

SI APPENDIX: COVID-19 AND RURAL WELL-BEING

Title: SI Appendix for Impacts of the Covid-19 Pandemic on Rural America

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Supplemental Tables

Table S1. Experience with the Covid-19 Pandemic

	Percent reporting Covid-19 Diagnosis or Symptoms for...			
	Self	Family	Friend or Acquaintance	Any
Overall	2.26 [1.46, 3.48]	8.52 [6.43, 11.20]	19.35 [16.22, 22.90]	28.35 [24.73, 32.26]
Sex				
Male	1.89 [0.99, 3.56]	8.02 [5.23, 12.12]	20.08 [15.46, 25.67]	28.34 [23.07, 34.27]
Female	2.74 [1.51, 4.90]	8.79 [5.98, 12.74]	18.63 [14.66, 23.38]	28.69 [23.84, 34.09]
Age				
18 – 29	n.e.	13.14 [5.79, 27.15]	22.71 [11.74, 39.35]	22.71 [11.74, 39.35]
30 – 39	1.5 [0.48, 4.62]	24.48 [16.05, 35.46]	33.58 [23.83, 44.97]	33.58 [23.83, 44.97]
40 – 49	4.77 [2.12, 10.39]	22.91 [15.55, 32.41]	31.49 [23.27, 41.06]	31.49 [23.27, 41.06]
50 – 64	2.78 [1.36, 5.61]	19.90 [15.26, 25.52]	30.32 [24.77, 36.51]	30.32 [24.77, 36.51]
65+	1.55 [0.62, 3.78]	13.20 [9.88, 17.43]	20.01 [15.95, 24.79]	20.01 [15.95, 24.79]
Education				
Less than high school	n.e.	7.37 [2.16, 22.31]	21.46 [6.76, 50.76]	28.83 [11.38, 56.12]
High School or GED	0.26 [0.037, 1.86]	8.90 [4.10, 18.23]	9.46 [5.79, 15.08]	18.62 [12.15, 27.45]
Some College	2.61 [1.25, 5.38]	6.92 [4.22, 11.15]	21.66 [15.63, 29.21]	29.27 [22.68, 36.87]
Bachelors or Associates	3.27 [1.55, 6.74]	10.09 [6.68, 14.97]	20.53 [15.67, 26.42]	31.60 [25.88, 37.94]
Graduate or Professional Degree	3.60 [1.68, 7.56]	10.32 [6.27, 16.52]	28.67 [21.96, 36.46]	38.42 [31.16, 46.23]
Latino/a				
Latino/a	1.68 [0.41, 6.66]	10.11 [3.73, 24.60]	17.20 [9.23, 29.79]	28.25 [17.17, 42.79]
Not Latino/a	2.18 [1.35, 3.51]	8.09 [6.12, 10.62]	19.18 [15.92, 22.93]	27.90 [24.20, 31.92]

Note: In the case of a zero the cell is filled in by n.e. for ‘not estimable’ because a zero occurrence is improbable at a population level and simply reflects a low sample size for the specific cell. Numbers inside brackets are 95% confidence intervals.

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Table S2. Perceived Impact of the Covid-19 Pandemic

	Average Perceived Impact on...			
	Overall Life	Household Finances	Mental Health	Physical Health
Overall	4.56 [4.36, 4.76]	4.67 [4.47, 4.86]	4.64 [4.46, 4.83]	5.21 [5.02, 5.41]
Sex				
Male	4.48 [4.19, 4.77]	4.69 [4.40, 4.98]	4.78 [4.50, 5.06]	5.25 [4.97, 5.53]
Female	4.66 [4.40, 4.93]	4.69 [4.44, 4.94]	4.48 [4.24, 4.73]	5.23 [4.97, 5.49]
Age				
18 – 29	3.85 [3.30, 4.40]	3.90 [3.19, 4.62]	3.64 [3.04, 4.23]	4.23 [3.55, 4.91]
30 – 39	4.76 [4.19, 5.34]	4.43 [3.89, 4.96]	4.49 [3.99, 4.98]	5.49 [4.91, 6.06]
40 – 49	4.20 [3.76, 4.64]	4.53 [4.08, 4.98]	4.33 [3.91, 4.75]	4.97 [4.63, 5.32]
50 – 64	4.58 [4.25, 4.91]	4.84 [4.54, 5.15]	4.82 [4.52, 5.12]	5.41 [5.13, 5.69]
65+	4.96 [4.72, 5.20]	5.20 [5.01, 5.38]	5.35 [5.11, 5.59]	5.36 [5.14, 5.59]
Education				
Less than high school	4.57 [3.18, 5.96]	3.73 [2.30, 5.16]	5.72 [4.36, 7.08]	6.35 [4.98, 7.73]
High School or GED	4.68 [4.18, 5.18]	4.59 [4.13, 5.05]	4.65 [4.22, 5.08]	5.16 [4.72, 5.60]
Some College	4.71 [4.36, 5.06]	4.78 [4.43, 4.13]	4.72 [4.38, 5.05]	5.30 [4.94, 5.67]
Bachelors or Associates	4.37 [4.10, 4.64]	4.67 [4.40, 4.94]	4.42 [4.15, 4.69]	5.03 [4.78, 5.28]
Graduate or Professional Degree	4.25 [3.92, 4.57]	4.67 [4.35, 4.99]	4.59 [4.28, 4.91]	5.19 [4.93, 5.44]
Latino/a				
Latino/a	4.42 [3.64, 5.21]	4.57 [3.85, 5.28]	4.11 [3.41, 4.81]	5.25 [4.36, 6.13]
Not Latino/a	4.59 [4.40, 4.78]	4.69 [4.50, 4.89]	4.75 [4.58, 4.93]	5.22 [5.05, 5.39]

