HIV in Alameda County, Hot Spot Analysis

Danny Allgeier, MPH
HIV Epidemiology and Surveillance Unit
Alameda County Public Health Department
Oakland neighborhoods, as referred to in our analyses, are defined by the Community Assessment, Planning, and Evaluation Unit (CAPE) of the Alameda County Healthcare Services Administration and consist of the groups of contiguous 2010 census tracts shown here.
Human Immunodeficiency Virus (HIV)

• Sexually transmitted disease
• CDC testing guidelines recommend all individuals between 13 and 64 years of age get tested at least once
  – People at high risk should be screened annually
  – Included in routine panel of prenatal screening for all pregnant women
• Treatment is recommended starting early in the course of the infection with anti-retroviral therapy
  – Effective treatment slows progression to AIDS and dramatically decreases transmission of HIV to others
  – Treatment with the goal of viral suppression
Who does surveillance data include?

• Our subset of eHARS (the statewide HIV surveillance database) includes any person living with HIV (PLHIV) who...

1. Was a resident of Alameda County when diagnosed with HIV infection

AND/OR

2. Has ever had an HIV-related lab test ordered by a provider in Alameda County
People Living with HIV (PLHIV) in Alameda

- A person ever diagnosed with HIV with a last known address within Alameda County
- May be at any stage of HIV infection
  - Stage 1 – acute HIV infection
  - Stage 2 – chronic HIV infection
  - Stage 3 – Acquired Immunodeficiency Syndrome (AIDS)
## Table 3.1: People Living with HIV Disease and Prevalence Rates, Alameda County, Year-End 2015

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Category</th>
<th>Count</th>
<th>Percent</th>
<th>Prevalence per 100,000</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>All PLHIV</td>
<td>--</td>
<td>5,897</td>
<td>100.0%</td>
<td>372.5</td>
<td>363.0 - 382.0</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>4,861</td>
<td>82.4%</td>
<td>625.0</td>
<td>607.5 - 642.6</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1,036</td>
<td>17.6%</td>
<td>128.6</td>
<td>120.8 - 136.5</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>AfrAmer</td>
<td>2,411</td>
<td>40.9%</td>
<td>1,382.2</td>
<td>1,327.0 - 1,437.4</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>1,915</td>
<td>32.5%</td>
<td>374.0</td>
<td>357.3 - 390.8</td>
</tr>
<tr>
<td></td>
<td>Latino</td>
<td>1,066</td>
<td>18.1%</td>
<td>286.9</td>
<td>269.7 - 304.1</td>
</tr>
<tr>
<td></td>
<td>API</td>
<td>376</td>
<td>6.4%</td>
<td>83.1</td>
<td>74.7 - 91.5</td>
</tr>
<tr>
<td></td>
<td>Other/Unk</td>
<td>129</td>
<td>2.2%</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Age (years)</td>
<td>0-12</td>
<td>7</td>
<td>0.1%</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>13-19</td>
<td>26</td>
<td>0.4%</td>
<td>18.7</td>
<td>12.2 - 27.4</td>
</tr>
<tr>
<td></td>
<td>20-29</td>
<td>455</td>
<td>7.7%</td>
<td>201.1</td>
<td>182.6 - 219.6</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>851</td>
<td>14.4%</td>
<td>374.8</td>
<td>349.6 - 399.9</td>
</tr>
<tr>
<td></td>
<td>40-49</td>
<td>1,437</td>
<td>24.4%</td>
<td>639.4</td>
<td>606.4 - 672.5</td>
</tr>
<tr>
<td></td>
<td>50-59</td>
<td>1,932</td>
<td>32.8%</td>
<td>871.7</td>
<td>832.9 - 910.6</td>
</tr>
<tr>
<td></td>
<td>60 &amp; over</td>
<td>1,189</td>
<td>20.2%</td>
<td>408.6</td>
<td>385.4 - 431.8</td>
</tr>
</tbody>
</table>
People Living with HIV Infection, Alameda County, Year-End 2015

Countywide prevalence: 372.5 per 100,000

Prevalence (per 100,000)
- < 10 cases
- 139.8 - 360.0
- 360.1 - 570.0
- 570.1 - 840.0
- 840.1 - 1260.0
- 1260.1 - 2285.0

NOTE: N=5,254; an additional 643 (10.9% of all PLHIV) not represented due to missing or ungeocodable address data.
DATA SOURCE: Alameda County eHARS, 2016 Q2
Hot Spot Analysis

• Hot Spot Analysis
  – Identifies statistically significant spatial clusters of high and low values given weighted features
  – Uses the Getis_ord Gi* statistic
  – Is an observed spatial cluster of high or low values more pronounced than one would expect in a random distribution of these values?

• Optimized Hot Spot Analysis
  – Identifies spatial clusters using incident points, representing presence or absence rather than a value
  – Automatically chooses settings for optimal hot spot analysis
  – Aggregates incident data
PLHIV Optimized Hot Spot Analysis, Alameda County, Year-End 2015

NOTE: N=5,254; an additional 643 (16.9% of all PLHIV) not represented due to missing or unrecognizable address data.
DATA SOURCE: Alameda County eHARS, 2015-02
San Mateo
The Continuum of HIV Care in Alameda County

Among N=634 new diagnoses in 2012-2014*
- Incl. labs at dx: 85.2%
- Excl. labs at dx: 75.1%

Among N=5,373 PLHIV in Alameda Co. for the entirety of 2014**
- 1+ visit: 75.9%
- 2+ visits 90+ days apart: 64.2%

*Of 651 total diagnoses, 17 died within 90 days and are excluded from analysis
**Of 5,662 PLHIV at year-end 2013, 62 are known to have died and an additional 227 to have moved out of Alameda County in 2014

1) Linkage defined as having a reported CD4 or VL ordered within 90 days or less of diagnosis; 2) Retention calculated using labs ordered in 2013; 3) Viral suppression defined as most recent VL in 2013 < 200 copies/mL
Continuum of HIV Care – Hot Spot Analysis

• Retention in care
  – 2 or more HIV care visits at least 90 days apart during 2015
  – As determined by HIV laboratory tests reported to the state Office of AIDS

• Viral Suppression
  – Viral Load under 200 viral RNA copies per milliliter of blood
  – Must have at least 1 viral load test in 2015 for this analysis
PLHIV Viral Suppression Status, Hot Spot Analysis, Alameda County, Year-End 2015

Countyside Viral Suppression: 67%

Hot Spot Analysis

Percent Viral Suppression
- Red: Low - 99% Confidence
- Dark Red: Low - 95% Confidence
- Orange: Low - 90% Confidence
- Light Orange: Low - 90% Confidence
- Gray: Not Significant
- Light Gray: High - 80% Confidence
- Dark Gray: High - 95% Confidence
- Blue: High - 99% Confidence
- Cities
- <10 cases

NOTE: N=5,254; an additional 1643 (10.9% of all PLHIV) not represented due to missing or ungeocodable address data.

DATA SOURCE: Alameda County eHARS, 2017 (City analysis not included).
Next Steps

• Locate all HIV treatment locations
• Identify areas that would benefit from more testing and treatment facilities and services
• Map social characteristics known to be associated with HIV cascade measures
• Identify hot spots among newly diagnosed cases
Acknowledgements

• Dr. Neena Murgai, Director of HIV Epidemiology and Surveillance
• Alameda County Community Assessment, Planning, and Evaluation (CAPE)
• ESRI Tech Support