Abstract This study assesses the relationship between political partisanship and attitudes and behavior with respect to the H1N1 virus (swine flu) crisis of 2009 in general, and the U.S. mass vaccination program in particular. I argue that even seemingly nonpartisan political issues like public health are increasingly characterized by partisan polarization in public attitudes and that such polarization is attributable, at least partly, to the breakdown of the information commons that characterized the U.S. mass media from roughly the 1950s until the early 1990s. In its place has arisen an increasingly fragmented and niche-oriented media marketplace in which individuals are better able to limit their information exposure to attitudes and opinions that reinforce, rather than challenge, their preexisting beliefs. I test my argument against a variety of data sources, including opinion surveys and state-level swine flu vaccination rate data.

On September 30, 2009, as the U.S. federal government’s efforts to persuade Americans to vaccinate themselves and their families against the H1N1 virus (swine flu) were moving into high gear, conservative Fox News commentator Glenn Beck informed his roughly 3 million viewers that, with respect to the vaccine, “you don’t know if this is going to cause neurological damage like it did in the 1970s,” adding that he would do “the exact opposite” of what the federal government recommended and might even attend a swine flu party to deliberately infect himself before the virus could mutate (Maugh 2009). A week later, on October 7, conservative commentator Rush Limbaugh told his radio audience — estimated at around 20 million listeners per week (Boehlert 2009) — “I am not going
to take it [the H1N1 vaccine], precisely because you are now telling me I
must. . . . I don’t want to take your vaccine. I don’t get flu shots.”1 He added
that if “you have some idiot government official demanding, telling me I
must take this vaccine, I’ll never take it” (Maugh 2009).

Taking a different tack, two Republican U.S. House members—both
doctors—raised objections to the pandemic funding included in a defense
supplemental bill. Rep. Phil Gingrey (R-GA) commented, “We can’t let
all of our spending and our reaction be media-driven in responding to a
panic so that we don’t get Katrina-ed. . . . It’s important because what we
are talking about as we discuss the appropriateness of spending $2 billion
to produce a vaccine that may never be used—that is a very important
decision that our country has to make.” Rep. Paul Broun (R-GA) added,
“I don’t think we need to spend $1.5 billion on flu vaccine when . . . the
research shows that it’s not going to be very virulent. . . . We are stealing
our grandchildren’s future by borrowing and spending. . . . This hyste-
ria over the flu is driving the media, and it’s driving the administration,
driving the leadership here. We’ve got to stop that” (Thrush 2009). More
recently, Fox News business commentator David Asman expressed skepti-
cism about the safety of the swine flu vaccine and criticized the govern-
ment for having exaggerated the threat (Media Matters 2010).

Though much of the criticism of the H1N1 vaccine and the govern-
ment’s response to the virus’s emergence came from the right, such con-
cerns also appeared on the other end of the political spectrum. Notably,
left-leaning/libertarian talk show host Bill Maher tweeted that “people
who get flu shots are idiots” and commented, in an interview with former
Republican Senate majority leader and heart surgeon Bill Frist, “Why
would you let them [the government] be the ones to stick a disease into
your arm? I would never get a swine flu vaccine or any vaccine. I don’t
trust the government, especially with my health” (Parker-Pope 2009).

Perhaps not surprisingly, given the skepticism voiced by prominent pol-
iticians and commentators, combined with preexisting skepticism about
vaccination and immunization programs in general, many Americans—
roughly half according to an October 2009 Pew Project survey—indicated
that they did not plan to get the H1N1 vaccine. Such figures worried public
health officials who feared that the virus could unleash a potentially dev-
astating pandemic. A somewhat less well-known but potentially even more

1. Estimates of Limbaugh’s audience magnitude vary from 2 to 50 million listeners per week
(Boehlert 2009). The Pew Project for Excellence in Journalism rated his audience in spring
2009 at about 15 million (Pew Project 2009), compared with 14 million for Sean Hannity.
troubling pattern emerged in the same survey: Democrats were nearly 50 percent more likely than Republicans (60 vs. 41 percent) to indicate that they would take the vaccine (Schlesinger 2009a, 2009b).

What accounts for this stark partisan gap over a seemingly nonpartisan topic? And does it hold potentially broader public health implications? In assessing the first question, the most obvious proximate explanation is that Republican partisans were merely responding to trusted (i.e., conservative and Republican) opinion leaders, who voiced greater skepticism of the vaccine (and of the seriousness of the threat in general) than their Democratic counterparts, as the opening anecdotes suggest.

This, of course, begs the question of why Republican elites would be more skeptical than Democratic elites. Several potential explanations immediately come to mind. First, Republicans tend to be more skeptical than Democrats of proactive government intervention in public life. The Obama administration’s push to promote near-universal H1N1 vaccinations constituted a major government intervention in the private lives of citizens. Second, the messenger in this case—the Obama administration—was more credible, all else being equal, to Democrats than Republicans, simply by virtue of its partisan affiliation, while for the same reason skeptical Republican elites were more credible to Republican partisans. Third, greater Republican skepticism of international institutions, like the World Health Organization, further weakened the credibility of the provaccination message to Republicans, relative to Democrats, who tend to be more trusting of global institutions (Page and Bouton 2006; Holsti 2004; Baum and Nau 2009).

Finally, Republicans and Democrats increasingly expose themselves to distinct information streams via the new media. The streams favored by Republicans, such as the Fox News Channel on cable, as well as conservative talk radio and Internet sites, may have been more critical of the swine flu vaccination program—because of the first three explanations noted above—than their liberal analogs preferred by Democrats. Such a pattern could, in turn, shape vaccination patterns in ways that hold profound implications for public policy and public health.

In this article I assess the relationship between political partisanship and attitudes and behavior with respect to the swine flu crisis of 2009 in general and the U.S. mass vaccination program in particular. I argue that even seemingly nonpartisan political issues like public health are increasingly characterized by partisan polarization in public attitudes and that such polarization is partly attributable to the breakdown of the information commons that characterized the U.S. mass media from roughly the
1950s until the early 1990s. In its place has arisen an increasingly fragmented and niche-oriented media marketplace in which individuals are better able to limit their information exposure to attitudes and opinions that reinforce, rather than challenge, their preexisting beliefs.

**The Changing Media Marketplace**

The decline of the traditional news media since the early 1990s is well documented and widely reported (Baum and Kernell 1999, 2007; Hamilton 2003; Baum 2003). The combined ratings for the evening newscasts of the “big three” broadcast networks (ABC, CBS, and NBC) have fallen from about 52 million viewers in 1980 to 22.3 million in 2009 (Pew Project 2010). Indeed, according to a 2008 survey (Pew Research Center 2008), the percentage of Americans indicating that they regularly watch cable news now exceeds the percentage regularly watching network news (39 and 29 percent, respectively).

Not only has the overall audience for network news declined dramatically, but the demographics of network news viewers have also shifted starkly. Where the typical network news viewer was once comparable to the median television viewer (after all, the networks enjoyed an oligopoly from the 1950s to the 1980s), by 2008 the network audience was notably older (with a median age of 61.3 [Pew Project 2009]) and, according to the Pew Research Center (2008), composed of more than twice as many Democrats as Republicans (45 vs. 22 percent “regular” viewers).

The so-called new media, by which I refer primarily to cable news channels and the Internet but also to political talk radio, differ in important ways from their traditional media cousins. Most notably, nearly all such outlets self-consciously seek to appeal to relatively narrow, and hence more loyal, niches of the public. Rather than seek to be all things to all people — as the major networks did during their heyday — new media outlets try to provide a product that more closely fits the preferences of a particular subset of the public.

