**Jackson Heart Study Neighborhood Environment Variable**

**Summary and Recommendation**

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## JHS Neighborhood Census Data

JHS neighborhood census data includes a series of variables on the demographic and socioeconomic characteristics of the census tracts of residence of JHS participants. Domains include race/ethnic composition and % foreign born, household annual income, education, poverty level, employment, household facilities (e.g. telephone, vehicle), public assistance, household value, and population density based on data from multiple data sources including the US Census 2000, the American Community Survey 2005-2009 (ACS0509), the American Community Survey 2007 – 2011 (ACS0711) and the US Census 2010, in order to create time varying measures. All these sources were downloaded from the US Census American Fact Finder.

US Census 2000 data is used for JHS visit at year 2000-2004 (which covers JHS Exam 1 period: Sep.2000 – Mar. 2004), ACS0509 data is used for JHS visit year 2005-2008 (which covers JHS Exam 2 period: Oct. 2005 – Dec. 2008). At the time of this writing census variables are available for JHS Exam 1 and Exam 2. When Exam 3 JHS addresses become available census variables will be generated using ACS0711 data.

The population density variables are based on total population counts from US Census 2000 and US Census 2010, not the ACS0509/0711 data because ACS is based on a sample which tends to undercount the population. For visit dates in years 2000-2005, the population density is based on US 2000 Census data; for visit dates in years 2006-2008, the population density is based on US 2010 Census data.

The JHS neighborhood census variables are for a total of 5301 JHS participants, of which 4203 have information for both JHS Exams 1 and Exam 2, 1098 have information only on Exam 1, and 0 have information on only Exam 2.

### 1.1. Variables

A list of the census variables available is included in Table 1 below.

Table 1. Census Variable List

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable Name** | **Label** | **Description** | **PC1** | **PC2** | **PC3** |
| birth\_foreign | % foreign born | Percent foreign born | Yes |  | Yes |
| crowd\_gt1\_ppr | % Household with crowding > 1 person per room | Percent of households with crowding > 1 person per room | Yes |  | Yes |
| Educ\_minBA | % 25+ with minimum bachelor degree | Percent of persons age 25+ with at least a Bachelor’s degree |  | Yes | Yes |
| Educ\_minHS | % 25+ with minimum High School education | Percent of persons age 25+ with at least a high school education |  | Yes | Yes |
| HU\_sampleocc | % Household occupied | Percent of occupied housing units |  | Yes | Yes |
| HUcost\_medownval | Median owner Household cost | Median housing value of owner units |  | Yes | Yes |
| inc\_HHge50k | % Household w/income >= $50,000 | Percent of households with household income >$50,000 |  | Yes | Yes |
| inc\_IntDivRent | % Household with interest, dividend, rental income | Percent of households with interest, dividend, or net rental income |  | Yes | Yes |
| inc\_medHH | Median Household income | Median household income (not-inflation adjusted) |  | Yes | Yes |
| inc\_pubass | % with public assistance | Percent of households with public assistance |  | Yes | Yes |
| NotInLaborForce | % not in labor force | Percent not in labor force, among persons 16 and over |  | Yes | Yes |
| Occup\_I | % managerial occupation | Percent with managerial, professional, or related occupation among those 16+ in the labor force |  | Yes | Yes |
| ownerocc\_hh | % Household owner occupied | Percent housing units owner occupied, among total housing units |  | Yes | Yes |
| phone\_none | % Household w/no telephone | Percent of households without a telephone |  | Yes | Yes |
| popden\_tot | Total population density including (per square km) | Total population density |  |  |  |
| Pov | % below poverty | Percent of persons below poverty level |  | Yes | Yes |
| race\_asianNH | % asian non-hispanic | Percent Non-Hispanic Asian | Yes |  | Yes |
| race\_blackNH | % black non-hispanic | Percent Non-Hispanic Black | Yes |  | Yes |
| race\_hisp | % Hispanic | Percent Hispanic | Yes |  | Yes |
| race\_otherNH | % other non-hispanic | Percent Other Non-Hispanic races |  |  |  |
| race\_whiteNH | % white non-hispanic | Percent Non-Hispanic White |  |  |  |
| samehouse | % in same house | Percent of persons living in the same house since last census |  | Yes | Yes |
| unemployed | % unemployed | Percent unemployed among civilians 16+ in the labor force |  | Yes | Yes |
| vehicle\_none | % Household w/no vehicle | Percent of households without a vehicle |  | Yes | Yes |

In some cases analysts require a summary measure of the census tract for analyses. In order to determine the best way to combine various census variables we conducted factor analyses of census tract data for the whole US. Analyses were conducted using data from the 2000 Census and the ACS0509 and ACS0711. Because factors identified may vary depending on the variables included in the factor analyses and recognizing that some analysts might wish to retain race/ethnic composition and SES composition as separate domains (even if correlated in the data) we conducted three separate factor analyses: one included only variables related to race/ethnic composition (PC1), a second included only SES variables (PC2), and a third included both race/ethnicity and SES variables (PC3). The variables included in each set are noted in Table 1 above. The results of each factor analysis are summarized below:

Type 1: PC1 = Race/Ethnicity/Crowding variables only (2 factors)

Two factors were retained based on the criteria of having at least 70% of the variance explained. With two factors, 70.98% of the variance is explained.

* 1. Loading to 0.60 on Factor1 (F1\_PC1)
     1. Percent Hispanic\*
     2. Percent Non-Hispanic Asian\*
     3. Percent foreign born\*
     4. Percent households with crowding > 1 person per room\*
  2. Loading to 0.60 on Factor2 (F2\_PC1)
     1. Percent Non-Hispanic Black\*

Type 2: PC2 = non-race/ethnicity SES variables (4 factors)

Four factors were retained based on the criteria of having at least 70% of the variance explained. With four factors, 73.2% of the variance is explained.

1. Loading to 0.60 on Factor1 (F1\_PC2)
2. Percent of persons 25+ with at least a Bachelor’s degree (reverse coded)
3. Percent of persons with managerial/professional occupation (reverse coded)
4. Median owner value of households (reverse coded)\*
5. Percent persons 25+ with at least a high school diploma (reverse coded)
6. Percent of households with interest, dividend, or rental income (reverse coded)
7. Median household income (reverse coded)\*
8. Percent of household income >$50,000 (reverse coded)
9. Loading to 0.60 on Factor2 (F2\_PC2)
10. Percent of households with no vehicle\*
11. Percent of households that are owner occupied (reverse coded)
12. Percent of households below poverty level\*
13. Percent of persons unemployed\*
14. Loading to 0.60 on Factor3 (F3\_PC2)
15. Percent of households that are occupied (reverse coded)\*
16. Percent of persons not in labor force
17. Loading to 0.60 on Factor4 (F4\_PC2)
18. Percent of persons in the same house as previous census (reverse coded)\*
19. Not loading to 0.60 on any Factor (F5\_PC2)
20. Percent of persons with public assistance\*
21. Percent of households with no telephone\*

Type 3: PC3 = All SES-related variables in PC1+PC2 (5 factors)

Five factors were retained based on the criteria of having at least 70% of the variance explained. With five factors, 73.2% of the variance is explained.

1. Loading to 0.60 on Factor1 (F1\_PC3)
2. Percent of persons 25+ with at least a Bachelor’s degree (reverse coded)
3. Percent of persons with managerial/professional occupation (reverse coded)
4. Percent persons 25+ with at least a high school diploma (reverse coded)
5. Median owner value of households (reverse coded)\*
6. Median household income (reverse coded)\*
7. Percent of household income >$50,000 (reverse coded)
8. Loading to 0.60 on Factor2 (F2\_PC3)
9. Percent Non-Hispanic Black\*
10. Percent of households that are owner occupied (reverse coded)
11. Percent of households with no vehicle\*
12. Percent of households with interest, dividend, or rental income (reverse coded)
13. Percent of households below poverty level\*
14. Percent of persons unemployed\*
15. Loading to 0.60 on Factor3 (F3\_PC3)
16. Percent foreign born\*
17. Percent Hispanic\*
18. Percent households with crowding > 1 person per room\*
19. Loading to 0.60 on Factor4 (F4\_PC3)
20. Percent of persons not in labor force
21. Percent of households that are occupied (reverse coded)\*
22. Loading to 0.60 on Factor5 (F5\_PC3)
23. Percent of persons in the same house as previous census (reverse coded)\*
24. Not loading to 0.60 on any Factor (F6\_PC3)
25. Percent Non-Hispanic Asian\*
26. Percent of persons with public assistance\*
27. Percent of households with no telephone\*

Note: all variables were standardized before conducting factor analysis. Variables whose distribution is far from normal (skewness was >1.5) were transformed into normality (labelled with \*). Factors and weights were derived via principal factor analyses of pooled datasets across Census 2000, ACS0509 and ACS0711 in order to obtain a single result that could be used across all years[[1]](#footnote-1).

For details on the methods used to create factor scored, please refer to “Census Factor Scales documentation.docx”

For each factor, there are 3 ways to calculate the factor score:

1. weighted sum of all variables with weights being the factor loadings. This type of factor is labeled as shown in the list above with no suffix. For example, F1\_PC2, is factor 1 from the factor analysis using the Type 2 subset of census SES variables created using weights from the factor analysis.
2. Sum of the raw (unstandardized) variables that have high loadings (>0.6) on a factor. This type of factor is labeled by adding a “\_BR” suffix to the factor name. For example, F1\_PC2\_BR is factor 1 from the factor analysis using the Type 2 subset created by summing raw values with high loadings.
3. Sum of the standardized variables that have high loadings (>0.60) on a factor. This type of factor is labeled by adding a “\_BT” suffix to the factor name. For example, F1\_PC2\_BT is factor 1 from the factor analysis using the Type 2 subset created by summing the standardized values for the variables with high loadings.

For each factor a higher value indicates a more disadvantaged SES environment.

Another SES summary measure based on the score used in the 2001 Diez Roux et al, paper[[2]](#footnote-2) and labeled Factor\_Ana.. This variable is the sum of the standardized variables of the following variables (please note that the following variables are standardized to the mean and standard deviation of the entire US distribution, not just Mississippi).

1. Log of median owner value of households
2. Percent of persons 25+ with HS education
3. Percent of persons 25+ with Bachelor’s degree
4. Percent of persons with managerial/professional occupation
5. Log of median household income
6. Percent of households with interest/dividends/rental income.

For this scale, a higher value indicates a better SES environment.

### 1.2 Descriptive Statistics

Summary statistics on each variable including sample size, mean, standard deviation, range, median, Q1, Q3, max and min are shown in Appendix Table A.1. Based on the summary statistics, we noticed that:

* Extremely high population densities (popden\_nowat or popden\_tot >3000/KM2) are found at 2 participants addresses at exam 2 because the 2 addresses are outside Mississippi and in two major US cities.
* All variables in this dataset represent census tract level neighborhood information for each JHS participant at each exam. For population density, we also have buffer-level (e.g. 1-mile or 2-mile buffer of residential address) population density of the participants’ neighborhood. This buffer-level population density variable can be found in built environment dataset (see Section 4).
* Household income, household values, and unemployment increased between exams 1 and 2. Population density decreased. Considering the time of exams: Exam 1 (2000-2004) and Exam 2 (2005-2008), these changes look reasonable compared to those observed in other studies (e.g. MESA). **Please note that these changes are the result of both mobility and changes in census tracts over time as the census tract data are time varying in this case**.

### 1.3 Recommendations

Currently, F1\_PC2 is the most commonly used single summary SES score. The advantage of this score is that it does not combine SES and race/ethnic composition factors which many analysts will want to keep separate. It also makes the best use of the factor loadings by incorporating weights based on these loadings into the score. Factor 1 captures 47.88 % of the variance in all the SES measures included in the factor analysis. Addition of factor 2 will capture 9.88% additional variance and could be considered for some analyses. Users may want to conduct sensitivity analyses using other versions (e.g. F1\_PC2\_BT and Factor\_Ana) although the three versions (F1\_PC2, F1\_PC2\_BT and Factor\_Ana) are strongly correlated (correlation > 0.8) in the JHS data (see Appendix Table A.2). All variables used to create the scores are also available if users prefer a more specific measure to a summary indicator.

Table 2: List of Recommended Neighborhood Census Variables

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Label** | **Description** |
| birth\_foreign | % foreign born | Percent foreign born |
| crowd\_gt1\_ppr | % Household with crowding > 1 person per room | Percent of households with crowding > 1 person per room |
| Educ\_minBA | % 25+ with minimum bachelor degree | Percent of persons age 25+ with at least a Bachelor’s degree |
| Educ\_minHS | % 25+ with minimum High School education | Percent of persons age 25+ with at least a high school education |
| HU\_sampleocc | % Household occupied | Percent of occupied housing units |
| HUcost\_medownval | Median owner Household cost | Median housing value of owner units |
| inc\_HHge50k | % Household w/income >= $50,000 | Percent of households with household income >$50,000 |
| inc\_IntDivRent | % Household with interest, dividend, rental income | Percent of households with interest, dividend, or net rental income |
| inc\_medHH | Median Household income | Median household income (not-inflation adjusted) |
| inc\_pubass | % with public assistance | Percent of households with public assistance |
| NotInLaborForce | % not in labor force | Percent not in labor force, among persons 16 and over |
| Occup\_I | % managerial occupation | Percent with managerial, professional, or related occupation among those 16+ in the labor force |
| ownerocc\_hh | % Household owner occupied | Percent housing units owner occupied, among total housing units |
| phone\_none | % Household w/no telephone | Percent of households without a telephone |
| popden\_tot | Total population density including land+water (per square km) | Total population density including land and water is calculated as the number of population over the area (square kilometers) in the census tract; there is another version of the population density available-- the population density in area without water calculated as the number of population over the census area that subtracts any water area. In JHS study area, the two type of population density are close. We recommended using the total population density. |
| Pov | % below poverty | Percent of persons below poverty level |
| race\_asianNH | % asian non-hispanic | Percent Non-Hispanic Asian |
| race\_blackNH | % black non-hispanic | Percent Non-Hispanic Black |
| race\_hisp | % Hispanic | Percent Hispanic |
| race\_otherNH | % other non-hispanic | Percent Other Non-Hispanic races |
| race\_whiteNH | % white non-hispanic | Percent Non-Hispanic White |
| samehouse | % in same house | Percent of persons living in the same house since last census |
| unemployed | % unemployed | Percent unemployed among civilians 16+ in the labor force |
| vehicle\_none | % Household w/no vehicle | Percent of households without a vehicle |
| **US Census Factor Score (census level)** | |  |
| F1\_PC2 | SES (PC2) Weighted Factor1 score | Weighted Factor1 scale from the Other SES PCA (PC2). Highly weighted variables include % Bachelor degree, % managerial occupation, median home value, % HS education, median household income, and % HH income >$50,000. The weights are calculated based on all 3 data sources: Census 2000, ACS: 2005-2009 and ACS: 2007-2011. A higher value indicates a more disadvantage SES. This will be missing if any variables are missing. |
| F2\_PC2 | SES (PC2) Weighted Factor2 score | Weighted Factor2 scale from the Other SES PCA (PC2). This is highly weighted on % no vehicle, % owner occupied housing, % poverty, and % unemployed. The weights are calculated based on all 3 data sources: Census 2000, ACS: 2005-2009 and ACS: 2007-2011. A higher value indicates a more disadvantage SES. This will be missing if any variables are missing. |
| F3\_PC2 | SES (PC2) Weighted Factor3 score | Weighted Factor3 scale from the Other SES PCA (PC2). Highly weighted on % occupied households and % not in labor force. The weights are calculated based on all 3 data sources: Census 2000, ACS:2005-2009 and ACS: 2007-2011. A higher value indicates a more disadvantage SES. This will be missing if any variables are missing. |
| F4\_PC2 | SES (PC2) Weighted Factor4 score | Weighted Factor4 scale from the Other SES PCA (PC2). This is highly weighted on % in same house The weights are calculated based on all 3 data sources: Census 2000, ACS:2005-2009 and ACS: 2007-2011. A higher value indicates a more disadvantage SES. This will be missing if any variables are missing. |
| F1\_PC2\_BT | Factor1 based score w/transformed variables for SES (PC2) | Factor1 based scale from Other SES PCA (PC2). This is based on the standardized to all 3 data sources (Census 2000, ACS: 2005-2009 and ACS: 2007-2011) combined transformed variables summed together. The variables are: % Bachelor degree reverse coded, % managerial occupation reverse coded, median home value reverse coded cube root, % HS education reverse coded, median household income reverse coded cube root, and % HH income >$50,000 reverse coded. A higher value indicates a more disadvantage SES. This will be missing if any variables are missing. |
| F2\_PC2\_BT | Factor2 based score w/transformed variables for SES (PC2) | Factor2 based scale from Other SES PCA (PC2). This is based on the standardized to all 3 data sources (Census 2000, ACS: 2005-2009 and ACS: 2007-2011) combined transformed variables summed together. The variables are: % no vehicle cube root, % owner occupied housing reverse coded, % poverty cube root, and % unemployed cube root. A higher value indicates a more disadvantage SES. This will be missing if any variables are missing. |
| factor\_ana | Factor score based on Ana Diez-Roux 1990 PC factor analysis | Factor based scale from Diez-Roux et. al. 2001. This is based on the standardized to all 3 data sources (Census 2000, ACS: 2005-2009 and ACS: 2007-2011) combined transformed variables summed together. The variables are: median housing value log, % HS education, % Bachelor’s degree, % managerial occupation, median HH income log, and % interest/dividend income. A higher value indicates a better SES. This will be missing if any variables are missing. |

## JHS Neighborhood Survey Data

### 2.1. Variables

The JHS neighborhood survey data includes a series of variables that capture various features of the neighborhoods of JHS participants derived from a series of questions administered to JHS participants during annual follow up exams between JHS exams 1 and 2. Each participant was administered these questions only once, but the timing of the administration was spread over a period of 7 years (2004-2010) with most surveys (97.8%) administered between 2004 and 2008. The neighborhood questions included a total of 17 items (Table 3) which asked the participants to rate the conditions of their neighborhood on issues related to social cohesion (4=A: Strongly agree to 1=D: Strongly disagree), exposure to violence (4=O: Often to 1=N: Never) and neighborhood problem measures (4=V: Very serious problem to 1=N: Not really a problem).

Table 3: Items used in JHS to assess neighborhood conditions

|  |  |
| --- | --- |
| **Items** | **Description** |
| **Social cohesion** | |
| AF3V13 | This is a close knit neighborhood |
| AF3V14 | People around here are willing to help their neighbors |
| AF3V15 | People in this neighborhood generally don't get along |
| AF3V16 | People in this neighborhood can be trusted |
| AF3V17 | People in this neighborhood do not share the same values |
| AF3V18 | This neighborhood is safe from crime |
| **Violence** | |
| AF3V19 | How often was there a fight in this neighborhood in which a weapon was used |
| AF3V20 | How often was there a violent argument between neighbors |
| AF3V21 | How often were there gang fights? |
| AF3V22 | How often was there a sexual assault or rape? |
| AF3V23 | How often was there a robbery or mugging? |
| **Neighborhood problem** | |
| AF3V24 | Excessive noise |
| AF3V25 | Heavy traffic or speeding cars |
| AF3V26 | Lack of access to adequate food and/or shopping |
| AF3V27 | Lack of parks and playground |
| AF3V28 | Trash and Litter |
| AF3V29 | No sidewalks and poorly maintained sidewalks |

Principal component analysis (PCA) on the 17 items showed that they could be grouped into the domains shown below (these domains correspond to a priori identified constructs):

Table 4: PCA identified neighborhood scales

|  |
| --- |
| **PCA-based Scales** |
| ***Neighborhood Social Cohesion*** |
| 1. AF3V13: This is a close knit neighborhood |
| 2. AF3V14: People around here are willing to help their neighbors |
| 3. AF3V15: People in this neighborhood generally don't get along (REVERSE CODED) |
| 4. AF3V16: People in this neighborhood can be trusted |
| 5. AF3V17: People in this neighborhood do not share the same values (REVERSE CODED) |
| ***Neighborhood violence*** |
| 1. AF3V19: How often was there a fight in this neighborhood in which a weapon was used |
| 2. AF3V20: How often was there a violent argument between neighbors |
| 3. AF3V21: How often were there gang fights? |
| 4. AF3V22: How often was there a sexual assault or rape? |
| 5. AF3V23: How often was there a robbery or mugging? |
| ***Neighborhood Problems*** |
| 1. AF3V24: Excessive noise |
| 2. AF3V25: Heavy traffic or speeding cars |
| 4. AF3V26: Lack of access to adequate food and/or shopping |
| 5. AF3V27: Lack of parks and playground |
| 3. AF3V28: Trash and Litter |
| 6. AF3V29: No sidewalks and poorly maintained sidewalks |

\*AF3V18 was excluded due to low factor loading (<0.4). See page 3 in “NeighborhoodSurveyEB\_Estimatesdocumntation.docx”

Factor analyses on the same set of items yielded slightly different domains as shown below.

Table 4: FA identified neighborhood scales

|  |
| --- |
| **FA-based Scales** |
| ***Neighborhood Social Cohesion*** |
| 1. AF3V13: This is a close knit neighborhood |
| 2. AF3V14: People around here are willing to help their neighbors |
| 3. AF3V15: People in this neighborhood generally don't get along (REVERSE CODED) |
| 4. AF3V16: People in this neighborhood can be trusted |
| 5. AF3V18: This neighborhood is safe from crime |
| ***Neighborhood violence*** |
| 1. AF3V19: How often was there a fight in this neighborhood in which a weapon was used |
| 2. AF3V20: How often was there a violent argument between neighbors |
| 3. AF3V21: How often were there gang fights? |
|  |
| 4. AF3V23: How often was there a robbery or mugging? |
| ***Neighborhood Disorder*** |
| 1. AF3V24: Excessive noise |
| 2. AF3V25: Heavy traffic or speeding cars |
| 3. AF3V28: Trash and Litter |
| ***Neighborhood Resources*** |
| 4. AF3V26: Lack of access to adequate food and/or shopping |
| 5. AF3V27: Lack of parks and playground |
| 6. AF3V29: No sidewalks and poorly maintained sidewalks |

Therefore both PCA and FA based scales were created and included in the dataset. For most purposes PCA-based measures should be adequate and we generally recommend that those be used unless there is a strong rationale for using the FA-based measures. Additional details on the PCA and FA can be found in documentation labeled “NeighborhoodSurveyEB\_Estimatesdocumntation.docx*”*.

Creation of neighborhood-level measures

Census tracts were used to proxy neighborhoods. In order to create a more reliable and valid measure of the neighborhood environment we aggregated the responses of all JHS participants reporting on the same census tract between the year 2004 and the year 2008. This time frame was selected because it captured the vast majority (97.8%) of the respondents. **Please note that this measure was treated as time invariant and assigned to JHS exam 1 or exam 2 based on where each JHS participant lived at the time of the exam. Therefore any changes in these measures between exams 1 and 2 are due to residential mobility.** Unfortunately there was not enough information available to create time varying neighborhood survey measures. A total of 5301 JHS participants have survey-derived neighborhood measures at exam 1 or 2: 4203 have information for exams 1 and 2, 1098 have information only on Exam 1, and 0 have information on only Exam 2.

A number of approaches can be used to create the aggregated measures for each census tract. These differ in the extent to which information from other “similar” tracts is used to “improve” the estimate for a given census tract (using empirical Bayes approaches) and in the extent to which estimates are adjusted for the age and sex of respondents (failure to adjust for age and sex could result in biased estimates if there are systematic differences in the way respondents view their neighborhoods by age and sex and if the distribution of the age and sex of respondents differs across tracts).

The different approaches and their benefits are briefly summarized below (additional details can be found in Section V atNeighborhoodSurveyEB\_Estimatesdocumntation.docx).

* Crude mean: average score of responses in a census tract, this may be unreliable due to small sample sizes in some census tracts.
* Unadjusted unconditional empirical Bayes estimates (UEBE\_unadjusted): estimates for neighborhoods with very small sample sizes are “shrunken” towards the global mean.
* Adjusted unconditional empirical Bayes estimates (UEBE): similar to UEBE\_unadjusted but estimates are also adjusted to the mean age and sex distributions of respondents across all tracts
* Conditional empirical Bayes estimates (CEBE): estimates for neighborhoods with very small sample sizes are “shrunken” towards the mean for neighborhoods with similar SES levels . Thus SES information of the tract (and information on the relation between tract SES and the score) is used to “improve” estimates. A disadvantage is that SES information is incorporated into the measure.

**In additional to adjusting for age and gender, this estimate also is conditioned on the SES indicators[[3]](#footnote-3), i.e. it uses information on SES characteristics of the census tract to “improve” the estimate for a specific tract based on the relation between tract SES and the survey measures observed across the whole sample. A disadvantage is that SES information is incorporated into the measure.**

* Spatial empirical Bayes estimates (SEBE): unreliable estimates are shrunken to the mean of the surrounding neighborhoods. This approach uses spatial autocorrelation present in the data to improve estimates. These estimates are also adjusted for the age and sex of respondents.

Detailed description on the score calculation methods can be found on Page 8 in “NeighborhoodSurveyEB\_Estimatesdocumntation.docx”

For each measure a higher value indicates high levels of the construct as specified i.e. higher social cohesion, more violence, more neighborhood problems, more social disorder, and fewer social resources.

### 2.2. Descriptive Statistics

This section provides descriptive statistics of survey based neighborhood measures. Summary statistics on each variable including sample size, mean, standard deviation, range, median, Q1, Q3, max and min are shown (Appendix Table B.1). On average, participants were living in a better environment (in terms of various neighborhood environment measures) in Exam 2 compared with Exam 1. As noted above, this is wholly attributable to residential mobility. Of the 4203 participants who attended both exams, 18% of them (N=758) changed census tracts between both exams. Overall the correlations between the various neighborhood estimates (crude mean, UEBE, unadjusted UEBE, CEB, spatial EB) were high (0.83-1) with the highest correlations observed between unadjusted UEBE and UEBE and the lowest between crude mean and CEBE (Appendix tables B.2 – B.6). The various domains were also correlated in the expected direction. In addition, the scaled based on PCA and FA are strongly correlated (>=0.94).

In order to explore associations between JHS survey scores and census variables, we also created descriptive tables summarizing census tract level neighborhood measures by selected neighborhood survey scores. Higher social cohesion, less social disorder, less neighborhood violence, fewer neighborhood problems, more sufficient neighborhood resource are found in neighborhoods with higher household income, fewer % households that need public assistance, more households with vehicle, higher education, lower unemployment rate, higher % owner occupied households, lower % household with crowding > 1 per room, more managerial/professional occupation, and higher SES in general (Appendix Table C.1-C.7).

### 2.3 Recommendations

For most analyses the use of the age and gender adjusted empirical Bayes (EB) estimates should be appropriate. By borrowing information across census tracts EB estimation yields improved estimates especially for census tracts with few observations. In addition these estimates adjust for differences in the age and gender composition of respondents across tracts. The Conditional Empirical Bayes may further improve estimates by incorporating information on census tract SES characteristics. However, the use of these estimates may be problematic if neighborhood SES is also a variable of interest in the analyses, i.e. if there is a desire to estimate the independent effect of neighborhood SES as well. As noted above PCA based scales make theoretical sense and are consistent with a priori classifications of the items. Unless there is a strong rationale to proceed otherwise we therefore recommend the use of PCA-based scales. Therefore, in general, we recommend using PCA-based adjusted unconditional empirical Bayes estimates (UEBE) for analysis (Table 5).

Table 5: List of Recommended Neighborhood Social Environment Variables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **LABEL** | **Neighborhood Aspect** | **PCA/FA** | **Method** |
| NPPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | Problem | PCA | UEBE |
| SCPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | Social Cohesion | PCA | UEBE |
| VOPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | Violence | PCA | UEBE |

## JHS Data on Food and Physical Activity Resources (NETS derived data)

### 3.1. Variables

Jackson Heart Study Food and Physical Activity Resources data contains variables characterizing the spatial proximity of food stores, recreational facilities, social engagement destinations, and popular walking destinations. Data on business locations used to create these measures was obtained from the National Establishment Time Series (NETS) data purchased from Walls and Associates for all zip codes within a 5-mile buffer of all available JHS addresses between 2000 and 2010 (sometimes this data is referred to a NETS Data for short). A series of time-varying variables were created to capture the densities of food stores, recreational facilities, social engagement, and popular walking destinations for buffer sizes of ¼, ½, 1, 3, and 5 miles around each participant’s residential address at each exam. Total counts of number of facilities for census tracts and block groups are also available. Distances to closest resource are also available for some types of resources.

