Influenza Vaccination- Opportunity to Extend Cardiovascular Disease Prevention to Millions of Hearts

(National Adult and Influenza Immunization Summit Plenary Session)

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Disclaimer/Disclosure

The opinions expressed by the speaker do not necessarily reflect the opinions of the US Department of Health and Human Services, the Public Health Service, the Centers for Disease Control and Prevention, or the Center for Medicare and Medicaid Services.

Dr. Sperling has no conflicts to disclose.
Influenza and Cardiovascular Disease

- Viral illnesses (such as seasonal influenza) increase the likelihood of acute coronary syndromes, stroke, hospitalization, heart failure (notably in high risk populations)
- Mechanisms
  - Cytokines / plaque destabilization
  - Increased demand
- Among adults hospitalized with influenza from 2018-19 heart disease among most common chronic conditions (47.2%)

CDC.gov/flu/high risk/ heart disease.htm

Influenza Vaccination for Cardiovascular(CV) Disease Prevention

- AHA/ ACC Class I Recommendation for Secondary Prevention (LOE B)
- Myocardial infarction 6 X greater within week of influenza
- Influenza vaccination reduces burden of influenza-associated illness including CV events (15-45%- similar relative risk reduction as other Guideline-directed medical therapy; single administration)
- Readiness for influenza seasons needed
  - Health systems and team-based approaches

CDC.gov/flu/high risk/ heart disease
Davis MM, et al. Circulation 2006;114(14)
Kwong JC, et l. NEJM 2018;378(4)
MacIntyre CR, et al. Heart 2016; 102(4)
Influenza Burden and Vaccination

- Only 45% of adult Americans received influenza vaccine during the 2018-2019 flu season.
- There is a significant association between clinician recommendation and vaccination.

CDC estimates* that, from October 1, 2019, through April 4, 2020, there have been:

- 39,000,000 - 56,000,000 flu illnesses
- 18,000,000 - 26,000,000 flu medical visits
- 410,000 - 740,000 flu hospitalizations
- 24,000 - 62,000 flu deaths

*Because influenza surveillance does not capture all cases of flu that occur in the U.S., CDC provides these estimated ranges to better reflect the larger burden of influenza. These estimates are calculated based on CDC’s weekly influenza surveillance report and are preliminary.

Influenza Vaccination and Cardiovascular Risk

- Meta-analysis
- 16 trials (4 RCT, 12 Observational)
- 237K participants
- Mean age 69, 37% women
- Median follow-up 19.5 mo.
- All cause mortality relative risk (RR) 0.75
- CV mortality RR 0.82
- MACE RR 0.87
- MI RR 0.73 (CI 0.49-1.09, p=0.12)
- Cardiologists least likely of all medical professionals to stock flu vaccines in clinic

Yedlapat SH, et al. JAHA 2021; doi.10.1161

https://www.cdc.gov/flu/fluvaxview/coverage-1819estimates.htm
https://www.cdc.gov/flu/about/burden/preliminary-in-season-estimates.htm
Disparities in Influenza Vaccination Access and Uptake

- Disparities in influenza vaccination access and uptake

<table>
<thead>
<tr>
<th>Table. Estimated Influenza Vaccination Coverage Among US Adults by Race and Ethnicity for 2017-2018 and 2018-2019 Influenza Seasons³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Overall</td>
</tr>
<tr>
<td>Non-Hispanic</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Black</td>
</tr>
<tr>
<td>Hispanic</td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
</tr>
<tr>
<td>Other or multiple races</td>
</tr>
</tbody>
</table>

Groshskopf LA, Liburd LC, Redfield RR. JAMA 2020; 324(11): 1029-30
cdc.gov/fluSurv-NET

Disparities in Influenza-associated Hospitalization

cdc.gov/fluSurv-NET
Disparities in Influenza Vaccination Among Adults with ASCVD in the U.S.

- Cross-sectional pooled analysis from Medical Expenditure Panel Survey extrapolated to U.S. population
- Influenza vaccination rates (self-reported in year prior to completion of survey) from 2008-2016 in adults > 40 yo with Atherosclerotic Cardiovascular Disease (ASCVD) (self-report and / or ICD-9)

Grandhi GR, et al. JAMA Cardiol 2020.3978; published online Sept. 9, 2020

Prevalence and characteristics of adults with ASCVD who lacked influenza vaccination during the past year

