

# Racial Similarities in Response to Standardized Offer of Influenza Vaccination

## A MetroNet Study

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**BACKGROUND:** Despite known benefits of influenza vaccination and coverage by Medicare Part B, elderly minority patients are less likely to receive influenza vaccination than whites.

**OBJECTIVES:** To test whether a nonphysician-initiated standardized offer of influenza vaccination to all elderly primary care patients would result in similar proportions of African-American and white patients accepting vaccine.

**DESIGN:** In 7 metropolitan Detroit primary care practices during the 2003 influenza vaccination season, medical assistants assessed influenza immunization status of all patients 65 years and older and collected limited demographic data. Eligible patients were offered vaccination.

**MEASUREMENTS:** Proportion of patients accepting influenza vaccination by race and predictors of vaccine acceptance.

**RESULTS:** Four hundred and fifty-four eligible patients with complete racial information were enrolled: 40% African American, 52% white, 8% other race/ethnicity. Similar proportions of African Americans and whites had already received the 2003 vaccine (11.6% and 11.0%, respectively) or stated vaccination as the reason for visit (23.8% and 30.5%, respectively). Among the remainder, there also were similar proportions who accepted vaccination: 68.9% white and 62.1% African-American patients. History of previous vaccination was the only statistically significant predictor of vaccine acceptance (odds ratio [OR] 8.64, 95% confidence interval [CI] 4.17, 17.91,  $P < .001$ ). After adjusting for history of previous vaccination, age, gender, and education, the odds of vaccine acceptance were no different for whites and African Americans (OR 1.20, 95% CI 0.63, 2.29,  $P = .57$ ).

**CONCLUSIONS:** Vaccination acceptance differed little between African-American and white elderly patients. Using nonphysician personnel to identify and offer influenza vaccine to eligible patients is easily accomplished in primary care offices and has the potential to eliminate racial disparities in influenza vaccination.

**KEY WORDS:** health care delivery; influenza; vaccination; race/ethnicity; underserved populations; disparities.

DOI: 10.1111/j.1525-1497.2006.00401.x

J GEN INTERN MED 2006; 21:346-351.

Annual influenza vaccination decreases influenza-associated morbidity and mortality in the elderly,<sup>1-3</sup> and is recommended for all persons 50 years and older by the Advisory Committee on Immunization Practices.<sup>4</sup> Furthermore, Medicare Part B has provided coverage for influenza vaccine and administration since 1993.<sup>5</sup> Despite the benefit and afford-

ability of influenza vaccination, many elderly adults are not vaccinated.

According to the most recent National Health Interview Survey (NHIS), 65.5% of adults 65 years and older received influenza vaccination in the previous 12 months,<sup>6</sup> short of the Healthy People 2010 goal of 90%.<sup>7</sup> Multiple sources including the NHIS, the Behavioral Risk Factor Surveillance Survey, and the Medical Expenditures Panel Survey indicate that influenza vaccination rates are lower among minority adults than among white adults.<sup>6,8,9</sup> All consistently indicate that influenza vaccination among African Americans is 15 to 20 percentage points less than among whites. For example, in the 2003 NHIS (the most recent full year available), 68.6% of whites had a flu shot within the past year, while 47.7% of blacks and 45.4% of Hispanics reported having a flu shot.

Predictors of vaccination acceptance include physician recommendation, patient attitudes, and beliefs about the vaccine, patient's perceived susceptibility to influenza, and their belief about the potential serious nature of acute influenza,<sup>10-15</sup> but it is unknown whether or to what extent these factors differ between racial/ethnic groups. Several studies have determined that the observed racial/ethnic disparities are not fully explained by socioeconomic status and access to health care<sup>8,16-19</sup>, leading some to hypothesize that differences in attitudes regarding vaccine may explain the observed disparities.<sup>8,16,19,20</sup> Because it has been demonstrated that nurse-initiated pneumococcal and influenza vaccination improves vaccination rates in the outpatient setting<sup>21,22</sup>, the objective for this project was to test the hypothesis that a medical assistant (MA)-initiated universal standardized offer of influenza vaccination to a racially diverse group of elderly primary care patients would result in a similar number of African-American and white patients accepting vaccine.

