

**Catchment Area of Miami Children's Hospital Emergency Room -
Implications for Syndromic Surveillance in Miami-Dade County**
Rene Borroto-Ponce, BSc, Guoyan Zhang, MD MPH, Fermin Leguen, MD MPH
Rodlescia Sneed, MPH, Claudio Micieli, MPH
Miami-Dade County Health Department (MDCHD), Florida Department of Health

OBJECTIVE

This research aims to determine the catchment area of Miami Children's Hospital Emergency Department (ED). The purpose is to identify pediatric populations and territories within Miami-Dade County that are insufficiently covered by this hospital's ED.

BACKGROUND

Miami-Dade County Health Department is using the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) to conduct syndromic surveillance [1]. Patients' chief complaint records from 14 Hospitals EDs are fed into ESSENCE on a daily basis. This research focuses on Miami Children's Hospital, the largest, 268-bed, pediatric teaching hospital in the Southeastern United States, with more than 650 physicians and over 130 pediatric sub-specialists. It is South Florida only licensed specialty hospital exclusively for children and draws the largest number of pediatric patients from Miami-Dade County

METHODS

A total of 85 661 residents in Miami-Dade County below 18 years old visited Miami Children's Hospital ED in 2005. This figure was previously cleaned of double entries resulting from classification of ED visits into more than one syndromic group. Direct standardization was used to calculate age standardized rates of visits by patient's zip code of residence. The 2000 US population aged 0-17 was used as standard. Standardized ratios were calculated by dividing each zip code rate by the countywide age-standardized rate. The zip codes' absolute number and standardized ratio of ED visits were mapped using the ArcView 9 Geographic Information System (GIS). Hot Spot cluster analysis was done with the ArcToolBox capability of the GIS. The Getis-Ord Gi statistics was used to determine the main catchment areas of the hospital. Using the zip codes as analytical units, ecological multiple

regression analysis was performed in SPSS to identify socio-demographic and accessibility variables that are associated to the spatial pattern of the standardized ratio of visits.

RESULTS

Two main clustered local catchment areas were detected. One is located north of Miami Children's Hospital and is made up of West Little Havana, Doral, Hialeah, and Brownsville. The other is in the south and is formed by Cutler, Perrine, and Palmetto Estates. Statistically significant variables that were positively associated to the standardized ratio of visits were the proportion of county household with annual income below 25 000 US dollars ($p=.012$), and distance to neighboring Broward county ($p=.05$). Distance to Miami Children's Hospital showed negative association ($p=.006$). Overall, these variables accounted for 34 % of the variance of the standardized ratio of ED visits.

CONCLUSIONS

The weakest links to Miami Children's Hospital ED are in zip codes located in the Northeast, Miami Beach, the Downtown area, Overtown, and the Southernmost areas of the county. An estimate of 7 900 of the county's most vulnerable pediatric populations reside in these territories. A question to answer is whether populations of these areas visit other EDs currently feeding data into ESSENCE. Was the answer negative, they should be prioritized by alternative surveillance systems targeting pediatric populations, such as school absenteeism or outpatient visits. This research should be replicated for all hospitals feeding data into ESSENCE to determine catchment areas for each of them.

REFERENCE

1. Lombardo J, Burkom H, Pavlin J. ESSENCE II and the framework for evaluating syndromic surveillance systems. MMWR 2004; 53 (Suppl): 159-165