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Add Health Wave V Documentation

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Waves I-V Gentrification and Retail Environments User Guide

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Notes

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Introduction

Gentrification, Retail Environments, and Chronic Disease Risk is an ancillary study that links data on neighborhood change, food environments, and tobacco retail environments to Add Health. This linkage facilitates longitudinal analyses of how these contextual factors may impact health within the Add Health cohort. Linked data include census tract-level variables representing dimensions of neighborhood change, food and tobacco retail environments, and supplemental contextual data. Neighborhood change measures are provided for Waves I, III, IV, and V, whereas retail environment measures are provided for Waves III, IV, and V. In this guide, we provide detailed descriptions of the data, definitions of each variable, and considerations for analysis.

Data Structure and Form

The data file (**w5gentretail**) contains a total of 62 variables. The first variable is the respondent identifier (AID), by which these data can be merged with other Add Health data files. The remaining variables include measures of neighborhood change, the food and tobacco retail environments, and supplementary variables to facilitate analyses of change over time.

Source Description

The variables in this dataset were derived from US Census and National Establishment Time Series (NETS) data, using protocols developed in previous research.[1-3] Calculations for each variable type are described below and definitions for each variable are provided in the Data Dictionary section of this user guide.

Gentrification-Related Variables

Evidence is emerging about associations between gentrification and health, but this research is limited by lack of longitudinal data.[4] Studies to date mainly use a cross-sectional or repeated cross-sectional design, leading to selection bias because 1) new residents (i.e., gentrifiers) are included in analyses and 2) original residents who stay in a neighborhood that gentrifies may have more health-enhancing resources than those who move.[4,5] To address this limitation and facilitate longitudinal research on the effects of gentrification on *original* residents, the gentrification-related variables provided in this ancillary study focus on whether gentrification occurred in the census tract in which individuals lived at baseline. Thus, for example, gentrification-related measures for an Add Health participant in Wave V relate to whether the participant's Wave IV census tract underwent gentrification over the Wave IV-V time period.

Studies on gentrification typically use a two-step measure that considers 1) eligibility to gentrify, and 2) whether gentrification occurred. In this ancillary study, we provide census tract-level variables that can be used to construct this two-step measure. Although many studies have used similar measures,[6-11] we specifically drew from a definition proposed by Hirsch and Schinasi for use in large, longitudinal population health studies.[1,12–14] Using this definition, census tract-level socioeconomic changes and changes in housing costs are compared with changes of other tracts in the corresponding area: *core-based statistical area (CBSA)* for tracts in metropolitan or micropolitan areas, or *state* for tracts in rural areas.

The definition includes several possible cutoffs for determining both gentrification eligibility and whether gentrification occurred. For example, researchers can define tracts as eligible to gentrify if their median household income falls below the 75th percentile compared with tracts in the corresponding area; alternatively, they can use the 50th percentile or 90th percentile to determine eligibility. To facilitate definition flexibility and sensitivity testing in future studies using these data, we have provided percentile ranks rather than categorical variables based on specific cutoffs.

Eligibility to gentrify: To determine eligibility to gentrify, we linked one variable at Waves I, III, and IV:

- Percentile rank, median household income in census tract compared with other tracts in corresponding area

Gentrification status: To assess whether gentrification occurred, we linked the three variables specified in Hirsch and Schinasi's definition at Waves III, IV, and V. Two versions of the variables marked with an asterisk (*) are provided: one based on percent change and one based on absolute change in dollar amount.

- Percentile rank, change in % of residents over 25 with a bachelor's degree compared with other tracts in corresponding area
- Percentile rank, change in median rent compared with other tracts in corresponding area*
- Percentile rank, change in median home value compared with other tracts in corresponding area*

Racial/ethnic change: In addition, we linked measures of change in racial/ethnic composition of census tracts. Although racial/ethnic change is often not included in gentrification definitions in existing literature,[15] scholars acknowledge its importance[16,17] and advocate for its inclusion in gentrification research.[15] Add Health researchers may wish to use racial/ethnic change measures as moderators to assess the differential effects of gentrification under different racial change dynamics[18] or incorporate them into their definitions of gentrification.[19] We linked three measures of racial/ethnic change at Waves III, IV, and V:

- Change in % of residents identifying as non-Hispanic White
- Change in % of residents identifying as non-Hispanic Black
- Change in % of residents identifying as Hispanic or Latino

Because census tract boundaries change over time, for all change measures we used harmonized census data to maintain consistent tract boundaries. Data harmonization involves use of a "crosswalk" that contains estimates of the proportion of one year's population (e.g., the 1990 population) in another year's census tract boundaries (e.g., the boundaries for 2000). In this example, by multiplying 1990 estimates by this proportion, researchers can estimate 1990 tract-level data within 2000 tract boundaries. The table below indicates the census data source and harmonization method we used for each change period.

