

Concise Communication

Attitudes toward policies to encourage influenza vaccination in long-term care facilities: A national survey of US adults aged 50–80 years

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Abstract

In October 2017, the National Poll on Healthy Aging surveyed a nationally representative sample of 2,007 adults aged 50–80 years to assess attitudes toward influenza (flu) vaccination policies in long-term care facilities. Support for requiring vaccinations was lowest for visitors. Policy makers can use these findings to develop sustainable vaccination strategies.

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Each year, people aged 65 and older represent ~57% of flu-related hospitalizations and 75% of flu-related deaths in the United States.^{1,2} The US Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization and Practices (ACIP) recommends flu vaccination among older adults.³ In 2017, many flu-related hospitalizations and deaths among older adults occurred among residents in long-term care facilities (LTCFs).^{4,5} In such facilities, interactions between residents and staff, other residents, and visitors can increase the risk of transmission of not only flu but also other infectious diseases such as coronavirus (COVID-19), which has ravaged LTCFs in the United States.⁶

One important strategy to protect LTCF residents from flu and other infectious diseases is vaccination of staff, residents, and visitors. Policy makers and leaders of LTCFs could take steps to encourage flu vaccination, such as mandating flu vaccination among individuals who interact with facility residents and enacting policies to encourage staff vaccination. However, little is known about public support for different approaches. In this study, we examined attitudes toward policies to encourage influenza (flu) vaccination in LTCFs among older adults.

Methods

In October 2017, the University of Michigan National Poll on Healthy Aging (NPHA) conducted a cross-sectional survey of adults

aged 50–80 years about their attitudes toward policies to encourage flu vaccination in LTCFs. The NPHA is a recurring, nationally representative Internet survey conducted using Ipsos KnowledgePanel, a large probability-based Internet survey panel (Ipsos Public Affairs, LLC, Norwalk, CT).⁷ The University of Michigan Medical School Institutional Review Board deemed the project exempt from review.

The Ipsos KnowledgePanel collects demographic information from panel respondents annually. Ipsos provides non-Internet households with a tablet and mobile data plan to complete the surveys. The survey was distributed to 2,760 individuals in English, and 2,007 individuals completed the survey (73% completion rate).

All respondents were included in the analysis. Reported percentages reflect only survey questions that respondents answered. Overall, 9 multivariable logistic regression models were estimated to measure associations between respondent characteristics and attitudes toward requiring influenza vaccination. For different types of individuals interacting with LTCF residents, we used 4 separate multivariable logistic regression models with the outcome “require” vaccination. To examine support for policies to encourage flu vaccinations for LTCF staff, we used 5 separate multivariable logistic regression models with the outcome “support” for the policy. In each regression model, the independent variables included demographic characteristics, urbanicity, political ideology, chronic medical conditions, knowing someone in an LTCF, and previous flu vaccination.

Odds ratios are reported as marginal effects indicating the estimated adjusted weighted prevalence (ie, weighted percentage) of outcomes for different categories of respondents. All analyses were performed with Stata version 16 software (Stata Corp, College Station, TX). We used survey weights to yield nationally representative estimates. The threshold for statistical significance was $P < .05$ (2-tailed).

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PREVIOUS PRESENTATION. Selected aggregate results were published in a previous University of Michigan National Poll on Healthy Aging (NPHA) report (attached). Some results from this manuscript were presented as a poster at the 2021 AcademyHealth Annual Research Meeting on June 14, 2021, held virtually.

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Table 1. Adjusted Prevalence of Support for Requiring Influenza (Flu) Vaccination of Different Groups of Individuals in Long-Term Care Facilities Among Adults Aged 50–80 Years

