Influenza antiviral use in patients hospitalized with laboratory-confirmed influenza in the United States, FluSurv-NET, 2015 – 2019

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Background

Influenza antiviral therapy is recommended for patients hospitalized with suspected or confirmed influenza illness, and early treatment initiation may improve outcomes [1,2]

Objectives: To 1) Evaluate temporal trends in influenza therapy use in patients hospitalized with laboratory-confirmed influenza; and 2) Explore factors associated with delayed treatment initiation (3 or more days after onset of symptoms)

Methods

Population
- Residents from Influenza Hospitalization Surveillance Network (FluSurv-NET) catchment area hospitalized with lab-confirmed influenza October 1 – April 30 during 2015-2016 through 2018-2019 influenza seasons

FluSurv-NET 2016-2017
Population-based Hospitalization Surveillance
Legend
EIP Sites
HSP Sites
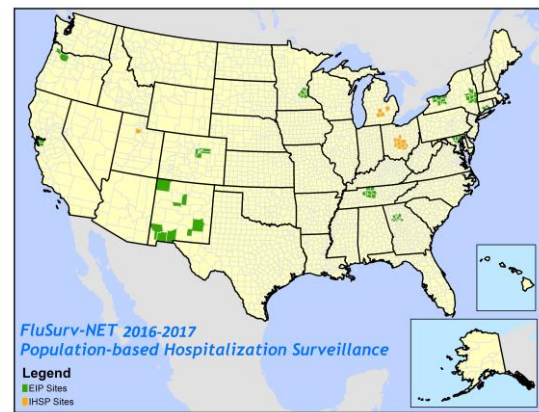
Methods
- Abstracted demographic, clinical, and treatment data
- All patients during 2015-2016 – 2016-2017 seasons
- Age-stratified random sample of patients ≥50-years and all patients <50-years during 2017-2018 – 2018-2019 seasons

Analysis
- Described characteristics of patients (unweighted counts and weighted percentages)
- Assessed proportion receiving treatment – by season and age category – and trends over time using Cochran-Armitage test
- Among treated patients, multivariable logistic regression models used to evaluate factors associated with delayed treatment (3 or more days from symptom onset), adjusting for age, sex, race/ethnicity, and high-risk medical conditions, using replicate weights for variance assessment

Results

Table. Of 62,182 patients, most were older and had 1 or more high-risk medical conditions, and the median time from symptoms onset to admission was 3 days.

Characteristic	No. (%) or median (IQR)
Age, No. (%)	
0-17 yrs	6851 (9%)
18-49 yrs	11019 (15%)
50-64 yrs	14529 (22%)
65-74 yrs	10787 (19%)
75-84 yrs	10337 (18%)
≥85 yrs	9093 (16%)
Female, No. (%)	33845 (54%)
Race/ethnicity, No. (%)	
White, non-Hispanic	36059 (59%)
Black, non-Hispanic	12989 (20%)
Hispanic	5649 (9%)
Other, non-Hispanic	3451 (6%)
Unknown	4429 (7%)
High-risk conditions*, No. (%)	
0	11367 (17%)
1	16605 (26%)
2	15664 (26%)
≥3	18980 (31%)
Illness onset to admission, median (IQR) days	3 (2-5)

* High-risk conditions included: asthma, other chronic lung disease, cardiovascular disease, diabetes, blood disorder, neurological condition, neuromuscular condition, immunosuppressive condition, chronic kidney disease, chronic liver disease

Figure. Percentage who received influenza antiviral therapy increased over time (Cochrane Armitage p<0.001 for all age groups) – 86% in 2015-2016 to 94% in 2018-2019.