In news and politics, the primary dimension on which new media outlets have sought to differentiate themselves is ideology. Most notably, in 2010 there are prominent cable news channels aimed primarily at liberals (MSNBC), conservatives (Fox), and moderates (CNN). Similarly, on the Internet, the political blogosphere is dominated by ideologically narrow Web sites like HuffingtonPost.com on the left and MichelleMalkin.com on the right. Political talk radio, in turn, is dominated by conservative voices like those of Beck, Sean Hannity, and Limbaugh, though there
are some liberal niches, such as a program hosted by MSNBC analyst Ed Schultz. As the range of options available to consumers seeking political information has expanded, making available media environments that closely match their personal political preferences, audiences have increasingly availed themselves of the opportunity to self-select into ideologically friendly political news environments.

Cable News

Figure 1 shows the trend, from 2000 to 2009, in the partisan makeup of audiences for CNN, Fox, and MSNBC. These data are derived from pooled national surveys conducted by a market research firm (Scarborough), representing over 100,000 interviews for each period included in the graphic (Kernell and Rice 2010; Feltus 2009).

The curves in figure 1 indicate that in 2000 the audiences for all three networks consisted of fairly similar proportions of Democrats and Republicans. The partisan gaps for viewers of CNN, Fox, and MSNBC were 4, 8, and 2 percentage points, respectively. By 2009 these gaps had expanded...
dramatically to 30, 20, and 27 points, respectively. While it is certainly the case that some partisan overlap remains (Feltus 2009; Prior 2007; Kernell and Rice 2010; Gentzkow and Shapiro 2010), these data clearly suggest a fairly strong tendency toward partisan filtering on cable news.2

Internet

If niche programming has emerged as an important competitive strategy for television news, it is arguably the most consequential such strategy on the Internet. Research (Hindman 2007) has shown that a stunningly small number of political news-oriented outlets dominate news and public affairs traffic on the Web. While some of the most heavily trafficked sites—such as CNN.com, MSNBC.com, and Yahoo News—remain predominantly audience aggregators rather than disaggregators—and collectively make up 27 percent of the top news sites (Pew Project 2009)—the political blogosphere functions primarily as an arena for partisan and ideological self-selection.

There are a variety of well-documented digital divides online, including by age, gender, race, and socioeconomic status. Some—particularly gender and race—have receded somewhat in recent years. In each case, the net effect is that some Americans are systematically more likely than others to rely on the Internet for political news. Many of these divides are exogenous to the preferences and policies of individual Internet outlets. However, political ideology remains a key proactive filter that political news Web sites in general, and blogs in particular, frequently employ in seeking to build a loyal niche audience.

Along these lines, Baum and Groeling (2008, 2010) report that left-leaning political blogs, such as DailyKos.com, are disproportionately likely to cover news that favors Democrats over Republicans, while right-leaning blogs, such as FreeRepublic.com, are disproportionately likely to feature news favorable to Republicans. Perhaps not surprisingly, given the ideological and partisan slant on political blogs, users of these sites are, on average, more likely than typical Americans to prefer news that reinforces their preexisting preferences, more likely to discuss political news with family and friends (Baum and Groeling 2008), and, as shown in figure 2, more ideologically extreme.

Not surprisingly, the audiences for such outlets are highly skewed based on party affiliation. For instance, according to an April 2007 Nielsen report

2. For additional data on partisan filtering of cable news audiences, see Baum 2011.
While the audience for political news on the Internet does not yet match that for television news (Baum and Groeling 2008), it is growing rapidly and is by no means trivial. For instance, according to an October 2008 comScore.com press release (2008), in September 2008 the total number

3. Along these lines, Baum and Groeling (2008) report evidence that some ideological news blogs cover the “other side” primarily to set the stage for making their own political argument, in effect using “opposition” political blogs as straw men. It seems likely that at least some politically sophisticated Internet news consumers are similarly motivated when “crossing over” to ideologically hostile news sources.
of unique visitors to the top fifteen political blog sites was approximately 190 million. This represents about a 4 percent increase over the prior year. According to Pew Research Center data, in turn, 41 percent of respondents in 2010 identified the Internet as their primary source of news, compared with 66 percent who identified television. This represents the smallest television advantage ever recorded in Pew Research Center surveys. According to the same data, among Americans under age thirty, the Internet is now the predominant source of news, beating out television by 13 percentage points (65 to 52 percent) (Pew Research Center 2011).

Political Talk Radio

In one sense, political talk radio is anything but new. Indeed, the tradition of populist radio dates back to Father Charles Coughlin who, during the Great Depression, railed against everything from President Franklin Roosevelt and the New Deal to racial and ethnic minorities and the influence of Jews. Hence it is something of an awkward fit in the category of new media. That said, talk radio in many respects predates other forms of media in targeting niche audiences in general, and political niche audiences in particular. Hence it warrants at least a brief mention here.

According to Pew’s stateofthemedia.org Web site, twelve of the fifteen most popular talk radio hosts in fall 2009 were conservative, and none were liberal. Indeed, MSNBC’s Schultz, the most popular liberal talk show host, attracted roughly 2.5 million listeners per day in 2009, down from 3 million in 2008. This represents roughly one-sixth of the audience magnitude of Limbaugh or Hannity. This suggests that despite prominent liberal attempts to crack into the medium—most notably by the Air America Radio Network, which declared bankruptcy and ceased broadcasting in 2010—political talk radio remains largely a medium for conservative populism in the tradition of Father Coughlin.

Back to the Future?

Though in some ways unique, the current period is by no means the first time in American politics that partisan media have played an important role in public policy debates. Rather, viewed in a broader context, overwhelmingly nonpartisan journalism, as it existed in roughly the first four decades following World War II, appears to have been a historical anomaly.

To better understand the implications of our increasingly polarized information environment, it is helpful to consider the partisan press of
the nineteenth and early twentieth centuries. In that era, citizens who wanted an accurate picture of the political landscape could read multiple newspapers with differing partisan loyalties in order to triangulate on the “truth” (Schudson 1981; Baum and Groeling 2010). Such a strategy could offset to some extent any potentially harmful effects of partisan-oriented media. Yet the question remains as to whether typical citizens in the contemporary period, faced with far more varied alternatives, are likely to embrace a triangulation approach to news consumption. The present differs from the past in numerous important respects, not least of which is the explosion in the twenty-first century of entertainment mass media and other competitors for scarce public attention.

While it may be the case that politically attentive Americans in the twenty-first century are proportionately similar in number to their counterparts in prior news eras, a far larger portion of the contemporary population enjoys and exercises the franchise than was the case in the nineteenth century. Moreover, the ability of party organizations to reliably direct the voting of their members has declined with the death of party machines and the waning influence of state party bosses. Consequently, the breadth of consensus necessary to forge a bipartisan accord is far greater in the twenty-first century, and modern communication and polling technologies allow nervous politicians to sense precisely when that consensus is eroding. Of course, gaining consent first requires capturing public attention, and even politically attentive citizens are unlikely to be able to attend to all the competing messages in the modern media environment.

Not only is it possible to consume nearly limitless political news from virtually any ideological perspective, it is also possible to consume equally limitless entertainment media, while rarely if ever encountering politics (Prior 2007). This raises the opportunity costs for typical consumers of seeking out alternative political perspectives. Survey evidence suggests that substantial portions of the public also appear to lack the motivation to do so. Not surprisingly, these same data indicate that as the strength of an individual’s political ideology increases, so too does that individual’s preference for news that reinforces his or her preexisting beliefs (recall fig. 2) (Baum and Groeling 2010).

