**MESA Neighborhood Study (Ancillary Study AS023)**

**Crime Measures**

Please acknowledge the following grant in manuscripts and abstracts: R01 HL071759 (Diez Roux)

# Overview:

As part of the MESA Neighborhood study, an attempt was made to collect data on crime from the six MESA sites to be able to study both cross-sectional and longitudinal relationships of crime with various health outcomes and health behaviors. Although an attempt was made to collect the data for the six MESA sites, in many areas, the data was unavailable, difficult to obtain, or does not cover the full study period of MESA. The City of Chicago provided the most complete data for all study years and analyses over time including all exams would need to be subset to only this site. St Paul, MN has data available starting 2003 so this could be used in time-varying analyses starting with Exam 3. Additional study sites of Baltimore City, MD and Winston Salem, NC is available for Exam5. The other study sites were difficult to obtain or data is not available in a usable form. Table 1 below outlines data available. Details on the data obtained, methods, and measures created are described in the “details” section.

Table 1: Summary of Crime data available for MESA study

| **Source of data** | **Years Available** | **Exams** | **Geographical Extent** |
| --- | --- | --- | --- |
| Chicago Data Portal/Chicago Police Department | 1999-Apr 2012 | 1-5 | City of Chicago, IL |
| Open Baltimore\* | 2008-2012 | 5 | Baltimore City, MD |
| St Paul Police Department | 2003-Jun 2013 | 3-5 | St Paul, MN |
| Winston Salem Police Department^ | 2007-2011 | 5 | City of Winston Salem, NC |

\*For Baltimore study site, only those in Baltimore City will have data, those in Baltimore County do not have data.

^For Forsyth County study site, only those in the city of Winston Salem will have data, those outside the city limits will not have data.

Crime rates per 1,000 persons, based on Census 2000 and 2010 population data, were created for ¼, ½, and 1 mile buffers around the home address at each exam where data is available. Measures are available for total crimes, as well as disaggregated categories as outlined in Table 2 below. There are multiple measures created for criminal offenses due to availability of types of crime in each site. For the measures available in Chicago, all categories are also available for whether the crime occurred indoors or outdoors. This is unavailable for the other sites.

Table 2: Summary of Crime categorizations available by MESA study

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Chicago | Baltimore | St Paul | Winston Salem |
| Murders | X | X | X | X |
| Burglaries | X | X | X | X |
| Criminal offenses\* | X |  |  |  |
| Criminal offenses^ | X | X | X | X |
| Criminal offenses# | X | X | X |  |
| Incivilities | X |  |  |  |
| Assault and Battery | X | X | X | X |
| Drug offenses | X |  |  |  |
| Total crimes\* | X |  |  |  |
| Total crimes^ | X | X | X | X |
| Total crimes# | X | X | X |  |

\*Criminal offenses include: robbery, pocket-picking, purse-snatching, criminal sexual assault, burglary, stalking, arson, and kidnapping

^Common across all sites criminal offenses include: robbery, criminal sexual assault, and burglary

# Common across 3 sites criminal offenses include: robbery, pocket-picking, purse-snatching, criminal sexual assault, burglary, stalking, arson, and kidnapping

To assess long-term cumulative exposure to the neighborhood environment, we created time-varying cumulative averages, defined as the mean across all months from the baseline to each follow-up exam. This is only available for Chicago since it is the only site where data is available starting at baseline.

# Recommendations:

**Buffer size**: The choice as to which buffer size to use needs to be carefully thought out in terms of the outcome of interest. 1/4 mile buffers may need to be used with some caution for some of the variables, especially at certain sites, due to the high number of 0 values for the densities which may need to be analyzed as dichotomous yes/no any incidents. To date, most analyses have used the 1-mile buffers.

**Partial Buffers in data collection area**: The crime data was collected only for certain jurisdictions and not all areas or complete coverage of study sites. For participants whose address falls completely outside the area with data, these measures will be missing. For participants whose buffers fall partially within the study area, there is an indicator for the percent of the buffer within the area. It is recommended to restrict analysis to those with at least 90% of the buffer within the area.

**Longitudinal Analyses**: For longitudinal analyses, the City of Chicago is the only site with data available at a fine enough level to complete these analyses at all exams. For the City of St Paul, longitudinal analyses can be completed starting in Exam3.

**Cross-sectional Analyses:** For Exam 5, cross-sectional analyses can be performed which include Chicago, Baltimore City, St Paul, and Winston Salem. Indoor/outdoor coding and incivilities and drugs cannot be used for these since they are unavailable for Baltimore City, St Paul, and Winston Salem. For the criminal offenses, it is best to use the version that has the reduced types of crimes since it will be most consistent across sites. Even though the effort was made to make the coding as close as possible for all three sites, there may still be some unevenness across sites since the data was collected and provided to us in very different ways and there are no consistent regulations for providing the data.

Table 3: Recommended variables

| **Variable name** | **Description** | **Recommendation for when to use this** |
| --- | --- | --- |
| AVG\_TOTCRM1 | Crime Rate 1 Year prior to exam: 1 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only | For contemporaneous exposure or change in exposure |
| AY\_TOTCRM1 | Cumulative Average: 1 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only | For long-term exposure to environment |
| AVG\_ATOTCRM1 | Crime Rate 1 Year prior to exam: 1 mile buffer total crimes (criminal offenses common across all sites) (crimes per 1,000 persons) - Available in all 4 sites | For contemporaneous exposure or change in exposure |
| AVG\_BTOTCRM1 | Crime Rate 1 Year prior to exam: 1 mile buffer total crimes (criminal offenses common across 3 sites w/arson) (crimes per 1,000 persons) – Available in Baltimore City, St Paul, and Chicago | For contemporaneous exposure or change in exposure |

# Example Methodology Section for Manuscripts:

Police-recorded crime data for years 2001–2012 were from the “City of Chicago Data Portal,” which houses crime data that occurred within the Chicago city limits (Chicago 2011), which included location geocoded to 100th block centerlines, date, time, and type of crime. For years 1999–2000, police recorded crime was obtained from the Chicago Police Department similar to that available from the data portal. Crimes were excluded from analyses if they were missing any of this information. Types of crime were categorized as: assault and battery, criminal offenses, incivilities, and murder (see http://

www.unc.edu/~kevenson/\_MESA\_ChicagoCrime\_Type.pdf for further information on how crimes were coded into each of the six crime categories). Crimes were coded as indoor and outdoor based on the location of the crime (see http://www.unc.edu/~kevenson/\_MESA\_ChicagoCrime\_Location.pdf for further information on how crimes were coded as indoor/outdoor). Locations with missing location information, or listed as ATM, coin operated machine, and other, were not coded as either indoor or outdoor. However, they were included in the “total” number of crimes for each category. Crimes occurring at an airport or in an airplane were excluded. These were determined to not affect neighborhood facilities usage or health outcomes. Measures for the total number of incidents within each crime category for one-mile buffers around the participants' addresses were created using ArcGIS.

