

Using Spatial Analysis to Assess Accessibility of Obtaining HIV Healthcare by Bus in Newark, NJ



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Background

- Essex County, NJ is one of 48 hotspot counties in the US where HIV transmission occurs most frequently and is part of the federal response to Ending the HIV Epidemic.¹
- Newark is considered the epicenter of the NJ HIV epidemic.²
- At the end of 2018, the NJ Department of Health reported that Newark had
 - 15,651 new cases of HIV/AIDS³
 - 5,679 residences living with HIV/AIDS³
 - 9,504 deaths due to HIV/AIDS³
- Federally Qualified Health Centers (FQHCs) are an integral part of addressing medically underserved communities because no patient is turned away due to their inability to pay and care is provided on a sliding fee scale.
- Pre-exposure prophylaxis (PrEP) is effective at reducing one's risk for acquiring HIV. In 2018 in Essex County, 628 people were prescribed PrEP, which is 12.2% of people who had indications for PrEP.⁴
- In 2018, 37% of households in Newark had no motor vehicles available and 39% of households had 1 motor vehicle available.⁵ Thus, public transportation is highly used throughout the city.

Objectives

- Objective 1** Determine if HIV healthcare is evenly distributed throughout Newark
- Objective 2** Assess ease of accessibility of obtaining HIV healthcare in Newark when using NJ TRANSIT buses

Mapping Technique

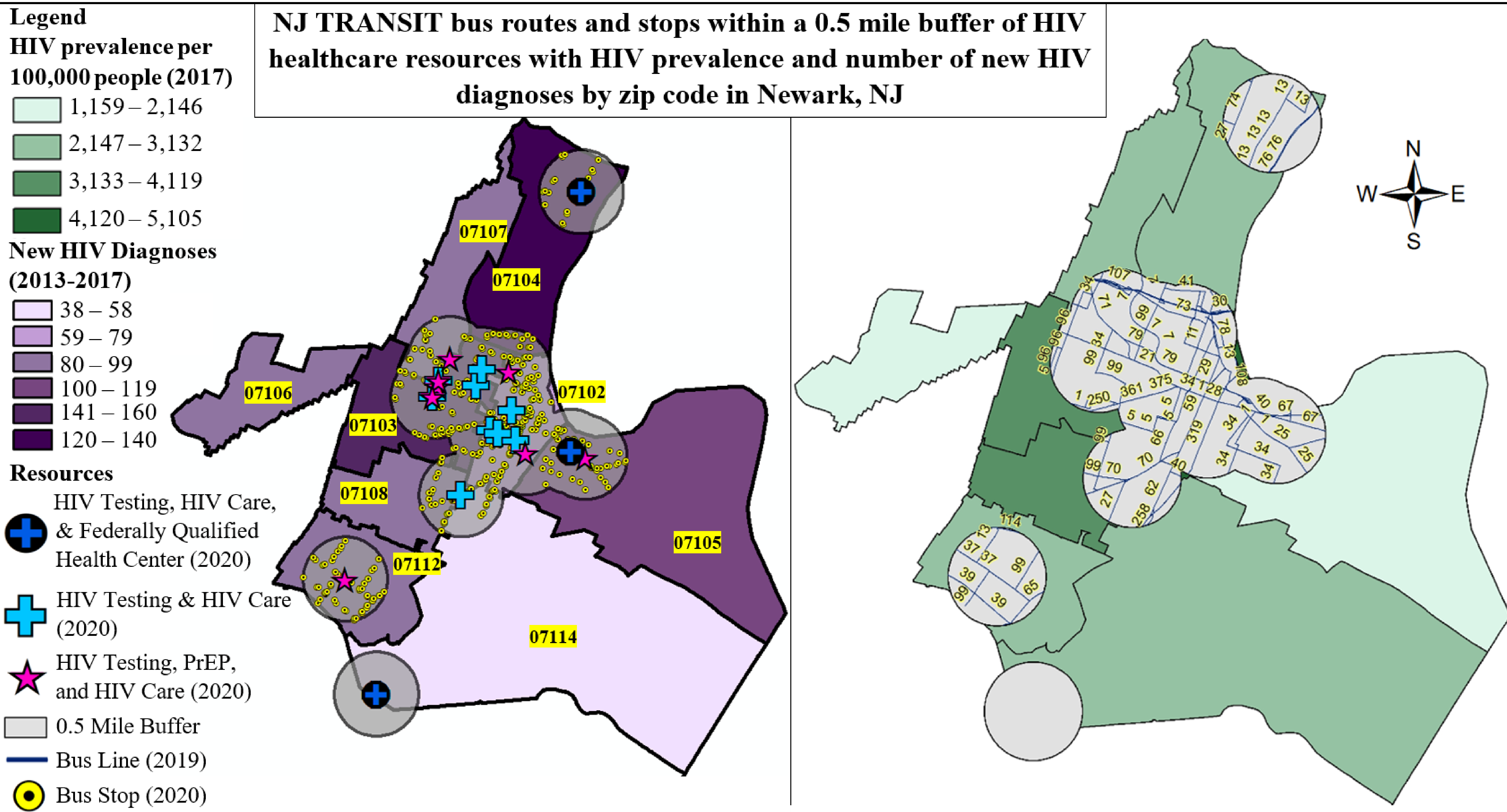
The spatial analysis was performed using Esri ArcGIS 10.7.1. Clip was used to create the Newark shapefile. Geocoding was used to plot all the addresses. New HIV diagnoses and HIV prevalence data was joined to the shapefile. Buffer was used to create a 0.5 mile buffer zone around the HIV healthcare resources. Intersect was used to remove any bus lines and bus stops not within the buffer zones. Dissolve was used to remove overlapping buffers.

