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ORIGINAL ARTICLE

A relationship between US healthcare worker smallpox vaccination rates in 2003 and presidential election results in 2004

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Abstract

A statistical relationship exists between state per capita smallpox vaccination rates of healthcare workers in 2003 and state presidential election results in 2004. The potential implications of political influence on national biosecurity decision making are discussed.

Key words: smallpox, vaccination, immunization, healthcare worker, Presidential election

Introduction

In 2003, the US Government instituted a program to vaccinate healthcare workers against smallpox. The program was initiated because the nation was perceived to be at a significant risk of a bioterror smallpox attack, and the goal of the program was to immunize 500,000 individual healthcare workers who, once immunized, could then enable mass vaccination of the general population in the event of an attack. The vaccination program fell far short of its goal, and only 39,000 healthcare and related workers were vaccinated.[1] Many healthcare workers declined the government's request that they be immunized for various reasons that included the perceived risks of the vaccine and the perceived likelihood of a smallpox bioterror attack. This study finds a relationship between the smallpox vaccination rates of the individual states and the results of the 2004 presidential election in each state. States that had higher per capita smallpox vaccination rates in 2003 were more likely to vote for the Republican presidential candidate in the 2004 national election, while states that had lower per capita vaccination rates in 2003 were more likely to vote for the Democratic presidential candidate in 2004. This relationship implies that there was a considerable political influence on the individuals' decisions that were made by healthcare workers as to whether or not to receive smallpox vaccination. This is concerning when one considers the decisions that individual healthcare workers made about vaccine risks and benefits as well as about the bioterror threat level for smallpox, which were at least in part colored by political views. There is a potential that future politicization of smallpox immunization might result in the loss of life of thousands or even millions of Americans.

Methods

A visual comparison of maps showing the state distribution of healthcare worker per capita smallpox vaccinations[2] in 2003 (Figure 1) and the 2004 presidential election results[3] (Figure 2) gives indication of the potential for a correlation between these two seemingly disparate parameters. To test the strength of this potential relationship, 2003 smallpox vaccination data and 2004 presidential election data were sought at both the state and county levels.

Openly published and available data on each state's per capita smallpox vaccination rates of healthcare and related workers during the 2003 program, along with each state's results for the 2004 presidential election, were obtained and examined (Table 1).[1] This data were subjected to a Mann-Whitney two-tailed statistical test to determine if there was any significant difference between the two populations that were examined. These two populations consisted of the states that voted for the Democratic presidential candidate and the states that voted for the

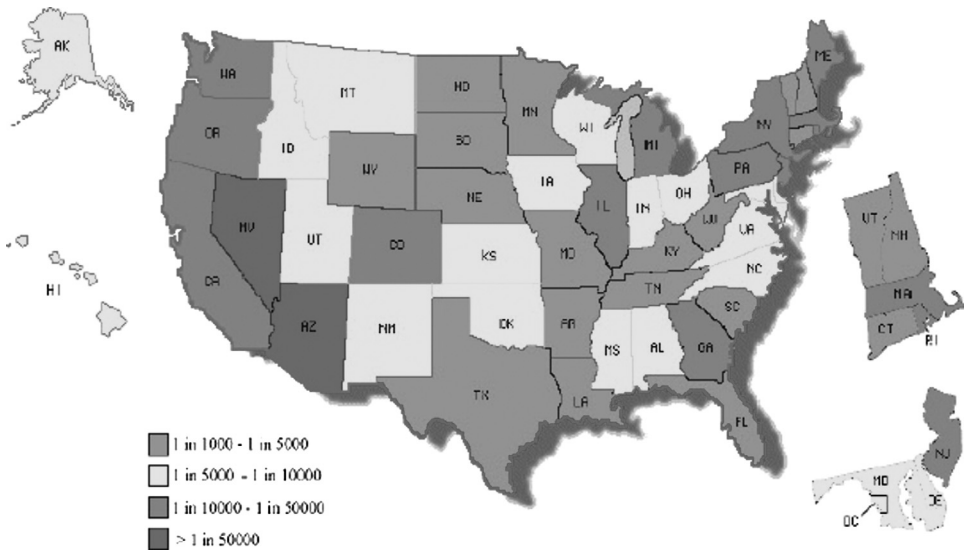

Figure 1. Number of vaccinated workers per capita.

