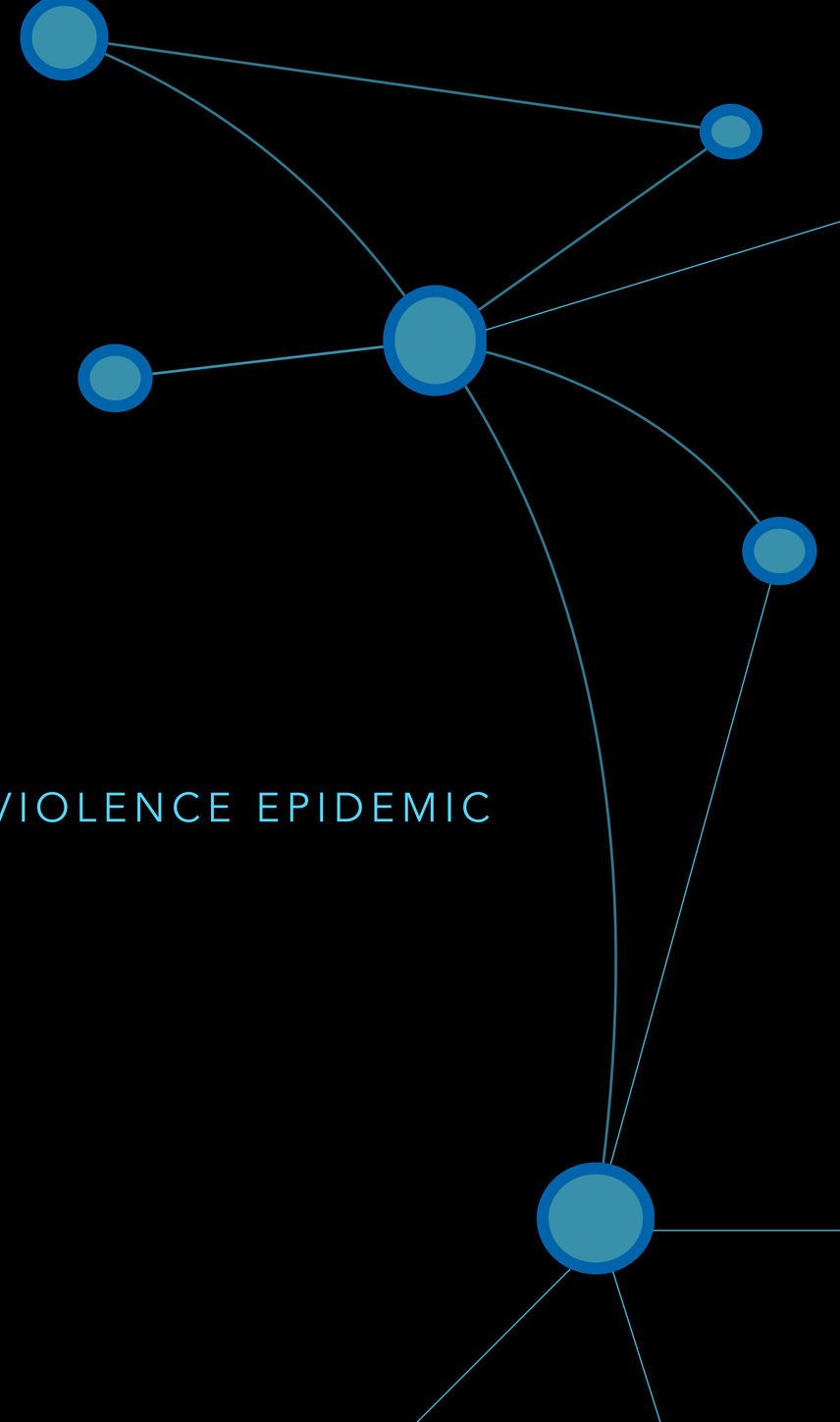


CONNECTED IN CRIME

HOW NETWORK SCIENCE CAN HELP ADDRESS THE YOUTH GUN VIOLENCE EPIDEMIC

A.V. PAPACHRISTOS ~ YALE UNIVERSITY

CRIME EPIDEMIC

Baby dies day after she and dad shot: 'We have another tragedy'

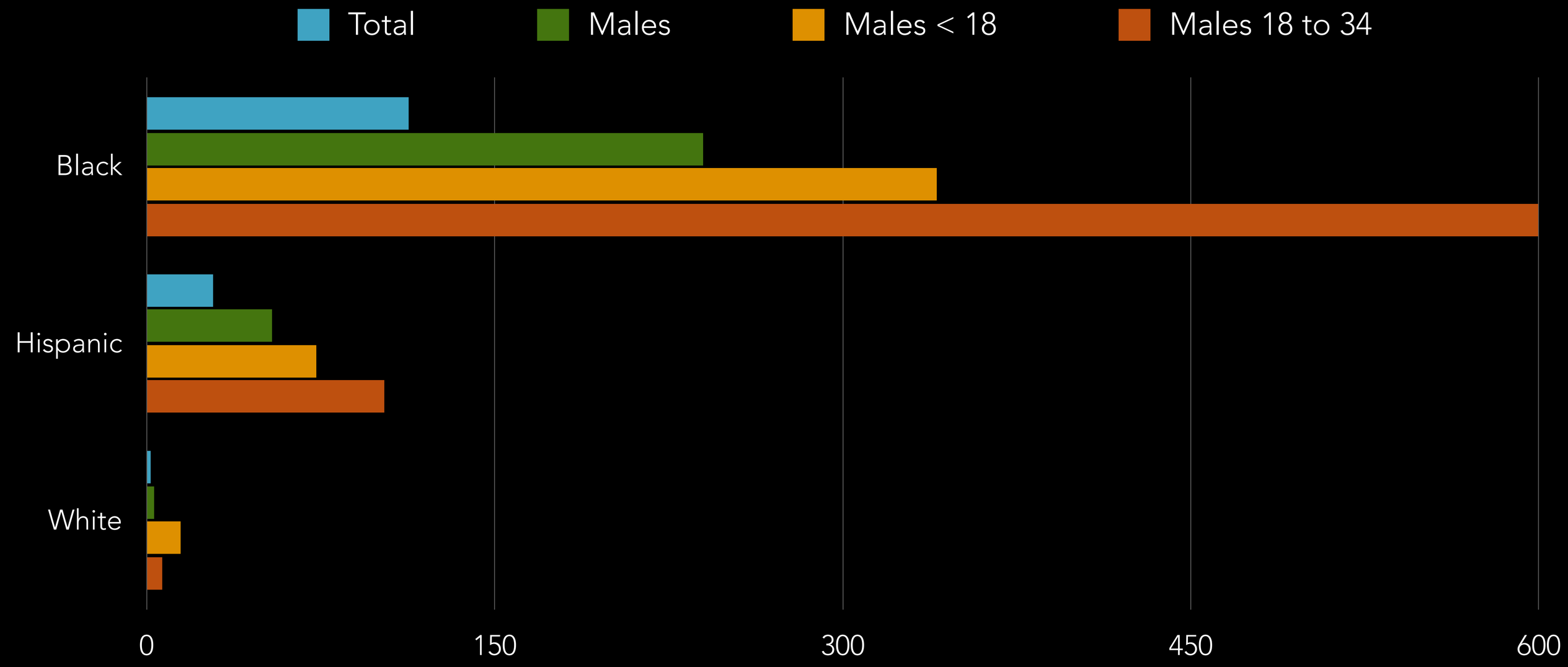
March 19, 2013

6-month-old Jonylah Watkins died one day after she and her father, Jonathan Watkins, 29, were shot whil in a vehicle in the Woodlawn neighborhood.

RISK FACTORS

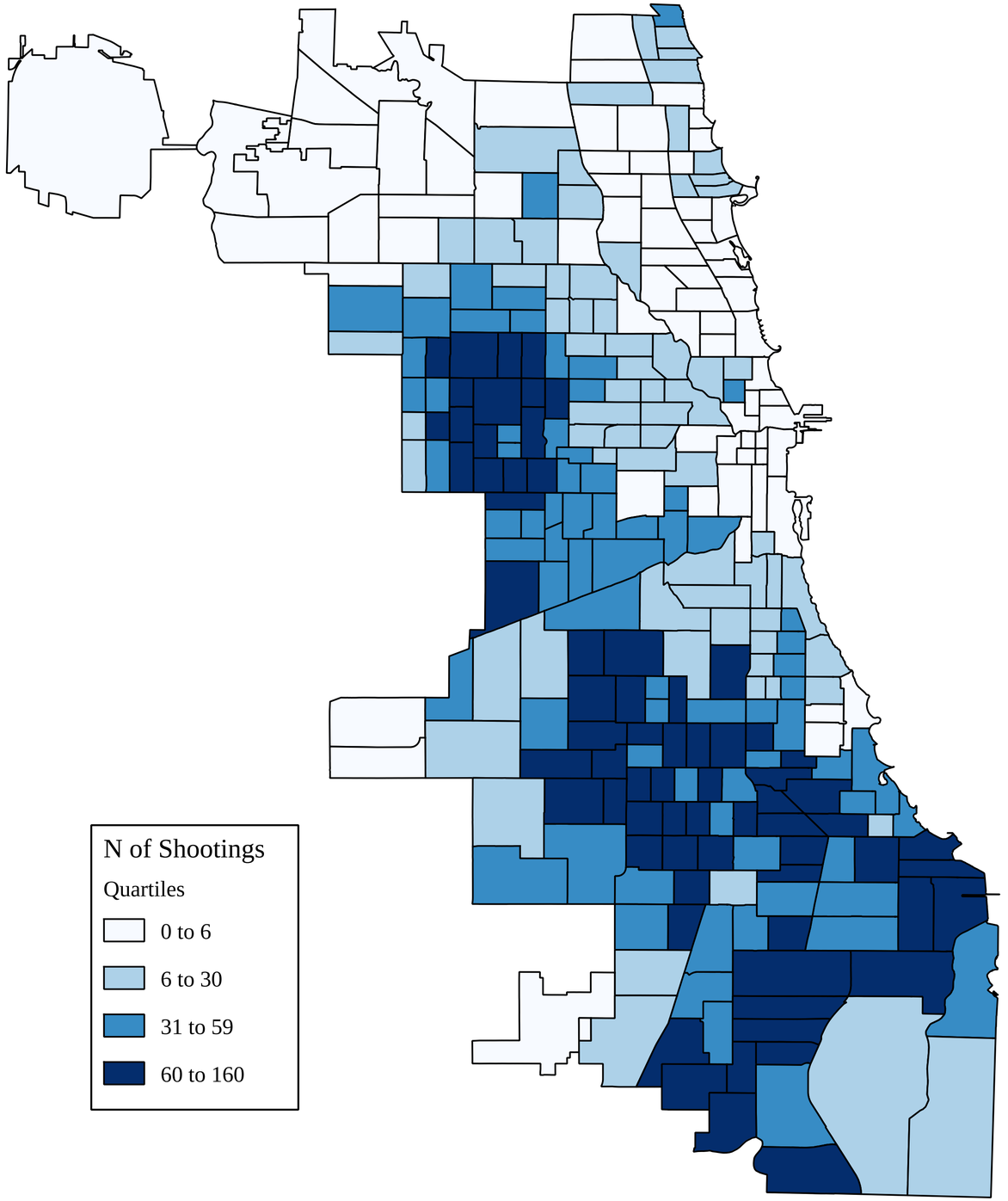
being poor, young, & black

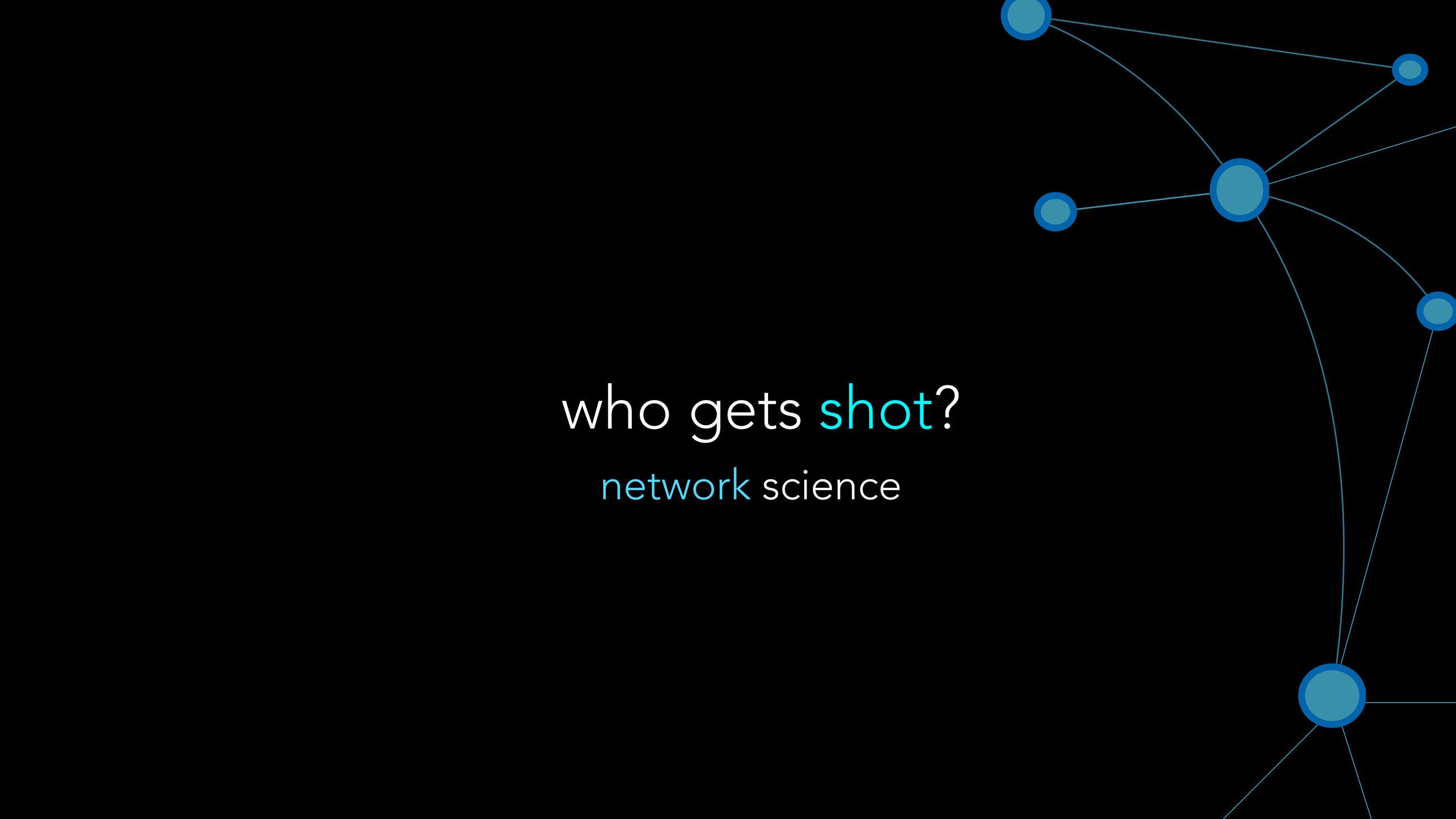
non-fatal shooting rate chicago, 2006 to 2012



@AVPapachristos

fatal & non-fatal shootings
in chicago, 2006-2012




who gets shot?
network science

Baby dies day after she and dad shot: 'We have another tragedy'

March 19, 2013

6-month-old Jonylah Watkins died one day after she and her father, Jonathan Watkins, 29, were shot whil in a vehicle in the Woodlawn neighborhood.