We then created population normalized one-year rates of crime per 1000 persons. The numerator for the normalized one-year crime rate was the sum of counts of crime within the buffer over the previous one-year period prior to the exam date. For example, an exam occurring in January 2002 would utilize the sum of counts of crime occurring from January 2001 to December 2001. The denominator for the normalized one-year crime rate was the total population within the buffer, which was calculated based on census block-level population. Each block was weighted by the percent of the area that fell with the participant buffer. The total population within that block was then multiplied by this weight and the weighted populations were summed together for the total population within the buffer. For dates prior to January 2006 (midpoint between 2000 and 2010), population counts originated from the 2000 Census. For dates on and after January 2006, population counts originated from the 2010 Census. These rates were created for total crime, assault and battery, criminal offenses, incivilities, and murder.

Chicago Police Department, 2011. City of Chicago Data Portal 〈https://data.ci tyofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2〉. Online (accessed 21.04.15).

# Published MESA Manuscripts Using the Data:

Evenson, K.R., et al., *Associations of adult physical activity with perceived safety and police-recorded crime: the Multi-ethnic Study of Atherosclerosis.* The international journal of behavioral nutrition and physical activity, 2012. **9**: p. 146.

Berchuck, S.I., et al., *Spatially modelling the association between access to recreational facilities and exercise: the ‘Multi-ethnic study of atherosclerosis’.* Journal of the Royal Statistical Society: Series A (Statistics in Society), 2015: p. n/a-n/a.

Kerr, Z., et al., *Changes in walking associated with perceived neighborhood safety and police-recorded crime: The multi-ethnic study of atherosclerosis.* Prev Med, 2015. **73**: p. 88-93.

Nethery, R.C., et al., *A common spatial factor analysis model for measured neighborhood-level characteristics: The Multi-Ethnic Study of Atherosclerosis.* Health Place, 2015. **36**: p. 35-46.

# Dataset Description:

Participant inclusion: MESA participants who agreed to participate in the MESA Neighborhood study (N=6191)

Data set-up: Panel (stacked) dataset with 1 row per participant per exam; an exam indicator is included

Notes: Data will be missing for any addresses that were unable to geocode for all data sources. Crime measures will be missing where the address falls outside the jurisdiction where these data were collected or if the exam date is outside the time period where data is available. An indicator is included for the reason crime data is missing (CRMMISS).