Variables on food stores, recreational facilities, social engagement, and popular walking destinations are available for JHS participants at Exams 1 and 2. A total of 5301 JHS participants are represented, of which 4203 have information for JHS Exams 1 and Exam 2, 1098 have information only on Exam 1, and 0 have information on only Exam 2.

Calculation densities of resources and distance to resources

Densities were calculated using two approaches: simple densities per square mile within the buffer and kernel densities. Kernel densities give a greater with to resources located closer to the participant and less weight to resources towards the edge of the buffer. Details are available in Section IV in “Documentation of NETS data.docx*”*. If it is theorized that use varies as a function of distance, kernel densities should be used. However, in practice kernel and simple densities are highly correlated and the simple density is more intuitive. A range of buffer sizes were used to calculate densities to allow flexibility in analyses as there is no clear consensus on the most relevant spatial context and this could differ from region to region and depending on population density.

Definitions of various categories of resources used in calculating densities and distances

Food environment data

The food stores were initially categorized into 15 categories based on SIC codes supplemented with other data as noted below[[4]](#footnote-4).

1. **Grocers**
   1. *Technical definition:* Any food store with fewer than 25 employees, sales less than $2 million, and not on the supermarket name list, and a primary SIC code of 54110000, 54110100, 54110101, 54110102, 54110103, 54110104, 54110105, 54119900, 54119901, 54119904, or 54119905.
   2. *General description:* This category was derived from whatever stores remained after removing supermarkets and convenience stores (as defined below). Thus, it includes all smaller, non-supermarket, non-convenience stores.
   3. *Assumed health association:* Unknown. This is a heterogeneous category including stores that sell fresh food and stores that almost exclusively sell food with a long shelf life.
2. **Supermarket Chains**
   1. *Technical definition:* Industry defines a “chain” supermarket operators as having >=10 locations. For this study, we defined it as companies that operate 8 or more stores in the study area. This cut point is slightly lower than the industry definition reflecting that there will be fewer stores in JHS ZIP codes. We use the standardized supermarket name list from TD to determine “chain” companies (that had 8 or more locations within the 2000, 2005, or 2010 data).
   2. *General description:* For this study, the store is a chain if it has the company and/or trade name of any of the 263 stores identified as chain supermarkets based on the criteria noted above.
   3. *Assumed health association:* Favorable. A wide variety of fruits, vegetables and low-fat foods are assumed to be available, though unhealthy food options are also available. Food sold in large markets is typically cheaper than food sold in small grocers. If healthier food is more expensive than unhealthy food, then supermarkets may encourage healthier food purchases.
3. **Supermarket Non-Chain**
   1. *Technical definition:* Any food store with 25 employees or greater or sales of $2 million or greater, and a primary SIC code of 54110000, 54110100, 54110101, 54110102, 54110103, 54110104, 54110105, 54119900, 54119901, 54119904, or 54119905 and not part of Supermarket Chains above.
   2. *General description:* The categories of grocers (described above) and supermarkets derive from the constellation of SIC Codes that generally apply to all types of grocery stores and supermarkets.
   3. *Assumed health association:* Favorable. A wide variety of fruits, vegetables and low-fat foods are assumed to be available, though unhealthy food options are also available. Food sold in large markets is typically cheaper than food sold in small grocers. If healthier food is more expensive than unhealthy food, then supermarkets may encourage healthier food purchases.
4. **Convenience**
   1. *Technical definition:* Any food store with a primary SIC code of 54110200, 54110201, or 54110202.
   2. *General description:* National Association of Convenience Stores, an international trade association and publisher of the industry trade publication Convenience Store News, defines the channel as small stores between 800 and 3,000 square feet, carrying between 500 and 1,500 SKUs, and meet the following criteria: operating at least 13 hours per day, the store must carry a limited selection of grocery items including at least two of the following: toilet paper, soap, disposable diapers, pet foods, breakfast cereal, tuna fish, toothpaste, ketchup, and canned goods. These stores may or may not sell gasoline and offer fast food services.
   3. *Assumed health association*: Unfavorable. Assumed to sell mostly highly processed snack food, fast food to go (microwave burgers, etc.) and low quantity (if any) fresh produce.
5. **Deli, meat, fish, dairy (not ice cream)**
   1. *Technical definition:* Any food store with a primary SIC code of 54119902, 54210000, 54210100, 54210101, 54210102, 54210200, 54210201, 54210202, 54999902, 54999904, 54510000, 54519900, 54519901, 54519902, or 54519904.
   2. *General description*: Stand-alone stores that sell primarily meat, fish, egg products, milk, cheese, and/or other dairy products (except ice cream) including delicatessens and gourmet shops.
   3. *Assumed health association:* Unknown. These places tend to offer foods that are high in fat and cholesterol but they also stock foods that may not be highly processed and are a part of a healthy Mediterranean diet.
6. **Fruit, vegetable**
   1. *Technical definition:* Any food store with a primary SIC code of 54319900, 54310000, 54319901, or 54319902.
   2. *General description:* Stand-alone stores that sell primarily fruits and vegetables. This category may be too small to analyze on its own and could be combined with several different categories, depending on the research question.
   3. *Assumed health association*: Favorable.
7. **Bakeries, pastry, candy, nuts, ice cream**
   1. *Technical definition:* Any food store that is NOT a fast food restaurant (see categories 11 and 12) with a primary SIC code of 54610000, 54619900, 54619901, 54619902, 54410000, 54419900, 54419901, 54419902, 54419903, 54419904, 54419905, 54519903, 54619903, 54619904, 54619905, 54619906, 54619907, 54619908, 54999901, 58120202, 58120203, 58120204, or 58120200.
   2. *General description:* Bakeries, candy and nut shops, and ice cream parlors.
   3. *Assumed health association:* Unfavorable. Though some of the bakeries may provide fresh breads and some of the nut stores may have plain/unprocessed nuts, it is impossible to differentiate these stores from providers of cupcakes, cookies, pastries, and candied nuts. It is assumed that the majority of these stores sell high calorie and high sugar foods.
8. **Health food, vitamins, and supplements**
   1. *Technical definition*: Any food store with a primary SIC code of 54990100, 54990102, 54990103, or 54990101.
   2. *General description:* Small stores that specialize in natural foods, vitamins and nutritional supplements. These SIC categories were kept together because stores listed under these codes are indistinguishable from each other (health food stores classify themselves as vitamin stores so are not able to be separated). This category may be too small to analyze on its own.
   3. *Assumed health association*: Unknown. Health food stores are generally considered to be healthy. However, stores that exclusively sell vitamins and supplements are not comparable to food stores, rarely sell fresh produce, and may sell supplements that can be harmful to health (e.g., athletic supplements).
9. **Liquor**
   1. *Technical definition:* Any food store with a primary SIC code of 59210000, 59210100, 59210101, 59210102, 59219900, or 59219901.
   2. *General description*: Stores that primarily sell alcohol for consumption elsewhere.
   3. *Assumed health association:* Unfavorable
10. **Drinking places (non-alcohol)**
    1. *Technical definition:* Any food store with a primary SIC code of 54990200, 54990201, 54990202, 54990203, 54990204, 54990205, 58120205, 58120206, or 58120304.
    2. *General description:* Food stores that sell coffee, smoothies, juices, and tea for consumption on site.
    3. *Assumed health association*: Unknown. These beverages are generally not thought to be health promoting, but 100% fresh juices and green tea can be beneficial. There may be other social benefits from having local places like these.
11. **Drinking places (alcohol)**
    1. *Technical definition:* Any food store with a primary SIC code of 58130000, 58130101, 58130202, 58130103, 58130200, 58130201, 58130100, 58130102, 58130104, 58130105, 58130106, or 58130203.
    2. *General description:* Food stores that primarily sell alcohol for consumption on site.
    3. *Assumed health association*: Unfavorable.
12. **Fast food (chains)**
    1. *Technical definition:* Any food store regardless of SIC code that appears on the list of fast food eating places. The list is derived as described below.
    2. *General description:* Large chain eating places that specialize in low preparation time foods that are eaten cafeteria-style (no waiter service) or take-away. The list of the largest chains was derived from pulling the top 75 revenue-ranked fast-food restaurants for the year during 2005 (derived from Restaurant & Institutions Top 100)[[5]](#footnote-5). We excluded coffee, donut, and ice cream shops because those shops generally sell snacks and thus are not often thought of fast-food by consumers and so JHS respondents who report on fast-food eating behaviors and presence of fast food in their neighborhood are not likely to count the coffee, donut, and ice cream restaurants.
    3. *Assumed health association*: Unfavorable. Foods tend to be highly processed and therefore high in calories, saturated fat, salt, and sugar.
13. **Fast food (non-chain)**
    1. *Technical definition:* Any food store with the limited service restaurant SIC 581203 (except 58120304: Coffee shops) that are not on the fast food chain list as described in above Fast food chains.
    2. *General description:* Eating places that specialize in low preparation time foods that are eaten cafeteria-style (no waiter service) or take-away. Fast food is defined by the industry as being "designed for ready availability, use or consumption and sold at eating establishments for quick availability or take-out. Fast food restaurants are also known as quick-service restaurants. That definition has low specificity so we added cafeteria style (no waiter service).
    3. *Assumed health association*: Unfavorable. Foods tend to be highly processed and therefore high in calories, saturated fat, salt, and sugar.
14. **Other eating places**
    1. *Technical definition:* Any eating place with SIC 5812 that is not in the fast food categories above.
    2. *General description:* A wide variety of restaurants and other eating places that are not considered to be fast food.
    3. *Assumed health association:* Unknown. There is a wide variety of different types of restaurants in this category.
15. **Other**
    1. *Technical definition:* Any food establishment not already in a category including stores with "general" or "unknown" SIC codes 54119903, 54990000, 54999900, 54999903, or 54999905.
    2. *General description*: All other food stores not in another category.
    3. *Assumed health association:* Unknown.

These categories were collapsed into broader categories for analysis as follows:

1. **Favorable food stores:** Consists of supermarkets (chain and non-chain) and fruit and vegetable markets.
2. **Unfavorable food stores (with alcohol)** :Consists of convenience stores, bakeries/nuts/candy/ice cream, liquor stores, drinking places alcoholic, and fast food (chain and non-chain).
3. **Unfavorable food stores (no alcohol)** .Consists of convenience stores, bakeries/nuts/candy/ice cream, and fast food (chain and non-chain).
4. **Neutral/unknown food stores** Consist of grocers, deli/meat/dairy, health/vitamin stores, drinking places non-alcoholic, and other food stores.

In addition, there are two summary measures created to capture the relationship of favorable to unfavorable food stores:

1. Ratio of Unfavorable to Favorable food stores including alcohol

This is calculated as:

RATIO\_TOT = (Unfavorable including alcohol)/(Favorable) and

RATIO\_NOALC = (Unfavorable excluding alcohol)/(Favorable)

This will give a ratio where the larger the number, the worse the mix of retail options (i.e.: if there is a high number, there is much easier access to unhealthy food compared to healthy food). For cases where the denominator (favorable food stores) is 0 but unfavorable food stores is not 0, the ratio is coded as 888888888. This indicates that there are some unfavorable food stores in the area but there is no retail mix to calculate. For cases in which both favorable and unfavorable food stores have a density 0, the ratio is coded as 999999999. This indicates that there are no stores in the area.

1. Modified Retail Food Environment Index

This is calculated as:

MRFEI\_TOT = (Favorable)/(Favorable+Unfavorable including alcohol)

MRFEI\_NOALC = (Favorable)/(Favorable+Unfavorable excluding alcohol)

This is based on the mRFEI variable as defined by the CDC[[6]](#footnote-6). Modifications were made to the definition of unfavorable to include bakery/candy/nut/ice cream shops, liquor stores, and alcoholic drinking places.

The MRFEI is the proportion of favorable food stores among all food stores (favorable and unfavorable): the closer the value is to 1 the better the access to favorable food. For cases in which the densities of both favorable and unfavorable food stores are 0, the MRFEI is will coded as 999999999. This indicates that there are no stores in the area.

When using any of these indices, careful consideration needs to be taken into account as to how to use them when the denominator is 0. In general, these ratios are easier to interpret for the simple densities than for the kernel densities.

Some analysts recommend using these ratio or % measures as categorical variables. Values where there are no food stores (healthy or unhealthy) can be treated as separate categories.

Recreational environment data

The recreational facilities are categorized into 12 categories based on prior work[[7]](#footnote-7) [[8]](#footnote-8) [[9]](#footnote-9). Categories are as follows:

1. **Indoor Conditioning Activities**
   * *Technical definition:* Any recreational facility with SIC codes 79110100, 79110101, 79110102, 79910000, 79910100, 79910101, 79910102, 79910300, 79910301, 79910302, 79970000.
   * *General description*: Physical fitness facilities, dancing–aerobics/ballet, athletic club exercise.
2. **Recreational**
   * *Technical definition:* Any recreational facility with SIC codes 79330000, 79339901, 79339902, 79339903, 79920000, 79970100, 79970400, 79979906, 79979907, 79979908, 79990202, 79990204, 79990205, 79990601, 79990602, 79990603, 79990700, 79990701, 79991200, 79991202, 79991204, 79991604, 79999903, 79999907, 79999910, 79999912, 79999917, 79990501, 79991205, 79970302, 79990000, 79339900, 79990402, 79990600.
   * *General description*: Bowling, golf, ice sports, outdoor field clubs, horse riding, lawn bowling, skating–ice or roller, shooting/hunting, archery, trail hiking, baseball batting cage, recreation centers/services, trampolines, biking, ping pong.
3. **Team Sports**
   * *Technical definition:* Any recreational facility with SIC codes 79970101, 79970102, 79970401, 79970402, 79970404, 79979902.
   * *General description*: Curling, hockey, baseball, football, soccer, bowling league/team.
4. **Water Activities**
   * *Technical definition:* Any recreational facility with SIC codes 79970201, 79970202, 79991402, 79991512, 79991513, 79991409, 79991410, 79991411.
   * *General description*: Boating, beach club/bathing beach, waterslide, wave pool, rowboat/canoe rental, sailboard/surfing rental.
5. **Water Activities that involve Conditioning**
   * *Technical definition:* Any recreational facility with SIC codes 79970200, 79970203, 79991412.
   * *General description*: Swimming clubs and pools.
6. **Racquet Sports**
   * *Technical definition:* Any recreational facility with SIC codes 79970500, 79970501, 79970502, 79970503, 79970504, 79990101, 79990102, 79990300, 79990301, 79990302, 79990303.
   * *General description*: Handball, racquetball, squash, tennis.
7. **Camps/Vacation**
   * *Technical definition:* Any recreational facility with SIC codes 70110200, 70110201, 70110202, 70320000, 70320100, 70320101, 70320102, 70320300, 70320301, 70320302, 70330000, 70339900, 70339901, 70339902, 79991602.
   * *General description*: Non-regular use and/or may be used by out-of-town people more than locals.
8. **Instructional in Indoor Conditioning**
   * *Technical definition:* Any recreational facility with SIC codes 79110000, 79110200, 79110202, 79110203, 79110204, 79991111, 79991112, 79991113, 79991127, 79991123.
   * *General description*: Instruction in indoor conditioning.
9. **Instructional in Recreational**
   * *Technical definition:* Any recreational facility with SIC codes 79990200, 79990203, 79991104, 79991118, 79991119, 79991201.
   * *General description*: Instruction in recreational activities.
10. **Instructional in Team Sports**
    * *Technical definition:* Any recreational facility with SIC codes 79991102, 79991103, 79991110.
    * *General description*: Instruction in team sports.
11. **Instructional in Water Activities**
    * *Technical definition:* Any recreational facility with SIC codes 79991107, 79991115, 79991116, 79991121, 79991122.
    * *General description*: Instruction in water activities.
12. **Instructional in Racquet Sports**
    * *Technical definition:* Any recreational facility with SIC codes 79990100, 79990103.
    * *General description*: Instruction in racquet sports.

These categories were then collapsed into broader categories for analysis purposes of:

1. Total Physical Activities including recreational
   * Consists of Indoor Conditioning, Recreational, Team Sports, Water Activities Conditioning, Racquet Sports
2. Total Physical Activities with Instructional and Water Activities including recreational
   * Consists of Indoor Conditioning, Recreational, Team Sports, Water Activities, Water Activities Conditioning, Racquet Sports, Instructional in Indoor Conditioning, Instructional in Recreational, Instructional in Team Sports, Instructional in Water Activities, Instructional in Racquet Sports
3. Total Physical Activities excluding recreational
   * Consists of Indoor Conditioning, Team Sports, Water Activities Conditioning, Racquet Sports
4. Total Physical Activities with Instructional and Water Activities excluding recreational
   * Consists of Indoor Conditioning, Team Sports, Water Activities, Water Activities Conditioning, Racquet Sports, Instructional in Indoor Conditioning, Instructional in Team Sports, Instructional in Water Activities, Instructional in Racquet Sports

All of the above categories are also available for indoor and outdoor activities separately. Indoor and outdoor are not mutually exclusive categories (i.e.: a facility could be categorized as both indoor and outdoor).

Social engagement destinations

The social engagement data consists of places which promote social engagement and social interaction. SIC codes were selected based on previous work by Christine Hoehner[[10]](#footnote-10).

The social engagement destinations are categorized into 15 categories as follows:

1. **Beauty Shops and Barbers**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7231, 7241.
   * *General description*: Beauty shops and barbers including cosmetology and nail salons.
2. **Performance Based Entertainment**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7832, 7911 (except 79110200, 79110202, 79110203, 79110204), 7922, 7929.
   * *General description*: Locations for watching performances. Includes movie theaters, dance studios and theaters, opera production, performing arts centers, entertainment and musical groups.
3. **Participatory Entertainment**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7933, 7992 or 6 digit SIC code in 799901 (except 79990103), 799902 (except 79990203), 799903, 799904, 799906, 799907, 799908, 799914 (except 79991409, 79991410, 79991411) or 8 digit SIC code in 79999902, 79999903, 79999905, 79999907, 79999909, 79999910, 79999912.
   * *General description*: Clubs and sporting and game venues in which the use participates in the activities that typically do not require a membership. Includes bowling centers, golf courses, tennis clubs, indoor court sports, table tennis, billiards, skating rinks, archery and other shooting ranges, card and bingo halls, bath houses, beaches, and recreation centers.
4. **Sports and Professional Stadium Entertainment**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7941, 7948 or 8 digit SIC code in 79999913.
   * *General description*: Sporting venues in which the user watches an event but does not participate. Includes professional sports clubs (i.e.: baseball, basketball, football, etc.), motor vehicle racing, horse racing, and dog racing.
5. **Exercise Facilities**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7991.
   * *General description*: Exercise facilities where the user participates in physical fitness activities in gym or class setting. Includes athletic clubs, spas, and exercise classes.
6. **Coin-Operated Amusements and Gambling**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7993 or 6 digit SIC code in 799913.
   * *General description*: Venues for gambling or other machine-based entertainment. Includes gaming machines, arcades, gambling machines, and gambling and lottery services.
7. **Amusement Parks, Carnivals, and Rodeos**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7996 or 6 digit SIC code in 799909, 799910, 799912 (except 79991201, 79991205) or 8 digit SIC code in 79990000, 79991502, 79991503, 79991504, 79991505, 79991506, 79991508, 79991509, 79991512, 79991513, 79991514, 79991516, 79991604, 79999900, 79999904, 79999917.
   * *General description*: Amusement parks and other recreational shows and activities typically not used frequently. Typically includes places with amusement rides or shows. Includes amusement parks, animal and circus shows, exhibitions, fairs, carnivals, rodeo and riding stables, go carts, scenic trains, waterslides, wave pools, and fireworks.
8. **Membership Sports and Recreational Clubs**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 7997 or 6 digit SIC code in 869901 or 8 digit SIC code in 86990000, 86999900, 86999906.
   * *General description*: Sports and activities clubs that require a membership typically with monetary dues. Includes boating and beach clubs, swimming club, gun clubs, team sports clubs, ice sports clubs, racquet sports clubs, bowling club, golf club, riding club, and other athletic clubs (all require membership).
9. **Libraries**
   * *Technical definition:* Any social engagement destination with 4 digit SIC code 8231.
   * *General description*: Libraries and other places for book check out and reading. Includes general and specialized libraries and book rentals.
10. **Museums and Art Galleries**
    * *Technical definition:* Any social engagement destination with 4 digit SIC code 8412 or 8 digit SIC code in 79999901.
    * *General description*: Museums and galleries to observe art, history, science, etc. Includes museums, art galleries, historical societies, science centers, and planetarium.
11. **Zoo, Aquarium, and Arboretum**
    * *Technical definition:* Any social engagement destination with 4 digit SIC code 8422 or 8 digit SIC code in 79991515.
    * *General description*: Zoos, aquariums, etc to observe wildlife or plants. May not be used on a regular basis. Includes zoos, botanical gardens, aquarium, and arboretum.
12. **Civil, Social, and Political Clubs**
    * *Technical definition:* Any social engagement destination with 4 digit SIC code 8651 or 6 digit SIC code in 864101, 864102, 864105, 864199 or 8 digit SIC code in 86410000, 86410400, 86410402, 86410403, 86990200, 86990202, 86990203, 86999901, 86999902, 86999903, 86999904, 86999905, 86999908, 86999909, 86999910.
    * *General description*: Political, civil, and social clubs that typically require membership. Includes political organizations, fraternal associations, alumni associations, university clubs, business person club, homeowners associations, booster club, environmental protection club, PTA, charitable organization, travel club, and historical club.
13. **Religion**
    * *Technical definition:* Any social engagement destination with 4 digit SIC code 8661 or 8 digit SIC code in 86990201, 86990204.
    * *General description*: Religious organizations or other places of worship. Includes churches, temples, synagogue, mosque, and religious reading rooms.
14. **Eating and Dining Places**
    1. *Technical definition:* Any social engagement destination with 4 digit SIC code 5812 or on fast food chain name list as described in the Food Stores section.
    2. *General description*: Food stores designed for dining out and consumption on site.
15. **Night Clubs and Bars**
    * *Technical definition:* Any social engagement destination with 4 digit SIC code 5813 or 8 digit SIC code in 79999918, 86410401.
    * *General description*: Night clubs, dance halls, and bars. May or may not serve alcohol. These categories were then also summed together for a total social engagement destination environment.

There is also an overall social engagement destinations variable which sums together all of the above categories.

Popular walking destinations

The popular walking data consists of places which promote walking. SIC codes were selected based on previous work by Christine Hoehner[[11]](#footnote-11).

The popular walking destinations are categorized into 6 categories as follows:

1. **Postal Service**
   1. *Technical definition:* Any walking destination with 4 digit SIC code 4311.
   2. *General description*: Post offices and other postal services.
2. **Drug Stores and Pharmacy**
   1. *Technical definition:* Any walking destination with 4 digit SIC code 5912.
   2. *General description*: Drug stores and pharmacies. Does not include those that are also supermarkets.
3. **Banks and Credit Unions**
   1. *Technical definition:* Any walking destination with 4 digit SIC code 6021, 6022, 6029, 6035, 6036, 6061, 6062.
   2. *General description*: Banks and credit unions including private banks and federal and state credit unions.
4. **Food Stores Non-Beverage**
   1. *Technical definition:* Any walking destination with 4 digit SIC code 5411, 5421, 5431, 5441, 5451, 5461, 5499 (except 549902) or 8 digit SIC code 86999907 or on supermarket chain name list as described in the Food Stores section.
   2. *General description*: Food stores designed for grocery shopping including supermarkets, grocers, convenience stores, delis, food co-ops, ect. Excludes any stores used only for purchases of beverages.
5. **Eating and Dining Places Non-Beverage**
   1. *Technical definition:* Any walking destination with 4 digit SIC code 5812 (except 58120205, 58120206, 58120304) or on fast food chain name list as described in the Food Stores section.
   2. *General description*: Food stores designed for dining out and consumption on site. Excludes any stores used only for purchases of beverages including coffee.
6. **Drinking Places Non-Alcoholic**
   1. *Technical definition:* Any walking destination with SIC code 54990200, 54990201, 54990202, 54990203, 54990204, 54990205, 58120205, 58120206, 58120304. Note that this is the same definition as the drinking places non-alcoholic in food stores coding.
   2. *General description*: Food stores that sell coffee, smoothies, juices, and tea for consumption on site.

There is also an overall/total popular walking destinations variable which sums together all of the above categories.

### 3.2 Descriptive Statistics

Summary statistics of selected variables including sample size, mean, standard deviation, range, median, Q1, Q3, max and min are shown (Appendix Table D.1 - D.5) and correlations in various types of densities (Appendix Table D.6 - D.9). Based on these summary statistics, we found that:

* Both favorable food store and unfavorable food store increased while neutral food stores decreased between exams 1 and 2. However, % of favorable stores decreased due to a greater increase in unfavorable stores.
* Extreme values can be observed for the ratio of unfavorable favorable food stores because of the very low densities of favorable food stores. This variable should be used with caution if at all.
* In general, recreational facilities, social engagement places, popular walking destinations and total stores increase overtime.
* 1 mile buffer density for the recreational facilities/food store density is often very low; larger buffers may be required in JHS analyses. In the analytic recommendation dataset, we have retained variables corresponding to 1/2, 1 and 3 mile buffers to give more flexibility in the analysis.
* Kernel and simple densities are highly correlated (e.g. correlation between kernel and simple favorite food store densities is 0.74 for ½ mile, 0.81 for 1 mile, 0.91 for 3 mile in exam 1); higher correlation in densities of various buffers are found in smaller buffer-miles (e.g. the correlation in favorite food store kernel densities between ½ mile and 1 mile is 0.72 vs. 0.36 between ½ mile and 3 mile).

### 3.3 Recommendations

As described above there are a wealth of measures of spatial access to food resources, physical activity resources, social engagement and walking destinations. As of the time of writing these measures and their relationships to outcomes have not been investigated. Better guidance may therefore be available as research proceeds.

Preliminarily, we recommend that analysts focus on the key summary measures:

Food stores: density of favorable food stores and density of unfavorable food stores (excluding alcohol) can also be used but note that it is correlated with favorable which creates methodological problems. Adjusting for population density may reduce the correlation.

Recreational facilities: density of total instructional activities including water and instructional

Social engagement: density of total social engagement destinations

Popular walking destinations: density of total walking destinations.

A total store density variable is also available if the intent is to adjust for store density. Please note that this variable includes all stores include in the food environment, recreational facility environment, social engagement and walking destinations data. It does not include other types of stores (e.g. other retail stores).

We recommend beginning with the 1 mile buffer and investigating sensitivity to smaller (1/2 mile) and larger (3 mile) buffeters. Additional buffers (5-mile buffer) are also available in the NETS dataset upon request. Simple densities should be adequate for most purposes. **Adjustment for population density should be considered when examining the associations of densities with outcomes (the analyst should carefully consider whether population density may be a confounder)**.

