No. 20-0394

IN THE SUPREME COURT OF TEXAS

In re STATE OF TEXAS,
Relator.

On Petition for Writ of Mandamus
to the Harris County Clerk, the Travis County Clerk,
the Dallas County Elections Administrator, the Cameron County Elections Administrator, and the El Paso County Elections Administrator

BRIEF OF AMICI CURIAE MEDICAL DOCTORS

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IDENTITY AND INTEREST OF AMICI CURIAE MEDICAL DOCTORS

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ARGUMENT

I. Under Texas Election Code section 82.002, each voter decides whether s/he has a physical condition that prevents voting in person without a likelihood of injury to her/his health.

Section 82.002 of the Texas Election Code allows a voter to early vote by mail by requesting a mail ballot from the county clerk:

> "if the voter has a sickness or physical condition that prevents the voter from appearing at the polling place on election day without a likelihood . . . of injuring the voter's health."

The statute does not require the voter to say, much less prove medically, what the physical condition is. The statute does not require the voter to say, much less prove medically, how voting in person with such a condition results in a likelihood of injuring the voter's health, or how great the likelihood is.

On its face, the statute leaves it up to each voter to make a judgment whether to vote early by mail to avoid a likelihood of injuring her/his health.

A. The Legislature in 1981 removed a requirement that a doctor certify the voter has a physical disability.

This was the result of a series of deliberate decisions by the Legislature.

In 1975, the Legislature amended the Texas Election Code to authorize early voting by mail on various grounds. "If the ground of application is sickness or physical disability," it required "a certificate of a duly licensed physician or chiropractor or accredited Christian Science practitioner certifying to such sickness or physical disability shall accompany the application." Act of May 30, 1975, 64th Leg., R.S., ch. 682, § 6, sec. 37, 1975 Tex. Gen. Laws 2080, 2084–85.

In 1981, the Legislature replaced that requirement with this one: "a certificate of the applicant certifying to such sickness or physical disability shall accompany the application ... ." Act of May 26, 1981, 67th Leg., R.S., ch 301, 1981 Tex. Gen. Laws 854.

B. The Legislature in 1985 removed a requirement that the voter self-certify s/h e has a physical disability.

In 1985, the Legislature extensively amended the Election Code. Act of May 13, 1985, 69th Leg., R.S., ch. 211, 1985 Tex. Gen. Laws 802. It adopted section 82.002's present "physical condition" language and removed any self-certification requirement. *Id.* at 897, 901.

In 1987 the Legislature amended section 84.011 requiring "I certify that the information given in this application is true, and I understand that giving false information in this application is a crime" before the applicant's signature. Act of June 1, 1987, 70th Leg., R.S., ch. 472, §24, sec. 84.011, 1987 Tex. Gen. Laws 2061, 2067.

C. In 2020, a physical condition—lack of immunity to COVID-19—makes voting in person a serious health injury risk.

Reading words into a statute is rarely permissible. Reading words ***back into*** a statute the Legislature ***took out*** should never be. At most, here one might read in Texas Election Code section 82.002 an implied requirement that the voter's judgment s/he has a physical condition as a result of which voting in person poses an unacceptable risk of health injury must be in objectively reasonable good faith.

At least through 2020, every Texas voter has such a physical condition.

Medical science is quite clear that lack of immunity to COVID-19 is a physical condition as a result of which voting in person on election day carries with it a definite risk of serious health injury or even death. The record evidence and literature will be addressed in the briefs of the respondents and other amici. ***Amici Medical Doctors wish to underscore the severity of the risk and the sheer irresponsibility of requiring voters to chose between risking their health and losing their vote. Here is what Drs. Chenven and Allen tell any patient who asks.***

"Covid-19 is a very dangerous disease that can be mild in some individuals but very serious in as many as 15% of its victims, often leading to hospitalization, and causing serious multi-organ injury or even death. This is established science."

"Standing in line to vote with a large number of other people and then voting in an interior space with a dozen or more other people and after hundreds of other people have done so significantly increases the risk of contracting this highly contagious virus." *See* Appx. C, Cotti et al., *The Relationship Between In-Person, Voting Consolidated Polling Locations, And Absentee Voting On COVID-19: Evidence From The Wisconsin Primary* (Nat'l Bureau of Econ. Research, Working Paper No. 27187, 2020).[1]

"Voting in person is therefore medically unwise if there is a vote by mail alternative. You have to make this medical choice for yourself, but if you chose to vote by mail, doing so is medically wise."

The State's response is to say voters who make such decisions are claiming that fear of contracting COVID-19 is a sickness entitling the voter to vote by mail and to suggest that they are giving false information by checking the disability box. The State is mischaracterizing their decisions.

Whether or not the voter is subjectively afraid, in choosing to vote by mail s/he is making an objectively rational decision in good faith. It is true, not false, that lack of immunity is a physical condition. It is true, not false, that absent known immunity to COVID-19, either as a result of having had the disease or of

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[1] Available at https://www.nber.org/papers/w27187?utm_campaign=ntwh&utm_medium=email&utm_source=ntwg21.

vaccination, the voter is at definite risk of contracting this infection by voting in person, suffering illness, injury to her/his vital organs, and even death.

Amici Medical Doctors wish to underscore that <u>everyone</u> presently has the lack of immunity physical condition.

At this point we have no vaccine. We do not know when we will. The most encouraging news so far suggests we might have one by year-end.

At this point, only a few people know whether they have antibodies to COVID-19 from prior infection. No one knows how much immunity such antibodies would give, nor how long any immunity would last.

A perfectly healthy 25 year old decathlon athlete therefore could stand in line for hours to vote, then vote inside a room in which 1,000 others have voted in the last several hours, contract this disease, and suffer anything from a bad upper respiratory bout to a hospitalization for pneumonia or even death. All of this has already happened to many young and healthy individuals.

Without in <u>any</u> way undercutting the main point that <u>everyone</u> is at such risk, amici medical doctors also note that very large numbers of Americans have other sicknesses or physical conditions that, it is medically indisputable, make the likelihood of severe injury and even death much, much greater. *See* Appx. A, CDC COVID-19 Response Team, *Preliminary Estimates of the Prevalence of Selected*

Underlying Health Conditions Among Patients with Coronavirus Disease, 69 Morbidity and Mortality Weekly Report 382 (Dep't Health and Human Services April 3, 2020). Such physical conditions include obesity (30-40% of Texans), diabetes, asthma, chronic obstructive pulmonary disorder, and compromised immune systems (e.g., from undergoing chemotherapy).

Veterans face heightened risks. Among those who served in Afghanistan or Iraq, for example, asthma is more common and more severe. *See* Associated Press, *8 Ways Veterans Are Particularly at Risk from the Coronavirus Pandemic*, Military.com, April 16, 2020.[2]

Thus, each voter in making the choice to vote by mail because of COVID-19 may have especially important individual reasons to do. But ***we repeat that <u>everyone</u> presently has the lack of immunity physical condition***.

II. County election officials have no duty, authority, or ability to second guess a voter's judgment that s/he has such a physical condition.

The State did not name as respondents any voters who have requested to vote by mail. They have named county election officials in five urban counties.

The county officials are doing exactly what section 82.002 and the related

[2] Available at https://www.military.com/us-military-coronavirus-response/2020/04/16/8-ways-veterans-are-particularly-risk-coronavirus-pandemic.html.

parts of the Election Code specific to such officials authorize and require them to do: mail ballots to voters who check the disability box on the request form.

The Election Code does not require a county clerk to second-guess the voter on whether s/he has a physical condition such that in-person voting results in a likelihood of injury to her/his health. Nor does statute authorize a county clerk to second-guess the voter on whether s/he has such a physical condition.

The request form, Appx. B (promulgated by the Texas Secretary of State), only requires the voter to check "disability." There is no way for a clerk to know what sickness or physical condition the voter, in her/his own judgment, considers to pose an unacceptable risk when voting in person of injury to her/his health.

Important factors affecting the likelihood of contracting COVID-19 by voting in person vary from county to county as well as from time to time.[3] It is thus not only lawful but sound public policy for election officials, especially in large urban areas where the in-person lines would be longest, to encourage voters to minimize everyone's risk of contracting COVID-19 by instead voting by mail.

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[3]A Moore County spike in COVID-19 cases that may be spilling over into Potter County may be due to infection at a meatpacking plant. *See* Juan Pablo Garnham, *More than 700 new cases of coronavirus reported after testing at meatpacking plants in Amarillo region*, TexasTribune.com, May 16, 2020, *available at* https://www.texastribune.org/2020/05/16/700-new-coronavirus-cases-amarillo/.

Consider a young employee at a skilled nursing facility. Such a voter acts not only in her/his own objectively reasonable best medical interest by voting by mail, but also in the best medical interests of all the residents. County clerks act in everyone's best interests by encouraging such employees to vote by mail.

III. Threatened prosecution of doctors and others who urge Texans to vote by mail to protect their health violates the First Amendment.

The Attorney General has threated criminal prosecution of unspecified "third parties" who encourage Texas citizens to vote by mail to avoid contracting COVID-19. This violates the First Amendment.

Any threat of criminal prosecution based on a citizen's speech has an impermissible chilling effect on free expression. *E.g., Citizens United v. Federal Election Com'n*, 558 U.S. 310, 336 (2010). Actual prosecution, of course, would be even worse.

> When Government seeks to use its full power, including the criminal law, to command where a person may get his or her information or what distrusted source he or she may not hear, it uses censorship to control thought. This is unlawful. The First Amendment confirms the freedom to think for ourselves.

Id. at 356.

Texas physicians and Texas Physicians for Social Responsibility are medically expert "third parties" who may advise Texas citizens, both patients and the public generally, to request a mail ballot to avoid the health risks posed by in-person voting during the COVID-19 pandemic.

If asked by a patient whether voting in person poses a health risk, a doctor owes a duty to give their best medical opinion. Health care providers may face liability claims for failing to meet the standard of care when dealing with infectious diseases.[4]

As discussed above, amici consider all Texans who lack immunity to COVID-19 to have a physical condition that means voting in person poses a definite risk of health injury, a medical opinion well-grounded in current research and certainly not definitively refuted.