**Data Set Name: MESANBH\_CRIME01032017**

| **Variable Order** | **Variable name** | **Description** | **Coding** |
| --- | --- | --- | --- |
| 1 | idno | MESA ID number |  |
| 2 | EXAM | MESA Exam number |  |
| 3 | accuracy | Geocoding accuracy indicator. It is recommended that that only those with accuracy to at least zip code + 4 centroid are used in analyses, at least for sensitivity analysis. | 1 = Street level  2 = Zip+4 centroid level  3 = Zip+2 centroid level  4 = Zip code centroid  5 = Unable to geocode |
| 4 | cenid | Fake census tract id for clustering analysis. This should be used when using census tract level data in models. This is from 2000 census since census 2000 and ACS use this geography. |  |
| 5 | CRMMISS | Reason for missing crime data. | 0 = Not missing  1 = Unable to geocode  2 = Outside area where data available  3 = In crime data site but exam before data available |
| 6 | CRMSITE | Study site of crime data. | 3 = Winston-Salem  5 = Baltimore City  6 = St Paul  7 = Chicago |
| 7 | CRMPCT14 | Percent of 1/4 mile buffer within crime data study site. |  |
| 8 | CRMPCT0 | Percent of 1/2 mile buffer within crime data study site. |  |
| 9 | CRMPCT1 | Percent of 1 mile buffer within crime data site. |  |
| 10 | AVG\_MURD14 | Crime Rate 1 year prior to exam: 1/4 mile buffer murders (crimes per 1,000 persons) - Available in all 4 sites |  |
| 11 | AVG\_MURD0 | Crime Rate 1 year prior to exam: 1/2 mile buffer murders (crimes per 1,000 persons) - Available in all 4 sites |  |
| 12 | AVG\_MURD1 | Crime Rate 1 year prior to exam: 1 mile buffer murders (crimes per 1,000 persons) - Available in all 4 sites |  |
| 13 | AY\_MURD14 | Cumulative Average: 1/4 mile buffer murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 14 | AY\_MURD0 | Cumulative Average: 1/2 mile buffer murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 15 | AY\_MURD1 | Cumulative Average: 1 mile buffer murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 16 | AVG\_MURDO14 | Crime Rate 1 year prior to exam: 1/4 mile buffer outdoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 17 | AVG\_MURDO0 | Crime Rate 1 year prior to exam: 1/2 mile buffer outdoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 18 | AVG\_MURDO1 | Crime Rate 1 year prior to exam: 1 mile buffer outdoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 19 | AY\_MURDO14 | Cumulative Average: 1/4 mile buffer outdoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 20 | AY\_MURDO0 | Cumulative Average: 1/2 mile buffer outdoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 21 | AY\_MURDO1 | Cumulative Average: 1 mile buffer outdoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 22 | AVG\_MURDI14 | Crime Rate 1 year prior to exam: 1/4 mile buffer indoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 23 | AVG\_MURDI0 | Crime Rate 1 year prior to exam: 1/2 mile buffer indoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 24 | AVG\_MURDI1 | Crime Rate 1 year prior to exam: 1 mile buffer indoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 25 | AY\_MURDI14 | Cumulative Average: 1/4 mile buffer indoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 26 | AY\_MURDI0 | Cumulative Average: 1/2 mile buffer indoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 27 | AY\_MURDI1 | Cumulative Average: 1 mile buffer indoor murders (crimes per 1,000 persons) – Available in Chicago only |  |
| 28 | AVG\_BURG14 | Crime Rate 1 year prior to exam: 1/4 mile buffer burglaries (crimes per 1,000 persons) - Available in all 4 sites |  |
| 29 | AVG\_BURG0 | Crime Rate 1 year prior to exam: 1/2 mile buffer burglaries (crimes per 1,000 persons) - Available in all 4 sites |  |
| 30 | AVG\_BURG1 | Crime Rate 1 year prior to exam: 1 mile buffer burglaries (crimes per 1,000 persons) - Available in all 4 sites |  |
| 31 | AY\_BURG14 | Cumulative Average: 1/4 mile buffer burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 32 | AY\_BURG0 | Cumulative Average: 1/2 mile buffer burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 33 | AY\_BURG1 | Cumulative Average: 1 mile buffer burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 34 | AVG\_BURGO14 | Crime Rate 1 year prior to exam: 1/4 mile buffer outdoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 35 | AVG\_BURGO0 | Crime Rate 1 year prior to exam: 1/2 mile buffer outdoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 36 | AVG\_BURGO1 | Crime Rate 1 year prior to exam: 1 mile buffer outdoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 37 | AY\_BURGO14 | Cumulative Average: 1/4 mile buffer outdoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 38 | AY\_BURGO0 | Cumulative Average: 1/2 mile buffer outdoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 39 | AY\_BURGO1 | Cumulative Average: 1 mile buffer outdoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 40 | AVG\_BURGI14 | Crime Rate 1 year prior to exam: 1/4 mile buffer indoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 41 | AVG\_BURGI0 | Crime Rate 1 year prior to exam: 1/2 mile buffer indoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 42 | AVG\_BURGI1 | Crime Rate 1 year prior to exam: 1 mile buffer indoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 43 | AY\_BURGI14 | Cumulative Average: 1/4 mile buffer indoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 44 | AY\_BURGI0 | Cumulative Average: 1/2 mile buffer indoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 45 | AY\_BURGI1 | Cumulative Average: 1 mile buffer indoor burglaries (crimes per 1,000 persons) – Available in Chicago only |  |
| 46 | AVG\_CRIM14 | Crime Rate 1 year prior to exam: 1/4 mile buffer criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 47 | AVG\_CRIM0 | Crime Rate 1 year prior to exam: 1/2 mile buffer criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 48 | AVG\_CRIM1 | Crime Rate 1 year prior to exam: 1 mile buffer criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 49 | AY\_CRIM14 | Cumulative Average: 1/4 mile buffer criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 50 | AY\_CRIM0 | Cumulative Average: 1/2 mile buffer criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 51 | AY\_CRIM1 | Cumulative Average: 1 mile buffer criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 52 | AVG\_CRIMO14 | Crime Rate 1 year prior to exam: 1/4 mile buffer outdoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 53 | AVG\_CRIMO0 | Crime Rate 1 year prior to exam: 1/2 mile buffer outdoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 54 | AVG\_CRIMO1 | Crime Rate 1 year prior to exam: 1 mile buffer outdoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 55 | AY\_CRIMO14 | Cumulative Average: 1/4 mile buffer outdoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 56 | AY\_CRIMO0 | Cumulative Average: 1/2 mile buffer outdoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 57 | AY\_CRIMO1 | Cumulative Average: 1 mile buffer outdoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 58 | AVG\_CRIMI14 | Crime Rate 1 year prior to exam: 1/4 mile buffer indoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 59 | AVG\_CRIMI0 | Crime Rate 1 year prior to exam: 1/2 mile buffer indoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 60 | AVG\_CRIMI1 | Crime Rate 1 year prior to exam: 1 mile buffer indoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 61 | AY\_CRIMI14 | Cumulative Average: 1/4 mile buffer indoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 62 | AY\_CRIMI0 | Cumulative Average: 1/2 mile buffer indoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 63 | AY\_CRIMI1 | Cumulative Average: 1 mile buffer indoor criminal offenses (crimes per 1,000 persons) – Available in Chicago only |  |
| 64 | AVG\_ACRM14 | Crime Rate 1 year prior to exam: 1/4 mile buffer criminal offenses common across all sites (crimes per 1,000 persons) - Available in all 4 sites |  |
| 65 | AVG\_ACRM0 | Crime Rate 1 year prior to exam: 1/2 mile buffer criminal offenses common across all sites (crimes per 1,000 persons) - Available in all 4 sites |  |
| 66 | AVG\_ACRM1 | Crime Rate 1 year prior to exam: 1 mile buffer criminal offenses common across all sites (crimes per 1,000 persons) - Available in all 4 sites |  |
| 67 | AY\_ACRM14 | Cumulative Average: 1/4 mile buffer criminal offenses common across all sites (crimes per 1,000 persons) – Available in Chicago only |  |
| 68 | AY\_ACRM0 | Cumulative Average: 1/2 mile buffer criminal offenses common across all sites (crimes per 1,000 persons) – Available in Chicago only |  |
| 69 | AY\_ACRM1 | Cumulative Average: 1 mile buffer criminal offenses common across all sites (crimes per 1,000 persons) – Available in Chicago only |  |
| 70 | AVG\_BCRM14 | Crime Rate 1 year prior to exam: 1/4 mile buffer criminal offenses offenses common across 3 sites w/arson (crimes per 1,000 persons) – Available in Baltimore City, St Paul, and Chicago |  |
| 71 | AVG\_BCRM0 | Crime Rate 1 year prior to exam: 1/2 mile buffer criminal offenses offenses common across 3 sites w/arson (crimes per 1,000 persons) – Available in Baltimore City, St Paul, and Chicago |  |
| 72 | AVG\_BCRM1 | Crime Rate 1 year prior to exam: 1 mile buffer criminal offenses common across 3 sites w/arson (crimes per 1,000 persons) – Available in Baltimore City, St Paul, and Chicago |  |
| 73 | AY\_BCRM14 | Cumulative Average: 1/4 mile buffer criminal offenses common across 3 sites w/arson (crimes per 1,000 persons) – Available in Chicago only |  |
| 74 | AY\_BCRM0 | Cumulative Average: 1/2 mile buffer criminal offenses common across 3 sites w/arson w/arson (crimes per 1,000 persons) – Available in Chicago only |  |
| 75 | AY\_BCRM1 | Cumulative Average: 1 mile buffer criminal offenses common across 3 sites w/arson (crimes per 1,000 persons) – Available in Chicago only |  |
