson et al.

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**Table S1: Life Changes factor analysis (adolescents)**

Variable	1 Insecurity	2 Family (rev)	3 Stress	4 Activities	5 Friends
Food insecurity	<b>0.727</b>	-0.026	-0.185	-0.103	-0.099
Housing insecurity	<b>0.708</b>	0.194	0.355	0.049	0.044
Financial difficulty	<b>0.705</b>	-0.226	0.332	0.134	0.107
Difficulty following regulations	-0.037	<b>-0.737</b>	0.284	-0.220	-0.080
<b>Change in family relations (rev)</b>	-0.097	<b>0.673</b>	0.342	-0.336	0.014
Stress about friendship changes	0.063	-0.013	<b>0.789</b>	-0.026	0.132
Stress about restrictions	0.225	-0.156	<b>0.681</b>	0.057	0.000
Stress about family changes	-0.016	<b>0.417</b>	<b>0.611</b>	0.123	0.085
Stress about Event Cancellation	0.041	-0.024	0.229	<b>0.833</b>	0.110
Change in relations with friends (rev)	0.075	-0.130	0.287	<b>-0.515</b>	<b>0.406</b>
Change in external conversations (rev)	-0.058	0.012	-0.100	-0.059	<b>0.804</b>
Positives during the crisis (rev)	0.043	0.094	0.211	0.083	<b>0.609</b>
<b>% of total variance explained</b>	<b>13.379</b>	<b>10.607</b>	<b>17.636</b>	<b>9.836</b>	<b>10.413</b>

**Table S2: Life Changes factor analysis (children)**

Variable	1 Relationships	2 Stress	3 Insecurity	4 External
<b>Change in family relations (rev)</b>	<b>0.806</b>	0.003	0.076	-0.222
Positives during the crisis (rev)	<b>0.582</b>	0.208	-0.115	0.061
Change in relations with friends (rev)	<b>0.510</b>	-0.034	<b>0.582</b>	0.213
Stress about Event Cancellation	-0.085	<b>0.683</b>	-0.030	0.048
Stress about family changes	0.384	<b>0.674</b>	0.106	-0.040
Stress about restrictions	0.252	<b>0.661</b>	-0.007	0.207
Stress about friendship changes	0.324	<b>0.640</b>	0.196	0.064
Food insecurity	-0.099	<b>0.639</b>	0.119	-0.259
Financial difficulty	0.008	0.006	<b>0.835</b>	-0.049
Housing insecurity	-0.302	<b>0.416</b>	<b>0.648</b>	-0.017
Change in external conversations (rev)	-0.096	-0.006	0.041	<b>0.907</b>
Difficulty following regulations	0.341	0.344	-0.073	0.286
<b>% tot variance explained</b>	<b>14.989</b>	<b>20.924</b>	<b>12.884</b>	<b>9.356</b>

Shown are the results of Principal Components Analysis of 12 Life Changes items in each cohort, after Varimax rotation, retaining factors with Eigenvalue>1.

Total variance explained is 61.9% in adolescents and 58.2% in children.

For individual items, “rev” indicates that the directionality of the rating was reversed so that a high rating would indicate changes that would typically be viewed as more adverse, e.g., for Change in Family Relations, in the questionnaire a rating of 5 denotes “much better” and 1 denotes “much worse. These values were subtracted from 6 to create the reversed score (1 denotes much better 5 denotes much worse).

For the Factor 2 score for Adolescents, loadings have been reversed here and in Figure 2 (left panel) to clarify that worsening of *Change in Family Relations* was correlated with worsening (positive change) of Mood8-Change scores, as shown in the Figure. This was true in Children as well.

**Table S3: Diagnoses of adolescent cases**

Diagnosis	Absent	Past only	Now only	Past & Now	ALL
Separation anxiety	103	9	0	11	20
Performance anxiety	90	9	0	24	33
Social Phobia	112	4	0	7	11
Other anxiety disorder	93	10	2	18	30
Obsessive-compulsive disorder	117	2	0	4	6
Any anxiety disorder	58	14	1	50	65
Somatization disorder	107	1	0	15	16
Adjustment disorder	105	4	1	13	18
PTSD	116	3	0	4	7
Attachment disorder	113	3	0	7	10
Acute psychotic episode	120	1	0	2	3
Schizophrenia	121	0	1	1	2
Depression	79	13	2	29	44
Bipolar disorder	119	2	0	2	4
Conduct disorder	106	7	0	10	17
Tourette's disorder	121	0	0	2	2
Eating disorder	110	2	2	9	13
Other diagnosis	114	6	0	3	9
ADHD	99			24	
Intellectual deficiency	116			7	
ASD	113			10	
Learning disability	87			36	

