



BRIEF REPORT

Increase in Daily New COVID-19 Cases Not Seen Following the Wisconsin Primary Election April 2020

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Abstract

Background: Wisconsin (WI) held a primary election in the midst of the COVID-19 pandemic, 453,222 persons voted live at the polls.

Objective: To determine if an increase in COVID-19 activity was associated with the election.

Methods: We did not design the election process as an experiment, we observed the outcome of the events. Using the voting age population for the United States (US), and Wisconsin (WI), and daily COVID-19 case reports from various dashboards, daily new case rates (all rates per 100,000 voting age adults) were calculated. With election day April 7, allowing for initial incubation, we choose to measure April 12-21.

Results: WI daily new case rates were 3.647 in the 10 day period leading up to the election and they fell to 3.234 during the 10 day period following the election. Daily new case rates for the rest of the US, averaged 10.77, for the 10-day period before the election and 11.62 following the election. The ratio of Wisconsin new case rates to US new case rates was 0.34 WI: 1 US for the 10 days leading up to the election and declined to 0.28 WI: 1 US for the 10-day post-incubation period after the election.

Conclusions: There was no increase in COVID-19 new case daily rates observed for Wisconsin following the election on April 7, 2020. Social distancing, masks, poll sanitation, self-selection for appropriate live voting, and a high rate of absentee voters may have all contributed to minimizing the risk of acquiring COVID-19 during live voting.

Keywords

COVID-19, Wisconsin election april 2020, Live voting

Introduction

Since the World Health Organization declared SARS-CoV-2 (COVID-19) a global pandemic on March 11, 2020, drastic social distancing measures have been declared across the United States [1] and in Wisconsin by Governor Evers Safer at Home Order [2]. Many businesses and social activities have been closed and minimized, leading to unrest about individual freedoms. The intricate balance between constitutional voting rights and public health took front seat on April 7, 2020, the scheduled primary election date for the state of Wisconsin. The presidential primary election, a key state Supreme Court justice election, and numerous local office elections were on the ballot for April 7.

A U.S. District judge rejected a request to postpone the election, but provided an extension for absentee ballots. Later, the Supreme Court cancelled the extended period for absentee voting [3] and on April 7, the election occurred, a mixture of live and absentee mail in voting. Absentee ballots needed to be postmarked by April 7 to count, causing a change in many voter's plans.

We aimed to see whether a subsequent rise in COVID-19 cases followed the controversial in-person Wisconsin election on April 7, 2020. Not only may this impact local public health action, but could impact future election behaviors.

Methods

Websites for new COVID-19 daily cases were visited

daily to obtain new case data for the United States (US) [4], Wisconsin [5], Milwaukee county [6], Dane county [7], and Waukesha county [8]. Those counties represented the largest 3 contingents of voter age adults in Wisconsin and were counties where COVID-19 was active during election time. The number of new cases reported by the websites daily were extracted, and the daily new case rates per 100,000 voting age (age 18 or older) adults were calculated in those populations. Census data [9] was used to obtain population data and age mix, then the number of voter age adults were calculated for the cohorts. The number of Wisconsin (WI) voters was subtracted from the US total, so the US data would represent all of the country excluding WI data. Daily new cases of COVID-19 infections extracted from the websites were then divided by the number of voter age adults in the cohorts to determine the daily new case rates. COVID-19 daily cases numbers from WI were removed to determine the number of new daily cases for US. The daily new COVID-19 cases were not adjusted for age (< 3% under age 19) [5]. The study was exempt from IRB, it did not include protective health information and used data in the public domain exclusively.

The median incubation period of the virus is 5 days [10]. With the election on April 7, we used April 12 as the first date to start monitoring the number of new COVID-19 cases that may be related to the election. We then continued the analysis for the full 14-day period following exposure, mimicking a self-quarantine period, as < 1% are shown to develop symptoms after 14 days [10]. Analysis of data from April 12-21 best represents the viral properties and course of action by the individual, from symptoms to testing to receiving results to being reported by the local health department.

Results

Wisconsin's April 7, 2020 election was completed and allowed live in-person voting. There were 453,222 live votes included in the 1,551,711 total votes with 1,098,489 (70.8%) voting absentee (Table 1). In the three most populous counties, absentee voting was higher, 77-84.7%, but together there were 109,052 live voters.

Figure 1 displays the daily rate of new cases of COVID-19 by day of the pandemic, for Wisconsin and the rest of the US, with curves visually mimicking each

other. Figure 1 displays election day occurring on April 7, and the incubation period occurring until April 12, five days post-election. Figure 2 provides a focused comparison between Wisconsin and the US for the 5-14 days post-election period. It does not suggest any spike in post-election cases in Wisconsin in relation to the rest of the US.

