2017 Neighborhood Health Profile Technical Notes
January 2019

Explanation of the Community Statistical Area (CSA) Geography

Baltimore is a city of neighborhoods, with over 270 currently recognized by the City. Over time, the nature of numerous neighborhoods – boundaries, personalities, even names – have changed. In order to analyze data at a community level, we use a geography known as the Community Statistical Area (CSA). There are 55 CSAs in Baltimore City, each representing areas of the city with similar social and economic characteristics, and defined as groupings of census tracts. These groupings allow for the collection, aggregation, and presentation of a wide range of data for a stable geography over time. From the Baltimore Neighborhood Indicators Alliance's Vital Signs report:

"CSAs were initially designed by the Baltimore Data Collaborative with the Baltimore City Department of Planning. Four guidelines were established for constructing the CSAs:

- CSA boundaries had to align with Census Tracts;

- CSAs would consist of 1-8 tracts, preferably with total populations in the rage of 5,000 to 20,000;

- CSAs would define relatively demographically homogenous areas;

- CSAs should reflect the City planners' understanding of residents' and institutions' perceptions of the boundaries of the community."[1]

Geospatial Analysis

Esri's ArcGIS 10.1 was used to carry out all geocoding, geoprocessing, and geospatial analysis.

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[1] Frequently Asked Questions (FAQs); Baltimore Neighborhoods Indicators Alliance - Jacob France Institute. Accessed July 2016. http://bniajfi.org/faqs/

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Aggregation of Data to the Community Statistical Area (CSA) Level

Data were aggregated to the CSA level in one of two manners. For indicators based on American Community Survey data, numerator and denominator data were downloaded at the census tract level. These data were then aggregated by CSA, and the indicator calculated based on the aggregate data. Mortality data, made available on a census tract level by the Vital Statistics Administration, were similarly aggregated.

For indicators based on location data, such as incident, built environment, or available resource indicators, data were first geocoded, then joined based on spatial location with the Community Statistical Area shapefile to give a count of points within each CSA.

Denominators

Denominators for indicators based on rates per demographic unit - i.e. residents, households, or housing units - were provided by the United States Census; for the purposes of these profiles, we are using data from the 2010 decennial census. Denominators for indicators based on density per square mile or percent of land coverage were calculated using land area only.

Demographics and Socioeconomic Environment

Demographic and socioeconomic data at the CSA and City level were provided by the U.S. Census' American Community Survey; for the purposes of these profiles, we are using 2011-2015 5-year estimate data.

Percentage of Children in Single-Parent Households

Data come from American Community Survey table B09005: HOUSEHOLD TYPE FOR CHILDREN UNDER 18 YEARS IN HOUSEHOLDS (EXCLUDING HOUSEHOLDERS, SPOUSES, AND UNMARRIED PARTNERS), 2011-2015 American Community Survey 5-Year Estimates.

Percentage of Adults and Percentage of Children with No Health Insurance

Data come from American Community Survey table B27001: HEALTH INSURANCE COVERAGE STATUS BY SEX BY AGE, 2011-2015 American Community Survey 5-Year Estimates.

Percentage of Limited English Speaking Proficiency

Data come from American Community Survey table DP02: SELECTED SOCIAL CHARACTERISTICS IN THE UNITED STATES, 2011-2015 American Community Survey 5-Year Estimates.

Household Income Distribution

Data come from American Community Survey table B19001: HOUSEHOLD INCOME IN THE PAST 12 MONTHS, IN 2014 INFLATION-ADJUSTED DOLLARS, 2011-2015 American Community Survey 5-Year Estimates.

Unemployment Rate

Data come from American Community Survey table B23025: EMPLOYMENT STATUS FOR THE POPULATION 16 YEARS AND OLDER, 2011-2015 American Community Survey 5-Year Estimates.

Family Poverty Rate

Data come from American Community Survey table B17010: POVERTY STATUS IN THE PAST 12 MONTHS OF FAMILIES BY FAMILY TYPE BY PRESENCE OF RELATED CHILDREN UNDER 18 YEARS BY AGE OF CHILDREN, 2011-2015 American Community Survey 5-Year Estimates.