Table 6: Food and Physical Activity Resources (NETS derived data)

|  |  |
| --- | --- |
| **NAME** | **LABEL** |
| **Food Store** | |
| K1FAV | 1 mile kernel FAVORABLE FOOD STORES |
| K1MRFEI\_NOALC | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| K1MRFEI\_TOT | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| K1TOTFOOD | 1 mile kernel TOTAL FOOD STORES |
| K1UNFAV | 1 mile kernel UNFAVORABLE FOOD STORES |
| K1UNFAVFO | 1 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| S1FAV | 1 mile simple FAVORABLE FOOD STORES |
| S1MRFEI\_NOALC | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| S1MRFEI\_TOT | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| S1TOTFOOD | 1 mile simple TOTAL FOOD STORES |
| S1UNFAV | 1 mile simple UNFAVORABLE FOOD STORES |
| S1UNFAVFO | 1 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| K0FAV | 1/2 mile kernel FAVORABLE FOOD STORES |
| K0MRFEI\_NOALC | 1/2 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| K0MRFEI\_TOT | 1/2 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| K0TOTFOOD | 1/2 mile kernel TOTAL FOOD STORES |
| K0UNFAV | 1/2 mile kernel UNFAVORABLE FOOD STORES |
| K0UNFAVFO | 1/2 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| S0FAV | 1/2 mile simple FAVORABLE FOOD STORES |
| S0MRFEI\_NOALC | 1/2 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| S0MRFEI\_TOT | 1/2 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| S0TOTFOOD | 1/2 mile simple TOTAL FOOD STORES |
| S0UNFAV | 1/2 mile simple UNFAVORABLE FOOD STORES |
| S0UNFAVFO | 1/2 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| K3FAV | 3 mile kernel FAVORABLE FOOD STORES |
| K3MRFEI\_NOALC | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| K3MRFEI\_TOT | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| K3TOTFOOD | 3 mile kernel TOTAL FOOD STORES |
| K3UNFAV | 3 mile kernel UNFAVORABLE FOOD STORES |
| K3UNFAVFO | 3 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| S3FAV | 3 mile simple FAVORABLE FOOD STORES |
| S3MRFEI\_NOALC | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| S3MRFEI\_TOT | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| S3TOTFOOD | 3 mile simple TOTAL FOOD STORES |
| S3UNFAV | 3 mile simple UNFAVORABLE FOOD STORES |
| S3UNFAVFO | 3 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| **Recreational facilities** | |
| K1IPAI | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| K1OPAI | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| K1PAI | 1 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| S1IPAI | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| S1OPAI | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| S1PAI | 1 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| K0IPAI | 1/2 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| K0OPAI | 1/2 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| K0PAI | 1/2 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| S0IPAI | 1/2 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| S0OPAI | 1/2 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| S0PAI | 1/2 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| K3IPAI | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| K3OPAI | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| K3PAI | 3 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| S3IPAI | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| S3OPAI | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| S3PAI | 3 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| **Social engagement** | |
| K1SOC | 1 mile kernel total social engagement destinations |
| S1SOC | 1 mile simple total social engagement destinations |
| K0SOC | 1/2 mile kernel total social engagement destinations |
| S0SOC | 1/2 mile simple total social engagement destinations |
| K3SOC | 3 mile kernel total social engagement destinations |
| S3SOC | 3 mile simple total social engagement destinations |
| **Walking destination** | |
| K1WALK | 1 mile kernel total neighborhood popular walking destinations |
| S1WALK | 1 mile simple total neighborhood popular walking destinations |
| K0WALK | 1/2 mile kernel total neighborhood popular walking destinations |
| S0WALK | 1/2 mile simple total neighborhood popular walking destinations |
| K3WALK | 3 mile kernel total neighborhood popular walking destinations |
| S3WALK | 3 mile simple total neighborhood popular walking destinations |
| **Total store** |  |
| K1TOTSTR | 1 mile kernel TOTAL STORES |
| S1TOTSTR | 1 mile simple TOTAL STORES |
| K0TOTSTR | 1/2 mile kernel TOTAL STORES |
| S0TOTSTR | 1/2 mile simple TOTAL STORES |
| K3TOTSTR | 3 mile kernel TOTAL STORES |
| S3TOTSTR | 3 mile simple TOTAL STORES |

## JHS Built Environment Data

Jackson Heart Study (JHS) built environment data contains the neighborhood built environment information of JHS participants’ neighborhood at the time when they participated in JHS exam 1 and exam 2. Domains assessed include: land use, street connectivity, pedestrian/bike fatality crashes and population density for buffer sizes of ¼, ½, and 1 mile around each address.

Data are available for a total of 5301 JHS participants, of which 4203 have information for both JHS Exams 1 and Exam 2, 1098 have information only on Exam 1, and 0 have information on only Exam 2.

### 4.1 Variables

JHS built environment data contains both density and count measures related to land use, street connectivity, pedestrian/bike fatality crashes and population density for buffer sizes of ¼, ½, and 1 mile around each address. These buffers were selected because they are the one most commonly used in assessing the impact of the built environment on behaviors. Both simple and kernel densities are available.

#### 4.1.2 Street connectivity

All network and street calculations were performed using streets from StreetMap 03 to represent year 2000 and from StreetMap Premium 2012 for year 2010. Residential address at visit dates in year 2000 – 2005 used StreetMap 03 data and residential address at visit dates in year 2006 – 2012 used StreetMap Premium 2012 data.

Intersection count is used as a measure of how connected the streets are. A higher intersection count (or intersection density) means better connections between streets and greater ease of walking to places. In this calculation, “dangle points” (cul-de-sacs) were removed and then the number of intersections was counted within each buffer size of ¼, ½, and 1 mile.

Intersection density was created for each buffer by the following formula:

Intersection density = intersection count/total area in hectares

The unit of measure is intersections per hectare.

Network area and network ratio (network area/total (Euclidean) area) are used as alternative measures of how connected the streets are. A higher network area and network ratio indicates higher street connectivity (more places accessible within a given distance of the home). Network buffers were created so as to obtain network area (the land area covered by the network buffers). Network buffers differ from straight-line buffers in that they reflect the distance from a point along the network (in our case, streets).

#### 4.1.2 Land use

**Data on land use is only available for Hinds County which was collected in 1998 and 2013 from Hinds County Tax Assessor’s office in Jackson, MS**. Residential addresses at visit dates before July 2005 used 1998 land use data and residential addresses at visit dates after July 2005 used 2013 land use data.

For each land use file, the parcels were coded into residential, retail, and commercial. The parcel coding within each file is highly variable in terms of the types of codes and detail available. Coding was standardized as much as possible across time periods and sites to have measures that are comparable. Coding was based on what type of service the parcel is zoned for. Two investigators simultaneously classified parcels into three non-mutually exclusive categories (retail, commercial, and residential), based on the land use codes provided for each study area. Three additional investigators verified the classification and resolved disagreements. In general, coding rules are as follows:

1. Residential – Land parcels devoted to areas where people can live. This can include areas that are mixed use.
   1. Any codes that have the term “residential” or “residence” in the name
   2. Single family homes
   3. Duplex dwellings
   4. Apartment complex
   5. Condominium
   6. Mobile Home/Trailer parks
   7. Assisted Living/Nursing Homes
   8. Rooming Houses
   9. Group Quarters
   10. Farmsteads
   11. Seasonal/Vacation homes
   12. Church Residence
   13. Bed and Breakfast (assumed the owners are living here also)
   14. NOT INCLUDING: student housing and fraternities.
2. Retail – Land parcels devoted to retail uses where people can purchase goods
   1. Any codes that have the term “retail” in the name
   2. Shopping Center/Malls
   3. Food stores
   4. Convenience stores
   5. Restaurants
   6. Bars/Night clubs
   7. Clothing stores
   8. Mixed use – this was assumed to have at least some retail as part of the land use mix
   9. Combination of commercial and residential – It was assumed that this contains some retail, because parcels coded as both commercial and residential may represent development that has stores with goods for purchase below residences.
3. Commercial – Land parcels devoted to commercial uses where people can either purchase goods or obtain services (professional included)
   1. Any coded as “Retail” above are included
   2. Any codes that have the term “commercial” in the name
   3. Trade/Wholesale Trade
   4. Finance/Banks
   5. Insurance
   6. Personal services
   7. Theater
   8. Office Parks
   9. NOT INCLUDING: hospitals and medical facilities

Measures for land use include percent retail, percent commercial, and percent residential within participant buffers for ¼, ½, and 1 mile and the straight-line (Euclidean) distance to nearest retail and commercial. Also included are the percent of the participants’ buffers that falls within the jurisdiction for which land use data is available (i.e.: those within Hinds County). For these indicators, a value of 1 means the entire buffer is within the land use jurisdiction and a value of 0 means the buffer is completely outside the land use jurisdiction. Values between 0 and 1 mean that only part of the buffer is within the land use jurisdiction. **Land use data should only be used for participants for whom the proportion of buffer within Hinds is 100%** (use percent buffer in land use data boundary variables: PCTLU0, PCTLU1, PCTLU14 or use whether the address is within Hinds County (INLUCOUNTY) to decide).

The percent of land use was calculated using the formulas:

Percent residential = Residential Area in meters square/total area in meters square

Percent retail = Retail Area in meters square/total area in meters square

Percent commercial = Commercial Area in meters square/total area in meters square

#### 4.1.3 Population density

The census-based total population (based on census block population data from US Census 2000 and US Census 2010 SF1 data; US Census 2000 for JHS address in year 2000-2005 and US Census 2010 for JHS address in year 2006-2008) within a study participant’s ¼ mile, ½ mile, and 1 mile buffers was calculated. First, a population density is calculated for each block (assuming an equal distribution of people per unit area). The density for a given buffer is a weighted average of the densities of all blocks intersecting the buffer with weights being proportional to the % of the blocks area that falls within the buffer. Densities are expressed as persons per square km and persons per square mile.

Population density per square km = Total Population/Total Area in square kilometers)

Population density per square mile = Total Population/(Total Area in square mile)

In addition, the population density within residential area (per square kilometer) was calculated using the formula:

Population density in residential area per square km = (Total Population/Total Residential Area in square kilometers)

#### 4.3.3 Pedestrian/bike crash fatalities

Data for fatalities suffered in motor vehicle traffic crashes were obtained through the Fatality Analysis Reporting System (FARS), which is a nationwide census providing the National Highway Traffic Safety Administration (NHTSA), Congress, and the American public yearly data regarding these incidents. The data was downloaded through the FARS website (<http://www.nhtsa.gov/FARS>) and is available for years 2001-2011. The data was subset to include only those incidents that involved a pedestrian fatality, which includes any non-motorized transport such as pedestrian, bikes, rollerblades, wheelchair, skateboards, etc. In cases where there was more than one fatality involved in an incident, these were counted as one incident and the additional fatalities were excluded from analysis.

Kernel and simple densities of pedestrian fatality crashes were calculated for ¼, ½, and 1 mile buffers around the addresses. **Although these measures are available we do not recommend their use until further exploration is conducted as the data are very sparse.**

#### 4.1.4 Public transportation

Distances to nearest bus stops and bus routes were calculated based on Jatran bus stops and routes obtained through the city of Jackson, MS. The unit of measure for these variables is in meters. The Near Tool in ArcGIS 10.1 was used to identify the nearest transportation station or route to the participant’s address using a 300 mile search radius. These measures are only available for participants who are within 5 miles of the boundaries for the city of Jackson. If the address is more than 5 miles from the city of Jackson, then the data will be missing.

The public transportation data for JHS study is only available at year 2013. This information was used to create measures for all exams. **Although these measures are available we do not recommend their use until further exploration is conducted as the data are limited.**

For all measures described above, please refer to “EAC\_MESA\_JHS\_BuiltEnvironment Documentation.docx” to obtain further information on the variable creation.

### 4.2 Descriptive statistics

Summary statistics of selected variables including sample size, mean, standard deviation, range, median, Q1, Q3, max and min are shown (Appendix Table E.1 - E.5) and correlations in various types of densities (Appendix Table E.6 - E.8). Based on these summary statistics, we found that:

* Crash density (# crashes per area) is highly sparse; we also found this highly sparse crash density in other studies (e.g. MESA); missing values (NMISS) are due to invalid JHS participant’s residential addresses.
* In general, there are small change in % retail (decrease), commercial (decrease) and residential (increase) between Exam 1 and Exam 2. Data on land use is only available for Hinds County which was collected from Hinds County Tax Assessor’s office in Jackson, MS; therefore, participants who did not live in Hinds County or had invalid residential address info at the time of exam visit have missing values.
* Population density (recommended) decreased between Exam 1 and Exam 2. Usually the population density is used as an adjustment variable and the buffer size version of the population density should be used consistent with the other variables (e.g. if 1 mile buffer % retail is used, 1 mile buffer population density is recommended if the population density variable needs to be used). Missing values (NMISS) are due to invalid JHS participant’s residential address.
* The network ratio did not change much between Exam 1 and Exam 2 (only a small decrease is observed). Missing values (NMISS) are due to invalid JHS participant’s residential address.
* In general, the distances to closest bus stop/route increase between Exam 1 and Exam 2. Bus route information is only available for participants who are within 5 miles of the boundaries for the city of Jackson; therefore, participants lived outside the area or had invalid residential address info at the time of exam visit have missing values.
* Higher correlations are observed between measures corresponding to smaller buffer sizes (e.g. the correlation in % commercial between ¼ mile and 1 mile is 0.59 vs. 0.80 in between ¼ mile and ½ mile in Exam 1).

### 4.3 Variable Recommendation

As in the case of the resource densities these variables have not been examined in relation to outcomes yet, so recommendations may change after these studies are conducted. Preliminarily and based on other work we recommend the following measures:

Land use: % retail, % commercial and % residential as a measure of land use mix;

Street connectivity: intersection density and network ratio;

Population density for the corresponding buffer can be used as an adjustment variable if required.

We suggest beginning with the 1 mile buffers although for some built environment measures smaller buffers may also be appropriate.

Table 7: Built environment measures recommendation variable list

|  |  |
| --- | --- |
| **NAME** | **LABEL** |
| **neighborhood land use** |  |
| PCOM0 | Percent Commercial 1/2 mile |
| PCOM1 | Percent Commercial 1 mile |
| PCOM14 | Percent Commercial 1/4 mile |
| PRES0 | Percent Residential 1/2 mile |
| PRES1 | Percent Residential 1 mile |
| PRES14 | Percent Residential 1/4 mile |
| PRET0 | Percent Retail 1/2 mile |
| PRET1 | Percent Retail 1 mile |
| PRET14 | Percent Retail 1/4 mile |
| PCTLU0 | Percent of 1/2 mile buffer in land use data boundary (Hinds County) |
| PCTLU1 | Percent of 1 mile buffer in land use data boundary (Hinds County) |
| PCTLU14 | Percent of 1/4 mile buffer in land use data boundary (Hinds County) |
| INLUCOUNTY | Falls within county boundaries for land use data (0=outside; 1=within) |
| **neighborhood population density** |  |
| POPDENKM0 | Population density per square km 1/2 mile |
| POPDENKM1 | Population density per square km 1 mile |
| POPDENKM14 | Population density per square km 1/4 mile |
| POPDENMI0 | Population density per square mile 1/2 mile |
| POPDENMI1 | Population density per square mile 1 mile |
| POPDENMI14 | Population density per square mile 1/4 mile |
| **street connectivity** |  |
| NetRatio0 | Network Ratio 1/2 mile |
| NetRatio1 | Network Ratio 1 mile |
| NetRatio14 | Network Ratio 1/4 mile |
| INTCNT0 | Number of intersections in 1/2 mile buffer |
| INTCNT1 | Number of intersections in 1 mile buffer |
| INTCNT14 | Number of intersections in 1/4 mile buffer |

## Appendix A: Census Variable Summary

Table A.1: Summary statistics of JHS census variables

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NAME** | **LABEL** | **exam** | **MEAN** | **STD** | **NMISS** | **NOBS** | **Max** | **P95** | **Q3** | **Median** | **Q1** | **P5** | **Min** |
| Educ\_minBA | % 25+ with minimum bachelor degree | exam1 | 0.22 | 0.13 | 4 | 5301 | 0.74 | 0.44 | 0.28 | 0.18 | 0.12 | 0.08 | 0.00 |
| Educ\_minBA | % 25+ with minimum bachelor degree | exam2 | 0.23 | 0.13 | 1 | 4203 | 0.76 | 0.50 | 0.29 | 0.22 | 0.13 | 0.06 | 0.00 |
| Educ\_minHS | % 25+ with minimum High School education | exam1 | 0.74 | 0.13 | 4 | 5301 | 0.99 | 0.94 | 0.86 | 0.73 | 0.63 | 0.54 | 0.43 |
| Educ\_minHS | % 25+ with minimum High School education | exam2 | 0.78 | 0.12 | 1 | 4203 | 0.99 | 0.95 | 0.89 | 0.79 | 0.70 | 0.56 | 0.48 |
| F1\_PC1 | Race/Ethnicity (PC1) Weighted Factor1 score | exam1 | -1.13 | 0.28 | 4 | 5301 | 0.06 | -0.59 | -0.97 | -1.15 | -1.36 | -1.52 | -1.79 |
| F1\_PC1 | Race/Ethnicity (PC1) Weighted Factor1 score | exam2 | -1.54 | 0.55 | 1 | 4203 | 1.26 | -0.52 | -1.24 | -1.63 | -1.97 | -2.25 | -2.50 |
| F1\_PC1\_BR | Factor1 based score w/raw vars for Race/Ethnicity (PC1) | exam1 | -1.32 | 0.54 | 4 | 5301 | 0.49 | -0.66 | -0.88 | -1.32 | -1.76 | -2.12 | -2.40 |
| F1\_PC1\_BR | Factor1 based score w/raw vars for Race/Ethnicity (PC1) | exam2 | -1.99 | 0.45 | 1 | 4203 | 2.73 | -1.31 | -1.78 | -2.13 | -2.32 | -2.53 | -2.55 |
| F1\_PC1\_BT | Factor1 based score w/transformed vars for Race/Ethnicity (PC1) | exam1 | -2.13 | 0.70 | 4 | 5301 | 1.03 | -1.02 | -1.71 | -2.05 | -2.71 | -2.97 | -4.18 |
| F1\_PC1\_BT | Factor1 based score w/transformed vars for Race/Ethnicity (PC1) | exam2 | -3.71 | 1.47 | 1 | 4203 | 4.16 | -0.91 | -3.01 | -3.80 | -4.74 | -6.21 | -6.98 |
| F1\_PC2 | SES (PC2) Weighted Factor1 score | exam1 | 0.63 | 0.65 | 4 | 5301 | 1.65 | 1.50 | 1.15 | 0.75 | 0.24 | -0.69 | -2.23 |
| F1\_PC2 | SES (PC2) Weighted Factor1 score | exam2 | 0.32 | 0.67 | 1 | 4203 | 1.51 | 1.23 | 0.82 | 0.34 | -0.09 | -0.85 | -2.65 |
| F1\_PC2\_BR | Factor1 based score w/raw vars for SES (PC2) | exam1 | 3.29 | 3.89 | 4 | 5301 | 10.24 | 8.38 | 6.32 | 3.98 | 1.09 | -3.23 | -10.84 |
| F1\_PC2\_BR | Factor1 based score w/raw vars for SES (PC2) | exam2 | 2.15 | 3.98 | 1 | 4203 | 10.50 | 7.81 | 4.55 | 2.58 | -0.64 | -5.04 | -11.68 |
| F1\_PC2\_BT | Factor1 based score w/transformed vars for SES (PC2) | exam1 | 3.55 | 4.20 | 4 | 5301 | 11.33 | 9.11 | 6.71 | 4.14 | 0.94 | -3.47 | -10.76 |
| F1\_PC2\_BT | Factor1 based score w/transformed vars for SES (PC2) | exam2 | 2.22 | 4.24 | 1 | 4203 | 11.62 | 8.60 | 4.65 | 2.62 | -0.94 | -5.35 | -11.33 |
| F1\_PC3 | Full (PC3) Weighted Factor1 score | exam1 | 0.52 | 0.65 | 4 | 5301 | 1.61 | 1.26 | 1.02 | 0.67 | 0.31 | -0.74 | -2.40 |
| F1\_PC3 | Full (PC3) Weighted Factor1 score | exam2 | 0.19 | 0.65 | 1 | 4203 | 1.55 | 1.07 | 0.74 | 0.20 | -0.18 | -1.01 | -2.69 |
| F1\_PC3\_BR | Factor1 based score w/raw vars for FULL (PC3) | exam1 | 3.29 | 3.89 | 4 | 5301 | 10.24 | 8.38 | 6.32 | 3.98 | 1.09 | -3.23 | -10.84 |
| F1\_PC3\_BR | Factor1 based score w/raw vars for FULL (PC3) | exam2 | 2.15 | 3.98 | 1 | 4203 | 10.50 | 7.81 | 4.55 | 2.58 | -0.64 | -5.04 | -11.68 |
| F1\_PC3\_BT | Factor1 based score w/transformed vars for FULL (PC3) | exam1 | 3.55 | 4.20 | 4 | 5301 | 11.33 | 9.11 | 6.71 | 4.14 | 0.94 | -3.47 | -10.76 |
| F1\_PC3\_BT | Factor1 based score w/transformed vars for FULL (PC3) | exam2 | 2.22 | 4.24 | 1 | 4203 | 11.62 | 8.60 | 4.65 | 2.62 | -0.94 | -5.35 | -11.33 |
| F2\_PC1 | Race/Ethnicity (PC1) Weighted Factor2 score | exam1 | 2.12 | 0.74 | 4 | 5301 | 3.02 | 2.80 | 2.61 | 2.33 | 1.95 | 0.48 | -0.56 |
| F2\_PC1 | Race/Ethnicity (PC1) Weighted Factor2 score | exam2 | 1.82 | 0.76 | 1 | 4203 | 2.89 | 2.57 | 2.31 | 2.04 | 1.57 | -0.06 | -1.13 |
| F2\_PC2 | SES (PC2) Weighted Factor2 score | exam1 | 0.38 | 0.78 | 4 | 5301 | 2.36 | 1.58 | 1.02 | 0.55 | -0.31 | -0.90 | -2.25 |
| F2\_PC2 | SES (PC2) Weighted Factor2 score | exam2 | 0.32 | 0.79 | 1 | 4203 | 2.53 | 1.64 | 0.91 | 0.21 | -0.31 | -0.87 | -1.67 |
| F2\_PC2\_BR | Factor2 based score w/raw vars for SES (PC2) | exam1 | 1.31 | 2.99 | 4 | 5301 | 12.37 | 7.15 | 3.26 | 1.80 | -1.41 | -3.08 | -4.68 |
| F2\_PC2\_BR | Factor2 based score w/raw vars for SES (PC2) | exam2 | 1.59 | 3.43 | 1 | 4203 | 11.11 | 7.41 | 4.16 | 0.84 | -1.60 | -2.87 | -4.24 |
| F2\_PC2\_BT | Factor2 based score w/transformed vars for SES (PC2) | exam1 | 1.64 | 2.98 | 4 | 5301 | 9.65 | 6.38 | 3.81 | 2.48 | -0.87 | -3.43 | -8.55 |
| F2\_PC2\_BT | Factor2 based score w/transformed vars for SES (PC2) | exam2 | 1.57 | 3.37 | 1 | 4203 | 9.06 | 6.65 | 4.43 | 1.51 | -1.61 | -3.19 | -6.32 |
| F2\_PC3 | Full (PC3) Weighted Factor2 score | exam1 | 1.30 | 0.71 | 4 | 5301 | 2.46 | 2.16 | 1.79 | 1.44 | 1.10 | -0.10 | -1.56 |
| F2\_PC3 | Full (PC3) Weighted Factor2 score | exam2 | 1.54 | 0.71 | 1 | 4203 | 3.03 | 2.49 | 2.05 | 1.55 | 1.13 | 0.36 | -0.99 |
| F2\_PC3\_BR | Factor2 based score w/raw vars for FULL (PC3) | exam1 | 4.82 | 4.41 | 4 | 5301 | 17.55 | 12.34 | 8.15 | 5.84 | 1.13 | -3.48 | -6.71 |
| F2\_PC3\_BR | Factor2 based score w/raw vars for FULL (PC3) | exam2 | 5.53 | 4.69 | 1 | 4203 | 16.54 | 12.84 | 9.46 | 5.67 | 2.35 | -2.69 | -5.52 |
| F2\_PC3\_BT | Factor2 based score w/transformed vars for FULL (PC3) | exam1 | 4.42 | 4.01 | 4 | 5301 | 13.66 | 10.35 | 7.42 | 5.36 | 1.34 | -3.37 | -10.03 |
| F2\_PC3\_BT | Factor2 based score w/transformed vars for FULL (PC3) | exam2 | 4.79 | 4.22 | 1 | 4203 | 13.31 | 10.86 | 8.52 | 5.19 | 1.26 | -2.76 | -7.55 |
| F3\_PC2 | SES (PC2) Weighted Factor3 score | exam1 | 0.10 | 0.67 | 4 | 5301 | 1.99 | 1.22 | 0.69 | -0.09 | -0.31 | -0.83 | -1.66 |
| F3\_PC2 | SES (PC2) Weighted Factor3 score | exam2 | 0.65 | 0.79 | 1 | 4203 | 3.04 | 1.92 | 1.19 | 0.57 | 0.08 | -0.68 | -2.23 |
| F3\_PC3 | Full (PC3) Weighted Factor3 score | exam1 | -1.07 | 0.21 | 4 | 5301 | 0.20 | -0.74 | -0.95 | -1.07 | -1.24 | -1.45 | -1.50 |
| F3\_PC3 | Full (PC3) Weighted Factor3 score | exam2 | -1.44 | 0.44 | 1 | 4203 | 1.30 | -0.71 | -1.12 | -1.48 | -1.80 | -2.19 | -2.19 |
| F3\_PC3\_BR | Factor3 based score w/raw vars for FULL (PC3) | exam1 | -0.89 | 0.56 | 4 | 5301 | 0.96 | -0.19 | -0.44 | -0.90 | -1.30 | -1.67 | -2.01 |
| F3\_PC3\_BR | Factor3 based score w/raw vars for FULL (PC3) | exam2 | -1.56 | 0.41 | 1 | 4203 | 2.53 | -0.86 | -1.39 | -1.71 | -1.84 | -2.05 | -2.08 |
| F3\_PC3\_BT | Factor3 based score w/transformed vars for FULL (PC3) | exam1 | -1.33 | 0.61 | 4 | 5301 | 1.84 | -0.39 | -0.92 | -1.31 | -1.66 | -2.23 | -3.89 |
| F3\_PC3\_BT | Factor3 based score w/transformed vars for FULL (PC3) | exam2 | -2.60 | 1.20 | 1 | 4203 | 3.43 | -0.32 | -1.94 | -2.66 | -3.35 | -4.82 | -5.59 |
| F4\_PC2 | SES (PC2) Weighted Factor4 score | exam1 | 0.44 | 0.49 | 4 | 5301 | 2.64 | 1.49 | 0.66 | 0.35 | 0.17 | -0.36 | -0.49 |
| F4\_PC2 | SES (PC2) Weighted Factor4 score | exam2 | -0.58 | 0.45 | 1 | 4203 | 0.80 | 0.15 | -0.35 | -0.65 | -0.94 | -1.19 | -1.59 |
| F4\_PC3 | Full (PC3) Weighted Factor4 score | exam1 | -0.73 | 0.88 | 4 | 5301 | 2.05 | 0.63 | 0.03 | -0.79 | -1.36 | -2.07 | -2.40 |
| F4\_PC3 | Full (PC3) Weighted Factor4 score | exam2 | -0.46 | 0.91 | 1 | 4203 | 2.10 | 1.06 | 0.28 | -0.33 | -1.28 | -1.76 | -2.72 |
| F4\_PC3\_BR | Factor4 based score w/raw vars for FULL (PC3) | exam1 | 0.15 | 1.23 | 4 | 5301 | 4.54 | 2.35 | 1.11 | 0.10 | -0.77 | -1.45 | -2.76 |
| F4\_PC3\_BR | Factor4 based score w/raw vars for FULL (PC3) | exam2 | 0.55 | 1.41 | 1 | 4203 | 5.39 | 3.00 | 1.62 | 0.66 | -0.68 | -1.39 | -2.33 |
| F4\_PC3\_BT | Factor4 based score w/transformed vars for FULL (PC3) | exam1 | 0.29 | 1.34 | 4 | 5301 | 4.48 | 2.62 | 1.21 | 0.08 | -0.64 | -1.59 | -3.43 |
| F4\_PC3\_BT | Factor4 based score w/transformed vars for FULL (PC3) | exam2 | 0.69 | 1.47 | 1 | 4203 | 5.13 | 3.17 | 1.55 | 0.98 | -0.59 | -1.68 | -4.38 |
| F5\_PC3 | Full (PC3) Weighted Factor5 score | exam1 | 0.69 | 0.44 | 4 | 5301 | 2.49 | 1.62 | 0.91 | 0.59 | 0.52 | -0.02 | -0.26 |
| F5\_PC3 | Full (PC3) Weighted Factor5 score | exam2 | -0.44 | 0.42 | 1 | 4203 | 0.85 | 0.35 | -0.20 | -0.44 | -0.75 | -0.97 | -1.58 |
| HU\_sampleocc | % Household occupied | exam1 | 0.91 | 0.06 | 4 | 5301 | 0.99 | 0.97 | 0.95 | 0.93 | 0.87 | 0.80 | 0.57 |
| HU\_sampleocc | % Household occupied | exam2 | 0.86 | 0.09 | 1 | 4203 | 1.00 | 0.98 | 0.93 | 0.86 | 0.79 | 0.70 | 0.48 |
| HUcost\_medownval | Median owner Household cost | exam1 | 64633 | 30871 | 4 | 5301 | 296600 | 112400 | 84800 | 54900 | 44900 | 32900 | 29400 |
| HUcost\_medownval | Median owner Household cost | exam2 | 94443 | 52798 | 1 | 4203 | 519100 | 174900 | 123100 | 74100 | 64200 | 39700 | 27300 |
| NotInLaborForce | % not in labor force | exam1 | 0.39 | 0.09 | 4 | 5301 | 0.70 | 0.53 | 0.45 | 0.38 | 0.32 | 0.28 | 0.16 |
| NotInLaborForce | % not in labor force | exam2 | 0.39 | 0.09 | 1 | 4203 | 0.78 | 0.57 | 0.44 | 0.39 | 0.32 | 0.25 | 0.16 |
| Occup\_I | % managerial occupation | exam1 | 0.27 | 0.11 | 4 | 5301 | 0.72 | 0.49 | 0.33 | 0.25 | 0.20 | 0.15 | 0.08 |
| Occup\_I | % managerial occupation | exam2 | 0.29 | 0.11 | 1 | 4203 | 0.68 | 0.48 | 0.33 | 0.31 | 0.21 | 0.07 | 0.00 |
| birth\_foreign | % foreign born | exam1 | 0.01 | 0.01 | 4 | 5301 | 0.10 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| birth\_foreign | % foreign born | exam2 | 0.01 | 0.02 | 1 | 4203 | 0.29 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| crowd\_gt1\_ppr | % Household with crowding > 1 person per room | exam1 | 0.08 | 0.04 | 4 | 5301 | 0.22 | 0.14 | 0.12 | 0.09 | 0.05 | 0.02 | 0.00 |
| crowd\_gt1\_ppr | % Household with crowding > 1 person per room | exam2 | 0.03 | 0.03 | 1 | 4203 | 0.18 | 0.08 | 0.04 | 0.02 | 0.01 | 0.00 | 0.00 |
| factor\_ana | Factor score based on Ana Diez-Roux 1990 PC factor analysis | exam1 | -2.77 | 3.74 | 4 | 5301 | 10.40 | 4.25 | -0.58 | -3.43 | -5.60 | -7.73 | -9.86 |
| factor\_ana | Factor score based on Ana Diez-Roux 1990 PC factor analysis | exam2 | -2.34 | 3.58 | 1 | 4203 | 10.46 | 3.71 | 0.28 | -2.83 | -4.28 | -7.39 | -10.55 |
| inc\_HHge50k | % Household w/income >= $50,000 | exam1 | 0.29 | 0.17 | 4 | 5301 | 0.85 | 0.56 | 0.43 | 0.22 | 0.14 | 0.10 | 0.04 |
| inc\_HHge50k | % Household w/income >= $50,000 | exam2 | 0.35 | 0.17 | 1 | 4203 | 0.86 | 0.68 | 0.44 | 0.33 | 0.23 | 0.06 | 0.04 |
| inc\_IntDivRent | % Household with interest, dividend, rental income | exam1 | 0.18 | 0.11 | 4 | 5301 | 0.68 | 0.43 | 0.23 | 0.16 | 0.10 | 0.06 | 0.01 |
| inc\_IntDivRent | % Household with interest, dividend, rental income | exam2 | 0.11 | 0.10 | 1 | 4203 | 0.65 | 0.30 | 0.14 | 0.09 | 0.05 | 0.00 | 0.00 |
| inc\_medHH | Median Household income | exam1 | 32892 | 15314 | 4 | 5301 | 118192 | 54236 | 42329 | 28889 | 22131 | 15076 | 10507 |
| inc\_medHH | Median Household income | exam2 | 36894 | 18012 | 1 | 4203 | 120938 | 71250 | 43782 | 32128 | 26042 | 14881 | 9391 |
| inc\_pubass | % with public assistance | exam1 | 0.06 | 0.04 | 4 | 5301 | 0.18 | 0.11 | 0.08 | 0.05 | 0.04 | 0.01 | 0.00 |
| inc\_pubass | % with public assistance | exam2 | 0.03 | 0.03 | 1 | 4203 | 0.10 | 0.07 | 0.06 | 0.03 | 0.01 | 0.00 | 0.00 |
| ownerocc\_hh | % Household owner occupied | exam1 | 0.59 | 0.19 | 4 | 5301 | 0.95 | 0.86 | 0.77 | 0.60 | 0.45 | 0.26 | 0.10 |
| ownerocc\_hh | % Household owner occupied | exam2 | 0.53 | 0.18 | 1 | 4203 | 0.97 | 0.83 | 0.66 | 0.53 | 0.38 | 0.24 | 0.06 |
| phone\_none | % Household w/no telephone | exam1 | 0.06 | 0.04 | 4 | 5301 | 0.19 | 0.15 | 0.08 | 0.05 | 0.02 | 0.01 | 0.00 |
| phone\_none | % Household w/no telephone | exam2 | 0.05 | 0.04 | 1 | 4203 | 0.24 | 0.13 | 0.07 | 0.04 | 0.03 | 0.01 | 0.00 |
| popden\_nowat | population density with only land (no water) (per km square) | exam1 | 903.40 | 646.31 | 4 | 5301 | 2605.39 | 1944.78 | 1423.94 | 855.92 | 271.29 | 12.92 | 4.46 |
| popden\_nowat | population density with only land (no water) (per km square) | exam2 | 766.67 | 618.17 | 1 | 4203 | 18328.3 | 1642.67 | 1176.51 | 755.94 | 261.40 | 19.93 | 3.97 |
| popden\_tot | population density including land+water (per km square) | exam1 | 900.45 | 648.04 | 4 | 5301 | 2605.39 | 1944.78 | 1423.94 | 855.92 | 268.32 | 12.89 | 4.43 |
| popden\_tot | population density including land+water (per km square) | exam2 | 763.91 | 618.92 | 1 | 4203 | 18328.3 | 1642.67 | 1176.51 | 740.02 | 259.40 | 19.69 | 3.94 |
| Pov | % below poverty | exam1 | 0.24 | 0.13 | 4 | 5301 | 0.55 | 0.45 | 0.34 | 0.24 | 0.11 | 0.05 | 0.01 |
| Pov | % below poverty | exam2 | 0.24 | 0.14 | 1 | 4203 | 0.58 | 0.52 | 0.33 | 0.23 | 0.13 | 0.05 | 0.01 |
| race\_asianNH | % asian non-hispanic | exam1 | 0.00 | 0.01 | 4 | 5301 | 0.05 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| race\_asianNH | % asian non-hispanic | exam2 | 0.00 | 0.01 | 1 | 4203 | 0.14 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| race\_blackNH | % black non-hispanic | exam1 | 0.79 | 0.27 | 4 | 5301 | 0.99 | 0.99 | 0.98 | 0.93 | 0.70 | 0.16 | 0.00 |
| race\_blackNH | % black non-hispanic | exam2 | 0.79 | 0.28 | 1 | 4203 | 1.00 | 1.00 | 0.98 | 0.96 | 0.60 | 0.18 | 0.01 |
| race\_hisp | % hispanic | exam1 | 0.01 | 0.01 | 4 | 5301 | 0.13 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| race\_hisp | % hispanic | exam2 | 0.01 | 0.02 | 1 | 4203 | 0.36 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| race\_otherNH | % other non-hispanic | exam1 | 0.00 | 0.00 | 4 | 5301 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| race\_otherNH | % other non-hispanic | exam2 | 0.00 | 0.01 | 1 | 4203 | 0.42 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| race\_whiteNH | % white non-hispanic | exam1 | 0.19 | 0.27 | 4 | 5301 | 0.96 | 0.82 | 0.28 | 0.06 | 0.01 | 0.00 | 0.00 |
| race\_whiteNH | % white non-hispanic | exam2 | 0.19 | 0.27 | 1 | 4203 | 0.93 | 0.78 | 0.31 | 0.02 | 0.01 | 0.00 | 0.00 |
| samehouse | % in same house | exam1 | 0.60 | 0.12 | 4 | 5301 | 0.78 | 0.77 | 0.67 | 0.65 | 0.56 | 0.38 | 0.10 |
| samehouse | % in same house | exam2 | 0.79 | 0.08 | 1 | 4203 | 0.92 | 0.88 | 0.85 | 0.80 | 0.74 | 0.64 | 0.40 |
| unemployed | % unemployed | exam1 | 0.09 | 0.04 | 4 | 5301 | 0.31 | 0.17 | 0.12 | 0.09 | 0.06 | 0.03 | 0.00 |
| unemployed | % unemployed | exam2 | 0.10 | 0.08 | 1 | 4203 | 0.43 | 0.26 | 0.13 | 0.09 | 0.05 | 0.01 | 0.00 |
| vehicle\_none | % Household w/no vehicle | exam1 | 0.13 | 0.09 | 4 | 5301 | 0.48 | 0.30 | 0.19 | 0.10 | 0.05 | 0.02 | 0.00 |
| vehicle\_none | % Household w/no vehicle | exam2 | 0.11 | 0.09 | 1 | 4203 | 0.52 | 0.29 | 0.16 | 0.09 | 0.03 | 0.01 | 0.00 |

