

# **Violence, Parks, and Playgrounds in an Urban Environment: Understanding the Association and Implications for Outdoor Physical Activity**

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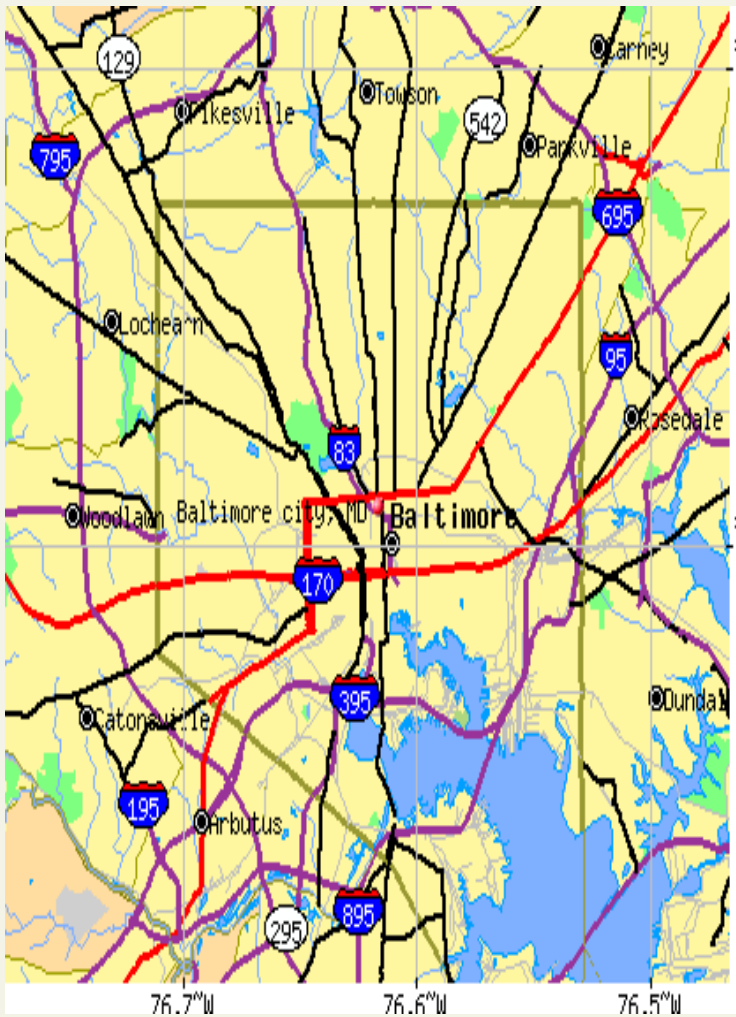
# *Background*

- Physical inactivity a major public health problem.
- Efforts to increase physical activity in communities.
- Importance of community violence in urban settings.
  - Perceived barriers to outdoor activity: crime and fear.
- Limited research has explored violence in and around these locations where people, especially youth, are encouraged to be active.

## *Specific Aims*

- Measure how much violence is in and surrounds parks and playgrounds in an urban setting.
- Determine if the locations of violent events and parks/play spaces are statistically independent.
- Identify what distinguishes safer parks and playgrounds from less safe ones, in an urban setting.

# Baltimore City Key Demographics



- 620K
- 64% Black
- Median household income: \$38K
- Obesity prevention advocates suggest use parks and playgrounds
- Lack of safe places for physical activity and exercise – cited barrier by parents and youth

