

SUPPLEMENTARY ONLINE MATERIAL FOR

Strict nonselective quarantine and the prediction of suicidal thinking, hopelessness, and substance use in undergraduates: A longitudinal natural experiment 1000 km from a COVID-19 outbreak

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Supplementary Methods

Measures

Suicidal ideation was assessed using the Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2008) adapted for self-report. From the C-SSRS items addressing recent passive (i.e., thoughts of wanting life to be ended, such as by going to sleep and not waking) and active suicidal ideation (i.e., thoughts of wanting to kill one's self), four self-report items were constructed (wished you were dead, wished you could go to sleep and not wake up, wished you were not alive, actually had thoughts of killing yourself), with *Yes-No* response options. At baseline, the reference time-frame was the past month; at follow-ups, the past three days. If endorsed, participants were asked to rate the frequency (1 = *once*, to 5 = *many times each day*) and duration (1 = *fleeting, a few seconds or minutes*, to 5 = *more than 8 hours (or persistent or continuous)*) of the most severe form of ideation endorsed (i.e., active prioritized over passive). For each assessment, the dependent measure was a single binary score reflecting the presence of absence of any suicidal ideation. An item sum score, derived from binary scores from each of the four constituent items at the baseline, gave an internal consistency estimate (Kuder-Richardson-20) of $r_{KR} = .87$. Frequency and duration ratings, which were correlated $r = .40$ ($p < .001$, $n = 109$), were summed to obtain an intensity estimate ($\alpha = .56$) that is reported here for completion but was not used in modelling.

State hopelessness was measured at baseline and follow-ups using the 2-item Brief-H-Neg (Everson et al., 1996). Item wording was amended by adding the prefix phrase, "Right now" (e.g., "Right now, I feel that it is impossible to reach the goals I would like to strive for"). Participants responded using a labelled 5-point agreement scale (*absolutely agree*, to *absolutely disagree*); the dependent measure was the sum of ratings (range 0 = minimum hopelessness, 8 = maximum). In large adult medical samples, the Brief-H-Neg items are correlated $r = .53$ (Everson et al., 1996), have high internal consistency ($\alpha = .80$) (Fraser et al., 2014), and the rating sum correlates $r = .93$ with the Beck

Hopelessness Scale (Fraser et al., 2014). Using baseline data from our sample, the Brief-H-Neg items correlated $r = 0.52$ with $\alpha = .68$.

Alcohol, nicotine, and recreational drug use were assessed using three items from the *DSM-5* Self-Rated Level 1 Cross-Cutting Symptom Measure—Adult (American Psychiatric Association, 2013). Wording of the nicotine item was amended to include vaping. For the baseline, the response options were those of the published scale (past two weeks); for follow-ups, the reference time-frame was “today” with *Yes-No* response options. The dependent measure was a binary score for the presence of drug use.

At baseline participants provided demographic data and completed a range of other measures among which were distributed six inattention items (e.g., “to show you are paying attention, select the response that means agree”). Scored dichotomously, inattention items were used to detect random responding. As a sum score, the internal consistency estimate for inattentive responding was $r_{KR} = .72$. The dependent measure of the inattention items was a single binary variable indicating inattentive responding (i.e., one or more incorrect responses).

Statistical analysis

Bayesian growth models, without priors, were tested using Mplus 8.8. Model results were obtained using the Bayes estimator, Gibbs parameter extension (PX1) and random walk Markov chain Monte Carlo algorithms, 2 chains, thinning set to every 30th iteration, and the probit link function. The convergence criterion was set to 0.05 and the iteration minimum and maximum to 1000 and 1×10^6 , respectively. If convergence was achieved, to determine that convergence was stable, the analysis was repeated with double the iterations required to meet convergence. For hopelessness—a continuous indicator—residual variances were constrained to be equal across time and intercepts were set to zero. For dichotomous indicators (ideation, substance use), the means of intercept growth factors were fixed at zero, the starting values for the slope components (linear, quadratic, etc) were set at zero, error variances of the indicators were fixed at 1, and the thresholds were constrained to be equal (Grimm et al., 2017).

Model-based estimates of ideation and drug use probabilities across the nine assessment waves were approximated (Grimm et al., 2017). I approximated change in these probabilities arising from the influence of quarantine. Estimated variance of quarantine, required for estimating change, was approximated from the geometric average of the model-estimated variance of quarantine at each wave.

