OPEN DATA, EPIDEMIOLOGY AND HOMICIDES IN BALTIMORE, 2005 TO 2017

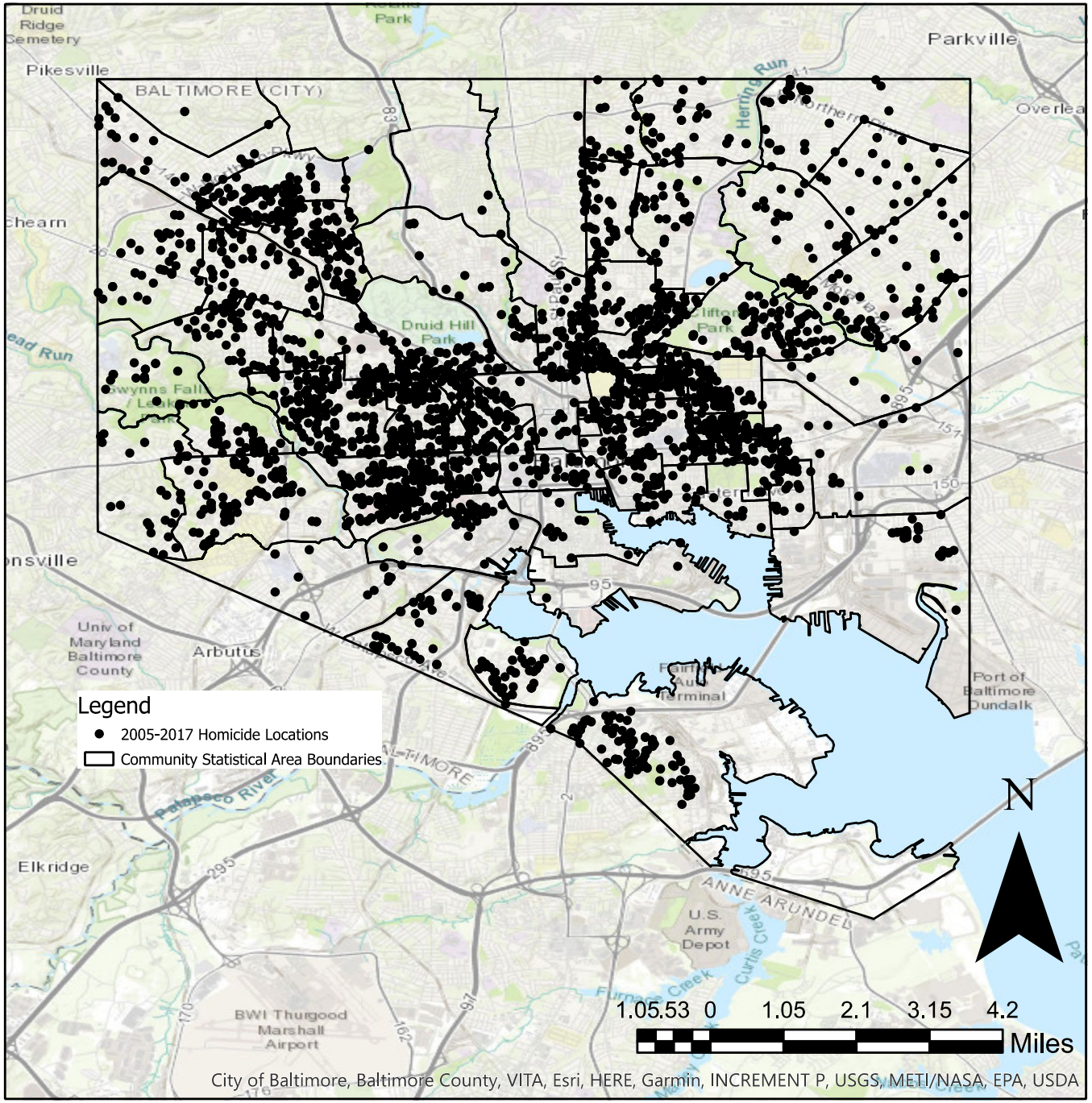
Rene F. Najera, MPH, DrPH

Johns Hopkins University

Fairfax County Health Department

VIOLENCE S DUS DISEASES

Clustering, Spread, an



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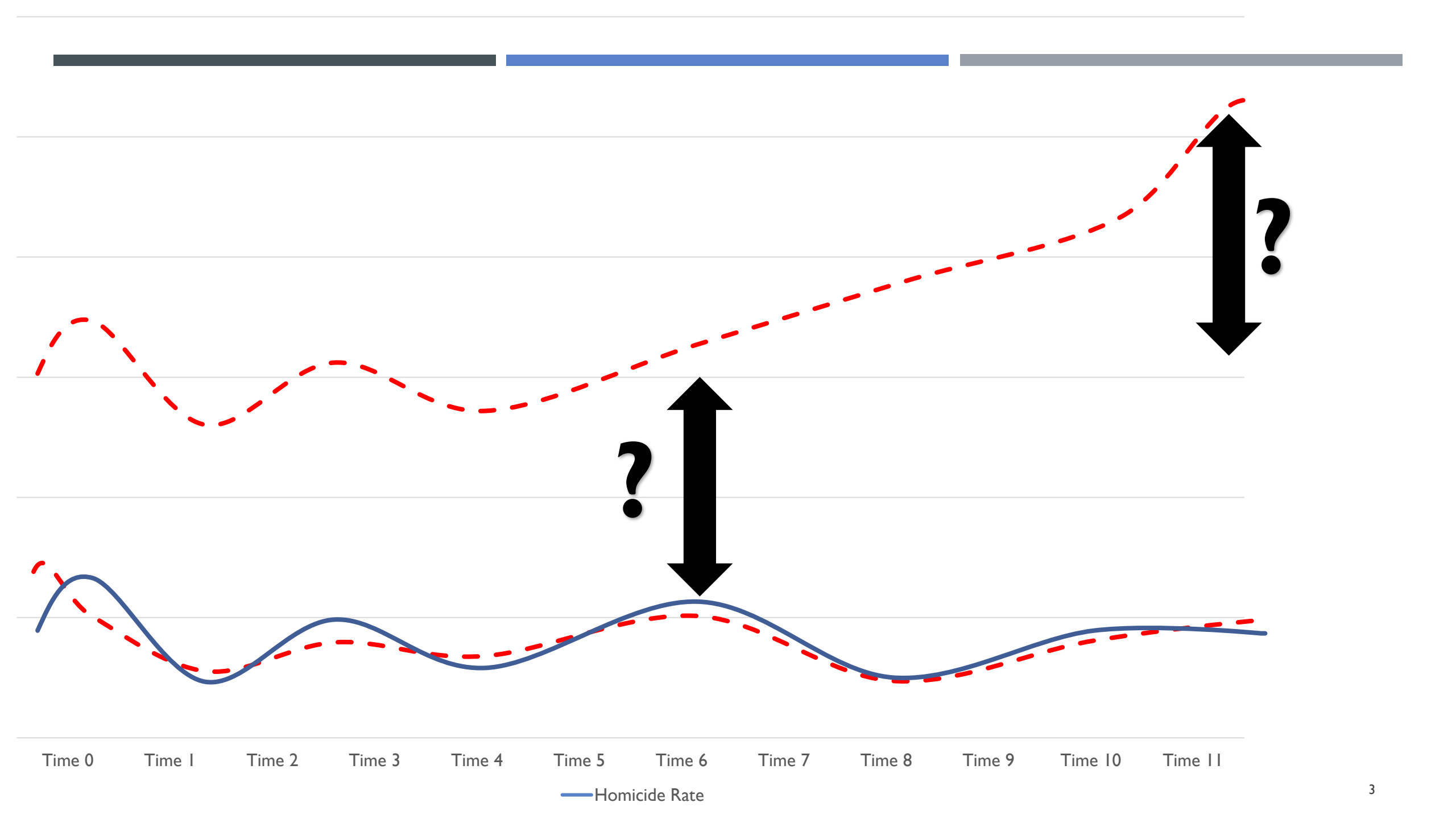
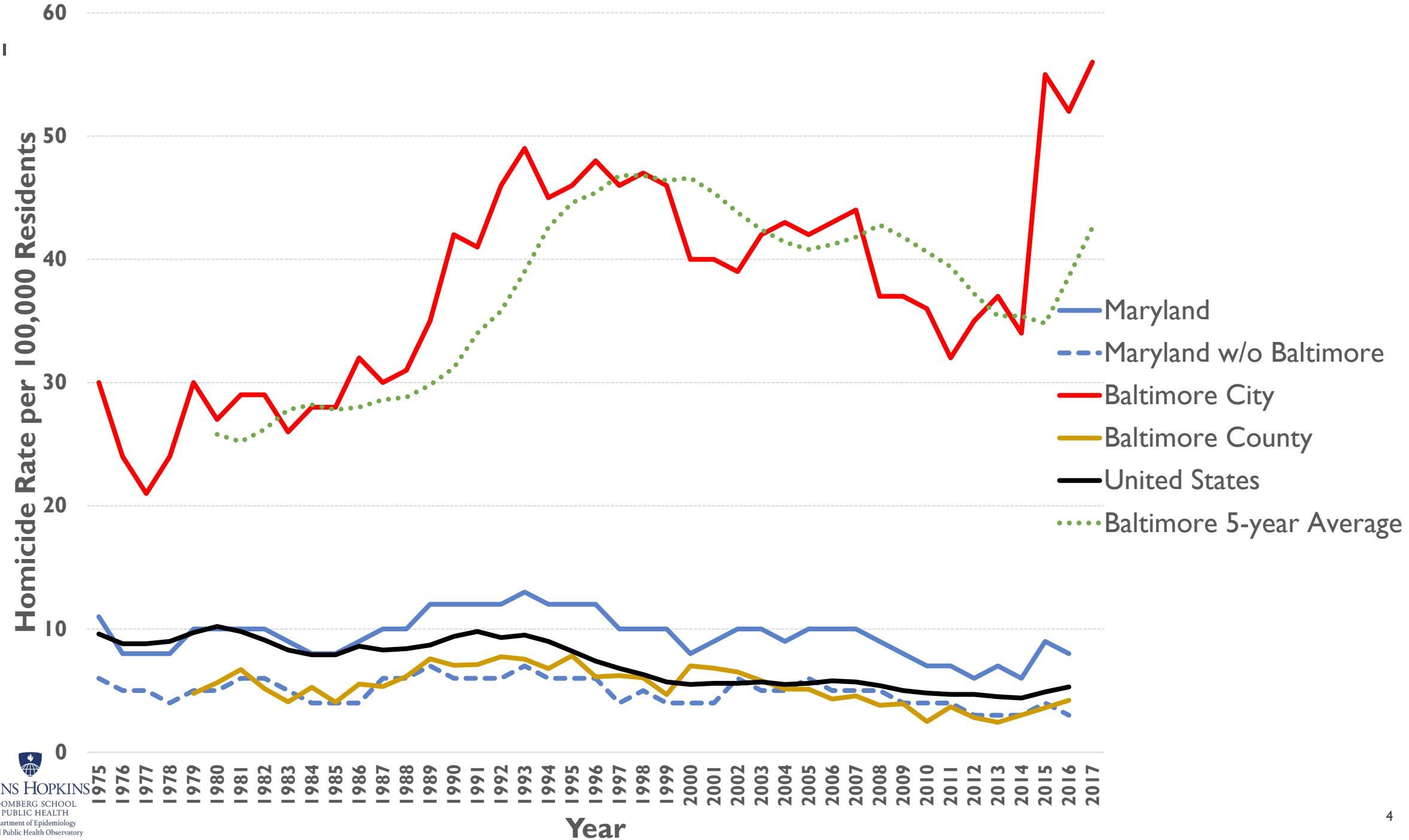