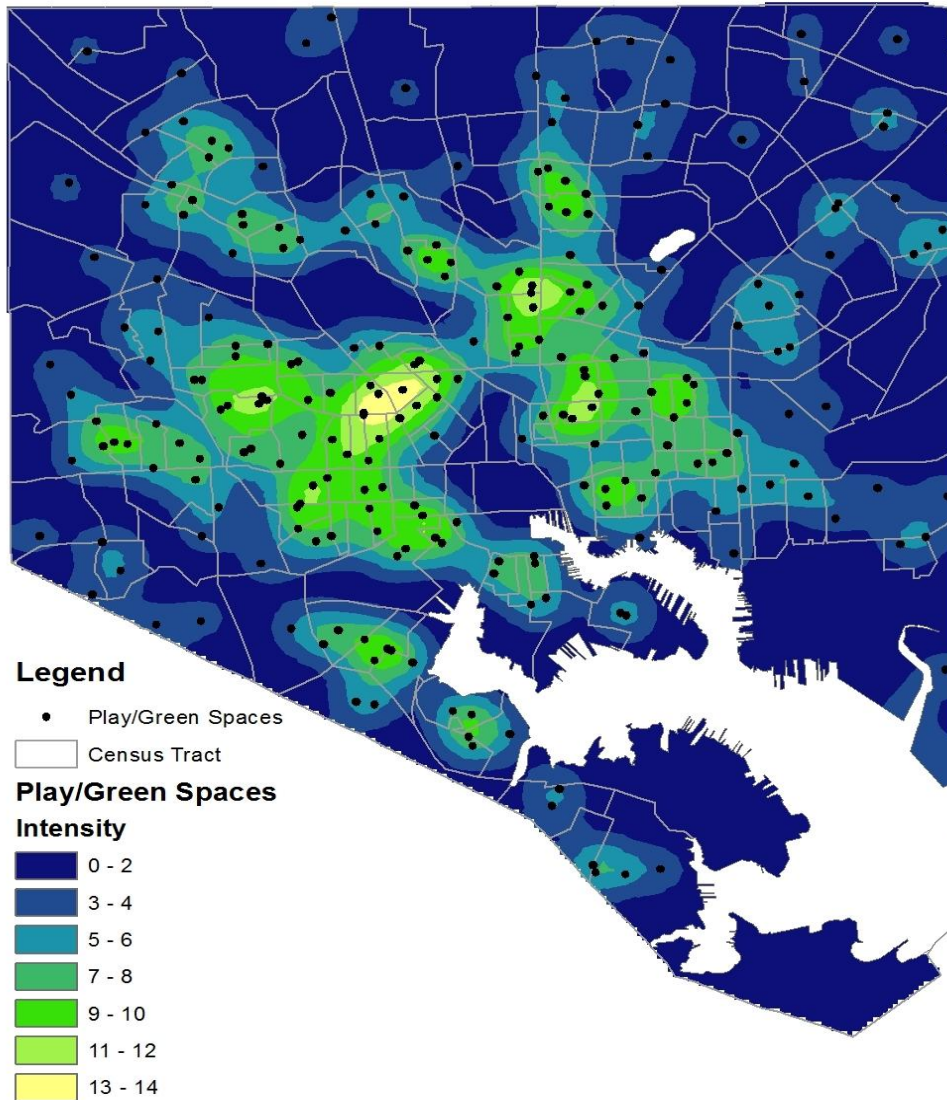
## *Methods*

- 2007 data from the Baltimore City Police Department on violent events (aggravated assaults, homicides, robberies, and shootings); and from the Department of Planning on locations of public parks and playgrounds (play/green spaces).
- Average number and intensity of criminal events (together and by type of violence) was estimated within radii of various buffers around play/green spaces.
- Cross K-function was used to assess spatial independence between locations of violence and play/green spaces.
- Analysis: R version 2.10.1 and *spatstat*; ArcGIS

