HIV in Alameda County, Hot Spot Analysis

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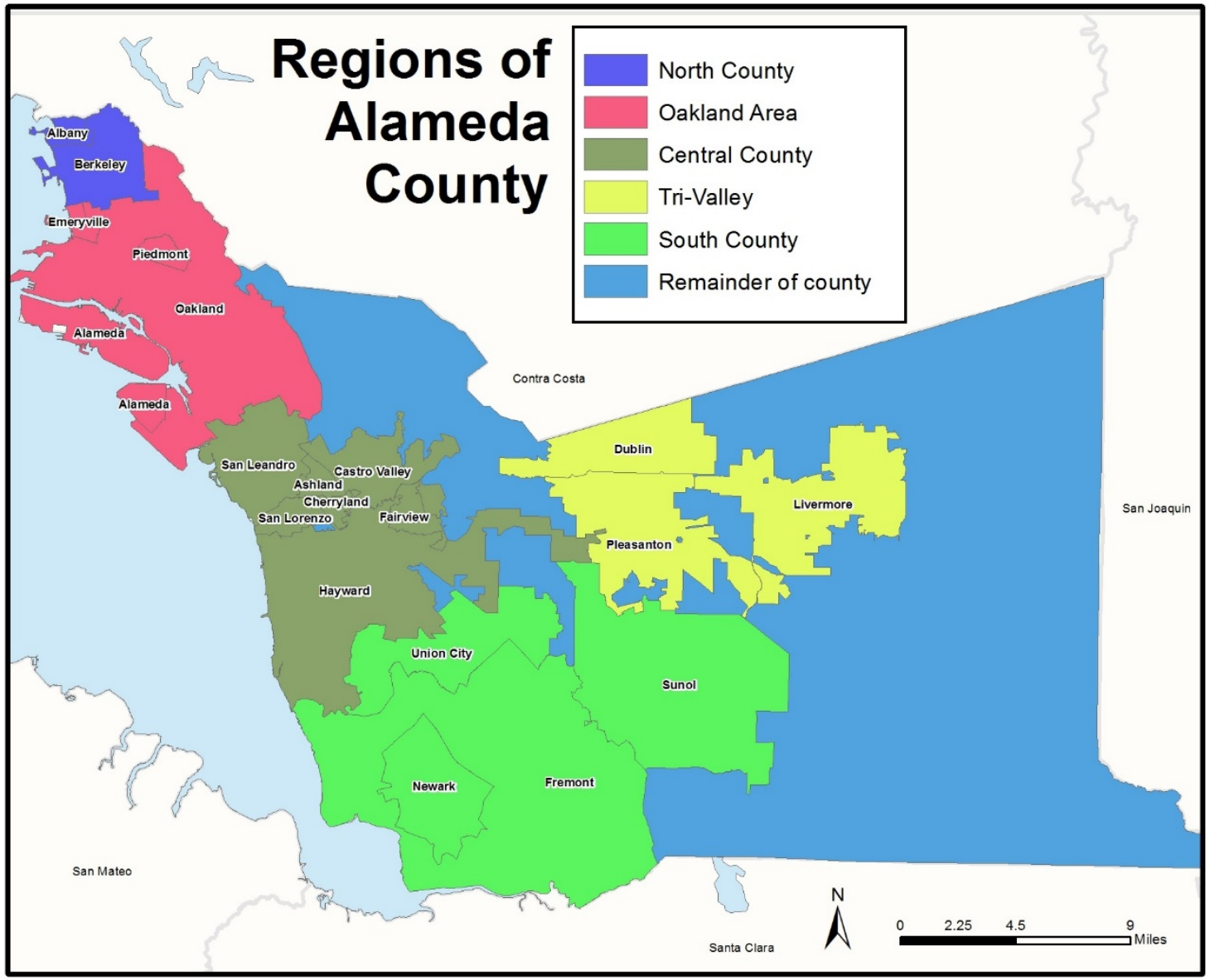
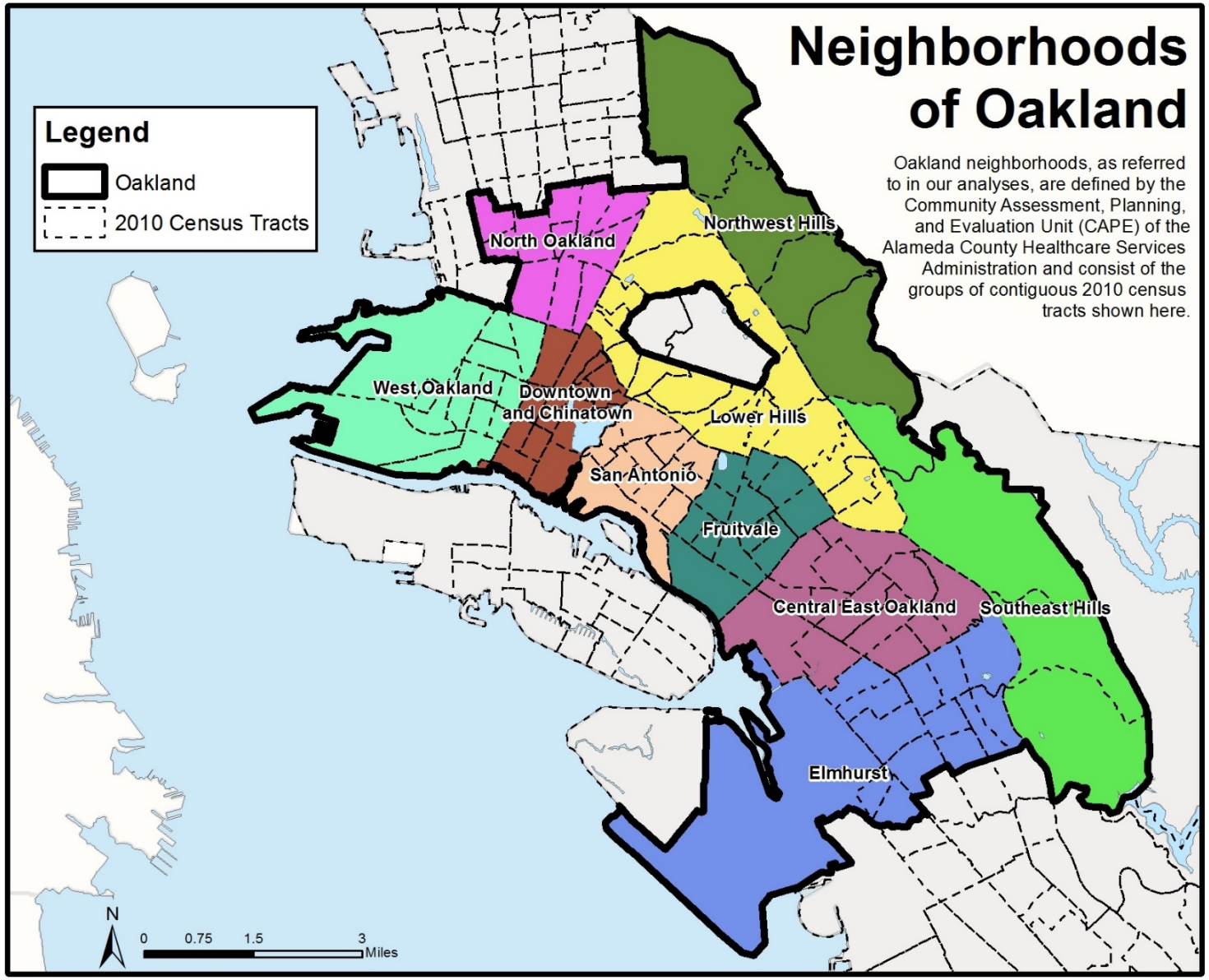
Modoc National Forest
Shasta National Forest
Carson City
NEVADA
GREAT BASIN
Great Salt Lake
Salt Lake City
UTAH
Sacramento
CALIFORNIA
San Francisco
Fresno
Las Vegas
MOJAVE DESERT
Los Angeles
SAN FRANCISCO PLATEAU
ARIZONA
Tonto National Forest
Phoenix
SONORAN


Regions of Alameda County
North County
Oakland Area
Central County
Tri-Valley
South County
Remainder of county
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
Contra Costa
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Dublin
Livermore
Pleasanton
San Joaquin
Union City
Sunol
Newark
Fremont
San Mateo
Santa Clara
N
0
2.25
4.5
9
Miles


Neighborhoods of Oakland
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.
Legend
Oakland
2010 Census Tracts
North Oakland
Northwest Hills
West Oakland
Downtown and Chinatown
Lower Hills
San Antonio
Fruitvale
Central East Oakland
Southeast Hills
Elmhurst
N
0
0.75
1.5
3
Miles

