PUBLICATION CARD

Regional Disparities in the Uptake of Differentiated Influenza Vaccines in the United States

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INTRODUCTION

- Annual influenza vaccination is recommended for eligible individuals ≥6 months of age, including older adults ≥ 65 years of age who are at higher risk of influenza complications; however, disparities in influenza vaccination in this at-risk population remain a concern[1,2,3]
- A 2021 publication showed that among vaccinated Medicare beneficiaries ≥ 65 years of age, minorities were 26–32% less likely to receive the high-dose influenza vaccine (HDV) compared to white individuals[1]
- Follow up analyses further demonstrated that non-white older adults were less likely to receive a differentiated influenza vaccine (DIV; includes adjuvanted, HDV, cell-based, and recombinant vaccines), especially if they lived in a predominantly minority county[2]

OBJECTIVE

- To further explore whether regional inequities in DIV uptake exists and improve understanding of the role of socio-economic, medical, healthcare utilization, community, and vaccinator characteristics in mediating these disparities among Medicare Advantage and commercial health plan beneficiaries ≥ 65 years of age

METHODS

Study type: Retrospective, longitudinal study

Data: Optum Research Database (deidentified physician, hospital, and pharmacy claims data on ≥ 60 million Medicare Advantage and commercial health plan beneficiaries nationally)

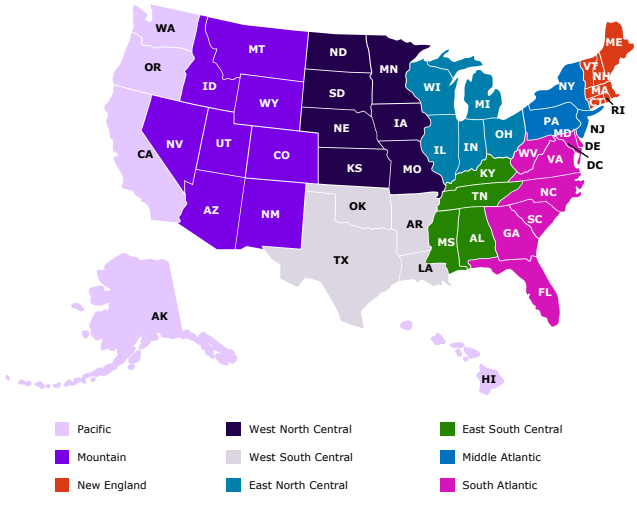
Study duration: July 2014 – June 2018

Population: Community dwelling Medicare Advantage and commercial health plan beneficiaries ≥ 65 years of age who had ≥ 1 year of insurance coverage and received ≥ 1 influenza vaccine during the study period (N = 1,561,638)

Exposure: US Census Bureau area used in analysis (**Fig. 1**)
Outcome: Type of influenza vaccine received

Analyses: Multilevel logistic regression modeling to assess the influence of socio-demographics, medical history, healthcare utilization, community, and vaccinator characteristics

Figure 1. US Census Bureau regions used in the analysis

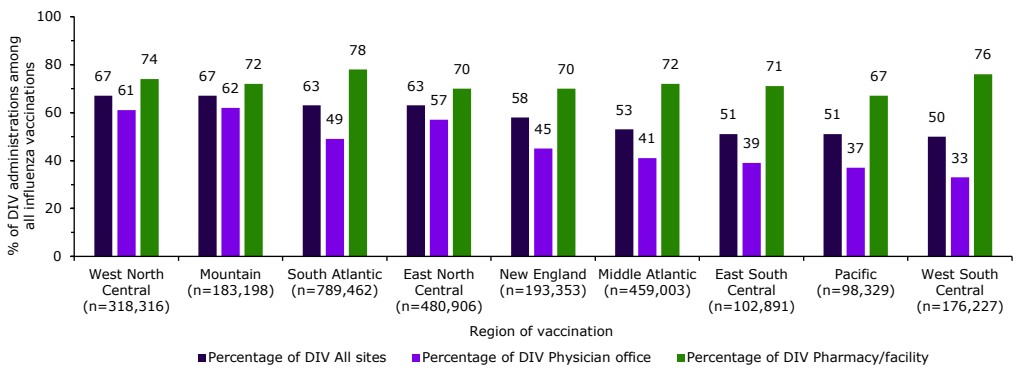


RESULTS

Regional disparities in % of DIV uptake (**Fig. 2**)

- Overall, 60% of 2.8 million distinct vaccination claims during the study period were for DIVs
- Substantial regional disparities in DIV uptake were observed
  - In physician offices, estimates ranged from > 60% in the Mountain and West North Central regions to < 40% in the South and Pacific regions
  - Differences were smaller among those vaccinated in pharmacies

Figure 2. % of DIV administrations of all influenza vaccinations by vaccination site and US Census Bureau area (2014–15 to 2017–18)



RESULTS

Figure 3A and 3B. Baseline Odds ratio*‡ of association between US census divisions and DIV uptake among persons receiving influenza vaccination (2014–15 to 2017–18)