Variable	Medical Staff (n=1,914) % (95% CI) ^{a,b}	Nonmedical Staff (n=1,914) % (95% CI) ^{a,b}	Visitors (n=1,908) % (95% CI) ^{a,b}	Residents (n=1,914) % (95% CI) ^{a,b}
Age				
50–64 y (ref)	90.6 (88.9–92.4)	90.2 (88.4–91.9)	70.0 (67.3–72.8)	87.8 (85.9–89.8)
65–80	93.0 (91.0–94.9)	92.4 (90.3–94.4)	71.0 (67.9–74.1)	90.2 (88.0–92.5)
Sex				
Male (ref)	89.7 (87.7–91.7)	89.6 (87.5–91.6)	69.1 (66.1–72.1)	86.7 (84.5–89.0)
Female	92.9 (91.2–94.5)*	92.0 (90.3–93.8)	71.5 (68.7–74.4)	90.3 (88.4–92.2)*
Race/ethnicity				
White, non-Hispanic (ref)	91.0 (89.4–92.5)	90.5 (89.0–92.1)	69.7 (67.3–72.1)	88.6 (86.9–90.2)
Black, non-Hispanic	95.8 (92.7–98.9)*	94.6 (90.7–98.5)	69.7 (62.4–77.1)	92.6 (87.9–97.2)
Hispanic	90.9 (85.8–95.9)	91.3 (86.8–95.9)	75.9 (68.8–83.0)	87.8 (82.2–93.5)
Other, non-Hispanic	90.4 (83.8–97.0)	89.0 (82.3–95.7)	70.6 (61.0–80.1)	84.4 (76.7–92.2)
Education				
Less than high school	90.2 (84.9–95.5)	87.7 (81.7–93.6)	75.0 (67.1–82.9)	87.8 (81.7–94.0)
High school	92.5 (90.2–94.8)	92.3 (90.0–94.6)	72.7 (68.9–76.5)	90.6 (88.1–93.0)
Some college	91.3 (89.1–93.6)	90.7 (88.3–93.0)	69.8 (66.0–73.6)	87.1 (84.4–89.9)
Bachelor's degree	91.9 (88.8–95.0)	92.1 (89.0–95.1)	67.0 (61.9–72.0)	89.4 (86.0–92.7)
Professional degree	88.6 (84.6–92.6)	88.3 (84.3–92.3)	67.6 (62.3–72.9)	86.5 (82.6–90.5)
Received flu vaccine since July 1, 2017				
No and don't plan to (ref)	79.0 (75.3–82.7)	78.3 (74.7–82.0)	44.1 (39.4–48.9)	73.4 (69.4–77.4)
Yes	96.6 (94.6–98.5)***	96.5 (94.6–98.4)***	80.6 (76.9–84.4)***	94.8 (92.4–97.1)***
Not yet, but plan to	96.8 (95.6–98.1)***	96.3 (95.0–97.7)***	81.1 (78.2–83.9)***	95.5 (94.0–97.0)***
Knows anyone in a nursing home or assisted living				
No (ref)	90.8 (89.2–92.3)	90.2 (88.6–91.8)	70.0 (67.5–72.5)	88.4 (86.7–90.1)
Yes	93.0 (90.8–95.2)	92.7 (90.4–94.9)	71.3 (67.6–75.0)	89.1 (86.3–91.8)
Political ideology^c				
Conservative (ref)	88.8 (86.4–91.2)	88.0 (85.6–90.4)	67.3 (63.9–70.6)	85.7 (83.1–88.3)
Moderate	92.4 (90.0–94.7)	92.3 (89.9–94.6)*	72.0 (68.4–75.6)	90.7 (88.2–93.2)*
Liberal	94.9 (92.9–97.0)**	94.3 (92.1–96.5)**	73.5 (69.2–77.7)*	91.2 (88.5–93.8)**
Chronic conditions^d				
0–1 (ref)	90.7 (88.9–92.5)	89.8 (88.0–91.7)	69.6 (66.6–72.5)	87.9 (85.9–89.9)
2 or 3	92.2 (90.0–94.4)	92.5 (90.3–94.6)	70.2 (66.7–73.7)	89.2 (86.6–91.7)
4 or more	92.4 (88.5–96.3)	92.0 (88.1–96.0)	74.0 (68.5–79.5)	90.6 (86.6–94.6)

Notes: CI, confidence interval. Nonmedical staff at the facility included food service and administrators. All prevalences (weighted percentages) have been adjusted for all variables in the table as well as US Census region and urbanicity.

^aThe outcome is a combined variable that includes both “definitely require” and “possibly require” responses.

^bThe base outcome for the analysis was “do not require.”

^cPolitical ideology was measured in seven categories: slightly liberal; liberal; extremely liberal; moderate or “middle of the road”; slightly conservative; conservative; extremely conservative. For analyses, respondents' self-reported ideologies were collapsed into 3 categories: conservative (slightly conservative to extremely conservative), moderate, and liberal (slightly liberal to extremely liberal).