Supplementary Results

Bivariate correlations (**Table 2**) show that there was moderate to high consistency across waves in suicidal ideation and hopelessness; mean correlations were medium to large in size and did not vary widely. Drug use appeared slightly less consistent, although still moderately correlated across waves.

Whereas ideation and hopelessness were consistently related, neither of these was related to drug use. Most correlations of male sex and minority status with ideation, drug use, and hopelessness—28 of the 30 coefficients—were not significant.

Growth models

In all quadratic models, variance estimates in all growth components were significant (for all, $p < .001$), indicating variability across participants. Convergence and fit statistics for exploratory intercept-only, linear, quadratic, cubic, and quartic growth models appear in **Tables S1 and S2**. For suicidal ideation, intercept-only and linear models were not satisfactory, with these yielding significant non-fitting residuals. The quadratic growth model provided the best fit for suicidal ideation, with cubic and quartic models offering no improvement. Trace plots indicated parameter estimates were stable, although there was a high level of autocorrelation in the growth factors and covariance estimates. When sex and minority status were added as time-invariant predictors of growth parameters in the quadratic model, autocorrelation improved even though sex and minority status did not have significant effects on the intercept and slope of growth (**Table S3**).

None of the growth models for drug use were free of non-fitting residuals; the linear and non-linear models could not be distinguished in respect of fit (**Table S1**). For most models, trace and autocorrelation plots were satisfactory; adjustment for sex and minority status led to improvement in autocorrelation. The cubic and quartic models did not converge when using the Gibbs random walk algorithm.

Unadjusted intercept-only, linear, and quadratic models of growth in hopelessness did not fit observed data ($PPP < .05$) whereas the unadjusted cubic and quartic models had satisfactory PPP values (**Table S2**). DIC statistics suggested that, with the random walk algorithm, the quadratic and cubic models were optimal, and with the parameter extension algorithm, the cubic model was optimal. When adjusted for sex and minority status, the quadratic model was satisfactory ($PPP = .153$) and only negligibly worse in respect of relative and absolute fit indices. RMSEA, TLI, and CFI indices were good in all nonlinear models of growth in hopelessness.

Mediation model for the indirect effects of quarantine on suicidal ideation

Given the absence of direct effects does not preclude indirect effects (Hayes, 2009; MacKinnon et al., 2000), I tested whether quarantine affected suicidal ideation through its influence on hopelessness. Modelling proceeded in several steps. In Model 1, simultaneous quadratic growth trajectories for ideation and hopelessness and paths from linear slopes of one were regressed on to intercepts of the other. In Model 2, observed ratings were regressed onto quarantine, which was treated as a time-varying covariate. In Model 3, which is shown in **Fig. 3**, observed ratings of suicidal ideation were regressed onto observed hopelessness ratings, and the indirect effect of quarantine on suicidal ideation was obtained. In Model 4, the direct path from quarantine to suicidal ideation was

removed. Models 3 and 4 were tested without and with adjustment for sex and minority ethnic status. Modelling relied on the Gibbs random walk algorithm; these could not be run with the PX1 algorithm.

Convergence and fit indices for the four models are shown in **Table S5** and model parameter estimates in **Table S6**. Model 3 with adjustment and Model 4 without adjustment were the best fitting models. As in the planned analyses, quarantine had no direct effect on suicidal ideation (probit = -0.23, 95% credibility interval = -0.59, 0.11) and had a significant direct effect on hopelessness (standardized $b = 0.12$, 95% CI = 0.05, 0.19). Hopelessness significantly affected suicidal ideation (probit = 0.42, $p < .001$, 95% credibility interval = 0.32, 0.54). At the mean level of hopelessness, the approximate mean rate of suicidal ideation was 16.7% (range across assessment waves = 11.6% to 22.2%), at 1 *SD* below average hopelessness, the mean rate was 9.4% (6.7% to 14.2% across waves), and at 1 *SD* above average hopelessness, the mean rate was 27.0% (17.9% to 32.7%). Quarantine had a significant indirect effect on suicidal ideation (effect = 0.11, $p < .001$, 95% credibility interval = 0.04, 0.19; **Table S6**). Removal of the direct path from quarantine to suicidal ideation had no meaningful effect on model fit or the parameter estimates (**Tables S5 & S6**).

