Does Antimicrobial Prescription Data Improve Influenza Surveillance in VA?

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Introduction

Antimicrobial prescriptions are a new data source available to the Veterans Health Administration (VHA) biosurveillance program. Little is known about whether antiviral or antibacterial prescription data correlates with influenza ICD-9-CM coded encounters. We therefore evaluated the utility and timeliness of antiviral and antibacterial utilization for influenza surveillance.

Methods

Antiviral (oseltamivir, zanamivir) and antibacterial (azithromycin) outpatient (OP) prescriptions and OP ESSENCE coded respiratory syndrome, influenza-like-illness (ILI) or influenza-specific ICD-9-CM coded visits were analyzed covering the 2010-2011 and 2011-2012 influenza seasons (July 1, 2010-July 31, 2012) for 152 VA medical centers and 971 outpatient clinics using VA Corporate Data Warehouse and ESSENCE biosurveillance tool. Correlation analysis and peak comparisons were performed.

Results

For this time period, there were 2,880,415 respiratory, 1,578,421 ILI, and 5,158 influenza-specific coded visits. For both influenza seasons, respiratory and ILI visits peaked at weeks 1-2 whereas influenza-specific visits had two peaks between weeks 37-40 and weeks 6-11 (See Figure 1 and 2). The total number of prescriptions was 631,272 azithromycin; 8,362 oseltamivir; and 88 zanamivir (See Figure 2). Spearman rank correlation coefficients for daily antiviral prescriptions and influenza-coded visits were (0.70); ILI visits (0.64), and respiratory illness visits (0.62), respectively; and for azithromycin prescriptions 0.77, 0.98, and 0.97 respectively. Oseltamivir and zanamivir prescriptions only increased in 2010-2011 starting with week 51 and peaking week 6 and in 2011-2012 starting with week 8 and peaking week 14. However, azithromycin prescriptions tracked better across the entire influenza season (peaking at weeks 1-2 for both influenza seasons).

Conclusions

VA outpatient prescription data indicated that significantly more ILI and respiratory syndrome visits occurred compared to antiviral prescriptions dispensed with marginal temporal correlation between visits and antiviral prescriptions. Reasons for this finding require further investigation. Although we did not chart review the visit code and antimicrobial prescription in individual records, possible factors may be related to later presentation of cases, perceived lack of efficacy of antivirals, or insufficient coding of influenza. Thus, antiviral prescription data provided minimal additional information for influenza trend monitoring in VA although may still be useful a marker of more severe illness. Interestingly, azithromycin use tracked better with the onset and peaks of the influenza season. Further investigation is also needed to determine whether patients with influenza-specific coded encounters were also prescribed azithromycin and why relatively few encounters were coded with an influenza-specific code.
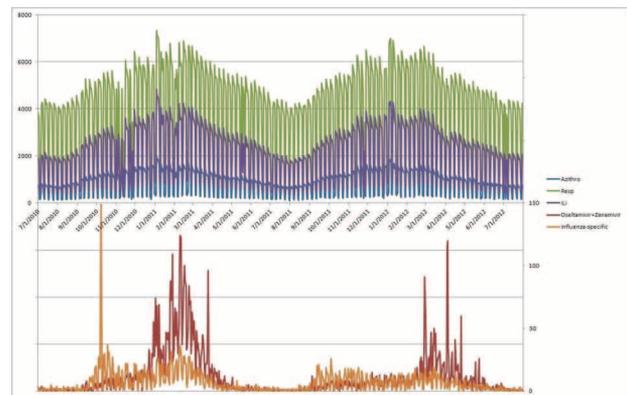

Figure 1: Daily respiratory (Resp) [green], Influenza-like Illness (ILI) [purple], and Influenza-specific [yellow] encounters compared to azithromycin (Azithro) [blue] and oseltamivir and zanamivir [red] orders in VA facilities nationally from July 1, 2010-July 31, 2012.
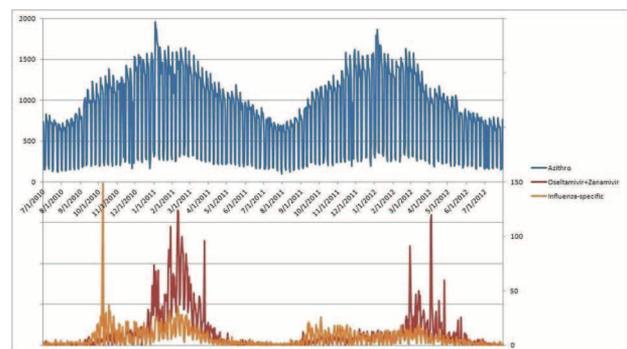

Figure 2: Detailed view of daily influenza-specific coded encounters [yellow] and azithromycin (azithro) [blue], oseltamivir and zanamivir [red] orders in VA facilities nationally from July 1, 2010-July 31, 2012.

Keywords

ESSENCE; Surveillance; Influenza; Veterans; Antimicrobials

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