If the new media environment is characterized more by reinforcement

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4. For example, in their famous “Middletown” study of what they regarded as a typical American city in the 1920s, Robert and Helen Lynd (1929, 471) found that “the local morning paper distributes 8,851 copies to the 9,200 homes of the city, and the afternoon paper 6,715, plus at least half of an additional 785 sold on the street and news-stand. In addition, the circulation of out-of-town-papers . . . now totals 1200 to 1500 a day.”
seeking than by triangulation, forging and sustaining bipartisan consensus around even seemingly nonpartisan issues such as flu vaccination programs will likely prove a daunting and perhaps all but insurmountable task for future leaders. Evidence of this dilemma emerges in public reactions to the 2003 U.S. invasion and subsequent occupation of Iraq, a conflict that produced the greatest partisan divide ever recorded in scientific polling, both in terms of support for a U.S. military conflict and in terms of overall presidential approval (Jacobson 2006). Scholars (e.g., Kull, Ramsay, and Lewis 2003; Della Vigna and Kaplan 2003; Jacobson 2007) continue to debate the media’s role in sharpening, if not altogether producing, the partisan gulf in evaluations of the president and the Iraq War. Jacobson (2007), for instance, speculates that a combination of differences in content and partisan self-selection into friendly news environments—such as Fox for Republicans and conservatives; PBS, MSNBC, and CNN for Democrats and liberals; and network news for independents and moderates—may have contributed to partisan differences in perceptions of the war and the president leading it.

As the prior discussion attests, self-selection, a concept dating back to Campbell and colleagues’ (1960) theory of minimalism, may well be sharpening partisan polarization, and this phenomenon seems likely to expand in the future. However, there exists a second, perhaps complementary, culprit: ideologically driven credibility assessments. In other words, contemporary citizens possess, arguably to a greater extent than their predecessors, the means to engage in a multipronged dissonance-avoidance strategy. Selective exposure, or avoiding dissonant information altogether, presumably represents the first such prong. However, even when this first defense mechanism fails and individuals are exposed to ideologically hostile news, they increasingly possess the means—by assigning ideological reputations to individual sources and media outlets—to discount it systematically. In other words, consumers appear also to selectively accept or reject information to which they are exposed based on its perceived credibility (Baum and Groeling 2010). Credibility assessments in turn depend on the perceived ideological leaning of the outlet presenting the information, as well as on the content of the information itself (e.g., its perceived costliness to the speaker). The combined influence of selective exposure and acceptance appears, at least in the cases of Iraq and overall assessments of President George W. Bush’s job performance, to have contributed substantially to then historically unprecedented levels of partisan polarization during Bush’s second term and more recently in President Barack Obama’s second year in office. This leads consumers toward what I term
self-segregated information streams (SSIS). This, in turn, contributes to
the progressive erosion of what might be thought of as the informational
commons, that is, the common civic (virtual) space, occupied for roughly
four decades by network television nightly newscasts, where a broad cross-
section of Americans gathered to learn about the day’s events.

Figures 3 and 4 summarize this process, contrasting the attitudinal
effects of traditional (fig. 3) versus partisan (fig. 4) media. Figure 3 repre-
sents the hypothetical attitudinal effects of a common information stream,
in which opposing partisans expose themselves to similar information
about politics. The y-axis represents the attitude location for a given group
at a given point in time. Prior to a policy debate in the media, conservatives
and Republicans are located on this particular attitude dimension at the top
point above “Predebate Public Attitudes” on the x-axis, while liberals and
Democrats are located at the corresponding bottom point. This represents
a relatively large partisan gap, represented by the distance between the
two points on the y-axis. Both groups then expose themselves to a policy
debate on the issue in question via the traditional media (represented by
Figure 4  Effects of Self-Segregated Information Streams on Partisan Attitude Polarization

The diamond shape in the center of the graphic, which is wider toward the center, indicating that the bulk of news content clusters toward the ideological center of the spectrum). This represents a common information stream. The result is that conservatives and Republicans move downward, toward the “Neutral/Centrist” point along the y-axis, while liberals and Democrats move upward, toward the same point. Note that the partisan gap here is somewhat smaller. The net effect is that exposure to a common information stream narrows the partisan divide, all else being equal.

The pattern is quite different in figure 4, which represents an environment characterized by SSIS, with liberals and Democrats consuming liberal media while conservatives and Republicans consume conservative media. Exposure to these distinct media (represented by the two smaller diamond shapes) produces the mirror opposite effect, progressively moving the two groups away from rather than toward each other. Note that the partisan attitude gap here grows wider as we move from the pre-policy debate (in the media) period to the post-policy debate period.

The patterns depicted in these hypothetical scenarios are intended
to illustrate that while partisan self-segregating into ideologically consonant information environments does not create ideological attitudinal divides—note that the two groups are divided to some illustrative degree at the outset in both graphics—they can accentuate (as in figure 4), rather than mitigate (as in figure 3), such divides. But to what extent do the patterns identified herein, and resulting SSIS, shape public perceptions of, and responses to, the 2009 swine flu pandemic and subsequent vaccination program? It is to this question that I now turn.

**Partisan Polarization and the Flu**

When news of the H1N1 virus first hit the U.S. media, Americans across the political spectrum focused intensely on the issue. As shown in figure 5, in the first Pew Center News Interest Index survey to include a question on swine flu—conducted in late April 2009—91 percent of Republicans, 89 percent of Democrats, and 87 percent of independents indicated that they were following the issue “very” or “fairly” closely (Pew Research Center 2009a). These data suggest that at least initially there was no partisan gap in attention to the swine flu story.

This near-universal interest rapidly dissolved; within a week, a sec-
ond Pew survey found Democrats 12 percentage points more likely than Republicans to report following the flu story very or fairly closely, a gap that recurred in thirteen of fifteen Pew Center surveys that included the question between May and December 2009. The gap peaked at 18 percentage points in November 2009. In that same survey, Republicans were nearly 2.5 times more likely (49 vs. 21 percent) to believe that news reports were overstating the danger of swine flu (Pew Research Center 2009b). This partisan gap further expands—from 28 to 34 percentage points (39 vs. 5 percent)—when we limit the sample to respondents who indicated that they were following the swine flu story very closely.

Returning to the October survey cited at the outset of this article, which found Democrats far more likely than Republicans to indicate that they would get the H1N1 vaccine if available, nearly twice as many Democrats as Republicans (82 vs. 49 percent) expressed confidence in the government’s ability to deal with swine flu. Moreover, nearly twice as many Republicans as Democrats (18 vs. 10 percent) indicated (in an open-ended question) that they would not get the vaccine because it was too risky or inadequately tested. Among Republicans who report following the swine flu issue more closely than any of the other issues in the news included in the survey, the percentage indicating that they would not get the flu vaccine because it was too risky swells to 26 percent. The corresponding percentage among Democrats varies hardly at all as attention to the swine flu issue rises.

Interestingly, these percentages far exceed the roughly 4 and 5 percent of Republicans and Democrats, respectively, who indicated that they would not get the vaccine because the swine flu risk had been exaggerated. These percentages remain nearly constant for Democrats or Republicans regardless of their level of attention to the issue. This latter justification seems on its face more clearly attributable to a general distrust of the government, which, as noted, was far more prevalent among Republicans, presumably because of the presence of a polarizing Democrat in the White House combined with generally lower levels of faith in government among Republicans.

That said, in a May 2009 Gallup poll, the correlations between approval of President Obama’s job performance and expressing an intent to get the H1N1 vaccine when available, on the one hand, and believing the media were exaggerating the danger associated with swine flu, on the other, were only about 0.10 and –0.02, respectively, among Republicans (compared with 0.01 and –0.06, respectively, among Democrats) (USA Today/Gallup Poll 2009). The correlations among Republicans change only modestly
when we limit the sample to self-described conservative Republicans (0.09 and 0.03, respectively). This suggests that while general Republican or conservative distrust of government, or of a Democratic president, almost certainly accounts for part of these differences, it is insufficient to fully account for them.

Why then would those respondents most attentive to the swine flu story be most likely to diverge in their opinions about it, with nearly all highly attentive Democrats believing the story was either being covered appropriately or that the media were understating the danger, while nearly 40 percent of attentive Republicans held the opposing view? Why, in turn, were Republicans less trusting of the government’s capacity to deal with the flu epidemic and more likely to worry that the vaccine itself was dangerous, especially if they were paying close attention to the issue, while variations in attentiveness had almost no effect on Democrats? In the next section, I argue that the explanation lies, at least partly, in the different information streams to which Republicans and Democrats exposed themselves and from which they received starkly varying messages—both in terms of quantity and valence—on swine flu in general and the vaccination program in particular.

