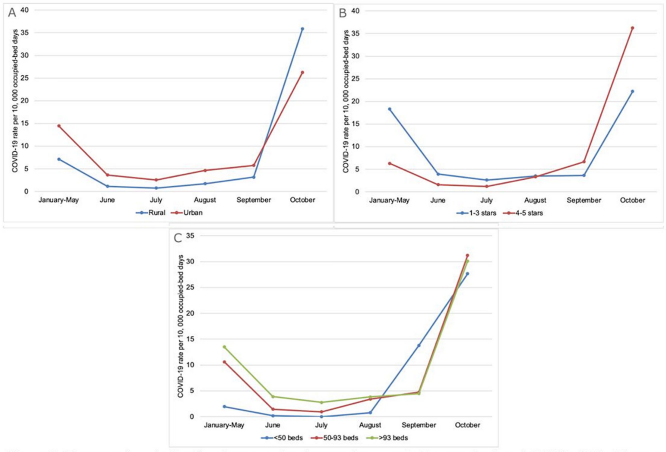

Figure 1: Temporal analysis of various nursing home characteristics vs calculated COVID-19 incidence.

(standard deviation) or median (interquartile range). We compared groups using the Pearson χ^2 test and the Kruskal-Wallis test. COVID-19 incidence rates were calculated by dividing the number of COVID-19 cases by monthly occupied bed days and multiplied by 10,000. **Results:** From January 1, 2020, to November 1, 2020, in total, 3,133 SARS-CoV-2–confirmed cases were reported among 248 (70.5%) nursing homes. Urban location (P = .027), overall 5-star rating (P = .035), number of beds ($p < 0.001$), and average count of residents per day ($p < 0.001$) were associated with a greater number of COVID-19 cases. Temporal analysis showed that the highest incidence rates of COVID-19 in NHs were observed from January to May and in October 2020 (11.36 and 30.33 cases per 10,000 occupied-bed days, respectively). Urban NHs experienced higher incidence rates until September, then incidence rates among rural facilities surged (Fig.1A). In the first half of the year, NHs with lower quality scores (1-3 stars) had a higher COVID-19 incidence rate; however, in August this trend reversed, and facilities with higher quality scores (4-5 stars) showed the highest incidence rates (Fig.1B). Fig. 2 shows a temporal depiction of the shift from urban to rural settings. **Conclusions:** Higher COVID-19 incidence rates during the first 5 months of the pandemic were observed in urban, larger facilities with lower 5-star rating. By the end of the year, nursing homes in rural areas and those with higher quality ratings had the highest incidence rates.

Funding: No
Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2021;1(Suppl. S1):s11–s12
doi:10.1017/ash.2021.22

Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Respiratory Viruses Other than SARS-CoV-2

Traditional Definition of Healthcare-Associated Influenza Underestimates Cases Associated with Other Healthcare Exposures

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Background: Healthcare-associated transmission of influenza leads to significant morbidity, mortality, and cost. Most studies classify healthcare-associated viral respiratory infections (HA-VRI) as those with a positive test result after the first 3 days following admission, which does not account for healthcare exposures prior to admission. Utilizing an expanded definition of healthcare-associated influenza, we aimed to improve the estimates of disease prevalence on a population level. **Methods:** This study included laboratory-confirmed cases of influenza in adult and pediatric patients admitted to any acute-care hospital in a catchment area of 8 counties Tennessee identified between October 1, 2012, and April 30, 2019. Surveillance information was abstracted from hospital and state laboratory databases, hospital infection control practitioner databases, reportable condition databases, and electronic health records as a part of the Influenza Hospitalization Surveillance Network (FluSurv-NET) by the Centers for Disease Control and Prevention (CDC) Emerging Infections Program (EIP). Cases were defined as healthcare-associated influenza laboratory confirmation of infection occurred (1) on or after hospital day 4 ("traditional definition"), or (2) between hospital days 0 and 3 in patients transferred from a chronic care facility or with a recent discharge from another acute-care facility in the 7 days preceding the current index admission (ie, enhanced definition). The proportion of laboratory-confirmed influenza designated as HA-VRI using both the traditional definition as well as with the added enhanced definition were compared. Data were imported into Stata software for analysis. **Results:** We identified 5,904 cases of laboratory-confirmed influenza in hospitalized patients over the study period. Using the traditional definition for HA-VRI, only 147 (2.5%, seasonal range