Note: Perceived impact of Covid-19 pandemic rated on a scale from 1 – Extremely Negative to 10 – Extremely Positive, with 5 being No Impact at All. Numbers inside brackets are 95% confidence intervals.

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Table S3. Impact of the Covid-19 Pandemic on Work

	Percent Temporality Unemployed		Formal Work Percent Reporting Household Unemployment Insurance Usage		Informal work Percent Reporting Informal Work in Household	
	Pre	Now	Pre	Now	Pre	Now
Overall	3.00 [1.86, 4.81]	12.74 [9.95, 16.17]	2.73 [1.60, 4.60]	12.31 [9.71, 15.49]	16.35 [13.32, 19.92]	14.39 [11.66, 17.63]
Sex						
Male	2.82 [1.24, 6.29]	10.62 [7.20, 15.39]	2.94 [1.30, 6.53]	9.51 [6.40, 13.90]	16.70 [12.52, 21.94]	15.99 [11.93, 21.10]
Female	3.31 [1.93, 5.63]	15.40 [11.17, 20.88]	2.52 [1.29, 4.85]	15.56 [11.55, 20.65]	15.93 [11.77, 21.20]	13.07 [9.63, 17.51]
Age						
18 – 29	2.25 [0.55, 8.78]	14.21 [6.77, 27.42]	2.79 [0.39, 17.37]	10.90 [4.48, 24.18]	28.00 [16.11, 44.06]	24.89 [13.76, 40.77]
30 – 39	5.29 [2.19, 12.23]	24.03 [15.34, 35.57]	4.64 [1.62, 12.57]	17.30 [10.08, 28.08]	22.66 [14.38, 33.83]	15.45 [8.98, 25.27]
40 – 49	n.e.	9.83 [5.63, 16.60]	1.32 [0.30, 5.67]	19.10 [12.90, 27.36]	14.74 [9.27, 22.62]	16.69 [10.82, 24.85]
50 – 64	4.01 [1.93, 8.13]	11.69 [8.14, 16.52]	2.99 [1.49, 5.94]	11.56 [8.10, 16.23]	13.59 [9.71, 18.69]	12.40 [8.70, 17.38]
65+	1.91 [0.83, 4.34]	3.15 [1.77, 5.56]	1.08 [0.46, 2.50]	3.06 [1.82, 5.09]	8.89 [6.19, 12.59]	9.38 [6.60, 13.16]
Education						
Less than high school	n.e.	5.95 [0.81, 32.94]	n.e.	14.46 [4.18, 39.61]	38.55 [16.13, 67.18]	58.00 [31.80, 80.35]
High School or GED	1.50 [0.29, 7.4]	15.36 [9.21, 24.51]	1.83 [0.43, 7.49]	10.78 [6.13, 18.26]	14.68 [9.44, 22.10]	13.76 [8.58, 21.33]
Some College	4.34 [2.15, 8.60]	11.52 [6.95, 18.49]	3.86 [1.69, 8.57]	12.72 [8.08, 19.47]	18.16 [12.65, 25.38]	12.63 [8.39, 18.56]
Bachelors or Associates	2.32 [0.98, 5.42]	12.84 [9.16, 17.72]	2.49 [1.28, 4.78]	13.11 [9.30, 18.16]	10.93 [7.16, 16.32]	11.40 [7.73, 16.50]
Graduate or Professional Degree	3.56 [1.57, 7.89]	12.58 [7.98, 19.28]	1.89 [0.72, 4.86]	12.02 [7.73, 18.23]	19.16 [12.94, 27.41]	17.61 [11.69, 25.65]
Latino/a						
Latino/a	5.24 [1.86, 13.86]	14.32 [6.49, 28.72]	0.60 [0.083, 4.2]	6.28 [1.64, 21.27]	17.70 [8.91, 32.11]	11.65 [5.63, 22.57]
Not Latino/a	2.62 [1.49, 4.55]	12.59 [9.69, 16.20]	3.06 [1.73, 5.36]	13.55 [10.69, 17.04]	16.04 [12.93, 19.74]	15.01 [12.00, 18.60]