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

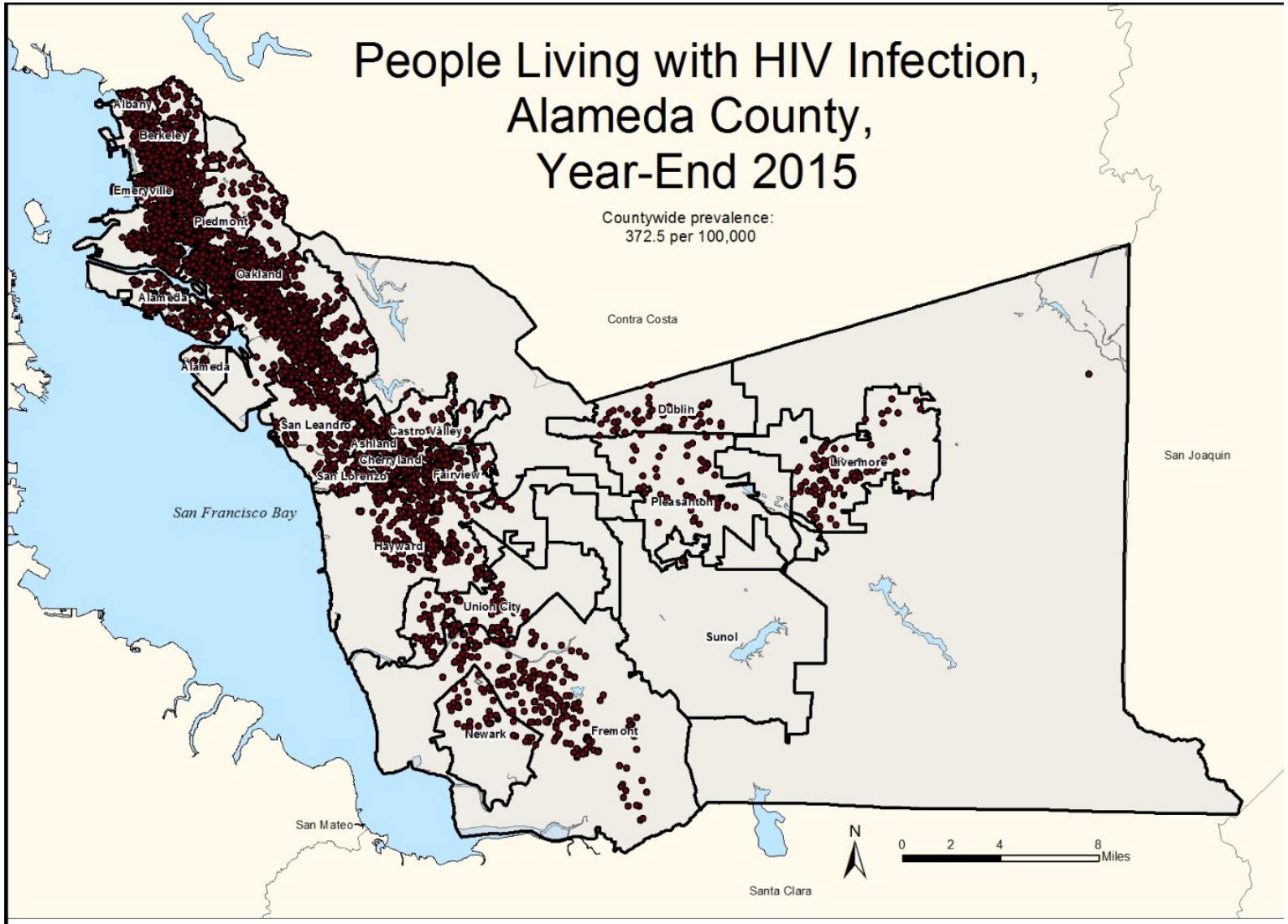
People Living with HIV (PLHIV) in Alameda

- 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

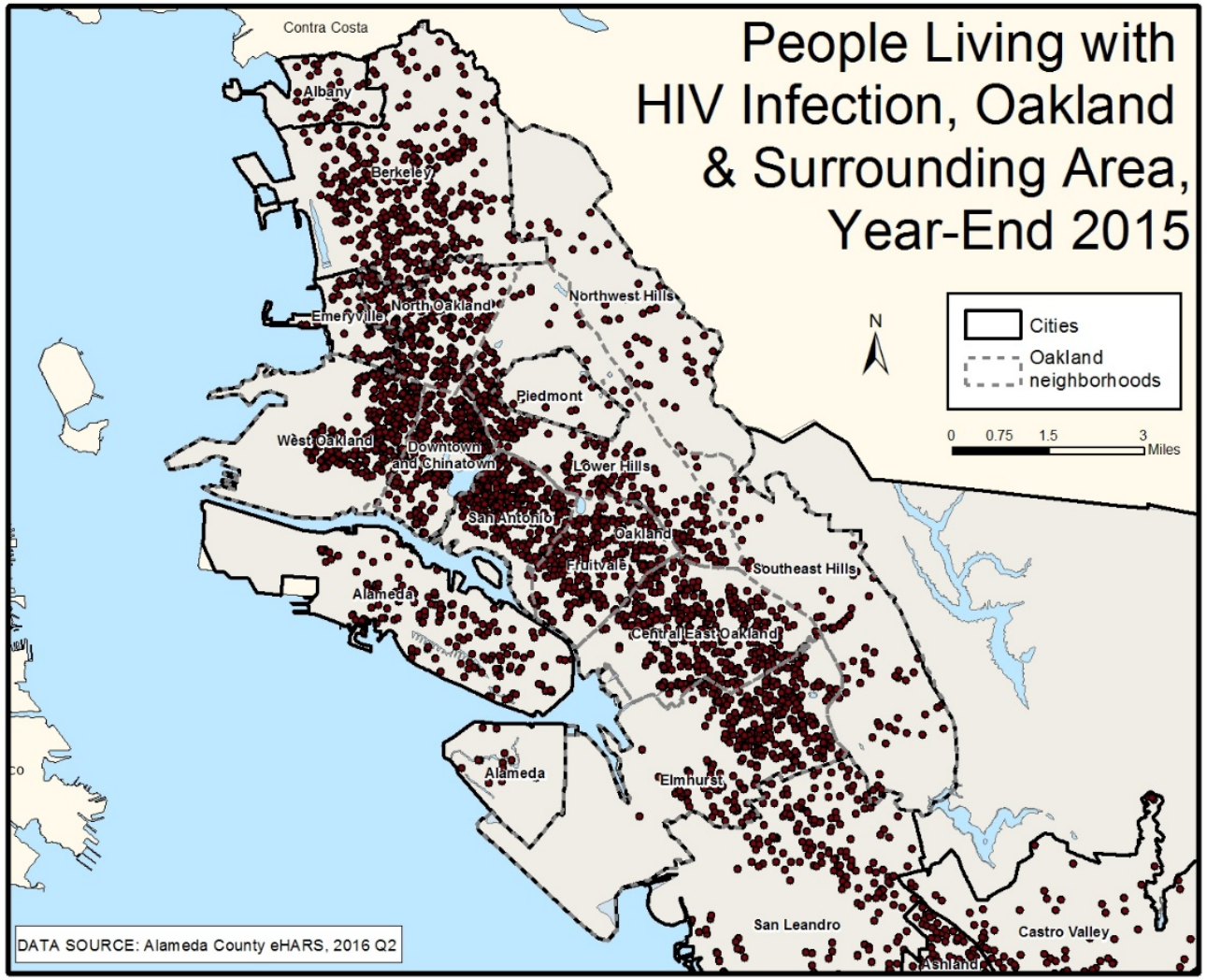
NOTE: This table spans multiple pages.

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

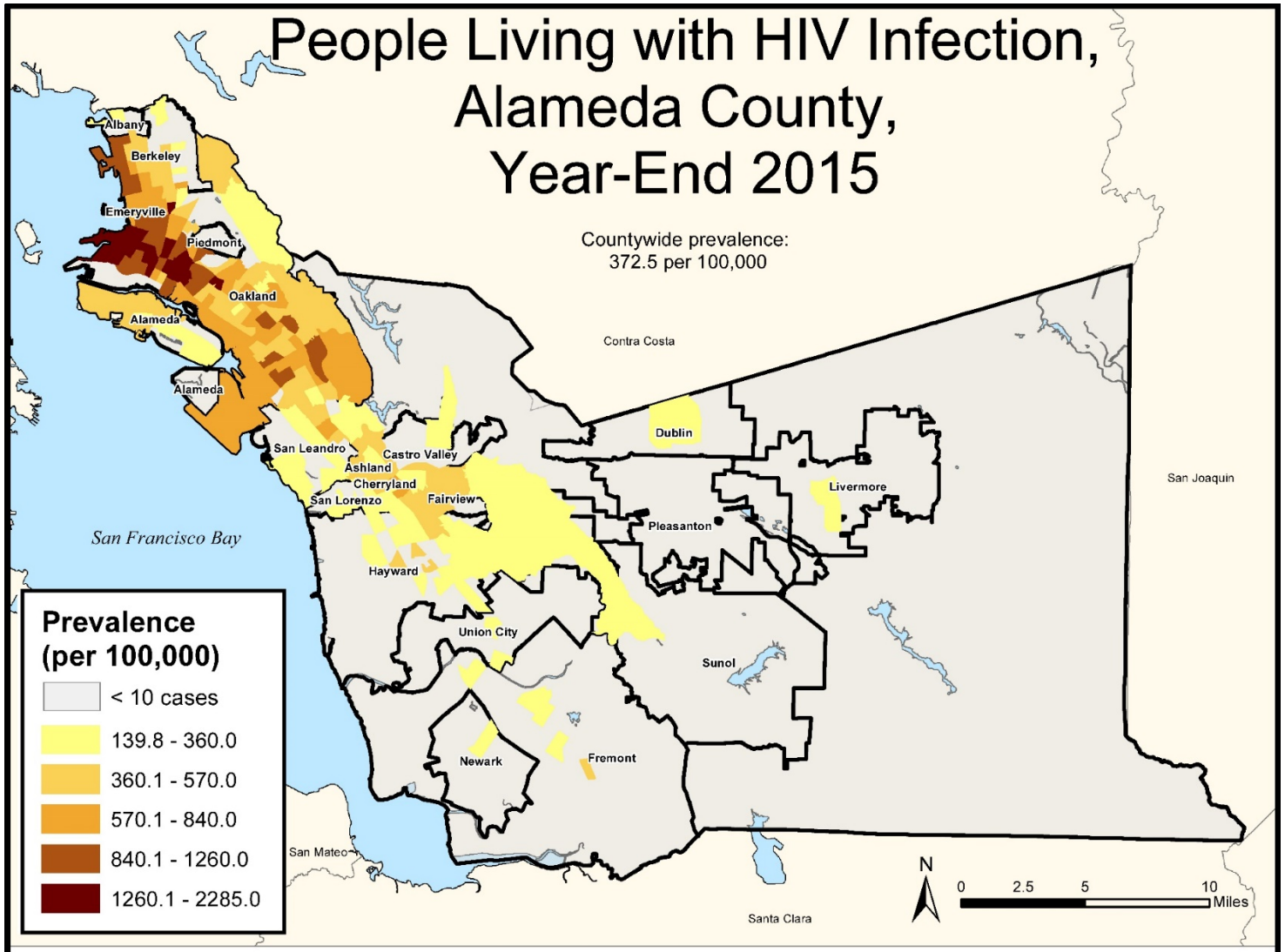


NOTE: N=5,254; an additional 643 (10.9% of all PLHIV) not represented due to missing or ungeocodable address data.