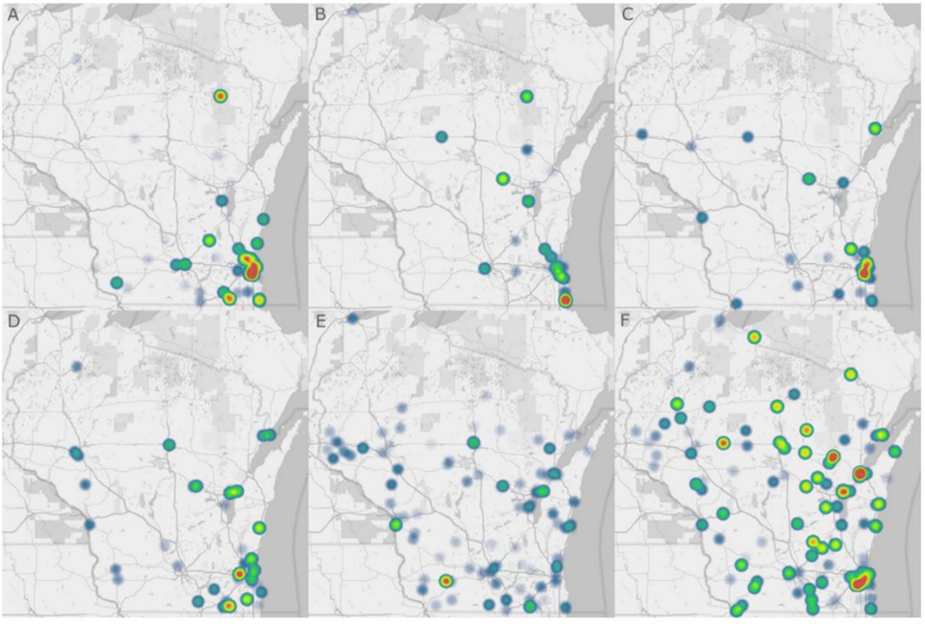

Figure 2: Map of COVID-19 incidence in Wisconsin nursing homes from January to October.

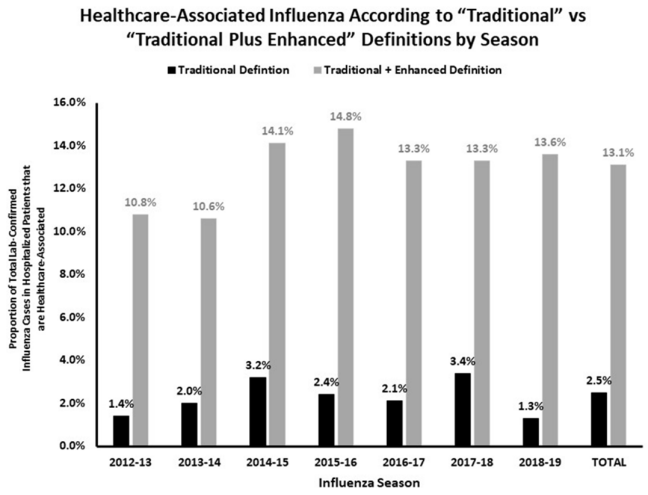

Figure 1.

1.3%–3.4%) were deemed healthcare associated (Figure 1). Adding the cases identified using the enhanced definition, an additional 317 (5.4%, range 2.3%–6.7%) cases were noted in patients transferred from a chronic care facility for the current acute-care admission and 336 cases (5.7%; range, 4.1%–7.4%) were noted in patients with a prior acute-care facility admission in the preceding 7 days. Using our expanded definition, the total proportion of healthcare-associated influenza in this cohort was 772 of 5,904 (13.1%; range, 10.6%–14.8%). **Conclusion:** HA-VRI due to influenza is an under-recognized infection in hospitalized patients. Limiting surveillance assessment of this important outcome to just those patients with a positive influenza test after hospital day 3 captured only 19% of possible healthcare-associated influenza infections across 7 influenza seasons. These results suggest that the traditionally used definitions of healthcare-associated influenza underestimate the true burden of cases.

Funding: No
Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2021;1(Suppl. S1):s12–s13
doi:10.1017/ash.2021.23

Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Surveillance/Public Health

Evaluation of Electronic Health Record and Long-Term Care Pharmacy Data for Tracking and Reporting Antibiotic Use in the United States

Matthew Hudson; Katryna Gouin; Stanley Wang; Manjiri Kulkarni; Mary Beckerson; Laura Ditz; Stephen Creasy; Marti Wdowicki; Nancy Chi; Lauri Hicks and Sarah Kabbani

Background: Antibiotics are frequently prescribed in nursing homes, often inappropriately. Data sources are needed to facilitate measurement and reporting of antibiotic use to inform antibiotic stewardship efforts. Previous analyses have shown that the type of nursing-home stay, that is, short stay (<100 days), is a strong predictor of high antibiotic use compared to longer nursing-home stays. The study objective was to compare 2 different data sources, electronic health record (EHR) and long-term care (LTC) pharmacy data, for surveillance of antibiotic use and type of nursing-home stay. **Methods:** EHR and pharmacy data during 2017 were included from 1,933 and 1,348 US-based nursing homes, respectively. We compared data elements available in each data source for antibiotic use reporting. In each data set, we attempted to describe antibiotic use as the proportion of residents on an antibiotic, days-of-therapy (DOT) per 1,000 resident days (RD), and distribution of antibiotic course duration, overall and at the facility level. Facility proportion of short-stay and long-stay (>100 days) nursing-home residents were calculated using admission dates and census data in the EHR data set and a payor variable in the pharmacy data set (Figure 1). The 2 data sources also provided