Change Period	U.S. Census Datasets	Boundary Year	Data Source and Harmonization Method
Wave 1-3	W1: 1990 Decennial W3: 2000 Decennial	2000	1990 census data acquired from NHGIS[20] harmonized to 2000 boundaries via the U.S. Census Bureau 1990-2000 crosswalk[21]; 2000 census data acquired from NHGIS[20] left as is.
Wave 3-4	W3: 2000 Decennial W4: 2005-2009 ACS	2000	Census data acquired from NHGIS[20] left as is; no harmonization required. Some tracts from 2005-2009 ACS data renumbered according to changes reported by the census.[22]
Wave 4-5	W4: 2005-2009 ACS W5: 2014-2018 ACS	2010	2005-2009 census data acquired from NHGIS[20] harmonized to 2010 boundaries using Stata code and crosswalk provided by the Longitudinal Tract Data Base[23]; 2014-2018 census data acquired from NHGIS[20] left as is.

Note: To maintain consistency across gentrification-related measures, variables measuring eligibility to gentrify were also harmonized to the change period of interest (e.g., Wave 1 eligibility to gentrify data were harmonized to 2000 census tract boundaries).

Retail Environment Variables

All retail environment variables are counts of each retail type per census tract. Counts for the seven retail categories are not mutually exclusive, and therefore cannot be combined to find overall counts. To find the count of each retail type, we used business list data from NETS24 and protocols developed by Golden et al. for tobacco retail[2] and Hirsch et al. for food retail.[3] We then spatially joined identified retailers with 2000 census tracts (Wave III and IV) and 2010 census tracts (Wave V).

Tobacco retail: Golden et al. used North American Identification Classification System (NAICS) codes, Standard Industrial Classification (SIC) codes, retailer names, and state and local policy information to identify probable tobacco retailers from NETS business list data.[2] We used counts that were identified using this protocol and provided by Advancing Science & Practice in the Retail Environment (ASPiRE, P01CA225597).[25]

Food retail: Hirsch et al. used SIC codes, chain names, Google Street View, and expert review to develop a protocol for use by other researchers.[3] We used this protocol to identify food retail and fast food outlets from NETS business list data[24] with deviations from the protocol detailed below.

Protocol Component	Change from Protocol
Data sources for supplemental identification using chain names	Hirsch et al. used data on chain names by business category from Nielsen TDLinx® and Technomics as part of their process for identifying food retail and fast food, respectively. Specifically, chain name lists were used in combination with SIC codes (e.g., a record was included if it matched a range of SIC codes AND its company or trade name was in the list of chain names). We did not have access to these data sources, and instead used the following sources for chain names: 1. Nielsen Homescan® data from 2003 to 2017 for supermarkets/grocery stores, convenience stores, and warehouse clubs. Homescan is a nationally representative consumer panel dataset that has been used in previous food retail studies.[26] 2. Quick Service Restaurant Top 50 (QSR 50) lists from 2001 to 2017 for fast food outlets[27] following methods used in previous literature.[28]
Data cleaning	Although Hirsch et al. did not report cleaning for duplicates beyond what had been done by Walls & Associates,[3] we identified duplicate stores as those with the same company name, latitude, longitude, and year-specific SIC code. In addition, we extensively cleaned chain names for supplemental identification.
Supermarkets/ grocery stores	We included "medium grocery stores" in our supermarket/grocery store category. Although Hirsch et al. did not include medium grocery stores in their "supermarkets" category, we considered a broader definition of supermarkets and grocery stores to be relevant to our measure.
Convenience stores	We included "small grocery stores/bodegas" and "gas stations" in our convenience store category. Although Hirsch et al. did not include these retailers in their "convenience stores" category, we considered them to be relevant to our measure.
Dollar stores	We constructed a "dollar stores" category including retailers that had SIC codes in the ranges 51000000-51999999, 53000000-53999999, 54000000-54999999, 55400000-55499999, 56000000-56999999, 58000000-58999999, 59000000-59999999, or 65120200-65120200 AND store name in the Nielsen Homescan dollar store channel or containing "dollar" or "dolgen."