\*missing values (NMISS) are due to invalid participants’ residential address.

Table A.2: Census SES factors correlation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| exam1 | NAME | F1\_PC2 | F1\_PC2\_BR | F1\_PC2\_BT | factor\_ana |
|  | F1\_PC2 | 1.00 | 0.85 | 0.84 | -0.87 |
|  | F1\_PC2\_BR | 0.85 | 1.00 | 1.00 | -0.99 |
|  | F1\_PC2\_BT | 0.84 | 1.00 | 1.00 | -0.99 |
|  | factor\_ana | -0.87 | -0.99 | -0.99 | 1.00 |
|  | NAME | F1\_PC2 | F1\_PC2\_BR | F1\_PC2\_BT | factor\_ana |
| exam2 | F1\_PC2 | 1.00 | 0.83 | 0.82 | -0.86 |
|  | F1\_PC2\_BR | 0.83 | 1.00 | 1.00 | -0.99 |
|  | F1\_PC2\_BT | 0.82 | 1.00 | 1.00 | -0.99 |
|  | factor\_ana | -0.86 | -0.99 | -0.99 | 1.00 |

## Appendix B: Neighborhood Survey Variable Summary

Table B.1: summary statistics on neighborhood survey variables

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Category | **NAME** | **LABEL** | **Exam** | **MEAN** | **STD** | **NMISS** | **NOBS** | **Max** | **P95** | **Q3** | **Median** | **Q1** | **P5** | **Min** |
| Disorder | NDFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Disorder FA-based | exam1 | 1.69 | 0.25 | 10 | 5301 | 2.25 | 2.06 | 1.88 | 1.71 | 1.47 | 1.3 | 0.94 |
| Disorder | NDFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Disorder FA-based | exam2 | 1.66 | 0.25 | 10 | 4203 | 2.25 | 2.05 | 1.86 | 1.7 | 1.45 | 1.27 | 0.94 |
| Disorder | NDFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Disorder FA-based | exam1 | 1.69 | 0.25 | 10 | 5301 | 2.25 | 2.04 | 1.88 | 1.71 | 1.46 | 1.29 | 1.11 |
| Disorder | NDFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Disorder FA-based | exam2 | 1.66 | 0.25 | 10 | 4203 | 2.25 | 2.04 | 1.86 | 1.69 | 1.44 | 1.29 | 1.11 |
| Disorder | NDFA\_UEBE | Age & gender adjusted unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | exam1 | 1.69 | 0.24 | 10 | 5301 | 2.31 | 2.07 | 1.9 | 1.7 | 1.46 | 1.32 | 1.15 |
| Disorder | NDFA\_UEBE | Age & gender adjusted unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | exam2 | 1.66 | 0.24 | 10 | 4203 | 2.31 | 2 | 1.82 | 1.69 | 1.44 | 1.31 | 1.15 |
| Disorder | NDFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | exam1 | 1.69 | 0.24 | 10 | 5301 | 2.3 | 2.06 | 1.89 | 1.69 | 1.46 | 1.33 | 1.15 |
| Disorder | NDFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | exam2 | 1.66 | 0.24 | 10 | 4203 | 2.3 | 2 | 1.81 | 1.69 | 1.44 | 1.31 | 1.15 |
| Problem | NPPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Problem PCA-based | exam1 | 1.57 | 0.19 | 10 | 5301 | 2.01 | 1.84 | 1.71 | 1.58 | 1.39 | 1.23 | 0.94 |
| Problem | NPPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Problem PCA-based | exam2 | 1.55 | 0.2 | 10 | 4203 | 2.01 | 1.84 | 1.71 | 1.58 | 1.39 | 1.21 | 0.94 |
| Problem | NPPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Problem PCA-based | exam1 | 1.57 | 0.19 | 11 | 5301 | 2.02 | 1.88 | 1.7 | 1.58 | 1.38 | 1.26 | 1.15 |
| Problem | NPPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Problem PCA-based | exam2 | 1.55 | 0.19 | 11 | 4203 | 2.02 | 1.86 | 1.69 | 1.57 | 1.38 | 1.26 | 1.15 |
| Problem | NPPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | exam1 | 1.57 | 0.19 | 10 | 5301 | 2.07 | 1.84 | 1.71 | 1.58 | 1.41 | 1.28 | 1.13 |
| Problem | NPPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | exam2 | 1.55 | 0.19 | 10 | 4203 | 2.07 | 1.82 | 1.71 | 1.56 | 1.37 | 1.26 | 1.13 |
| Problem | NPPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | exam1 | 1.57 | 0.18 | 10 | 5301 | 2.06 | 1.83 | 1.71 | 1.58 | 1.42 | 1.29 | 1.14 |
| Problem | NPPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | exam2 | 1.55 | 0.18 | 10 | 4203 | 2.06 | 1.81 | 1.71 | 1.55 | 1.37 | 1.27 | 1.14 |
| Resource | NRFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Resources FA-based | exam1 | 1.45 | 0.14 | 10 | 5301 | 1.76 | 1.65 | 1.56 | 1.46 | 1.33 | 1.19 | 0.94 |
| Resource | NRFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Resources FA-based | exam2 | 1.43 | 0.15 | 10 | 4203 | 1.76 | 1.65 | 1.53 | 1.45 | 1.33 | 1.15 | 0.94 |
| Resource | NRFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Resources FA-based | exam1 | 1.45 | 0.14 | 11 | 5301 | 1.77 | 1.7 | 1.53 | 1.45 | 1.34 | 1.23 | 1.13 |
| Resource | NRFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Resources FA-based | exam2 | 1.43 | 0.14 | 11 | 4203 | 1.77 | 1.66 | 1.5 | 1.44 | 1.32 | 1.22 | 1.13 |
| Resource | NRFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | exam1 | 1.45 | 0.13 | 10 | 5301 | 1.78 | 1.69 | 1.51 | 1.43 | 1.34 | 1.24 | 1.17 |
| Resource | NRFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | exam2 | 1.43 | 0.13 | 10 | 4203 | 1.78 | 1.69 | 1.51 | 1.43 | 1.34 | 1.21 | 1.17 |
| Resource | NRFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | exam1 | 1.44 | 0.12 | 10 | 5301 | 1.75 | 1.68 | 1.5 | 1.44 | 1.33 | 1.26 | 1.17 |
| Resource | NRFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | exam2 | 1.43 | 0.12 | 10 | 4203 | 1.75 | 1.68 | 1.5 | 1.42 | 1.33 | 1.23 | 1.17 |
| Disorder | NbDiso\_fa\_RAW | Crude Mean Neighborhood (NB) Disorder FA-based | exam1 | 1.69 | 0.28 | 6 | 5301 | 2.67 | 2.1 | 1.92 | 1.69 | 1.44 | 1.25 | 1 |
| Disorder | NbDiso\_fa\_RAW | Crude Mean Neighborhood (NB) Disorder FA-based | exam2 | 1.66 | 0.29 | 9 | 4203 | 4 | 2.1 | 1.83 | 1.69 | 1.41 | 1.22 | 1 |
| Problem | NbProb\_pca\_RAW | Crude Mean NB Problem PCA-based | exam1 | 1.57 | 0.22 | 7 | 5301 | 3.33 | 1.87 | 1.73 | 1.57 | 1.4 | 1.22 | 1 |
| Problem | NbProb\_pca\_RAW | Crude Mean NB Problem PCA-based | exam2 | 1.55 | 0.23 | 10 | 4203 | 3.33 | 1.85 | 1.72 | 1.55 | 1.37 | 1.17 | 1 |
| Resource | NbRes\_fa\_RAW | Crude Mean Neighborhood (NB) Resources FA-based | exam1 | 1.45 | 0.19 | 7 | 5301 | 4 | 1.7 | 1.54 | 1.44 | 1.33 | 1.15 | 1 |
| Resource | NbRes\_fa\_RAW | Crude Mean Neighborhood (NB) Resources FA-based | exam2 | 1.43 | 0.19 | 10 | 4203 | 4 | 1.69 | 1.52 | 1.43 | 1.33 | 1.11 | 1 |
| Cohesion | SCFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion FA-based | exam1 | 2.96 | 0.14 | 10 | 5301 | 3.26 | 3.17 | 3.09 | 2.96 | 2.87 | 2.76 | 2.59 |
| Cohesion | SCFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion FA-based | exam2 | 2.98 | 0.14 | 10 | 4203 | 3.26 | 3.18 | 3.11 | 2.98 | 2.87 | 2.76 | 2.59 |
| Cohesion | SCFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion FA-based | exam1 | 3 | 0.14 | 11 | 5301 | 3.28 | 3.21 | 3.13 | 2.99 | 2.9 | 2.79 | 2.58 |
| Cohesion | SCFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion FA-based | exam2 | 3.01 | 0.13 | 14 | 4203 | 3.28 | 3.22 | 3.13 | 3.02 | 2.9 | 2.81 | 2.58 |
| Cohesion | SCFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | exam1 | 2.97 | 0.14 | 10 | 5301 | 3.25 | 3.19 | 3.07 | 2.95 | 2.87 | 2.77 | 2.57 |
| Cohesion | SCFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | exam2 | 2.98 | 0.13 | 10 | 4203 | 3.25 | 3.19 | 3.09 | 2.98 | 2.87 | 2.77 | 2.57 |
| Cohesion | SCFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | exam1 | 2.97 | 0.13 | 10 | 5301 | 3.23 | 3.17 | 3.07 | 2.96 | 2.89 | 2.78 | 2.59 |
| Cohesion | SCFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | exam2 | 2.98 | 0.12 | 10 | 4203 | 3.23 | 3.17 | 3.07 | 2.96 | 2.89 | 2.78 | 2.59 |
| Cohesion | SCPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion PCA-based | exam1 | 3.01 | 0.13 | 10 | 5301 | 3.25 | 3.19 | 3.11 | 3.01 | 2.92 | 2.81 | 2.64 |
| Cohesion | SCPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion PCA-based | exam2 | 3.02 | 0.12 | 10 | 4203 | 3.25 | 3.19 | 3.11 | 3.03 | 2.92 | 2.82 | 2.64 |
| Cohesion | SCPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion PCA-based | exam1 | 3.04 | 0.12 | 11 | 5301 | 3.26 | 3.21 | 3.14 | 3.05 | 2.93 | 2.81 | 2.65 |
| Cohesion | SCPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion PCA-based | exam2 | 3.05 | 0.12 | 13 | 4203 | 3.26 | 3.21 | 3.14 | 3.06 | 2.96 | 2.86 | 2.65 |
| Cohesion | SCPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | exam1 | 3.01 | 0.12 | 10 | 5301 | 3.23 | 3.19 | 3.12 | 3.02 | 2.93 | 2.81 | 2.63 |
| Cohesion | SCPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | exam2 | 3.02 | 0.12 | 10 | 4203 | 3.23 | 3.19 | 3.12 | 3.03 | 2.93 | 2.83 | 2.63 |
| Cohesion | SCPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | exam1 | 3.01 | 0.12 | 10 | 5301 | 3.21 | 3.19 | 3.1 | 3.02 | 2.94 | 2.82 | 2.66 |
| Cohesion | SCPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | exam2 | 3.02 | 0.12 | 10 | 4203 | 3.21 | 3.19 | 3.12 | 3.02 | 2.94 | 2.82 | 2.66 |
| Cohesion | SocCo\_fa\_RAW | Crude Mean Social Cohesion FA-based | exam1 | 3 | 0.17 | 11 | 5301 | 4 | 3.21 | 3.12 | 3 | 2.9 | 2.64 | 2.34 |
| Cohesion | SocCo\_fa\_RAW | Crude Mean Social Cohesion FA-based | exam2 | 3.01 | 0.17 | 14 | 4203 | 4 | 3.23 | 3.13 | 3.02 | 2.9 | 2.71 | 2 |
| Cohesion | SocCo\_pca\_RAW | Crude Mean Social Cohesion PCA-based | exam1 | 3.04 | 0.17 | 11 | 5301 | 4 | 3.22 | 3.17 | 3.07 | 2.94 | 2.67 | 2.43 |
| Cohesion | SocCo\_pca\_RAW | Crude Mean Social Cohesion PCA-based | exam2 | 3.05 | 0.17 | 13 | 4203 | 4 | 3.23 | 3.18 | 3.07 | 2.95 | 2.73 | 2 |
| Violence | VOFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence FA-based | exam1 | 1.31 | 0.15 | 11 | 5301 | 1.74 | 1.55 | 1.41 | 1.33 | 1.18 | 1.08 | 0.88 |
| Violence | VOFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence FA-based | exam2 | 1.29 | 0.15 | 11 | 4203 | 1.74 | 1.54 | 1.41 | 1.31 | 1.17 | 1.07 | 0.88 |
| Violence | VOFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence FA-based | exam1 | 1.27 | 0.12 | 12 | 5301 | 1.59 | 1.46 | 1.36 | 1.31 | 1.16 | 1.07 | 0.99 |
| Violence | VOFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence FA-based | exam2 | 1.26 | 0.12 | 14 | 4203 | 1.59 | 1.46 | 1.36 | 1.28 | 1.16 | 1.06 | 0.99 |
| Violence | VOFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | exam1 | 1.31 | 0.15 | 11 | 5301 | 1.89 | 1.55 | 1.39 | 1.32 | 1.17 | 1.11 | 1.03 |
| Violence | VOFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | exam2 | 1.29 | 0.14 | 11 | 4203 | 1.89 | 1.53 | 1.39 | 1.3 | 1.17 | 1.1 | 1.03 |
| Violence | VOFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | exam1 | 1.3 | 0.13 | 11 | 5301 | 1.86 | 1.5 | 1.38 | 1.29 | 1.19 | 1.15 | 1.08 |
| Violence | VOFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | exam2 | 1.29 | 0.12 | 11 | 4203 | 1.86 | 1.5 | 1.38 | 1.28 | 1.18 | 1.14 | 1.08 |
| Violence | VOPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence PCA-based | exam1 | 1.27 | 0.13 | 11 | 5301 | 1.63 | 1.48 | 1.35 | 1.29 | 1.16 | 1.07 | 0.9 |
| Violence | VOPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence PCA-based | exam2 | 1.25 | 0.13 | 11 | 4203 | 1.63 | 1.47 | 1.34 | 1.26 | 1.15 | 1.06 | 0.9 |
| Violence | VOPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence PCA-based | exam1 | 1.22 | 0.1 | 12 | 5301 | 1.48 | 1.37 | 1.3 | 1.25 | 1.13 | 1.06 | 0.99 |
| Violence | VOPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence PCA-based | exam2 | 1.21 | 0.1 | 15 | 4203 | 1.48 | 1.37 | 1.3 | 1.23 | 1.13 | 1.06 | 0.99 |
| Violence | VOPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | exam1 | 1.26 | 0.13 | 11 | 5301 | 1.76 | 1.49 | 1.33 | 1.28 | 1.15 | 1.1 | 1.03 |
| Violence | VOPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | exam2 | 1.25 | 0.12 | 11 | 4203 | 1.76 | 1.45 | 1.32 | 1.26 | 1.15 | 1.1 | 1.03 |
| Violence | VOPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | exam1 | 1.26 | 0.11 | 11 | 5301 | 1.74 | 1.44 | 1.32 | 1.25 | 1.16 | 1.13 | 1.07 |
| Violence | VOPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | exam2 | 1.25 | 0.11 | 11 | 4203 | 1.74 | 1.44 | 1.32 | 1.24 | 1.16 | 1.12 | 1.07 |
| Violence | Viol\_fa\_RAW | Crude Mean Violence FA-based | exam1 | 1.27 | 0.16 | 12 | 5301 | 2 | 1.47 | 1.36 | 1.26 | 1.16 | 1.06 | 1 |
| Violence | Viol\_fa\_RAW | Crude Mean Violence FA-based | exam2 | 1.26 | 0.15 | 14 | 4203 | 2.5 | 1.47 | 1.33 | 1.26 | 1.15 | 1.03 | 1 |
| Violence | Viol\_pca\_RAW | Crude Mean Violence PCA-based | exam1 | 1.22 | 0.12 | 12 | 5301 | 1.86 | 1.4 | 1.3 | 1.21 | 1.14 | 1.04 | 1 |
| Violence | Viol\_pca\_RAW | Crude Mean Violence PCA-based | exam2 | 1.21 | 0.12 | 15 | 4203 | 2.2 | 1.4 | 1.29 | 1.2 | 1.12 | 1.03 | 1 |

\*missing values (NMISS) due to invalid participants’ residential address or unavailable neighborhood measures for participants’ residential address.