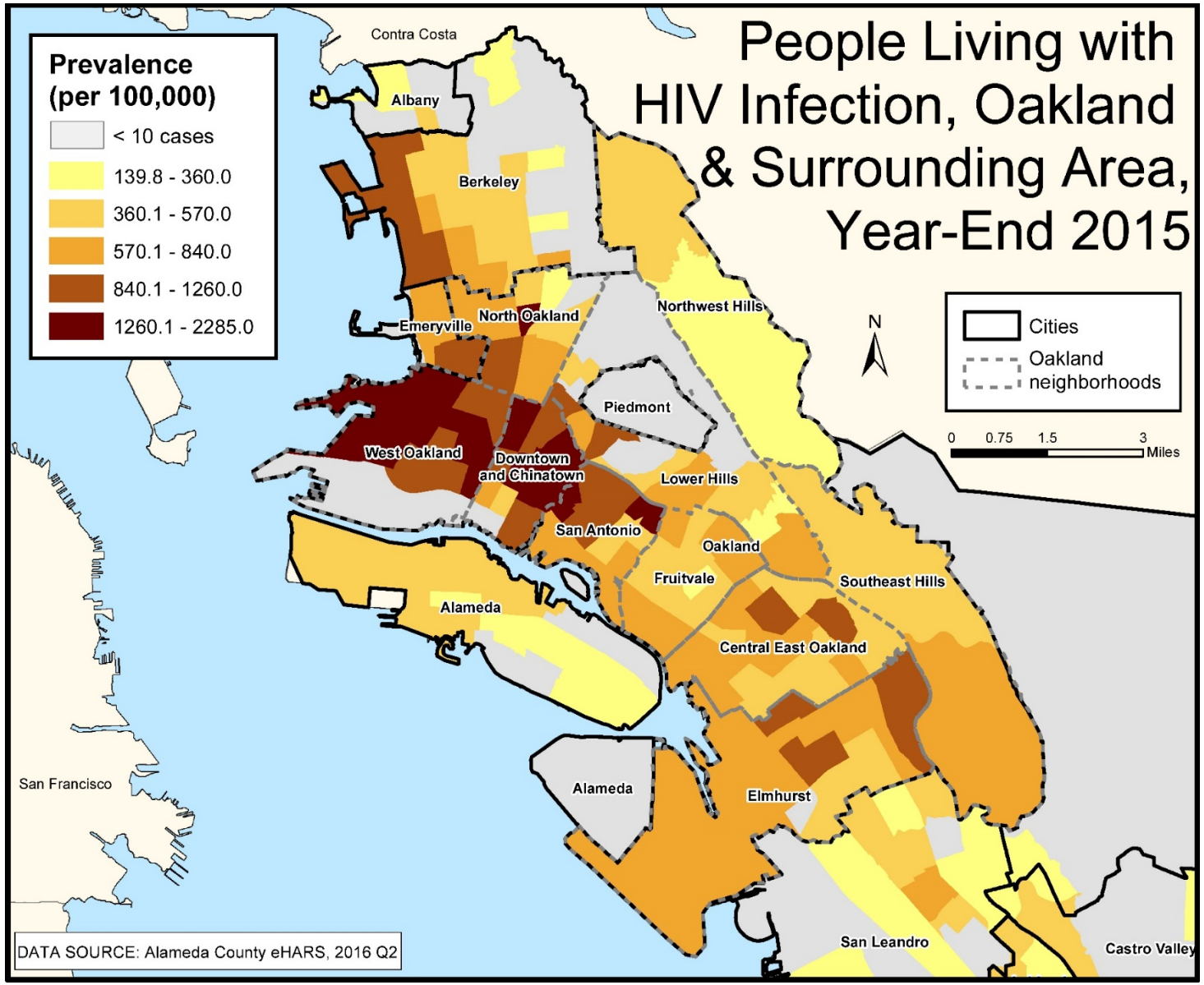
DATA SOURCE: Alameda County eHARS, 2016 Q2


People Living with HIV Infection, Oakland & Surrounding Area, Year-End 2015
Contra Costa
Albany
Berkeley
Emeryville
North Oakland
Northwest Hills
Piedmont
West Oakland
Downtown and Chinatown
Lower Hills
San Antonio
Oakland
Fruitvale
Southeast Hills
Alameda
Central East Oakland
Alameda
Elmhurst
San Leandro
Castro Valley
Ashland
N
Cities
Oakland neighborhoods
0 0.75 1.5 3 Miles
DATA SOURCE: Alameda County eHARS, 2016 Q2

People Living with HIV Infection, Alameda County, Year-End 2015

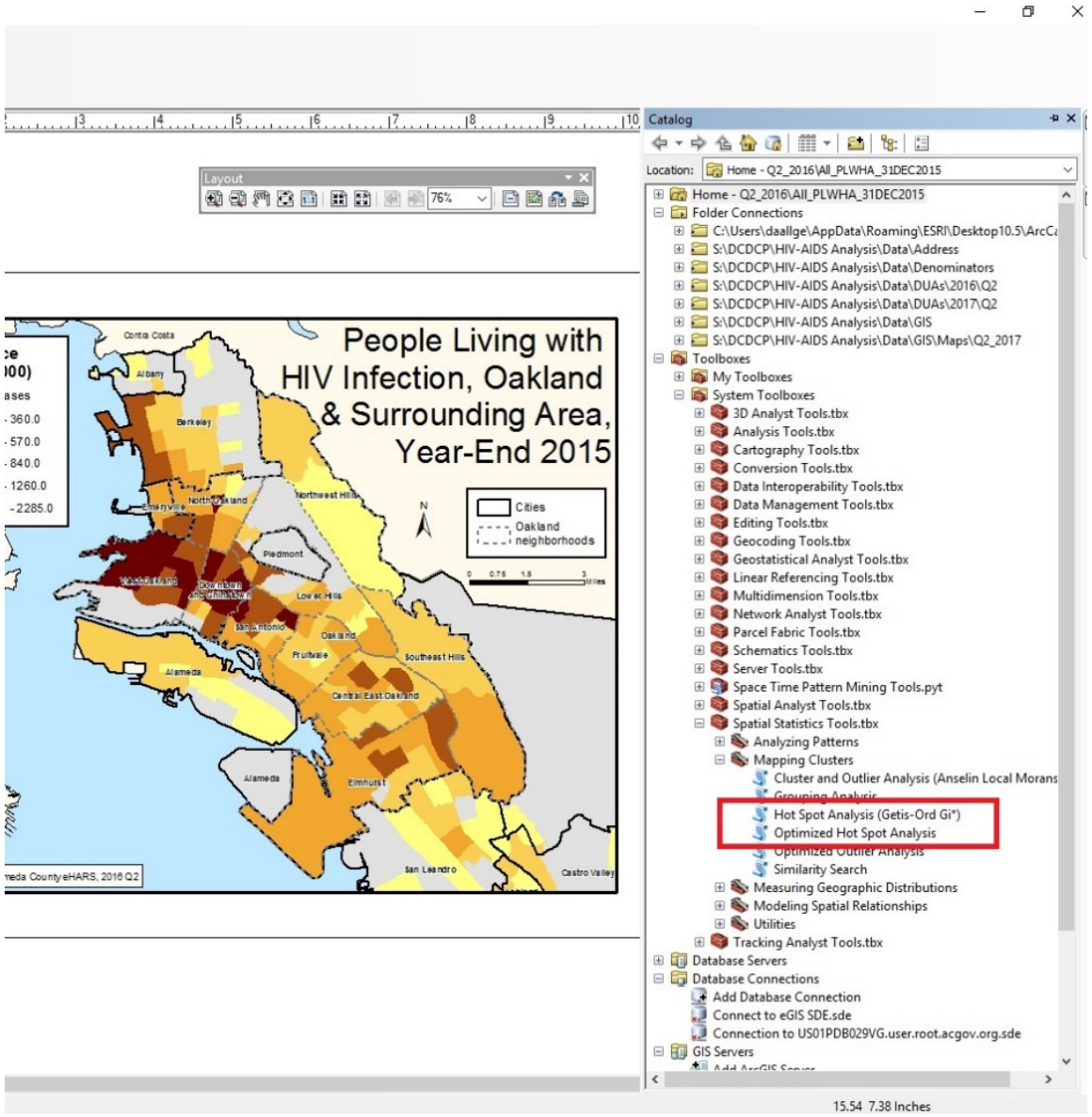


NOTE: N=5,254; an additional 643 (10.9% of all PLHIV) not represented due to missing or ungeocodable address data.
DATA SOURCE: Alameda County eHARS, 2016 Q2


People Living with HIV Infection, Oakland & Surrounding Area, Year-End 2015
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
Cities
Oakland neighborhoods
N
0 0.75 1.5 3 Miles
Contra Costa
Albany
Berkeley
Emeryville
North Oakland
Northwest Hills
Piedmont
West Oakland
Downtown and Chinatown
Lower Hills
San Antonio
Oakland
Fruitvale
Southeast Hills
Alameda
Central East Oakland
San Francisco
Alameda
Elmhurst
San Leandro
Castro Valley
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


