Economic Inquiry

ALLOCATING INFECTION: THE POLITICAL ECONOMY OF THE SWINE FLU (H1N1) VACCINE

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Previous research has isolated the effect of "congressional dominance" in explaining bureaucracy-related outcomes. This analysis extends the concept of congressional dominance to the allocation of H1N1, or swine flu, vaccine doses. States with Democratic United States Representatives on the relevant House oversight committee received roughly 60,000 additional doses per legislator during the initial allocation period, though this political advantage dissipated after the first 3 weeks of vaccine distribution. As a result political factors played a role in determining vaccine allocation only when the vaccine was in particularly short supply. At-risk groups identified by the Centers for Disease Control (CDC), such as younger age groups and first responders, do not receive more vaccine doses, and in fact receive slightly fewer units of vaccine. (*JEL* D72, D73, I18)

I. INTRODUCTION

Public choice theory provides a fertile ground to analyze government activity. Traditional economic theory modeled public officials as pure optimizers of public welfare, even at the expense of their private well-being. By allowing actors in the public sector the opportunity to respond to incentives, public choice theory allows behavior that was once difficult to describe in the context of traditional economic models to become logical and rational. If public choice theory is correct, one would expect to see government officials acting in a manner such that individual self-interest could displace the "public good." The distribution of the H1N1, or swine flu, vaccine provides exactly such a forum for testing.

II. BACKGROUND: CONGRESSIONAL DOMINANCE AND THE H1N1 VIRUS

Previous research has focused on the ability of Congress to impose its preferences upon bureaus—a scenario known as congressional dominance. Weingast and Moran (1983) provide the theoretical framework by which a "congressional incentive system" emerges:

> *First, in the budgetary process each agency competes with a host of others for budgetary favors. Congressmen pursuing their own electoral goals favor those agencies that provide the best clientele service. . .Second, oversight plays an important role in sanctioning errant agencies. This includes new legislation, specific prohibitions on activities, and other means that serve to embarrass agency heads, hurt future career opportunities, and foil pet projects. Finally, and perhaps the most effective means of influence, Congress controls who gets appointed and reappointed. (Weingast and Moran 1983)*

The result is a political structure whereby Congress wields substantial influence over the behavior of bureaus not only through direct means (i.e., legislation, appointments), but also by creating the incentive for bureaus to serve the Congress—and more specifically, the appropriate oversight committees pertaining to each individual bureau.

Congressional dominance outlines one scenario in which legislators utilize their political advantage to secure personal benefits. In addition to the "congressional incentive system," there exists a geographic nature to both the bureaucratic allocation of federal funds and political representation within Congress. The result of these institutional structures is a

*The author would like to thank Peter Leeson, David Skarbek, Russell Sobel, two anonymous referees and the associate editor for comments, and Lee Albert and Tracy Winters for data assistance. The usual disclaimer applies.

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ABBREVIATIONS

CDC: Centers for Disease Control
HHS: Health and Human Services

Economic Inquiry
(ISSN 0095-2583)
Vol. 52, No. 1, January 2014, 138–154

doi:10.1111/ecin.12023
Online Early publication June 7, 2013

bureaucracy seeking to appease the members of its congressional oversight committee by providing a disproportionate share of public benefits to its constituents.

Empirical evidence supporting the claims of congressional dominance theories initially focused on the activities of the Federal Trade Commission; in addition to the above study, see Calvert and Weingast (1984), Faith, Leavens, and Tollison (1982), Katzmann (1984), and Moran and Weingast (1982), among others. More recent research focuses on the impact that Congress has on a wider range of bureaus. Young, Reksulak, and Shughart (2001) show that IRS audit rates are lower in the Congressional districts of members on key oversight committees of the IRS. Garrett and Sobel (2003) note that Congressional oversight committees play a large role in determining the fiscal nature of FEMA disaster payments. Drury, Olson, and Belle (2005) show that the Office of U.S. Foreign Disaster Assistance responds to the preferences of Congress when allocating humanitarian aid. Garrett, Marsh, and Marshall (2006) find a similar Congressional influence concerning agricultural disaster relief.

Sitting on a Congressional committee has long been viewed as advantageous to the constituents of committee members (see Arnold 1979; Ferejohn 1974; Ritt 1976, among many others). However, identifying causality can prove difficult (see, for example, Ray 1980; Rundquist and Griffith 1976), as self-selection could lead members of Congress to be placed on committees the services of which their constituencies are particularly in need. For example, a representative from an area with a heavy military presence could be placed on the appropriate committee for military spending oversight. Such possibilities obfuscate any causal effects that can be gleaned from a straightforward statistical analysis. The political scenario surrounding the emergence of the H1N1 virus, however, touches on a unique subset of congressional dynamics. Weingast and Marshall (1988) note that the organizational structure of Congress leads to legislators populating committees which deal with issues of particular importance to the legislator's constituency. This facet of congressional dominance implies a degree of foresight about upcoming legislation or, in the absence of knowledge of the specifics of upcoming legislation, a degree of foresight about the issues with which upcoming legislation will deal. Due to the unanticipated spread of the H1N1 virus beginning in the late spring of 2009 (see below), the distribution of the Congressional members populating the oversight committees relevant for allocating vaccines was unrelated to the need for vaccine, thus getting around the key endogeneity problem in evaluating this theory. As such, this analysis focuses on a unique instance of exogenous variation by which to isolate the impact of self-interested politicians in the legislative allocation process.

The allocation of the H1N1 vaccine fell under the guidance of the Department of Health and Human Services (HHS). Political oversight of the HHS as it pertained to the distribution of the swine flu vaccine in the House of Representatives fell to the Committee on Energy and Commerce, and in the Senate fell to the Committee on Health, Education, Labor, and Pensions. Section II provides more specific information as to the makeup of each committee.

In early 2009, the H1N1 virus began to spread throughout the United States. By June, the Centers for Disease Control (CDC) provided a candidate vaccine and identified a manufacturer to produce the first batches of the swine flu vaccine. On August 18, the Department of Health and Human Services reported that 45 million doses of vaccine would be available by October 15, with an additional 20 million doses weekly throughout the rest of the year, totaling 195 million doses. On October 14, approximately 5.5 million doses had been distributed to the 50 states and the District of Columbia, and the total amount of vaccine distributed by the end of December was nearly 100 million doses.

III. EMPIRICAL MODEL

The empirical framework analyzes the total doses shipped per state as opposed to total doses per state as a percentage of population. While population is ultimately a factor in the number of units distributed to a state—and is thus controlled for in all of the regression analyses—members of Congress from all states are competing over the same fixed pool of resources, namely the available weekly units of H1N1 vaccine. To say that an additional 10,000 units for Alaska should be weighted much more heavily (as a result of calculating units as a percentage of state population) than an additional 10,000 units for California makes sense when viewing the vaccine's ultimate medical impact upon the population of the two states, but does not make economic sense when analyzing the competition to secure these fixed-amount units in the first place.[1]

The analysis utilizes ordinary least squares with robust standard errors to investigate two separate questions. First, did the nature of the allocation of H1N1 vaccine doses change over the first 9 weeks of the program? More specifically, have political influences had a constant or changing impact over time? Second, can the initial allocations be characterized by the directives of the CDC, as production shortcomings generated a situation of distinct dose shortage?

