THE LANCET
Psychiatry

Supplementary appendix

Supplemental Table 1. Missing data for associated variables at the COVID-19 wave.

Associated Variable	Complete Cases, %(N)	Missing Cases, %(N)	χ^2	p-value
Income (<80,000)	95·7 (1276/1333)	4·3 (57/1333)	1·97	0·16
Ethnicity	99·5 (1326/1333)	0·5 (7/1333)	0·.73	0·39
Healthcare worker	97·9 (1305/1333)	2·1 (28/1333)	3·75	0·053
Child under 5	97·1 (1294/1333)	2·9 (39/1333)	0·35	0·56
Single parent	97·1 (1295/1333)	2·9 (38/1333)	0·84	0·36
Income disruption	91·4 (1219/1333)	8·6 (114/1333)	0·71	0·40
Exposure to COVID-19	99·5 (1326/1333)	0·5 (7/1333)	0·72	0·40
Difficulty balancing	97·2 (1296/1333)	2·8 (37/1333)	3·04	0·08
Difficulty with childcare	96·9 (1292/1333)	3·1 (41/1333)	1·56	0·21

Note: The χ^2 value is examining the difference in distribution of the associated variable based on whether there was complete (n=1,301) or not complete (n=32) outcome data available.

Supplementary Table 2: Baseline characteristics of AOF participants by whether they participated in the COVID-19 Impact Survey, unweighted analysis.

	Responders (%)	Non-Responders (%)
N	1333 (100·0)	2054 (100·0)
Age, years		
<25	76/1303 (5·80)	220/1978 (11·1)
25-34	958/1303 (73·50)	1385/1978 (70·0)
35-44	269/1303 (20·60)	373/1978 (18·90)
Ethnicity		
Asian	148/1326 (11·20)	290/2026 (14·30)
Black	10/1326 (0·80)	40/2026 (2·0)
First Nations, Inuit, Metis	7/1326 (0·50)	25/2026 (1·20)
Latin	20/1326 (1·50)	58/2026 (2·90)
Other/Mixed	39/1326 (2·90)	79/2026 (3·90)
White	1102/1326 (83·10)	1534/2026 (75·70)
Household income		
>$80,000	945/1277 (74·0)	1290/1973 (65·40)
<$79,999	332/1277 (26·0)	683/1973 (34·60)
Depression score* (mean, SD)	4·81±4·14	5·73±4·62
Anxiety score* (mean, SD)	30·41±8·41	31·83±9·25

Note: Raw data is presented with no corrective weights applied. Depression was measured using the Edinburgh Postnatal Depression Scale. Anxiety was measured using the Spielberger State-Trait Anxiety Inventory.

Supplementary Table 3: Characteristics of AOF participants prior to and after the application of the inverse probability weights.

	Baseline % (N)	3yr Unweighted % (N)	3 yr Weighted %	5 yr Unweighted % (N)	5 yr Weighted %	8 yr Unweighted % (N)	8 yr Weighted %	COVID Unweighted % (N)	COVID Weighted %
Income									
≤59,999	18·43 (607)	13·99 (273)	18·13	13·67 (266)	18·12	14·68 (297)	18·13	13·51 (176)	17·67
≥60,000	81·57 (2687)	86·01 (1678)	81·87	86·33 (1680)	81·88	85·32 (1726)	81·87	86·49 (1127)	82·33
Education									
Some elementary/high school	3·54 (119)	2·31 (46)	3·57	1·76 (35)	3·57	2·17 (45)	3·41	1·35 (18)	3·16
Graduated High School	7·43 (250)	5·92 (118)	7·45	5·68 (113)	7·37	6·04 (125)	7·51	4·96 (66)	7·46
Some post-secondary	14·32 (482)	12·44 (248)	14·36	13·07 (260)	14·37	13·19 (273)	14·26	13·08 (174)	14·40
Graduate post-secondary	58·93 (1983)	62·87 (1253)	59·04	63·25 (1258)	59·12	62·95 (1303)	59·16	64·44 (857)	59·42
Some graduate school	2·67 (90)	2·56 (51)	2·70	2·61 (52)	2·70	2·56 (53)	2·67	2·63 (35)	2·70
Completed graduate school	13·11 (441)	13·90 (277)	12·88	13·62 (271)	12·87	13·09 (271)	12·98	13·53 (180)	12·85
Ethnicity									
Asian	13·07 (438)	11·45 (227)	12·58	11·81 (234)	12·65	12·17 (251)	12·71	11·16 (148)	12·59
Black	1·49 (50)	1·21 (24)	1·43	1·21 (24)	1·37	1·21 (25)	1·40	0·75 (10)	1·18
First Nation, Inuit, Metis	1·0 (32)	0·45 (9)	1·0	0·50 (10)	0·08	0·68 (14)	0·08	0·53 (7)	0·09
Latin	2·33 (78)	1·51 (30)	2·44	1·51 (30)	2·44	1·70 (35)	2·34	1·51 (20)	2·09
Mixed/Other	3·52 (118)	3·08 (61)	3·43	3·03 (60)	3·55	3·49 (72)	3·49	2·94 (39)	3·55
White	78·64 (2636)	82·29 (1631)	79·27	81·93 (1623)	79·21	80·75 (1655)	79·22	83·11 (1102)	79·69