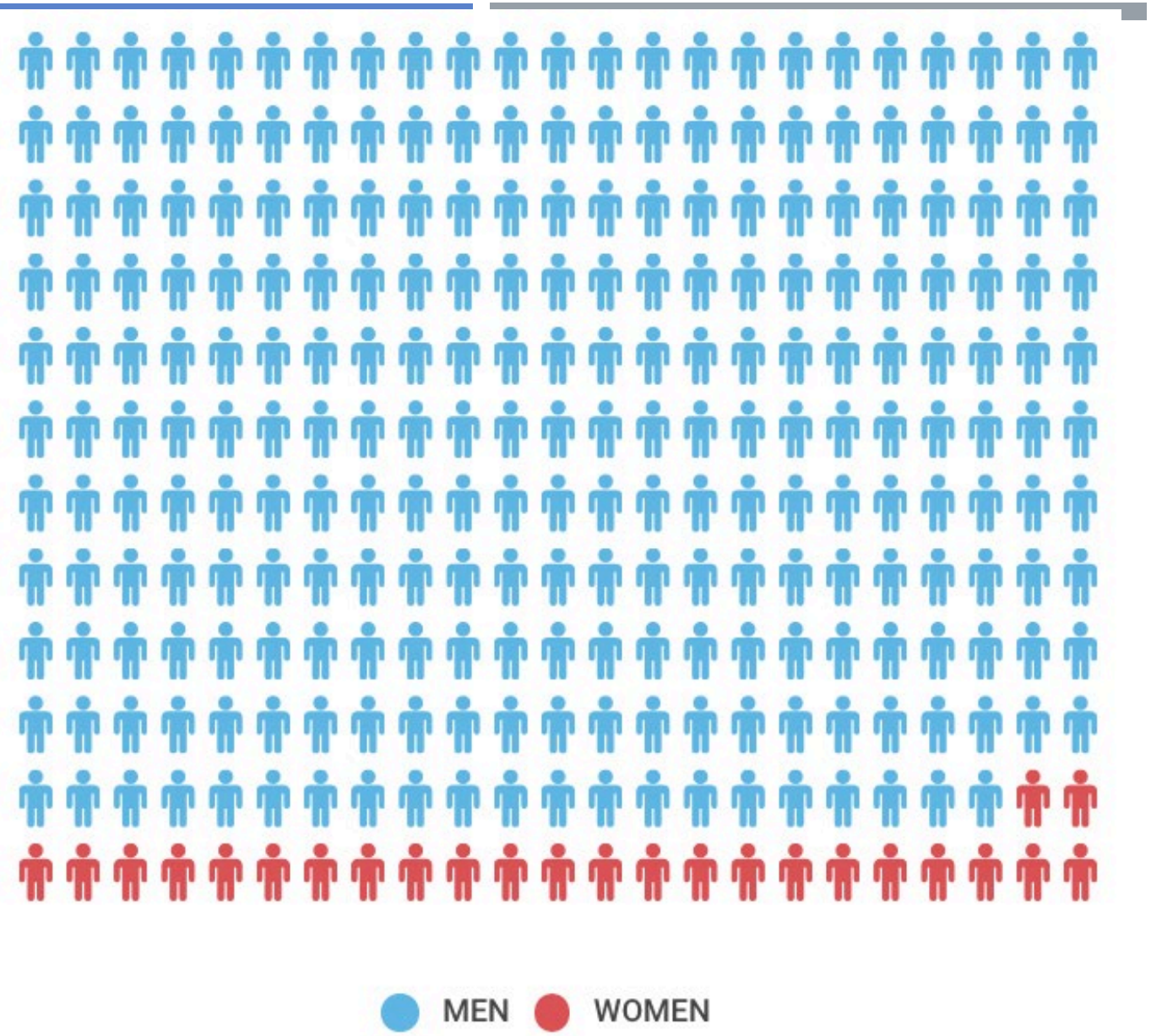

?
?
Time 0
Time 1
Time 2
Time 3
Time 4
Time 5
Time 6
Time 7
Time 8
Time 9
Time 10
Time 11
Homicide Rate


Homicide Rate per 100,000 Residents
60
50
40
30
20
10
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year
Maryland
Maryland w/o Baltimore
Baltimore City
Baltimore County
United States
Baltimore 5-year Average

