Survey Research and Design

Working with Census Data

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November 1, 2023

Obtaining Weighting Targets

- Survey adjustment methods require population targets
- For small area estimation using MRP: need population-level poststratification table
- For raking: need population-level marginals
- **Today**: obtaining and working with Census data

Working with Census Data

1. Data structures: microdata vs. tabular data
2. Census geographies
3. Available datasets
4. Sources for downloading data

Microdata

Microdata: data from individual-level respondents

- Enables observation of full joint distribution of variables $\rightsquigarrow$ necessary for poststratification
- Useful for understanding individual-level correlations (e.g. correlation between income and education, controlling for location and other variables)
- Enables custom sample selections – can filter based on any criteria in the data
- Drawbacks: large file sizes (millions of rows), no fine-grained geographic identifiers for privacy reasons

Tabular Data

Tabular Data: aggregate counts of units with different levels of a variable

- Shows you the marginal distribution of the variable $\rightsquigarrow$ sufficient for raking
- Pre-computed summaries of the microdata
- Can be useful for understanding ecological patterns (e.g., correlation between the median income and voting patterns in an area)
- Much smaller data size, often easier to work with, available at finer geographic levels

Microdata vs. Tabular Data

Microdata

ID	State	Age	Income	Employment
1	PA	49	67,000	Full-Time
2	PA	20	45,000	Not employed
3	KS	71	103,000	Retired
⋮	⋮	⋮	⋮	