**News Consumption and Attitudes toward Swine Flu**

Having established that Democrats and Republicans differ substantially in their attitudes about swine flu, the question becomes whether and to what extent differences in media consumption among partisans (SSIS) account for these differences. To investigate this question, I turn to a series of public opinion polls. Each survey I investigate has limitations as a vehicle for testing my argument. Indeed, I have been unable to identify any surveys asking respondents in detail their sources of news about and attitudes toward swine flu and the vaccine, as well as their partisanship and ideology. However, several surveys include basic questions on attitudes toward H1N1 or the vaccine as well as on general categories of news sources about the flu (e.g., cable, Internet, national TV), while one survey includes somewhat more specific questions about news consumption and swine flu, as well as a question about attentiveness to the issue. Combined, these data allow some suggestive, albeit admittedly not definitive, tests of the SSIS hypothesis, which holds that the different information streams preferred by Democrats and Republicans in the new media help account for the partisan gap in attitudes toward the pandemic.
The subsequent investigations test both my SSIS hypothesis as well as what I consider the most plausible alternative explanation for the patterns I find. The core difference between the two explanations is that they derive from distinct causal assumptions. The SSIS hypothesis assumes an external causal pathway. That is, it holds that, whatever individuals might “bring to the table” (e.g., their party or ideology), exposure to new information, via the media, can interact with those prior preferences and influence their opinions. In short, information exposure drives attitudes.

Conversely, the alternative causal logic holds that it is the ex ante internal characteristics of individuals (in this case particularly their party and ideology) that guide them to particular media outlets, and that differences in expressed attitudes across consumers of different media outlets thus derive not from the information streams to which they are exposed via those outlets but from differences in the types of individuals who are choosing to expose themselves to such streams. So, according to this logic, attitudes drive information exposure. While the SSIS hypothesis, as depicted in figures 3 and 4, presumes that ex ante beliefs influence initial decisions regarding media outlet exposure, it holds that such exposure has a subsequent ex post facto influence on attitudes. The internal characteristics alternative de-emphasizes the ex post facto part of the process depicted in figures 3 and 4.

The May 2009 Pew Center survey affords an opportunity to investigate both causal logics, to varying degrees. It asked respondents how worried they were that they or a family member would be exposed to the flu. Responses ranged from “not worried at all” to “very worried.” The survey also asked about respondents’ primary sources of news about swine flu. Following the SSIS hypothesis, I anticipate greater partisan polarization in worry over the flu among new media consumers—who can relatively easily self-select into ideologically friendly media environments—than among consumers of traditional news sources, where all viewers are exposed to more similar information streams.

To test this hypothesis, I divided the media outlets included in the question into two categories, with cable TV, Internet, and radio counted as “new media” and local TV news, national network TV news, morning TV news shows, and newspapers counted as traditional news sources. I then compare the extent of “worry” about the flu among new versus traditional media-consuming partisans (Democrats vs. Republicans). I summarize the results of a series of $t$-tests derived from this survey in the top section of table 1.

An initial $t$-test indicates that there is no statistically significant differ-
Table 1  T-tests of Effects of Media Outlet Exposure on Attitudes toward Swine Flu

May 2009 Pew Center Survey

<table>
<thead>
<tr>
<th></th>
<th>Democrats/ Liberals</th>
<th>Republicans/ Conservatives</th>
<th>Difference</th>
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<tr>
<td>Percent “very or somewhat” worried about H1N1</td>
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<tr>
<td>Traditional media</td>
<td>0.39</td>
<td>0.38</td>
<td>Insig</td>
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<tr>
<td>New media</td>
<td>0.40</td>
<td>0.29</td>
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<td>New media (no radio)</td>
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<td>0.28</td>
<td>0.13*</td>
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<tr>
<td>Percent believing media offering “too much” versus “too little” coverage of H1N1</td>
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<tr>
<td>Traditional media</td>
<td>0.27</td>
<td>0.40</td>
<td>0.13*</td>
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<tr>
<td>New media</td>
<td>0.37</td>
<td>0.61</td>
<td>0.24***</td>
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<tr>
<td>Percent rating quality of news coverage of H1N1 positively</td>
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<tr>
<td>Traditional media</td>
<td>0.83</td>
<td>0.61</td>
<td>0.22</td>
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<tr>
<td>New media</td>
<td>0.77</td>
<td>0.48</td>
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<td>Gap in percentage “very or somewhat” worried about H1N1, traditional versus new media, as rating of news coverage varies</td>
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<td>Positive media rating gap</td>
<td>Insig</td>
<td>0.06 (Insig)</td>
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<tr>
<td>Negative media rating gap</td>
<td>Insig</td>
<td>0.21**</td>
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<td>Difference in attention to partisan and nonpartisan news stories as H1N1 news sources vary from traditional to new media</td>
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<tr>
<td>Partisan issue gap</td>
<td>Insig</td>
<td>0.16 (~Insig)</td>
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<td>Nonpartisan issue gap</td>
<td>Insig</td>
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May/June 2009 Pew Global Values Survey

Partisan gap (Dems-Reps) in percent “very or somewhat” worried about H1N1 (excluding strong partisans)

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<thead>
<tr>
<th></th>
<th>Democrats/ Liberals</th>
<th>Republicans/ Conservatives</th>
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<tbody>
<tr>
<td>Internet news consumers</td>
<td>0.39*</td>
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<tr>
<td>TV news consumers</td>
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<td>Newspaper/magazine consumers</td>
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October 2009 Pew Center Survey

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<th>Liberal Democrats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent naming swine flu as news story followed most closely in prior week as regular news sources vary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fox News</td>
<td>–0.22**</td>
<td>–0.03 (Insig)</td>
</tr>
<tr>
<td>Network news</td>
<td>+0.10^</td>
<td>+0.24*</td>
</tr>
<tr>
<td>CNN</td>
<td>–0.12^</td>
<td>0.00 (Insig)</td>
</tr>
<tr>
<td>MSNBC</td>
<td>–0.01 (Insig)</td>
<td>+0.09 (Insig)p</td>
</tr>
<tr>
<td>Local TV news</td>
<td>–0.01 (Insig)</td>
<td>+0.18*</td>
</tr>
<tr>
<td>Radio news</td>
<td>–0.07 (Insig)</td>
<td>–0.08 (Insig)</td>
</tr>
<tr>
<td>Internet</td>
<td>–0.07 (Insig)</td>
<td>–0.01 (Insig)</td>
</tr>
</tbody>
</table>

Source: Author’s data and Pew 2009b, 2009c

Notes:
*aSample limited to “very conservative” Republicans
*bSample limited to “very liberal” Democrats
*p<0.05; **p<0.01; ***p<0.001; ^p<0.10
ence in the likelihood that Democrats or Republicans who rely primarily on *traditional* news sources will be “very” or “somewhat” worried about the flu. Conversely, among respondents who indicated that they relied primarily on *new* media sources, Democrats were 11 percentage points more likely than Republicans to express worry over swine flu (0.40 vs. 0.29). This partisan gap is statistically significant at $p < 0.02$. If we exclude radio from the new media category, which is then limited to cable and the Internet, the gap expands to 13 percentage points (0.41 vs. 0.28, $p < 0.02$). Given the aforementioned greater skepticism among Republican media and political elites, this is precisely the pattern the SSIS hypothesis would anticipate.