**Table S4: Diagnoses of child cases**

Diagnosis	Absent	Past	Current	Past & Now	ALL
Separation anxiety	66	8	0	25	33
Performance anxiety	75	4	2	18	24
Social Phobia	90	3	1	5	9
Other anxiety disorder	83	0	2	14	16
Obsessive-compulsive disorder	98	0	0	1	1
Any anxiety disorder	46	7	4	42	53
Somatization disorder	98	0	0	1	1
Adjustment disorder	84	2	1	12	15
PTSD	97	1	1	0	2
Attachment disorder	88	4	0	7	11
Acute psychotic episode	97	2	0	0	2
Depression	89	2	1	7	10
Bipolar disorder	99	0	0	0	0
Conduct disorder	77	10	1	11	22
Tourette's disorder	96	0	0	3	3
Eating disorder	93	0	0	6	6
ADHD	65			34	
Intellectual deficiency	69			30	
ASD	78			21	
Learning disability	66			33	

**Table S5: MOOD8 scores in relation to confinement and diagnosis (adolescents)**

Diagnosis	Period	N	Mean	SD		t	df	P		
All (during vs. before)	CONF1. Before	123	19.69	6.96		-3.67	122.00	0.00036		
			21.89	6.60						
		<b>Dx-</b>	<b>Mean</b>	<b>SD</b>	<b>Dx+</b>	<b>Mean</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>P</b>
Any anx disorder	CONF1	58	18.81	5.96	65	20.48	7.71	-1.35	118.68	0.180
	Before		21.02	6.41		22.68	6.72	-1.40	120.46	0.164
	Change		-2.21	6.41		-2.20	6.91	-0.01	120.81	0.995
MDD	CONF1	79	18.87	6.33	44	21.16	7.83	-1.66	74.55	0.102
	Before		20.03	5.76		25.25	6.76	-4.33	77.78	0.00004
	Change		-1.15	6.02		-4.09	7.37	2.26	75.12	0.027
ADHD	CONF1	99	19.75	7.15	24	19.46	6.26	0.20	38.92	0.845
	Before		22.30	6.77		20.21	5.67	1.56	40.52	0.127
	Change		-2.56	7.06		-0.75	4.45	-1.57	54.91	0.123
ASD	CONF1	113	19.99	7.06	10	16.30	4.81	2.22	12.72	0.045
	Before		21.93	6.71		21.50	5.58	0.23	11.43	0.823
	Change		-1.94	6.65		-5.20	6.21	1.58	10.91	0.142
ID	CONF1	116	19.72	6.96	7	19.14	7.58	0.20	6.62	0.849
	Before		22.09	6.60		18.57	6.16	1.46	6.86	0.188
	Change		-2.37	6.70		0.57	5.56	-1.34	7.09	0.221

Shown are mean MOOD8 scores and SD before and during the first COVID-19 confinement. The **first row** shows Before and During scores for All participants and the results of a paired t-test demonstrating a significant change (lower MOOD8 during confinement). The **remaining rows** report data for participants without (Dx-) and with (Dx+) five frequent ICD-10 diagnoses and results of t-tests comparing those subgroups. The **Change** score is **CONF1-Before**, so that a negative Change score reflects less low mood and worry during CONF1. Anxiety includes Separation Anxiety Disorder, Performance Anxiety Disorder, Social Phobia, Obsessive-Compulsive Disorder, or Other Anxiety Disorder. MDD = Major Depressive Disorder. ADHD = Attention Deficit Hyperactivity Disorder. ASD = Autism Spectrum Disorder (these were mostly higher-functioning ASD, without comorbid ID). ID = Intellectual Disability or Autism Spectrum Disorder. ID = intellectual Disability.