Figure 3A. Vaccination at Physician offices

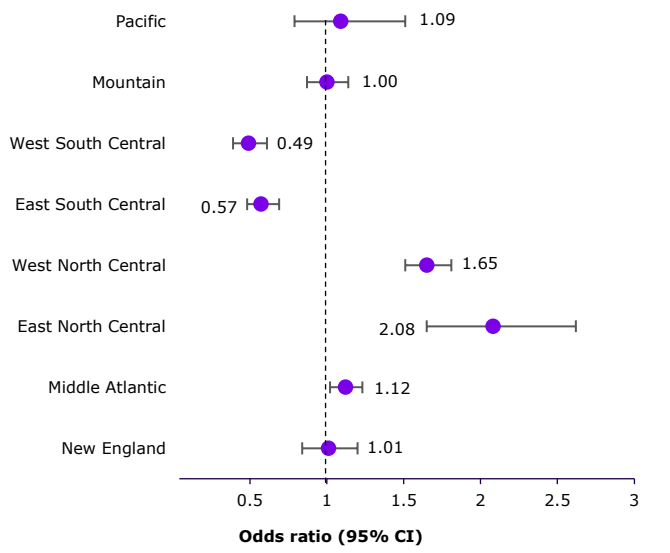
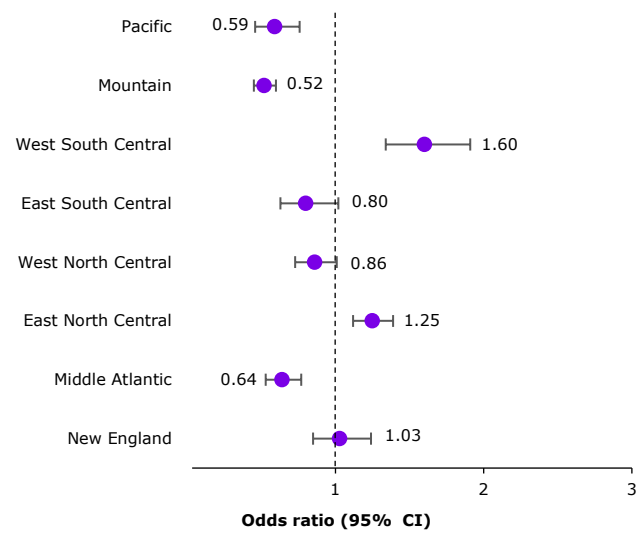


Figure 3B. Vaccination at pharmacies and facilities



*At baseline; error bars denotes 95% Cis; ‡ South Atlantic region was considered as the reference group

Multilevel model analyses of DIV uptake at varying vaccination sites

- **Physician offices** (**Fig. 3A**)
  - East North Central region vaccinees were **~2x** as likely to receive a DIV compared to South Atlantic region vaccinees who in turn were **~2x** as likely to receive a DIV compared to those vaccinated in the East and West South Central regions
  - **After adjusting for socio-demographic factors** (income, education, and race/ethnicity), medical history and healthcare utilization patterns, and community characteristics (rurality, mean household income, age and sex composition, and the proportion of migrants), **regional disparities increased**, particularly in the New England, Mountain, and Pacific regions (not shown in figure)
  - **Healthcare access factors**, such as availability of physicians, **appeared to lessen the gap** to some extent, while the county's Gini index (a summary measure of income inequality[4]) and the overall Social Vulnerability Index ranking had minimal impact
  - The most influential factors in explaining the regional disparities were the characteristics of the vaccinator, particularly their usage of HDV in prior seasons, as evidenced by the fact that all odds ratio estimations approached 1.0 after controlling for these variables (not shown in figure)
  - Only controlling for the vaccinators' prior use of HDV reduced the observed disparities, indicating that DIV accessibility issues, particularly to physician offices, might be a factor
- **Pharmacies and facilities** (**Fig. 3B**)
  - Similar patterns of disparities observed for pharmacies and facilities, which increased after adjusting for socio-demographic factors. However, **disparities were generally smaller**, and vaccinators' characteristics were less influential

STRENGTH & LIMITATIONS

Strength

A large database was used to help avoid sampling, social desirability, and non-response biases associated with surveys and self-reports of vaccine receipt

Limitations

- Analysis at the state level was not possible due to relatively small numbers in many states
- No assessment of other potential influential factors such as immigration status, English proficiency, vaccinator profile (eg. knowledge and attitudes about vaccines, intentions to discuss available options, and behavioral tendencies)
- Study findings may not apply to adults without insurance or to other insurance types where disparities may be more pronounced

KEY MESSAGES

1. Significant regional disparities exist in DIV uptake among fully insured older adults, particularly among those vaccinated in physician offices
2. Observed regional disparities could not be fully explained by differences in clinical, sociodemographic, community, or vaccinator characteristics
3. New legislative, economic, educational, and research strategies are required to address vaccine uptake inequities

Glossary: DIV, differentiated influenza vaccine; HDV, high-dose influenza vaccine; US, The United States of America

Reference: Mahmud S.M., et al. *J. Racial and Ethnic Health Disparities 2023.* doi:10.1007/s40615-023-01875-0.

Additional References: 1. Mahmud SM et al. Lancet Healthy Longev 2021;2: e143–53. doi: 10.1016/S2666-7568(20)30074-X **2.** Mahmud SM et al. Preventive Medicine 2022;163:107236. doi: 10.1016/j.ypmed.2022.107236. **3.** CDC. Influenza Vaccination: A Summary for Clinicians (Link). **4.** Gini Index. Census.gov (Link).

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