

A 20-year longitudinal cohort study of post-traumatic stress disorder in World Trade Center responders

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Sample Characteristics

The average age of responders at the time of exposure was 37.53 years ($SD = 8.47$). The sample was predominately male ($n = 11,652$; $\sim 91\%$), with comparatively few females ($n = 1,170$; $\sim 9\%$). The majority of responders identified as White and not Latino ($n = 9693$; $\sim 76\%$), followed by Black and not Latino ($n = 640$; $\sim 5\%$), multi-racial and Latino ($n = 356$; $\sim 3\%$), and Asian or Pacific Islander and not Latino ($n = 127$; $\sim 1\%$), while Native Americans ($n = 19$; $< 1\%$) comprised less than 1% of the sample. Approximately 14% of responders had missing data for race and/or ethnicity and, therefore, were categorized as “Other/Unknown” race/ethnicity ($n = 1775$). Reported in Table 1, demographic characteristics were self-identified by participants selecting responses from a multiple-choice survey.

Descriptive Statistics

Compared to a normal distribution, positive third and fourth order moments indicated that, year by year, cross-sectional distributions of PCL scores were peaked with comparatively thick and positively skewed tails, suggesting a possible floor effect. Indeed, depending on the year, 16% to 34% of responders reported few to no symptoms, indicated by PCL scores equal to 17 or 18 (on a scale that ranges from 17 - 85). In the full sample, the average PCL score was relatively stable from year to year (range of means = [26.04, 29.70], range of $SD = [11.24, 14.77]$), and there were higher average and greater variation in symptoms for responders with a lifetime diagnosis of PTSD (range of means = [38.22, 49.59], range of $SD = [13.05, 17.68]$).

Mixed Effects Models

In the equations below, PCL_{ti} is the repeatedly measured PTSD symptoms at time t for responder i . $[\beta_0 + d_{i0}]$ is the intercept or predicted score for responder i when $Time_{ti} - 10 = 0$. β_0 is the fixed effect or expected sample mean for the intercept and d_{0i} is the random effect or

individual deviations from the expected sample mean. $[\beta_1 + d_{1i}]$ is the predicted linear slope or rate of change for responder i given a one-unit change in time, where time is the number of years since the 9/11 attacks. β_1 is the fixed linear slope or expected sample mean for the linear slope and d_{1i} is the random linear slope, which captures individual deviations from the expected sample mean. $[\beta_2 + d_{i2}]$ and $[\beta_3 + d_{i3}]$ are the non-linear slopes or predicted rates of change for responder i given a one-unit change in a transformation of time, either quadratic (equations 4 or 5), natural log (equation 6), square root (equation 7), or cubic (equations 8 & 9). Finally, ϵ_{it} is an individual time-specific residual score. All models were estimated using maximum likelihood and results were compared across different R packages (“nlme”, “lme4”, “lcm”) to ensure consistency of findings across analytic routines.

$$(1) PCL_{it} = \beta_0 + d_{i0} + \epsilon_{ti}$$

$$(2) PCL_{it} = \beta_0 + d_{i0} + \beta_1 \times [Time_{ti} - 10] + \epsilon_{ti}$$

$$(3) PCL_{it} = [\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + \epsilon_{ti}$$

$$(4) PCL_{it} = [\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + \beta_2 \times [Time_{ti} - 10]^2 + \epsilon_{ti}$$

$$(5) PCL_{it} = [\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + [\beta_2 + d_{i2}] \times [Time_{ti} - 10]^2 + \epsilon_{ti}$$

$$(6) PCL_{it} = [\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times Time_{ti} + [\beta_2 + d_{i2}] \times \ln[Time_{ti}] + \epsilon_{ti}$$

$$(7) PCL_{it} = [\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times Time_{ti} + [\beta_2 + d_{i2}] \times \sqrt{Time_{ti}} + \epsilon_{ti}$$

$$(8) PCL_{it} = [\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + [\beta_2 + d_{i2}] \times [Time_{ti} - 10]^2 + \beta_3 \times [Time_{ti} - 10]^3 + \epsilon_{ti}$$

$$(9) PCL_{it} = [\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + [\beta_2 + d_{i2}] \times [Time_{ti} - 10]^2 + [\beta_3 + d_{i3}] \times [Time_{ti} - 10]^3 + \epsilon_{ti}$$

Note, the addition of a fixed cubic slope (equation 8) had negligible impact on information criteria (e.g., $\Delta < 10$), compared to a more parsimonious quadratic model with no cubic term (equation 5), but the addition of a random cubic slope (equation 9) lowered information criteria considerably (e.g., $\Delta BIC > 800$). However, less than 1% of the variance in PCL scores was accounted for by the addition of the random cubic effect ($\Delta R^2_{\text{conditional}} = .008$), and no variance was accounted for by the addition of a fixed cubic effect ($\Delta R^2_{\text{marginal}} = .000$). The intra-class correlation (ICC = .82 vs .83) and residual standard

deviation (5.6 vs 5.5) also remained largely unchanged before and after the inclusion of random cubic effects. Therefore, the more parsimonious model was selected as the preferred model and carried forward for subsequent analyses.

Generalized Mixed Effects Models

$$(10) \quad PCL_{it} = e^{(\beta_0 + d_{i0} + \epsilon_{ti})}$$

$$(11) \quad PCL_{it} = e^{(\beta_0 + d_{i0} + \beta_1 \times [Time_{ti} - 10] + \epsilon_{ti})}$$

$$(12) \quad PCL_{it} = e^{[\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + \epsilon_{ti}}$$

$$(13) \quad PCL_{it} = e^{[\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + \beta_2 \times [Time_{ti} - 10]^2 + \epsilon_{ti}}$$

$$(14) \quad PCL_{it} = e^{[\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + [\beta_2 + d_{i2}] \times [Time_{ti} - 10]^2 + \epsilon_{ti}}$$

$$(15) \quad PCL_{it} = e^{[\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times Time_{ti} + [\beta_2 + d_{i2}] \times \ln[Time_{ti}] + \epsilon_{ti}}$$

$$(16) \quad PCL_{it} = e^{[\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times Time_{ti} + [\beta_2 + d_{i2}] \times \sqrt{Time_{ti}} + \epsilon_{ti}}$$

$$(17) \quad PCL_{it} = e^{[\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + [\beta_2 + d_{i2}] \times [Time_{ti} - 10]^2 + \beta_3 \times [Time_{ti} - 10]^3 + \epsilon_{ti}}$$

$$(18) \quad PCL_{it} = e^{[\beta_0 + d_{i0}] + [\beta_1 + d_{i1}] \times [Time_{ti} - 10] + [\beta_2 + d_{i2}] \times [Time_{ti} - 10]^2 + [\beta_3 + d_{i3}] \times [Time_{ti} - 10]^3 + \epsilon_{ti}}$$

Table S1. Information Criteria Comparing Linear and Generalized Mixed Effects Models of PCL Total Scores for the Full Sample

Linear Mixed Effect Models Estimated in Full Sample	-LL	AIC	BIC	SSBIC
$PCL_{ti} = \beta_0 + u_{0i} + \epsilon_{ti}$	-286652.73	573314.10	573342.02	573342.02
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + u_{0i} + \epsilon_{ti}$	-286526.51	573072.21	573109.43	573109.43
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + \epsilon_{ti}$	-286335.78	572704.80	572751.33	572751.33
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti}$	-284015.18	568052.51	568108.35	568108.35
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti}$	-283833.84	567703.81	567768.95	567768.95
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	-282359.69	564761.02	564854.08	564854.08
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 \log(Time)_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \log(Time)_{ti} + \epsilon_{ti}$	-282735.55	565502.38	565595.44	565595.44
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 \sqrt{Time_{ti}} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \sqrt{Time_{ti}} + \epsilon_{ti}$	-283183.43	566398.20	566491.26	566491.26
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	-282350.63	564760.33	564862.69	564862.69
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + u_{3i} Time_{ti}^3 + \epsilon_{ti}$	-281876.74	563820.29	563959.88	563959.88
Generalized Mixed Effects Models Estimated in Full Sample	-LL	AIC	BIC	SSBIC
$PCL_{ti} = e^{(\beta_0 + u_{0i} + \epsilon_{ti})}$	-255322.44	510650.882	510678.800	510703.183
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + u_{0i} + \epsilon_{ti})}$	-255047.73	510103.449	510140.673	510173.185
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + \epsilon_{ti})}$	-254928.67	509867.348	509913.877	509954.517
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti})}$	-249294.66	498601.312	498657.147	498705.914
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti})}$	-249128.38	490951.104	498335.892	498392.788
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti})}$	-245465.55	497166.871	491044.163	491125.441
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 \log(Time)_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \log(Time)_{ti} + \epsilon_{ti})}$	-248573.44	496833.797	497259.930	497341.207
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 \sqrt{Time_{ti}} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \sqrt{Time_{ti}} + \epsilon_{ti})}$	-248406.90	490934.501	496926.856	497008.133
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti})}$	-245456.25	486824.970	491036.866	491126.273
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + u_{3i} Time_{ti}^3 + \epsilon_{ti})}$	-243397.49	510650.882	486964.558	487086.476

Notes. The top three models with the lowest information criteria are printed in bold font. Time = years since 9/11 – 10. β = fixed effect. u = random effect. ϵ = residual error term. LL = loglikelihood. AIC = Akaike Information Criteria. BIC = Bayesian Information Criteria. SSBIC = Sample-size adjusted Bayesian Information Criteria.

Table S2. Information Criteria Comparing Linear and Generalized Mixed Effects Models of PCL Total Scores for Responders with a Diagnosis of PTSD

Linear Mixed Effect Models Estimated for PTSD Cases	-LL	AIC	BIC	SSBIC
$PCL_{ti} = \beta_0 + u_{0i} + \epsilon_{ti}$	-34049.40	68104.79	68126.04	68157.10
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + u_{0i} + \epsilon_{ti}$	-33978.81	67971.22	67999.54	68035.35
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + \epsilon_{ti}$	-33823.53	67671.79	67707.20	67744.23
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti}$	-33617.44	67251.28	67293.78	67351.48
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti}$	-33468.24	66964.02	67013.60	67072.51
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	-33303.91	66640.71	66711.53	66802.15
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 \log(Time)_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \log(Time)_{ti} + \epsilon_{ti}$	-33353.88	66730.22	66801.04	66902.09
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 \sqrt{Time}_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \sqrt{Time}_{ti} + \epsilon_{ti}$	-33325.86	66673.44	66744.27	66846.06
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	-33303.61	68104.79	66732.49	66820.98
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + u_{3i} Time_{ti}^3 + \epsilon_{ti}$	-33227.72	67971.22	66616.80	66746.94
Generalized Mixed Effects Models Estimated for PTSD Cases	-LL	AIC	BIC	SSBIC
$PCL_{ti} = e^{(\beta_0 + u_{0i} + \epsilon_{ti})}$	-33530.62	67067.24	67088.48	67119.54
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + u_{0i} + \epsilon_{ti})}$	-33430.96	66869.91	66898.24	66939.65
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + \epsilon_{ti})}$	-33301.41	66612.82	66648.24	66699.99
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti})}$	-32685.10	65382.19	65424.69	65486.79
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti})}$	-32529.01	65072.03	65121.60	65194.06
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti})}$	-32129.11	64278.23	64349.05	64452.57
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 \log(Time)_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \log(Time)_{ti} + \epsilon_{ti})}$	-32247.85	64515.71	64586.53	64690.04
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 \sqrt{Time}_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \sqrt{Time}_{ti} + \epsilon_{ti})}$	-32193.49	64406.98	64477.81	64581.32
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti})}$	-32129.08	64280.17	64358.08	64471.94
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + u_{3i} Time_{ti}^3 + \epsilon_{ti})}$	-31910.24	63850.48	63956.72	64111.99

Notes. The top three models with the lowest information criteria are printed in bold font. Time = years since 9/11 – 10. β = fixed effect. u = random effect. ϵ = residual error term. LL = loglikelihood. AIC = Akaike Information Criteria. BIC = Bayesian Information Criteria. SSBIC = Sample-size adjusted Bayesian Information Criteria.

Table S3. Fit Statistics Comparing Generalized Mixed Effects Models to Linear Mixed Effects, Latent Class Growth Analysis, and Linear Growth Mixture Models in the Full Sample

Parameters	Model	G	-LL	AIC	BIC	SSBIC
$PCL_{ti} = \beta_0 + u_{0i} + \epsilon_{ti}$	MLM	1	-286652.73	573314.10	573342.02	573342.02
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + u_{0i} + \epsilon_{ti}$	MLM	1	-286526.51	573072.21	573109.43	573109.43
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + \epsilon_{ti}$	MLM	1	-286335.78	572704.80	572751.33	572751.33
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti}$	MLM	1	-284015.18	568052.51	568108.35	568108.35
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti}$	MLM	1	-283833.84	567703.81	567768.95	567768.95
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	MLM	1	-282359.69	564761.02	564854.08	564854.08
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 \log(Time)_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \log(Time)_{ti} + \epsilon_{ti}$	MLM	1	-282735.55	565502.38	565595.44	565595.44
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 \sqrt{Time}_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \sqrt{Time}_{ti} + \epsilon_{ti}$	MLM	1	-283183.43	566398.20	566491.26	566491.26
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	MLM	1	-282350.63	564760.33	564862.69	564862.69
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + u_{3i} Time_{ti}^3 + \epsilon_{ti}$	MLM	1	-281876.74	563820.29	563959.88	563959.88
$PCL_{ti} = e^{(\beta_0 + u_{0i} + \epsilon_{ti})}$	GMLM	1	-255322.44	510650.88	510678.80	510703.18
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + u_{0i} + \epsilon_{ti})}$	GMLM	1	-255047.94	510103.88	510141.10	510173.61
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + \epsilon_{ti})}$	GMLM	1	-254930.36	509870.73	509917.26	509957.90
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti})}$	GMLM	1	-249294.66	498601.31	498657.15	498705.91
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + \epsilon_{ti})}$	GMLM	1	-249128.33	498270.67	498335.81	498392.70
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti})}$	GMLM	1	-245450.09	490920.18	491013.24	491094.52
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 \log(Time)_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \log(Time)_{ti} + \epsilon_{ti})}$	GMLM	1	-246642.01	493304.01	493397.07	493478.35
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 \sqrt{Time}_{ti} + u_{0i} + u_{1i} Time_{ti} + u_{2i} \sqrt{Time}_{ti} + \epsilon_{ti})}$	GMLM	1	-246205.81	492431.61	492524.67	492605.95
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti})}$	GMLM	1	-245448.93	490919.86	491022.22	491111.63
$PCL_{ti} = e^{(\beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + \beta_3 Time_{ti}^3 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + u_{3i} Time_{ti}^3 + \epsilon_{ti})}$	GMLM	1	-243322.91	486675.81	486815.40	486937.32
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	LCGA	2	-282359.69	564747.38	564851.80	564807.31
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	GMM	2	-274851.87	549733.75	549845.63	549797.96
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	LCGA	3	-278755.74	557547.48	557681.74	557624.54
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	GMM	3	-273559.32	547158.63	547307.81	547244.25
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	LCGA	4	-279788.33	559620.65	559784.75	559714.83
$PCL_{ti} = \beta_0 + \beta_1 Time_{ti} + \beta_2 Time_{ti}^2 + u_{0i} + u_{1i} Time_{ti} + u_{2i} Time_{ti}^2 + \epsilon_{ti}$	GMM	4	-273306.90	546663.81	546850.28	546770.83

Notes. GMLM = generalized multi-level model. LCGA = latent class growth analysis. GMM = growth mixture model. G = number of groups or classes. Time = years since 9/11 – 10. β = fixed effect. u = random effect. ϵ = residual error term. LL = loglikelihood. AIC = Akaike Information Criteria. BIC = Bayesian Information Criteria. SSBIC = Sample-size adjusted Bayesian Information Criteria.

Table S4. Results of Generalized Mixed Effects Models with a Gamma Distribution and Log Link for the Full Sample and PTSD cases

$$\text{Equation: } PCL_{ti} = e^{([\beta_0 + d_{0i}] + [\beta_1 + d_{1i}] \times [Time_{ti} - 10] + [\beta_2 + d_{2i}] \times [Time_{ti} - 10]^2 + \epsilon_{ti})}$$

Parameters	Fixed Effects			Parameters	Correlations Between Random Effects		
	Regression Coefficient (β)	$e^{(\beta)}$	p-value		Intercept (d_0)	Linear Slope (d_1)	Quadratic Slope (d_2)
Full sample							
Intercept (β_0)	3.2730 (0.0029)	26.3835	< 2e-16	Intercept (d_0)	0.2484		
Linear Slope (β_1)	0.0019 (0.0004)	1.0018	2.49e-05	Linear Slope (d_1)	0.13	0.0264	
Quadratic Slope (β_2)	-0.0009 (0.0000)	0.9991	< 2e-16	Quadratic Slope (d_2)	-0.48	-0.67	0.0032
PTSD cases							
Intercept (β_0)	3.8373 (0.0076)	46.4015	< 2e-16	Intercept (d_0)	0.1979		
Linear Slope (β_1)	0.0064 (0.0015)	1.0064	1.33e-05	Linear Slope (d_1)	0.00	0.0305	
Quadratic Slope (β_2)	-0.0022 (0.0002)	0.9977	< 2e-16	Quadratic Slope (d_2)	-0.39	-0.67	0.0034

Note. β = Unstandardized coefficients are reported with standard errors in parentheses. $e^{(\beta)}$ = exponentiated coefficients. p-values are two-tailed and derived from a Wald test statistic. Standard deviations of random effects are reported on the diagonal of the correlation matrix of random effects. The exponentiated unstandardized intercept is the predicted PCL score 10-years after 9/11, when linear and quadratic effects equal zero. The exponentiated slopes are interpreted as average percent change in PCL scores as a linear and quadratic function of time, such that the effect of the linear coefficient remains constant over time, while the effect of the quadratic coefficient increases.