The average rate of new cases of COVID-19 was 10.77 (all rates are per 100,000 voting age adults) in the US for the 10 days leading up to the election on April 7, 2020, and 11.62 for the 10-day incubation period following the election (April 12-21) (Table 2). Using the same time period, the average daily rate of new COVID-19 cases for Wisconsin was 3.65 before the election, and 3.23 for the 10-day period following the election.

The US and WI rates themselves, are of course different as the circumstances in the US are different than those in Wisconsin as it pertains to the course of pandemic, population mix, population densities, and many other factors. So, a ratio was determined to see if the correlation between the US and Wisconsin was consistent. Prior to the election, the Wisconsin daily rate of new COVID-19 cases compared to that for the US rate was in a ratio of 0.34 WI:1 US (Table 2). The average daily new case rate after the election was 11.62 in the US compared to 3.23 in Wisconsin, with a ratio of 0.28 WI:1 US (Table 2). After the election the ratio of new daily case activity in Wisconsin compared to the rest of the US dropped from its pre-election level, suggesting the rate of development of new cases was decreasing following the election compared to what would have been expected if the relationship between Wisconsin and the rest of the US had continued at its pre-election ratio.

The daily rate of new cases of COVID-19, and the comparative ratios to the US, for the time period before and after the election, for each of the three Wisconsin counties with the most voting age residents-Milwaukee, Dane, and Waukesha-are shown in Table 2. The rates fell following the elections in the most populous counties as well.

Discussion

Our study did not find any significant increase in the rate of new COVID-19 cases following the April 7, 2020 election for the state of Wisconsin or its three major voting counties, as compared to the US. We did not de-

Table 1: Election Demographics for Wisconsin, Wisconsin Three Major Counties, and United States (US).

	Wisconsin	Milwaukee	Dane	Waukesha	US
Populations	5,822,434	945,726	456,695	404,198	328,239,523
Voting Age Adults	4,360,176	737,666	356,222	315,274	254,713,870
Total Ballots Cast	1,551,711	210,068	201,613	140,068	
Absentee Ballots Cast	1,098,489	168,882	155,195	118,620	
Live Votes Cast	453,222	41,186	46,418	21,448	
% Absentee Voting	70.8	80.4	77	84.7	