| 76 | AVG\_INCV14 | Crime Rate 1 year prior to exam: 1/4 mile buffer incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 77 | AVG\_INCV0 | Crime Rate 1 year prior to exam: 1/2 mile buffer incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 78 | AVG\_INCV1 | Crime Rate 1 year prior to exam: 1 mile buffer incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 79 | AY\_INCV14 | Cumulative Average: 1/4 mile buffer incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 80 | AY\_INCV0 | Cumulative Average: 1/2 mile buffer incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 81 | AY\_INCV1 | Cumulative Average: 1 mile buffer incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 82 | AVG\_INCVO14 | Crime Rate 1 year prior to exam: 1/4 mile buffer outdoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 83 | AVG\_INCVO0 | Crime Rate 1 year prior to exam: 1/2 mile buffer outdoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 84 | AVG\_INCVO1 | Crime Rate 1 year prior to exam: 1 mile buffer outdoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 85 | AY\_INCVO14 | Cumulative Average: 1/4 mile buffer outdoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 86 | AY\_INCVO0 | Cumulative Average: 1/2 mile buffer outdoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 87 | AY\_INCVO1 | Cumulative Average: 1 mile buffer outdoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 88 | AVG\_INCVI14 | Crime Rate 1 year prior to exam: 1/4 mile buffer indoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 89 | AVG\_INCVI0 | Crime Rate 1 year prior to exam: 1/2 mile buffer indoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 90 | AVG\_INCVI1 | Crime Rate 1 year prior to exam: 1 mile buffer indoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 91 | AY\_INCVI14 | Cumulative Average: 1/4 mile buffer indoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 92 | AY\_INCVI0 | Cumulative Average: 1/2 mile buffer indoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 93 | AY\_INCVI1 | Cumulative Average: 1 mile buffer indoor incivilities (crimes per 1,000 persons) – Available in Chicago only |  |
| 94 | AVG\_ASBA14 | Crime Rate 1 year prior to exam: 1/4 mile buffer assault and battery (crimes per 1,000 persons) - Available in all 4 sites |  |
| 95 | AVG\_ASBA0 | Crime Rate 1 year prior to exam: 1/2 mile buffer assault and battery (crimes per 1,000 persons) - Available in all 4 sites |  |
| 96 | AVG\_ASBA1 | Crime Rate 1 year prior to exam: 1 mile buffer assault and battery (crimes per 1,000 persons) - Available in all 4 sites |  |
| 97 | AY\_ASBA14 | Cumulative Average: 1/4 mile buffer assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 98 | AY\_ASBA0 | Cumulative Average: 1/2 mile buffer assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 99 | AY\_ASBA1 | Cumulative Average: 1 mile buffer assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 100 | AVG\_ASBAO14 | Crime Rate 1 year prior to exam: 1/4 mile buffer outdoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 101 | AVG\_ASBAO0 | Crime Rate 1 year prior to exam: 1/2 mile buffer outdoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 102 | AVG\_ASBAO1 | Crime Rate 1 year prior to exam: 1 mile buffer outdoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 103 | AY\_ASBAO14 | Cumulative Average: 1/4 mile buffer outdoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 104 | AY\_ASBAO0 | Cumulative Average: 1/2 mile buffer outdoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 105 | AY\_ASBAO1 | Cumulative Average: 1 mile buffer outdoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 106 | AVG\_ASBAI14 | Crime Rate 1 year prior to exam: 1/4 mile buffer indoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 107 | AVG\_ASBAI0 | Crime Rate 1 year prior to exam: 1/2 mile buffer indoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 108 | AVG\_ASBAI1 | Crime Rate 1 year prior to exam: 1 mile buffer indoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 109 | AY\_ASBAI14 | Cumulative Average: 1/4 mile buffer indoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 110 | AY\_ASBAI0 | Cumulative Average: 1/2 mile buffer indoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 111 | AY\_ASBAI1 | Cumulative Average: 1 mile buffer indoor assault and battery (crimes per 1,000 persons) – Available in Chicago only |  |
| 112 | AVG\_DRUG14 | Crime Rate 1 year prior to exam: 1/4 mile buffer drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 113 | AVG\_DRUG0 | Crime Rate 1 year prior to exam: 1/2 mile buffer drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 114 | AVG\_DRUG1 | Crime Rate 1 year prior to exam: 1 mile buffer drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 115 | AY\_DRUG14 | Cumulative Average: 1/4 mile buffer drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 116 | AY\_DRUG0 | Cumulative Average: 1/2 mile buffer drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 117 | AY\_DRUG1 | Cumulative Average: 1 mile buffer drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 118 | AVG\_DRUGO14 | Crime Rate 1 year prior to exam: 1/4 mile buffer outdoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 119 | AVG\_DRUGO0 | Crime Rate 1 year prior to exam: 1/2 mile buffer outdoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 120 | AVG\_DRUGO1 | Crime Rate 1 year prior to exam: 1 mile buffer outdoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 121 | AY\_DRUGO14 | Cumulative Average: 1/4 mile buffer outdoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 122 | AY\_DRUGO0 | Cumulative Average: 1/2 mile buffer outdoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 123 | AY\_DRUGO1 | Cumulative Average: 1 mile buffer outdoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 124 | AVG\_DRUGI14 | Crime Rate 1 Year prior to exam: 1/4 mile buffer indoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 125 | AVG\_DRUGI0 | Crime Rate 1 Year prior to exam: 1/2 mile buffer indoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 126 | AVG\_DRUGI1 | Crime Rate 1 Year prior to exam: 1 mile buffer indoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 127 | AY\_DRUGI14 | Cumulative Average: 1/4 mile buffer indoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 128 | AY\_DRUGI0 | Cumulative Average: 1/2 mile buffer indoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 129 | AY\_DRUGI1 | Cumulative Average: 1 mile buffer indoor drugs (crimes per 1,000 persons) – Available in Chicago only |  |
| 130 | AVG\_TOTCRM14 | Crime Rate 1 Year prior to exam: 1/4 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 131 | AVG\_TOTCRM0 | Crime Rate 1 Year prior to exam: 1/2 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 132 | AVG\_TOTCRM1 | Crime Rate 1 Year prior to exam: 1 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 133 | AY\_TOTCRM14 | Cumulative Average: 1/4 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 134 | AY\_TOTCRM0 | Cumulative Average: 1/2 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 135 | AY\_TOTCRM1 | Cumulative Average: 1 mile buffer total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 136 | AVG\_TOTCRMO14 | Crime Rate 1 Year prior to exam: 1/4 mile buffer outdoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 137 | AVG\_TOTCRMO0 | Crime Rate 1 Year prior to exam: 1/2 mile buffer outdoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 138 | AVG\_TOTCRMO1 | Crime Rate 1 Year prior to exam: 1 mile buffer outdoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 139 | AY\_TOTCRMO14 | Cumulative Average: 1/4 mile buffer outdoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 140 | AY\_TOTCRMO0 | Cumulative Average: 1/2 mile buffer outdoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 141 | AY\_TOTCRMO1 | Cumulative Average: 1 mile buffer outdoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 142 | AVG\_TOTCRMI14 | Crime Rate 1 Year prior to exam: 1/4 mile buffer indoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 143 | AVG\_TOTCRMI0 | Crime Rate 1 Year prior to exam: 1/2 mile buffer indoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 144 | AVG\_TOTCRMI1 | Crime Rate 1 Year prior to exam: 1 mile buffer indoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 145 | AY\_TOTCRMI14 | Cumulative Average: 1/4 mile buffer indoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 146 | AY\_TOTCRMI0 | Cumulative Average: 1/2 mile buffer indoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 147 | AY\_TOTCRMI1 | Cumulative Average: 1 mile buffer indoor total crimes (crimes per 1,000 persons) – Available in Chicago only |  |
| 148 | AVG\_ATOTCRM14 | Crime Rate 1 Year prior to exam: 1/4 mile buffer total crimes (criminal offenses common across all sites) (crimes per 1,000 persons) - Available in all 4 sites |  |
| 149 | AVG\_ATOTCRM0 | Crime Rate 1 Year prior to exam: 1/2 mile buffer total crimes (criminal offenses common across all sites) (crimes per 1,000 persons) - Available in all 4 sites |  |
| 150 | AVG\_ATOTCRM1 | Crime Rate 1 Year prior to exam: 1 mile buffer total crimes (criminal offenses common across all sites) (crimes per 1,000 persons) - Available in all 4 sites |  |
| 151 | AY\_ATOTCRM14 | Cumulative Average: 1/4 mile buffer total crimes (criminal offenses common across all sites) (crimes per 1,000 persons) – Available in Chicago only |  |
| 152 | AY\_ATOTCRM0 | Cumulative Average: 1/2 mile buffer total crimes (criminal offenses common across all sites) (crimes per 1,000 persons) – Available in Chicago only |  |
| 153 | AY\_ATOTCRM1 | Cumulative Average: 1 mile buffer total crimes (criminal offenses common across all sites) (crimes per 1,000 persons) – Available in Chicago only |  |
| 154 | AVG\_BTOTCRM14 | Crime Rate 1 Year prior to exam: 1/4 mile buffer total crimes (criminal offenses reduced w/arson) (crimes per 1,000 persons) – Available in Baltimore City, St Paul, and Chicago |  |
| 155 | AVG\_BTOTCRM0 | Crime Rate 1 Year prior to exam: 1/2 mile buffer total crimes (criminal offenses common across 3 sites w/arson) (crimes per 1,000 persons) – Available in Baltimore City, St Paul, and Chicago |  |
| 156 | AVG\_BTOTCRM1 | Crime Rate 1 Year prior to exam: 1 mile buffer total crimes (criminal offenses common across 3 sites w/arson) (crimes per 1,000 persons) – Available in Baltimore City, St Paul, and Chicago |  |
| 157 | AY\_BTOTCRM14 | Cumulative Average: 1/4 mile buffer total crimes (criminal offenses common across 3 sites w/arson) (crimes per 1,000 persons) – Available in Chicago only |  |
| 158 | AY\_BTOTCRM0 | Cumulative Average: 1/2 mile buffer total crimes (criminal offenses common across 3 sites w/arson) (crimes per 1,000 persons) – Available in Chicago only |  |
| 159 | AY\_BTOTCRM1 | Cumulative Average: 1 mile buffer total crime (criminal offenses common across 3 sites w/arson) (crimes per 1,000 persons) – Available in Chicago only |  |

