Data at Your Door: Census API Decoded

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August 30, 2022

Tyson Weister
Center for Enterprise Dissemination
Dissemination Outreach Branch
U.S. Census Bureau

United States Census Bureau

Outline

- **API Basics**
- Building an API Request
- API Demo
- Resources for Learning More

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Application Programming Interfaces

Free, publically accessible, open-source services:

- **Census Data API:** Raw statistical data from programs and surveys across the Bureau

- **Geocoder:** Translates addresses and other location formats into latitude/longitude parameters

- **TIGERweb Services:** Census area boundaries and shapes for mapping referenced by FIPS codes

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Census Data API

Census Data API

- Data service that allows software developers and other users to access public data in a standardized way

Uses:

- Supports mobile and web applications (internal and external)
- Drives interactive data visualizations
- Connects to statistical analysis software like SAS and R

Advantages:

- Access only the variables and geographies needed
- Immediate access to updates
- No need to host data on another server
- More data than what is available on data.census.gov

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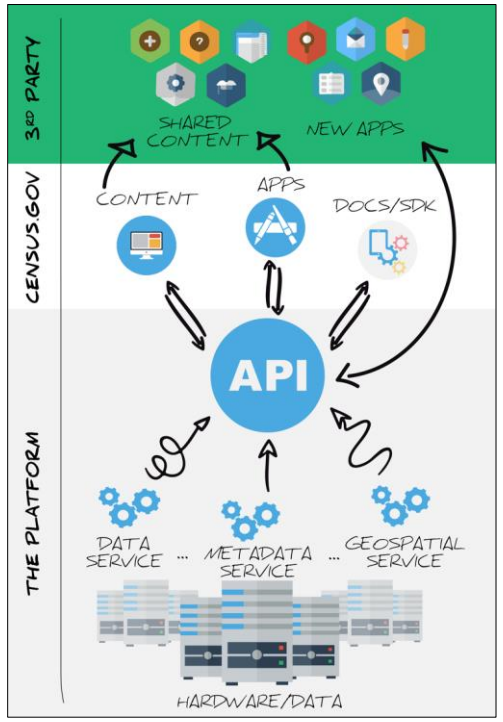
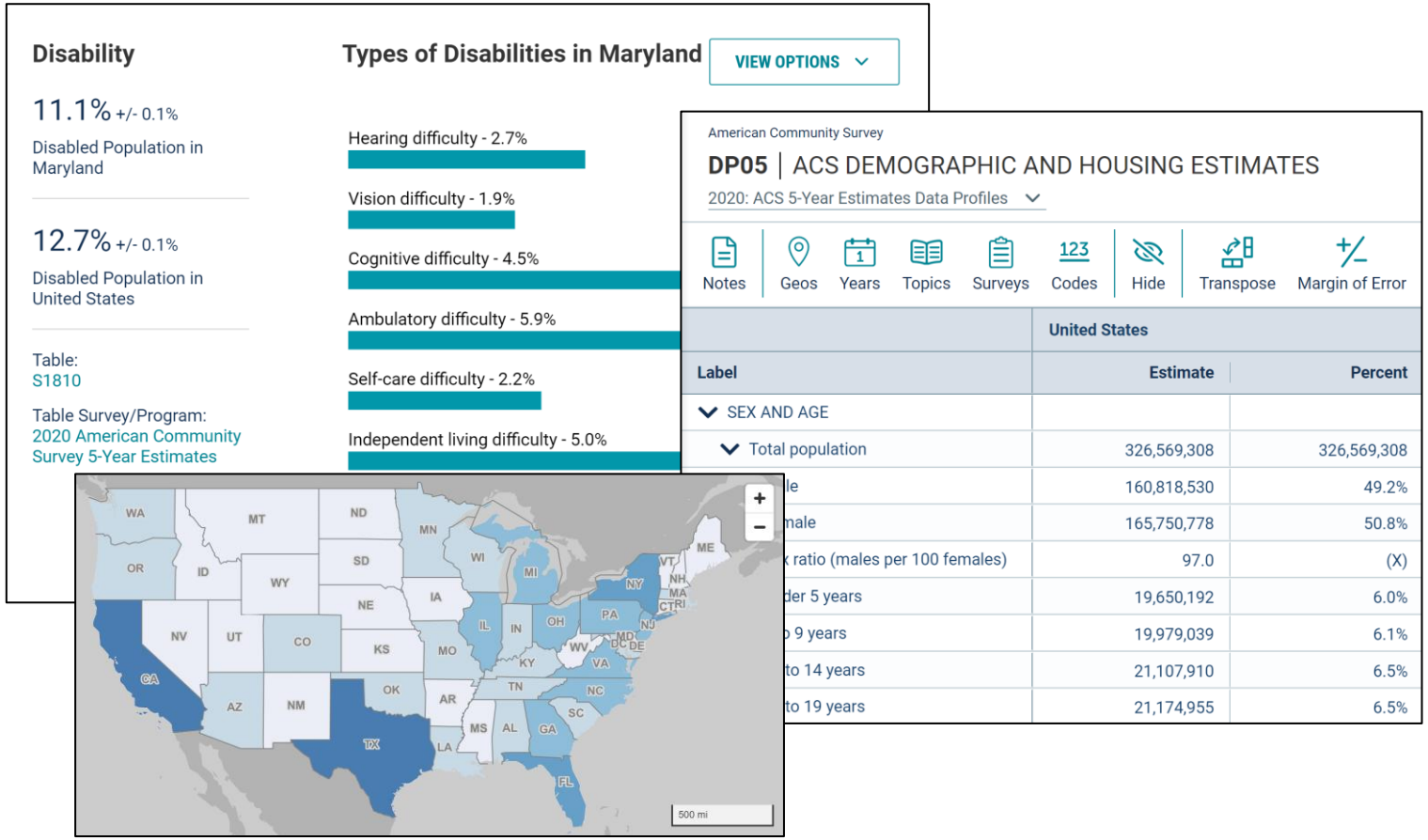
API Powers data.census.gov





