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| **Domain:** | Social Environments |
| **Measure:** | Neighborhood Concentrated Disadvantage |
| **Definition:** | This measure uses readily available secondary data from the U.S. Census Bureau. |
| **Purpose:** | This measure examines various population characteristics at the neighborhood level to determine the concentration of poverty. In the social science and public health literatures, one of the most important indicators for a host of individual outcome measures that are incorporated at the neighborhood level is Neighborhood Concentrated Disadvantage (Kawachi & Berkman, 2003; Massey & Denton, 1993; Sampson, Morenoff, & Gannon-Rowley, 2002; Wilson, 1987). |
| **Essential PhenX Measures:** |  |
| **Related PhenX Measures:** |  |
| **Collections:** |  |
| **Keywords:** | Neighborhood Poverty, Neighborhood Disadvantage, Public Assistance, Female-headed Households; U.S. Census |

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| **Protocol Release Date:** | October 20, 2010 |
| **PhenX Protocol Name:** | Neighborhood Concentrated Disadvantage |
| **Protocol Name from Source:** | This section will be completed when reviewed by an Expert Review Panel. |
| **Description:** | The protocol is based on extracting data from the U.S. Census Bureau on a set of variables related to the concept of "concentrated disadvantage" (Sampson, Raudenbush, & Earls, 1997). All the relevant variables are available from the long form of the 1990 and 2000 decennial Censuses. Once the data are extracted, an index score of concentrated disadvantage can be calculated at the neighborhood level of interest; this is usually based on census tract or census block-group data. All the necessary variables used in calculating concentrated disadvantage are included in the American Community Survey. As of summer 2010, concentrated disadvantage can be calculated from 3-year estimates (e.g., 2005-2007) of the American Community Survey, but for only a limited set of geographical levels. Once American Community Survey 5-year estimates (e.g., 2005-2009) become available in fall 2010, it should be possible to calculate concentrated disadvantage at smaller census geographies, including census tract and census block-group levels. |
| **Specific Instructions:** | Assuming that information on current address (see PhenX Demographics domain, Current Address measure) and any previous address(es) (see PhenX Environmental Exposures domain, Residential History measure) has been collected for a study respondent, then via geocoding it is possible to link the address of a study participant to his or her local neighborhood (a geographic area), typically by a Census-defined area, such as a census block-group or census tract, or by Zone Improvement Plan (ZIP) code area. The original paper by Sampson et al. (1997) was based on the use of variables from the 1990 decennial Census and applied to a neighborhood definition based on aggregates of Census tracts, called neighborhood clusters. The Social Environments Working Group recommends that researchers follow Sampson et al (1997) and conduct a factor analysis (e.g., a principal components analysis using varimax rotation methods or alpha-scoring factor analysis).The extracted variables are typically very highly correlated undermining any investigation of unique effects. Sampson et al (1997, p. 920) find that consistent with urban theory these six poverty-related variables are highly associated and load on the same factor (note: their work was based on 1990 Census data for Chicago). Other studies in other settings confirm that these six variables (poverty, percentage of single-parent families, percentage of family members on welfare and unemployed, and a measure of racial segregation) load on a single factor with individual factor loadings typically exceeding 0.8. The Social Environments Working Group recommends that investigators record and report the factor loading scores for each variable used in the factor analysis. These would vary across studies but knowing how they vary (i.e., what other studies found) would allow for comparison between studies. The calculation of concentrated disadvantage based on factor analysis generates a measure that is sample dependent (i.e., study specific). However, it is important to note that this is a well established, robust and highly cited measure across the social sciences and public health. The social science literature has long argued that neighborhood disadvantage is not a single-item construct captured by, for example, a measure of poverty (e.g., percent of individuals below the poverty level) or measures such as the Index of Concentration at the Extremes (Massey, 2001). |
| **Protocol:** | The technical documentation for the 1990 and 2000 decennial Censuses are available online at American Factfinder (http://factfinder.census.gov). Select the Data Sets link, and then select Decennial Census. Different tabs allow the user to select 2000 or 1990 data or materials. Specific data sets are then selected by clicking in data-specific radio buttons (e.g., for Census 2000 options, include SF1 or SF3). SF1 refers to Summary File 1 (the short form of the U.S. Census collected on everyone and referred to as "100% data"), and SF3 refers to Summary File 3 (the long form of the U.S. Census collected on detailed population and housing variables from a one-in-six [16%–17%] sample and weighted to represent the total population). For each data set, the user can create table and maps, extract data, or consult technical documentation. Users not familiar with Census data should consult the technical materials. The technical documentation for SF1 and SF3 data sets are available at the U.S. Census website:SF1: http://www.census.gov/prod/cen2000/doc/sf1.pdfSF3: http://www.census.gov/prod/cen2000/doc/sf3.pdfIn the instructions below, P stands for the Population tables, and H stands for the Household tables. Concentrated disadvantage is derived from six Census variables:1. Percent Of Individuals Below The Poverty Line (derived from SF3 Table P87)2. Percent Of individuals On Public Assistance (derived from SF3 Table PCT57)3. Percent Female-Headed Households (derived from SF3 Table P92)4. Percent Unemployed (derived from SF3 Table P43)5. Percent Less Than Age 18 (derived from SF3 Table P8 6. Percent Black (derived from SF3 Table P6)Concentrated disadvantage is calculated for all sub-areas within a study area.While some commercial data products may include the derivation of some of these variables, the detailed material below is based on the assumption that the user will go to the U.S. Census Bureau (original source) for all the raw data counts needed to calculate the individual variables that combined create the measure Concentrated Disadvantage. **1: "Percent of Individuals Below the Poverty Line" is derived from data in SF3 "Table P87. Poverty Status in 1999 by Age."**Table P87: Poverty Status in 1999 by AgeUniverse: Population for whom poverty status is determined: There are 17 cells in Table P87 (SF3, Technical Documentation, Chapter 7, p. 72).Table P87 is reproduced below:

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| **Variable**  | **Reference Cell #** |
| Total (Universe Total) | P087001 |
| Income in 1999 below poverty level:  | P087002 |
| Under 5 years | P087003 |
| 5 years | P087004 |
| 6–11 years | P087005 |
| 12–17 years | P087006 |
| 18–64 years | P087007 |
| 65–74 years | P087008 |
| 75 years and over | P087009 |
| Income in 1999 at or below poverty level: | P087010 |
| Under 5 years | P087011 |
| 5 years | P087012 |
| 6–11 years | P087013 |
| 12–17 years | P087014 |
| 18–64 years | P087015 |
| 65–74 years | P087016 |
| 75 years and over | P087017 |

The percent of individuals below the poverty line = (P087002 / P087001) \* 100. **2: "Percent of Individuals on Public Assistance" is derived from SF3 "Table PCT57. Poverty Status in 1999 of Unrelated Individuals by Householder Status (Including Living Alone) by Social Security Income by Public Assistance Income."**Table PCT57: Poverty Status in 1999 of Unrelated Individuals by Householder Status (Including Living Alone) by Social Security Income by Public Assistance IncomeUniverse: Unrelated individuals for whom poverty status is determined; there are 47 cells in Table PCT57 (SF3, Technical Documentation, Chapter 7, pp. 237–238).Individuals on public assistance can be both above and below the poverty level. To calculate the total number of individuals on public assistance, the user must sum across 12 categories (cells).Below the poverty level PCT057006, PCT057009, PCT057013, PCT057016, PCT057020, PCT057023At or above the poverty levelPCT057029, PCT057032, PCT057036, PCT057039, PCT057043, PCT057046The "percent of individuals on public assistance" = ((PCT057006 + PCT057009 + PCT057013 + PCT057016 + PCT057020 + PCT057023 + PCT057029 + PCT057032 + PCT057036 + PCT057039 + PCT057043 + PCT057046) / PCT057001) \* 100**3: "Percent Female-Headed Households" is derived from SF3 "Table P92. Poverty Status in 1999 of Households by Household Type by Age of Householder."**Table P92: Poverty Status in 1999 of Households by Household Type by Age of Householder Universe: Households; there are 59 cells in Table P92 (SF3, Technical Documentation, Chapter 7, pp. 75–76).Female-Headed Households fall under both Family Households—Other Family and Non-Family Households and fall both above and below poverty level. To calculate the percent Female-Headed Households, the user must sum across *x* categories.The "Percent of Female-Headed Households" = (P092015 + P092026 + P092044 + P092055) / P092001 \* 100**4. "Percent Unemployed" is derived from SF3 "Table P43. Sex by Employment Status for the Population 16 Years and Over."** Table P43: Sex by Employment Status for the Population 16 Years and OverUniverse: Population 16 years and over; there are 15 cells in Table P43 (SF3, Technical Documentation, Chapter 7, p. 50).From technical documentation on SF3 (Appendix B, p. B-10), the U.S. Census Bureau definition of being unemployed is the following:"All civilians 16 years old and over were classified as unemployed if they were neither 'at work' nor with a job but not 'at work' during the reference week, were looking for work during the last 4 weeks, and were available to start a job. Also included as unemployed were civilians 16 years old and over who: did not work at all during the reference week, were on temporary layoff from a job, had been informed that they would be recalled to work within the next 6 months or had been given a date to return to work, and were available to return to work during the reference week, except for temporary illness. Examples of job-seeking activities were: registering at a public or private employment office; meeting with prospective employers; investigating possibilities for starting a professional practice or opening a business; placing or answering advertisements; writing letters of application; and being on a union or professional register."In SF3 Table P43, the unemployed counts include separate totals for men and women. The "percent unemployed" = (P43007 + P43014 ) / P43001) \* 100**5. "Percent Less Than Age 18" is derived from SF3 "Table P8. Sex by Age."** Note that this variable can also be derived from the 100% data—THAT IS, SF1 Tables P12 AND P14 (SF3, Technical Documentation, Chapter 7, pp. 26–28)Table P8: Sex by AgeUniverse: Total Population; there are 79 cells in SF3 Table P8 (SF3, Technical Documentation, Chapter 7, pp. 26–28).The Census collects data on age and reports this information in single age groups for the population forms "under 1 year" through to age 21 years old, and thereafter age is grouped into multiage ranges (e.g., 22–24 years old, 25–29 years old, 30–34 years old, . . . , 85 years and older). Users also need to combine the counts for both males and females. Thus, the sum of males under age 18 years old (including under age 1 year old through to aged 17 years old) equals the sum of all cells P008003 through P008020 and for females the sum of all cells P008042 through P008059.The "percent less than age 18" = (((P008003:P008020) + (P008042:P008059)) / P008001) \* 100**6. "Percent Black" is derived from SF3 "Table P6. Race."** As all the previous variables used in the calculation of concentrated disadvantage are derived from SF3 data, for consistency the measure of Percent Black also draws on this data set. But note this variable can also be derived from the 100% data (i.e., SF1) using detailed race/ethnic data (see SF1, Technical Documentation, pp. 7-25–7-38). Table P8 of SF1 is the data table on race/ethnicity used by many social scientists to create the standard race/ethnicity-based indicators including, "Percent Black" (see PhenX Social Environments domain, Race/Ethnic Segregation).Using SF3 data, "Percent Black" should be calculated from "Table P7. Hispanic or Latino by Race" (SF3, Technical Documentation, Chapter 7, p. 26). Using Table P7 to derive "Percent Black" requires combining the count of (a) Not Hispanic or Latino—Black or African American Alone, with (b) Hispanic or Latino—Black or African American Alone. Table P6 does not include any breakdown by ethnicity (i.e., Hispanic/Latino). The definitions used by the U.S. Census Bureau can be found in SF3, Technical Documentation: Hispanic or Latino (Appendix B, pp. B13, B14) and Race (Appendix B, pp. B12–B17).Table P7: Hispanic or Latino by RaceUniverse: Total Population; there are 17 cells in Table P7 (SF3, Technical Documentation, Chapter 7, p. 25).The "Percent Black" = ((P007004 + P007012) / P007001) \* 100 |
| **Selection Rationale:** | The Social Environments Working Group preferred an objective measure using Census data over a questionnaire that would rely on subjective judgment based on retrospective ascertainment, which is likely to be unreliable. Additionally, the measure of "concentrated disadvantage" is derived from the work of Sampson and colleagues (1997) on the Project on Human Development in Chicago Neighborhoods (PHDCN), which is a well-known, large-scale study. The measure has been used in numerous papers including, the highly cited (3,000+ citations) paper by Sampson et al. (1997). |
| **Source:** | Recommended data sources include the following:The U.S. Census Bureau decennial Census (1990 and 2000).American Factfinder, http://factfinder.census.gov.American Community Survey (ACS) products (specifically, the 5-year estimates), http://www.census.gov/acs/www/.Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277(5238), 918–924.  |
| **Life Stage:** | Any age |
| **Language of source:** | English |
| **Participant:** | Not applicable: Derived from publicly available secondary data |
| **Personnel and Training Required:** | Knowledge of Census data products and websites, such as American Factfinder (http://factfinder.census.gov) and/or commercial geospatial data products, such as that provided by vendors like GeoLytics (http://www.geolytics.com). After extracting the necessary data, statistical methods are used (e.g., principal component analysis [PCA] and factor analysis). |
| **Equipment Needs:** | Access to a desktop/laptop computer with internet access to download raw data from the U.S. Census Bureau's American Factfinder website (http://factfinder.census.gov). Statistical Packages (e.g., SPSS, SAS) for data manipulation and factor analysis. |
| **Standards:** |