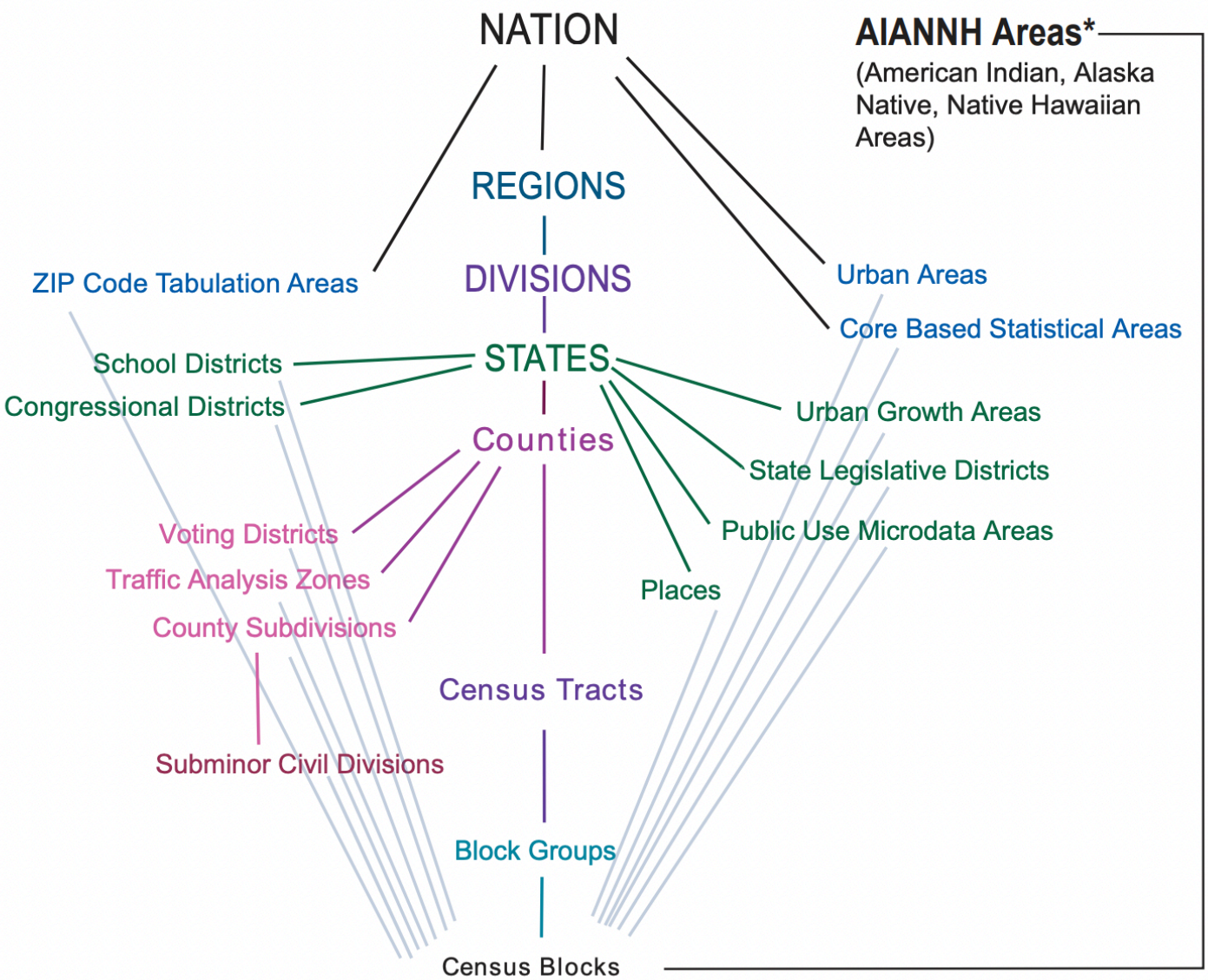
Tabular Data

State	Age	Count
PA	Under 5	690,660
PA	5 to 9	716,240
PA	10 to 14	767,400
⋮	⋮	⋮

Microdata or Tabular Data

- Depends strongly on the use case
- If you need cross-tabs of many variables, probably need to use microdata
- If cross-tabs of just a couple common variables, there may be tabular data available already
- If you need data at small levels of geographies, tabular data might be only option