Hardship Index

The Hardship Index is a composite score of socioeconomic hardship within a CSA, relative to other CSAs and to the City. The Hardship Index combines six indicators of public health significance: percentage of occupied housing units with more than one person per room (i.e. crowded housing); percentage of households living below the federal poverty level; percentage of persons aged 16 years or older in the labor force that are unemployed; percentage of persons aged 25 years or older without a high school diploma; percentage of the population under 18 or over 64 years of age (i.e., dependency); and per capita income. Scores can range from 1 to 100, with higher scores representing higher relative hardship. This index is based on work done by the City of Chicago, which first calculated its Hardship Index scores in November 2011.[2]

Built Environment

Liquor Store Density

Liquor stores are defined as establishments that sell beer, wine, and/or liquor under a Class A or A-2 license issued by the Baltimore City Liquor License Board. These licenses cover establishments that provide "Off Sale package goods - no on-premises consumption"[3] six days a week. Data were pulled from the OpenBaltimore data portal June 2016.

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[2] Selected socioeconomic indicators in Chicago, 2006-2010; Chicago Department of Public Health. November 2011. https://data.cityofchicago.org/api/assets/A02C1C5F-8D89-466C-8492-B1FED3DA4C87.
[3] License Types; Baltimore City Liquor License Board. Accessed July 2016. http://llb.baltimorecity.gov/license-types.

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Tobacco Store Density

Tobacco stores are defined as establishments that sell cigarettes or other tobacco products such as cigars, pipe tobacco, chewing tobacco, roll-your-own tobacco, snuff, snus, or other smokeless tobacco products. Data were provided June 2016.

Percentage of Land Covered by Green Space

A "green space" shapefile was created from separate shapefiles for tree canopy, vegetated area, and park land, using the union geoprocessing tool. This shapefile was split along CSA boundaries, and an amount of green space area was calculated per CSA; this was then divided by land area to provide a percentage of coverage. The tree canopy shapefile was created through analysis of satellite imagery by the University of Vermont Spatial Analysis Lab in 2007. The vegetated area shapefile represents photogrammetrically captured vegetation features such as wooded/brush areas and tree rows of 50 feet or greater in length, and was last updated in 2008. The park land shapefile is based on a 2016 inventory of parks by the Baltimore City Department of Recreation and Parks. This coverage is not mutually exclusive of coverage of pavement and coverage of industrial zoning; therefore, percentages may add up to more than 100%.

Percentage of Land Covered by Pavement

In order to obtain an amount of area covered by pavement, the dissolve geoprocessing tool was applied to the street area shapefile, thereby creating a simplified shapefile containing eight features: paved alleys, paved driveways, paved medians, unpaved medians, parking lots, paved roads, unpaved roads, and intersections. This shapefile was split along CSA boundaries, and an amount of pavement area was calculated per CSA by summing the amount of area of paved alleys, paved driveways, paved medians, parking lots, paved roads, and intersections. This sum was then divided by land area to provide a percentage of coverage. This coverage is not mutually exclusive of coverage of green space and coverage of industrial zoning; therefore, percentages may add up to more than 100%.

Percentage of Land Zoned Industrial

In order to obtain an amount of area zoned for industrial purposes, features from the Baltimore Department of Planning's zoning polygon shapefile were selected by attribute, using the query "CATEGORY" = "M". The results were exported to a separate shapefile, and split along CSA boundaries. An amount of area zoned industrial was calculated per CSA; this was then divided by land area to provide a percentage of coverage. This coverage is not mutually exclusive of coverage of pavement and coverage of green space; therefore, percentages may add up to more than 100%.

Rate of Rat Service Requests to 311

Rat Service Requests to 311 are defined as those citizen-generated requests categorized as service request type "HCD-Rodents", "SW-Rat Rubout", and "SW-Rat Rubout Follow-up"; this definition does not include those categorized as "SW-Rat Rubout (Proactive)", as those are generated by the Bureau of Solid Waste directly. Service requests are geocoded to address or street intersection when available; where specific location data are not available, requests are assigned to CSA by neighborhood. Rates may include multiple requests to the same location. Data were pulled from OpenBaltimore January 2017.