Note: Pre refers to the 2019, the year prior to the pandemic, and Now refers to the month leading up to the survey. In the case of a zero the cell is filled in by n.e. for 'not estimable' because a zero occurrence is improbable at a population level and simply reflects a low sample size for the specific cell. Numbers inside brackets are 95% confidence intervals.

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Table S4. Covid-19 and Perceptions of Local County Economic Health

	Perceptions of Local County Economic Health		
	Year Before Pandemic	Time of Survey	A Year from Time of Survey
Overall	4.69 [4.52, 4.86]	3.34 [3.19, 3.49]	4.25 [4.08, 4.41]
Sex			
Male	4.83 [4.61, 5.05]	3.48 [3.28, 3.68]	4.68 [4.44, 4.93]
Female	4.84 [4.60, 5.08]	3.47 [3.24, 3.70]	4.38 [4.15, 4.62]
Age			
18 – 29	5.04 [4.47, 5.61]	3.63 [3.06, 4.21]	4.89 [4.37, 5.41]
30 – 39	4.73 [4.23, 5.23]	3.49 [3.04, 3.94]	4.20 [3.71, 4.7]
40 – 49	4.90 [4.53, 5.26]	3.43 [3.12, 3.75]	4.41 [4.00, 4.82]
50 – 64	4.78 [4.52, 5.03]	3.26 [3.04, 3.49]	4.65 [4.37, 4.92]
65+	4.80 [4.59, 5.01]	3.59 [3.40, 3.78]	4.59 [4.38, 4.82]
Education			
Less than high school	5.76 [4.97, 6.55]	5.54 [4.81, 6.27]	5.78 [5.04, 6.52]
High School or GED	5.05 [4.68, 5.42]	3.53 [3.14, 3.93]	4.69 [4.36, 5.03]
Some College	4.58 [4.27, 4.89]	3.34 [3.10, 3.59]	4.53 [4.19, 4.88]
Bachelors or Associates	5.09 [4.86, 5.31]	3.55 [3.35, 3.76]	4.48 [4.22, 4.73]
Graduate or Professional Degree	4.45 [4.17, 4.74]	3.09 [2.80, 3.37]	4.00 [3.70, 4.29]
Latino/a			
Latino/a	4.56 [4.05, 5.07]	3.52 [2.95, 4.09]	4.17 [3.62, 4.71]
Not Latino/a	4.88 [4.70, 5.05]	3.44 [3.28, 3.59]	4.59 [4.41, 4.77]

Note: Perceptions of economic health rated on a scale from 1 – Extremely Poor to 10 – Extremely Good, with 5 being neither poor nor good. Numbers inside brackets are 95% confidence intervals.

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Table S5. Linear Probability Models of Direct Experience with Covid-19

	Probability of Reporting Covid-19 Diagnosis or Symptoms for...			
	Self	Family	Friends and Acquaintances	Any
Sex				
Male [Reference]				
Female	0.00500 (0.601)	0.00278 (0.909)	-0.0150 (0.658)	0.0000382 (0.999)
Age				
18-29 [Reference]				
30-39	0.0138 (0.186)	0.00801 (0.898)	0.0701 (0.314)	0.0802 (0.371)
40-49	0.0432 (0.027)	-0.0351 (0.501)	0.0734 (0.288)	0.0681 (0.416)
50-64	0.0185 (0.033)	0.00927 (0.858)	0.0431 (0.466)	0.0554 (0.462)
65+	0.00739 (0.345)	-0.0286 (0.566)	-0.0331 (0.567)	-0.0559 (0.449)
Education				
No High School	-0.0343 (0.014)	-0.0323 (0.558)	-0.0818 (0.505)	-0.106 (0.416)
High School	-0.0320 (0.028)	-0.0167 (0.684)	-0.202 (0.000)	-0.208 (0.000)
Some College	-0.0160 (0.345)	-0.0385 (0.239)	-0.0787 (0.121)	-0.106 (0.046)
Associates or Bachelors	-0.00298 (0.878)	-0.0122 (0.717)	-0.107 (0.023)	-0.0903 (0.074)
Graduate Degree [Reference]				
Ethnicity				
Latino/a [Reference]				
Not Latino/a	0.00201 (0.884)	-0.0195 (0.681)	0.0223 (0.678)	-0.00267 (0.969)
Constant	0.0153 (0.423)	0.129 (0.097)	0.251 (0.001)	0.365 (0.000)
<i>N</i>	935	935	935	935
<i>R</i> ²	0.017	0.008	0.037	0.032