In a free society like ours, unlike China,[5] such opinions may be expressed. *Milkovich v. Lorain Journal Co*, 497 U.S. 1, 19-21 (1990) (expressions of opinion, unless shown to be verifiably false statements of fact, are constitutionally protected); *Bentley v. Bunton*, 94 S.W.3d 561, 579-81 (2002) (same).

As Justice Thomas explained in *National Inst. of Family and Life Advocates v. Becerra*, 138 S. Ct. 2362 (2018), the Supreme Court has "long protected the

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[4] *E.g., Coming Attractions Bridal and Formal, Inc. v. Texas Health Resources*, 595 S.W.3d 659, 663-664 (Tex. 2020) (claim that hospital failed to recognize danger of Ebola virus and take appropriate measures a health care liability suit).

[5] *See* "Chinese Doctor, Silenced After Warning of Outbreak, Dies of Coronavirus," *New York Times*, Feb. 7, 2020, *available at* https://www.nytimes.com/2020/02/06/world/asia/chinese-doctor-Li-Wenliang-coronavirus.html.

First Amendment rights of professionals." *Id.* at 2374. Protecting professional speech is especially important "in the fields of medicine and public health, where information can save lives." *Sorrell v. IMS Health Inc.*, 564 U.S. 552, 566 (2011).

"Doctors help patients make deeply personal decisions, and their candor is crucial." *Becerra*, 138 S. Ct. 2374 (quoting *Wallschlaeger v. Gov. of Florida*, 848 F.3d 1293, 1328 (11th Cir. 2017)). Other "governments have 'manipulat[ed] the content of doctor patient discourse' to increase state power and suppress minorities." *Id*.[6]

Speech by non-medical "third parties" is also protected by the First Amendment. Nonpartisan organizations and partisan organizations, whether parties or candidates and their campaigns or political action committees, have the strongest core First Amendment right of speech to advocate exercising the right to vote by mail under the present pandemic circumstances.

Consider the League of Women Voters. Its Austin area president testified in the Travis County district court hearing that the LWV-AA desires to proactively engage and encourage voters to vote by mail under the present pandemic circumstances, already gets many questions about doing so, and views the threat

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[6] Citing Berg, *Toward a First Amendment Theory of Doctor-Patient Discourse and the Right to Receive Unbiased Medical Advice*, 74 B.U.L. Rev 201, 201–02 (1994) and *McCullen v. Coakley*, 134 S. Ct. 2518, 2529 (2014).

of criminal liability as a deterrent to doing so. *See* Declaration of Joyce LeBombard, Mandamus Record Vol. 4 at 636.

Speech about voting and elections "is central to the meaning and purpose of the First Amendment." *Citizens United*, 558 U.S. at 329. The right of free speech "guarantees at least the liberty to discuss publicly and truthfully all matters of public concern without previous restraint or fear of subsequent punishment." *Federal Election Com'n v. Wisconsin Right to Life, Inc.*, 551 U.S. 449, 469 (2007).

CONCLUSION AND PRAYER

Amici Curiae Medical Doctors respectfully request that the Court receive and consider this brief, deny the State's petition for mandamus, and support the decisions of voters to vote by mail and doctors, county elected officials and others to encourage voting by mail under section 82.002 during the extraordinary circumstances of the COVID-19 pandemic.

Respectfully submitted,

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<u>**CERTIFICATE OF COMPLIANCE**</u>

Pursuant to Tex. R. App. P. 9.4(i)(3), I certify that the foregoing document complies with the word count limitations set out in Tex. R. App. P. 9.4. It contains 2,368 words, excluding parts exempted by Tex. R. App. P. 9.4(i)(1). In making this Certificate of Compliance, I am relying on the word count provided by the software used to prepare the document. This is a computer-generated document created in Microsoft Word, using 14-point Calibri typeface for body text and 12-point Calibri typeface for footnotes.

/s/ P.M.Schenkkan

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CERTIFICATE OF SERVICE

This is to certify that a true and correct copy of **Brief of AmicI Curiae Medical Doctors** was served on this 19th day of May, 2020 via electronic service on:

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APPENDIX

Tab A — CDC COVID-19 Response Team, *Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease*, 69 Morbidity and Mortality Weekly Report 382 (Dep't Health and Human Services April 3, 2020)

Tab B — Application for Ballot by Mail

Tab C — Cotti et al., *The Relationship Between In-Person, Voting Consolidated Polling Locations, And Absentee Voting On COVID-19: Evidence From The Wisconsin Primary,* (National Bureau of Economic Research, Working Paper No. 27187, 2020)

APPENDIX A

Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease 2019 — United States, February 12–March 28, 2020

CDC COVID-19 Response Team

On March 31, 2020, this report was posted as an MMWR *Early Release on the* MMWR *website (https://www.cdc.gov/mmwr).*

On March 11, 2020, the World Health Organization declared Coronavirus Disease 2019 (COVID-19) a pandemic (*1*). As of March 28, 2020, a total of 571,678 confirmed COVID-19 cases and 26,494 deaths have been reported worldwide (*2*). Reports from China and Italy suggest that risk factors for severe disease include older age and the presence of at least one of several underlying health conditions (*3*,*4*). U.S. older adults, including those aged ≥65 years and particularly those aged ≥85 years, also appear to be at higher risk for severe COVID-19–associated outcomes; however, data describing underlying health conditions among U.S. COVID-19 patients have not yet been reported (*5*). As of March 28, 2020, U.S. states and territories have reported 122,653 U.S. COVID-19 cases to CDC, including 7,162 (5.8%) for whom data on underlying health conditions and other known risk factors for severe outcomes from respiratory infections were reported. Among these 7,162 cases, 2,692 (37.6%) patients had one or more underlying health condition or risk factor, and 4,470 (62.4%) had none of these conditions reported. The percentage of COVID-19 patients with at least one underlying health condition or risk factor was higher among those requiring intensive care unit (ICU) admission (358 of 457, 78%) and those requiring hospitalization without ICU admission (732 of 1,037, 71%) than that among those who were not hospitalized (1,388 of 5,143, 27%). The most commonly reported conditions were diabetes mellitus, chronic lung disease, and cardiovascular disease. These preliminary findings suggest that in the United States, persons with underlying health conditions or other recognized risk factors for severe outcomes from respiratory infections appear to be at a higher risk for severe disease from COVID-19 than are persons without these conditions.

Data from laboratory-confirmed COVID-19 cases reported to CDC from 50 states, four U.S. territories and affiliated islands, the District of Columbia, and New York City with February 12–March 28, 2020 onset dates were analyzed. Cases among persons repatriated to the United States from Wuhan, China, and the Diamond Princess cruise ship were excluded. For cases with missing onset dates, date of onset was estimated by subtracting 4 days (median interval from symptom onset to specimen collection date among cases with known dates in these data) from the earliest specimen collection. Public health departments reported cases to CDC using a standardized case report form that captures information (yes, no, or unknown) on the following conditions and potential risk factors: chronic lung disease (inclusive of asthma, chronic obstructive pulmonary disease [COPD], and emphysema); diabetes mellitus; cardiovascular disease; chronic renal disease; chronic liver disease; immunocompromised condition; neurologic disorder, neurodevelopmental, or intellectual disability; pregnancy; current smoking status; former smoking status; or other chronic disease (*6*). Data reported to CDC are preliminary and can be updated by health departments over time; critical data elements might be missing at the time of initial report; thus, this analysis is descriptive, and no statistical comparisons could be made.

The percentages of patients of all ages with underlying health conditions who were not hospitalized, hospitalized without ICU admission, and hospitalized with ICU admission were calculated. Percentages of hospitalizations with and without ICU admission were estimated for persons aged ≥19 years with and without underlying health conditions. This part of the analysis was limited to persons aged ≥19 years because of the small sample size of cases in children with reported underlying health conditions (N = 32). To account for missing data among these preliminary reports, ranges were estimated with a lower bound including cases with both known and unknown status for hospitalization with and without ICU admission as the denominator and an upper bound using only cases with known outcome status as the denominator. Because of small sample size and missing data on underlying health conditions among COVID-19 patients who died, case-fatality rates for persons with and without underlying conditions were not estimated.

As of March 28, 2020, a total of 122,653 laboratory-confirmed COVID-19 cases (Figure) and 2,112 deaths were reported to CDC. Case report forms were submitted to CDC for 74,439 (60.7%) cases. Data on presence or absence of underlying health conditions and other recognized risk factors for severe outcomes from respiratory infections (i.e., smoking and pregnancy) were available for 7,162 (5.8%) patients (Table 1). Approximately one third of these patients (2,692, 37.6%), had at least one underlying condition or risk factor. Diabetes mellitus (784, 10.9%), chronic lung disease (656, 9.2%), and cardiovascular disease (647, 9.0%) were the most frequently reported conditions among all cases. Among 457 ICU admissions and 1,037 non-ICU hospitalizations, 358 (78%) and 732 (71%), respectively occurred among persons with one or more reported underlying health condition. In contrast, 1,388 of 5,143 (27%) COVID-19 patients who were not hospitalized were reported to have at least one underlying health condition.

