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Short Communication

Change in settings for early-season influenza vaccination among US adults, 2012 to 2013

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ABSTRACT

Vaccination in non-medical settings is recommended as a strategy to increase access to seasonal influenza vaccine. To evaluate change in early-season influenza vaccination setting, we analyzed data from the National Internet Flu Survey. Bivariate comparison of respondent characteristics by location of vaccination was assessed using chi-square tests. Multinomial logistic regression was performed to compare the predicted probability of being vaccinated in medical, retail, and mobile settings in 2012 vs 2013. In both 2012 and 2013, vaccination in medical settings was more likely among elderly adults, those with chronic conditions, and adults with a high school education or less. Adults 18–64 without a chronic condition had a lower probability of vaccination in the medical setting, and higher probability of vaccination in a retail or mobile setting, in 2013 compared to 2012. Adults 18–64 with a chronic condition had no change in their location of flu vaccination. Elderly adults had a lower probability of vaccination in the medical setting, and higher probability of vaccination in a retail setting, in 2013 compared to 2012. Non-medical settings continue to play an increasing role in influenza vaccination of adults, particularly for adults without a chronic condition and elderly adults. Retail and mobile settings should continue to be viewed as important mechanisms to ensure broad access to influenza vaccination.

1. Introduction

Vaccination in non-medical settings is recommended as a strategy to increase access to seasonal influenza vaccine. (Fiore et al., 2010) National data from the 2011–2012 influenza season showed that 57% of adults ≥18 years received influenza vaccine in medical settings, such as a doctor's office, while the remaining 43% were vaccinated in non-medical settings. (Lu et al., 2014) Prior research has shown a downward trend in influenza vaccination in medical settings, with a corresponding upward trend in vaccination in non-medical settings. (Lu et al., 2014) In addition, the setting for influenza vaccination has been shown to vary by characteristics such as age, race/ethnicity, education level, and chronic condition status. (Lu et al., 2014; Centers for Disease Control and Prevention (CDC), 2011).

To build upon these findings using more recent national data, our objective was to explore changes in place of early season influenza vaccination among adults from 2012 to 2013, by age and chronic condition status. We hypothesized that for elderly persons and non-elderly adults with chronic diseases, medical settings would predominate, with minimal change across the two years studied. Conversely, we hypothesized that non-elderly adults without chronic conditions would have less vaccination in medical settings, and would demonstrate a shift toward increasing use of non-medical settings across the two years studied. Studying changes in place of vaccination can support public health officials' efforts to increase flu vaccine coverage rates among adults by offering guidance on whether educational campaigns, public health funding opportunities, and immunization policy initiatives are appropriately targeted.

2. Methods

2.1. Study design

In November 2012 and November 2013, we conducted the National Internet Flu Survey, a nationally representative, cross-sectional survey of US adults using the internet-enabled KnowledgePanel® (GfK Custom Research, LLC). The purpose of the National Internet Flu Survey was to provide information on early-season influenza vaccination results (Santibanez et al., 2012; Srivastav et al., 2013) for use by vaccination campaigns during National Influenza Vaccination Week. The study was approved by the University of Michigan Medical School Institutional Review Board.

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2.2. Survey sample and administration

KnowledgePanel® members have been selected by GfK using address-based probability sampling and cover approximately 97% of US households. (GfK, 2013) Households without internet access at the time of panel enrollment are given a web-enabled computer and free internet service. For these surveys, a random sample of KnowledgePanel® members was invited to participate. Panel members in racial/ethnic minority groups were oversampled to ensure adequate representation in the results. Surveys were fielded by GfK during the first 2 weeks of November, in both English and Spanish. The completion rate was 63% (5057 of 8039) in 2012 and 59% (5333 of 9039) in 2013.

2.3. Survey questions

In the 29-question survey, respondents reported their influenza vaccination status for that year's influenza season, as of the time of survey completion; whether they had visited a health professional since July of the survey year; and whether they had any of 10 health conditions that would place them at increased risk for influenza complications. Those who had received influenza vaccine indicated the setting for vaccination, selecting from 13 options, including *other*.

2.4. Data analyses

GfK provided a data file with survey responses, respondent demographic information (age, gender, race/ethnicity, and education attainment) from KnowledgePanel® member profile data, and U.S. Census-based post-stratification weights to match the U.S. population distribution on respondent sex, age, race/ethnicity, education, and U.S. Census region. The weights include adjustments for survey nonresponse and are applied to the survey data to produce nationally representative response estimates. (GfK, 2013; Dennis, 2010).