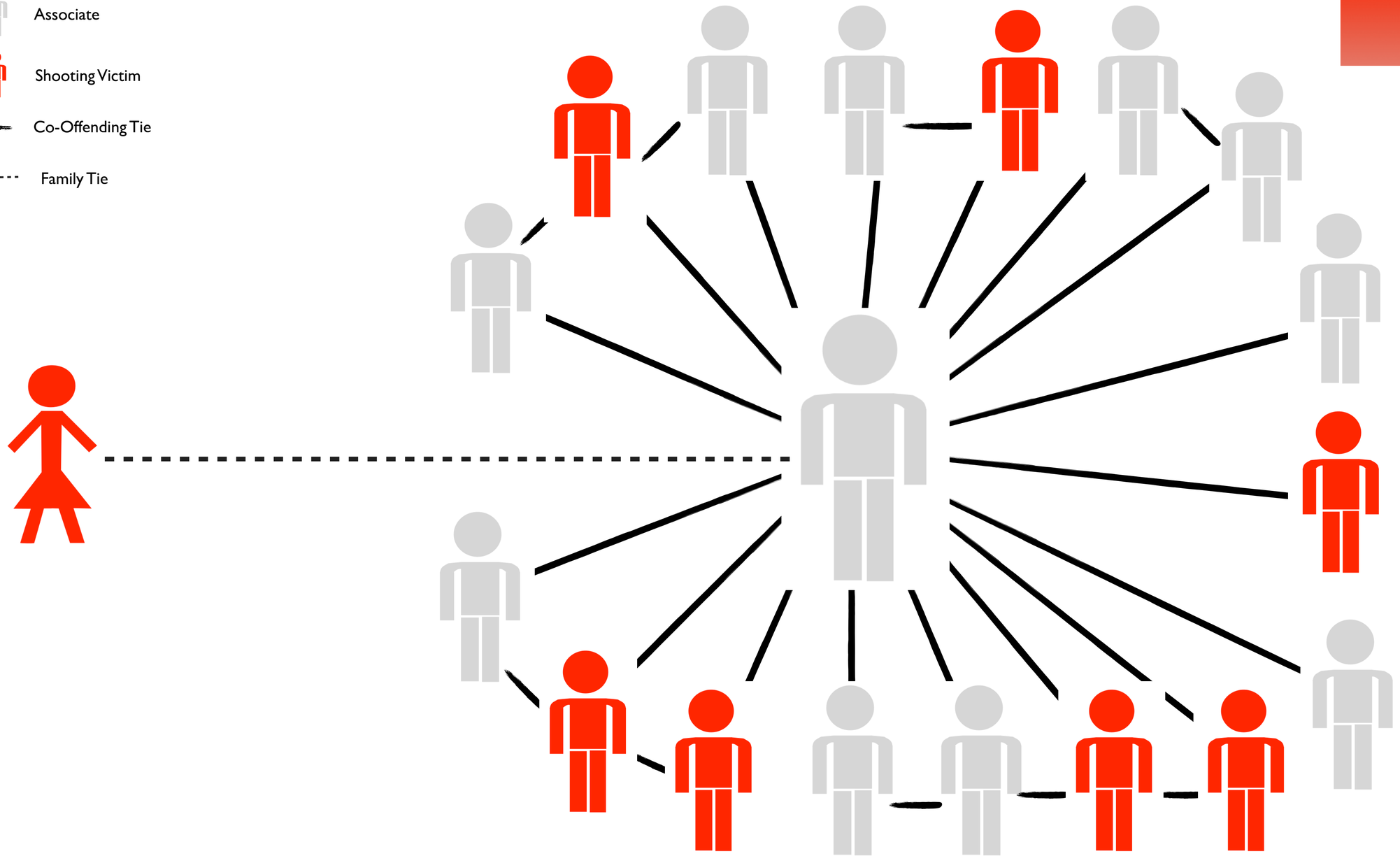
Associate

Shooting Victim

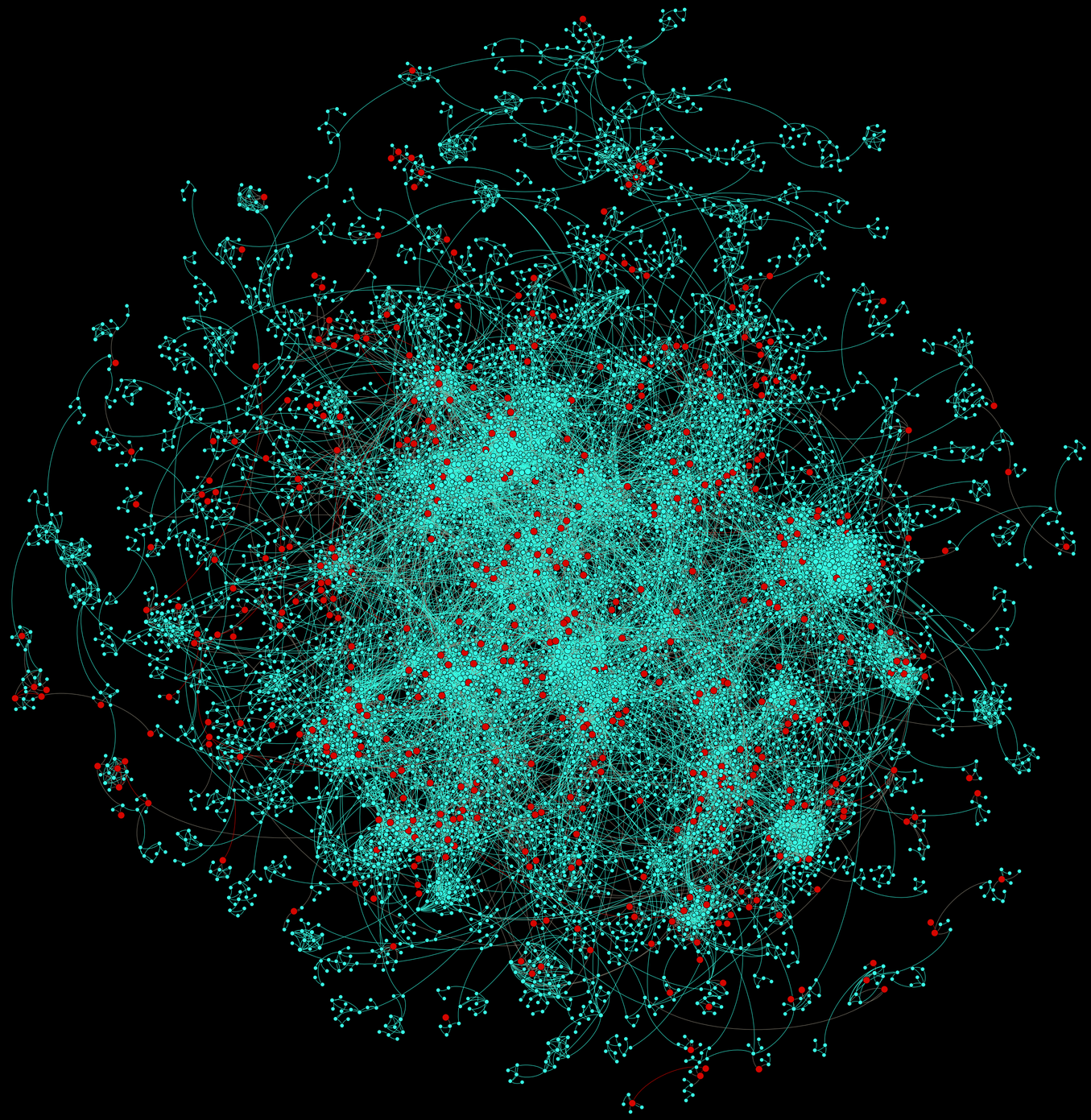
Co-Offending Tie

Family Tie

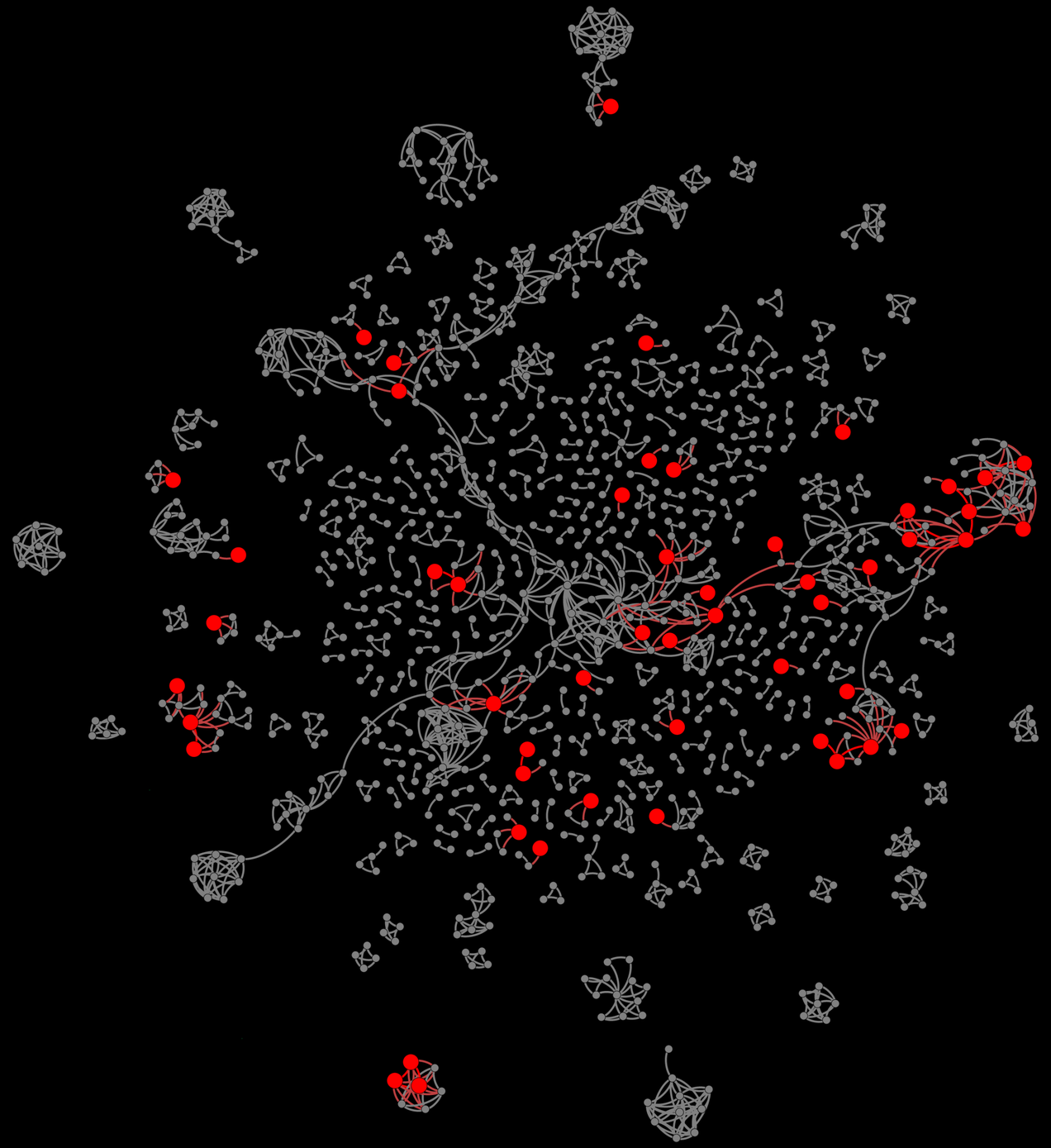
40 % OF ASSOCIATES ARE VICTIMS



westside of chicago



east palo alto, CA



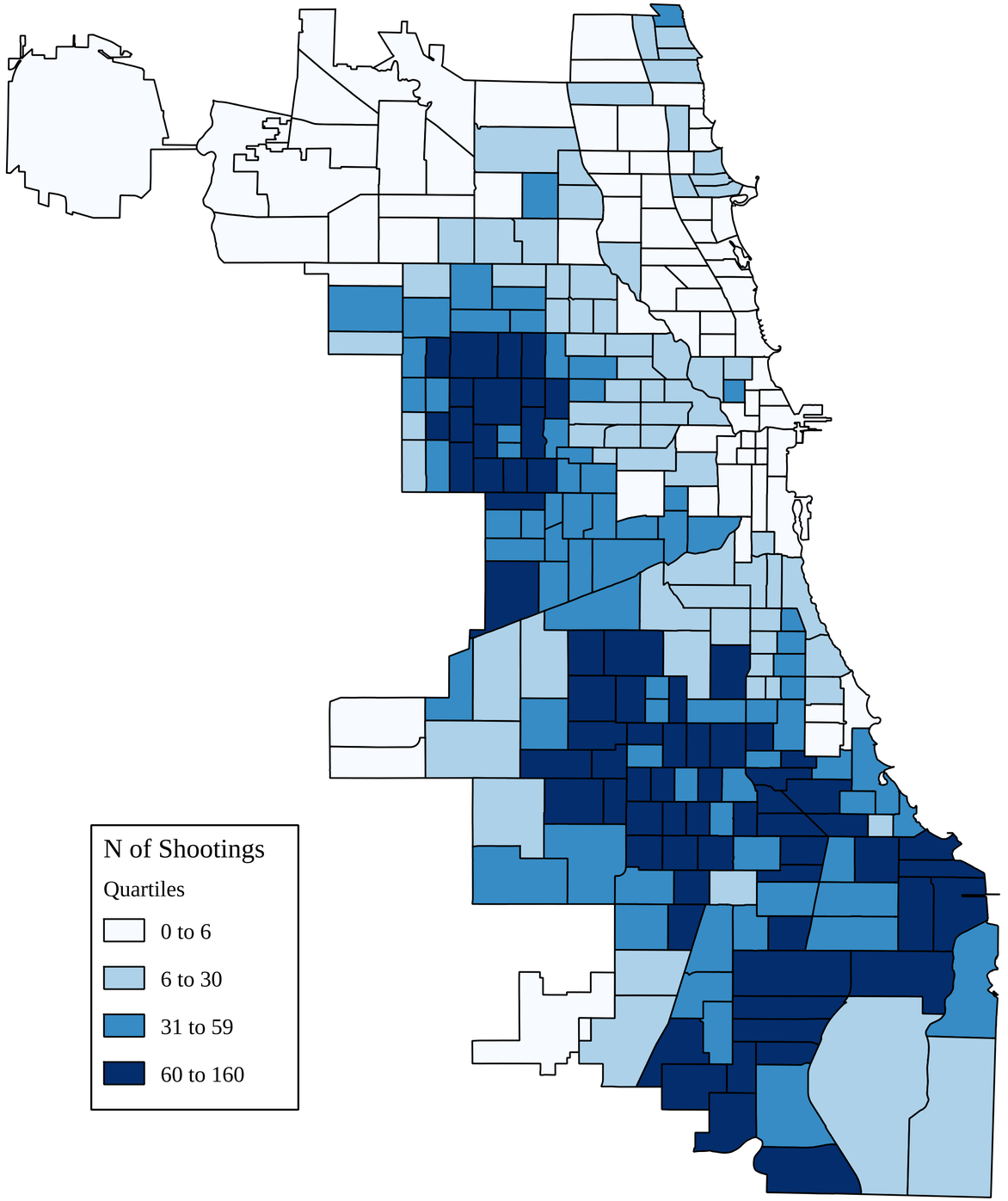
ROAD MAP

- the idea ~ gun violence as a bloodborne pathogen
- recent findings ~ concentration & exposure
- youth in these networks
- gun violence prevention implications

THE IDEA

gun violence as a bloodborne pathogen

fatal & non-fatal shootings
in chicago, 2006-2012



http://www.shiply.com/blog/uploaded_images/sneeze_682_473022a-755805.jpg

http://www.english.globalarabnetwork.com/images/stories/Health/EGYPT_Needle_sharing_rife_among_drug_users-.jpg

why gun violence?

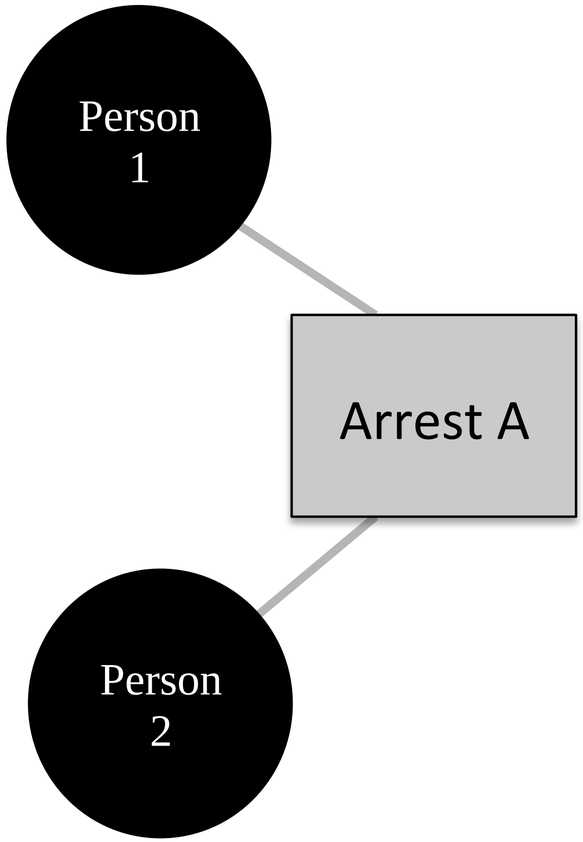
http://www.glasschord.com/wp-content/uploads/2011/09/Gangs7_photo_1.jpg

- gun violence occurs between people who know each other
- gun use/carrying associated with peer influence
- guns are durable goods
- concentration within places and populations