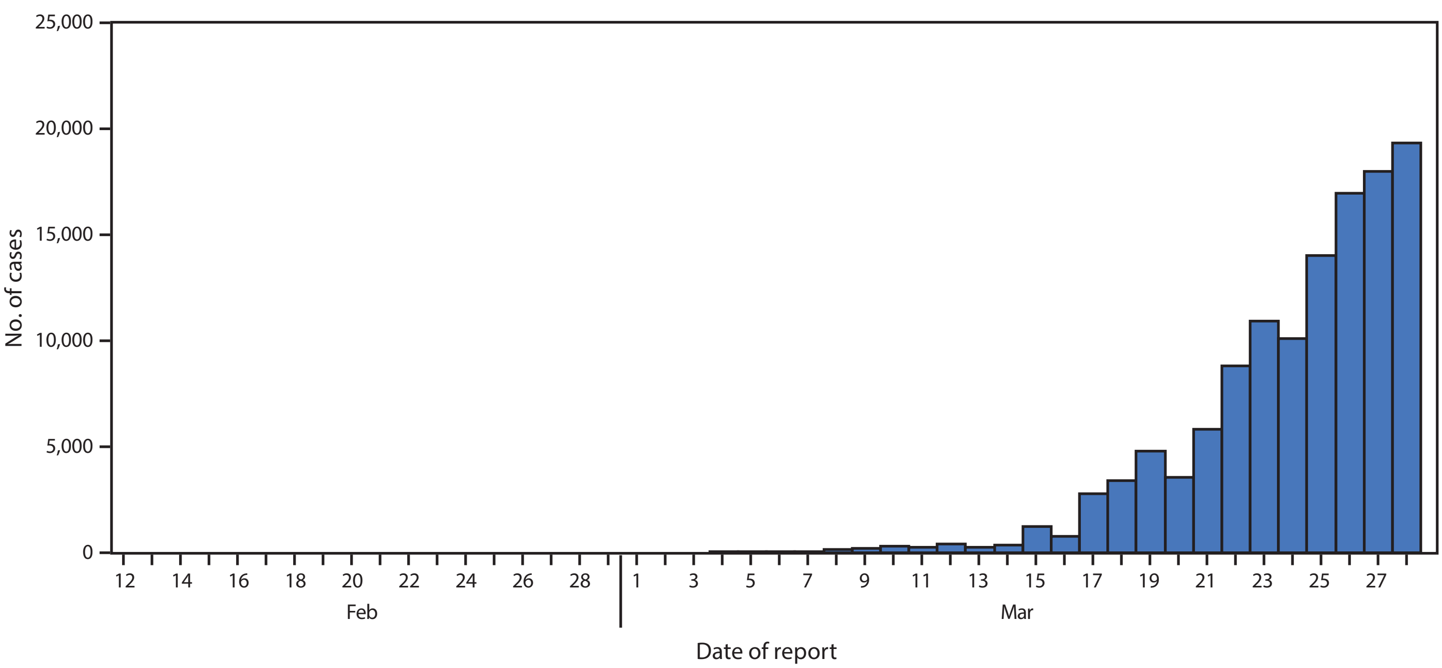
Among patients aged ≥19 years, the percentage of non-ICU hospitalizations was higher among those with underlying health conditions (27.3%–29.8%) than among those without underlying health conditions (7.2%–7.8%); the percentage of cases that resulted in an ICU admission was also higher for those with underlying health conditions (13.3%–14.5%) than those without these conditions (2.2%–2.4%) (Table 2). Small numbers of COVID-19 patients aged <19 years were reported to be hospitalized (48) or admitted to an ICU (eight). In contrast, 335 patients aged <19 years were not hospitalized and 1,342 had missing data on hospitalization. Among all COVID-19 patients with complete information on underlying conditions or risk factors, 184 deaths occurred (all among patients aged ≥19 years); 173 deaths (94%) were reported among patients with at least one underlying condition.

Discussion

Among 122,653 U.S. COVID-19 cases reported to CDC as of March 28, 2020, 7,162 (5.8%) patients had data available pertaining to underlying health conditions or potential risk factors; among these patients, higher percentages of patients with underlying conditions were admitted to the hospital and to an ICU than patients without reported underlying conditions. These results are consistent with findings from China and Italy, which suggest that patients with underlying health conditions and risk factors, including, but not limited to, diabetes mellitus, hypertension, COPD, coronary artery disease, cerebrovascular disease, chronic renal disease, and smoking, might be at higher risk for severe disease or death from COVID-19 (*3*,*4*). This analysis was limited by small numbers and missing data because of the burden placed on reporting health departments with rapidly rising case counts, and these findings might change as additional data become available.

It is not yet known whether the severity or level of control of underlying health conditions affects the risk for severe disease associated with COVID-19. Many of these underlying health conditions are common in the United States: based on self-reported 2018 data, the prevalence of diagnosed diabetes among U.S. adults was 10.1% (*7*), and the U.S. age-adjusted prevalence of all types of heart disease (excluding hypertension without other heart disease) was 10.6% in 2017 (*8*). The age-adjusted prevalence of COPD among U.S. adults is 5.9% (*9*), and in 2018, the U.S. estimated prevalence of current asthma among persons of all ages was 7.9% (*7*). CDC continues to develop and update resources for persons with underlying

FIGURE. Daily number of reported COVID-19 cases* — United States, February 12–March 28, 2020†



* Cases among persons repatriated to the United States from Wuhan, China, and the Diamond Princess cruise ship are excluded.
† Cumulative number of COVID-19 cases reported daily by jurisdictions to CDC using aggregate case count was 122,653 through March 28, 2020.

TABLE 1. Reported outcomes among COVID-19 patients of all ages, by hospitalization status, underlying health condition, and risk factor for severe outcome from respiratory infection — United States, February 12–March 28, 2020

Underlying health condition/Risk factor for severe outcomes from respiratory infection (no., % with condition)	No. (%)			
	Not hospitalized	Hospitalized, non-ICU	ICU admission	Hospitalization status unknown
Total with case report form (N = 74,439)	**12,217**	**5,285**	**1,069**	**55,868**
Missing or unknown status for all conditions (67,277)	**7,074**	**4,248**	**612**	**55,343**
Total with completed information (7,162)	**5,143**	**1,037**	**457**	**525**
One or more conditions (2,692, 37.6%)	1,388 (27)	732 (71)	358 (78)	214 (41)
Diabetes mellitus (784, 10.9%)	331 (6)	251 (24)	148 (32)	54 (10)
Chronic lung disease* (656, 9.2%)	363 (7)	152 (15)	94 (21)	47 (9)
Cardiovascular disease (647, 9.0%)	239 (5)	242 (23)	132 (29)	34 (6)
Immunocompromised condition (264, 3.7%)	141 (3)	63 (6)	41 (9)	19 (4)
Chronic renal disease (213, 3.0%)	51 (1)	95 (9)	56 (12)	11 (2)
Pregnancy (143, 2.0%)	72 (1)	31 (3)	4 (1)	36 (7)
Neurologic disorder, neurodevelopmental, intellectual disability (52, 0.7%)†	17 (0.3)	25 (2)	7 (2)	3 (1)
Chronic liver disease (41, 0.6%)	24 (1)	9 (1)	7 (2)	1 (0.2)
Other chronic disease (1,182, 16.5%)§	583 (11)	359 (35)	170 (37)	70 (13)
Former smoker (165, 2.3%)	80 (2)	45 (4)	33 (7)	7 (1)
Current smoker (96, 1.3%)	61 (1)	22 (2)	5 (1)	8 (2)
None of the above conditions¶ (4,470, 62.4%)	3,755 (73)	305 (29)	99 (22)	311 (59)

Abbreviation: ICU = intensive care unit.

* Includes any of the following: asthma, chronic obstructive pulmonary disease, and emphysema.

† For neurologic disorder, neurodevelopmental, and intellectual disability, the following information was specified: dementia, memory loss, or Alzheimer's disease (17); seizure disorder (5); Parkinson's disease (4); migraine/headache (4); stroke (3); autism (2); aneurysm (2); multiple sclerosis (2); neuropathy (2); hereditary spastic paraplegia (1); myasthenia gravis (1); intracranial hemorrhage (1); and altered mental status (1).

§ For other chronic disease, the following information was specified: hypertension (113); thyroid disease (37); gastrointestinal disorder (32); hyperlipidemia (29); cancer or history of cancer (29); rheumatologic disorder (19); hematologic disorder (17); obesity (17); arthritis, nonrheumatoid, including not otherwise specified (16); musculoskeletal disorder other than arthritis (10); mental health condition (9); urologic disorder (7); cerebrovascular disease (7); obstructive sleep apnea (7); fibromyalgia (7); gynecologic disorder (6); embolism, pulmonary or venous (5); ophthalmic disorder (2); hypertriglyceridemia (1); endocrine (1); substance abuse disorder (1); dermatologic disorder (1); genetic disorder (1).

¶ All listed chronic conditions, including other chronic disease, were marked as not present.

TABLE 2. Hospitalization with and without intensive care unit (ICU) admission, by age group among COVID-19 patients aged ≥19 years with and without reported underlying health conditions — United States, February 12–March 28, 2020*

Age group (yrs)	Hospitalized without ICU admission, No. (% range†) Underlying condition present/reported§		ICU admission, No. (% range†) Underlying condition present/reported§	
	Yes	No	Yes	No
19–64	285 (18.1–19.9)	197 (6.2–6.7)	134 (8.5–9.4)	58 (1.8–2.0)
≥65	425 (41.7–44.5)	58 (16.8–18.3)	212 (20.8–22.2)	20 (5.8–6.3)
Total ≥19	**710 (27.3–29.8)**	**255 (7.2–7.8)**	**346 (13.3–14.5)**	**78 (2.2–2.4)**

* Includes COVID-19 patients aged ≥19 years with known status on underlying conditions.

† Lower bound of range = number of persons hospitalized or admitted to an ICU among total in row stratum; upper bound of range = number of persons hospitalized or admitted to an ICU among total in row stratum with known outcome status: hospitalization or ICU admission status.

§ Includes any of following underlying health conditions or risk factors: chronic lung disease (including asthma, chronic obstructive pulmonary disease, and emphysema); diabetes mellitus; cardiovascular disease; chronic renal disease; chronic liver disease; immunocompromised condition; neurologic disorder, neurodevelopmental, or intellectual disability; pregnancy; current smoker; former smoker; or other chronic disease.

health conditions to reduce the risk of acquiring COVID-19 (*10*). The estimated higher prevalence of these conditions among those in this early group of U.S. COVID-19 patients and the potentially higher risk for more severe disease from COVID-19 associated with the presence of underlying conditions highlight the importance of COVID-19 prevention in persons with underlying conditions.