Table S5. Percentiles of Predicted Change in PCL-17 Total Scores Across Increasing Time Lags

PCL at Baseline (range = 17-26)															
Time Lag	1%	5%	10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%	95%	99%
1 Year	-1	-1	-1	0	0	0	0	0	0	1	1	1	2	2	3
5 Years	-4	-3	-2	-1	-1	-1	0	0	1	2	3	4	7	10	14
10 Years	-6	-5	-4	-3	-2	-1	0	1	2	4	5	7	13	19	29
15 Years	-7	-5	-4	-3	-3	-2	-1	0	2	4	5	8	15	21	33
20 Years	-7	-6	-5	-4	-3	-3	-2	-1	1	2	3	5	11	17	28

PCL at Baseline (range = 27-36)															
Time Lag	1%	5%	10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%	95%	99%
1 Year	-3	-2	-2	-1	-1	-1	0	0	1	1	1	2	2	3	4
5 Years	-9	-7	-6	-4	-4	-3	-1	0	2	4	5	6	10	12	16
10 Years	-14	-11	-9	-7	-6	-5	-3	0	3	7	8	12	18	23	33
15 Years	-15	-12	-10	-8	-7	-6	-3	0	3	7	10	12	20	26	35
20 Years	-15	-12	-11	-9	-7	-6	-3	-1	2	6	8	11	18	23	31

PCL at Baseline (range = 37-46)															
Time Lag	1%	5%	10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%	95%	99%
1 Year	-5	-4	-4	-2	-2	-1	-1	0	0	1	1	2	3	3	4
5 Years	-15	-13	-11	-7	-6	-5	-3	-1	1	3	5	7	10	13	16
10 Years	-22	-20	-17	-13	-11	-10	-6	-3	1	5	7	10	18	23	28
15 Years	-25	-21	-18	-15	-14	-12	-8	-5	-1	3	6	8	16	24	28
20 Years	-25	-22	-19	-16	-15	-13	-11	-8	-4	1	3	4	11	14	20

PCL at Baseline (range = 47-56)															
Time Lag	1%	5%	10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%	95%	99%
1 Year	-6	-5	-4	-3	-3	-2	-1	-1	0	1	1	1	2	2	4
5 Years	-19	-16	-13	-10	-9	-8	-5	-3	-1	2	3	4	6	7	14
10 Years	-27	-24	-22	-18	-16	-14	-11	-7	-3	2	3	5	9	11	23
15 Years	-32	-28	-25	-22	-20	-19	-15	-10	-7	-2	0	2	6	12	21
20 Years	-36	-30	-27	-24	-22	-20	-18	-13	-10	-6	-5	-2	4	8	11

PCL at Baseline (range = 57-66)															
Time Lag	1%	5%	10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%	95%	99%
1 Year	-8	-8	-6	-5	-4	-4	-2	-2	-1	0	0	0	2	3	3
5 Years	-25	-23	-19	-15	-12	-12	-9	-7	-5	-1	-1	0	7	9	11
10 Years	-36	-35	-32	-25	-22	-21	-18	-15	-9	-4	-3	-1	11	14	18
15 Years	-41	-38	-37	-31	-29	-27	-25	-18	-13	-8	-6	-3	2	9	14
20 Years	-45	-43	-38	-31	-30	-29	-28	-24	-18	-11	-9	-7	-1	0	7

PCL at Baseline (>66)															
Time Lag	1%	5%	10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%	95%	99%
1 Year	-12	-9	-9	-9	-9	-8	-5	-4	-4	-3	-3	-2	0	1	1
5 Years	-39	-39	-37	-31	-29	-28	-27	-25	-19	-16	-14	-11	-9	1	1
10 Years	-62	-62	-57	-54	-53	-48	-45	-42	-31	-25	-25	-19	-19	-2	-2
15 Years	-68	-68	-64	-63	-60	-58	-54	-45	-35	-28	-27	-27	-22	-10	-10
20 Years	-67	-67	-66	-63	-63	-63	-58	-42	-35	-33	-31	-24	-22	-21	-21

Table S6A. Results of Generalized Mixed Effects Model with Demographic Factors and PTSD Diagnosis Predicting Level of PTSD Symptoms

Parameter/Predictor	Beta¹	95% CI¹	p-value	q-value²
(Intercept)	3.1172	3.0963, 3.1382	<0.0001	<0.0001
Linear Effect of Time	0.0010	0.0001, 0.0019	0.0276	0.0441
Quadratic Effect of Time	-0.0007	-0.0008, -0.0006	<0.0001	<0.0001
Age Group on 9/11/2001				
< 26 Years	—	—		
26-35 Years	0.0091	-0.0124, 0.0305	0.4069	0.5008
36-45 Years	0.0424	0.0211, 0.0637	0.0001	0.0003
46-55 Years	0.0481	0.0245, 0.0718	0.0001	0.0002
56-65 Years	0.0023	-0.0333, 0.0378	0.9005	0.9441
> 65 Years	-0.0851	-0.1649, -0.0052	0.0368	0.0535
Sex				
Male	—	—		
Female	0.0251	0.0094, 0.0408	0.0017	0.0031
Race/Ethnicity				
White (Not Latino)	—	—		
API (Not Latino)	0.0151	-0.0300, 0.0601	0.5119	0.5851
Black (Not Latino)	-0.0007	-0.0213, 0.0198	0.9441	0.9441
Multi-Racial (Latino)	0.0380	0.0153, 0.0606	0.0010	0.0021
Other/Unknown	0.0468	0.0222, 0.0714	0.0002	0.0004
White (Latino)	0.0251	-0.0035, 0.0536	0.0855	0.1139
Occupation on 9/11/2001				
Law Enforcement	—	—		
Not Law Enforcement	0.1334	0.1233, 0.1436	<0.0001	<0.0001
PTSD Diagnosis				
No	—	—		
Yes	0.5713	0.5584, 0.5841	<0.0001	<0.0001

¹Beta = unstandardized coefficient. CI = Confidence Interval. p-values are two-tailed and derived from a Wald test statistic. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure

Table S6B. Results of Bayesian Generalized Mixed Effects Model with Imputation of Missing Data and Demographic Factors and PTSD Diagnosis Predicting Level of PTSD Symptoms

Parameter/Predictor	Beta¹	95% CI¹		p-value	q-value²
(Intercept)	2.9902	2.8380	3.0836	<0.0001	<0.0001
Linear Effect of Time	0.0540	0.0254	0.1003	<0.0001	<0.0001
Quadratic Effect of Time	-0.0048	-0.0084	-0.0027	<0.0001	<0.0001
Age Group on 9/11/2001					
< 26 Years	-	-	-		
26-35 Years	0.0287	0.0037	0.0528	0.0253	0.0450
36-45 Years	0.0463	0.0201	0.0707	0.0027	0.0071
46-55 Years	0.0440	0.0153	0.0712	0.0067	0.0133
56-65 Years	0.0481	0.0052	0.0900	0.0333	0.0485
> 65 Years	-0.0147	-0.1296	0.0918	0.8027	0.8562
Sex					
Male	-	-	-		
Female	0.0260	0.0033	0.0477	0.0293	0.0469
Race/Ethnicity					
White (Not Latino)	-	-	-		
API (Not Latino)	0.0200	-0.0359	0.0730	0.4760	0.5440
Black (Not Latino)	-0.0002	-0.0295	0.0260	0.9707	0.9707
Multi-Racial (Latino)	0.0438	0.0127	0.0759	0.0053	0.0122
Other/Unknown	0.0145	-0.0399	0.0418	0.2867	0.3528
White (Latino)	0.0371	-0.0020	0.0793	0.0653	0.0871
Occupation on 9/11/2001					
Law Enforcement	-	-	-		
Not Law Enforcement	0.1150	0.0898	0.1299	<0.0001	<0.0001
PTSD Diagnosis					
No	-	-	-		
Yes	0.5401	0.4539	0.5749	<0.0001	<0.0001

¹Beta = mean posterior estimate. CI = credibility interval. p-values are two-tailed and derived from posterior distributions of the estimated parameters. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure.³ The Bayesian Generalized Mixed Effects Model adjusts for multiple covariates reported above. The response variable, PTSD symptom severity (PCL), is modeled using a Gamma distribution with a log link to account for its positive skewness. Fixed effects include linear and quadratic terms for time since 9/11, as well as covariates such as age group, sex, race/ethnicity, law enforcement status, and PTSD diagnosis. Random effects account for individual-level variability through random intercepts and random slopes for time (both linear and quadratic terms) to model repeated measures over time. This approach ensures robust inference while addressing potential biases from missing observations. The fixed effects used default priors that are non-informative, specifically normal distributions for regression coefficients, while the default prior for variance components of random effects is an inverse-gamma distribution with hyperparameters designed to be weakly informative. In the absence of custom priors, these defaults were employed to ensure stable estimation without overly influencing the posterior distribution.

Table S7A. Results of Generalized Mixed Effects Model with Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels of PTSD Symptoms using Listwise Deletion of Missing Data

Characteristic	Beta	95% CI¹	p-value	q-value²
(Intercept)	2.9673	2.9371, 2.9974	<0.0001	<0.0001
Linear Effect of Time	0.0024	0.0014, 0.0034	<0.0001	<0.0001
Quadratic Effect of Time	-0.0008	-0.0009, -0.0007	<0.0001	<0.0001
Age on 9/11/2001				
< 26 Years	—	—		
26-35 Years	0.0009	-0.0246, 0.0265	0.9425	0.9425
36-45 Years	0.0280	0.0024, 0.0536	0.0319	0.0408
46-55 Years	0.0453	0.0164, 0.0742	0.0021	0.0031
56-65 Years	-0.0584	-0.1013, -0.0155	0.0077	0.0104
> 65 Years	-0.0407	-0.1589, 0.0776	0.5005	0.5482
Sex				
Male	—	—		
Female	0.0670	0.0483, 0.0856	<0.0001	<0.0001
Race/Ethnicity				
White (Not Latino)	—	—		
API (Not Latino)	0.0884	0.0390, 0.1378	0.0005	0.0007
Black (Not Latino)	-0.0030	-0.0272, 0.0212	0.8075	0.8442
Multi-Racial (Latino)	0.0823	0.0546, 0.1100	<0.0001	<0.0001
Other/Unknown	0.0936	0.0615, 0.1257	<0.0001	<0.0001
White (Latino)	0.0269	-0.0070, 0.0607	0.1198	0.1450
Occupation on 9/11/2001				
Law Enforcement	—	—		
Not Law Enforcement	0.2474	0.2344, 0.2604	<0.0001	<0.0001
WTC-Related Traumatic Exposures				
Early Arrival				
Not Exposed	—	—		
Exposed	0.0307	0.0179, 0.0435	<0.0001	<0.0001
Witnessed Collapse of Towers				
Not Exposed	—	—		
Exposed	0.0105	-0.0037, 0.0247	0.1470	0.1691
Dust Cloud				
Not Exposed	—	—		
Exposed	0.0543	0.0406, 0.0681	<0.0001	<0.0001
Human Remains				
Not Exposed	—	—		
Exposed	0.0524	0.0386, 0.0662	<0.0001	<0.0001
Blood or Bodily Fluids				
Not Exposed	—	—		
Exposed	0.0247	0.0117, 0.0376	0.0002	0.0003
Slept on Ditch at Ground Zero				
Not Exposed	—	—		
Exposed	0.1087	0.0950, 0.1225	<0.0001	<0.0001
Knew Someone Who Was Injured				
Not Exposed	—	—		
Exposed	0.0716	0.0601, 0.0830	<0.0001	<0.0001
Traumatic Bereavement				
Not Exposed	—	—		
Exposed	0.0579	0.0457, 0.0702	<0.0001	<0.0001

Notes. ¹Beta = unstandardized estimate. CI = confidence interval. p-values are two-tailed and derived from a Wald test statistic. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure

Table S7B. Results of Bayesian Generalized Mixed Effects Model with Imputation of Missing Data and Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels of PTSD Symptoms

Characteristic	Beta	95% CI ¹		p-value	q-value ²
(Intercept)	2.8921	2.7532	2.9839	<0.0001	<0.0001
Linear Effect of Time	0.0484	0.0204	0.0948	<0.0001	<0.0001
Quadratic Effect of Time	-0.0044	-0.0080	-0.0023	<0.0001	<0.0001
Age on 9/11/2001					
< 26 Years	-	-	-		
26-35 Years	0.0133	-0.0149	0.0424	0.3760	0.3945
36-45 Years	0.0207	-0.0082	0.0480	0.1827	0.2471
46-55 Years	0.0283	-0.0096	0.0639	0.1333	0.1917
56-65 Years	-0.0231	-0.0761	0.0272	0.3707	0.3945
> 65 Years	-0.0833	-0.2175	0.0589	0.2400	0.2905
Sex					
Male	-	-	-		
Female	0.0765	0.0549	0.0994	<0.0001	<0.0001
Race/Ethnicity					
White (Not Latino)	-	-	-		
API (Not Latino)	0.0364	-0.0464	0.1098	0.3773	0.3945
Black (Not Latino)	0.0288	0.0006	0.0568	0.0453	0.0695
Multi-Racial (Latino)	0.0706	0.0340	0.1086	<0.0001	<0.0001
Other/Unknown	0.0442	0.0072	0.0698	0.0293	0.0482
White (Latino)	0.0325	-0.0220	0.0793	0.2293	0.2905
Occupation on 9/11/2001					
Law Enforcement	-	-	-		
Not Law Enforcement	0.2206	0.1850	0.2383	<0.0001	<0.0001
WTC-Related Traumatic Exposures					
Early Arrival					
Not Exposed	-	-	-		
Exposed	0.0335	0.0177	0.0499	<0.0001	<0.0001
Witnessed Collapse of Towers					
Not Exposed	-	-	-		
Exposed	0.0039	-0.0160	0.0247	0.6947	0.6947
Dust Cloud					
Not Exposed	-	-	-		
Exposed	0.0478	0.0261	0.0685	<0.0001	<0.0001
Human Remains					
Not Exposed	-	-	-		
Exposed	0.0479	0.0256	0.0679	<0.0001	<0.0001
Blood or Bodily Fluids					
Not Exposed	-	-	-		
Exposed	0.0300	0.0069	0.0510	0.0107	0.0189
Slept on Ditch at Ground Zero					
Not Exposed	-	-	-		
Exposed	0.1070	0.0817	0.1305	<0.0001	<0.0001
Knew Someone Who Was Injured					
Not Exposed	-	-	-		
Exposed	0.0630	0.0472	0.0788	<0.0001	<0.0001
Traumatic Bereavement					
Not Exposed	-	-	-		
Exposed	0.0535	0.0367	0.0700	<0.0001	<0.0001

¹Beta = mean posterior estimate. CI = credible interval. p-values are two-tailed and derived from posterior distributions of the estimated parameters. ²q = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure. See note in Table 7B

Table S8A. Results of Generalized Mixed Effects Model with Demographic Factors and PTSD Diagnosis Predicting Levels and Rates of Change in PTSD Symptoms with Listwise Deletion of Missing Data

Characteristic	Beta	95% CI ¹	p-value	q-value ²
(Intercept)	3.1006	3.0737, 3.1275	<0.0001	<0.0001
Linear Effect of Time	0.0019	-0.0030, 0.0068	0.4417	0.7291
Quadratic Effect of Time	-0.0005	-0.0010, 0.0000	0.0703	0.2460
Age Group on 9/11/2001				
< 26 Years	—	—		
26-35 Years	0.0107	-0.0171, 0.0385	0.4513	0.7291
36-45 Years	0.0614	0.0338, 0.0890	<0.0001	0.0001
46-55 Years	0.0801	0.0498, 0.1103	<0.0001	<0.0001
56-65 Years	-0.0029	-0.0469, 0.0410	0.8957	0.9561
> 65 Years	-0.1066	-0.2002, -0.0129	0.0257	0.0982
Sex				
Male	—	—		
Female	0.0071	-0.0124, 0.0266	0.4769	0.7418
Race/Ethnicity				
White (Not Latino)	—	—		
API (Not Latino)	0.0061	-0.0499, 0.0620	0.8319	0.9334
Black (Not Latino)	-0.0149	-0.0408, 0.0109	0.2577	0.6622
Multi-Racial (Latino)	0.0168	-0.0106, 0.0442	0.2297	0.6622
Other/Unknown	0.0515	0.0206, 0.0825	0.0011	0.0058
White (Latino)	0.0161	-0.0195, 0.0517	0.3749	0.7291
Occupation on 9/11/2001				
Law Enforcement	—	—		
Not Law Enforcement	0.1355	0.1229, 0.1481	<0.0001	<0.0001
PTSD Diagnosis				
Yes	0.6221	0.6064, 0.6378	<0.0001	<0.0001
Linear Effect of Time x Age Group				
Time x 26-35 Years	-0.0003	-0.0053, 0.0048	0.9141	0.9561
Time x 36-45 Years	-0.0028	-0.0078, 0.0022	0.2680	0.6622
Time x 46-55 Years	-0.0044	-0.0098, 0.0010	0.1069	0.3455
Time x 56-65 Years	-0.0007	-0.0081, 0.0066	0.8422	0.9334
Time x > 65 Years	0.0046	-0.0102, 0.0193	0.5426	0.8139
Linear Effect of Time x Sex				
Time x Female	0.0048	0.0015, 0.0081	0.0041	0.0187
Linear Effect of Time x Race/Ethnicity				
Time x API (Not Latino)	-0.0002	-0.0091, 0.0088	0.9673	0.9673
Time x Black (Not Latino)	-0.0002	-0.0048, 0.0044	0.9333	0.9561
Time x Multi-Racial (Latino)	-0.0019	-0.0064, 0.0026	0.4118	0.7291
Time x Other/Unknown	-0.0006	-0.0060, 0.0049	0.8419	0.9334
Time x White (Latino)	-0.0023	-0.0080, 0.0034	0.4293	0.7291
Linear Effect of Time x Occupation				
Time x Not Law Enforcement	-0.0003	-0.0023, 0.0017	0.7556	0.9334
Linear Effect of Time x PTSD Diagnosis				
Time x “Yes”/Diagnosed	0.0057	0.0031, 0.0083	<0.0001	0.0001
Quadratic Effect of Time x Age Group				
Time ² x 26-35 Years	0.0001	-0.0005, 0.0006	0.8168	0.9334
Time ² x 36-45 Years	-0.0001	-0.0006, 0.0005	0.7750	0.9334
Time ² x 46-55 Years	-0.0003	-0.0009, 0.0003	0.3755	0.7291