# Details:

## Data Obtained (By site or source)

### City of Chicago, IL

#### General Information

The City of Chicago's Data Portal is dedicated to promoting access to government data and encouraging the development of creative tools to engage and serve Chicago's diverse community. The site hosts over 200 datasets presented in easy-to-use formats about City departments, services, facilities and performance[[1]](#footnote-1). This includes data on the type of crime, location of crime, and latitude/longitude of the incident.

Data for the years 2001-2011 were downloaded from the Chicago Data Portal website[[2]](#footnote-2) in February 2012. Year 2012 was downloaded in January 2013 and only includes data through Dec 26, 2012. This includes data on crimes from the years 2001-present within the city.

Since data prior to 2001 is not available on the Chicago Data Portal, data was obtained for the years 1999-2000 from the Chicago Police Department (CPD). Data was obtained to mimic the Chicago Data Portal as closely as possible to give comparable data across all years. The file received from the CPD contains data on the type of crime, location of crime, and address of the incident similar to the Chicago Data Portal. Since the data from CPD was not geocoded when received at UM, geocoding was completed at UM. Geocoding was completed using an address locator in ArcGIS based on the Chicago streets files available on the city of Chicago website[[3]](#footnote-3). The accuracy of geocoding gave about 2-3% that were unable to geocode and the mean match score has a mean of 96-97 (out of 100). Data was cleaned to match the coding and variable names of the Chicago Data Portal as close as possible.

The crimes available from these sources are:

1. Arson
2. Assault
3. Battery
4. Burglary
5. Criminal Abortion
6. Criminal Damage
7. Criminal Sexual Assault
8. Criminal Trespass
9. Deceptive Practice
10. Gambling
11. Homicide
12. Interference with Public Officer
13. Intimidation
14. Kidnapping
15. Liquor Law Violation
16. Motor Vehicle Theft
17. Narcotics
18. Obscenity
19. Offense Involving Children
20. Other Narcotic Violation
21. Other Offense
22. Prostitution
23. Public Indecency
24. Public Peace Violation
25. Ritualison
26. Robbery
27. Sex Offense
28. Stalking
29. Theft
30. Weapons Violation