The findings in this report are subject to at least six limitations. First, these data are preliminary, and the analysis was limited by missing data related to the health department reporting burden associated with rapidly rising case counts and delays in completion of information requiring medical chart review; these findings might change as additional data become available. Information on underlying conditions was only available for 7,162 (5.8%) of 122,653 cases reported to CDC. It cannot be assumed that those with missing information are similar to those with data on either hospitalizations or underlying health conditions. Second, these data are subject to bias in outcome ascertainment because of short follow-up time. Some outcomes might be underestimated, and long-term outcomes cannot be assessed in this analysis. Third, because of the limited availability of testing in many jurisdictions during this period, this analysis is likely biased toward more severe cases, and findings might change as testing becomes more widespread. Fourth, because of the descriptive nature of these data, attack rates among persons with and without underlying health conditions could not be compared, and thus the risk difference of severe disease with COVID-19 between these groups could not be estimated. Fifth, no conclusions could be drawn about underlying conditions that were not included in the case report form or about different conditions that were reported in a single, umbrella category. For example, asthma and COPD were included in a chronic lung disease category. Finally, for some underlying health conditions and risk factors, including neurologic disorders, chronic liver disease, being a current smoker, and pregnancy, few severe outcomes were reported; therefore, conclusions cannot be drawn about the risk for severe COVID-19 among persons in these groups.

Persons in the United States with underlying health conditions appear to be at higher risk for more severe COVID-19, consistent with findings from other countries. Persons with underlying health conditions who have symptoms of COVID-19, including fever, cough, or shortness of breath, should immediately contact their health care provider. These persons should take steps to protect themselves from COVID-19, through washing their hands; cleaning and disinfecting high-touch surfaces; and social distancing, including staying at home, avoiding crowds, gatherings, and travel, and avoiding contact with persons who are ill. Maintaining at least a 30-day supply of medication, a 2-week supply of food and other necessities, and knowledge of COVID-19 symptoms are recommended for those with underlying health conditions (*10*). All persons should take steps to protect themselves from COVID-19 and to protect others. All persons who are ill should stay home, except to get medical care; should not go to work; and should stay away from others. This is especially important for those who work with persons with underlying conditions or who otherwise are at high risk for severe outcomes from COVID-19. Community mitigation strategies, which aim to slow the spread of COVID-19, are important to protect all persons from COVID-19, especially persons with underlying health conditions and other persons at risk for severe COVID-19–associated disease (https://www.cdc.gov/coronavirus/2019-ncov/downloads/community-mitigation-strategy.pdf).

Acknowledgments

State, local, and territorial health departments; clinical staff members caring for patients.

Summary

What is already known about this topic?

Published reports from China and Italy suggest that risk factors for severe COVID-19 disease include underlying health conditions, but data describing underlying health conditions among U.S. COVID-19 patients have not yet been reported.

What is added by this report?

Based on preliminary U.S. data, persons with underlying health conditions such as diabetes mellitus, chronic lung disease, and cardiovascular disease, appear to be at higher risk for severe COVID-19–associated disease than persons without these conditions.

What are the implications for public health practice?

Strategies to protect all persons and especially those with underlying health conditions, including social distancing and handwashing, should be implemented by all communities and all persons to help slow the spread of COVID-19.

CDC COVID-19 Response Team

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All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflicts of interest were disclosed.

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APPENDIX B

DO NOT REMOVE PERFORATED TABS. Moisten here and fold bottom to top to seal. DO NOT REMOVE PERFORATED TABS. Moisten here and fold bottom to top to seal.

Application for Ballot by Mail

Prescribed by the Office of the Secretary of State of Texas
A5-15 12/17

For Official Use Only
VUID #, County Election Precinct #, Statement of Residence, etc.

1 **Last Name** (Please print information) | **Suffix** (Jr., Sr., III, etc) | **First Name** | **Middle Initial**

2 **Residence Address:** See back of this application for instructions. | **City** ,TX | **ZIP Code**

3 **Mail my ballot to:** If mailing address differs from residence address, please complete Box # 7. | **City** | **State** | **ZIP Code**

4 **Date of Birth (mm/dd/yyyy)** (Optional)

☐☐/☐☐/☐☐☐☐

Contact Information (Optional)*
Please list phone number and/or email address:
* Used in case our office has questions.

5 **Reason for Voting by Mail:**

- ☐ 65 years of age or older. (**Complete Box #6a)**
- ☐ Disability. (**Complete Box #6a**)
- ☐ Expected absence from the county. (**Complete Box #6b and Box #8**)
  You will receive a ballot for the upcoming election **only**
- ☐ Confinement in jail. (**Complete Box #6b**)
  You will receive a ballot for the upcoming election **only**

7 **If you are requesting this ballot be mailed to a different address (other than residence), indicate where the ballot will be mailed. See reverse for instructions.**

- ☐ Mailing Address as listed on my voter registration certificate
- ☐ Nursing home, assisted living facility, or long term care facility
- ☐ Hospital
- ☐ Retirement Center
- ☐ Address of the jail
- ☐ Relative; relationship _____
- ☐ Address outside the county (see Box #8)

6a **ONLY Voters 65 Years of Age or Older or Voters with a Disability:**
If applying for one election, select appropriate box.
If applying once for elections in the calendar year, select "Annual Application."

☐ Annual Application

Uniform and Other Elections:
- ☐ May Election
- ☐ November Election
- ☐ Other ___

Primary Elections:
You must declare one political party to vote in a primary:
- ☐ Democratic Primary
- ☐ Republican Primary

☐ Any Resulting Runoff

8 **If you selected "expected absence from the county," see reverse for instructions**

☐☐/☐☐/☐☐☐☐ — ☐☐/☐☐/☐☐☐☐

Date you can begin to receive mail at this address | **Date of return to residence address**

9 Voters may submit a completed, signed, and scanned application to the Early Voting Clerk at:

_____________________ (early voting clerk's e-mail address)

_____________________ (early voting clerk's fax)

NOTE: If you fax or e-mail this form, please be aware that you must also mail the form to the early voting clerk within four business days. See "Submitting Application" on the back of this form for additional information.

6b **ONLY Voters Absent from County or Voters Confined in Jail:**
You may only apply for a ballot by mail for one election, and any resulting runoff.
Please select the appropriate box.

Uniform and Other Elections:
- ☐ May Election
- ☐ November Election
- ☐ Other ____

Primary Elections:
You must declare one political party to vote in a primary:
- ☐ Democratic Primary
- ☐ Republican Primary

☐ Any Resulting Runoff

10 **"I certify that the information given in this application is true, and I understand that giving false information in this application is a crime."**

→ **X** **Date**

SIGN HERE
If applicant is unable to sign or make a mark in the presence of a witness, the witness shall complete Box #11.

If someone helped you to complete this form or mails the form for you, then that person must complete the sections below.

11 **See back for Witness and Assistant definitions.**

If applicant is unable to mark Box #10 and you are acting as a **Witness** to that fact, please check this box and sign below. ☐

If you assisted the applicant in completing this application in the applicant's presence or e-mailed/mailed or faxed the application on behalf of the applicant, please check this box as an **Assistant** and sign below. ☐

*If you are acting as **Witness and Assistant,** please check **both boxes**. Failure to complete this information is a Class A misdemeanor if signature was witnessed or applicant was assisted in completing the application.

X ______________________ Signature of Witness /Assistant

X ______________________ Printed Name of Witness/Assistant

______________________ Street Address | Apt Number (if applicable)

______________________ City

______________________ State

______________________ ZIP Code

Witness' Relationship to Applicant
(Refer to Instructions on back for clarification)

☐

Este formulario está disponible en Español. Para conseguir la version en Español favor de llamar sin cargo al 1.800.252.8683 a la oficina del Secretario de Estado o la Secretaria de Votación por Adelantado.

Instructions for Application for Ballot by Mail

Residence Address - Give full address as shown on your voter registration certificate. If you have moved within the county but not yet changed your voter registration address with the voter registrar, indicate your new residence address.

Mail Ballot To - Give full address where you wish to have ballot mailed, if the address is different from your residence address.

Mailing Ballot to a Different Address - Your ballot must be mailed to your home where you live or to your mailing address on your voter registration certificate. There are some exceptions that allow you to have your ballot mailed to a different location as specified below.

Reason for voting by mail	Location to mail ballot
65 or disabled	Nursing home, assisted living/retirement center, relative, hospital
In jail	Address of jail or relative
Absent from county	Address located outside of county

Expected Absence from County - If you chose expected absence from county, you must expect to be absent from the county on election day and during the hours of early voting in person or for the remainder of the early voting period after you submit your application. **Your ballot must be mailed to an address outside the county.** Important: Give date you can begin to receive mail at the address given.

Annual Application - If you are 65 years of age or older, or disabled you may apply to receive all ballots by mail for a calendar year. If you do not select any elections in Box 6a, your application will be considered an Annual Application. If you submit an annual application for a ballot by mail, your application may be forwarded to other entities holding elections where you are a qualified voter. This means that you may receive a ballot for those elections in addition to the ballot(s) you requested with this application.

Submitting Application

1. Sign and date your application - If unable to sign, please go to Witness/Address boxes (11 on reverse) and have a person witness your mark. Witness/Assistant instructions follow below.

2. Deliver to Early Voting Clerk - You may submit your application via these methods:

In Person: Only the applicant may submit their application in person to the Early Voting Clerk **until** the early voting period begins. However, after the early voting period begins for an election, the applicant may only submit their application via mail, common contract carrier, fax, or e-mail.

By Mail: You may mail your application via the U.S. Postal Service.

By Common Contract Carrier: You may submit via a common or contract carrier which is a bona fide, for profit carrier.

By Fax: You may fax your application to the Early Voting Clerk. Please contact your Early Voting Clerk or the Secretary of State's Office for fax numbers.

By E-Mail: You may e-mail a signed, scanned image of your application to the Early Voting Clerk. Please contact your Early Voting Clerk or the Secretary of State's Office for e-mail addresses.

IF YOU FAX OR E-MAIL YOUR APPLICATION TO THE EARLY VOTING CLERK, YOU MUST ALSO MAIL THE APPLICATION SO THAT THE CLERK RECEIVES IT NO LATER THAN THE FOURTH BUSINESS DAY AFTER THE DAY THE CLERK RECEIVED YOUR FAXED OR EMAILED APPLICATION. If you fax or e-mail your application by the deadline noted below, your application will be considered complete and timely as long as the original is received by the early voting clerk by the fourth business day after it was submitted by fax or e-mail.