**Table S6: MOOD8 scores in relation to confinement and diagnosis (children)**

Diagnosis	Period	N	Mean	SD		T	df	P		
All (during vs. before)	CONF1 Before	99	18.43	6.18		-3.77	98.00	0.00028		
			20.77	5.68						
		<b>Dx-</b>	<b>Mean</b>	<b>SD</b>	<b>Dx+</b>	<b>Mean</b>	<b>SD</b>	<b>T</b>	<b>df</b>	<b>P</b>
Any anxiety disorder	CONF1	46	17.50	5.47	53	19.25	6.68	-1.43	96.70	0.156
	Before		19.37	4.55		21.98	6.30	-2.39	94.01	0.019
	Change		-1.87	5.25		-2.74	6.89	0.71	95.46	0.480
Conduct disorder	CONF1	77	18.08	6.03	22	19.68	6.67	-1.02	31.46	0.318
	Before		20.39	5.68		22.09	5.61	-1.25	34.33	0.219
	Change		-2.31	6.27		-2.41	5.92	0.07	35.64	0.947
ADHD	CONF1	64	17.89	6.30	35	19.43	5.90	-1.21	74.12	0.230
	Before		20.47	5.89		21.31	5.31	-0.73	76.47	0.469
	Change		-2.58	6.78		-1.89	4.90	-0.58	89.49	0.561
ID	CONF1	68	18.40	6.23	31	18.52	6.16	-0.89	58.72	0.930
	Before		21.56	5.81		19.03	5.04	2.20	66.45	0.031
	Change		68	-3.16		6.52	31	-0.52	4.93	-2.23

See legend for **Table S5**. ASD was not analyzed separately for children, because out of 22 ASD and 31 ID patients, 19 had both diagnoses.

**Table S7: Lack of association of Mood8-Change with Sex or Age**

<b>Analysis</b>	<b>Subjects</b>	<b>N</b>	<b>t (df)</b>
Mood8-Change X Sex (t-test)	Adolescents	119	0.388 (114.52)
	Children	98	0.360 (44.32)
			<b>r</b>
Mood8-Change X Age (Pearson r)	Adolescents	123	-0.005
	Children	99	-0.062

To determine whether either Sex or Age predicted Mood8-Change, in each cohort t-tests were carried out of Mood8-Change in males vs. females, and Pearson correlations were calculated between Mood8-Change and Age.

All p-values were  $> 0.10$ .

Note that for analyses of sex, Ns are reduced because there were 4 adolescent participants and 1 child participant with non-binary gender so that sex was reported as "other"..

**Table S8: Linear mixed model analysis of Mood8 scores during CONF1 vs. the three months before CONF1, with adjustment for age and sex**

**(A) Adolescents**

Effect	Beta	SE	t	p-value
<b>No covariates (N=123)</b>				
Time	-2.20	0.60	-3.672	<b>0.00036</b>
<b>Adjusting for Age (N=123)</b>				
Time	-2.20	0.60	-3.672	<b>0.00036</b>
Age	1.09	0.25	4.339	<b>0.00003</b>
<b>Adjusting) for Age and Sex (N=119)</b>				
Time	-2.48	0.59	-4.196	<b>0.000052</b>
Age	0.95	0.26	3.613	<b>0.00044</b>
Sex	-1.88	1.06	-1.770	0.079

**(B) Children**

Effect	Beta	SE	t	p-value
<b>No covariates (N=99)</b>				
Time	-2.33	0.62	-3.765	<b>0.00028</b>
<b>Adjusting for Age (N=99)</b>				
Time	-2.33	0.62	-3.765	<b>0.00028</b>
Age	0.03	0.17	0.184	0.85
<b>Adjusting for Age and Sex (N=98)</b>				
Time	-2.49	0.61	-4.110	<b>0.000082</b>
Age	0.01	0.17	0.032	0.97
Sex	0.57	1.14	0.504	0.62

These analyses utilized Linear Mixed Models to evaluate whether, in each cohort, there was a significant change in Mood8 scores during the first COVID-19 confinement period (CONF1, “lockdown”) compared with the scores for the three months prior to COVID. Each model included Subjects (random effect) and Time (fixed effect); subsequently Age and then Age and Sex were entered as fixed effects). Models were fitted by restricted maximum likelihood using R package *lme4*.

The analyses that included Sex as a covariate had reduced Ns because they omitted 4 adolescents and 1 child who were reported as “other” gender. This was because they were seen in a clinic for transgender issues. Thus we first entered Age alone to utilize the full cohorts, and then added Sex (coded categorically as “male” or “female”) as a second covariate after excluding those with “other” sex.

