Using Geographic Information Systems (GIS) to Analyze Statewide Get With The Guidelines-Stroke (GWTGS) Data
A Feasibility Project from the Kentucky Stroke Encounter Quality Improvement Project (SEQIP)

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Background

The Stroke Encounter Quality Improvement Project is a collaboration between certified stroke centers in Kentucky, the American Heart Association/American Stroke Association and the Kentucky Department of Public Health to implement statewide quality initiatives to improve the care of stroke patients. Since 2008, 23 hospitals participating in SEQIP have entered 56,513 ischemic stroke patient records into GWTGS.

Purpose

Geographic information systems (GIS) tools can expand our understanding of care and outcomes based on patient location. The purpose of this project was (1) to demonstrate the methods of linking a disease management registry with GIS mapping and analysis program, (2) to understand challenges when performing this link, and (3) to derive meaningful insight on stroke care and outcomes based by zip codes.

Methods

Registry data was derived from GWTGS and downloaded by the KDPH. The information was converted to a database file for use in ArcGIS. Geocoding was performed and after excluding those who had missing or incomplete zip codes, records were geocoded annually from 2013-October 2018. The data were then matched to one of 945 zip codes in Kentucky. Data was summarized by zip code and calendar year for:

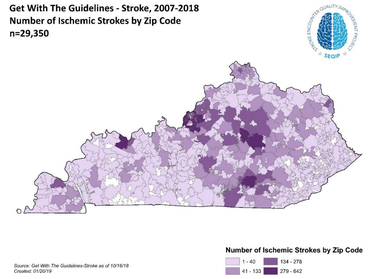
- Number ischemic strokes
- Number ischemic strokes that received IV alteplase administration
- Rate ischemic strokes receiving IV alteplase
- Number of ischemic stroke patients transferred
- Percent of ischemic stroke patients arriving by EMS

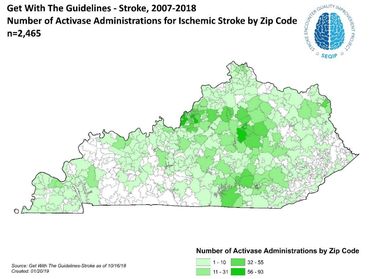
Results

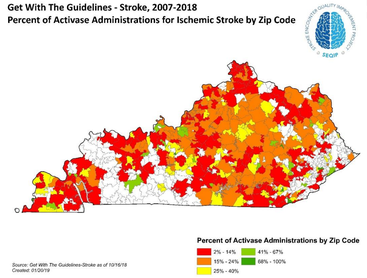
After excluding patients with missing or incorrectly formatted zip codes, data from 29,350 GWTGS patients records were joined and analyzed.

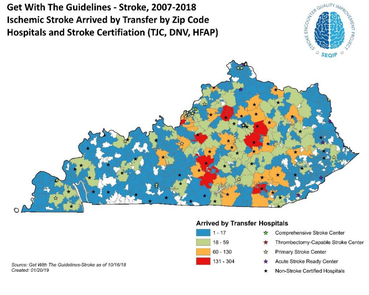
Conclusions

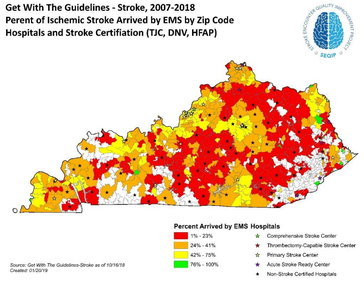
This feasibility project provides an example of a useful application of GIS analyses with a data registry. Using GIS mapping and methodology can assist hospital stroke coordinators and public health officials in developing and implementing interventions to improve systems of care and outcomes by targeted messaging to the community, referral facilities, and EMS. Further analysis is planned including hospital and EMS locations, socioeconomic, demographic and marketing/consumer preference data is planned to better understand variations by zip codes.











American Stroke Association.
A division of the American Heart Association.

Kentucky Heart Disease and Stroke Prevention Program