Deadline

Your application must be received by the early voting clerk of the local entity conducting the election not later than the 11th day before election day. If the 11th day is a weekend or holiday, the deadline is the first preceding business day. You may submit an application throughout the calendar year, beginning January 1. Please remember that the application must be received not later than the 11th day before the first election in which you seek to vote by mail.

If you submit an Annual Application for Ballot by Mail within 60 days before an election that takes place in the following calendar year, your application will be valid for any election that takes place in the following calendar year, regardless of the fact that your application was submitted prior to the end of the preceding calendar year. This applies to Annual Applications only and not to a regular application for ballot by mail.

Witness/Assistant Section

Witness: If you are unable to sign your name (due to a physical disability or illiteracy), the application may be signed at Box #11 for you by a Witness. You must affix your mark to the application in Box #10 or, if you are unable to make a mark, then the Witness must check the appropriate box in 11 indicating the inability to make a mark. The Witness must state his/her name in printed form and indicate his/her relationship to you or, if unrelated, state that fact. The Witness must sign and provide his or her printed name and residence address. Unless the Witness is a close relative of the voter (parent, grandparent, spouse, child or sibling), it is a Class B misdemeanor for a person to witness more than one application for ballot by mail.

Assistant: If a person (other than a close relative or person registered to vote at the same address) assists you in completing this application in your presence or mails/faxes/e-mails this application on your behalf, then that person must complete Box #11. The Assistant must sign, provide his or her printed name, and his or her residence address. A person commits a Class A misdemeanor if the person provides assistance without providing the information described above unless a close relative or registered at your address.

If you have further questions or need additional assistance, please contact your Early Voting Clerk or The Secretary of State's office at 1-800-252-8683 or www.sos.state.tx.us.

Reset

DO NOT REMOVE PERFORATED TABS. Moisten tab and fold top to bottom to seal.

FROM:

AFFIX LABEL HERE OR ADDRESS

TO: EARLY VOTING CLERK

AFFIX FIRST CLASS POSTAGE

APPENDIX C

NBER WORKING PAPER SERIES

THE RELATIONSHIP BETWEEN IN-PERSON VOTING, CONSOLIDATED POLLING LOCATIONS, AND ABSENTEE VOTING ON COVID-19: EVIDENCE FROM THE WISCONSIN PRIMARY

Chad D. Cotti
Bryan Engelhardt
Joshua Foster
Erik T. Nesson
Paul S. Niekamp

Working Paper 27187
http://www.nber.org/papers/w27187

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 2020

We thank Safegraph for providing access to their data. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

The Relationship between In-Person Voting, Consolidated Polling Locations, and Absentee Voting on Covid-19: Evidence from the Wisconsin Primary
Chad D. Cotti, Bryan Engelhardt, Joshua Foster, Erik T. Nesson, and Paul S. Niekamp
NBER Working Paper No. 27187
May 2020
JEL No. D72,H75,I1,I18

ABSTRACT

On April 7, 2020, Wisconsin held a major election for state positions and presidential preferences for both major parties. News reports showed pictures of long lines of voters due to fewer polling locations and suggested that the election may further the spread of the SARS-CoV-2 virus. A contract-tracing analysis by the Wisconsin Department of Health identified 52 confirmed cases of COVID-19 to in-person voting, but no research has conducted a broader analysis of the extent to which in-person voting increased the number of COVID-19 cases. We use county level data on voting and COVID-19 tests to connect the election to the spread of the SARS-CoV-2 virus. We find a statistically and economically significant association between in-person voting and the spread of COVID-19 two to three weeks after the election. Furthermore, we find the consolidation of polling locations, and relatively fewer absentee votes, increased positive testing rates two to three weeks after the election. Our results offer estimates of the potential increased costs of in-person voting as well as potential benefits of absentee voting during a pandemic.

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1 Introduction

A headline on the New York Times website on April 7th read, "Wisconsin Primary Recap: Voters Forced to Choose Between Their Health and Their Civic Duty" (New York Times, 2020). The headline referred to the Wisconsin election for state positions and presidential preferences for both major parties held on that day. The New York Times article referenced long lines, especially in Milwaukee, where only five polling places were open, and concerns that in-person voting would lead to increased COVID-19 cases. It is well established that increased social interactions increase the probability of the transmission of the SARS-CoV-2 virus, and as of April 28th, the Wisconsin Department of Health Services had directly traced and linked 52 confirmed cases of COVID-19 to in-person voting that occurred on April 7th. While the test and trace method used to determine the sources of infection cannot exclude other potential sources, the investigation also missed cases caused by in-person voting activity that were not successfully tested and traced by the state's Department of Health (Associated Press, 2020).

To circumvent these issues, we attempt to estimate the relationship between in-person voting and the number of cases of COVID-19 using data aggregated at the county level. Our aim is to offer a general estimate on the increased spread of infection, if any, related to in-person voting during a pandemic, and by extension provide insights into the potential benefits of absentee voting (vote-by-mail). We combine information on the number of tests for COVID-19 and number of positive test results from the Wisconsin Department of Health Services with information on in-person and absentee voting from the Wisconsin Elections Commission to examine the trajectory of COVID-19 in counties with higher in-person vs. absentee voting.

Our results indicate that Wisconsin counties with higher levels of in-person voting per polling location led to increases in the weekly positive rate of COVID-19 tests. Furthermore, counties with higher absentee voting participation had lower rates of detecting COVID-19 two to three weeks after the election. We show that this finding is unlikely to be a function of differing trajectories by population density, and controls for demographics and measures of social distancing do not explain our findings either.

Our work relates to the literature on modeling the trajectory of new cases of COVID-19 in a community. The trajectory, or number of cases and deaths, of the COVID-19 pandemic is often modeled by larger structural models such as the highly publicized report from an Imperial College team, Flaxman, Mishra, Gandy, Unwin, Coupland, Mellan, Zhu, Berah, Eaton, Perez Guzman et al. (2020), or alternatively, IHME and Murray (2020). These are based to differing degrees on the "standard epidemiological model," or SIR model (refer to Avery, Bossert, Clark, Ellison, and Ellison (2020) for a COVID-19 related survey). As we are investigating a potential link between behavior and the virus's spread, we take an alternative reduced-form approach that builds on the general understanding that increased socialization is a primary vector for transmission of the virus. Our strategy is similar to other economics papers which examine associations between the virus and various social factors (e.g. Allcott, Boxell, Conway, Gentzkow, Thaler, and Yang, 2020; Bursztyn, Rao, Roth, and Yanagizawa-Drott, 2020; Courtemanche, Garuccio, Le, Pinkston, and Yelowitz, 2020a,b).

The aforementioned Wisconsin Department of Health Services investigation directly traced and linked COVID-19 cases to in-person voting, which confirms transmission in this circumstance, yet the investigation was not comprehensive and doesn't allow for a broad conversation about the overall relationship at hand. Our work looks at geographical differences in voting/quantity of polling locations and COVID-19 cases and positive test rates to estimate how voting impacted the disease's spread. As a result, our work relates to Harris (2020), Almagro and Orane-Hutchinson (2020) and Kuchler, Russel, and Stroebel (2020) among others looking at how geographical differences in behavior (e.g., public transit availability or occupation characteristics) affects the spread of COVID-19. As we measure the impact of polling locations, we also inform models such as Goscé, Barton, and Johansson (2014) who analyze the impact of the proximity of persons on the spread of a disease. Relatedly, an emerging literature examines the determinants and effects of social distancing orders on the spread of COVID-19 cases (Andersen, 2020; Courtemanche et al., 2020a,b; Friedson, McNichols, Sabia, and Dave, 2020).

Due to the political nature of the decision in switching to absentee voting (vote-by-mail), our work relates to an emerging economics literature suggesting that political beliefs and actions may impact the spread of the SARS-CoV-2 virus. Allcott et al. (2020) uses cellphone location data from Safegraph to suggest that areas with higher Republican vote share in the 2016 presidential election engaged in less social distancing than areas with higher Democratic vote share in the 2016 presidential election. Relatedly, Adolph, Amano, Bang-Jensen, Fullman, and Wilkerson (2020) also analyze differing social distancing policy responses for COVID-19 based on the politics of the local government(s). Finally, Bursztyn et al. (2020) suggests that people responded to the COVID-19 pandemic differently based on likely viewership of the two most widely-viewed cable news shows, *Tucker Carlson Tonight* and *Hannity*. Also, as our work may inform future public debate on switching to absentee voting, our work offers insights on the costs and benefits of absentee voting. Therefore, we tie into the analysis of districts switching to absentee voting (vote-by-mail).

2 Data

In this section we outline the data used to study the effect of in-person voting on the measurable spread of COVID-19. Our sample was taken from the state of Wisconsin, USA, which had a statewide election on April 7, 2020.

The timing of Wisconsin's election, in conjunction with the spread of COVID-19 throughout the state, makes it uniquely suited to offer relevant insights into the effects of voting on the spread of COVID-19. First, voting took place during a "Safer at Home" order where Wisconsin residents were restricted to essential activities only, allowing for better identification of the effect of in-person voting. Second, the "Safer at Home" order was issued only two weeks prior to the date of the election, on March 23, 2020, making it difficult for all eligible voters to receive and return an absentee ballot before election day.[1] And third, the Wisconsin Elections Commission allowed County and Municipal Clerks to alter the voting setup and number of voting locations at their own discretion in the weeks leading up to the election. Among those clerks who modified the voting locations available to their registered voters, nearly all sought to consolidate – a decision that almost certainly increased the in-person voter density per voting location.[2]

2.1 Voting Data

We use voting data provided by the Wisconsin Elections Commission (WEC). The WEC maintains a publicly available database of official election results and voter participation metrics, all of which are available at the county level.[3] Of particular interest to this paper are the data on (1) total in-person votes, (2) total absentee ballots requested, (3) total absentee ballots returned, (4) number

[1]On April 6, 2020 – the day before the election – Wisconsin governor Tony Evers issued an executive order that moved the election to June 9, 2020. Later that same day, the State Supreme Court ruled that the Governor cannot unilaterally move the date of an election, thus maintaining the in-person voting.

[2]In some cases reductions in the number of voting locations were significant. For example, the city of Green Bay, WI (in Brown County), which typically has 31 voting locations, had only two open during the April 7th election, resulting a significant consolidation of in-person voters.