Table S8A. Results of Generalized Mixed Effects Model with Demographic Factors and PTSD Diagnosis Predicting Levels and Rates of Change in PTSD Symptoms with Listwise Deletion of Missing Data

Characteristic	Beta	95% CI¹	p-value	q-value²
Time ² x 56-65 Years	0.0005	-0.0003, 0.0013	0.2405	0.6622
Time ² x > 65 Years	0.0008	-0.0010, 0.0026	0.3920	0.7291
Quadratic Effect of Time x Sex				
Time ² x Female	0.0000	-0.0004, 0.0003	0.8445	0.9334
Quadratic Effect of Time x Race/Ethnicity				
Time ² x API (Not Latino)	0.0002	-0.0008, 0.0013	0.6472	0.9334
Time ² x Black (Not Latino)	0.0002	-0.0003, 0.0007	0.3742	0.7291
Time ² x Multi-Racial (Latino)	0.0008	0.0002, 0.0013	0.0045	0.0187
Time ² x Other/Unknown	-0.0001	-0.0008, 0.0005	0.6945	0.9334
Time ² x White (Latino)	0.0003	-0.0003, 0.0010	0.3351	0.7291
Quadratic Effect of Time x Occupation				
Time ² x Not Law Enforcement	0.0000	-0.0003, 0.0002	0.7394	0.9334
Quadratic Effect of Time x PTSD Diagnosis				
Time ² x Yes	-0.0017	-0.0020, -0.0014	<0.0001	<0.0001

Notes. Beta = unstandardized estimate. ¹CI = Confidence Interval. p-values are two-tailed and derived from a Wald test statistic. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure.

Table S8B. Results of Bayesian Generalized Mixed Effects Model with Imputation of Missing Data and Demographic Factors Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta¹	95% CI		p-value	q-value²
(Intercept)	2.9755	2.8140	3.0678	<0.0001	<0.0001
Linear Effect of Time	0.0631	0.0250	0.1177	<0.0001	<0.0001
Quadratic Effect of Time	-0.0048	-0.0086	-0.0021	<0.0001	<0.0001
Age Group on 9/11/2001					
< 26 Years	-	-	-		
26-35 Years	0.0611	0.0244	0.1058	0.0027	0.0093
36-45 Years	0.0897	0.0476	0.1354	<0.0001	<0.0001
46-55 Years	0.0991	0.0576	0.1426	<0.0001	<0.0001
56-65 Years	0.0838	0.0228	0.1507	0.0040	0.0129
> 65 Years	0.0631	-0.0789	0.1957	0.3187	0.4957
Sex					
Male	-	-	-		
Female	0.0221	-0.0045	0.0538	0.1187	0.2769
Race/Ethnicity					
White (Not Latino)	-	-	-		
API (Not Latino)	0.0075	-0.0737	0.0856	0.8053	0.8845
Black (Not Latino)	-0.0201	-0.0724	0.0227	0.3773	0.5465
Multi-Racial (Latino)	0.0555	0.0080	0.1177	0.0347	0.0910
Other/Unknown	-0.1166	-0.3909	-0.0199	<0.0001	<0.0001
White (Latino)	0.0426	-0.0171	0.0977	0.1520	0.3040
Occupation on 9/11/2001					
Law Enforcement	-	-	-		
Not Law Enforcement	0.1121	0.0815	0.1308	0.0000	0.0000
PTSD Diagnosis					
No	-	-	-		
Yes	0.5266	0.4642	0.5598	0.0000	0.0000
Linear Effect of Time x Age Group					
Time x 26-35 Years	-0.0235	-0.0581	-0.0036	0.0133	0.0400
Time x 36-45 Years	-0.0290	-0.0585	-0.0040	0.0213	0.0597
Time x 46-55 Years	-0.0585	-0.1005	-0.0266	0.0013	0.0051
Time x 56-65 Years	-0.0849	-0.2206	0.0280	0.1253	0.2771
Time x > 65 Years	-0.4923	-1.5654	0.4131	0.2627	0.4413
Linear Effect of Time x Sex					
Time x Female	0.0037	-0.0303	0.0347	0.7667	0.8703
Linear Effect of Time x Race/Ethnicity					
Time x API (Not Latino)	0.0915	-0.1637	0.3591	0.5520	0.6868
Time x Black (Not Latino)	0.0337	-0.0315	0.1255	0.2480	0.4340
Time x Multi-Racial (Latino)	-0.0335	-0.1649	0.0824	0.6760	0.7887
Time x Other/Unknown	0.0707	-0.0259	0.1419	0.1360	0.2856
Time x White (Latino)	-0.0347	-0.1427	0.1077	0.4840	0.6353
Linear Effect of Time x Occupation					
Time x Not Law Enforcement	0.0010	-0.0097	0.0112	0.8667	0.8919
PTSD Diagnosis					
Time x Yes/Diagnosed	0.0562	0.0374	0.0844	<0.0001	<0.0001
Quadratic Effect of Time x Age Group					
Time ² x 26-35 Years	0.0012	-0.0003	0.0033	0.0987	0.2438
Time ² x 36-45 Years	0.0011	-0.0007	0.0028	0.2027	0.3701
Time ² x 46-55 Years	0.0018	-0.0011	0.0042	0.1613	0.3080
Time ² x 56-65 Years	0.0026	-0.0053	0.0105	0.4440	0.6015
Time ² x > 65 Years	0.0296	-0.0519	0.1000	0.4227	0.5917

Table S8B. Results of Bayesian Generalized Mixed Effects Model with Imputation of Missing Data and Demographic Factors Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta ¹	95% CI		p-value	q-value ²
Quadratic Effect of Time x Sex					
Time ² x Female	0.0006	-0.0015	0.0030	0.5893	0.7072
Quadratic Effect of Time x Race/Ethnicity					
Time ² x API (Not Latino)	-0.0054	-0.0227	0.0120	0.5560	0.6868
Time ² x Black (Not Latino)	-0.0005	-0.0070	0.0044	0.9427	0.9427
Time ² x Multi-Racial (Latino)	0.0033	-0.0059	0.0116	0.3733	0.5465
Time ² x Other/Unknown	0.0004	-0.0044	0.0140	0.8213	0.8845
Time ² x White (Latino)	0.0044	-0.0061	0.0121	0.3027	0.4889
Quadratic Effect of Time x Occupation					
Time ² x Not Law Enforcement	0.0001	-0.0008	0.0009	0.8707	0.8919
Quadratic Effect of Time x PTSD Diagnosis					
Time ² x Diagnosed/Yes	-0.0070	-0.0107	-0.0052	<0.0001	<0.0001

¹Beta = mean posterior estimate. CI = credible interval. p-values are two-tailed and derived from posterior distributions of the estimated parameters. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure. See note in Table 7B

Table S9A. Results of Generalized Mixed Effects Model with Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta	95% CI ¹	p-value	q-value ²
(Intercept)	2.9102	2.8719, 2.9484	<0.0001	<0.0001
Linear Effect of Time	0.0078	0.0015, 0.0142	0.0161	0.0674
Quadratic Effect of Time	-0.0004	-0.0011, 0.0003	0.2513	0.4948
Age Group				
< 26 Years	—	—		
26-35 Years	0.0245	-0.0084, 0.0574	0.1450	0.4153
36-45 Years	0.0634	0.0305, 0.0963	0.0002	0.0007
46-55 Years	0.0913	0.0545, 0.1280	<0.0001	<0.0001
56-65 Years	-0.0602	-0.1134, -0.0071	0.0263	0.0974
> 65 Years	-0.0427	-0.1794, 0.0941	0.5408	0.7316
Sex				
Male	—	—		
Female	0.0694	0.0461, 0.0928	<0.0001	<0.0001
Race/Ethnicity				
White (Not Latino)	—	—		
API (Not Latino)	0.0723	0.0103, 0.1344	0.0224	0.0880
Black (Not Latino)	-0.0187	-0.0494, 0.0120	0.2335	0.4745
Multi-Racial (Latino)	0.0656	0.0322, 0.0989	0.0001	0.0006
Other/Unknown	0.1080	0.0653, 0.1507	<0.0001	<0.0001
White (Latino)	0.0109	-0.0310, 0.0528	0.6105	0.7732
Occupation				
Law Enforcement	—	—		
Not Law Enforcement	0.2584	0.2422, 0.2746	<0.0001	<0.0001
Early Arrival				
Not Exposed	—	—		
Exposed	0.0428	0.0267, 0.0589	<0.0001	<0.0001
Witnessed Collapse of Twin Towers				
Not Exposed	—	—		
Exposed	0.0038	-0.0140, 0.0217	0.6750	0.7732
Caught in Dust Cloud				
Not Exposed	—	—		
Exposed	0.0541	0.0373, 0.0709	<0.0001	<0.0001
Human Remains				
Not Exposed	—	—		
Exposed	0.0604	0.0431, 0.0778	<0.0001	<0.0001
Blood or Bodily Fluids				
Not Exposed	—	—		
Exposed	0.0364	0.0203, 0.0525	<0.0001	<0.0001
Slept on Ditch at Ground Zero				
Not Exposed	—	—		
Exposed	0.1266	0.1097, 0.1434	<0.0001	<0.0001
Knew Someone Injured				
Not Exposed	—	—		
Exposed	0.0784	0.0641, 0.0926	<0.0001	<0.0001
Knew Someone Who Died				
Not Exposed	—	—		
Exposed	0.0658	0.0506, 0.0810	<0.0001	<0.0001
Linear Effect of Time x Age Group				

Table S9A. Results of Generalized Mixed Effects Model with Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta	95% CI¹	p-value	q-value²
Time x 26-35 Years	0.0014	-0.0041, 0.0069	0.6107	0.7732
Time x 36-45 Years	-0.0017	-0.0072, 0.0037	0.5329	0.7316
Time x 46-55 Years	-0.0039	-0.0099, 0.0020	0.1970	0.4253
Time x 56-65 Years	-0.0013	-0.0094, 0.0069	0.7600	0.8400
Time x > 65 Years	0.0046	-0.0152, 0.0245	0.6484	0.7732
Linear Effect of Time x Sex				
Time x Female	0.0021	-0.0016, 0.0058	0.2607	0.4976
Linear Effect of Time x Race/Ethnicity				
Time x API (Not Latino)	0.0020	-0.0073, 0.0113	0.6724	0.7732
Time x Black (Not Latino)	0.0016	-0.0034, 0.0065	0.5388	0.7316
Time x Multi-Racial (Latino)	-0.0034	-0.0085, 0.0017	0.1874	0.4253
Time x Other/Unknown	0.0036	-0.0036, 0.0109	0.3275	0.5732
Time x White (Latino)	-0.0022	-0.0084, 0.0040	0.4888	0.7316
Linear Effect of Time x Occupation				
Time x Not Law Enforcement	-0.0006	-0.0030, 0.0019	0.6547	0.7732
Linear Effect of Time x Early Arrival				
Time x Exposed	-0.0008	-0.0033, 0.0018	0.5458	0.7316
Linear Effect of Time x Witnessed Collapse				
Time x Exposed	-0.0030	-0.0059, -0.0002	0.0383	0.1341
Linear Effect of Time x Dust Cloud				
Time x Exposed	-0.0019	-0.0044, 0.0006	0.1351	0.4052
Linear Effect of Time x Human Remains				
Time x Exposed	-0.0009	-0.0036, 0.0019	0.5303	0.7316
Linear Effect of Time x Blood or Bodily Fluids				
Time x Exposed	-0.0018	-0.0043, 0.0008	0.1720	0.4253
Linear Effect of Time x Slept at Ground Zero				
Time x Exposed	0.0009	-0.0016, 0.0035	0.4652	0.7316
Linear Effect of Time x Knew Someone Injured				
Time x Exposed	-0.0005	-0.0027, 0.0017	0.6453	0.7732
Linear Effect of Time x Knew Someone Died				
Time x Exposed	0.0005	-0.0018, 0.0028	0.6750	0.7732
Quadratic Effect of Time x Age Group				
Age ² x 26-35 Years	-0.0003	-0.0009, 0.0003	0.3914	0.6665
Age ² x 36-45 Years	-0.0003	-0.0009, 0.0003	0.2981	0.5366
Age ² x 46-55 Years	-0.0004	-0.0011, 0.0002	0.1920	0.4253
Age ² x 56-65 Years	0.0001	-0.0008, 0.0011	0.7912	0.8594
Age ² x > 65 Years	0.0001	-0.0025, 0.0027	0.9365	0.9365
Quadratic Effect of Time x Sex				
Age ² x Female	0.0000	-0.0005, 0.0004	0.8709	0.9052
Quadratic Effect of Time x Race/Ethnicity				
Age ² x API (Not Latino)	0.0001	-0.0010, 0.0012	0.8932	0.9077
Age ² x Black (Not Latino)	0.0000	-0.0005, 0.0006	0.8764	0.9052
Age ² x Multi-Racial (Latino)	0.0005	-0.0001, 0.0011	0.1261	0.3972
Age ² x Other/Unknown	-0.0005	-0.0013, 0.0002	0.1773	0.4253
Age ² x White (Latino)	0.0004	-0.0003, 0.0011	0.2761	0.5116
Quadratic Effect of Time x Occupation				
Age ² x Not Law Enforcement	-0.0002	-0.0005, 0.0001	0.1583	0.4155
Quadratic Effect of Time x Early Arrival				

Table S9A. Results of Generalized Mixed Effects Model with Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta	95% CI¹	p-value	q-value²
Age ² x Exposed	-0.0001	-0.0004, 0.0002	0.4848	0.7316
Quadratic Effect of Time x Witnessed Collapse				
Age ² x Exposed	0.0002	-0.0001, 0.0005	0.2025	0.4253
Quadratic Effect of Time x Dust Cloud				
Age ² x Exposed	0.0000	-0.0002, 0.0003	0.7463	0.8396
Quadratic Effect of Time x Human Remains				
Age ² x Exposed	0.0000	-0.0003, 0.0003	0.8239	0.8798
Quadratic Effect of Time x Blood or Bodily Fluid				
Age ² x Exposed	0.0001	-0.0002, 0.0004	0.4302	0.6949
Quadratic Effect of Time x Slept on Ditch				
Age ² x Exposed	-0.0003	-0.0006, 0.0000	0.0715	0.2370
Quadratic Effect of Time x Knew Someone Injured				
Age ² x Exposed	-0.0001	-0.0004, 0.0001	0.4135	0.6855
Quadratic Effect of Time x Knew Someone Who Died				
Age ² x Exposed	-0.0002	-0.0005, 0.0001	0.1552	0.4155

Notes. Beta = unstandardized estimate. ¹CI = Confidence Interval. p-values are two-tailed and derived from a Wald test statistic. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure

Table S9B. Results of Bayesian Generalized Mixed Effects Model with Imputation of Missing Data and Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta	95% CI¹		p-value	q-value²
(Intercept)	2.8315	2.6359	2.9333	0.0000	0.0000
Linear Effect of Time	0.0751	0.0370	0.1407	0.0000	0.0000
Quadratic Effect of Time	-0.0051	-0.0091	-0.0025	0.0000	0.0000
Age Group					
< 26 Years	-	-	-		
26-35 Years	0.0304	-0.0088	0.0774	0.1293	0.2910
36-45 Years	0.0520	0.0108	0.1026	0.0160	0.0630
46-55 Years	0.0654	0.0238	0.1072	0.0027	0.0140
56-65 Years	0.0130	-0.0427	0.0861	0.7173	0.8070
> 65 Years	-0.0482	-0.2115	0.0858	0.5360	0.7035
Sex					
Male	-	-	-		
Female	0.0873	0.0448	0.1239	0.0013	0.0076
Race/Ethnicity					
White (Not Latino)	-	-	-		
API (Not Latino)	0.0787	-0.0162	0.1866	0.0907	0.2352
Black (Not Latino)	0.0005	-0.0442	0.0413	0.9600	0.9627
Multi-Racial (Latino)	0.0760	0.0293	0.1226	0.0013	0.0076
Other/Unknown	-0.0774	-0.3228	0.0127	0.1880	0.4032
White (Latino)	0.0424	-0.0355	0.1199	0.2227	0.4384
Occupation					
Law Enforcement	-	-	-		
Not Law Enforcement	0.2234	0.1823	0.2436	0.0000	0.0000
Early Arrival					
Not Exposed	-	-	-		
Exposed	0.0380	0.0039	0.0640	0.0253	0.0939
Witnessed Collapse of Twin Towers					
Not Exposed	-	-	-		
Exposed	0.0161	-0.0131	0.0511	0.2600	0.4813
Caught in Dust Cloud					
Not Exposed	-	-	-		
Exposed	0.0628	0.0333	0.0918	0.0000	0.0000
Human Remains					
Not Exposed	-	-	-		
Exposed	0.0510	0.0225	0.0773	0.0013	0.0076
Blood or Bodily Fluids					
Not Exposed	-	-	-		
Exposed	0.0541	0.0270	0.0922	0.0013	0.0076
Slept on Ditch at Ground Zero					
Not Exposed	-	-	-		
Exposed	0.1210	0.0899	0.1489	0.0000	0.0000
Knew Someone Injured					
Not Exposed	-	-	-		
Exposed	0.0552	0.0278	0.0772	0.0013	0.0076
Knew Someone Who Died					
Not Exposed	-	-	-		
Exposed	0.0471	0.0203	0.0684	0.0053	0.0240
Linear Effect of Time x Age Group					

