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## Promoting Influenza Vaccination to Restaurant Employees

**Meredith C. Graves, PhD, Jeffrey R. Harris, MD, MPH, MBA, Peggy A. Hannon, PhD, MPH, Kristen Hammerback, MA, Amanda T. Parrish, MA, Faruque Ahmed, PhD, Chuan Zhou, PhD, Claire L. Allen, MPH**

Meredith C. Graves, PhD, is with VA Puget Sound Health Care System, Seattle, WA. Jeffrey R. Harris, MD, MPH, MBA; Peggy A. Hannon, PhD, MPH; Kristen Hammerback, MA; Amanda T. Parrish, MA; Chuan Zhou, PhD; and Claire L. Allen, MPH, are with the Department of Health Services, University of Washington School of Public Health and Jeffrey R. Harris, MD, MPH, MBA; Peggy A. Hannon, PhD, MPH; Kristen Hammerback, MA; Amanda T. Parrish, MA; and Claire L. Allen, MPH, are with the Health Promotion Research Center, a Centers for Disease Control and Prevention Research Center, Seattle, Washington. Faruque Ahmed, PhD, is with the Immunization Services Division, Centers for Disease Control and Prevention, Atlanta, Georgia. Chuan Zhou, PhD, is with the Seattle Children's Research Institute, Seattle, Washington.

### Abstract

**Purpose.**—To evaluate an evidence-based workplace approach to increasing adult influenza vaccination levels applied in the restaurant setting

**Design.**—We implemented an intervention and conducted a pre/post analysis to determine effect on vaccination.

**Setting.**—Eleven Seattle-area restaurants.

**Subjects.**—Restaurants with 25+ employees speaking English or Spanish and over 18 years.

**Intervention.**—Restaurants received influenza vaccination promotion materials, assistance arranging on-site vaccination events, and free influenza vaccinations for employees.

**Measures.**—Pre/post employee surveys of vaccination status with direct observation and employer interviews to evaluate implementation.

**Analysis.**—We conducted descriptive analysis of employee survey data and performed qualitative analysis of implementation data. To assess intervention effect, we used a mixed-effects logistic regression model with a restaurant-specific random effect.

**Results.**—Vaccination levels increased from 26% to 46% (adjusted odds ratio 2.33, 95% confidence interval 1.69, 3.22), with 428 employees surveyed preintervention, 305 surveyed postintervention, and response rates of 73% and 55%, respectively. The intervention was effective across subgroups, but there were restaurant-level differences.

**Conclusion.**—An access-based workplace intervention can increase influenza vaccination levels in restaurant employees, but restaurant-level factors may influence success.

**Keywords**

Influenza; Vaccination; Immunization; Workplace; Employee; Promotion; Prevention Research; Manuscript format: research; Research purpose: intervention testing; Study design: pre/post analysis; Outcome measure: behavioral; Setting: workplace; Health focus: medical self care; Strategy: behavior change; Target population age: adults; Target population circumstances: low-income; Hispanic/Latino

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**PURPOSE**

Adults between 18 and 64 years of age experience morbidity and productivity losses associated with influenza. The Centers for Disease Control and Prevention recommends influenza vaccination for all people over 6 months of age; however, in 2011–2012, vaccination levels among adults 18 to 49 and 50 to 64 years of age were only 29% and 43%, respectively.<sup>1,2</sup>

Workplace-based vaccination programs are an effective strategy for increasing influenza vaccination rates among working-age adults. Employers' use of evidence-based promotion practices is associated with increases in employee vaccination levels.<sup>3–5</sup>

Workplace-based promotion of vaccination could help reach restaurant employees, which is important because of their low vaccination rates, frequent lack of sick leave, exposure to the public, and large numbers.<sup>6–9</sup>

We present results of a pilot study to increase restaurant employees' vaccination rates using evidence-based workplace promotion practices. Our objectives were to evaluate implementation, to determine the effect of the intervention on vaccination rates, and to assess the necessary resource investment.

**METHODS****Design**

In the fall of 2012, we implemented an intervention intended to increase vaccination rates through improved access and communication practices. We conducted a pre/post analysis. The University of Washington Institutional Review Board reviewed the study procedures and declared the study exempt. Survey participants gave written consent.

**Sample**

We recruited a convenience sample of restaurants in the Seattle area with at least 25 employees speaking English or Spanish and at least 18 years of age. A sample size of 250 employees was required for analysis and we aimed to include at least 10 restaurants. One restaurant was excluded because it had offered influenza vaccination to employees in the past.

