Vaccine 34 (2016) 2671–2678

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Reasons given for not receiving an influenza vaccination, 2011–12 influenza season, United States☆

Tammy A. Santibanez*, Erin D. Kennedy

Centers for Disease Control and Prevention, Atlanta, GA, United States

ARTICLE INFO

Article history:
Received 14 January 2016
Received in revised form 11 April 2016
Accepted 13 April 2016
Available online 24 April 2016

Keywords:
Adult
Child
Influenza, Human
United States
Vaccination

ABSTRACT

Background: Influenza vaccination coverage in the United States remains below national targets and racial/ethnic differences persist.
Objectives: To gain insights into potential strategies for improving influenza vaccination by examining reasons given for not receiving an influenza vaccination during the 2011–12 influenza season.
Methods: Data from the National Flu Survey were analyzed for the 2011–12 influenza season.

Tests of association between reasons for non-vaccination and demographic variables were conducted using Wald chi-square tests. Multivariable logistic regression analyses were used to determine variables independently associated with each reason for non-vaccination.
Results: For adults and children, there were no racial/ethnic differences in the overall most frequent reason for non-vaccination: "unlikely to get very sick from the flu". Regarding adults, there were racial/ethnic differences in seven of the twelve reasons for non-vaccination in bivariate analyses, but only three remained significant in the multivariable models. Most notable of these was that blacks (40.9%) were more likely than Hispanics (27.0%), whites (25.2%), and adults of other/multiple races (21.2%) to report concerns about getting the flu from the vaccination and blacks (39.8%) were more likely than whites (28.4%) and adults of other/multiple races (29.3%) to report concerns about side effects from the vaccine. Regarding children, there were racial/ethnic differences for three of the reasons for non-vaccination, and these remained significant in the multivariable models. The most noteworthy of these was that more black (44.4%) than white (24.0%) and other/multiple race (19.0%) parents had concerns about their child getting the flu from the vaccination. Other demographic variables (age, gender income, MSA for adults and age and income for children) were also associated with reasons for non-vaccination based on the multivariable models.
Conclusions: There are racial/ethnic group differences in reasons for not receiving an influenza vaccination; recognition of these differences should guide the choice of interventions to increase vaccination rates.

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1. Introduction

Since 2010, the Advisory Committee for Immunization Practices has recommended influenza vaccination for all people ≥6 months of age [1]. Yet, during the 2014–15 influenza season, only 43.6% of adults and 59.3% of children were vaccinated [2]. These rates remain below the national *Healthy People 2020* target of 70% influenza vaccination coverage for adults and children [3]. Furthermore, racial/ethnic differences in influenza vaccination coverage have been persistent, with coverage being even lower for some racial/ethnic groups [4,5].

Many evidence-based strategies have been promoted for increasing influenza vaccination coverage, including but not limited to standing orders, provider reminders and recommendations, expanding access to vaccination services by reducing cost, and having vaccinations available at schools and pharmacies and other non-medical sites [6,7]. These strategies do not take into account specific patient attitudes; however, these strategies have been shown to work regardless of patient attitude [8]. Yet attitudes play a role in accepting vaccination as evidenced by a study of pregnant women which found the percentage vaccinated among women recommended and offered vaccine by their physician was 77.2% for those with a positive attitude about vaccine efficacy compared with 15.4% for those with a negative attitude; the percentages vaccinated were 79.2% for those with a positive and 26.1% for those

☆ The findings and conclusions in this paper are those of the authors and do not necessarily represent the views of CDC.

* Corresponding author at: Centers for Disease Control and Prevention, 1600 Clifton Road, NE, Mailstop A-19, Atlanta, GA 30329-4027, United States.
E-mail address: afz5@cdc.gov (T.A. Santibanez).

http://dx.doi.org/10.1016/j.vaccine.2016.04.039
0264-410X/Published by Elsevier Ltd.

with a negative attitude about vaccine safety [9]. An exploration of reasons for non-vaccination, by quantifying the most common reasons given for non-vaccination, could be useful to healthcare providers and immunization programs so that they are better prepared to address the concerns of patients. This could aid efforts to increase vaccination rates and decrease disparities in influenza vaccination. The objective of this study was to examine the reasons given for not receiving an influenza vaccination for adults and for children overall and by racial/ethnic group.

