U.S. Census and American Community Survey Overview

Open a web browser and go to:

http://tinyurl.com/tufts-census
Open these documents in **new** tabs:

- **MPP Social Explorer Tutorial** - you can use this in class or later on.

- **Census 2020 Questionnaire** - this is the questionnaire that will go with similar questions for other people in the housing unit. Who should the "census" goes out once every 10 years to every housing unit address.

- **2020 American Community Survey (ACS) questionnaire** - the ACS detailed questions. It is sent to a sample of housing units. Take a look of interest to you and your work? How would you feel filling out this question about ancestry.

- **Why the Census asks each question** - Take a look at a few questions and wants people to know how the questions are used and how it will be. The census form are kept private for 70 years. The individual data of the [https://1940census.archives.gov/index.asp](https://1940census.archives.gov/index.asp)
Today’s session

- The CENSUS (full count of people in US – once a decade)

- The AMERICAN COMMUNITY SURVEY (continuing sample of population and housing characteristics)

- Using Social Explorer to map and get reports of Census and ACS data
US Census Bureau Collection

Methods

Three basic methods of collection

- Census (100%)
- Survey (sample)
- Administrative records
Two Types of Census by the US

- **Decennial census**: population and housing
  - On the 0’s (2000, 2010, 2020)

- **Economic census**: business and industry
  - On the 2’s and 7’s (2012, 2017, 2022)

Census = the enumeration of *entire population or universe* of collection units such as housing units or businesses
Survey Types

Data collected from *sample* of population, that represents the full population

- American Community Survey - monthly
- Current Population Survey - monthly
- Survey of Income and Program Participation - monthly
- American Housing Survey - every 2 years
Administrative Records

The Census Bureau also collects some administrative records (e.g., births and deaths, Medicare, Social Security, IRS, immigration data)

- Population estimates and projections
- County Business Patterns
- Exports/Imports
We will focus on:

- The 2020 Census
- The American Community Survey (ACS)
- How to map census / ACS data in Social Explorer and make reports
Let’s take a look at the 2020 Census form…

Start here OR go online at [url removed] to complete your 2020 Census questionnaire.

Before you answer Question 1, count the people living in this house, apartment, or mobile home using our guidelines.

- Count all people, including babies, who live and sleep here most of the time.
- If no one lives and sleeps at this address most of the time, go online at [url removed] or call the number on page 8.

The census must also include people without a permanent place to live, so:

- If someone who does not have a permanent place to live is staying here on April 1, 2020, count that person.

The Census Bureau also conducts counts in institutions and other places, so:

- Do not count anyone living away from here, either at college or in the Armed Forces.
- Do not count anyone in a nursing home, jail, prison, detention facility, etc., on April 1, 2020.
- Leave these people off your questionnaire, even if they will return to live here after they leave college, the nursing home,
Look over – questions or comments?

Start here OR go online at [uri removed] to complete your 2020 Census questionnaire.

Before you answer Question 1, count the people living in this house, apartment, or mobile home using our guidelines.

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- Do not count anyone living away from here, either at college or in the Armed Forces.
- Do not count anyone in a nursing home, jail, prison, detention facility, etc., on April 1, 2020.
- Leave these people off your questionnaire, even if they will return to live here after they leave college, the nursing home,

2. Were there any additional people staying here on April 1, 2020, that you did not include in Question 1?

Mark [X] all that apply.

- Children, related or unrelated, such as newborn babies, grandchildren, or foster children
- Relatives, such as adult children, cousins, or in-laws
- Nonrelatives, such as roommates or live-in babysitters
- People staying here temporarily
- No additional people

3. Is this house, apartment, or mobile home — Mark [ONE box]

- Owned by you or someone in this household with a mortgage or loan? Include home equity loans.
- Owned by you or someone in this household free and clear (without a mortgage or loan)?
- Rented?
- Occupied without payment of rent?