Layout
76%
People Living with HIV Infection, Oakland & Surrounding Area, Year-End 2015
Cities
Oakland neighborhoods
N
Contra Costa
Albany
Berkeley
Emeryville
North Oakland
Northwest Hills
Piedmont
Downtown
Lower Hills
San Antonio
Oakland
Fruitvale
Southeast Hills
Alameda
Central East Oakland
Alameda
Elmhurst
San Leandro
Castro Valley
360.0
570.0
840.0
1260.0
2285.0
Catalog
Location: Home - Q2_2016\All_PLWHA_31DEC2015
Home - Q2_2016\All_PLWHA_31DEC2015
Folder Connections
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S:\DCDCP\HIV-AIDS Analysis\Data\Denominators
S:\DCDCP\HIV-AIDS Analysis\Data\DUAs\2016\Q2
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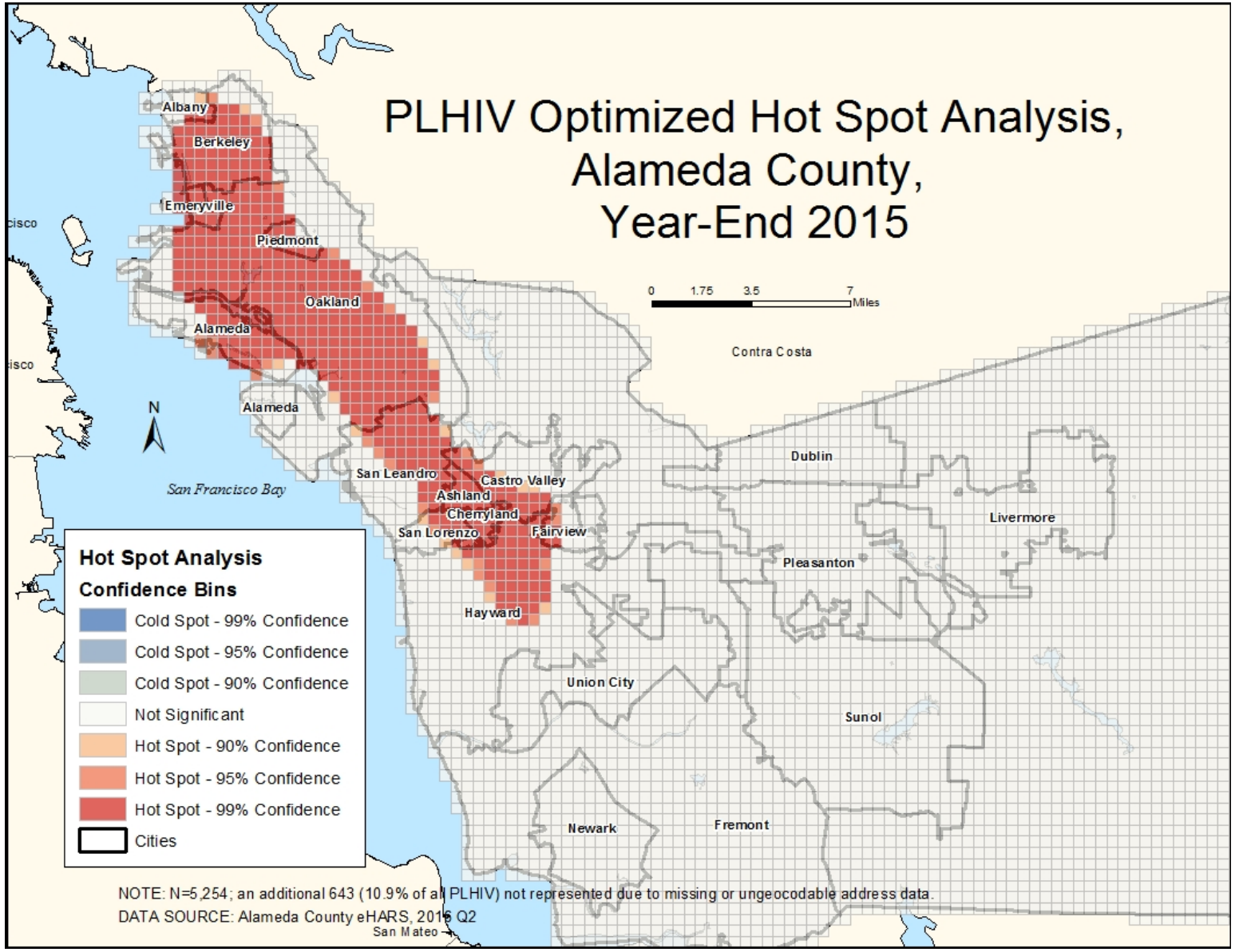
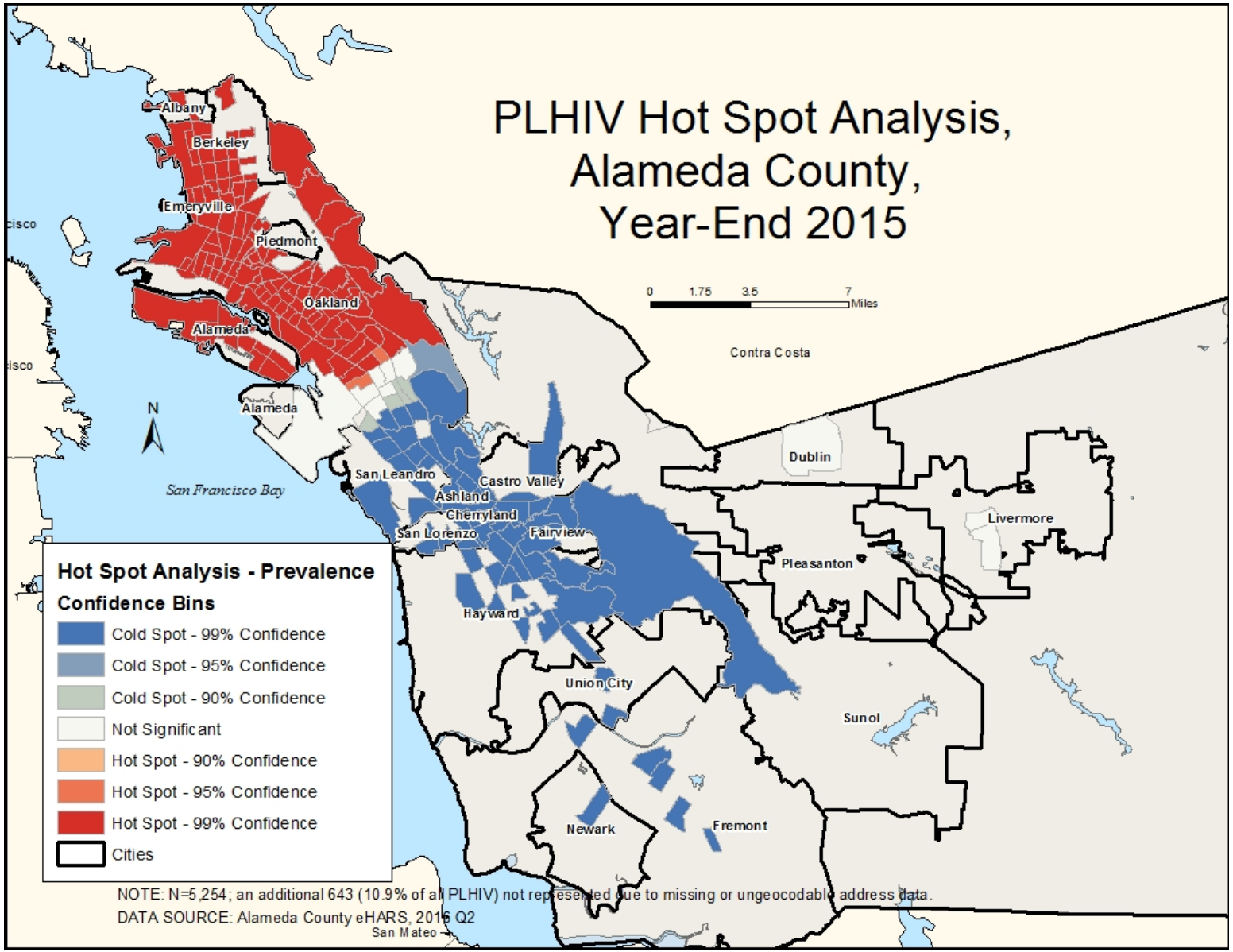
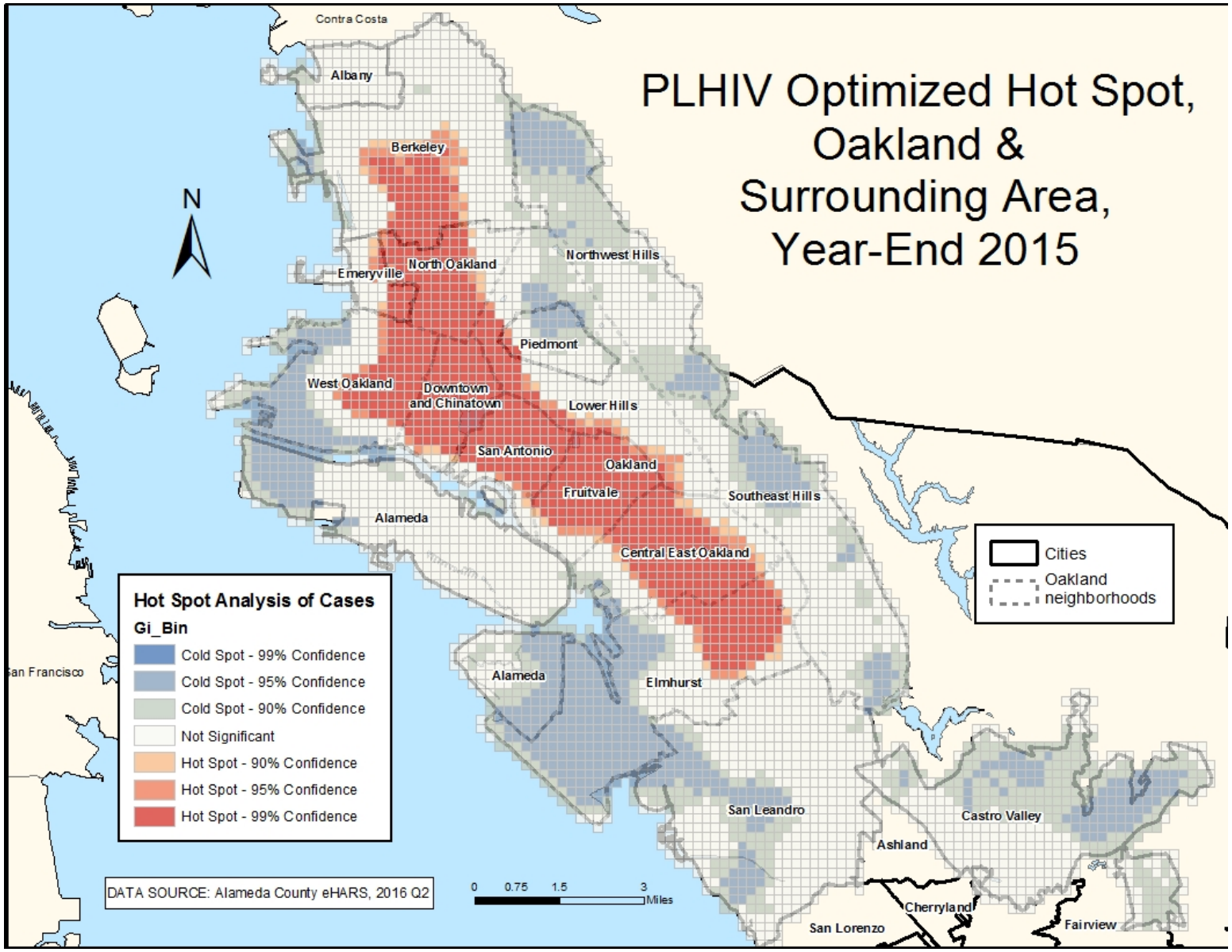
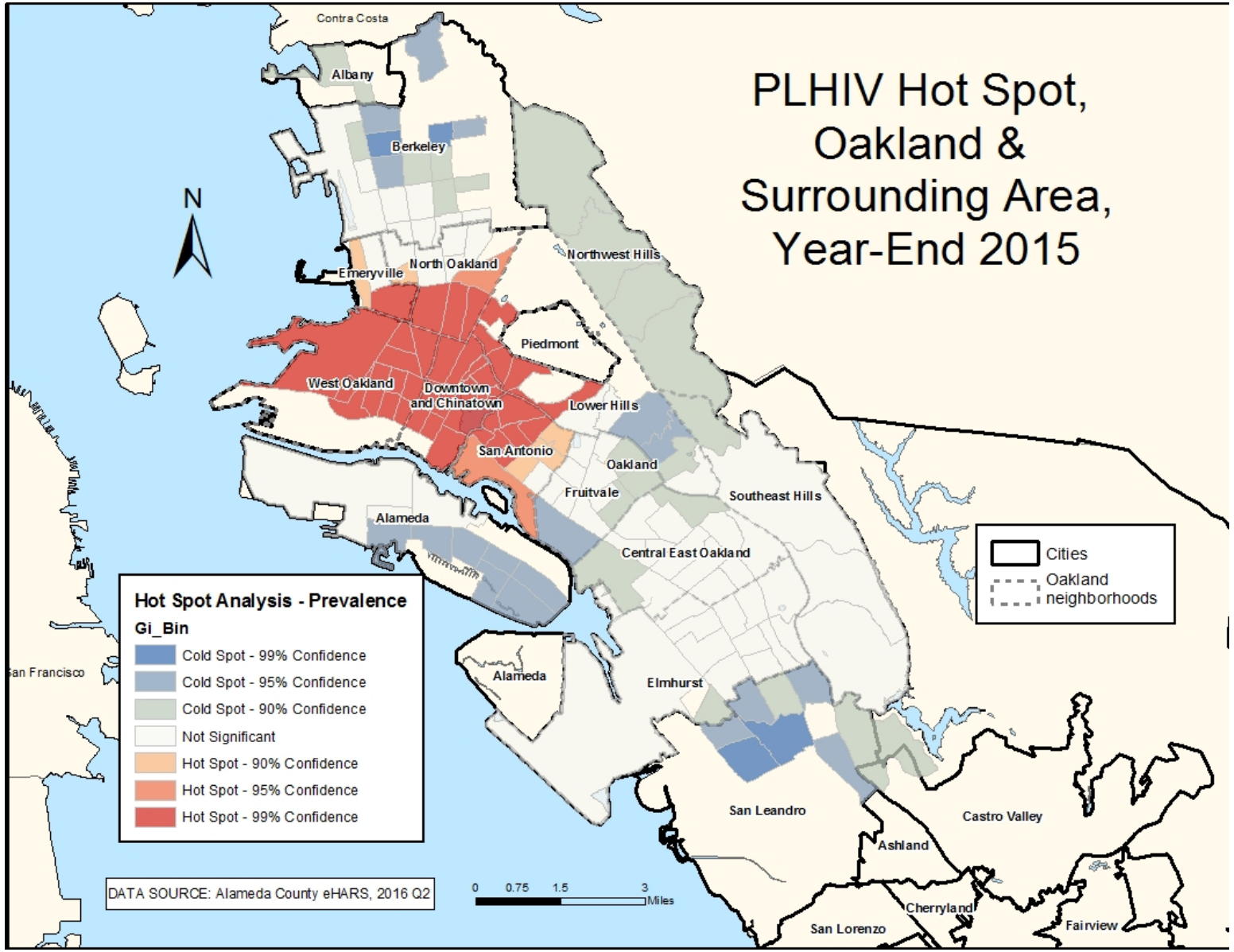
Toolboxes
My Toolboxes
System Toolboxes
3D Analyst Tools.tbx
Analysis Tools.tbx
Cartography Tools.tbx
Conversion Tools.tbx
Data Interoperability Tools.tbx
Data Management Tools.tbx
Editing Tools.tbx
Geocoding Tools.tbx
Geostatistical Analyst Tools.tbx
Linear Referencing Tools.tbx
Multidimension Tools.tbx
Network Analyst Tools.tbx
Parcel Fabric Tools.tbx
Schematics Tools.tbx
Server Tools.tbx
Space Time Pattern Mining Tools.pyt
Spatial Analyst Tools.tbx
Spatial Statistics Tools.tbx
Analyzing Patterns
Mapping Clusters
Cluster and Outlier Analysis (Anselin Local Morans
Hot Spot Analysis (Getis-Ord Gi*)
Optimized Hot Spot Analysis
Similarity Search
Measuring Geographic Distributions
Modeling Spatial Relationships
Utilities
Tracking Analyst Tools.tbx
Database Servers
Database Connections
Add Database Connection
Connect to eGIS SDE.sde
Connection to US01PDB029VG.user.root.acgov.org.sde
GIS Servers
15.54 7.38 Inches