Protocol Component	Change from Protocol
Specialty stores	We constructed a "specialty stores" category including fish, meat, and fruit and vegetable markets.

Wave IV Variables Using 2010 Census Tracts

We derived 13 variables at Wave IV using 2010 census tract boundaries to facilitate analyses of change over time from Wave IV to V. These include all seven retail environment variables, total population, population density, the index of concentration at the extremes (ICE) for race and the interaction of race and income for Black-White residential segregation, and rural-urban commuting area (RUCA) codes. Retail environment variables were obtained by spatially joining NETS 2008 counts to 2010 census tracts. Census variables were obtained by harmonizing 2005-2009 ACS census data from NHGIS[20] to 2010 census tract boundaries using the Stata code and crosswalk provided by the Longitudinal Tract Data Base.[23] RUCA codes were obtained from the United States Department of Agriculture (USDA).[29]

Guidance for Using Gentrification-Related Variables

Determining Which Add Health Participants Experienced Gentrification

Researchers using these data to measure gentrification are advised to familiarize themselves with the literature[1,4,5,14,30–33] to consider possible cutoffs and additional measurement options. As an example, the following table details how the variables could be used to determine which participants experienced gentrification from Wave IV to V using Hirsch and Schinasi's primary definition (see Source Description).[1]

Analysis Step	Calculation (SAS Syntax)
1. Identify participants who lived in census tracts that were eligible to gentrify in Wave 4.	if T4PMINC < 75 and T4POP10 >= 50 then ELIGIBLE = 1; else ELIGIBLE = 0;
2. Identify participants who lived in census tracts that experienced high increases in the proportion of college-educated residents compared to their surrounding area from Wave 4 to Wave 5.	if T5PCHCOL >= 50 then EDUC = 1; else EDUC = 0;

3. Identify participants who lived in census tracts that experienced *moderately* and *intensely* high increases in housing costs compared to their surrounding area from Wave 4 to Wave 5.	if 50 =< T5PPCHMRENT < 75 or
	50 =< T5PPCHMVAL < 75 then
	HOUSING_MOD = 1;
	else HOUSING_MOD = 0;
	
	if T5PPCHMRENT >= 75 or T5PPCHMVAL >= 75 then HOUSING_INTENSE = 1;
	else HOUSING_INTENSE = 0;
	
	if HOUSING_INTENSE = 1 then HOUSING_MOD = 0;

Analysis Step	Calculation (SAS Syntax)

4. Identify participants who lived in census tracts that experienced *moderate* and *intense* gentrification from Wave 4 to Wave 5.	if ELIGIBLE = 1 and EDUC = 1 and HOUSING_MOD = 1 then GENTRIFIED_MOD = 1;
	else GENTRIFIED_MOD = 0;
	
	if ELIGIBLE = 1 and
	EDUC = 1 and
	HOUSING_INTENSE = 1 then
	GENTRIFIED_INTENSE = 1;
	else GENTRIFIED_INTENSE = 0;

Exploring Differential Associations for Movers and Stayers

A major advantage of using Add Health to study gentrification is the ability to detect differences for those who leave a gentrifying neighborhood (*movers*) vs. those who remain (*stayers*). Researchers can use the grouping variables in the Wave I, II, III, IV & V Grouping Data file (2010 tract boundaries) or the Wave I, II, III & IV Grouping File file (2000 tract boundaries) to determine which participants moved census tracts between waves. Grouping variables are set up as pseudo-FIPS codes, with the first 11 characters acting as an identifier for census tracts. Participants for whom these 11 characters change from one wave to another can be treated as movers, and those for whom they remain the same can be considered stayers.