Educational Environment

School Readiness and 3rd and 8th Grade Reading Proficiency

Data were provided by the Baltimore Neighborhood Indicators Alliance via the Baltimore City Public School System. School readiness represents the percentage of children whose composite score indicates full school readiness out of all kindergarten school children tested within an area in a school year. The Maryland Model for School Readiness (MMSR) is an assessment and instructional system that was designed to provide parents, teachers, and early childhood providers with a common understanding of what children know and are able to do upon entering school. Under the MMSR system, all children entering kindergarten are assessed for level of mastery across several learning domains. These domains include: social and personal development; language and literacy; mathematical thinking; scientific thinking; social studies; the arts; and physical development and health. Kindergarten teachers must evaluate students during the first few months of the kindergarten year using selected Work Sampling System (WSS) indicators and report their ratings by the end of November of each year to the state. Maryland's Kindergarten Readiness Assessment (KRA) is part of Maryland's new Ready 4 Kindergarten (R4K): Early Childhood Comprehensive Assessment System, and was first administered in the 2014-15 school year to measure the skills and behaviors that children should learn prior to entering kindergarten. Future profiles will reference this assessment.

Reading proficiency represents the percentages of students passing Maryland School Assessment (MSA) exams in reading in 3rd and 8th grades. MSA scores measure the number of students scoring in one of three classifications out of all students enrolled in that grade. Students can either be rated as advanced, proficient, or having basic knowledge of a subject. This indicator includes only those students who have tested as advanced or proficient. Future versions of the Neighborhood Health Profiles will present PARCC data on ELA for 3rd and 8th grades.

School Absenteeism

Data were provided by the Baltimore Neighborhood Indicators Alliance via the Baltimore City Public School System. School absenteeism data represents the percentages of students in elementary (1st – 5th grades), middle (6th – 8th grades), and high (9th – 12th grades) school that missed at least 20 school days in the previous school year.

Adult Educational Attainment

Data come from American Community Survey table B15003: EDUCATIONAL ATTAINMENT FOR THE POPULATION 25 YEARS AND OVER, 2011-2015 American Community Survey 5-year estimates.

Safety Environment

Rate of Animal Abuse Service Requests to 311

Animal Abuse Service Requests to 311 are defined as those categorized as service request type "HLTH-Animal in Danger/Injured/Abused/Neglected". Service requests are geocoded to address or street intersection when available; where specific location data are not available, requests are assigned to CSA by neighborhood. Rates may include multiple calls to the same location. Data were pulled from OpenBaltimore January 2017.

Non-Fatal Shooting Rate

Non-fatal shooting data represent a subset of the Baltimore Police Department's Part 1 Victim Based Crime Data set, available publicly at Baltimore City's OpenBaltimore data portal. Data were filtered by crime date and description; those crimes that occurred between January 1, 2011 and December 31, 2015 and matched "shooting" in the description column were pulled. All data are geocoded to the approximate latitude/longitude location of the incident; those records for which an address could not be geocoded are excluded. Data were pulled July 2016. Due to a change in methodology, data are not comparable to previous versions of the Neighborhood Health Profiles.

Homicide Rate

Homicide data represent a subset of the Baltimore Police Department's Part 1 Victim Based Crime Data set, available publicly at Baltimore City's OpenBaltimore data portal. Data were filtered by crime date and description; those crimes that occurred between January 1, 2011 and December 31, 2015 and matched "homicide" in the description column were pulled. All data are geocoded to the approximate latitude/longitude location of the incident (not victim's home address); those records for which an address could not be geocoded are excluded. Data were pulled July 2016. Due to a change in methodology, data are not comparable to previous versions of the Neighborhood Health Profiles.

Youth Homicide Mortality Rate

This represents the number of deaths due to homicide per 100,000 youths under 25 years old. Death data are provided by the Maryland Department of Health and Mental Hygiene's Vital Statistic Administration, filtered by ICD-10 code to categorize cause of death; for assault/homicide, these codes are X85-Y09 and Y87.1. Mortality rates are based on the home addresses of the deceased; this differentiates this rate from the other rates in this category, which are based on the location of the incident. This should not be considered a subset of Homicide Rate.

Housing Environment

Average Annual Lead Paint Violation Rate

Lead paint violations in Baltimore City are tracked by address by the Baltimore City Health Department's Lead Program. Violations were assigned to CSAs by geolocation of their physical address in ArcGIS 10.1. Some addresses have received multiple violations during the time period examined (2006-2015). For the purposes of this indicator, all violations were included in the numerator. This indicator is calculated differently than in previous versions of the Neighborhood Health Profiles; data are not comparable.