[3]See `https://elections.wi.gov/` for more information on this data.

of registered voters, and (5) number of voting locations. Total in-person votes is the only item that is not directly reported by the WEC. To measure this, we use official county-level vote data provided by the County Clerks for the State Supreme Court seat election, adjusting for the number of over/under-votes, and then from that number subtract the total absentee ballots returned.[4]

According to a memorandum released by the WEC on March 30, 2020, County and Municipal Clerks expressed concern with hosting voters in buildings serving relatively vulnerable portions of the population (e.g. nursing homes, senior centers).[5] As a result on March 12, 2020, the WEC gave County and Municipal Clerks the ability to consolidate polling places. Of course, the decision to consolidate polling locations poses a unique problem for these Clerks: closing locations can create some insulation to the relatively vulnerable, but it also increases the likelihood of infection at the remaining locations due to the increase in voter density.

Between March 12, 2020 and April 4, 2020, County and Municipal Clerks in 22 counties (of 72) chose to consolidate the number of polling locations offered to voters, the average reduction among these counties being approximately 15%. In total, Wisconsin used 2,132 voting locations for this election, each of which can be categorized by the venue's normal purpose. Statewide, approximately 90% of the voting locations were hosted in governmental buildings (e.g. city halls, fire stations), approximately 10% were hosted in social or commercial locations (e.g. churches, VFWs, grocery stores), and 5% were hosted in local primary, secondary, and post-secondary education buildings.[6]

2.2 COVID-19 Data

We use COVID-19 infection data provided by the Wisconsin Department of Health Services (WDHS). From March 30, 2020 to May 3, 2020 (the observation window of this study), the WDHS updated their database daily and exclusively reported laboratory-confirmed COVID-19 cases as well as the total number of tests performed. The primary items of interest from this database are (1) total positive cases and (2) total negative cases, each at the county level, from which we construct weekly measures of the percent of total COVID-19 tests that are positive.

[4] If a number of absentee ballots are returned but not counted (an outcome we are unable to observe), then our measure of in-person voting exposure would be biased downward.

[5] See `https://elections.wi.gov/sites/elections.wi.gov/files/2020-03/Consolidated%20Polling%20Places.pdf`.

[6] Some locations shared functions across our categories (e.g. a town hall that houses a senior center), thus their collective representation will exceed 100%.

2.3 Demographics and Social Distancing Measures

Additionally, we supplement the voting and COVID-19 data with measures of social distancing and county-level demographics.

We use Safegraph Social Distancing Metrics data, which are collected from anonymized GPS pings derived from smartphone app usage. The dataset provides daily metrics of human movement at a highly granular level (Geohash-7) and is continuously updated with a three day lag. We use median home dwelling time, percent of devices completely home, and median distance traveled from home to provide a localized measure of social distancing. While Safegraph data are reported at the Census Block Group level by day, we aggregate the data to the county by week level to match the level COVID-19 and voting data.

In addition, we use Safegraph Weekly Patterns over the period of March 1st to May 2nd. This dataset also uses GPS pings from smartphones but provides device counts to specific Points-of-Interest (POIs) for every day of the week. Safegraph provides a 6-digit NAICS code and a text string of the business or building name for every POI. After merging this dataset with Safegraph POI data, we have the coordinates of approximately 70,000 POIs in Wisconsin. We then calculate the distance between each POI and the closest of the 2,132 voting locations in Wisconsin. Matching these three datasets allows us to measure increases in traffic to highly localized voting locations that would not be visible in Social Distancing Metrics. While measuring general human traffic during pandemics is important, it is especially pertinent to measure the impact that policies have on forcing individuals into population dense situations.

We also include estimates of county population and population density, both of which are provided by the US Census Bureau (2010 Census data), and a number of additional demographics from the 2018 5-Year American Community Survey Estimates, including the percent of the population without a high school degree, the percent of the population with at least a bachelor's degree, the 2018 unemployment rate, the median household income, and the percent of the population age 65 or older.

2.4 Summary Statistics

We first show the geographic variation in voter density and the striking correlation between voter density and the evolution of the COVID-19 Pandemic. Figure 1a provides a visual representation of voter density by county (created using Kahle and Wickham (2013)), as represented by the average number of in-person votes per county voting location open during the election. Figures 1b and 1c demonstrate the variation in the positive COVID-19 test rates across counties and overtime across Wisconsin counties. Collectively, these figures show increases in positive test results are much higher in locations with higher in-person voting.

Table 1 offers summary statistics on our primary measures relevant to the empirical analysis presented below. We split the summary statistics by counties which have above-median numbers of in-person votes per polling location compared to counties which are below the median. Consistent with Figures 1b and 1c, Table 1 shows that COVID-19 positive test rates are approximately twice as high (5.1% versus 2.7%) in above-median counties. Individuals in above-median counties are 2.6 percentage points (61.6% versus 64.2%) less likely to leave home and are approximately 7 percentage points (26.6% versus 19.5%) more likely to have at least a Bachelor's degree. In addition, above-median counties are higher income and have younger populations. There is a significant difference in population density between above-median and below-median in-person vote counties (298.1 versus 34.3). Therefore, it is important that we be diligent in designing our specifications to account for the dynamic effect of population density on the evolution of COVID-19 growth. Furthermore, we illustrate the robustness of our results to the omission of population dense areas like Milwaukee County.

While voter data provide an imperfect measure of the number of individuals traveling to a voting location, they do not indicate how many individuals visit these buildings or surrounding areas on other days of the year. Any detrimental impact of in-person voting on COVID-19 cases would be derived from excess human activity above and beyond baseline levels. Figure 2 displays mean visits to approximately 70,000 POIs in Wisconsin for the fourteen days before and after April 7th. We use the coordinates of the POI data to focus on visits to businesses and buildings directly next to, or including, voting locations. It is clear that POIs within 50 meters and over 50 meters exhibit parallel trends in visitation before and after April 7th. While visits to POIs greater than 50 meters from voting polls are unaffected by voting, visits to POIs less than 50 meters from a polling location exhibit a remarkable increase.

3 Methods

3.1 Counts of New COVID-19 Cases

To understand the impact of in-person voting on the spread of COVID-19, we focus on the percent of COVID-19 tests that are positive in each county and week. While another strategy may be to examine new confirmed COVID-19 cases, it is likely that the implementation of testing can inhibit this analysis.[7] Schmitt-Grohé, Teoh, and Uribe (2020) document concerns that testing is not random and widespread. Almagro and Orane-Hutchinson (2020) also recognizes this issue and as a result analyzes changes in the percentage of positive tests. Specifically, Almagro and Orane-Hutchinson (2020) analyze the percent of positive tests, rather than the number of new cases, because,

> "First, random testing has not been possible in NYC,[8] as only those with certain conditions are tested because of limited capacity. Second, Borjas (2020) points out that the incidence of different variables on positive results per capita is composed of two things: A differential incidence on those who are tested, but also a differential incidence on those with a positive result conditional on being tested. Therefore, we believe that the fraction of positive tests is the variable that correlates the most with the actual spread of the disease within a neighborhood throughout our sample." (p. 2)

As a result, we follow Almagro and Orane-Hutchinson (2020) and focus on estimating the impact on the proportion of positive tests, or

$$\begin{aligned}\text{Positive Rate}_{c,t} \quad = \quad & \delta\left(\frac{\text{IPV}}{\text{Location}}\right)_c + \delta_t\left(\frac{\text{IPV}}{\text{Location}}\right)_c \times \text{Week}_t \\ & + \beta\text{Absentee}_c + \beta_t\text{Absentee}_c \times \text{Week}_t + \gamma X_c + \eta_t\text{Week}_t + \epsilon_{c,t}\end{aligned} \tag{1}$$

where Positive $\text{Rate}_{c,t}$ is the proportion of positive cases per week in each county, $\frac{\text{IPV}}{\text{Location}}$ is in-person votes (in 1000s) per polling location, Absentee_c is absentee ballots returned (in 10,000s) per county, Week_t are weekly dummies, with the week of the election (April 7th) serving as the reference category, and X_c are county level controls. Based on the conclusions of Papke and Wooldridge (1996) and Papke and Wooldridge (2008), we estimate a fractional logistic regression model with robust standard errors (clustered at the county-level).

[7] While suffering from this concern, analyses on the number of new COVID-19 cases, rather than the positive case test rate was robust.

[8] Refer to Wahlberg (2020) among many others discussing limited testing capacity.

To account for the incubation period of the disease, lags associated with seeking testing, and lags in labs acquiring results, we interact voting metrics and weekly dummies as we should not see a relationship between voting behavior and COVID-19 cases prior to a week after the election. As a result, the key estimates of interest (treatment variables) are the estimates of the interaction between the weekly dummies, which run from one week before the election to three weeks after the election, with voting per location (δ_t) and absentee voting (β_t). In addition to the treatment variables, we control for the demographic and social distancing measures outlined in Section 2. We additionally interact population density with the week dummies in some specifications to account for differential trends in COVID-19 cases by population density. In one specification, we also include the number tests per capita to control for the prevalence of testing by county and across time.

4 Results

Table 2 shows results from our models described in Equation (1). The table shows the logit coefficients, standard errors in parentheses, and marginal effects in brackets. Moving from left to right, we systematically add in controls, culminating in our preferred specification in Column (4). Column (5) adds in controls for the cumulative number of tests per capita.[9] In Column (6), we remove Brown County, which contains the City of Green Bay, and which saw a large outbreak of COVID-19 traced to a meat-packing facility. Finally, in Column (7), we remove Milwaukee County to confirm that the long lines in Milwaukee are not the sole driver of any relationship we find.

Across all models we see a large increase in COVID-19 cases in the weeks following the election in counties that had more in-person votes per voting location, all else equal. Our results support and extend the Wisconsin Department of Health Services findings on the link between the spread of COVID-19 and in-person voting. The coefficient magnitudes and statistical significance levels are remarkably consistent across the different models. Furthermore, in one to three weeks following the election, we observe a decreased number of new positive COVID-19 cases in counties with relatively more absentee votes. These differences are measured after accounting for differences in in-person voting, county level COVID-19 testing, and population measures.[10]

We also find very little evidence of pre-trends in the week preceding the election, where the

[9] While measures of testing may be endogenous, Almagro and Orane-Hutchinson (2020) argue that including measures of testing are important as controls.