# Data

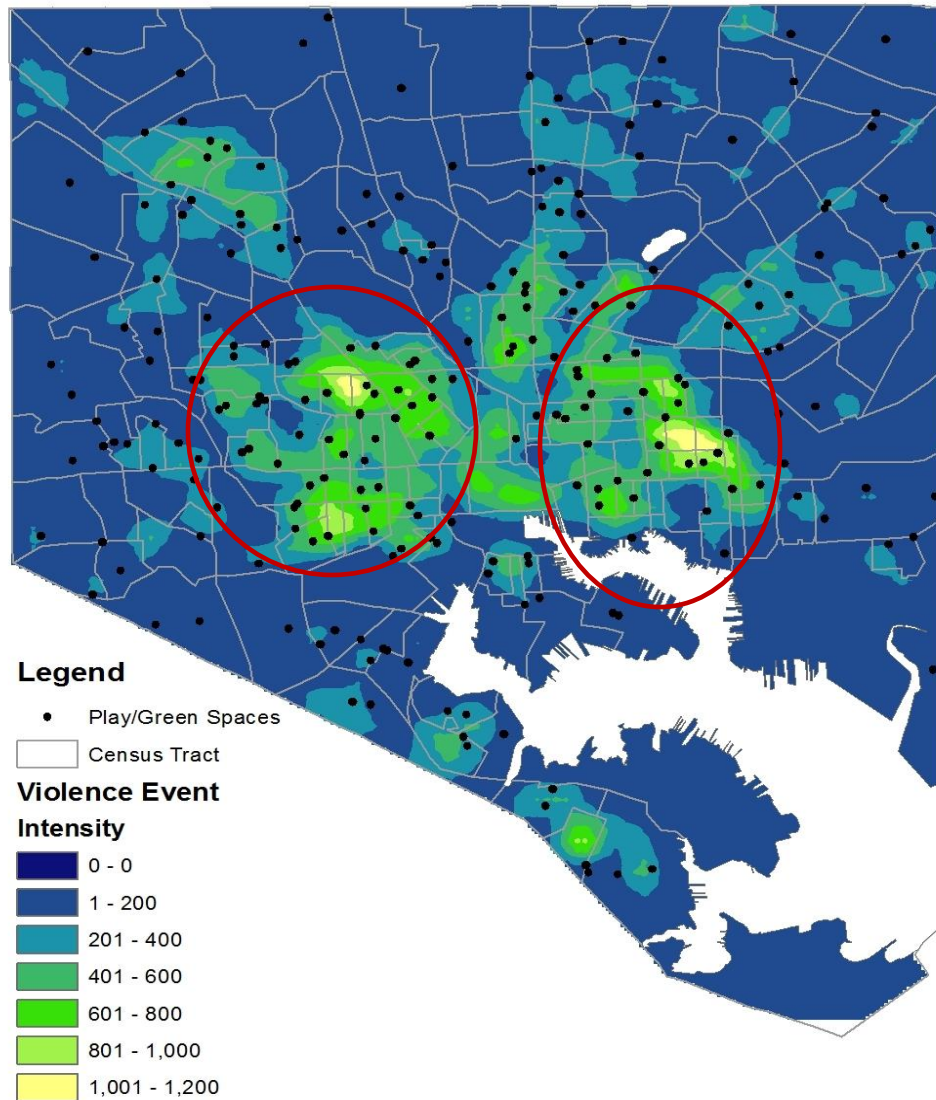
- Violent events (7 files of events for 2007)
  - Aggravated assaults (n=8,093)
  - Robbery (n=8,082)
  - Shootings (n=1,208)
  - Homicides: (n=491)
  - Arrests: robbery (n=1,255) and weapons (n=1,232)
- Play spaces (parks and green spaces)
  - 239 public parks and playgrounds