data.census.gov

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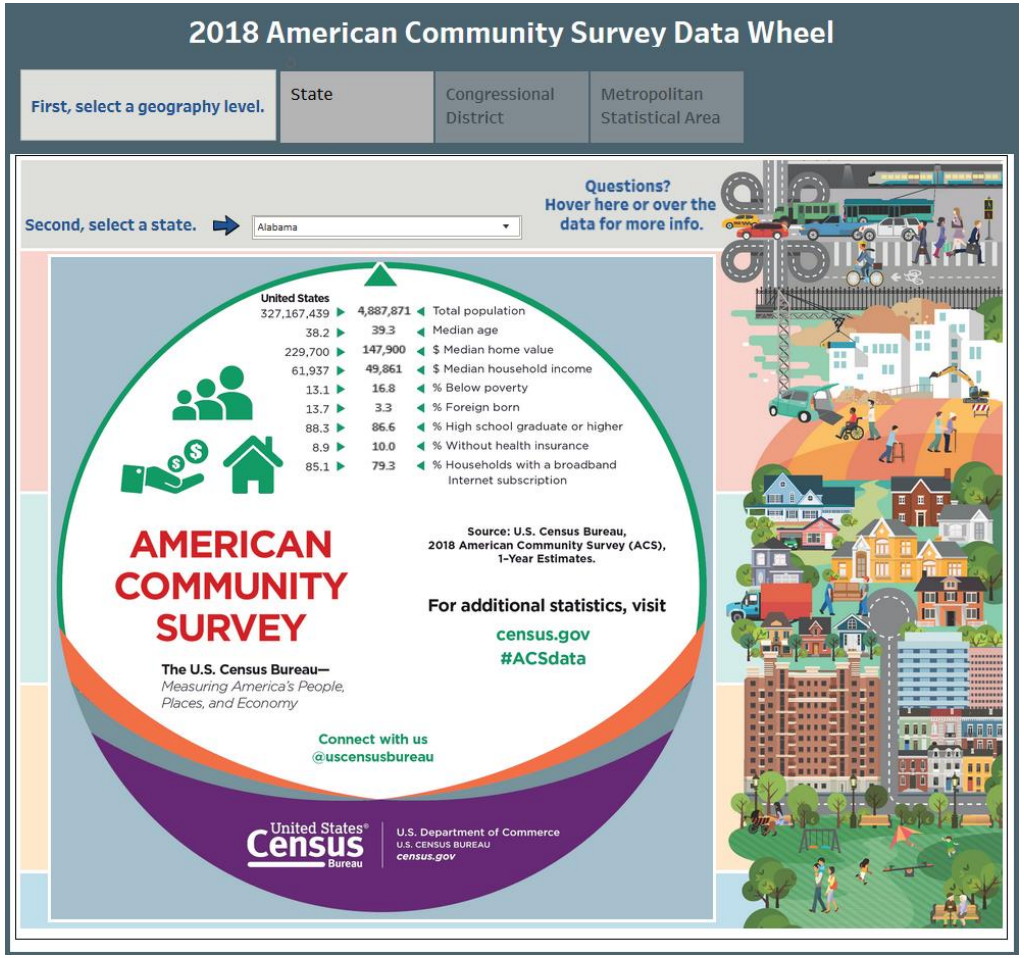
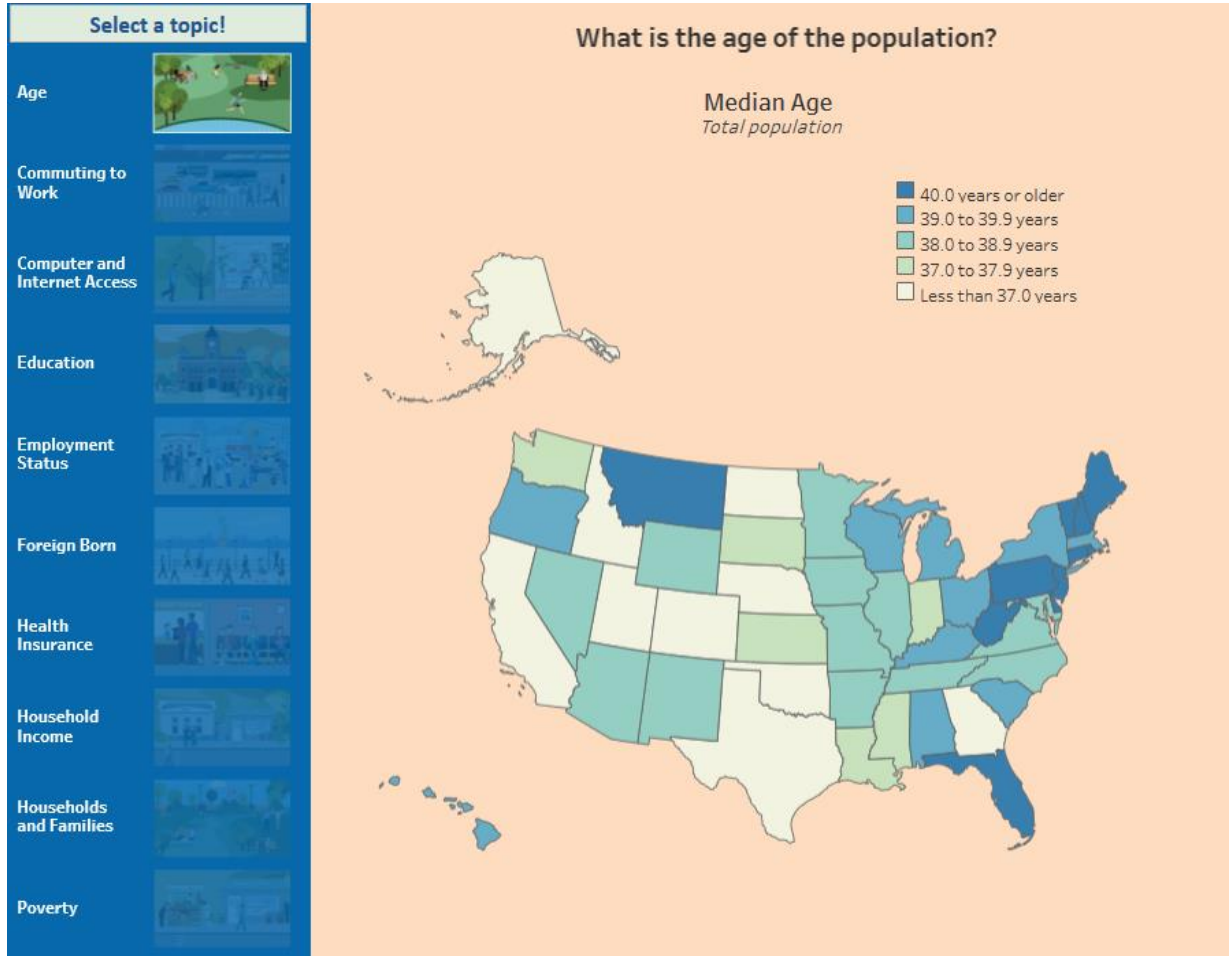
API Powers Data Visualizations





https://www.census.gov/library/visualizations.html

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Census Programs in the API

Demographic Programs

- American Community Survey
- Decennial Census
- Decennial Census Self Response Rates
- Health Insurance stats (from Current Population Survey, Survey of Income Program Participation, ACS, Small Area Health Insurance Estimates)
- International Database
- Population Estimates and Projections
- Poverty stats (from CPS, Small Area Income & Poverty Estimates)

Economic (Business) Programs

- Annual Survey of Entrepreneurs and Annual Survey of Manufacturers
- Annual Business Survey and Survey of Business Owners
- Business Dynamics Statistics
- County/ZIP Business Patterns and Nonemployer Stats
- Commodity Flow Survey
- Economic Census and Economic Indicators
- International Trade
- Longitudinal Employer-Household Dynamics (LEHD)
- Quarterly Workforce Indicators