- 2015/2016 (n=8,465)
- 2016/2017 (n=16,891)
- 2017/2018 (n=20,814)
- 2018/2019 (n=16,012)
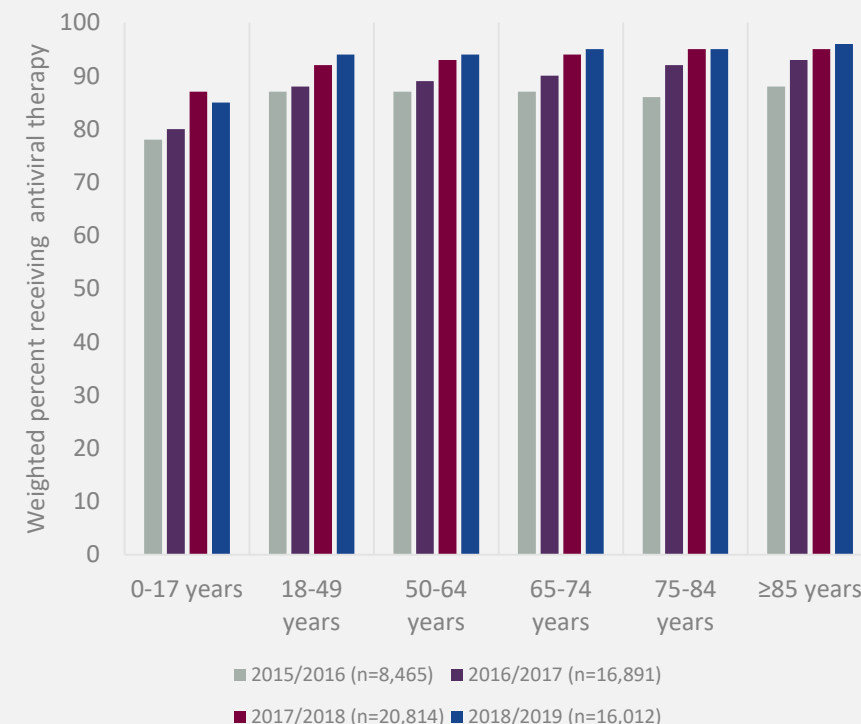
Oseltamivir was used in 99% of those who received influenza antiviral treatment

- Baloxavir used in 2% of patients who received treatment during the 2018-2019 season

Of those who received antiviral treatment:

- **62% started influenza therapy 3 or more days after symptom onset (median 3 days, IQR 2-5)**

- **However, 87% started treatment on or prior to the first day of hospitalization**

Table. Black, non-Hispanic race/ethnicity, 3 or more compared to 0 high-risk conditions, and 1-day increase in time from symptoms onset to admission associated with late influenza antiviral initiation (3 or more days from symptom onset).

Characteristic	Unadjusted OR	Adjusted OR
Race/ethnicity		
White, non-Hispanic	Ref	Ref
Black, non-Hispanic	0.97 (0.92-1.02)	1.23 (1.13-1.33)
Hispanic	0.96 (0.89-1.03)	1.07 (0.97-1.19)
Other, non-Hispanic	1.00 (0.91-1.10)	1.06 (0.93-1.21)
Unknown	1.03 (0.95-1.12)	1.27 (1.13-1.43)
High-risk conditions		
0	Ref	Ref
1	0.98 (0.92-1.04)	1.05 (0.96-1.15)
2	1.04 (0.97-1.10)	1.09 (0.99-1.20)
≥3	1.07 (1.01-1.14)	1.21 (1.09-1.33)
1-day increase from illness onset to admission	8.77 (8.05-9.57)	8.79 (8.06-9.60)

* Models adjusted for other variables in table along with age and sex; age and sex were not associated with late initiation of antiviral therapy in adjusted models (results not included in table)

Conclusions

In patients hospitalized with laboratory-confirmed influenza, most received influenza antiviral therapy and coverage improved over time

However, a majority of treated patients started 3 or more days after symptom onset, driven by delayed entry into care

[1] Uyeki TM, Bernstein HH, Bradley JS, et al. Clinical Practice Guidelines by the Infectious Diseases Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenzaa. Clin Infect Dis. 2019 Mar 5;68(6):e1-e47.
[2] Aoki FY, Macleod MD, Paggiaro P, et al. Early administration of oral oseltamivir increases the benefits of influenza treatment. J Antimicrob Chemother. 2003 Jan;51(1):123-9.

Affiliates / Partners

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