ACS Data Dictionary

ACS 2005-2009, to be merged with NHANES 1999-2010

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| --- | --- | --- |
| Variable Name | Description | Code used to generate |
| GEOID | Census tract number (10 or 11 digits, directly from ACS but missing leading 0 values for states 01 through 09) | Directly from ACS |
| GEOID\_11 | 11-digit character variable including FIPS state code (2 digit), FIPS county code (3 digit), and census tract ID (6 digit) | all09$GEOID\_11 <- str\_pad(as.character(all09$GEOID), 11, pad='0') |
| FIPS\_state | FIPS state code (equivalent to GEO\_2010 STATE2KX) | all09$FIPS\_state <- substr(all09$GEOID\_11, start=1, stop=2) |
| FIPS\_county | FIPS county code (equivalent to GEO\_2010 CNTY2KX | all09$FIPS\_county <- substr(all09$GEOID\_11, start=3, stop=5) |
| GEOID\_6 | 6-digit census tract number (equivalent to GEO\_2010 TRACT2KX) | all09$GEOID\_6 <- str\_sub(all09$GEOID\_11, -6) |
| ACS variable origins |  | key\_acs\_vars2009 <-c(tot\_pop='B01003\_001',tot\_pop\_racetab='B03002\_001',Hispanic = "B03002\_012", White = "B03002\_003", Black = "B03002\_004", Asian = "B03002\_006",  MHI='B19013\_001', tot\_pop\_FPL='C17002\_001',FPL00.50='C17002\_002', FPL50.99='C17002\_003', FPL100.124='C17002\_004',  FPL125.149='C17002\_005', FPL150.184='C17002\_006', FPL185.199='C17002\_007', #gini='B19083\_001',  emp.pop\_ge\_16='C23002A\_001',unemp16.64men='C23002A\_008', unemp16.64women='C23002A\_021',unemp65men='C23002A\_013', unemp65women='C23002A\_026',  educ.pop\_ge\_25='B15002\_001',educ.male.pop\_ge\_25='B15002\_002',educ.male.none='B15002\_003', educ.male.lt5th='B15002\_004', educ.male.56th='B15002\_005',  educ.male.78th='B15002\_006', educ.male.9th='B15002\_007', educ.male.10th='B15002\_008', educ.male.11th='B15002\_009', educ.male.12th\_nodegree='B15002\_010',  educ.male.HSged='B15002\_011', educ.male.some\_coll1yr='B15002\_012', educ.male.some\_coll='B15002\_013', educ.male.assocdeg='B15002\_014',  educ.male.bach='B15002\_015', educ.male.mast='B15002\_016', educ.male.prof='B15002\_017', educ.male.doct='B15002\_018',  educ.female.pop\_ge\_25='B15002\_019',educ.female.none='B15002\_020', educ.female.lt5th='B15002\_021', educ.female.56th='B15002\_022',  educ.female.78th='B15002\_023', educ.female.9th='B15002\_024', educ.female.10th='B15002\_025', educ.female.11th='B15002\_026', educ.female.12th\_nodegree='B15002\_027',  educ.female.HSged='B15002\_028', educ.female.some\_coll1yr='B15002\_029', educ.female.some\_coll='B15002\_030', educ.female.assocdeg='B15002\_031',  educ.female.bach='B15002\_032', educ.female.mast='B15002\_033', educ.female.prof='B15002\_034', educ.female.doct='B15002\_035') |
| estimate.tot\_pop |  | B01003\_001 |
| moe.tot\_pop |  | B01003\_001 |
| estimate.pct\_white | Number of white residents divided by total population | estimate.White / estimate.tot\_pop |
| moe.pct\_white |  | (1 / estimate.tot\_pop) \* (sqrt((moe.White^2)-((estimate.White / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Black | Number of Black residents divided by total population | estimate.Black / estimate.tot\_pop |
| moe.pct\_Black |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Black^2)-((estimate.Black / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Asian | Number of Asian residents divided by total population | estimate.Asian / estimate.tot\_pop |