Other Programs

- The Planning Database

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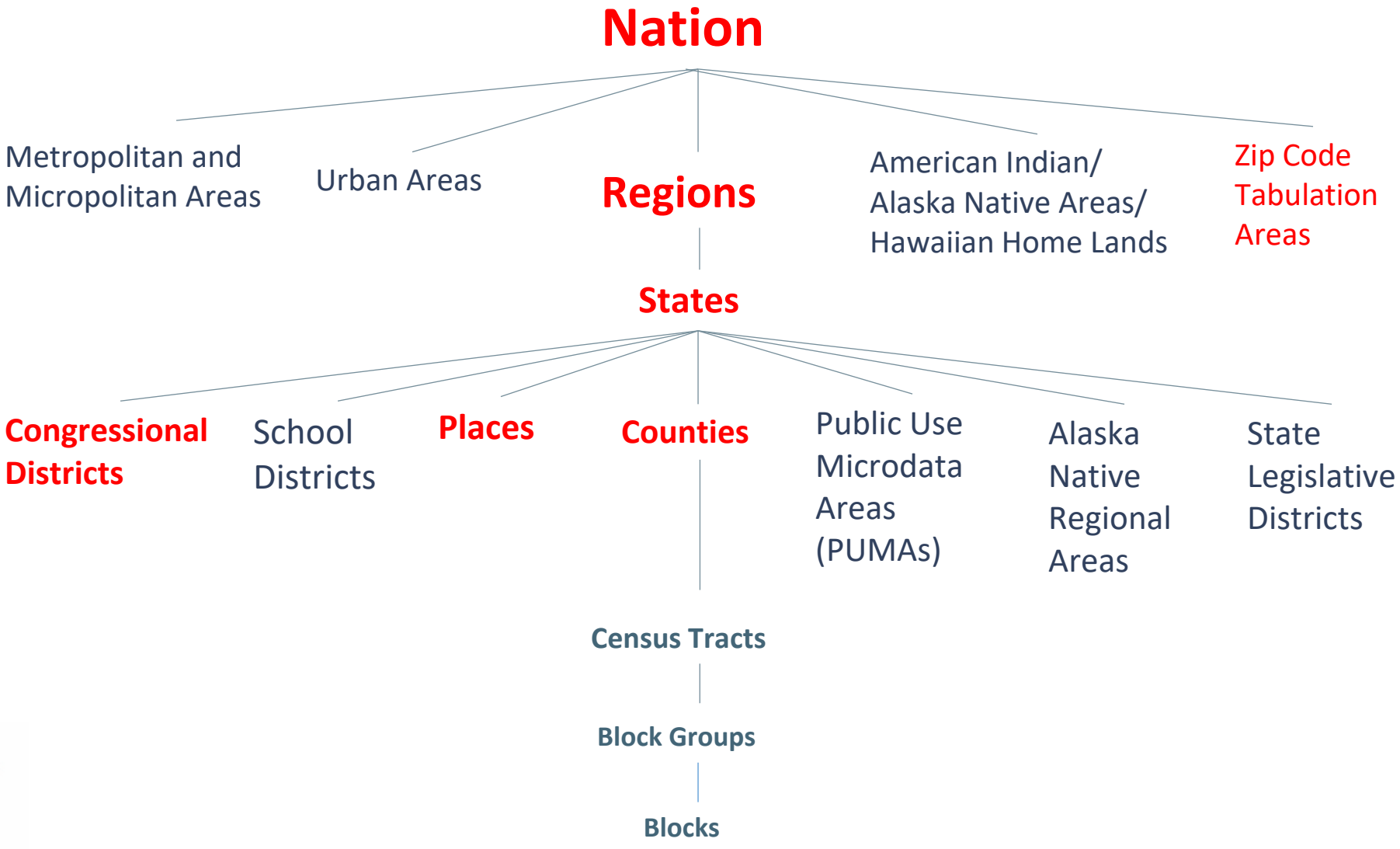
Available Geographic Areas



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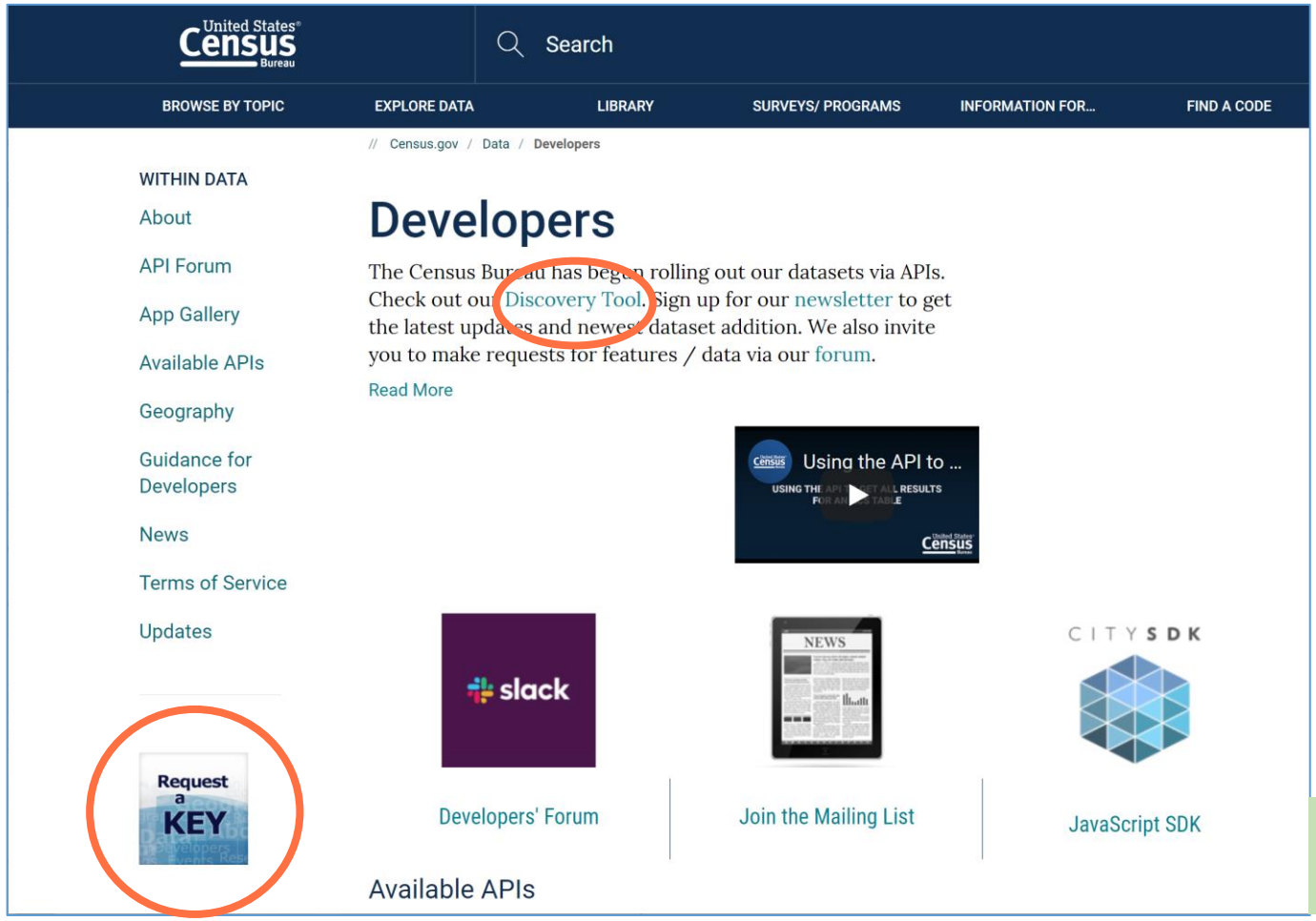
Developers Page



Accessing our API

- Request a Key
  - No charge
  - No throttling/limitations
- Browse the Discovery Tool
  - List of available datasets/endpoints (1,251 as of 8/29/2022)
  - Descriptions, etc.
- Review the Updates Periodically
  - Join the Mailing List
  - Check your Spam folder for alerts
- Share your Experiences
  - Developers Forum

Developers Home Page
https://www.census.gov/developers/

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Discovery Tool

Developers

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Census Data API Discovery Tool

MARCH 01, 2014

The Census Data API Discovery Tool provides a machine-readable dataset discovery service and is available in three formats:

- api.census.gov/data.html
- api.census.gov/data.xml
- api.census.gov/data.json

The content of api.census.gov/data.json is based largely on the Open Project Data