91% MEN

N = 3,366



85% AFRICAN AMERICAN MEN

N = 3,366

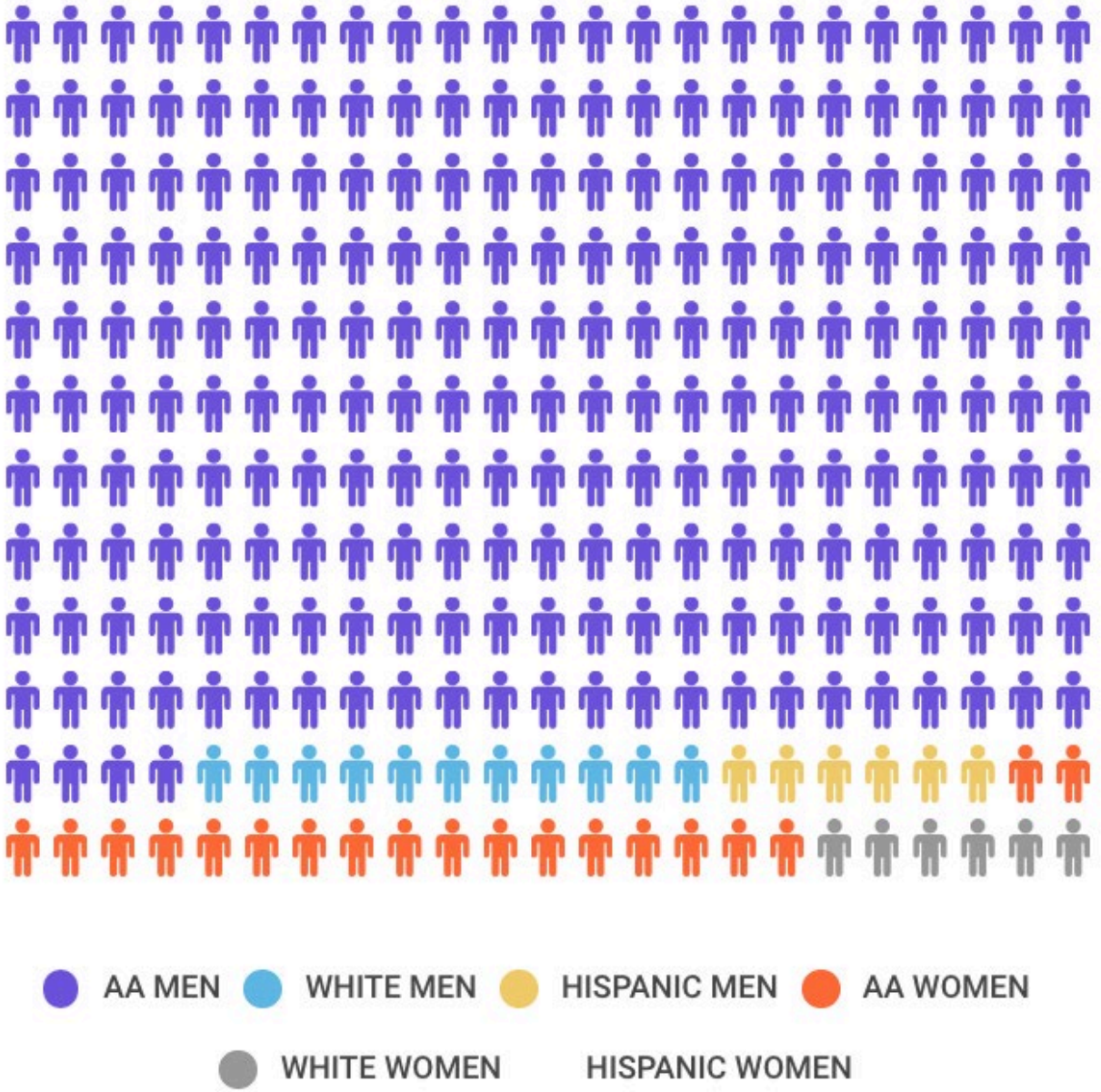
African American Women = 7%

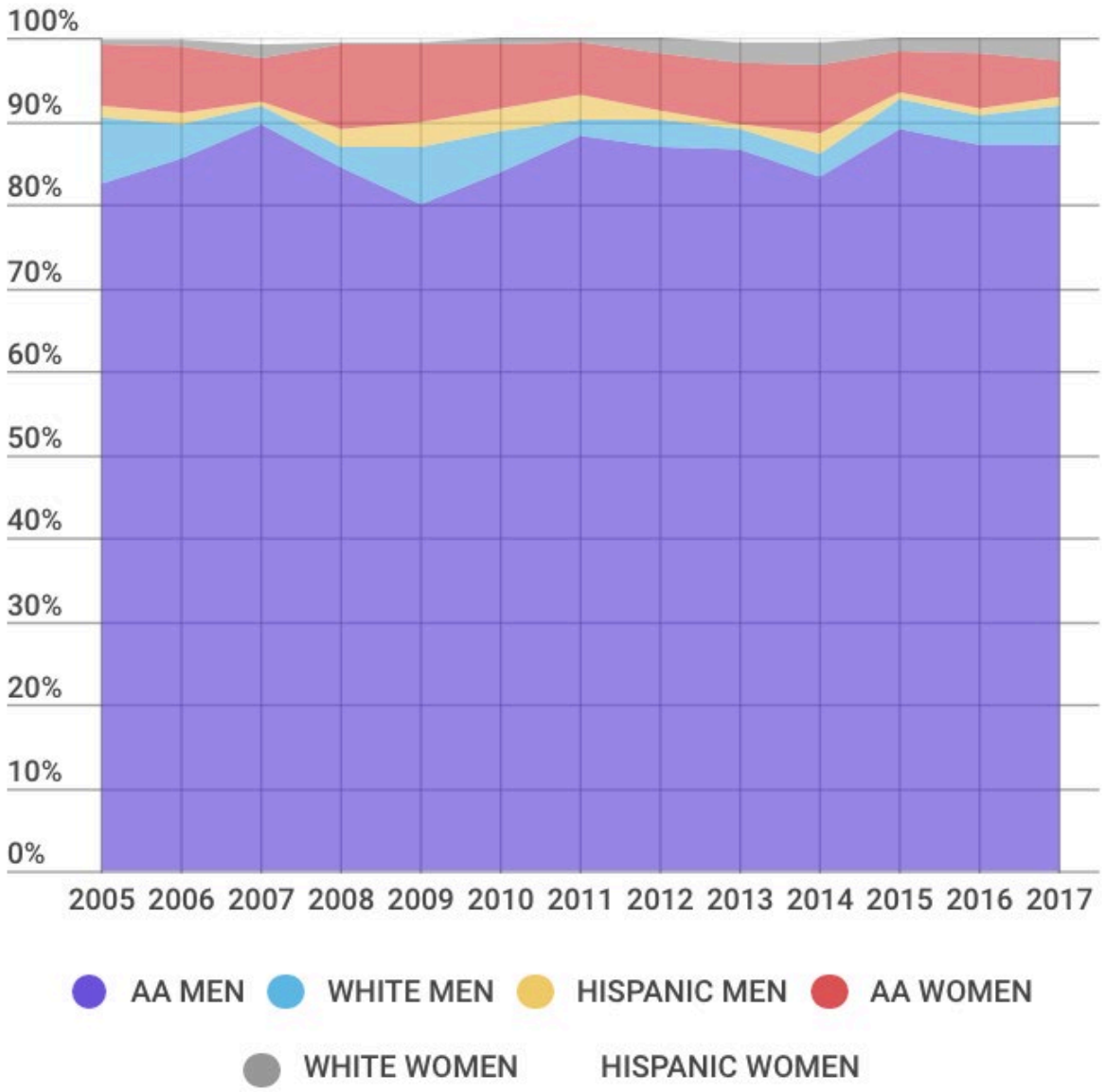
White Men = 4%

Hispanic Men = 2%

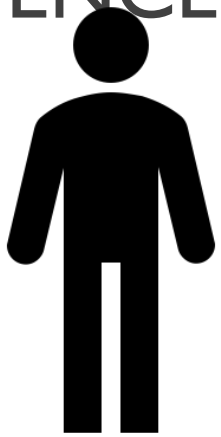
White Women = 2%

Hispanic Women = <1%

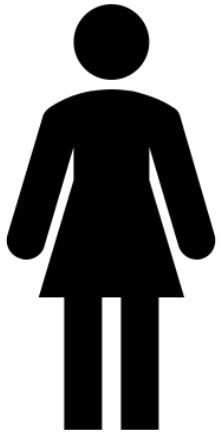



100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
AA MEN
WHITE MEN
HISPANIC MEN
AA WOMEN
WHITE WOMEN
HISPANIC WOMEN

INCIDENCE RATE PER 100,000 RESIDENTS (AGE ADJUSTED)