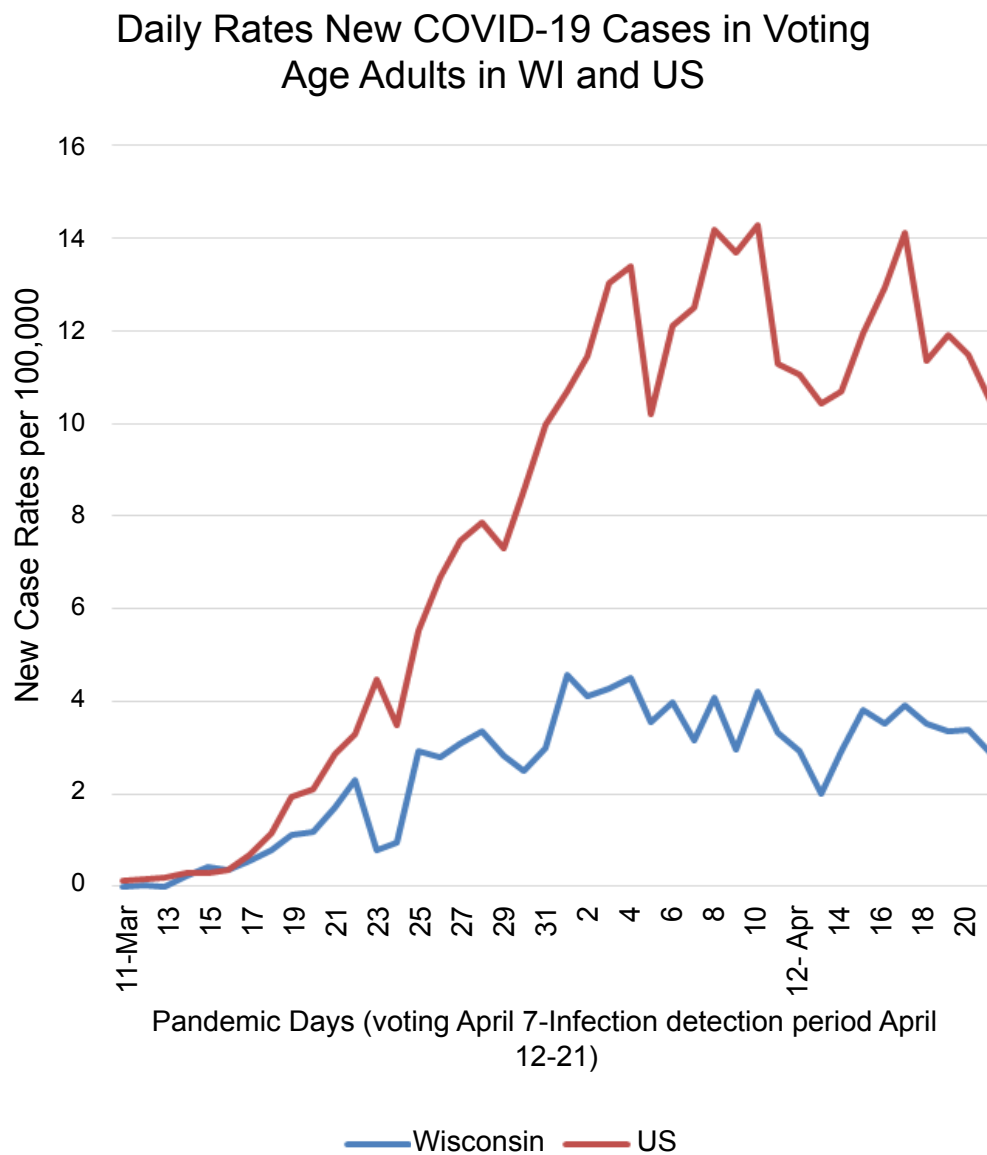


Figure 1: Daily COVID-19 new case rates per 100,000 voting age adults in WI and US by day of pandemic. Live voting occurred April 7, and viral infection detection period April 12-21.

Table 2: Pre- and Post-Election Daily New COVID-19 Case Rates and Ratios Comparing United States (US), Wisconsin, and Wisconsin Three Major Counties.

Region	Election Period	Mean Daily New Cases	Mean Daily New Case Rates per 100,000 Voting- Age Adults	Ratio of Region: US, New Case Rates
United States	Prior	27,365	10.77	-
	After	29,599	11.62	-
Wisconsin	Prior	159	3.65	0.34
	After	141	3.23	0.28
Milwaukee County	Prior	80.9	10.97	1.02
	After	53.7	7.28	0.63
Dane County	Prior	13.1	3.68	0.21
	After	5.5	1.54	0.13
Waukesha County	Prior	9.2	2.92	0.27
	After	6.8	2.16	0.19

US: United States; For all "prior", this represents 10-days prior to April 7 election; For all "after", this represents 10-days (April 12-21) after the 5-day viral incubation period; Mean daily new case rates for US have Wisconsin data excluded from totals; Empty cells are seen, as US is the comparison group.

