Online Appendix Figures and Tables

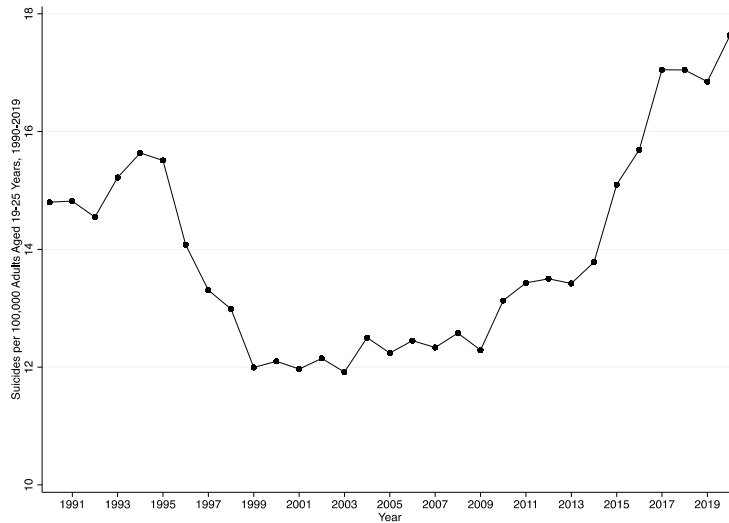# Appendix A:
Ancillary Exhibits

Figure A1.
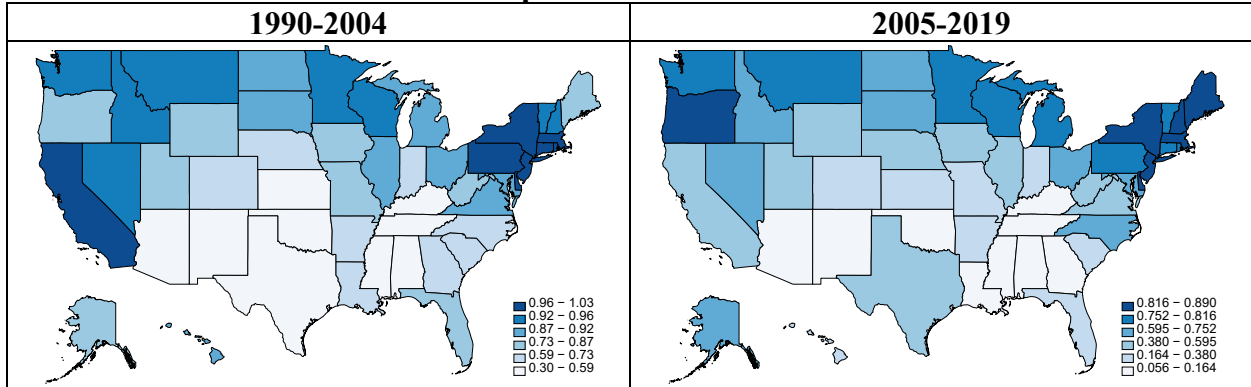### Panel A: Annual Youth (Ages 12-18) Suicide Rate Per 100,000 Population, 1990-2020

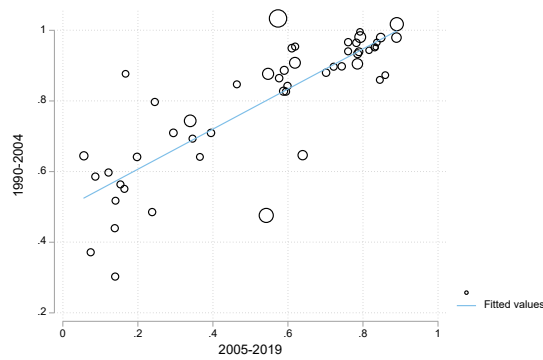### Panel B: Annual Young Adult (Ages 19-25) Suicide Rate Per 100,000 Population, 1990-2020

Notes: Annual suicide rates per 100,000, based on multiple cause of death files collected by the National Center for Health Statistic

Figure A2:
Panel A: September School Start Dates

1990-2004	2005-2019

0.96 – 1.03
0.92 – 0.96
0.87 – 0.92
0.73 – 0.87
0.59 – 0.73
0.30 – 0.59

0.816 – 0.890
0.752 – 0.816
0.595 – 0.752
0.380 – 0.595
0.164 – 0.380
0.056 – 0.164