The intercepts of suicidal ideation and hopelessness were correlated across all models. These correlations were higher in models without hopelessness as a time-varying covariate (e.g., in Model 2, $r = .66$, $p < .001$, and in Model 3, $r = .31$, $p = .002$). The linear and nonlinear changes in ideation and hopelessness were correlated in Models 1 and 2 (e.g., Model 2, for the linear slope, $r = .63$, $p = .001$, for the quadratic, $r = .37$, $p = .034$) but not in models where hopelessness was a time-varying covariate (e.g., Model 3, linear $r = .18$, $p = .50$; quadratic $r = -.05$, $p = .87$). That is, the starting points for ideation and hopelessness were strongly related, and before allowing mediation, ideation and hopelessness followed related patterns of linear and non-linear change. Once mediation was permitted, involving a contemporaneous effect of hopelessness on ideation, the growth patterns were less closely linked.

Mplus analysis code excerpts for growth models (without quarantine)

1. Intercept only model, categorical dependent variable

```
VARIABLE:
    CATEGORICAL = si_t1-si_t9;
    MISSING = .;

ANALYSIS:
    PROCESSORS = 6;
    ESTIMATOR = BAYES;
    LINK = PROBIT;
    TYPE = RANDOM;
    THIN = 30;
    COVERAGE = 0;
    BSEED = 1856;    ! random.org on 20220525 at 2033

MODEL:
    is | si_t1@-1.00 si_t2@-0.75 si_t3@-0.50 si_t4@-0.25 si_t5@0.00
        si_t6@0.25 si_t7@0.50 si_t8@0.75 si_t9@1.00;

    is;
    [is@0];
    si_t1-si_t9@1; !error var fixed at 1 in probit
    [si_t1$1-si_t9$1] (tau);
```

2. Quadratic growth model, categorical dependent variable

```
MODEL:
    is ss qs | si_t1@-1.00 si_t2@-0.75 si_t3@-0.50 si_t4@-0.25
        si_t5@0.00 si_t6@0.25 si_t7@0.50 si_t8@0.75 si_t9@1.00;

    is ss qs;
    [is@0 ss*0 qs*0];
    is WITH ss qs;
    ss WITH qs;
    si_t1-si_t9@1; ! error var fixed at 1 in probit
    [si_t1$1-si_t9$1] (tau);
```

3. Quadratic growth model, continuous dependent variable, with adjustment

```
VARIABLE:
    USEVARIABLES = bNeg_t1-bNeg_t9 male minority;

MODEL:
    is ss qs | bNeg_t1@-1.00 bNeg_t2@-0.75 bNeg_t3@-0.50 bNeg_t4@-0.25
        bNeg_t5@0.00 bNeg_t6@0.25 bNeg_t7@0.50 bNeg_t8@0.75
        bNeg_t9@1.00;

    is ss qs;
    [is ss qs];
    is WITH ss qs;
    ss WITH qs;
    bNeg_t1-bNeg_t9 (theta);
    [bNeg_t1-bNeg_t9@0];
    is ss ON male minority;
```

Mplus analysis code excerpts for growth models with quarantine as time-varying covariate

1. Quadratic model, categorical dependent variable with quarantine

```
VARIABLE:
    USEVARIABLES = si_t1-si_t9 lock_t1-lock_t9

MODEL:
    is ss qs | si_t1@-1.00 si_t2@-0.75 si_t3@-0.50 si_t4@-0.25
               si_t5@0.00 si_t6@0.25 si_t7@0.50 si_t8@0.75 si_t9@1.00;

    is ss qs;
    [is@0 ss*0 qs*0];
    is WITH ss qs;
    ss WITH qs;

    si_t1-si_t9@1; ! error var fixed at 1 in probit
    [si_t1$1-si_t9$1] (tau);
    si_t1 ON lock_t1 (lock);
    si_t2 ON lock_t2 (lock);
    si_t3 ON lock_t3 (lock);
    si_t4 ON lock_t4 (lock);
    si_t5 ON lock_t5 (lock);
    si_t6 ON lock_t6 (lock);
    si_t7 ON lock_t7 (lock);
    si_t8 ON lock_t8 (lock);
    si_t9 ON lock_t9 (lock);
```