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| **Standard** | **Name** | **ID** | **Source** |
| Common Data Element (CDE) | Social Environment Neighborhood Concentrated Disadvantage Assessment Score | 3150986 | [CDE Browser](https://cdebrowser.nci.nih.gov/CDEBrowser/search?elementDetails=9&FirstTimer=0&PageId=ElementDetailsGroup&publicId=3150986&version=1.0) |
| Logical Observation Identifiers Names and Codes (LOINC) | Neighborhood disadvantage proto | 63036-8 | [LOINC](http://s.details.loinc.org/LOINC/63036-8.html?sections=Web) |

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| **General references:** | Kawachi, I., & Berkman, L. (2003). *Neighborhoods and health*. New York: Oxford University Press.Massey, D. S., & Denton, N. (1993). *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press. Sampson, R. J., Morenoff, J., & Gannon-Rowley, T. (2002). Assessing neighborhood effects: Social processes and new directions in research. Annual Review of Sociology, *28,* 443–478.Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277(5238), 918–924. Wilson, W. J. (1987). *The truly disadvantaged: The inner city, the underclass, and public policy*. Chicago: University of Chicago Press. |
| **Mode of Administration:** | Secondary Data Analysis |
| **Derived Variables:** | None |
| **Requirements:** |

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| **Requirement Category** | **Required** |
| Major equipment | No |
| Specialized training | No |
| Specialized requirements for biospecimen collection | No |
| Average time of greater than 15 minutes in an unaffected individual | No |

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| **Process and Review:** | This section will be completed when reviewed by an Expert Review Panel. |