**Process 1: Demographic Data collection 1**

**Source:** Census Bureau’s data of American Community Survey (ACS) 5-year estimate of 2017:

- From American Fact Finder

1. **Downloading the data of incorporated areas (communities) and county:**
   1. Open the website: <https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
   2. Go to “Geographies” 🡪 Select a geographic type: County – 050 🡪 Select a state: West Virginia 🡪 Select one or more geographic areas: The county should be selected 🡪 Add to your selections
   3. Go to “Geographies” 🡪 Select a geographic type: Place – 160 🡪 Select a state: West Virginia 🡪 Select one or more geographic areas: The incorporated areas should be selected 🡪 Add to your selections
   4. Go to “Topics” and select these data sets one by one and download:

**ACS\_17\_5YR\_S1101** Households and families

**ACS\_17\_5YR\_B25008** Total population in housing units (in households)

**ACS\_17\_5YR\_B19001** Household income (smaller intervals)

**ACS\_17\_5YR\_B19301** Per capita income

**ACS\_17\_5YR\_S0101** Median age by sex and total population

**ACS\_17\_5YR\_** **B25002** Occupied and vacant housing units

**ACS\_17\_5YR\_** **S2503** Occupied housing units; ownership and costs

1. **Processing the data of incorporated areas:**

**2-1)** Create a new excel sheet named COUNTY\_Demographic\_DATE

**2-2)** Extract and copy the below fields from ACS\_17\_5YR\_ S1101, to the new sheet:

GEO.id (Id)

GEO.id2 (Id2)

GEO.display-label (Geography)

HC01\_EST\_VC02 (Total; Estimate; Total households)

HC01\_EST\_VC03 (Total; Estimate; Average household size)

**2-3)** Extract and copy the below fields, use the GEO.id2 (Id2) field to match to the previous rows:

**2-4)** In ACS\_17\_5YR\_B25008, extract:

GEO.id2 (Id2)

HD01\_VD01 (Estimate; Total:)

**2-5)** In ACS\_17\_5YR\_B19001, extract:

GEO.id2 (Id2)

HD01\_VD02 (Estimate; Total: - Less than $10,000)

HD01\_VD03 (Estimate; Total: - $10,000 to $14,999)

HD01\_VD04 (Estimate; Total: - $15,000 to $19,999)

HD01\_VD05 (Estimate; Total: - $20,000 to $24,999)

HD01\_VD06 (Estimate; Total: - $25,000 to $29,999)

HD01\_VD07 (Estimate; Total: - $30,000 to $34,999)

HD01\_VD08 (Estimate; Total: - $35,000 to $39,999)

HD01\_VD09 (Estimate; Total: - $40,000 to $44,999)

HD01\_VD10 (Estimate; Total: - $45,000 to $49,999)

HD01\_VD11 (Estimate; Total: - $50,000 to $59,999)

HD01\_VD12 (Estimate; Total: - $60,000 to $74,999)

HD01\_VD13 (Estimate; Total: - $75,000 to $99,999)

HD01\_VD14 (Estimate; Total: - $100,000 to $124,999)

HD01\_VD15 (Estimate; Total: - $125,000 to $149,999)

HD01\_VD16 (Estimate; Total: - $150,000 to $199,999)

HD01\_VD17 (Estimate; Total: - $200,000 or more)

**2-6)** In ACS\_17\_5YR\_ B19301, extract:

GEO.id2 (Id2)

HD01\_VD01 (Estimate; Per capita income in the past 12 months (in 2017 inflation-adjusted dollars))

**2-7)** In ACS\_17\_5YR\_ S0101, extract:

GEO.id2 (Id2)

HC01\_EST\_VC01 (Total; Estimate; Total population)

HC02\_EST\_VC03 (Percent; Estimate; AGE - Under 5 years)

HC02\_EST\_VC04 (Percent; Estimate; AGE - 5 to 9 years)

HC02\_EST\_VC05 (Percent; Estimate; AGE - 10 to 14 years)

HC02\_EST\_VC06 (Percent; Estimate; AGE - 15 to 19 years)

HC02\_EST\_VC07 (Percent; Estimate; AGE - 20 to 24 years)

HC02\_EST\_VC08 (Percent; Estimate; AGE - 25 to 29 years)