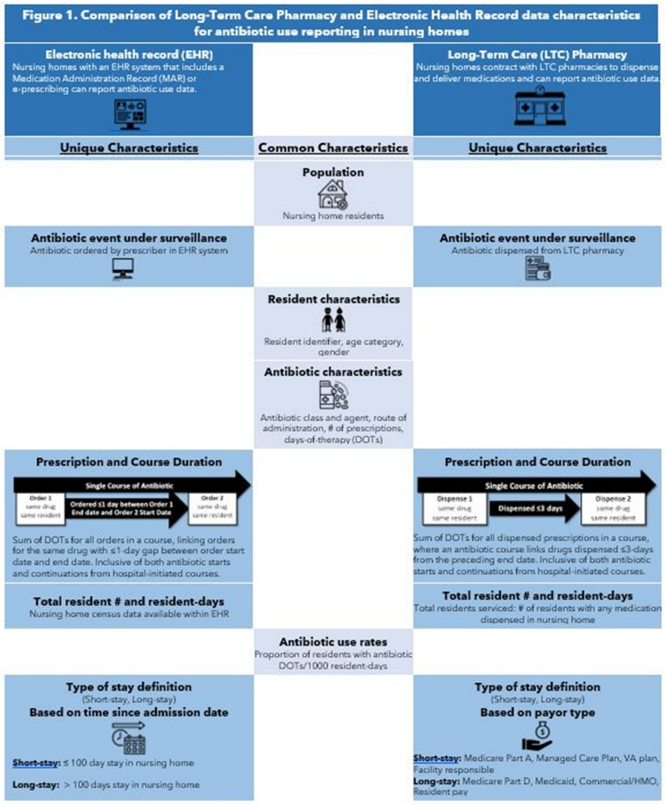

Figure 1.

Table I. Comparison of Electronic Health Record and Long-Term Care Pharmacy antibiotic use data in nursing homes, 2017

	Electronic Health Record Data N (%) or Median (IQR)*		Long-term Care Pharmacy Data N (%) or Median (IQR)	
Total number of facilities	1933		1348	
Total number of residents†	381,132		326,713	
Short-stay residents	308,619		279,257	
Long-stay residents	72,513		117,031	
Total number of residents receiving antibiotics	191,831	(50%)	146,794	(45%)
Facility proportion of residents prescribed antibiotics	51%	(44-58%)	46%	(39-54%)
Total number of resident-days	50,165,839		38,137,191	
Short-stay resident-days	10,465,420	(21%)	19,201,236	(50%)
Long-stay resident-days	39,700,419	(79%)	18,935,865	(50%)
Total antibiotic days-of-therapy/1000 resident-days	90		86	
Facility antibiotic days-of-therapy/1000 resident-days	77	(49-119)	79	(54-109)
Route of Administration				
Oral	484,810	(81%)	277,115	(85%)
Intravenous/Intramuscular	117,470	(19%)	47,118	(15%)
Antibiotic course duration				
1-7 days	357,837	(60%)	176,087	(54%)
8-14 days	194,542	(33%)	113,333	(35%)
15-30 days	29,417	(5%)	22,193	(7%)
31+ days	13,602	(2%)	12,693	(4%)

*N=number, IQR=Interquartile range
† Residents in long-term care pharmacy data may be categorized as both short-stay and long-stay over the course of the year, therefore sum does not reflect the total unique number of residents

antibiotic characteristics, including antibiotic class, agent, and route of administration. The deidentified nature of facility data prevented direct comparison of antibiotic use measures between facilities. **Results:** The EHR and pharmacy data sets contained 381,382 and 326,713 residents, respectively (Table 1). Within the EHR, 51% of residents were prescribed an antibiotic in 2017, at a median rate of 77 DOT per 1,000 RD. In the LTC pharmacy, 46% of residents were prescribed an antibiotic at a median rate of 79 DOT per 1,000 RD (Table 1). Short-stay residents contributed a smaller proportion of total RDs in the EHR relative to the pharmacy cohort (21% vs 50%, respectively). **Conclusions:** Nursing-home antibiotic use data obtained from EHR and pharmacy vendors can be used for calculating antibiotic use measures, which is important for antibiotic use reporting and facility-level tracking to identify opportunities for improving prescribing