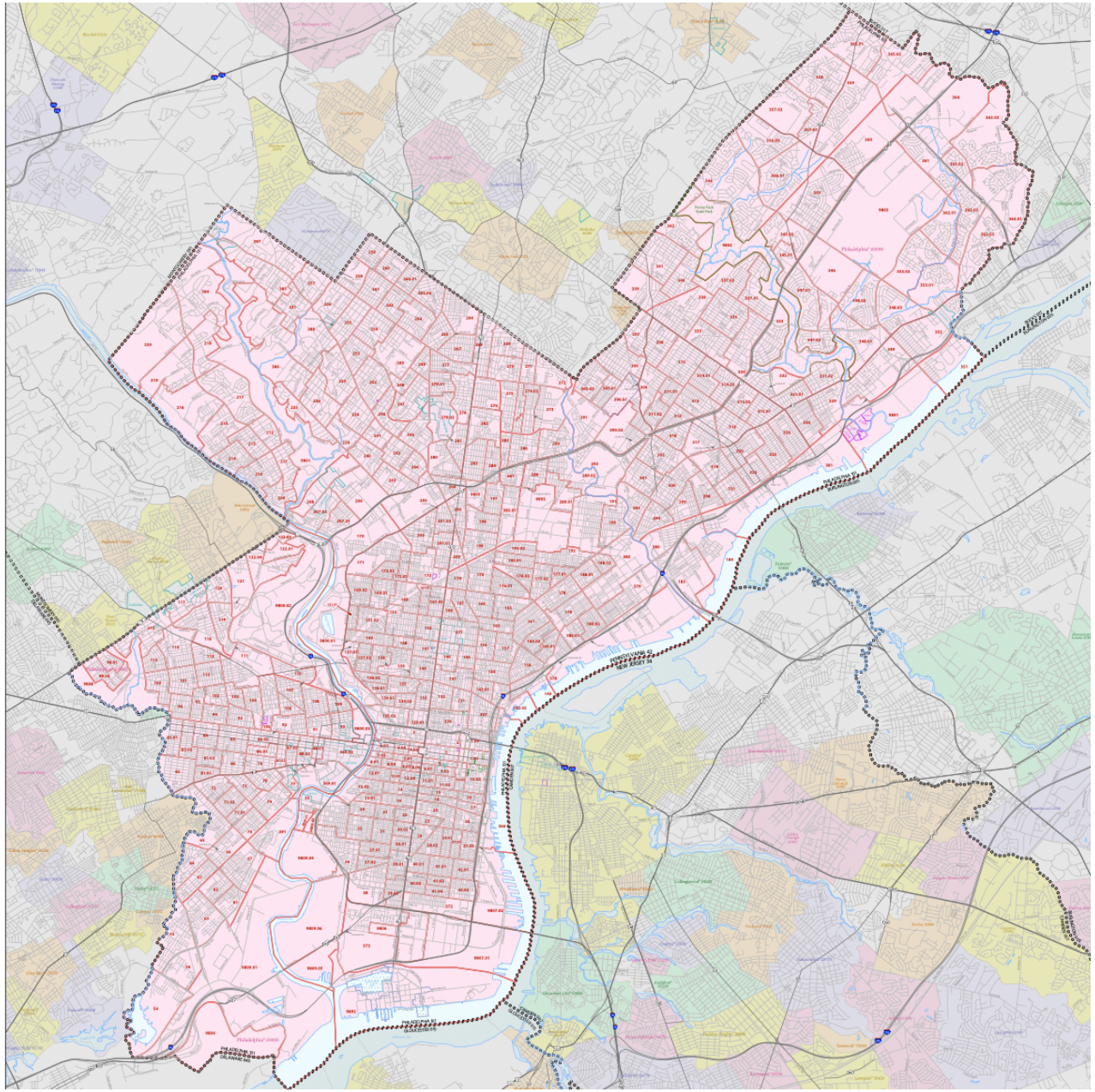
Census Geographies



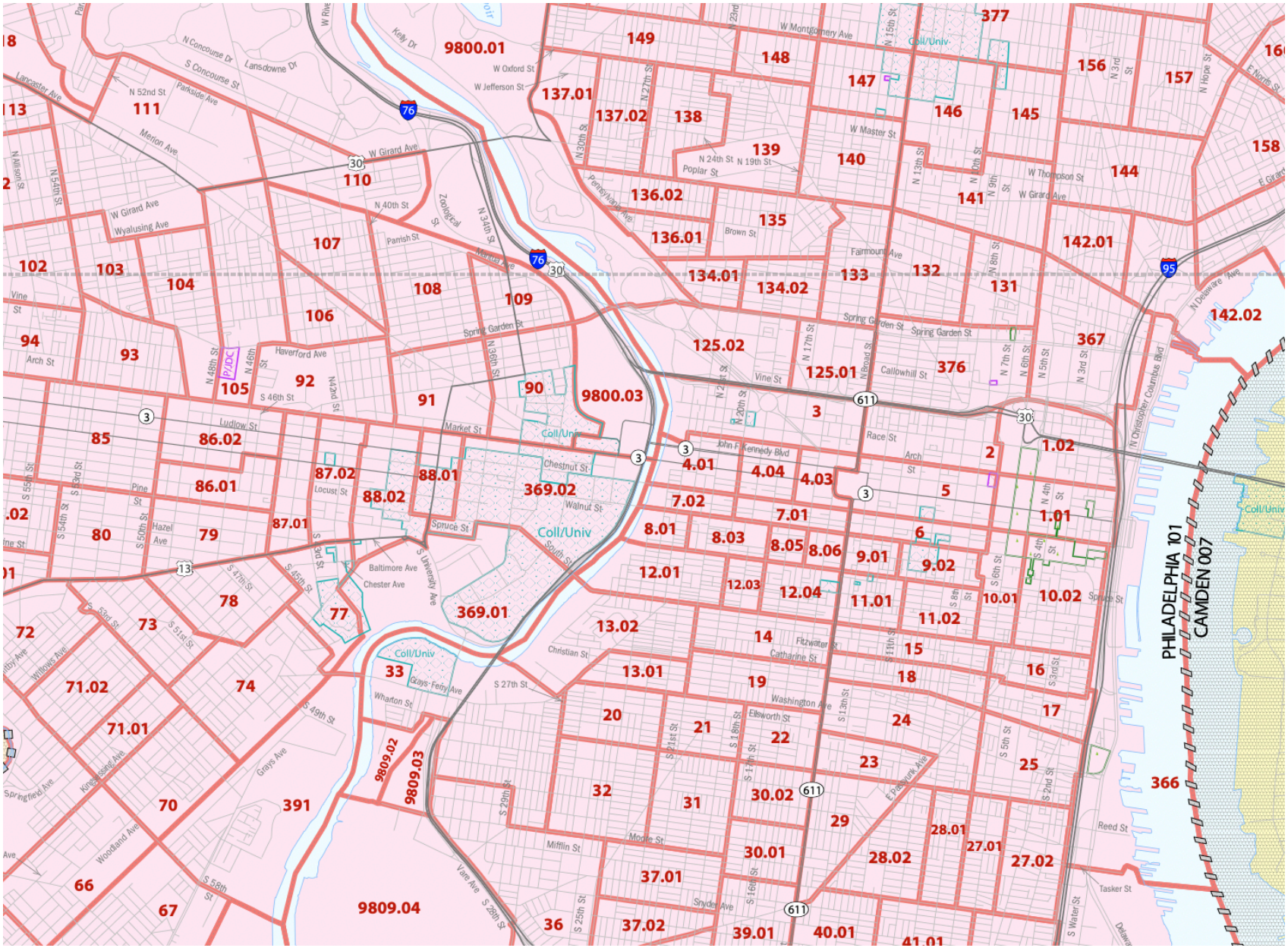
Census Geographies

- Tracts: roughly neighborhood sized, typically 1,200 - 8,000 residents
- Block group: nested within tracts, typically 600 - 3,000 residents