2. Quadratic model, continuous dependent variable with quarantine

```
VARIABLE:
    USEVARIABLES = bNeg_t1-bNeg_t9 lock_t1-lock_t9

MODEL:
    is ss qs | bNeg_t1@-1.00 bNeg_t2@-0.75 bNeg_t3@-0.50 bNeg_t4@-0.25
               bNeg_t5@0.00 bNeg_t6@0.25 bNeg_t7@0.50 bNeg_t8@0.75
               bNeg_t9@1.00;

    is ss qs;
    [is ss qs];
    is WITH ss qs;
    ss WITH qs;

    bNeg_t1-bNeg_t9 (theta);
    [bNeg_t1-bNeg_t9@0];
    bNeg_t1 ON lock_t1 (hlock);
    bNeg_t2 ON lock_t2 (hlock);
    bNeg_t3 ON lock_t3 (hlock);
    bNeg_t4 ON lock_t4 (hlock);
    bNeg_t5 ON lock_t5 (hlock);
    bNeg_t6 ON lock_t6 (hlock);
    bNeg_t7 ON lock_t7 (hlock);
    bNeg_t8 ON lock_t8 (hlock);
    bNeg_t9 ON lock_t9 (hlock);
```

Mplus analysis code excerpts for modelling of indirect effects

```
VARIABLE:
    USEVARIABLES = si_t1-si_t9 bNeg_t1-bNeg_t9 lock_t1-lock_t9
                  male minority;
    CATEGORICAL = si_t1-si_t9;
    MISSING = .;

ANALYSIS:
    PROCESSORS = 6;
    ESTIMATOR = BAYES;
    ALGORITHM = GIBBS(RW);      ! Mediation modelling required Gibbs RW;
                                ! these could not be run with the PX1
                                ! algorithm.

    LINK = PROBIT;
    TYPE = RANDOM;
    THIN = 30;
    COVERAGE = 0;
    BSEED = 1856;      ! random.org on 20220525 at 2033

MODEL:
    ! quadratic model of suicidal ideation
    is ss qs | si_t1@-1.00 si_t2@-0.75 si_t3@-0.50 si_t4@-0.25
              si_t5@0.00 si_t6@0.25 si_t7@0.50 si_t8@0.75 si_t9@1.00;
    is ss qs;      [is@0 ss*0 qs*0];
    is WITH ss qs; ss WITH qs;
    si_t1-si_t9@1; ! error var fixed at 1 in probit
    [si_t1$1-si_t9$1] (tau);
    ! quadratic models of hopelessness
    ih sh qh | bNeg_t1@-1.00 bNeg_t2@-0.75 bNeg_t3@-0.50 bNeg_t4@-0.25
              bNeg_t5@0.00 bNeg_t6@0.25 bNeg_t7@0.50 bNeg_t8@0.75
              bNeg_t9@1.00;
    ih sh qh;      [ih sh qh];
    ih WITH sh qh; sh WITH qh;
    bNeg_t1-bNeg_t9 (theta);
    [bNeg_t1-bNeg_t9@0];
    ss ON ih; sh ON is; is WITH ih; ss WITH sh;
    ! adjustment
    is ss ih sh ON male minority;
    ! path from hopelessness to ideation
    si_t1 ON bNeg_t1 (hless);
    si_t2 ON bNeg_t2 (hless);
    si_t3 ON bNeg_t3 (hless);
    si_t4 ON bNeg_t4 (hless);
    si_t5 ON bNeg_t5 (hless);
    si_t6 ON bNeg_t6 (hless);
    si_t7 ON bNeg_t7 (hless);
```

```

    si_t8 ON bNeg_t8 (hless);
    si_t9 ON bNeg_t9 (hless);
    ! path from quarantine (lockdown) to ideation (omitted to test
    ! mediation without a direct effect)
    si_t1 ON lock_t1 (lock);
    si_t2 ON lock_t2 (lock);
    si_t3 ON lock_t3 (lock);
    si_t4 ON lock_t4 (lock);
    si_t5 ON lock_t5 (lock);
    si_t6 ON lock_t6 (lock);
    si_t7 ON lock_t7 (lock);
    si_t8 ON lock_t8 (lock);
    si_t9 ON lock_t9 (lock);
    !path from quarantine to hopelessness
    bNeg_t1 ON lock_t1 (hlock);
    bNeg_t2 ON lock_t2 (hlock);
    bNeg_t3 ON lock_t3 (hlock);
    bNeg_t4 ON lock_t4 (hlock);
    bNeg_t5 ON lock_t5 (hlock);
    bNeg_t6 ON lock_t6 (hlock);
    bNeg_t7 ON lock_t7 (hlock);
    bNeg_t8 ON lock_t8 (hlock);
    bNeg_t9 ON lock_t9 (hlock);
MODEL CONSTRAINT:
    ! estimate indirect effect
    NEW(path);
    path = hless * hlock;