~75 per year per 100,000 residents



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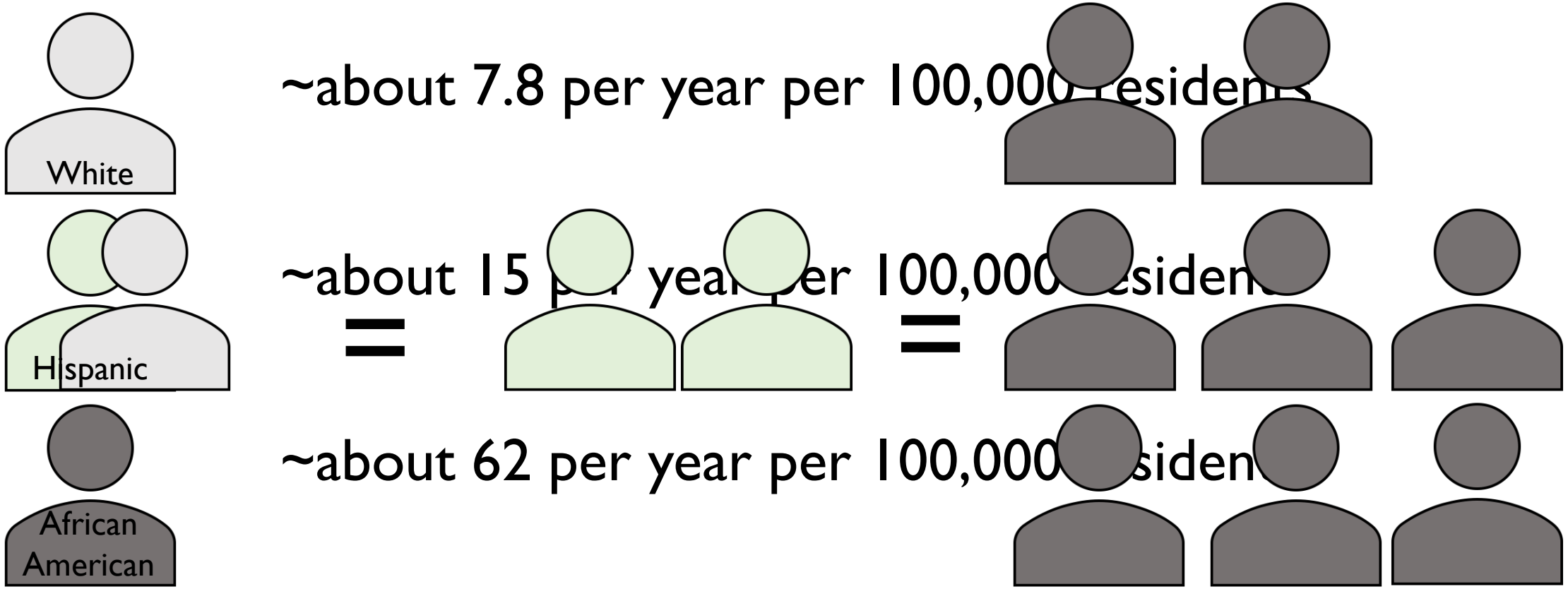
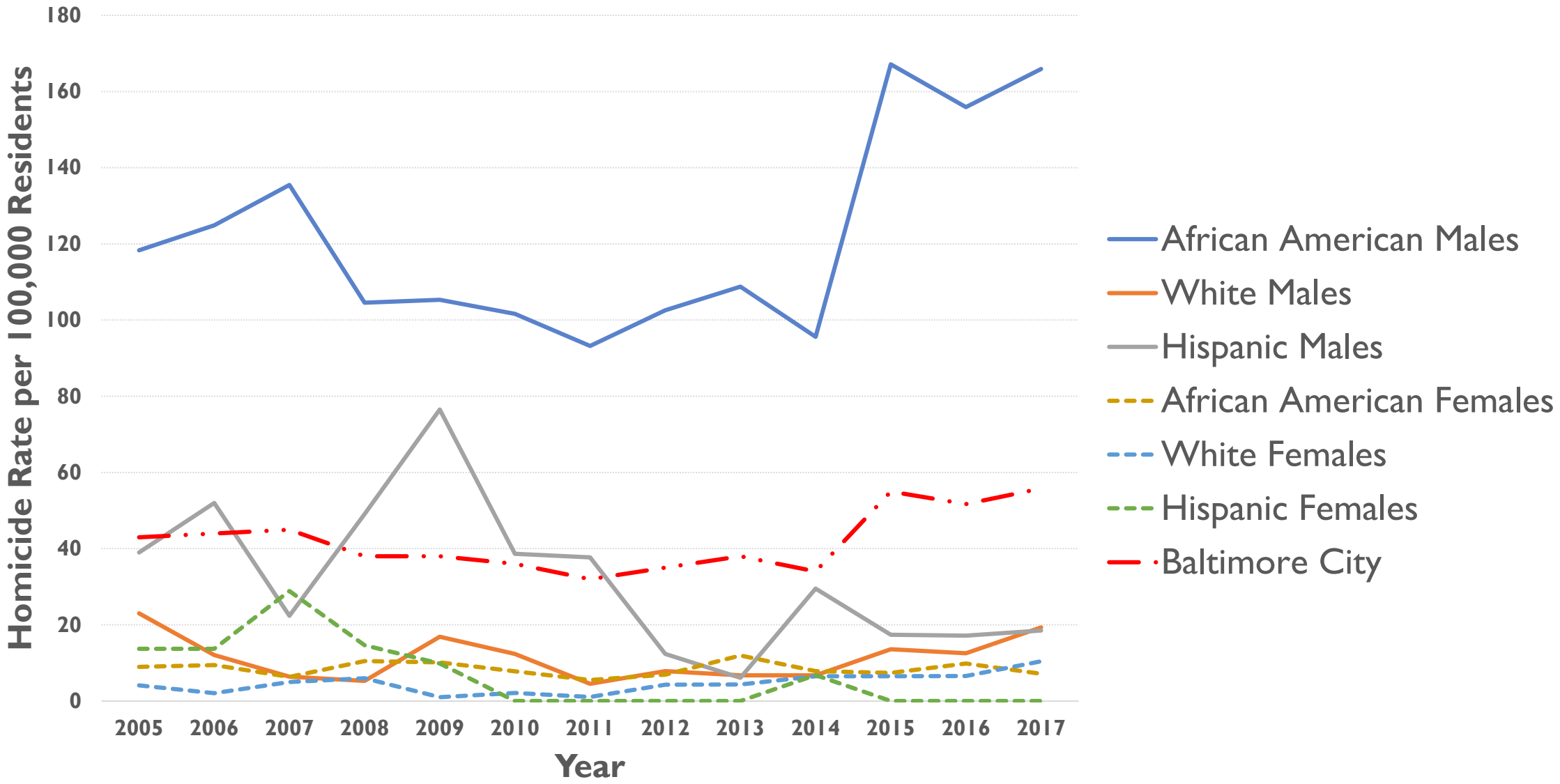
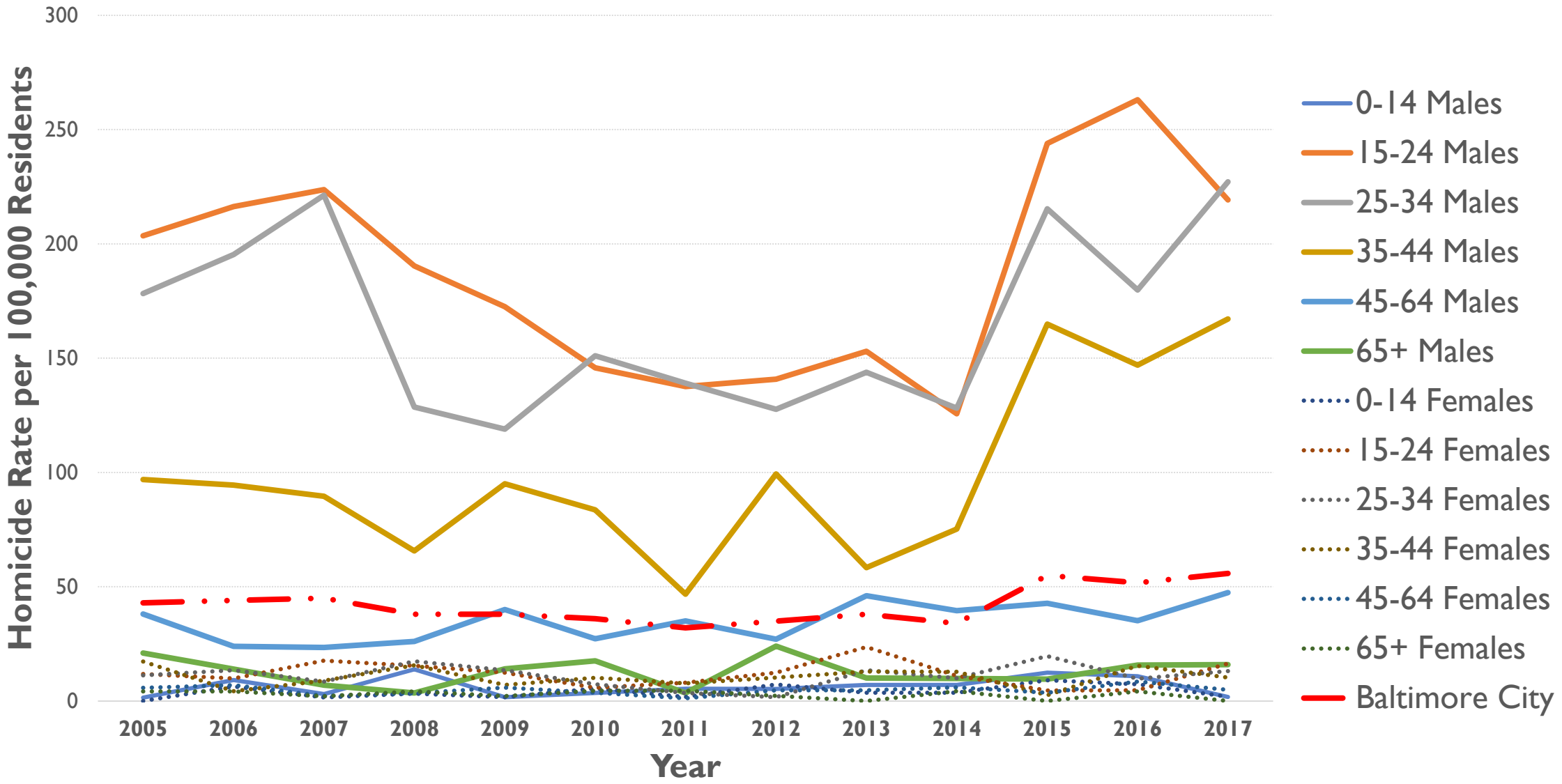
~6.8 per year per 100,000 residents