Census API: Datasets in /data/2017/acs/acs5/profile and its descendants

Title	Description	Vintage	Dataset Name	Geography List	Variable List	Group List	Tag List	Examples	Developer Documentation	API Base URL
ACS 5-Year Data Profiles	The American Community Survey (ACS) is an ongoing survey that provides data every year -- giving communities the current information they need to plan investments and services. The ACS covers a broad range of topics about social, economic, demographic, and housing characteristics of the U.S. population. The data profiles include the following geographies: nation, all states (including DC and Puerto Rico), all metropolitan areas, all congressional districts, all counties, all places and all tracts. Data profiles contain broad social, economic, housing, and demographic information. The data are presented as both counts and percentages. There are over 2,400 variables in this dataset.	2017	acs› acs5› profile	geographies	variables	groups	N/A	examples	documentation	https://api.census.gov/data/2017/acs/acs5/profile

Information Provided

- Dataset Description
- Variables Included, Changes, Variable Formats, and Notes
- Annotation Variables and Values
- Cross-Tab Variables
- Supported Geographies
- Example Calls
- Sample Use Cases
- Links to Program Technical Documentation

Links to FTP Servers

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Outline

- API Basics
- **Building an API Request**
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- Resources for Learning More

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How to Start Your Data Request

api.census.gov/data/2018/pep/charagegroups?get=POP,GEONAME,DATE_DESC&DATE_CODE=11&RACE=10&for=county:*&in=state:24

1

Requests always begin with:
https://api.census.gov/data

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Add the Dataset Name

api.census.gov/data**/2018/pep/charagegroups**?get=POP,GEONAME,DATE_DESC&DATE_CODE=11&RACE=10&for=county:*&in=state:24

2

Find the dataset name at: https://api.census.gov/data/2018.html

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Start Your Data Request

api.census.gov/data/2018/pep/charagegroups**?get=**POP,GEONAME,DATE_DESC&DATE_CODE=11&RACE=10&for=county:*&in=state:24

3

Always start your variable request with ?get=

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Add Your Variables

api.census.gov/data/2018/pep/charagegroups?get=**POP,GEONAME,DATE_DESC&DATE_CODE=11&RACE=10**&for=county:*&in=state:24

4

Find the variables you want here:

https://api.census.gov/data/2018/pep/charagegroups/variables.html

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Add Your Geography

api.census.gov/data/2018/pep/charagegroups?get=POP,GEONAME,DATE_DESC&DATE_CODE=11&RACE=10**&for=county:*&in=state:24**

5

Find available geographies here:

https://api.census.gov/data/2018/pep/charagegroups/geography.html

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Put it all Together

api.census.gov/data/2018/pep/charagegroups?get=POP,GEONAME,DATE_DESC&DATE_CODE=11&RACE=10&for=county:*&in=state:24

6

Returns data in json format

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Output From the API

API output in JSON format


```
[["POP","GEONAME","DATE_DESC","DATE_CODE","RACE","state","county"],
["1017","Allegany County, Maryland","7/1/2018 population estimate","11","10","24","1"],
["31385","Anne Arundel County, Maryland","7/1/2018 population estimate","11","10","24","3"],
["59617","Baltimore County, Maryland","7/1/2018 population estimate","11","10","24","5"],
["2731","Calvert County, Maryland","7/1/2018 population estimate","11","10","24","9"],
["535","Caroline County, Maryland","7/1/2018 population estimate","11","10","24","11"],
["4579","Carroll County, Maryland","7/1/2018 population estimate","11","10","24","13"],
["2085","Cecil County, Maryland","7/1/2018 population estimate","11","10","24","15"],
["7391","Charles County, Maryland","7/1/2018 population estimate","11","10","24","17"],
["490","Dorchester County, Maryland","7/1/2018 population estimate","11","10","24","19"],
```


api.census.gov/data/2018/pep/charagegroups?get=POP,GEONAME,DATE_DESC&DATE_CODE=11&RACE=10&for=county:*&in=state:24

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Outline

- API Basics
- Building an API Request
- **API Demo**
- Resources for Learning More

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Learning Objectives

At the end of this training, you will be able to:

- Find available datasets in the API
- Navigate the Discovery Tool
- Edit a sample URL to access the data you need
- View results in your web browser
- Save results as a .csv file and format it into a readable format

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Demo

1. **Single estimate, Single Geo (Population Estimates Program)**

   What was the Hispanic population in California as of 7/1/2019?

2. Multiple estimates, multiple geographies (American Community Survey)

   What was the median income and homeownership rate across all counties in California in 2020?

3. Entire table – Groups functionality (Decennial Census)

   How can I access table P2 from the 2020 Decennial Census Redistricting Data for all Metropolitan/Micropolitan Statistical Areas?

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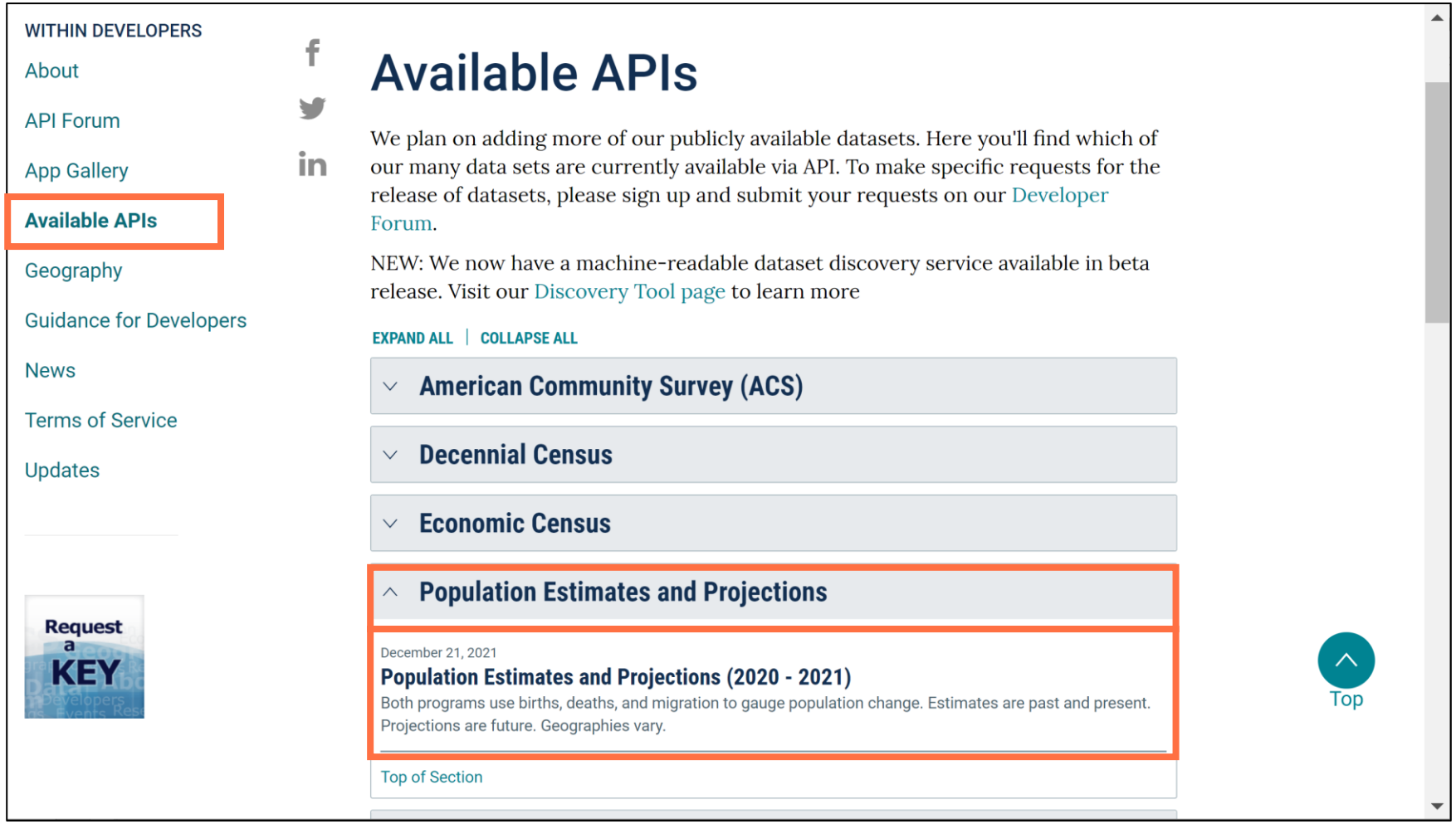
Single Variable and Geography: Hispanic Population in California