### Panel B: Correlation between School Enrollment Measures 1990-2004 and 2005-2019

Notes: Based on school enrollment reports from the Current Population Survey for those under 18. To measure September school starts, we estimate linear probability models, and include indicators for month of the year. Relative enrollment is the ratio of the estimated decline August enrollment divided by the estimated decline July enrollment. Numbers close to one indicate enrollment in August is similar to July, and numbers close to 0 suggest August enrollment is similar to September.
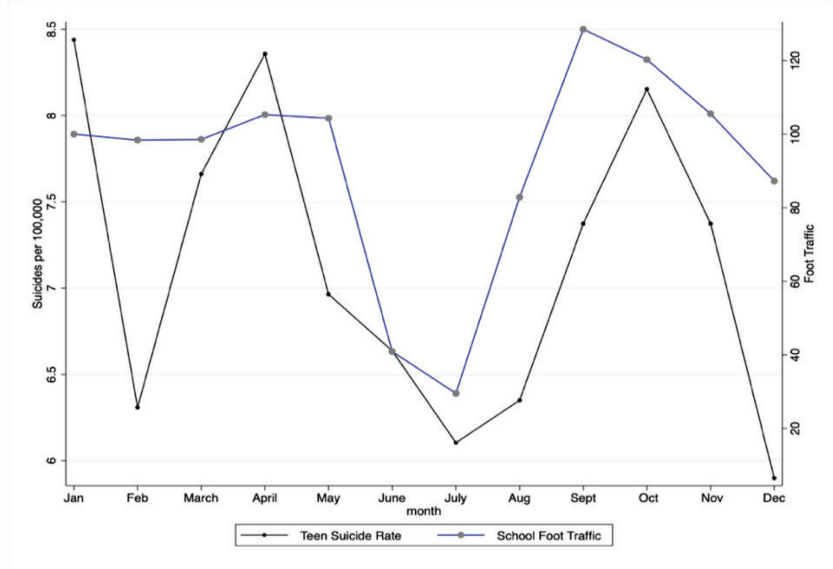
Figure A3:
Correlation of August Foot Traffic and June Foot Traffic
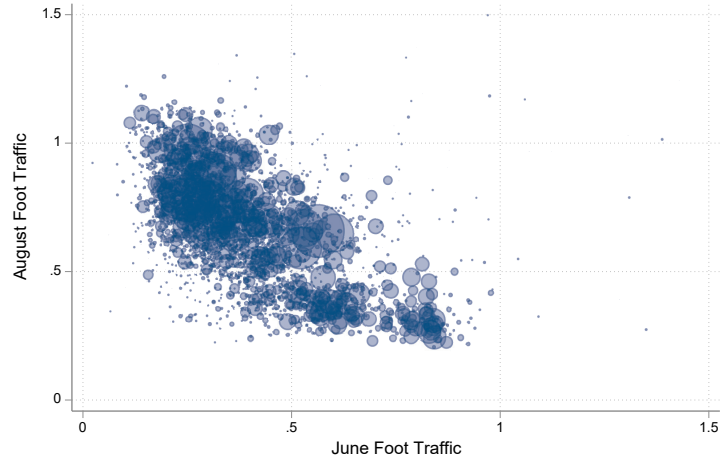
Notes: Based on the Safegraph data from 2019.

Appendix Figure A4. Monthly Youth (Ages 12-18) Suicide Rate Per 100,000 Population and Relative School Foot Traffic, 2019 and 2020

Panel (a): Monthly Youth Suicide Rate, 2019

Panel (b): Monthly Youth Suicide Rate, 2020
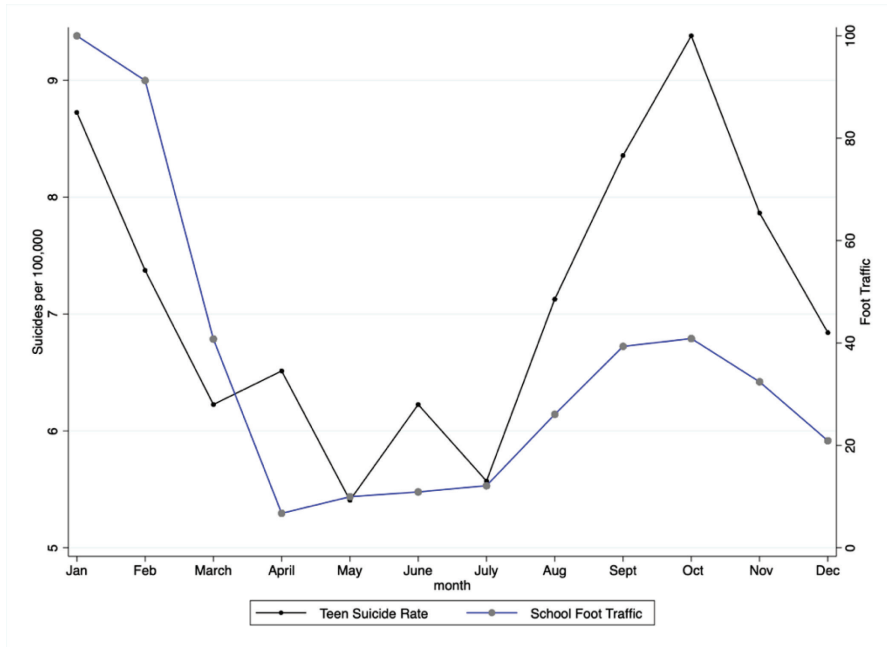
Appendix Figure A5. Variation in School Foot Traffic Relative to Jan/Feb 2020, Reproduced from Hansen, Sabia and Schaller (2022)