Results

| Locations in Newark That Offer HIV Healthcare | |
|-----------------------------------------------|---------------------------|
| HIV Healthcare Resource | Total Number of Locations |
| HIV testing & HIV care | 10 |
| HIV testing, PrEP, & HIV care | 8 |
| FQHCs that offer HIV testing & HIV care | 3 |
| Grand Total | 21 |

- The FQHC in zip code 07114 has 0 bus routes or bus stops within a 0.5 mile radius and the FQHC in 07104 only has 3 bus lines with bus stops in a 0.5 mile radius
- The HIV healthcare resources are predominately clustered in the center of Newark and not all zip codes have HIV healthcare resources

Spatial Analysis



Conclusion

- The spatial analysis illustrated that less than half of the HIV healthcare locations in Newark do not prescribe PrEP and PrEP prescribers are not evenly distributed throughout the city
- Zip code 07104 has the highest number of new HIV diagnoses but does not have a PrEP prescriber in the zip code
- HIV healthcare resources are not evenly distributed throughout Newark
 - Individuals who do not reside in the center on the Newark may have to take more than 1 bus to access HIV care
 - 2 out of the 3 Federally Qualified Health Centers in Newark are not easily accessibly by NJ TRANSIT buses
- Expanding the use of telehealth and home HIV testing could help bring HIV services to the Newark zip codes that have none
- This study is limited by the data available on AIDSVu.org

Next Steps

Increase Accessibility and Convenience

- Develop novel ways to bring HIV healthcare to patients
- Provide patients with bus tickets
- Advocate for more bus routes and stops at HIV healthcare locations
- Increase the number of PrEP prescribers

Future Research

- Quantify how many bus, how far a patient walks, and cost of transportation to obtain HIV care
- Determine if HIV viral loads are higher in areas that require the most inconvenient travel to obtain HIV care

References & Data Sources

References: 1. CDC. (2020). Ending the HIV epidemic: A plan for America. Retrieved from <https://www.cdc.gov/endhiv/docs/ending-HIV-epidemic-overview-508.pdf>. [Accessed 20 May 2020]. 2. Martin EG, Salaru G, Mohammed D, et al. (2013). Finding those at risk: acute HIV infection in Newark, NJ. Journal of clinical virology: the official publication of the Pan American Society for Clinical Virology, 58 Suppl 1(0 1), e24–e28. <https://doi.org/10.1016/j.jcv.2013.07.016>. 3. NJDOH. Top Ten Cities with Highest Number of HIV/AIDS Cases. (2018). Retrieved from https://www.nj.gov/health/hivstd/tb/documents/stats/hiv/other_cities/newark.pdf. [Accessed 28 February 2020]. 4. CDC. (2018). Explore CDC's Atlas Plus. Retrieved from <https://www.cdc.gov/features/atlasplus/index.html>. [Accessed April 4, 2020]. 5. US Census Bureau ACS. (2018). Household Size By Vehicles Available. Retrieved from <https://data.census.gov/cedsci/i> [Accessed May 19, 2020]. **Mapping Data Sources:** Newark, NJ shapefiles came from the US Census (2010). HIV new diagnoses (2013-2017), HIV prevalence (2017), and addresses for HIV healthcare resources (2020) came from AIDSVU <https://aidsvu.org/services/#/>; extracted April 4, 2020. NJ TRANSIT Bus Routes (2019) and bus stop (2020) data came from NJGIN <https://nigin.nj.gov/nigin/#/>. Addresses for FQHC (2020) came from Newark Community Health Centers <http://www.nchcfqhc.org/>; extracted April 4, 2020.