4. What is your telephone number?
“Race” is a self-identification data item in which respondents choose the race or *races* with which they most closely identify.
2020 – first time White and Black identities provide for sub-identities…

<table>
<thead>
<tr>
<th>7. What is this person’s race?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark one or more boxes AND print origins.</td>
</tr>
<tr>
<td>□ White – Print, for example, German, Irish, English, Italian, Lebanese, Egyptian, etc.</td>
</tr>
<tr>
<td>□ Black or African Am. – Print, for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, etc.</td>
</tr>
<tr>
<td>□ American Indian or Alaska Native – Print name of enrolled or principal tribe(s), for example, Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community, etc.</td>
</tr>
<tr>
<td>□ Chinese</td>
</tr>
<tr>
<td>□ Filipino</td>
</tr>
<tr>
<td>□ Asian Indian</td>
</tr>
<tr>
<td>□ Japanese</td>
</tr>
<tr>
<td>□ Other Asian – Print, for example, Pakistani, Cambodian, Hmong, etc.</td>
</tr>
<tr>
<td>□ Vietnamese</td>
</tr>
<tr>
<td>□ Native Hawaiian</td>
</tr>
<tr>
<td>□ Korean</td>
</tr>
<tr>
<td>□ Samoan</td>
</tr>
<tr>
<td>□ Chamorro</td>
</tr>
<tr>
<td>□ Other Pacific Islander – Print, for example, Tongan, Fijian, Marshallese, etc.</td>
</tr>
<tr>
<td>□ Some other race – Print race or origin.</td>
</tr>
</tbody>
</table>
9. What is Person 1’s race? Mark one or more boxes.

- White
- Black, African Am., or Negro
- American Indian or Alaska Native — Print name of enrolled or principal tribe.
- Asian Indian
- Japanese
- Native Hawaiian
- Chinese
- Korean
- Guamanian or Chamorro
- Filipino
- Vietnamese
- Samoan
- Other Asian — Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.
- Other Pacific Islander — Print race, for example, Fijian, Tongan, and so on.
- Some other race — Print race.
Hispanic / Latino ethnicity—also self-identified

- Questions pertaining to *Hispanic/Latino*—a person’s options are *either*:
  - Hispanic or Latino
    - Mexican, Mexican American, Chicano
    - Puerto Rican
    - Cuban
    - Other
  - **Not** Hispanic or Latino
So be careful when mapping race and Latino ethnicity!

Look for Hispanic and Non-Hispanic tabulations (requires you to be very observant of the details when getting data!)
Other differences - 2010 and 2020

2010

2. How is this person related to Person 1? Mark \( \_\_\_\) ONE box.
- Husband or wife
- Biological son or daughter
- Adopted son or daughter
- Stepson or stepdaughter
- Brother or sister
- Grandchild
- Parent-in-law
- Son-in-law or daughter-in-law
- Other relative
- Roomer or boarder
- Housemate or roommate
- Unmarried partner
- Other nonrelative

3. What is this person? Mark \( \_\_\_\) ONE box.

2020

2. Does this person usually live or stay somewhere else?
Mark \( \_\_\_\) all that apply.
- No
- Yes, for college
- Yes, for a military assignment
- Yes, for a job or business
- Yes, in a nursing home
- Yes, with a parent or other relative
- Yes, at a seasonal or second residence
- Yes, in a jail or prison
- Yes, for another reason

3. How is this person related to Person 1? Mark \( \_\_\_\) ONE box.
- Opposite-sex husband/wife/spouse
- Opposite-sex unmarried partner
- Same-sex husband/wife/spouse
- Same-sex unmarried partner
- Biological son or daughter
- Adopted son or daughter
- Stepson or stepdaughter
- Brother or sister
- Grandchild
- Parent-in-law
- Son-in-law or daughter-in-law
- Other relative
- Roommate or housemate
- Foster child
- Other nonrelative
American Community Survey

- Continuous monthly survey
- Began in 2005
- It has replaced the decennial census long form
Look at the American Community Survey Questionnaire
Again, think about how people would respond to these questions