Note: Inverse probability weights were estimated for each time point (i.e., 3,5, and 8-years, and COVID-19 wave) using methods described by Seaman & White (1). The probability of being a responder at each wave was calculated using logistic regression. Demographic and baseline mental health variables were considered as potential predictors of being a responder. Maternal age, income, education, ethnicity and baseline depression and baseline anxiety scores were included. Weights were calculated as 1/the predicted probability of participation and trimmed at the 0.05 and 99.5 percentiles to reduce variability due to outliers. Application of weights at each time point (i.e., 3, 5, 8 years, and COVID-19 wave) restored the proportion of individuals in each category to the baseline estimate.

Supplemental Table 4. Cross-sectional unweighted means and 95% CIs of mental health difficulties scores only for mothers who responded to the COVID-19 Impact Survey (n=1333).

Variable	3 yr (April 2012-Oct· 2014) n=1138	5yr (April 2014-Oct· 2016) n=1205	8yr (Feb 2017-Oct· 2019) n=1297	COVID-19 (May 20th- July 15th, 2020) n=1333
Depression				
Overall	4·73 (4·49-4·97)	5·16 (4·89-5·42)	5·43 (5·18-5·69)	8·06 (7·75-8·38)
Missing, N(%)	196/1333 (14·7)	145/1333 (10·9)	83/1333 (6·2)	49/1333 (3·7)
Age (years)				
<25	7·14 (2·35-11·93)	10·00 (-15·41-35·41)	-	-
25-34	4·68 (4·33-5·03)	4·98 (4·53-5·44)	6·65 (5·76-7·54)	8·57 (7·00-10·14)
35-44	4·79 (4·44-5·14)	5·24 (4·91-5·58)	5·28 (4·99-5·58)	8·06 (7·67-8·45)
45-54	4·22 (2·27-6·18)	5·51 (4·02-7·00)	5·44 (4·71-6·18)	8·00 (7·41-8·61)
Income				
≤$79,999	5·68 (5·09,6·28)	6·87 (6·10-7·64)	6·71 (5·99-7·42)	9·01 (8·16-9·86)
≥$80,000	4·47 (4·20-4·73)	4·82 (4·54-5·09)	5·17 (4·90-5·45)	7·89 (7·55-8·23)
Anxiety				
Overall	9·27 (9·08-9·46)	9·30 (9·11-9·49)	10·14 (9·94-10·33)	11·76 (11·54-11·98)
Missing, N(%)	197/1333 (14·8)	143/1333 (10·7)	62/1333 (4·7)	43 (3·2)
Age (years)				
<25	9·86 (6·96-12·75)	11·00 (-1·71-23·71)	-	-
25-34	9·13 (8·87-9·40)	9·12 (8·81-9·43)	9·98 (9·36-10·60)	12·23 (11·14-13·31)
35-44	9·46 (9·17-9·74)	9·39 (9·15-9·63)	10·21 (9·98-10·44)	11·70 (11·44-11·97)
45-54	7·94 (6·94-8·95)	9·79 (8·66-10·93)	10·00 (9·49-10·51)	11·78 (11·32-12·23)
Income				
≤$79,999	9·94 (9·50-10·39)	9·89 (9·40-10·37)	10·94 (10·41-11·47)	12·26 (11·65-12·86)
≥$80,000	9·10 (8·89-9·31)	9·18 (8·98-9·38)	9·98 (9·77-10·18)	11·64 (11·40-11·88)

Supplemental Table 5. Cross-sectional unweighted proportions and 95% CIs of mental health difficulties scores only for mothers who responded to the COVID-19 Impact Survey (n=1333).

