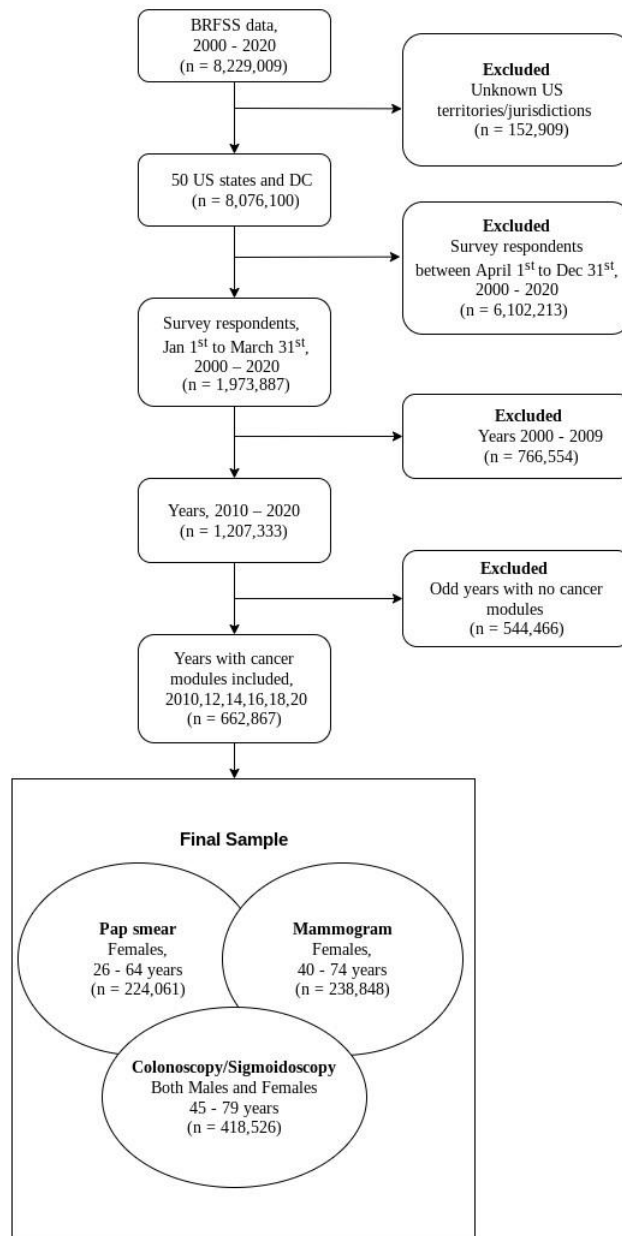
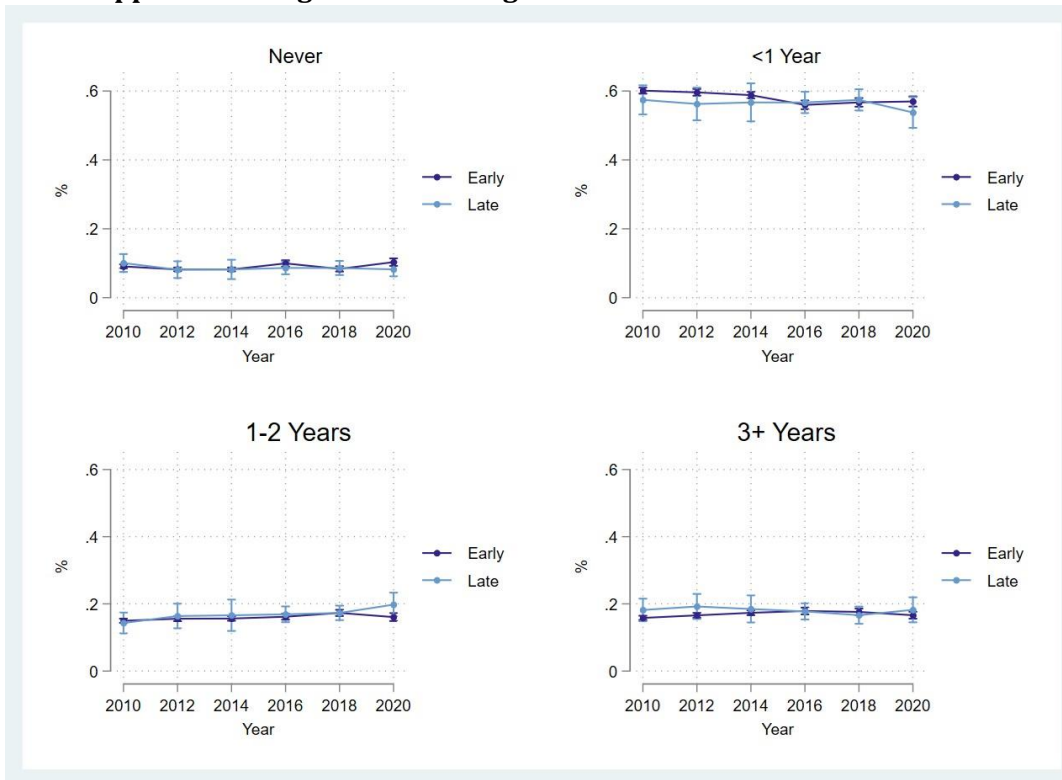