Table S9B. Results of Bayesian Generalized Mixed Effects Model with Imputation of Missing Data and Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta	95% CI¹		p-value	q-value²
Time x 26-35 Years	-0.0136	-0.0375	0.0077	0.1920	0.4032
Time x 36-45 Years	-0.0204	-0.0471	0.0030	0.0787	0.2253
Time x 46-55 Years	-0.0378	-0.0725	0.0020	0.0613	0.1932
Time x 56-65 Years	-0.1075	-0.2618	0.0071	0.0693	0.2080
Time x > 65 Years	-0.1533	-1.1212	0.9958	0.6933	0.8070
Linear Effect of Time x Sex					
Time x Female	-0.0077	-0.0466	0.0462	0.6040	0.7766
Linear Effect of Time x Race/Ethnicity					
Time x API (Not Latino)	-0.0859	-0.4794	0.2420	0.6947	0.8070
Time x Black (Not Latino)	0.0397	-0.0336	0.1194	0.3933	0.5900
Time x Multi-Racial (Latino)	-0.0108	-0.1239	0.0772	0.8707	0.9297
Time x Other/Unknown	0.0864	0.0203	0.1371	0.0133	0.0560
Time x White (Latino)	-0.0529	-0.2153	0.0905	0.3680	0.5900
Linear Effect of Time x Occupation					
Time x Not Law Enforcement	-0.0013	-0.0152	0.0099	0.9627	0.9627
Linear Effect of Time x Early Arrival					
Time x Exposed	-0.0022	-0.0153	0.0182	0.6493	0.8070
Linear Effect of Time x Witnessed Collapse					
Time x Exposed	-0.0075	-0.0224	0.0066	0.3267	0.5416
Linear Effect of Time x Dust Cloud					
Time x Exposed	-0.0194	-0.0469	0.0076	0.2213	0.4384
Linear Effect of Time x Human Remains					
Time x Exposed	-0.0194	-0.0469	0.0076	0.2213	0.4384
Linear Effect of Time x Blood or Bodily Fluids					
Time x Exposed	-0.0196	-0.0501	-0.0041	0.0053	0.0240
Linear Effect of Time x Slept at Ground Zero					
Time x Exposed	-0.0189	-0.0467	0.0038	0.1053	0.2458
Linear Effect of Time x Knew Someone Injured					
Time x Exposed	0.0057	-0.0047	0.0224	0.3840	0.5900
Linear Effect of Time x Knew Someone Died					
Time x Exposed	0.0102	-0.0023	0.0249	0.0867	0.2352
Quadratic Effect of Time x Age Group					
Age ² x 26-35 Years	0.0007	-0.0007	0.0021	0.2827	0.4813
Age ² x 36-45 Years	0.0007	-0.0008	0.0022	0.2787	0.4813
Age ² x 46-55 Years	0.0009	-0.0026	0.0029	0.3933	0.5900
Age ² x 56-65 Years	0.0064	-0.0012	0.0152	0.1000	0.2423
Age ² x > 65 Years	0.0024	-0.1071	0.0760	0.7947	0.8632
Quadratic Effect of Time x Sex					
Age ² x Female	0.0009	-0.0026	0.0031	0.4693	0.6571
Quadratic Effect of Time x Race/Ethnicity					
Age ² x API (Not Latino)	0.0061	-0.0178	0.0354	0.7173	0.8070
Age ² x Black (Not Latino)	-0.0010	-0.0059	0.0038	0.6960	0.8070
Age ² x Multi-Racial (Latino)	0.0007	-0.0056	0.0071	0.7733	0.8547
Age ² x Other/Unknown	-0.0013	-0.0059	0.0126	0.4667	0.6571
Age ² x White (Latino)	0.0051	-0.0051	0.0152	0.2387	0.4556
Quadratic Effect of Time x Occupation					
Age ² x Not Law Enforcement	-0.0003	-0.0011	0.0007	0.5120	0.6863
Quadratic Effect of Time x Early Arrival					

Table S9B. Results of Bayesian Generalized Mixed Effects Model with Imputation of Missing Data and Demographic Factors and WTC-Related Traumatic Exposures Predicting Levels and Rates of Change in PTSD Symptoms

Characteristic	Beta	95% CI¹		p-value	q-value²
Age ² x Exposed	-0.0001	-0.0015	0.0008	0.9400	0.9627
Quadratic Effect of Time x Witnessed Collapse					
Age ² x Exposed	0.0006	-0.0004	0.0015	0.2760	0.4813
Quadratic Effect of Time x Dust Cloud					
Age ² x Exposed	0.0009	-0.0011	0.0026	0.4480	0.6564
Quadratic Effect of Time x Human Remains					
Age ² x Exposed	-0.0002	-0.0014	0.0008	0.6680	0.8070
Quadratic Effect of Time x Blood or Bodily Fluid					
Age ² x Exposed	0.0011	0.0001	0.0030	0.0360	0.1194
Quadratic Effect of Time x Slept on Ditch					
Age ² x Exposed	0.0005	-0.0014	0.0023	0.5013	0.6863
Quadratic Effect of Time x Knew Someone Injured					
Age ² x Exposed	-0.0007	-0.0017	0.0001	0.0933	0.2352
Quadratic Effect of Time x Knew Someone Who Died					
Age ² x Exposed	-0.0010	-0.0020	-0.0001	0.0280	0.0980

¹Beta = mean posterior estimate. CI = credible interval. p-values are two-tailed and derived from posterior distributions of the estimated parameters. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure. See note in Table 7B

Table S10. Results of Cox Regressions Predicting Time Until Symptoms Get Better and Worse

Characteristic	Time Until Symptoms Get Better				Time Until Symptoms Get Worse			
	HR ¹	95% CI ²	p-value	q-value	HR ¹	95% CI ²	p-value	q-value
Age								
< 26 Years	—	—			—	—		
26-35 Years	0.90	0.71, 1.14	0.393	0.500	0.99	0.81, 1.22	0.944	0.962
36-45 Years	0.83	0.66, 1.05	0.123	0.478	0.99	0.81, 1.22	0.955	0.962
46-55 Years	0.87	0.68, 1.12	0.280	0.489	1.05	0.84, 1.31	0.691	0.962
56-65 Years	0.82	0.55, 1.22	0.326	0.500	1.01	0.72, 1.41	0.962	0.962
> 65 Years	1.19	0.43, 3.34	0.736	0.736	1.14	0.55, 2.34	0.726	0.962
Sex								
Male	—	—			—	—		
Female	0.97	0.82, 1.15	0.710	0.736	0.98	0.85, 1.14	0.816	0.962
Race/Ethnicity								
White (Not Latino)	—	—			—	—		
API (Not Latino)	0.71	0.40, 1.28	0.255	0.489	1.14	0.76, 1.70	0.534	0.934
Black (Not Latino)	1.38	1.11, 1.70	0.003	0.028	1.14	0.95, 1.38	0.165	0.578
Multi-Racial (Latino)	1.16	0.92, 1.46	0.206	0.481	1.09	0.89, 1.34	0.412	0.824
Other/Unknown	1.08	0.84, 1.38	0.563	0.656	1.32	1.06, 1.64	0.013	0.063
White (Latino)	0.86	0.63, 1.19	0.365	0.500	1.17	0.91, 1.52	0.223	0.625
Law								
Law Enforcement	—	—			—	—		
Other Responder	0.93	0.84, 1.03	0.171	0.478	1.24	1.14, 1.36	<0.001	<0.001
Unknown	0.58	0.28, 1.22	0.154	0.478	1.31	0.76, 2.26	0.334	0.780
PTSD Diagnosis								
No	—	—			—	—		
Yes	0.86	0.77, 0.95	0.004	0.028	2.43	2.20, 2.68	<0.001	<0.001

Notes. ¹HR = multivariable adjusted Hazard Ratio. ²CI = Confidence Interval. *p-value* = two-tailed p-values derived from Wald test statistics. *q-value* = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure. Breslow approximation was used for tied times.

Table S11. Results of Cox Regressions Predicting Time Until Symptoms Get Better and Worse

Characteristic	Time Until Symptoms Get Better				Time Until Symptoms Get Worse			
	HR ¹	95% CI ²	p	q	HR ¹	95% CI ²	p	q
Age								
< 26 Years	—	—			—	—		
26-35 Years	0.81	0.61, 1.07	0.144	0.512	1.18	0.93, 1.51	0.181	0.318
36-45 Years	0.76	0.57, 1.00	0.049	0.324	1.14	0.89, 1.46	0.288	0.414
46-55 Years	0.81	0.60, 1.09	0.162	0.512	1.21	0.93, 1.59	0.157	0.313
56-65 Years	0.76	0.48, 1.19	0.230	0.512	0.97	0.65, 1.44	0.881	0.928
> 65 Years	1.27	0.38, 4.28	0.701	0.738	1.09	0.39, 2.98	0.874	0.928
Sex								
Male	—	—			—	—		
Female	1.05	0.88, 1.27	0.569	0.734	1.09	0.92, 1.28	0.325	0.433
Race/Ethnicity								
White (Not Latino)	—	—			—	—		
API (Not Latino)	0.70	0.39, 1.23	0.216	0.512	1.37	0.93, 2.03	0.110	0.274
Black (Not Latino)	1.10	0.85, 1.42	0.455	0.734	1.24	1.01, 1.52	0.037	0.122
Multi-Racial (Latino)	1.20	0.92, 1.55	0.177	0.512	1.21	0.96, 1.52	0.107	0.274
Other/Unknown	1.08	0.80, 1.45	0.622	0.734	1.24	0.93, 1.64	0.139	0.310
White (Latino)	0.89	0.63, 1.25	0.500	0.734	1.20	0.91, 1.59	0.191	0.318
Law								
Law Enforcement	—	—			—	—		
Other Responder	0.88	0.78, 1.00	0.044	0.324	1.55	1.39, 1.73	<0.001	<0.001
WTC Exposures								
Early Arrival								
Not Exposed	—	—			—	—		
Exposed	0.94	0.82, 1.08	0.385	0.734	1.00	0.89, 1.12	0.975	0.975
Witnessed Collapse of Towers								
Not Exposed	—	—			—	—		
Exposed	1.11	0.95, 1.30	0.179	0.512	0.93	0.82, 1.06	0.290	0.414
Dust Cloud								
Not Exposed	—	—			—	—		
Exposed	0.99	0.87, 1.13	0.888	0.888	0.95	0.85, 1.07	0.422	0.528
Human Remains								
Not Exposed	—	—			—	—		
Exposed	0.96	0.83, 1.11	0.583	0.734	1.15	1.01, 1.30	0.029	0.122
Blood or Bodily Fluids								
Not Exposed	—	—			—	—		
Exposed	0.97	0.85, 1.10	0.623	0.734	1.03	0.92, 1.16	0.580	0.682
Slept on Ditch at Ground Zero								
Not Exposed	—	—			—	—		
Exposed	0.87	0.77, 0.99	0.041	0.324	1.18	1.05, 1.32	0.005	0.031
Knew Someone Injured								
Not Exposed	—	—			—	—		
Exposed	0.98	0.87, 1.10	0.678	0.738	1.18	1.07, 1.31	0.001	0.012
Traumatic Bereavement								
Not Exposed	—	—			—	—		
Exposed	1.05	0.92, 1.20	0.444	0.734	1.12	1.01, 1.25	0.036	0.122

Notes. ¹HR = multivariable adjusted Hazard Ratio. ²CI = Confidence Interval. *p-value* = two-tailed p-values derived from Wald test statistics. *q-value* = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure. Breslow approximation was used for tied times.

Table S12. Results of Robust Quasi-Poisson Regression Predicting Impairment in Mental Function in 2022

Characteristic	RR ¹	95% CI ¹		p-value	q-value ²
Age Group					
< 26 Years	—				
26-35 Years	1.16	0.89	1.53	0.278	0.417
36-45 Years	1.20	0.92	1.57	0.186	0.298
46-55 Years	1.27	0.95	1.70	0.106	0.182
56-65 Years	1.25	0.79	1.99	0.341	0.481
> 65 Years	0.49	0.06	3.79	0.491	0.655
Sex					
Male	—				
Female	1.18	0.99	1.40	0.065	0.120
Race/Ethnicity					
White (Not Latino)	—				
API (Not Latino)	1.20	0.68	2.12	0.529	0.668
Black (Not Latino)	1.07	0.85	1.37	0.558	0.670
Multi-Racial (Latino)	1.02	0.77	1.36	0.887	0.892
Other/Unknown	1.01	0.85	1.20	0.891	0.892
White (Latino)	1.66	1.25	2.20	<.001	<.001
Occupation					
Law Enforcement	—				
Not Law Enforcement	1.36	1.21	1.53	<.001	<.001
Unknown	0.90	0.27	2.95	0.857	0.892
Baseline PTSD Symptoms	1.43	1.36	1.50	<.001	<.001
Deciles of Predicted Change in PTSD Symptoms					
1	—				
2	0.95	0.47	1.92	0.892	0.892
3	1.88	1.04	3.38	0.036	0.072
4	2.73	1.56	4.79	<.001	<.001
5	4.64	2.76	7.81	<.001	<.001
6	4.45	2.64	7.49	<.001	<.001
7	5.64	3.39	9.38	<.001	<.001
8	6.90	4.20	11.35	<.001	<.001
9	8.44	5.18	13.77	<.001	<.001
10	12.19	7.47	19.91	<.001	<.001

¹RR = Relative Risk Ratio, CI = confidence interval calculated using heteroskedastic-consistent standard errors. p-values are two-tailed and derived from t-tests calculated using heteroskedastic-consistent standard errors. ²q-value = p-value adjusted for false discovery rate using the Benjamini-Hochberg procedure. Impairment in mental function was operationalized as a mental component summary (MCS < 40) score more than one standard deviation below the norm-referenced mean. Given significant intercept-slope correlations in the preferred mixed model, we stratified participants by their baseline PCL-S scores into three strata: 17–26, 27–36, and >36. Within each stratum, predicted changes in PCL-S scores (derived from the fitted model) were calculated for each participant. These predicted changes were then ranked within each stratum and divided into deciles of predicted change, as reported above. This approach adjusts for baseline-dependent differences in predicted change due to the intercept-slope covariance.

Table S13. Results of Robust Quasi-Poisson Regression Predicting Impairment in Physical Function in 2022

Characteristic	RR ¹	95% CI ¹		p-value	q-value ²
Age Group					
< 26 Years	—				
26-35 Years	1.24	1.04	1.47	0.015	0.026
36-45 Years	1.62	1.37	1.92	<.001	<.001
46-55 Years	1.81	1.52	2.16	<.001	<.001
56-65 Years	2.40	1.95	2.96	<.001	<.001
> 65 Years	1.82	1.01	3.31	0.048	0.071
Sex					
Male	—				
Female	1.10	1.00	1.22	0.050	0.071
Race/Ethnicity					
White (Not Latino)	—				
API (Not Latino)	0.88	0.64	1.21	0.428	0.514
Black (Not Latino)	0.99	0.87	1.13	0.901	0.901
Multi-Racial (Latino)	0.96	0.81	1.14	0.643	0.701
Other/Unknown	0.97	0.88	1.07	0.546	0.624
White (Latino)	1.03	0.84	1.27	0.783	0.817
Occupation					
Law Enforcement	—				
Not Law Enforcement	1.14	1.07	1.21	<.001	<.001
Unknown	1.22	0.81	1.84	0.335	0.423
Baseline PTSD Symptoms	1.20	1.17	1.23	<.001	<.001
Deciles of Predicted Change in PTSD Symptoms					
1	—				
2	1.13	0.93	1.37	0.237	0.316
3	1.25	1.04	1.52	0.019	0.030
4	1.39	1.15	1.67	0.001	0.002
5	1.62	1.36	1.94	<.001	<.001
6	1.76	1.48	2.09	<.001	<.001
7	2.07	1.75	2.44	<.001	<.001
8	2.29	1.95	2.70	<.001	<.001
9	2.42	2.06	2.84	<.001	<.001
10	2.97	2.54	3.48	<.001	<.001

¹RR = Relative Risk Ratio, CI = confidence interval calculated using heteroskedastic-consistent (HC1) standard errors. p-values are two-tailed and derived from t-tests calculated using heteroskedastic-consistent standard errors. ²False discovery rate correction for multiple testing. Impairment in physical function was operationalized as a physical component summary (PCS < 40) score more than one standard deviation below the norm-referenced mean. Given significant intercept-slope correlations in the preferred mixed model, we stratified participants by their baseline PCL-S scores into three strata: 17–26, 27–36, and >36. Within each stratum, predicted changes in PCL-S scores (derived from the fitted model) were calculated for each participant. These predicted changes were then ranked within each stratum and divided into deciles of predicted change, as reported above. This approach adjusts for baseline-dependent differences in predicted change due to the intercept-slope covariance.