Variable Naming Conventions

The first character of the variable name represents the geographic scale; since all measures are tract-based, all variables start with T. The next 1-2 numeric characters indicate the associated waves. If there is only one number after "T" (e.g., T1PMINC), that number indicates the wave for which the measure is associated. If there are two numbers after "T" (e.g., T13PPCHMRENT), those numbers indicate the two waves over which the change is measured. For some variables, a percentile rank is provided. These variables compare the measure for the census tract to other tracts in the corresponding area (see Source Description). When the variable is a percentile rank, the next character is P. Variables representing tract-level change over time contain "CH" and those representing medians contain "M." Two versions of change variables based on median rent and home value include are provided; for these, "ACH" represents percentile calculations based on absolute change and "PCH" represents percentile calculations based on percent change. The remaining characters indicate the overall construct (e.g., household income or rent). Definitions of all variables are provided below.

Data Dictionary

Neighborhood Change Measures: Eligibility to Gentrify

Name	Description
T1PMINC	Percentile rank, median household income in participant's Wave I census tract compared with other tracts in corresponding area
T3PMINC	Percentile rank, median household income in participant's Wave III census tract compared with other tracts in corresponding area
T4PMINC	Percentile rank, median household income in participant's Wave IV census tract compared with other tracts in corresponding area

Neighborhood Change Measures: Gentrification

Name	Description
T13PCHCOL	Percentile rank, percentage point change within participant's Wave I census tract in % of residents aged 25+ with a bachelor's degree compared with other tracts in corresponding area (Wave I-III)
T34PCHCOL	Percentile rank, percentage point change within participant's Wave III census tract in % of residents aged 25+ with a bachelor's degree compared with other tracts in corresponding area (Wave III-IV)
T45PCHCOL	Percentile rank, percentage point change within participant's Wave IV census tract in % of residents aged 25+ with a bachelor's degree compared with other tracts in corresponding area (Wave IV-V)
T13PPCHMRENT	Percentile rank, percent change within participant's Wave I census tract in median gross rent compared with other tracts in corresponding area (Wave I-III)
T34PPCHMRENT	Percentile rank, percent change within participant's Wave III census tract in median gross rent compared with other tracts in corresponding area (Wave III-IV)
T45PPCHMRENT	Percentile rank, percent change within participant's Wave IV census tract in median gross rent compared with other tracts in corresponding area (Wave IV-V)
T13PPCHMVAL	Percentile rank, percent change within participant's Wave I census tract in median home value compared with other tracts in corresponding area (Wave I-III)
T34PPCHMVAL	Percentile rank, percent change within participant's Wave III census tract in median home value compared with other tracts in corresponding area (Wave III-IV)
T45PPCHMVAL	Percentile rank, percent change within participant's Wave IV census tract in median home value compared with other tracts in corresponding area (Wave IV-V)
T13PACHMRENT	Percentile rank, absolute change within participant's Wave I census tract in median gross rent compared with other tracts in corresponding area (Wave I-III)
T34PACHMRENT	Percentile rank, absolute change within participant's Wave III census tract in median gross rent compared with other tracts in corresponding area (Wave III-IV)
T45PACHMRENT	Percentile rank, absolute change within participant's Wave IV census tract in median gross rent compared with other tracts in corresponding area (Wave IV-V)
T13PACHMVAL	Percentile rank, absolute change within participant's Wave I census tract in median home value compared with other tracts in corresponding area (Wave I-III)
T34PACHMVAL	Percentile rank, absolute change within participant's Wave III census tract in median home value compared with other tracts in corresponding area (Wave III-IV)
T45PACHMVAL	Percentile rank, absolute change within participant's Wave IV census tract in median home value compared with other tracts in corresponding area (Wave IV-V)

Neighborhood Change Measures: Racial Change

Name	Description
T13CHNHWT	Percentage point change within participant's Wave I census tract in % of residents identifying as non-Hispanic White (Wave I-III)
T34CHNHWT	Percentage point change within participant's Wave III census tract in % of residents identifying as non-Hispanic White (Wave III-IV)
T45CHNHWT	Percentage point change within participant's Wave IV census tract in % of residents identifying as non-Hispanic White (Wave IV-V)
T13CHNHBK	Percentage point change within participant's Wave I census tract in % of residents identifying as non-Hispanic Black (Wave I-III)
T34CHNHBK	Percentage point change within participant's Wave III census tract in % of residents identifying as non-Hispanic Black (Wave III-IV)
T45CHNHBK	Percentage point change within participant's Wave IV census tract in % of residents identifying as non-Hispanic Black (Wave IV-V)
T13CHHISP	Percentage point change within participant's Wave I census tract in % of residents identifying as Hispanic or Latino (Wave I-III)
T34CHHISP	Percentage point change within participant's Wave III census tract in % of residents identifying as Hispanic or Latino (Wave III-IV)
T45CHHISP	Percentage point change within participant's Wave IV census tract in % of residents identifying as Hispanic or Latino (Wave IV-V)