■	0.82 – 1.50
■	0.70 – 0.82
■	0.59 – 0.70
■	0.48 – 0.59
■	0.35 – 0.48
□	0.09 – 0.35
■	No data

Figure A6. Event-Study Analysis of K-12 Foot Traffic and Suicides, Using Two-Way Fixed Effects Estimates
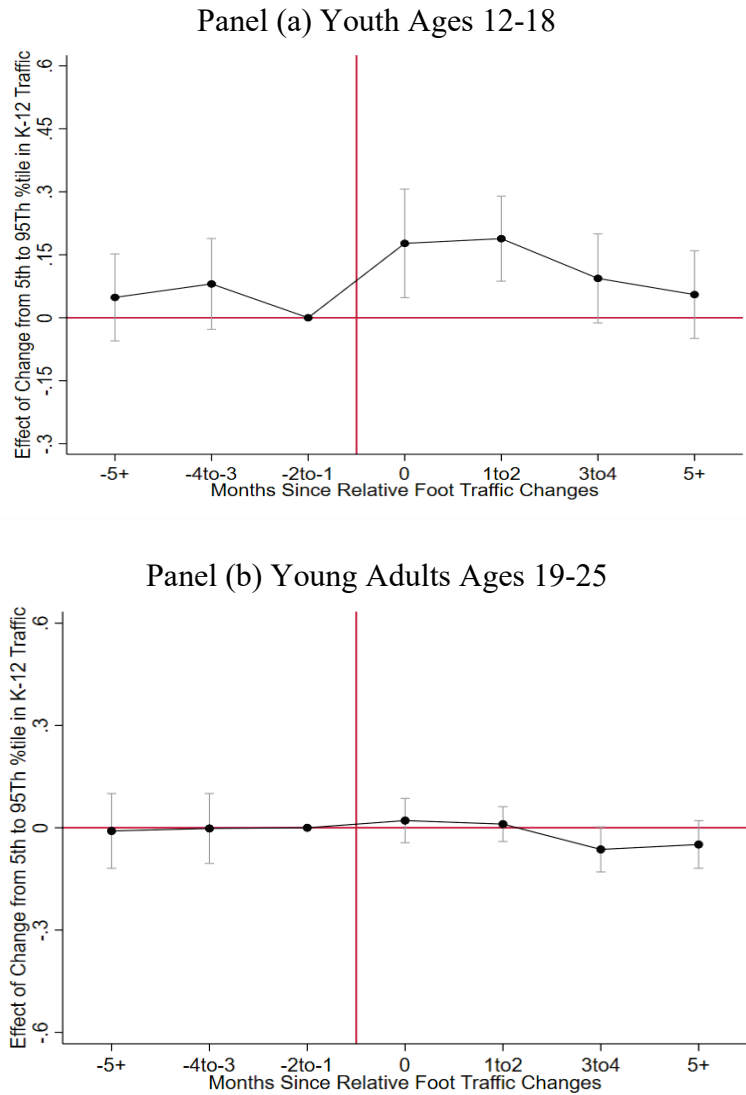
Panel (a) Youth Ages 12-18