Table S14. Parameter Estimates from Linear Regression Predicting the Natural Log of Total Expenditures for Mental Health Care (USD) in 2022

Characteristic	Beta ¹	95% CI ¹		p-value	q-value ²
Age Group					
< 26 Years	—				
26-35 Years	0.03	0.10	0.47	0.719	0.750
36-45 Years	0.12	-0.15	0.22	0.196	0.276
46-55 Years	0.06	-0.06	0.31	0.580	0.633
56-65 Years	-0.17	-0.16	0.28	0.292	0.369
> 65 Years	-0.89	-0.48	0.15	0.002	0.004
Sex					
Male	—				
Female	0.50	0.30	0.70	<.001	<.001
Race/Ethnicity					
White (Not Latino)	—				
API (Not Latino)	-0.43	-0.82	-0.04	0.031	0.053
Black (Not Latino)	-0.23	-0.45	-0.02	0.036	0.057
Multi-Racial (Latino)	-0.16	-0.43	0.12	0.264	0.352
Other/Unknown	-0.42	-0.53	-0.31	<.001	<.001
White (Latino)	0.15	-0.28	0.57	0.501	0.572
Occupation					
Law Enforcement	—				
Not Law Enforcement	0.00	-0.11	0.11	0.988	0.988
Unknown	0.48	-0.78	1.75	0.455	0.546
Baseline PTSD Symptoms	0.52	0.44	0.60	<.001	<.001
Deciles of Predicted Change in PTSD Symptoms					
1	—				
2	0.12	0.01	0.23	0.031	0.053
3	0.10	-0.01	0.20	0.069	0.103
4	0.22	0.10	0.35	<.001	0.001
5	0.36	0.22	0.50	<.001	<.001
6	0.31	0.18	0.45	<.001	<.001
7	0.35	0.19	0.51	<.001	<.001
8	0.50	0.31	0.69	<.001	<.001
9	0.84	0.62	1.06	<.001	<.001
10	2.36	2.06	2.67	<.001	<.001

Notes. Total expenditures were determined based on insurance claims for mental health care treatment in 2022.

¹Beta = unstandardized coefficient, CI = confidence interval calculated using heteroskedastic-consistent (HC1) standard errors. p-values are two-tailed and derived from Wald test statistics calculated using HC1 standard errors. ²False discovery rate correction for multiple testing. Given significant intercept-slope correlations in the preferred mixed model, we stratified participants by their baseline PCL-S scores into three strata: 17–26, 27–36, and >36. Within each stratum, predicted changes in PCL-S scores (derived from the fitted model) were calculated for each participant. These predicted changes were then ranked within each stratum and divided into deciles of predicted change, as reported above. This approach adjusts for baseline-dependent differences in predicted change due to the intercept-slope covariance.

Table S15. Results of Robust Quasi-Poisson Regression Predicting Number of Prescriptions for Mental Health Care Treatment in 2022

Predictors	RR ¹	95% CI ¹		p-value	q-value ²
Age Group					
< 26 Years	—				
26-35 Years	1.42	0.88	2.31	0.156	0.208
36-45 Years	1.90	1.19	3.04	0.007	0.015
46-55 Years	1.51	0.89	2.55	0.125	0.176
56-65 Years	1.39	0.62	3.12	0.424	0.509
> 65 Years	0.00	0.00	0.00	<.001	<.001
Sex					
Male	—				
Female	1.23	0.90	1.68	0.195	0.246
Race/Ethnicity					
White (Not Latino)	—				
API (Not Latino)	0.28	0.10	0.81	0.018	0.033
Black (Not Latino)	0.39	0.21	0.72	0.002	0.005
Multi-Racial (Latino)	0.64	0.41	1.01	0.053	0.085
Other/Unknown	0.29	0.20	0.43	<.001	<.001
White (Latino)	1.25	0.71	2.20	0.445	0.509
Occupation					
Law Enforcement	—				
Not Law Enforcement	0.82	0.66	1.03	0.083	0.124
Unknown	1.09	0.28	4.16	0.905	0.905
Baseline PTSD Symptoms	1.69	1.54	1.86	<.001	<.001
Deciles of Predicted Change in PTSD Symptoms					
1	—				
2	1.15	0.47	2.77	0.765	0.798
3	1.23	0.51	2.96	0.648	0.707
4	2.48	1.13	5.46	0.024	0.041
5	2.83	1.29	6.18	0.009	0.018
6	3.19	1.46	6.97	0.004	0.010
7	3.85	1.82	8.12	<.001	<.001
8	5.10	2.49	10.46	<.001	<.001
9	6.15	3.05	12.42	<.001	<.001
10	12.84	6.38	25.83	<.001	<.001

Notes. Number of prescriptions was determined based on insurance claims for mental health care treatment in 2022.

¹RR = Relative Risk Ratio, CI = confidence interval calculated using heteroskedastic-consistent (HC1) standard errors. p-values are two-tailed and derived from Wald test statistics calculated using HC1 standard errors. ²False discovery rate correction for multiple testing. Given significant intercept-slope correlations in the preferred mixed model, we stratified participants by their baseline PCL-S scores into three strata: 17–26, 27–36, and >36. Within each stratum, predicted changes in PCL-S scores (derived from the fitted model) were calculated for each participant. These predicted changes were then ranked within each stratum and divided into deciles of predicted change, as reported above. This approach adjusts for baseline-dependent differences in predicted change due to the intercept-slope covariance.

Table S16. Results of Robust Quasi-Poisson Regression Predicting Number of Treatment Visits for Mental Health Care in 2022

Characteristic	RR ¹	95% CI ¹		p-value	q-value ²
Age Group					
< 26 Years	—				
26-35 Years	1.04	0.72	1.50	0.856	0.893
36-45 Years	1.09	0.75	1.58	0.651	0.744
46-55 Years	0.99	0.65	1.52	0.970	0.970
56-65 Years	0.43	0.15	1.21	0.108	0.199
> 65 Years	0.00	0.00	0.00	<.001	<.001
Sex					
Male	—				
Female	2.20	1.73	2.80	<.001	<.001
Race/Ethnicity					
White (Not Latino)	—				
API (Not Latino)	0.21	0.07	0.65	0.007	0.014
Black (Not Latino)	0.89	0.61	1.31	0.563	0.676
Multi-Racial (Latino)	0.78	0.49	1.24	0.289	0.408
Other/Unknown	0.51	0.35	0.72	<.001	<.001
White (Latino)	1.20	0.70	2.06	0.515	0.651
Occupation					
Law Enforcement	—				
Not Law Enforcement	1.14	0.94	1.40	0.191	0.303
Unknown	2.96	0.68	12.92	0.148	0.254
Baseline PTSD Symptoms	1.35	1.25	1.47	<.001	<.001
Deciles of Predicted Change in PTSD Symptoms					
1	—				
2	1.38	0.57	3.32	0.480	0.640
3	1.18	0.53	2.65	0.686	0.748
4	1.69	0.76	3.79	0.202	0.303
5	3.78	1.85	7.72	<.001	<.001
6	3.28	1.66	6.49	0.001	0.002
7	4.84	2.46	9.52	<.001	<.001
8	6.54	3.42	12.51	<.001	<.001
9	7.48	3.98	14.04	<.001	<.001
10	17.62	9.38	33.08	<.001	<.001

Notes. Number of treatment visits was determined based on insurance claims in 2022. ¹RR = Relative Risk Ratio, CI = confidence interval calculated using heteroskedastic-consistent standard errors. p-values are two-tailed and derived from Wald test statistics calculated using HC1 standard errors. ²False discovery rate correction for multiple testing. Given significant intercept-slope correlations in the preferred mixed model, we stratified participants by their baseline PCL-S scores into three strata: 17–26, 27–36, and >36. Within each stratum, predicted changes in PCL-S scores (derived from the fitted model) were calculated for each participant. These predicted changes were then ranked within each stratum and divided into deciles of predicted change, as reported above. This approach adjusts for baseline-dependent differences in predicted change due to the intercept-slope covariance.

Table S17. Descriptive Statistics for Traumatic Exposures from the World Trade Center Attacks

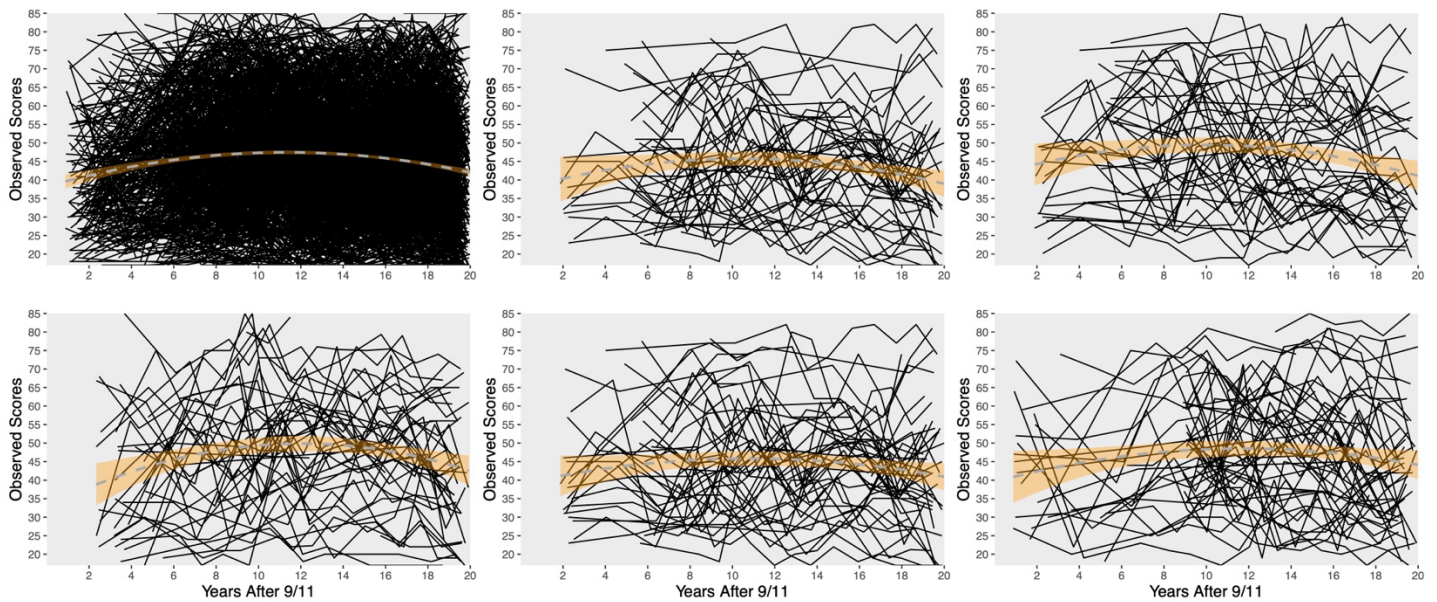
Exposure	Frequency	Percent
Early Arrival		
Not Exposed	2605	20.32
Exposed	6701	52.26
Missing	3516	27.42
Witnessed Collapse of Towers		
Not Exposed	1639	12.78
Exposed	7434	57.98
Missing	3749	29.24
Dust Cloud		
Not Exposed	7541	58.81
Exposed	1765	13.77
Missing	3516	27.42
Human Remains		
Not Exposed	2508	19.56
Exposed	5084	39.65
Missing	5230	40.79
Blood or Bodily Fluids		
Not Exposed	4461	34.79
Exposed	3020	23.55
Missing	5341	41.65
Slept on Ditch at Ground Zero		
Not Exposed	7576	59.09
Exposed	1395	10.88
Missing	3851	30.03
Knew Someone Who Was Injured		
Not Exposed	4017	31.33
Exposed	4797	37.41
Missing	4008	31.26
Traumatic Bereavement		
Not Exposed	3061	23.87
Exposed	5848	45.61
Missing	3913	30.52

Table S18. Number of Responders Each Year with Elevated Symptoms Stratified by Diagnostic Status

Year	PTSD Cases		PTSD Controls	
	$n_{(PCL \geq 44)}$	n	$n_{(PCL \geq 44)}$	n
2002	17	38	20	201
2003	27	90	45	615
2004	27	72	22	498
2005	45	86	28	583
2006	68	129	60	723
2007	113	197	78	1187
2008	104	192	85	1174
2008	199	361	157	2107
2010	231	406	166	2340
2011	272	439	208	2293
2012	261	467	189	2459
2013	279	516	205	2753
2014	303	564	206	3069
2015	267	487	198	2741
2016	322	602	281	3550
2017	374	649	304	3646
2018	393	713	314	4411
2019	392	736	335	4766
2020	282	603	258	4089
2021	328	754	312	4816
2022	279	698	264	4601
Year	Not Interviewed		Full Sample	
	$n_{(PCL \geq 44)}$	n	$n_{(PCL \geq 44)}$	n
2002	10	61	47	300
2003	22	170	94	875
2004	12	133	61	703
2005	9	97	82	766
2006	14	151	142	1003
2007	30	232	221	1616
2008	29	186	218	1552
2008	31	282	387	2750
2010	46	366	443	3112
2011	63	384	543	3116
2012	52	415	502	3341
2013	76	542	560	3811
2014	108	805	617	4438
2015	103	789	568	4017
2016	140	985	743	5137
2017	159	1220	837	5515
2018	169	1397	876	6521
2019	260	2120	987	7622
2020	278	2347	818	7039
2021	380	3486	1020	9056
2022	371	3709	914	9008

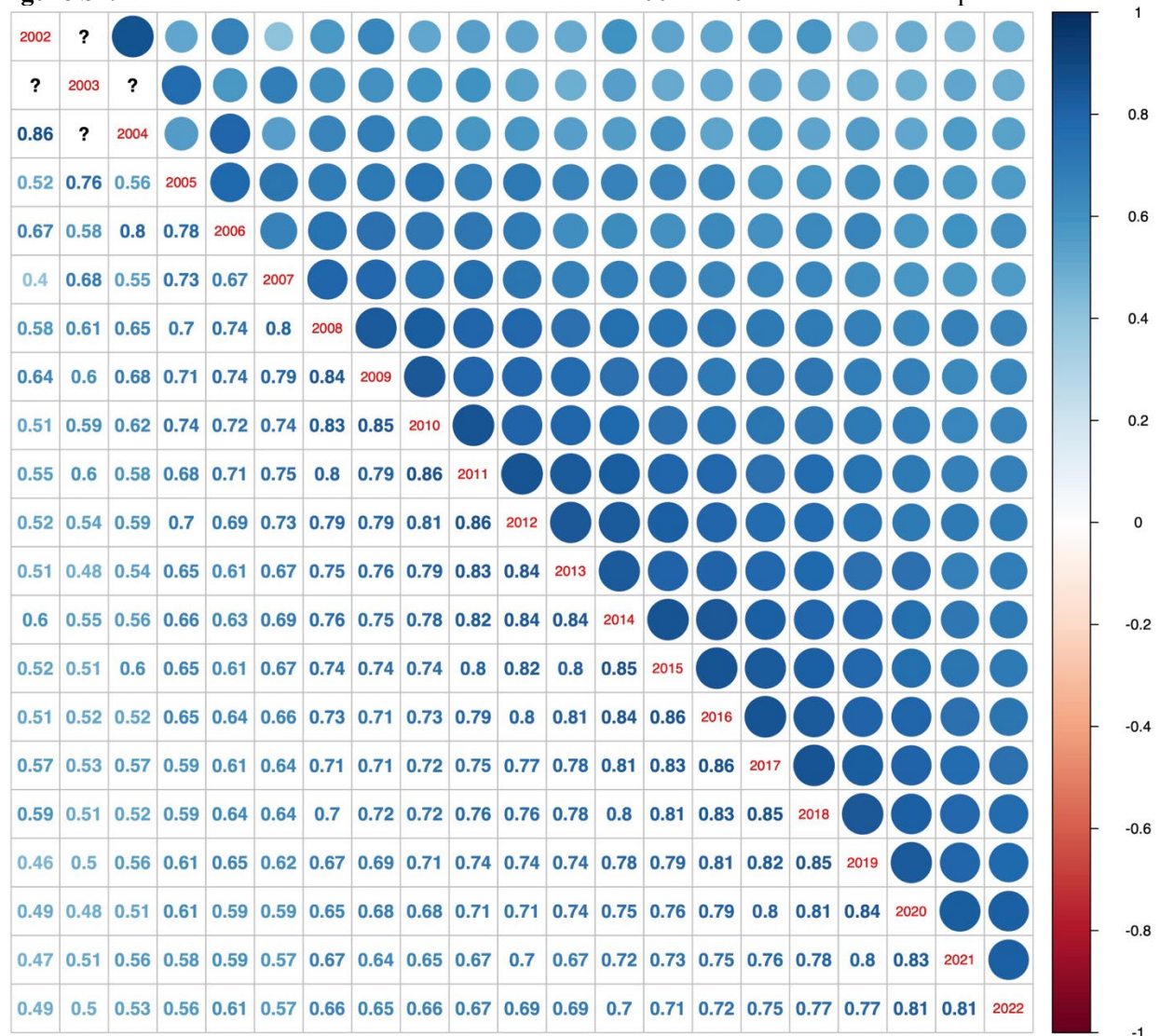
Notes. $n_{(PCL \geq 44)}$ indicates the number of responders with elevated symptoms of PTSD, and n indicates the total number of responders.

