

Influenza Vaccination Status and Attitudes Among Restaurant Employees

Amanda T. Parrish, MA; Meredith C. Graves, MS, PhD; Jeffrey R. Harris, MD, MPH, MBA; Peggy A. Hannon, PhD, MPH; Kristen Hammerback, MA; Claire L. Allen, MPH

Context: Restaurant employees represent a substantial portion of the US workforce, interact closely with the public, and are at risk for contracting influenza, yet their influenza vaccination rates and attitudes are unknown. **Objective:** Assess influenza vaccination rates and attitudes among Seattle restaurant employees, to identify factors that could enhance the success of a restaurant-based vaccination program. **Design:** In 2012, we invited employees of Seattle restaurants to complete an anonymous paper survey assessing participant demographics, previous influenza vaccination status, and personal attitudes toward influenza vaccination (using a 5-point scale). **Setting:** Sit-down, full service restaurants in or near Seattle, Washington, were eligible if they had no previous history of offering worksite influenza vaccinations and had more than 20 employees who were older than 18 years and spoke either English or Spanish. **Participants:** We invited staff in all restaurant positions (servers, bussers, kitchen staff, chefs, managers, etc) to complete the survey, which was available in English and Spanish. **Results:** Of 428 restaurant employees surveyed, 26% reported receiving the seasonal influenza vaccine in 2011-2012 (response rate = 74%). Across 8 attitude statements, participants were most likely to agree that the vaccine is not too expensive (89%), and least likely to agree that it is relevant for their age group (25%), or normative at their workplace (13%). Vaccinated participants reported significantly more positive attitudes than unvaccinated participants, and Hispanics reported significantly more positive attitudes than non-Hispanic whites. **Conclusions:** Increasing influenza vaccination rates among restaurant employees could protect a substantial portion of the US workforce, and the public, from influenza. Seattle restaurant employees have low

vaccination rates against seasonal influenza. Interventions aimed at increasing vaccination among restaurant employees should highlight the vaccine's relevance and effectiveness for working-age adults.

KEY WORDS: attitudes, health knowledge, influenza vaccines, practice, restaurants, vaccination

Seasonal influenza is a serious disease in the United States. From 1976 to 2007, annual mortality from seasonal influenza ranged from 3000 to 49 000 per year.¹ The total economic burden imposed by influenza, including lost earnings, is estimated at \$87.1 billion annually.²

Since 2010, the Centers for Disease Control and Prevention has recommended that all adults receive the seasonal influenza vaccination (an expansion of previous recommendations, toward universal coverage). In 2011-2012, US adult vaccination rates were highest (64.9%) among those 65 years and older, and lowest

Author Affiliations: Health Promotion Research Center (a Centers for Disease Control and Prevention Research Center) (Drs Harris and Hannon and Ms Parrish, Hammerback, and Allen), Department of Health Services (Drs Harris and Hannon and Ms Parrish, Hammerback, and Allen), School of Public Health; and Department of Psychiatry and Behavioral Sciences, School of Medicine (Dr Graves), University of Washington, Seattle.

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Correspondence: Amanda T. Parrish, MA, Health Promotion Research Center, Department of Health Services, School of Public Health, University of Washington, 1107 NE 45th St, Ste 200, Seattle, WA 98105 (parrisha@uw.edu).

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(28.6%) among those aged 18 to 49 years.³ Among this younger group, vaccination rates were slightly higher among non-Hispanic whites (30.1%) than among Hispanics (24.6%).³ In Washington state, the rate was higher than nationally (30.8% for adults 18-49 years) but still low.⁴

Previous studies⁵⁻⁷ have suggested that low vaccination rates may be due to prevalent beliefs that the seasonal influenza vaccine is not relevant for young healthy adults, is not effective, and may have serious side effects (including actually infecting recipients with influenza). Other barriers include vaccination out-of-pocket costs, injection discomfort, and lack of convenient physical access.^{5,6}

These low vaccination rates and negative attitudes are of concern because vaccination protects not only individuals but also those with whom they have contact. For example, evidence indicates that vaccinating health care employees against influenza can enhance patient safety.^{8,9} Like health care employees and school teachers, restaurant employees work with the public and can spread infectious diseases like influenza. Yet restaurant employees are a hard-to-reach population that has not been well studied.