A. Evolution of Vaccine Allocation

To investigate the evolution of the distribution of the swine flu vaccine, nine separate regression models are calculated using the following equation:

$$(1) \qquad \text{Total Doses}_i = \alpha + \phi\mathbf{Y}_i + \gamma\mathbf{Z}_i + \varepsilon_i.$$

The dependent variable is the total number of swine flu vaccine doses shipped to state i. To analyze the impact of different factors over the course of the first 9 weeks of vaccine allocation, the analysis is performed weekly on aggregate totals for the first 9 weeks of the vaccine distribution. The analysis allows a full picture to emerge concerning the role of different independent factors in determining the ultimate allocation of vaccines throughout the 9-week distribution process. $\mathbf{Y}$ is the matrix of political variables, and ϕ is the vector of coefficients estimated for $\mathbf{Y}$. The political variables are the number of members from each committee and each political party from state i. This classification yields four separate variables. $\mathbf{Z}$ is the matrix of nonpolitical control variables, and γ is the vector of coefficients estimated for $\mathbf{Z}$. For this portion of the analysis, these variables include the population of the state i, the number of doctors and nurses per capita, the percentage of the state i's population under the age of 24, and the weekly mortality rate due to H1N1 infection in state i. These control variables account for allocation recommendations made by the CDC (see Section III), which dictate that vaccine units should be directed toward higher-risk groups. In addition, the weekly mortality rate from H1N1 infection attempts to capture the latent need for vaccine at the state level—an ex post–type breakdown of where the H1N1 virus actually had a large impact as compared to the ex ante–type breakdown of which states had more high-risk individuals. The subsequent model, while further investigating the first week's allocation of swine flu vaccine doses, also provides a robustness check on incorporating different variables to capture the CDC's suggestions. Robust standard errors are utilized in the model.

B. Initial Allocation Period

Owing to significant public interest in receiving the swine flu vaccine as soon as possible, the high levels of anticipation for the distribution of the first units, and the production shortage that limited supply of vaccine doses, the initial allocation of swine flu vaccine deserves separate analysis. The regression model is similar to Equation (1). The dependent variable is the total number of doses shipped to state i by October 14, which covers the first week of swine flu vaccine distribution. The political variables (see Section III) remain the same. To explore more fully the recommendations of the CDC as to who should receive vaccine doses first, the following additional variables are considered. To capture the "first responders" effect, the number of doctors per capita is incorporated as well as the number of nurses per capita, in addition to analyzing the number of nurses *and* doctors per capita, as is used above. Furthermore, to capture the possibility of first responders beyond nurses and doctors, the number of hospital beds per capita is analyzed as well. A range of age cohort figures are also used. In addition to considering the percentage of the population under the age of 24, the analysis also includes the percentage of the population under the age of 5, from age 5 to age 13, and from age 14 to age 17, as well as the 2009 birth rate. To additionally control for the latent "need" of swine flu vaccine in state i beyond the weekly mortality rate, a set of dummy variables is created to capture different state-reported levels of influenza propagation, as discussed in Section III, covering the time period of October 1 to October 10, the most pertinent period to the allocation decisions made by October 14. States fall into one of three mutually exclusive categories: widespread influenza activity, regional influenza activity, and local influenza activity.

1. A per-capita analysis—most closely replicating Table 1b—is included in the Appendix. As predicted, and due to the factors described above, no consistent political impact can be drawn from such a model.

IV. DATA

A. H1N1 Vaccine Doses Shipped

The dependent variable in this analysis is the total number of H1N1 vaccine doses shipped to each state and the District of Columbia by the appropriate weekly date during the final quarter of 2009. Initially, the CDC reported the total number of doses shipped on a weekly basis. Subsequently, the CDC reported not only doses shipped, but also doses allocated and ordered, as well as reporting the figures on a bi- or tri-weekly schedule.[2] To maintain consistency in the data, only doses shipped are utilized on a weekly basis. The first set of weekly data on state shipments measures doses shipped during the week ending on October 14, and the last set of weekly data measures shipments during the week ending on December 9. Summary statistics for vaccine doses, along with all other variables, can be found in Table 2.

B. Congressional Oversight Committees

To isolate evidence of congressional dominance in the distribution of the H1N1 vaccine, committee membership information is included in the statistical analysis. Oversight of the distribution of the swine flu vaccine fell to two committees, one within each chamber of Congress. Both committees verified their role. In the House of Representatives, the Committee on Energy and Commerce provided Congressional oversight of the Department of Health and Human Services as it pertains to the distribution of the swine flu vaccine. The committee has 57 members from 31 states, 35 of which are Democrats and 22 are Republicans. In the Senate, the Committee on Health, Education, Labor, and Pensions has oversight responsibility for the Department of Health and Human Services as it pertains to the distribution of swine flu vaccine doses. Twenty-three members from 22 states hold positions on the committee, 12 of which are Democrats, 10 are Republicans, and 1 is Independent.

For a discussion of the importance of committee membership in shaping bureaucratic behavior, see Section II.

2. Information concerning the number of doses allocated and the number of doses ordered are only available for the final three weeks of the analysis. As such, they cannot be uniformly utilized in the forthcoming empirical framework. For a discussion pertaining specifically to the issues of incorporating the number of doses ordered by state per week, see the subsection "H1N1-prone areas" below.

C. H1N1 Target Groups

The CDC advises the following concerning prioritization of the swine flu vaccine doses:

> *CDC's Advisory Committee on Immunization Practices (ACIP) recommends that certain groups of the population receive the 2009 H1N1 flu vaccine first. These target groups include pregnant women, people who live with or care for infants younger than 6 months of age, healthcare and emergency medical services personnel with direct patient contact, infants 6 months through young adults 24 years of age (especially children younger than 5 years of age), and adults 25 through 64 years of age who are at high risk for 2009 H1N1 complications because of chronic health disorders or compromised immune systems.*

Concerning the above directive, the following variables are used to capture high-risk groups—those who arguably have the highest "need" for vaccination. The Census Bureau provides population projections by state and by age group, based on the 2000 Census, for 2005. The age groups incorporated into this study are under 5 years, 5 years to 13 years, 14 years to 17 years, 18 years to 24 years, and over 65 years. The figures utilized in this analysis are percentage of state population that falls within the particular age group. These variables directly capture the CDC's suggestion that more vaccine should be directed toward younger individuals. In addition, states with higher percentages of young children are likely to have more pregnant women. As another measure of controlling for factors related to infants, birth rates by state are included for 2009.[3] This measure captures well the incidence of children below the age of 1, as well as proxies for the incidence of individuals in contact with children below the age of 1. The author knows of no adequate process by which to specifically control for adults 25 to 64 years of age who are at high risk for H1N1 complications, and thereby assumes that these individuals are proportional to the population of the state and, as a percentage of their state's populations, are evenly distributed across states.