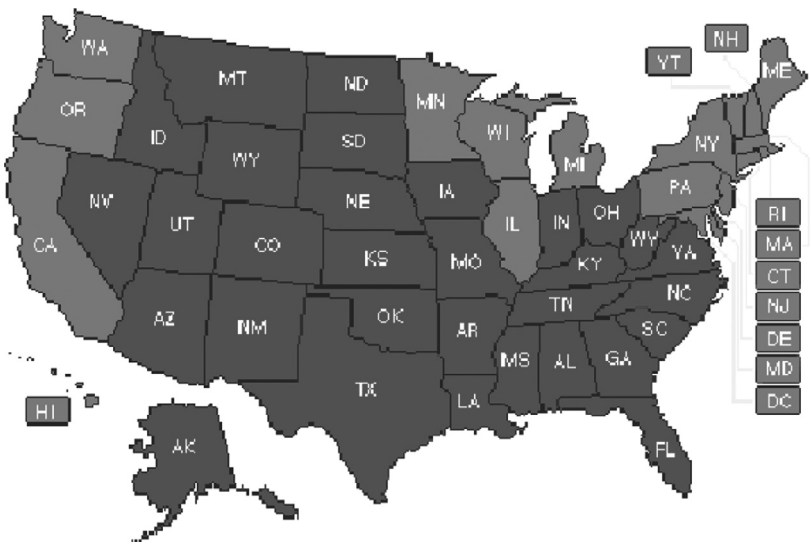

Figure 2. 2004 presidential election results.[3]

Republican candidate in the 2004 presidential election. The Mann-Whitney two-tailed statistical test was completed using the SPSS software package. The statistical significance of the Mann-Whitney test was set at $\alpha = 0.05$, and a statistically significant difference between the two populations of 0.014 was thus calculated, indicating a meaningful political relationship to the states' smallpox vaccination rates (Table 2).

An attempt was made to assess the possible significant differences at the county level within states. Information at this level was very difficult to obtain from the states because most states were reluctant to share this data because of security concerns. County-by-county data could only be obtained from a limited number of states, often with some stipulation. Some states were even legally bound to not release their data on smallpox immunization.

Eventually, county-by-county data on smallpox vaccination numbers could only be obtained from seven states, with most asking that this raw data not be made public, but that overall state vaccination data and statistical correlations could be published. No significant difference in vaccination results was found

Table 1. 2003 state smallpox vaccination and 2004 presidential election results[1]