Figure S1. Observed Trajectories of PTSD Symptoms for WTC Responders with a Diagnosis of PTSD



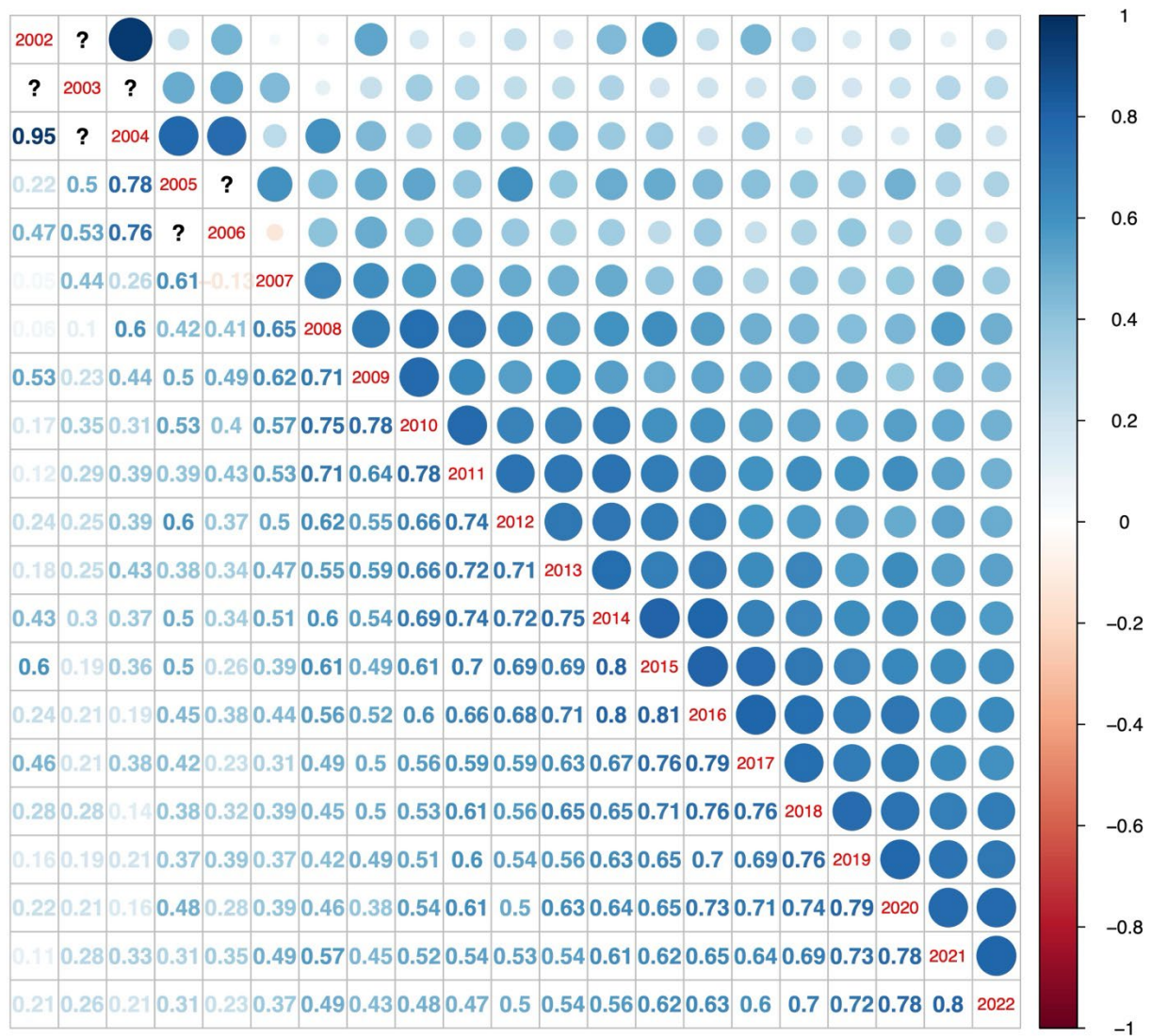
Notes. Top left panel, individual trajectories are plotted for all responders with a lifetime clinical diagnosis of PTSD. The remaining panels plot random subsamples of $n = 500$ observations without replacement. Dashed gray lines depict the average quadratic trend for each subsample with 95% confidence bands shaded in orange.

Figure S2. Correlations Between PCL Total Scores from 2002 to 2022 for the Full Sample



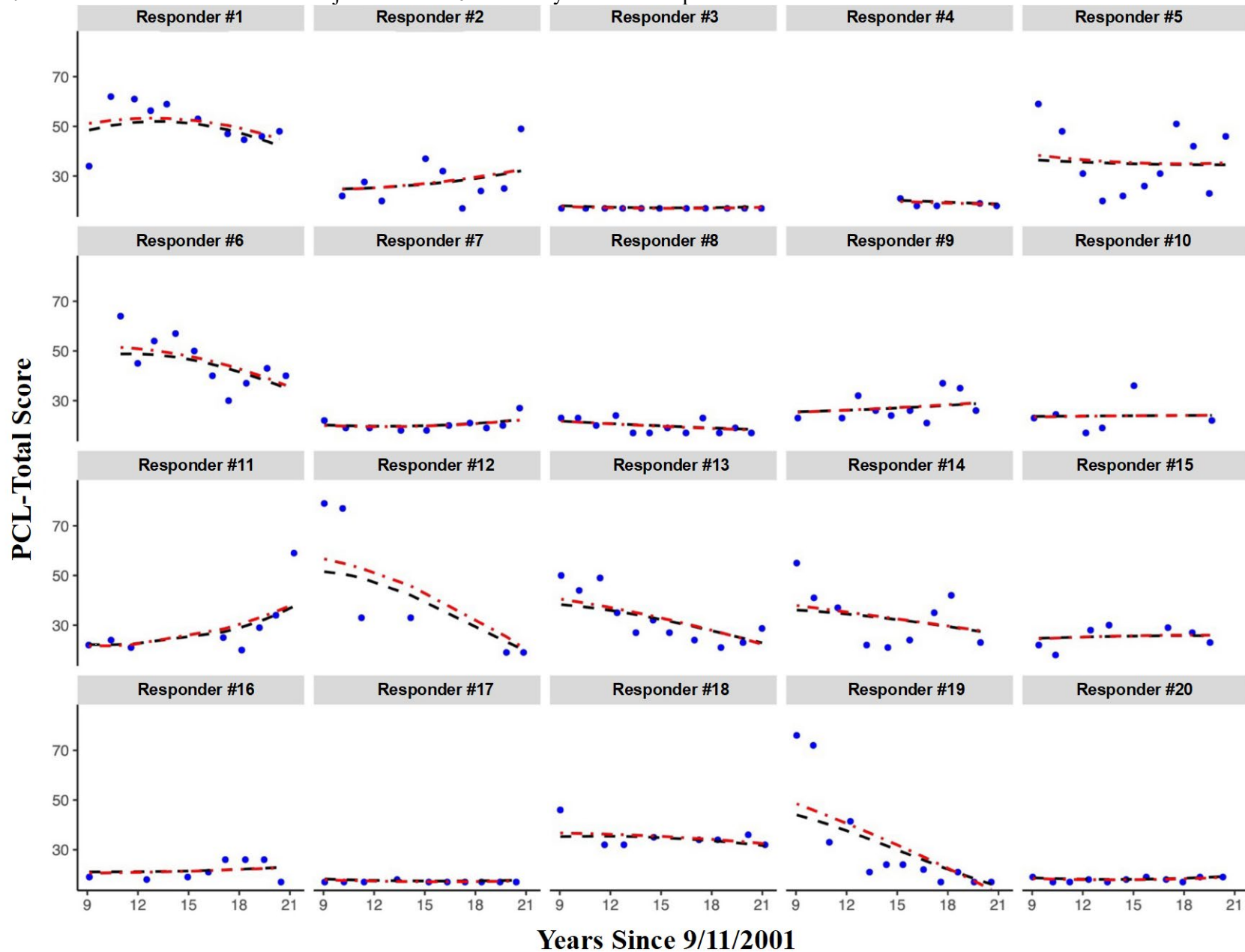
Notes. Pearson's product-moment correlations are reported. All correlations are statistically significant at two-tailed $p < .001$ unadjusted for multiple comparisons. ? indicate insufficient sample sizes.

Figure S3. Correlations Between PCL Total Scores from 2002 to 2022 for PTSD cases



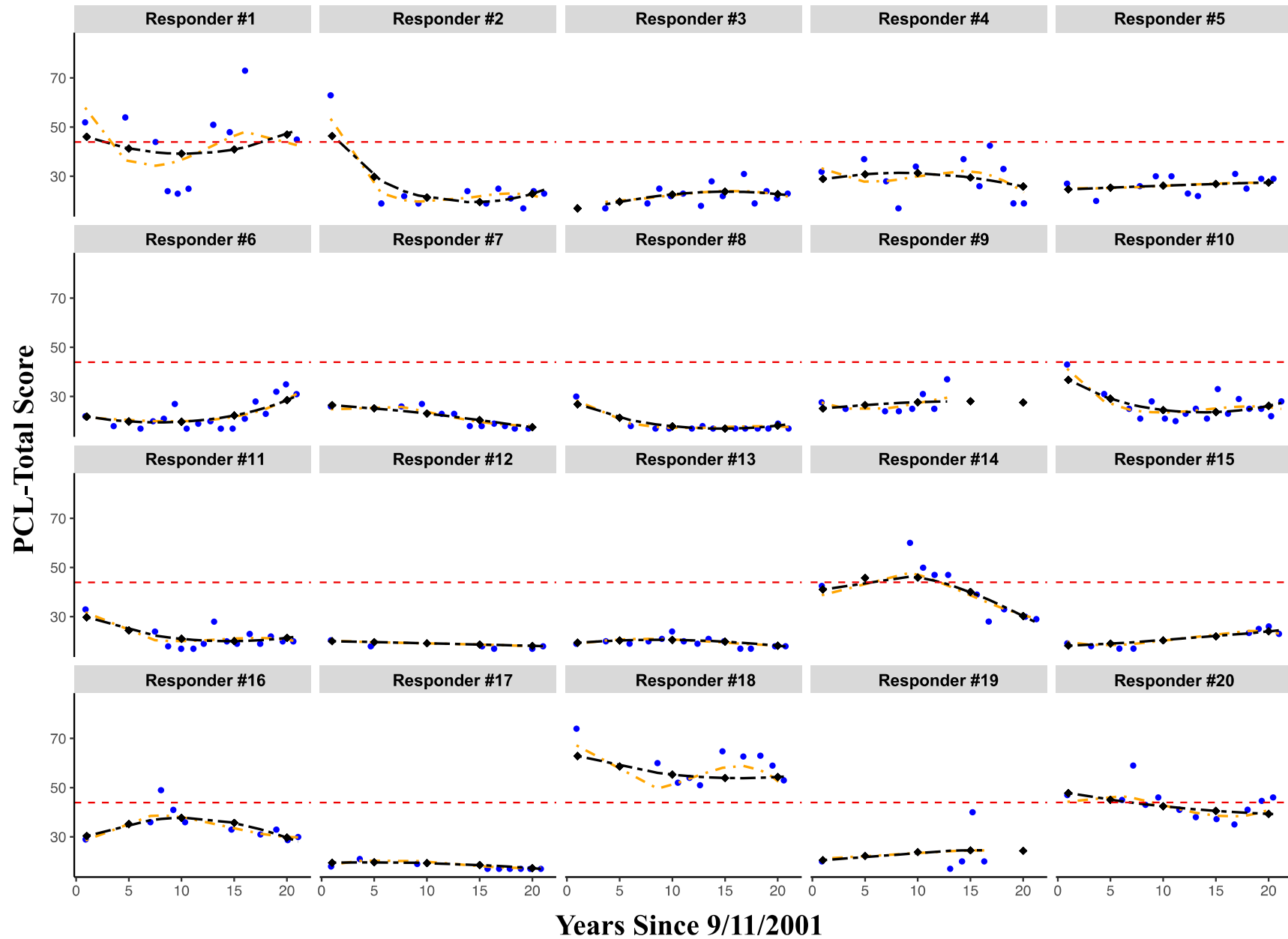
Notes. Pearson's product-moment correlations are reported. All correlations are statistically significant at two-tailed $p < .001$ unadjusted for multiple comparisons. ? indicate insufficient sample sizes.

Figure S4. Observed Scores and Predicted Trajectories for 20 Randomly Selected Responders from Parametric and Generalized Mixed Effect Models



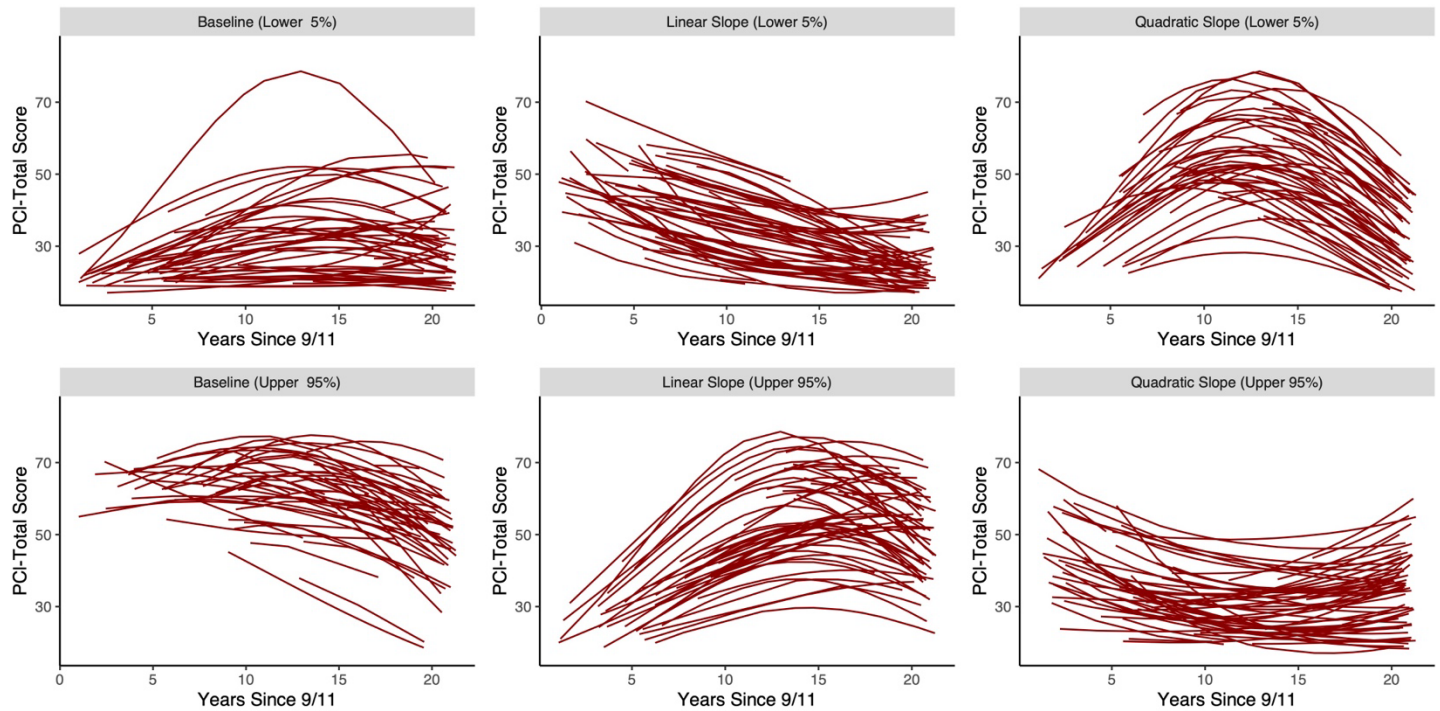
Notes. Observed scores (blue circles) from 20 responders with baseline assessments after 2009 are plotted with predicted trends from a linear mixed effect model (dashed red line) and a generalized mixed effect model with Gamma distribution and log link (dashed black line).