HC02\_EST\_VC09 (Percent; Estimate; AGE - 30 to 34 years)

HC02\_EST\_VC10 (Percent; Estimate; AGE - 35 to 39 years)

HC02\_EST\_VC11 (Percent; Estimate; AGE - 40 to 44 years)

HC02\_EST\_VC12 (Percent; Estimate; AGE - 45 to 49 years)

HC02\_EST\_VC13 (Percent; Estimate; AGE - 50 to 54 years)

HC02\_EST\_VC14 (Percent; Estimate; AGE - 55 to 59 years)

HC02\_EST\_VC15 (Percent; Estimate; AGE - 60 to 64 years)

HC02\_EST\_VC16 (Percent; Estimate; AGE - 65 to 69 years)

HC02\_EST\_VC17 (Percent; Estimate; AGE - 70 to 74 years)

HC02\_EST\_VC18 (Percent; Estimate; AGE - 75 to 79 years)

HC02\_EST\_VC19 (Percent; Estimate; AGE - 80 to 84 years)

HC02\_EST\_VC20 (Percent; Estimate; AGE - 85 years and over)

**2-8)** In ACS\_17\_5YR\_ B25002, extract:

GEO.id2 (Id2)

HD01\_VD02 (Estimate; Total: - Occupied)

HD01\_VD03 (Estimate; Total: - Vacant)

**2-9)** In ACS\_17\_5YR\_ S2503, extract:

GEO.id2 (Id2)

HC03\_EST\_VC01 (Owner-occupied housing units; Estimate; Occupied housing units)

HC05\_EST\_VC01 (Renter-occupied housing units; Estimate; Occupied housing units)

HC01\_EST\_VC14 (Occupied housing units; Estimate; HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2017 INFLATION-ADJUSTED DOLLARS) - Median household income (dollars))

HC01\_EST\_VC31 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - Less than $20,000 - Less than 20 percent)

HC01\_EST\_VC32 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - Less than $20,000 - 20 to 29 percent)

HC01\_EST\_VC33 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - Less than $20,000 - 30 percent or more)

HC01\_EST\_VC35 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $20,000 to $34,999 - Less than 20 percent)

HC01\_EST\_VC36 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $20,000 to $34,999 - 20 to 29 percent)

HC01\_EST\_VC37 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $20,000 to $34,999 - 30 percent or more)

HC01\_EST\_VC39 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $35,000 to $49,999 - Less than 20 percent)

HC01\_EST\_VC40 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $35,000 to $49,999 - 20 to 29 percent)

HC01\_EST\_VC41 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $35,000 to $49,999 - 30 percent or more)

HC01\_EST\_VC43 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $50,000 to $74,999 - Less than 20 percent)

HC01\_EST\_VC44 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $50,000 to $74,999 - 20 to 29 percent)

HC01\_EST\_VC45 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $50,000 to $74,999 - 30 percent or more)

HC01\_EST\_VC47 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $75,000 or more - Less than 20 percent)

HC01\_EST\_VC48 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $75,000 or more - 20 to 29 percent)

HC01\_EST\_VC49 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $75,000 or more - 30 percent or more)

**2-10)** Extract CID codes of the communities and the relevant unincorporated area from the GIS layer “floodTool\_Pol\_Ar\_CID\_NFIP\_utm83\_20190110” and add them to the excel sheet

**2-11)** In the new excel sheet, rename and sort the fields (Columns) removing all spaces as:

GEO.display-label (Geography) 🡪 **GEO\_Label**

CID 🡪 **CID**

GEO.id (Id) 🡪 **GEO\_ID**

GEO.id2 (Id2) 🡪 **Census\_ID** (keep one and remove duplicated fields)

HC01\_EST\_VC01 (Total; Estimate; Total population) 🡪 **Population\_Total**

HC01\_EST\_VC02 (Total; Estimate; Total households) 🡪 **Households\_Total**

HC01\_EST\_VC03 (Total; Estimate; Average household size) 🡪 **Ave\_Household\_Size**