| moe.pct\_Asian |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Asian^2)-((estimate.Asian / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Hispanic | Number of Hispanic residents divided by total population | estimate.Hispanic / estimate.tot\_pop |
| moe.pct\_Hispanic |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Hispanic^2)-((estimate.Hispanic / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.mhi | Median Household Income | B19013\_001 |
| moe.mhi |  | B19013\_001 |
| estimate.pct\_fpl100 | Number living below 100% of the federal poverty level divided by total population | estimate.fpl\_lt100 <- estimate.FPL00.50 + estimate.FPL50.99  moe.fpl\_lt100 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2)  estimate.pct\_fpl100 <- estimate.fpl\_lt100 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl100 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt100^2)-((estimate.fpl\_lt100 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_fpl150 | Number living below 150% of the federal poverty level divided by total population | estimate.fpl\_lt150 <- estimate.FPL00.50 + estimate.FPL50.99 + estimate.FPL100.124 + estimate.FPL125.149  moe.fpl\_lt150 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2 + (moe.FPL100.124)^2 + (moe.FPL125.149)^2)  estimate.pct\_fpl150 <- estimate.fpl\_lt150 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl150 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt150^2)-((estimate.fpl\_lt150 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_fpl200 | Number living below 200% of the federal poverty level divided by total population | estimate.fpl\_lt200 <- estimate.FPL00.50 + estimate.FPL50.99 + estimate.FPL100.124 + estimate.FPL125.149 + estimate.FPL150.184 + estimate.FPL185.199  moe.fpl\_lt200 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2 + (moe.FPL100.124)^2 + (moe.FPL125.149)^2 + (moe.FPL150.184)^2 + (moe.FPL185.199)^2)  estimate.pct\_fpl200 <- estimate.fpl\_lt200 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl200 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt200^2)-((estimate.fpl\_lt200 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_unemp | Total unemployed civilian labor force (age 16+) divided by total civilian labor force (seeking employ) | estimate.unemp <- estimate.unemp16.64men + estimate.unemp16.64women + estimate.unemp65men + estimate.unemp65women  moe.unemp <- sqrt((moe.unemp16.64men)^2 + (moe.unemp16.64women)^2 + (moe.unemp65men)^2 + (moe.unemp65women)^2)  estimate.pct\_unemp <- estimate.unemp / estimate.emp.pop\_ge\_16 |
| moe.pct\_unemp |  | (1 / estimate.emp.pop\_ge\_16) \* (sqrt((moe.unemp^2)-((estimate.unemp / estimate.emp.pop\_ge\_16)^2)\*moe.emp.pop\_ge\_16^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_lths | Number with less than a high school degree divided by population greater than age 25 | estimate.lths <- estimate.educ.male.none + estimate.educ.male.lt5th + estimate.educ.male.56th + estimate.educ.male.78th + estimate.educ.male.9th + estimate.educ.male.10th + estimate.educ.male.11th + estimate.educ.male.12th\_nodegree +  estimate.educ.female.none + estimate.educ.female.lt5th + estimate.educ.female.56th + estimate.educ.female.78th + estimate.educ.female.9th + estimate.educ.female.10th + estimate.educ.female.11th + estimate.educ.female.12th\_nodegree  moe.lths <- + sqrt((moe.educ.male.none)^2 + (moe.educ.male.lt5th)^2 + (moe.educ.male.56th)^2 + (moe.educ.male.78th)^2 + (moe.educ.male.9th)^2 + (moe.educ.male.10th)^2 + (moe.educ.male.11th)^2 + (moe.educ.male.12th\_nodegree)^2 +  (moe.educ.female.none)^2 + (moe.educ.female.lt5th)^2 + (moe.educ.female.56th)^2 + (moe.educ.female.78th)^2 + (moe.educ.female.9th)^2 + (moe.educ.female.10th)^2 + (moe.educ.female.11th)^2 + (moe.educ.female.12th\_nodegree)^2)  estimate.pct\_lths <- estimate.lths / estimate.educ.pop\_ge\_25 |