#### Data Description from Chicago Data Portal

This dataset reflects reported incidents of crime (with the exception of murders where data exists for each victim) that occurred in the City of Chicago from 2001 to present, minus the most recent seven days. Data is extracted from the Chicago Police Department’s CLEAR (Citizen Law Enforcement Analysis and Reporting) system. In order to protect the privacy of crime victims, addresses are shown at the block level only and specific locations are not identified. Should you have questions about this dataset, you may contact the Research & Development Division of the Chicago Police Department at 312.745.6071 or [RandD@chicagopolice.org](mailto:RandD@chicagopolice.org). Disclaimer: These crimes may be based upon preliminary information supplied to the Police Department by the reporting parties that have not been verified. The preliminary crime classifications may be changed at a later date based upon additional investigation and there is always the possibility of mechanical or human error. Therefore, the Chicago Police Department does not guarantee (either expressed or implied) the accuracy, completeness, timeliness, or correct sequencing of the information and the information should not be used for comparison purposes over time. The Chicago Police Department will not be responsible for any error or omission, or for the use of, or the results obtained from the use of this information. All data visualizations on maps should be considered approximate and attempts to derive specific addresses are strictly prohibited. The Chicago Police Department is not responsible for the content of any off-site pages that are referenced by or that reference this web page other than an official City of Chicago or Chicago Police Department web page. The user specifically acknowledges that the Chicago Police Department is not responsible for any defamatory, offensive, misleading, or illegal conduct of other users, links, or third parties and that the risk of injury from the foregoing rests entirely with the user. The unauthorized use of the words “Chicago Police Department,” “Chicago Police,” or any colorable imitation of these words or the unauthorized use of the Chicago Police Department logo is unlawful. This web page does not, in any way, authorized such use. Data is updated daily Tuesday through Sunday. The dataset contains more than 65,000 records/rows of data and cannot be viewed in full in Microsoft Excel. Therefore, when downloading the file, select CSV from the Export menu. Open the file in an ASCII text editor, such as WordPad, to view and search. To access a list of Chicago Police Department – Illinois Uniform Crime Reporting (IUCR) codes, go to <http://data.cityofchicago.org/Public-Safety/Chicago-Police-Department-Illinois-Uniform-Crime-R/c7ck-438e>

### Baltimore City, MD

#### General Information

Data for the years 2008-2012 were downloaded from the Open Baltimore website[[4]](#footnote-4). Baltimore City has made crime data from the years 2008-present within the city publically available on the Open Baltimore website. This is only available for the city of Baltimore and not any outlying areas (such as Baltimore County). This includes information on the type of crime, location of crime, and latitude/longitude of the incident. Indication of indoor or outdoor is unavailable in this dataset. The crimes available from this website are:

1. Aggravated assault
2. Arson
3. Auto Theft
4. Burglary
5. Common Assault
6. Homicide
7. Larceny
8. Larceny from Auto
9. Rape
10. Robbery – Carjacking
11. Robbery – Commercial
12. Robbery – Residence
13. Robbery – Street
14. Shooting

#### Data Description from Open Baltimore

All BPD data on Open Baltimore is preliminary data and subject to change. The information presented through Open Baltimore represents Part I victim based crime data. The data do not represent statistics submitted to the FBI’s Uniform Crime Report (UCR); therefore any comparisons are strictly prohibited. For further clarification of UCR data, please visit <http://www.fbi.gov/about-us/cjis/ucr/ucr>. Please note that this data is preliminary and subject to change. Prior month data is likely to show changes when it is refreshed on a monthly basis. All data is geocoded to the approximate latitude/longitude location of the incident and excludes those records for which an address could not be geocoded. Any attempt to match the approximate location of the incident to an exact address is strictly prohibited. The data is provided by the Baltimore Police Department (<http://www.baltimorepolice.org/>) and is updated monthly. Records have been geocoded to the hundredth block and not the precise point that the crime took place.

### St Paul, MN

Data for the Part 1 crimes within the city of St Paul, MN are available electronically starting in Jan 2003 by contacting the St Paul Police Department (SPPD). At time of data receipt, data was available for Jan 2003-Jun 2013. This data contains the date, time, location (address to the 100th block), and type of offense. Indication of indoor or outdoor is unavailable in this dataset. The dataset received includes the following crimes within the city of St Paul (received 10/7/2013):

1. Arson
2. Aggravated Assault
3. Burglary
4. Homicide
5. Rape
6. Robbery

Incidents were not geocoded in data received from SPPD. Geocoding was completed at UM. Since the addresses were only given to us at the 100th block level, not the full street address, “00” was added to the end of each street number so the geocoding will be for the beginning of the 100th block, not the middle of the block. Geocoding was completed using an address locator in ArcGIS based on the streets files available from Street Map Premium 2010 for ArcGIS 10.1. The accuracy of geocoding gave about 2-3% that were unable to geocode and the mean match score has a mean of 94-97 (out of 100).

### Winston-Salem, NC

Data for the Part 1 crimes within the city of Winston Salem, NC are available electronically starting in Jan 2007 by contacting the Winston Salem Police Department (WSPD) (received 5/22/2012). The years Jan 2007-May 2012 are available electronically through WSPD at time of data receipt. This contains the date, time, location (address and x-y coordinates), and type of offense. Indication of indoor or outdoor is unavailable in this dataset. The crimes available in this dataset are:

1. Aggravated assault
2. Burglary – B&E
3. Homicide
4. Larceny
5. Motor Vehicle Theft
6. Rape
7. Robbery

## Crime Coding

Chicago is the only site for which all six categories of crime are applicable (see coding details below). In Baltimore City, St Paul, and Winston Salem, only the murder, criminal offenses, assault and battery, and burglary categories could be coded. The data provided by the Chicago Police Department included much more detail than the data from other sites. Whereas, other sites only provided the FBI codes, Chicago provided as many as 13 IUCR codes for each FBI code. Since most researchers are primarily interested in broad characterizations of crime for analyses, the FBI codes were synchronized. Larceny is one FBI code that Chicago has disaggregated. Pocket picking and purse snatching are two forms of larceny that data experts recommended we include in the criminal offenses category. Stalking and kidnapping are additional crimes that experts suggested for included in the criminal offenses category, but which are not indexed and not provided for other sites. Given these crime types could not be identified with the data provided from other sites, pocket picking, purse snatching, stalking and kidnapping were excluded from the criminal offenses variables that can be used when aggregating all of the sites. In addition, Winston Salem did not provide arson in the data. A separate version of the criminal offenses category was created which excludes arson. However, for analyses of Chicago data alone, the version of criminal offenses including pocket picking, purse snatching, stalking and kidnapping was created. Three versions of criminal offenses were created:

1. Full criminal offenses (robbery, criminal sexual assault (rape), burglary, arson, pocket-picking, purse-snatching, stalking, and kidnapping).
   1. Chicago only
2. Criminal offenses common across 3 sites with arson (robbery, criminal sexual assault (rape), burglary, arson).
   1. Chicago, Baltimore City, and St Paul
3. Criminal offenses common across all sites (robbery, criminal sexual assault (rape), burglary).
   1. Chicago, Baltimore City, St Paul, and Winston Salem

The Chicago dataset also has additional variables to delineate indoor and outdoor crimes based on the location of the crime as listed in description of the location of the crime which is not available for the other sites.