State	Vaccinated	1 (Rep.), 2 (Dem.)	Population	Per capita	% rep.	% dem.
Alabama	503	1	4,527,166	0.0001111	62.4	36.84
Alaska	96	1	661,110	0.0001452	61.07	35.52
Arizona	39	1	5,878,004	6.635E-06	54.87	44.4
Arkansas	1,138	1	2,777,007	0.0004098	54.31	44.55
California	1,854	2	37,038,859	5.006E-05	44.36	54.31
Colorado	224	1	4,301,261	5.208E-05	51.69	47.02
Connecticut	697	2	3,405,565	0.0002047	43.95	54.31
Delaware	109	2	783,600	0.0001391	45.75	53.35
District of Columbia	105	2	572,059	0.0001835	9.34	89.18
Florida	3,981	1	15,982,378	0.0002491	52.1	47.09
Georgia	175	1	8,186,453	2.138E-05	57.97	41.37
Hawaii	181	2	1,211,537	0.0001494	45.26	54.01
Idaho	200	1	1,293,953	0.0001546	68.38	30.26
Illinois	376	2	12,419,293	0.00012568	44.48	54.82
Indiana	765	1	6,086,485	0.0001257	59.94	39.26
Iowa	492	1	2,926,324	0.0001681	49.9	49.23
Kansas	448	1	2,688,418	0.0001666	62	36.62
Kentucky	840	1	4,041,769	0.0002078	59.55	39.69
Louisiana	1,107	1	4,468,976	0.0002477	56.72	42.22
Maine	63	2	1,274,923	4.941E-05	44.58	53.57
Maryland	752	2	5,296,486	0.000142	42.93	55.91
Massachusetts	156	2	6,349,097	2.457E-05	36.78	61.94
Michigan	925	2	9,938,444	9.307E-05	47.81	51.23
Minnesota	1,476	2	4,919,479	0.0003	47.61	51.09
Mississippi	403	1	2,844,658	0.0001417	59.44	39.75
Missouri	1,253	1	5,595,211	0.0002239	53.3	46.1
Montana	144	1	902,195	0.0001596	59.07	38.56
Nebraska	1,470	1	1,711,263	0.000859	65.9	32.68
Nevada	17	1	1,998,257	8.507E-06	50.47	47.88
New Hampshire	331	2	1,235,786	0.0002678	48.87	50.24
New Jersey	671	2	8,414,350	7.974E-05	46.24	52.92
New Mexico	233	1	1,819,046	0.0001281	49.84	49.05
New York	1,130	2	18,976,457	5.954E-05	40.08	58.37

(continued)

Table 1. 2003 state smallpox vaccination and 2004 presidential election results[1] (continued)						
State	**Vaccinated**	**1 (Rep.), 2 (Dem.)**	**Population**	**Per capita**	**% rep.**	**% dem.**
North Carolina	1,305	1	8,049,313	0.0001621	56.02	43.58
North Dakota	415	1	642,200	0.0006462	62.86	35.5
Ohio	1,921	1	11,353,140	0.0001692	50.81	48.71
Oklahoma	376	1	3,450,654	0.000109	65.57	34.43
Oregon	115	2	3,421,399	3.361E-05	47.19	51.35
Pennsylvania	288	2	12,281,054	2.345E-05	48.42	50.92
Rhode Island	36	2	1,048,319	3.434E-05	38.67	59.42
South Carolina	890	1	4,012,012	0.0002218	57.98	40.9
South Dakota	737	1	754,844	0.0009764	59.91	38.44
Tennessee	2,429	1	5,689,289	0.0004269	56.08	42.53
Texas	4,563	1	20,851,820	0.0002188	61.09	38.22
Utah	288	1	2,233,169	0.000129	71.54	26
Vermont	130	2	608,827	0.0002135	38.8	58.94
Virginia	876	1	7,078,515	0.0001238	53.68	45.48
Washington	554	2	5,894,121	9.399E-05	45.64	52.82
West Virginia	734	1	1,808,344	0.0004059	56.06	43.2
Wisconsin	759	2	5,363,675	0.0001415	49.32	49.7
Wyoming	414	1	493,782	0.0008384	68.86	29.07

Table 2. Mann-Whitney test results*			
Ranks			
Vacrate† 1 (rep.), 2 (dem.)	n	Mean rank	Sum of ranks
1	31	30.10	933.00
2	20	19.65	393.00
Total	51		

*Test statistics: Vacrate: Mann-Whitney $U = 183.000$; Wilcoxon $W = 393.000$; $Z = -2.450$; Asymp. Sig. (2-tailed) = 0.014.
†Grouping variable: 1-Rep; 2-Dem.

when comparing vaccination rates at the county level for any of the seven states from which immunization data were obtained. However, a trend toward significance was indicated in the county-by-county breakdown of the immunization data in two of those seven states from which the data were received.