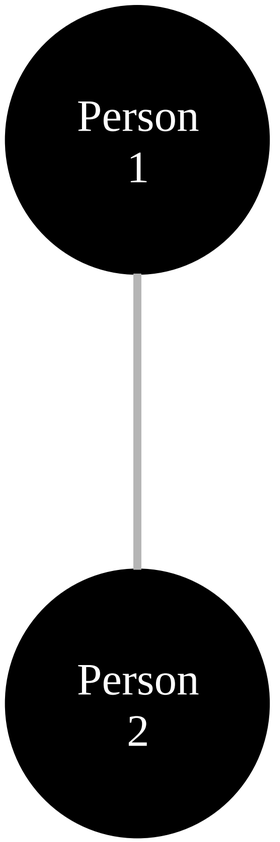
risky behaviors

risky behavior: co-offending

Two-Mode Co-Arrest Network



One-Mode Co-Offending Network



THE FINDINGS

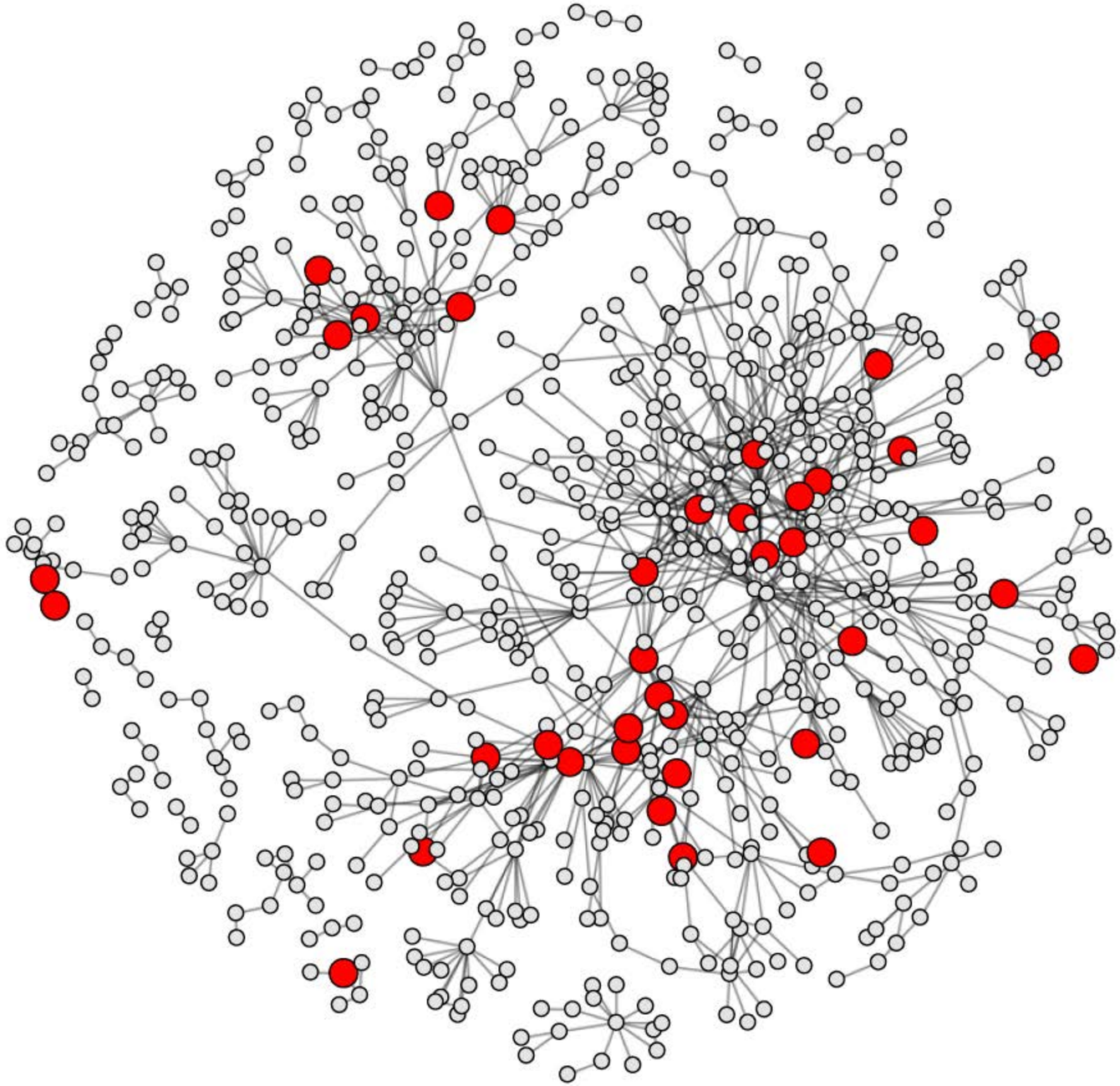
social concentration and exposure

violence concentrates socially

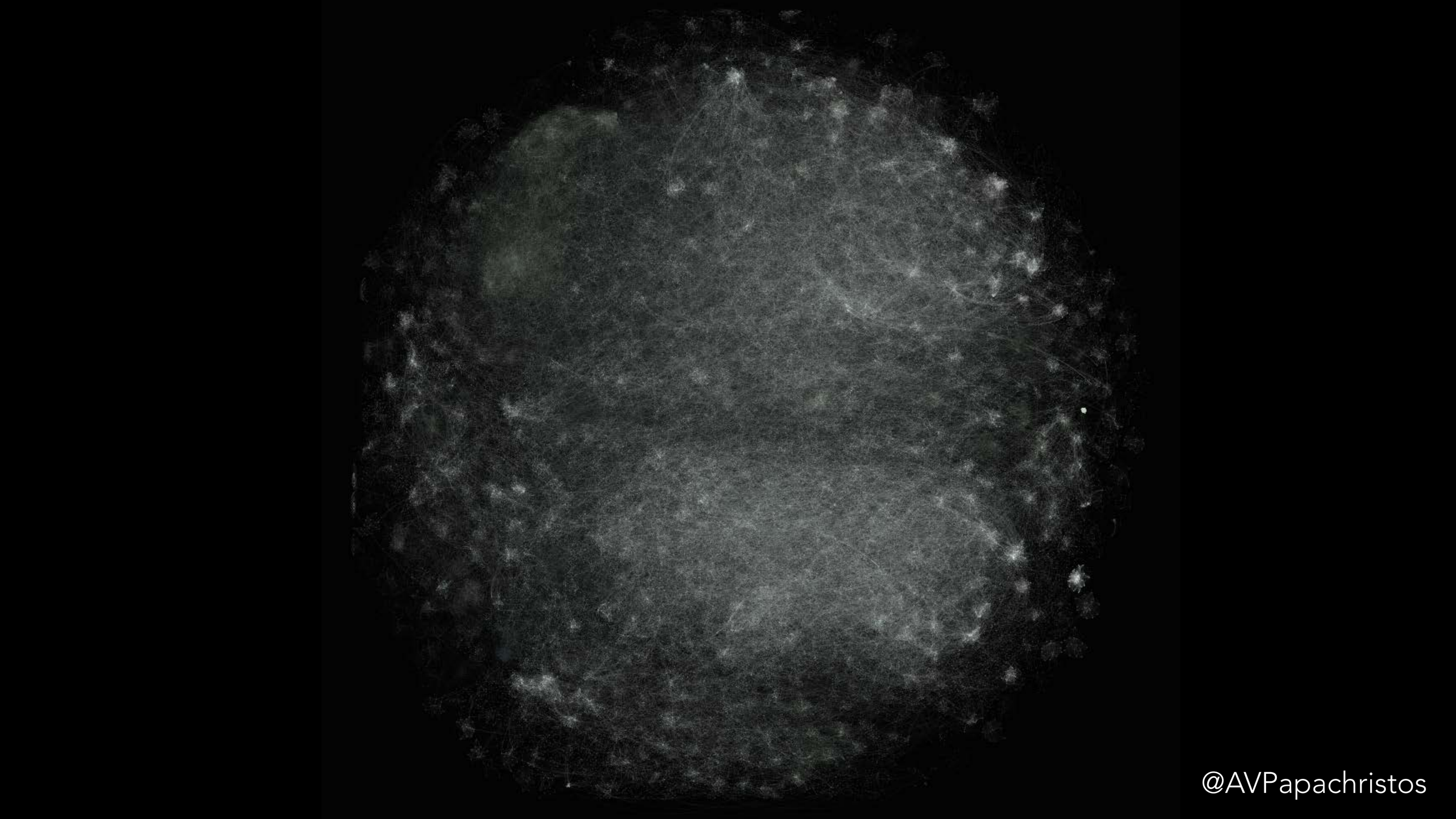
Boston

6% of population

85% of all gunshot injuries

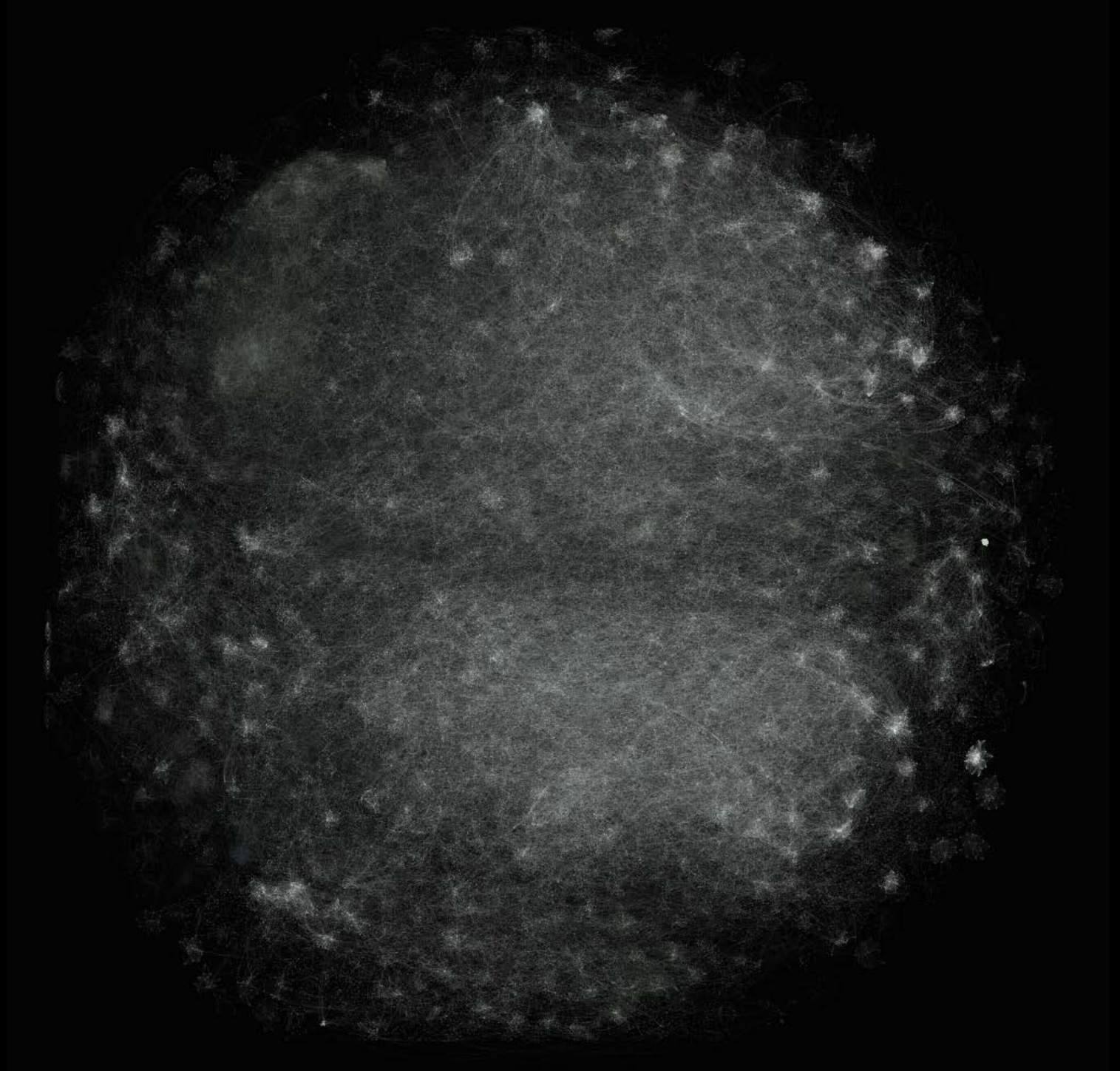


Papachristos, Hureau, & Braga 2012



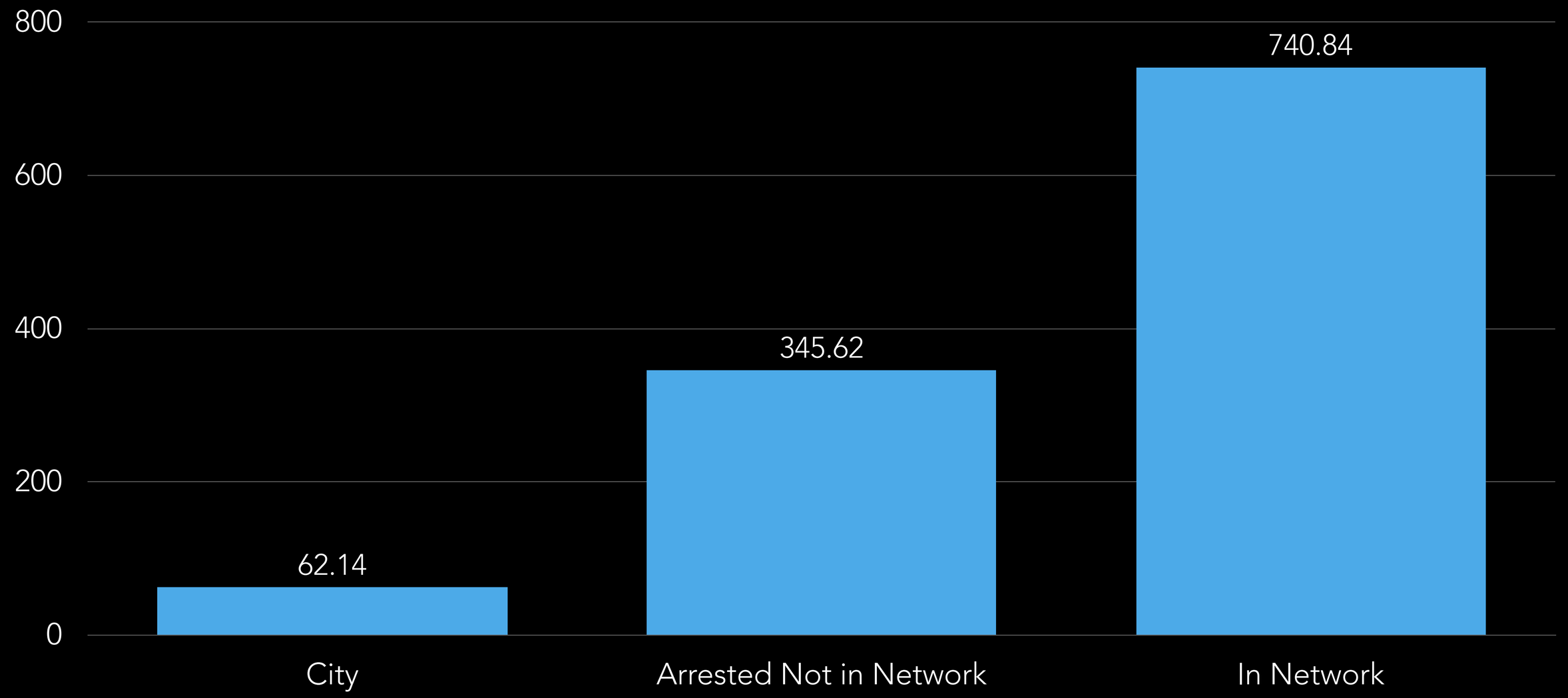
@AVPapachristos

- 6 % of total population
- 40 % of arrested population
- 70 % of all shootings
- 89% in a single network



Papachristos, Wildeman, & Roberto 2014

five year average non-fatal gunshot victimization rate (per 100,000)



Papachristos, Wildeman, & Roberto 2014

violence concentrates socially

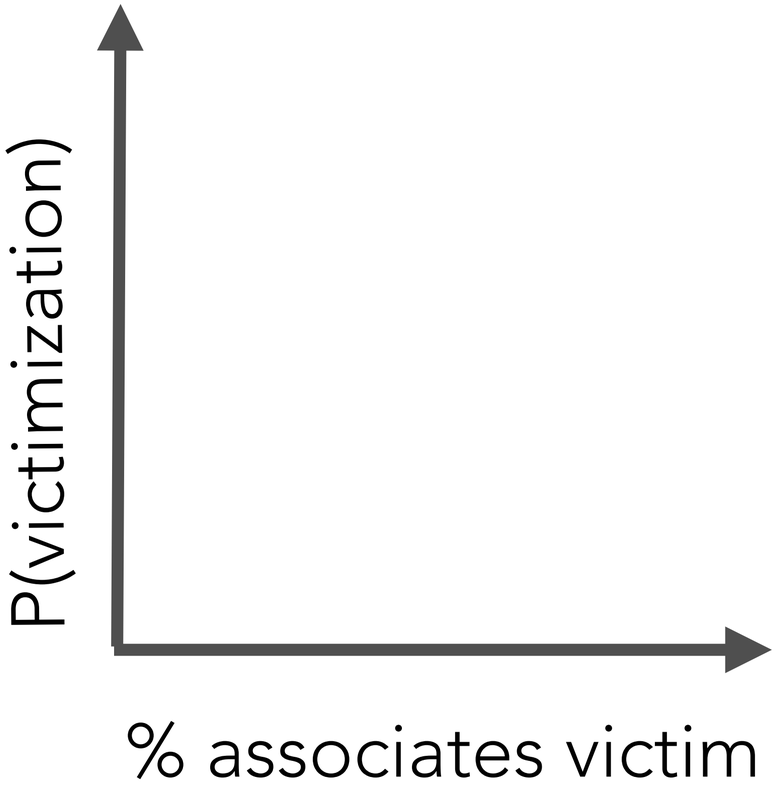
exposure to violence matters

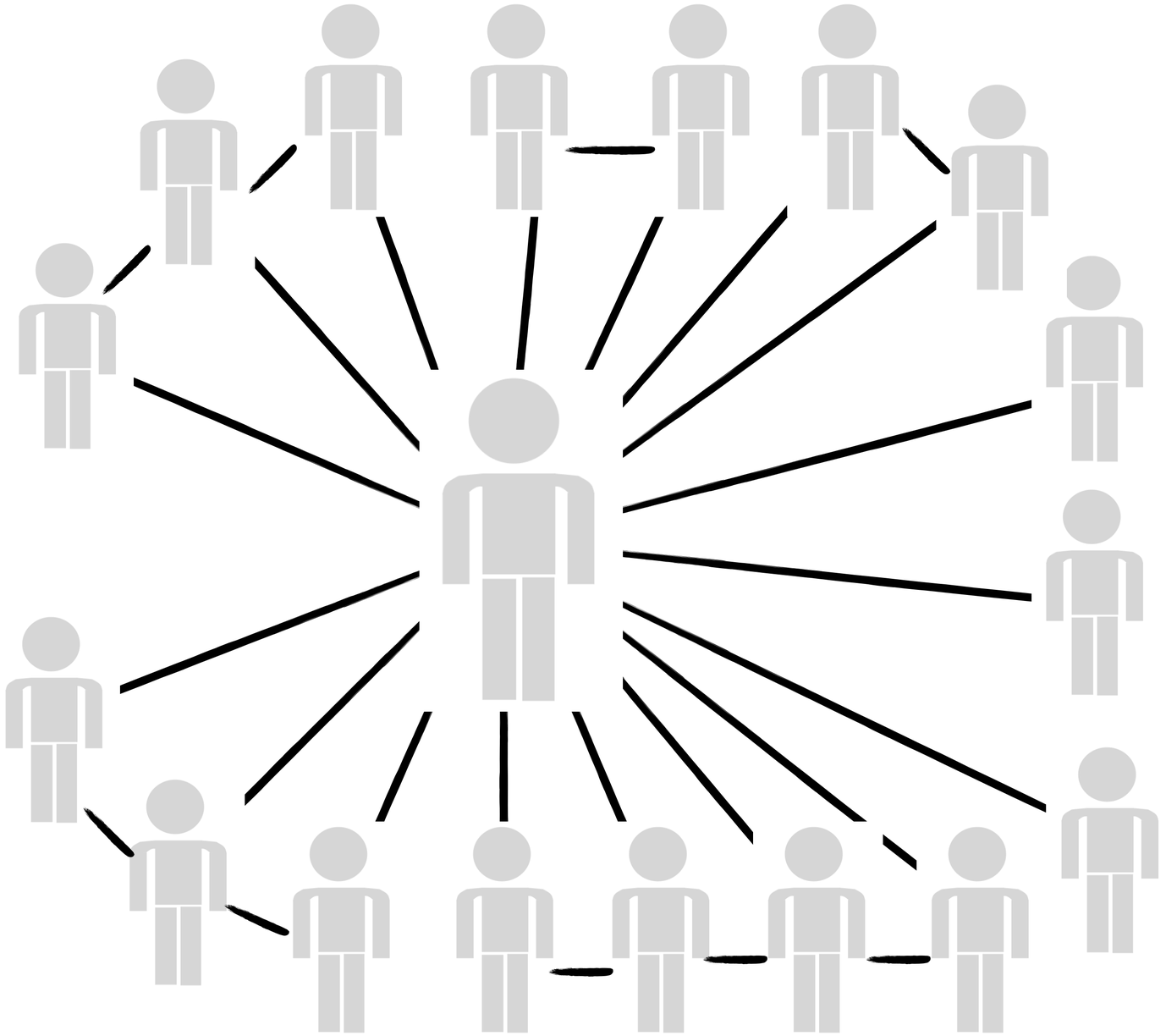
$$E_i = \frac{\sum_{j=1} W_{ij} Y_j}{\sum_{j=1} W_{ij}}$$