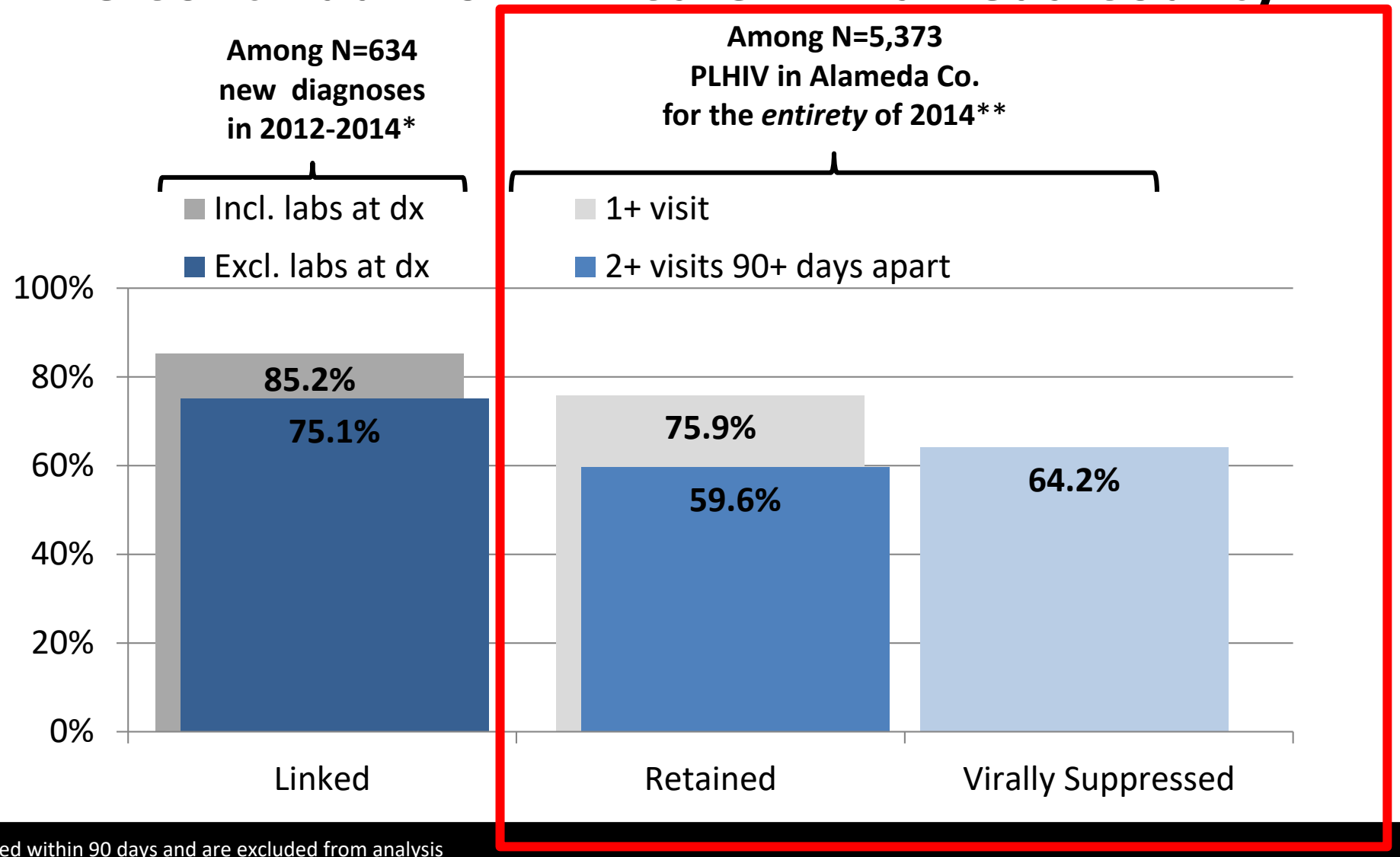

PLHIV Optimized Hot Spot Analysis,
Alameda County,
Year-End 2015
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Newark
Fremont
Sunol
Pleasanton
Dublin
Livermore
Contra Costa
San Francisco Bay
N
0 1.75 3.5 7 Miles
Hot Spot Analysis
Confidence Bins
Cold Spot - 99% Confidence
Cold Spot - 95% Confidence
Cold Spot - 90% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 95% Confidence
Hot Spot - 99% Confidence
Cities
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
San Mateo