- Accuracy of answers?
- Would you know when your house was built?
- Do you know how much you spent for heating costs?
- Concerns about privacy?
- Concern about government knowing these things about you?
Look at the following maps of New York City by Emily Earle

Would the data come from the Census or only from the American Community Survey (ACS)?
New York City
Spanish Speaking New Yorkers

New Yorkers who speak Spanish at home (% by Census Tract)
0 - 11.5
11.7 - 25.2
25.3 - 42.9
43 - 62.8
62.9 - 100

Source: U.S. Census Bureau, American Community Survey 5-Year Est. (2006-2010)
Emily E. Earle 2012
### Most important for you:

<table>
<thead>
<tr>
<th>Decennial Census</th>
<th>American Community Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once every 10 years</td>
<td>Sample survey</td>
</tr>
<tr>
<td>100% count*</td>
<td>Detailed information on income, education, commute, place of birth, etc.</td>
</tr>
<tr>
<td>Basic information on population, race/Hispanic ethnicity, age, family structure, housing units, owner/renter housing tenure</td>
<td>To be discussed – high sampling error at neighborhood level!</td>
</tr>
</tbody>
</table>

* Who might be missed?
Some other important definitions to understand
A house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters.

Separate living quarters are those in which the occupants live separately from any other individuals in the building and which have direct access from outside the building or through a common hall. For vacant units, the criteria of separateness and direct access are applied to the intended occupants whenever possible.
Living Quarters

- **Housing unit**: unit occupied as separate living quarters, or, if vacant, is intended for occupancy as a separate living quarters

- **Group quarters**
  - Institutionalized population (such as correctional institutions, nursing homes, and juvenile institutions)
  - Noninstitutionalized population (such as college dormitories, military quarters, and group homes)
Household

- **Household**: all persons who occupy a housing unit

**Important**: *housing unit* and *household* are TWO different things! Be clear about which you are using!
Two Types of Households

- **Family Household**: householder plus all persons in the household related by blood, marriage, or adoption
  
  Can also include:
  
  - Subfamily  *Example*: householder’s son and daughter-in-law
  - Nonrelative  *Example*: roomers, boarders

- **Nonfamily Household**: persons living alone or with nonrelatives **only**
**Income**

- **Median Household Income** – this is the most frequently used in policy and planning – half of household incomes in the tract are above this and half are below.

- **Per Capita Income:** divide total income everyone by the total population – **don’t use this!**
The “universe” for each variable

- The total number of units, e.g., individuals, households, businesses, in the population of interest.

- This is important for understanding percentages

- Know your “universe”!
**MEANS OF TRANSPORTATION AND CARPOOLSING**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Workers 16 and over</strong></td>
<td>99,197</td>
<td>100.0</td>
</tr>
<tr>
<td>Car, truck, or van</td>
<td>88,745</td>
<td>69.5</td>
</tr>
<tr>
<td>Drove alone</td>
<td>80,672</td>
<td>81.3</td>
</tr>
<tr>
<td>Carpoled</td>
<td>8,073</td>
<td>8.1</td>
</tr>
<tr>
<td>In 2-person carpool</td>
<td>6,909</td>
<td>7.0</td>
</tr>
<tr>
<td>In 3-person carpool</td>
<td>899</td>
<td>0.9</td>
</tr>
<tr>
<td>In 4-person carpool</td>
<td>76</td>
<td>0.1</td>
</tr>
<tr>
<td>In 5- or 6-person carpool</td>
<td>68</td>
<td>0.1</td>
</tr>
<tr>
<td>In 7-or-more-person carpool</td>
<td>121</td>
<td>0.1</td>
</tr>
<tr>
<td>Workers per car, truck, or van</td>
<td>1.05</td>
<td>(X)</td>
</tr>
<tr>
<td>Public transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus or trolley bus</td>
<td>1,436</td>
<td>1.4</td>
</tr>
<tr>
<td>Streetcar or trolley car (público in Puerto Rico)</td>
<td>1,077</td>
<td>1.1</td>
</tr>
<tr>
<td>Railroad</td>
<td>127</td>
<td>0.1</td>
</tr>
<tr>
<td>Ferryboat</td>
<td>67</td>
<td>0.1</td>
</tr>
<tr>
<td>Taxicab</td>
<td>65</td>
<td>0.1</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>35</td>
<td>0.0</td>
</tr>
<tr>
<td>Bicycle</td>
<td>318</td>
<td>0.3</td>
</tr>
<tr>
<td>Walked</td>
<td>2,616</td>
<td>2.6</td>
</tr>
<tr>
<td>Other means</td>
<td>903</td>
<td>0.9</td>
</tr>
<tr>
<td>Worked at home</td>
<td>5,144</td>
<td>5.2</td>
</tr>
</tbody>
</table>
## Barnstable County, MA