[10] We also conduced analyses on the number of new COVID-19 cases using a Poisson specification and find similar results. These results are available upon request.

coefficients are much smaller in magnitude and not statistically significant.

Beyond finding a statistically significant impact, we provide more clarity on the economic significance of the relationship with the marginal effects from the models reported in brackets below each corresponding standard error in Table 2. When the average number of votes per voting location increases by 100 (a 0.10 unit change), the rate of positive tests in a county rises by roughly 0.034 to 0.035 (3.4 to 3.5 percentage points) two to three weeks after the election. With an average weekly positive test share of 0.039, these estimates suggest that counties with higher numbers of voters per polling location see notably higher increases in their positive test rate in the weeks following the election, relative to those with lower in-person votes per location realities. The estimates from absentee ballot voting suggest that every unit increase in absentee ballots (an additional 10,000 absentee ballots), lead to decreases in the positive rate of between 0.07 and 0.08 percentage points two to three weeks after the election.

Our hypothesis suggests that in-person voting is most associated with the incidence of new COVID-19 cases through higher numbers of voters in each polling location. However, it is also likely that the simple number of in person votes in a county matters as well. Thus, in addition to analyzing in-person voting per location and absentee voting, we also provide an analysis of the impact of overall in-person voting (not accounting for variation in the number of voting locations per county) and absentee voting on new cases in Table 3. Here, the major difference is that we have replaced in-person votes per polling location with in-person votes in ten thousands. We still see a similar pattern between in-person voting and the percent of positive cases as well as the negative relationship between absentee voting and the percent of positive cases.

5 Conclusion

Using county level data from the entire state of Wisconsin, we analyze whether the election held in Wisconsin on April 7, 2020 is associated with the spread of COVID-19.

Our results confirm the Wisconsin Department of Health Services findings on the link between the spread of COVID-19 and voting using testing and tracing methods. However, the tracing investigation undertaken was not comprehensive, and our results indicate a much larger potential relationship. Specifically, results show that counties which had more in-person voting per voting location (all else equal) had a higher rate of positive COVID-19 tests than counties with relatively fewer in-person voters. Furthermore, we find a consistent negative relationship between absentee voting and the rate of positive COVID-19 tests. Similar to patterns with in-person voting, this association appears two to three weeks after the election and persists across a number of specification tests, but is not observed in the pre-trend week prior to the election.

An important policy consideration among County and Municipal Clerks is that of location consolidation for forthcoming elections, and the results reported here may aid in their decision on the matter. As discussed in Section 2, when given the ability to modify the location of polling places at their own discretion, the overwhelming majority of clerks that made changes chose to consolidate locations, which effectively led to increases in voter density per location. Our results show large increases in the rate of positive COVID-19 tests two and three weeks following the election, and the estimates are to some extent driven by variation in voter density. These increases arrive when one would anticipate the effect of in-person voting on infection spread to manifest, and they are statistically significant at the 5% or 1% level across different specifications. Likewise, the data support the hypothesis that voter density per polling location will not vary with the positive rate in the week immediately preceding or during the the election, as neither parameter is significant in Table 2.

Given these results, it may be prudent, to the extent possible, that policy makers and election clerks take steps to either expand the number of polling locations or encourage absentee voting for future elections held during the COVID-19 pandemic.

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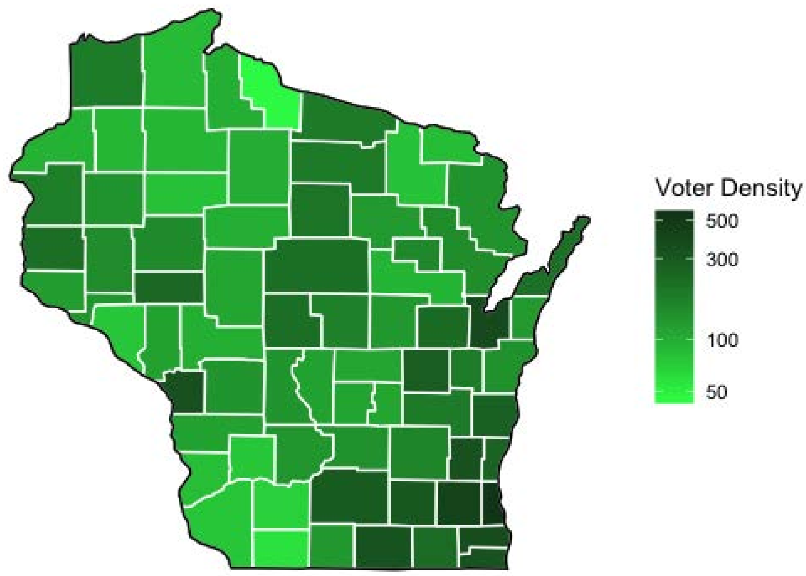
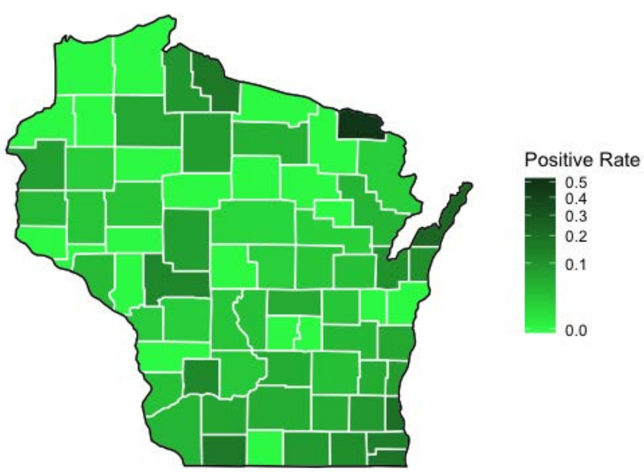
Figure 1: Average Voter Density and Positive Test Rates Over Time, by County

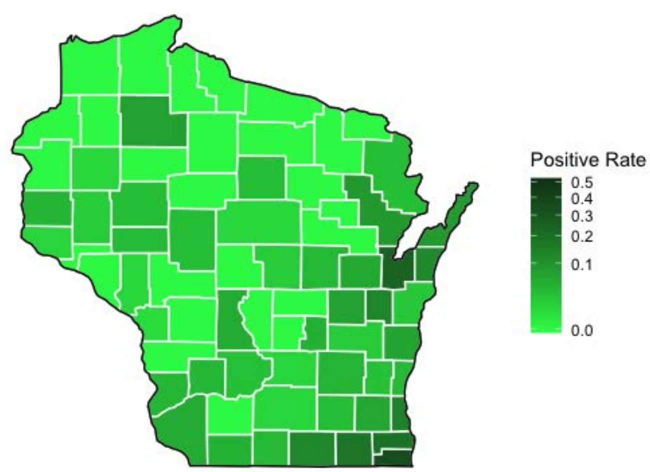
(a) Average Voter Density



(b) COVID-19 Positive Rate: Week of Election

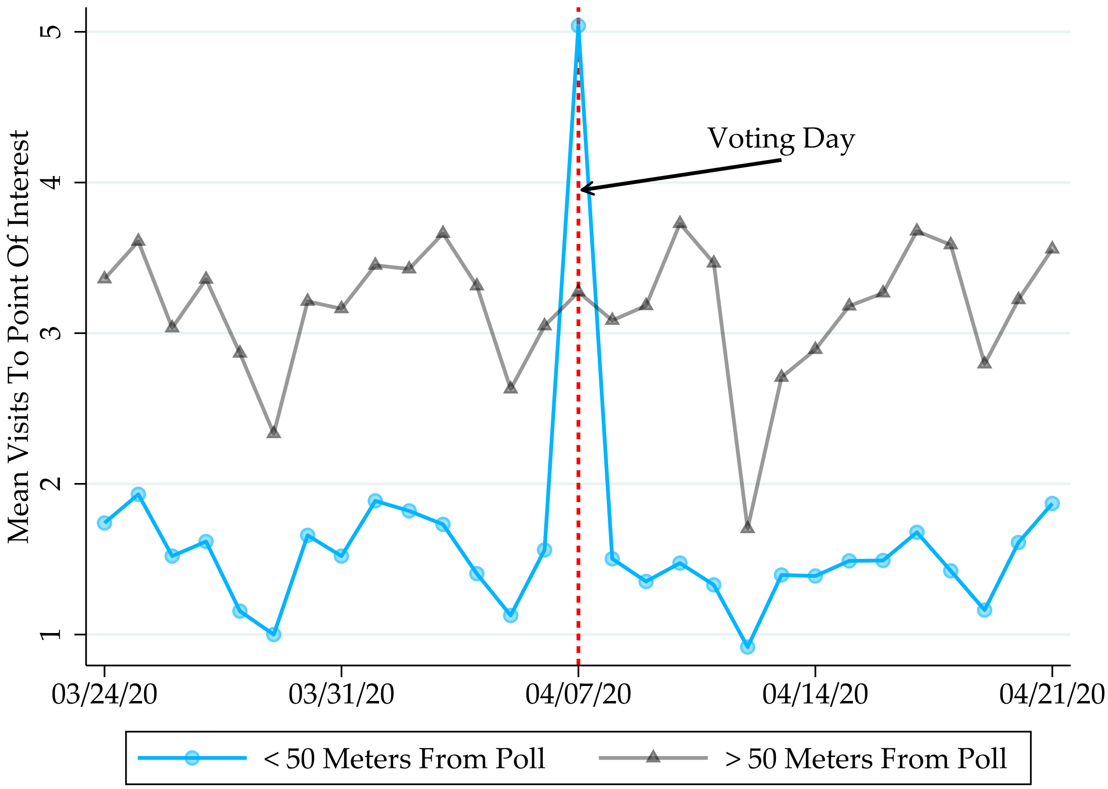


(c) COVID-19 Positive Rate: 3 Weeks After Election



Notes: Voting data in 1a from the Wisconsin Elections Commission; Positive COVID-19 test rates in 1b and 1c from the Wisconsin Department of Health Services.