Descriptions of the coding methods are listed below for each study site.

### City of Chicago, IL

Crimes were coded using the Illinois Uniform Crime Reporting (IUCR) code to categorize into 8 categories:

1. **Murder**
   1. Includes first or second degree murder.
   2. Excludes homicides that are involuntary manslaughter or reckless homicide. These are excluded since they are not relevant to the actual safety of a neighborhood. They are more “accidental.” They are also not index crimes.
2. **Criminal Offenses (full)**
   1. Includes robbery, pocket-picking, purse-snatching, criminal sexual assault, burglary, stalking, arson, and kidnapping.
   2. Excludes weapons violations (these are in incivilities).
3. **Criminal Offenses (common across 3 sites)**
   1. Includes robbery, criminal sexual assault, and burglary.
   2. Excludes weapons violations (these are in incivilities), pocket-picking, purse-snatching, stalking, arson, and kidnapping (these are not available in all study sites).
4. **Criminal Offenses (common across all sites with arson)**
   1. Includes robbery, criminal sexual assault, burglary, and arson.
   2. Excludes weapons violations (these are in incivilities), pocket-picking, purse-snatching, stalking, and kidnapping (these are not available in all study sites).
5. **Incivilities** (Physical incivilities was based on the work by Perkins et al, defined as physical disorder that is associated with increased crime, including items such as trash and vacant buildings.[[5]](#footnote-5))
   1. Includes possession and sale of narcotics, prostitution, criminal damage, weapons violations, public indecency, probation/parole violation, gambling with cards/dice, and peeping tom.
   2. Excludes other narcotics that are not possession or sale. These are rare.
6. **Assault and Battery**
   1. Includes any assault or battery
7. **Drugs**. These are also included in incivilities but a separate category for these was wanted.
   1. Includes possession or sale of narcotics.
   2. Excludes other narcotics that are not possession or sale. These are rare.
8. **Burglary.** These are also included in criminal offenses but a separate category was wanted since several studies have found that burglary is a strong predictor of leaving your home. Perhaps in high crime neighborhoods, fear of burglary might inhibit outside activity.
   1. Includes any burglary.

Crimes were also coded as indoor and outdoor based on the location of the crime as listed in description of the location of the crime. If the location description was missing, ATM (AUTOMATIC TELLER MACHINE), COIN OPERATED MACHINE, or OTHER, then these could not be coded as either indoor or outdoor. Crimes with these location descriptions are included in the “total” number of crimes for each category but will not appear in either the indoor or outdoor variables. Any crimes where the location description indicated that it occurred at an airport or airplane are excluded from all measures. These were determined to not significantly affect neighborhood facilities usage or health outcomes. Three indicator variables were created for each of the 8 crime classifications: Total, Indoor, and Outdoor. Further information for coding of Chicago data can be found at http://

www.unc.edu/~kevenson/\_MESA\_ChicagoCrime\_Type.pdf and http://www.unc.edu/~kevenson/\_MESA\_ChicagoCrime\_Location.pdf.

### Baltimore City, MD

An attempt was made to match the City of Chicago coding as much as possible. The data was not as finely detailed as the Chicago data and therefore, could not use all of the same categorizations as Chicago. Also, the location of the crime was unavailable so they could not be coded into indoor and outdoor. Crimes were coded using the Baltimore City crime code to categorize into 5 categories:

1. **Murder**
   1. Includes homicide.
   2. There was only on possible grouping for homicide. Homicides that are involuntary manslaughter or reckless homicide may not be excluded from this.
2. **Criminal Offenses (common across all sites)**
   1. Includes robbery, rape, and burglary.
   2. Excludes pocket-picking, purse-snatching, stalking, arson and kidnapping since these are not available in the available data.
3. **Criminal Offenses (common across 3 sites with arson)**
   1. Includes robbery, rape, burglary, and arson.
   2. Excludes pocket-picking, purse-snatching, stalking, and kidnapping since these are not available in the available data.
4. **Assault and Battery**
   1. Includes any assault or battery
5. **Burglary.** These are also included in criminal offenses but a separate category was wanted since several studies have found that burglary is a strong predictor of leaving your home. Perhaps in high crime neighborhoods, fear of burglary might inhibit outside activity.
   1. Includes any burglary.

Incivilities and drugs were unable to be coded since this data was not available in the data available on OpenBaltimore.

### St Paul, MN

An attempt was made to match the City of Chicago coding as much as possible. The data was not as finely detailed as the Chicago data and therefore, could not use all of the same categorizations as Chicago. Also, the location of the crime was unavailable so they could not be coded into indoor and outdoor. Crimes were coded using the St Paul crime code to categorize into 5 categories:

1. **Murder**
   1. Includes homicide.
   2. There was only on possible grouping for homicide. Homicides that are involuntary manslaughter or reckless homicide may not be excluded from this.
   3. Note from St Paul Police Department (12/3/2013): Offense ID 3100, investigation of a death is the most common code and acts as a catch-all until investigation determines if it should remain a death code (natural, suicide, or accidental industrial) or move into a Homicide code (110 or 120).  It’s unclear what the distinction between Offense ID 110 and 120 is for the homicide codes. Also, some homicides never get recoded from 3100’s into 110’s for whatever reason, so actual homicides are kept track of manually. Plus, some homicides come in as Aggravated Assault or Robberies etc, and never get recoded from 300 or 400 type crimes into 110s.
   4. Based on the note above, homicides were only included for Offense ID 110 and 120, not 3100. This may lead to slight undercounts in the number of homicides.
2. **Criminal Offenses (common across all sites)**
   1. Includes robbery, rape, and burglary.
   2. Excludes pocket-picking, purse-snatching, stalking, arson and kidnapping since these are not available in the available data.
3. **Criminal Offenses (common across 3 sites with arson)**
   1. Includes robbery, rape, burglary, and arson.
   2. Excludes pocket-picking, purse-snatching, stalking, and kidnapping since these are not available in the available data.
4. **Assault and Battery**
   1. Includes any assault or battery
5. **Burglary.** These are also included in criminal offenses but a separate category was wanted since several studies have found that burglary is a strong predictor of leaving your home. Perhaps in high crime neighborhoods, fear of burglary might inhibit outside activity.
   1. Includes any burglary.

Incivilities and drugs were unable to be coded since this data was not available from the SPPD data.