## METHODS

### Setting

The data were collected prospectively during the influenza vaccination season of 2003. Seven offices that are members of MetroNet, the metropolitan Detroit practice-based research network, participated in data collection, which began in October 2003 and ended in early January 2004. The 7 offices were invited to participate because all have racially/ethnically diverse patient populations. Three of the offices are located in federally designated medically underserved areas (MUA) and another office borders an MUA. One of the offices is a residency-training site, 2 are single provider sites, and the remaining

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Previously presented at the annual meeting of North American Primary Care Research Group, October 2004.

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the funding agency.

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Manuscript received October 21, 2005

Initial editorial decision December 5, 2005

Final acceptance December 21, 2005

offices are group provider sites. None of the participating offices had a "standing orders" policy of influenza vaccination of all elderly patients before this study, that is, MAs or other staff were not authorized to assess a patient's need for vaccination and administer it. Although the study was designed to collect data through January 2004, the offices had exhausted their supply of vaccine before the expected end date. In fact, the entire State of Michigan experienced a shortage of vaccine due to a high demand after the publication of early influenza outbreaks in Texas and Colorado.<sup>23</sup>

## Subjects

All patients who were 65 years and older and seen at one of the participating MetroNet offices were eligible to participate. Eligible patients were identified at registration by the office staff and a data collection form was placed on their chart at registration.

## Intervention

Participation in the study involved several steps conducted by office staff. All staff received training in the protocol before implementation at a given office. After the front desk verified the patient's age, the data collection form was placed on the chart. When eligible patients were taken to the examination room, the MA asked a series of questions:

- (1) "What is the reason for your visit today?" The MA then recorded whether receipt of influenza vaccination was the reason for the visit.
- (2) If the patient's reason for visit was for something other than influenza vaccination, the MA asked, "Would you like your flu shot today?" Replies were categorized as "yes," "no," "unsure," "already received," and "already participated in study" (for those patients who attended clinic more than 1 time during the course of the study).
- (3) The MA then asked the patient to answer several brief questions as part of a study about influenza vaccination. The MA read an IRB-approved statement about the purpose of the study and the rights of participants in the study. Patients who agreed to participate were asked to provide their age, race, education level, whether they had ever received a flu shot and approximately how many years before, and whether they had been previously diagnosed with 5 different medical conditions. Those patients who indicated they did not want a flu shot were asked to provide a reason. If patients did not agree to participate in the questions, the MA recorded the observed race and gender of the patient on the form without asking the questions.
- (4) For those patients who stated they did not want influenza vaccination, the physician had the option to address the patient's concerns and recommend vaccination. Patients who accepted vaccination after the physician's recommendation were counted as accepting vaccine.

The protocol was approved by the Wayne State University Human Investigation Committee, and the respective Institutional Review Boards of participating offices. We received approval to conduct the "standing orders" portion of the protocol, i.e., identification of eligible patients and offer of influenza vaccine under a waiver of consent. A verbal consent was needed for the MA to ask the patient demographic questions about

age, education, and race; previous vaccine history; and reasons for refusal.

## Data Analysis

Comparisons between proportions of African-American, white, and other race/ethnicity patients regarding acceptance of influenza vaccination offer and the other variables were performed using the  $\chi^2$  test. We estimated that approximately 300 previously unvaccinated patients (50% African American, 50% white) were needed to detect a 15% difference in vaccine acceptance (2-tailed  $\alpha=0.05$ ,  $\beta=0.80$ ). Univariate and multivariate logistic regression analyses were conducted to determine factors associated with vaccine acceptance, which are reported as odds ratios.

## RESULTS

The intervention was given to 484 patients. Fifteen had previously participated in the study and 8 were age ineligible, resulting in 461 eligible patients. For 40 patients, the race was provided by the MA because the patient did not agree to participate in the verbal questionnaire portion of the study ( $n=10$ ) or because the patient did not provide race when asked. Seven patients were missing race information from either source and were excluded from the analysis, for a total of 454 participants with either self-reported or MA-observed race. The study sample was 181 (40%) African-American patients, 236 (52%) white patients, and 37 (8%) patients of other race/ethnicities. Among the self-identified other group, the largest proportions were other not specified (53%), followed by Hispanic or Latino (39%), and Asian (8%).