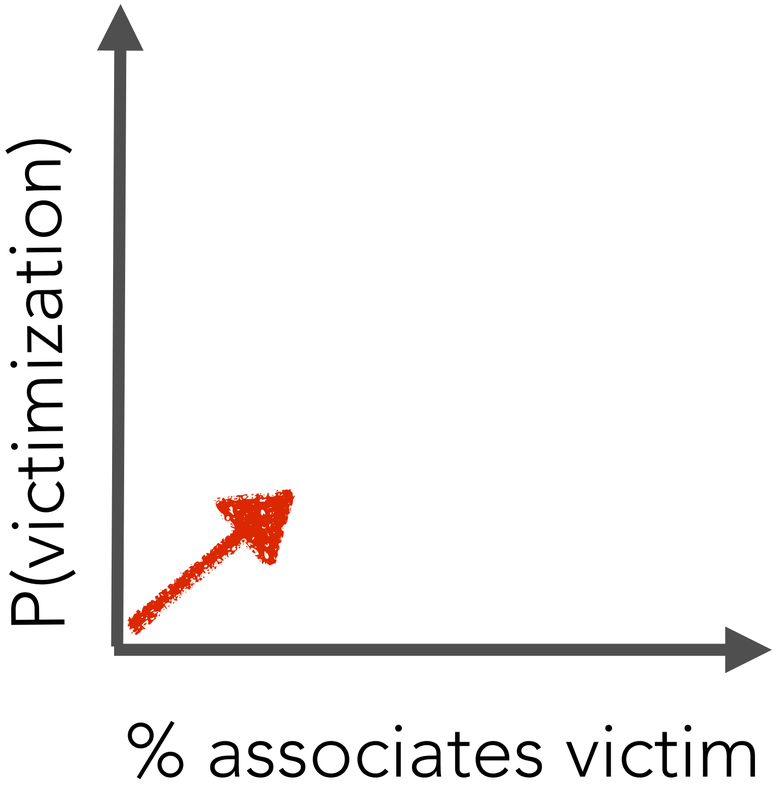
$$for\ i, j = 1, \ldots, N$$

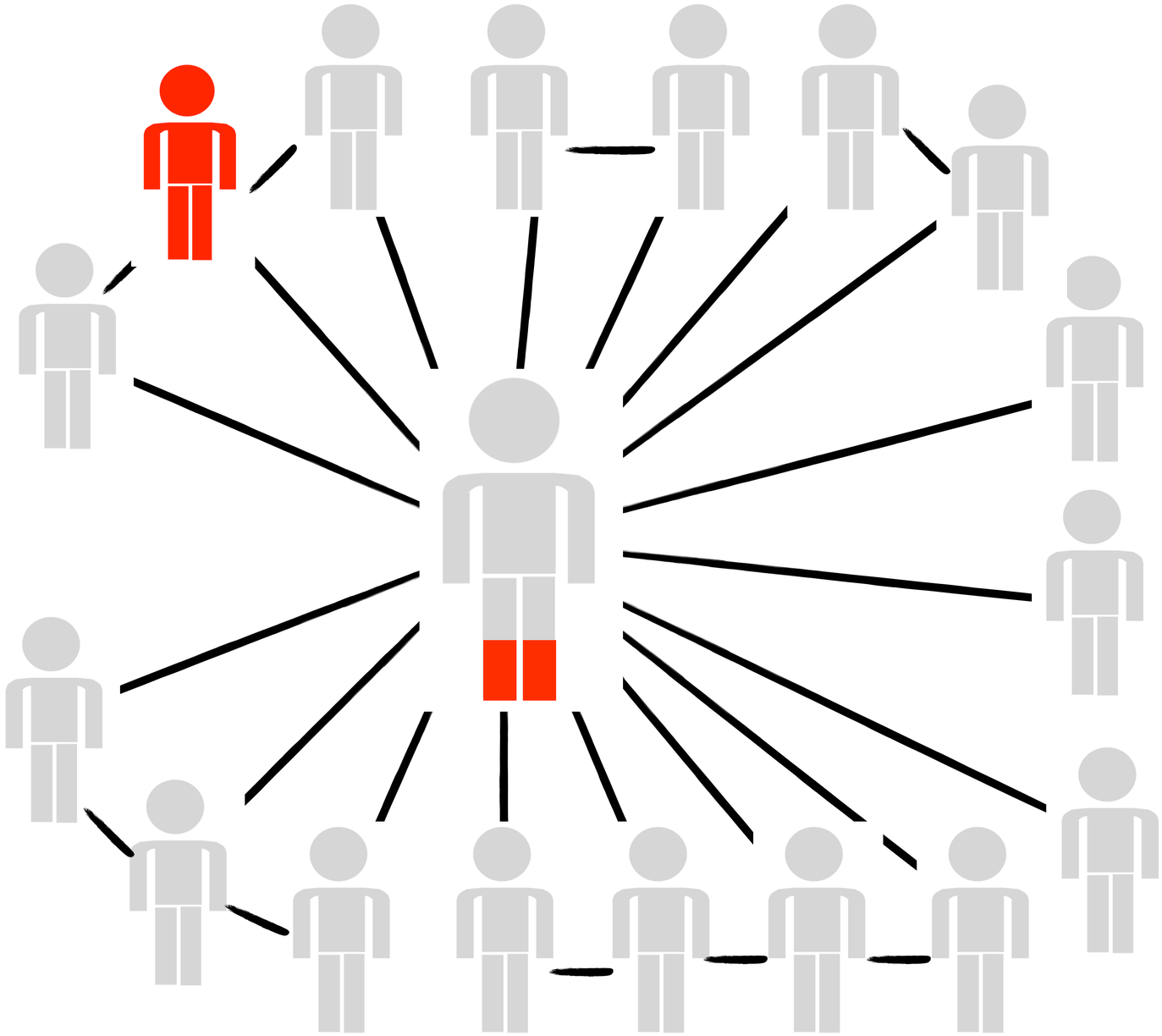
$$i \neq j$$

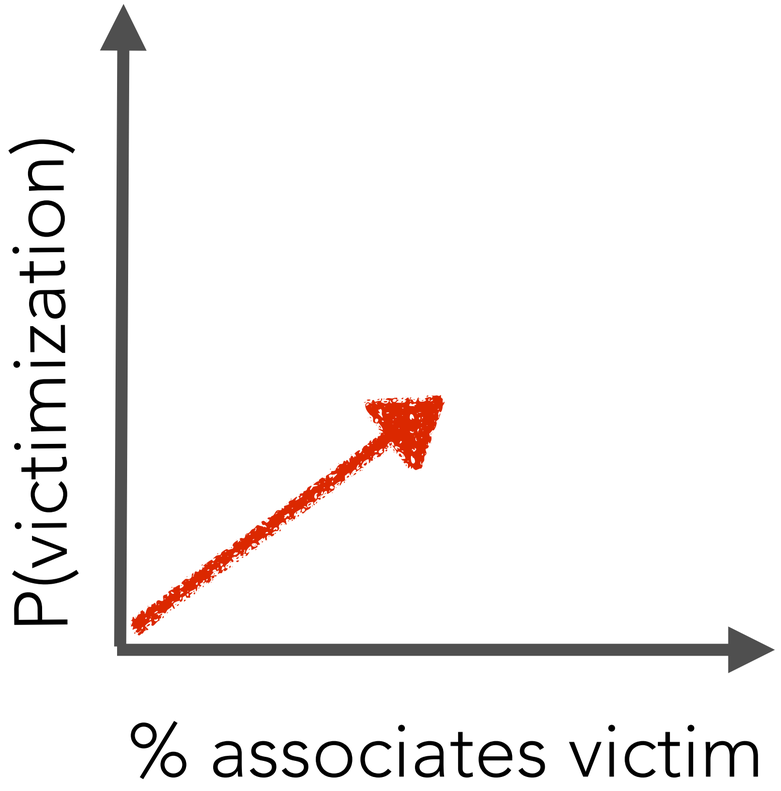
Following (Fujimoto & Valente 2012)