Table B.2: Correlation between various measures on Social Cohesion

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Exam1 | Name | Description | SCFA\_CEBE | SCFA\_SEBE | SCFA\_UEBE | SCFA\_UEBE\_unadj | SocCo\_fa\_RAW | SCPCA\_CEBE | SCPCA\_SEBE | SCPCA\_UEBE | SCPCA\_UEBE\_unadj | SocCo\_pca\_RAW |
|  | SCFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion FA-based | 1.00 | 0.96 | 0.97 | 0.94 | 0.89 | 0.96 | 0.94 | 0.91 | 0.88 | 0.86 |
|  | SCFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion FA-based | 0.96 | 1.00 | 0.96 | 0.93 | 0.90 | 0.92 | 0.96 | 0.89 | 0.86 | 0.85 |
|  | SCFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | 0.97 | 0.96 | 1.00 | 0.99 | 0.94 | 0.94 | 0.94 | 0.95 | 0.93 | 0.90 |
|  | SCFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | 0.94 | 0.93 | 0.99 | 1.00 | 0.95 | 0.94 | 0.93 | 0.96 | 0.96 | 0.91 |
|  | SocCo\_fa\_RAW | Crude Mean Social Cohesion FA-based | 0.89 | 0.90 | 0.94 | 0.95 | 1.00 | 0.88 | 0.89 | 0.90 | 0.89 | 0.97 |
|  | SCPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion PCA-based | 0.96 | 0.92 | 0.94 | 0.94 | 0.88 | 1.00 | 0.96 | 0.97 | 0.95 | 0.90 |
|  | SCPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion PCA-based | 0.94 | 0.96 | 0.94 | 0.93 | 0.89 | 0.96 | 1.00 | 0.95 | 0.93 | 0.90 |
|  | SCPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | 0.91 | 0.89 | 0.95 | 0.96 | 0.90 | 0.97 | 0.95 | 1.00 | 1.00 | 0.93 |
|  | SCPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | 0.88 | 0.86 | 0.93 | 0.96 | 0.89 | 0.95 | 0.93 | 1.00 | 1.00 | 0.93 |
|  | SocCo\_pca\_RAW | Crude Mean Social Cohesion PCA-based | 0.86 | 0.85 | 0.90 | 0.91 | 0.97 | 0.90 | 0.90 | 0.93 | 0.93 | 1.00 |
| Exam2 | Name | Description | SCFA\_CEBE | SCFA\_SEBE | SCFA\_UEBE | SCFA\_UEBE\_unadj | SocCo\_fa\_RAW | SCPCA\_CEBE | SCPCA\_SEBE | SCPCA\_UEBE | SCPCA\_UEBE\_unadj | SocCo\_pca\_RAW |
|  | SCFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion FA-based | 1.00 | 0.95 | 0.96 | 0.93 | 0.87 | 0.96 | 0.92 | 0.89 | 0.86 | 0.82 |
|  | SCFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion FA-based | 0.95 | 1.00 | 0.95 | 0.92 | 0.87 | 0.90 | 0.96 | 0.88 | 0.84 | 0.82 |
|  | SCFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | 0.96 | 0.95 | 1.00 | 0.99 | 0.92 | 0.94 | 0.93 | 0.94 | 0.92 | 0.87 |
|  | SCFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion FA-based | 0.93 | 0.92 | 0.99 | 1.00 | 0.92 | 0.93 | 0.93 | 0.96 | 0.95 | 0.88 |
|  | SocCo\_fa\_RAW | Crude Mean Social Cohesion FA-based | 0.87 | 0.87 | 0.92 | 0.92 | 1.00 | 0.85 | 0.86 | 0.87 | 0.86 | 0.96 |
|  | SCPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Social Cohesion PCA-based | 0.96 | 0.90 | 0.94 | 0.93 | 0.85 | 1.00 | 0.95 | 0.96 | 0.94 | 0.87 |
|  | SCPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Social Cohesion PCA-based | 0.92 | 0.96 | 0.93 | 0.93 | 0.86 | 0.95 | 1.00 | 0.94 | 0.92 | 0.87 |
|  | SCPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | 0.89 | 0.88 | 0.94 | 0.96 | 0.87 | 0.96 | 0.94 | 1.00 | 0.99 | 0.90 |
|  | SCPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based | 0.86 | 0.84 | 0.92 | 0.95 | 0.86 | 0.94 | 0.92 | 0.99 | 1.00 | 0.89 |
|  | SocCo\_pca\_RAW | Crude Mean Social Cohesion PCA-based | 0.82 | 0.82 | 0.87 | 0.88 | 0.96 | 0.87 | 0.87 | 0.90 | 0.89 | 1.00 |

Table B.3: Correlation between various measures on violence

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Exam1 | Name | Description | VOFA\_CEBE | VOFA\_SEBE | VOFA\_UEBE | VOFA\_UEBE\_unadj | Viol\_fa\_RAW | VOPCA\_CEBE | VOPCA\_SEBE | VOPCA\_UEBE | VOPCA\_UEBE\_unadj | Viol\_pca\_RAW |
|  | VOFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence FA-based | 1.00 | 0.95 | 0.95 | 0.92 | 0.86 | 1.00 | 0.95 | 0.95 | 0.91 | 0.85 |
|  | VOFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence FA-based | 0.95 | 1.00 | 0.95 | 0.93 | 0.88 | 0.95 | 1.00 | 0.94 | 0.92 | 0.88 |
|  | VOFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | 0.95 | 0.95 | 1.00 | 0.98 | 0.93 | 0.95 | 0.93 | 1.00 | 0.98 | 0.92 |
|  | VOFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | 0.92 | 0.93 | 0.98 | 1.00 | 0.95 | 0.92 | 0.91 | 0.99 | 1.00 | 0.94 |
|  | Viol\_fa\_RAW | Crude Mean Violence FA-based | 0.86 | 0.88 | 0.93 | 0.95 | 1.00 | 0.86 | 0.86 | 0.93 | 0.95 | 0.99 |
|  | VOPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence PCA-based | 1.00 | 0.95 | 0.95 | 0.92 | 0.86 | 1.00 | 0.95 | 0.95 | 0.92 | 0.86 |
|  | VOPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence PCA-based | 0.95 | 1.00 | 0.93 | 0.91 | 0.86 | 0.95 | 1.00 | 0.93 | 0.90 | 0.87 |
|  | VOPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | 0.95 | 0.94 | 1.00 | 0.99 | 0.93 | 0.95 | 0.93 | 1.00 | 0.98 | 0.93 |
|  | VOPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | 0.91 | 0.92 | 0.98 | 1.00 | 0.95 | 0.92 | 0.90 | 0.98 | 1.00 | 0.94 |
|  | Viol\_pca\_RAW | Crude Mean Violence PCA-based | 0.85 | 0.88 | 0.92 | 0.94 | 0.99 | 0.86 | 0.87 | 0.93 | 0.94 | 1.00 |
| Exam2 | Name | Description | VOFA\_CEBE | VOFA\_SEBE | VOFA\_UEBE | VOFA\_UEBE\_unadj | Viol\_fa\_RAW | VOPCA\_CEBE | VOPCA\_SEBE | VOPCA\_UEBE | VOPCA\_UEBE\_unadj | Viol\_pca\_RAW |
|  | VOFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence FA-based | 1.00 | 0.95 | 0.95 | 0.92 | 0.85 | 1.00 | 0.94 | 0.94 | 0.91 | 0.84 |
|  | VOFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence FA-based | 0.95 | 1.00 | 0.95 | 0.92 | 0.87 | 0.94 | 1.00 | 0.94 | 0.92 | 0.87 |
|  | VOFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | 0.95 | 0.95 | 1.00 | 0.98 | 0.91 | 0.95 | 0.93 | 1.00 | 0.98 | 0.90 |
|  | VOFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence FA-based | 0.92 | 0.92 | 0.98 | 1.00 | 0.93 | 0.92 | 0.91 | 0.98 | 1.00 | 0.92 |
|  | Viol\_fa\_RAW | Crude Mean Violence FA-based | 0.85 | 0.87 | 0.91 | 0.93 | 1.00 | 0.85 | 0.85 | 0.91 | 0.93 | 0.99 |
|  | VOPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for Violence PCA-based | 1.00 | 0.94 | 0.95 | 0.92 | 0.85 | 1.00 | 0.94 | 0.95 | 0.91 | 0.84 |
|  | VOPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for Violence PCA-based | 0.94 | 1.00 | 0.93 | 0.91 | 0.85 | 0.94 | 1.00 | 0.93 | 0.90 | 0.85 |
|  | VOPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | 0.94 | 0.94 | 1.00 | 0.98 | 0.91 | 0.95 | 0.93 | 1.00 | 0.98 | 0.90 |
|  | VOPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based | 0.91 | 0.92 | 0.98 | 1.00 | 0.93 | 0.91 | 0.90 | 0.98 | 1.00 | 0.92 |
|  | Viol\_pca\_RAW | Crude Mean Violence PCA-based | 0.84 | 0.87 | 0.90 | 0.92 | 0.99 | 0.84 | 0.85 | 0.90 | 0.92 | 1.00 |

Table B.4: Correlation between various measures on neighborhood Problem

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Exam1 | Name | Description | NPPCA\_CEBE | NPPCA\_SEBE | NPPCA\_UEBE | NPPCA\_UEBE\_unadj | NbProb\_pca\_RAW |
|  | NPPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Problem PCA-based | 1.00 | 0.95 | 0.95 | 0.95 | 0.93 |
|  | NPPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Problem PCA-based | 0.95 | 1.00 | 0.97 | 0.97 | 0.95 |
|  | NPPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | 0.95 | 0.97 | 1.00 | 1.00 | 0.98 |
|  | NPPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | 0.95 | 0.97 | 1.00 | 1.00 | 0.98 |
|  | NbProb\_pca\_RAW | Crude Mean NB Problem PCA-based | 0.93 | 0.95 | 0.98 | 0.98 | 1.00 |
| Exam2 | Name | Description | NPPCA\_CEBE | NPPCA\_SEBE | NPPCA\_UEBE | NPPCA\_UEBE\_unadj | NbProb\_pca\_RAW |
|  | NPPCA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Problem PCA-based | 1.00 | 0.95 | 0.95 | 0.95 | 0.91 |
|  | NPPCA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Problem PCA-based | 0.95 | 1.00 | 0.97 | 0.97 | 0.93 |
|  | NPPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | 0.95 | 0.97 | 1.00 | 1.00 | 0.97 |
|  | NPPCA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based | 0.95 | 0.97 | 1.00 | 1.00 | 0.97 |
|  | NbProb\_pca\_RAW | Crude Mean NB Problem PCA-based | 0.91 | 0.93 | 0.97 | 0.97 | 1.00 |

Table B.5: Correlation between various measures on neighborhood Disorder

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Exam1 | Name | Description | NDFA\_CEBE | NDFA\_SEBE | NDFA\_UEBE | NDFA\_UEBE\_unadj | NbDiso\_fa\_RAW |
|  | NDFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Disorder FA-based | 1.00 | 0.97 | 0.96 | 0.96 | 0.95 |
|  | NDFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Disorder FA-based | 0.97 | 1.00 | 0.98 | 0.98 | 0.96 |
|  | NDFA\_UEBE | Age & gender adjusted unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | 0.96 | 0.98 | 1.00 | 1.00 | 0.99 |
|  | NDFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | 0.96 | 0.98 | 1.00 | 1.00 | 0.99 |
|  | NbDiso\_fa\_RAW | Crude Mean Neighborhood (NB) Disorder FA-based | 0.95 | 0.96 | 0.99 | 0.99 | 1.00 |
| Exam2 | Name | Description | NDFA\_CEBE | NDFA\_SEBE | NDFA\_UEBE | NDFA\_UEBE\_unadj | NbDiso\_fa\_RAW |
|  | NDFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Disorder FA-based | 1.00 | 0.96 | 0.96 | 0.96 | 0.93 |
|  | NDFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Disorder FA-based | 0.96 | 1.00 | 0.98 | 0.98 | 0.95 |
|  | NDFA\_UEBE | Age & gender adjusted unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | 0.96 | 0.98 | 1.00 | 1.00 | 0.97 |
|  | NDFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Disorder FA-based | 0.96 | 0.98 | 1.00 | 1.00 | 0.97 |
|  | NbDiso\_fa\_RAW | Crude Mean Neighborhood (NB) Disorder FA-based | 0.93 | 0.95 | 0.97 | 0.97 | 1.00 |

Table B.6: Correlation between various measures on neighborhood Resource

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Exam1 | Name | Description | NRFA\_CEBE | NRFA\_SEBE | NRFA\_UEBE | NRFA\_UEBE\_unadj | NbRes\_fa\_RAW |
|  | NRFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Resources FA-based | 1.00 | 0.91 | 0.89 | 0.88 | 0.84 |
|  | NRFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Resources FA-based | 0.91 | 1.00 | 0.94 | 0.93 | 0.87 |
|  | NRFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | 0.89 | 0.94 | 1.00 | 1.00 | 0.94 |
|  | NRFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | 0.88 | 0.93 | 1.00 | 1.00 | 0.94 |
|  | NbRes\_fa\_RAW | Crude Mean Neighborhood (NB) Resources FA-based | 0.84 | 0.87 | 0.94 | 0.94 | 1.00 |
| Exam2 | Name | Description | NRFA\_CEBE | NRFA\_SEBE | NRFA\_UEBE | NRFA\_UEBE\_unadj | NbRes\_fa\_RAW |
|  | NRFA\_CEBE | Conditional Empirical Bayes Estimate (CEBE) for NB Resources FA-based | 1.00 | 0.91 | 0.89 | 0.88 | 0.83 |
|  | NRFA\_SEBE | Spatial Empirical Bayes Estimate (SEBE) for NB Resources FA-based | 0.91 | 1.00 | 0.94 | 0.93 | 0.85 |
|  | NRFA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | 0.89 | 0.94 | 1.00 | 1.00 | 0.92 |
|  | NRFA\_UEBE\_unadj | Unadjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Resources FA-based | 0.88 | 0.93 | 1.00 | 1.00 | 0.92 |
|  | NbRes\_fa\_RAW | Crude Mean Neighborhood (NB) Resources FA-based | 0.83 | 0.85 | 0.92 | 0.92 | 1.00 |

## Appendix C: Neighborhood Survey Score and Census Variable Association

Table C.1 Neighborhood Characteristics: Overall and by Quartile of Neighborhood Social Cohesion (SCPCA\_UEBE) in JHS participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exam 1 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 5301 | 10 | 1125 | 1514 | 1250 | 1402 |
| Mean Neighborhood Social Cohesion | 3.01 | . | 2.84 | 2.96 | 3.05 | 3.16 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 32892 | 33591 | 22907 | 28206 | 36776 | 42498 |
| % Households below poverty | 0.24 | 0.16 | 0.35 | 0.28 | 0.20 | 0.15 |
| % Households on public assistance | 0.06 | 0.04 | 0.07 | 0.07 | 0.05 | 0.05 |
| % Housing units with no vehicle | 0.13 | 0.08 | 0.18 | 0.13 | 0.11 | 0.10 |
| % Adults 25 years and older with at least a high school education | 0.74 | 0.72 | 0.67 | 0.72 | 0.77 | 0.78 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.09 | 0.06 | 0.12 | 0.11 | 0.08 | 0.06 |
| % occupied housing units | 0.91 | 0.92 | 0.85 | 0.92 | 0.93 | 0.92 |
| % households with crowding > 1 person per room | 0.08 | 0.05 | 0.11 | 0.10 | 0.07 | 0.05 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.27 | 0.27 | 0.21 | 0.24 | 0.30 | 0.33 |
| % not in labor force, among persons 16 and over | 0.39 | 0.38 | 0.42 | 0.41 | 0.36 | 0.37 |
| Socioeconomic status (SES) --higher score indicates disadvantage SES | 0.63 | 0.97 | 0.80 | 0.81 | 0.57 | 0.37 |
| Exam 2 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 4203 | 10 | 998 | 1013 | 1118 | 1064 |
| Mean Neighborhood Social Cohesion | 3.02 | . | 2.86 | 2.97 | 3.06 | 3.16 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 36894 | 55344 | 27768 | 34471 | 41979 | 42262 |
| % Households below poverty | 0.24 | 0.12 | 0.33 | 0.30 | 0.22 | 0.14 |
| % Households on public assistance | 0.03 | 0.02 | 0.04 | 0.04 | 0.04 | 0.02 |
| % Housing units with no vehicle | 0.11 | 0.06 | 0.17 | 0.11 | 0.08 | 0.07 |
| % Adults 25 years and older with at least a high school education | 0.78 | 0.87 | 0.72 | 0.75 | 0.80 | 0.86 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.10 | 0.08 | 0.13 | 0.13 | 0.10 | 0.03 |
| % occupied housing units | 0.86 | 0.89 | 0.80 | 0.87 | 0.88 | 0.88 |
| % households with crowding > 1 person per room | 0.03 | 0.03 | 0.04 | 0.04 | 0.03 | 0.01 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.29 | 0.38 | 0.20 | 0.27 | 0.32 | 0.35 |
| % not in labor force, among persons 16 and over | 0.39 | 0.31 | 0.40 | 0.40 | 0.37 | 0.38 |
| Socioeconomic status (SES) --higher score indicates disadvantage SES | 0.32 | -0.32 | 0.51 | 0.50 | 0.35 | -0.07 |

\*missing value due to invalid residential address or unavailable social environment measures for the residential addresses.

Table C.2 Neighborhood Characteristics: Overall and by Quartile of Neighborhood Social Disorder (NDFA\_UEBE) in JHS participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exam 1 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 5301 | 10 | 1320 | 1265 | 1379 | 1327 |
| Mean Neighborhood Social Disorder | 1.69 | . | 1.38 | 1.59 | 1.76 | 2.00 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 32892 | 33591 | 51599 | 33664 | 23558 | 23245 |
| % Households below poverty | 0.24 | 0.16 | 0.09 | 0.20 | 0.33 | 0.33 |
| % Households on public assistance | 0.06 | 0.04 | 0.03 | 0.04 | 0.07 | 0.09 |
| % Housing units with no vehicle | 0.13 | 0.08 | 0.05 | 0.09 | 0.18 | 0.19 |
| % Adults 25 years and older with at least a high school education | 0.74 | 0.72 | 0.86 | 0.80 | 0.65 | 0.64 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.09 | 0.06 | 0.05 | 0.08 | 0.10 | 0.13 |
| % occupied housing units | 0.91 | 0.92 | 0.95 | 0.94 | 0.88 | 0.87 |
| % households with crowding > 1 person per room | 0.08 | 0.05 | 0.03 | 0.08 | 0.10 | 0.12 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.27 | 0.27 | 0.39 | 0.29 | 0.23 | 0.18 |
| % not in labor force, among persons 16 and over | 0.39 | 0.38 | 0.33 | 0.33 | 0.45 | 0.45 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.63 | 0.97 | 0.06 | 0.56 | 0.83 | 1.07 |
| Exam 2 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 4203 | 10 | 986 | 1023 | 1108 | 1076 |
| Mean Neighborhood Social Disorder | 1.66 | . | 1.36 | 1.53 | 1.74 | 1.97 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 36894 | 55344 | 54450 | 41114 | 28165 | 25629 |
| % Households below poverty | 0.24 | 0.12 | 0.09 | 0.22 | 0.29 | 0.34 |
| % Households on public assistance | 0.03 | 0.02 | 0.01 | 0.03 | 0.04 | 0.05 |
| % Housing units with no vehicle | 0.11 | 0.06 | 0.03 | 0.08 | 0.14 | 0.17 |
| % Adults 25 years and older with at least a high school education | 0.78 | 0.87 | 0.91 | 0.82 | 0.73 | 0.68 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.10 | 0.08 | 0.04 | 0.09 | 0.12 | 0.14 |
| % occupied housing units | 0.86 | 0.89 | 0.93 | 0.90 | 0.81 | 0.81 |
| % households with crowding > 1 person per room | 0.03 | 0.03 | 0.01 | 0.04 | 0.03 | 0.03 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.29 | 0.38 | 0.39 | 0.31 | 0.25 | 0.21 |
| % not in labor force, among persons 16 and over | 0.39 | 0.31 | 0.32 | 0.35 | 0.43 | 0.43 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.32 | -0.32 | -0.28 | 0.24 | 0.46 | 0.80 |

\*missing value due to invalid residential address or unavailable social environment measures for the residential addresses.

Table C.3 Neighborhood Characteristics: Overall and by Quartile of Neighborhood Violence (VOPCA\_UEBE) in JHS participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exam 1 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 5301 | 11 | 1295 | 1324 | 1321 | 1350 |
| Mean Neighborhood Violence | 1.26 | . | 1.12 | 1.21 | 1.30 | 1.42 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 32892 | 33540 | 52836 | 33256 | 22272 | 23791 |
| % Households below poverty | 0.24 | 0.16 | 0.08 | 0.20 | 0.33 | 0.34 |
| % Households on public assistance | 0.06 | 0.04 | 0.03 | 0.05 | 0.08 | 0.08 |
| % Housing units with no vehicle | 0.13 | 0.08 | 0.04 | 0.10 | 0.18 | 0.19 |
| % Adults 25 years and older with at least a high school education | 0.74 | 0.72 | 0.89 | 0.76 | 0.64 | 0.65 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.09 | 0.06 | 0.05 | 0.08 | 0.11 | 0.13 |
| % occupied housing units | 0.91 | 0.92 | 0.96 | 0.93 | 0.86 | 0.88 |
| % households with crowding > 1 person per room | 0.08 | 0.05 | 0.03 | 0.08 | 0.10 | 0.12 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.27 | 0.26 | 0.40 | 0.28 | 0.22 | 0.19 |
| % not in labor force, among persons 16 and over | 0.39 | 0.39 | 0.31 | 0.35 | 0.46 | 0.44 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.63 | 0.99 | -0.01 | 0.61 | 0.88 | 1.04 |
| Exam 2 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 4203 | 11 | 764 | 1331 | 986 | 1111 |
| Mean Neighborhood Violence | 1.25 | . | 1.10 | 1.18 | 1.29 | 1.40 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 36894 | 54199 | 59622 | 40658 | 25602 | 26622 |
| % Households below poverty | 0.24 | 0.13 | 0.10 | 0.18 | 0.32 | 0.34 |
| % Households on public assistance | 0.03 | 0.02 | 0.01 | 0.03 | 0.04 | 0.05 |
| % Housing units with no vehicle | 0.11 | 0.06 | 0.03 | 0.06 | 0.17 | 0.16 |
| % Adults 25 years and older with at least a high school education | 0.78 | 0.86 | 0.91 | 0.84 | 0.71 | 0.70 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.10 | 0.08 | 0.05 | 0.06 | 0.11 | 0.17 |
| % occupied housing units | 0.86 | 0.89 | 0.94 | 0.89 | 0.80 | 0.82 |
| % households with crowding > 1 person per room | 0.03 | 0.03 | 0.02 | 0.02 | 0.03 | 0.04 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.29 | 0.37 | 0.40 | 0.31 | 0.25 | 0.20 |
| % not in labor force, among persons 16 and over | 0.39 | 0.33 | 0.32 | 0.35 | 0.43 | 0.44 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.32 | -0.24 | -0.23 | 0.18 | 0.38 | 0.81 |

\*missing value due to invalid residential address or unavailable social environment measures for the residential addresses.

Table C.4 Neighborhood Characteristics: Overall and by Quartile of Neighborhood Problem (NPPCA\_UEBE) in JHS participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exam 1 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 5301 | 10 | 1319 | 1322 | 1123 | 1527 |
| Mean Neighborhood Problem | 1.57 | . | 1.33 | 1.50 | 1.62 | 1.79 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 32892 | 33591 | 51886 | 32870 | 23584 | 23345 |
| % Households below poverty | 0.24 | 0.16 | 0.09 | 0.21 | 0.32 | 0.34 |
| % Households on public assistance | 0.06 | 0.04 | 0.03 | 0.05 | 0.06 | 0.09 |
| % Housing units with no vehicle | 0.13 | 0.08 | 0.05 | 0.12 | 0.16 | 0.18 |
| % Adults 25 years and older with at least a high school education | 0.74 | 0.72 | 0.87 | 0.75 | 0.67 | 0.65 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.09 | 0.06 | 0.05 | 0.07 | 0.11 | 0.13 |
| % occupied housing units | 0.91 | 0.92 | 0.95 | 0.91 | 0.91 | 0.87 |
| % households with crowding > 1 person per room | 0.08 | 0.05 | 0.03 | 0.07 | 0.10 | 0.12 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.27 | 0.27 | 0.39 | 0.29 | 0.21 | 0.19 |
| % not in labor force, among persons 16 and over | 0.39 | 0.38 | 0.32 | 0.37 | 0.43 | 0.44 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.63 | 0.97 | -0.01 | 0.56 | 1.03 | 0.96 |
| Exam 2 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 4203 | 10 | 753 | 1196 | 1159 | 1085 |
| Mean Neighborhood Problem | 1.55 | . | 1.30 | 1.43 | 1.60 | 1.79 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 36894 | 55344 | 57538 | 42819 | 27404 | 26021 |
| % Households below poverty | 0.24 | 0.12 | 0.12 | 0.17 | 0.29 | 0.34 |
| % Households on public assistance | 0.03 | 0.02 | 0.02 | 0.02 | 0.05 | 0.04 |
| % Housing units with no vehicle | 0.11 | 0.06 | 0.05 | 0.06 | 0.14 | 0.17 |
| % Adults 25 years and older with at least a high school education | 0.78 | 0.87 | 0.88 | 0.86 | 0.74 | 0.68 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.10 | 0.08 | 0.05 | 0.06 | 0.13 | 0.13 |
| % occupied housing units | 0.86 | 0.89 | 0.92 | 0.91 | 0.81 | 0.81 |
| % households with crowding > 1 person per room | 0.03 | 0.03 | 0.02 | 0.03 | 0.03 | 0.03 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.29 | 0.38 | 0.40 | 0.32 | 0.25 | 0.20 |
| % not in labor force, among persons 16 and over | 0.39 | 0.31 | 0.35 | 0.33 | 0.43 | 0.43 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.32 | -0.32 | -0.26 | 0.09 | 0.49 | 0.79 |

\*missing value due to invalid residential address or unavailable social environment measures for the residential addresses.

Table C.5 Neighborhood Characteristics: Overall and by Quartile of Neighborhood Resource (NRFA\_UEBE) in JHS participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exam 1 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 5301 | 10 | 1056 | 1225 | 1476 | 1534 |
| Mean Neighborhood Resource | 1.45 |  | 1.28 | 1.38 | 1.46 | 1.60 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 32892 | 33591 | 46013 | 43492 | 23735 | 24202 |
| % Households below poverty | 0.24 | 0.16 | 0.12 | 0.15 | 0.31 | 0.33 |
| % Households on public assistance | 0.06 | 0.04 | 0.03 | 0.05 | 0.07 | 0.08 |
| % Housing units with no vehicle | 0.13 | 0.08 | 0.06 | 0.07 | 0.18 | 0.17 |
| % Adults 25 years and older with at least a high school education | 0.74 | 0.72 | 0.84 | 0.85 | 0.64 | 0.67 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.09 | 0.06 | 0.05 | 0.07 | 0.10 | 0.13 |
| % occupied housing units | 0.91 | 0.92 | 0.94 | 0.94 | 0.89 | 0.88 |
| % households with crowding > 1 person per room | 0.08 | 0.05 | 0.05 | 0.05 | 0.10 | 0.12 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.27 | 0.27 | 0.37 | 0.35 | 0.22 | 0.20 |
| % not in labor force, among persons 16 and over | 0.39 | 0.38 | 0.33 | 0.33 | 0.45 | 0.43 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.63 | 0.97 | 0.06 | 0.28 | 1.02 | 0.94 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Neighborhood Characteristics: Overall and by Quartile of Neighborhood Resource in JHS participants | | | | | | |
| Exam 2 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 4203 | 10 | 985 | 1003 | 1090 | 1115 |
| Mean Neighborhood Resource | 1.43 |  | 1.27 | 1.37 | 1.46 | 1.60 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 36894 | 55344 | 53610 | 42346 | 26447 | 27286 |
| % Households below poverty | 0.24 | 0.12 | 0.15 | 0.17 | 0.30 | 0.33 |
| % Households on public assistance | 0.03 | 0.02 | 0.02 | 0.02 | 0.05 | 0.04 |
| % Housing units with no vehicle | 0.11 | 0.06 | 0.06 | 0.05 | 0.15 | 0.16 |
| % Adults 25 years and older with at least a high school education | 0.78 | 0.87 | 0.87 | 0.87 | 0.72 | 0.70 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.10 | 0.08 | 0.06 | 0.07 | 0.14 | 0.13 |
| % occupied housing units | 0.86 | 0.89 | 0.91 | 0.91 | 0.81 | 0.82 |
| % households with crowding > 1 person per room | 0.03 | 0.03 | 0.02 | 0.03 | 0.03 | 0.04 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.29 | 0.38 | 0.38 | 0.33 | 0.25 | 0.20 |
| % not in labor force, among persons 16 and over | 0.39 | 0.31 | 0.33 | 0.34 | 0.45 | 0.41 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.32 | -0.32 | -0.23 | 0.11 | 0.57 | 0.75 |

\*missing value due to invalid residential address or unavailable social environment measures for the residential addresses.

