# Influenza hospitalizations among adults aged 18–64 years and the potential benefit of recombinant vaccines: USA, 2012–13 through 2022–23

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### BACKGROUND

- Influenza can cause severe illness across all age groups. Young children, the elderly, and those with chronic medical conditions are at highest risk of influenza complications<sup>1</sup>
- However, influenza also significantly impacts adults aged 18–64 years (y), though there are fewer studies highlighting its effects $^{2,3}$
- Despite the universal influenza vaccine recommendation in the USA since 2010, vaccination rates among adults aged 18–64y remain low compared to children and the elderly<sup>4</sup>
- Burden of disease estimates are needed to support recognition of value of vaccination in adults 18–64y given that this age group accounts for more than 60% of the US population and represents its entire workforce<sup>5</sup>

## OBJECTIVE

To document influenza hospitalizations among US adults aged 18–64y and to evaluate whether the use of recombinant influenza vaccine (RIV), as opposed to the standard dose influenza vaccine (SD-IIV), could result in a greater number of averted influenza-related hospitalizations

## METHODS

### **Clinical Burden**

#### Data

- Extracted from US-CDC websites<sup>6</sup>
- 10-year period: **2012–13 to 2022–23** (excluded 2020–21 due to lack of influenza circulation)
- Clinical outcome: hospitalization
- Other data: viral strains circulation, vaccination coverage rate

### Analysis

• 10-year retrospective descriptive analysis of the age-stratified influenza hospitalization burden in the US, assessing the impact of circulation of different influenza virus type and subtype on disease severity overtime

### **Risk group burden**

### Data

- US prevalence of at least one chronic medical condition considered a risk factor for influenza extracted from Clark A, et al. (Lancet 2020)<sup>7</sup> using 2017 US data from Global Burden of Diseases, Injuries, and Risk Factors Study
- Relative risk (RR) of hospitalization associated with influenza among people with any chronic medical condition from Coleman BL, et al. (IORV, 2018)<sup>8</sup>

#### Analysis

#### Averted cases model Data

- US-CDC estimates of absolute vaccine effectiveness (VE) against medically attended influenza<sup>9</sup> pooled over 8 years (2012–13 to 2019–20) to inform absolute VE against hospitalization<sup>10</sup>
- Range of rVE (relative vaccine effectiveness) RIV vs SD-IIV from 3 major studies<sup>11-1</sup>
- Ratio of absolute VE between all adults at risk and not at-risk<sup>14</sup>
- Market shares of RIV (from 2012–13 to 2022–23) using IQVIA National Claims Data

#### Analysis

## steps

- Calculate the number of influenza hospitalizations attributable to at-risk and non-at-risk individuals without vaccination
- Estimate the hospitalizations that could be prevented through a fully RIV-based program, comparing it to the vaccination program as implemented in the 2012–2023 timeframe
- To account for uncertainty in burden estimates, relative risk (RR) of hospitalization for the at-risk groups, VE estimates, and the ratio in VE between at-risk and non-at-risk groups, a probabilistic sensitivity analysis with 1000 Monte Carlo simulations was performed. Results were reported with median value and 95% confidence interval (CI)

### RESULTS

### **Clinical burden**

- Over the past decade, the CDC (Centers for Disease Control and Prevention) has reported annual influenza related hospitalizations ranging from 37,000 to 204,000 among those aged 18-64y. This age group contributed from 21% to 47% of all-age hospitalizations during this period with higher percentages observed during seasons dominated by H1N1pdm09 (from 35% to 47% in 2018–19 and 2013–14 respectively) (Figure 1)
- Among working aged adults, 50–64y were almost 3 times at higher risk of influenza hospitalization than 18–49y (average annual hospitalization rate of 123 in 50–64y compared to 42 in 18–49y per 100,000 persons per season)

#### REFERENCES

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• Estimated age-stratified hospitalization burden in those with clinical risk condition for influenza vs those without

#### Age and risk-group specific decision-tree model, executed in two



Health Laboratories - National Summary per season, all ages. https://gis.cdc.gov/grasp/fluview/flu\_by\_age\_virus.html





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Use of RIV in 50–64y and at-risk 18–49y could decrease influenza hospitalizations each season in the US

![](_page_0_Picture_75.jpeg)

FUNDING STATEMENT This study was funded by Sanofi

**CONFLICT OF INTEREST** 

LTP, LC, RCH, and SSC are Sanofi employees and may hold company shares and/ stock options

ACKNOWLEDGEMENT Medical writing support was provided by Hardeep Kaur Manchanda, M.S. Pharm (Sanofi)