- Block: smallest area, typically bounded by streets, streams, etc. In 2010, $>$ 8 million blocks.

Philadelphia Census Tracts



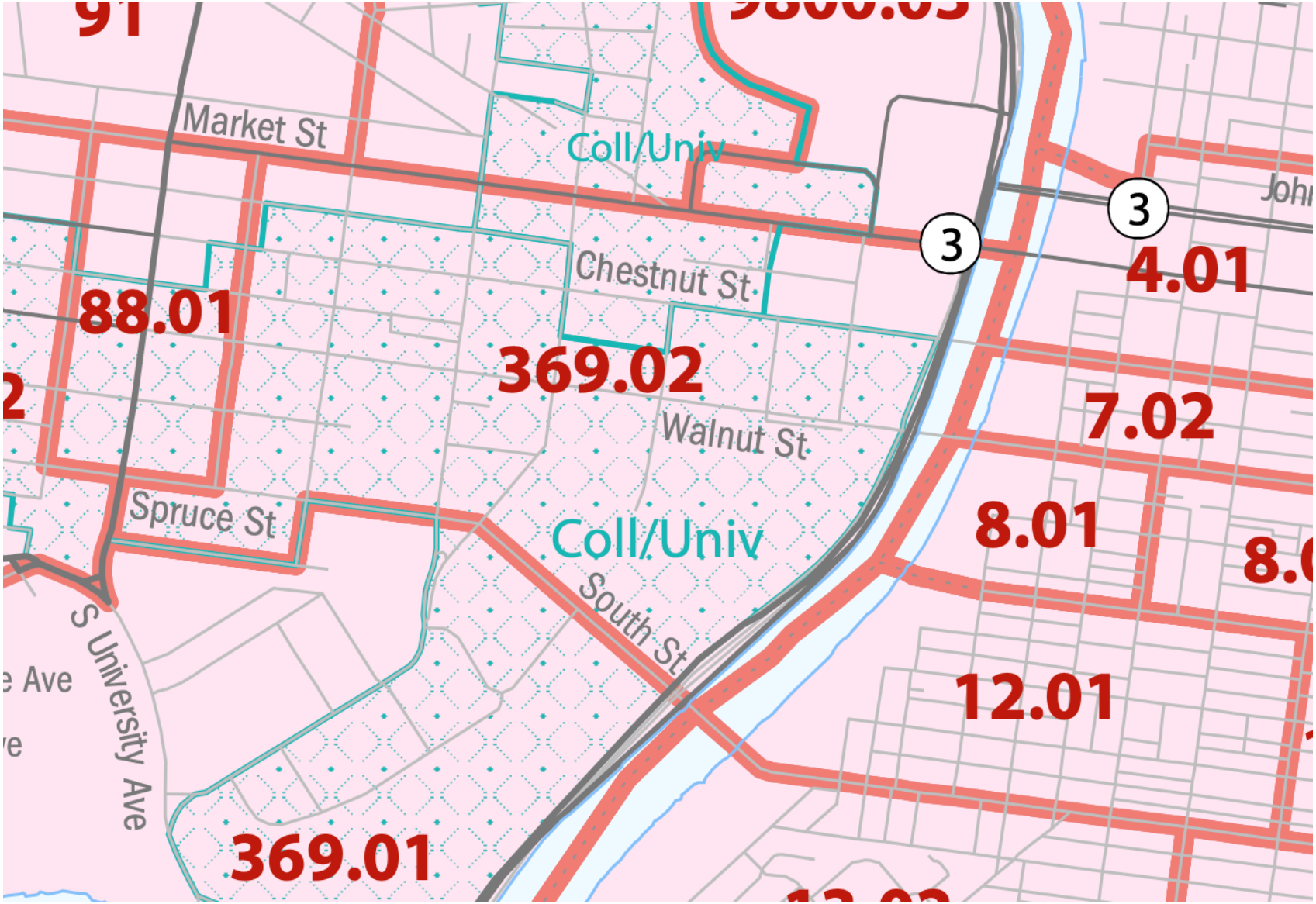
Center City and University City Census Tracts