P(victimization)
% associates victim




P(victimization)
% associates victim




P(victimization)
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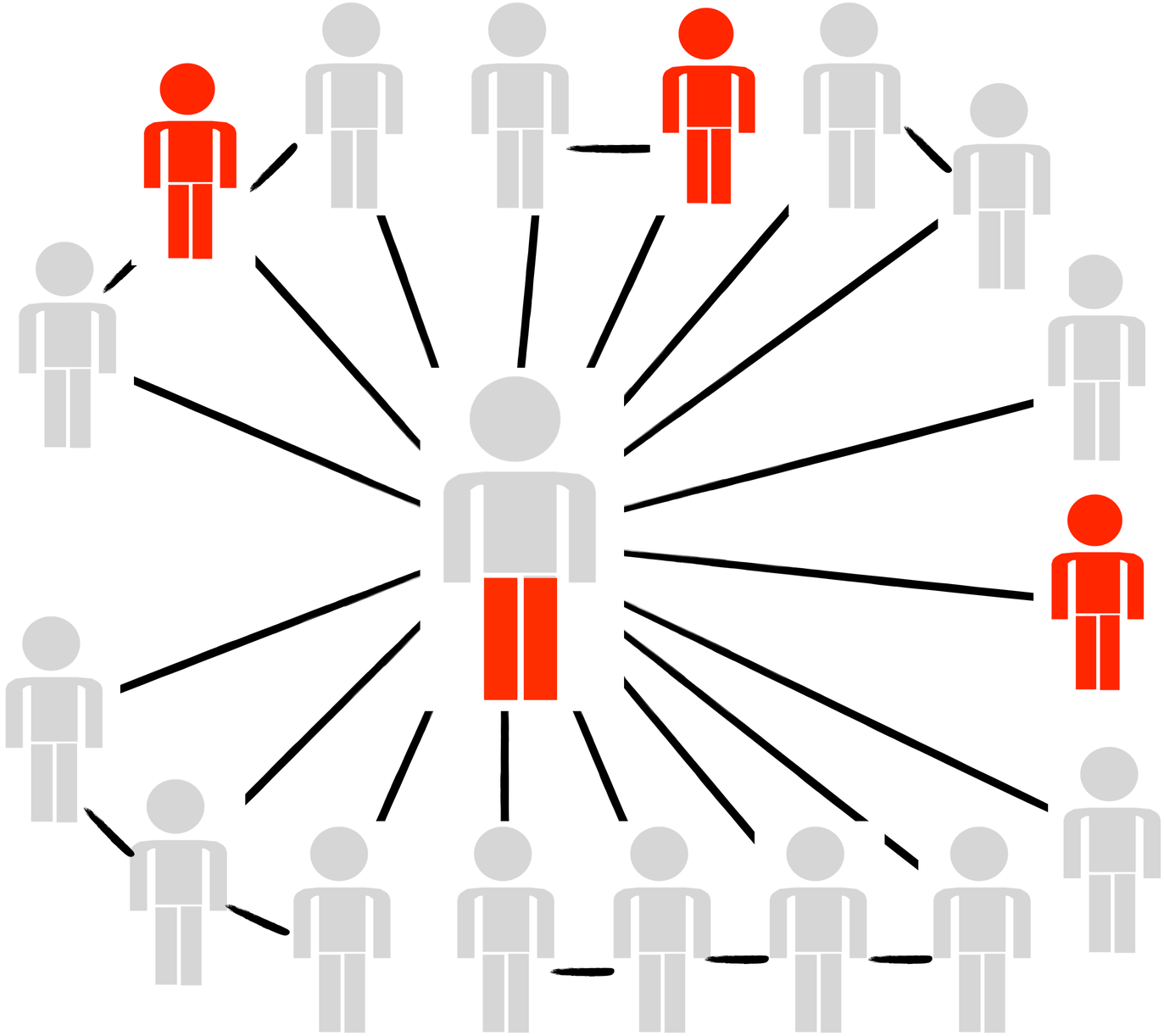
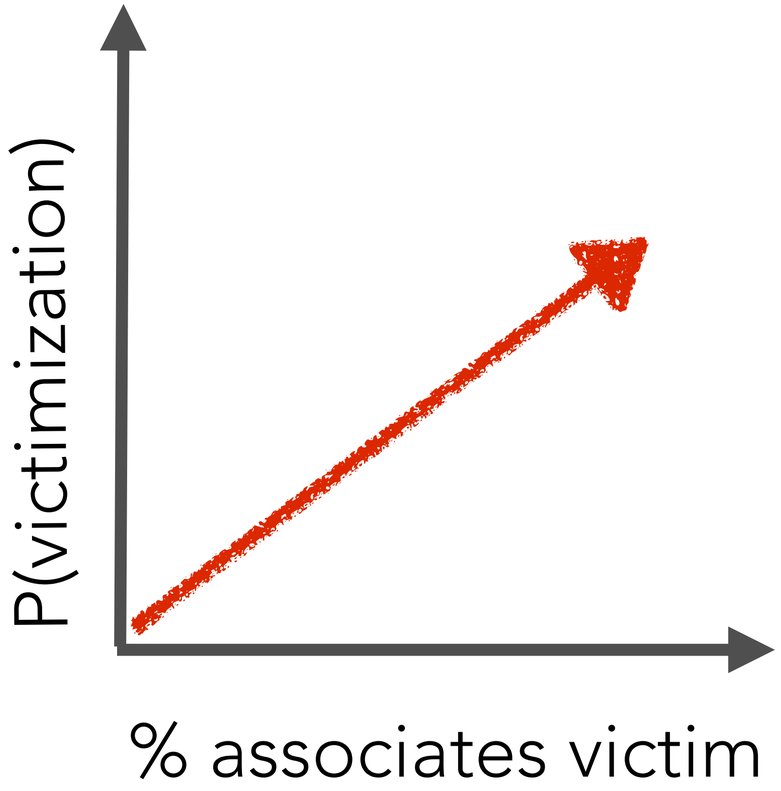
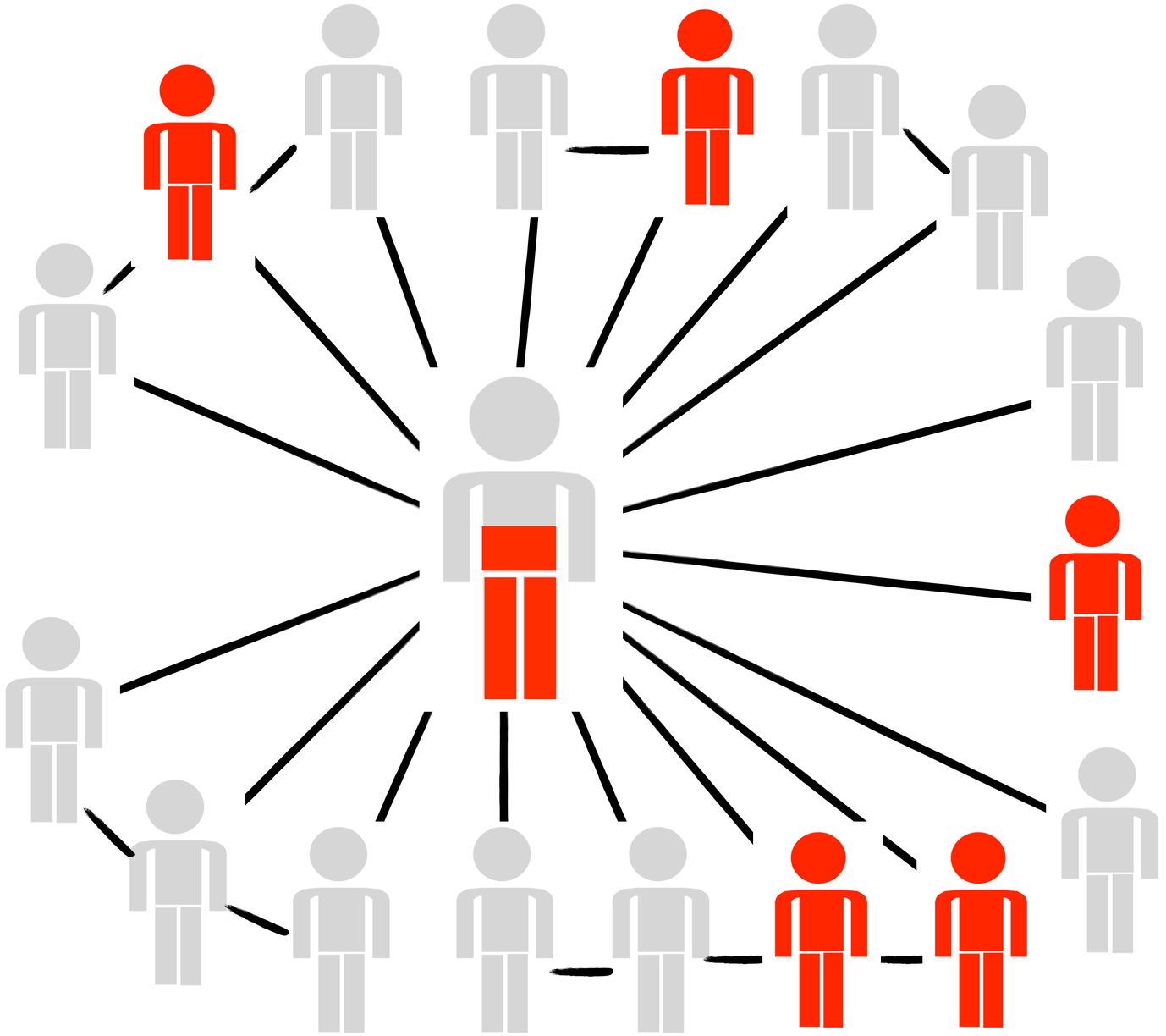
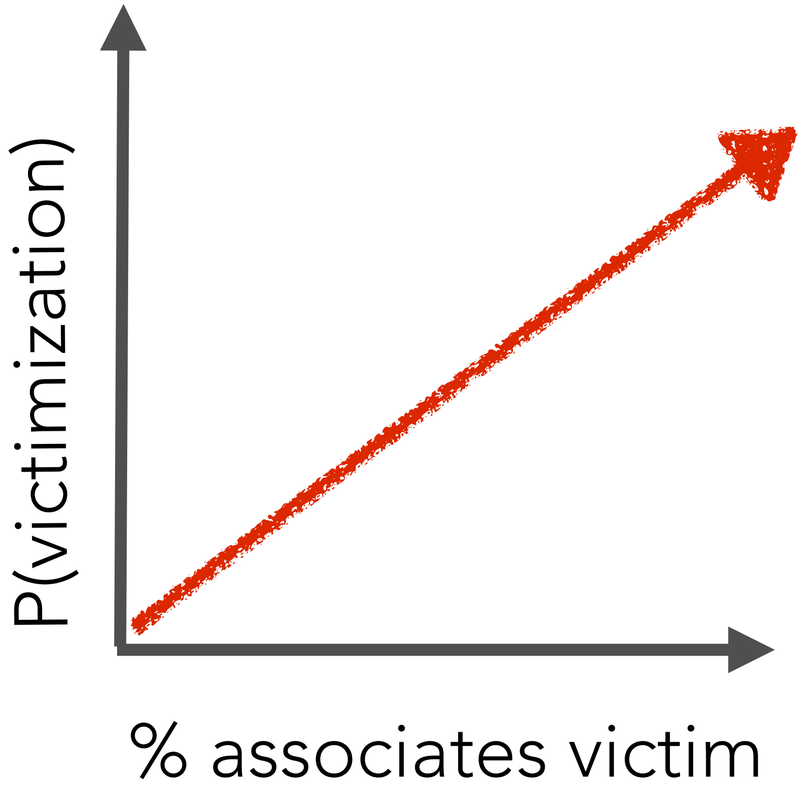
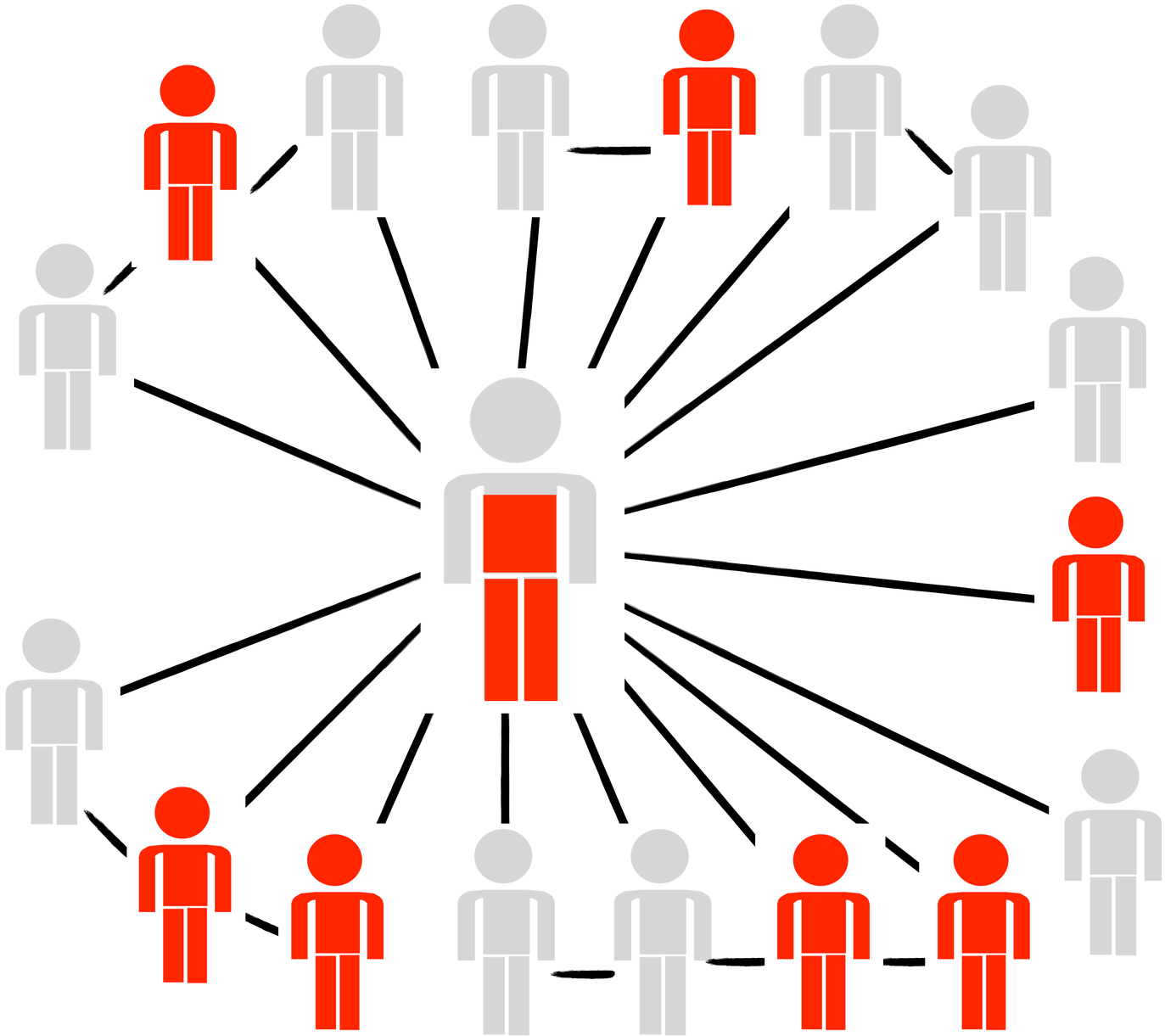
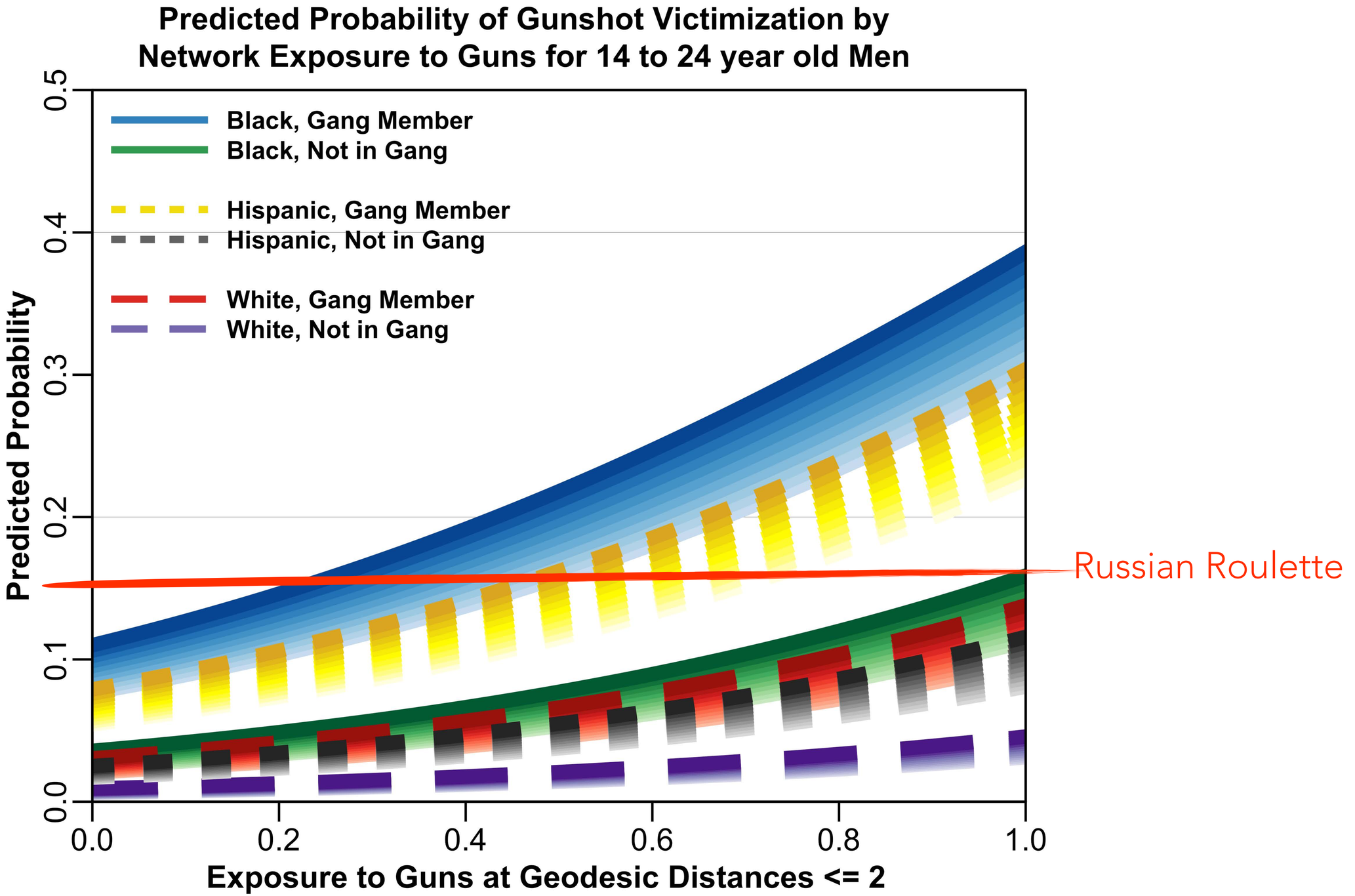



P(victimization)
% associates victim




P(victimization)
% associates victim





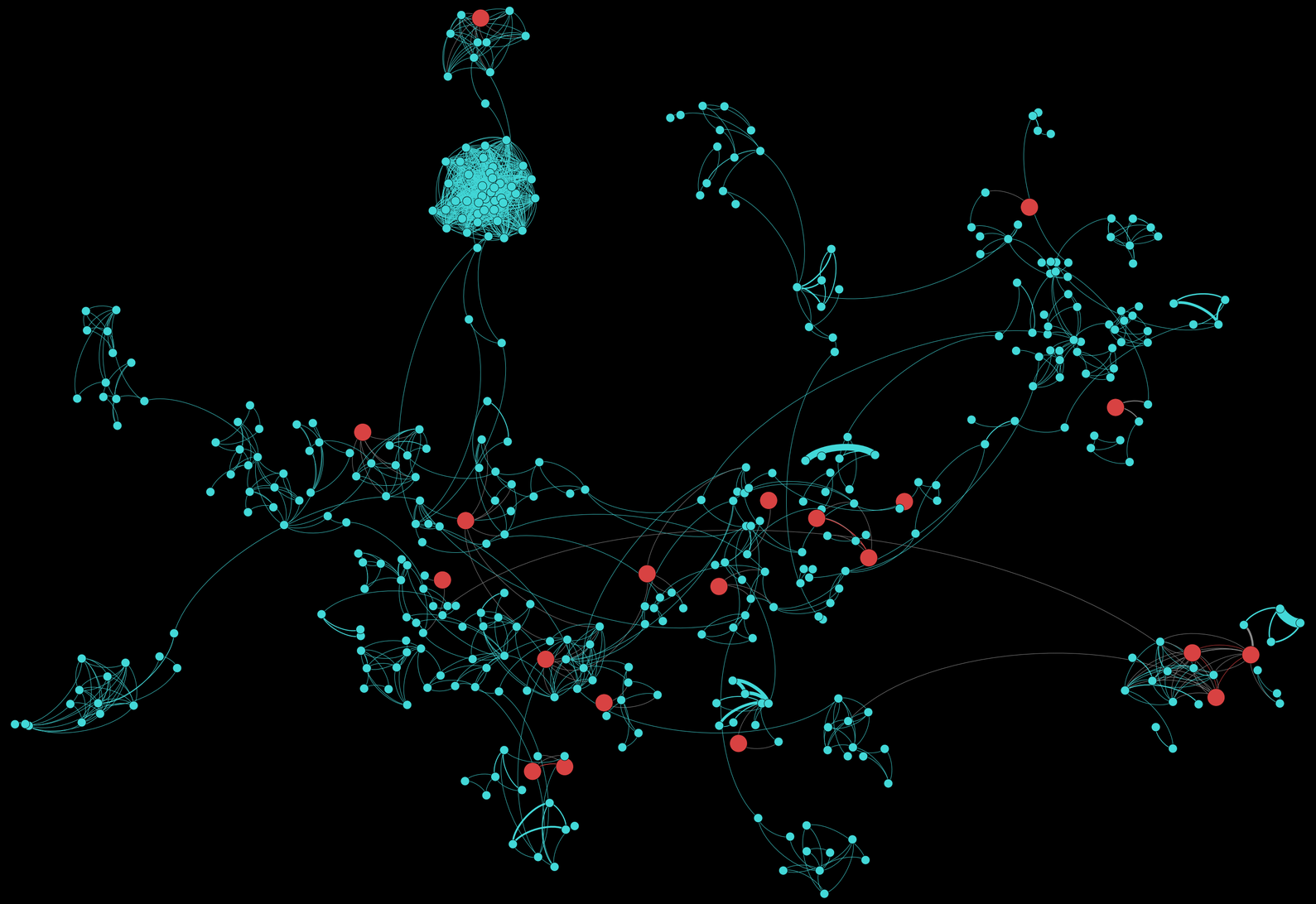
Papachristos, Wildeman, & Roberto 2014

Note: Predicted probabilities are estimated with remaining variables held constant at their mode.