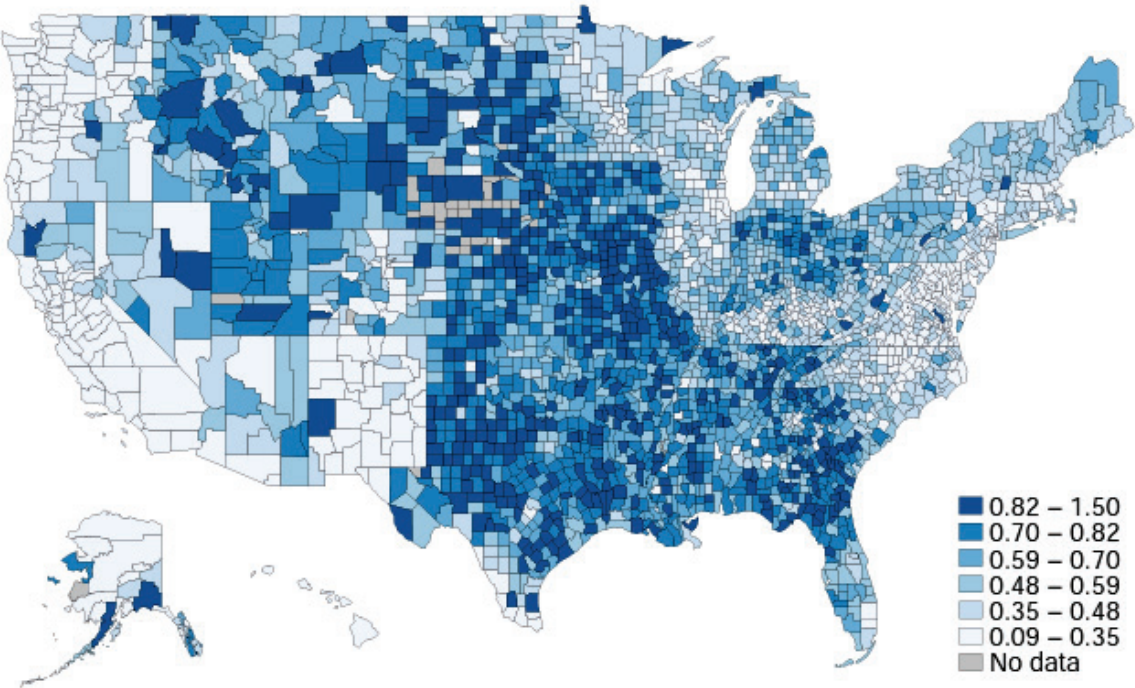### Panel (b) Young Adults Ages 19-25

Notes: Each regression is weighted by the population in each county. All models include controls for foot traffic into restaurants, COVID-19 mortality, income, unemployment rate, divorce rate, and summer months fixed effect. COVID-19 deaths are coded as zero until the first documented COVID-19 related deaths, which occurred in March 2020. The vertical bars represent 95% confidence interval generated using standard errors clustered at the state level.

Figure A7. Event-Study Analysis of Prominent Increases in K-12 School Foot Traffic "Full Reopening", Using Sun and Abraham (2021) Estimates

Panel (a): Youth Ages 12-18
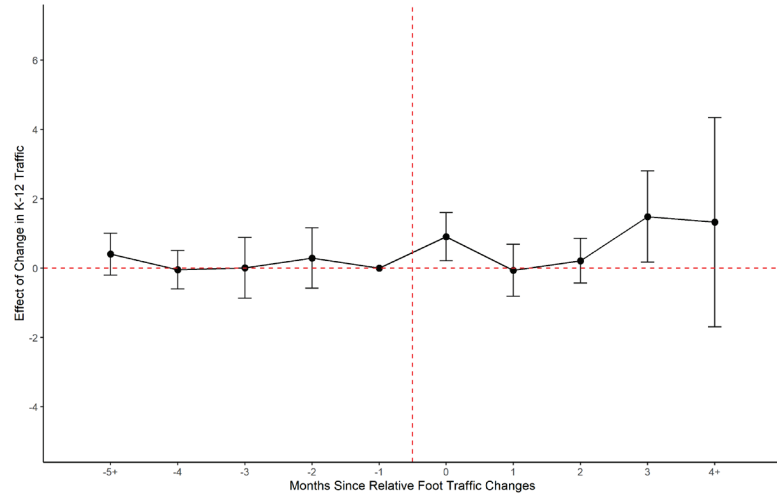
Panel (b): Young Adults Ages 19-25

Notes: Each regression is weighted by the population in each county. All models include controls for foot traffic into restaurants, COVID-19 mortality, income, unemployment rate, divorce rate, summer months fixed effect, and smaller reopening status of 20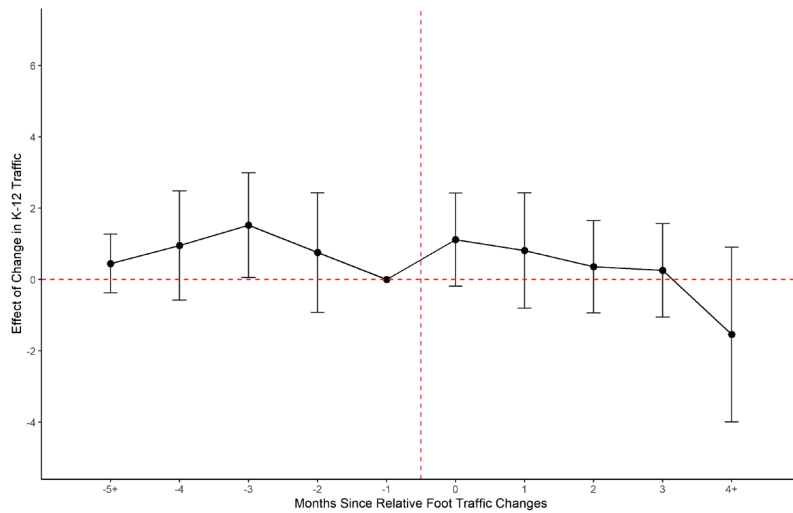% or higher between March and December of 2020. COVID-19 deaths are coded as zero until the first documented COVID-19 related deaths, which occurred in March 2020. Prominent increases are defined as K-12 relative foot traffic of at least 90% of pre-pandemic K-12 foot traffic levels. For this approach, we restrict the set of counterfactuals to those jurisdictions that did not attain at least 90% relative foot traffic in the post-pandemic period (March 2020-December 2020). The vertical bars represent 95% confidence interval generated using standard errors clustered at the state level.