Two additional sets of *t*-tests, also summarized in the top section of table 1, offer further evidence that media consumption is linked to attitudes toward the dangers of swine flu and hence support the *external* causal pathway (i.e., that information exposure influences attitudes). The first compares whether Democrats and Republicans who *do* or *do not* report relying on new media sources for news about the flu believe the media are offering too much versus too little swine flu–related news. The prediction that follows from the SSIS hypothesis is that new media–consuming Republicans would be more likely than their Democratic counterparts to believe the media were offering too much coverage. I would not anticipate comparable differences across traditional news–oriented partisans.

The results indicate that among traditional news–oriented respondents, Democrats were 13 percentage points less likely than Republicans (0.27 vs. 0.40, $p < 0.03$) to believe the media were offering too much swine flu news. The partisan gap is far larger (24 percentage points) among new media consumers (0.37 vs. 0.61, $p < 0.001$). The results are comparable when we substitute a question asking respondents how they would rate the quality of news coverage of swine flu, with Republicans again being significantly more likely than Democrats to rate press coverage poorly, particularly if they relied on new media sources for news about the pandemic. Fully 83 and 77 percent of Democratic traditional and new media–reliant consumers, respectively, rated press coverage positively, compared with only 61 and 48 percent of Republicans. The difference between new and traditional news consumers is insignificant among Democrats, while among Republicans the gap is statistically significant at $p < 0.03$.

The results thus far suggest that Republican new media consumers are more skeptical of news coverage of swine flu than their traditional news–consuming counterparts, while Democrats predictably vary less
with their media consumption preferences. Such attitudes about the quality of media coverage of swine flu, in turn, influence the extent of respondents’ concern about it. For instance, among Republicans who rate press coverage of the flu positively, there is no significant difference in concern over the flu between those who report relying on traditional versus new media sources for flu-related information (0.34 vs. 0.40). However, among Republicans who rate press coverage of the flu negatively, a large (21 percentage point, \( p < 0.01 \)) gap emerges between those who report relying on new versus traditional media sources for flu-related news, with new media consumers reporting far lower levels of concern about the flu. Nearly all of that gap, in turn, results from a 23-percentage-point drop among new media–reliant consumers as they move from positive to negative attitudes toward the quality of press coverage of the flu story.

In sharp contrast, no significant gaps emerge among Democrats. This, again, seems likely attributable to the propensity of Democrats to seek out news sources via news media that are relatively sympathetic to the administration’s representation of the swine flu pandemic as a major emergency. Moreover, traditional news sources (like network newscasts) are, all else being equal, highly likely to highlight the administration’s perspective in a crisis, because of its status as the most authoritative information source, especially early in the crisis, as was the case at the time of this survey (Baum and Groeling 2008, 2010).

Finally, it is worth noting that among both groups of partisans who rate press coverage positively, relying on new media sources for flu news is associated with higher levels of concern about swine flu, while among those who rate coverage poorly, reliance on new media sources is associated with lower levels of concern (though these latter differences are not statistically significant and hence must be interpreted with caution).

These results suggest that when given the opportunity to self-select into ideologically “friendly” media environments—as is far more likely in the new than in the traditional media—partisans diverge fairly starkly in their attitudes toward the pandemic. However, when confronted with a common information stream—as in the traditional news media—they respond by converging in their attitudes, regardless of partisanship. Moreover, the fact that attitudes toward press coverage of the swine flu story appear closely correlated with news source selection, which in turn appears closely related to concern over the flu—with each relationship heavily mediated by party affiliation—represents further suggestive evidence in favor of the SSIS hypothesis.
Unfortunately, data limitations in this survey make it impossible to rule out the alternative, *internal* causal pathway (i.e., that attitudes drive information exposure). Recall that this represents the possibility that differences in the internal characteristics—such as ideological extremeness—of Republicans or Democrats who view new media versus traditional news may account for these patterns. If so, information exposure would be essentially epiphenomenal; individuals predisposed to be concerned about swine flu and accepting of the vaccine (perhaps disproportionately liberal Democrats) would seek out media outlets that would tend to reinforce their concerns, while those predisposed to *not* be overly concerned about swine flu and be skeptical of the vaccine (perhaps disproportionately conservative Republicans) would seek out media outlets that would tend to reinforce their relative disinterest and skepticism. To some extent, this causal pathway is surely part of the story. After all, as I have shown (recall fig. 2; see also Baum and Groeling 2010, Baum 2011), strength of ideology is positively associated with preferring news that reinforces one’s preexisting beliefs. So it is doubtless the case that stronger partisans are more prone to self-select into ideologically friendly information environments than are weaker partisans, which in turn seems likely to steer them toward new media outlets that tend to be more amenable to such self-selection. That said, for my purposes the key question is whether the *internal characteristics* of consumers, rather than the *information to which they are exposed* in a given media outlet, can largely or fully account for the observed attitudinal differences between new- versus traditional-news-consuming partisans. It is to this question that I now turn.

To begin my comparison of the explanatory power of the SSID hypothesis as compared with the alternative, *internal* causal pathway, it is worth noting that these results do not appear to derive from differences in overall interest in or attention to the flu across new media versus traditional news consumers. There is no statistically significant difference in the likelihood of having followed the swine flu story most closely among the six major news items included in the survey for either Democrats or Republicans who reported relying primarily on new media versus traditional news sources for flu-related news.

If it is the case that respondents who prefer new media sources for news about swine flu do *so because* they are, on average, more partisan or more ideologically extreme (i.e., because of differences in their *internal characteristics*)—with new media—oriented Republicans being more conservative and new media—oriented Democrats more liberal than their
traditional news—consuming counterparts—then such a preference might also predict similar differences in attention to other news stories, particularly those with clear partisan implications. I thus conducted a series of tests to determine whether the *ex ante* internal characteristics of respondents, rather than the information to which they were exposed in a given media outlet, were driving the differences in attitudes toward swine flu across partisans. The first *t*-test compares two nonovertly partisan news issues (the financial problems of the U.S. auto industry and the state of the economy), while the second employs two more directly partisan issues (President Obama’s first one hundred days in office and Senator Arlen Specter’s switch from the Republican to the Democratic Party). For the less-partisan issues, I found, as expected, comparably small and insignificant differences for both parties. That is, preferring new over traditional media sources for news about swine flu does not predict differences in attention to the financial woes of the American auto industry or the economy, regardless of party.

For the more overtly partisan issues, Republican new media consumers reported having followed the stories 6 percent more closely (2.76 vs. 2.60 on a 1–4 scale), on average, than their traditional news—viewing counterparts. This gap, though nearly significant, is substantively small. This, in combination with the fact that virtually no gap at all emerged among Democrats, suggests that a preference for new media sources for swine flu news—here employed as a possible indicator of *ex ante* strength of partisanship or ideology—does not appear clearly associated with the decision to consume new versus traditional news media. This suggests that while we cannot rule out the possibility that media outlet choice to some extent *reflects* rather than *causes* attitudes toward swine flu, it is unlikely that this *internally based* causal relationship can fully account for the observed partisan gaps. Rather, this initial evidence suggests that exposure to media content does influence the attitudes of consumers, independent of, or in addition to, the ideological or partisan propensities that such consumers “bring to the table” when they opt in to a given information stream (via a particular media outlet).

Somewhat more direct evidence in this regard—that is, in support of the SSIS hypothesis and counter to the alternative *internal* causal pathway—is available from a May–June 2009 Pew Global Values Survey, which included several questions with clear ideological implications, along with questions about swine flu and news sources (Princeton Survey Research Associates 2009). In this instance, the survey asked whether respondents’
primary source of national or international news was television, radio, Internet, newspapers, or magazines. Because television is not divided into cable versus broadcast, while the radio category is obviously not necessarily limited to political talk radio, the status of these outlets as new versus traditional media is ambiguous. However, I find substantively tiny and statistically insignificant differences in the self-reported ideological extremeness of respondents who rely on television, radio, or the Internet for national or international news. The results from my investigations of this survey appear in the middle section of table 1.