## Intervention

To improve physical access, we arranged for a community vaccination vendor to provide on-site vaccination at each restaurant. To address financial access, vaccination was provided free of cost for employees. Cost was covered by the study; employers did not contribute. To improve communication practices, employers were given posters, flyers, and model e-mails and text messages to publicize the event and promote vaccination. We also recommended making group announcements about the event and speaking one on one with employees.

## Measures and Data Collection

Employees were surveyed twice, providing data on vaccination rates for the year before the intervention and for the intervention year. Surveys included demographics and an index of employee attitudes. Employees were offered \$5 for survey completion. An additional survey was offered to employees vaccinated at workplace events to assess demographics, vaccination history, and the number vaccinated.

Two researchers visited each restaurant during its vaccination event to conduct a site audit. They observed implementation, including use of communication practices and management attitude.

Finally, owners and managers were invited to complete a postintervention telephone survey about their time investment and attitudes. For chains, we attempted to survey both chain owners/managers and location managers. Responses to quantitative items related to attitude were summarized with an index ranging from 0 to 20. Qualitative data were also collected regarding implementation experiences and attitudes, including successes, challenges, beliefs about vaccination effectiveness, and susceptibility of employees to influenza.

## Analysis

We conducted descriptive analysis of the demographic characteristics and vaccination history of employees. We calculated the mean and variance of the employer attitude index and characterized the variation in qualitative observations. Implementation analysis was conducted qualitatively using measures from the site audits and employer interviews.

We tested the significance of the association between the intervention and the likelihood that an employee was vaccinated using a mixed-effects logistic regression model with a restaurant-specific random effect.

We calculated the difference in vaccination rate for each restaurant and descriptively compared these differences to baseline vaccination rate, management attitude, employee attitude at baseline, and selected implementation measures. The analysis was conducted using Stata 11 (StataCorp, College Station, Texas).

## RESULTS

Eleven restaurant sites participated, including three chains with three to four restaurants each and one single-site restaurant. Restaurant size ranged from 20 to 125 employees. We collected site-audit data at all restaurants. An owner or manager of each chain and the

single-site restaurant were surveyed. For 8 of 10 chain locations, a location manager was also surveyed.

### Implementation

Restaurants found arranging vaccination events easy, but access and use of communication practices differed by restaurant. Employers found identifying a suitable location challenging; only a portion chose high-traffic areas. Selecting an ideal event time was also difficult. Events were limited to 2 hours and shift schedules limited employee availability. We observed variation in whether employers scheduled events during fully staffed hours. Employers used three to five of six recommended communication methods, with posters and text messages used most and least frequently, respectively.

### Management Attitude

We also observed differences in management attitude among restaurants. Scores on the management attitude index ranged from 10 to 20 with a mean of 16.7 (SD = 3.4). Based on the qualitative data, managers generally had positive attitudes regarding vaccination and the intervention. However, two expressed negative views, with one stating that it was not management's role to promote vaccination and another joking with employees that vaccination would make them sick.

### Outcomes

Sample sizes were 428 preintervention and 305 postintervention, yielding response rates of 73% and 55%, respectively. Demographics of respondents were similar for both surveys. About 30% were Hispanic and the majority of the remainder were non-Hispanic whites. The most prevalent education level was some college or tech school. Sixty-two percent of postintervention survey respondents had health insurance. Differences in baseline vaccination rate by demographic characteristics have been described previously.<sup>10</sup>

Self-reported vaccination rates increased 20 percentage points after the intervention, from 26% the year before the intervention to 46% at follow-up. A total of 210 employees, or approximately 34.5%, were vaccinated at workplace vaccination events. The intervention was equally successful in raising vaccination rates in Hispanics and non-Hispanic whites and was particularly effective in those with less than a high school education. Approximately one-third of all employees and nearly 50% of Hispanic employees vaccinated at the workplace vaccination event received influenza vaccination for the first time.

The regression analysis showed that the intervention was associated with a significant increase in the likelihood that an employee was vaccinated. The adjusted odds ratio for vaccination comparing the intervention year to the previous year was 2.33 (95% confidence interval 1.69, 3.22).

Five restaurants had large vaccination rate increases, ranging from 26 to 46 percentage points, whereas six had small increases, from 2 to 14 percentage points. No single factor fully explained these differences. However, five of the six with small changes had evidence

of poor management attitudes based on observations or site audits, whereas management attitudes were average or above at all of the more successful restaurants.

### **Resource Investment**

Employers spent an average of 2 hours and 40 minutes on the intervention. Based on their reported salaries, this equates to \$60.00 to \$120.00. The total cost of providing on-site vaccination was approximately \$500 to \$600 per restaurant or about \$25 per vaccination.