Table C.6 Neighborhood Characteristics: Overall and by Quartile of Social Cohesion (SCFA\_UEBE) in JHS participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Neighborhood Characteristics: Overall and by Quartile of Neighborhood Social Cohesion in JHS participants | | | | | | |
| Exam 1 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 5301 | 10 | 1311 | 1045 | 1612 | 1323 |
| Mean Neighborhood Social Cohesion | 2.97 | . | 2.80 | 2.90 | 3.00 | 3.14 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 32892 | 33591 | 23799 | 24977 | 32761 | 48310 |
| % Households below poverty | 0.24 | 0.16 | 0.33 | 0.33 | 0.21 | 0.11 |
| % Households on public assistance | 0.06 | 0.04 | 0.07 | 0.09 | 0.05 | 0.03 |
| % Housing units with no vehicle | 0.13 | 0.08 | 0.17 | 0.16 | 0.13 | 0.06 |
| % Adults 25 years and older with at least a high school education | 0.74 | 0.72 | 0.67 | 0.66 | 0.76 | 0.83 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.09 | 0.06 | 0.13 | 0.12 | 0.08 | 0.05 |
| % occupied housing units | 0.91 | 0.92 | 0.87 | 0.89 | 0.91 | 0.95 |
| % households with crowding > 1 person per room | 0.08 | 0.05 | 0.11 | 0.11 | 0.07 | 0.04 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.27 | 0.27 | 0.20 | 0.22 | 0.29 | 0.36 |
| % not in labor force, among persons 16 and over | 0.39 | 0.38 | 0.43 | 0.44 | 0.37 | 0.34 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.63 | 0.97 | 0.95 | 0.87 | 0.52 | 0.27 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Neighborhood Characteristics: Overall and by Quartile of Neighborhood Social Cohesion in JHS participants | | | | | | |
| Exam 2 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 4203 | 10 | 959 | 1131 | 1049 | 1054 |
| Mean Neighborhood Social Cohesion | 2.98 |  | 2.81 | 2.92 | 3.03 | 3.14 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 36894 | 55344 | 27978 | 30754 | 41183 | 47169 |
| % Households below poverty | 0.24 | 0.12 | 0.32 | 0.32 | 0.20 | 0.13 |
| % Households on public assistance | 0.03 | 0.02 | 0.04 | 0.04 | 0.04 | 0.01 |
| % Housing units with no vehicle | 0.11 | 0.06 | 0.15 | 0.13 | 0.11 | 0.05 |
| % Adults 25 years and older with at least a high school education | 0.78 | 0.87 | 0.71 | 0.74 | 0.82 | 0.87 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.10 | 0.08 | 0.13 | 0.14 | 0.09 | 0.04 |
| % occupied housing units | 0.86 | 0.89 | 0.83 | 0.82 | 0.86 | 0.92 |
| % households with crowding > 1 person per room | 0.03 | 0.03 | 0.03 | 0.04 | 0.03 | 0.02 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.29 | 0.38 | 0.22 | 0.24 | 0.34 | 0.34 |
| % not in labor force, among persons 16 and over | 0.39 | 0.31 | 0.41 | 0.40 | 0.39 | 0.35 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.32 | -0.32 | 0.71 | 0.47 | 0.04 | 0.08 |

\*missing value due to invalid residential address or unavailable social environment measures for the residential addresses.

Table C.7 Neighborhood Characteristics: Overall and by Quartile of Neighborhood Violence (VOFA\_UEBE) in JHS participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Neighborhood Characteristics: Overall and by Quartile of Neighborhood Violence in JHS participants | | | | | | |
| Exam 1 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 5301 | 11 | 997 | 1622 | 1294 | 1377 |
| Mean Neighborhood Violence | 1.31 | . | 1.12 | 1.23 | 1.35 | 1.49 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 32892 | 33540 | 50431 | 38331 | 22376 | 23665 |
| % Households below poverty | 0.24 | 0.16 | 0.10 | 0.17 | 0.33 | 0.34 |
| % Households on public assistance | 0.06 | 0.04 | 0.02 | 0.04 | 0.08 | 0.08 |
| % Housing units with no vehicle | 0.13 | 0.08 | 0.05 | 0.08 | 0.18 | 0.19 |
| % Adults 25 years and older with at least a high school education | 0.74 | 0.72 | 0.86 | 0.81 | 0.64 | 0.65 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.09 | 0.06 | 0.05 | 0.07 | 0.11 | 0.13 |
| % occupied housing units | 0.91 | 0.92 | 0.95 | 0.94 | 0.86 | 0.88 |
| % households with crowding > 1 person per room | 0.08 | 0.05 | 0.04 | 0.07 | 0.10 | 0.12 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.27 | 0.26 | 0.39 | 0.31 | 0.22 | 0.19 |
| % not in labor force, among persons 16 and over | 0.39 | 0.39 | 0.32 | 0.34 | 0.45 | 0.44 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.63 | 0.99 | 0.08 | 0.44 | 0.87 | 1.04 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Neighborhood Characteristics: Overall and by Quartile of Neighborhood Violence in JHS participants | | | | | | |
| Exam 2 | Overall | Missing | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
| N | 4203 | 11 | 919 | 1176 | 995 | 1102 |
| Mean Neighborhood Violence | 1.29 | . | 1.13 | 1.22 | 1.34 | 1.47 |
|  |  |  |  |  |  |  |
| Median Household Income (U.S. $1000) | 36894 | 54199 | 56555 | 40555 | 25914 | 26348 |
| % Households below poverty | 0.24 | 0.13 | 0.12 | 0.18 | 0.32 | 0.35 |
| % Households on public assistance | 0.03 | 0.02 | 0.01 | 0.03 | 0.05 | 0.04 |
| % Housing units with no vehicle | 0.11 | 0.06 | 0.04 | 0.06 | 0.17 | 0.17 |
| % Adults 25 years and older with at least a high school education | 0.78 | 0.86 | 0.89 | 0.85 | 0.72 | 0.69 |
| % Unemployed individuals 16 years and older in the civilian labor force | 0.10 | 0.08 | 0.05 | 0.06 | 0.11 | 0.17 |
| % occupied housing units | 0.86 | 0.89 | 0.93 | 0.89 | 0.80 | 0.82 |
| % households with crowding > 1 person per room | 0.03 | 0.03 | 0.02 | 0.02 | 0.03 | 0.04 |
| % managerial, professional, or related occupation among those 16+ in the labor force | 0.29 | 0.37 | 0.39 | 0.31 | 0.25 | 0.20 |
| % not in labor force, among persons 16 and over | 0.39 | 0.33 | 0.33 | 0.34 | 0.43 | 0.44 |
| socioeconomic status (SES) --higher score indicates disadvantage SES | 0.32 | -0.24 | -0.15 | 0.17 | 0.36 | 0.83 |

\*missing value due to invalid residential address or unavailable social environment measures for the residential addresses.

## Appendix D: Food and Physical Activity Resources (NETS derived data) Summary

Table D.1: food store density (1 mile buffer)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NAME** | **LABEL** | **exam** | **MEAN** | **STD** | **NMISS** | **NOBS** | **Max** | **P95** | **Q3** | **Median** | **Q1** | **P5** | **Min** |
| K1FAV | 1 mile kernel FAVORABLE FOOD STORES | exam1 | 0.31 | 0.45 | 4 | 5301 | 2.70 | 1.22 | 0.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| K1FAV | 1 mile kernel FAVORABLE FOOD STORES | exam2 | 0.32 | 0.51 | 2 | 4203 | 3.07 | 1.42 | 0.53 | 0.00 | 0.00 | 0.00 | 0.00 |
| K1MRFEI\_NOALC | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam1 | 0.12 | 0.15 | 955 | 5301 | 1.00 | 0.36 | 0.20 | 0.07 | 0.00 | 0.00 | 0.00 |
| K1MRFEI\_NOALC | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam2 | 0.10 | 0.15 | 722 | 4203 | 1.00 | 0.37 | 0.17 | 0.03 | 0.00 | 0.00 | 0.00 |
| K1MRFEI\_TOT | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam1 | 0.07 | 0.10 | 820 | 5301 | 1.00 | 0.25 | 0.12 | 0.03 | 0.00 | 0.00 | 0.00 |
| K1MRFEI\_TOT | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam2 | 0.07 | 0.11 | 650 | 4203 | 1.00 | 0.24 | 0.11 | 0.01 | 0.00 | 0.00 | 0.00 |
| K1NEUT | 1 mile kernel NEUTRAL FOOD STORES | exam1 | 1.80 | 1.94 | 4 | 5301 | 11.55 | 5.53 | 2.73 | 1.17 | 0.32 | 0.00 | 0.00 |
| K1NEUT | 1 mile kernel NEUTRAL FOOD STORES | exam2 | 1.63 | 1.98 | 2 | 4203 | 44.77 | 5.20 | 2.40 | 1.02 | 0.17 | 0.00 | 0.00 |
| K1RATIO\_NOALC | 1 mile kernel UNFAVORABLE/FAVORABLE RATIO EXCLUDE ALCOHOL | exam1 | 3149.07 | 146024.07 | 2578 | 5301 | 7607784.47 | 138.71 | 11.17 | 5.10 | 2.89 | 1.40 | 0.00 |
| K1RATIO\_NOALC | 1 mile kernel UNFAVORABLE/FAVORABLE RATIO EXCLUDE ALCOHOL | exam2 | 855.20 | 17979.02 | 2218 | 4203 | 692396.58 | 141.52 | 11.92 | 5.41 | 3.19 | 1.25 | 0.00 |
| K1RATIO\_TOT | 1 mile kernel UNFAVORABLE/FAVORABLE RATIO INCLUDE ALCOHOL | exam1 | 4243.20 | 170650.38 | 2578 | 5301 | 8791424.83 | 292.23 | 19.18 | 8.89 | 5.26 | 2.46 | 0.00 |
| K1RATIO\_TOT | 1 mile kernel UNFAVORABLE/FAVORABLE RATIO INCLUDE ALCOHOL | exam2 | 2286.45 | 50495.92 | 2218 | 4203 | 1817966.78 | 261.26 | 20.10 | 9.23 | 5.18 | 2.35 | 0.00 |
| K1TOTFOOD | 1 mile kernel TOTAL FOOD STORES | exam1 | 7.09 | 6.67 | 4 | 5301 | 42.96 | 20.29 | 10.69 | 5.37 | 1.70 | 0.00 | 0.00 |
| K1TOTFOOD | 1 mile kernel TOTAL FOOD STORES | exam2 | 7.57 | 7.94 | 2 | 4203 | 213.47 | 22.19 | 11.72 | 5.73 | 1.36 | 0.00 | 0.00 |
| K1UNFAV | 1 mile kernel UNFAVORABLE FOOD STORES | exam1 | 3.22 | 3.22 | 4 | 5301 | 20.61 | 9.85 | 4.77 | 2.38 | 0.63 | 0.00 | 0.00 |
| K1UNFAV | 1 mile kernel UNFAVORABLE FOOD STORES | exam2 | 3.62 | 3.93 | 2 | 4203 | 74.39 | 11.51 | 5.66 | 2.58 | 0.50 | 0.00 | 0.00 |
| K1UNFAVFO | 1 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam1 | 1.91 | 2.19 | 4 | 5301 | 18.59 | 6.34 | 2.70 | 1.19 | 0.28 | 0.00 | 0.00 |
| K1UNFAVFO | 1 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam2 | 2.18 | 2.63 | 2 | 4203 | 35.37 | 7.44 | 3.13 | 1.24 | 0.27 | 0.00 | 0.00 |
| S1FAV | 1 mile simple FAVORABLE FOOD STORES | exam1 | 0.30 | 0.36 | 4 | 5301 | 1.91 | 0.96 | 0.64 | 0.32 | 0.00 | 0.00 | 0.00 |
| S1FAV | 1 mile simple FAVORABLE FOOD STORES | exam2 | 0.33 | 0.45 | 2 | 4203 | 2.55 | 1.27 | 0.64 | 0.00 | 0.00 | 0.00 | 0.00 |
| S1MRFEI\_NOALC | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam1 | 0.12 | 0.13 | 955 | 5301 | 1.00 | 0.33 | 0.20 | 0.12 | 0.00 | 0.00 | 0.00 |
| S1MRFEI\_NOALC | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam2 | 0.11 | 0.14 | 722 | 4203 | 1.00 | 0.33 | 0.18 | 0.08 | 0.00 | 0.00 | 0.00 |
| S1MRFEI\_TOT | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam1 | 0.08 | 0.08 | 820 | 5301 | 1.00 | 0.20 | 0.13 | 0.07 | 0.00 | 0.00 | 0.00 |
| S1MRFEI\_TOT | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam2 | 0.07 | 0.10 | 650 | 4203 | 1.00 | 0.23 | 0.12 | 0.06 | 0.00 | 0.00 | 0.00 |
| S1NEUT | 1 mile simple NEUTRAL FOOD STORES | exam1 | 1.69 | 1.60 | 4 | 5301 | 9.55 | 4.78 | 2.87 | 1.27 | 0.32 | 0.00 | 0.00 |
| S1NEUT | 1 mile simple NEUTRAL FOOD STORES | exam2 | 1.55 | 1.68 | 2 | 4203 | 47.77 | 4.46 | 2.55 | 0.96 | 0.32 | 0.00 | 0.00 |
| S1RATIO\_NOALC | 1 mile simple UNFAVORABLE/FAVORABLE RATIO EXCLUDE ALCOHOL | exam1 | 5.80 | 4.56 | 2578 | 5301 | 34.00 | 15.00 | 6.50 | 4.00 | 3.00 | 2.00 | 0.00 |
| S1RATIO\_NOALC | 1 mile simple UNFAVORABLE/FAVORABLE RATIO EXCLUDE ALCOHOL | exam2 | 6.23 | 4.76 | 2218 | 4203 | 33.00 | 16.00 | 7.50 | 5.00 | 3.33 | 1.71 | 0.00 |
| S1RATIO\_TOT | 1 mile simple UNFAVORABLE/FAVORABLE RATIO INCLUDE ALCOHOL | exam1 | 9.47 | 6.02 | 2578 | 5301 | 42.00 | 22.00 | 12.00 | 8.00 | 6.00 | 3.00 | 0.00 |
| S1RATIO\_TOT | 1 mile simple UNFAVORABLE/FAVORABLE RATIO INCLUDE ALCOHOL | exam2 | 9.80 | 6.68 | 2218 | 4203 | 42.00 | 24.00 | 13.00 | 8.00 | 5.33 | 3.00 | 0.00 |
| S1TOTFOOD | 1 mile simple TOTAL FOOD STORES | exam1 | 6.87 | 6.10 | 4 | 5301 | 30.57 | 18.15 | 10.83 | 5.73 | 1.59 | 0.00 | 0.00 |
| S1TOTFOOD | 1 mile simple TOTAL FOOD STORES | exam2 | 7.34 | 7.56 | 2 | 4203 | 243.61 | 19.74 | 11.78 | 5.73 | 1.59 | 0.00 | 0.00 |
| S1UNFAV | 1 mile simple UNFAVORABLE FOOD STORES | exam1 | 3.13 | 2.79 | 4 | 5301 | 13.37 | 8.60 | 4.78 | 2.55 | 0.64 | 0.00 | 0.00 |
| S1UNFAV | 1 mile simple UNFAVORABLE FOOD STORES | exam2 | 3.53 | 3.47 | 2 | 4203 | 77.70 | 10.19 | 5.41 | 2.87 | 0.64 | 0.00 | 0.00 |
| S1UNFAVFO | 1 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam1 | 1.90 | 1.95 | 4 | 5301 | 10.83 | 6.05 | 2.87 | 1.27 | 0.32 | 0.00 | 0.00 |
| S1UNFAVFO | 1 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam2 | 2.16 | 2.36 | 2 | 4203 | 44.26 | 7.32 | 3.18 | 1.59 | 0.32 | 0.00 | 0.00 |

\*Missing values (NMISS) in Unfavorable/favorable ratio is due to none favorable stores in the area; missing values in MODIFIED RETAIL FOOD ENVIRONMENT INDEX is due to none favorable or unfavorable stores in the area. Participants with invalid address had missing values.

Table D.2: recreational facility density (1 mile buffer)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | Exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| K1INR | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.14 | 0.342 | 4 | 5301 | 3.4123 | 0.8317 | 0.0549 | 0 | 0 | 0 | 0 |
| K1INR | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.295 | 0.533 | 2 | 4203 | 12.21 | 1.1641 | 0.4497 | 0 | 0 | 0 | 0 |
| K1INRI | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam1 | 0.236 | 0.496 | 4 | 5301 | 5.1549 | 1.1965 | 0.2499 | 0 | 0 | 0 | 0 |
| K1INRI | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam2 | 0.39 | 0.722 | 2 | 4203 | 19.634 | 1.7543 | 0.5586 | 0.0104 | 0 | 0 | 0 |
| K1IPA | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.229 | 0.489 | 4 | 5301 | 4.4697 | 1.177 | 0.2402 | 0 | 0 | 0 | 0 |
| K1IPA | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.394 | 0.649 | 2 | 4203 | 15.181 | 1.4603 | 0.6185 | 0.057 | 0 | 0 | 0 |
| K1IPAI | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam1 | 0.325 | 0.62 | 4 | 5301 | 5.2497 | 1.4712 | 0.4565 | 0.0009 | 0 | 0 | 0 |
| K1IPAI | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam2 | 0.489 | 0.83 | 2 | 4203 | 22.605 | 1.9424 | 0.7612 | 0.1193 | 0 | 0 | 0 |
| K1NR | 1 mile kernel TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.141 | 0.344 | 4 | 5301 | 3.4123 | 0.8348 | 0.0549 | 0 | 0 | 0 | 0 |
| K1NR | 1 mile kernel TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.295 | 0.533 | 2 | 4203 | 12.21 | 1.1641 | 0.4497 | 0 | 0 | 0 | 0 |
| K1NRI | 1 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.237 | 0.499 | 4 | 5301 | 5.1549 | 1.2024 | 0.2499 | 0 | 0 | 0 | 0 |
| K1NRI | 1 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.39 | 0.726 | 2 | 4203 | 20.186 | 1.7543 | 0.5586 | 0.0104 | 0 | 0 | 0 |
| K1ONR | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.003 | 0.04 | 4 | 5301 | 0.9193 | 0 | 0 | 0 | 0 | 0 | 0 |
| K1ONR | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.007 | 0.062 | 2 | 4203 | 0.9547 | 0 | 0 | 0 | 0 | 0 | 0 |
| K1ONRI | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.006 | 0.055 | 4 | 5301 | 0.9193 | 0 | 0 | 0 | 0 | 0 | 0 |
| K1ONRI | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.017 | 0.098 | 2 | 4203 | 2.191 | 0 | 0 | 0 | 0 | 0 | 0 |
| K1OPA | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.146 | 0.278 | 4 | 5301 | 1.7304 | 0.8109 | 0.1387 | 0 | 0 | 0 | 0 |
| K1OPA | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.26 | 0.399 | 2 | 4203 | 2.6352 | 1.0204 | 0.48 | 0 | 0 | 0 | 0 |
| K1OPAI | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam1 | 0.151 | 0.283 | 4 | 5301 | 2.1646 | 0.8111 | 0.1609 | 0 | 0 | 0 | 0 |
| K1OPAI | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam2 | 0.275 | 0.412 | 2 | 4203 | 4.0351 | 1.0706 | 0.496 | 0.0008 | 0 | 0 | 0 |
| K1PA | 1 mile kernel TOTAL PHYSICAL ACTIVITIES | exam1 | 0.336 | 0.536 | 4 | 5301 | 4.4697 | 1.3248 | 0.5449 | 0.0447 | 0 | 0 | 0 |
| K1PA | 1 mile kernel TOTAL PHYSICAL ACTIVITIES | exam2 | 0.599 | 0.79 | 2 | 4203 | 15.242 | 2.0835 | 0.9705 | 0.2893 | 0 | 0 | 0 |
| K1PAI | 1 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam1 | 0.433 | 0.658 | 4 | 5301 | 6.1088 | 1.6558 | 0.6567 | 0.1534 | 0 | 0 | 0 |
| K1PAI | 1 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam2 | 0.699 | 0.966 | 2 | 4203 | 23.217 | 2.4516 | 1.1044 | 0.3601 | 0 | 0 | 0 |
| S1INR | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.155 | 0.284 | 4 | 5301 | 2.2291 | 0.6369 | 0.3184 | 0 | 0 | 0 | 0 |
| S1INR | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.288 | 0.435 | 2 | 4203 | 14.012 | 0.9553 | 0.6369 | 0 | 0 | 0 | 0 |
| S1INRI | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam1 | 0.25 | 0.417 | 4 | 5301 | 3.5029 | 0.9553 | 0.3184 | 0 | 0 | 0 | 0 |
| S1INRI | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam2 | 0.388 | 0.646 | 2 | 4203 | 23.247 | 1.5922 | 0.6369 | 0.3184 | 0 | 0 | 0 |
| S1IPA | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.236 | 0.382 | 4 | 5301 | 2.866 | 0.9553 | 0.3184 | 0 | 0 | 0 | 0 |
| S1IPA | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.384 | 0.539 | 2 | 4203 | 17.515 | 1.2738 | 0.6369 | 0.3184 | 0 | 0 | 0 |
| S1IPAI | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam1 | 0.331 | 0.505 | 4 | 5301 | 3.8214 | 1.2738 | 0.3184 | 0.3184 | 0 | 0 | 0 |
| S1IPAI | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam2 | 0.485 | 0.746 | 2 | 4203 | 26.75 | 1.9107 | 0.6369 | 0.3184 | 0 | 0 | 0 |
| S1NR | 1 mile simple TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.156 | 0.286 | 4 | 5301 | 2.2291 | 0.6369 | 0.3184 | 0 | 0 | 0 | 0 |
| S1NR | 1 mile simple TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.288 | 0.435 | 2 | 4203 | 14.012 | 0.9553 | 0.6369 | 0 | 0 | 0 | 0 |
| S1NRI | 1 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.251 | 0.42 | 4 | 5301 | 3.5029 | 1.2738 | 0.3184 | 0 | 0 | 0 | 0 |
| S1NRI | 1 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.389 | 0.65 | 2 | 4203 | 23.565 | 1.5922 | 0.6369 | 0.3184 | 0 | 0 | 0 |
| S1ONR | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.004 | 0.035 | 4 | 5301 | 0.6369 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1ONR | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.006 | 0.047 | 2 | 4203 | 0.9553 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1ONRI | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.008 | 0.049 | 4 | 5301 | 0.6369 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1ONRI | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.017 | 0.079 | 2 | 4203 | 2.2291 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1OPA | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.143 | 0.218 | 4 | 5301 | 1.2738 | 0.6369 | 0.3184 | 0 | 0 | 0 | 0 |
| S1OPA | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.247 | 0.31 | 2 | 4203 | 3.5029 | 0.9553 | 0.3184 | 0 | 0 | 0 | 0 |
| S1OPAI | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam1 | 0.148 | 0.223 | 4 | 5301 | 1.5922 | 0.6369 | 0.3184 | 0 | 0 | 0 | 0 |
| S1OPAI | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam2 | 0.263 | 0.323 | 2 | 4203 | 4.7767 | 0.9553 | 0.3184 | 0.3184 | 0 | 0 | 0 |
| S1PA | 1 mile simple TOTAL PHYSICAL ACTIVITIES | exam1 | 0.343 | 0.435 | 4 | 5301 | 3.1845 | 1.2738 | 0.6369 | 0.3184 | 0 | 0 | 0 |
| S1PA | 1 mile simple TOTAL PHYSICAL ACTIVITIES | exam2 | 0.573 | 0.647 | 2 | 4203 | 18.151 | 1.5922 | 0.9553 | 0.3184 | 0 | 0 | 0 |
| S1PAI | 1 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam1 | 0.439 | 0.551 | 4 | 5301 | 4.1398 | 1.5922 | 0.6369 | 0.3184 | 0 | 0 | 0 |
| S1PAI | 1 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam2 | 0.68 | 0.846 | 2 | 4203 | 27.705 | 2.2291 | 0.9553 | 0.3184 | 0 | 0 | 0 |

\* Participants with invalid address had missing values.

Table D.3: social engagement and population walking destinations density (1 mile buffer)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| K1SOC | 1 mile kernel SOCIAL ENGAGEMENT | exam1 | 20.25615 | 16.52598 | 4 | 5301 | 140.2647 | 49.24669 | 30.75815 | 17.6663 | 5.989644 | 0.106924 | 0 |
| K1SOC | 1 mile kernel SOCIAL ENGAGEMENT | exam2 | 20.66551 | 19.0428 | 2 | 4203 | 492.0103 | 53.47536 | 32.35125 | 16.05943 | 5.755879 | 0.062421 | 0 |
| K1TOTSTR | 1 mile kernel TOTAL STORES | exam1 | 24.89313 | 20.37429 | 4 | 5301 | 168.6032 | 60.88201 | 37.3585 | 21.31982 | 7.935766 | 0.213624 | 0 |
| K1TOTSTR | 1 mile kernel TOTAL STORES | exam2 | 25.31273 | 23.34222 | 2 | 4203 | 595.1385 | 65.84804 | 39.44388 | 19.92637 | 7.063325 | 0.136173 | 0 |
| K1WALK | 1 mile kernel WALKING | exam1 | 6.766429 | 6.72288 | 4 | 5301 | 52.09872 | 20.48768 | 9.822623 | 5.056576 | 1.717488 | 0 | 0 |
| K1WALK | 1 mile kernel WALKING | exam2 | 7.178058 | 7.857088 | 2 | 4203 | 199.679 | 22.58167 | 10.54263 | 5.237307 | 1.477268 | 0 | 0 |
| S1SOC | 1 mile simple SOCIAL ENGAGEMENT | exam1 | 18.88993 | 15.37258 | 4 | 5301 | 99.03711 | 43.30883 | 30.57094 | 15.92236 | 5.732051 | 0.318447 | 0 |
| S1SOC | 1 mile simple SOCIAL ENGAGEMENT | exam2 | 19.28202 | 18.42716 | 2 | 4203 | 609.5081 | 46.4933 | 32.48162 | 14.64858 | 5.732051 | 0.318447 | 0 |
| S1TOTSTR | 1 mile simple TOTAL STORES | exam1 | 23.41607 | 19.02908 | 4 | 5301 | 120.3731 | 54.13604 | 37.57678 | 20.69907 | 7.642735 | 0.318447 | 0 |
| S1TOTSTR | 1 mile simple TOTAL STORES | exam2 | 23.87346 | 22.55653 | 2 | 4203 | 721.2831 | 57.9574 | 39.16902 | 18.46994 | 7.00584 | 0.318447 | 0 |
| S1WALK | 1 mile simple WALKING | exam1 | 6.730558 | 6.278498 | 4 | 5301 | 36.93989 | 18.78839 | 10.50876 | 5.413604 | 1.592236 | 0 | 0 |
| S1WALK | 1 mile simple WALKING | exam2 | 7.097637 | 7.608123 | 2 | 4203 | 244.5675 | 19.42528 | 11.4641 | 5.413604 | 1.592236 | 0 | 0 |

\* Participants with invalid address had missing values.