- Select Your Dataset On The Developers Page



census.gov/data/developers/data-sets.html

- **Choose Program** - Select **“Populations Estimates APIs”**

// Census.gov / Data / Developers / Available APIs / Population Estimates and Projections (2020 - 2021)

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Population Estimates and Projections (2020 - 2021)

DECEMBER 21, 2021

Population Estimates Program

Each year, the Census Bureau's Population Estimates Program uses current data on births, deaths, and migration to calculate population change since the most recent decennial census and produces a time series of estimates of population, demographic components of change, and housing units. The annual time series of estimates begins with the most recent decennial census data and extends to the vintage year.

December 21, 2021

Population Estimates APIs

Population estimates datasets currently available via API.

Population Projections

census.gov/data/developers/data-sets/popest-popproj.html

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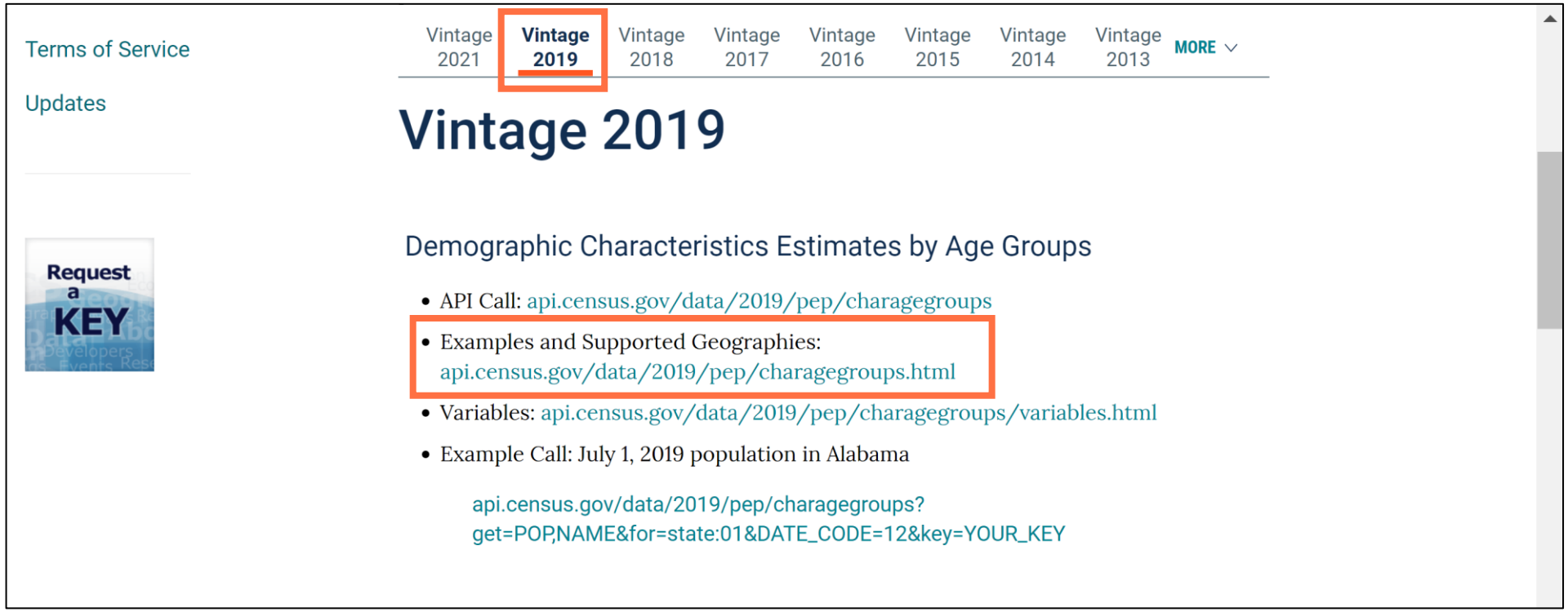
- **Choose Year –** Vintage 2019
- **Choose Type of Table** - Select **"Examples and Supported Geography"** under Demographic Characteristics Estimates by Age Groups



census.gov/data/developers/data-sets/popest-popproj/popest.html

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- Select **“examples”**

Census API: Datasets in /data/2019/pep/charagegroups and its descendants

Title	Description	Vintage	Dataset Name	Dataset Type	Geography List	Variable List	Group List	SortList	Examples	Developer Documentation	API Base URL
Population Estimates: Estimates by Age Group, Sex, Race, and Hispanic Origin	Annual Resident Population Estimates by Age Group, Sex, Race, and Hispanic Origin; for the United States, States, Counties; and for Puerto Rico and its Municipios: April 1, 2010 to July 1, 2019 // Source: U.S. Census Bureau, Population Division // The contents of this file are released on a rolling basis from December through June. // Note: 'In combination' means in combination with one or more other races. The sum of the five race-in-combination groups adds to more than the total population because individuals may report more than one race. Hispanic origin is considered an ethnicity, not a race. Hispanics may be of any race. Responses of 'Some Other Race' from the 2010 Census are modified. This results in differences between the population for specific race categories shown for the 2010 Census population in this file versus those in the original 2010 Census data. The estimates are based on the 2010 Census and reflect changes to the April 1, 2010 population due to the Count Question Resolution program and geographic program revisions. // Current data on births, deaths, and migration are used to calculate population change since the 2010 Census. An annual time series of estimates is produced, beginning with the census and extending to the vintage year. The vintage year (e.g., Vintage 2019) refers to the final year of the time series. The reference date for all estimates is July 1, unless otherwise specified. With each new issue of estimates, the entire estimates series is revised. Additional information, including historical and intercensal estimates, evaluation estimates, demographic analysis, research papers, and methodology is available on website: https://www.census.gov/programs-surveys/popest.html.	2019	pep› charagegroups	Aggregate	geographies	variables	groups	sorts	examples	documentation	http://api.census.gov/data/2019/pep/charagegroups
1 dataset											

https://api.census.gov/data/2019/pep/charagegroups.html

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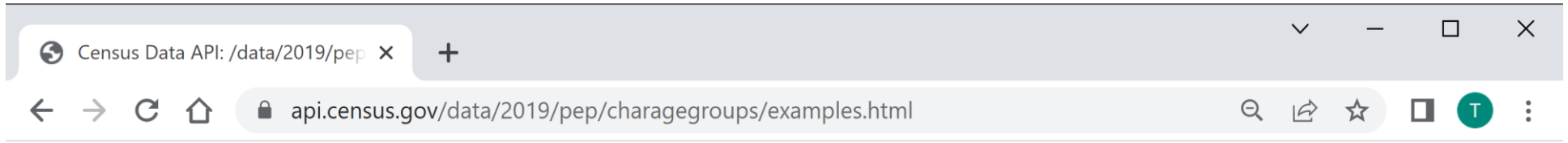
- **Choose Your Geography –** Explore the available geographic levels on the left, copy a sample URL, and open a new tab