Figure S5. Observed Scores and Predicted Trajectories for Individual Responders from Generalized Quadratic and Cubic Mixed Effect Models



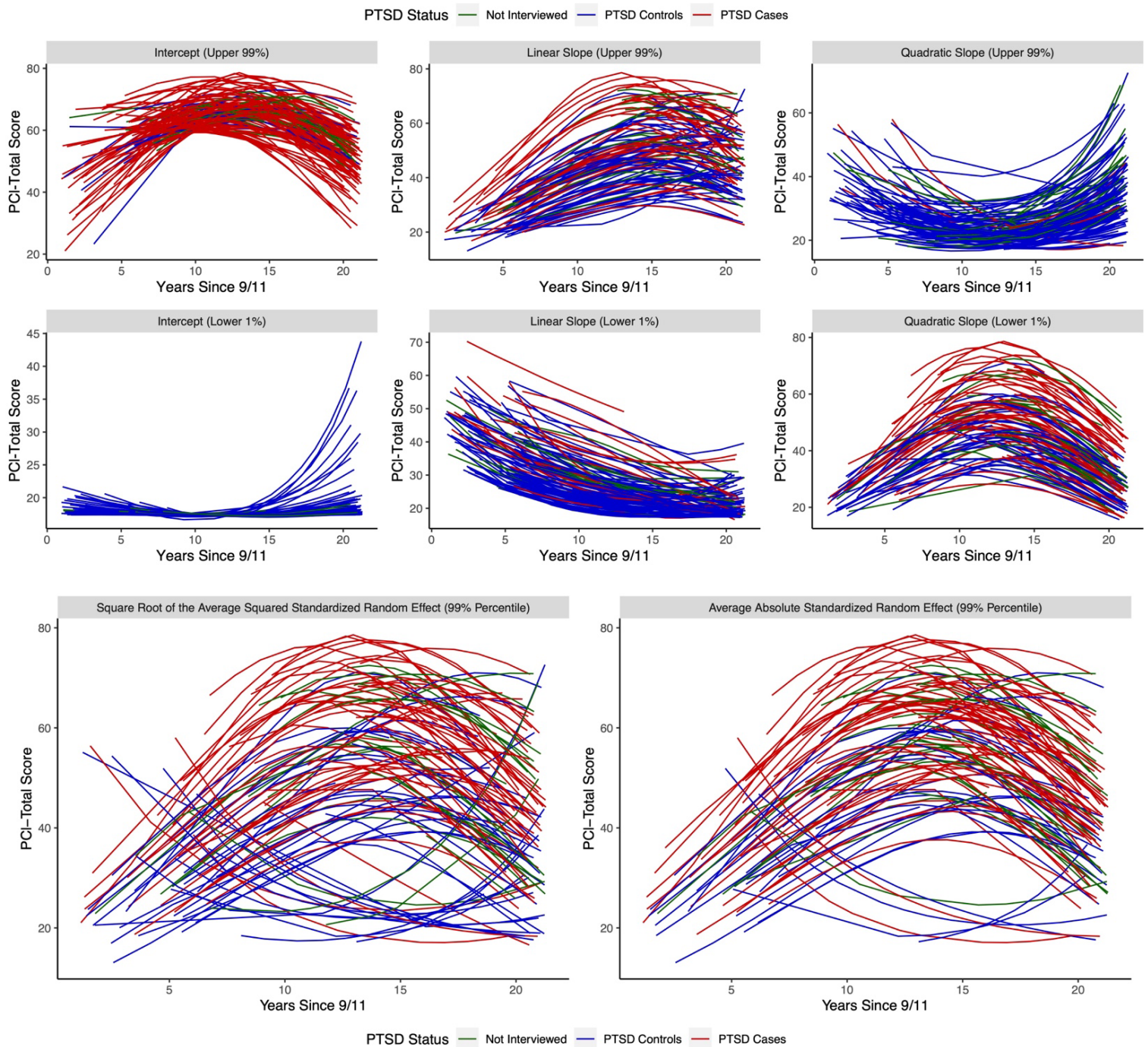
Notes. Observed scores (blue circles) from 20 responders with >3 observations are plotted with predicted trends from generalized quadratic (dashed black line) and generalized cubic (dashed yellow line) mixed effect models with Gamma distribution and log link.

Figure S6. Predicted Trajectories for PTSD Cases at the Lower and Upper Extremes of Parameter Estiamtes



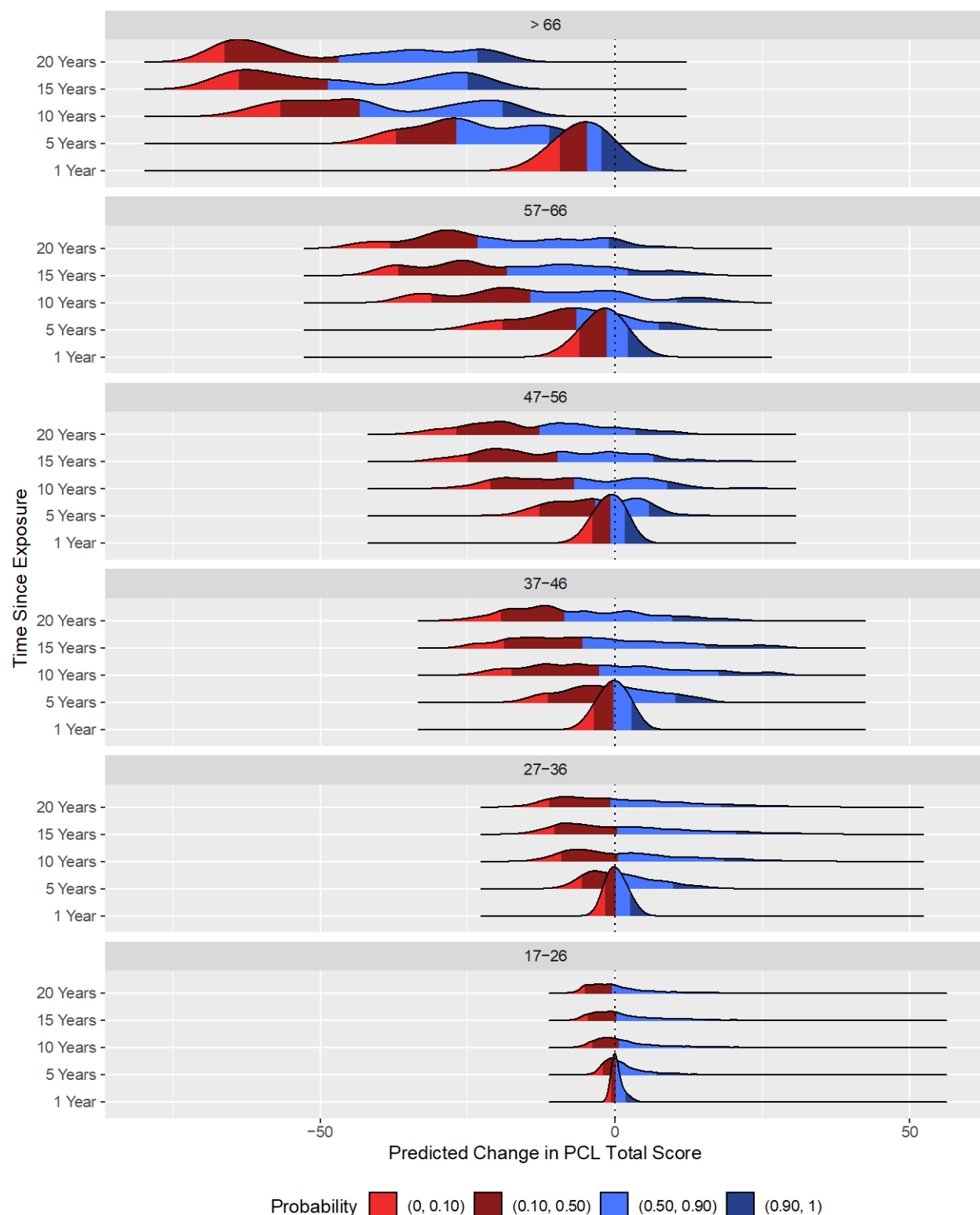
Notes. In the top two panels, predicted trajectories for responders with random intercepts, linear slopes, and quadratic slopes in the upper 95th and lower 5th percentiles are plotted on the left, middle, right panels, respectively. In the bottom panel, predicted symptom trajectories for responders in the 95th percentile of the average absolute value of the standardized random effect (right panel).

Figure S7. Predicted Trajectories at the Lower, Upper, and Combinatorial Extremes of Parameter Estimates



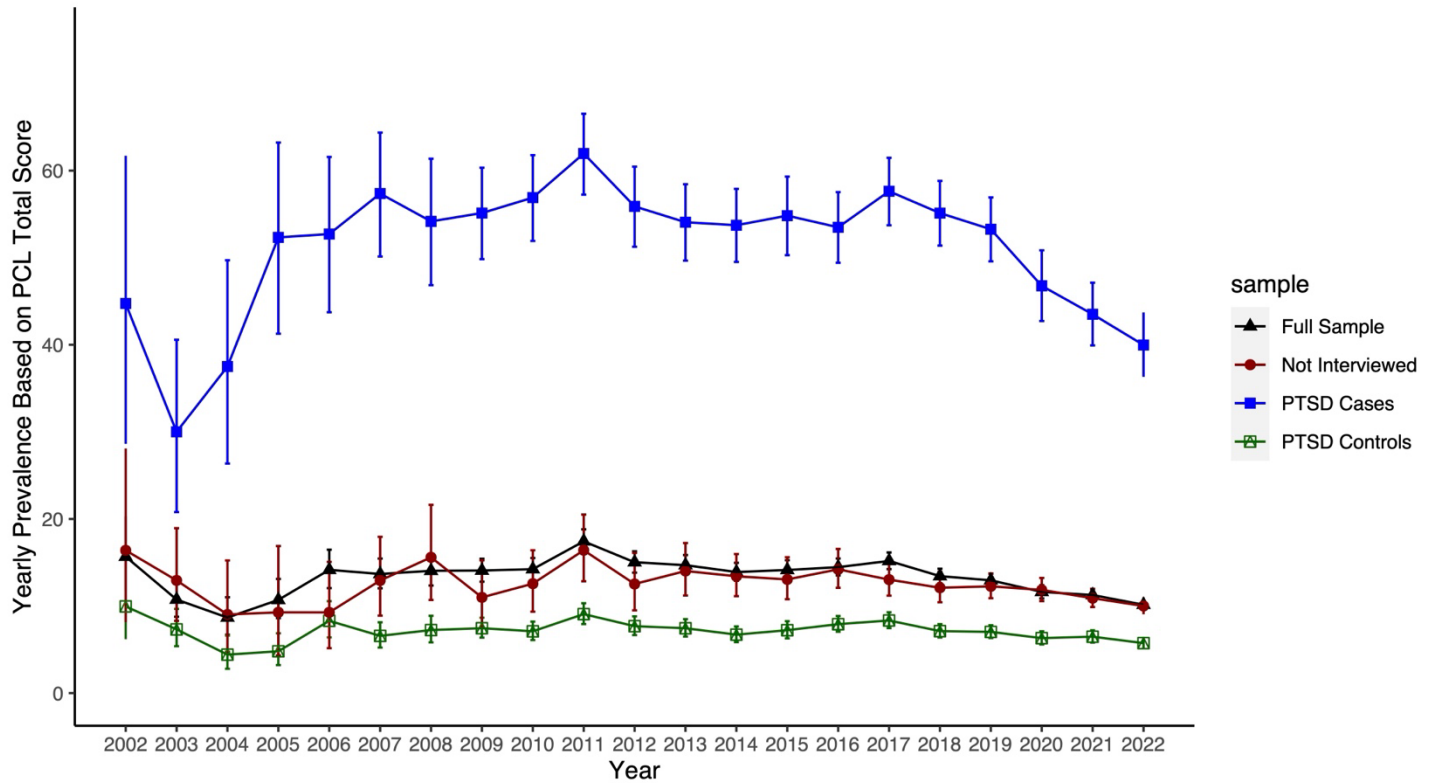
Notes. In the top two panels, predicted trajectories for responders with random intercepts, linear slopes, and quadratic slopes in the upper 99th and lower 1st percentiles are plotted on the left, middle, and right panels, respectively. In the bottom panels, predicted symptom trajectories for responders in the 99th percentile of the average squared standardized random effect (left panel), and average absolute value of the standardized random effect (right panel) are depicted to visualize trajectories at combinatorial extremes of model parameters.

Figure S8. Distributions of Changes in Predicted PCL-S Scores Across Increasing Time Lags Stratified By PCL-S Score 1-Year After 9/11



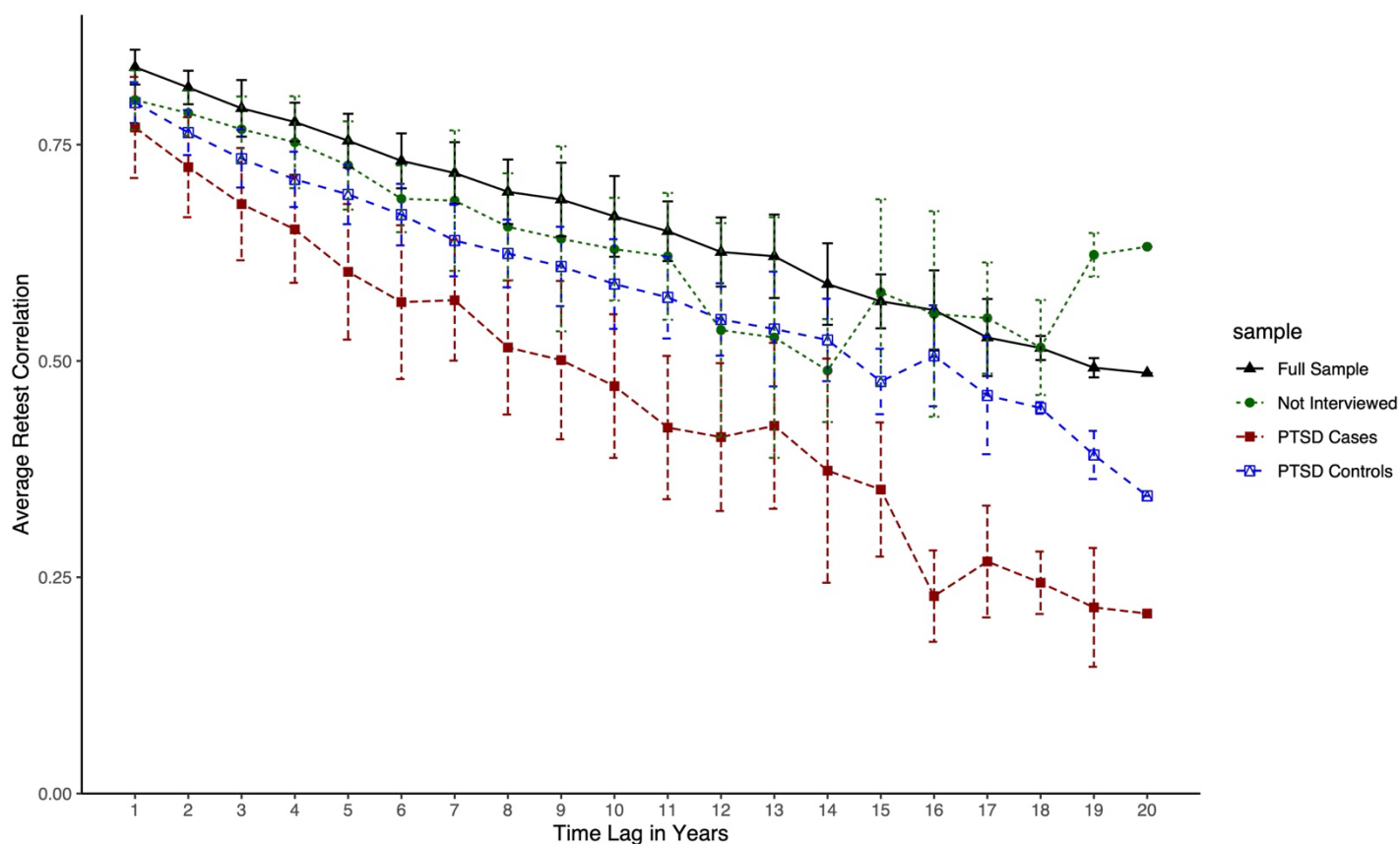
Notes. Given the intercept-slope correlations, plots were stratified by predicted 2002 PCL-S scores. Density plots of predicted changes in PCL-S scores (x-axis) across increasing time lags (y-axis) grouped by predicted PCL-S scores in 2002 (top label of panel). The three vertical lines and colors denote the lower 10% tail, median, and upper 10% tail of each distribution.

Figure S9. Prevalence of Clinically Elevated PTSD Symptoms ($PCL \geq 44$) Stratified by Clinical Status Based on Diagnostic Interviews



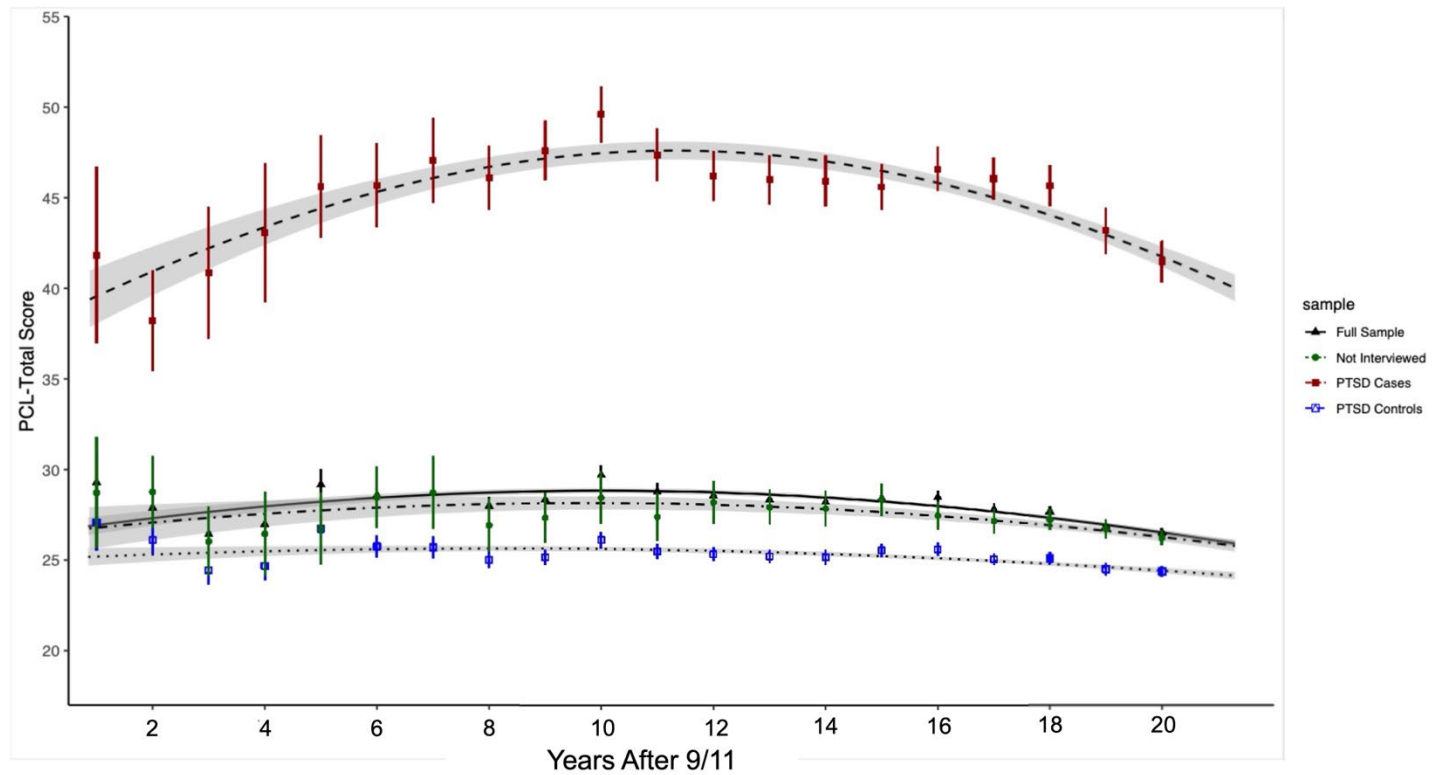
Notes. Estimated prevalence of clinically elevated symptoms (≥ 44 PCL-17 total score) per 100 responders with bars denoting 95% confidence intervals calculated using the Clopper-Pearson exact method. Subgroups were diagnosed via clinical interview 10 to 15 years after 9/11. Sample sizes for the different subsamples (full, not interviewed, PTSD cases, and PTSD controls) are reported in supplemental Table S18

Figure S10. Longitudinal Stability of PTSD Symptoms Stratified by Clinical Status Based on Diagnostic Interviews



Notes. PTSD symptoms were measured using PCL-17 total scores. Average weighted Pearson's correlations are reported (y-axis) across increasing time lags (x-axis) for the full sample (plotted using black triangles) and for WTC responders with a lifetime diagnosis of PTSD (plotted using red squares), for WTC responders without a lifetime diagnosis of PTSD (plotted using blue squared triangles, and for WTC responders who did not complete a diagnostic interview (plotted using green circles) with error bars denoting plus and minus 1 standard deviation. Subgroups were diagnosed via clinical interview 10 to 15 years after 9/11. Sample sizes for the different subsamples (full, not interviewed, PTSD cases, and PTSD controls) are reported in supplemental Table S18.