3. Monthly birth rates by state were not available from the CDC at the time of composition. Utilizing monthly birth rates by state would provide different results only under the assumption that monthly birth rates exhibit significant variance from the annual rate, and in a manner that would correlate with H1N1 vaccine distribution. While conceivable, the author finds no reason to expect this scenario to be the case. Further, those in a position to act upon such knowledge would require such real-time, pointed information pertaining to live births—information not available over 1 year after the fact.

Including overall state population not only controls for the clear relationship between larger states receiving more vaccine doses, but also captures this final risk group as well.

To control for the number of first responders within a state, data on nurses and doctors per 1,000 residents are included. The Bureau of Labor Statistics provides information on the number of registered nurses by state, and the American Medical Association provides information on the total number of doctors by state.[4] In addition, to capture a state that may perform more medical services utilizing health personnel who are not identified as doctors or nurses, the number of hospital beds per 1,000 residents is included.

D. H1N1-Prone Areas

Holding all else constant, one could argue that more vaccine doses can be expected to be sent to areas most heavily hit by swine flu. For example, a state with no reported cases of swine flu may receive less doses, *ceteris paribus*, than a state where the flu is rapidly spreading or expected to spread. To control for this latent "need" of vaccine doses, the CDC reports influenza activity by category across states on a weekly basis.[5] The categories of influenza activity are widespread, regional, local, and sporadic.

There are several shortcomings of using this classification system. First, the categories are broad measures of flu propagation—both the traditional and H1N1 influenza virus. Further, the CDC reports that inclusion in one category or another "does not measure the severity of influenza activity." Instead, the categories simply measure the geographic spread of both seasonal flu and H1N1. Second, it is difficult to provide a theoretical foundation for how exactly to incorporate this information into the analysis. For example, would states repeatedly classified as having widespread influenza receive more vaccine doses than states newly classified? Would states geographically near other states that have widespread influenza activity receive more vaccine doses? Despite the flaws inherent in utilizing the data, one of the two empirical models includes these classifications as an attempt to control for the "need" of vaccine.

Another possibility that could capture the "need" for vaccine is the number of doses ordered by each state. Despite the considerable amount of resources devoted to the H1N1 vaccination effort, accurately assessing the need for vaccine within each state remained a difficult, if not impossible, task at the federal level. Indeed, the information needed to make an accurate, objective decision concerning each state's "need" simply did not exist. As a result, states may have been in a better position to determine their status with regards to the H1N1 virus and, as a result, the number of doses ordered may better reflect each state's need.[6] Unfortunately, the CDC only provides information on the number of doses ordered for the final 3 weeks of the analysis. Furthermore, utilizing even this modicum of information is statistically untenable due to the fact that the orders were largely filled during the last 3 weeks of distribution—the correlation between doses ordered and doses shipped is nearly linear ($r = 0.9981$) and the mean fulfillment rate over these 3 weeks is over 95%.

Though also imperfect, the best-available measure to control for the "need" for vaccine is deaths due to the H1N1 virus. While particular circumstances may cause a deviation between those areas that are most risky and the ultimate mortality rate—and, in fact, the correlation between the above-mentioned risk factors and the weekly death rates is not strong—the weekly death rate does capture which states ultimately have been hit hardest by the H1N1 virus. As the H1N1 virus spread through interaction with infected individuals, it is natural to conclude that those states with higher death rates are subject to more instances of H1N1 infection and, as such, require more doses of vaccine. Weekly death figures were obtained by state, and then transformed into a weekly H1N1 mortality rate (per million state residents).

Yet another possibility for identifying a H1N1-prone area—and hence the latent need for vaccine—is a state's proximity to Mexico. During the initial emergence of the H1N1

4. The number of doctors by state is the total number of nonfederal physicians, or physicians not employed by the federal government. The number includes allopathic physicians (MDs) and osteopathic physicians (DOs). Nonfederal physicians represent 98% of total physicians.

5. The clearest measure of "need" would be to track the cases of swine flu by state; however, the CDC ceased collecting said data at the state level in July, 2009 as states stopped aggregating information on swine flu cases.

6. This measure, too, is not perfect. States may receive guidelines from the federal government concerning intervals within which they may request vaccine doses, and thus the amount ordered is not a pure figure derived solely by the state. Further, states may artificially inflate orders so as to better their chances of receiving more vaccine units.

virus, Mexico was thought particularly worthy of attention in order to help mitigate the spread of the virus.[7] As a communicable disease, the belief that Mexico presented a discernible threat to the United States in terms of H1N1 transmission implies that states with a closer proximity to Mexico would therefore have a greater need for vaccine units. To control for this aspect of the H1N1 virus, a variable is included in a range of specifications that captures whether a state shares a border with Mexico.

V. RESULTS AND DISCUSSION

There are a number of intriguing results in categorizing the determinants of swine flu vaccine allocation. The discussion is split into two broad areas: (1) political factors, which consider the evidence of congressional dominance and its implications, and (2) risk factors, which consider the range of H1N1 target groups and H1N1-prone areas.

A. Political Factors

First, different political factors play differing roles in determining which states receive more or less vaccine. The clearest influence is the role of Democratic committee members from the House of Representatives. Table 1a shows how the allocation process evolved over the first 9 weeks of the distribution program. In the first 3 weeks, states with Democratic committee members on the Committee on Energy and Commerce received, in total, significantly more swine flu vaccine than states without committee representation. For every Democratic committee member, the home state had received roughly 60,000 additional doses of swine flu vaccine after the first week and after the second week, and nearly 100,000 more doses after the third week.[8] As the average state received approximately 109,000 units of vaccine during the first week, and approximately 310,000 by the end of the third week, these political effects are considerable. Table 1b provides a robustness check by analyzing the distribution of vaccine using *only* political measures; the results confirm the main specification.

Should vaccine doses be allocated according to where they would have the highest medical impact, congressional factors should play no role in determining distribution patterns. However, any deviation from the null hypothesis of no statistical impact suggests congressional dominance. The particular nature of this influence is both specific in nature to political party and chamber within the U.S. Congress. Given the political advantage held by the Democratic party during the distribution of the H1N1 vaccine, both at the federal level as a whole and within the House Committee on Energy and Commerce, it is natural to witness the majority party utilizing its position to secure additional doses of vaccine. That the House committee appears dominant in this analysis contributes to the line of research showing the relative dominance of House committees relative to Senate committees (see, for example, Shepsle 1978).