In all analyses, the Time effect remained robustly significant with negative t, **demonstrating a reduction of Mood8 scores, on average, during the first lockdown period (CONF1).**

In Adolescents, older patients had higher Mood8 scores than younger patients across the two time periods. However, as shown in Table S7, there was no correlation between age and the **change** in Mood8 score.

**Table S9: Change in clinicians' CGI-Severity ratings (5 time periods, Linear Mixed Model regression): all subjects, and subgrouped by presence of ID and/or ASD**

**A. Cohort/subgroup statistics; and overall significance of variance across time (LMM)**

	CGI_PAST	CGI_BEFORE	CGI_CONF1	CGI_DECONF	CGI_CONF2	Effect(s)	Chi-sq (df)	P-value
<b>All cases N:</b>	138	139	138	134	128	Global	101.94 (9)	<b>6.38E-18</b>
						Time	42.99 (4)	<b>1.04E-8</b>
						Diagnosis	31.24 (1)	<b>2.27E-8</b>
						Time x Diagnosis	11.05(4)	<b>0.026</b>
<b>Arithmetic Mean</b>	3.21	3.08	2.92	2.75	2.88			
<b>Standard Error</b>	0.12	0.12	0.13	0.13	0.13			
<b>Standard Deviation</b>	1.42	1.47	1.51	1.484	1.51			
<b>With ID and/or ASD N:</b>	35	35	34	34	32	Time	2.63 (4)	0.62
<b>Arithmetic Mean</b>	4.31	4.26	4.32	4.17	4.25			
<b>Standard Error</b>	0.20	0.21	0.23	0.24	0.24			
<b>Standard Deviation</b>	1.21	1.22	1.34	1.38	1.34			
<b>Without ID or ASD N:</b>	103	104	104	100	96	Time	45.45 (4)	<b>3.20E-9</b>
<b>Arithmetic Mean</b>	2.84	2.68	2.46*	2.27*	2.43*			
<b>Standard Error</b>	0.13	0.13	0.12	0.12	0.13			
<b>Standard Deviation</b>	1.29	1.32	1.27	1.18	1.28			

Shown are the Mean, SE and SD of clinician CGI-S ratings for 5 time periods -- PAST (>3 months before COVID); the 3 months BEFORE confinement; CONF1 (first confinement); DECONF (first deconfinement); and CONF2 (second confinement) -- for the entire cohort (N=139), and for subgroups *with* Intellectual Deficiency and/or Autism Spectrum Disorder (N=35) or *without* either diagnosis (N=104), as illustrated in **Figure 4**.

The last 3 columns summarize the LMM analysis of CGI-S ratings using R package *lme4*. The model included Subjects (random effect, intercept); and Time, Diagnosis and Time x Diagnosis (fixed effects) (see Methods for details). Significance was evaluated by likelihood ratio tests. There was a significant interaction between time and diagnostic group ( $p=0,026$ ): CGI-S differed across time points in those without ID or ASD ( $p=3.20E-9$ ) but not in those with ID or ASD ( $p=0.62$ ). For patients without ID or ASD, \* indicates mean CGI-S values that were significantly different than the previous time period (see details in B below).

**B. Pairwise comparisons of adjacent time periods (subgroup *without* ID or ASD, N=104)**

Time period comparison	beta	Se	t	P
<b>BEFORE vs. PAST</b>	-0.129	0.069	-1.881	0.060
<b>CONF1 vs. BEFORE</b>	-0.146	0.069	-2.132	<b>0.033</b>
<b>DECONF vs. CONF1</b>	-0.154	0.069	-2.220	<b>0.026</b>
<b>CONF2 vs. DECONF</b>	0.149	0.071	2.103	<b>0.035</b>

As shown in (A) above, LMM analysis showed significant change of CGI-S score over time, but only in patients *without* ID or ASD. Here we show results of post hoc LMM analysis of differences in CGI-S scores between adjacent time periods. Consistent with the primary analyses of Mood8 scores in both Adolescents and Children, they show an **improvement**, on average, during CONF1. This was followed by a modest **additional improvement** during DECONF and then a **modest worsening** during CONF2 (back to the CONF1 level).