INCIDENCE RATE PER 100,000 RESIDENTS (AGE ADJUSTED)



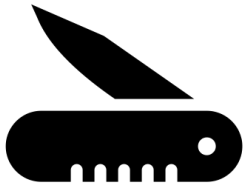

Homicide Rate per 100,000 Residents
180
160
140
120
100
80
60
40
20
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year
African American Males
White Males
Hispanic Males
African American Females
White Females
Hispanic Females
Baltimore City


Homicide Rate per 100,000 Residents
300
250
200
150
100
50
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year
0-14 Males
15-24 Males
25-34 Males
35-44 Males
45-64 Males
65+ Males
0-14 Females
15-24 Females
25-34 Females
35-44 Females
45-64 Females
65+ Females
Baltimore City

CAUSE OF DEATH (N = 3,366)

Firearm

Total Firearm Homicides:
2,779 (83%)



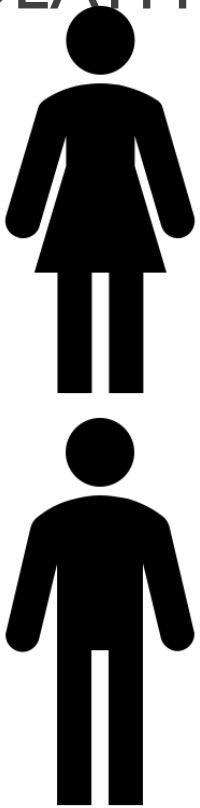
Stabbing

Total Homicides from Stabbing:
311 (9.2%)

Other Causes

Total Homicides from Other:
276 (8.2%)

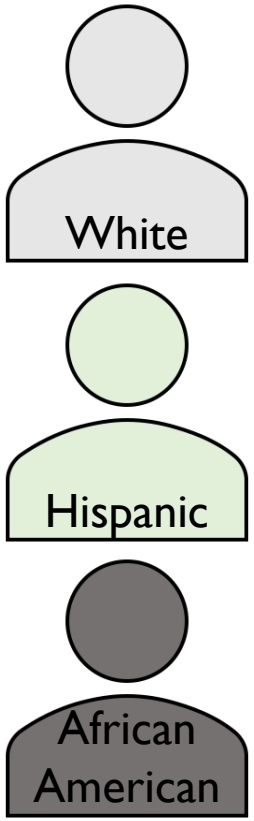
CAUSE OF DEATH (N = 3,366)



- 2005–2017: 157 (**51**%) of female homicide victims were killed by firearm
  - 58 (19%) by stabbing
  - 92 (30%) by other

- 2005–2017: 2,622 (**86**%) of male homicide victims were killed by firearm
  - 253 (8%) by stabbing
  - 184 (6%) by other

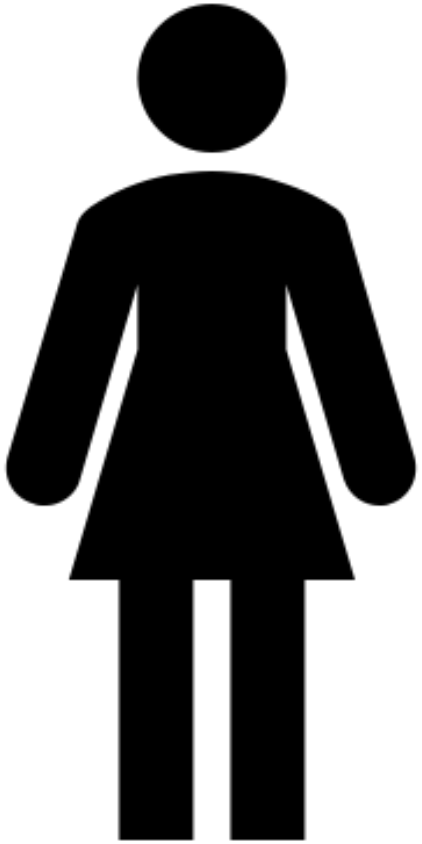
CAUSE OF DEATH (N = 3,366)



- 2005–2017: 98 (**52%**) of white homicide victims were killed by firearm
  - 36 (19%) by stabbing
  - 5 (29%) by other
- 2005–2017: 34 (**60%**) of Hispanic homicide victims were killed by firearm
  - 11 (19%) by stabbing
  - 12 (21%) by other
- 2005–2017: 2,637 (**85%**) of African American homicide victims were killed by firearm
  - 259 (8%) by stabbing
  - 204 (7%) by other

INDIVIDUAL CHARACTERISTICS: FEMALE VICTIMS

- Older than male victims*
  - Female Average: 33
  - Male Average: 30
- More likely to be Intimate Partner Violence
  - 68% of IPV victims were female
  - 7% of non-IPV victims were female
- More likely to be killed at home
  - 33% of victims killed at home were female
  - 6% of victims not killed at home were female
- Less likely to be killed by firearm
  - 25% of victims killed by non-firearms were female
  - 5% of victims killed by firearm were female



*Statistically significant difference, $p<0.05$, t-test

INDIVIDUAL CHARACTERISTICS AND ODDS OF BEING A FIREARM HOMICIDE VICTIM

- Gender, Male: **4.65 (3.52 - 6.14)**
- Race, African American: **4.65 (3.52 - 6.14)**
- Age, Adult: **2.38 (1.70 - 3.35)**
- Education, ≥ High School: 0.79 (0.61 - 1.04)
- Marital Status, Married: 0.89 (0.64 - 1.23)
- Presence of Alcohol, Present: **0.38 (0.26 - 0.56)**
- Employment, Employed: **0.71 (0.55 - 0.92)**
- Injured at Home, Yes: **0.26 (0.20 - 0.34)**
- Intimate Partner Violence, Yes: **0.24 (0.14 - 0.40)**
- Homeless, Yes: **0.14 (0.06 - 0.36)**
- Gang-Involved, Yes: 1.51 (0.51 - 4.48)