PLHIV Hot Spot Analysis,
Alameda County,
Year-End 2015
0 1.75 3.5 7 Miles
N
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
San Francisco Bay
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Newark
Fremont
Sunol
Pleasanton
Dublin
Livermore
Contra Costa
San Mateo
Hot Spot Analysis - Prevalence
Confidence Bins
Cold Spot - 99% Confidence
Cold Spot - 95% Confidence
Cold Spot - 90% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 95% Confidence
Hot Spot - 99% Confidence
Cities
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


PLHIV Optimized Hot Spot, Oakland & Surrounding Area, Year-End 2015
N
Contra Costa
Albany
Berkeley
Emeryville
North Oakland
Northwest Hills
Piedmont
West Oakland
Downtown and Chinatown
Lower Hills
San Antonio
Oakland
Fruitvale
Southeast Hills
Alameda
Central East Oakland
Alameda
Elmhurst
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
San Francisco
Hot Spot Analysis of Cases
Gi_Bin
Cold Spot - 99% Confidence
Cold Spot - 95% Confidence
Cold Spot - 90% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 95% Confidence
Hot Spot - 99% Confidence
Cities
Oakland neighborhoods
DATA SOURCE: Alameda County eHARS, 2016 Q2
0 0.75 1.5 3 Miles


PLHIV Hot Spot, Oakland & Surrounding Area, Year-End 2015
Contra Costa
Albany
Berkeley
N
Emeryville
North Oakland
Northwest Hills
Piedmont
West Oakland
Downtown and Chinatown
Lower Hills
San Antonio
Oakland
Fruitvale
Southeast Hills
Alameda
Central East Oakland
Alameda
Elmhurst
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
San Francisco
Hot Spot Analysis - Prevalence
Gi_Bin
Cold Spot - 99% Confidence
Cold Spot - 95% Confidence
Cold Spot - 90% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 95% Confidence
Hot Spot - 99% Confidence
Cities
Oakland neighborhoods
DATA SOURCE: Alameda County eHARS, 2016 Q2
0 0.75 1.5 3 Miles

The Continuum of HIV Care in Alameda County



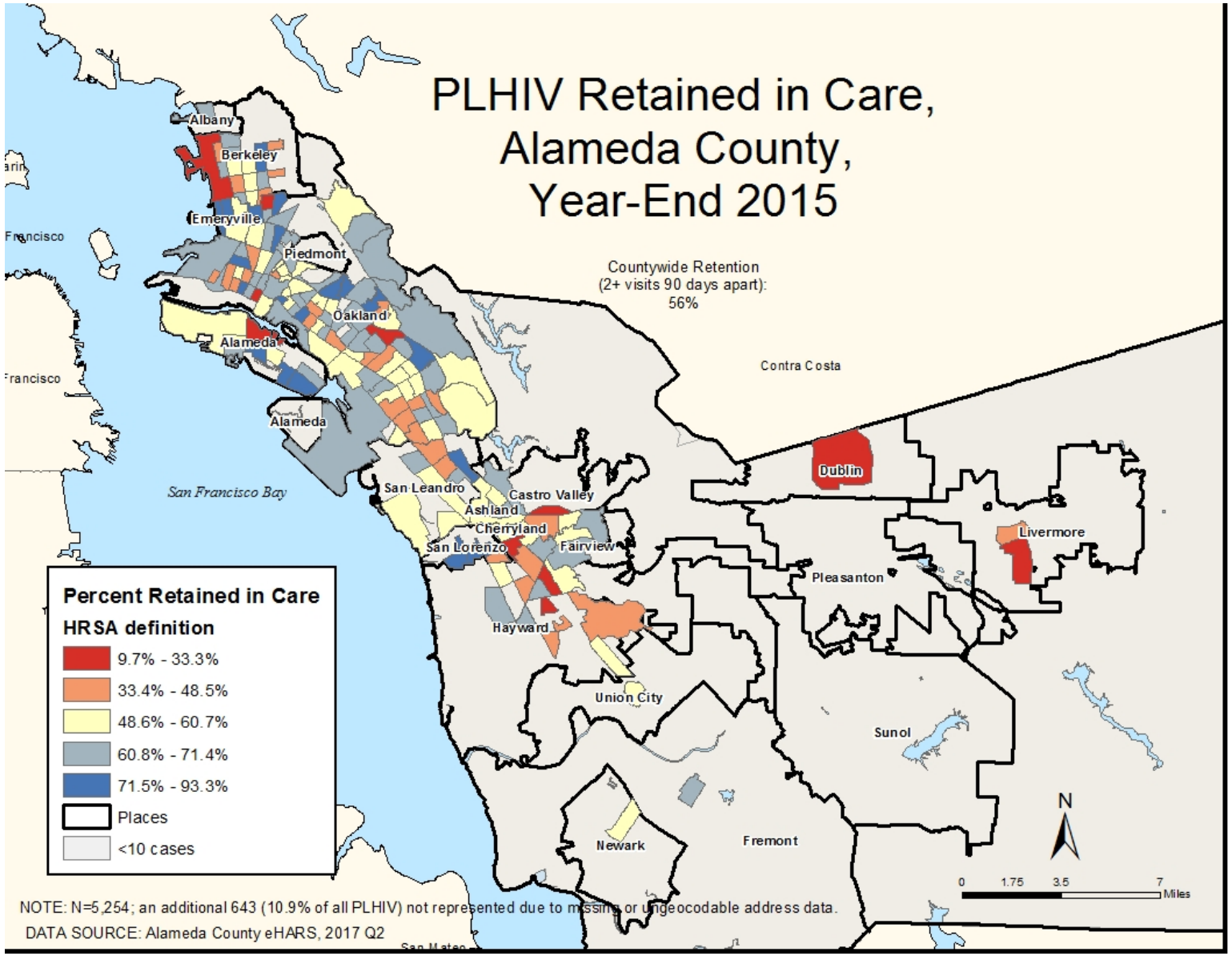
*Of 651 total diagnoses, 17 died within 90 days and are excluded from analysis

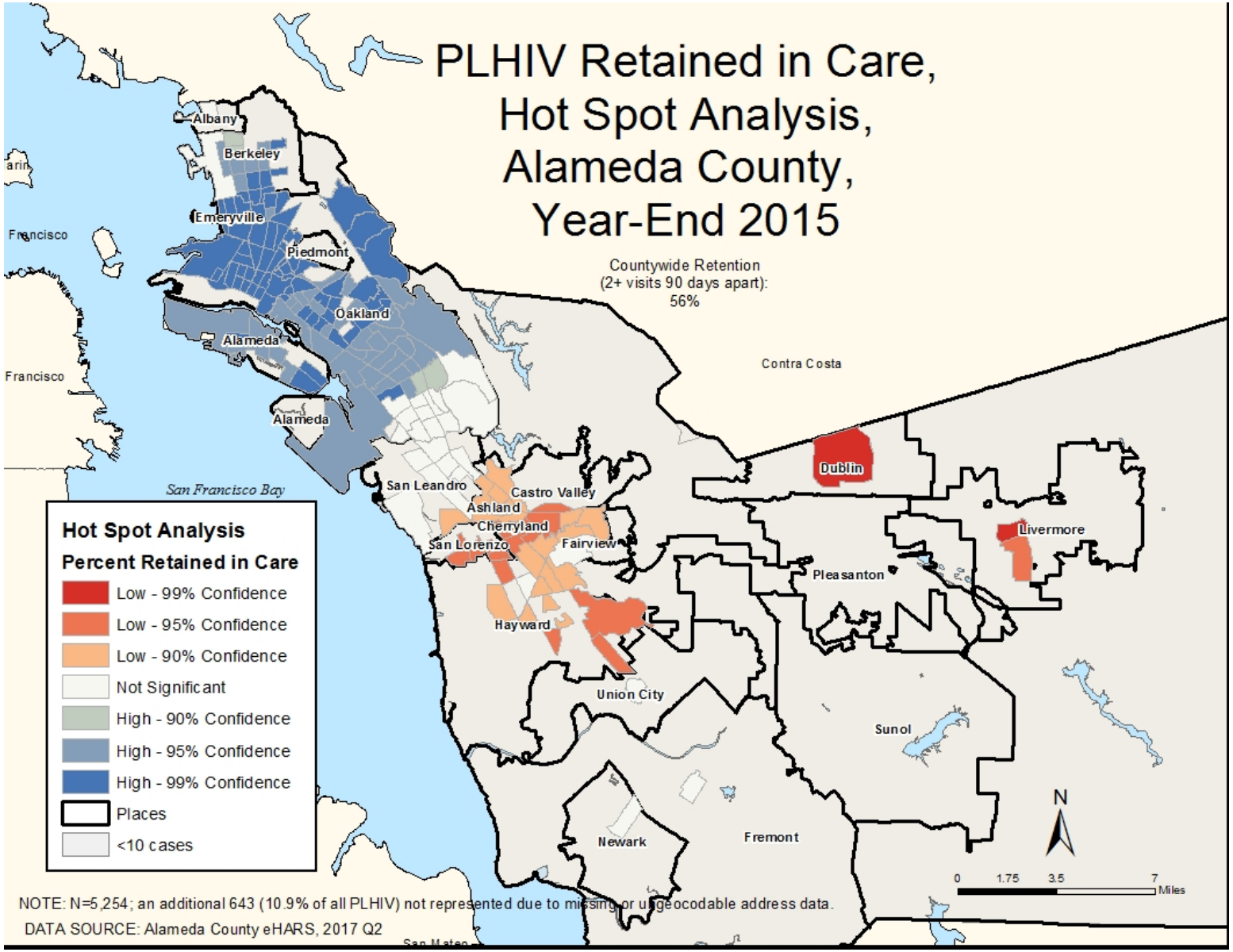
**Of 5,662 PLHIV at year-end 2013, 62 are known to have died and an additional 227 to have moved out of Alameda County in 2014