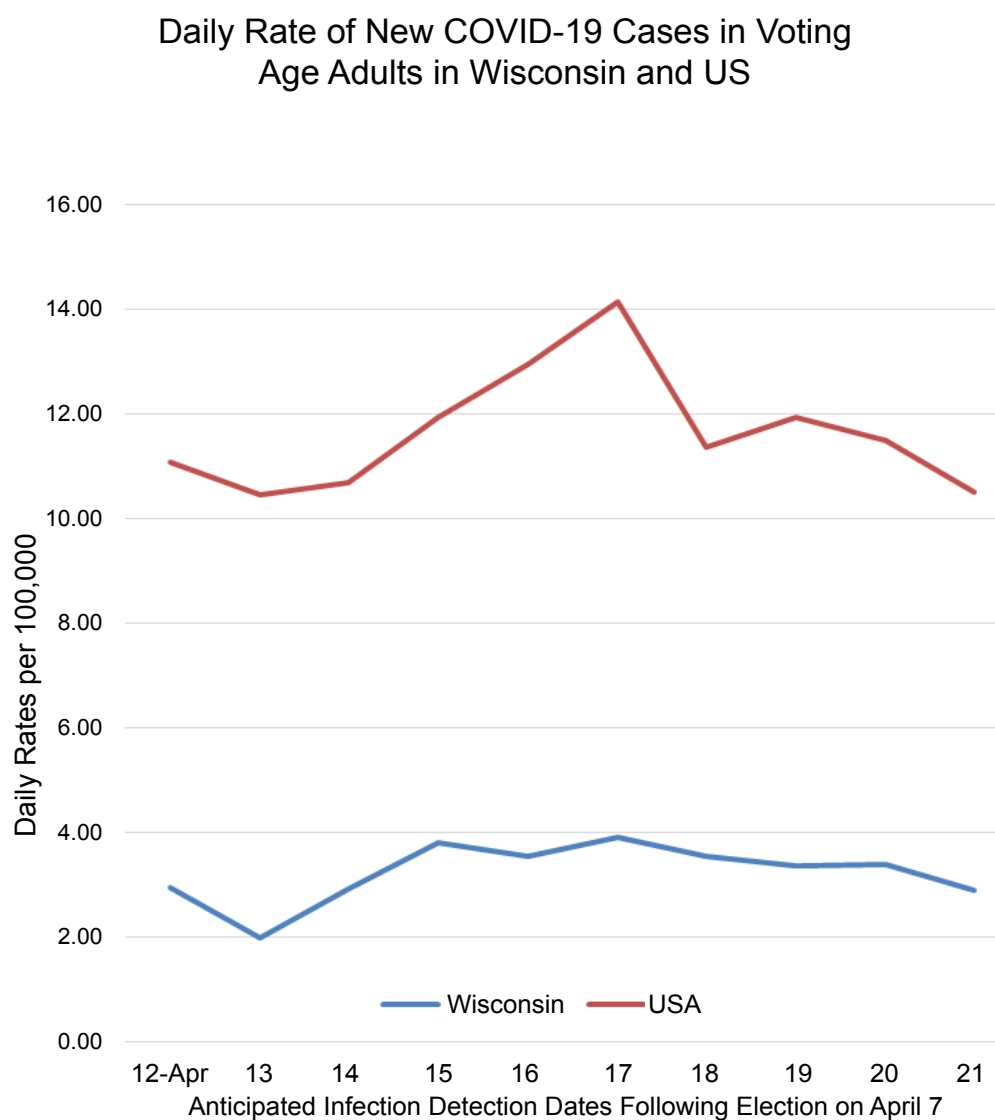


Figure 1: Daily COVID-19 new case rates per 100,000 voting age adults in WI and US by day of pandemic. Live voting occurred April 7, and viral infection detection period April 12-21.

sign the election as an experiment to measure how safe it would be to vote live. It would be impossible to design a randomized blinded study with live voting as the only variable, and almost impossible to study two groups of people, matched for all the known risks factors for contracting COVID-19 such as age, gender, race, diabetes, hypertension, occupation, sick contacts, household contacts and their behaviors, etc. The Supreme Court decision 1 day prior to the vote forced many people to vote live or not have their vote counted, and forced us to largely an observer role.

Our study compared the rate of new COVID-19 cases following the Wisconsin election to the rest of the US. Thus, we took a reasonable, practical approach, and observed that the COVID-19 activity in Wisconsin seemed to parallel the activity in the rest of the United States (Figure 1 and Figure 2). Prior studies have shown that most people who are going to show symptoms do so between 5-14 days following an exposure [9]. Thus, a 10-day period before the election was used to establish

a ratio reflecting the relationship between Wisconsin and US rates and then was compared with the ratio observed during the 10-day period, days 5-14, following the potential COVID-19 exposure during the in-person election.

An absolute reduction in daily new case rates in Wisconsin was observed, and a reduction in daily new cases rates compared to what would have been expected if the rates in Wisconsin had followed the pre-election ratios compared to the rest of the US. Our initial hypothesis of an increase in COVID-19 activity following the live election was not supported.

Daily test volume remained steady during the before (mean = 1487 (range 590-2076)) and after (mean = 1457 (range 940-1802)) election measurement periods ($p = 0.821$). Test results during this time period were generally available within 1 business day of obtaining the sample.

The concern that live voting in Wisconsin would

cause a large spike in COVID-19 cases caused considerable turmoil in the days prior to election and an increase in absentee voting, that may have been a large factor in preventing an increase in COVID-19 activity. There were 1,098,489 absentee ballots cast, but there were 453,222 ballots [11] cast by voters who went to polls to vote and many stood in line for hours. With the heightened publicity around COVID-19 and the perceived risks associated with voting live, high-risk individuals may have self-selected themselves out of the live voting process. The last presidential primary election in WI in 2016 had an absentee voting rate of 27.3%, compared to 70.4% absentee for this election.

Protective measures at the polls may also have mitigated some of the risk associated with the increased social exposure. Maybe the characteristics of the live voters were more favorable to producing asymptomatic infections and many went undetected. A mixture of all those things likely contributed to the absence of an increase in daily new case rates following the election. In the three most populous Wisconsin counties, where 109,052 live ballots were cast, there was a decrease in average daily new case rates, and similar to Wisconsin as a whole, those counties' daily new case rates fell compared to the rest of the US as well (Table 2).

Individual cases of COVID-19 infections most likely occurred as a result of additional exposure from live voting, although we could not detect an increase in rates for the population as a whole. Contact tracing is very difficult at this time with potential for exposure virtually everywhere in the community, linking an individual to live voting as their sole risk is not possible.

Conclusions

No evidence was found to support an increase in COVID-19 new daily case rates for the state of Wisconsin,

nor its major voting counties, compared to the rest of the US following live voting on April 7, 2020. We must continue to utilize our knowledge about COVID-19 virus transmission to create the safest and most effective voting environment for all.

Funding

None.

Authors Contribution

All authors equally contributed to the manuscript and study.

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