Table D.4: food store density (3 mile buffer)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| K3FAV | 3 mile kernel FAVORABLE FOOD STORES | exam1 | 0.27 | 0.21 | 4 | 5301 | 0.82 | 0.63 | 0.45 | 0.25 | 0.07 | 0.00 | 0.00 |
| K3FAV | 3 mile kernel FAVORABLE FOOD STORES | exam2 | 0.29 | 0.26 | 2 | 4203 | 2.48 | 0.78 | 0.49 | 0.23 | 0.05 | 0.00 | 0.00 |
| K3MRFEI\_NOALC | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam1 | 0.12 | 0.07 | 284 | 5301 | 1.00 | 0.20 | 0.17 | 0.13 | 0.08 | 0.00 | 0.00 |
| K3MRFEI\_NOALC | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam2 | 0.12 | 0.08 | 158 | 4203 | 1.00 | 0.21 | 0.17 | 0.12 | 0.07 | 0.00 | 0.00 |
| K3MRFEI\_TOT | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam1 | 0.08 | 0.06 | 215 | 5301 | 1.00 | 0.15 | 0.11 | 0.09 | 0.06 | 0.00 | 0.00 |
| K3MRFEI\_TOT | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam2 | 0.08 | 0.07 | 141 | 4203 | 1.00 | 0.14 | 0.11 | 0.08 | 0.05 | 0.00 | 0.00 |
| K3NEUT | 3 mile kernel NEUTRAL FOOD STORES | exam1 | 1.45 | 1.15 | 4 | 5301 | 4.20 | 3.55 | 2.37 | 1.23 | 0.43 | 0.00 | 0.00 |
| K3NEUT | 3 mile kernel NEUTRAL FOOD STORES | exam2 | 1.37 | 1.22 | 2 | 4203 | 28.92 | 3.54 | 2.21 | 1.07 | 0.34 | 0.00 | 0.00 |
| K3TOTFOOD | 3 mile kernel TOTAL FOOD STORES | exam1 | 6.38 | 4.85 | 4 | 5301 | 17.14 | 15.07 | 10.38 | 5.55 | 1.93 | 0.07 | 0.00 |
| K3TOTFOOD | 3 mile kernel TOTAL FOOD STORES | exam2 | 6.75 | 5.66 | 2 | 4203 | 141.42 | 16.14 | 11.08 | 5.46 | 1.87 | 0.08 | 0.00 |
| K3UNFAV | 3 mile kernel UNFAVORABLE FOOD STORES | exam1 | 2.88 | 2.12 | 4 | 5301 | 7.29 | 6.66 | 4.51 | 2.67 | 0.99 | 0.01 | 0.00 |
| K3UNFAV | 3 mile kernel UNFAVORABLE FOOD STORES | exam2 | 3.21 | 2.55 | 2 | 4203 | 44.27 | 7.67 | 5.27 | 2.87 | 1.03 | 0.02 | 0.00 |
| K3UNFAVFO | 3 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam1 | 1.81 | 1.34 | 4 | 5301 | 5.20 | 4.29 | 2.80 | 1.59 | 0.72 | 0.00 | 0.00 |
| K3UNFAVFO | 3 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam2 | 1.98 | 1.58 | 2 | 4203 | 27.22 | 4.85 | 3.12 | 1.65 | 0.71 | 0.01 | 0.00 |
| S3FAV | 3 mile simple FAVORABLE FOOD STORES | exam1 | 0.25 | 0.16 | 4 | 5301 | 0.57 | 0.46 | 0.39 | 0.28 | 0.11 | 0.00 | 0.00 |
| S3FAV | 3 mile simple FAVORABLE FOOD STORES | exam2 | 0.26 | 0.19 | 2 | 4203 | 1.98 | 0.57 | 0.42 | 0.25 | 0.07 | 0.00 | 0.00 |
| S3MRFEI\_NOALC | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam1 | 0.12 | 0.05 | 284 | 5301 | 0.67 | 0.18 | 0.16 | 0.12 | 0.10 | 0.00 | 0.00 |
| S3MRFEI\_NOALC | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL | exam2 | 0.11 | 0.07 | 158 | 4203 | 1.00 | 0.19 | 0.15 | 0.12 | 0.08 | 0.00 | 0.00 |
| S3MRFEI\_TOT | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam1 | 0.08 | 0.04 | 215 | 5301 | 0.50 | 0.14 | 0.10 | 0.08 | 0.06 | 0.00 | 0.00 |
| S3MRFEI\_TOT | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL | exam2 | 0.08 | 0.06 | 141 | 4203 | 1.00 | 0.14 | 0.10 | 0.08 | 0.05 | 0.00 | 0.00 |
| S3NEUT | 3 mile simple NEUTRAL FOOD STORES | exam1 | 1.29 | 0.92 | 4 | 5301 | 3.18 | 2.94 | 1.91 | 1.24 | 0.42 | 0.00 | 0.00 |
| S3NEUT | 3 mile simple NEUTRAL FOOD STORES | exam2 | 1.23 | 0.95 | 2 | 4203 | 17.26 | 2.86 | 1.84 | 1.17 | 0.39 | 0.00 | 0.00 |
| S3TOTFOOD | 3 mile simple TOTAL FOOD STORES | exam1 | 5.95 | 4.01 | 4 | 5301 | 13.44 | 12.52 | 8.67 | 6.47 | 1.95 | 0.07 | 0.00 |
| S3TOTFOOD | 3 mile simple TOTAL FOOD STORES | exam2 | 6.28 | 4.50 | 2 | 4203 | 83.54 | 13.37 | 9.44 | 6.93 | 2.05 | 0.07 | 0.00 |
| S3UNFAV | 3 mile simple UNFAVORABLE FOOD STORES | exam1 | 2.70 | 1.76 | 4 | 5301 | 6.33 | 5.55 | 3.89 | 2.97 | 0.88 | 0.04 | 0.00 |
| S3UNFAV | 3 mile simple UNFAVORABLE FOOD STORES | exam2 | 3.02 | 2.07 | 2 | 4203 | 26.92 | 6.30 | 4.49 | 3.40 | 0.95 | 0.04 | 0.00 |
| S3UNFAVFO | 3 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam1 | 1.75 | 1.10 | 4 | 5301 | 3.96 | 3.43 | 2.62 | 1.95 | 0.64 | 0.00 | 0.00 |
| S3UNFAVFO | 3 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL | exam2 | 1.89 | 1.25 | 2 | 4203 | 16.55 | 3.75 | 2.86 | 2.05 | 0.71 | 0.04 | 0.00 |

\*Missing values (NMISS) in Unfavorable/favorable ratio is due to none favorable stores in the area; missing values in MODIFIED RETAIL FOOD ENVIRONMENT INDEX is due to none favorable or unfavorable stores in the area. Participants with invalid address had missing values.

Table D.5: recreational facility density (3 mile buffer)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| K3INR | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.167987 | 0.168498 | 4 | 5301 | 0.79759 | 0.559423 | 0.225297 | 0.117679 | 0.047562 | 0 | 0 |
| K3INR | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.2699 | 0.260852 | 2 | 4203 | 7.870383 | 0.70702 | 0.436523 | 0.224178 | 0.070807 | 0 | 0 |
| K3INRI | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam1 | 0.270638 | 0.255858 | 4 | 5301 | 1.283209 | 0.832702 | 0.374013 | 0.195823 | 0.086742 | 0 | 0 |
| K3INRI | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam2 | 0.387254 | 0.405877 | 2 | 4203 | 12.07643 | 1.118982 | 0.607873 | 0.287394 | 0.093449 | 0 | 0 |
| K3IPA | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.255591 | 0.245197 | 4 | 5301 | 1.244419 | 0.772948 | 0.385 | 0.179339 | 0.07351 | 0 | 0 |
| K3IPA | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.373111 | 0.34439 | 2 | 4203 | 9.942688 | 0.943001 | 0.587049 | 0.31423 | 0.094789 | 0 | 0 |
| K3IPAI | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam1 | 0.358285 | 0.329191 | 4 | 5301 | 1.611253 | 1.058299 | 0.530989 | 0.256086 | 0.112405 | 0 | 0 |
| K3IPAI | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam2 | 0.490522 | 0.481132 | 2 | 4203 | 14.16152 | 1.369765 | 0.763845 | 0.383589 | 0.119617 | 0 | 0 |
| K3NR | 3 mile kernel TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.168538 | 0.169674 | 4 | 5301 | 0.79759 | 0.563002 | 0.225297 | 0.117679 | 0.047562 | 0 | 0 |
| K3NR | 3 mile kernel TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.26992 | 0.260893 | 2 | 4203 | 7.875805 | 0.70702 | 0.436523 | 0.224178 | 0.070807 | 0 | 0 |
| K3NRI | 3 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.273009 | 0.257794 | 4 | 5301 | 1.352502 | 0.847869 | 0.381936 | 0.196912 | 0.086742 | 0 | 0 |
| K3NRI | 3 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.387416 | 0.406983 | 2 | 4203 | 12.20294 | 1.118982 | 0.607873 | 0.287394 | 0.093449 | 0 | 0 |
| K3ONR | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.005706 | 0.020067 | 4 | 5301 | 0.210373 | 0.036647 | 0 | 0 | 0 | 0 | 0 |
| K3ONR | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.00875 | 0.025413 | 2 | 4203 | 0.39946 | 0.058167 | 0.00063 | 0 | 0 | 0 | 0 |
| K3ONRI | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.01085 | 0.026729 | 4 | 5301 | 0.260915 | 0.069355 | 0.006139 | 0 | 0 | 0 | 0 |
| K3ONRI | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.019545 | 0.041039 | 2 | 4203 | 0.949804 | 0.106831 | 0.018367 | 0 | 0 | 0 | 0 |
| K3OPA | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.138383 | 0.114774 | 4 | 5301 | 0.641879 | 0.32676 | 0.216004 | 0.128583 | 0.033726 | 0 | 0 |
| K3OPA | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.221314 | 0.171294 | 2 | 4203 | 1.533834 | 0.532609 | 0.332026 | 0.204824 | 0.075276 | 0 | 0 |
| K3OPAI | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam1 | 0.14523 | 0.116954 | 4 | 5301 | 0.718397 | 0.334251 | 0.221421 | 0.130915 | 0.043775 | 0 | 0 |
| K3OPAI | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam2 | 0.238239 | 0.182248 | 2 | 4203 | 2.122702 | 0.569055 | 0.354848 | 0.221764 | 0.0886 | 0 | 0 |
| K3PA | 3 mile kernel TOTAL PHYSICAL ACTIVITIES | exam1 | 0.353979 | 0.287631 | 4 | 5301 | 1.53944 | 0.921632 | 0.498104 | 0.302484 | 0.129433 | 0 | 0 |
| K3PA | 3 mile kernel TOTAL PHYSICAL ACTIVITIES | exam2 | 0.529914 | 0.415436 | 2 | 4203 | 10.20847 | 1.202797 | 0.82575 | 0.496907 | 0.186051 | 0 | 0 |
| K3PAI | 3 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam1 | 0.460197 | 0.372684 | 4 | 5301 | 1.950872 | 1.209567 | 0.648545 | 0.377762 | 0.190755 | 0 | 0 |
| K3PAI | 3 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam2 | 0.653597 | 0.551879 | 2 | 4203 | 14.58692 | 1.585501 | 1.003964 | 0.565353 | 0.219852 | 0 | 0 |
| S3INR | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.175727 | 0.13416 | 4 | 5301 | 0.601262 | 0.424421 | 0.282947 | 0.141474 | 0.070737 | 0 | 0 |
| S3INR | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.265124 | 0.20063 | 2 | 4203 | 4.810099 | 0.601262 | 0.42442 | 0.247579 | 0.106105 | 0 | 0 |
| S3INRI | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam1 | 0.289624 | 0.20705 | 4 | 5301 | 1.025683 | 0.671999 | 0.42442 | 0.247579 | 0.106105 | 0 | 0 |
| S3INRI | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL NO RECREATIONAL | exam2 | 0.395299 | 0.312233 | 2 | 4203 | 7.321254 | 0.919578 | 0.601262 | 0.389052 | 0.141474 | 0 | 0 |
| S3IPA | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.268551 | 0.197309 | 4 | 5301 | 0.848841 | 0.601262 | 0.42442 | 0.247579 | 0.106105 | 0 | 0 |
| S3IPA | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.366893 | 0.267278 | 2 | 4203 | 6.295571 | 0.778104 | 0.565894 | 0.353684 | 0.141474 | 0 | 0 |
| S3IPAI | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam1 | 0.382555 | 0.269296 | 4 | 5301 | 1.273262 | 0.848841 | 0.601262 | 0.353684 | 0.176842 | 0 | 0 |
| S3IPAI | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL | exam2 | 0.49722 | 0.372643 | 2 | 4203 | 8.842094 | 1.061051 | 0.778104 | 0.459789 | 0.176842 | 0 | 0 |
| S3NR | 3 mile simple TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.176561 | 0.135429 | 4 | 5301 | 0.601262 | 0.424421 | 0.282947 | 0.141474 | 0.070737 | 0 | 0 |
| S3NR | 3 mile simple TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.265166 | 0.200827 | 2 | 4203 | 4.845468 | 0.601262 | 0.42442 | 0.247579 | 0.106105 | 0 | 0 |
| S3NRI | 3 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.292515 | 0.209018 | 4 | 5301 | 1.061051 | 0.671999 | 0.42442 | 0.247579 | 0.106105 | 0 | 0 |
| S3NRI | 3 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.395577 | 0.313447 | 2 | 4203 | 7.462727 | 0.919578 | 0.601262 | 0.389052 | 0.141474 | 0 | 0 |
| S3ONR | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam1 | 0.010416 | 0.022094 | 4 | 5301 | 0.106105 | 0.070737 | 0 | 0 | 0 | 0 | 0 |
| S3ONR | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES NO RECREATIONAL | exam2 | 0.013832 | 0.027103 | 2 | 4203 | 0.42442 | 0.070737 | 0.035368 | 0 | 0 | 0 | 0 |
| S3ONRI | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam1 | 0.016426 | 0.026034 | 4 | 5301 | 0.21221 | 0.070737 | 0.035368 | 0 | 0 | 0 | 0 |
| S3ONRI | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER NO RECREATIONAL | exam2 | 0.026587 | 0.037311 | 2 | 4203 | 0.707367 | 0.106105 | 0.035368 | 0 | 0 | 0 | 0 |
| S3OPA | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam1 | 0.132747 | 0.095411 | 4 | 5301 | 0.459789 | 0.318315 | 0.176842 | 0.141474 | 0.035368 | 0 | 0 |
| S3OPA | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES | exam2 | 0.197519 | 0.137407 | 2 | 4203 | 1.061051 | 0.459789 | 0.282947 | 0.21221 | 0.070737 | 0 | 0 |
| S3OPAI | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam1 | 0.14108 | 0.097014 | 4 | 5301 | 0.530526 | 0.318315 | 0.21221 | 0.141474 | 0.070737 | 0 | 0 |
| S3OPAI | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER | exam2 | 0.216748 | 0.14663 | 2 | 4203 | 1.414735 | 0.495157 | 0.318315 | 0.21221 | 0.106105 | 0 | 0 |
| S3PA | 3 mile simple TOTAL PHYSICAL ACTIVITIES | exam1 | 0.358765 | 0.237698 | 4 | 5301 | 1.061051 | 0.778104 | 0.530526 | 0.318315 | 0.176842 | 0 | 0 |
| S3PA | 3 mile simple TOTAL PHYSICAL ACTIVITIES | exam2 | 0.499097 | 0.328265 | 2 | 4203 | 6.472413 | 0.990315 | 0.742736 | 0.495157 | 0.21221 | 0 | 0 |
| S3PAI | 3 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam1 | 0.477149 | 0.310949 | 4 | 5301 | 1.556209 | 1.025683 | 0.707368 | 0.459789 | 0.247579 | 0 | 0 |
| S3PAI | 3 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER | exam2 | 0.636134 | 0.434918 | 2 | 4203 | 9.195778 | 1.273262 | 0.954946 | 0.636631 | 0.282947 | 0 | 0 |

\* Participants with invalid address had missing values.

Table D.6: Correlation in various types of favorite food store densities

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Exam |  | K0FAV | S0FAV | K1FAV | S1FAV | K3FAV | S3FAV |
| exam1 | K0FAV | 1.00 | 0.74 | 0.72 | 0.43 | 0.36 | 0.26 |
|  | S0FAV | 0.74 | 1.00 | 0.86 | 0.56 | 0.48 | 0.37 |
|  | K1FAV | 0.72 | 0.86 | 1.00 | 0.81 | 0.67 | 0.53 |
|  | S1FAV | 0.43 | 0.56 | 0.81 | 1.00 | 0.81 | 0.65 |
|  | K3FAV | 0.36 | 0.48 | 0.67 | 0.81 | 1.00 | 0.91 |
|  | S3FAV | 0.26 | 0.37 | 0.53 | 0.65 | 0.91 | 1.00 |
| exam2 | K0FAV | 1.00 | 0.71 | 0.68 | 0.44 | 0.38 | 0.27 |
|  | S0FAV | 0.71 | 1.00 | 0.84 | 0.59 | 0.51 | 0.38 |
|  | K1FAV | 0.68 | 0.84 | 1.00 | 0.84 | 0.70 | 0.55 |
|  | S1FAV | 0.44 | 0.59 | 0.84 | 1.00 | 0.80 | 0.65 |
|  | K3FAV | 0.38 | 0.51 | 0.70 | 0.80 | 1.00 | 0.92 |
|  | S3FAV | 0.27 | 0.38 | 0.55 | 0.65 | 0.92 | 1.00 |

Table D.7: Correlation in various types of total physical activity facility densities

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Exam |  | K0PAI | S0PAI | K1PAI | S1PAI | K3PAI | S3PAI |
| exam1 | K0PAI | 1.00 | 0.78 | 0.75 | 0.45 | 0.38 | 0.29 |
|  | S0PAI | 0.78 | 1.00 | 0.87 | 0.58 | 0.49 | 0.38 |
|  | K1PAI | 0.75 | 0.87 | 1.00 | 0.82 | 0.67 | 0.51 |
|  | S1PAI | 0.45 | 0.58 | 0.82 | 1.00 | 0.79 | 0.60 |
|  | K3PAI | 0.38 | 0.49 | 0.67 | 0.79 | 1.00 | 0.90 |
|  | S3PAI | 0.29 | 0.38 | 0.51 | 0.60 | 0.90 | 1.00 |
| exam2 | K0PAI | 1.00 | 0.83 | 0.79 | 0.56 | 0.44 | 0.33 |
|  | S0PAI | 0.83 | 1.00 | 0.91 | 0.71 | 0.57 | 0.43 |
|  | K1PAI | 0.79 | 0.91 | 1.00 | 0.88 | 0.72 | 0.56 |
|  | S1PAI | 0.56 | 0.71 | 0.88 | 1.00 | 0.84 | 0.67 |
|  | K3PAI | 0.44 | 0.57 | 0.72 | 0.84 | 1.00 | 0.92 |
|  | S3PAI | 0.33 | 0.43 | 0.56 | 0.67 | 0.92 | 1.00 |

Table D.8: Correlation in various types of social engagement densities

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Exam |  | K0SOC | S0SOC | K1SOC | S1SOC | K3SOC | S3SOC |
| exam1 | K0SOC | 1.00 | 0.92 | 0.88 | 0.74 | 0.68 | 0.66 |
|  | S0SOC | 0.92 | 1.00 | 0.96 | 0.84 | 0.77 | 0.74 |
|  | K1SOC | 0.88 | 0.96 | 1.00 | 0.94 | 0.86 | 0.81 |
|  | S1SOC | 0.74 | 0.84 | 0.94 | 1.00 | 0.93 | 0.85 |
|  | K3SOC | 0.68 | 0.77 | 0.86 | 0.93 | 1.00 | 0.96 |
|  | S3SOC | 0.66 | 0.74 | 0.81 | 0.85 | 0.96 | 1.00 |
| exam2 | K0SOC | 1.00 | 0.91 | 0.86 | 0.72 | 0.69 | 0.67 |
|  | S0SOC | 0.91 | 1.00 | 0.96 | 0.85 | 0.80 | 0.75 |
|  | K1SOC | 0.86 | 0.96 | 1.00 | 0.95 | 0.89 | 0.83 |
|  | S1SOC | 0.72 | 0.85 | 0.95 | 1.00 | 0.93 | 0.85 |
|  | K3SOC | 0.69 | 0.80 | 0.89 | 0.93 | 1.00 | 0.97 |
|  | S3SOC | 0.67 | 0.75 | 0.83 | 0.85 | 0.97 | 1.00 |

Table D.9: Correlation in various types of popular walking destination densities

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Exam |  | K0WALK | S0WALK | K1WALK | S1WALK | K3WALK | S3WALK |
| exam1 | K0WALK | 1.00 | 0.88 | 0.82 | 0.60 | 0.55 | 0.48 |
|  | S0WALK | 0.88 | 1.00 | 0.93 | 0.75 | 0.67 | 0.58 |
|  | K1WALK | 0.82 | 0.93 | 1.00 | 0.90 | 0.79 | 0.68 |
|  | S1WALK | 0.60 | 0.75 | 0.90 | 1.00 | 0.87 | 0.76 |
|  | K3WALK | 0.55 | 0.67 | 0.79 | 0.87 | 1.00 | 0.95 |
|  | S3WALK | 0.48 | 0.58 | 0.68 | 0.76 | 0.95 | 1.00 |
| exam2 | K0WALK | 1.00 | 0.86 | 0.80 | 0.58 | 0.55 | 0.49 |
|  | S0WALK | 0.86 | 1.00 | 0.94 | 0.76 | 0.70 | 0.62 |
|  | K1WALK | 0.80 | 0.94 | 1.00 | 0.91 | 0.82 | 0.72 |
|  | S1WALK | 0.58 | 0.76 | 0.91 | 1.00 | 0.90 | 0.78 |
|  | K3WALK | 0.55 | 0.70 | 0.82 | 0.90 | 1.00 | 0.95 |
|  | S3WALK | 0.49 | 0.62 | 0.72 | 0.78 | 0.95 | 1.00 |

## Appendix E: Built Environment Summary

Table E.1 built environment variable summary -- pedestrian/bike fatality crashes

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| K0CRASH | 1/2 Mile kernel density pedestrian /bike crashes | exam1 | 0.01 | 0.16 | 4 | 5301 | 3.67 | 0 | 0 | 0 | 0 | 0 | 0 |
| K0CRASH | 1/2 Mile kernel density pedestrian /bike crashes | exam2 | 0.04 | 0.32 | 1 | 4203 | 3.69 | 0 | 0 | 0 | 0 | 0 | 0 |
| K14CRASH | 1/4 Mile kernel density pedestrian /bike crashes | exam1 | 0.01 | 0.30 | 4 | 5301 | 13.02 | 0 | 0 | 0 | 0 | 0 | 0 |
| K14CRASH | 1/4 Mile kernel density pedestrian /bike crashes | exam2 | 0.04 | 0.61 | 1 | 4203 | 13.23 | 0 | 0 | 0 | 0 | 0 | 0 |
| K1CRASH | 1 Mile kernel density pedestrian /bike crashes | exam1 | 0.01 | 0.08 | 4 | 5301 | 0.95 | 0 | 0 | 0 | 0 | 0 | 0 |
| K1CRASH | 1 Mile kernel density pedestrian /bike crashes | exam2 | 0.05 | 0.18 | 1 | 4203 | 1.95 | 0.38 | 0 | 0 | 0 | 0 | 0 |
| S0CRASH | 1/2 Mile simple density pedestrian /bike crashes | exam1 | 0.01 | 0.11 | 4 | 5301 | 1.27 | 0 | 0 | 0 | 0 | 0 | 0 |
| S0CRASH | 1/2 Mile simple density pedestrian /bike crashes | exam2 | 0.04 | 0.25 | 1 | 4203 | 3.82 | 0 | 0 | 0 | 0 | 0 | 0 |
| S14CRASH | 1/4 Mile simple density pedestrian /bike crashes | exam1 | 0.01 | 0.24 | 4 | 5301 | 5.09 | 0 | 0 | 0 | 0 | 0 | 0 |
| S14CRASH | 1/4 Mile simple density pedestrian /bike crashes | exam2 | 0.04 | 0.48 | 1 | 4203 | 5.09 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1CRASH | 1 Mile simple density pedestrian /bike crashes | exam1 | 0.01 | 0.07 | 4 | 5301 | 0.64 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1CRASH | 1 Mile simple density pedestrian /bike crashes | exam2 | 0.05 | 0.15 | 1 | 4203 | 1.91 | 0.32 | 0 | 0 | 0 | 0 | 0 |

Note: crashes density (# crashes per area) is highly sparse; we also found this highly sparse crash density in other studies (e.g. MESA); missing values (NMISS) are due to invalid participant’s residential address.

Table E.2 built environment variable summary – land use

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| COMMAREA0 | Commercial Area for 1/2 mile | exam1 | 91827 | 116035 | 739 | 5301 | 678637 | 344536 | 130409 | 47549 | 11227 | 0 | 0 |
| COMMAREA0 | Commercial Area for 1/2 mile | exam2 | 78799 | 99140 | 655 | 4203 | 536176 | 292759 | 104178 | 42425 | 9006 | 0 | 0 |
| COMMAREA1 | Commercial Area for 1 mile | exam1 | 453725 | 394528 | 721 | 5301 | 1605427 | 1243553 | 745300 | 332329 | 143509 | 0 | 0 |
| COMMAREA1 | Commercial Area for 1 mile | exam2 | 376279 | 317499 | 639 | 4203 | 1508022 | 1003358 | 594767 | 280635 | 144142 | 0 | 0 |
| COMMAREA14 | Commercial Area for 1/4 mile | exam1 | 16662 | 30074 | 741 | 5301 | 255420 | 81384 | 20499 | 2864 | 0 | 0 | 0 |
| COMMAREA14 | Commercial Area for 1/4 mile | exam2 | 15307 | 31378 | 657 | 4203 | 216861 | 70271 | 17465 | 1746 | 0 | 0 | 0 |
| PCOM0 | Percent Commercial 1/2 mile | exam1 | 0.05 | 0.06 | 739 | 5301 | 0.33 | 0.17 | 0.06 | 0.02 | 0.01 | 0.00 | 0.00 |
| PCOM0 | Percent Commercial 1/2 mile | exam2 | 0.04 | 0.05 | 655 | 4203 | 0.26 | 0.14 | 0.05 | 0.02 | 0.00 | 0.00 | 0.00 |
| PCOM1 | Percent Commercial 1 mile | exam1 | 0.06 | 0.05 | 721 | 5301 | 0.20 | 0.15 | 0.09 | 0.04 | 0.02 | 0.00 | 0.00 |
| PCOM1 | Percent Commercial 1 mile | exam2 | 0.05 | 0.04 | 639 | 4203 | 0.19 | 0.12 | 0.07 | 0.03 | 0.02 | 0.00 | 0.00 |
| PCOM14 | Percent Commercial 1/4 mile | exam1 | 0.03 | 0.06 | 741 | 5301 | 0.50 | 0.16 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 |
| PCOM14 | Percent Commercial 1/4 mile | exam2 | 0.03 | 0.06 | 657 | 4203 | 0.43 | 0.14 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCTLU0 | Percent of 1/2 mile buffer in land use data | exam1 | 0.85 | 0.35 | 4 | 5301 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| PCTLU0 | Percent of 1/2 mile buffer in land use data | exam2 | 0.83 | 0.36 | 1 | 4203 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| PCTLU1 | Percent of 1 mile buffer in land use data | exam1 | 0.84 | 0.35 | 4 | 5301 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| PCTLU1 | Percent of 1 mile buffer in land use data | exam2 | 0.83 | 0.36 | 1 | 4203 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| PCTLU14 | Percent of 1/4 mile buffer in land use data | exam1 | 0.86 | 0.35 | 4 | 5301 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| PCTLU14 | Percent of 1/4 mile buffer in land use data | exam2 | 0.84 | 0.36 | 1 | 4203 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| PRES0 | Percent Residential 1/2 mile | exam1 | 0.40 | 0.14 | 739 | 5301 | 0.77 | 0.64 | 0.49 | 0.39 | 0.30 | 0.17 | 0.00 |
| PRES0 | Percent Residential 1/2 mile | exam2 | 0.39 | 0.14 | 655 | 4203 | 0.85 | 0.64 | 0.49 | 0.39 | 0.30 | 0.16 | 0.00 |
| PRES1 | Percent Residential 1 mile | exam1 | 0.32 | 0.11 | 721 | 5301 | 0.69 | 0.49 | 0.39 | 0.31 | 0.24 | 0.11 | 0.00 |
| PRES1 | Percent Residential 1 mile | exam2 | 0.32 | 0.12 | 639 | 4203 | 0.68 | 0.52 | 0.39 | 0.32 | 0.24 | 0.12 | 0.00 |
| PRES14 | Percent Residential 1/4 mile | exam1 | 0.49 | 0.18 | 741 | 5301 | 0.88 | 0.76 | 0.62 | 0.49 | 0.37 | 0.17 | 0.00 |
| PRES14 | Percent Residential 1/4 mile | exam2 | 0.48 | 0.18 | 657 | 4203 | 0.93 | 0.77 | 0.61 | 0.49 | 0.36 | 0.16 | 0.00 |
| PRET0 | Percent Retail 1/2 mile | exam1 | 0.02 | 0.03 | 739 | 5301 | 0.24 | 0.08 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 |
| PRET0 | Percent Retail 1/2 mile | exam2 | 0.02 | 0.03 | 655 | 4203 | 0.16 | 0.08 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 |
| PRET1 | Percent Retail 1 mile | exam1 | 0.02 | 0.02 | 721 | 5301 | 0.09 | 0.06 | 0.04 | 0.02 | 0.00 | 0.00 | 0.00 |
| PRET1 | Percent Retail 1 mile | exam2 | 0.02 | 0.02 | 639 | 4203 | 0.11 | 0.06 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 |
| PRET14 | Percent Retail 1/4 mile | exam1 | 0.02 | 0.03 | 741 | 5301 | 0.34 | 0.08 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| PRET14 | Percent Retail 1/4 mile | exam2 | 0.02 | 0.04 | 657 | 4203 | 0.31 | 0.08 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| RESIDAREA0 | Residential Area for 1/2 mile | exam1 | 804530 | 283331 | 739 | 5301 | 1572801 | 1298039 | 987471 | 797048 | 613432 | 340838 | 0 |
| RESIDAREA0 | Residential Area for 1/2 mile | exam2 | 800518 | 292681 | 655 | 4203 | 1736529 | 1305561 | 986740 | 787695 | 610162 | 324700 | 0 |
| RESIDAREA1 | Residential Area for 1 mile | exam1 | 2567804 | 902267 | 721 | 5301 | 5600772 | 4024939 | 3158816 | 2557100 | 1984303 | 910903 | 0 |
| RESIDAREA1 | Residential Area for 1 mile | exam2 | 2580048 | 947030 | 639 | 4203 | 5554420 | 4256292 | 3139164 | 2580955 | 1913950 | 961566 | 0 |
| RESIDAREA14 | Residential Area for 1/4 mile | exam1 | 247482 | 89720 | 741 | 5301 | 447626 | 384377 | 313373 | 251713 | 188750 | 86345 | 0 |
| RESIDAREA14 | Residential Area for 1/4 mile | exam2 | 244911 | 92592 | 657 | 4203 | 472377 | 389542 | 310996 | 248662 | 183590 | 79214 | 0 |
| RETAREA0 | Retail Area for 1/2 mile | exam1 | 41376 | 54900 | 739 | 5301 | 484688 | 157742 | 56835 | 20586 | 4258 | 0 | 0 |
| RETAREA0 | Retail Area for 1/2 mile | exam2 | 37192 | 52814 | 655 | 4203 | 331580 | 157966 | 47116 | 17711 | 3291 | 0 | 0 |
| RETAREA1 | Retail Area for 1 mile | exam1 | 188167 | 168637 | 721 | 5301 | 768162 | 495639 | 284838 | 152260 | 36698 | 0 | 0 |
| RETAREA1 | Retail Area for 1 mile | exam2 | 164555 | 157043 | 639 | 4203 | 857827 | 457001 | 265418 | 119582 | 35205 | 0 | 0 |
| RETAREA14 | Retail Area for 1/4 mile | exam1 | 8147 | 17311 | 741 | 5301 | 171440 | 40210 | 8146 | 1214 | 0 | 0 | 0 |
| RETAREA14 | Retail Area for 1/4 mile | exam2 | 8177 | 20953 | 657 | 4203 | 157359 | 39156 | 6492 | 696 | 0 | 0 | 0 |
| SDCOMM | Distance to closest commercial (meter) | exam1 | 492 | 716 | 721 | 5301 | 6964 | 1676 | 569 | 285 | 137 | 28 | 0 |
| SDCOMM | Distance to closest commercial (meter) | exam2 | 517 | 724 | 639 | 4203 | 6340 | 1866 | 588 | 309 | 155 | 28 | 2 |
| SDRET | Distance to closest retail (meter) | exam1 | 613 | 902 | 721 | 5301 | 8102 | 2215 | 650 | 332 | 165 | 43 | 3 |
| SDRET | Distance to closest retail (meter) | exam2 | 652 | 913 | 639 | 4203 | 7952 | 2338 | 692 | 371 | 191 | 37 | 3 |

Note: In general, small change in % retail (decrease), commercial (decrease) and residential (increase) between Exam 1 and Exam 2. Usually 1 mile buffer is used (recommendation in MESA). Data on land use is only available for Hinds County which was collected from Hinds County Tax Assessor’s office in Jackson, MS; therefore, participants who did not live in Hinds County or had invalid residential address info at the time of exam visit have missing values.

