HERCULES
EXPOSOME RESEARCH CENTER

Data Science

The HERCULES Exposome Research Center develops new tools and technologies to study the exposome.

The Exposome

The exposome is the concept that **environmental exposures** play a role in our **health** over a lifetime. These exposures include what we eat and drink, the air we breathe, our behaviors and lifestyles, and where we work, live and play. Data Sciences is one of the tools HERCULES uses to study the exposome.

What is Environmental Health Data Science?

Data science uses a variety of computational, mathematical, and statistical tools to combine different types of data to reveal patterns and associations. Within environmental health, data science tools link exposure data from different sources in order to measure their impact on health across time and space. These tools create "pipelines" for processing the different pieces of the exposome puzzle in order to measure the exposome more holistically. By linking the tools together, we can create tools that can be used in reproducible ways, that is, tools to do the same type of analysis in a different location or time period.

Tools and Methods

Using advanced statistics and geographical tools (e.g. ArcGIS), data science can interpret patterns or trends in a population by integrating multiple datasets and displaying associations over time and geography.

What questions can data science answer?

The question you *want* to answer

The data you need to answer that question

The question you *can* answer with those data

The data you can get

- What data do you need to answer a specific exposome question?
- What exposome data can you collect, given the methods available?
- What exposome questions can be answered given the data and methods available?

Data Science in Action

Using data science for data-driven decision-making

In collaboration with a community group, data science was used to visualize a local city's infrastructure in order to inform and educate local residents and decision-makers and facilitate data-driven city planning.

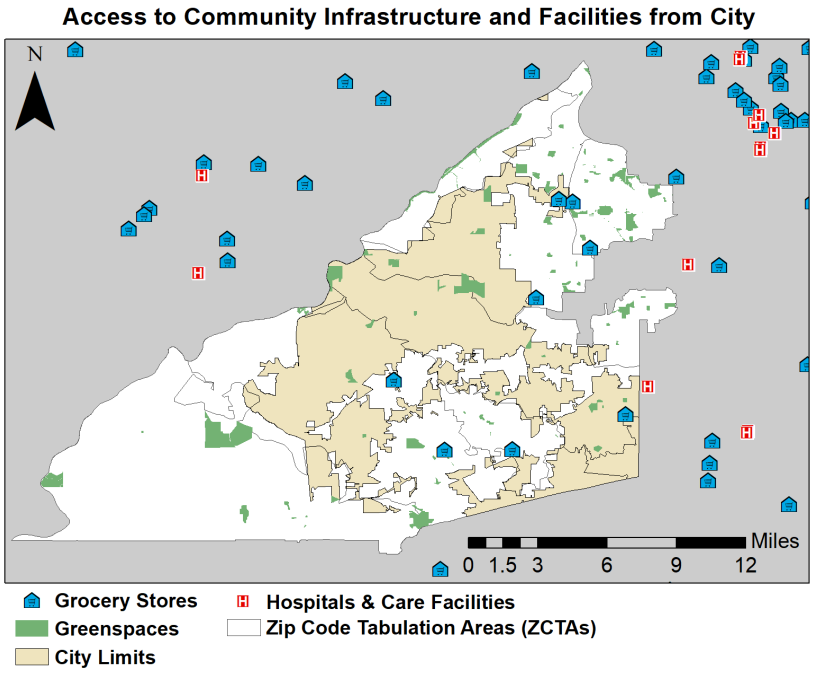
Methods

Used GIS to combine location data for factors related to the community's health and concerns, including grocery stores, hospitals and care facilities, and greenspace.

Results

There is a lack of hospitals, grocery stores, or greenspace within the city limits.

Access to Community Infrastructure and Facilities from City



This project illustrates how HERCULES links exposome data with the analytical tools in data science to respond to community questions about environmental influences on their health.

How can I learn more?

For more information about HERCULES:
https://emoryhercules.com/

For more information about how HERCULES works with communities:
https://emoryhercules.com/community/

EMORY UNIVERSITY
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HERCULES is funded by the National Institute of Environmental Health Sciences (P30ES019776)