Census API: Examples for /data/2019/pep/charagegroups

Geography Hierarchy	Geography Level	Example URL	Number
us	010	https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=us:*&key=YOUR_KEY_GOES_HERE	1
		https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=us:1&key=YOUR_KEY_GOES_HERE	2
state	040	https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=state:*&key=YOUR_KEY_GOES_HERE	3
		https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=state:01&key=YOUR_KEY_GOES_HERE	4
state› county	050	https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=county:*&key=YOUR_KEY_GOES_HERE	5
		https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=county:*&in=state:*&key=YOUR_KEY_GOES_HERE	6
		https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=county:001&in=state:01&key=YOUR_KEY_GOES_HERE	7
7 examples			

https://api.census.gov/data/2019/pep/charagegroups/examples.html

- &for=state:* gets data for all states
- &for=state:01 gets data for AL

Choose the example with the wildcard (*) to get data for all states so you can find the code for California

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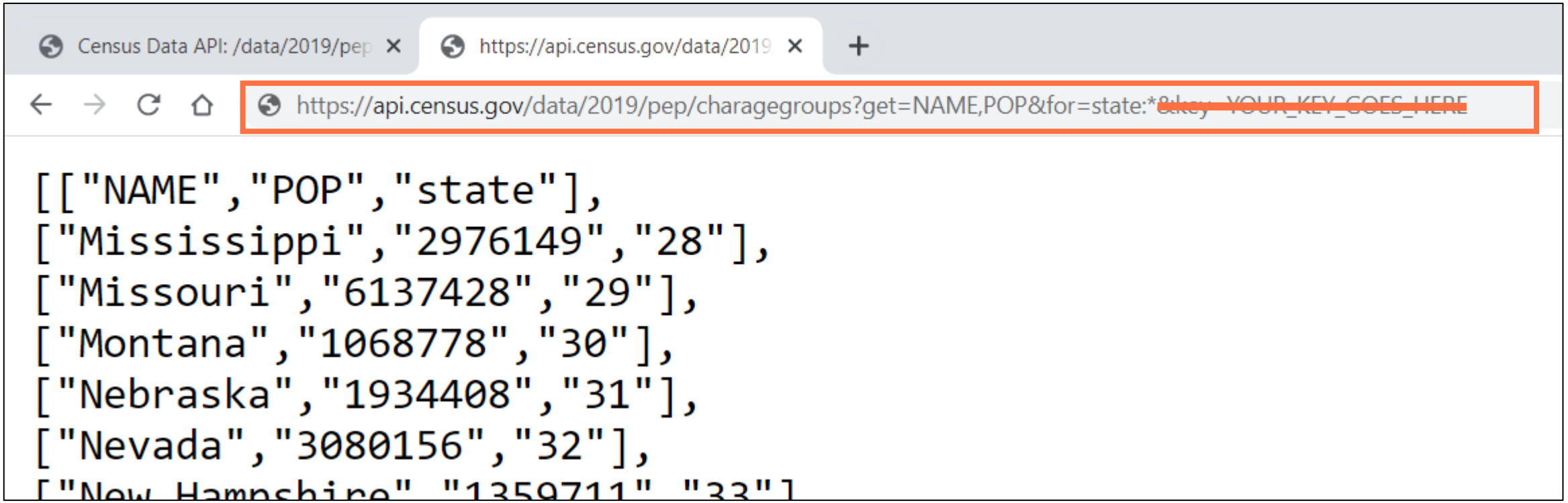
- **Paste A Sample URL Into The Address Bar**
- **Enter Your API Key Or Delete "&key=YOUR_KEY_GOES_HERE"**
- **Press Enter And View Results to find that the state code for CA is 06**



https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=state:*

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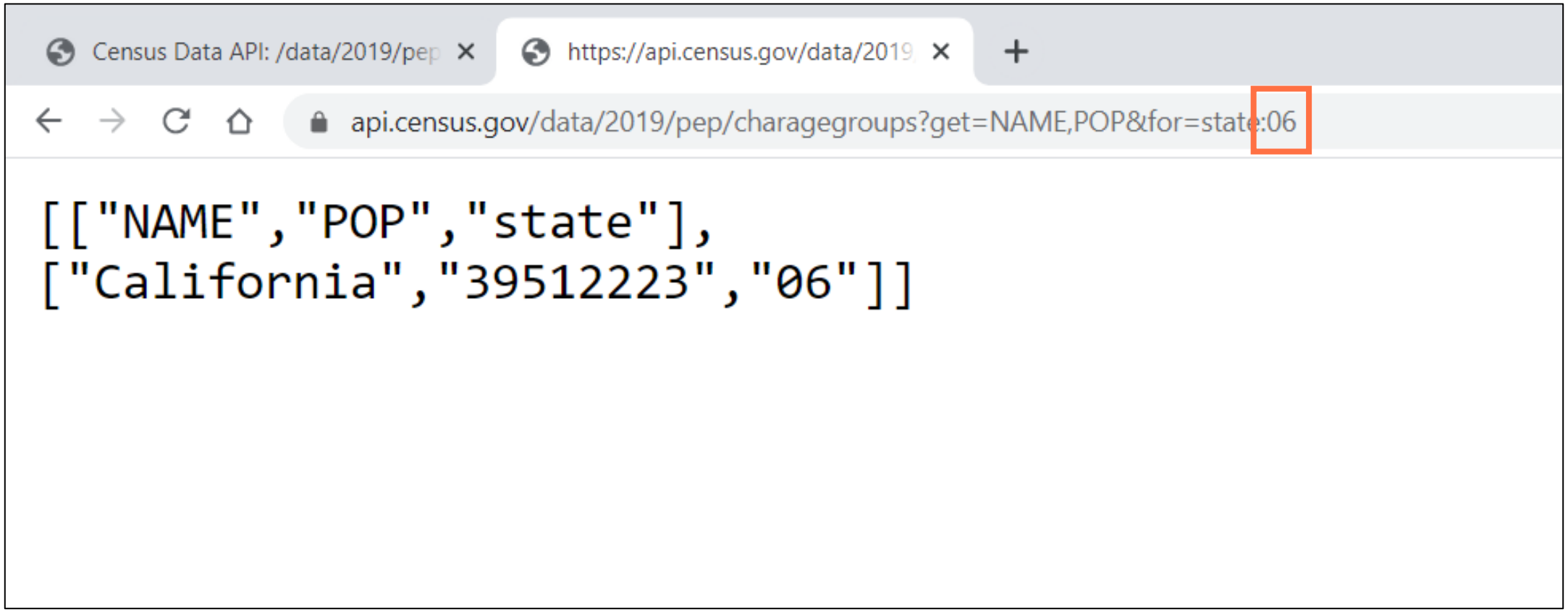
- **Edit Geography Selection To Retrieve Data for California –** In this example, replace the state wildcard (*) with state code **06** for CA