Besides, the existence of congressional dominance does not necessitate political influence on all margins by all players; indeed, of the four possible Representative/Senator, Democrat/Republican combinations tested in this analysis, only one of them carries statistical significance in any of the range of specifications. Given the complexity of the collective decision-making processes of the U.S. Congress, a blanket rule of all members on all committees generating personal benefits with every decision is extremely unlikely to ever be witnessed. This reality, however, does *not* mean that congressional dominance does not exist. Congress is a dynamic body where committee-based influence along party lines could oscillate among dozens (if not hundreds) of issues and across chambers. Nevertheless, this analysis tested for congressional dominance exhibited only in the distribution of the H1N1 vaccine and found that Democratic committee members in the House of Representatives benefitted from their position. Further, this study is not a proclamation of the existence of congressional dominance *only* in the distribution of the H1N1 vaccine; similar analyses of other legislative action could yield Republican and/or Senatorial influence as well. These hypothetical results, too, would not invalidate the theory of congressional dominance but rather provide

7. Janet Napolitano, Secretary of the Department of Homeland Security during the spring of 2009, noted in a statement before Congress on April 29, 2009 that both the Centers for Disease Control and the State Department had advised against non-essential travel to Mexico. Further, border patrol agents were provided with personal protection equipment and anti-viral drugs as “viruses do not respect borders.”

8. Given the aggregated nature of the total figures, the estimates for Democratic House committee members implies an advantage in the initial allocation in Week 1, a slight disadvantage in the allocation in Week 2 which does not erode the overall advantage after 2 weeks, and a distinct advantage in the third week which gives an even larger overall advantage after 3 weeks.

TABLE 1
Evolution of Swine Flu Vaccine Allocation

	Dependent Variable: Total Doses of Swine Flu Vaccine Shipped								
	Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
(a)									
House committee members									
Democrat	63136.1***	62196.3**	99538.2***	62218.4	124937.1	65882.2	169938.1	134114.9	177974.7
	(23083.0)	(25883.8)	(34011.4)	(50585.3)	(78092.1)	(71249.2)	(98087.5)	(114344.6)	(128888.9)
Republican	−15336.5	36998.9	39234.1	53102.2	21264.4	84995.8	70365.8	133087.1	79942.5
	(21444.9)	(26826.4)	(34963.5)	(57556.2)	(77028.5)	(73869.3)	(96011.8)	(115434.1)	(131188.4)
Senate committee members									
Democrat	−11682.5	6307.4	−8384.1	−16981.4	−7893.0	8607.3	27080.0	78042.0	−173.0
	(16237.9)	(13759.9)	(21684.4)	(27254.6)	(39733.2)	(37224.3)	(59739.5)	(62370.7)	(76126.6)
Republican	32360.6	3064.8	−15827.8	−36815.2	20590.8	−23790.0	7.0	23334.5	36972.3
	(20391.3)	(9446.9)	(16759.6)	(29083.8)	(27422.3)	(29987.3)	(36910.9)	(47275.3)	(51058.8)
Percentage of population under 24 years of age	−6869.4**	−1368.8	−3181.8	−2314.2	−12560.6*	−3027.2	−8319.1	−15001.9	−1446.9
	(3369.2)	(2108.8)	(4027.9)	(5565.6)	(7301.2)	(7382.8)	(9813.6)	(11373.2)	(1288.3)
First responders	−1907.3	−2192.1	−853.9	1273.8	−1234.2	820.6	−3413.9	−3712.4	−1957.8
	(2386.6)	(2617.1)	(3032.9)	(5604.1)	(6631.1)	(6533.5)	(9257.0)	(10300.0)	(11200.0)
Weekly H1N1 mortality rate	7494.2	−14993.5	−6520.5	−6056.6	−3590.4	−951.9	−16825.1	−23720.6	−19735.3
	(9191.0)	(9513.6)	(6818.5)	(5621.3)	(9683.2)	(6097.7)	(17385.7)	(19681.5)	(48677.2)
Borders Mexico	39702.6	83551.8*	79537.3	106002.7	160234.1	142981.1	229949.0	251302.1	405547.1
	(45121.7)	(42393.6)	(52724.6)	(95890.4)	(146662.4)	(136590.1)	(187440.4)	(224619.8)	(276492.3)
Population (thousands)	8.69**	20.17***	32.47***	63.97***	88.05***	114.18***	122.85***	151.09***	190.74***
	(3.87)	(6.63)	(8.74)	(14.32)	(21.31)	(19.59)	(27.24)	(32.03)	(34.90)
N	51	51	51	51	51	51	51	51	51
R^2	0.83	0.96	0.96	0.96	0.96	0.98	0.97	0.97	0.98
(b) Only political factors									
House committee members									
Democrat	54526.1**	55415.6**	94169.3***	57163.1	105770.0	57058.2	149983.6*	110926.9	147197.2
	(21495.2)	(24167.2)	(30285.1)	(44052.4)	(69152.9)	(61993.5)	(84512.9)	(101667.5)	(120696.5)
Republican	−15814.6	38291.8	39208.5	55317.2	19441.2	86741.5	74482.2	135149.9	83226.8
	(21697.3)	(28486.2)	(35575.6)	(55710.2)	(79922.5)	(77001.0)	(103495.3)	(122047.7)	(142248.9)

TABLE 1
Continued

	Dependent Variable: Total Doses of Swine Flu Vaccine Shipped								
	Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Senate committee members									
Democrat	−10978.1	6849.3	−5857.2	−12562.6	−380.0	13894.3	22645.9	80213.1	6647.4
	(14377.6)	(12438.9)	(19921.6)	(26177.5)	(35337.1)	(34925.6)	(48504.3)	(53513.5)	(56856.0)
Republican	25341.2	3963.7	−16038.0	−40062.1	5648.3	−22977.9	−4928.2	21450.4	34399.9
	(18212.5)	(11373.0)	(16873.7)	(25417.6)	(27183.3)	(23347.9)	(34472.0)	(38288.3)	(42178.8)
Population (thousands)	10.51***	22.86***	34.88***	66.75***	93.56***	117.99***	130.56***	159.21***	202.69***
	(3.68)	(5.80)	(7.41)	(11.81)	(17.50)	(16.31)	(21.96)	(26.50)	(29.65)
N	51	51	51	51	51	51	51	51	51
R^2	0.82	0.95	0.96	0.96	0.96	0.98	0.97	0.97	0.97
(c) Only risk factors									
Percentage of population under 24 years of age	−1599.9	2925.7	2873.9	1079.2	−3479.9	1660.3	3389.2	−3758.2	133.1
	(3287.3)	(2388.7)	(3696.3)	(3387.8)	(4132.0)	(4561.9)	(3792.6)	(5570.5)	(5899.0)
First responders	−539.1	−1699.1	1763.2	3336.1	2321.9	2706.3	3034.3	−134.5	2350.1
	(2560.0)	(2078.5)	(3243.0)	(4986.6)	(5698.8)	(5359.6)	(7267.4)	(7819.0)	(8751.1)
Weekly H1N1 mortality rate	5768.9	−7945.4	−12071.9*	−9110.2	−2706.5	−3303.3	−7806.8	−22497.8	−14523.1
	(8740.4)	(11272.5)	(7160.4)	(7482.8)	(7605.0)	(5102.7)	(14768.3)	(18229.0)	(30791.4)
Borders Mexico	16865.0	67311.0	59248.3	100018.3	125080.8	140079.9	187450.6	241255.2	361804.9
	(62065.2)	(50394.9)	(67311.2)	(106235.9)	(147954.5)	(145857.6)	(192462.3)	(291853.8)	(275805.3)
Population (thousands)	16.19***	30.64***	47.97***	75.30***	106.00***	127.63***	150.14***	175.77***	218.82***
	(3.20)	(3.26)	(4.65)	(6.20)	(9.56)	(8.14)	(12.64)	(14.16)	(16.36)
N	51	51	51	51	51	51	51	51	51
R^2	0.76	0.94	0.94	0.96	0.96	0.97	0.97	0.97	0.97

Notes: Robust standard errors in parentheses.
***Significant at 1%; **significant at 5%; *significance at 10% level.

insight into its particular nature as it pertained to the specific issues and legislation at hand.