Variable	3 yr (April 2012-Oct· 2014) n=1138	5yr (April 2014-Oct· 2016) n=1205	8yr (Feb 2017-Oct· 2019) n=1297	COVID-19 (May 20th- July 15th, 2020) n=1333
Depression				
Overall	12·14 (10·36, 14·17)	14·98 (13·06, 17·13)	16·80 (14·83, 18·98)	33·57 (31·03, 36·20)
Missing, N(%)	196/1333 (14·7)	145/1333 (10·9)	83/1333 (6·2)	49/1333 (3·7)
Age (years)				
<25	28·57 (7·19, 67·38)	50·00 (5·87, 94·13)	-	-
25-34	12·57 (10·06, 15·59)	14·52 (11·29, 18·48)	26·28 (19·59, 34·28)	38·10 (27·00, 50·59)
35-44	11·30 (8·89, 14·26)	15·09 (12·72, 17·82)	15·45 (13·25, 17·94)	32·95 (29·90, 36·15)
45-54	22·22 (8·59, 46·50)	17·95 (8·80, 33·16)	17·44 (12·47, 23·86)	35·09 (30·07, 40·47)
Income				
≤$79,999	18·42 (13·90, 24·00)	24·38 (18·93, 30·79)	22·97 (17·76, 29·16)	39·58 (32·91, 46·67)
≥$80,000	10·46 (8·62, 12·63)	13·15 (11·17, 15·42)	15·53 (13·43, 17·88)	32·46 (29·70, 35·33)
Anxiety				
Overall	10·92 (9·23, 12·87)	10·59 (8·96, 12·47)	18·17 (16·15, 20·39)	30·16 (27·71, 32·72)
Missing, N(%)	197/1333 (14·8)	143/1333 (10·7)	62/1333 (4·7)	43 (3·2)
Age (years)				
<25	14·29 (1·96, 58·12)	-	-	-
25-34	10·41 (8·13, 13·24)	8·89 (6·39, 12·25)	17·14 (11·76, 24·31)	35·48 (24·63, 48·07)
35-44	11·48 (9·05, 14·46)	11·37 (9·31, 13·83)	19·10 (16·70, 21·75)	29·03 (26·11, 32·13)
45-54	-	15·38 (7·07, 30·28)	14·20 (9·78, 20·18)	31·15 (26·32, 36·43)
Income				
≤$79,999	15·86 (11·66, 21·21)	13·30 (9·28, 18·71)	26·54 (21·02, 32·91)	32·98 (26·68, 39·96)
≥$80,000	9·57 (7·81, 11·67)	9·99 (8·26, 12·03)	16·40 (14·27, 18·77)	29·14 (26·48, 31·94)

Supplemental Table 6· Bivariate and multivariable fixed-effects regression estimates·

Variable	Unadjusted Estimates				Adjusted Estimates*			
	Depression (95% CI)	p-value	Anxiety (95% CI)	p-value	Depression (95% CI)	p-value	Anxiety (95% CI)	p-value
Linear Time Trend	0·01 (0·006, 0·014)	<·0001	-0· 008(-0·02, 0·01)	0·30	0·01 (0·005, 0·014)	<0·0001	-0·01 (-0·02, 0·01)	0·472
Squared Time Trend	-	-	0·0002 (0·00007,0·0004)	0·004	-	-	0·0002 (0·00004, 0·0003)	0·010
Change at COVID	2·30 (1·95, 2·65)	<0·0001	1·04 (0·65, 1·43)	<0·0001	0·47 (-0·22, 1·16)	0·177	-0·34 (-0·89, 0·22)	0·348
Household income before COVID-19	-0·23 (-1·00, 0·54)	0·563	0·06 (-0·51, 0·63)	0·836	-	-	-	-
Single parent	-0·09 (-1·23, 1·05)	0·873	0·30 (-0·56, 1·16)	0·498	-	-	-	-
Children < 5 years	0·31 (-0·52, 1·14)	0·462	-0·05 (-0·68, 0·57)	0·868	-	-	-	-
Ethnic minority	-0·51 (-1·19, 0·18)	0·145	-0·79 (-1·33, -0·24)	0·005	-	-	-0·66 (-1·17, -0·14)	0·027
Impact of COVID-19 on income/employment	0·88 (0·36, 1·40)	0·001	0·78 (0·37, 1·19)	<0·0001	0·86 (0·34, 1·39)	0·001	0·79 (0·41, 1·17)	<0·0001
Healthcare worker	-0·73 (-1·33, -0·13)	0·017	0·00 (-0·47, 0·47)	0·999	-0·81 (-1·45, -0·18)	0·011	-	
Difficulty balancing	1·77 (1·17, 2·37)	<0·0001	1·23 (0·77, 1·68)	<0·0001	1·57 (0·91, 2·23)	<0·0001	1·09 (0·65, 1·54)	<0·0001
Difficulty obtaining childcare	1·10 (0·50, 1·69)	<0·0001	0·78 (0·32, 1·24)	0·001	0·91 (0·27, 1·55)	0·005	0·55 (0·09, 1·01)	0·052
History of mental illness	0·05 (-0·50, 0·60)	0·847	-0·02 (-0·46, 0·41)	0·922	-	-	-	-