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total No.</th>
<th>Mean/median</th>
<th>Estimated US population</th>
<th>RR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>19,703</td>
<td>9,839 32.7</td>
<td>7,247,180 NA</td>
<td></td>
</tr>
<tr>
<td>Age ≥65 yrs</td>
<td>10,900</td>
<td>5,723 27.7</td>
<td>3,846,351 (1.05-1.33)</td>
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</tr>
<tr>
<td>Adolescent</td>
<td>879</td>
<td>419 46.4</td>
<td>371,270 2.31(1.20-4.42)</td>
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</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8,863</td>
<td>4,594 33.2</td>
<td>2,129,427 1.69(1.40-2.00)</td>
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</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>10,358</td>
<td>5,235 38.8</td>
<td>3,213,182 (1.01-1.38)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>625</td>
<td>317 48.8</td>
<td>988,617 1.24(1.03-1.49)</td>
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</tr>
<tr>
<td>Hispanic</td>
<td>271</td>
<td>129 38.5</td>
<td>207,902 0.81(0.60-1.12)</td>
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<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Income</td>
<td>10,277</td>
<td>5,158 32.2</td>
<td>3,187,138 (1.00-1.24)</td>
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<tr>
<td>Low</td>
<td>9,126</td>
<td>4,390 37.1</td>
<td>2,049,343 1.34(1.12-1.61)</td>
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<tr>
<td>Insurance status</td>
<td>18,621</td>
<td>9,037 33.8</td>
<td>4,715,469 (1.01-1.38)</td>
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<tr>
<td>Uninsured</td>
<td>1,972</td>
<td>834 56.8</td>
<td>738,723 2.05(1.47-2.83)</td>
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</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;High school</td>
<td>288</td>
<td>129 38.5</td>
<td>1,123,335 (1.06-1.49)</td>
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</tr>
<tr>
<td>College</td>
<td>13,945</td>
<td>6,738 46.4</td>
<td>4,567,544 1.24(1.03-1.49)</td>
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<tr>
<td>Usual source of care</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>17,607</td>
<td>8,381 41.7</td>
<td>3,889,752 (1.00-1.32)</td>
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</tr>
<tr>
<td>No</td>
<td>1,996</td>
<td>872 54.6</td>
<td>646,839 2.01(1.72-2.33)</td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>3,388</td>
<td>1,605 28.8</td>
<td>1,123,335 (1.06-1.49)</td>
<td></td>
</tr>
<tr>
<td>Midwest</td>
<td>4,088</td>
<td>1,930 31.4</td>
<td>1,527,140 1.37(1.06-1.75)</td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>8,275</td>
<td>3,624 44.6</td>
<td>2,449,180 1.23(1.07-1.42)</td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>4,209</td>
<td>1,905 33.1</td>
<td>1,324,576 1.31(1.03-1.61)</td>
<td></td>
</tr>
</tbody>
</table>

Grandhi GR, et al. JAMA Cardiol. Published online September 09, 2020.
Prevalence of Lacking Influenza Vaccination with Stepwise Increasing High-Risk Characteristics

Figure 1. Weighted Proportions and Variations in Lacking Influenza Vaccination Among Adults With Atherosclerotic Cardiovascular Disease Stratified by the Cumulative Number of High-risk Sociodemographic Characteristics

Odds of Lacking Influenza Vaccination with Increasing High-Risk Characteristics

Figure 2. National Estimates and ORs of Lacking Influenza Vaccination Among Adults With Atherosclerotic Cardiovascular Disease and High-risk Sociodemographic Characteristics

Grandhi GR, et al. JAMA Cardiol. Published online September 09, 2020.
Potential Impact of Sociodemographic Disparities in Influenza Vaccination among Adult with ASCVD in U.S.

- Findings extrapolated to U.S. population
- 1 in 3 adults with ASCVD reported no influenza vaccination in past year- representing 7.4M annually
- Adults with 2 high-risk characteristics had 2.5 fold greater odds of lacking vaccination- representing 2.4M / year
- Adults with 4 or more high-risk characteristics and ASCVD (OR 6.06 of no vaccination)- representing 733K / year

Grandhi GR et al. JAMA Cardiol. 2020.3978. published online Sept. 9, 2020

Editorial / Commentary

- Report by Grandhi, et al. first to highlight potential magnitude of gap associated with sociodemographic and age-related disparities of influenza vaccination in those with ASCVD possibly affecting millions

Sperling LS, Albert MA, Koppaka R. JAMA Cardiol 2020.3978. published online Sept. 9, 2020
Disparities in Influenza Vaccination—Opportunity to Extend Cardiovascular Prevention to Millions of Hearts

- Composite model of high-risk characteristics highlights disparities and opportunities
- Significant 2-fold higher odds of not receiving influenza vaccination among 40-64 year old group
- Barriers exist at patient, clinician, community, and health system level
- Multi-faceted approaches required to reduce disparities
- Extension of proven, effective, and high-impact strategies for CVD prevention
- Given prospect of co-circulation of COVID-19 with influenza never been more important time to reduce these disparities

Sperling LS, Albert MA, Koppaka R.. JAMA Cardiol. 2020;3978. published online Sept. 9, 2020

Missed Opportunities to Prevent Cardiovascular Events

9.0 M not taking aspirin as recommended
40.1 M with uncontrolled HBP
39.1 M not using statins when indicated
54.1 M combustible tobacco users

+ 70.9 M who are physically inactive

213.1 M missed opportunities

Millions of opportunities to provide influenza vaccination

Addressing Influenza Vaccination Disparities During the COVID-19 Pandemic

- Prevention or reduction in severity of acute respiratory illnesses to conserve strained healthcare resources
- Medical and public health professionals working with partners trusted by racial and ethnic minority communities
- Prioritize measures to help ensure full and equal access to influenza vaccination, and reduce disproportionate effect of illness on racial and ethnic minorities


A Million Thanks!

More on Million Hearts at Millionhearts.hhs.gov
Reach me at LSperling@cdc.gov
Twitter @MillionHeartsUS