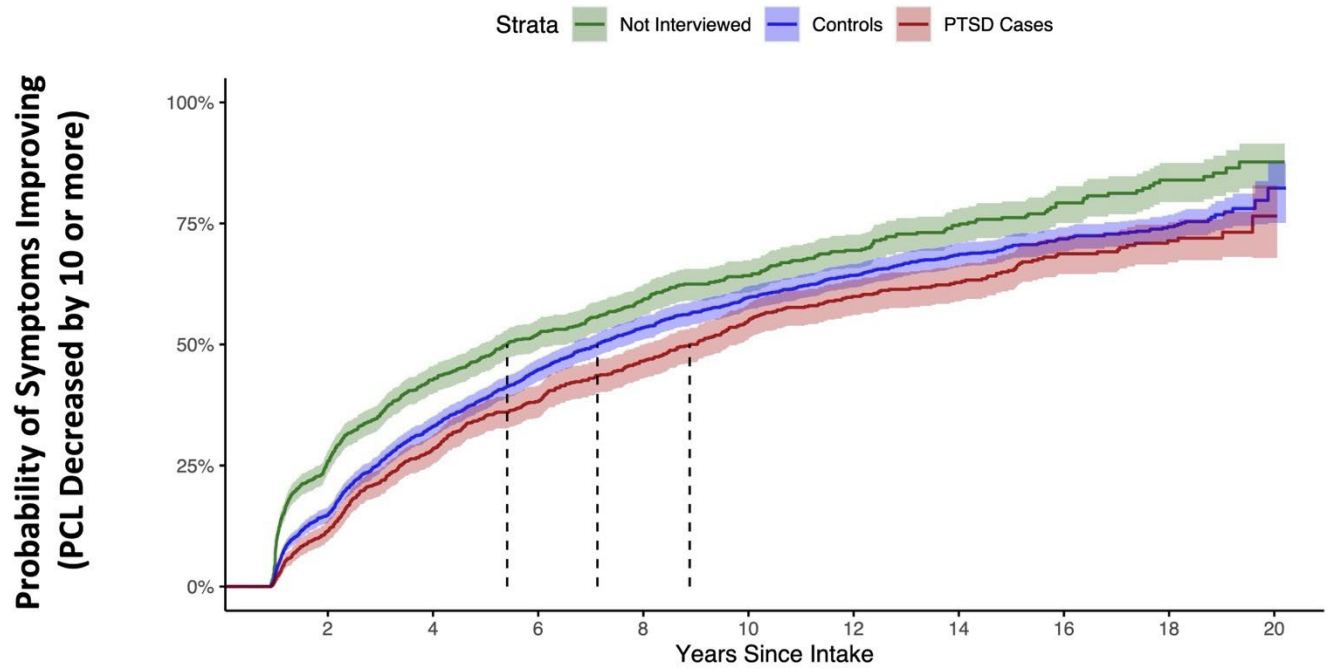
Figure S11. Average Predicted Trajectory of PTSD Symptoms Stratified by Clinical Status Based on Diagnostic Interviews



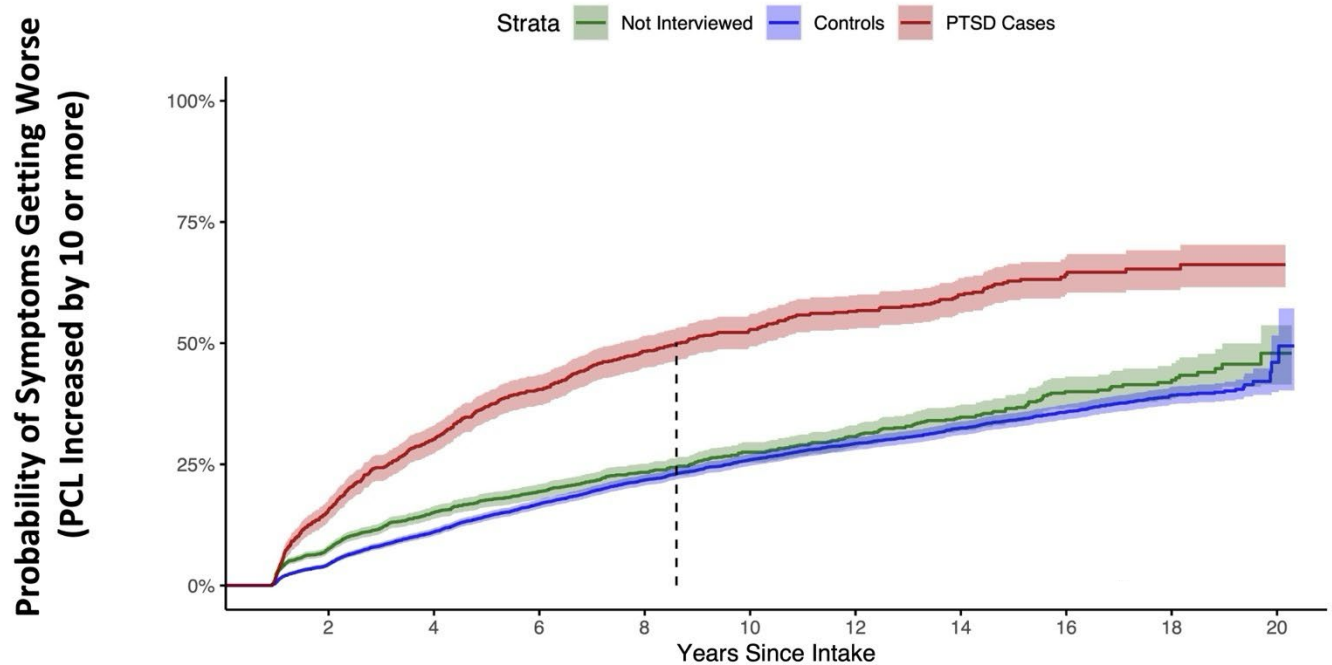
Notes. “X”s and vertical bars denote yearly observed means for the full sample (printed in blue) and for patients with a lifetime diagnosis of PTSD (printed in red) $\pm$ 2 times the standard error of the mean. Dashed lines denote the average trajectories from generalized mixed effects models with a gamma distribution and log link with 95% confidence bands shaded in gray. Subgroups were diagnosed via clinical interview 10 to 15 years after 9/11. Sample sizes for the different subsamples (full, not interviewed, PTSD cases, and PTSD controls) are reported in supplemental Table S18.

Figure S12. Time Until Symptoms Get Better and Worse

A.

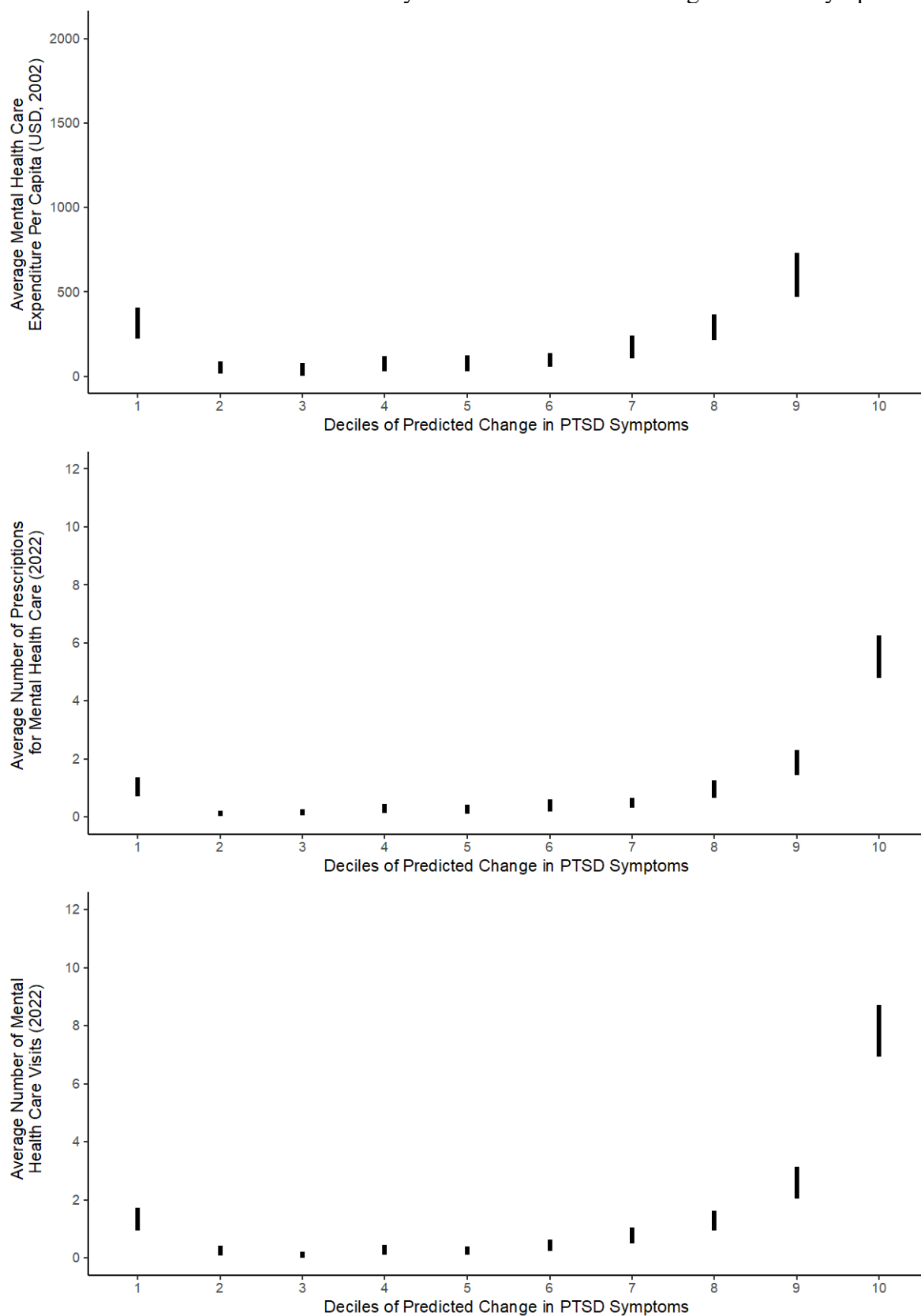


B.



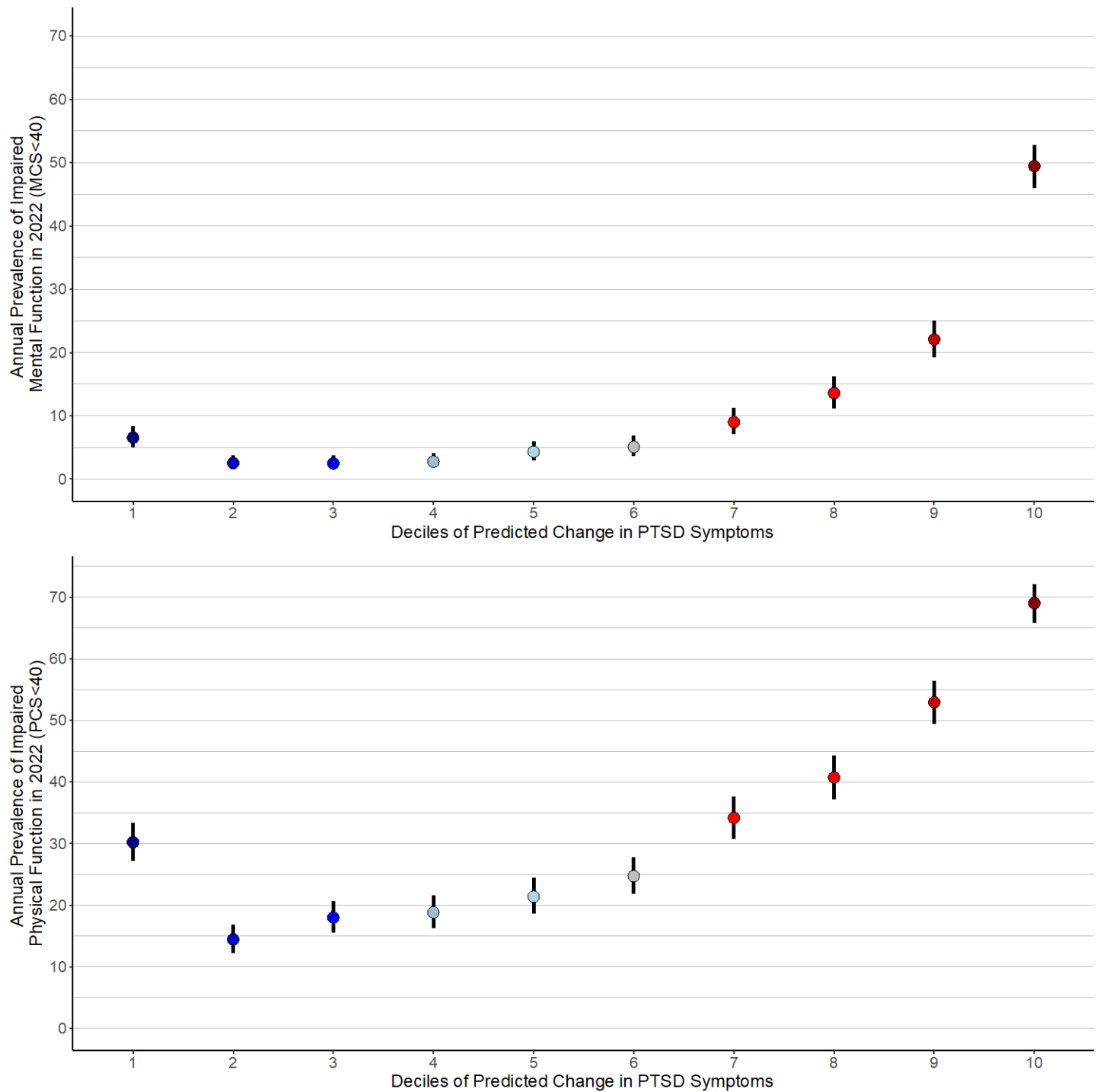
Notes. The complement of Kaplan-Meier non-parametric survival probabilities are plotted with shaded regions indicating 95% confidence bands. The dashed lines indicate median times to event. Subgroups were diagnosed via clinical interview 10 to 15 years after 9/11. Sample sizes for the different subsamples (full, not interviewed, PTSD cases, and PTSD controls) are reported in supplemental Table S18.

Figure S13. Use of Mental Health Care in 2022 by Deciles of Predicted Change in PTSD Symptoms.



Notes. On the x-axis, predicted changes in PCL scores (derived from the fitted model) were calculated for each participant and divided into deciles. On the y-axis, cost of mental health care in USD (panel A), the number of prescriptions for mental health care (panel B), and the average number of treatment visits (panel C) are reported. Bars depict means and vertical lines denote plus and minus two times the standard error.

Figure S14. Crude Prevalence of Functional Impairments by Deciles of Predicted Change in PTSD Symptoms.



Notes. Number of cases of functional impairment in 2022 per 100 individuals at risk are depicted in panels A & B, indicated by a mental component score (MCS < 40) or physical component score (PCS < 40) on the SF-12 more than one standard deviation below the normed average. Vertical lines denote 95% confidence intervals calculated using the Clopper-Pearson method.