Appendix Figure A8. Fall 2020 Reopening and 2021 Bullying Victimization Rates
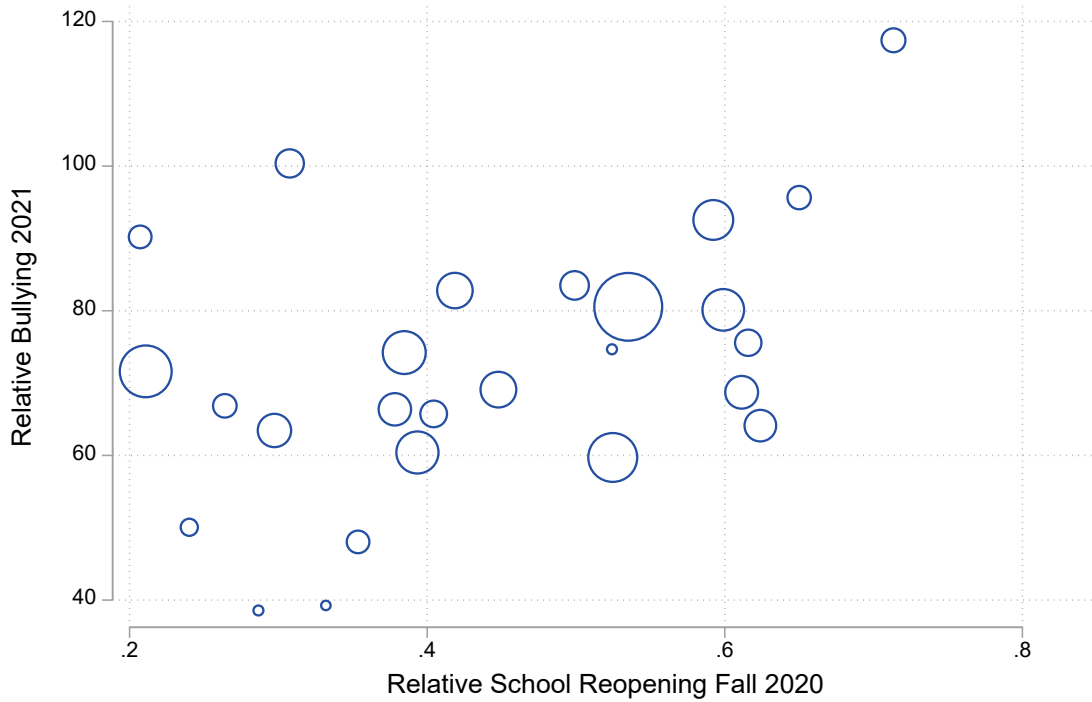
Notes: Based on results from the Youth Risk Behavior Survey 2013-2021. The school reopening measure is the ratio of SafeGraph school foot traffic in fall of 2020 relative to January and February 2020. The relative bullying rate is the bullying rate in 2021 divided by the average bullying rate from 2013-2019 multiplied by 100. Each dot represents a state with survey results in the YRBS during 2013-2019 and 2021, weighted by population size.