```

Table S1. Model convergence and fit indices for suicidal ideation and drug use ($n = 280$)

Model (free parameters)	Suicidal ideation			Drug use		
	PSR	PPP	Non-fitting residuals n (%)	PSR	PPP	Non-fitting residuals n (%)
Algorithm: random walk						
Intercept only (2)	1.000	.480	11 (6.4)	1.000	.480	6 (3.5)
Linear (5)	1.048	.510	2 (1.2)	1.057	.427	9 (5.2)
Quadratic (9)	1.068	.493	0	1.056	.477	8 (4.6)
Cubic (14)	1.008	.503	1 (0.6)	DNC	—	—
Quartic (20)	1.085	.457	1 (0.6)	DNC	—	—
Quad adjusted (13)	1.010	.512	1 (0.6)	1.053	.522	9 (5.2)
Quad quarantine (10)	1.072	.426	0	1.067	.519	8 (4.6)
Quad quarantine adj (14)	1.075	.424	0	1.075	.526	6 (3.5)
Algorithm: parameter extension 1						
Intercept only (2)	1.000	.480	11 (6.4)	1.000	.480	6 (3.5)
Linear (5)	1.000	.520	2 (1.2)	1.001	.475	4 (2.3)
Quadratic (9)	1.003	.514	0	1.008	.503	4 (2.3)
Cubic (14)	1.057	.569	0	1.076	.485	3 (1.7)
Quartic (20)	1.013	.530	0	1.060	.520	3 (1.7)
Quad adjusted (13)	1.007	.569	0	1.031	.489	5 (2.9)
Quad quarantine (10)	1.008	.436	0	1.040	.475	4 (2.3)
Quad quarantine adj (14)	1.030	.450	0	1.070	.532	4 (2.3)

Note. PSR – potential scale reduction, PPP – posterior predictive p -value, (%) – percentage of 173 standardized residuals in the model, DNC – did not converge, adj – adjusted for male sex and minority status.

Table S2. Model convergence and fit indices for hopelessness ($n = 280$)

Model (free parameters)	PSR	PPP	DIC	RMSEA	CFI	TLI
Algorithm: random walk						
Intercept only (3)	1.001	.000	8258.986	.066	.969	.978
Linear (6)	1.004	.010	8221.791	.040	.989	.992
Quadratic (10)	1.001	.032	8218.834	.035	.992	.994
Cubic (15)	1.078	.096	8218.827	.031	.995	.995
Quartic (21)	1.063	.126	8221.285	.030	.996	.996
Quad adjusted (14)	1.004	.153	8221.633	.019	.997	.997
Quad quarantine (11)	1.008	.267	8207.326	.004	1.00	1.00
Quad quarantine adj (15)	1.007	.423	8213.085	.000	1.00	1.00
Cubic adjusted (19)	1.002	.257	8222.085	.013	.999	.999
Cubic quarantine (16)	1.078	.378	8207.651	.000	1.00	1.00
Cubic quarantine adj (20)	1.083	.530	8210.574	.000	1.00	1.00
Algorithm: parameter extension 1						
Intercept only (3)	1.001	.000	8258.986	.066	.969	.978
Linear (6)	1.000	.015	8221.960	.041	.989	.992
Quadratic (10)	1.002	.035	8220.037	.036	.992	.994
Cubic (15)	1.001	.114	8218.091	.032	.994	.995
Quartic (21)	1.002	.158	8218.942	.027	.996	.996
Quad adjusted (14)	1.002	.153	8223.771	.022	.996	.996
Quad quarantine (11)	1.002	.267	8209.038	.007	.999	.999
Quad quarantine adj (15)	1.001	.406	8212.389	.000	1.00	1.00
Cubic adjusted (19)	1.033	.252	8221.226	.010	.999	.999
Cubic quarantine (16)	1.005	.386	8207.095	.000	1.00	1.00
Cubic quarantine adj (20)	1.003	.559	8209.209	.000	1.00	1.00

Note. PSR – potential scale reduction, PPP – posterior predictive p -value, DIC – deviance information criterion, RMSEA – root mean square error of approximation, CFI – comparative fit index, TLI – Tucker-Lewis index, quad – quadratic, adj – adjusted for male sex and minority status.