To begin with, a t-test on the extent to which respondents indicate they are worried that either they or a family member will be exposed to swine flu finds that Democrats who primarily rely on the Internet or TV for national or international news are significantly more worried than their Republican counterparts, even when I exclude strong ideologues (i.e., respondents describing themselves as “very conservative” or “very liberal” and hence most likely to self-select into ideologically consistent media environments). Excluding strong partisans in effect controls for the alternative internal causal pathway, as it is among these respondents that the alternative internal logic is most likely to apply. (The alternative, which I employ in a subsequent analysis below, is to limit the analysis to strong partisans or ideologues only, thereby mitigating the extent to which internal characteristics—at least ideology or partisanship—could account for variations in attitudes.)

The partisan gaps, with strong ideologues excluded, are 0.39 (p < 0.02) and 0.32 (p < 0.001) points on the 1–4 scale, or 0.35 and 0.29 standard deviations for Internet and TV news consumers, respectively. The corresponding partisan gap for respondents who indicated that they rely primarily on newspapers or magazines (more traditional news sources with less opportunity for ideologically based self-selection) for their news was far smaller (0.14, or 0.13 standard deviations) and statistically insignificant, again with strong ideologues excluded. Once again, these results suggest

5. This is based on a question asking respondents about their political ideology, recoded to a 0–3 scale, where 0 = moderate or “don’t know,” 1 = liberal or conservative, and 2 = very liberal or very conservative.

6. Response options were as follows: 3 = very worried, 2 = somewhat worried, 1 = not too worried, or 0 = not at all worried. Those who indicated they were “exposed already” were excluded, while “don’t know” responses were recoded to the center of the scale (1.5).

7. Too few respondents identified radio as their primary news source to include it as a separate new media category. For the same reason I combine newspaper- and magazine-oriented respondents, though the results are similar if I isolate the newspaper category (too few respondents chose magazines to allow a separate t-test of that category).
that \textit{ex ante} ideological preferences cannot fully account for differences in attitudes across or among partisans exposed to different media outlets.

As a robustness test, I replicated this investigation with ideologues included. The results differ only modestly. Similar patterns emerged in additional robustness checks excluding respondents who indicated in a separate question that they had either “no confidence at all” (in one test) or “a lot of confidence” (in a second test) that President Obama would “do the right thing regarding world affairs,” or excluding respondents who indicated, in still another question, that they did not approve of President Obama’s international policies.\textsuperscript{8} This suggests that while \textit{ex ante} ideological extremeness or attitudes toward President Obama, and the effects of those attitudes on media outlet choice, almost certainly influence the observed partisan gaps, they cannot, by themselves, fully account for them. Once again, the evidence suggests that the information to which respondents expose themselves in these various media also matters.

I next turn to a final survey-based test of the SSIS and alternative hypotheses. A October 23–26, 2009, Pew Center survey asked respondents which news stories they were following most closely as well as their “regular” sources of news (Pew Research Center 2009c). The question listed six specific news story options as well as an “other story” category. Response options for the latter question, that in this survey (unlike the others) were not mutually exclusive, included local TV news, national network TV news, MSNBC, FOX, CNN, radio news, newspapers, and the Internet. This survey also included questions on both party identification and ideology. This allows me to better isolate those respondents most likely to have \textit{ex ante} attitudes drive their opinions (i.e., for whom the internal causal pathway is most likely to apply). This makes the present analysis a particularly difficult case for finding support for the SSIS hypothesis, which anticipates that individuals’ attitudes will vary partly depending on the information to which they are exposed. In an analysis limited to partisan ideologues, this particular dimension of respondents’ internal characteristics— which seems almost certainly the most important one for the present analysis— cannot account for variations in attitudes across consumers of different media outlets.

I conducted a set of $t$-tests to determine whether self-identified conservative Republicans differed in their propensity to identify swine flu as the issue they had followed most closely in the news during the pre-

\textsuperscript{8} In this instance, too few respondents (29 percent and 6 percent of Democrats) expressed disapproval to isolate that category for a separate $t$-test of partisan differences.
vious week, depending on whether or not they identified conservative/Republican-leaning Fox News as a regular source of news. I then compared the results for swine flu with those for several other news stories identified in the survey, including the health care debate, the state of the national economy, efforts by the Obama administration to place limits on executive pay for companies that took bailout funds, the war in Afghanistan, and political instability in Pakistan. I subsequently replicated this analysis for liberal Democrats.

Beginning with the “other” news stories, the results indicate that there is no statistically significant attention difference between conservative Republican Fox viewers and their non-Fox-viewing counterparts with respect to the economy, executive pay, or Afghanistan. This makes sense given the logic of SSIS and the fact that there was far less variation across parties in emphasis on the importance of these issues, compared with swine flu. Finally, regular Fox viewers were 18 percentage points more likely than nonregular viewers to cite the health care debate as the issue they had followed most closely in the news ($p < 0.05$). This again seems consistent with the SSIS hypothesis, in that conservatives and Republican partisans, along with conservative political pundits, have focused on the health care debate subsequent to passage of the law far more than their liberal or Democratic counterparts.

The results for swine flu, summarized in the bottom section of table 1, are far more stark. Conservative Republicans who did not cite Fox News as a regular news source were more than twice as likely as those who did mention Fox to name swine flu and the vaccine as the issue they had followed most closely (0.40 vs. 0.18, $p < 0.003$). Equally important, this relationship is unique to Fox News, at least in its magnitude and significance. No statistically significant relationships emerged for local TV news or newspapers. However, conservative Republicans who cited national network news as a regular news source were 10 percentage points more likely than their counterparts who did not to name swine flu and the vaccine issue as the story they had followed most closely the prior week (0.30 vs. 0.20, $p < 0.10$).

Several of the other new media outlets—including CNN and radio news—were also associated with reduced attention to swine flu. Regular radio news consumers were about 7 percentage points less likely than

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9. Too few conservative Republicans mentioned Pakistan to determine whether or not viewers and nonviewers differed meaningfully.
non-radio-news consumers to indicate that they had followed the swine flu/vaccine issue most closely, though this effect is not statistically significant. The corresponding drop in attention for regular CNN viewers is about 12 percentage points (0.28 vs. 0.16, \( p < 0.10 \)). If I limit the sample to respondents who identified themselves as “very conservative,” then regular Internet consumption is associated with a 7-percentage-point, albeit statistically insignificant (\( p < 0.19 \), decline in the likelihood of having followed swine flu and its vaccine most closely of the issues in the news the prior week (0.18 vs. 0.11). This last pattern is at least suggestively consistent with the SSIS hypothesis.

The fact that other new media did not produce attention effects vis-à-vis swine flu and the vaccine comparable in magnitude or significance to that associated with Fox likely stems from several factors, including (1) Fox’s status as a particular focal point for conservative Republican news consumers, (2) in some instances, the specificity of Fox News relative to, say, the general category of radio news in the survey question, the latter of which presumably includes political talk radio but also other less politically slanted fare, and perhaps most important, (3) the fact that respondents were able to select as many of the outlets from the list as they liked. This means that some of the Fox consumers almost certainly also utilized other media, like national network news or local TV news, potentially offering somewhat different messages about swine flu and the vaccine program.

In sharp contrast to the patterns for conservative Republicans, among self-described liberal Democrats no statistically significant differences between regular Fox viewers and nonviewers emerged for any of the news stories. The same pattern emerges among liberal Democrats across all the media outlets included in the survey, with the sole exception of local TV news. Liberal Democrats who regularly watch local TV news were 18 percentage points more likely (0.34 vs. 0.16, \( p < 0.05 \)) than their counterparts who did not regularly watch to report following the swine flu/vaccine issue most closely. Presumably, the weaker relationships for liberal Democrats stem from the aforementioned higher \( ex \ ante \) levels of interest in the issue among Democrats and greater trust of the government officials and agencies talking about it in the media.