| moe.pct\_lths |  | (1 / estimate.educ.pop\_ge\_25) \* (sqrt((moe.lths^2)-((estimate.lths / estimate.educ.pop\_ge\_25)^2)\*moe.educ.pop\_ge\_25^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_ltcoll | Number with less than a college degree divided by population greater than age 25 | estimate.ltcoll <- estimate.educ.male.none + estimate.educ.male.lt5th + estimate.educ.male.56th + estimate.educ.male.78th + estimate.educ.male.9th + estimate.educ.male.10th + estimate.educ.male.11th + estimate.educ.male.12th\_nodegree + estimate.educ.male.HSged + estimate.educ.male.some\_coll1yr + estimate.educ.male.some\_coll + estimate.educ.male.assocdeg + estimate.educ.female.none + estimate.educ.female.lt5th + estimate.educ.female.56th + estimate.educ.female.78th + estimate.educ.female.9th + estimate.educ.female.10th + estimate.educ.female.11th + estimate.educ.female.12th\_nodegree + estimate.educ.female.HSged + estimate.educ.female.some\_coll1yr + estimate.educ.female.some\_coll + estimate.educ.female.assocdeg  moe.ltcoll <- sqrt((moe.educ.male.none)^2 + (moe.educ.male.lt5th)^2 + (moe.educ.male.56th)^2 + (moe.educ.male.78th)^2 + (moe.educ.male.9th)^2 + (moe.educ.male.10th)^2 + (moe.educ.male.11th)^2 + (moe.educ.male.12th\_nodegree)^2 + (estimate.educ.male.HSged)^2 + (estimate.educ.male.some\_coll1yr)^2 + (estimate.educ.male.some\_coll)^2 + (estimate.educ.male.assocdeg)^2 + (moe.educ.female.none)^2 + (moe.educ.female.lt5th)^2 + (moe.educ.female.56th)^2 + (moe.educ.female.78th)^2 + (moe.educ.female.9th)^2 + (moe.educ.female.10th)^2 + (moe.educ.female.11th)^2 + (moe.educ.female.12th\_nodegree)^2 + (estimate.educ.female.HSged)^2 + (estimate.educ.female.some\_coll1yr)^2 + (estimate.educ.female.some\_coll)^2 + (estimate.educ.female.assocdeg)^2)  estimate.pct\_ltcoll <- estimate.ltcoll / estimate.educ.pop\_ge\_25 |
| moe.pct\_ltcoll |  | (1 / estimate.educ.pop\_ge\_25) \* (sqrt((moe.ltcoll^2)-((estimate.ltcoll / estimate.educ.pop\_ge\_25)^2)\*moe.educ.pop\_ge\_25^2))  \*if sqrt(x) is i (x<0), change – to + |
| adi | Area Deprivation Index | adi2009\_raw <- get\_adi('tract', year=2009, raw\_data\_only=T) #dataset='acs5' is default  adi2009 <- calculate\_adi(adi2009\_raw) |
| Financial\_Strength |  |  |
| Economic\_Hardship\_and\_Inequality |  |  |
| Educational\_Attainment |  |  |
| sdi | Social Deprivation Index | SDI 2008-2012 from : https://www.graham-center.org/content/dam/rgc/documents/maps-data-tools/sdi/2008-2012-sdi/rgcsdi-2008-2012-factorloadings.csv |
| svi | Social Vulnerability Index | R\_PL\_THEMES of SVI 2010 from: https://www.atsdr.cdc.gov/placeandhealth/svi/data\_documentation\_download.html |

ACS 2010-2014, to be merged with NHANES 2011-2014

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| --- | --- | --- |
| Variable Name | Description | Code used to generate |
| GEOID | Census tract number (10 or 11 digits, directly from ACS but missing leading 0 values for states 01 through 09) | Directly from ACS |
| GEOID\_11 | 11-digit character variable including FIPS state code (2 digit), FIPS county code (3 digit), and census tract ID (6 digit) | all14$GEOID\_11 <- str\_pad(as.character(all09$GEOID), 11, pad='0') |