Supplemental Files

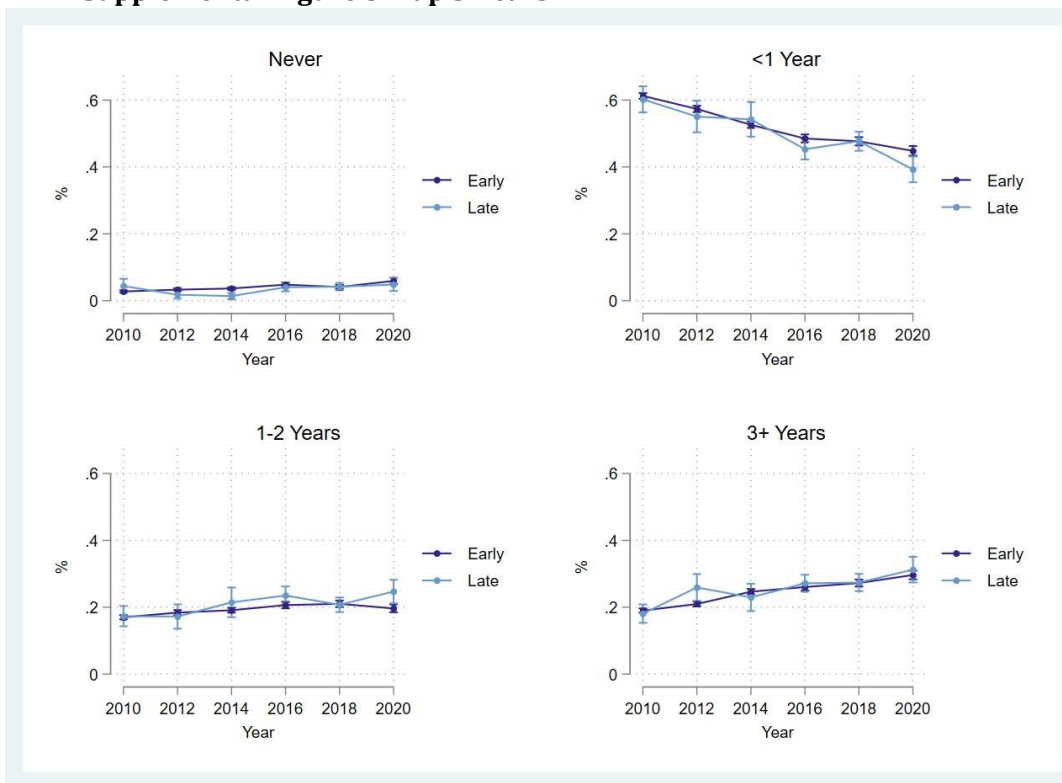
The 2020 U.S. cancer screening deficit and the timing of adults' most recent screen: A population-based cross-sectional study