Table E.3 built environment variable summary – population density

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| POPDENKM0 | Population density per sq km 1/2 mile | exam1 | 1039 | 609 | 4 | 5301 | 2336 | 1937 | 1521 | 1138 | 523 | 25 | 1 |
| POPDENKM0 | Population density per sq km 1/2 mile | exam2 | 876 | 559 | 1 | 4203 | 12259 | 1681 | 1259 | 929 | 437 | 28 | 1 |
| POPDENKM1 | Population density per sq km 1 mile | exam1 | 820 | 490 | 4 | 5301 | 1703 | 1539 | 1250 | 848 | 420 | 25 | 2 |
| POPDENKM1 | Population density per sq km 1 mile | exam2 | 703 | 446 | 1 | 4203 | 9720 | 1333 | 1054 | 717 | 377 | 27 | 2 |
| POPDENKM14 | Population density per sq km 1/4 mile | exam1 | 1257 | 760 | 4 | 5301 | 3810 | 2375 | 1794 | 1353 | 629 | 26 | 0 |
| POPDENKM14 | Population density per sq km 1/4 mile | exam2 | 1043 | 665 | 1 | 4203 | 8685 | 2028 | 1476 | 1107 | 518 | 28 | 0 |
| POPDENMI0 | Population density per sq mile 1/2 mile | exam1 | 2692 | 1578 | 4 | 5301 | 6051 | 5017 | 3939 | 2947 | 1354 | 64 | 2 |
| POPDENMI0 | Population density per sq mile 1/2 mile | exam2 | 2268 | 1447 | 1 | 4203 | 31750 | 4354 | 3262 | 2407 | 1131 | 72 | 3 |
| POPDENMI1 | Population density per sq mile 1 mile | exam1 | 2124 | 1269 | 4 | 5301 | 4410 | 3985 | 3237 | 2196 | 1087 | 66 | 4 |
| POPDENMI1 | Population density per sq mile 1 mile | exam2 | 1820 | 1154 | 1 | 4203 | 25176 | 3454 | 2730 | 1857 | 976 | 69 | 5 |
| POPDENMI14 | Population density per sq mile 1/4 mile | exam1 | 3257 | 1967 | 4 | 5301 | 9869 | 6152 | 4647 | 3504 | 1630 | 67 | 1 |
| POPDENMI14 | Population density per sq mile 1/4 mile | exam2 | 2702 | 1722 | 1 | 4203 | 22494 | 5253 | 3822 | 2867 | 1343 | 72 | 0 |
| TOTPOP0 | Total population 1/2 mile | exam1 | 2114 | 1239 | 4 | 5301 | 4753 | 3940 | 3094 | 2314 | 1064 | 51 | 2 |
| TOTPOP0 | Total population 1/2 mile | exam2 | 1781 | 1137 | 1 | 4203 | 24936 | 3420 | 2562 | 1890 | 888 | 57 | 2 |
| TOTPOP1 | Total population 1 mile | exam1 | 6673 | 3986 | 4 | 5301 | 13855 | 12521 | 10168 | 6900 | 3416 | 206 | 13 |
| TOTPOP1 | Total population 1 mile | exam2 | 5718 | 3625 | 1 | 4203 | 79092 | 10850 | 8577 | 5834 | 3066 | 216 | 16 |
| TOTPOP14 | Total population 1/4 mile | exam1 | 639 | 386 | 4 | 5301 | 1938 | 1208 | 912 | 688 | 320 | 13 | 0 |
| TOTPOP14 | Total population 1/4 mile | exam2 | 531 | 338 | 1 | 4203 | 4417 | 1032 | 750 | 563 | 264 | 14 | 0 |

Note: population density (recommended) decrease between Exam 1 and Exam 2. Usually the population density is used as an adjustment variable and the buffer size version of the population density should be used consistent with the other variables (e.g. if 1 mile buffer % retail is used, 1 mile buffer population density is recommended if the population density variable needs to be used). Missing values (NMISS) are due to invalid participant’s residential address.

Table E.4 built environment variable summary – street connectivity

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| INTCNT0 | Number of intersections in 1/2 mile buffer | exam1 | 75.98 | 41.42 | 4 | 5301 | 239 | 157 | 97 | 76 | 52 | 8 | 0 |
| INTCNT0 | Number of intersections in 1/2 mile buffer | exam2 | 64.28 | 38.03 | 1 | 4203 | 298 | 141 | 83 | 65 | 39 | 3 | 0 |
| INTCNT1 | Number of intersections in 1 mile buffer | exam1 | 258.58 | 145.10 | 4 | 5301 | 702 | 527 | 340 | 252 | 156 | 27 | 2 |
| INTCNT1 | Number of intersections in 1 mile buffer | exam2 | 224.33 | 136.10 | 1 | 4203 | 1232 | 498 | 299 | 219 | 136 | 12 | 0 |
| INTCNT14 | Number of intersections in 1/4 mile buffer | exam1 | 22.14 | 12.58 | 4 | 5301 | 79 | 44 | 28 | 22 | 14 | 2 | 0 |
| INTCNT14 | Number of intersections in 1/4 mile buffer | exam2 | 18.24 | 11.27 | 1 | 4203 | 92 | 38 | 24 | 18 | 11 | 1 | 0 |
| IntDen0 | Intersection density for 1/2 mile | exam1 | 0.37 | 0.20 | 4 | 5301 | 1.17 | 0.77 | 0.48 | 0.37 | 0.26 | 0.04 | 0.00 |
| IntDen0 | Intersection density for 1/2 mile | exam2 | 0.32 | 0.19 | 1 | 4203 | 1.46 | 0.69 | 0.41 | 0.32 | 0.19 | 0.01 | 0.00 |
| IntDen1 | Intersection density for 1 mile | exam1 | 0.32 | 0.18 | 4 | 5301 | 0.86 | 0.65 | 0.42 | 0.31 | 0.19 | 0.03 | 0.00 |
| IntDen1 | Intersection density for 1 mile | exam2 | 0.28 | 0.17 | 1 | 4203 | 1.51 | 0.61 | 0.37 | 0.27 | 0.17 | 0.01 | 0.00 |
| IntDen14 | Intersection density for 1/4 mile | exam1 | 0.44 | 0.25 | 4 | 5301 | 1.55 | 0.87 | 0.55 | 0.43 | 0.28 | 0.04 | 0.00 |
| IntDen14 | Intersection density for 1/4 mile | exam2 | 0.36 | 0.22 | 1 | 4203 | 1.81 | 0.75 | 0.47 | 0.35 | 0.22 | 0.02 | 0.00 |
| NetArea0 | Area of 1/2 mile Network buffer | exam1 | 654754 | 290794 | 4 | 5301 | 1349533 | 1148016 | 864793 | 657429 | 409120 | 213878 | 94963 |
| NetArea0 | Area of 1/2 mile Network buffer | exam2 | 620070 | 279023 | 1 | 4203 | 1513002 | 1108869 | 815199 | 623022 | 381730 | 197440 | 91612 |
| NetArea1 | Area of 1 mile Network buffer | exam1 | 2284480 | 1086066 | 4 | 5301 | 4822079 | 3944139 | 3219348 | 2254817 | 1364564 | 579138 | 248808 |
| NetArea1 | Area of 1 mile Network buffer | exam2 | 2145705 | 1048853 | 1 | 4203 | 5829047 | 3829327 | 3024429 | 2154810 | 1273079 | 513611 | 219385 |
| NetArea14 | Area of 1/4 mile Network buffer | exam1 | 199012 | 73434 | 4 | 5301 | 405802 | 335171 | 245859 | 195748 | 142051 | 88244 | 48038 |
| NetArea14 | Area of 1/4 mile Network buffer | exam2 | 192772 | 71061 | 1 | 4203 | 408619 | 322786 | 239200 | 188180 | 136028 | 88230 | 47534 |
| NetRatio0 | Network Ratio 1/2 mile | exam1 | 0.32 | 0.14 | 4 | 5301 | 0.66 | 0.56 | 0.43 | 0.32 | 0.20 | 0.11 | 0.05 |
| NetRatio0 | Network Ratio 1/2 mile | exam2 | 0.30 | 0.14 | 1 | 4203 | 0.74 | 0.55 | 0.40 | 0.31 | 0.19 | 0.10 | 0.05 |
| NetRatio1 | Network Ratio 1 mile | exam1 | 0.28 | 0.13 | 4 | 5301 | 0.59 | 0.48 | 0.40 | 0.28 | 0.17 | 0.07 | 0.03 |
| NetRatio1 | Network Ratio 1 mile | exam2 | 0.26 | 0.13 | 1 | 4203 | 0.72 | 0.47 | 0.37 | 0.26 | 0.16 | 0.06 | 0.03 |
| NetRatio14 | Network Ratio 1/4 mile | exam1 | 0.39 | 0.14 | 4 | 5301 | 0.80 | 0.66 | 0.48 | 0.38 | 0.28 | 0.17 | 0.09 |
| NetRatio14 | Network Ratio 1/4 mile | exam2 | 0.38 | 0.14 | 1 | 4203 | 0.80 | 0.63 | 0.47 | 0.37 | 0.27 | 0.17 | 0.09 |

Note: network area is the area where people can walk or reach by walking. The network ratio (recommend to use) is the percent of network area in neighborhood (e.g. 1 mile buffer). The network ratio looks not change much between Exam 1 and Exam 2, but only a little decrease. Missing values (NMISS) are due to invalid participant’s residential address.

Table E.5 built environment variable summary – bus route

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NAME | LABEL | exam | MEAN | STD | NMISS | NOBS | Max | P95 | Q3 | Median | Q1 | P5 | Min |
| MS\_BUSROUTE | Distance to closest bus route (meters) | exam1 | 1122.1 | 2333.8 | 693 | 5301 | 15276.3 | 7101.5 | 563.1 | 217.3 | 92.0 | 13.0 | 0.3 |
| MS\_BUSROUTE | Distance to closest bus route (meters) | exam2 | 1272.2 | 2480.6 | 618 | 4203 | 15276.3 | 7478.4 | 767.1 | 234.5 | 96.8 | 12.8 | 0.6 |
| MS\_BUSSTOP | Distance to closest bus stop (meters) | exam1 | 1581.9 | 2287.1 | 693 | 5301 | 14938.7 | 7542.8 | 1301.3 | 743.7 | 488.2 | 201.3 | 14.0 |
| MS\_BUSSTOP | Distance to closest bus stop (meters) | exam2 | 1740.2 | 2449.3 | 618 | 4203 | 14938.7 | 8015.7 | 1488.3 | 774.4 | 491.5 | 204.4 | 14.0 |

Note: in general, the distances to closest bus stop/route increase between Exam 1 and Exam 2. Bus route information is only available for participants who are within 5 miles of the boundaries for the city of Jackson; therefore, participants lived outside the area or had invalid residential address info at the time of exam visit have missing values.

Table E.6 correlations in land use of various buffers

% commercial area

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exam |  | PCOM0 | PCOM1 | PCOM14 |
| exam 1 | PCOM0 | 1.00 | 0.80 | 0.80 |
|  | PCOM1 | 0.80 | 1.00 | 0.59 |
|  | PCOM14 | 0.80 | 0.59 | 1.00 |
| exam2 | PCOM0 | 1.00 | 0.78 | 0.76 |
|  | PCOM1 | 0.78 | 1.00 | 0.51 |
|  | PCOM14 | 0.76 | 0.51 | 1.00 |

% residential area

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exam |  | PRES0 | PRES1 | PRES14 |
| exam1 | PRES0 | 1.00 | 0.71 | 0.81 |
|  | PRES1 | 0.71 | 1.00 | 0.41 |
|  | PRES14 | 0.81 | 0.41 | 1.00 |
| exam2 | PRES0 | 1.00 | 0.72 | 0.81 |
|  | PRES1 | 0.72 | 1.00 | 0.41 |
|  | PRES14 | 0.81 | 0.41 | 1.00 |

% retail area

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exam |  | PRES0 | PRES1 | PRES14 |
| exam1 | PRES0 | 1.00 | 0.71 | 0.81 |
|  | PRES1 | 0.71 | 1.00 | 0.41 |
|  | PRES14 | 0.81 | 0.41 | 1.00 |
| exam2 | PRES0 | 1.00 | 0.72 | 0.81 |
|  | PRES1 | 0.72 | 1.00 | 0.41 |
|  | PRES14 | 0.81 | 0.41 | 1.00 |

Table E.7: correlations in population density of various buffers

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exam |  | POPDENKM0 | POPDENKM1 | POPDENKM14 |
| exam1 | POPDENKM0 | 1.00 | 0.89 | 0.91 |
|  | POPDENKM1 | 0.89 | 1.00 | 0.75 |
|  | POPDENKM14 | 0.91 | 0.75 | 1.00 |
| exam2 | POPDENKM0 | 1.00 | 0.89 | 0.89 |
|  | POPDENKM1 | 0.89 | 1.00 | 0.75 |
|  | POPDENKM14 | 0.89 | 0.75 | 1.00 |

Table E.8: correlations in street connectivity density of various buffers

Network ratio

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exam |  | NetRatio0 | NetRatio1 | NetRatio14 |
| exam1 | NetRatio0 | 1.00 | 0.91 | 0.88 |
|  | NetRatio1 | 0.91 | 1.00 | 0.75 |
|  | NetRatio14 | 0.88 | 0.75 | 1.00 |
| exam2 | NetRatio0 | 1.00 | 0.90 | 0.87 |
|  | NetRatio1 | 0.90 | 1.00 | 0.74 |
|  | NetRatio14 | 0.87 | 0.74 | 1.00 |

# Intersections

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exam |  | INTCNT0 | INTCNT1 | INTCNT14 |
| exam1 | INTCNT0 | 1.00 | 0.90 | 0.89 |
|  | INTCNT1 | 0.90 | 1.00 | 0.74 |
|  | INTCNT14 | 0.89 | 0.74 | 1.00 |
| exam2 | INTCNT0 | 1.00 | 0.92 | 0.89 |
|  | INTCNT1 | 0.92 | 1.00 | 0.77 |
|  | INTCNT14 | 0.89 | 0.77 | 1.00 |

## Appendix F: Data Dictionary of JHS Neighborhood Analytic Dataset

Recommended JHS neighborhood variables as mentioned in the main documents are included in the JHS neighborhood analytic dataset (jhs\_nb\_analytic\_long.sas7bdat). The dataset is in a long format which has multiple rows for each subject at each JHS visit. The analytic dataset contains 134 variables including 131 neighborhood recommended variables plus 1 subject ID and 1 exam indicator variable. The data dictionary is shown below.

Note fake census tract ID, instead of the real census tract ID of subject’s residential address, is included to facilitate users to use multilevel model approach for analysis while keeping subject’s residential information unidentified.

|  |  |
| --- | --- |
| **Variable Name** | **Label** |
| SUBJID | Subject ID |
| Exam | JHS Visit Indicator |
| Fake\_STCOTRK | fake census tract ID (missing due to unavailable address) |
| **Census variable** |  |
| **US Census variable (census level)** | |
| birth\_foreign | % foreign born |
| crowd\_gt1\_ppr | % Household with crowding > 1 person per room |
| Educ\_minBA | % 25+ with minimum bachelor degree |
| Educ\_minHS | % 25+ with minimum High School education |
| HU\_sampleocc | % Household occupied |
| HUcost\_medownval | Median owner Household cost |
| inc\_HHge50k | % Household w/income >= $50,000 |
| inc\_IntDivRent | % Household with interest, dividend, rental income |
| inc\_medHH | Median Household income |
| inc\_pubass | % with public assistance |
| NotInLaborForce | % not in labor force |
| Occup\_I | % managerial occupation |
| ownerocc\_hh | % Household owner occupied |
| phone\_none | % Household w/no telephone |
| popden\_tot | Total population density including land+water (per square km) |
| Pov | % below poverty |
| race\_asianNH | % asian non-hispanic |
| race\_blackNH | % black non-hispanic |
| race\_hisp | % Hispanic |
| race\_otherNH | % other non-hispanic |
| race\_whiteNH | % white non-hispanic |
| samehouse | % in same house |
| unemployed | % unemployed |
| vehicle\_none | % Household w/no vehicle |
| **US Census Factor Score (census level)** | |
| F1\_PC2 | SES (PC2) Weighted Factor1 score |
| F2\_PC2 | SES (PC2) Weighted Factor2 score |
| F3\_PC2 | SES (PC2) Weighted Factor3 score |
| F4\_PC2 | SES (PC2) Weighted Factor4 score |
| F1\_PC2\_BT | Factor1 based score w/transformed variables for SES (PC2) |
| F2\_PC2\_BT | Factor2 based score w/transformed variables for SES (PC2) |
| factor\_ana | Factor score based on Ana Diez-Roux 1990 PC factor analysis |
| **JHS Neighborhood Survey Score** | |
| NPPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for NB Problem PCA-based |
| SCPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Social Cohesion PCA-based |
| VOPCA\_UEBE | Age & gender adjusted Unconditional Empirical Bayes Estimate (UEBE) for Violence PCA-based |
| **JHS NETS variables** | |
| **Food Store** | |
| K1FAV | 1 mile kernel FAVORABLE FOOD STORES |
| K1MRFEI\_NOALC | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| K1MRFEI\_TOT | 1 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| K1TOTFOOD | 1 mile kernel TOTAL FOOD STORES |
| K1UNFAV | 1 mile kernel UNFAVORABLE FOOD STORES |
| K1UNFAVFO | 1 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| S1FAV | 1 mile simple FAVORABLE FOOD STORES |
| S1MRFEI\_NOALC | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| S1MRFEI\_TOT | 1 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| S1TOTFOOD | 1 mile simple TOTAL FOOD STORES |
| S1UNFAV | 1 mile simple UNFAVORABLE FOOD STORES |
| S1UNFAVFO | 1 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| K0FAV | 1/2 mile kernel FAVORABLE FOOD STORES |
| K0MRFEI\_NOALC | 1/2 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| K0MRFEI\_TOT | 1/2 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| K0TOTFOOD | 1/2 mile kernel TOTAL FOOD STORES |
| K0UNFAV | 1/2 mile kernel UNFAVORABLE FOOD STORES |
| K0UNFAVFO | 1/2 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| S0FAV | 1/2 mile simple FAVORABLE FOOD STORES |
| S0MRFEI\_NOALC | 1/2 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| S0MRFEI\_TOT | 1/2 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| S0TOTFOOD | 1/2 mile simple TOTAL FOOD STORES |
| S0UNFAV | 1/2 mile simple UNFAVORABLE FOOD STORES |
| S0UNFAVFO | 1/2 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| K3FAV | 3 mile kernel FAVORABLE FOOD STORES |
| K3MRFEI\_NOALC | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| K3MRFEI\_TOT | 3 mile kernel MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| K3TOTFOOD | 3 mile kernel TOTAL FOOD STORES |
| K3UNFAV | 3 mile kernel UNFAVORABLE FOOD STORES |
| K3UNFAVFO | 3 mile kernel UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| S3FAV | 3 mile simple FAVORABLE FOOD STORES |
| S3MRFEI\_NOALC | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX EXCLUDE ALCOHOL |
| S3MRFEI\_TOT | 3 mile simple MODIFIED RETAIL FOOD ENVIRONMENT INDEX INCLUDE ALCOHOL |
| S3TOTFOOD | 3 mile simple TOTAL FOOD STORES |
| S3UNFAV | 3 mile simple UNFAVORABLE FOOD STORES |
| S3UNFAVFO | 3 mile simple UNFAVORABLE FOOD STORES EXCLUDING ALCOHOL |
| **Recreational facilities** | |
| K1IPAI | 1 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| K1OPAI | 1 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| K1PAI | 1 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| S1IPAI | 1 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| S1OPAI | 1 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| S1PAI | 1 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| K0IPAI | 1/2 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| K0OPAI | 1/2 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| K0PAI | 1/2 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| S0IPAI | 1/2 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| S0OPAI | 1/2 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| S0PAI | 1/2 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| K3IPAI | 3 mile kernel INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| K3OPAI | 3 mile kernel OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| K3PAI | 3 mile kernel TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| S3IPAI | 3 mile simple INDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL |
| S3OPAI | 3 mile simple OUTDOOR TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+WATER |
| S3PAI | 3 mile simple TOTAL PHYSICAL ACTIVITIES+INSTRUCTIONAL+INSTRUCTIONAL+WATER |
| **Social engagement** | |
| K1SOC | 1 mile kernel total social engagement destinations |
| S1SOC | 1 mile simple total social engagement destinations |
| K0SOC | 1/2 mile kernel total social engagement destinations |
| S0SOC | 1/2 mile simple total social engagement destinations |
| K3SOC | 3 mile kernel total social engagement destinations |
| S3SOC | 3 mile simple total social engagement destinations |
| **Walking destination** | |
| K1WALK | 1 mile kernel total neighborhood popular walking destinations |
| S1WALK | 1 mile simple total neighborhood popular walking destinations |
| K0WALK | 1/2 mile kernel total neighborhood popular walking destinations |
| S0WALK | 1/2 mile simple total neighborhood popular walking destinations |
| K3WALK | 3 mile kernel total neighborhood popular walking destinations |
| S3WALK | 3 mile simple total neighborhood popular walking destinations |
| **Total store** |  |
| K1TOTSTR | 1 mile kernel TOTAL STORES |
| S1TOTSTR | 1 mile simple TOTAL STORES |
| K0TOTSTR | 1/2 mile kernel TOTAL STORES |
| S0TOTSTR | 1/2 mile simple TOTAL STORES |
| K3TOTSTR | 3 mile kernel TOTAL STORES |
| S3TOTSTR | 3 mile simple TOTAL STORES |
| **JHS Built Environment** | |
| **Neighborhood land use** |  |
| PCOM0 | Percent Commercial 1/2 mile |
| PCOM1 | Percent Commercial 1 mile |
| PCOM14 | Percent Commercial 1/4 mile |
| PRES0 | Percent Residential 1/2 mile |
| PRES1 | Percent Residential 1 mile |
| PRES14 | Percent Residential 1/4 mile |
| PRET0 | Percent Retail 1/2 mile |
| PRET1 | Percent Retail 1 mile |
| PRET14 | Percent Retail 1/4 mile |
| PCTLU0 | Percent of 1/2 mile buffer in land use data boundary (Hinds County) |
| PCTLU1 | Percent of 1 mile buffer in land use data boundary (Hinds County) |
| PCTLU14 | Percent of 1/4 mile buffer in land use data boundary (Hinds County) |
| INLUCOUNTY | Falls within county boundaries for land use data (0=outside; 1=within) |
| **Neighborhood population density** |  |
| POPDENKM0 | Population density per square km 1/2 mile |
| POPDENKM1 | Population density per square km 1 mile |
| POPDENKM14 | Population density per square km 1/4 mile |
| POPDENMI0 | Population density per square mile 1/2 mile |
| POPDENMI1 | Population density per square mile 1 mile |
| POPDENMI14 | Population density per square mile 1/4 mile |
| **Street connectivity** |  |
| NetRatio0 | Network Ratio 1/2 mile |
| NetRatio1 | Network Ratio 1 mile |
| NetRatio14 | Network Ratio 1/4 mile |
| INTCNT0 | Number of intersections in 1/2 mile buffer |
| INTCNT1 | Number of intersections in 1 mile buffer |
| INTCNT14 | Number of intersections in 1/4 mile buffer |

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3. These two factors (*factor 1*: % vacant housing, % houses without a telephone, % of houses without a vehicle, % unemployed individuals, % poverty, median household income; *factor2:* % with at least a bachelor’s degree, %non-managerial occupation, % of households with interest, dividends, or net rental income) were included as predictors in the conditional EB estimation. For details about how these two factors are developed by Mahasin Mujahid, please refer to paper by Mahasin Mujahid, 2008 (*Relation between neighborhood environments and obesity in the Multi-Ethnic Study of Atherosclerosis. American journal of epidemiology, 2008. 167(11): p. 1349-57*). [↑](#footnote-ref-3)
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11. Hoehner CM, Schootman M. Concordance of Commercial Data Sources for Neighborhood-Effects Studies. Journal of Urban Health, Volume 87, Issue 4, Pages 713-25 [↑](#footnote-ref-11)