Adjusting for gender, race, and age ≥ 18

Bold is statistically significant, <0.05

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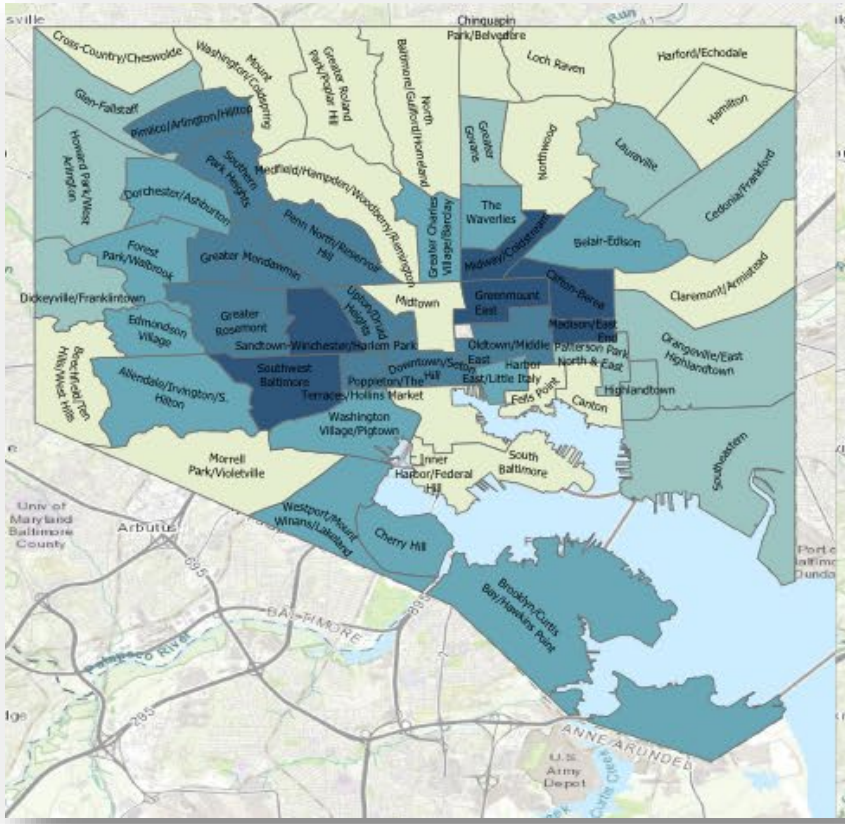
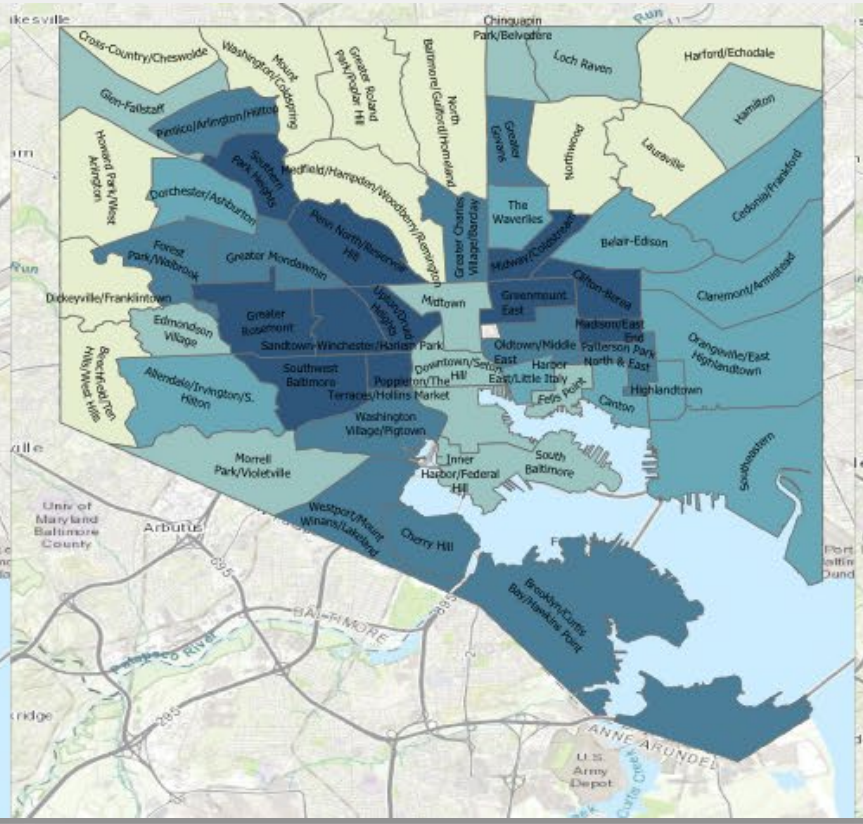
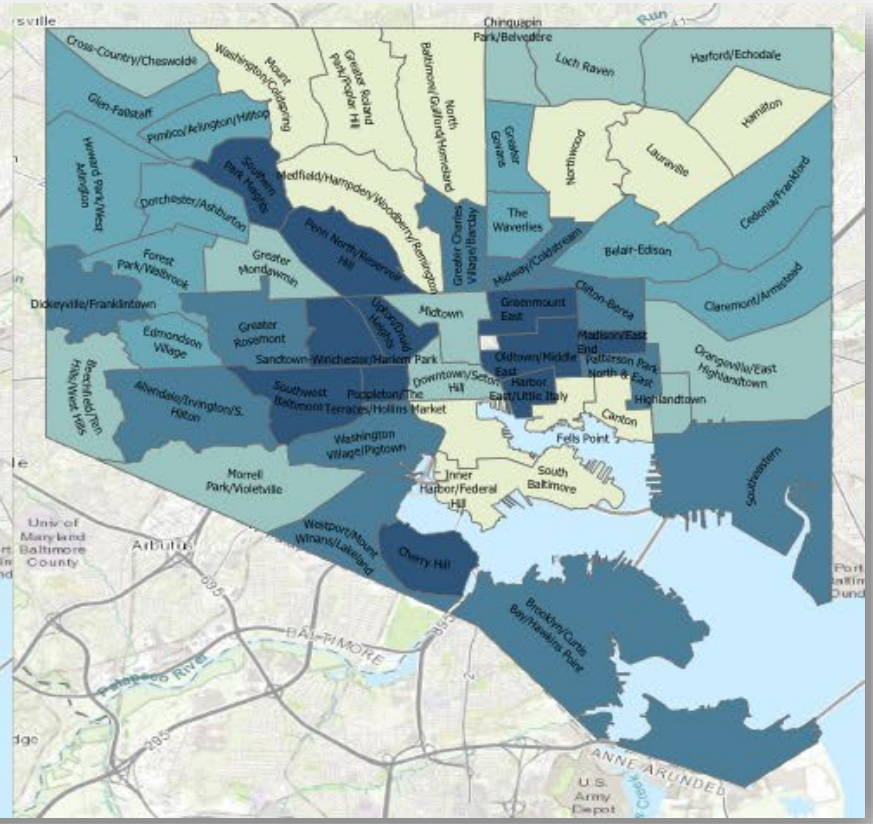


Homicide Rate



Index of Physical Disorder



Percent of Households Under Poverty Line

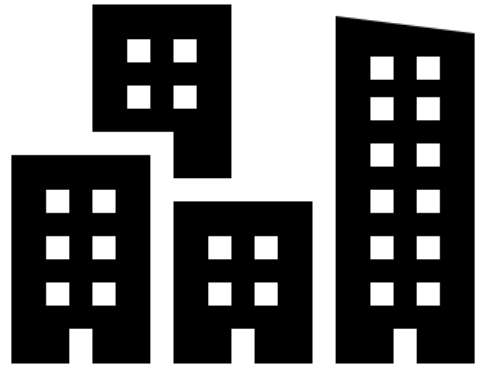
Community Statistical Area Indicator	Univariate Model Incidence Rate Ratio (95% CI)[a]
Percentage of Households Living Under the Poverty Line (10% Increments)	**1.73 (1.47 - 2.04)**
Index of Physical Disorder	**1.64 (1.49 - 1.80)**
Average Number of Homicides in Neighboring CSAs (10 Homicide Increments)	**1.19 (1.11 - 1.27)**
Percentage of Residential Properties That Are Vacant and Abandoned (10% Increments)	**1.77 (1.50 - 2.10)**
High School Completion Rate (10% Increments)	**0.39 (0.24 - 0.63)**
Population Density (1,000 people per square mile increments)	**1.05 (1.01 - 1.09)**
Racial Diversity Index	**0.89 (0.82 - 0.96)**

Results from negative binomial regression on homicide counts (rates) per Community Statistical Area (CSA) by CSA indicators. [a] Each row represents a univariate model. [b] *Results represent a multivariable model.* [c] *Results from single, multivariable model with* ***Percentage of Households Living Under the Poverty Line***, ***Physical Disorder***, *and* ***Average Number of Homicides in Neighboring CSAs*** *as independent variables. (****Bold*** *indicates statistical significance at* $p \leq 0.05$ *level.)*

WHAT DOES THE FINAL MODEL MEAN?