^dChronic conditions include asthma, chronic bronchitis, or chronic obstructive pulmonary disease; cancer; chronic pain; diabetes or pre-diabetes; heart attack, heart disease, or other heart condition; hepatitis C; high blood pressure; high cholesterol; human immunodeficiency virus or acquired immunodeficiency syndrome; kidney disease; multiple sclerosis; osteoarthritis; joint pain or inflammation; pulmonary arterial hypertension; rheumatoid arthritis; seasonal allergies; or stroke.

* $P < .05$; ** $P < .01$; *** $P < .001$.

Results

Most individuals were white (71.8%; 95% CI, 69.4–74.0), female (52.5%; 95% CI, 50.1–54.9), had a high school degree (31.2%; 95% CI, 29.1–33.5). The mean age was 62.1 years (95% CI, 61.8–62.5). Most respondents in both the group aged 50–64 years

and the group aged 65–80 years supported a flu vaccination requirement for LTCF staff, visitors, and residents. Non-Hispanic Blacks reported significantly greater support for a flu vaccination requirement among medical staff compared to non-Hispanic Whites (95.8% vs 91.0%; $P < .05$) (Table 1). Moderates were more likely than conservatives to support requiring flu

Table 2. Adjusted Prevalence of Support for Policy Interventions to Encourage Influenza (Flu) Vaccination Among Staff in Long-Term Care Facilities Among Adults Aged 50–80 Years

Variable	Mandate Flu Vaccination (n=1,890) % (95% CI) ^a	Provide Vaccine for Free, Onsite (n=1,901) % (95% CI) ^a	Bonus Pay for Getting Flu Vaccine (n=1,877) % (95% CI) ^a	Do not allow Unvaccinated staff to Come to Work if Sick (n=1,891) % (95% CI) ^a	Encourage vaccination Without Pressure (n=1,887) % (95% CI) ^a
Age					
50–64 y (ref)	53.0 (50.0–56.2)	93.8 (92.5–95.2)	52.9 (49.6–56.1)	82.1 (79.8–84.5)	79.2 (76.5–81.9)
65–80 y	58.1 (54.9–61.4)*	92.1 (90.1–94.2)	38.7 (35.1–42.2)***	83.0 (80.2–85.8)	75.2 (72.1–78.3)
Sex					
Male (ref)	57.4 (54.1,60.6)	91.2 (89.4–93.0)	45.8 (42.3–49.3)	81.7 (79.1–84.3)	76.7 (73.8–79.6)
Female	52.8 (49.6–55.9)	95.3 (94.0–96.6)*	49.3 (46.0–52.7)	83.1 (80.6–85.6)	78.7 (75.9–81.4)
Race/ethnicity					
White, non-Hispanic (ref)	54.9 (52.3–57.5)	93.5 (92.3–94.8)	45.8 (43.0–48.6)	83.3 (81.2–85.3)	76.1 (73.7–78.5)
Black, non-Hispanic	56.3 (48.3–64.3)	94.8 (91.0–98.7)	52.1 (43.8–60.3)	80.0 (73.4–86.6)	81.6 (74.9–88.4)
Hispanic	53.0 (44.8–61.2)	89.0 (84.0–94.1)	51.3 (42.8–59.7)	81.3 (74.6–88.0)	80.3 (73.6–87.0)
Other, non- Hispanic	56.7 (46.1–67.4)	94.9 (90.3–99.5)	55.0 (44.2–65.8)	77.8 (68.6–87.0)	85.1 (77.8–92.5)
Education					
Less than high school (ref)	67.6 (59.5–75.8)	93.4 (89.2–97.6)	55.1 (45.5–64.5)	84.3 (77.9–90.7)	77.6 (69.5–85.7)
High school	54.4 (50.0–58.7)**	92.7 (90.5–95.0)	50.2 (45.8–54.6)	83.8 (80.5–87.0)	82.9 (79.5–86.3)
Some college	52.3 (48.1–56.6)**	93.9 (91.9–95.9)	46.2 (41.8–50.5)	81.9 (78.5–85.3)	79.7 (76.1–83.2)
Bachelor's degree	55.0 (49.6–60.4)*	95.7 (93.4–97.0)	44.0 (38.4–49.7)	82.2 (77.8–86.7)	74.1 (69.2–79.0)
Professional degree	52.1 (46.6–57.7) **	89.8 (86.4–93.2)	43.9 (37.7–50.1)	79.3 (74.6–84.1)	68.0 (62.3–73.4)
Received flu vaccine since July 1, 2017					
No and do not plan to (ref)	27.0 (22.7–31.4)	83.7 (80.4–86.9)	43.2 (38.5–47.8)	67.3 (62.8–71.8)	76.6 (72.5–80.7)
Yes	69.0 (64.7–73.3)**	97.7 (96.2–99.2)***	47.4 (42.7–52.0)	85.3 (82.0–88.6)***	78.3 (74.6–82.0)
Not yet, but plan to	63.7 (60.2–67.2)***	97.2 (96.1–98.3)***	50.6(47.0–54.2)*	90.4 (88.3–92.6)***	78.0 (75.1–80.9)
Knows anyone in a nursing home or assisted living					
No (ref)	54.5 (51.8–57.2)	92.3 (90.9–93.7)	47.4 (44.5–50.2)	82.0 (79.8–84.1)	77.0 (74.6–79.4)
Yes	56.0 (51.9–60.2)	96.0 (94.4–97.7)**	48.3 (43.9–41.7)	83.5 (80.3–86.8)	79.4 (75.9–82.8)
Political ideology^b					
Conservative (ref)	52.8 (49.1–56.5)	89.6 (87.4–91.8)	44.1 (40.3–47.9)	81.4 (78.5–84.3)	75.7 (72.3–79.1)
Moderate	56.9 (53.1–60.8)	96.2 (94.6–97.9)***	47.8 (43.6–51.9)	83.1 (80.0–86.2)	82.2 (79.0–85.4)**
Liberal	55.7 (50.9–60.5)	96.0 (94.1–97.8)***	53.2(48.2–58.2)*	83.2 (79.6–86.9)	75.1 (70.9–79.3)
Chronic conditions^c					
0–1 (ref)	55.1 (51.9–58.3)	92.1 (90.5–93.7)	48.0 (44.6–51.4)	81.7 (79.2–84.2)	77.9 (75.1–80.7)
2 or 3	55.4 (51.4–59.3)	96.3 (94.8–97.8)**	47.0 (42.9–51.2)	82.5 (79.4–85.6)	76.8 (73.4–80.3)
4 or more	53.5(47.5–59.5)	91.5 (87.6–95.4)	47.7 (41.3–54.2)	85.1 (80.1–90.1)	79.0 (73.9–84.1)