That said, when I limit the analysis to self-described “very liberal” respondents, the results strengthen considerably for two reputedly liberal outlets that were perhaps relatively more likely than Fox News to emphasize the Obama administration’s perspective on the pandemic:
national network news and MSNBC. In the former case, regular viewing of network news among very liberal respondents is associated with a 24-percentage-point *increase* in the likelihood of having followed swine flu and its vaccine most closely during the prior week (0.42 vs. 0.18, \( p < 0.05 \)). The corresponding increase among regular MSNBC viewers is 9 percentage points (0.35 vs. 0.26). However, this latter relationship is statistically insignificant (\( p < 0.25 \)), presumably because of the small number of regular MSNBC consumers in the survey.

These results clearly suggest that regularly consuming Fox News had quite different effects on the attention of conservative Republicans to swine flu and the vaccine than with respect to any of the other policy issues on the national agenda, substantially reducing their interest in the issue. Clearly, the fact of being a conservative Republican cannot by itself account for these differences between Fox viewers and non-Fox viewers, given that all respondents included in this analysis self-identified as conservative Republicans. Other new media mostly exhibited similar, albeit weaker, effects. In contrast, network news consumption produced the opposite effect, at least among especially conservative respondents. This opposing pattern again strongly suggests that differences in content across these outlets matters in shaping viewers' attitudes toward swine flu.

Fewer significant relationships emerged among liberal Democrats regardless of their sources of news, though several outlets typically preferred by liberals were associated with positive attention effects among “very liberal” respondents.\(^{10}\) This, again, makes sense, given the presence of a Democratic administration leading the campaign to contain H1N1 and the preferences of liberal Democrats for news sources likely to emphasize the frames offered by the president and his advisers. Taken together, these patterns offer greater support for the SSIS hypothesis than for the alternative internal causal pathway.

Thus far, we have seen suggestive evidence that the trend toward increasing self-selection by Americans into politically friendly news environments, especially in the new media (cable, Internet, political talk radio, and Fox News), may help account for the partisan gap in concern over swine flu and in self-reported intent to seek the swine flu vaccine. Of course, survey questions about interest or “intent” are not equivalent to

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10. While, in order to address the endogeneity concern raised earlier, I focused in this instance on “liberal Democrats” and “conservative Republicans,” many of the patterns identified above, particularly with respect to Fox News, remain similar if I limit the analysis to liberals, conservatives, Democrats, or Republicans.
actual behavior. Hence in the next section I investigate state-level data on swine flu vaccination rates to see whether the sorts of patterns identified in the survey data reflect actual behavior.

A Vaccination Gap?

To investigate actual patterns of vaccinations for swine flu and determine whether political partisanship influences vaccination rates partly because of the different information streams to which partisans expose themselves, I turn to state-level Centers for Disease Control and Prevention data on H1N1 immunizations and deaths from swine flu.\textsuperscript{11} To account for partisan differences, I employ Gallup data on the gap in party affiliation in each state in 2008, as well as on whether each state voted for Senator Barack Obama or Senator John McCain in 2008 (Jones 2009). The best-available proxy I was able to identify for the differing media streams consumed by residents of each state is a data set developed by Gentzkow and Shapiro (2010) on partisan bias in newspapers. Gentzkow and Shapiro rated 434 U.S. newspapers on a left-to-right ideological continuum, with the number of papers for an individual state ranging from 1 (in Wyoming, Arkansas, and Delaware) to 49 (in California). The mean number of newspapers per state is 8.5 with a standard deviation of 8.68. The scale ranges from –0.08 to 0.585, with larger numbers representing a more rightward slant.\textsuperscript{12} I also collected state-level demographic and political data, which I employ as control variables in my analyses.\textsuperscript{13}

The survey analysis presented in the prior section suggests that Republicans are, all else being equal, less concerned than Democrats about swine flu. The implication is that we would expect Republicans to be less likely to seek the H1N1 vaccine. At the state level, this should manifest itself—again, all else being equal—in the form of higher per capita infection rates and potentially also higher per capita H1N1-related fatality levels in states with relatively higher proportions of registered Republicans. Moreover, to the extent that differences in media coverage of the flu influenced consumers’ levels of concern about it and hence propensity to seek the vaccine, we would expect that, net of other likely causal factors,

\begin{itemize}
\item \textsuperscript{12} I am grateful to Matt Gentzkow for making these data available to me. For a detailed explanation of the construction of the slant scale, see Gentzkow and Shapiro 2010.
\item \textsuperscript{13} Data available at www.statehealthfacts.org.
\end{itemize}
more right-leaning state media would be associated with lower per capita H1N1 vaccine rates and perhaps also higher H1N1-related death rates.

As preliminary tests of these predictions, I begin with some simple correlations and t-tests. The first such test reveals, consistent with my expectations, a highly significant 0.30 correlation between per capita swine flu deaths and the partisan registration gap in 2008, indicating that as states become relatively more Republican, swine flu–related deaths rise. The data on H1N1 vaccination rates for people over six months of age indicate that in states with more than a standard deviation above the mean pro-Republican tilt in party registration, residents were, on average, more than 8 percent less likely to be vaccinated than their counterparts in states with over a standard deviation above the mean pro-Democratic Party registration tilt (0.247 vs. 0.329, \( p < 0.03 \)). This represents a 1.33 standard deviation difference in proportions of the population vaccinated against H1N1. A similar, albeit predictably somewhat less stark, pattern emerges if we compare states that voted for Obama in 2008 with those that voted for McCain. Here the partisan vaccination gap is about 4 percentage points (0.22 vs. 0.26, \( p < 0.02 \)), or two-thirds of a standard deviation on the vaccination scale.

These simple correlations suggest that there is indeed a fairly strong correlation at the state level between partisanship and H1N1 vaccination rates. However, it cannot rule out the possibility that demographic factors, like poverty, might be the true causal factor. Nor do they address the potential influence of media exposure. To address these concerns, I turn to a multiple regression analysis. The dependent variable for this analysis is the percentage of state residents over six months of age who were vaccinated against H1N1 in 2009. The key causal variables are newspaper slant, the partisan registration gap, and whether a state voted for Obama in 2008.

Controls include the unemployment rate, the percentage of the population that is African American, the percentage of the population that is Hispanic, the per capita number of swine flu cases in the state, as well as the ideological slant in rhetoric by the state’s congressional delegation (as measured by Gentzkow and Shapiro 2010). Tables 2 and 3 present the results of thirteen regressions. The first model excludes all but several basic controls (unemployment, race, number of H1N1 cases per capita, and the rhetorical slant of the state’s congressional delegation). The second adds the partisan registration gap, and the third adds the voted for Obama dummy. The remaining models incrementally add socioeconomic
and demographic variables that could potentially account for variations in H1N1 vaccine rates. I include them incrementally because of the limited statistical leverage available in the data.

The results indicate that even after controlling for potential alternative causal factors, both the partisan registration gap and having voted for Obama in 2008 influence the percentage of a state’s population immunized against H1N1. So too do many of the controls, including unemployment rates, race, flu vaccination rates, and the rhetorical slant of the state’s congressional delegation. In the first case, model 2 indicates that each 1 percent increase in the pro-Democratic registration tilt is associated with about a 7 percent increase in immunization rates ($p < 0.10$). Model 3, in turn, indicates that states that voted for Obama in 2008 had about 2.7 percent higher immunization rates than their counterparts who voted for McCain ($p < 0.10$). Model 1, which presents the base model, represents the most basic test of the SSIS hypothesis. The results here indicate that states with more conservative newspapers did indeed have lower immunization rates, even after accounting for alternative explanations. The coefficient on newspaper slant indicates that each one-point increase in rightward slant in a state’s newspapers is associated with a 0.98 percent decrease in immunization rates.