Appendix Figure A9: Trends in Major Depressive Episodes
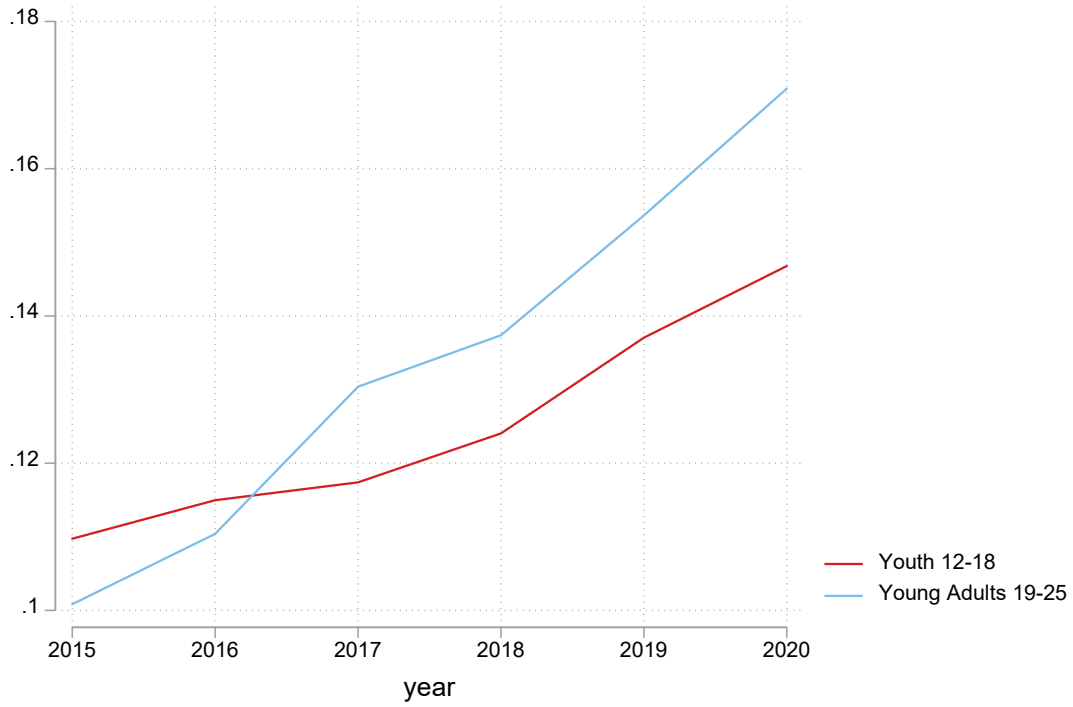
Notes: Based on data on self-reports of major depressive episodes from the National Survey of Drug Use and Health 2015-2020.

Appendix Table A1. Poisson Estimates of Seasonality of County-Level Youth (Ages 12-18) Suicides, 1990-2019 vs. 2020

	1990-2019			2020	
	(1)	(2)	(3)	(4)	(5)
February	0.0233	0.0234	0.0236	-0.102	-0.102
	(0.0192)	(0.0192)	(0.0193)	(0.104)	(0.104)
March	0.00210	0.00192	0.00146	-0.337***	-0.337***
	(0.0217)	(0.0217)	(0.0216)	(0.108)	(0.108)
April	0.0397	0.0395	0.0395	-0.260**	-0.260**
	(0.0252)	(0.0252)	(0.0252)	(0.103)	(0.103)
May	-0.0243	-0.0244	-0.0244	-0.478***	-0.478***
	(0.0244)	(0.0244)	(0.0244)	(0.116)	(0.116)
June	-0.212***	-0.212***	-0.212***	-0.305***	-0.305***
	(0.0214)	(0.0214)	(0.0214)	(0.0963)	(0.0963)
July	-0.248***	-0.248***	-0.248***	-0.449***	-0.449***
	(0.0294)	(0.0294)	(0.0293)	(0.118)	(0.118)
August	-0.169***	-0.169***	-0.169***	-0.202**	-0.202**
	(0.0231)	(0.0231)	(0.0232)	(0.0928)	(0.0928)
September	-0.0502*	-0.0502*	-0.0501*	-0.0104	-0.0104
	(0.0288)	(0.0288)	(0.0289)	(0.0906)	(0.0906)
October	0.0199	0.0197	0.0198	0.0724	0.0724
	(0.0262)	(0.0262)	(0.0261)	(0.100)	(0.100)
November	-0.0434*	-0.0436*	-0.0438*	-0.0710	-0.0710
	(0.0235)	(0.0234)	(0.0237)	(0.0989)	(0.0989)
December	-0.210***	-0.210***	-0.210***	-0.243**	-0.243**
	(0.0246)	(0.0246)	(0.0249)	(0.112)	(0.112)
Observations	1,129,323	1,129,323	1,129,323	37,692	37,692
County Fixed Effects?	No	Yes	Yes	No	Yes
Year Fixed Effects?	No	Yes	Yes	No	Yes
County-State-by-Year Controls?	No	No	Yes	No	No

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors are clustered at the state level. Each regression uses population in each county times the number of days in a month as an exposure variable. Per-capita income has been adjusted to 2020 dollars. Due to perfect prediction of the outcome from indicator controls, the coefficients in columns (2) and (3) are identified from 91% and 76% of the listed observations in column (1), respectively. For column (5), the coefficients are identified from 30% of the observations listed in column (4). Observable annual controls include the county unemployment rate, county personal income (0000s of 2020$), the state divorce rate, and the presence of a state anti-bullying law.