Note: Reported values are unstandardized regression coefficients, corresponding *p*-values are below each coefficient in parentheses. Model N less than total study N due to refusals and “Do not know” responses.

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Table S6. OLS Regression Models of Perceived Impact of the Covid-19 pandemic

	Perceived Impact on...			
	Overall Life	Household Finances	Mental Health	Physical Health
Age				
Male [Reference]				
Female	0.205 (0.308)	0.00187 (0.992)	-0.348 (0.058)	-0.0483 (0.801)
Age				
18-29 [Reference]				
30-39	1.049 (0.014)	0.651 (0.150)	0.821 (0.042)	1.397 (0.003)
40-49	0.307 (0.386)	0.613 (0.141)	0.656 (0.077)	0.745 (0.053)
50-64	0.667 (0.048)	0.873 (0.022)	1.188 (0.001)	1.213 (0.002)
65+	1.121 (0.000)	1.326 (0.000)	1.690 (0.000)	1.152 (0.002)
Education				
No High School	0.327 (0.625)	-0.842 (0.237)	1.260 (0.067)	1.189 (0.074)
High School	0.487 (0.095)	0.0268 (0.924)	0.290 (0.270)	0.0502 (0.842)
Some College	0.573 (0.022)	0.248 (0.291)	0.317 (0.176)	0.207 (0.342)
Associates or Bachelors	0.282 (0.206)	0.188 (0.394)	-0.000204 (0.999)	-0.0638 (0.745)
Graduate Degree [Reference]				
Ethnicity				
Latino/a [Reference]				
Not Latino/a	0.0750 (0.850)	-0.0395 (0.912)	0.416 (0.242)	-0.164 (0.697)
Constant	3.283 (0.000)	3.823 (0.000)	3.254 (0.000)	4.262 (0.000)
<i>N</i>	935	935	935	935
<i>R</i> ²	0.039	0.036	0.075	0.051

Note: Reported values are unstandardized regression coefficients, corresponding *p*-values are below each coefficient in parentheses. Model N less than total study N due to refusals and “Do not know” responses. Perceived impact of Covid-19 pandemic rated on a scale from 1 – Extremely Negative to 10 – Extremely Positive, with 5 being No Impact at All.

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Table S7. Linear Probability Models of Work and Covid-19

	Probability of Formal Work Impacts				Probability of Informal Work	
	Unemployment		Unemployment Insurance		Pre	Now
	Pre	Now	Pre	Now		
Sex						
Male [Reference]						
Female	-0.000261 (0.986)	0.0544 (0.088)	-0.00897 (0.546)	0.0613 (0.041)	-0.00257 (0.939)	-0.0217 (0.469)
Age						
18-29 [Reference]						
30-39	0.0296 (0.350)	0.116 (0.136)	0.0117 (0.758)	0.0542 (0.432)	-0.0624 (0.484)	-0.0981 (0.237)
40-49	-0.0235 (0.213)	-0.0449 (0.465)	-0.0202 (0.512)	0.0630 (0.303)	-0.159 (0.047)	-0.105 (0.191)
50-64	0.0197 (0.420)	-0.0322 (0.588)	-0.00306 (0.920)	-0.0228 (0.666)	-0.151 (0.047)	-0.129 (0.091)
65+	-0.00233 (0.914)	-0.118 (0.037)	-0.0249 (0.410)	-0.110 (0.031)	-0.222 (0.003)	-0.185 (0.015)
Education						
No High School	-0.0386 (0.032)	-0.0977 (0.209)	-0.0221 (0.055)	0.0106 (0.907)	0.159 (0.277)	0.381 (0.008)
High School	-0.0235 (0.258)	0.00457 (0.923)	0.000377 (0.982)	-0.0210 (0.609)	-0.0819 (0.101)	-0.0663 (0.180)
Some College	0.00716 (0.749)	-0.0271 (0.497)	0.0239 (0.186)	0.00529 (0.890)	-0.0260 (0.586)	-0.0597 (0.188)
Associates or Bachelors	-0.0146 (0.426)	-0.00812 (0.831)	0.00131 (0.913)	-0.00347 (0.924)	-0.121 (0.004)	-0.0877 (0.043)
Graduate Degree [Reference]						
Ethnicity						
Latino/a [Reference]						
Not Latino/a	-0.0250 (0.386)	0.00601 (0.916)	0.0299 (0.043)	0.0906 (0.045)	0.0206 (0.727)	0.0573 (0.197)
Constant	0.0511 (0.116)	0.127 (0.048)	0.00412 (0.885)	0.0289 (0.589)	0.330 (0.000)	0.272 (0.002)
<i>N</i>	935	935	935	935	935	935
<i>R</i> ²	0.021	0.063	0.016	0.051	0.053	0.066