It is important to reiterate that this effect is net of the ideological slant of the state’s congressional delegation, as well as of the socioeconomic characteristics of the state. It is also net of the partisan registration gap, though the magnitude of the effect is slightly weaker when the latter variable is included in the model (with the coefficient declining from $-0.98$ to $-0.76$, while remaining significant at the 0.10 level). It is also largely unaffected when I include child immunization rates or adult flu vaccination rates as controls, and remains substantively large and statistically significant in every model, regardless of the socioeconomic or demographic control included. This suggests that generalized skepticism of vaccinations does not fully account for reluctance to seek the H1N1 vaccine. The reason, presumably, is that the latter vaccine was more overtly politicized than seasonal flu vaccines or child immunizations.

14. In separate models (not shown), I tested additional socioeconomic factors such as the percentage of the state’s population living in urban versus rural communities, median state income, infant death rates, state spending on Medicaid and health care in general, per capita GDP, and population size. None significantly affected the H1N1 vaccination rate after the reported controls were included in the models. Hence, given my limited degrees of freedom, I excluded them from the reported results.
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<td>(0.34)</td>
<td>(0.42)</td>
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<td>% Child deaths 2009</td>
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Table 2  (continued)

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<td>0.64</td>
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Source: Author’s data  
Note: Robust standard errors in parentheses  
*p<0.05; **p<0.01; ***p<0.001; ^p<0.10
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<td>Unemployment (9/09)</td>
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<td>-1.032**</td>
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<td>(0.28)</td>
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<td>% Black</td>
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<td>% Hispanic</td>
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<td>H1N1 cases per capita</td>
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<td>0.0103</td>
<td>0.0101</td>
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<td>(0.011)</td>
<td>(0.011)</td>
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<td>(0.011)</td>
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<td>Congressional delegation slant</td>
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<td>-0.174*</td>
<td>-0.169*</td>
<td>-0.166*</td>
<td>-0.157^</td>
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<td>(0.078)</td>
<td>(0.078)</td>
<td>(0.074)</td>
<td>(0.081)</td>
<td>(0.077)</td>
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<td>Medicaid spending per capita 2008</td>
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<td>( \times 10,000 )</td>
<td>0.0004</td>
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<td>Median income 2007 ( \times 1,000 )</td>
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<td>% Urban population</td>
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<td>-0.008</td>
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<td>% Living in poverty 2009</td>
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<td>R-squared</td>
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*Source: Author’s data*

*Note: Robust standard errors in parentheses*

*\( *p<0.05; **p<0.01; ***p<0.001; ^p<0.10\)
Interestingly, when I replicated tables 2 and 3 with childhood immunizations as the dependent variable (not shown), there is no significant effect of newspaper slant across all models. On the other hand, in an additional model (also not shown), newspaper slant does significantly affect the percentage of adults receiving seasonal flu vaccines in many, though not all models. In this last set of models, the coefficients on newspaper slant are consistently smaller than they are in the swine flu immunization models. More important for my purposes, the coefficient on newspaper slant becomes small and insignificant when I include the partisan gap variable as a control. In other words, absent an explicit control for general partisan differences in attitudes toward flu vaccines, newspaper slant was a reasonably appropriate proxy. However, in the presence of a more direct control, it loses its predictive power. This suggests that in the case of the seasonal flu, while partisan differences in attitudes among Democrats and Republicans do appear to matter—most likely owing to general differences in levels of trust in government programs and pronouncements—these differences do not appear to stem directly from differences in SSIS via mass media.

Conclusion

I began this study by highlighting a potentially important puzzle: Republicans appeared in surveys to express far lower levels of intent to seek swine flu vaccines than their Democratic counterparts. While there are almost certainly multiple explanations for this partisan gap, I argued that one part of the explanation concerned the evolution of mass media toward greater consumer capacity to self-select into ideologically “friendly” news and information environments.

I tested several implications of what I termed the SSIS hypothesis against several data sets. I first found strong partisan gaps in concern over the flu that appeared highly correlated with news consumption preferences. Most notably, Republicans who rely on new media in general, and Fox News in particular, for news about swine flu are substantially less concerned about the flu, less attentive to it, and more skeptical of press coverage of the flu than their counterparts who rely on traditional news sources, or Democrats regardless of news sources. In the latter case, Democrats are most likely encountering similar information streams both in self-selected new media contexts, where they can seek out pro-administration information streams, and in the traditional news media, where indexing theory
(Bennett 1990; Baum and Groeling 2010) anticipates that the administration’s voice will tend to dominate news coverage in a crisis, especially in its early stages.

While these survey data cannot rule out the possibility of reverse causality—that is, attitudes toward the swine flu vaccine are “caused” by ideological preferences, which in turn “cause” media consumption choices—several indirect tests suggested that this causal arrow (the internal causal pathway) is unlikely to fully account for the observed patterns (though it almost certainly contributes to them).

Finally, an investigation of real-world, state-level vaccine data reveals that these attitudes expressed in surveys appear to be reflected in actual patterns of swine flu vaccinations. Here, while I could not distinguish new versus traditional media exposure, I was able to demonstrate that the overall tone of newspaper coverage in a state, on a left-to-right scale, strongly influences the percentage of the population seeking the H1N1 vaccine, even after accounting for a wide range of alternative potential explanations, including a state’s political orientation, its demographics, and the socioeconomic and ethnic profile of its population.

Because the evidence presented in this study is mostly suggestive, further research is necessary to more directly draw a linkage between SSIS and public health behavior in general, or swine flu vaccine rates in particular. However, the evidence presented herein does strongly suggest that changes in the mass media environment hold potentially profound implications for public health.

Current trends toward ever more consumer self-selection and increasingly sophisticated information filtering and media targeting of consumer preferences all appear to portend greater audience fragmentation and hence continued shrinking of the informational commons. For instance, it seems inevitable that news providers will increasingly apply the filtering technologies that allow media content distributors like Netflix and iTunes to determine the types of movies or music customers are likely to prefer—and suggest to them precisely that—to news and public affairs content. The result may be what Cass Sunstein (2007) terms “cyberbalkanization,” where the informational commons is largely supplanted by a “daily me” in which consumers encounter only the news and information they want, most of which tends to confirm rather than challenge their pre-existing attitudes. Whether or not the informational commons disappears entirely, there is little question that technological innovations and shifts in audience behavior are changing the way citizens consume news,
increasingly personalized content subject to individual preferences about what, when, and where citizens entertain themselves or expose themselves to politically themed information.

Given the immensity and speed of the changes in this media marketplace, and the potential consequences for democratic participation and the strategic landscape for politicians, the evolution of the communication environment within which our politics is contested seems likely to play a central role in shaping the future course of American democracy, including with respect to public health policy. This holds important implications for both public health scholars and policy makers. In the former case, because public health programs — like vaccination campaigns — cannot succeed without public acceptance of the premises on which they are based, accounting for patterns of disease proliferation requires understanding the factors shaping public attitudes. Here traditional socioeconomic factors, though surely important, cannot tell the whole story. Rather, such factors interact with political attitudes, which themselves shape and are shaped by the varying information streams to which individuals expose themselves. These diverse influential factors and processes come into clearer relief when one combines analyses of real-world behavioral “outcome” data with systematic analysis of the correlates of public attitudes, including citizens’ sources of information.

For policy makers, in turn, to the extent that this SSIS process continues apace, the politicization of public health campaigns poses substantial risks to the efficacy of public health policy. It is therefore incumbent on policy makers to strive to avoid such politicization to the greatest extent possible. Because many public health issues are not intrinsically partisan, it is easy to miss their potential for generating polarized attitudes and behaviors, a potential that politically oriented new media providers have strong commercial (and sometimes also ideological) incentives to exploit. Failing to recognize the potential health consequences of polarized debates over seemingly nonpartisan issues like protecting against flu pandemics thus risks undermining effective responses to public health threats.
References