Further, the role of constituency size is worth discussing as well. Members of the U.S. Senate serve entire states while most members of the U.S. House of Representatives serve smaller constituencies at the sub-state level. As units of H1N1 vaccine were allocated at the state level, the interests of Representatives' constituents, at face value, may not be well aligned with the distribution abilities of the CDC—in the least, not as well aligned as those interests of Senators. Representative interests, however, are still aligned with securing more vaccine units. Should Representatives look to serve their constituents, securing units of vaccine for their respective states is a necessary condition for doing so (along with, perhaps, other within-state political activities). But because state allocation is not itself a sufficient condition for Representatives—as it is for Senators—does not mean that Representatives are indifferent toward the process.

After the third week, state-level allocative preference due to congressional dominance dissipates. There are two important aspects of this finding. First, this result provides evidence on the substitutability between directing vaccine doses in a manner that maximizes public well-being and directing vaccine doses in a manner that secures a legislator private benefits from favoring their constituency. Should an allocative advantage persist in a well-represented state over many weeks, committee members may face the increasing possibility of public contempt and accusations of political manipulation. While politicians are generally popular within their constituencies for favorable treatment, it is conceivable to imagine an indirect effect of being labeled a political insider who uses his advantage at the expense of others.[9] The overall political effect of receiving more federal spending at the expense of others is, admittedly, very likely to be positive; however, with the larger issue of public health at stake, the overall effect may be difficult for the legislators to anticipate, and could well be negative. In the strictest sense of equilibrium, politicians engage in legislation that provides personal benefits until the marginal cost of action equals the marginal benefit. To this end, Democratic committee members may have performed a delicate balancing act—and quite well.

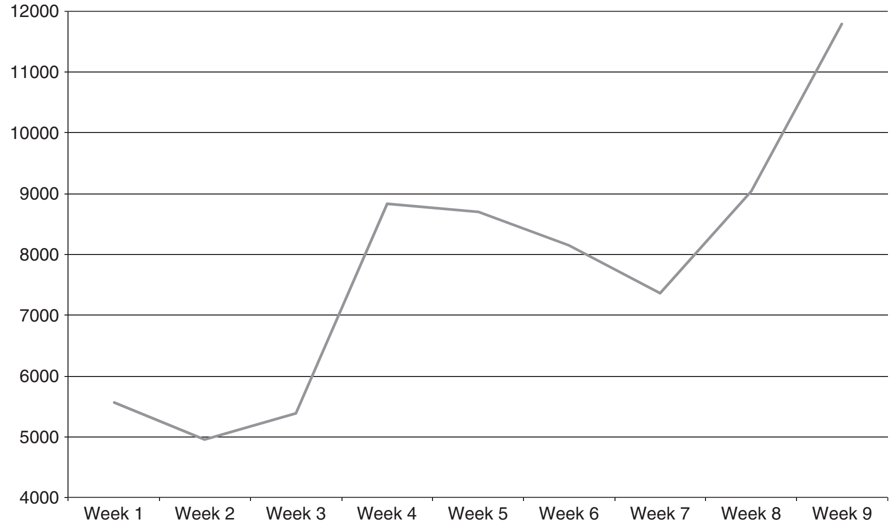
One alternative possibility that could provide similar results is that committee members come from states that are deemed to be in the greatest need of vaccine. As such, there would be a high correlation between the assorted risk factors presented in this analysis and committee membership. Table A3 provides pairwise correlations between committee membership and the risk factors. Only one of the four political groups—Republican Senate committee members—shows any semblance of correlation with risk factors. This result would imply that any additional allocation directed toward states represented by Republican Senate committee members could be misconstrued as political. However, the results do not dictate that Republican Senate committee members gained a political advantage. Democratic house members are shown to have the strongest political impact and, per the pairwise correlations, this result is not a function of their being from particularly high-risk areas.

Moreover, a variable to capture a state bordering Mexico was included in some of the specifications as well (specifically, Tables 1a, 1c, and 3). It conceivably could be the case that the political variables are capturing the circumstance that committee members happened to be representing areas of naturally high risk—i.e., bordering Mexico. Two important results come from this variable. First, while all estimates for this variable are positive, only two specifications exhibit any degree of statistical significance—and both are at the marginal level of 10%. Thus, while Mexico was thought to be a threat for the transmission of the H1N1 virus, there is little solid evidence to show that states which bordered Mexico received more units of vaccine because of their geographic proximity. Second, the political variables remain unchanged with the inclusion of the Mexico variable. As such, there is no reason to believe that there is any interplay between the observed political influence presented in this analysis and the latent "need" or riskiness of a particular state.

Second, the periods of political influence over the allocation of the swine flu vaccine coincide with the scarcity of vaccine doses. Figure 1 shows the weekly increase in the total number of vaccine doses shipped. Relatively large increases in the availability of swine flu vaccine did not occur until Week

9. In fact, Nebraska citizens in late 2009 responded negatively to one of their own Congressmen, Senator Ben Nelson, legislating in a manner that placed Nebraska at an advantage over other states concerning Medicaid payments.

FIGURE 1
Total Increase in Units (thousands) of H1N1 Vaccine Over Previous Week



4—the precise time when committee membership *ceased* being a significant determinant of which states received more doses of H1N1 vaccine. The timing of these two factors suggests an inverse relationship between the marginal benefit of political influence over the vaccine distribution process and the availability of units of vaccine. Given the substitutability between public well-being and private benefits, the consequences of consistently resorting to the political process in vaccine allocation, and the timing of the relative scarcity of units of H1N1 vaccine, political factors played a large role only through the first 3 weeks of the swine flu vaccine distribution process.[10] Indeed, when vaccine allocations across all weeks are pooled into one specification (Table 3), the effect of political influence only under marked scarcity goes away. Politics mattered most when vaccine was in shortest supply.

B. Risk Factors

While committee members utilizing their political position to secure more vaccine is evidence of a failure to pursue the "public good," so, too, is failing to provide vaccine doses where they could have the largest impact. As mentioned earlier, there are a number of factors considered most important when deciding where to allocate units of vaccine, per the directives of the CDC, none of which play a role in describing allocation patterns.