Figure 2: Average Visits To POIs By Distance From Voting Location



Notes: Figure displays mean visits to approximately 70,000 points of interest (POIs) in Wisconsin for the fourteen days before and after April 7th. Data demonstrate that visits to POIs greater than 50 meters from voting polls are unaffected on election day, while visits to POIs less than 50 meters from a polling location exhibit a large increase. Data are from Safegraph Core Places and Weekly Patterns, which use GPS pings from smartphones to track devices that enter a point of interest each day. POIs consist of restaurants, religious institutions, schools, and other commonly visited locations.

Table 1: Summary Statistics

	All Counties		Above Median Votes/Polling Location		Below Median Votes/Polling Location		
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	T-Test
Election Variables							
In-Person Votes (k) per Polling Location	0.171	0.095	0.240	0.089	0.102	0.024	0.000
In-Person Votes (10k)	0.591	0.633	0.918	0.756	0.263	0.119	0.000
Absentee Votes (10k)	1.581	2.987	2.803	3.850	0.359	0.256	0.000
Polling Locations Open	30.708	16.927	36.083	20.844	25.333	9.059	0.000
COVID-19 Testing Variables							
Weekly New Positive Covid-19 Cases	19.033	77.968	36.489	107.564	1.578	3.018	0.000
Weekly New Positive Covid-19 Tests	235.692	584.584	407.950	788.666	63.433	60.944	0.000
Weekly Positive Covid-19 Test Rate	0.039	0.062	0.051	0.069	0.027	0.052	0.000
Demographic Variables							
Population Density	166.249	475.398	298.134	646.326	34.363	23.455	0.000
% Population with less than a H.S. Degree	8.400	2.533	7.497	1.814	9.303	2.817	0.000
% Population with at least a B.A. Degree	23.065	7.529	26.578	8.177	19.553	4.692	0.000
Unemployment Rate (2018)	3.307	0.738	3.131	0.645	3.483	0.784	0.000
Median Household Income ($k)	58.009	9.133	61.087	8.984	54.930	8.217	0.000
Percent of Population Age 65 or Older	20.161	4.341	18.489	3.994	21.832	4.029	0.000
SafeGraph Social Distancing Variables							
Average Time in Dwelling (SafeGraph)	742.481	120.613	777.306	121.979	707.657	108.897	0.000
% Leaving Home (SafeGraph)	0.629	0.037	0.616	0.036	0.642	0.033	0.000
Average Distance Traveled (SafeGraph)	10074.431	3355.867	9126.853	3343.025	11022.010	3099.185	0.000
County-Week Observations	360		180		180		
Counties	72		36		36		

Notes: Data from the Wisconsin Department of Health Services, the Wisconsin Department of Health Services, the U.S. Census, The American Community Survey, and Safegraph.

Table 2: Relationship between COVID-19 and In-Person Voting per Polling Location and Absentee Voting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IPV/Loc × Week -1	2.801	3.061	2.744	2.801	2.817	3.143	5.724
	(1.987)	(2.259)	(2.292)	(2.344)	(2.357)	(2.618)	(4.498)
	[0.0422]	[0.0972]	[0.1317]	[0.1343]	[0.1367]	[0.1249]	[0.2585]
IPV/Loc × Week 1	5.522*	5.826*	5.694*	5.727*	5.767*	4.550	5.167
	(2.889)	(3.088)	(3.053)	(3.053)	(3.076)	(3.118)	(4.823)
	[0.2056]	[0.2361]	[0.2478]	[0.2495]	[0.2519]	[0.1894]	[0.2449]
IPV/Loc × Week 2	11.100***	11.620***	11.708***	11.638***	11.797***	8.880***	11.593**
	(3.602)	(3.614)	(3.637)	(3.500)	(3.603)	(2.967)	(4.544)
	[0.3377]	[0.3856]	[0.4173]	[0.4161]	[0.4226]	[0.2850]	[0.4411]
IPV/Loc × Week 3	10.064***	10.650***	10.951***	11.065***	11.336***	10.612***	9.099**
	(2.776)	(2.934)	(2.885)	(2.864)	(3.010)	(2.940)	(3.871)
	[0.3494]	[0.3937]	[0.4259]	[0.4302]	[0.4412]	[0.3848]	[0.3777]
AV × Week -1	-0.054	-0.066	-0.068	-0.067	-0.066	-0.071	-0.030
	(0.040)	(0.050)	(0.055)	(0.061)	(0.061)	(0.064)	(0.031)
	[-0.0025]	[0.0060]	[0.0064]	[0.0069]	[0.0064]	[0.0012]	[0.0088]
AV × Week 1	-0.082	-0.099*	-0.104*	-0.071	-0.073	-0.061	-0.072
	(0.051)	(0.060)	(0.063)	(0.054)	(0.055)	(0.055)	(0.049)
	[-0.0037]	[-0.0007]	[-0.0007]	[0.0008]	[0.0005]	[-0.0008]	[0.0015]
AV × Week 2	-0.197**	-0.226***	-0.234***	-0.150**	-0.155*	-0.136**	-0.149**
	(0.079)	(0.077)	(0.075)	(0.076)	(0.079)	(0.057)	(0.075)
	[-0.0071]	[-0.0018]	[-0.0018]	[0.0012]	[0.0007]	[-0.0011]	[0.0022]
AV × Week 3	-0.194***	-0.224***	-0.243***	-0.252***	-0.260***	-0.256***	-0.246***
	(0.057)	(0.061)	(0.057)	(0.063)	(0.065)	(0.066)	(0.050)
	[-0.0076]	[-0.0039]	[-0.0043]	[-0.0044]	[-0.0049]	[-0.0067]	[-0.0029]
N	360	360	360	360	360	355	355
Demographic Controls		Y	Y	Y	Y	Y	Y
Social Distancing Controls			Y	Y	Y	Y	Y
Pop. Dens × Week Controls				Y	Y	Y	Y
Tests per Capita					Y		
No Green Bay						Y	
No Milwaukee							Y

Notes: Data sources are identical to Table 1. The table shows logit coefficients, standard errors clustered at the county level in parentheses, and marginal effects in brackets. Controls include county population, population density, the percent of the population without a high school degree, the percent of the population with at least a bachelor's degree, the 2018 unemployment rate, the median household income, and the percent of the population age 65 or older. The Safegraph Social Distancing Controls include median home dwelling time, percent of devices completely home, and median distance traveled from home. Stars denote statistical significance levels: * 10% ** 5% and *** 1%.

Table 3: Relationship between New COVID-19 Cases and In-Person Voting and Absentee Voting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IPV × Week -1	0.644	0.923	0.736	0.739	0.739	0.771	0.895
	(0.859)	(1.244)	(1.173)	(1.160)	(1.163)	(1.160)	(1.249)
	[0.0468]	[0.0813]	[0.0820]	[0.0824]	[0.0826]	[0.0597]	[0.0792]
IPV × Week 1	1.492	2.228	2.359*	2.363*	2.361*	2.054	2.087
	(0.991)	(1.436)	(1.356)	(1.330)	(1.328)	(1.294)	(1.402)
	[0.0714]	[0.1105]	[0.1176]	[0.1179]	[0.1179]	[0.0948]	[0.1024]
IPV × Week 2	2.189**	3.067**	3.286**	3.228**	3.230**	2.715**	2.811*
	(1.001)	(1.513)	(1.453)	(1.375)	(1.377)	(1.247)	(1.439)
	[0.0927]	[0.1391]	[0.1494]	[0.1477]	[0.1480]	[0.1100]	[0.1268]
IPV × Week 3	1.973**	2.718*	2.612*	2.709**	2.712**	2.507**	2.013
	(0.974)	(1.457)	(1.349)	(1.294)	(1.297)	(1.263)	(1.338)
	[0.0886]	[0.1289]	[0.1275]	[0.1312]	[0.1314]	[0.1093]	[0.1011]
AV × Week -1	-0.114	-0.155	-0.129	-0.131	-0.131	-0.134	-0.128
	(0.144)	(0.199)	(0.186)	(0.177)	(0.178)	(0.175)	(0.172)
	[-0.0104]	[0.0017]	[0.0016]	[0.0014]	[0.0011]	[-0.0033]	[0.0002]
AV × Week 1	-0.249	-0.351	-0.368*	-0.373*	-0.372*	-0.338*	-0.377*
	(0.161)	(0.227)	(0.212)	(0.202)	(0.202)	(0.203)	(0.203)
	[-0.0128]	[-0.0115]	[-0.0123]	[-0.0125]	[-0.0126]	[-0.0122]	[-0.0125]
AV × Week 2	-0.379**	-0.493**	-0.520**	-0.500**	-0.499**	-0.449**	-0.525**
	(0.160)	(0.238)	(0.224)	(0.195)	(0.195)	(0.188)	(0.206)
	[-0.0175]	[-0.0124]	[-0.0136]	[-0.0131]	[-0.0132]	[-0.0124]	[-0.0137]
AV × Week 3	-0.350**	-0.446*	-0.426**	-0.480**	-0.480**	-0.467**	-0.503***
	(0.156)	(0.228)	(0.209)	(0.200)	(0.199)	(0.205)	(0.185)
	[-0.0168]	[-0.0136]	[-0.0130]	[-0.0150]	[-0.0152]	[-0.0158]	[-0.0151]
N	360	360	360	360	360	355	355
Demographic Controls		Y	Y	Y	Y	Y	Y
Social Distancing Controls			Y	Y	Y	Y	Y
Pop. Dens × Week Controls				Y	Y	Y	Y
Tests per Capita					Y		
No Green Bay						Y	
No Milwaukee							Y

Notes: The data sources and models are identical to Table 2, with the exception that we replace in-person voting per location with in-person votes (in ten thousands). The table shows logit coefficients, standard errors clustered at the county level in parentheses, and marginal effects in brackets. Stars denote statistical significance levels: * 10% ** 5% and *** 1%.

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Nancy Karnes on behalf of Pete Schenkkan
Bar No. 17741500
nkarnes@gdhm.com
Envelope ID: 43079469
Status as of 05/19/2020 11:59:00 AM -05:00

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