newark, NJ

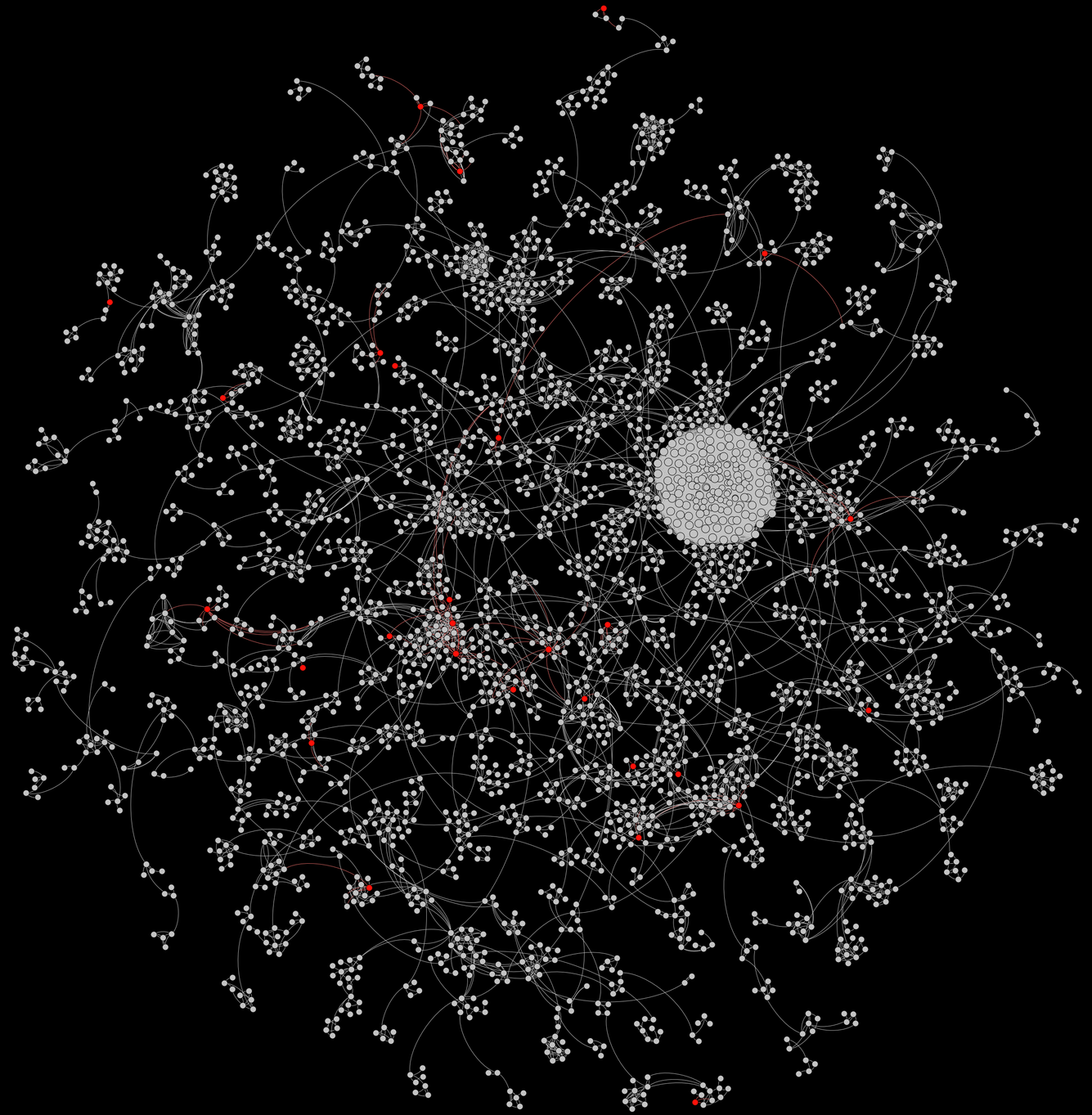
largest component

cincinnati, OH

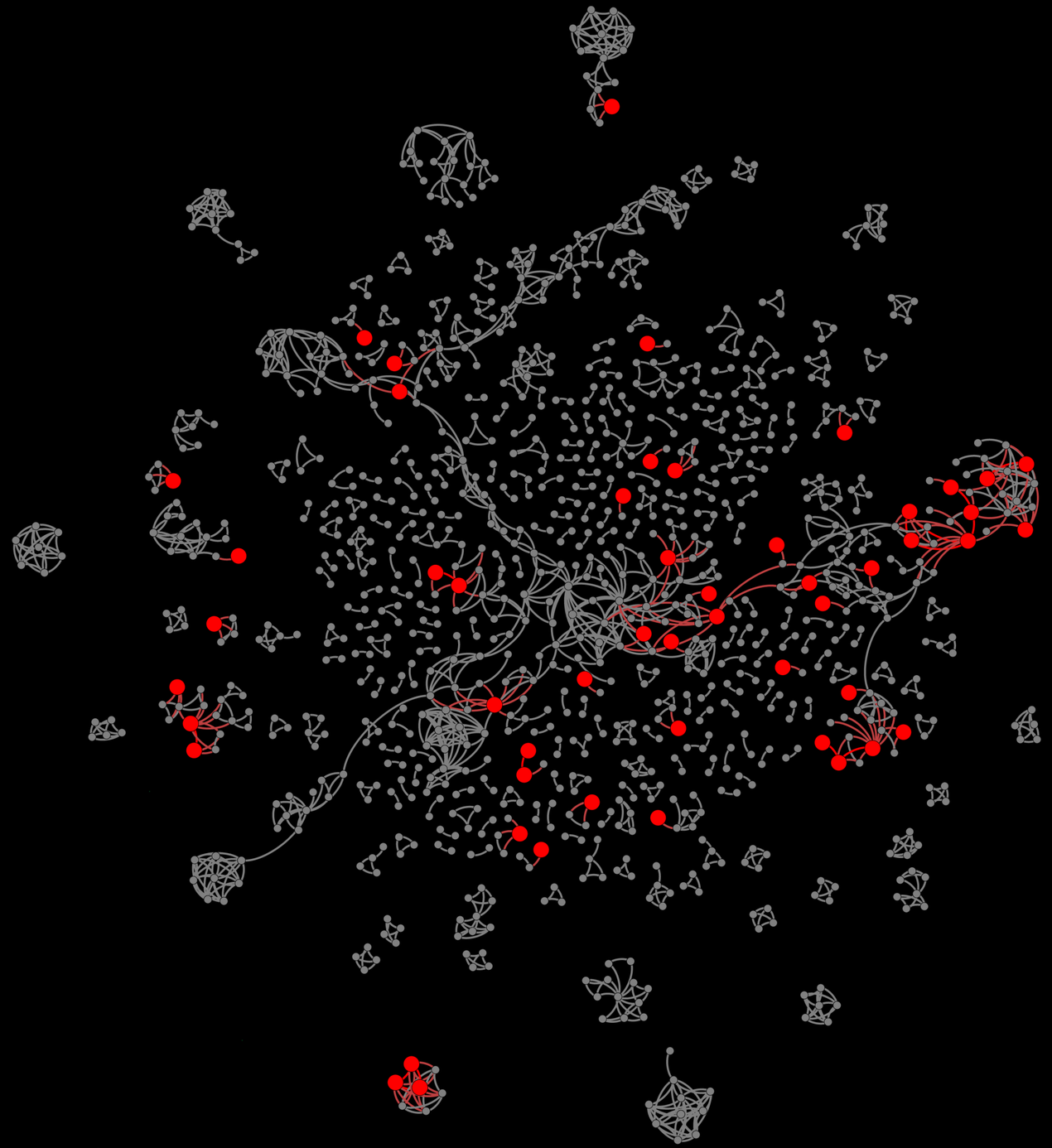


largest component

new haven, CT



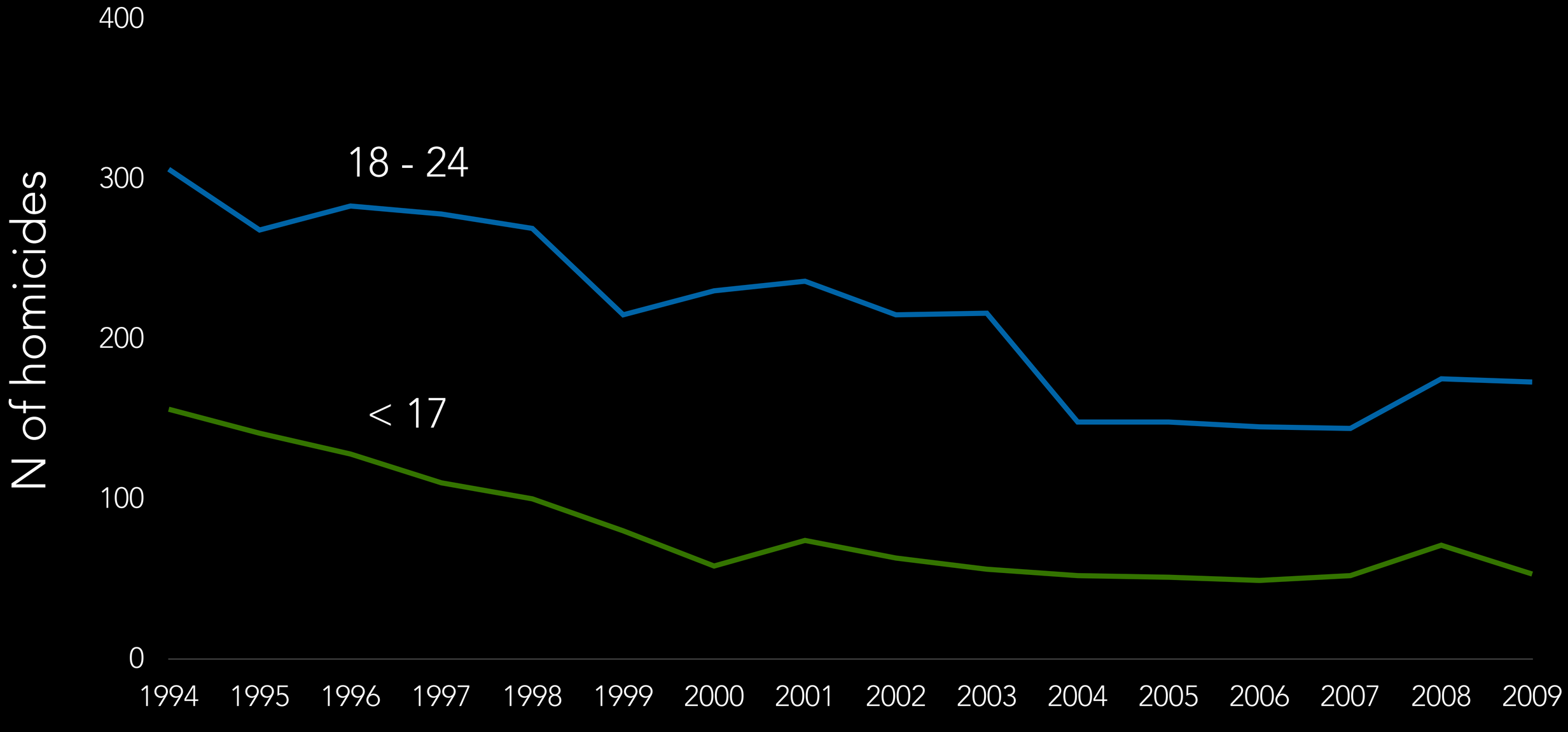
east palo alto, CA



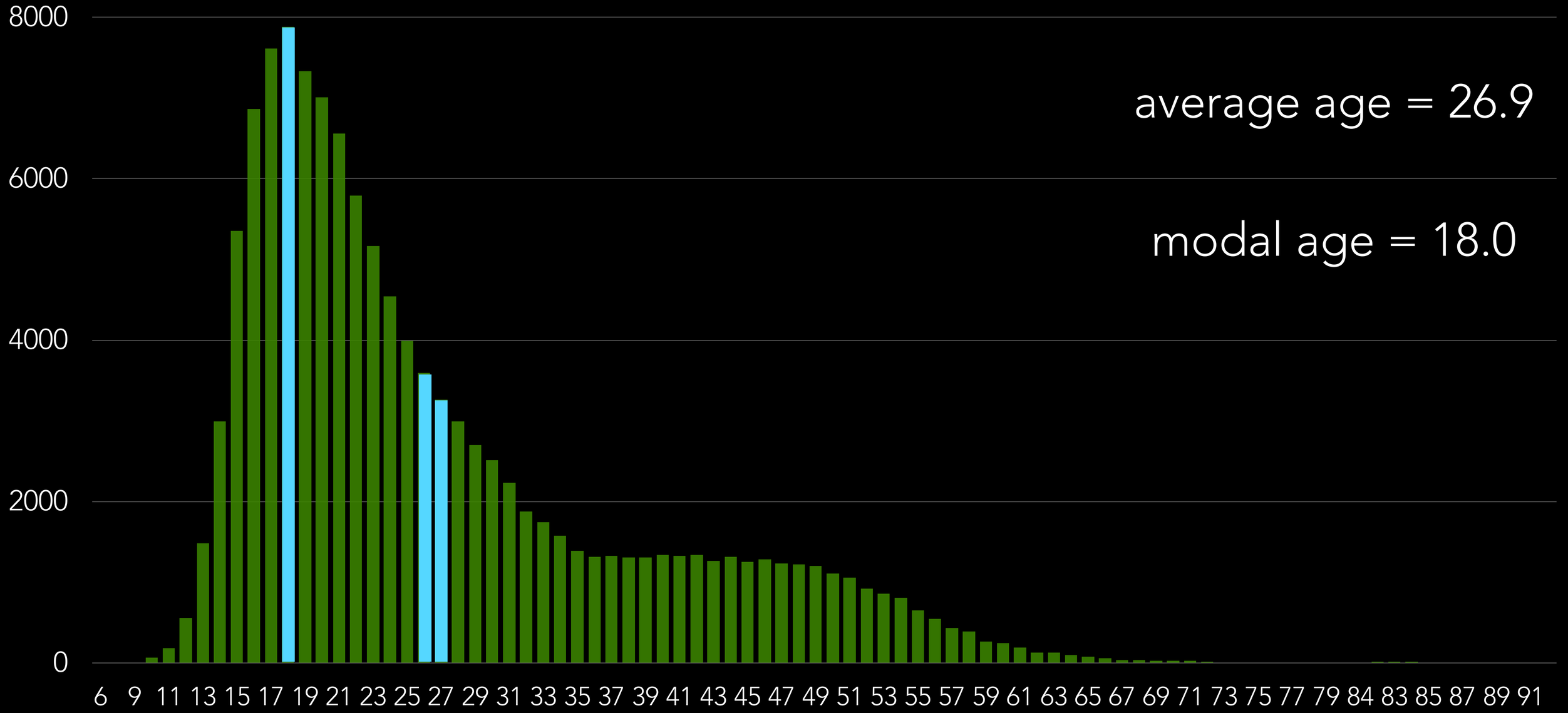
total network

what about the youth?

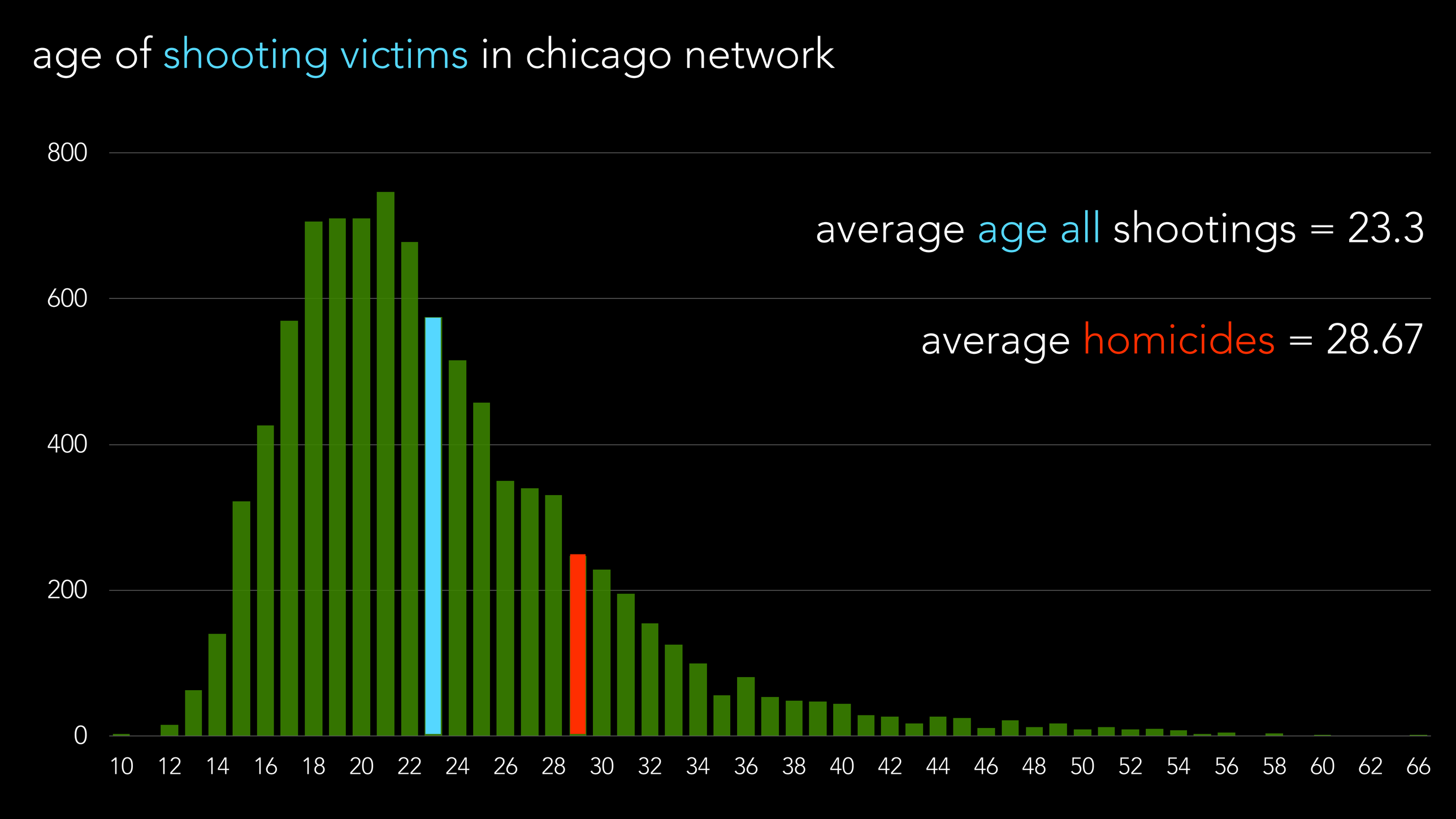
homicide victims in chicago, 1994 to 2009