| FIPS\_state | FIPS state code (equivalent to GEO\_2010 STATE2KX) | all14$FIPS\_state <- substr(all09$GEOID\_11, start=1, stop=2) |
| FIPS\_county | FIPS county code (equivalent to GEO\_2010 CNTY2KX | all14$FIPS\_county <- substr(all09$GEOID\_11, start=3, stop=5) |
| GEOID\_6 | 6-digit census tract number (equivalent to GEO\_2010 TRACT2KX) | all14$GEOID\_6 <- str\_sub(all09$GEOID\_11, -6) |
| ACS variable origins |  | acs14\_vars <-c(tot\_pop='B01003\_001',tot\_pop\_racetab='B03002\_001',Hispanic = "B03002\_012", White = "B03002\_003", Black = "B03002\_004", Asian = "B03002\_006",  MHI='B19013\_001', tot\_pop\_FPL='C17002\_001', FPL00.50='C17002\_002', FPL50.99='C17002\_003', FPL100.124='C17002\_004',  FPL125.149='C17002\_005', FPL150.184='C17002\_006', FPL185.199='C17002\_007', gini='B19083\_001',  educ.pop\_ge\_25='B15003\_001',educ.none='B15003\_002', educ.prek='B15003\_003', educ.kind='B15003\_004', educ.1st='B15003\_005', educ.2nd='B15003\_006',  educ.3rd='B15003\_007', educ.4th='B15003\_008', educ.5th='B15003\_009', educ.6th='B15003\_010', educ.7th='B15003\_011', educ.8th='B15003\_012',  educ.9th='B15003\_013', educ.10th='B15003\_014', educ.11th='B15003\_015', educ.12th\_nodegree='B15003\_016',educ.HS='B15003\_017',  educ.ged='B15003\_018', educ.some\_coll1yr='B15003\_019', educ.some\_coll='B15003\_020', educ.assocdeg='B15003\_021',  educ.bach='B15003\_022', educ.mast='B15003\_023', educ.prof='B15003\_024', educ.doct='B15003\_025',  emp.pop\_ge\_16='B23025\_001', emp.civlabforce='B23025\_003', emp.unemp\_civlabforce='B23025\_005') |
| estimate.tot\_pop |  | B01003\_001 |
| moe.tot\_pop |  | B01003\_001 |
| estimate.pct\_white | Number of white residents divided by total population | estimate.White / estimate.tot\_pop |
| moe.pct\_white |  | (1 / estimate.tot\_pop) \* (sqrt((moe.White^2)-((estimate.White / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Black | Number of Black residents divided by total population | estimate.Black / estimate.tot\_pop |
| moe.pct\_Black |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Black^2)-((estimate.Black / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Asian | Number of Asian residents divided by total population | estimate.Asian / estimate.tot\_pop |
| moe.pct\_Asian |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Asian^2)-((estimate.Asian / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Hispanic | Number of Hispanic residents divided by total population | estimate.Hispanic / estimate.tot\_pop |
| moe.pct\_Hispanic |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Hispanic^2)-((estimate.Hispanic / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.MHI | Median Household Income | B19013\_001 |
| moe.MHI |  | B19013\_001 |
| estimate.pct\_fpl100 | Number living below 100% of the federal poverty level divided by total population | estimate.fpl\_lt100 <- estimate.FPL00.50 + estimate.FPL50.99  moe.fpl\_lt100 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2)  estimate.pct\_fpl100 <- estimate.fpl\_lt100 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl100 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt100^2)-((estimate.fpl\_lt100 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_fpl150 | Number living below 150% of the federal poverty level divided by total population | estimate.fpl\_lt150 <- estimate.FPL00.50 + estimate.FPL50.99 + estimate.FPL100.124 + estimate.FPL125.149  moe.fpl\_lt150 