https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP&for=state:06

- **Find Your Variables:** Click **variables** from the dataset page

Census Data API: /data/2019/pep | https://api.census.gov/data/2019

api.census.gov/data/2019/pep/charagegroups.html

Title	Description	Vintage	Dataset Name	Dataset Type	Geography List	Variable List	Group List	Examples	Developer Documentation	API Base URL
Population Estimates: Estimates by Age Group, Sex, Race, and Hispanic Origin	Annual Resident Population Estimates by Age Group, Sex, Race, and Hispanic Origin; for the United States, States, Counties; and for Puerto Rico and its Municipios: April 1, 2010 to July 1, 2019 // Source: U.S. Census Bureau, Population Division // The contents of this file are released on a rolling basis from December through June. // Note: 'In combination' means in combination with one or more other races. The sum of the five race-in-combination groups adds to more than the total population because individuals may report more than one race. Hispanic origin is considered an ethnicity, not a race. Hispanics may be of any race. Responses of 'Some Other Race' from the 2010 Census are modified. This results in differences between the population for specific race categories shown for the 2010 Census population in this file versus those in the original 2010 Census data. The estimates are based on the 2010 Census and reflect changes to the April 1, 2010 population due to the Count Question Resolution program and geographic program revisions. // Current data on births, deaths, and migration are used to calculate population change since the 2010 Census. An annual time series of estimates is produced, beginning with the census and extending to the vintage year. The vintage year (e.g., Vintage 2019) refers to the final year of the time series. The reference date for all estimates is July 1, unless otherwise specified. With each new issue	2019	pep› charagegroups	Aggregate	geographies	variables	groups	examples	documentation	https://api.census.gov/data/2019/pep/charagegroups

https://api.census.gov/data/2019/pep/charagegroups.html

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- **Find your variables of interest (cont.):** Variables that say **"default displayed"** in the "Required" column are categorical. Click on the variable name **HISP** to discover that including **&HISP=2** in the API call will provide data for the Hispanic population

Census Data API: /data/2019/pep | https://api.census.gov/data/2019

api.census.gov/data/2019/pep/charagegroups/variables.html

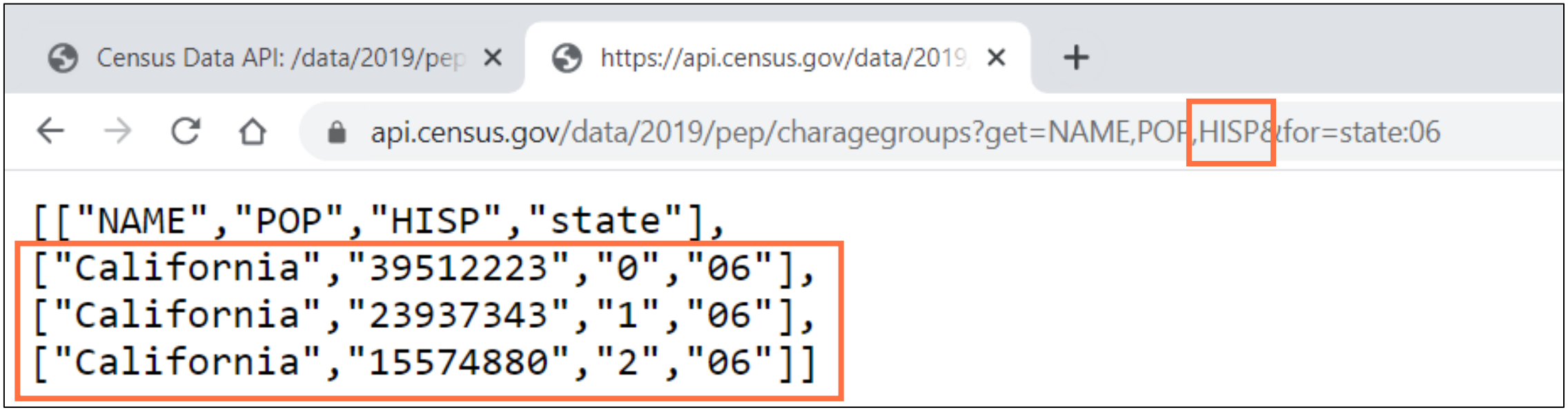
Census Data API: Variables in /data/2019/pep/charagegroups/variables

Name	Label	Concept	Required	Attributes	Limit	Predicate Type	Group
AGEGROUP	Age Group		default displayed		0	int	N/A
COUNTY	Geography		not required		0	*(not a predicate)*	N/A
DATE_CODE	Estimate Date		default displayed		0	int	N/A
DATE_DESC	Description of DATE values		not required		0	string	N/A
for	Census API FIPS 'for' clause	Census API Geography Specification	predicate-only		0	fips-for	N/A
GEO_ID	Geography		not required	NAME	0	string	N/A
GEOCOMP	GEO_ID Component		default displayed		0	string	N/A
HISP	Hispanic Origin		default displayed		0	int	N/A
		Census API Geography					


```
{
  "name": "HISP",
  "label": "Hispanic Origin",
  "required": "default displayed",
  "predicateType": "int",
  "group": "N/A",
  "limit": 0,
  "values": {
    "item": {
      "2": "Hispanic",
      "1": "Non Hispanic",
      "0": "Both Hispanic origins"
    }
  }
}
```


https://api.census.gov/data/2019/pep/charagegroups/variables.html

- **Update Query With Variable Of Interest: HISP**
- **View Results –** By default, you get data for all three values:
  - Total population = 0
  - Not Hispanic = 1
  - Hispanic =2



https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP,HISP&for=state:06

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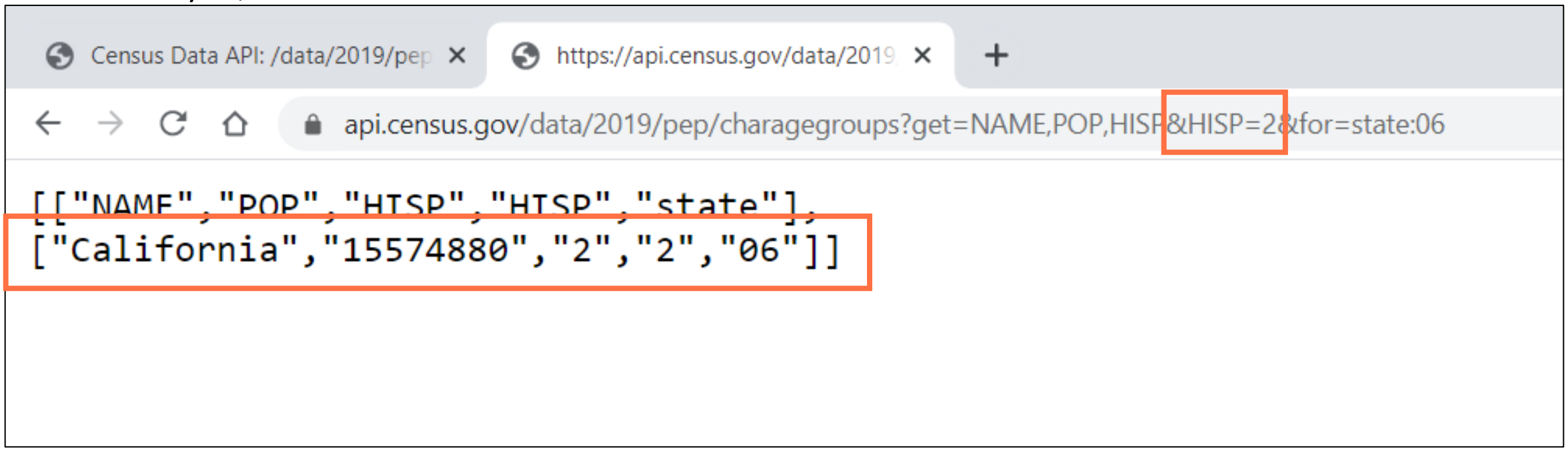
- **Add &HISP=2 to the URL to get restrict results to the Hispanic population**
- **View Results –** There were 15,574,880 Hispanic or Latino people living in California as of July 1, 2019



https://api.census.gov/data/2019/pep/charagegroups?get=NAME,POP,HISP&HISP=2&for=state:06