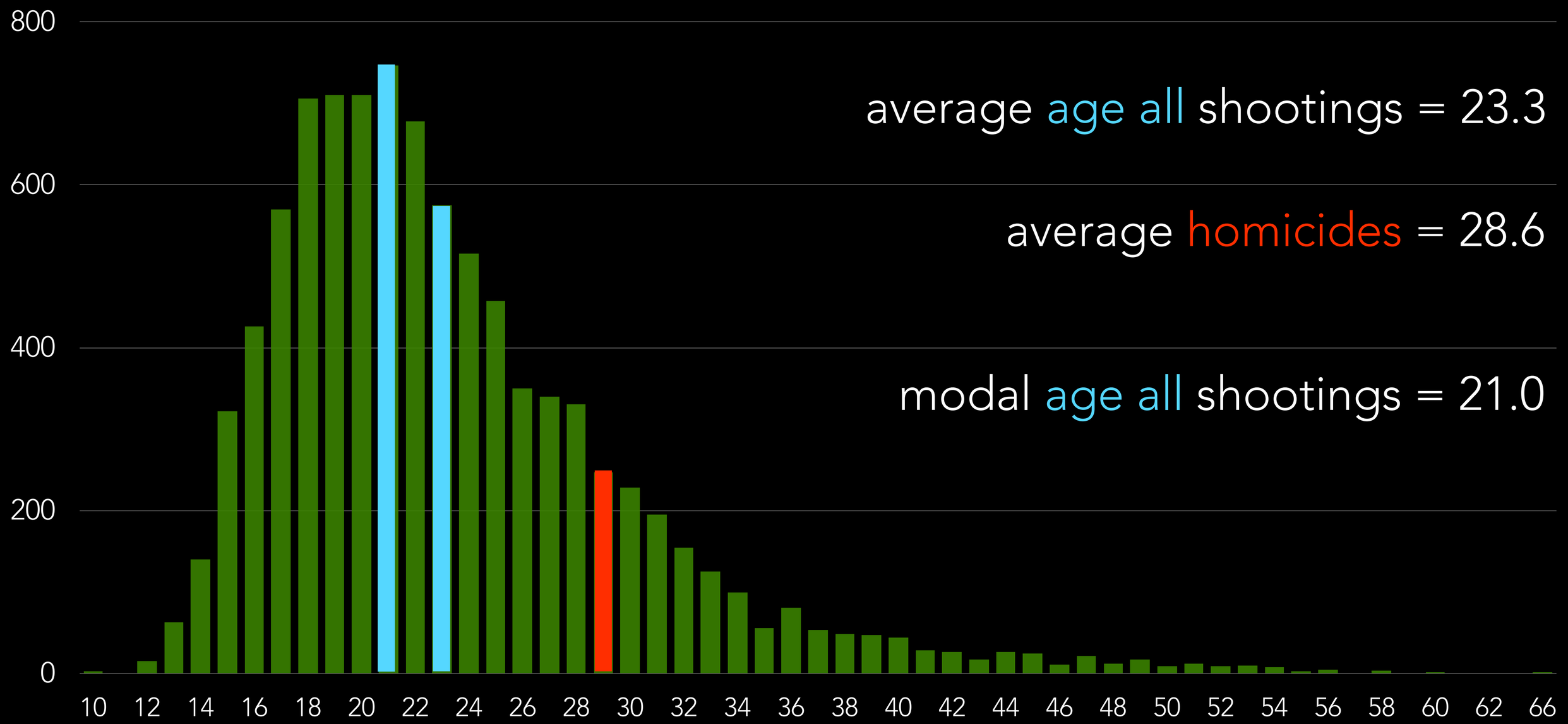
age of individuals in chicago network

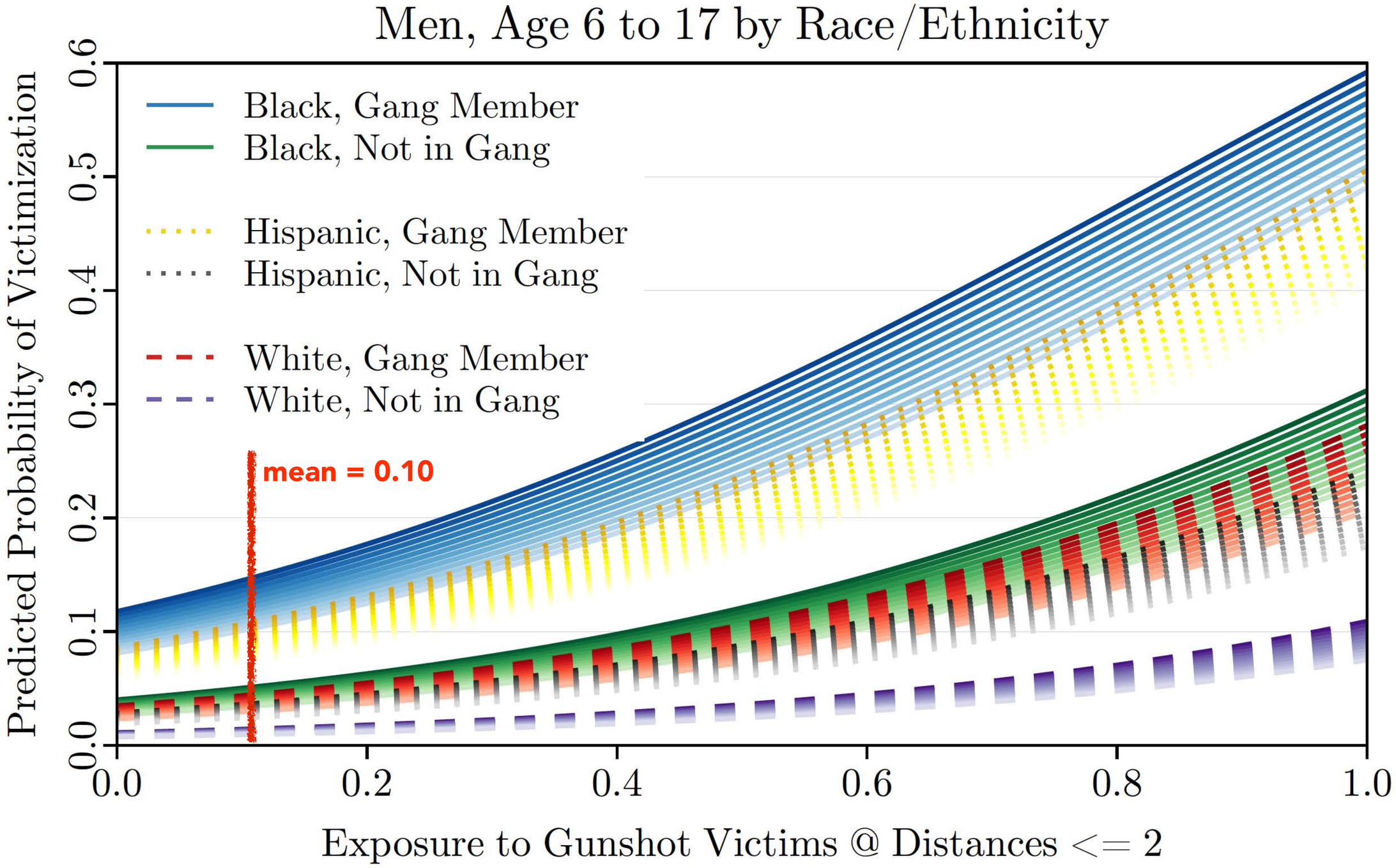


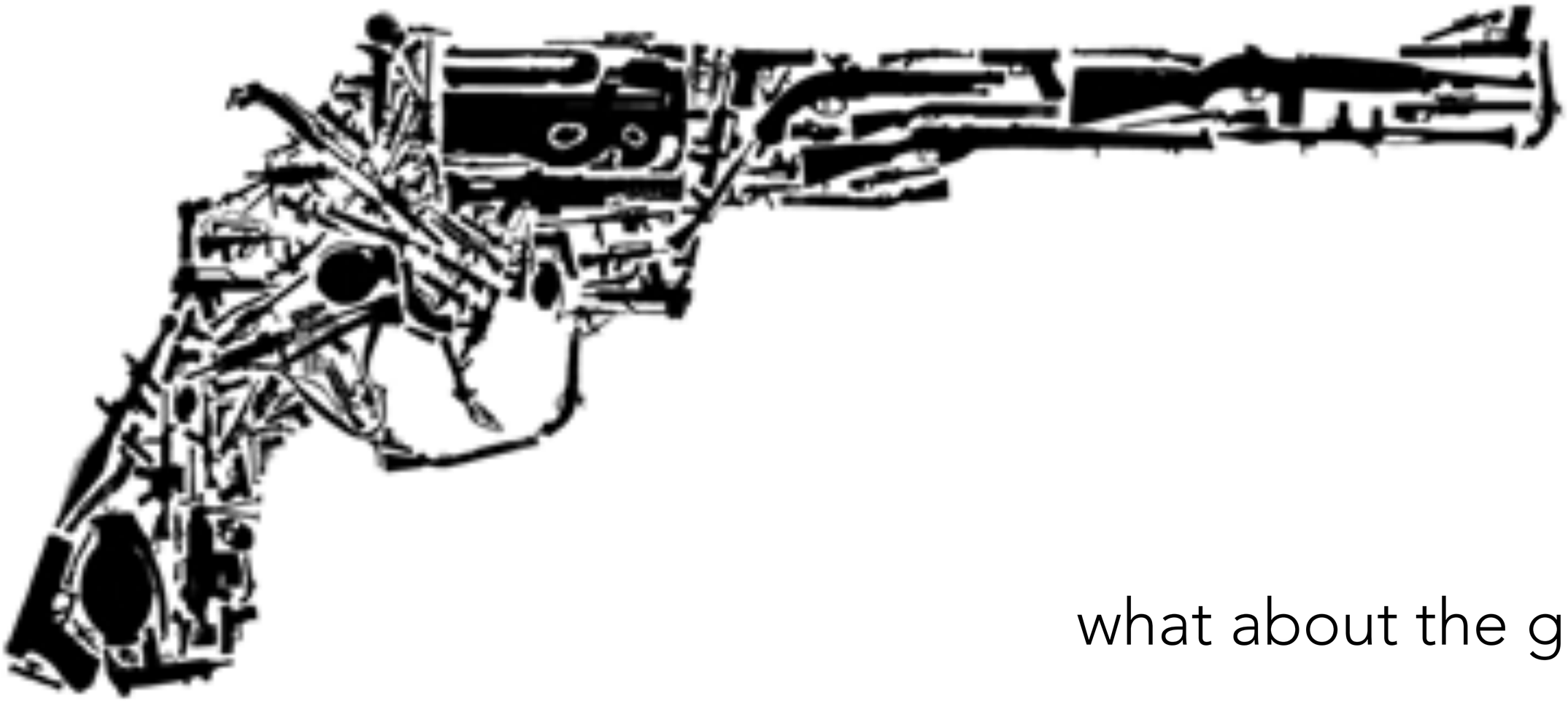
age of shooting victims in chicago network



age of victims in chicago network

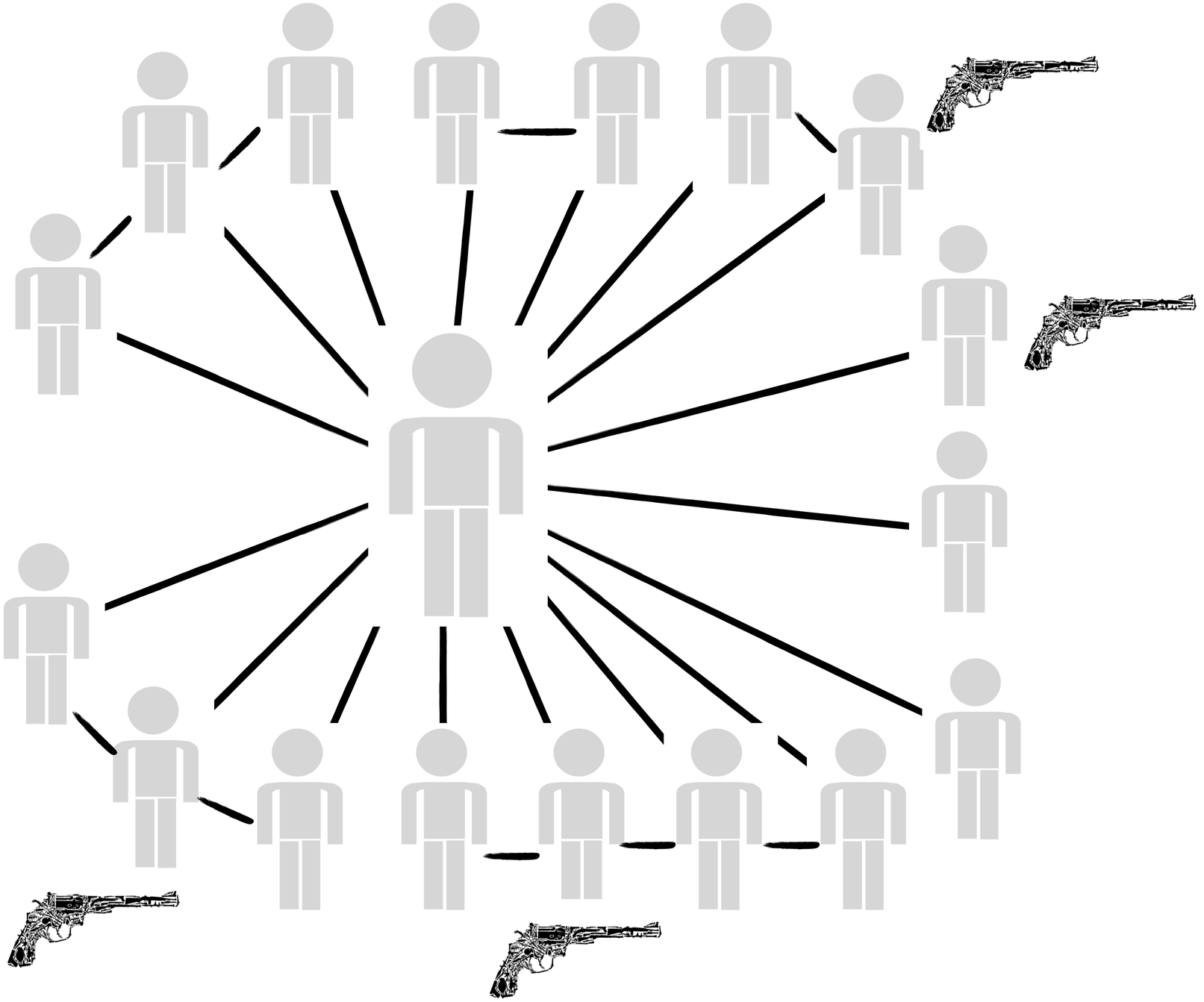


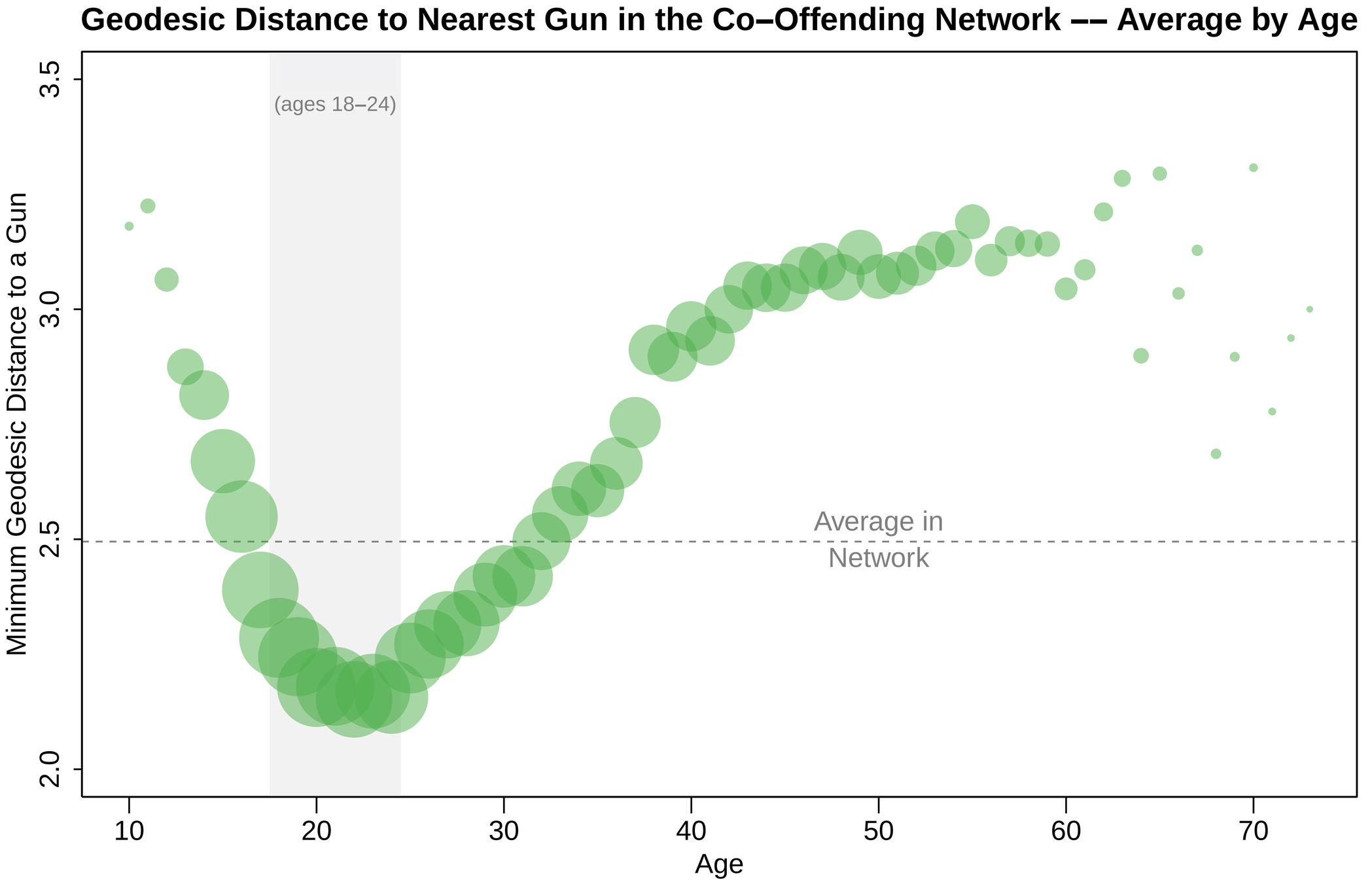

Men, Age 6 to 17 by Race/Ethnicity
Black, Gang Member
Black, Not in Gang
Hispanic, Gang Member
Hispanic, Not in Gang
White, Gang Member
White, Not in Gang
mean = 0.10
Predicted Probability of Victimization
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.0
0.2
0.4
0.6
0.8
1.0
Exposure to Gunshot Victims @ Distances <= 2