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2 + (moe.FPL100.124)^2 + (moe.FPL125.149)^2)  estimate.pct\_fpl150 <- estimate.fpl\_lt150 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl150 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt150^2)-((estimate.fpl\_lt150 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_fpl200 | Number living below 200% of the federal poverty level divided by total population | estimate.fpl\_lt200 <- estimate.FPL00.50 + estimate.FPL50.99 + estimate.FPL100.124 + estimate.FPL125.149 + estimate.FPL150.184 + estimate.FPL185.199  moe.fpl\_lt200 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2 + (moe.FPL100.124)^2 + (moe.FPL125.149)^2 + (moe.FPL150.184)^2 + (moe.FPL185.199)^2)  estimate.pct\_fpl200 <- estimate.fpl\_lt200 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl200 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt200^2)-((estimate.fpl\_lt200 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_unemp | Total unemployed civilian labor force (age 16+) divided by total civilian labor force (seeking employ) | moe.estimate.pct\_unemp <- moe.estimate.emp.unemp\_civlabforce / moe.estimate.emp.civlabforce |
| moe.pct\_unemp |  | (1 / moe.estimate.emp.civlabforce) \* (sqrt((moe.moe.emp.unemp\_civlabforce^2)-((moe.estimate.emp.unemp\_civlabforce / moe.estimate.emp.civlabforce)^2)\*moe.moe.emp.civlabforce^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_lths | Number with less than a high school degree divided by population greater than age 25 | moe.estimate.lths <- moe.estimate.educ.none + moe.estimate.educ.prek + moe.estimate.educ.kind + moe.estimate.educ.1st + moe.estimate.educ.2nd + moe.estimate.educ.3rd + moe.estimate.educ.4th + moe.estimate.educ.5th + moe.estimate.educ.6th + moe.estimate.educ.7th + moe.estimate.educ.8th + moe.estimate.educ.9th + moe.estimate.educ.10th + moe.estimate.educ.11th + moe.estimate.educ.12th\_nodegree  moe.moe.lths <- sqrt((moe.moe.educ.none)^2 + (moe.moe.educ.prek)^2 + (moe.moe.educ.kind)^2 + (moe.moe.educ.1st)^2 + (moe.moe.educ.2nd)^2 + (moe.moe.educ.3rd)^2 + (moe.moe.educ.4th)^2 + (moe.moe.educ.5th)^2 + (moe.moe.educ.6th)^2 + (moe.moe.educ.7th)^2 + (moe.moe.educ.8th)^2 + (moe.moe.educ.9th)^2 + (moe.moe.educ.10th)^2 + (moe.moe.educ.11th)^2 + (moe.moe.educ.12th\_nodegree)^2)  moe.estimate.pct\_lths <- moe.estimate.lths / moe.estimate.educ.pop\_ge\_25 |
| moe.pct\_lths |  | moe.moe.pct\_lths <- ifelse(moe.moe.lths^2-((moe.estimate.lths / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2 <0, (1 / moe.estimate.educ.pop\_ge\_25) \* (sqrt((moe.moe.lths^2)+((moe.estimate.lths / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2)), (1 / moe.estimate.educ.pop\_ge\_25) \* (sqrt((moe.moe.lths^2)-((moe.estimate.lths / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_ltcoll | Number with less than a college degree divided by population greater than age 25 | moe.estimate.ltcoll <- moe.estimate.educ.none + moe.estimate.educ.prek + moe.estimate.educ.kind + moe.estimate.educ.1st + moe.estimate.educ.2nd + moe.estimate.educ.3rd + moe.estimate.educ.4th + moe.estimate.educ.5th + moe.estimate.educ.6th + moe.estimate.educ.7th + moe.estimate.educ.8th + moe.estimate.educ.9th + moe.estimate.educ.10th + moe.estimate.educ.11th + moe.estimate.educ.12th\_nodegree + moe.estimate.educ.HS + moe.estimate.educ.ged + moe.estimate.educ.some\_coll1yr + moe.estimate.educ.some\_coll + moe.estimate.educ.assocdeg  moe.moe.ltcoll <- sqrt((moe.moe.educ.none)^2 + (moe.moe.educ.prek)^2 + (moe.moe.educ.kind)^2 + (moe.moe.educ.1st)^2 + (moe.moe.educ.2nd)^2 + (moe.moe.educ.3rd)^2 + (moe.moe.educ.4th)^2 + (moe.moe.educ.5th)^2 + (moe.moe.educ.6th)^2 + (moe.moe.educ.7th)^2 + (moe.moe.educ.8th)^2 + (moe.moe.educ.9th)^2 + (moe.moe.educ.10th)^2 + (moe.moe.educ.11th)^2 + (moe.moe.educ.12th\_nodegree)^2 + (moe.estimate.educ.HS)^2 + (moe.estimate.educ.ged)^2 + (moe.estimate.educ.some\_coll1yr)^2 + (moe.estimate.educ.some\_coll)^2 + (moe.estimate.educ.assocdeg)^2)  moe.estimate.pct\_ltcoll <- moe.estimate.ltcoll / moe.estimate.educ.pop\_ge\_25 |
| moe.pct\_ltcoll |  | (1 / moe.estimate.educ.pop\_ge\_25) \* (sqrt((moe.moe.ltcoll^2)-((moe.estimate.ltcoll / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2))  \*if sqrt(x) is i (x<0), change – to + |
| adi | Area Deprivation Index | adi2014\_raw <- get\_adi('tract', year=2009, raw\_data\_only=T) #dataset='acs5' is default  adi2014 <- calculate\_adi(adi2014\_raw) |
| Financial\_Strength |  |  |
| Economic\_Hardship\_and\_Inequality |  |  |
| Educational\_Attainment |  |  |
| sdi | Social Deprivation Index | SDI 2011-2015 from : https://www.graham-center.org/content/dam/rgc/documents/maps-data-tools/sdi/2011-2015-sdi/rgcsdi-2011-2015-factorloadings.csv |
| svi | Social Vulnerability Index | RPL\_THEMES of SVI 2014 from: https://www.atsdr.cdc.gov/placeandhealth/svi/data\_documentation\_download.html |

ACS 2014-2018, to be merged with NHANES 2015-2018

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| --- | --- | --- |
| Variable Name | Description | Code used to generate |
| GEOID | Census tract number (10 or 11 digits, directly from ACS but missing leading 0 values for states 01 through 09) | Directly from ACS |
| GEOID\_11 | 11-digit character variable including FIPS state code (2 digit), FIPS county code (3 digit), and census tract ID (6 digit) | all18$GEOID\_11 <- str\_pad(as.character(all09$GEOID), 11, pad='0') |
| FIPS\_state | FIPS state code (equivalent to GEO\_2010 STATE2KX) | all18$FIPS\_state <- substr(all09$GEOID\_11, start=1, stop=2) |
| FIPS\_county | FIPS county code (equivalent to GEO\_2010 CNTY2KX | all18$FIPS\_county <- substr(all09$GEOID\_11, start=3, stop=5) |
| GEOID\_6 | 6-digit census tract number (equivalent to GEO\_2010 TRACT2KX) | all18$GEOID\_6 <- str\_sub(all09$GEOID\_11, -6) |
| ACS variable origins |  | acs18\_vars <-c(tot\_pop='B01001\_001',tot\_pop\_racetab='B03002\_001',Hispanic = "B03002\_012", White = "B03002\_003", Black = "B03002\_004", Asian = "B03002\_006",  MHI='B19013\_001', tot\_pop\_FPL='B17026\_001', FPL00.50='B17026\_002', FPL50.74='B17026\_003',FPL75.99='B17026\_004', FPL100.124='B17026\_005',  FPL125.149='B17026\_006', FPL150.184='B17026\_007', FPL185.199='B17026\_008', gini='B19083\_001',  educ.pop\_ge\_25='B15003\_001',educ.none='B15003\_002', educ.prek='B15003\_003', educ.kind='B15003\_004', educ.1st='B15003\_005', educ.2nd='B15003\_006',  educ.3rd='B15003\_007', educ.4th='B15003\_008', educ.5th='B15003\_009', educ.6th='B15003\_010', educ.7th='B15003\_011', educ.8th='B15003\_012',  educ.9th='B15003\_013', educ.10th='B15003\_014', educ.11th='B15003\_015', educ.12th\_nodegree='B15003\_016',educ.HS='B15003\_017',  educ.ged='B15003\_018', educ.some\_coll1yr='B15003\_019', educ.some\_coll='B15003\_020', educ.assocdeg='B15003\_021',  educ.bach='B15003\_022', educ.mast='B15003\_023', educ.prof='B15003\_024', educ.doct='B15003\_025',  emp.pop\_ge\_16='B23025\_001', emp.civlabforce='B23025\_003', emp.unemp\_civlabforce='B23025\_005') |