## Spatial Intensity of Play/Green Spaces





# Spatial Intensity of Violence Events

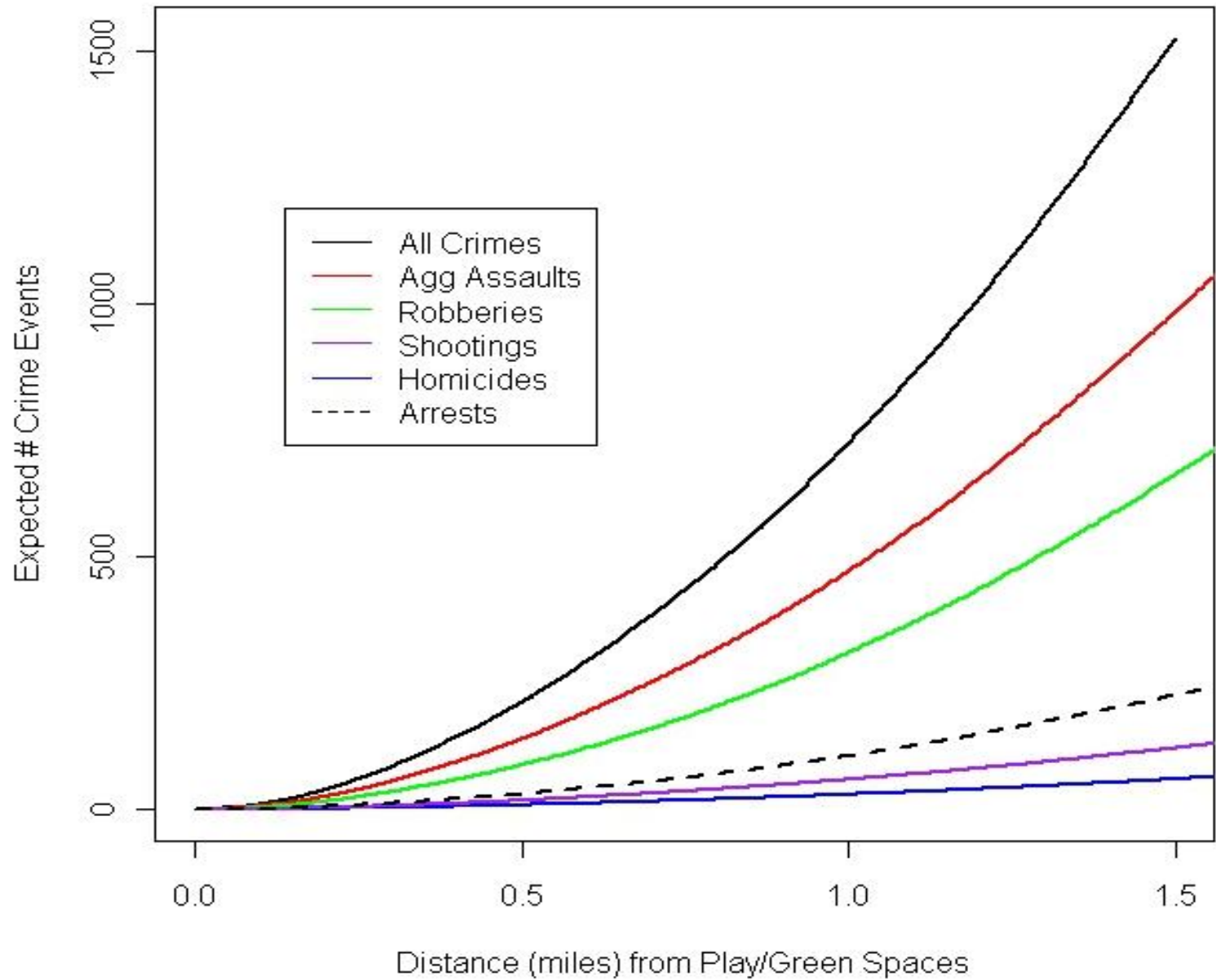


# *Total Observed of Crime Events Around Play/Green Spaces for Various Highlighted Distances*

<b>Distance (miles)</b>	<b>All Crimes*</b>	<b>Aggravated Assaults</b>	<b>Robberies</b>	<b>Shootings</b>	<b>Homicide</b>	<b>Arrests</b>
<b>0.10</b>	<b>10</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>0.25</b>	<b>60</b>	<b>39</b>	<b>25</b>	<b>5</b>	<b>2</b>	<b>9</b>
<b>0.50</b>	<b>213</b>	<b>140</b>	<b>89</b>	<b>18</b>	<b>9</b>	<b>31</b>
<b>0.75</b>	<b>446</b>	<b>292</b>	<b>187</b>	<b>37</b>	<b>19</b>	<b>65</b>
<b>1.00</b>	<b>790</b>	<b>515</b>	<b>338</b>	<b>66</b>	<b>33</b>	<b>116</b>

**\*all crimes does not include arrests.**

# Average # of Crime Events Near Play/Green Spaces



# *Crime Events Around Locations of Play/Green Spaces: Cross K-function Analysis*

<b>Distance (miles)</b>	<b>All Crimes</b>	<b>Aggravated Assaults#</b>	<b>Robberies</b>	<b>Shootings</b>	<b>Homicide</b>	<b>Arrests</b>
<b>0.10</b>	<b>10 (4)*</b>	<b>7 (3) *</b>	<b>4 (2)</b>	<b>1 (0)</b>	<b>0 (0)</b>	<b>1 (1)</b>
<b>0.25</b>	<b>60 (28) *</b>	<b>39 (18) *</b>	<b>25 (12) *</b>	<b>5 (2)</b>	<b>2 (1)</b>	<b>9 (4) *</b>
<b>0.50</b>	<b>213 (111) *</b>	<b>140 (71) *</b>	<b>89 (49) *</b>	<b>18 (8) *</b>	<b>9 (4) *</b>	<b>31 (16) *</b>
<b>0.75</b>	<b>446 (250) *</b>	<b>292 (159) *</b>	<b>187 (110) *</b>	<b>37 (18) *</b>	<b>19 (9) *</b>	<b>65 (35) *</b>
<b>1.00</b>	<b>790 (445) *</b>	<b>515 (283) *</b>	<b>338 (195) *</b>	<b>66 (33) *</b>	<b>33 (16) *</b>	<b>116 (62) *</b>

**# Average number of events (expect number of events)**

**\*  $p < 0.05$ ; adjusted for edge effects**

## *Study Limitations*

- Did not explore quality of the play/green spaces (YET!).
- Nor did we explore other environmental factors that explain spatial variation in crime events (YET!).
- Locations for play/green spaces were at the point (address) level but clearly these are more area-unit spatial objects and the size likely varies. So we currently cannot distinguish events within versus surrounding play/green spaces nor how the size of these play/green spaces effects distance calculations to surrounding crime events.

## *Conclusions and Implications*

- Violence clustered in and around parks and playgrounds located in specific areas of the city, which tend to also have the highest rates of violence.
- Prior to promoting the use of outdoor spaces, it is important to determine if they are violence-related barriers.
- Opportunity for violence prevention and obesity prevention researchers/advocates to work together.
- Support for policies and programs to support safe environments to be active (translational research funding from Active Living Research).

## *Contact Information*

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