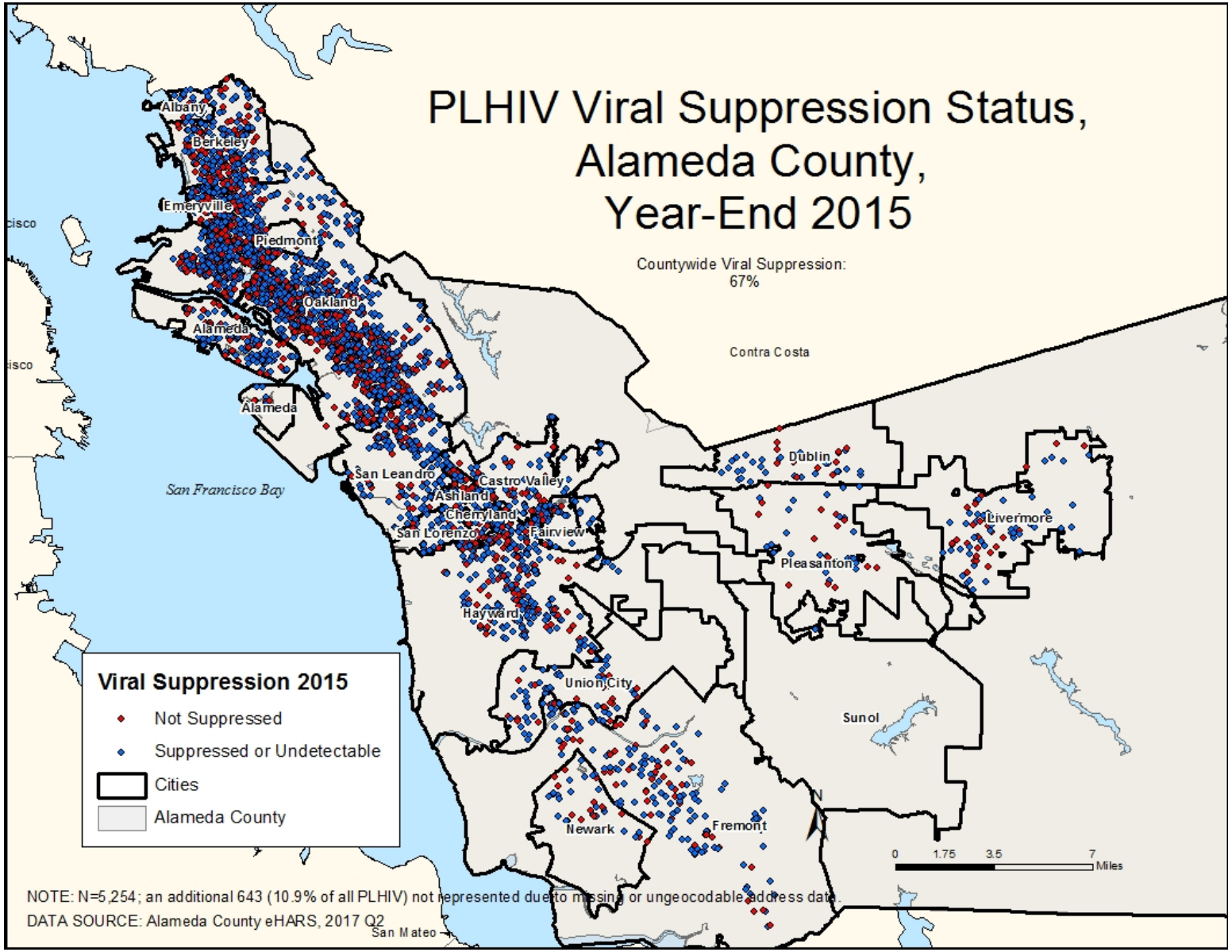
1) Linkage defined as having a reported CD4 or VL ordered within 90 days or less of diagnosis; 2) Retention calculated using labs ordered in 2013; 3) Viral suppression defined as most recent VL in 2013 < 200 copies/mL

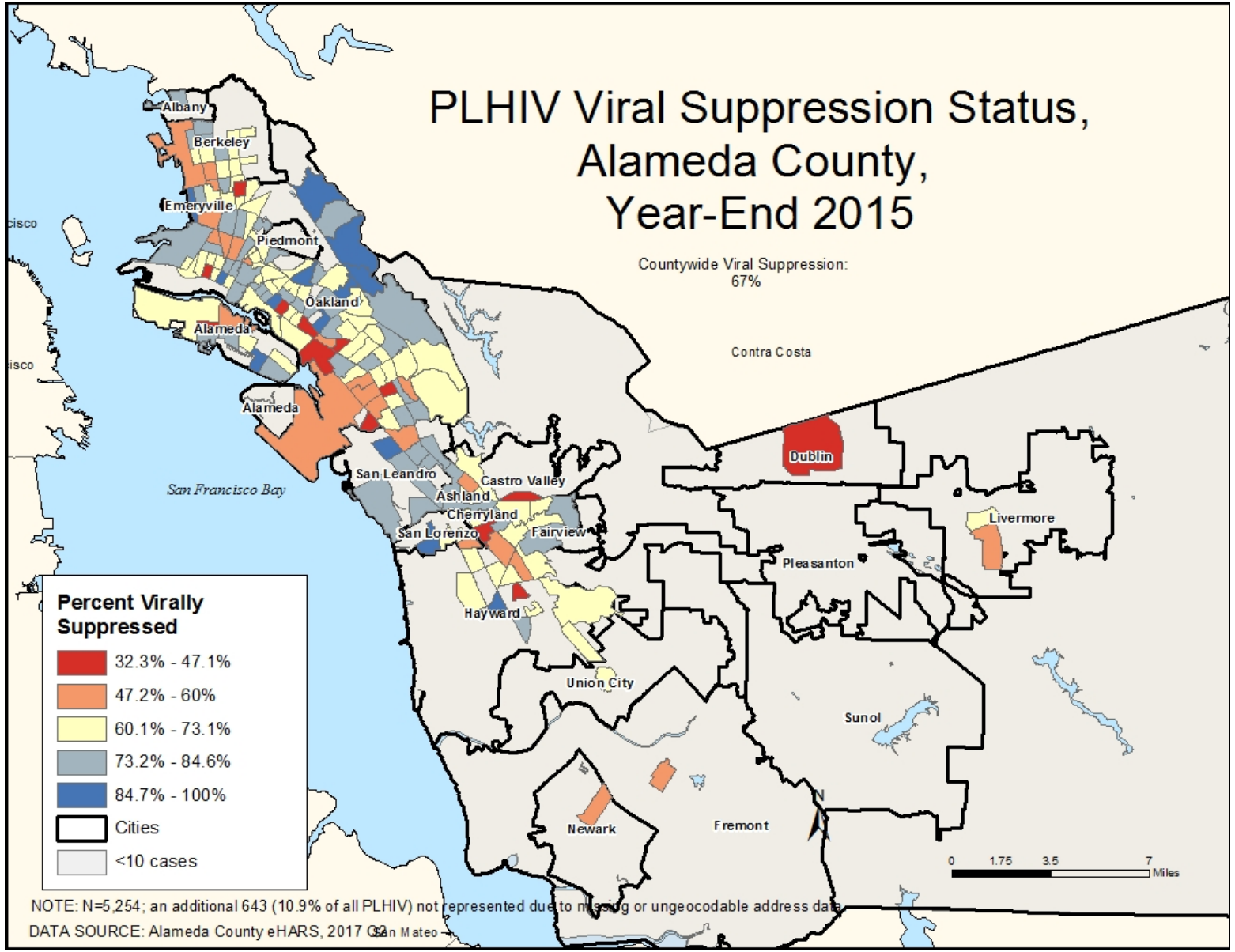
Continuum of HIV Care – Hot Spot Analysis

