GIS mapping aims to improve health care access for older adults

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With a growing aging population in South Florida, a University of Miami geographer who specializes in public health teamed up with geriatricians and other geographers to conduct the first age-adjusted analysis of socially and medically vulnerable older adults in Miami-Dade, Broward, and Palm Beach counties.

Using census data and geographic information systems (GIS) mapping techniques, Dr. Justin Stoler, an assistant professor at the UM College of Arts and Sciences, and his fellow researchers mapped and analyzed areas of socially and medically vulnerable older adults in the tri-county area who were not being identified by traditional population-wide health care analyses.

"We used a rich data set to help identify pockets of vulnerable older adults who may be slipping through the cracks in neighborhoods that were not previously considered vulnerable," said Stoler, who also holds a courtesy appointment in the Miller School of Medicine's Department of Public Health Sciences.

The concepts of medical and social vulnerability—which incorporate sociodemographic factors such as age, sex, race, and ethnicity—are becoming well established in the field, Stoler says. Accurately defining these vulnerabilities and indicators geographically, particularly in diverse populations, is still a challenge but becoming increasingly important in the rapidly changing medical landscape.

In an attempt to overcome the challenges, Stoler and his team applied principal components analysis (PCA) to previously identified indicators of social and medical vulnerability at the census tract level. Using GIS, the researchers created and mapped age-stratified vulnerability scores and then used spatial analysis techniques to identify patterns and interactions between social and medical vulnerability throughout the study area.

The study, Stoler says, grew from observations by mobile health clinicians affiliated with Nova Southeastern University in Broward County. They found that a surprising number of older adults were in need of medical assistance but had inadequate access to health services.

Stoler, whose research has focused on the geographic patterns of urban health disparities and environmental influences on social and behavioral epidemiology, is excited about the potential for follow-up research to ultimately improve access to care for older adults. He and his fellow researchers hope to better determine sub-populations of medically and socially vulnerable older adults, whose age was defined for the study as 65 and older, and elderly adults, defined as over 85.

As their study noted, with an age-stratified analysis, policymakers can develop more targeted and low-cost methods to serve the health care needs of often-overlooked populations who are in higher need of medical and social assistance.

"Local and regional government agencies, such as Area Agencies on Aging, are increasingly connecting people to information and resources, and would benefit greatly from more detailed data about the population served," the study says. "In this rapidly evolving paradigm, data that explain the driving factors of older adult social and medical vulnerability remain essential to medical practice."

Stoler collaborated with Elizabeth Hames, Sweta Tewary, and Naushira Pandya of Nova Southeastern University's Department of Geriatrics and the Florida Coastal Geriatric Resources, Education and Training Center, and with Christopher T. Emrich of the University of South Carolina's Department of Geography and Hazards and Vulnerability Research Institute. Their study, "A GIS approach to identifying socially and medically vulnerable older adult populations in South Florida," was published August 5, 2016 in *The Gerontologist*.

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