Table S3. Coefficients for change and predictors of change in suicidal ideation and drug use ($n = 280$)

Component	Suicidal ideation			Drug use		
	Base growth model	Base + quarantine	Base + quarantine + adjustment	Base growth model	Base + quarantine	Base + quarantine + adjustment
Threshold	1.86 (1.54, 2.22)	1.84 (1.50, 2.27)	1.83 (1.43, 2.26)	3.02 (2.48, 3.80)	3.04 (2.46, 3.97)	3.38 (2.72, 4.48)
Linear	-0.48 (-0.98, -0.08)	-0.48 (-0.96, -0.08)	-0.50 (-1.05, -0.11)	-0.41 (-1.77, 0.28)	-0.57 (-1.94, 0.27)	-0.47 (-1.66, 0.37)
Quadratic	-0.50 (-1.14, 0.04)	-0.54 (-1.15, 0.05)	-0.51 (-1.23, 0.12)	-0.17 (-1.58, 0.82)	-0.41 (-2.01, 0.93)	-0.22 (-1.48, 0.89)
I on male	—	—	-0.68 (-1.59, 0.11)	—	—	0.66 (-0.06, 1.43)
L on male	—	—	0.24 (-0.38, 0.92)	—	—	-0.18 (-0.95, 0.62)
I on minority	—	—	0.14 (-0.64, 0.95)	—	—	0.78 (0.07, 1.54)
L on minority	—	—	0.02 (-0.59, 0.55)	—	—	-0.25 (-0.95, 0.48)
Quarantine	—	-0.08 (-0.36, 0.20)	-0.08 (-0.37, 0.22)	—	0.17 (-0.26, 0.59)	0.21 (-0.24, 0.68)

Note. Coefficients are probability units (probits) and their 95% credibility intervals obtained using the PX1 algorithm. Base model is the quadratic growth model. The linear time weights range from -1 to 1 (interval increments = 0.25) across Waves 1 to 9, respectively; quadratic time weights are the linear time weights squared. For quarantine, note that negative probits correspond to lower outcome probabilities; positive probits correspond to higher outcome probabilities. I — intercept, L — linear slope.

Table S4. Coefficients for change and predictors of change in hopelessness ($n = 280$)

Component	Quadratic			Cubic		
	Base growth model	Base + quarantine	Base + quarantine + adjustment	Base growth model	Base + quarantine	Base + quarantine + adjustment
Intercept	1.17 (1.01, 1.34)	1.15 (0.99, 1.31)	1.18 (1.00, 1.35)	1.16 (1.00, 1.33)	1.14 (0.98, 1.30)	1.17 (1.00, 1.34)
Linear	0.14 (-0.04, 0.32)	0.01 (-0.18, 0.21)	-0.05 (-0.27, 0.16)	0.14 (-0.08, 0.37)	0.07 (-0.15, 0.30)	0.05 (-0.19, 0.28)
Quadratic	0.13 (-0.13, 0.46)	0.07 (-0.20, 0.37)	0.07 (-0.21, 0.40)	0.13 (-0.12, 0.37)	0.07 (-0.19, 0.33)	0.06 (-0.19, 0.33)
Cubic	—	—	—	-0.10 (-0.45, 0.19)	-0.10 (-0.44, 0.18)	-0.11 (-0.46, 0.17)
I on male	—	—	-0.29 (-0.64, 0.07)	—	—	-0.29 (-0.61, 0.07)
L on male	—	—	0.24 (-0.29, 0.75)	—	—	0.11 (-0.18, 0.42)
I on minority	—	—	0.02 (-0.33, 0.35)	—	—	0.01 (-0.34, 0.35)
L on minority	—	—	0.23 (-0.30, 0.78)	—	—	0.12 (-0.16, 0.41)
Quarantine	—	0.12 (0.05, 0.19)	0.12 (0.05, 0.19)	—	0.13 (0.06, 0.20)	0.13 (0.06, 0.20)

Note. Coefficients are standardized (STDY) beta values and their 95% credibility intervals obtained using the PX1 algorithm, indicating standardized changes in outcomes for unit changes in time (e.g., from Wave 1 to 5) and the binary covariates (present = 1, absent = 0). The linear time weights range from -1 to 1 (interval increments = 0.25) across Waves 1 to 9, respectively; quadratic time weights are the linear time weights squared. I — intercept, L — linear slope.