Patients were compared by demographic characteristics, medical history, and previous vaccination (Table 1). There were a smaller percentage of African Americans in the young age group ( $P=.01$ ). Patients in the other race/ethnicity category had a lower education level when compared with whites and African Americans ( $P<.001$ ). Both African-American and other race/ethnicity patients were more likely to report a history of diabetes than white patients ( $P=.01$ ). There was no statistical difference in the proportion of each racial group who reported ever having received influenza vaccination: 80.1% for African-American, 85.2% for white, and 78.4% for other.

Patients also were asked how many years had elapsed since their last influenza vaccination if they reported ever having received one. Although there were many missing responses, significantly fewer African Americans (29.8%) reported vaccination in the previous season than whites (45.3%) ( $P=.01$ ) (Table 2). Owing to the small number of study participants in the other race/ethnicity category for the outcomes in Table 2, the comparisons were restricted to African-American and white participants.

Similar proportions of African-American and white patients had already received the current vaccine before their visit (11.6% and 11.0%, respectively), or stated vaccination as the reason for visit (23.8% and 30.5%, respectively). Vaccination acceptance among those who had not already received vaccine or had a reason for visit other than vaccination was the test of the standardized offer; 62.1% of African Americans and 68.9% of whites accepted vaccination. This difference was not statistically significant.

Table 1. Demographic Characteristics, Previous Influenza Vaccination, and Medical History of Participants by Race. (n=454)

Characteristic	African American (n=181)		White (n=236)		Other (n=37)		$\chi^2$ P-Value*
	n	% <sup>†</sup>	n	% <sup>†</sup>	n	% <sup>†</sup>	
<i>Demographics</i>							
Gender							.06
Female	111	61.3	119	50.4	17	46.0	
Male	63	34.8	106	44.9	17	46.0	
Missing	7	3.9	11	4.7	3	8.1	
Age group (y)							.01
65-74	80	44.2	128	54.2	26	70.3	
≥75	88	48.6	92	39.0	7	18.9	
Missing	13	7.2	16	6.8	4	10.8	
Education level							<.001
Less than high school	45	24.9	44	18.6	22	59.5	
High school diploma	70	38.7	104	44.1	8	21.6	
Beyond high school	55	30.4	72	30.5	3	8.1	
Missing	11	6.1	16	6.8	4	10.8	
<i>Medical history</i>							
Ever had a flu shot							.21
Yes	145	80.1	201	85.2	29	78.4	
No	27	14.9	22	9.3	5	13.5	
Missing	9	5.0	13	5.5	3	8.1	
History of anemia							.86
Yes	8	4.4	13	5.5	2	5.4	
No	166	91.7	211	89.4	32	86.5	
Missing	7	3.9	12	5.1	3	8.1	
History of lung disease							.75
Yes	16	8.8	16	6.8	3	8.1	
No	158	87.3	208	88.1	31	83.8	
Missing	7	3.9	12	5.1	3	8.1	
History of kidney failure							.99
Yes	5	2.8	6	2.5	1	2.7	
No	169	93.4	218	92.4	33	89.2	
Missing	7	3.9	12	5.1	3	8.1	
History of diabetes							.01
Yes	57	31.5	40	17.0	11	29.7	
No	117	64.6	184	78.0	23	62.2	
Missing	7	3.9	12	5.1	3	8.1	
History of heart disease							.42
Yes	41	22.7	66	28.0	9	24.3	
No	133	73.5	158	67.0	25	67.6	
Missing	7	3.9	12	5.1	3	8.1	

\* $\chi^2$  P-values do not include the missing category.

<sup>†</sup>Column percentages.

