


Influenza Vaccination Uptake Trends by Age, Race, and Ethnicity in the United States Between 2017 and 2020

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Keywords

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Introduction

Seasonal influenza has varying impacts on morbidity and mortality by year. However, influenza pandemics, such as the 1918 pandemic, are a public health concern and are increasing in frequency.¹ The result of this can be attributed, in part, to increasing population density. Throughout the history of influenza pandemics, morbidity and mortality has been highest among the young, elderly, and those with multiple comorbidities.¹

Infection prevention includes both behavioral modifications—mask use and social distancing—as well as through vaccination.² While influenza vaccine effectiveness varies by year as a result of virus mutation, a meta-analysis of trials assessing the inactivated influenza vaccine showed an efficacy of 59% (95% CI 51–67) in prevention of laboratory confirmed cases.³ Prevalence trends of influenza vaccination among U.S. citizens with diabetes between 2007 and 2018 ranged from 62% to 65%⁴ and was similar in patients with COPD.⁵ The Healthy People 2030 U.S. national goal for influenza vaccination rate for low to moderate risk adults was 70%, yet we found that no recent study has assessed the prevalence trends among a nationally representative sample of patients, irrespective of other medical conditions. Additionally, given the start of the SARS-CoV-2 pandemic in 2020 and its mortality rate, influenza vaccination rates may have been altered. Thus, our objective was to identify temporal trends of influenza vaccination uptake among U.S. citizens and to assess the impact of race and ethnicity on vaccination rates.

Methods

A cross-sectional analysis of the Behavioral Risk Factor Surveillance System (BRFSS)—a nationally representative,

self-reported, validated, questionnaire derived database of U.S. citizens—using data from the 2017 to 2020 surveys was performed. BRFSS is a yearly survey supported by the Centers for Disease Control and Prevention which collects sociodemographics, health behaviors, and comorbid diagnoses of non-institutionalized adults in the U.S., Guam, and Puerto Rico. Adults aged 18 years or greater and who reported receiving the influenza vaccine within the past year were included. Institutionalized adults were excluded. Appropriate sampling weights were obtained from BRFSS. Weighted sample estimates were used to determine population level estimates.

Results

We identified remarkably low rates of influenza vaccination among our sample, particularly in the age group 18–64 years (Table 1). Between 2017 and 2020, influenza vaccination rates ranged from 27.6% (2018; n=81 920, N=51 920 753) to 40% (2020; n=104 299, N=73 427 361) among respondents aged 18–64. In those 65 and older, the rate of vaccination was 54% (n=79 572, N=27 506 974) to 67% (n=89 425, N=35 345 537) in 2018 and 2020, respectively. The prevalence of influenza vaccine uptake by race and ethnicity was lowest among American Indians/Alaskan Natives aged 18–64 (24.1%) in 2018 and highest among Asians over 65 years in 2020 (75.5%; Figure 1). Hispanics, American

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Table I. Trends of US Adults Receiving Flu Shots by Age Group and Race.

Overall by age group	2017	2018	2019	2020
18-64				
Sample (n)	99488	81920	94705	104299
Population estimate (N)	61 276 991	51 920 753	63 179 429	73 427 361
Percent	34.7	27.6	36.8	40
65+				
Sample	88458	79572	91 121	89425
Population estimate (N)	28 396 039	27 506 974	30 760 174	35 345 537
Percent	60.2	54	63.4	67
By race/ethnicity* and age group (weighted %)				
American Indian/Alaskan Native, Non-Hispanic				
18-64	32.2	24	32.7	36.8
65+	54.7	53.5	54.7	54.6
Asian, Non-Hispanic				
18-64	40.9	35.5	41.5	48.8
65+	61.6	57.3	63.5	75.5
Black, Non-Hispanic				
18-64	31.1	24.1	32.6	33.2
65+	51.9	47.3	55.5	57.8
Hispanic				
18-64	30.8	22.1	30.3	32.1
65+	57.8	50.1	54.3	56.6
Race not listed, Non-Hispanic				
18-64	33.6	24.6	34.3	35.3
65+	55.8	50.1	55.2	57.2
White, Non-Hispanic				
18-64	36	29.5	39.4	43.5
65+	61.5	55.1	65.7	69.5

*Race/ethnicity groups defined by CDC/BRFSS.