The CDC recommended that pregnant women, all individuals under 24 years of age, and especially children younger than 5 years of age receive vaccine doses first. Table 4 shows the breakdown of age groups in determining preferential treatment in swine flu vaccine allocation. States with higher percentages of children aged 5 years or younger received no additional vaccine; in fact, the estimate, while statistically insignificant, is negative, implying that states with higher concentrations of children received *less* vaccine. The same can be said for the age groups 5 years to 13 years, as well as 14 years to 17 years and the birth rate. States with higher percentages of individuals aged 18 years to 24 years received an amount of vaccine significantly *less* than those states with lower percentages of this age group, though that result is only significant to the 10% level. When looking at the combination of all age groups less than 24 years, there is weak evidence to say that it was those states that had a smaller share of individuals in at-risk age groups that received more vaccine. In any case, no evidence exists that doses of swine flu vaccine were directed

10. Interestingly, the only other statistically significant finding in the evolution of the swine flu vaccine allocation process—and a statistically marginal (90%) finding at that—was in Week 7, coinciding with the dip in Figure 1 at the same point, pointing again to the importance of scarcity as a determinant of the existence of political factors in vaccine allocation.

TABLE 2
Summary Statistics

	For the Following Variables, $N = 51$			
Variable	**Mean**	**SD**	**Min**	**Max**
Population (in millions)	5.96	6.72	0.53	36.76
House committee members				
Democrat	0.69	1.01	0	6
Republican	0.43	0.70	0	3
Senate committee members				
Democrat	0.24	0.43	0	1
Republican	0.20	0.40	0	1
Percentage of population under 24 years of age	34.57%	2.30%	30.21%	44.31%
Percentage of population from 18 to 24 years of age	9.93%	0.73%	8.53%	12.40%
Percentage of population from 14 to 17 years of age	5.81%	0.33%	5.08%	7.08%
Percentage of population from 5 to 13 years of age	12.03%	0.91%	8.75%	15.21%
Percentage of population under 5 years of age	6.80%	0.77%	5.10%	9.61%
Percentage of population over 65 years of age	12.57%	1.74%	6.66%	17.23%
Birth rate	13.42	1.68	9.80	19.40
Nurses per 1,000 residents	8.90	1.81	5.81	15.61
Doctors per 1,000 residents	3.21	1.04	2.07	8.57
Beds per 1,000 residents	2.92	0.96	1.70	5.80
Borders Mexico	0.08	0.27	0	1
Influenza activity				
Widespread	0.80	0.40	0	1
Regional	0.16	0.37	0	1
H1N1 mortality rate				
Week 1	0.35	0.56	0.00	2.41
Week 2	0.31	0.51	0.00	2.02
Week 3	0.64	0.81	0.00	3.10
Week 4	0.99	1.50	0.00	8.70
Week 5	1.03	1.13	0.00	5.17
Week 6	0.83	1.16	0.00	6.22
Week 7	1.35	1.20	0.00	5.54
Week 8	0.70	1.12	0.00	6.20
Week 9	0.51	0.61	0.00	2.11

toward areas with higher shares of at-risk age groups.[11] On the basis of the advice and directives of the CDC, these results indicate that the political allocation was not consistent with the "public good."

A note of clarification is in order. The vast majority of specifications show that the degree of at-risk individuals within a state played no role in determining the pattern; however, during the first week of vaccine distribution, there appears to be evidence that states with a larger share of at-risk individuals received *fewer* units of vaccine. There are two important aspects to consider. First, that states with higher levels of at-risk individuals received fewer units of vaccine does not necessarily mean that any particular at-risk individual within any given state did not receive a unit of vaccine. States ultimately determined exactly how they distributed their allocated vaccine doses; nonetheless, the directive of the CDC implies that states with higher shares of at-risk individuals should receive more vaccine. They did not. Again, the vast majority of specifications dictate no statistical difference from zero when considering a state's at-risk population. Second, that states with higher levels of at-risk individuals received *less* vaccine during the initial first week distribution does not reveal a misguided desire by the CDC to deprive at-risk individuals access to units of vaccine. Instead, it sheds light upon the nature of competing interests. Given an abundance of vaccine units, all interested parties could be satisfied, be it at-risk

11. For robustness, Table 1c considers *only* the risk factors identified in the main specification as a determinant in vaccine allocation, and they carry no significance in these specifications.

TABLE 3
Swine Flu Vaccine Allocation, Pooled Analysis

	Dependent Variable: Total Doses of Swine Flu Vaccine Shipped per Week			
	(1)	(2)	(3)	(4)
House committee members				
Democrat	16355.2 (17662.7)	19738.2 (19141.6)	19669.6 (17699.1)	16319.6 (18119.9)
Republican	9247.4 (14181.5)	8893.6 (13646.3)	8697.9 (12387.6)	10705.4 (11007.1)
Senate committee members				
Democrat	738.6 (9513.9)	−898.8 (10119.0)	30.9 (9525.6)	2366.4 (10616.9)
Republican	3822.2 (9020.4)	3927.9 (11086.8)	4314.2 (10262.2)	5682.7 (12637.2)
Percentage of population under 24 years of age		−1499.7 (1985.5)	−1524.8 (1893.5)	−1729.4 (2387.0)
First responders		−193.1 (1185.7)	−405.6 (1267.0)	2234.3 (1924.8)
Weekly H1N1 mortality rate		−458.8 (1769.9)	−4536.8** (2148.0)	5280.4** (2164.0)
Borders Mexico		43987.6 (33234.4)	47264.8 (30393.4)	72754.9* (42059.1)
Population (thousands)	22.52*** (2.52)	21.24*** (2.59)	21.09*** (2.33)	21.39*** (2.35)
N	459	459	459	459
R^2	0.72	0.73	0.77	0.77

Notes: Robust standard errors in parentheses.
***Significant at 1%; **significant at 5%; *significant at 10% level.

groups, politically favored constituents, or any other group; nonetheless, scarcity of vaccine units was an issue for committee members to deal with, especially early in the allocation process. That politically connected states received more vaccine units than at-risk states sheds light on the relative importance of the two interests—clearly, politics won out over a sense of "need."

In addition to targeting at-risk age groups, the CDC advises directing more vaccine toward at-risk occupations. First responders and health-care industry workers with direct patient contact are the main focus. Table 5 provides an analysis of assorted measures of first responders by state. Similar to the findings with regard to at-risk age groups, there is no evidence to show that states with higher concentrations of first responders receive higher levels of vaccine. States with more nurses per capita and more medical doctors per capita receive fewer vaccine doses, though the results are statistically insignificant. Further, there is weak evidence to say that states with more medical activity—proxied by hospital beds per capita—receive less swine flu vaccine as well. Again, if directing vaccine toward larger concentrations of high-risk groups is done in pursuit of the "public good," there is no evidence that such an action took place.

Moreover, despite difficulties in capturing the "need" of vaccine due to the spread of swine flu, there is no evidence that the degree of influenza propagation played a role in the initial Week 1 allocation of swine flu vaccine. States deemed to have higher levels of influenza activity did not receive additional units of H1N1 vaccine. Furthermore, the mortality rate due to H1N1 infection also did not play any statistically significant role in determining the allocation of additional vaccine doses in any of the specifications. (The mortality rate is negative and significant at the 5% level in the final pooled specification; see Table 3, regression 4.) Insofar that providing a higher degree of protection from the H1N1 virus involves directing additional doses of vaccine toward areas with higher levels of influenza propagation, allocation patterns did not pursue the "public good."