After excluding those patients who had already received the current vaccine and those who stated vaccination as a reason for visit, the univariate logistic regression analysis indicated that the only statistically significant predictor for influenza vaccine acceptance was a prior history of receiving influenza vaccine (Table 3). The odds of vaccine acceptance were nearly 9 times greater among those with previous vaccination (odds ratio [OR] 8.64, 95% confidence interval [CI] 4.17, 17.91,  $P < .001$ ). In a multivariate analysis that adjusted for history of previous vaccination, age, gender, and education, the odds of vaccine acceptance were no different for whites and African Americans (OR 1.20, 95% CI 0.63, 2.29,  $P = .57$ ).

Patients who refused vaccination ( $n = 73$ ; 37 African American and 36 white) were asked why they did not want vaccination. They were given a list of possible responses; however, many responded without prompting and more than 1 response was allowed if given. A total of 75 responses were collected; 13 people did not provide a response. The most common reason (given by 48.6% of African-American and 41.6% of

white patients) for not accepting flu vaccine was previously getting sick from the flu shot (Table 4). Reasons for not wanting vaccination were similar for African Americans and whites. Physicians had the option of addressing the concerns expressed by patients who did not accept vaccine. For 59 patients, the physician attempted to change the patient's mind by addressing concerns about vaccination; 16 (27%) patients then did agree to influenza vaccination. A similar proportion of African-American (24%) and white (22%) patients were persuaded by their physician. Also, the reasons for not wanting vaccination were similar among those whom the physicians were able to convert and those who continued to decline vaccine (data not shown).

## DISCUSSION

Our results indicate that a MA-initiated standardized offer of influenza vaccination to all elderly patients in primary care offices will result in similar acceptance of vaccine by African-American and white patients. This, to our knowledge, is the

Table 2. Vaccination Outcomes by Race

Vaccination Outcome	African American (n=181)		White (n=236)		$\chi^2$ P-Value*
	n	%	n	%	
Reported vaccination in the previous season					.01
Yes	54	29.8	107	45.3	
No or never vaccinated	58	32.1	58	24.6	
Missing	69	38.1	71	30.1	
Vaccination was reason for visit					.12
Yes	43	23.8	72	30.5	
No	136	75.1	161	68.2	
Missing	2	1.1	3	1.3	
Already received current vaccine prior to visit					.87
Yes	21	11.6	26	11.0	
No	159	87.8	207	87.7	
Missing	1	0.6	3	1.3	
Vaccine accepted <sup>†</sup>					.26
Yes	72	62.1	93	68.9	
No or unsure <sup>‡</sup>	44	37.9	42	31.1	
Total vaccinated <sup>§</sup>					.11
Yes	136	75.6	191	82.0	
No or unsure	44	24.4	42	18.0	

\* $\chi^2$  P-values do not include the missing category.

<sup>†</sup>Excludes patients who stated vaccine as reason for visit or had received current vaccine before visit.

<sup>‡</sup>Includes patients who refused vaccine (n=73) or stated they were unsure if they wanted to receive it (n=13).

<sup>§</sup>Includes all patients who were eligible to accept vaccine, including those who stated that the vaccine was reason for visit and those patients who had previously received vaccine.

first study examining the impact of a standardized offer on influenza vaccine acceptance by race/ethnicity. In 1999, the Centers for Disease Control and Prevention, in its report on recommendations of the Task Force on Community Preventive Services for vaccine-preventable diseases, strongly recommended the use of nonphysician medical personnel to identify and offer vaccine to eligible patients to increase vaccination rates.<sup>24</sup> Our study used receptionists for the identification of elderly patients and the MA offered them the vaccine. We found no difference in acceptance rate between African-American and white patients; however, the small sample size of patients who were not already vaccinated and did not present for vaccination may partially account for the lack of statistical significance. Even so, the racial difference in vaccine acceptance (6.8%) among those patients who had not previously received or presented for vaccine contrasts sharply with the nationally observed racial difference in vaccine acceptance.