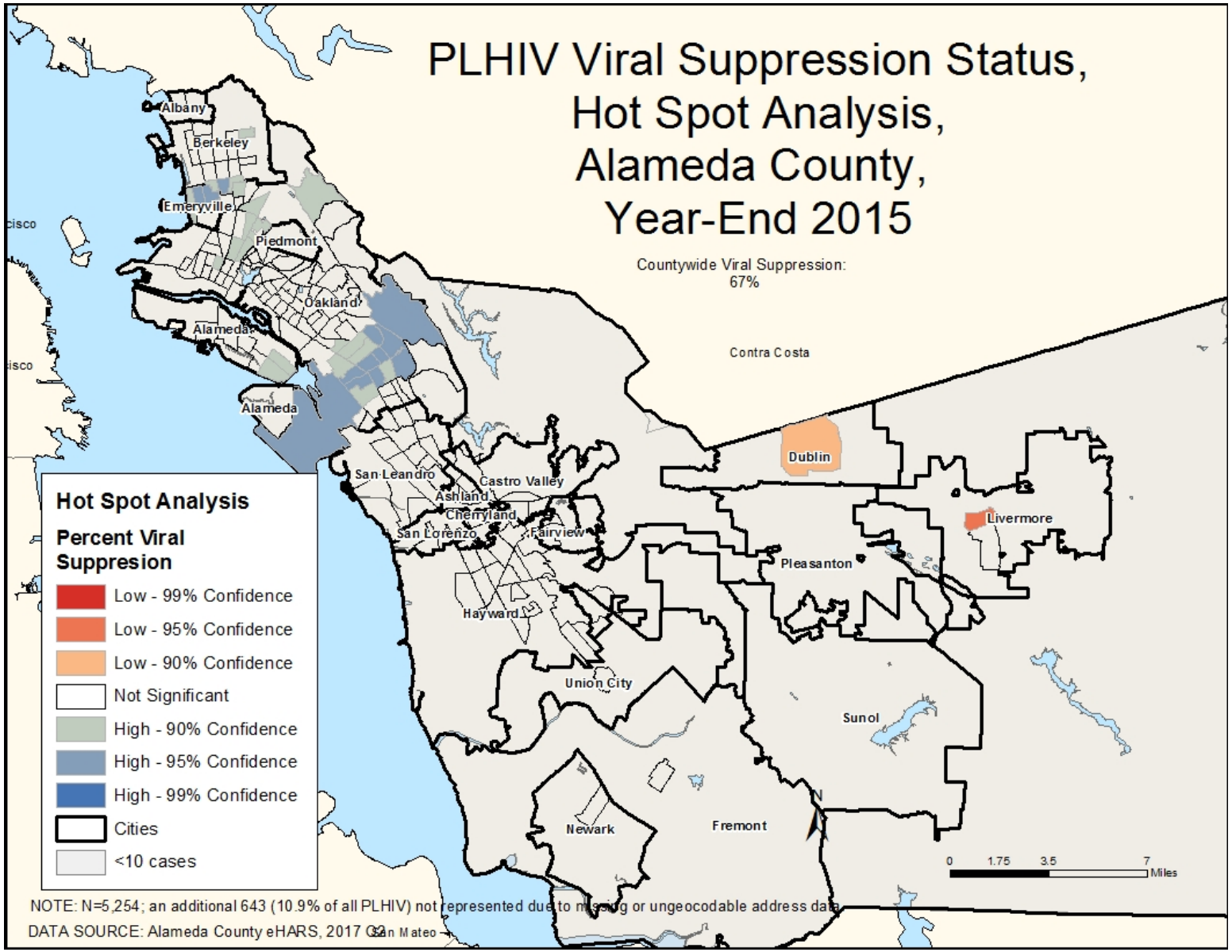
- Retention in care
  - 2 or more HIV care visits at least 90 days apart during 2015
  - As determined by HIV laboratory tests reported to the state Office of AIDS
- Viral Suppression
  - Viral Load under 200 viral RNA copies per milliliter of blood
  - Must have at least 1 viral load test in 2015 for this analysis

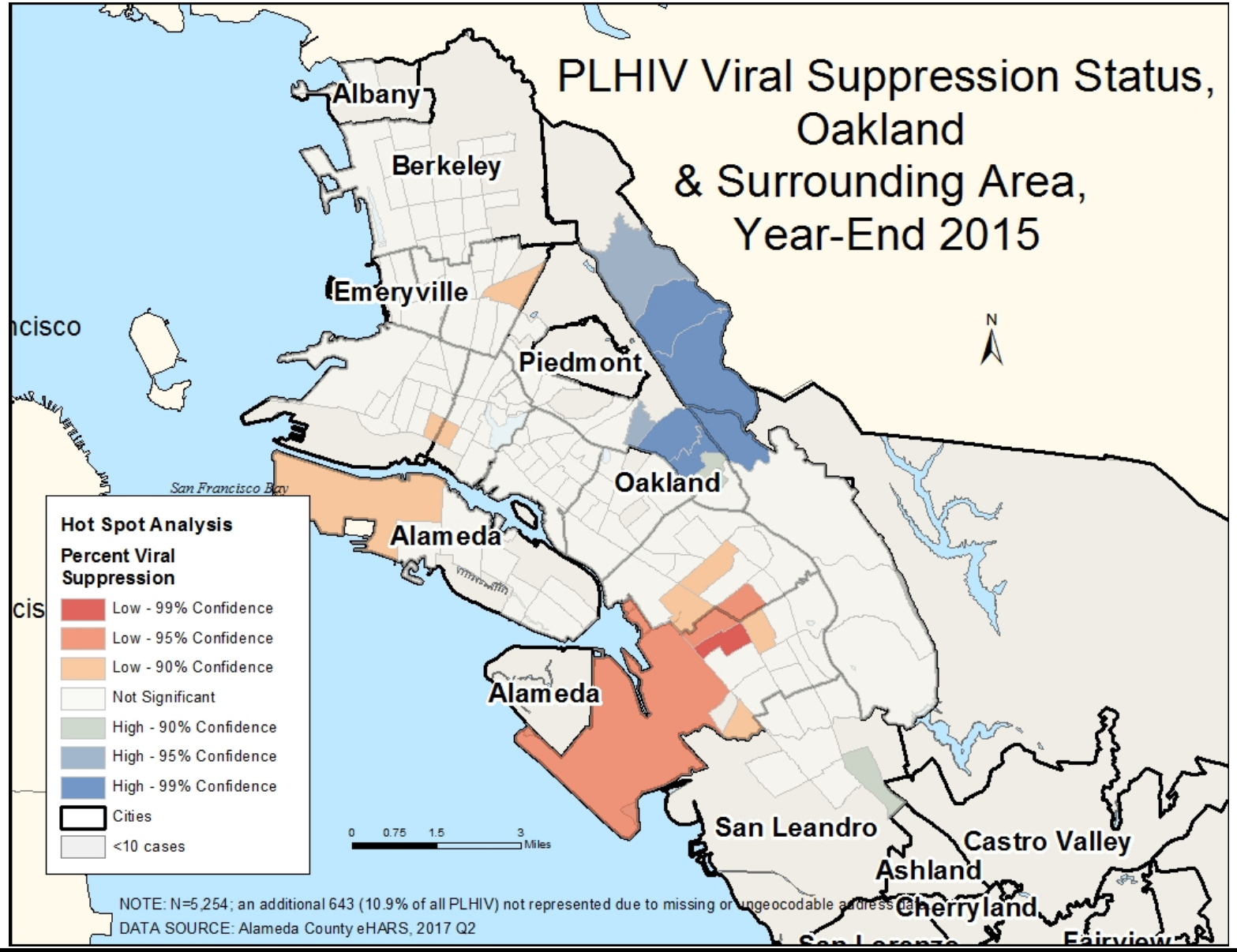

PLHIV Retained in Care,
Alameda County,
Year-End 2015
Countywide Retention
(2+ visits 90 days apart):
56%
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
San Francisco Bay
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Newark
Fremont
Sunol
Pleasanton
Dublin
Livermore
Contra Costa
Percent Retained in Care
HRSA definition
9.7% - 33.3%
33.4% - 48.5%
48.6% - 60.7%
60.8% - 71.4%
71.5% - 93.3%
Places
<10 cases
N
0 1.75 3.5 7 Miles
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, 2017 Q2


PLHIV Retained in Care,
Hot Spot Analysis,
Alameda County,
Year-End 2015
Countywide Retention
(2+ visits 90 days apart):
56%
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
Francisco
Francisco
San Francisco Bay
Contra Costa
Dublin
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Livermore
Pleasanton
Hayward
Union City
Sunol
Newark
Fremont
Hot Spot Analysis
Percent Retained in Care
Low - 99% Confidence
Low - 95% Confidence
Low - 90% Confidence
Not Significant
High - 90% Confidence
High - 95% Confidence
High - 99% Confidence
Places
<10 cases
N
0
1.75
3.5
7
Miles
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, 2017 Q2


PLHIV Viral Suppression Status,
Alameda County,
Year-End 2015
Countywide Viral Suppression:
67%
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
San Francisco Bay
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Newark
Fremont
Dublin
Pleasanton
Livermore
Sunol
Contra Costa
San Mateo
Viral Suppression 2015
Not Suppressed
Suppressed or Undetectable
Cities
Alameda County
0 1.75 3.5 7
Miles
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, 2017 Q2


PLHIV Viral Suppression Status,
Alameda County,
Year-End 2015
Countywide Viral Suppression:
67%
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Newark
Fremont
Dublin
Pleasanton
Livermore
Sunol
Contra Costa
San Francisco Bay
San Mateo
Percent Virally Suppressed
32.3% - 47.1%
47.2% - 60%
60.1% - 73.1%
73.2% - 84.6%
84.7% - 100%
Cities
<10 cases
0 1.75 3.5 7 Miles
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, 2017 Q2


PLHIV Viral Suppression Status,
Hot Spot Analysis,
Alameda County,
Year-End 2015
Countywide Viral Suppression:
67%
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
San Leandro
Castro Valley
Ashland
Cherryland
San Lorenzo
Fairview
Hayward
Union City
Newark
Fremont
Sunol
Pleasanton
Dublin
Livermore
Contra Costa
San Mateo
Hot Spot Analysis
Percent Viral Suppresion
Low - 99% Confidence
Low - 95% Confidence
Low - 90% Confidence
Not Significant
High - 90% Confidence
High - 95% Confidence
High - 99% Confidence
Cities
<10 cases
0 1.75 3.5 7
Miles
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, 2017 Q2


PLHIV Viral Suppression Status, Oakland & Surrounding Area, Year-End 2015
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Alameda
San Leandro
Castro Valley
Ashland
Cherryland
San Francisco Bay
N
Hot Spot Analysis
Percent Viral Suppression
Low - 99% Confidence
Low - 95% Confidence
Low - 90% Confidence
Not Significant
High - 90% Confidence
High - 95% Confidence
High - 99% Confidence
Cities
<10 cases
0 0.75 1.5 3 Miles
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, 2017 Q2

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