Supplemental Figure 1: Sample Selection Flow Chart

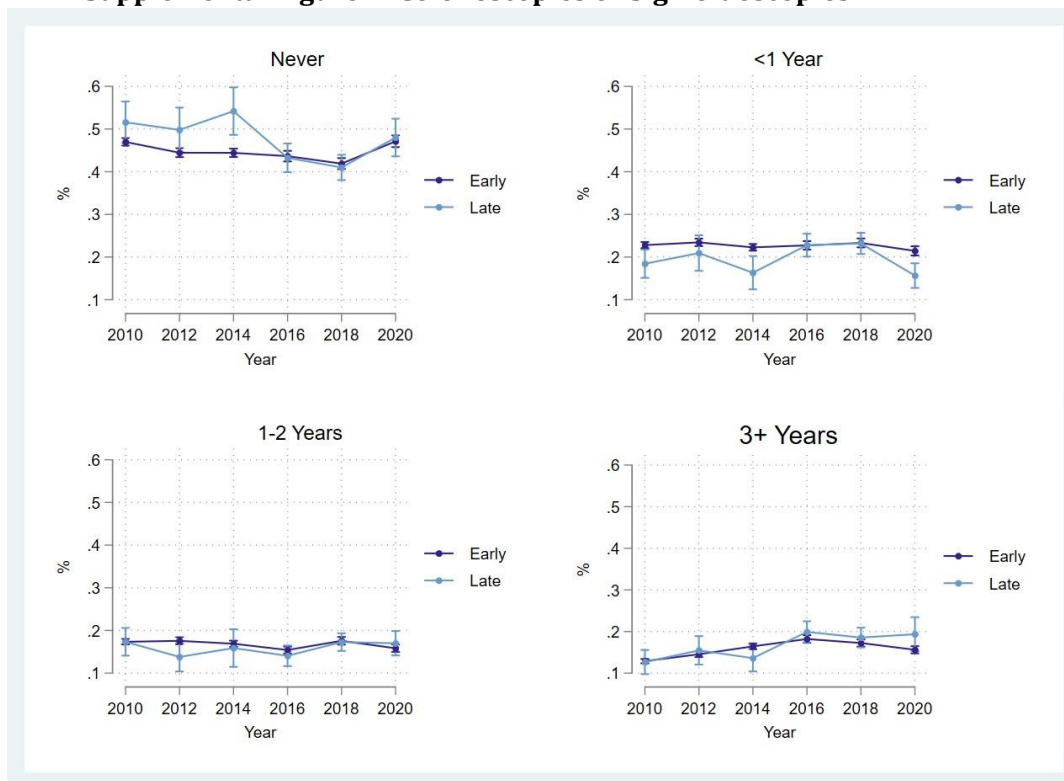


Supplemental Figure 2: Mammograms

Supplemental Figure 2 shows the year-by-year proportion of adults reporting having never received a mammogram, having received a mammogram in the past year, having received a mammogram 1-2 years ago, and having received a mammogram 3 or more years ago. The "early" cohort are adults surveyed by BRFSS in the first three months of the survey wave and the "late" cohort are adults surveyed in the final three months (Jan-Mar) or second year of the survey wave.

Supplemental Figure 3: Pap Smears

Supplemental Figure 3 shows the year-by-year proportion of adults reporting having never received a pap smear, having received a pap smear in the past year, having received a pap smear 1-2 years ago, and having received a pap smear 3 or more years ago. The "early" cohort are adults surveyed by BRFSS in the first three months of the survey wave and the "late" cohort are adults surveyed in the final three months (Jan-Mar) or second year of the survey wave.

Supplemental Figure 4: Colonoscopies or Sigmoidoscopies

Supplemental Figure 4 shows the year-by-year proportion of adults reporting having never received a colonoscopy or sigmoidoscopy, having received a colonoscopy or sigmoidoscopy in the past year, having received a colonoscopy or sigmoidoscopy 1-2 years ago, and having received a colonoscopy or sigmoidoscopy 3 or more years ago. The "early" cohort are adults surveyed by BRFSS in the first three months of the survey wave and the "late" cohort are adults surveyed in the final three months (Jan-Mar) or second year of the survey wave.