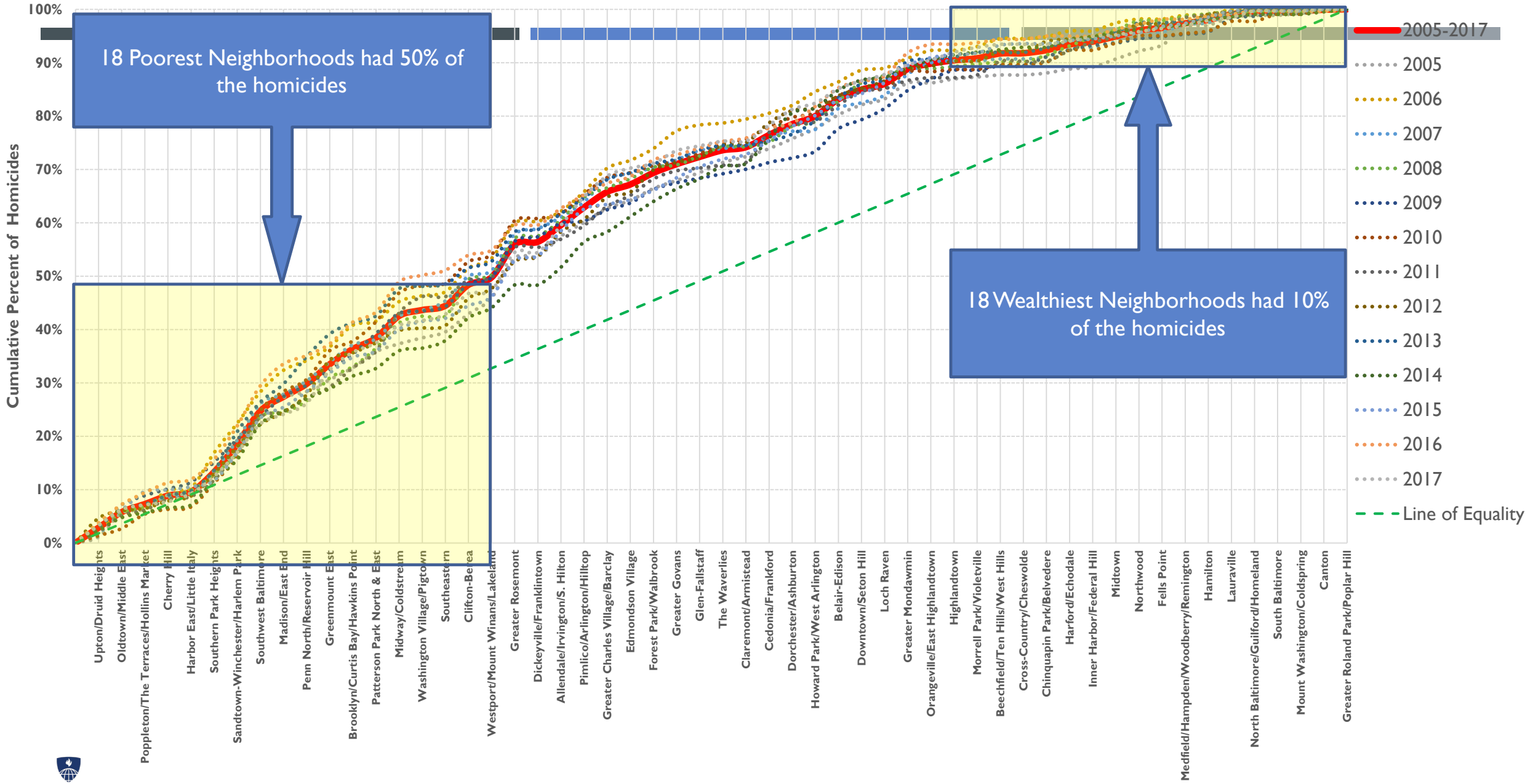
10% Households
Under Poverty Level

21% Higher
Homicide Rate



20% Households
Under Poverty Level

WHAT DOES THE FINAL MODEL MEAN?



Baltimore Community Statistical Areas in Order of Decreasing Proportion of Households Below the Poverty Line

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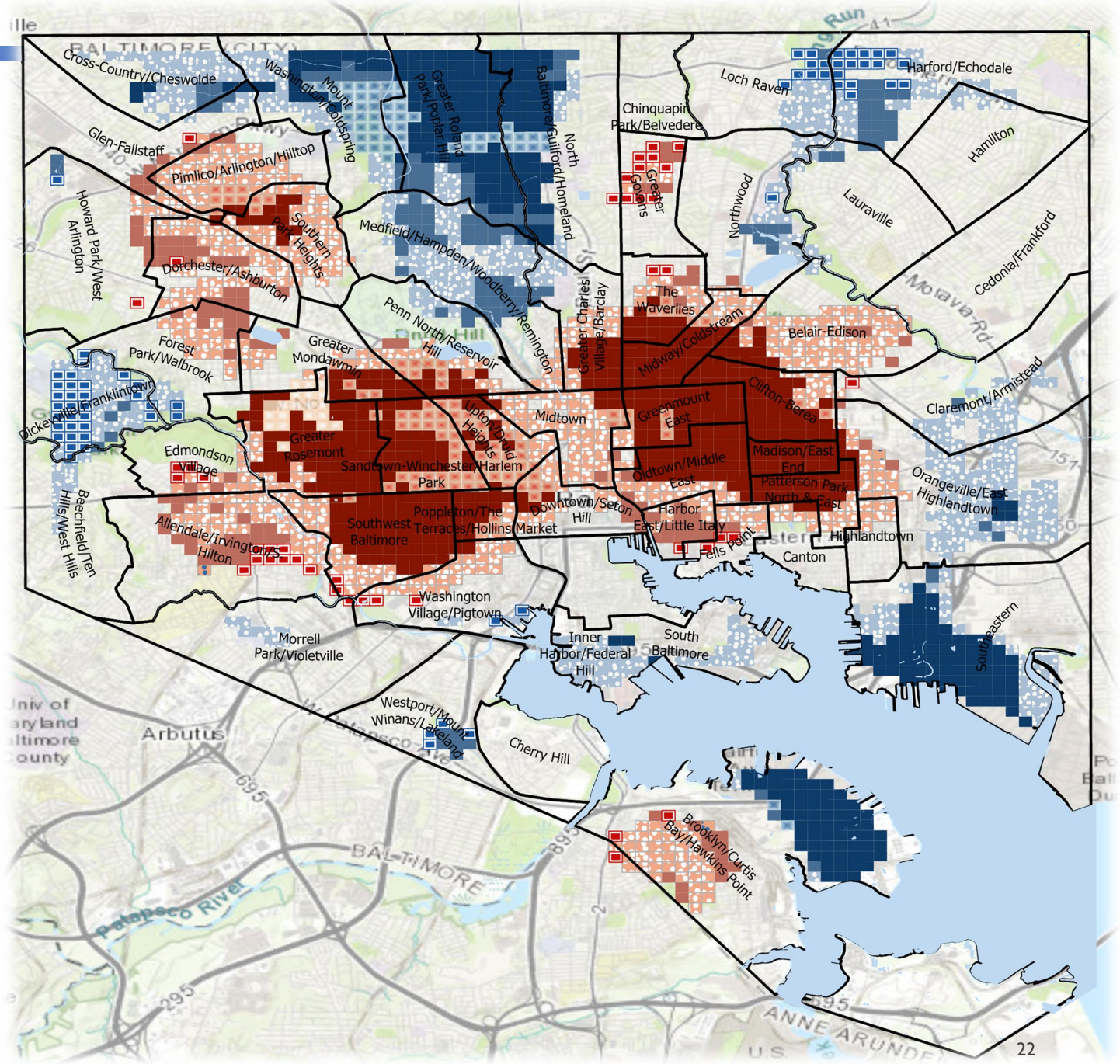
EMERGING HOT SPOT ANALYSIS, 2005 TO 2017

Two large **persistent** hot spots over east and west Baltimore, surrounded by **sporadic** hot spots.
In the west, there is an area of **intensifying** hot spots.
Greater Govans shows many **new** hot spots.

There are some cold spots as well.
There is a large area of **new** cold spots in Dickeyville/Franklintown and another in Loch Raven and Harford/Echodale.
There are **persistent** cold spots in the more affluent CSAs in the north and in the less populated industrial areas.