An unpublished analysis of publicly available data¹⁰ indicates that, compared to other employees in WA, restaurant employees are 2 to 3 times more likely to be members of racial/ethnic minorities, to have low education and income, and to be without health insurance or a regular health care provider. Together, these factors suggest WA restaurant employees likely have low vaccination rates for influenza.¹¹ Furthermore, national data suggest restaurant employees are at greater risk of developing severe pandemic influenza (H1N1) than employees in many other industries.¹²

The restaurant industry employs approximately 10% of the WA and national workforces.^{13,14} In 2009, more than 130 million Americans were food-service patrons each day.¹⁵ Increased vaccination rates among restaurant employees could protect millions of employees and patrons from influenza.

The objective of this study was to assess influenza vaccination rates and attitudes among Seattle restaurant employees, to identify factors that could enhance the success of a restaurant-based vaccination program. This work informed the design of a trial intervention to increase vaccination rates in this population.

● Methods

We invited employees at 11 restaurant sites (affiliated with 4 local Seattle restaurant groups) to complete an anonymous pencil-and-paper survey between August and October 2012.

Full-service restaurants in or near Seattle, Washington, were eligible to participate if they had no previous history of offering worksite influenza vaccinations and had more than 20 employees who were older than 18 years and spoke either English or Spanish.

We initially approached restaurants via a routine meeting of the trade association of Seattle restaurants and had follow-up discussions with 14 restaurant groups. Of these, 7 groups declined, 3 were ineligible, and 4 enrolled. Of the 4 enrolled groups, 3 had multiple (3-4) restaurant sites, and 1 had a single site; the study was conducted at 11 restaurant sites. National chains were not ineligible, though none participated.

We sought to survey all employees at the enrolled restaurants; surveys and consent forms in English and Spanish were made available in person to as many work shifts as possible. Each employee who completed a survey was offered \$5.00 in cash. We invited employees in all positions (servers, bussers, kitchen staff, chefs, managers, etc) to complete the survey, which included questions on demographics, previous influenza vaccination, and personal attitudes toward influenza vaccination (using a 5-point Likert-type scale: 1 = *strongly disagree*; 5 = *strongly agree*). The research protocol was approved by the University of Washington institutional review board, and participants provided written consent.

Within the survey, we framed influenza vaccination around injection ("flu shot"), rather than a more general term that would include the intranasal spray. Injection is the vaccination method most likely to be offered in a restaurant-based vaccination program and would be less challenging than intranasal spray due to fewer contraindications among adults.¹⁶

The association of attitudes toward influenza vaccination with previous vaccination status and race/ethnicity was assessed using 2 sets of logistic regression models for each attitude statement, with adjustment for age (categorical), sex (binary), and education level (categorical) ($\alpha = 0.05$). Agreement level (1-5) was dichotomized and was treated as the dependent variable in the regression analysis for each attitude statement. Subjects with missing data were excluded from analyses as necessary; the percentage of missing data was very low for all variables (<3%) and would not be expected to impact the validity of the findings. The survey data were analyzed using Stata 11 (StataCorp, College Station, Texas).

● Results

We collected 428 complete surveys, with an overall survey response rate of 74% (total employees surveyed divided by total employees at participating restaurants).

Of restaurant employees, 26% reported receiving seasonal influenza vaccination in 2011-2012 (Table). Vaccination rates were higher among Hispanics (31.4%) than among non-Hispanic whites (25.0%), and this difference was statistically significant after adjusting for age, sex, and education (adjusted odds ratio = 1.74; 95% CI: 1.12-2.72; further odds ratios not presented).

We grouped attitudes toward influenza vaccination into 6 categories: relevance, effectiveness, side effects, convenience, cost, and norms. Participants reported little concern about potential side effects and cost of vaccination, although few believed vaccination was relevant to their age group or normative at their workplace (Figure). Participants who received influenza vaccination in 2011-2012 were significantly more likely to report positive attitudes than those who were unvaccinated, with particularly large differences in the categories of effectiveness and relevance of the vaccine. Only in the positive perceptions of vaccine cost did we find no significant difference between the attitudes of the vaccinated and unvaccinated.

Regardless of vaccination status, Hispanics were significantly more likely to report positive attitudes toward influenza vaccination than white participants, excepting positive perceptions of cost and side effects, which were similar between the 2 groups (Figure). Both groups were most negative about vaccination relevance and norms, and whites reported additional concerns about convenience and effectiveness.

● Discussion

Restaurant employees represent an important opportunity for influenza vaccination: they are a substantial portion of the US workforce, interact closely with the public, and previous evidence suggests they may be at greater risk for contracting influenza than employees in many other industries.¹² Our results suggest that restaurant employees in Seattle have low vaccination rates against seasonal influenza. Given these low rates, however, attitudes toward vaccination were more positive than expected, with previously vaccinated participants reporting more positive attitudes than unvaccinated participants, and Hispanics reporting more positive attitudes than non-Hispanic whites.