Table S5. Convergence and fit indices for the mediation of the effect of quarantine on suicidal ideation via hopelessness

Model, model description (free parameters)	PSR	PPP	Non-fitting residuals <i>n</i> (%)
1: Separate H and SI growth (26)	1.022	.112	1 (0.6)
2: Quarantine added as time-varying predictor of H and SI (28)	1.083	.230	1 (0.6)
3a: H added as time-varying predictor of SI (29)	1.064	.365	1 (0.6)
3b: Model 3a with adjustment (male, minority) (35)	1.046	.496	0
4a: Direct path from quarantine to SI removed (28)	1.080	.389	0
4b: Model 4a with adjustment (male, minority) (34)	1.069	.493	1 (0.6)

Note. Models are illustrated in **Fig. S1** and **Fig. 3**. Models estimated using the PX1 algorithm. H – hopelessness, SI – suicidal ideation, PSR – potential scale reduction, PPP – posterior predictive *p*-value, (%) – percentage of 173 standardized residuals in the model, DNC – did not converge, adj – adjusted for male sex and minority status (*n* = 280).

Table S6. Coefficient estimates for mediation models ($n = 280$)

Path	Model 3a unadjusted	Model 3b adjusted	Model 4a unadjusted	Model 4b adjusted
H intercept to SI slope	0.24 (-0.12, 0.51)	0.24 (-0.10, 0.50)	0.21 (-0.16, 0.51)	0.21 (-0.14, 0.48)
SI intercept to H slope	0.01 (-0.22, 0.23)	0.01 (-0.22, 0.22)	0.01 (-0.22, 0.24)	0.01 (-0.21, 0.22)
Quarantine to H	0.12* (0.05, 0.19)	0.12* (0.05, 0.19)	0.12* (0.05, 0.20)	0.12* (0.05, 0.19)
Quarantine to SI	-0.23 (-0.59, 0.11)	-0.23 (-0.59, 0.11)	—	—
H to SI (probit)	0.42* (0.32, 0.54)	0.43* (0.32, 0.54)	0.41* (0.30, 0.53)	0.41* (0.31, 0.52)
Indirect effect of quarantine on SI	0.11* (0.04, 0.19)	0.11* (0.04, 0.19)	0.11* (0.04, 0.18)	0.11* (0.05, 0.18)
SI R^2 range over W1-9	0.818, 0.919	0.826, 0.912	0.815, 0.910	0.829, 0.908