**Supplemental Table 1: Marginal Effect Estimates for 2020*Late Group
(Linear & Multinomial Logistic Regression Models)**

		Model	
		Linear	Logistic
Mammogram	Never	-0.029* (0.013) - 0.021 (0.034)	-0.028*** (0.000) - 0.022 (0.030)
	<1 Year	0.031* (0.015)	0.031*** (0.000)
	1-2 Years	0.020 (0.024)	0.020 (0.037)
	3+ Years		
Pap Smear	Never	-0.011 (0.012) - 0.043 (0.031)	-0.010 (0.038) - 0.055 (0.069)
	<1 Year	0.042* (0.019)	0.038* (0.027)
	1-2 Years	0.012 (0.018)	0.028 (0.019)
	3+ Years		
Colonoscopy / Sigmoidoscopy	Never	-0.010 (0.020)	-0.016 (0.019)
	<1 Year	-0.035* (0.016)	-0.043*** (0.001)
	1-2 Years	0.030 (0.016)	0.038 (0.084)
	3+ Years	0.015 (0.019)	0.021 (0.024)

Supplemental - Table 1 reports the 2020*Late effect estimates from our primary linear regression model (left column) and the alternative non-linear multinomial logistic regression model (right column).

* $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$.

Supplemental Table 2: Alternative Specifications

		Mammogram			Pap Smear			Colonoscopy / Sigmoidoscopy		
		2020*Late	se	Pre-Trend Test (p)	2020*Late	se	Pre-Trend Test (p)	2020*Late	se	Pre-Trend Test (p)
Alt. 1		-0.028	(0.014)	0.290	-0.013	(0.012)	0.000 [^]	-0.002	(0.020)	0.009 [^]
Alt. 2	Never	-0.028	(0.015)	0.540	-0.013	(0.012)	0.005 [^]	-0.002	(0.027)	0.081
Alt. 3		0.005	(0.006)	0.581	-0.013	(0.012)	0.108	0.010	(0.011)	0.010 [^]
Alt. 1		-0.030	(0.032)	0.047	-0.055	(0.031)	0.110	-0.042*	(0.016)	0.356
Alt. 2	<1 Year	-0.030	(0.028)	0.368	-0.055*	(0.025)	0.612	-0.042*	(0.020)	0.294
Alt. 3		-0.047***	(0.012)	0.083	-0.055*	(0.025)	0.008 [^]	-0.043***	(0.009)	0.014
Alt. 1		0.036*	(0.016)	0.854	0.050*	(0.021)	0.157	0.026	(0.016)	0.207
Alt. 2	1-2 Years	0.036	(0.023)	0.935	0.050*	(0.022)	0.338	0.026	(0.019)	0.331
Alt. 3		0.031***	(0.009)	0.398	0.050*	(0.022)	0.933	0.035***	(0.009)	0.416
Alt. 1		0.022	(0.022)	0.366	0.017	(0.017)	0.011 [^]	0.019	(0.020)	0.001 [^]
Alt. 2	3+ Year	0.022	(0.024)	0.539	0.017	(0.025)	0.275	0.019	(0.023)	0.260
Alt. 3		0.011	(0.009)	0.618	0.017	(0.025)	0.056	-0.002	(0.009)	0.085

Supplemental - Table 2 reports the 2020*Late effect estimates for three alternative linear probability regression models. Alt 1 removes the state-level fixed effects. Alt 2 removes the state-level fixed effects and does not cluster robust standard errors at the state-level, opting only to estimate unclustered robust standard errors. Alt 3 removes fixed effects, does not cluster robust standard errors, and does not weight the analyses by BRFSS supplied sampling weights. * $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$.

Supplemental Table 3: Self-reported rates (2010-2018) of most recent cancer screening for early and late survey groups

	Survey Wave Group						
		Early		Late		T	p
Mammogram	Never	0.342	(0.007)	0.355	(0.009)	1.860	0.200
	<1 Year	0.400	(0.007)	0.379	(0.008)	-3.000	0.100
	1-2 Years	0.116	(0.001)	0.121	(0.003)	5.000	0.040
	3+ Years	0.143	(0.004)	0.145	(0.004)	0.500	0.670
Pap Smear	Never	0.088	(0.003)	0.102	(0.006)	4.670	0.040
	<1 Year	0.467	(0.008)	0.420	(0.009)	-5.880	0.030
	1-2 Years	0.172	(0.003)	0.186	(0.009)	4.670	0.040
	3+ Years	0.274	(0.008)	0.292	(0.008)	2.250	0.150
Colon/Sigmoidoscopy	Never	0.417	(0.006)	0.417	(0.012)	0.000	1.000
	<1 Year	0.211	(0.005)	0.195	(0.008)	-3.200	0.090
	1-2 Years	0.159	(0.004)	0.146	(0.008)	-3.250	0.080
	3+ Years	0.213	(0.006)	0.242	(0.010)	4.830	0.040

Supplemental - Table 3 reports the rates for each mutually exclusive cancer screening category (as a proportion) of the total sample of adults surveyed by BRFSS in years 2010, 2012, 2014, 2016, and 2018. The rates are stratified by adults surveyed early in the survey wave and adults surveyed later in the survey wave. The t-statistic is the result of the two-sample proportion test.