### Winston-Salem, NC

An attempt was made to match the City of Chicago coding as much as possible. The data was not as finely detailed as the Chicago data and therefore, could not use all of the same categorizations as Chicago. Also, the location of the crime was unavailable so they could not be coded into indoor and outdoor. Crimes were coded using the crime type code to categorize into 4 categories:

1. **Murder**
   1. Includes homicide.
   2. Where CRIME\_TYPE = “HOMICIDE”
   3. There was only on possible grouping for homicide. Homicides that are involuntary manslaughter or reckless homicide may not be excluded from this.
2. **Criminal Offenses (common across all sites)**
   1. Includes robbery, rape, and burglary.
   2. Where CRIME\_TYPE = “BURGLARY - B&E”, “RAPE”, “ROBBERY”
   3. Excludes pocket-picking, purse-snatching, stalking, arson, and kidnapping since these are not available in the available data.
3. **Assault and Battery**
   1. Includes any assault or battery
   2. Where CRIME\_TYPE = “AGGRAVATED ASSAULT”
4. **Burglary.** These are also included in criminal offenses but a separate category was wanted since several studies have found that burglary is a strong predictor of leaving your home. Perhaps in high crime neighborhoods, fear of burglary might inhibit outside activity.
   1. Includes any burglary.
   2. Where CRIME\_TYPE = “BURGLARY – B&E”

Incivilities and drugs were unable to be coded since this data was not available in the data received from the WSPD.

## GIS-Based Measures

Measures for the total counts of crimes within each crime category (as described above) for buffer sizes of 1/4, 1/2, and 1 mile around the participants’ residential addresses were created using ArcGIS 9.3. Any crime records where the latitude/longitude (or X/Y coordinate) is missing are excluded from all measures.

From these measures of counts of crimes, a yearly average of crime per 1,000 population was created by:

YEARLY AVERAGE OF CRIME = (NCRIME/NPOPULATION)\*1000

Where:

NCRIME = the sum of crime category over a 1 year period before the exam date within the buffer (for example: if the exam is Jan 2002, then this is the number of crimes from Jan 2001-Dec 2001)

NPOPULATION = the total population within the buffer for either 2000 or 2010 as described below

The total population is available based on Census 2000 and Census 2010. For exam dates between Jan 2000-Jan 2006, the population used is from Census 2000 and for exam dates between Jan 2006-Jun 2013, the population used is from Census 2010. This represents the mid-point between when the population measures are available. Total population within each of the buffer sizes was created using census block population data from Census 2000 and Census 2010. Each block was weighted by the percent of the area that fell with the participant buffer. The total population within that block was then multiplied by this weight and the weighted populations were summed together for the total population within the buffer. This assumes an equal distribution of people per unit area within the census block.

For analysis purposes, this will reflect the one year average for the neighborhood where the participant is living at the time of the exam. This is to stabilize the seasonal trends within a neighborhood.

A percent of the participants’ buffers for ¼, ½, and 1 mile that fall within the city limits of Chicago, Baltimore City, St Paul, and Winston Salem were created. The indicators for the percent of area that falls within the jurisdiction is used as indicators for which participants will have usable data for the crime measures. For these indicators, a value of 1 means the entire buffer is within the crime jurisdiction and a value of 0 means the buffer is completely outside the crime jurisdiction. Values between 0 and 1 mean that only part of the buffer is within the crime jurisdiction. If any portion of the buffer is within the study site, then crime measures are created. It is recommended that most analyses be restricted to those with at least 90% of the buffer contained in the site.

## Cumulative Averages

To assess long-term cumulative exposure to the neighborhood environment, we created time-varying cumulative means, defined as the mean across all months from the baseline to each follow-up exam. This is only available for Chicago since this is the only site with data available starting at baseline.

A monthly address dataset was created with a row for each month that the participant was in the study starting with their Exam 1 date. The last row in the dataset is the date at the last exam the participant completed. The cumulative average is then calculated as:

Where t = number of months from Exam 1 to follow-up exam (ie: Exam 2, Exam 3, Exam 4, or Exam 5)

For Exam1, the value of the cumulative average variable is the same as the actual value for Exam1. For any months with missing data, these months are excluded from the calculation of the average.

These summary measures are intended to be used in a model such as (Cumulative Average Model):

Ykit= βo+ β1Xki0+ β2Tkit+ β3(avgXkit\*Tkit)+ β4Aki0+ β5( Aki0\*Tkit)+ βmCovki0+βn(Covki0\*Tkit)+ βpCovTkit+ηk+αki+(νki\*Tkit)+ekit

Where:

Y*kit* = Outcome of interest

X*ki0* = Neighborhood exposure at Exam 1 (baseline)

T*kit* = Time elapsed since Exam1. This will be 0 for Exam1 (baseline) since no time has elapsed.

avgX*kit* = Average neighborhood exposure from Exam1 (baseline) to time *t*

Aki0 = Age at Exam1 (baseline). This controls for age and cohort effects assuming that period effects are null.

Covki0 = Covariates for adjustment at Exam1 (baseline - not time varying)

CovTkit = Time Varying covariates for adjustment

β0= Intercept

β1= Coefficient for baseline neighborhood exposure

β2= Coefficient for time trend

β3= Coefficient for the cumulative neighborhood exposure with change in outcome over time

β4= Coefficient for baseline age effect

β5= Coefficient for baseline age with change in outcome over time

βm= Coefficients for baseline covariates

βn= Coefficients for baseline covariates with change in outcome over time

βp= Coefficients for time varying covariates

ηk =Random effect for neighborhood intercept

αki= Random effect for person i intercept

νki\*Tkit= Random effect for person i time slope

e*kit* = measurement error associated with outcome

If a participant moved outside the study area where data was collected, crime measures are missing for those exams but a cumulative average is still available. This was calculated as the cumulative average to the point when they moved, then carried forward for future dates. You may want to exclude anyone whose buffer (CRMPCT14, CRMPCT0, CRMPCT1) is zero (outside study area).

1. <http://www.cityofchicago.org/content/city/en/narr/foia/CityData.html> [↑](#footnote-ref-1)
2. https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2 [↑](#footnote-ref-2)
3. <https://data.cityofchicago.org/Transportation/Street-Center-Lines/xy4z-b6aa> [↑](#footnote-ref-3)
4. <https://data.baltimorecity.gov/Crime/BPD-Part-1-Victim-Based-Crime-Data/wsfq-mvij> [↑](#footnote-ref-4)
5. Perkins D, Meeks J, Taylor R: The physical environment of street blocks and resident perceptions of crime and disorder: implications for theory and measurement.J Env Psych 1992, 12**:**21-34. [↑](#footnote-ref-5)