2. Methods

2.1. Survey description

Data from the National Flu Survey (NFS) were analyzed. The NFS was designed to provide rapid national estimates of influenza vaccination coverage and knowledge, attitudes, and practices during the influenza season and again at the end of the season. The NFS was sponsored by CDC and conducted by NORC at the University of Chicago in November 2010, March and November 2011, and lastly in March 2012 [10]. This study used data from the March 2012 NFS which included interviews conducted during March 1–29, 2012. The sample for the NFS was a list-assisted random digit-dial sample of both landline and cellular telephones. The interviews were conducted in English or Spanish with language line interpretation services used to conduct the survey in other languages as needed. Cellular telephone respondents were screened into the survey if they were a "cell telephone only" household (i.e., they reported that they do not maintain a landline telephone in their household) or a "cell telephone mainly" household (i.e., they maintain a landline but are unlikely to answer it if it rings while an adult is at home), and they were ≥18 years. For the landline sample, the youngest male ≥18 years currently at home was selected to be interviewed; if there were no males at home, the youngest female ≥18 years was selected [11]. For the cell telephone sample, the adult who answered the cell phone was selected to be interviewed. For interviews pertaining to children, the adult respondent was asked the ages of all children in the household younger than 18 years and one child was randomly selected. Then the interviewer stated that for the next section they needed to talk to the parent or guardian living in the household who knows about the health and health care of the selected child. If the respondent was the parent/guardian they continued with the survey; if they were not, the parent/guardian came to the phone or the interview was rescheduled for another time with the parent/guardian. Hereafter in this paper the parent/guardian is referred to as the parent.

The March 2012 survey questionnaire included questions about receipt of influenza vaccination, reasons for non-vaccination, and demographic questions. To assess influenza vaccination status, the respondents were asked: "Since July 1st, 2011, have you had a flu vaccination? It could have been a shot or a spray, drop, or mist in the nose." For those responding that they were unvaccinated, the following questions were asked: "There are many reasons why people do not get flu vaccinations. I am going to read you a list of reasons why people may not get a flu vaccination. Please tell me if each is a reason why you did not get a flu vaccination this flu season. You did not get the flu vaccination this year because. . ." The list included the following with the respondent reporting if it was a reason of theirs after each was read: you are allergic to the vaccine; you don't like needles and shots; you never get the flu; you are unlikely to get very sick from the flu; you did not have time to get the vaccination; you were not in a high risk or priority group; you were concerned about getting the flu from the vaccination; you were concerned about side effects from the vaccination other than getting the flu from the vaccine; you have an ongoing health condition that prevents you from getting the vaccination; you believe the flu vaccines do not work very well; you do not trust what the government says about the flu; the vaccine costs too much; you did not want the vaccination for some other reason. For reasons why the child did not receive a vaccination, the parent was asked the reasons for not having the child vaccinated in the same format as previously described. Information on the following demographic characteristics were included in this study: adult's and child's age, race/ethnicity, and sex, adult's education, income/poverty level, and Metropolitan Statistical Area (MSA) category. The income/poverty level variable was defined based on total family income in the past calendar year, and the U.S. Census poverty thresholds for that year specified for the applicable family size and number of children <18 years.

The Council of American Survey Research Organizations (CASRO) response rate for the NFS was 31% for landlines and 18% for cell phones [12]. The CASRO response rate is the product of the percentage of telephone lines identified as residential or non-residential (landline 76.2%, cell 49.0%), the percentage of known households with a completed screening interview (landline 96.6%, cell 72.6%), and the percentage of eligible respondents who complete the interview (landline 42.6%, cell 51.5%). A total of 15,630 households completed interviews (12,503 landline, 3127 cell); of these, 12,082 households had an interview regarding an adult only and 3548 households had an interview regarding both an adult and a child. Thus, there were completed interviews for 19,178 persons in the sample; of these, 19,017 had a non-missing influenza vaccination status (15,583 regarding adults, 3434 regarding children). Among the 15,583 interviews regarding adults, 45.5% received influenza vaccination in the 2011–12 season; the sample size of unvaccinated adults included in this study was 7398. Among the 3434 interviews regarding children, 55.5% of children were vaccinated; the sample size of unvaccinated children included was 1505. Of these 1505, there were 131 or 8.3%, in which the initial adult respondent was not the parent and the interview switched to the parent for the child questions. This left 1374 (91.7%) of the 1505 unvaccinated children in which the initial adult respondent was the parent of the child. Of these 1374 unvaccinated children, 316 had vaccinated parents leaving 1056 unvaccinated child/parent pairs for which to conduct a sub-analysis to examine agreement between reasons given for non-vaccination by parents for themselves versus their children.

2.2. Statistical methods

Tests of association between reasons for non-vaccination and demographic variables were conducted using Wald chi-square tests followed by post-hoc pair-wise comparison *t*-tests. Multivariable logistic regression analyses were used to determine variables independently associated with each reason for non-vaccination. Adjusted prevalence ratios (APR) based on predicted marginals from the logistic regression models were computed [13]. In the sub-analysis, agreement between reasons for non-vaccination given by parents for themselves versus for their children was evaluated using both the proportion of agreement and the unweighted kappa statistic, which adjusts for any agreement by chance [14]. Kappa values <0.40 show poor agreement, values between 0.40 and 0.75 show fair to good agreement, and values >0.75 show excellent agreement [14]. A two-sided significance level of 0.05 was adopted for all statistical tests. Reported percentages and corresponding 95% confidence intervals (95% CI) were weighted while sample sizes were unweighted. All analyses were weighted to population totals and to adjust for households having multiple telephone lines, unit non-response, and non-coverage of non-telephone households. Analyses were performed using SAS, release 9.3 (SAS Inc., Cary,