Vacant Lot Density

Vacant lot data are maintained in a shapefile by the Mayor's Office of Information Technology, Enterprise Geographic Information Services office. The data are automatically updated via the real property database managed by the Maryland State Department of Assessments and Taxation. Raw data on real property is collected by the Baltimore Department of Housing. This document includes data from the July 2016 shapefile update.

Vacant Building Density

The Housing Authority of Baltimore City provides vacant building data by address on the OpenBaltimore Data Portal; data were accessed July 2016.

Food Environment

Percent of Land Covered by Food Desert

The 2015 Baltimore City Food Desert shapefile, available for download on the Maryland Food System Map website at http://mdfoodsystemmap.org/glossary/baltimore-city-food-deserts-2/, was split along CSA boundaries, and an amount of food desert area was calculated per CSA; this was then divided by land area to provide a percentage of coverage. A food desert in Baltimore City is defined as "an area where the distance to a supermarket or supermarket alternative is more than 1/4 mile, the median household income is at or below 185% of the Federal Poverty Level, over 30% of

households have no vehicle available, and the average Healthy Food Availability Index score for all food stores is low."[4]

Carryout Density

Carryout data are from the BCHD open food facilities permit/license database, updated November 2016. These data were geocoded and used to calculate CSA-level densities. Carryout data in this report reflect establishments coded as a "carryout" in the establishment type and/or business code fields in the database, as well as establishments that were not coded as a carryout but had "carryout" in their restaurant name. Fast food restaurants are excluded from this count, as they have their own indicator. Please see Limitations below for information on data scrubbing.

Corner Store Density

Corner store data are from the Center for a Livable Future and include stores identified as corner stores, convenience stores, discount stores, and gas stations with minimarts in the Type field. These data were updated 2016 and used as provided.

Fast Food Density

Fast food data are from the BCHD open food facilities permit/license database, updated November 2016. These data were geocoded and used to calculate CSA-level densities. Fast food restaurants were categorized as the following: Baja Fresh*, Blimpie, Burger King, California Tortilla, Checkers*, Chik-Fil-A*, Chipotle, Dunkin' Donuts, Five Guys, Jimmy Johns*, KFC, Long John Silver, McDonalds, Popeyes, Potbelly, Qdoba, Quiznos, Subway, Taco Bell, and Wendy's.

* Fast food restaurants added since the 2011 Neighborhood Health Profiles. There are 11 locations of these restaurants city-wide; without these restaurants, the city-wide fast food density is 2.3 outlets per 10,000 residents.

Health Outcomes

Life Expectancy at Birth

Estimated life expectancy at birth is defined as the average number of years a person born today would live if he/she experienced the mortality rates observed in this report over the course of his/her life. The life expectancy estimate in this report reflects the mortality rates among people living in «CSA» from 2011 to 2015. Babies born today in «CSA» would experience this life expectancy only if the current age-specific mortality rates remained constant over the course of their

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[4] Mapping Baltimore City's Food Environment: 2015 Report; Johns Hopkins Center for a Livable Future. June 2015. http://mdfoodsystemmap.org/2015-baltimore-city-food-access-map/.

lives. Life expectancy was calculated using a life table calculator for small area estimates developed by the South East Public Health Observatory in England.[5]

Age-adjusted All-cause Mortality Rate

Age-adjusted mortality represents the number of deaths per 10,000 people per year assuming that each neighborhood had the same age structure (similar numbers of people in each age group). Age adjustment is done so that a neighborhood with a proportionally large number of elderly people (who are more likely to die because of their age) does not show a higher mortality rate simply because of the older age of its inhabitants. Direct age-adjustment was conducted using the 2000 US standard population and the following age groups, consistent with the Baltimore Neighborhood Indicators Alliance: < 1 year, 1-14 years, 15-24 years, 25-44 years, 45-64 years, 65-84 years, 85+ years.[6]

Rate of Reported Foodborne Illness

The CDC describes more than 250 types of foodborne illness; for the purposes of this report, foodborne illnesses include campylobacteriosis, salmonella, and shigellosis. These represent the three most commonly reported foodborne illnesses in Baltimore City. Data represent the incidence rate per year of said illnesses within each CSA for the years 2011-2015.

Rate of Hepatitis C

Laboratories and medical providers report confirmed cases of Hepatitis C to the Maryland National Electronic Disease Surveillance System. Where available, address data were geocoded and used to calculate CSA-level incidence rates. Addresses that could not be geocoded are not included in CSA-level calculations, but are included in the City-wide rate. Data represent the incidence rate per year within each CSA for the years 2011-2015.

