Spatial analyses of public health data can help to elucidate previously undetected population patterns. This article provides an example of “cluster” detection, whereby the authors identified a New York City neighborhood with an elevated number of HIV-positive individuals, one that had not previously identified as a high-risk neighborhood. Detection of new focus areas allows public health agencies to heighten their awareness and response efforts and act more quickly. However, sporadic clustering does occur. Monitoring trends across multiple years is ultimately a more reliable profile of a community’s collective risk.

Lorna Thorpe, PhD

Director, Epidemiology and Biostatistics Program

City University of New York School of Public Health, Hunter College

USING GIS-BASED DENSITY MAPS OF HIV SURVEILLANCE DATA TO IDENTIFY PREVIOUSLY UNRECOGNIZED GEOGRAPHIC FOCI OF HIV BURDEN IN AN URBAN EPIDEMIC

COLIN W. SHEPARD, MD

HEIDI W. GORTAKOWSKI, MPH

HANI NASRALLAH, MPH

BLAYNE H. CUTLER, MD, PhD

ELIZABETH M. BEGIER, MD, MPH

Spatial analysis lies at the core of methods used to understand public health surveillance data, perhaps most famously employed by John Snow in the identification of the source of a cholera epidemic in 19th century London.¹ Geographic distribution of disease is useful information not only because it can help identify the cause of an outbreak and suggest a means of interrupting the spread of disease, but also because understanding how the burden of disease aligns with political and bureaucratic borders assists in policy decisions and judicious allocation of resources. For sexually transmitted diseases, including human immunodeficiency virus (HIV), geographic distribution is especially salient because people tend to have sex with those who live close to them geographically.²

Spatial analysis by geopolitically defined areas (e.g., counties, towns, and cities) of HIV surveillance data is routinely performed and presented by the Centers for Disease Control and Prevention (CDC) and state and local health departments,^{3,4} and is used to inform HIV prevention, care, and treatment efforts at all levels of government. In New York City (NYC), several geographically focused HIV prevention efforts have been used to maximize the impact of public health resources.

In June 2008, NYC launched *The Bronx Knows* HIV Testing Initiative, the city’s largest attempt at municipal scale-up of routine HIV screening to date. The goal of *The Bronx Knows* is to ensure that every resident of the Bronx aged 13–64 years knows his or her HIV status. The Bronx was selected, in part, on the basis of a high proportional HIV-related mortality ratio compared with that of the other four NYC boroughs.^{5,6} In addition, condom distribution campaigns have been geographically focused on NYC neighborhoods with the highest HIV prevalence.⁷ Social marketing campaigns seeking to reach men who have sex with men (MSM) have concentrated a significant portion of their print media placement in bars and clubs in neighborhoods that have long been associated with gay men to maximize visibility among this priority population.

The finest level of geographic detail presented in NYC’s HIV public health surveillance reports since the advent of HIV reporting in 2001 has been the United Hospital Fund (UHF) neighborhood, which divides the five boroughs of NYC into 42 areas.⁸ The populations of UHF neighborhoods range from 30,895 in Lower Manhattan to 477,516 in West Queens,³ and sizes of the populations of people living with HIV range from 131 in Bayside-Little Neck to 5,888 in Chelsea-Clinton.⁹ Using UHF neighborhood as the smallest unit of geospatial analysis, six to eight neighborhoods in the South and Central Bronx, Central Brooklyn, East and Central Harlem, and Southern Manhattan have been consistently identified as having borne the greatest burden of HIV both in terms of period HIV prevalence and HIV diagnosis rate.^{3,10,11}

Although UHF neighborhood can be descriptive, the density and diversity of NYC’s population, and the size and scope of its HIV epidemic, require a finer level of geographic detail to characterize the burden of HIV in NYC at a level comparable to analyses in most