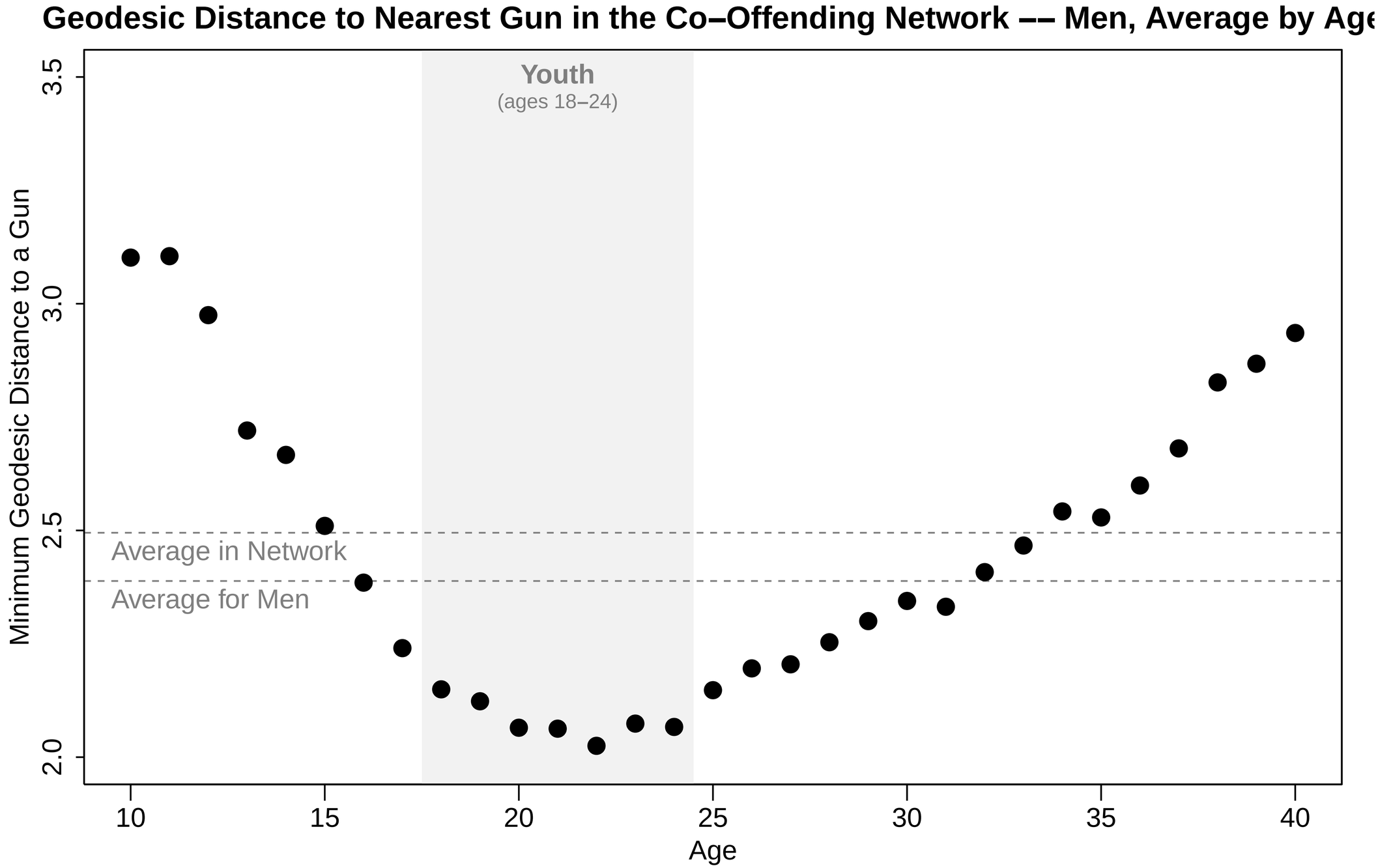


what about the guns?

http://www.utne.com/mind-and-body/women-with-guns-zm0z12jazros.aspx#axzz3JQCEiUIe




Geodesic Distance to Nearest Gun in the Co–Offending Network –– Average by Age
(ages 18–24)
Average in
Network
Minimum Geodesic Distance to a Gun
2.0
2.5
3.0
3.5
10
20
30
40
50
60
70
Age

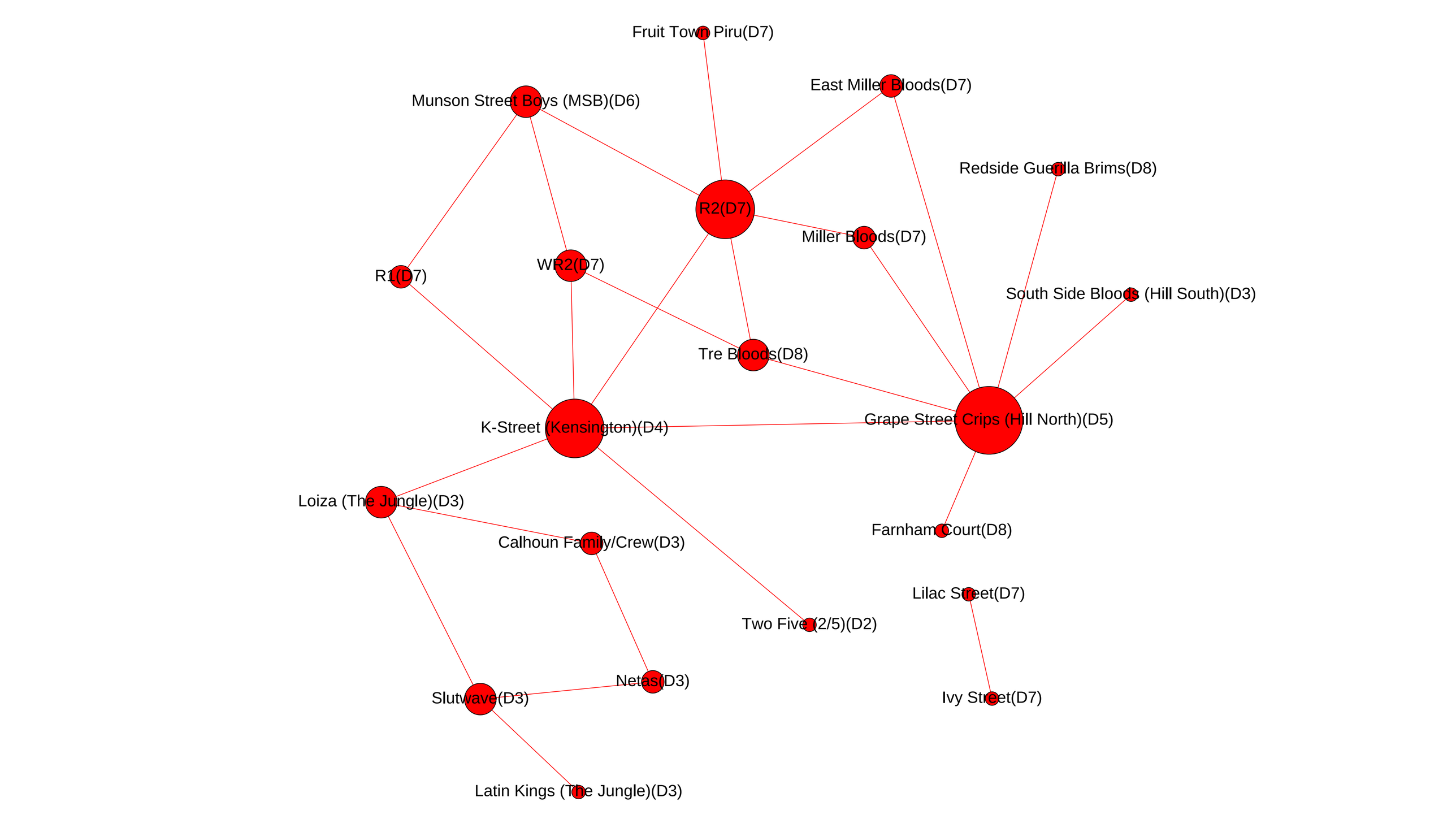

Geodesic Distance to Nearest Gun in the Co–Offending Network –– Men, Average by Age
Youth
(ages 18–24)
Minimum Geodesic Distance to a Gun
3.5
3.0
2.5
2.0
Average in Network
Average for Men
10
15
20
25
30
35
40
Age

leveraging for violence prevention

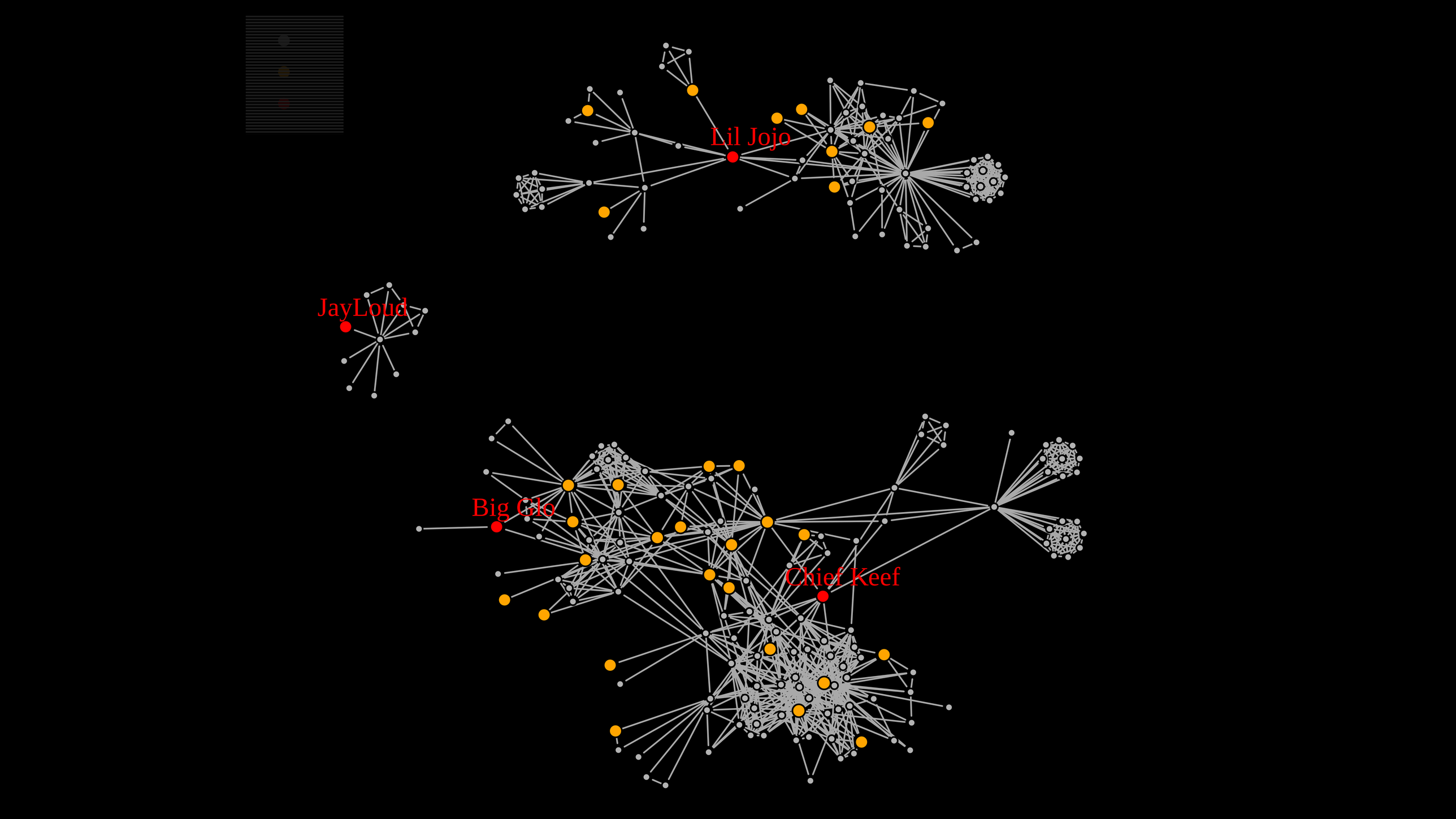
focussed vs. broad-sweeping

Group **V**iolence **R**eduction **S**trategy (VRS)

mapping the violence landscape


Fruit Town Piru(D7)
East Miller Bloods(D7)
Munson Street Boys (MSB)(D6)
Redside Guerilla Brims(D8)
R2(D7)
Miller Bloods(D7)
WR2(D7)
R1(D7)
South Side Bloods (Hill South)(D3)
Tre Bloods(D8)
Grape Street Crips (Hill North)(D5)
K-Street (Kensington)(D4)
Loiza (The Jungle)(D3)
Farnham Court(D8)
Calhoun Family/Crew(D3)
Lilac Street(D7)
Two Five (2/5)(D2)
Netas(D3)
Slutwave(D3)
Ivy Street(D7)
Latin Kings (The Jungle)(D3)

- mapping the violence landscape
- identifying individuals at risk


Lil Jojo
JayLoud
Big Glo
Chief Keef

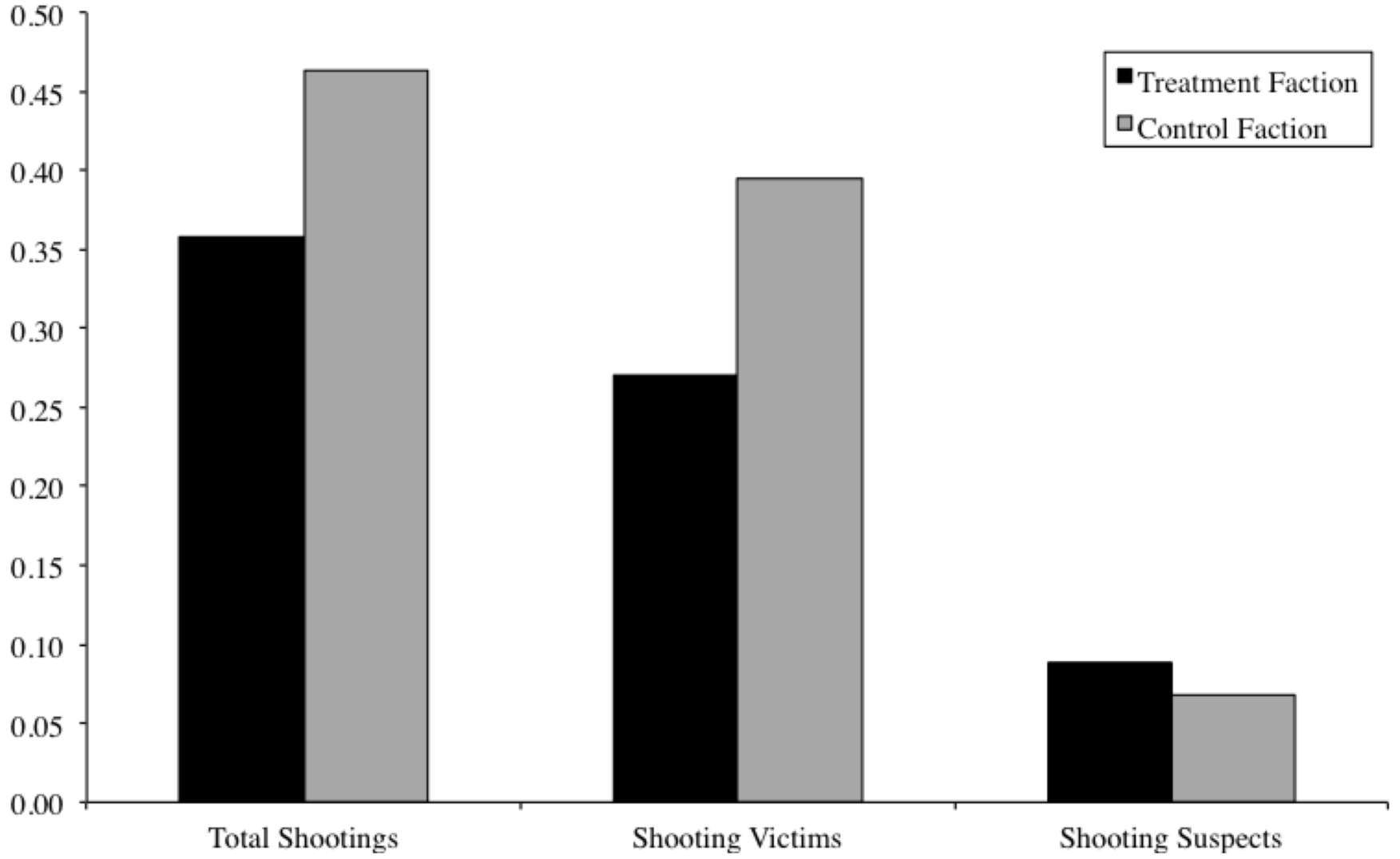
effects of VRS call-ins in Chicago

quasi-experimental design

- N = 149 treatment factions v. N = 428 matched control factions
- propensity score matching: 20 covaraites
- shooting behavior 12 months before/after call-in

the **one-year** effect of VRS Call-Ins

- 23 percent reduction in total fatal and non-fatal shootings
- 32 percent reduction in the likelihood of their members being a victim



THANK YOU

@AVPapachristos

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ACKNOWLEDGEMENTS: THE CHICAGO POLICE DEPARTMENT, THE NEW HAVEN POLICE DEPARTMENT, THE EAST PALO ALTO POLICE DEPARTMENT, THE NEWARK POLICE DEPARTMENT, THE CINCINNATI POLICE DEPARTMENT

COLLABORATORS: ELIZABETH ROBERTO, DAVID KIRK, CHRISTOPHER WILDEMAN, DAVID HUREAU, ANTHONY BRAGA, ROBIN ENGEL, BEN GREEN, JEFF FAGAN, & TRACEY MEARES