

ABSTRACT

Relationship between neighborhood poverty and emergency department utilization for fever/flu syndrome

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Objective

To describe the relationship between neighborhood poverty and emergency department visits for fever/flu syndrome illnesses reported through the Connecticut Hospital Emergency Department Syndromic Surveillance (HEDSS) system.

Introduction

The HEDSS system was implemented in 2004 to monitor disease activity.¹ In all, 18 of 32 emergency departments (ED) and 1 urgent care clinic provide data. Chief complaints are routinely categorized into eight syndromes. The fever/flu syndrome is used for early detection and monitoring of influenza in the community.²

Area-based measures, such as zip code, enable linkage to area-based socioeconomic census data. Neighborhood poverty, defined as the percentage of persons living below the federal poverty level in a geographic area, predicts a wide range of disease outcomes.³

Methods

HEDSS data were categorized into 6-week periods of maximal influenza activity: baseline (9/06-10/18/2008), 2008–2009 seasonal, spring 2009 H1N1 and fall 2009 H1N1. Neighborhood poverty was categorized as low (<5% below federal poverty level), medium–low (5–<10%), medium–high (10–<20%), and high (≥20%) based on zipcode. Chi-square for trend was calculated for age and poverty-stratified percentages of total ED visits for fever/flu for each time period. The percentage increase over baseline in ED visits for fever/flu was calculated by neighborhood poverty level (Figure 1).

Results

There were a total of 4051 fever/flu visits at baseline, 8369 during the seasonal peak, 11 426 during the 2009 spring H1N1 peak, and 14 057 during the fall 2009 H1N1 peak. During each of these periods, the percentage of ED visits that were fever/flu increased with increasing poverty level

($P < 0.0001$, χ^2 for trend). The strength of the association was similar at baseline and for each influenza period and for each age group except ≥65 years for which no relationship was seen between poverty and ED utilization for fever/flu.

The percentage increase in ED visits for fever/flu compared with baseline was similar for all poverty levels and age groups in each influenza season, with the exception of 5–17 year olds who had significantly higher rates of ED utilization with increasing poverty level during the spring 2009 H1N1 wave ($P < 0.0001$).

Conclusions

There is a strong and consistent association between neighborhood poverty and ED visits for fever/flu compared with all other syndromes combined. The strength of association is similar for fever/flu illnesses at baseline, during seasonal flu, and during each of the H1N1 waves. The percentage increase in ED visits for fever/flu during each flu season was similar for all poverty levels. If visiting the ED makes one more likely to be admitted as an inpatient than not visiting the ED, this could partially explain the increased incidence of hospitalization seen in persons in higher poverty neighborhoods. Efforts to reduce ED visits for

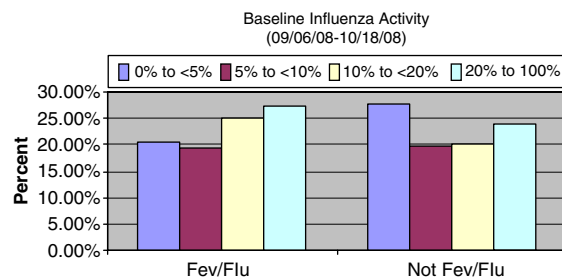


Figure 1 At baseline, ED utilization for fever/flu syndrome was associated with increasing neighborhood poverty. This was not true of non-fever/flu visits. Similar patterns in ED utilization were observed during the other influenza activity periods.

fever/flu (for example, vaccination, education) should be targeted to higher poverty neighborhoods. Additional study is needed to determine why persons from higher-poverty neighborhoods seem to be more likely to visit the ED for fever/flu syndrome.

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References

- 1 Dembek Z, Carley K, Hadler J. Guidelines for constructing a statewide hospital syndromic surveillance network. *MMWR* 2005;54 (Suppl): 21–4.
- 2 Heffernan R, Mostashari F, Das D, Karpati A, Kulldorff M, Weiss D. Syndromic surveillance in public health practice, New York City. *EID* 2004;10:858–64.
- 3 Krieger N, Chen JT, Waterman PD, Rehkopf DH, Subramanian SV. Race/ethnicity, gender, and monitoring socioeconomic gradients in health: a comparison of area-based socioeconomic measures—The Public Health Disparities Geocoding Project. *Am J Public Health* 2003;93:1655–71.