Retail Environment Measures

Name	Description
T3TOBCT00	Number of tobacco retailers in census tract (Wave III – 2000 boundaries)
T4TOBCT00	Number of tobacco retailers in census tract (Wave IV – 2000 boundaries)
T4TOBCT10	Number of tobacco retailers in census tract (Wave IV – 2010 boundaries)
T5TOBCT10	Number of tobacco retailers in census tract (Wave V – 2010 boundaries)
T3SMKCT00	Number of supermarkets and grocery stores in census tract (Wave III – 2000 boundaries)
T4SMKCT00	Number of supermarkets and grocery stores in census tract (Wave IV – 2000 boundaries)
T4SMKCT10	Number of supermarkets and grocery stores in census tract (Wave IV – 2010 boundaries)
T5SMKCT10	Number of supermarkets and grocery stores in census tract (Wave V – 2010 boundaries)
T3CNVCT00	Number of convenience stores in census tract (Wave III – 2000 boundaries)
T4CNVCT00	Number of convenience stores in census tract (Wave IV – 2000 boundaries)
T4CNVCT10	Number of convenience stores in census tract (Wave IV – 2010 boundaries)
T5CNVCT10	Number of convenience stores in census tract (Wave V – 2010 boundaries)
T3WHCCT00	Number of warehouse clubs in census tract (Wave III – 2000 boundaries)
T4WHCCT00	Number of warehouse clubs in census tract (Wave IV – 2000 boundaries)
T4WHCCT10	Number of warehouse clubs in census tract (Wave IV – 2010 boundaries)
T5WHCCT10	Number of warehouse clubs in census tract (Wave V – 2010 boundaries)
T3DOLCT00	Number of dollar stores in census tract (Wave III – 2000 boundaries)
T4DOLCT00	Number of dollar stores in census tract (Wave IV – 2000 boundaries)
T4DOLCT10	Number of dollar stores in census tract (Wave IV – 2010 boundaries)
T5DOLCT10	Number of dollar stores in census tract (Wave V – 2010 boundaries)
T3SPCCT00	Number of specialty food stores in census tract (Wave III – 2000 boundaries)
T4SPCCT00	Number of specialty food stores in census tract (Wave IV – 2000 boundaries)

Name	Description
T4SPCCT10	Number of specialty food stores in census tract (Wave IV – 2010 boundaries)
T5SPCCT10	Number of specialty food stores in census tract (Wave V – 2010 boundaries)
T3FASCT00	Number of fast food outlets in census tract (Wave III – 2000 boundaries)
T4FASCT00	Number of fast food outlets in census tract (Wave IV – 2000 boundaries)
T4FASCT10	Number of fast food outlets in census tract (Wave IV – 2010 boundaries)
T5FASCT10	Number of fast food outlets in census tract (Wave V – 2010 boundaries)

Wave 4 Contextual Data Using 2010 Census Tracts

Name	Description
T4POP10	Total population for Wave IV census tract – 2010 boundaries
T4POPDENS10	Population density (persons per square kilometer) for Wave IV census tract – 2010 boundaries
T4ICERACE10	Index of Concentration at the Extremes, Black vs. White, race only for Wave IV census tract – 2010 boundaries
T4ICERAINC10	Index of Concentration at the Extremes, Black vs. White, race and income for Wave IV census tract – 2010 boundaries
T4PRUCA10	Primary RUCA Code for Wave IV census tract - 2010 boundaries
T4SRUCA10	Secondary RUCA Code for Wave IV census tract - 2010 boundaries

Missing codes

This dataset has three different codes that indicate the source of missing data.

- -9992 Missing in the source data
- -9991 Respondent was not interviewed in that wave
- -9990 Respondent lacks the geocode necessary for merging the source data

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