Supplemental Table 4: Demographic rates (2010-2018) for early and late survey groups

Demographic Group	Survey Wave Group				
	Early	Late	T	p	
Age 18-24	0.126 (0.002)	0.134 (0.003)	4.000	0.060	
Age 25-29	0.081 (0.002)	0.091 (0.006)	5.000	0.040	
Age 30-34	0.094 (0.002)	0.103 (0.003)	4.500	0.050	
Age 35-39	0.081 (0.001)	0.088 (0.003)	7.000	0.020	
Age 40-44	0.089 (0.001)	0.088 (0.002)	-1.000	0.420	
Age 45-49	0.080 (0.001)	0.077 (0.001)	-3.000	0.100	
Age 50-54	0.097 (0.001)	0.094 (0.002)	-3.000	0.100	
Age 55-59	0.081 (0.001)	0.081 (0.003)	0.000	1.000	
Age 60-64	0.080 (0.001)	0.077 (0.002)	-3.000	0.100	
Age 65-69	0.061 (0.001)	0.059 (0.003)	-2.000	0.180	
Age 70-74	0.048 (0.001)	0.043 (0.004)	-5.000	0.040	
Age 75-79	0.038 (0.001)	0.030 (0.001)	-8.000	0.020	
Age 80-84	0.043 (0.002)	0.034 (0.002)	-4.500	0.050	
non-Hispanic White	0.659 (0.031)	0.581 (0.065)	-2.520	0.130	
non-Hispanic Black	0.114 (0.011)	0.106 (0.019)	-0.730	0.540	
non-Hispanic other race/ethnicity	0.074 (0.010)	0.100 (0.026)	2.600	0.120	
Hispanic	0.136 (0.027)	0.197 (0.055)	2.260	0.150	
No primary education	0.002 (0.001)	0.003 (0.001)	1.000	0.420	
Primary education only	0.041 (0.005)	0.053 (0.011)	2.400	0.140	
Some High School education, no degree	0.092 (0.002)	0.093 (0.004)	0.500	0.670	
High School degree only	0.285 (0.008)	0.270 (0.015)	-1.870	0.200	
Some college education, no bachelor's degree	0.305 (0.005)	0.308 (0.007)	0.600	0.610	
Bachelor's degree or more	0.274 (0.007)	0.273 (0.007)	-0.140	0.900	
Married	0.524 (0.005)	0.515 (0.009)	-1.800	0.210	
Divorced	0.105 (0.002)	0.101 (0.004)	-2.000	0.180	
Widowed	0.066 (0.002)	0.059 (0.004)	-3.500	0.070	
Separated	0.024 (0.001)	0.024 (0.001)	0.000	1.000	
Never Married	0.237 (0.005)	0.251 (0.010)	2.800	0.110	
Unmarried Partner	0.044 (0.002)	0.050 (0.005)	3.000	0.100	

Supplemental - Table 4 reports the rates each demographic group (used as independent variables in the primary analysis) of the total sample of adults surveyed by BRFSS in years 2010, 2012, 2014, 2016, and 2018. The rates are stratified by adults surveyed early in the survey wave and adults surveyed later in the survey wave. The t-statistic is the result of the two-sample proportion test.