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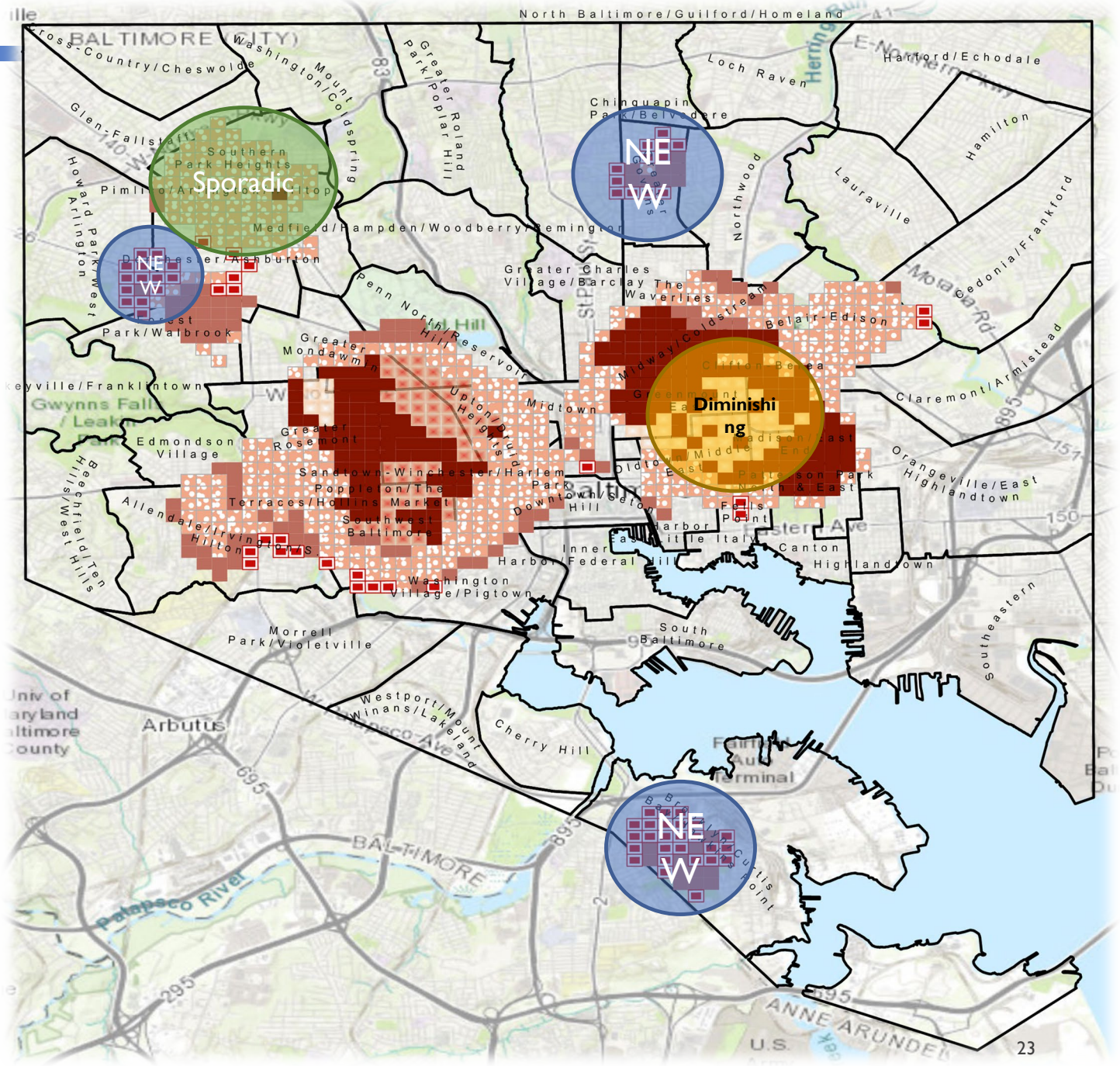
EMERGING HOT SPOT ANALYSIS, BLACK MALES, 15-34, KILLED BY FIREARM, 2005 TO 2017

The **persistent** hot spots are now less so, replaced by **sporadic** and **new** hot spots. In the west, there are **intensifying** hot spots within the larger western hot spot. In the east, there are **diminishing** hot spots within the larger eastern hot spot.

There is also an area of **new** and **consecutive** hot spots in Greater Govans. There are also **new** and **consecutive** hot spots in Howard Park/West Arlington and Forest Park/Walbrook. And the area to the northwest is mostly **sporadic**.



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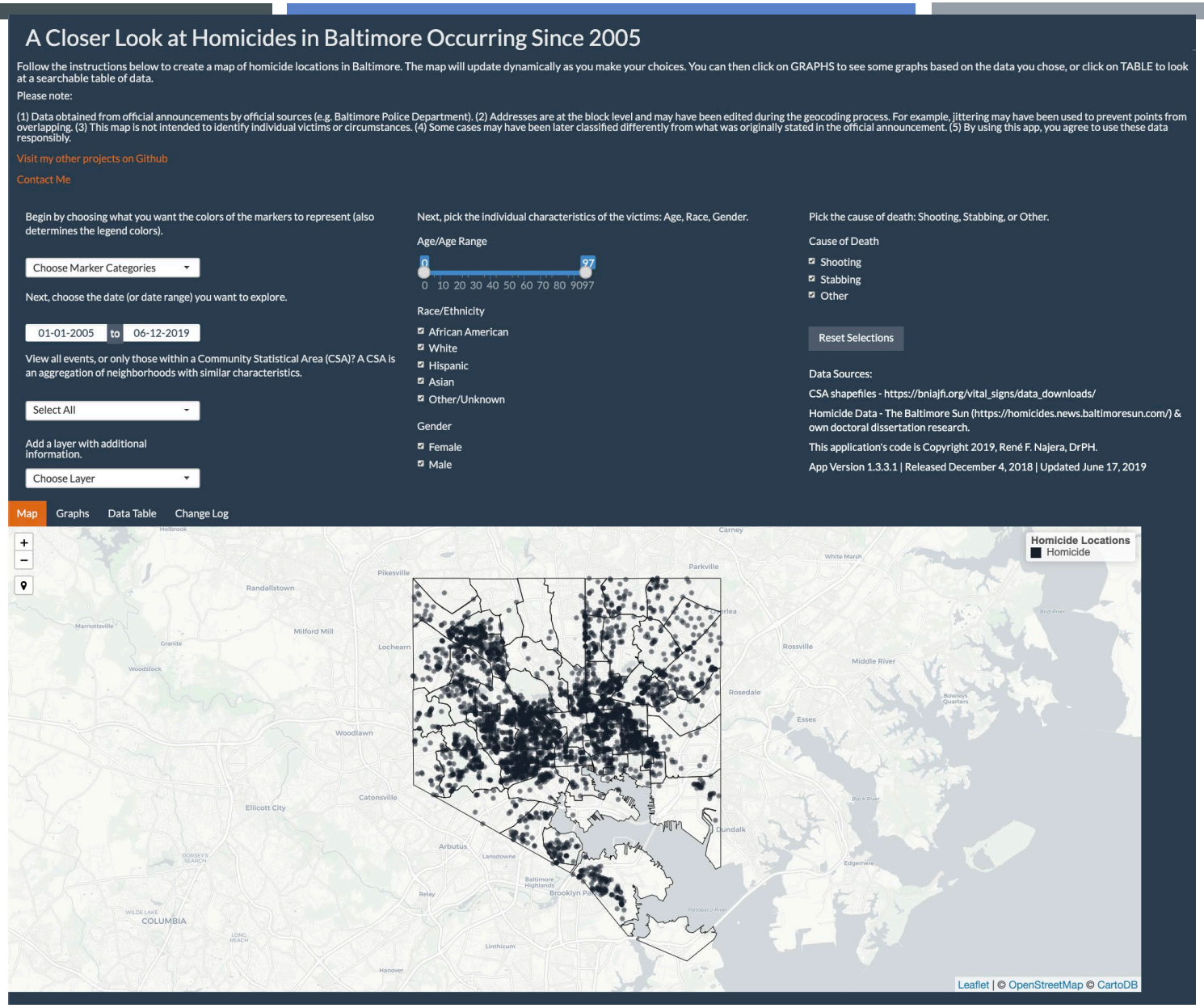

https://rfnajera.shinyapps.io/homicide_app/