GEOG788P Final Project

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Spatiotemporal patterns of drug activities in Chicago

Research on spatial and temporal patterns drug activities and finding drug activities clusters helps understanding the hot zones of drug activities and assessing the availability of drug treatment facilities provides an opportunity to investigate the degree to which locations where drug-related activities are occurring in a city coincide with locations of substance use treatment services in order to ensure that treatment is available as close to locations of drug use as possible. In this project, I will investigate the spatial distribution and temporal patterns of drug activities.

Potential sources of data

Emergency Medical Service (EMS) records, Medical Examiner Case Archive and Reported Narcotic Violation Incidents will be used as proxies for drug activities form medical service, drug related death and crime three aspects. Other data sources such as EPA and US censes ACS data will also be collected to analyze the relations between drug activities and buit environment.

Study area

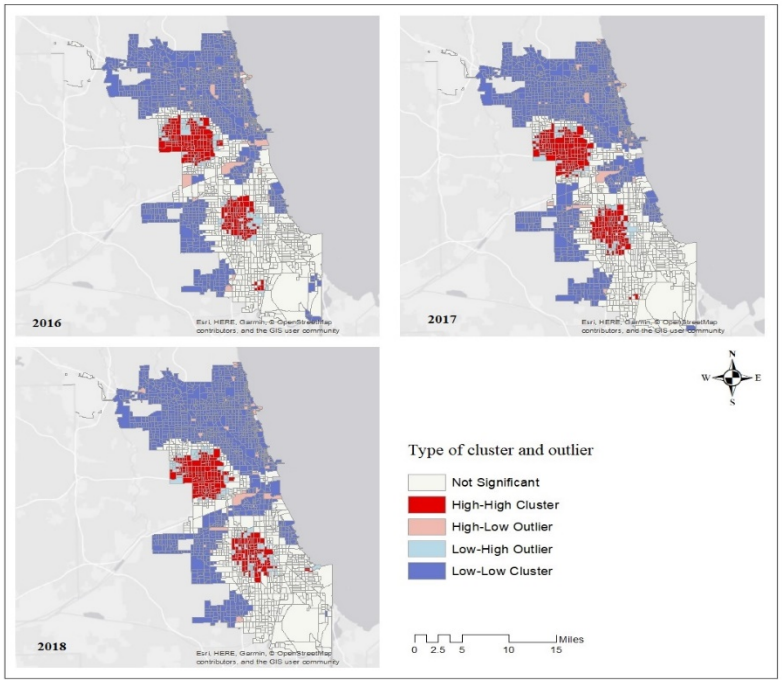
The study area is Chicago. The Office of National Drug Control Policy (ONDCP) has been administrating the High Intensity Drug Trafficking Areas (HIDTA) program since 1988 (HIDTA, n.d.). This program has determined 28 HIDTAs including approximately 18 percent of all counties, which are distributed in 49 states, as well as Puerto Rico, and has provided assistance law enforcements to these areas. Chicago is an important city in the middle north and crucial for drug trafficking.

Question or task

Three hypothesis will be investigated:

1) The spatial patterns of drug activities in city areas are significantly clustered

2) Drug arrests (which record times and locations) can be used as a proxy of drug activities



The figure shows the hotspots of drug arrest. Are the spatial patterns of EMS and drug related death the same with drug arrests? Can they be a reliable proxies of drug activities?

3) The spatial patterns of drug activities are correlated with built environment, demographic and socioeconomic.

Python tools

Access data:

sodapy (a python client for the Socrata Open Data API), osmnx, cenpy

Data analysis:

numpy, pandas, geopandas, PySAL, scikit-learn……

Envisioned challenges

1) Drug activates are episodic and difficult to capture the temporal patterns

2) The spatial patterns of different drug types are varied so it is hard to explain why some built environment factors may have different impacts on different drug type activities.