Finally, proximity to Mexico, despite its role as a perceived threat to the health of American citizens, also played no role in the distribution pattern of H1N1 vaccine units. The

TABLE 4
Initial Distribution of Swine Flu Vaccine—Age Factors

	Dependent Variable: Total Doses of Swine Flu Vaccine Shipped						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Political factors							
House committee members							
Democrat	57441.7**	63356.7**	63759.7**	60454.4**	63061.7**	57509.8**	59989.1**
	(23820.4)	(25116.3)	(24765.1)	(24954.9)	(25306.3)	(23875.13)	(25484.2)
Republican	−16332.4	−14056.5	−14977.2	−16093.0	−14091.4	−14913.3	−16043.6
	(22123.7)	(21196.2)	(21499.0)	(22473.0)	(21221.4)	(21582.0)	(21948.3)
Senate committee members							
Democrat	−12761.1	−10738.9	−11003.9	9646.8	−9784.5	−10352.8	−8708.1
	(17610.0)	(16875.3)	(17042.0)	(17260.9)	(16854.8)	(16773.6)	(16920.4)
Republican	(20857.9)	(20844.9)	(20034.1)	(20751.6)	(20132.6)	(21123.7)	(23590.6)
	27465.8	30892.9	31135.9	28185.5	27297.4	28097.2	29493.4
CDC control factors							
Age factors							
Birth rate	−7662.6						
	(6397.5)						
Percentage of population under 24 years of age		−6585.0*					
		(3645.3)					
Percentage of population from 18 to 24 years of age			−20996.2*				
			(10935.4)				
Percentage of population from 14 to 17 years of age				−24439.0			
				(20198.5)			
Percentage of population from 5 to 13 years of age					−17554.9		
					(11650.7)		
Percentage of population under 5 years of age						−15107.5	
						(13210.0)	
Percentage of population over 65 years of age							4774.6
							(5331.7)
First responders	−2062.7	−2659.4	−943.0	−905.0	−3353.0	−2380.0	−12994
	(2744.9)	(2835.1)	(2663.1)	(2631.3)	(3258.0)	(3000.4)	(2651.9)
Prevalence of flu							
Weekly H1N1 mortality rate	6800.4	5879.2	4027.2	5385.9	7219.7	7478.4	5239.8
	(10211.0)	(10456.2)	(10703.3)	(10540.6)	(10516.5)	(10040.2)	(10734.7)
Widespread	−19196.8	−4715.9	−15618.9	601.6	21941.9	−19948.8	−8560.6
	(22546.5)	(21473.2)	(21530.2)	(21086.5)	(26913.3)	(24417.9)	(21645.5)
Regional	−36511.2	−17109.1	−33034.1	−3282.2	14767.5	−30482.6	−14321.2
	(33450.2)	(25250.8)	(27857.9)	(22453.2)	(28063.8)	(32324.9)	(25344.6)
Population (thousands)	10.05**	9.28**	9.04**	9.70**	9.28**	10.25**	9.86**
	(4.07)	(4.20)	(4.22)	(4.21)	(4.23)	(4.01)	(4.21)
N	51	51	51	51	51	51	51
R^2	0.83	0.83	0.83	0.83	0.83	0.83	0.83

Notes: Robust standard errors in parentheses.
***Significant at 1%; **significant at 5%; *significant at 10% level.

variable exhibits significance only in the final pooled specification of Table 3 and in Week 2 of Table 1a, and even then only at the 10% level.[12] Insofar that Mexico threatened the United States through the transmission of the H1N1 virus, vaccine units were not allocated accordingly.

12. An alternative form of the Mexico variable included not only states with a direct border with Mexico, but states that bordered states with a direct border with Mexico. The results of these specifications do not differ from those presented herein.

VI. CONCLUSION

The analysis presented here outlines the nature of the allocation process of the H1N1, or swine flu, vaccine. By highlighting the role of Congressional dominance in bureaucratic activity, the models isolate the particular impact of politically relevant committee members.

Vaccine allocation failed to address the "public good" on two primary margins. First, Democratic representatives generated an over 60,000-dose increase of swine flu vaccine per committee member during the initial distribution period;

TABLE 5
Initial Distribution of Swine Flu Vaccine—First Responders

	Dependent Variable: Total Doses of Swine Flu Vaccine Shipped			
	(8)	**(9)**	**(10)**	**(11)**
Political factors				
House committee members				
Democrat	63356.7**	63056.5**	63250.3**	62547.5**
	(25116.3)	(25022.6)	(25221.0)	(24761.7)
Republican	−14056.5	−13773.7	−15023.0	−12824.5
	(21196.2)	(21306.2)	(20677.7)	(21005.0)
Senate committee members				
Democrat	−10738.9	−11680.7	−8960.5	−21496.3
	(16875.3)	(16799.1)	(17856.9)	(18921.9)
Republican	30892.9	30381.9	32748.6	26563.3
	(20844.9)	(20705.2)	(21229.4)	(20897.5)
CDC control factors				
Percentage of population under 24 years of age	−6585.0*	−6402.8*	−6455.1*	−7028.1*
	(3645.3)	(3660.1)	(3586.8)	(3776.1)
First responders				
Nurses and doctors per capita	−2659.4			
	(2835.1)			
Nurses per capita		−3112.1		
		(3556.7)		
Doctors per capita			−7884.5	
			(10700.0)	
Beds per capita				−13500.0*
				(7697.8)
Prevalence of flu				
Weekly H1N1 mortality rate	5879.2	6456.4	5373.7	8699.7
	(10456.2)	(10498.4)	(10399.7)	(9977.1)
Widespread	−4715.9	3029.7	−16903.1	2633.9
	(21473.2)	(16083.2)	(40132.5)	(18690.1)
Regional	−17109.1	−11285.5	−25923.3	−24160.9
	(25250.8)	(20341.4)	(38204.6)	(24014.1)
Population (thousands)	9.28**	9.21**	9.63**	8.87**
	(4.20)	(4.23)	(4.01)	(4.20)
N	51	51	51	51
R^2	0.83	0.83	0.83	0.84

Notes: Robust standard errors in parentheses.
***Significant at 1%; **significant at 5%; *significant at 10% level.

this advantage grew to nearly 100,000 doses by the third week. In a world of political actors concerned only with public welfare at large, this result should not occur. Second, the states with larger shares of at-risk groups, such as all age cohorts below 24 years and first responders, did not receive more units of vaccine, and if anything actually received less. Distribution aimed at maximizing the "public good" would consider these factors when determining which areas get more doses. In addition, despite imperfect measures, the initial "need" for swine flu vaccine appeared not to play a role as well.

This analysis sheds light on the role of incentives within the political system. The current structure of the federal government places political actors with state and local level interests in a position in which they are to pursue welfare at the national level. Insofar that federal legislators continue to hold positions tasked with confronting issues at the national level while being subject to the preferences of lower-than-national constituencies, political distortions like those witnessed in the distribution of the H1N1 vaccine are likely to persist.