Note. CI, confidence interval. All prevalences (weighted percentages) are adjusted for all other variables in the table as well as US Census region and urbanicity.

^aThe base outcome for the analysis was “do not support.”

^bPolitical ideology was measured in seven categories: slightly liberal; liberal; extremely liberal; moderate or “middle of the road”; slightly conservative; conservative; extremely conservative. For analyses, respondents’ self-reported ideologies were collapsed into three categories: conservative (slightly conservative to extremely conservative), moderate, and liberal (slightly liberal to extremely liberal).

^cChronic conditions include asthma, chronic bronchitis, or chronic obstructive pulmonary disease; cancer; chronic pain; diabetes or pre-diabetes; heart attack, heart disease or other heart condition; hepatitis C; high blood pressure; high cholesterol; human immunodeficiency virus or acquired immunodeficiency syndrome; kidney disease; multiple sclerosis; osteoarthritis; joint pain or inflammation; pulmonary arterial hypertension; rheumatoid arthritis; seasonal allergies; or stroke.

* $P < .05$; ** $P < .01$; *** $P < .001$.

vaccination among nonmedical staff (92.3% vs 88.0%; $P < .01$). Liberals were more likely than conservatives to support requiring flu vaccination among all 4 groups. Descriptive statistics, survey

questions, and aggregate survey results are provided in the Supplementary Material (online).

Compared with adults aged 50–64 years, adults aged 65–80 years reported greater support for mandating that all staff be vaccinated (53.0% vs 58.1%; $P < .05$), and they were less likely to support bonus pay for staff who get a flu vaccine (52.9% vs 38.7%; $P < .001$) (Table 2). Support for mandating that all staff be vaccinated was lower among older adults with at least a high school degree than among older adults with less than a high school education. Compared to conservatives, liberals were more likely to support bonus pay for staff who get a flu vaccine (53.2% vs 44.1%; $P < .05$).