Appendix Table A2. Poisson Estimates of Change in Seasonality of County-Level Youth (Ages 12-18) Suicides, 2020 vs 2000-2019

	(1)	(2)	(3)
February*Year_2020	-0.125	-0.125	-0.125
	(0.105)	(0.105)	(0.105)
March* Year_2020	-0.340***	-0.339***	-0.339***
	(0.112)	(0.112)	(0.112)
April* Year_2020	-0.299***	-0.299***	-0.299***
	(0.110)	(0.110)	(0.110)
May*Year_2020	-0.454***	-0.454***	-0.454***
	(0.121)	(0.122)	(0.122)
June*Year_2020	-0.0925	-0.0923	-0.0925
	(0.0960)	(0.0960)	(0.0959)
July*Year_2020	-0.201	-0.201	-0.201
	(0.126)	(0.126)	(0.126)
August*Year_2020	-0.0337	-0.0335	-0.0331
	(0.0943)	(0.0943)	(0.0944)
September*Year_2020	0.0398	0.0398	0.0397
	(0.0953)	(0.0953)	(0.0953)
October*Year_2020	0.0526	0.0528	0.0526
	(0.109)	(0.109)	(0.109)
November*Year_2020	-0.0276	-0.0274	-0.0273
	(0.105)	(0.105)	(0.106)
December*Year_2020	-0.0335	-0.0334	-0.0332
	(0.114)	(0.114)	(0.114)
February	0.0233	0.0234	0.0236
	(0.0192)	(0.0192)	(0.0193)
March	0.00210	0.00192	0.00146
	(0.0217)	(0.0217)	(0.0216)
April	0.0397	0.0395	0.0395
	(0.0252)	(0.0252)	(0.0252)
May	-0.0243	-0.0244	-0.0244
	(0.0244)	(0.0244)	(0.0244)
June	-0.212***	-0.212***	-0.212***
	(0.0214)	(0.0214)	(0.0214)
July	-0.248***	-0.248***	-0.248***
	(0.0294)	(0.0294)	(0.0293)
August	-0.169***	-0.169***	-0.169***
	(0.0231)	(0.0231)	(0.0232)
September	-0.0502*	-0.0502*	-0.0501*
	(0.0288)	(0.0288)	(0.0289)
October	0.0199	0.0197	0.0198
	(0.0262)	(0.0262)	(0.0261)
November	-0.0434*	-0.0436*	-0.0438*

	(0.0235)	(0.0234)	(0.0237)
December	-0.210***	-0.210***	-0.210***
	(0.0246)	(0.0246)	(0.0249)
Observations	1,167,015	1,167,015	1,167,015
County Fixed Effects?	No	Yes	Yes
Year Fixed Effects?	No	Yes	Yes
County-State-by-Year Controls?	No	No	Yes

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors are clustered at the state level. Each regression uses population in each county times the number of days in a month as an exposure variable. Per-capita income has been adjusted to 2020 dollars. Due to perfect prediction of the outcome from indicator controls, the coefficients in columns (2) and (3) are identified from 89% and 79% of the listed observations in column (1), respectively. Observable annual controls include the county unemployment rate, county personal income (0000s of 2020$), the state divorce rate, and the presence of a state anti-bullying law.

Appendix Table A3. Poisson Estimates of Effect of Seasonality on County-Level Young Adult (Ages 19-25) Suicides, 1990-2019 vs. 2020

	1990-2019			2020	
	(1)	(2)	(3)	(4)	(5)
February	-0.0302**	-0.0300**	-0.0297**	0.0475	0.0475
	(0.0149)	(0.0149)	(0.0149)	(0.0823)	(0.0823)
March	0.00869	0.00867	0.00867	0.0866	0.0866
	(0.0142)	(0.0142)	(0.0142)	(0.0763)	(0.0763)
April	0.0252	0.0252	0.0254	-0.00358	-0.00358
	(0.0158)	(0.0158)	(0.0158)	(0.0671)	(0.0671)
May	0.0253*	0.0252*	0.0255*	0.00238	0.00238
	(0.0147)	(0.0147)	(0.0147)	(0.0891)	(0.0891)
June	0.0133	0.0133	0.0135	0.0423	0.0423
	(0.0158)	(0.0158)	(0.0158)	(0.0757)	(0.0757)
July	0.0294	0.0293	0.0293	0.202***	0.202***
	(0.0185)	(0.0185)	(0.0185)	(0.0739)	(0.0739)
August	0.0342***	0.0341***	0.0338***	0.0975	0.0975
	(0.0113)	(0.0113)	(0.0113)	(0.0722)	(0.0722)
September	0.0220	0.0220	0.0220	0.213***	0.213***
	(0.0135)	(0.0135)	(0.0135)	(0.0626)	(0.0626)
October	0.0156	0.0155	0.0155	0.142**	0.142**
	(0.0149)	(0.0149)	(0.0149)	(0.0552)	(0.0552)
November	-0.0164	-0.0164	-0.0164	0.0793	0.0793
	(0.0120)	(0.0120)	(0.0120)	(0.0583)	(0.0583)
December	-0.0745***	-0.0745***	-0.0744***	-0.0388	-0.0388
	(0.0164)	(0.0164)	(0.0164)	(0.0734)	(0.0734)
Observations	1,129,323	1,129,323	1,129,323	37,692	37,692
County Fixed Effects?	No	Yes	Yes	No	Yes
Year Fixed Effects?	No	Yes	Yes	No	Yes
County-State-by-Year Controls?	No	No	Yes	No	No