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCHOOL ENROLLMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population 3 years and over enrolled in school</td>
<td>47,762</td>
<td>100.0</td>
</tr>
<tr>
<td>Nursery school, preschool</td>
<td>3,987</td>
<td>8.3</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>2,215</td>
<td>4.6</td>
</tr>
<tr>
<td>Elementary school (grades 1-8)</td>
<td>22,199</td>
<td>46.5</td>
</tr>
<tr>
<td>High school (grades 9-12)</td>
<td>10,869</td>
<td>22.8</td>
</tr>
<tr>
<td>College or graduate school</td>
<td>8,492</td>
<td>17.8</td>
</tr>
<tr>
<td><strong>EDUCATIONAL ATTAINMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population 25 years and over</td>
<td>165,115</td>
<td>100.0</td>
</tr>
<tr>
<td>Less than 5th grade</td>
<td>3,304</td>
<td>2.0</td>
</tr>
<tr>
<td>9th to 12th grade, no diploma</td>
<td>10,217</td>
<td>6.2</td>
</tr>
<tr>
<td>High school graduate (includes equivalency)</td>
<td>44,983</td>
<td>27.2</td>
</tr>
<tr>
<td>Some college, no degree</td>
<td>36,356</td>
<td>22.0</td>
</tr>
<tr>
<td>Associate degree</td>
<td>14,792</td>
<td>9.0</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>33,989</td>
<td>20.6</td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td>21,474</td>
<td>13.0</td>
</tr>
<tr>
<td>Percent high school graduate or higher</td>
<td>91.8</td>
<td>(X)</td>
</tr>
<tr>
<td>Percent bachelor's degree or higher</td>
<td>33.6</td>
<td>(X)</td>
</tr>
</tbody>
</table>
Census Tabulations

- The Census Bureau makes the data accessible by releasing **tabulations**
  - tabulations are aggregations of the data in ways that are useful for most users
- The tabulations are for various levels of **geography**, e.g.,
  - Census block, blockgroup, tract
  - City, County
  - Metropolitan areas
  - States
Example table of data for three Boston census tracts...