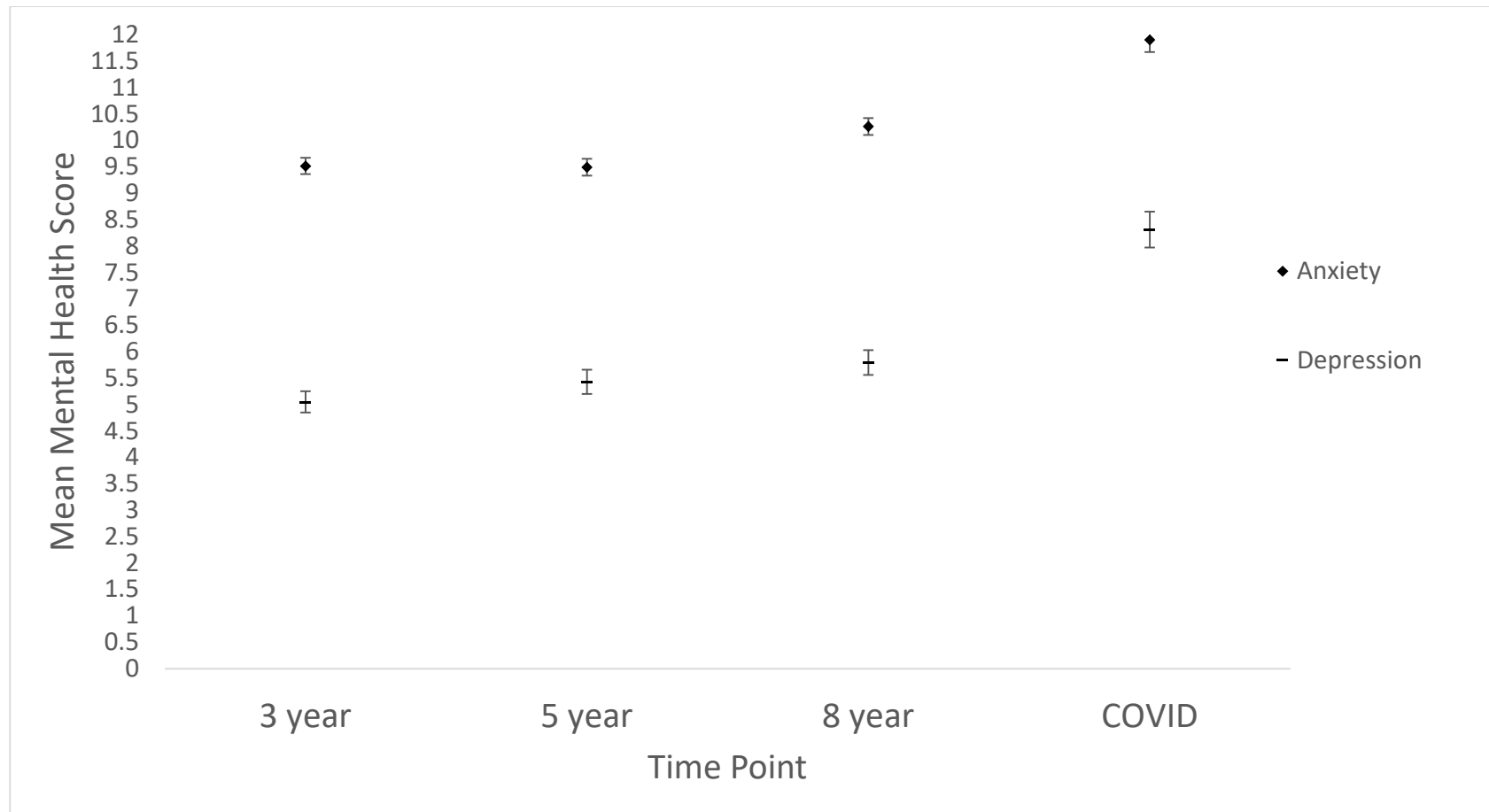*Adjusted for significant factors at the p<·05 level in the unadjusted analysis·
Note: A linear time trend was used for depression, whereas linear and quadratic time trends were used for the anxiety models.