Previous investigations of the disparity in influenza vaccination between elderly and other high-risk African-American and white patients, estimated to be as high as 21.6% in one study of Medicare beneficiaries,<sup>25</sup> postulated multiple reasons for the lower vaccination rates among African Americans. These reasons include less health care access, lower rates of health insurance, lower socioeconomic status (SES),<sup>8,16,25,26</sup> resistant attitudes, and beliefs regarding vaccination (such as vaccination causes influenza or vaccine side effects),<sup>10,26</sup> concern about vaccine contents,<sup>10</sup> and discriminatory behavior by providers.<sup>26</sup> Racial disparity in influenza vaccination appears to be independent of or only minimally explained by health care access, health insurance, SES,<sup>16,19,25,26</sup> provider dis-

crimination,<sup>26</sup> and concern about vaccine contents.<sup>10</sup> In a large study of Medicare beneficiaries, Hebert et al.<sup>26</sup> postulated that resistance to vaccination may be partially responsible for the lower vaccination rate among African Americans. In the same study, African-American patients were less likely to visit their physician for the purpose of vaccination. This was similar to what we observed, although the difference in our study did not reach statistical significance.

Our finding that a history of previous influenza vaccination is a significant predictor of acceptance of influenza vaccination is similar to the findings of others.<sup>10,27</sup> Also in agreement with previous studies, we found that a common reason for nonacceptance of influenza vaccination is concern regarding ill effects from the vaccine.<sup>10,14,20,27</sup> If the physician addresses these concerns and recommends the vaccine, some patients will change their minds, as we and others found.<sup>28</sup>

Although it appears that African Americans and whites accepted vaccination at similar rates under this MA-initiated protocol, the increased publicity related to the early cases of influenza in fall 2003<sup>23</sup> resulted in heightened demand for influenza vaccination. This may have contributed to our results if it led to a greater desire for vaccination among African Americans compared with previous years. However, data from the 2004 National Health Interview Survey,<sup>29</sup> largely reflecting vaccination received in fall 2003, showed no reduction in disparities nationwide, suggesting that our results were probably not affected by the national publicity. Although the MA racially identified forty of the patients, agreement occurred for 94.3% of the 383 African-American and white patients with MA- and self-identified race (95.8% for whites and 92.3% for African Americans). We also are unable to determine whether our standardized offer increased acceptance of vaccination among the participants compared with the preceding year. Although there does appear to be an increase in the proportion of patients receiving influenza vaccination in 2003 compared with 2002 (75.6% vs 48.2% for African Americans, and 82.0% vs 67.7% for whites, after excluding missing data), data on 2002 vaccination acceptance were missing for a substantial proportion of patients. Determining whether standing orders increased vaccination rates in these practices was not, however, the purpose of the study.

A strength of this study is its setting in primary care offices that serve racially and socioeconomically diverse populations. Half of the sites were either located in or near a federally designated medically underserved area. The intervention was easy to institute; none of the offices offered suggestions or complaints regarding the protocol during regularly scheduled visits by the research assistant while the study was in progress or at the conclusion of the study. Although we did not collect data on the time requirements or disruption to clinic flow for the intervention, we observed that it took only a few seconds at the reception desk to identify an eligible patient by birth date, and an additional few seconds for the MA to inquire whether the patient had already received a flu shot and wanted a vaccination at that visit. Although there was a potential disruption to patient flow if more than the usual number of vaccinations were given over a discreet time period, such disruption was not offered as a complaint by any of the sites involved in this study.

The Institute of Medicine's *Unequal Treatment* report calls for promoting consistency and equality of care through use of evidence-based guidelines.<sup>30</sup> For immunizations and other

**Table 3. Odds of Vaccine Acceptance by Demographics and Medical History Among African-American and White Subjects (Univariate Analyses, N=255).**

