Understanding Outreach: 2015-2016 outreach efforts of the Cambridge Needle Exchange

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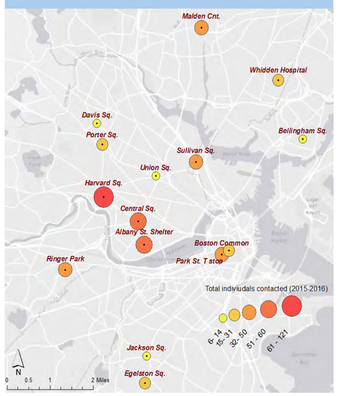
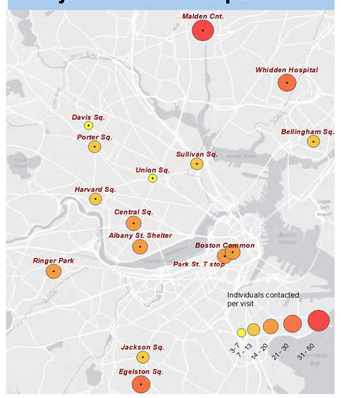
Tufts University | School of Medicine

Total Contacts



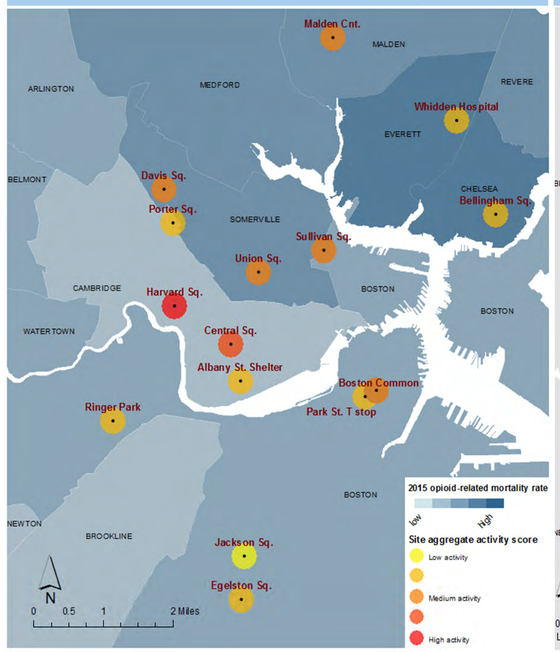
Adjusted Contacts per Visit



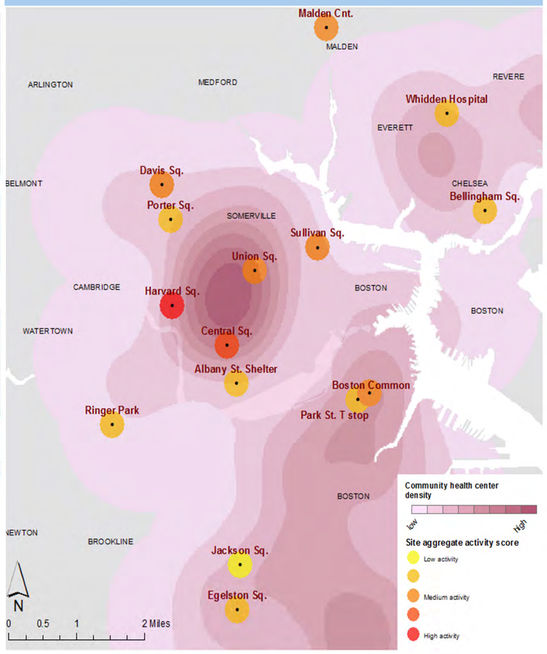
Background:

The Cambridge Needle Exchange, a subdivision of the Massachusetts AIDS Action Committee (AAC), works to promote safe practices around substance abuse, provide education and connect individuals to medical help[1]. Their outreach efforts are community based; AAC travels to fifteen locations in the greater Boston area to speak with and provide assistance to individuals in need of service. The efforts of needle exchange programs are incredibly important anywhere, but are particularly impactful in Massachusetts due to the growing opioid epidemic (Figure 1.) To combat the epidemic, the Department of Health and Human Services (HHS) has recommended a four-pronged approached combining prevention, intervention, treatment and recovery[2]. Via speaking with clients, distributing preventative materials, and making treatment referrals, AAC is hitting all the recommended marks. The committee wants to better understand the current (2015-2016) landscape of their outreach efforts and identify the most active outreach sites. The use of GIS in small scale community-based settings is not yet common, but has been lauded as an important technique by HHS[3]. The maps presented provide a holistic picture of site activity and place the findings in the larger context of Massachusetts substance abuse and access to relevant health services at present. Ideally, the maps will inform future policy and outreach decisions at AAC.

Site Activity and Opioid Mortality Rate



Site Activity and Community Health Center Density



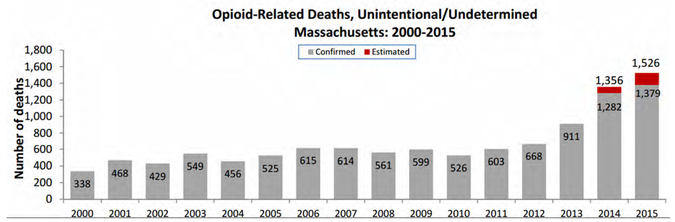


Figure 1. Opioid-related deaths have rapidly increased from 2012 –2015

Figure provided by: Massachusetts Department of Public Health[4]

Where in the World?

What is that???

-Narcan: a nasal spray to reverse fatal overdoses

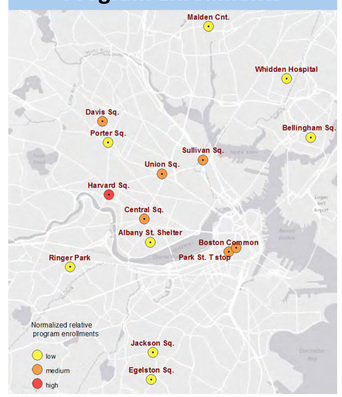
-Safe sex tools: HIV prevention medication (PREP) male/female condoms

-Harm reduction tools: antibiotics, clean cotton, filters

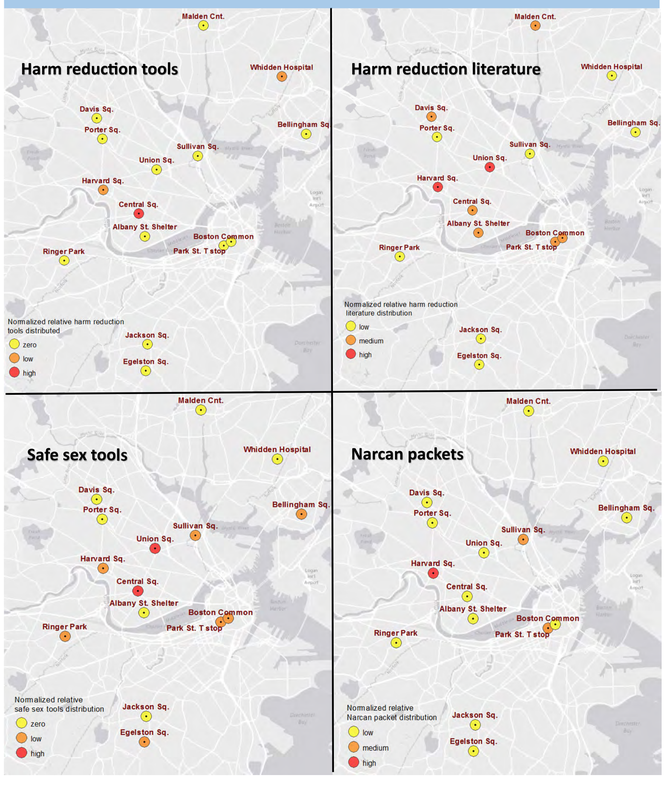
-Referrals: for sexually transmitted infection testing and substance abuse therapy