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Census Tract 815, Suffolk County, Massachusetts</th>
<th>Census Tract 817, Suffolk County, Massachusetts</th>
<th>Census Tract 819, Suffolk County, Massachusetts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population:</td>
<td>2,616</td>
<td>4,151</td>
<td>3,494</td>
</tr>
<tr>
<td>Under 5 Years</td>
<td>110 0.042</td>
<td>295 0.071</td>
<td>338 0.097</td>
</tr>
<tr>
<td>5 to 9 Years</td>
<td>102 0.039</td>
<td>291 0.07</td>
<td>153 0.044</td>
</tr>
<tr>
<td>10 to 14 Years</td>
<td>341 0.13</td>
<td>181 0.044</td>
<td>248 0.071</td>
</tr>
<tr>
<td>15 to 17 Years</td>
<td>82 0.031</td>
<td>200 0.048</td>
<td>203 0.058</td>
</tr>
<tr>
<td>18 to 24 Years</td>
<td>344 0.132</td>
<td>697 0.168</td>
<td>347 0.099</td>
</tr>
<tr>
<td>25 to 34 Years</td>
<td>595 0.227</td>
<td>508 0.122</td>
<td>432 0.124</td>
</tr>
<tr>
<td>35 to 44 Years</td>
<td>227 0.087</td>
<td>595 0.143</td>
<td>437 0.125</td>
</tr>
<tr>
<td>45 to 54 Years</td>
<td>237 0.091</td>
<td>523 0.126</td>
<td>405 0.116</td>
</tr>
<tr>
<td>55 to 64 Years</td>
<td>370 0.141</td>
<td>391 0.094</td>
<td>541 0.155</td>
</tr>
<tr>
<td>65 to 74 Years</td>
<td>119 0.046</td>
<td>314 0.076</td>
<td>239 0.068</td>
</tr>
<tr>
<td>75 to 84 Years</td>
<td>78 0.03</td>
<td>104 0.025</td>
<td>104 0.03</td>
</tr>
<tr>
<td>85 Years and Over</td>
<td>11 0.004</td>
<td>52 0.013</td>
<td>47 0.014</td>
</tr>
</tbody>
</table>
Census Geography
Census Tracts
Census Geography

- **NATION**
  - **REGIONS**
    - **DIVISIONS**
      - **STATES**
        - **Counties**
          - **Census Tracts**
            - **Subminor Civil Divisions**
            - **Block Groups**
            - **Census Blocks**
        - **Places**
        - **Urban Areas**
        - **Core Based Statistical Areas**
      - **AIANNH Areas**
        (American Indian, Alaska Native, Native Hawaiian Areas)
      - **Urban Growth Areas**
      - **State Legislative Districts**
      - **Public Use Microdata Areas**
    - **School Districts**
    - **Congressional Districts**
    - **Voting Districts**
    - **Traffic Analysis Zones**
    - **County Subdivisions**
  - **ZIP Code Tabulation Areas**
These are towns in New England
So far, you’ve learned...

- The Decennial **Census** has **fewer** variables than the **ACS**
- Which **kinds of data** are covered in the **Census** vs. the **ACS**
- There are different levels of **census geography**
Warning: there is a BIG problem for neighborhood level analysis...
The **decennial census** data at the census block, block group and tract level is very reliable – why?
The **decennial census** is as close to a 100% count as we can get...
But the ACS is problematic for those small areas. Why?
ACS is a monthly survey or a sample of households...

You need a lot of responses for areas with small populations to have reliable data
Means of transportation for commute – **Tract** Level - ACS 2005-2009 5 year estimates

Universe is workers 16 and over
What is Sampling Error?

Definition

The *uncertainty* associated with an estimate that is based on data gathered from a sample of the population rather than the full population.
Illustration of Sampling Error

Estimate average number of children per household for a population with 3 households living in a block:

- Household A has 1 child
- Household B has 2 children
- Household C has 3 children

The block average based on the full population is two children per household: \( \frac{1+2+3}{3} \)
Conceptualizing Sampling Error

But if we took samples of 2 households:

1. Households A and B (1 child, 2 children)
2. Households B and C (2 children, 3 children)
3. Households A and C (1 child, 3 children)

Three different averages based on which sample is used:

1. \( \frac{1 + 2}{2} = 1.5 \) children
2. \( \frac{1 + 3}{2} = 2 \) children
3. \( \frac{2 + 3}{2} = 2.5 \) children
How the ACS deals with sampling errors

- For smaller geographies, data is released every year as an average for the last 5 years
  - tracts
  - block groups
  - Any other areas under 20,000 people

- ACS data NOT released for blocks
Sampling Error

- The **Census** is a 100% survey so has smaller error.
- **ACS** data is based on samples – error is larger.
- The **smaller** the geography, the **larger** the error (because the sample is smaller).
- Especially true for variables that sample a small number of people, e.g., bike commuters.
## ACS and Margin of Error