Supplemental Table 5: Differential Pre-Trend Tests

		Pre-Treatment Coefficient Estimates								
		2010*Late		2012*Late		2014*Late		2016*Late		Joint Test (p)
Mammogram	Never	-0.007	(0.018)	0.006	(0.016)	-0.013	(0.014)	-0.018	(0.012)	0.307
	<1 Year	-0.012	(0.023)	-0.022	(0.024)	0.002	(0.025)	0.021	(0.021)	0.027
	1-2 Years	-0.008	(0.021)	0.000	(0.019)	0.001	(0.020)	0.001	(0.016)	0.965
	3+ Years	0.027	(0.021)	0.016	(0.018)	0.010	(0.013)	-0.003	(0.015)	0.499
Pap Smear	Never	0.017	(0.011)	-0.009	(0.012)	-0.025**	(0.008)	-0.010	(0.010)	0.000 [^]
	<1 Year	0.019	(0.022)	0.018	(0.026)	0.045*	(0.021)	0.006	(0.015)	0.007 [^]
	1-2 Years	-0.012	(0.014)	0.018	(0.017)	0.001	(0.017)	0.022	(0.014)	0.319
	3+ Years	-0.024	(0.016)	0.009	(0.019)	-0.021	(0.018)	-0.006	(0.017)	0.249
Colonoscopy/ Sigmoidoscopy	Never	0.019	(0.017)	0.015	(0.019)	0.019	(0.019)	-0.024	(0.018)	0.257
	<1 Year	-0.030	(0.019)	-0.023	(0.013)	-0.037	(0.023)	-0.009	(0.013)	0.445
	1-2 Years	0.012	(0.020)	-0.021	(0.015)	0.006	(0.015)	-0.009	(0.013)	0.096
	3+ Years	-0.011	(0.010)	0.014	(0.011)	-0.018*	(0.008)	-0.016	(0.009)	0.002 [^]

Supplemental - Table 5 reports the year-by-year coefficients of the event-history analyses (excluding 2020) with year 2018 as the baseline. Significant coefficients indicate differences in screening rate levels between quasi-treatment cohorts. The Joint Test (p) column reports the p-value from the Wald test, testing if each of the reported coefficient jointly equals zero. The Bonferroni correction was used to account for multiple hypotheses.

** p < 0.05, ** p < 0.01, *** p < 0.001. Note: [^] p < multiple-test*

corrected significance level for Joint Test.

Supplemental Table 6: Year-by-Year Differences in Screening Rates for Late Survey Group

		2010*Late	2012*Late	2014*Late	2016*Late	2020*Late	2020 Relative Change
Mammogram	Never	-0.006 (0.018)	0.009 (0.016)	-0.013 (0.014)	-0.017 (0.012)	-0.029* (0.013)	-33.0%
	<1 Year	-0.011 (0.023)	-0.030 (0.024)	0.004 (0.023)	0.020 (0.021)	-0.021 (0.034)	-3.5%
	1-2 Years	-0.008 (0.020)	0.003 (0.018)	0.002 (0.020)	-0.000 (0.016)	0.031* (0.015)	17.5%
	3+ Years	0.025 (0.021)	0.018 (0.018)	0.007 (0.012)	-0.002 (0.015)	0.020 (0.024)	11.5%
Pap Smear	Never	0.017 (0.010)	-0.011 (0.014)	-0.024* (0.009)	-0.009 (0.010)	-0.011 (0.012)	-22.2%
	<1 Year	0.019 (0.023)	0.015 (0.025)	0.046* (0.020)	-0.007 (0.015)	0.043 (0.031)	-13.5%
	1-2 Years	-0.008 (0.015)	-0.014 (0.017)	0.003 (0.017)	0.024 (0.014)	0.042* (0.019)	17.3%
	3+ Years	-0.028 (0.015)	0.010 (0.019)	-0.026 (0.017)	-0.008 (0.017)	0.012 (0.018)	10.2%
Colonoscopy	Never	0.025 (0.017)	0.045* (0.021)	0.042 (0.029)	-0.011 (0.022)	-0.010 (0.020)	-1.06
	<1 Year	-0.032 (0.022)	-0.012 (0.017)	-0.031 (0.030)	0.013 (0.018)	-0.035* (0.016)	-4.3%
	1-2 Years	0.016 (0.031)	-0.035 (0.020)	0.011 (0.025)	-0.009 (0.019)	0.030 (0.016)	3.8%
	3+ Years	-0.009 (0.020)	0.002 (0.012)	-0.023 (0.019)	0.008 (0.018)	0.015 (0.019)	2.1%

Supplemental Table 6 reports the year-by-year differences in cancer screening rates between the early and late survey groups. All analyses control for exogenous sociodemographic characteristics, state-level fixed effects, and temporal trends (year fixed effects). Robust standard errors were clustered at the state level and reported in parentheses. The relative change was estimated by computing the semi-elasticity (relative marginal effect) of belonging to the late survey group in 2020. * $p < 0.05$.