We examined attitudes by vaccination status to identify differences, which could inform future interventions. Previously unvaccinated employees were less likely to agree that influenza is a serious disease for their age group, and that vaccination would protect them and close associates from infection. If these negative perceptions of vaccine relevance and effectiveness could be altered through educational outreach tailored to this audience, vaccination rates might be raised.

Furthermore, even vaccinated participants expressed ambivalence about vaccination: 60% were neutral or negative about the vaccine's relevance for their age group (Likert 1-3), and 35% were neutral or

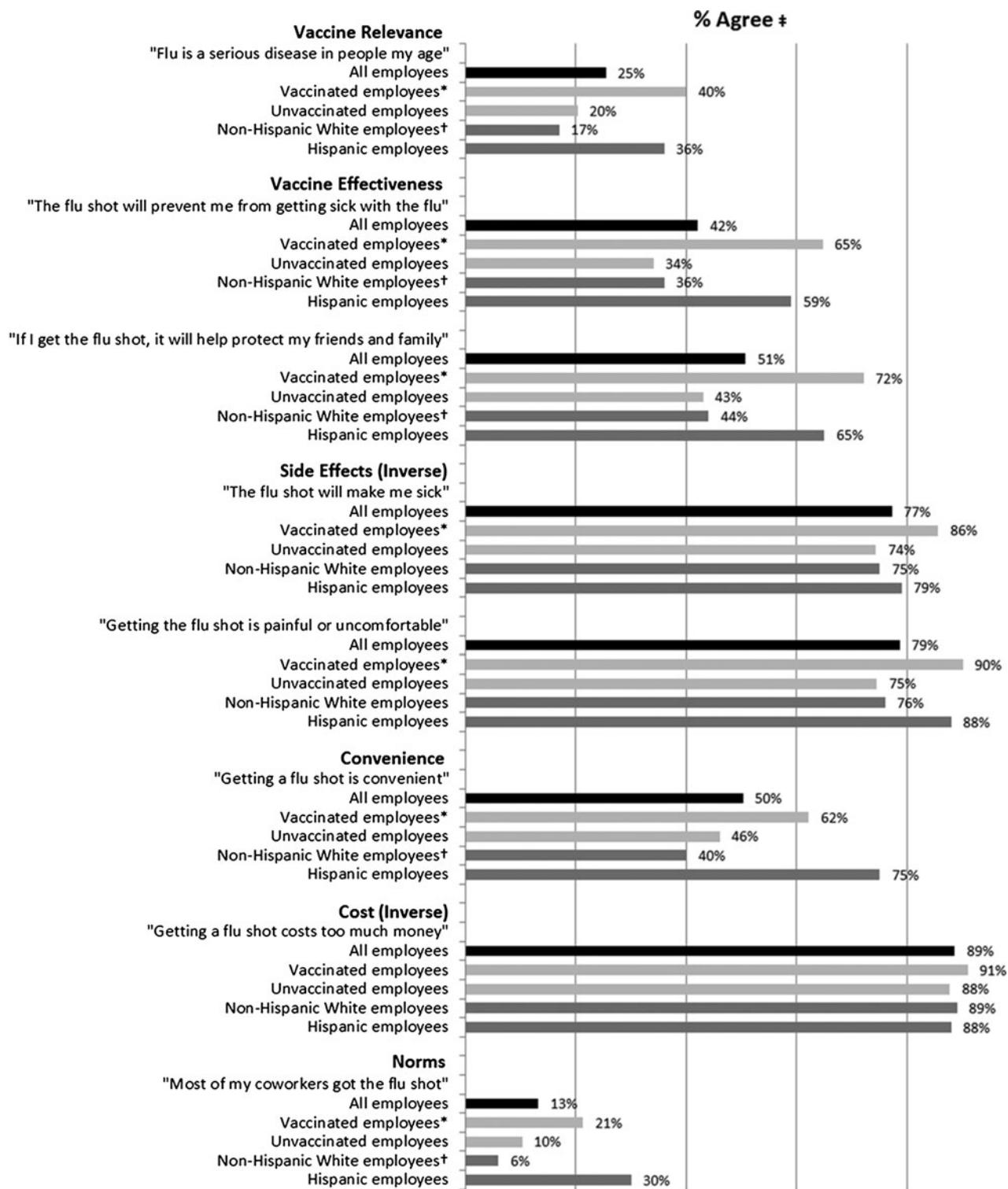
TABLE 1 ● Demographic and Seasonal Influenza Vaccination Data for a Sample of Seattle Restaurant Employees