<table>
<thead>
<tr>
<th>Type of Transportation</th>
<th>Census Tract 3.02, Suffolk County, Massachusetts</th>
<th>Census Tract 4.01, Suffolk County, Massachusetts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>Margin of Error</td>
</tr>
<tr>
<td>Total: Workers 16 and Over</td>
<td>2,321</td>
<td>+/- 363</td>
</tr>
<tr>
<td>Car, truck, or van:</td>
<td>1,464</td>
<td>+/- 361</td>
</tr>
<tr>
<td>Drove alone</td>
<td>1,274</td>
<td>+/- 380</td>
</tr>
<tr>
<td>Carpoled:</td>
<td>190</td>
<td>+/- 137</td>
</tr>
<tr>
<td>In 2-person carpool</td>
<td>110</td>
<td>+/- 82</td>
</tr>
<tr>
<td>In 3-person carpool</td>
<td>0</td>
<td>+/- 127</td>
</tr>
<tr>
<td>In 4-person carpool</td>
<td>74</td>
<td>+/- 111</td>
</tr>
<tr>
<td>In 5- or 6-person carpool</td>
<td>0</td>
<td>+/- 127</td>
</tr>
<tr>
<td>In 7 or more person carpool</td>
<td>6</td>
<td>+/- 9</td>
</tr>
<tr>
<td>Public transportation (excluding taxicab):</td>
<td>747</td>
<td>+/- 226</td>
</tr>
<tr>
<td>Bus or trolley bus</td>
<td>371</td>
<td>+/- 164</td>
</tr>
<tr>
<td>Streetcar or trolley car (carro publico in Puerto Rico)</td>
<td>45</td>
<td>+/- 243</td>
</tr>
<tr>
<td>Subway or elevated</td>
<td>250</td>
<td>+/- 154</td>
</tr>
<tr>
<td>Railroad</td>
<td>81</td>
<td>+/- 113</td>
</tr>
<tr>
<td>Ferryboat</td>
<td>0</td>
<td>+/- 127</td>
</tr>
<tr>
<td>Taxicab</td>
<td>0</td>
<td>+/- 127</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>0</td>
<td>+/- 127</td>
</tr>
<tr>
<td>Bicycle</td>
<td>10</td>
<td>+/- 17</td>
</tr>
<tr>
<td>Walked</td>
<td>81</td>
<td>+/- 54</td>
</tr>
<tr>
<td>Other means</td>
<td>9</td>
<td>+/- 16</td>
</tr>
<tr>
<td>Worked at home</td>
<td>10</td>
<td>+/- 15</td>
</tr>
</tbody>
</table>

Means of transportation for commute – **Tract** Level - ACS 2005-2009 5 year estimates
Universe is workers 16 and over
Bottom line for ACS vs. Census

- ACS has more up to date information
- Continuous (ACS) versus point in time measurement (Census)

But ACS has...

- Poorer precision at finer scales (e.g., census tract) or areas of low population (rural areas)
- Poorer precision for variables with low numbers (e.g., people who bike to work)
To map by tract you HAVE to use the ACS 5-year estimates!!
So let’s map!

How to use with Social Explorer – watch my demo, then try on your own using this powerpoint…
What have you learned?
Take home points

- There are two major Census Bureau products used for neighborhood analysis:
  - The **Decennial Census**
    - Basic data
    - By block, block group, and tract
    - Once a decade, one point in time
  - The **American Community Survey**
    - Lots of interesting data
    - By block group and tract – may be unreliable at those levels!
    - More up to date – 5-year rolling estimates
Policy Map is another mapping tool...
Census AND lots of other data from various agencies and organizations...
Also accessed through Tisch Library's databases...
New data site from the Census -
https://data.census.gov

Explore Census Data

The Census Bureau is the leading source of quality data about the nation's people and economy.

I'm looking for ...

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