Smoking and stroke prevalence across the United States

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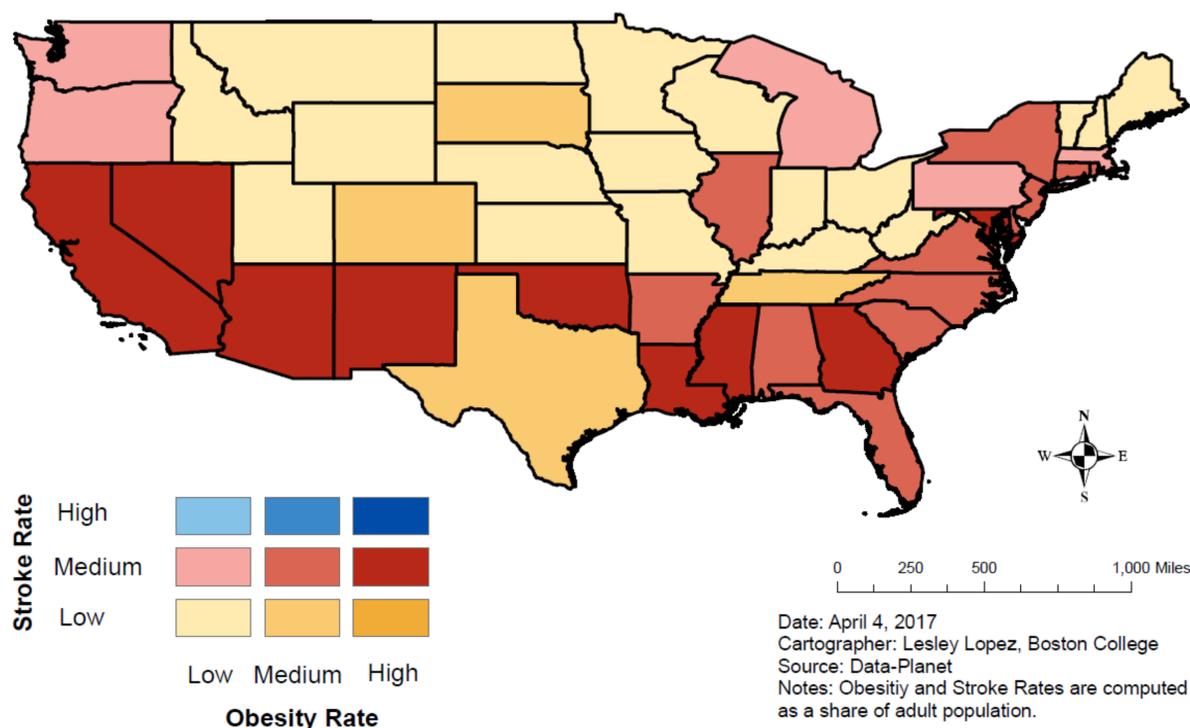Boston College University Libraries.

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SMOKING AND STROKE PREVALENCE ACROSS THE UNITED STATES

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Figure 1: Relationship between Stroke and Smoking, 2015