Navigating Census Geographies: FIPS Codes

- FIPS codes are standardized codes used to identify (among other things) Census geographies
- States, counties, tracts, block groups, and blocks have nested FIPS codes
- This building (LSRM) is in Census block 421010369025005
  - 42: Pennsylvania FIPS code
  - 101: Philadelphia County FIPS code
  - 036902: Census tract
  - 5005: Census block (first digit is block group)
- Often find leading 0's as placeholders

LSRM Census Tract



Useful Datasets

Decennial Census

- Basic information about (in theory) every person living in the U.S., collected every 10 years
- Name (not released publicly for 70 years), sex, age, race, ethnicity, not much else
- Used for congressional apportionment, redistricting, distributing federal $

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American Community Survey (ACS)

- Large survey conducted by Census Bureau yearly since 2006
- Much more detailed information: income and employment, education, housing characteristics, language, detailed demographics, migration, etc.
- Aggregated to 1-year and 5-year estimates (previously 3-year as well)
- 1-year estimates: more temporal detail, less geographic granularity
- 5-year estimates: more geographic granularity, less temporal detail

Other Useful Datasets

Current Population Survey (CPS)

- Monthly survey focused on labor force statistics
- Demographic information, work history, employment, industry, migration
- November: voter supplement – information about electoral turnout and registration

