BACKGROUND

- Neighborhood-level features such as transportation access, HIV & socioeconomic characteristics have been found to influence one’s ability to engage & remain in HIV care.

OBJECTIVES

- To identify ZIP codes that cluster spatially with respect to three HIV care outcomes: retention-in-care (RIC), prescribed antiretroviral therapy (‘on ART’), & viral suppression (VS)
- To describe person-level & neighborhood-level factors associated with residing in a cluster.

METHODS

Study design, eligibility criteria and data sources

- The DC Cohort, an observational cohort study of HIV-infected persons in care at 13 participating clinical sites throughout Washington, DC.
- Included participants enrolled from 1/2011 to 6/2015 with ≥1 year of follow-up; excluded those who withdrew, not seen in 18 months, had missing ZIP of current residence, resided outside DC or in ZIP with <5 participants.
- Data sources include the DC DOH, WMATA, US Census, ACS & AIDSvu (an online mapping resource; www.aidsvu.org).

Primary outcomes

- RIC, ‘on ART’; VS were based on nested outcomes along the HIV care cascade & aggregated to the ZIP level, using participant data collected from 6/2014 to 6/2015.
  - RIC: >2 visits and/or labs ≥90 days apart in a 12 month period.
  - ‘On ART’: Prescribed ART among retained.
  - VS: Last VL lab result <200 copies/mL among retained & ‘on ART.’

Analysis

- Generated choropleth maps and computed statistical statistics.
- Conducted hot spot analysis using GI*statistic to determine whether ZIPs with either high or low values cluster spatially.
- ZIPs with high proportion of RIC or VS mapped in red (‘Hot spots’).
- ZIPs with low proportion of RIC or VS mapped in blue (‘Cold spots’).
- Computed descriptive statistics by hot spot status.

Table 1. ZIP code-level HIV, transportation & socioeconomic characteristics among ZIPs in retention-in-care (RIC) cold spot, viral suppression (VS) cold spot & VS hot spot in Washington, DC 2014-2015 (N=25 ZIPs).

<table>
<thead>
<tr>
<th>ZIP-level features</th>
<th>Summary statistic</th>
<th>Overall</th>
<th>RIC in VS cold spot</th>
<th>VS in VS cold spot</th>
<th>VS in VS hot spot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ZIPs</td>
<td>N</td>
<td>25</td>
<td>23</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total participants</td>
<td>N</td>
<td>3,802</td>
<td>3,727</td>
<td>1,186</td>
<td>660</td>
</tr>
</tbody>
</table>

HIV-related

- 5-Year cumulative new dx (%)
  - Mean (SD): 272.3 (109.7)
  - Median (IQR): 272.3 (197.77)

- HIV prevalence per 100k
  - Mean (SD): 1,877.1 (945.6)
  - Median (IQR): 2,172.0 (1,754.5)

- Retention %
  - Mean (SD): 68.8 (8.8)
  - Median (IQR): 74.1 (72.8)

- On ART %
  - Mean (SD): 96.7 (3.4)
  - Median (IQR): 96.2 (2.2)

- Viral suppression %
  - Mean (SD): 88.7 (7.3)
  - Median (IQR): 86.1 (8.6)

Transportation-related

- Public transit density per 1%
  - Mean (Med): 5.6 (5.6)
  - 50th percentile: 5.5
  - 75th percentile: 5.6

- Bus stop density
  - Mean (Med): 5.5 (5.5)

- Metro stop density
  - Mean (Med): 0.1 (0.1)

- Car ownership %
  - Mean (Med): 64.2 (63.5)

Socioeconomic-related

- Gini coefficient
  - 0-1 scale
  - Mean (SD): 0.49
  - Median (IQR): 0.45

- Household income ($10k)
  - Mean (SD): 50.3 (19.2)

- Housing status
  - Mean (SD): 90.3 (17.7)

DISCUSSION & CONCLUSIONS

- Individual-level & neighborhood-level features (transportation, HIV & socioeconomic) may be associated with spatial clusters of RIC & VS.
- RIC cold spots had high proportion of VS, perhaps representing those with well-controlled infection who require fewer visits. Finding is similar to results from spatial analyses of HIV care in Philadelphia.
- Spatial analyses may inform geographically targeted interventions to improve care outcomes for HIV-infected persons.

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Figure 1. Retention-in-care (RIC) & viral suppression (VS) by ZIP code in Washington, DC 2014-2015. 1, A: RIC % (Quartiles). B, VS% (Quartiles).

- Polygons in white represent non-residential ZIPs or suppressed ZIPs with ≤5 participants.
- Polygons in red represent non-residential ZIPs or suppressed ZIPs with >75% participants.

Figure 2. Retention-in-care (RIC) & viral suppression (VS) clusters in Washington, DC 2014-2015. 1, A: Cold spots of low RIC. B, Hot and cold spots of VS.

- Polygons in white represent non-residential ZIPs or suppressed ZIPs with ≤5 participants.
- Polygons in red represent non-residential ZIPs or suppressed ZIPs with >75% participants.