APPENDIX

TABLE A1

Evolution of Swine Flu Vaccine Allocation

	Dependent Variable: Total Doses of Swine Flu Vaccine Shipped per 1,000 residents								
	Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
House committee members									
Democrat	0.79	0.01	0.28	−1.07	1.29	−1.74	0.16	−1.30	1.22
	(0.50)	(0.46)	(0.61)	(0.69)	(1.19)	(1.28)	(1.68)	(2.17)	(2.70)
Republican	−3.29**	0.51	−0.57	1.03	−1.71	2.40	−0.75	3.68	1.26
	(1.42)	(1.50)	(2.26)	(3.04)	(4.11)	(4.09)	(0.56)	(6.22)	(6.91)
Senate committee members									
Democrat	−1.52	1.86	0.79	−1.38	2.19	2.27	5.98	13.91	3.57
	(2.43)	(2.69)	(3.70)	(5.15)	(6.85)	(6.71)	(9.19)	(9.63)	(10.30)
Republican	6.01**	3.14	−0.63	−5.21	3.07	−0.27	3.70	10.97	12.58**
	(2.25)	(1.93)	(4.06)	(5.58)	(5.61)	(4.92)	(7.11)	(6.74)	(7.13)
N	51	51	51	51	51	51	51	51	51
R^2	0.20	0.04	0.01	0.03	0.02	0.05	0.02	0.10	0.03

Notes: Robust standard errors in parentheses.
***Significant at 1% level; **significant at 5% level; *significant at 10% level (estimations weighted by population).

TABLE A2

Evolution of Swine Flu Vaccine Allocation

	Dependent Variable: Total Doses of Swine Flu Vaccine Shipped								
	Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
House committee members									
Democrat	26475.0*	35528.4*	70760.5***	42570.1	43491.4	17634.1	74659.8	29577.5	6830.7
	(15286.1)	(18907.3)	(20765.9)	(29179.2)	(41829.8)	(38777.9)	(46875.8)	(61447.5)	(60404.0)
Republican	110.8	49082.2	53478.8	63743.7	55041.8	107285.2	117551.6	179898.4	158110.1
	(15411.79)	(29564.1)	(37819.9)	(68263.5)	(86337.6)	(89592.2)	(113290.9)	(137212.3)	(143232.9)
Chair, House committee	329033.0***	223992.7	292772.0	173800.8	735030.5	428324.2	889209.8	927572.1	1025735.1
	(74144.7)	(150399.8)	(193784.4)	(346251.2)	(447173.3)	(456655.5)	(583318.7)	(708957.7)	(736750.1)
Senate committee members									
Democrat	2730.6	14929.1	8796.1	−4966.7	30853.6	27135.9	60460.1	115263.8	59492.4
	(14252.4)	(17138.2)	(23738.4)	(36920.4)	(49095.2)	(50506.4)	(66620.7)	(79292.2)	(78547.2)
Republican	(16546.3)	−891.0	−22964.3	−44017.3	−10952.4	−31947.8	−25015.1	1120.6	1120.4
		(10998.1)	(17229.8)	(27702.4)	(28679.4)	(27527.2)	(38194.8)	(44810.1)	(45633.7)
Chair, Senate Committee	−30205.0**	−4054.2	−59237.2***	−20630.8	−75510.1	21359.1	−91732.2	−37767.3	15686.1
	(14394.4)	(17031.4)	(17331.4)	(33036.4)	(48806.8)	(46568.3)	(61604.5)	(74108.5)	(69437.5)
Population (thousands)	8.71***	21.75***	33.02***	65.76***	89.46***	116.11***	125.60***	154.48***	195.36***
	(2.67)	(5.44)	(6.90)	(13.07)	(17.22)	(17.22)	(21.35)	(26.88)	(26.79)
N	51	51	51	51	51	51	51	51	51
R^2	0.87	0.96	0.96	0.96	0.97	0.98	0.98	0.97	0.98

Notes: Robust standard errors in parentheses.
***Significant at 1%; **significant at 5%; *significant at 10% level.

TABLE A3
Pairwise Correlations Between Political and Risk Factors

	House Committee Members		Senate Committee Members	
	Democrat	Republican	Democrat	Republican
Birth rate	−0.0096 (.9465)	0.0987 (.4906)	−0.2169 (.1263)	0.3151** (.0243)
Percentage of population under 5 years of age	0.1378 (.3351)	0.2518* (.0747)	−0.1789 (.2090)	0.3321** (.0173)
Percentage of population from 5 to 13 years of age	0.2035 (.1521)	0.1994 (.1606)	−0.0515 (.7194)	0.2982** (.0336)
Percentage of population from 14 to 17 years of age	0.1565 (.2728)	0.0335 (.8157)	−0.0381 (.7909)	0.2930** (.0369)
Percentage of population from 18 to 24 years of age	0.0196 (.8916)	0.0009 (.9949)	−0.0778 (.5875)	0.2893** (.0395)
Percentage of population under 24 years of age	0.1552 (.2768)	0.1680 (.2387)	−0.1101 (.4419)	0.3624*** (.0090)
Percentage of population over 65 years of age	−0.1851 (.1936)	−0.0969 (.4987)	0.0410 (.7752)	−0.3619*** (.0091)
Nurses per capita	−0.2037 (.1517)	−0.2031 (.1529)	0.0814 (.5700)	−0.2504* (.0764)
Doctors per capita	0.0750 (.6009)	−0.1540 (.2807)	0.1522 (.2862)	−0.2535* (.0727)
Nurses and Doctors per capita	−0.1114 (.4365)	−0.2025 (.1541)	0.1174 (.4120)	−0.2752* (.0507)
Hospital beds per capita	−0.2871** (.0410)	−0.0927 (.5175)	−0.2908** (.0384)	−0.0901 (.5294)
H1N1 mortality rate				
Week 1	−0.0003 (.9983)	0.2168 (.1264)	−0.2478* (.0796)	0.1880 (.1865)
Week 2	−0.0248 (.8627)	0.0167 (.9074)	0.0502 (.7265)	0.2749* (.0509)
Week 3	−0.2358* (.0958)	−0.0178 (.9011)	0.0312 (.8280)	0.0489 (.7334)
Week 4	−0.2179 (.1245)	−0.1317 (.3570)	−0.0194 (.8924)	0.1369 (.3380)
Week 5	−0.1628 (.2536)	−0.0802 (.5756)	0.0911 (.5248)	0.1250 (.3820)
Week 6	−0.1156 (.4192)	−0.0516 (.7194)	0.0835 (.5601)	0.1286 (.3684)
Week 7	−0.1922 (.1767)	−0.1835 (.1973)	0.2571* (.0685)	0.1343 (.3476)
Week 8	−0.0957 (.5039)	−0.1135 (.4278)	−0.1606 (.2602)	−0.1182 (.4086)
Week 9	−0.1453 (.3088)	−0.0975 (.4963)	0.3211** (.0216)	0.0166 (.9080)

Notes: p values in parentheses.

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