Discussion

In this nationally representative survey of US adults aged 50–80 years, there was less support for requiring flu vaccinations among LTCF visitors compared to staff and residents. Support for policies to encourage flu vaccination varied by demographics and political ideology. The ACIP recommends that all healthcare providers (HCPs) be vaccinated against seasonal flu each year,⁸ and the Society for Healthcare Epidemiology of America views flu vaccination of HCPs as a core safety practice.⁹ However, during the 2017–2018 flu season, flu vaccination coverage was only 67.4% among HCPs working in LTCFs versus 91.9% among HCPs working in hospitals.⁸ This trend had continued for the last 7 flu seasons, with the highest vaccination rate of 94.8% among HCPs subject to workplace vaccination requirements and lowest rate of 47.6% where vaccination was not required, promoted, or offered on site.⁸

Our results illustrate potential resistance to requiring facility visitors to be vaccinated, relative to residents and staff. Facility administrators should consider targeted messaging emphasizing the importance of vaccination of visitors and opportunities for vaccination to preserve the benefits of visits to residents while also protecting their safety.

Our survey results reveal varying levels of support for strategies to vaccinate LTCF staff. Specifically, we observed lower levels of support for flu vaccinations, mandates, and bonus pay for staff. Non-Hispanic Blacks were more likely to support requiring medical staff are vaccinated. This finding could be explained by the higher flu-related hospitalization rate among non-Hispanic Blacks, which could garner more support for staff vaccination.¹⁰

Respondents aged 65–80 years and those with higher education levels reported lower support for mandating staff vaccination and bonus pay for staff receiving a flu vaccine. Respondents' political ideologies were associated with how they felt LTCF staff should be encouraged to receive a flu vaccine. These findings illustrate that policies promoting flu vaccination should be tailored to the perspectives of key target populations, which can vary across several dimensions.

This study had several limitations. We conducted an observational study using a cross-sectional design; therefore, causal relationships cannot be inferred. As with any survey, response bias was possible, though survey weights were used to help account for differential responses among subgroups. The use of multiple comparisons could have increased the chance of type I errors. The survey was conducted before the COVID-19 pandemic, and these findings cannot be generalized to all settings or vaccinations.

Flu and other infectious diseases present a serious challenge to LTCFs, and there is a critical need to encourage vaccination to protect the health of vulnerable residents. Adults aged 50–80 years are less likely to support requiring flu vaccination of LTCF visitors, compared to staff and residents. Support for policies to encourage staff vaccination varies by the policy approach and individual

factors. Our findings should be considered by policy makers and administration in LTCFs when developing policies that optimize vaccine uptake because such policies could engender sustained public support in the communities they serve.

Supplementary material. To view supplementary material for this article, please visit <https://doi.org/10.1017/ice.2022.30>

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References

1. People 65 years and older and influenza. Centers for Disease Control and Prevention website. <https://www.cdc.gov/flu/highrisk/65over.htm>. Accessed June 6, 2020.
2. Estimated influenza illnesses, medical visits, hospitalizations, and deaths in the United States 2018–2019 influenza season. Centers for Disease Control and Prevention website. <https://www.cdc.gov/flu/about/burden/2019-2020.html>. Accessed November 9, 2020.
3. Grohskopf LA, Sokolow LZ, Broder KR, Walter EB, Fry AM, Jernigan DB. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices—United States, 2018–19 Influenza Season. *MMWR Recomm Rep* 2018;67(No. RR-3):1–20.
4. Hado E, Friss Feinberg, L. Amid the COVID-19 pandemic, meaningful communication between family caregivers and residents of long-term care facilities is imperative. *J Aging Social Pol* 2020;32:410–415.
5. Nursing homes and assisted living (long-term care facilities). Centers for Disease Control and Prevention website. <https://www.cdc.gov/longtermcare/>. Accessed September 11, 2021.
6. Levitt AF, Ling SM. COVID-19 in the long-term care setting: the CMS perspective. *J Am Geriatr Soc* 2020;68:1366–1369.
7. Ipsos panel book: Knowledgepanel brings you a probability-based online sample. Ipsos website. https://www.ipsos.com/sites/default/files/june-2020_kp_book-1.pdf. Accessed August 14, 2020.
8. Black CL, Yue X, Ball SW, *et al*. Influenza vaccination coverage among healthcare personnel—United States, 2017–18 influenza season. *Morbidity Mortal Wkly Rep* 2018;67:1050–1054.
9. Talbot TR, Babcock H, Caplan AL, *et al*. Revised SHEA position paper: influenza vaccination of healthcare personnel. *Infect Control Hosp Epidemiol* 2010;31:987–995.
10. Flu disparities among racial and ethnic minority groups. Centers for Disease Control and Prevention website. <https://www.cdc.gov/flu/highrisk/disparities-racial-ethnic-minority-groups.html>. Accessed November 7, 2021.