Characteristic	Vaccine Acceptance						Odds Ratio <sup>‡</sup>	95% CI	P-Value
	Yes (n=165)		No or Unsure* (n=86)		Missing (n=4)				
	n	% <sup>†</sup>	n	% <sup>†</sup>	n	% <sup>†</sup>			
<i>Demographics</i>									
<i>Race</i>									
African American	72	61.5	44	37.6	1	0.9	1.0		
White	93	67.4	42	30.4	3	2.2	1.35	0.80, 2.28	.26
<i>Gender</i>									
Female	94	67.6	45	32.4	0	0.0	1.0		
Male	68	66.0	35	34.0	0	0.0	0.93	0.54, 1.60	.07
Missing	3	23.1	6	46.2	4	30.8			
<i>Age group (y)</i>									
65–4	78	62.9	43	34.7	3	2.4	1.0		
≥75	80	72.1	30	27.0	1	0.9	1.47	0.84, 2.58	.18
Missing	7	35.0	13	65.0	0	0.0			
<i>Education level</i>									
Less than high school	39	67.2	18	31.0	1	1.7	1.0		
High school diploma	75	66.4	35	31.0	3	2.7	0.99	0.50, 1.97	.98
Beyond high school	47	71.2	19	28.8	0	0.0	1.07	0.73, 1.57	.74
Missing	4	22.2	14	77.8	0	0.0			
<i>Medical history</i>									
<i>Ever had a flu shot</i>									
Yes	151	76.7	43	21.8	3	1.5	8.64	4.17, 17.91	<.001
No	13	28.3	32	69.6	1	2.2	1.0		
Missing	1	8.3	11	91.7	0	0.0			
<i>History of anemia</i>									
Yes	10	58.8	7	41.2	0	0.0	0.64	0.23, 1.74	.38
No	155	68.0	69	30.3	4	1.8	1.0		
Missing	0	0.0	10	100.0	0	0.0			
<i>History of lung disease</i>									
Yes	13	61.9	8	38.1	0	0.0	0.73	0.29, 1.84	.50
No	152	67.9	68	30.4	4	1.8	1.0		
Missing	0	0.0	10	100.0	0	0.0			
<i>History of kidney failure</i>									
Yes	6	75.0	1	12.5	1	12.5	2.83	0.34, 23.93	.34
No	159	67.1	75	31.7	3	1.3	1.0		
Missing	0	0.0	10	100.0	0	0.0			
<i>History of diabetes</i>									
Yes	46	74.2	14	22.6	2	3.2	1.71	0.87, 3.35	.12
No	119	65.0	62	33.9	2	1.1	1.0		
Missing	0	0.0	10	100.0	0	0.0			
<i>History of heart disease</i>									
Yes	58	75.3	19	24.7	0	0.0	1.63	0.88, 2.99	.12
No	107	63.7	57	33.9	4	2.4	1.0		
Missing	0	0.0	10	100.0	0	0.0			

\*Includes patients who refused vaccine (n=73) or stated they were unsure whether they wanted to receive it (n=13).

<sup>†</sup>Row percentages.

<sup>‡</sup>Odds ratio does not include individuals with missing data for vaccine acceptance.

preventive services, implementation of systems changes has been found to be the most effective means of improving service delivery.<sup>31</sup> Use of a standing orders approach, such as that implemented here, ensuring systematic assessment and offering of services, is an example of systems change. Zimmerman et al.<sup>20</sup> found no differences in influenza vaccination rates by race/ethnicity in Veterans Affairs (VA) patient populations. While VA patients may not be representative of all patients, it is notable that the VA system has implemented a multifaceted approach including standing orders and patient and provider reminders. Other studies have shown that a standing orders type intervention at the level of the ambulatory practice is effective in improving influenza vaccination rates when compared with no standing orders<sup>21</sup> or patient and physician reminders.<sup>22</sup>

**Table 4. Most Common Reasons Given For Refusing Influenza Vaccination\***

Reason	African American (n=32)	White (n=26)
I got sick from the flu shot	18	15
I know someone who got sick from the flu shot	5	5
I'm afraid of side effects	3	5
Flu shot won't prevent the flu	1	3
I'm afraid of needles and shots	2	1
I just don't want it	4	3
Flu is not a serious disease	1	4
I won't get the flu	3	2

\*Not all refusers provided a response; multiple responses were allowed.

In conclusion, we found that a MA-initiated standardized universal offer of influenza vaccine to elderly patients resulted in similar acceptance of vaccine among a racially and socioeconomically diverse group of primary care patients. Use of a standing orders-type policy that uses nonphysician personnel to identify vaccine-eligible patients and to offer vaccine to those patients is easily accomplished in primary care offices that serve elderly patients, and has the potential to eliminate the observed racial disparity in influenza vaccination in this age group.

Funded in part by AAMC/CDC cooperative grant U36/CCU319276 CFDA 93.283.

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