Stroke Rate: High / Medium / Low

Smoking Rate: Low / Medium / High

Date: April 4, 2017
Cartographer: Lesley Lopez, Boston College
Source: Data-Planet
Notes: Stroke and Smoking Rates are computed as a share of adult population.
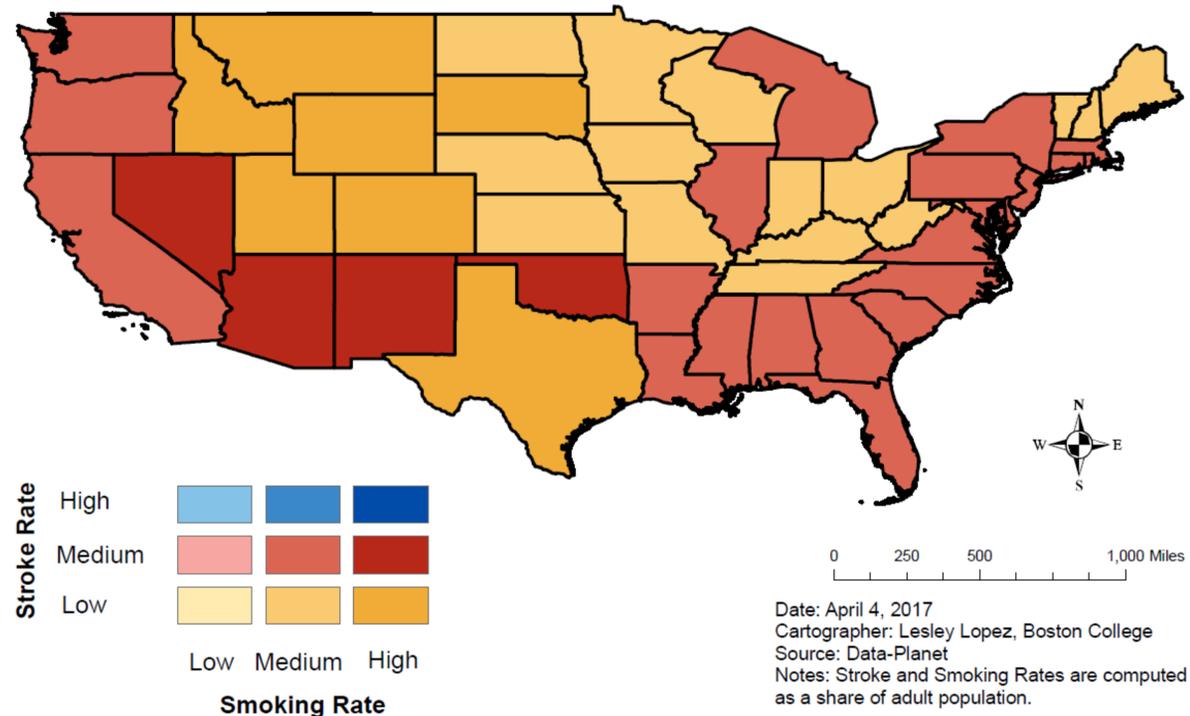
Figure 2: Relationship between Stroke and Obesity, 2015

Stroke Rate: High / Medium / Low

Obesity Rate: Low / Medium / High

Date: April 4, 2017
Cartographer: Lesley Lopez, Boston College
Source: Data-Planet
Notes: Obesitiy and Stroke Rates are computed as a share of adult population.

Abstract
An important public health issue is the prevalence of tobacco. Cigarette smoking is associated with various health risks. Research has shown that smoking leads to an increased risk of stroke by three to fourfold (Shah 2010). My hypothesis is that this relationship is nonlinear, and that other risk factors or geographic factors may be shaping it.

Findings
The bivariate choropleth map shown in Figure 1, which was produced with ArcGIS, displays the relationship between the stroke rate and the smoking rate for adults in 2015 across the United States. This relationship seems to be nonlinear. There are states, such as Texas and other states in the Midwest, with high rates of smoking but low rates of stroke.

What could be driving the nonlinearity?
1) There are other risk factors aside from smoking associated with lifestyle. For example, sleeping habits, eating habits, exposure to stress, etc. For example, obesity seems to be positively related to the rate of stroke. Figure 2 shows the map relating both variables, and while the north of the US displays a low-low stroke-smoking relationship, the south displays higher rates of obesity and stroke.
2) Weather conditions in different locations may also effect the relationship between smoking and stroke. For instance, the South exhibits a warmer climate, at times with extreme temperatures, that may lead to higher rates of stroke even with low rates of smoking.

Role of GIS
Compile and present spatial information on smoking and stroke rates using a bivariate choropleth map, using data downloaded from Data Planet.

Conclusions and Further Work
The relationship between stroke and smoking seems to be nonlinear. Moving forward I will explore the role of other variables affecting the risk of stroke aside from smoking. Even for smoking, I will consider both extensive and intensive margins. I will also explore variation not only at the state level, but also at the county level.

References
Data Planet: Easy Analytic Software Inc. (EASI). (2016). *Health - 2015*
Shah, Reena S., and John W. Cole. "Smoking and Stroke: The More You Smoke the More You Stroke." *Expert Review of Cardiovascular Therapy* 8.7 (2010): 917-32..