-Enrollments: for overdose prevention programs and needle exchange programs

Program Enrollments



Materials Distributed



Methods:

Preliminary Analysis: AAC outreach site locations were geocoded via longitude and latitude data from Google Maps. In most cases this corresponded to a Massachusetts public transportation center. Data on the utilization of variables for each site was provide by AAC. Raw data was aggregated into eight thematic variables. To ensure standardization between each map, thematic variables were adjusted by dividing by the number of contacts per site visits, as certain locations were visited more frequently than others. Eight maps were created to show the relative utilization of the eight thematic variables. ArcGIS's jenks tool was used to make the relative scales, when relevant "zero" was used instead of "low" for some maps. Because individuals contacted constitute an integral variable, the scale for this map was left in counts.

Suitability Analysis: As it was determined that all variables carried equal weight, a point scale was assigned to each thematic map (high=3, medium=2, low=1, zero=0); individuals contacted was assigned a 5 point scale. A sum total score, intended to depict a holistic picture of site activity and utilization, was calculated for each outreach site. Total scores were classified into 5 brackets using jenks.

Kernel Density Plot: Using the kernel density tool via Spatial Analysis, the density of Massachusetts community health centers in 2007 (Tufts Geodata) was generated. Suitability analysis results were then overlaid. Community health centers are likely service options for AAC clients.

Overdose Mortality Choropleth: Using the spatial joins tool, town-based data on opioid overdose mortality from 2015 was connected to a shapefile of Massachusetts towns located in Suffolk County. (MassGIS) Mortality data was provided by The Massachusetts Department of Public Health. Deaths were adjusted by the most recent population data from the 2010 census. Suitability analysis results were again overlaid over the choropleth map.

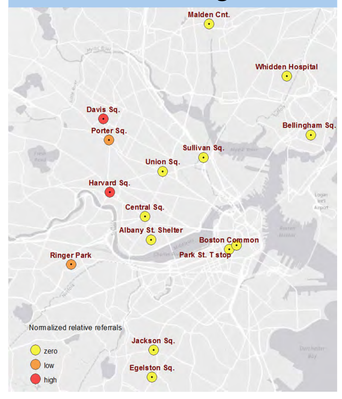
Results:

There is not substantial variability in variable utilization among sites. Noteworthy is the city of Malden with the largest contact/visit ratio, but relatively low uptake of all other variables. Additionally, the suitability analysis highlights Harvard as a particularly active site. The high concentration of Cambridge sites is correlated with both high density of community health centers and with low overdose mortality. Everett and Chelsea, however, show much higher mortality rates, less access to community health centers and moderately active sites. The least active sites were in the Jamaica Plain area; Jackson Sq. had the lowest aggregate score and Egelston Sq. also displayed a consistently low score.

Discussion:

This pilot analysis provides novel information to the committee, which may be useful in informing future decision making. If resources are not constrained, it may be advantageous to increase visit frequency to Everett, Malden and Chelsea as thematic maps indicate need and, interestingly, a high contact/visit ratio. Additionally, increasing Narcan distribution at all sites seems beneficial; distribution is lowest at sites with high mortality rates. Limitations: Temporality of site visits was ignored; winter visits may have fewer contacts than summer visits. The kernel density plot utilized 2007 data, mapping community health centers rather than general clinics which seemed more relevant to the population but the data available was a bit outdated.

Treatment & Testing Referrals



Data sources:

AIDS Action Committee, MassGIS, Massachusetts Department of Public Health, Tufts Geodata: Massachusetts Department of Public Health, Center for Environmental Health

Projection/Coordinate system: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001; GCS WGS 1984

References: [1] AIDS action committee 2015. [2] Mass.gov "DPH Responds to Opioid Epidemic", 2016 , [3] Alcaraz, K. I., Kreuter, M. W., & Bryan, R. P. (2009). Use of GIS to identify optimasettings for cancer prevention and control in African American communities. *Preventive medicine*, 49(1), 54-57. [4] Massachusetts Department of Public Health, "Data Brief: Opioid-related Overdose Deaths Among Massachusetts Residents". 2016

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