Supplemental Table 7· Depression and Anxiety Symptom Mean Scores and Proportions at the COVID-19 Wave for Mothers with Only Children Versus Mothers with Multiple Children.
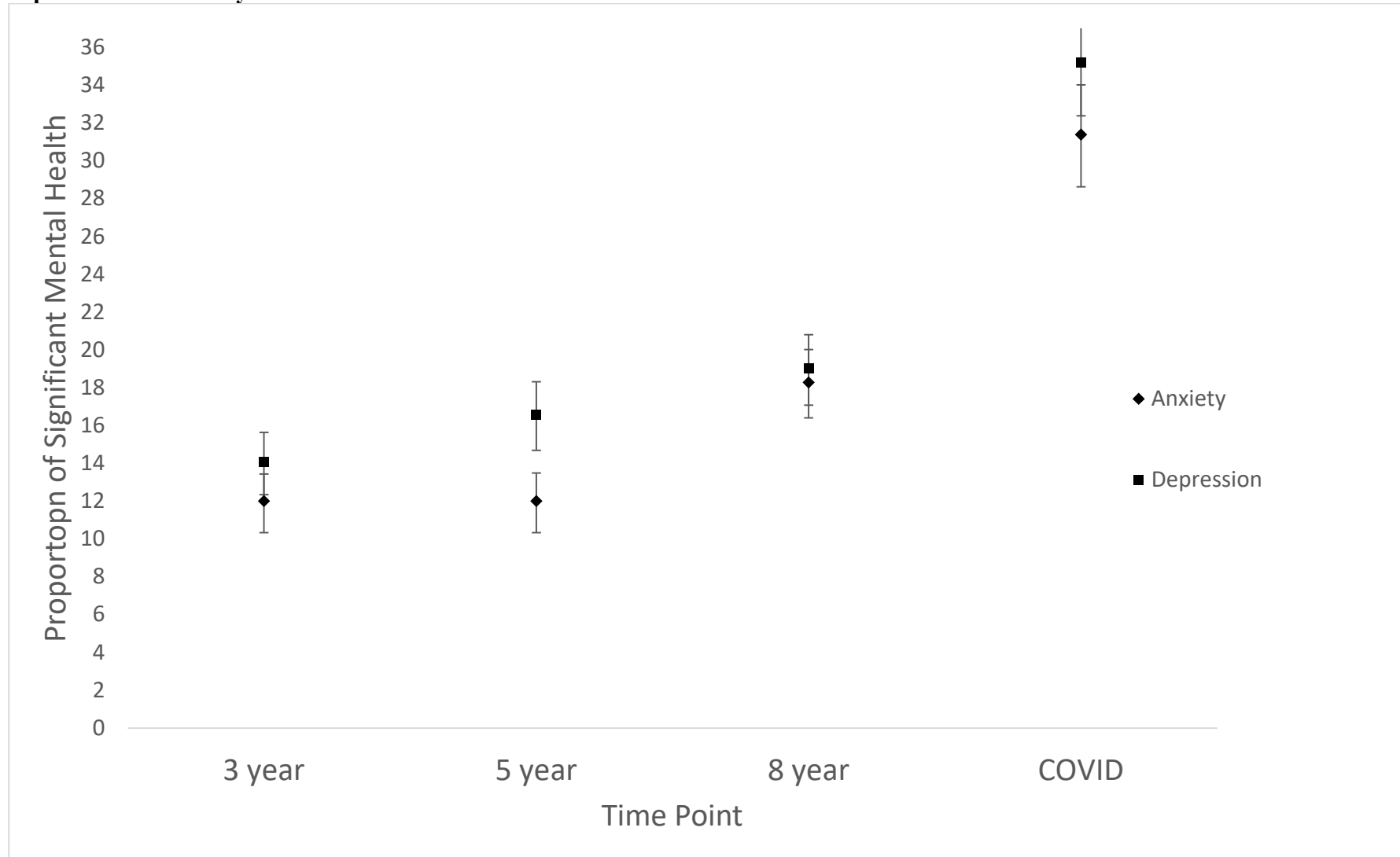
Variable	N (%)	Mean depression (95%CI)	Mean anxiety (95%CI)	Proportion with significant depression (95%CI)	Proportion with significant anxiety (95%CI)
Only Child	155/1333 (11·7)	8·14 (7·14-9·15)	11·62 (10·89-12·35)	30·07 (22·80-37·34)	30·77 (23·53-38·01)
More than one child	1138/1333 (85·4)	8·03 (7·70-8·36)	11·75 (11·51-11·98)	33·90 (31·13-36·67)	29·63 (26·95-32·30)
Missing	39/1333 (2·9)	-	-	-	-