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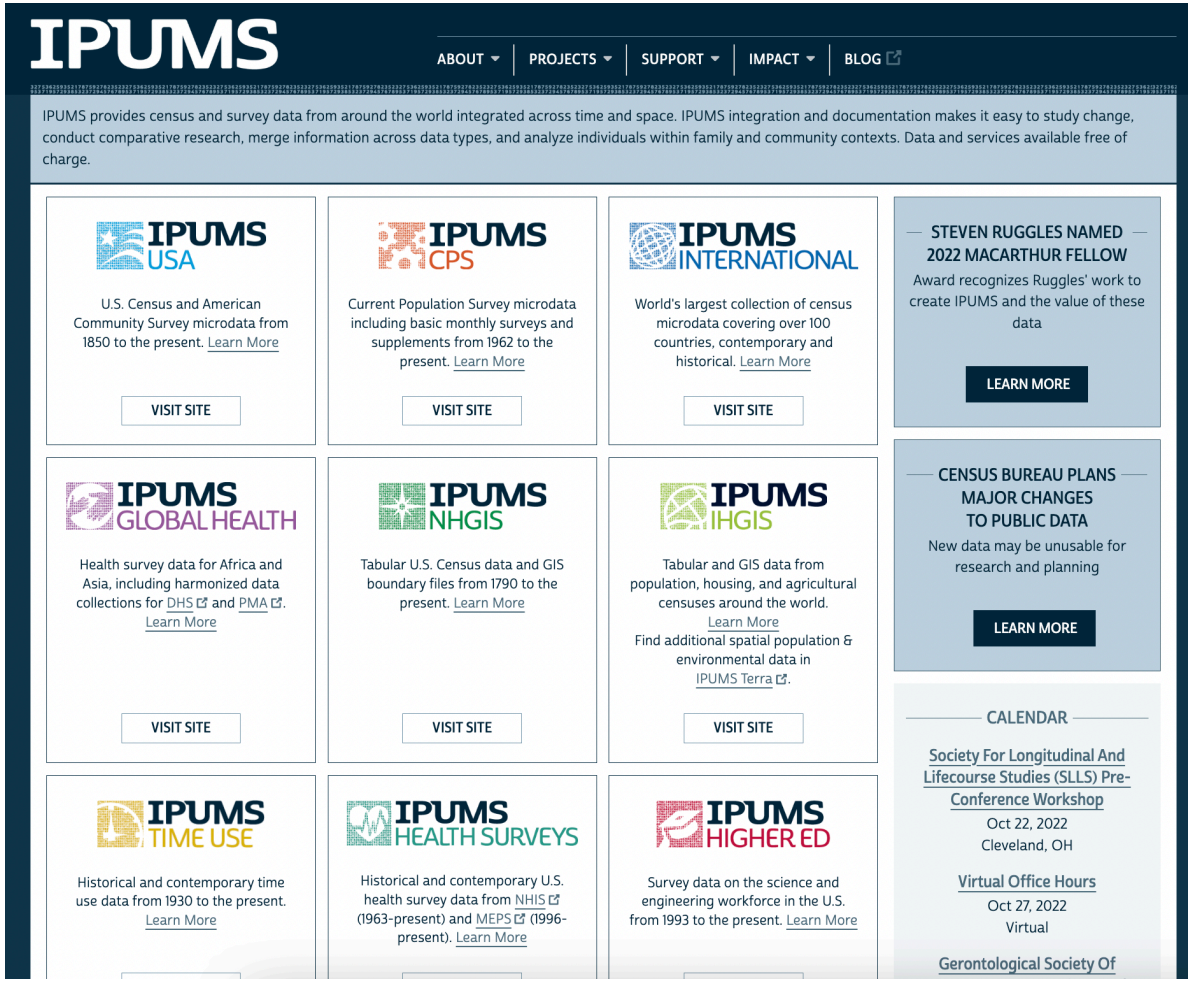
Others

- Longitudinal Employer-Household Dynamics (LEHD): detailed data on employment (e.g. job-to-job flows, detailed industry- and geography-specific employment data)
- Survey of Income and Program Participation (SIPP): longitudinal survey focusing on income/employment and participation in government programs
- National Health Interview Survey (NHIS): detailed information about health status

Obtaining Census Data

Best resource for obtaining Census data: IPUMS at Univ. of Minnesota



Microdata from ACS or Decennial Census: IPUMS USA

Tabular data from ACS or Decennial Census: NHGIS

Walk-Throughs

- income distribution by state from most recent ACS, using NHGIS
- income, employment status, age, education, work-from-home status from most recent ACS, using IPUMS USA

Try It Yourself

Find the state-level (marginal) distributions of educational attainment, race, and gender from the 2021 ACS.

1. Create an IPUMS account and search for relevant population data
2. Navigate to NHGIS.org
3. Choose "Dataset": 2021 ACS [1-year data], "Geography": State.
4. *One-by-one:* filter "Topic" to educational attainment, race, and gender
5. Add the relevant tables to your Cart
6. When you're ready, create the data extracts, download them, and see what code you'd need to write to generate the final dataset