HD01\_VD01 (Estimate; Total:) 🡪 **Population\_Households**

HD01\_VD02 (Estimate; Total: - Less than $10,000) 🡪 **Inc\_less\_10000**

HD01\_VD03 (Estimate; Total: - $10,000 to $14,999) 🡪 **Inc\_10000\_14999**

HD01\_VD04 (Estimate; Total: - $15,000 to $19,999) 🡪 **Inc\_15000\_19999**

HD01\_VD05 (Estimate; Total: - $20,000 to $24,999) 🡪 **Inc\_20000\_24999**

HD01\_VD06 (Estimate; Total: - $25,000 to $29,999) 🡪 **Inc\_25000\_29999**

HD01\_VD07 (Estimate; Total: - $30,000 to $34,999) 🡪 **Inc\_30000\_34999**

HD01\_VD08 (Estimate; Total: - $35,000 to $39,999) 🡪 **Inc\_35000\_39999**

HD01\_VD09 (Estimate; Total: - $40,000 to $44,999) 🡪 **Inc\_40000\_44999**

HD01\_VD10 (Estimate; Total: - $45,000 to $49,999) 🡪 **Inc\_45000\_49999**

HD01\_VD11 (Estimate; Total: - $50,000 to $59,999) 🡪 **Inc\_50000\_59999**

HD01\_VD12 (Estimate; Total: - $60,000 to $74,999) 🡪 **Inc\_60000\_74999**

HD01\_VD13 (Estimate; Total: - $75,000 to $99,999) 🡪 **Inc\_75000\_99999**

HD01\_VD14 (Estimate; Total: - $100,000 to $124,999) 🡪 **Inc\_100000\_124999**

HD01\_VD15 (Estimate; Total: - $125,000 to $149,999) 🡪 **Inc\_125000\_149999**

HD01\_VD16 (Estimate; Total: - $150,000 to $199,999) 🡪 **Inc\_150000\_199999**

HD01\_VD17 (Estimate; Total: - $200,000 or more) 🡪 **Inc\_200000\_more**

HD01\_VD01 (Estimate; Per capita income in the past 12 months (in 2017 inflation-adjusted dollars)) 🡪 **Percapita\_Income**

HC01\_EST\_VC14 (Occupied housing units; Estimate; HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2017 INFLATION-ADJUSTED DOLLARS) - Median household income (dollars)) 🡪 **Median\_Household\_Inc**

HD01\_VD02 (Estimate; Total: - Occupied) 🡪 **Occupied\_Res\_Units**

HD01\_VD03 (Estimate; Total: - Vacant) 🡪 **Vacant\_Res\_Units**

HC03\_EST\_VC01 (Owner-occupied housing units; Estimate; Occupied housing units) 🡪 **Owner\_Occupied\_Res**

HC05\_EST\_VC01 (Renter-occupied housing units; Estimate; Occupied housing units) 🡪 **Renter\_Occupied\_Res**

HC01\_EST\_VC31 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - Less than $20,000 - Less than 20 percent) 🡪 **Housing\_Cost\_Less20pct\_Less20000**

HC01\_EST\_VC32 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - Less than $20,000 - 20 to 29 percent) 🡪 **Housing\_Cost\_20\_29pct\_Less20000**

HC01\_EST\_VC33 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - Less than $20,000 - 30 percent or more) 🡪 **Housing\_Cost\_30pct\_more\_Less20000**

HC01\_EST\_VC35 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $20,000 to $34,999 - Less than 20 percent) 🡪 **Housing\_Cost\_Less20pct\_20000\_34999**

HC01\_EST\_VC36 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $20,000 to $34,999 - 20 to 29 percent) 🡪 **Housing\_Cost\_20\_29pct\_20000\_34999**

HC01\_EST\_VC37 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $20,000 to $34,999 - 30 percent or more) 🡪 **Housing\_Cost\_30pct\_more\_20000\_34999**

HC01\_EST\_VC39 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $35,000 to $49,999 - Less than 20 percent) 🡪 **Housing\_Cost\_Less20pct\_35000\_49999**

HC01\_EST\_VC40 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $35,000 to $49,999 - 20 to 29 percent) 🡪 **Housing\_Cost\_20\_29pct\_35000\_49999**

HC01\_EST\_VC41 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $35,000 to $49,999 - 30 percent or more) 🡪 **Housing\_Cost\_30pct\_more\_35000\_49999**

HC01\_EST\_VC43 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $50,000 to $74,999 - Less than 20 percent) 🡪 **Housing\_Cost\_Less20pct\_50000\_74999**