Note. Unweighted raw scores are presented here·

Supplemental Figure 1. Weighted means and 95% confidence intervals for depressive and anxiety symptoms over time.

Supplemental Figure 2. Weighted proportions and 95% confidence intervals for mothers reporting clinically significant depression and anxiety scores over time.

Comparing Difficulties Balancing Multiple Roles and Difficulties Obtaining Childcare based on the Timing of Questionnaire Completion

Differences in Difficulties Balancing Based on Response Prior to or After School Ending on June 26th, 2020

A chi-square test was used to determine whether there was a significant difference between the proportion of mothers who had difficulty balancing roles depending on when they completed the COVID-19 wave survey (i.e., before or after the school year formally ended on June 26th, 2020). Results indicated that 78·72% (984/1250) of mothers had difficulty balancing roles prior to June 26th, 2020, whereas 70·73% (29/41) of mothers had difficulty balancing roles after June 26th, 2020. This difference was not statistically significant, $\chi^2(1) = 1\cdot50$, p = 0·22·

Differences in Difficulties Obtaining Childcare based on Response Prior to or After School Ending on June 26th, 2020

A chi-square test was used to determine whether there was a significant difference between the proportion of mothers who had difficulty obtaining childcare depending on when they completed the COVID-19 wave survey (i.e., before or after the school year formally ended on June 26th, 2020). Results indicated that 25·02% (312/1247) of mothers had difficulty obtaining childcare prior to June 26th, 2020, whereas 30·0% (12/40) of mothers had difficulty obtaining childcare after June 26th, 2020. This difference was not statistically significant, $\chi^2(1) = 0\cdot51$, p = 0·48.

Differences in Difficulties Balancing Roles Based on Response Prior to or After Entering Phase 2 of Re-Opening on June 12th, 2021

A chi-square test was used to determine whether there was a significant difference between the proportion of mothers who had difficulty balancing roles depending on when they completed the COVID-19 wave survey (i.e., before or after the province entered Phase 2 of re-opening on June 12th, 2020). Results indicated that 77·99% (847/1086) of mothers had difficulty balancing roles prior to June 12th, 2020, whereas 80·98% (166/205) of mothers had difficulty balancing roles after June 12th, 2020· This difference was not statistically significant, $\chi^2(1) = 0\cdot91$, p = 0·34.

Differences in Difficulties Obtaining Childcare based on Response Prior to or After Entering Phase 2 of Re-Opening on June 12th, 2020

A chi-square test was used to determine whether there was a significant difference between the proportion of mothers who had difficulty obtaining childcare depending on when they completed the COVID-19 wave survey (i.e., before or after the province entered Phase 2 of re-opening on June 12th, 2020). Results indicated that 24·75% (268/1083) of mothers had difficulty obtaining childcare prior to June 12th, 2020, whereas 27·45% (56/204) of mothers had difficulty obtaining childcare after June 12th, 2020· This difference was not statistically significant, $\chi^2(1) = 0\cdot67$, p = 0·41·

Appendix References

1. Seaman SR, White IR. Review of inverse probability weighting for dealing with missing data. Stat Methods Med Res. 2013;22(3):278-95.