Analysis

The data and relationship indicate that healthcare workers who received smallpox immunization in 2003 were more likely to live in states that voted Republican in 2004 than in states that voted Democratic in 2004. While it would generally be expected and desirable that healthcare workers would make individual decisions to receive the smallpox vaccination based on their perception of the risk of the vaccine and on their perception of the likelihood of a smallpox bioterror attack, it would not be generally expected or desirable that there would be political influences in their decision making, as is indicated by the statistically significant relationship between 2003 healthcare worker immunization rates and 2004 presidential election results. Obviously, there was either a right decision or a wrong decision to be immunized, with plausible arguments made on either side. But, to have such important biosecurity decisions

politicized can only place the nation at great risk. One wonders that if it had been a Democratic presidential administration making the request for smallpox immunization, whether the trend would have been reversed and Democratic states would have relatively higher immunization rates, while Republican states would have relatively lower immunization rates.

While no significant correlations were found at the county level between 2003 per capita vaccination rates and 2004 presidential voting results in the seven states from which immunization data could be obtained, it is worth noting that only a considerably low number of states were willing to share such data because of security concerns. On one hand it is reassuring that potentially sensitive biosecurity information is generally not readily available to potential bioterrorists; however, on the other hand, given the relatively miniscule numbers of healthcare worker smallpox vaccinations across the nation in 2003, one would wonder if there would be any real value of the county-by-county data to potential terrorists. It is notable that these data are not available to be analyzed by those who might again someday be called upon to be immunized against smallpox, namely, the healthcare workers. Such a lack of data, which is important to an individual's decision making, might lead to further politicization of that individual's decision as to whether or not to be immunized. Individuals can only make personal decisions based on the information that they have, and, if because of a lack of objective data the bulk of an individual's information is politicized, then it would follow that the individual's decision making would reflect significant political influence.

Recommendations

To keep future biosecurity response free of political influence, the government should strive to present any response strategies in a nonpartisan or bipartisan manner. The president and his administration should not be the only ones making the recommendations, but mechanisms should be established to concurrently have all state governors and congressional leadership, along with all aspects of the Department of Health and Human Services, validate and reinforce the recommendations. This consensus among leaders should be arrived at long before any response or biosecurity actions are taken such as the launch of a mass immunization project. There should be a standing consensus among all of the associated national leadership that appropriate threat potential has been arrived at objectively, and that the decisions regarding biosecurity response have grown out of unified agreement. Any attempts to politicize the immunization efforts should be constrained.

For individuals to make personal decisions regarding their involvement with, and participation in, immunization programs or other biosecurity response recommendations made by the government, appropriate objective information must be made available to them. Decisions need to be made by appropriate governmental authorities as to what currently classified information should be made generally available to the public and specifically to healthcare workers. This objective information would help to limit partisan political influences on individuals as they make personal decisions regarding compliance with governmental biosecurity recommendations.

Such individual decision making might also be enabled by allowing recommended immunizations or medications to be available through private physicians. The political party in office might be seen as controlling distributions of immunizations and medications if they are made available solely through government sponsored clinics. The potential for such perceptions of partisan political influence could be reduced if immunizations or medications were seen to also be available outside of tight governmental control. This would enable individuals and their trusted personal medical consultants to make more informed decisions specific to their individual situations.

Conclusion

A significant difference was found in the 2003 smallpox immunization rates of healthcare workers between states that voted Democratic in the 2004 presidential election and states that voted Republican in the 2004 presidential election. States that voted for the Republican presidential candidate in 2004 were more likely to have had higher per capita smallpox immunization rates for healthcare workers in 2003. States that voted for the Democratic presidential

candidate in 2004 were more likely to have had lower per capita smallpox immunization rates for healthcare workers in 2003. This implies that there were significant political influences on the decisions of individual healthcare workers as to whether or not to receive the smallpox vaccination. Such political influences should be minimized by a bipartisan governmental attitude toward biosecurity response, and by greater appropriate information sharing by the government with those involved in the response.

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