Variable ^a	Category	Percent of Sample, (n)	Percent Vaccinated for Seasonal Influenza in 2011-2012
Sex	Male	65.9 (282)	26.6
	Female	33.2 (142)	25.4
Race/Ethnicity	Non-Hispanic white	56.1 (240)	25.0
	Hispanic	27.6 (118)	31.4
Age	Other†	16.4 (70)	21.4
	18-24	22.9 (98)	30.6
	25-34	40.7 (174)	27.6
	35-44	22.7 (97)	18.6
	45-54	11.4 (49)	28.6
	55-64	2.1 (9)	22.2
Education	65+	0.0 (0)	NA
	Less than high school	6.5 (28)	17.9
	High school or GED	22.2 (95)	28.4
	Some college or tech school	44.4 (190)	27.4
	College graduate	26.4 (113)	24.8
	Total	100.0 (428)	26.2

^aMissing data by variable: Sex (n = 4), Age (n = 1), Education (n = 2).

†Includes non-Hispanic members of these groups: black, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaskan Native, those who selected multiple races, "other," "prefer not to answer," or left the race question blank.

FIGURE ● Seattle Restaurant Employees' Attitudes Toward Seasonal Influenza Vaccination by Vaccination Status (2011-2012) and Race/Ethnicity (Total [n = 416-422]; 26.2% Vaccinated; Hispanic [n = 118]; Non-Hispanic White [n = 240])



* Statistically significant difference by vaccination status, adjusted for age, sex, education ($p < 0.05$)

† Statistically significant difference by race/ethnicity, adjusted for age, sex, education ($p < 0.05$)

‡ "Agree" represents Likert responses 4 or 5, except for Side Effects and Cost where Likert responses 1, 2, or 3 represent positive attitude [Inverse].

disagreed that the vaccine would prevent influenza. This suggests that even restaurant employees who received the vaccine did not necessarily do so because of strong positive attitudes, revealing further opportunities to build consensus that seasonal influenza vaccination is relevant and effective for all age groups.

Much of the literature on racial/ethnic minorities and influenza vaccination¹⁷⁻¹⁹ focuses on cultural and attitudinal barriers that may lower vaccination rates. For this reason, our finding that Hispanic restaurant employees held such positive attitudes toward vaccination was intriguing. Hispanics reported little concern about vaccine cost, convenience, or side effects, and less concern than their white colleagues about vaccine effectiveness. The role of Hispanic ethnicity in specific health behaviors and outcomes is complex and has often been confounded by other factors,²⁰ but there is evidence that Hispanics may be more trusting of the US health care system than non-Hispanics²¹ and, across age-groups, more likely than some other racial/ethnic groups to be open to vaccination.²² In addition, this study took place within a few years of the pandemic influenza outbreak of 2009. This outbreak was deadliest in Mexico and other Latin American countries and disproportionately affected children and young adults.^{23,24} Seattle restaurant employees with ties in Mexico and South America may have been inclined to take influenza vaccination more seriously than their colleagues in the years directly following the pandemic.

Although Hispanics were much more positive about vaccination than their white colleagues, vaccination relevance and norms still emerge as areas of concern for both groups. Perceptions of norms are likely to shift along with actual vaccination rates, so the key areas for future interventions to address may be perceived effectiveness and relevance of influenza vaccination: influenza can be a serious disease for adults of all age groups, vaccination is effective, and working-age adults should be vaccinated. Of note, the Centers for Disease Control and Prevention only recently began recommending that all adults receive seasonal influenza vaccination, and many working-age adults (such as restaurant employees) still may not realize or believe that vaccination is appropriate for them.

This study has some potential limitations. Surveys were offered to employees at 11 restaurant sites in a single city. On the basis of our observations, however, we believe that different managers and geographical locations contributed to distinct cultures within each of the 11 restaurants. We did not find previously published information on vaccination levels and attitudes among restaurant employees.

Efforts to increase influenza vaccination rates among restaurant employees could help protect a substan-

tial portion of the US workforce from influenza, as well as the public with whom they work so closely. While we found that attitudes toward vaccination vary significantly by previous vaccination status and race/ethnicity, overall relatively few employees agreed that influenza is a serious disease for their age group and that vaccination is effective. Our data suggest interventions aimed at increasing vaccination among restaurant employees should focus on highlighting the vaccine's relevance and effectiveness for working-age adults.

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