| estimate.tot\_pop |  | B01003\_001 |
| moe.tot\_pop |  | B01003\_001 |
| estimate.pct\_white | Number of white residents divided by total population | estimate.White / estimate.tot\_pop |
| moe.pct\_white |  | (1 / estimate.tot\_pop) \* (sqrt((moe.White^2)-((estimate.White / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Black | Number of Black residents divided by total population | estimate.Black / estimate.tot\_pop |
| moe.pct\_Black |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Black^2)-((estimate.Black / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Asian | Number of Asian residents divided by total population | estimate.Asian / estimate.tot\_pop |
| moe.pct\_Asian |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Asian^2)-((estimate.Asian / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_Hispanic | Number of Hispanic residents divided by total population | estimate.Hispanic / estimate.tot\_pop |
| moe.pct\_Hispanic |  | (1 / estimate.tot\_pop) \* (sqrt((moe.Hispanic^2)-((estimate.Hispanic / estimate.tot\_pop)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.MHI | Median Household Income | B19013\_001 |
| moe.MHI |  | B19013\_001 |
| estimate.pct\_fpl100 | Number living below 100% of the federal poverty level divided by total population | estimate.fpl\_lt100 <- estimate.FPL00.50 + estimate.FPL50.99  moe.fpl\_lt100 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2)  estimate.pct\_fpl100 <- estimate.fpl\_lt100 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl100 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt100^2)-((estimate.fpl\_lt100 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_fpl150 | Number living below 150% of the federal poverty level divided by total population | estimate.fpl\_lt150 <- estimate.FPL00.50 + estimate.FPL50.99 + estimate.FPL100.124 + estimate.FPL125.149  moe.fpl\_lt150 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2 + (moe.FPL100.124)^2 + (moe.FPL125.149)^2)  estimate.pct\_fpl150 <- estimate.fpl\_lt150 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl150 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt150^2)-((estimate.fpl\_lt150 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_fpl200 | Number living below 200% of the federal poverty level divided by total population | estimate.fpl\_lt200 <- estimate.FPL00.50 + estimate.FPL50.99 + estimate.FPL100.124 + estimate.FPL125.149 + estimate.FPL150.184 + estimate.FPL185.199  moe.fpl\_lt200 <- sqrt((moe.FPL00.50)^2 + (moe.FPL50.99)^2 + (moe.FPL100.124)^2 + (moe.FPL125.149)^2 + (moe.FPL150.184)^2 + (moe.FPL185.199)^2)  estimate.pct\_fpl200 <- estimate.fpl\_lt200 / estimate.tot\_pop\_FPL |
| moe.pct\_fpl200 |  | (1 / estimate.tot\_pop\_FPL) \* (sqrt((moe.fpl\_lt200^2)-((estimate.fpl\_lt200 / estimate.tot\_pop\_FPL)^2)\*moe.tot\_pop^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_unemp | Total unemployed civilian labor force (age 16+) divided by total civilian labor force (seeking employ) | moe.estimate.pct\_unemp <- moe.estimate.emp.unemp\_civlabforce / moe.estimate.emp.civlabforce |