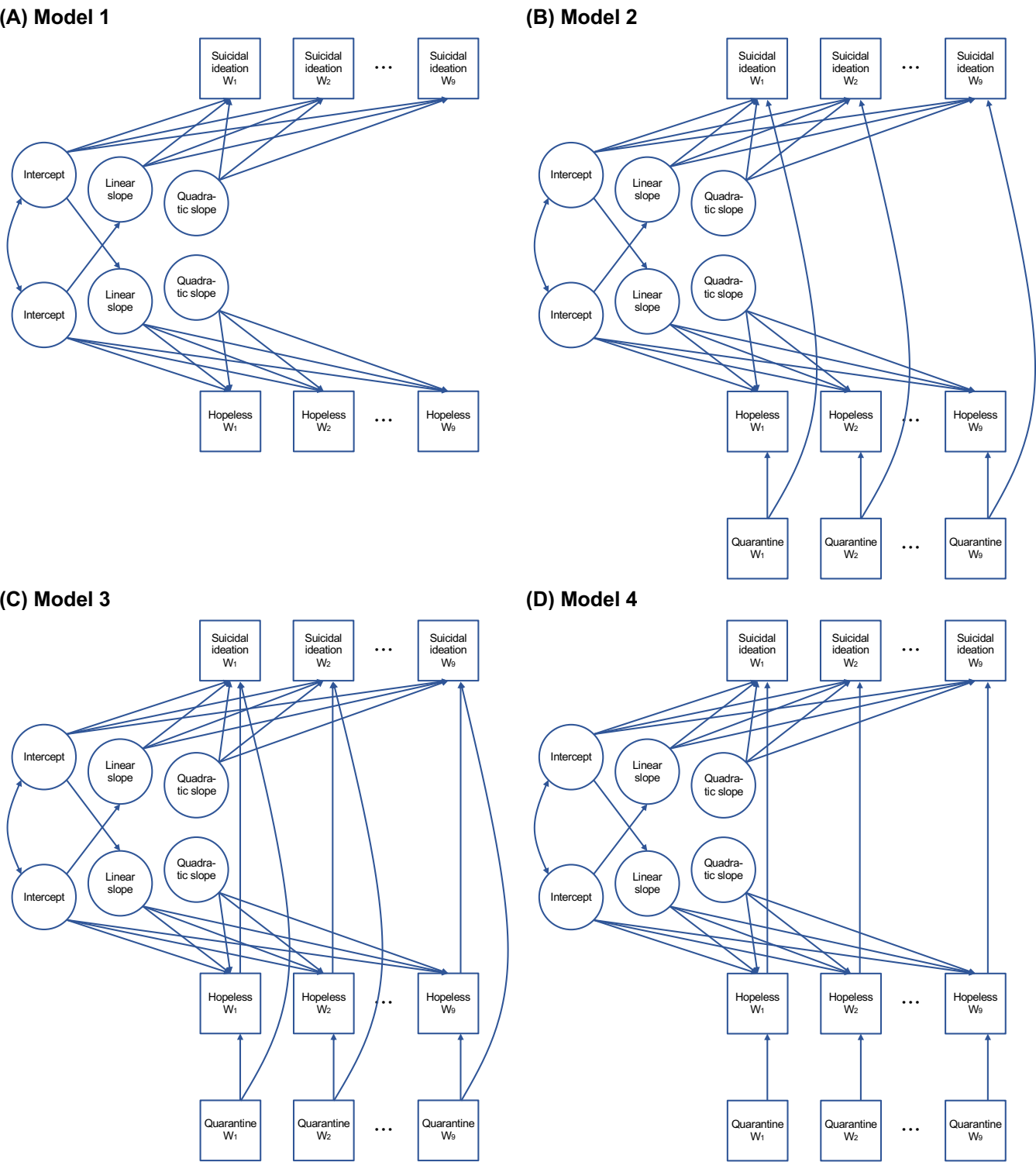
Note. Model compositions and adjustment variables are shown in **Table S5**; models are illustrated in **Fig. S1**. Coefficients are standardized beta values or probit coefficients and their 95% credibility intervals obtained using the random walk algorithm; the indirect effect is the product of the corresponding unstandardized beta and probit coefficients. SI – suicidal ideation, H – hopelessness, W1-9 – Wave 1 to Wave 9, * – 95% credibility interval excluded zero.

Table S7. Bivariate correlations between corresponding growth factors in mediation models

	Hopelessness					
	Intercept	Linear slope	Quadratic slope	Intercept	Linear slope	Quadratic slope
Suicidal ideation	Model 1			Model 2		
Intercept	.65***			.66***		
Linear slope		.61***			.59***	
Quadratic slope			.37*			.46**
	Model 3			Model 4		
Intercept	.31***			.32***		
Linear slope		.13			.16	
Quadratic slope			-.05			-.05

Note. Models are described in **Table S5** and illustrated in **Fig. S1**. * – $p < .05$, ** – $p < .01$, *** – $p < .001$

Fig. S1. Model Steps Used to Test for Indirect Effects of Quarantine on Suicidal Ideation Mediated by Hopelessness



Note: For clarity, residual error and covariance components are omitted. W1-9 – Wave 1 to Wave 9.

Alt text: Four simplified path diagrams for growth in hopelessness and suicidal ideation across assessment waves 1 to 9, representing Models 1 to 4, labelled A to D. Diagram A shows parallel quadratic growth models. Diagram B adds direct paths from quarantine to the outcomes. Diagram C adds direct paths from hopelessness to ideation, allowing for mediation. Diagram D has no direct paths from quarantine to ideation.

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