Note: Reported values are unstandardized regression coefficients, corresponding *p*-values are below each coefficient in parentheses. Model N less than total study N due to refusals and “Do not know” responses. Pre refers to the 2019, the year prior to the pandemic, and Now refers to the month leading up to the survey.

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Table S8. OLS Regression Models of Perceptions of Local County Economic Health

	Perceptions of Local County Economic Health		
	Year Before Pandemic	Time of Survey	A Year from Time of Survey
Sex			
Male [Reference]			
Female	-0.0367 (0.819)	-0.109 (0.442)	-0.267 (0.092)
Age			
18-29 [Reference]			
30-39	0.0505 (0.893)	0.0574 (0.870)	-0.542 (0.104)
40-49	0.107 (0.753)	-0.0587 (0.843)	-0.323 (0.332)
50-64	-0.0703 (0.827)	-0.213 (0.446)	-0.243 (0.409)
65+	-0.00923 (0.977)	0.0488 (0.858)	-0.218 (0.442)
Education			
No High School	1.212 (0.004)	2.276 (0.000)	1.942 (0.000)
High School	0.381 (0.115)	0.130 (0.576)	0.729 (0.001)
Some College	0.150 (0.465)	0.217 (0.249)	0.496 (0.013)
Associates or Bachelors	0.515 (0.007)	0.342 (0.054)	0.381 (0.037)
Graduate Degree [Reference]			
Ethnicity			
Latino/a [Reference]			
Not Latino/a	0.242 (0.388)	-0.241 (0.411)	0.310 (0.275)
Constant	4.268 (0.000)	3.412 (0.000)	3.954 (0.000)
<i>N</i>	913	913	877
<i>R</i> ²	0.020	0.055	0.048

Note: Reported values are unstandardized regression coefficients, corresponding *p*-values are below each coefficient in parentheses. Model N less than total study N due to refusals and “Do not know” responses. Perceptions of economic health rated on a scale from 1 – Extremely Poor to 10 – Extremely Good, with 5 being neither poor nor good.

Supplemental Detailed Description of Measurement

Direct experience with the Covid-19 virus was assessed by asking respondents if they, a family, or a friend or acquaintance had either contracted coronavirus or shown symptoms.

Perceived impacts of the Covid-19 pandemic was assessed by asking respondents to rate, from 1 – Extremely Negative to 10 – Extremely Positive, with 5 being No Impact at All, the impact of the Covid-19 pandemic on their overall life, household finances, mental health, and physical health.

Formal work was assessed by asking respondents if they were employed during 2019 before the Covid-19 pandemic. They were then asked if that employment was full or part-time. If they were not employed, they were asked to report whether they were unemployed temporarily, retired, a homemaker, a student, disabled, or other. This was then followed by a question asking their employment status in the month prior to the survey and the same follow up questions were asked.

Informal work was assessed by presenting respondents with the following definition of informal work, “Informal work, sometimes referred to as work that is ‘under the table’, is defined as work not reported to the government that is done for cash or the trade of goods and services. Some examples of this include selling or trading of clothes, babysitting, landscaping, mechanical work, and home repair.” Respondents were then asked how many members of their household, including themselves, participated in informal work in the year prior to the pandemic and in the month prior to the survey.

Use of unemployment insurance was assessed by asking respondents if they or anyone in their household used unemployment insurance in the year prior to the pandemic and if they or anyone in their household were on unemployment insurance at the time of the survey.

We assessed perceptions of local economic health by asking respondents to indicate how healthy they think their county’s economy was in the year prior to the pandemic, at the time of the survey, and how healthy they expect it to be one year after the survey. Respondents rated economic health from 1 – Extremely Poor to 7 – Extremely Good, with 4 being neither poor nor good.