For each survey year, among respondents who had received influenza vaccine by the time of survey completion, we explored differences in the setting for vaccination by respondent age, gender, race/ethnicity, education level, chronic condition status, and attendance at a health care visit since July of that year. For analysis purposes, the 13 response options for place of vaccination were classified into 3 groups: medical (doctor's office, clinic or health center, hospital, health department), retail (pharmacy or drugstore, supermarket or grocery store), and mobile (workplace, school, senior center, nursing home, military, home). These 3 groups represent the outcome of interest (location of vaccination). Bivariate comparison of respondent characteristics by location of vaccination was assessed for each year using chi-square tests. A multinomial logistic regression model was performed to compare the predicted probability of being vaccinated in each location, in 2012 vs 2013, for the three groups traditionally used in adult flu vaccination recommendations and coverage assessments: adults 18–64 without a chronic condition, adults 18–64 with a chronic condition, and adults ≥65 years. The model included year, age group/chronic condition and the interaction of year by age group/chronic condition variable.

Analyses were conducted using Stata 12 (Stata Corp, College Station, TX). Weighted proportions and predicted probabilities are reported.

3. Results

Among respondents to the National Internet Flu Survey, 35% in 2012 and 39% in 2013 had received influenza vaccine at the time of survey completion. Table 1 presents the setting for vaccination, overall and by respondent characteristics. Overall, medical settings were the most commonly reported place of vaccination, but the proportion declined from 2012 to 2013, with a concurrent increase for both retail and mobile settings.

In both 2012 and 2013, setting for vaccination varied significantly by age, gender, education level, chronic condition status, and attendance at a health care visit since July (Table 1). In both years, a greater proportion of elderly (≥65 years) were vaccinated in medical settings, compared to non-elderly adults, and adults 18–49 years were more likely than older adults to be vaccinated in mobile settings. Adults with a high school education or less, with a chronic condition, and with a health care visit after July 1 of the calendar year all had higher proportions of vaccination in a medical setting in both years, compared to those with more education, no chronic condition, and no health care visit, respectively.

Table 2 presents the comparison of the predicted probability of flu vaccination generated from the multinomial logistic regression model in different settings (medical, retail, and mobile) for 2012 vs 2013 survey respondents. Adults 18–64 without a chronic condition had a lower probability of vaccination in a medical setting in 2013 compared to 2012; though not significant, adults 18–64 without a chronic condition had a higher probability of vaccination in retail and mobile settings in 2013 compared to 2012. Adults 18–64 with a chronic condition had no change in their location of flu vaccination. Elderly adults had a lower probability of vaccination in a medical setting, and higher probability of vaccination in a retail setting, in 2013 compared to 2012.

4. Discussion

The initial recommendation for universal flu vaccination of all persons ≥6 months of age recognized that utilization of non-medical settings would be important for expanding access to influenza vaccine, (Fiore et al., 2010) especially to persons who do not regularly access the health care system. (Fiore et al., 2010; Uscher-Pines et al., 2010; National Vaccine Advisory Committee (NVAC), 2012) Findings from this study indicate that non-medical settings continue to play an increasing role in influenza vaccination of adults; adults without a chronic condition and elderly adults demonstrated a decreased proportion of vaccination in medical settings from 2012 to 2013. In contrast, adults with a chronic condition did not experience a change in their use of medical settings for flu vaccination. Between 2012 and 2013, early-season flu vaccination rates showed a larger increase (35% to 39%) than comparable end-of-season flu vaccination rates (41.5% to 42.2%), (Centers for Disease Control and Prevention, 2013b, 2014a) which suggests that non-medical settings may facilitate earlier vaccination. To provide a more nuanced look at non-medical settings, this study divided non-medical settings into two different categories: retail and mobile. Retail settings, such as pharmacies, were integral to 2009–2010 H1N1 vaccination efforts, (Association of State and Territorial Health Officials, 2009) and have continued to expand their immunization capacity. (American Pharmacists Association, 2013) Retail settings are advantageous because they are very accessible to the general public – almost 95% of the US population lives within 5 miles of a community pharmacy (National Vaccine Program Office, 2016) – and most have existing expertise and infrastructure for administering immunizations and promoting vaccines through mass media campaigns. (Rothholz, 2013) The use of retail settings for flu vaccination increased from 2012 to 2013 among both the elderly population and younger adults without a chronic condition.

For mobile settings, only younger adults without chronic conditions demonstrated an increase from 2012 to 2013, which was predominantly driven by workplace vaccination. Factors contributing to this increase could include the employee wellness program incentive policies created by the Affordable Care Act (US Department of Labor, 2014) and implementation of strategies to increase coverage rates among health care personnel. (National Vaccine Advisory Committee, 2012) The promotion of flu vaccination among large employers across many industry sectors is promising. (Graves et al., 2014).

To fully realize the benefits of vaccination in non-medical settings, as well as continue to support vaccination in medical settings, public health officials must continue to mitigate barriers to vaccination. For example, while the Affordable Care Act mandates coverage of vaccines, including flu vaccine, some health plans limit their coverage to certain