| moe.pct\_unemp |  | (1 / moe.estimate.emp.civlabforce) \* (sqrt((moe.moe.emp.unemp\_civlabforce^2)-((moe.estimate.emp.unemp\_civlabforce / moe.estimate.emp.civlabforce)^2)\*moe.moe.emp.civlabforce^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_lths | Number with less than a high school degree divided by population greater than age 25 | moe.estimate.lths <- moe.estimate.educ.none + moe.estimate.educ.prek + moe.estimate.educ.kind + moe.estimate.educ.1st + moe.estimate.educ.2nd + moe.estimate.educ.3rd + moe.estimate.educ.4th + moe.estimate.educ.5th + moe.estimate.educ.6th + moe.estimate.educ.7th + moe.estimate.educ.8th + moe.estimate.educ.9th + moe.estimate.educ.10th + moe.estimate.educ.11th + moe.estimate.educ.12th\_nodegree  moe.moe.lths <- sqrt((moe.moe.educ.none)^2 + (moe.moe.educ.prek)^2 + (moe.moe.educ.kind)^2 + (moe.moe.educ.1st)^2 + (moe.moe.educ.2nd)^2 + (moe.moe.educ.3rd)^2 + (moe.moe.educ.4th)^2 + (moe.moe.educ.5th)^2 + (moe.moe.educ.6th)^2 + (moe.moe.educ.7th)^2 + (moe.moe.educ.8th)^2 + (moe.moe.educ.9th)^2 + (moe.moe.educ.10th)^2 + (moe.moe.educ.11th)^2 + (moe.moe.educ.12th\_nodegree)^2)  moe.estimate.pct\_lths <- moe.estimate.lths / moe.estimate.educ.pop\_ge\_25 |
| moe.pct\_lths |  | moe.moe.pct\_lths <- ifelse(moe.moe.lths^2-((moe.estimate.lths / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2 <0, (1 / moe.estimate.educ.pop\_ge\_25) \* (sqrt((moe.moe.lths^2)+((moe.estimate.lths / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2)), (1 / moe.estimate.educ.pop\_ge\_25) \* (sqrt((moe.moe.lths^2)-((moe.estimate.lths / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2))  \*if sqrt(x) is i (x<0), change – to + |
| estimate.pct\_ltcoll | Number with less than a college degree divided by population greater than age 25 | moe.estimate.ltcoll <- moe.estimate.educ.none + moe.estimate.educ.prek + moe.estimate.educ.kind + moe.estimate.educ.1st + moe.estimate.educ.2nd + moe.estimate.educ.3rd + moe.estimate.educ.4th + moe.estimate.educ.5th + moe.estimate.educ.6th + moe.estimate.educ.7th + moe.estimate.educ.8th + moe.estimate.educ.9th + moe.estimate.educ.10th + moe.estimate.educ.11th + moe.estimate.educ.12th\_nodegree + moe.estimate.educ.HS + moe.estimate.educ.ged + moe.estimate.educ.some\_coll1yr + moe.estimate.educ.some\_coll + moe.estimate.educ.assocdeg  moe.moe.ltcoll <- sqrt((moe.moe.educ.none)^2 + (moe.moe.educ.prek)^2 + (moe.moe.educ.kind)^2 + (moe.moe.educ.1st)^2 + (moe.moe.educ.2nd)^2 + (moe.moe.educ.3rd)^2 + (moe.moe.educ.4th)^2 + (moe.moe.educ.5th)^2 + (moe.moe.educ.6th)^2 + (moe.moe.educ.7th)^2 + (moe.moe.educ.8th)^2 + (moe.moe.educ.9th)^2 + (moe.moe.educ.10th)^2 + (moe.moe.educ.11th)^2 + (moe.moe.educ.12th\_nodegree)^2 + (moe.estimate.educ.HS)^2 + (moe.estimate.educ.ged)^2 + (moe.estimate.educ.some\_coll1yr)^2 + (moe.estimate.educ.some\_coll)^2 + (moe.estimate.educ.assocdeg)^2)  moe.estimate.pct\_ltcoll <- moe.estimate.ltcoll / moe.estimate.educ.pop\_ge\_25 |
| moe.pct\_ltcoll |  | (1 / moe.estimate.educ.pop\_ge\_25) \* (sqrt((moe.moe.ltcoll^2)-((moe.estimate.ltcoll / moe.estimate.educ.pop\_ge\_25)^2)\*moe.moe.educ.pop\_ge\_25^2))  \*if sqrt(x) is i (x<0), change – to + |
| adi | Area Deprivation Index | adi2018\_raw <- get\_adi('tract', year=2009, raw\_data\_only=T) #dataset='acs5' is default  adi2018 <- calculate\_adi(adi2018\_raw) |
| Financial\_Strength |  |  |
| Economic\_Hardship\_and\_Inequality |  |  |
| Educational\_Attainment |  |  |
| sdi | Social Deprivation Index | SDI 2014-2018 from : https://www.graham-center.org/content/dam/rgc/documents/maps-data-tools/sdi/2014-2018-sdi/rgcsdi-2014-2018-factorloadings.csv |
| svi | Social Vulnerability Index | RPL\_THEMES of SVI 2018 from: https://www.atsdr.cdc.gov/placeandhealth/svi/data\_documentation\_download.html |