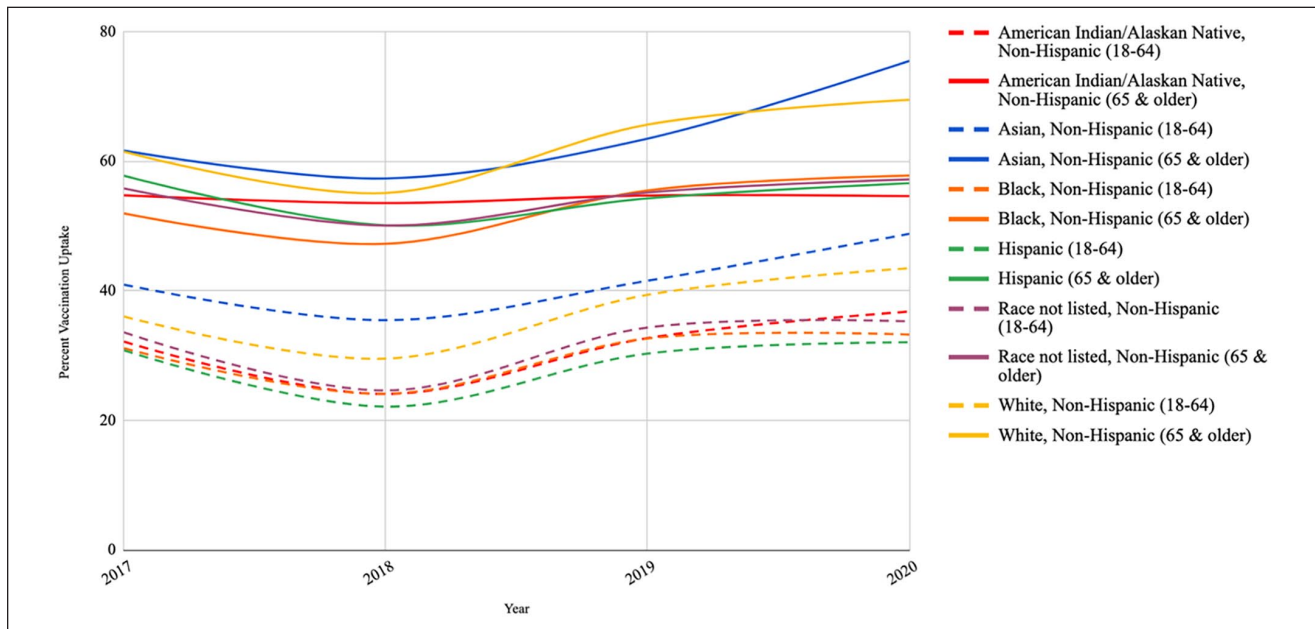


Figure I. Trends of Flu shots among US adult (18-64 and 65 & older) by Race.

Indians, and Blacks had the lowest prevalence and rate of change in vaccination uptake by year among those greater than 65 years.

Discussion

This is the first study in recent years to assess influenza vaccine uptake among a nationally representative sample of U.S. citizens, irrespective of comorbidities. We identified a positive trend in vaccine uptake from 2018 to 2020 in the 18-64 and 65+ cohorts, however, our findings are lower than what was reported by the most recent comparison study by Hung et al who reported vaccination rates of 71.3% in citizens greater than 65 years of age without diabetes in 2018 using a smaller sample than our study.⁴ This suggests that influenza vaccination rates are far below the Healthy People 2030 goal of 70% and that increased efforts are warranted to improve vaccination rates, particularly among minority groups. Notably, the highest overall vaccination rates were found in 2020 which coincided with the SARS-CoV-2 pandemic and preventative measures, such as flu vaccination, were highly marketed. Interventions to improve vaccine uptake should utilize grassroot efforts as well as electronic health record data.⁶ Specifically, current evidence recommends efforts to improve physician and patient accountability, awareness of disease burden, belief in vaccine efficacy, and through the facilitation of easily accessible vaccine clinics.⁷ BRFSS utilizes a telephone based survey which is self-reported and may have imputed reporting bias into our methodology; a limitation to the study.

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Declaration of Conflicting Interests

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