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors are clustered at the state level. Each regression uses population in each county times the number of days in a month as an exposure variable. Per-capita income has been adjusted to 2020 dollars. Due to perfect prediction of the outcome from indicator controls, the coefficients in columns (2) and (3) are identified from 96% and 86% of the listed observations in column (1), respectively. For column (5), the coefficients are identified from 47% of the observations listed in column (4). Observable annual controls include the county unemployment rate, county personal income (00000s of 2020$), the state divorce rate, and the presence of a state anti-bullying law.

Appendix Table A4. Poisson Estimates of Differential Effect of Seasonality on County-Level Young Adult Suicides, 2020 vs 2000-2019

	(1)	(2)	(3)
February*Year_2020	0.0765	0.0767	0.0764
	(0.0832)	(0.0833)	(0.0833)
March* Year_2020	0.0774	0.0777	0.0777
	(0.0794)	(0.0794)	(0.0794)
April* Year_2020	-0.0292	-0.0291	-0.0293
	(0.0688)	(0.0688)	(0.0688)
May*Year_2020	-0.0236	-0.0232	-0.0235
	(0.0893)	(0.0894)	(0.0894)
June*Year_2020	0.0275	0.0278	0.0275
	(0.0841)	(0.0841)	(0.0841)
July*Year_2020	0.172**	0.172**	0.172**
	(0.0798)	(0.0798)	(0.0798)
August*Year_2020	0.0624	0.0625	0.0629
	(0.0751)	(0.0751)	(0.0751)
September*Year_2020	0.191***	0.191***	0.191***
	(0.0622)	(0.0622)	(0.0622)
October*Year_2020	0.126**	0.126**	0.126**
	(0.0556)	(0.0556)	(0.0555)
November*Year_2020	0.0942	0.0944	0.0944
	(0.0587)	(0.0587)	(0.0587)
December*Year_2020	0.0345	0.0351	0.0350
	(0.0768)	(0.0768)	(0.0768)
February	-0.0290*	-0.0292*	-0.0290*
	(0.0150)	(0.0149)	(0.0149)
March	0.00925	0.00894	0.00894
	(0.0142)	(0.0142)	(0.0142)
April	0.0256	0.0256	0.0258
	(0.0158)	(0.0158)	(0.0158)
May	0.0260*	0.0256*	0.0259*
	(0.0147)	(0.0147)	(0.0147)
June	0.0148	0.0145	0.0148
	(0.0158)	(0.0158)	(0.0158)
July	0.0298	0.0297	0.0296
	(0.0185)	(0.0185)	(0.0185)
August	0.0351***	0.0349***	0.0346***
	(0.0114)	(0.0113)	(0.0114)
September	0.0224*	0.0220	0.0220
	(0.0135)	(0.0135)	(0.0135)
October	0.0159	0.0158	0.0158
	(0.0149)	(0.0149)	(0.0149)
November	-0.0149	-0.0151	-0.0151
	(0.0122)	(0.0122)	(0.0122)

December	-0.0734***	-0.0740***	-0.0739***
	(0.0165)	(0.0165)	(0.0164)
Observations	1,167,328	1,167,328	1,167,328
County Fixed Effects?	No	Yes	Yes
Year Fixed Effects?	No	Yes	Yes
County-State-by-Year Controls?	No	No	Yes

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors are clustered at the state level. Each regression uses population in each county times the number of days in a month as an exposure variable. Per-capita income has been adjusted to 2020 dollars. Due to perfect prediction of the outcome from indicator controls, the coefficients in columns (2) and (3) are identified from 95% and 84% of the listed observations in column (1), respectively. Observable annual controls include the county unemployment rate, county personal income (0000s of 2020$), the state divorce rate, and the presence of a state anti-bullying law.