

Spatial Distribution of Adolescents with Sexually Transmitted Infections Diagnosed in the Pediatric Emergency Departments of Washington, DC

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Objective

- (1) To describe the spatial distribution of adolescents with ED-diagnosed STIs in a large urban area with a high prevalence of STI
- (2) To compare census block groups and identify "hot spots" of STI.

Introduction

Utilization of local surveillance data has been shown to help risk stratify patients presenting to the emergency department presenting with GAS pharyngitis or meningitis. (1, 2) Adolescents frequently present to the emergency department (ED) with symptoms that may be associated with a sexually transmitted infection (STI). (3)

When ED providers perceive high local rates of STI and low rates of follow-up, empiric treatment is considered. This strategy may result in unnecessary treatment. Knowledge of the local spatial distribution of adolescents with STIs diagnosed in local pediatric emergency departments EDs may enhance risk stratification and allow targeted testing and/or treatment among future ED patients in whom STI is considered.

Methods

We performed a retrospective cross-sectional medical record review of all visits made by District residents aged 13-19 years old to the two large urban pediatric EDs in Washington, DC in 2012 and abstracted demographic and visit data, including STI testing results for gonorrhea and chlamydia. Multivariable logistic regression was utilized to compare odds of testing positive for STI between geographic regions. Geospatial statistical analyses were performed using ArcMap 10.1 tools, Hot Spot Analysis and Spatial Autocorrelation (Moran's I).

Results

Of 1002 adolescents tested for STIs, 6.8% tested positive for gonorrhea, 18.6% tested positive for chlamydia, 22.7% tested positive for either gonorrhea or chlamydia and 2.9% tested positive for co-infection. The mean age of patients with STIs was 16.9 years (SD 1.5); 78.4% were female. Of the 227 patients with ≥ 1 positive test, 95% of their addresses were successfully geocoded. Hot Spot Analysis indicated statistically significant clusters of STI cases (figure 1.) Spatial autocorrelation (Moran's I) demonstrated that the distribution of cases was not random (z-score 13.3, p value < 0.05). The odds of adolescent patients from DC Ward 6 testing positive for chlamydia was twice that of DC Ward 7 (aOR 2.07; 95% CI 1.07 – 3.98).

Conclusions

Geographic analyses identified areas with significantly higher cases of ED-diagnosed STIs. Modeling real time surveillance in conjunction with other clinical information readily available in the electronic medical record may improve prediction of STIs in adolescents presenting to the ED, decrease empiric treatment, and allow for targeted public health prevention. Incorporation of city-wide data could improve our ability to identify clusters of infection.

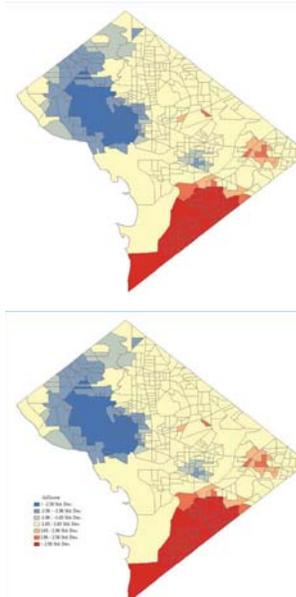


Figure 1. Hot spot analysis of ED-diagnosed STI cases by census block group (n=233)

Keywords

sexually transmitted infection; surveillance; emergency department

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