Selected Causes of Death

Selected causes of death are those that either accounted for the largest number of deaths in Baltimore in 2011-2015, as determined by the Maryland Vital Statistics Administration, or are of particular relevance to the Health Department's priorities, such as deaths that are drug- and/or alcohol-induced. Specific ICD-10 codes for each cause of death can be found in the Maryland Department of Health and Mental Hygiene's Maryland Vital Statistics Annual Report. Direct age-adjustment was conducted using the 2000 US standard population and 10-year age groups.

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[5] Life expectancy calculator: LA and ward level; Public Health England. September 2004. http://www.sepho.org.uk/viewResource.aspx?id=8943.
[6] Klein RJ, Schoenborn CA. Age-adjustment using the 2000 projected U.S. population. Healthy People Statistical Notes, no. 20, Hyattsville, Maryland: National Center for Health Statistics. January 2001.

Maternal and Child Health

Birth rate is defined as the number of live births per 1,000 residents. Teen birth rate is defined as the number of live births to females between 15-19 years of age per 1,000 females in the population in that age range.

Prenatal care, smoking during pregnancy, and maternal body mass index (BMI) are reported on the birth certificate. Preterm births are live births occurring before 37 weeks gestation. Low birth weight is defined as live births weighing less than 2500 grams (5 pounds 8 ounces) at delivery.

Infant mortality rate (IMR) is defined as the number of infant deaths (babies less than 1 year of age) per 1,000 live births in a given year. IMR is considered one of the most sensitive, accurate measures of mortality in the population, as it relies on vital statistics reporting, not census estimates or sampling. Birth outcomes were computed from vital records provided by the Vital Statistics Administration of the Maryland Department of Health and Mental Hygiene.

Lead Poisoning

Lead poisoning data are calculated by the Baltimore Neighborhood Indicators Alliance from data from the Lead Poisoning Prevention Program at the Maryland Department of the Environment, and represent the percentage of children tested with elevated blood lead levels of 10 micrograms/deciliter or higher. Not all children ages 0 to 6 years of age are tested annually, so this measure should not be used to indicate prevalence of lead poisoning in each CSA.

Limitations

Small Numbers

Because neighborhoods can have small population sizes in certain age groups, there is the possibility that small differences could produce large differences in rates. We addressed this potential issue by grouping years together and thereby estimating rates using larger numbers. Despite this, there is some uncertainty associated with these estimates due to the small population sizes involved.

Data Scrubbing

Some datasets, particularly those pertaining to licenses and permits, were provided "as-is". Data were scrubbed of duplicate, invalid, and inaccurate entries to the best of our ability prior to analysis; however, some such entries may have inadvertently been included in the calculation of density rates.

Citizen Service Requests (CSRs) to 311

CSRs are citizen-generated contacts to Baltimore City's 311 service requesting City services; as such, they are reliant on a citizen's level of trust with City services. Rates may be over-representative of the burden in CSAs with residents more willing to engage with City services, and under-representative of the burden

in CSAs with residents less willing to engage with City services – for example, CSAs with residents who opt for private extermination firms may have a lower rate of calls to 311 for rodents than expected.

Data Availability

These reports only contain data on a select set of indicators of health and the social determinants of health that are available at the neighborhood level. Data were not included for smoking and healthcare-seeking behaviors, diet, exercise, the prevalence of chronic diseases, disability, drug addiction, mental illness, air quality measures, stress, and a range of other individual- and community-level social determinants such as health literacy, social support, social capital, and social cohesion.

For further neighborhood information not included in this profile, visit the Baltimore Neighborhood Indicators Alliance (BNIA) website (http://bniajfi.org/). BNIA curates more than 100 indicators at the neighborhood-level on an annual basis for Baltimore City. We encourage you to visit BNIA's website and contact them at Baltimore Neighborhood Indicators Alliance, The Jacob France Institute, University of Baltimore, 1420 N. Charles Street, Baltimore, MD 21201, phone 410-837-4377, and email bnia-jfi@ubalt.edu.

Contact information

For additional information or questions about the 2017 Neighborhood Health Profiles, please contact the Office of Epidemiology Services at the Baltimore City Health Department at 410-361- 9580 or health_research@baltimorecity.gov.

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