HC01\_EST\_VC44 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $50,000 to $74,999 - 20 to 29 percent) 🡪 **Housing\_Cost\_20\_29pct\_50000\_74999**

HC01\_EST\_VC45 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $50,000 to $74,999 - 30 percent or more) 🡪 **Housing\_Cost\_30pct\_more\_50000\_74999**

HC01\_EST\_VC47 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $75,000 or more - Less than 20 percent) 🡪 **Housing\_Cost\_Less20pct\_75000\_more**

HC01\_EST\_VC48 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $75,000 or more - 20 to 29 percent) 🡪 **Housing\_Cost\_20\_29pct\_75000\_more**

HC01\_EST\_VC49 (Occupied housing units; Estimate; MONTHLY HOUSING COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS - $75,000 or more - 30 percent or more) 🡪 **Housing\_Cost\_30pct\_more\_75000\_more**

HC02\_EST\_VC03 (Percent; Estimate; AGE - Under 5 years) 🡪 **Age\_pct\_under\_5**

HC02\_EST\_VC04 (Percent; Estimate; AGE - 5 to 9 years) 🡪 **Age\_pct\_5\_9**

HC02\_EST\_VC05 (Percent; Estimate; AGE - 10 to 14 years) 🡪 **Age\_pct\_10\_14**

HC02\_EST\_VC06 (Percent; Estimate; AGE - 15 to 19 years) 🡪 **Age\_pct\_15\_19**

HC02\_EST\_VC07 (Percent; Estimate; AGE - 20 to 24 years) 🡪 **Age\_pct\_20\_24**

HC02\_EST\_VC08 (Percent; Estimate; AGE - 25 to 29 years) 🡪 **Age\_pct\_25\_29**

HC02\_EST\_VC09 (Percent; Estimate; AGE - 30 to 34 years) 🡪 **Age\_pct\_30\_34**

HC02\_EST\_VC10 (Percent; Estimate; AGE - 35 to 39 years) 🡪 **Age\_pct\_35\_39**

HC02\_EST\_VC11 (Percent; Estimate; AGE - 40 to 44 years) 🡪 **Age\_pct\_40\_44**

HC02\_EST\_VC12 (Percent; Estimate; AGE - 45 to 49 years) 🡪 **Age\_pct\_45\_49**

HC02\_EST\_VC13 (Percent; Estimate; AGE - 50 to 54 years) 🡪 **Age\_pct\_50\_54**

HC02\_EST\_VC14 (Percent; Estimate; AGE - 55 to 59 years) 🡪 **Age\_pct\_55\_59**

HC02\_EST\_VC15 (Percent; Estimate; AGE - 60 to 64 years) 🡪 **Age\_pct\_60\_64**

HC02\_EST\_VC16 (Percent; Estimate; AGE - 65 to 69 years) 🡪 **Age\_pct\_65\_69**

HC02\_EST\_VC17 (Percent; Estimate; AGE - 70 to 74 years) 🡪 **Age\_pct\_70\_74**

HC02\_EST\_VC18 (Percent; Estimate; AGE - 75 to 79 years) 🡪 **Age\_pct\_75\_79**

HC02\_EST\_VC19 (Percent; Estimate; AGE - 80 to 84 years) 🡪 **Age\_pct\_80\_84**

HC02\_EST\_VC20 (Percent; Estimate; AGE - 85 years and over) 🡪 **Age\_pct\_85\_over**

1. **Processing the data of unincorporated areas:**

**3-1)** Add a row to the table

**3-2)** Write Unincorporated\_COUNTY NAME in the field of GEO\_label

**3-3)** Input the CID of the unincorporated area

**3-4)** Except for Ave\_Household\_Size, subtract the values of the communities in every field from those of the county and put the results in the new row

**3-5)** For the Ave\_Household\_Size, subtract Population\_Households of the communities from that of the county then, divide the result by Households\_Total of the unincorporated area

**4)** Add a new field named **Inc\_ pct\_above\_60000** and calculated:

(Inc\_60000\_74999 + Inc\_75000\_99999 + Inc\_100000\_124999 + Inc\_125000\_149999 + Inc\_150000\_199999 + Inc\_200000\_more)/ Households\_Total\*100