## **DISCUSSION**

Evidence-based practices to increase influenza vaccination rates can be successfully implemented in the restaurant setting. The combination of free workplace availability of influenza vaccination and management promotion increased vaccination rates among restaurant employees. The increase in vaccination rates was achieved with only modest time investment for managers. Despite universal availability of free on-site vaccination, there was variation in the size of the change in vaccination rates across restaurants. This may be attributable to differences in implementation and management attitude.

The intervention is noteworthy not only because it succeeded in increasing vaccination rates, but because it was equally successful in changing a health behavior across demographic subcategories and eliminated disparities in vaccination rate by education level. This is a particular achievement because many of the Hispanic employees were Spanish speaking, increasing the challenge of reaching them with the intervention.

This study has some potential limitations. Vaccination rates before and after the intervention were self-reported, the pre/post design limits inference, and restaurants were not randomly selected. Additionally, validity and reliability of our attitude measures are unknown. Preintervention and postintervention survey response rates differed, though sensitivity analyses showed no impact on results. Additionally, restaurants were not required to cover the costs of vaccination, and the expense could limit adoptability.

Given the promising results of this pilot study, a large, randomized study would be appropriate to further evaluate effectiveness, investigate variation, and address our design limitations. Consideration should also be given to strategies for dissemination, including potential organizational partnerships. Access-based interventions, which make vaccinations free and convenient, have promise in increasing vaccination rates among restaurant employees and merit further study.

### **Acknowledgments**

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention. At the time this work was completed, Meredith C. Graves was with the Department of Health Services, University of Washington School of Public Health, Seattle, WA.

## References

1. Centers for Disease Control and Prevention. Prevention and control of influenza with vaccines. Recommendations of the advisory committee on immunization practices (ACIP). MMWR Recomm Rep. 2010;59:1–62.
2. McIntyre AF, Gonzalez-Feliciano AG, Santibanez TA, et al. Flu vaccination coverage, United States —2011–12 season. Available at: [http://www.cdc.gov/flu/professionals/vaccination/coverage\\_1112estimates.htm](http://www.cdc.gov/flu/professionals/vaccination/coverage_1112estimates.htm). Accessed November 2, 2013.
3. Guide to Community Preventive Services. Interventions to promote seasonal influenza vaccinations among non-healthcare workers. Taskforce Finding and Rationale Statement. Available at: <http://www.thecommunityguide.org/worksites/flunon-hcw.html>. Accessed October 10, 2013.
4. Strunk C Innovative workplace vaccination program: boosting employee immunization rates. AAOHN J. 2005;53: 432–437. [PubMed: 16255525]
5. Nowalk MP. Improving influenza vaccination rates in the workplace: a randomized trial. Am J Prev Med. 2010;38: 237–246. [PubMed: 20036102]
6. Bureau of Labor Statistics. National compensation survey. Table 6: selected paid leave benefits: access. Available at: <http://www.bls.gov/news.release/ebs2.t06.htm>. Accessed November 20, 2013.
7. Bureau of Labor Statistics. Labor force statistics from the current population survey. Table 11: employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity. Available at: <http://www.bls.gov/cps/cpsaat11.htm>. Accessed October 10, 2013.
8. Bureau of Labor Statistics. National compensation survey. Table 2: medical care benefits: access, participation, and take up rates. Available at: <http://www.bls.gov/news.release/ebs2.t02.htm>. Accessed October 15, 2013.
9. Takayama M, Wetmore CM, Mokdad AH Characteristics associated with the uptake of influenza vaccination among adults in the United States. Prev Med. 2012;54:358–362. [PubMed: 22465670]
10. Parrish AT, Graves MC, Harris JR, et al. Influenza vaccination status and attitudes among restaurant employees. J Public Health Manag Pract. 2015;21:E10–E15.

**SO WHAT? Implications for Health Promotion Practitioners and Researchers**

**What is already known on this topic?**

Influenza vaccination rates are low among adults 18 to 64. Workplace-based programs can increase influenza vaccination rates among adults in this age group.

**What does this article add?**

This article offers evidence that workplace-based vaccination programs can be successfully adapted to the restaurant setting with minimal resource investment. Improving physical and financial access to influenza vaccination increased vaccination levels across all restaurants, though there was variation among restaurants in the size of the improvement. The study also demonstrated an approach to addressing disparities in vaccination levels and reaching previously unvaccinated workers across racial/ethnic groups.

**What are the implications for health promotion practice or research?**

Access-based interventions in the restaurant industry setting have the potential to increase influenza vaccination levels across demographic groups. Further research is needed to assess the impact of intervention components and the effect of local-level factors on intervention success.

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