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API Variable Naming Convention: ACS and Decennial Census

The ACS and Decennial Census follow a code-based variable naming convention:

Example: DP04_0046PE for percent owner-occupied housing units


```
[["NAME","DP04_0046PE","state","county"],
["Alameda County, California","53.6","06","001"],
["Alpine County, California","80.9","06","003"],
["Butte County, California","59.5","06","007"],
["Colusa County, California","63.5","06","011"],
["Contra Costa County, California","66.8","06","013"],
```


https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP03_0046PE&for=county:*&in=state:06

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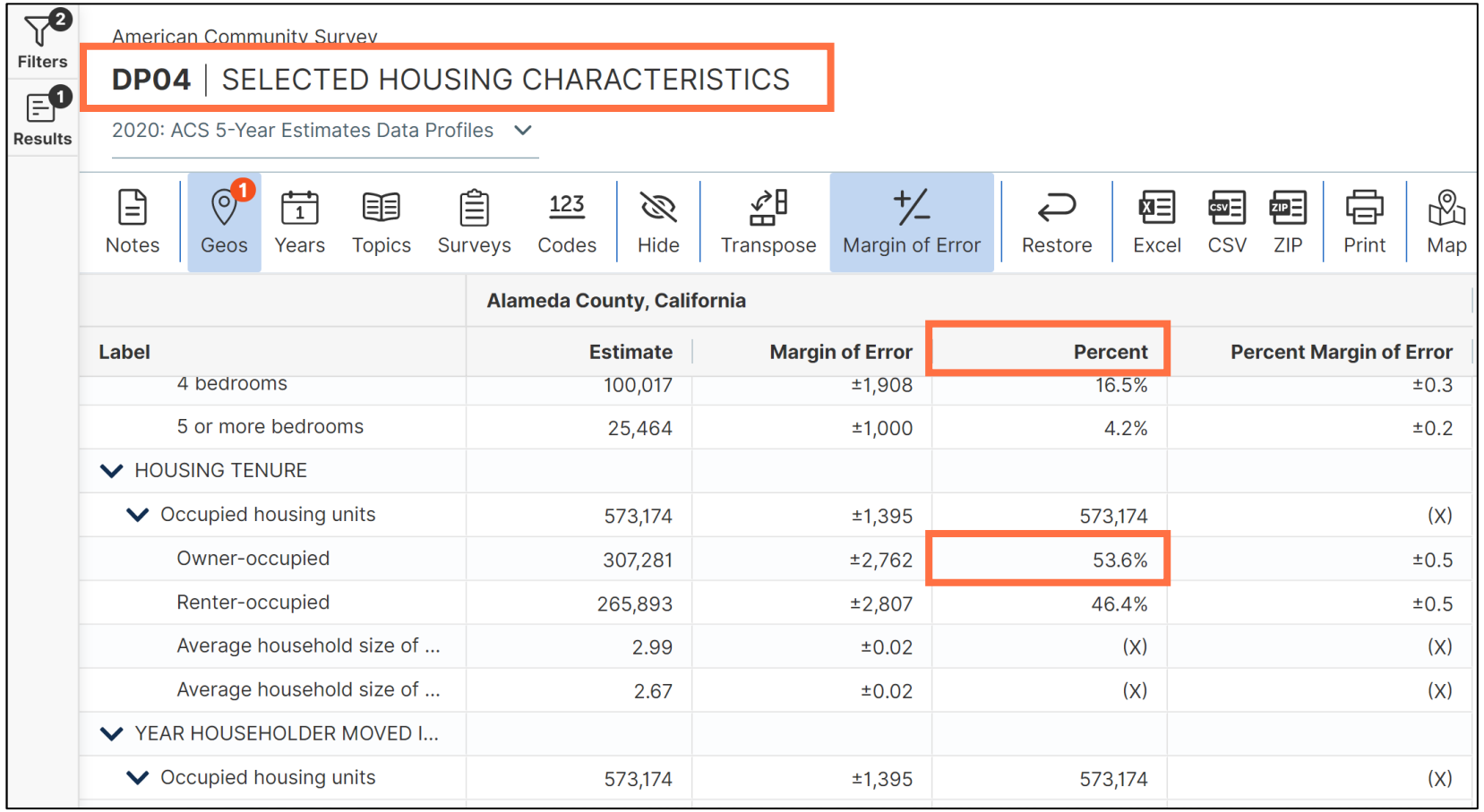
Visualizing ACS Variable Names: DP04_0046PE

DP04 = Table ID

0046 = Row of data

PE = Percent estimate



	Alameda County, California			
Label	Estimate	Margin of Error	Percent	Percent Margin of Error
4 bedrooms	100,017	±1,908	16.5%	±0.3
5 or more bedrooms	25,464	±1,000	4.2%	±0.2
HOUSING TENURE				
Occupied housing units	573,174	±1,395	573,174	(X)
Owner-occupied	307,281	±2,762	53.6%	±0.5
Renter-occupied	265,893	±2,807	46.4%	±0.5
Average household size of ...	2.99	±0.02	(X)	(X)
Average household size of ...	2.67	±0.02	(X)	(X)
YEAR HOUSEHOLDER MOVED I...				
Occupied housing units	573,174	±1,395	573,174	(X)

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https://data.census.gov/cedsci/table?q=DP04%20Alameda%20County,%20CA&tid=ACSDP5Y2020.DP04

Understanding Common ACS API Variables

Variables Ending in…	Meaning	Example
E	Estimate	13821
M	Margin of Error	519
PE	Percent Estimate	10.1
PM	Percent Margin of Error	1.2
EA	Annotation of Estimate	(X)
MA	Annotation of Margin of Error	*****
PEA	Annotation of Percent Estimate	(X)
PMA	Annotation of Percent Margin of Error	*****
SS	Statistical Significance	*
Other Variables	**Meaning**	**Example**
GEO_ID	Geography ID	0400000US24
NAME	Geography Name	Maryland

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Annual ACS Datasets

API Dataset	Table ID Begins with	API Call Begins with
Detailed Tables	B or C	api.census.gov/data/2020/acs/acs1
Data Profiles	DP	api.census.gov/data/2020/acs/acs1/profile
Comparison Profiles	CP	api.census.gov/data/2020/acs/acs1/cprofile
Selected Population Profiles	S0201	api.census.gov/data/2020/acs/acs1/spp
Subject Tables	S	api.census.gov/data/2020/acs/acs1/subject

census.gov/programs-surveys/acs/data/data-tables/table-ids-explained.html

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Demo

1. Single estimate, Single Geo (Population Estimates Program)

   What was the Hispanic population in California as of 7/1/2019?

2. **Multiple estimates, multiple geographies (American Community Survey)**

   What was the median income and homeownership rate across all counties in California in 2020?

3. Entire table – Groups functionality (Decennial Census)

   How can I access table P2 from the 2020 Decennial Census Redistricting Data for all Metropolitan/Micropolitan Statistical Areas?

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Single Variable and Geography: Median Income and Homeownership for all counties in California

- Select Your Dataset On The Developers Page

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Available APIs

We plan on adding more of our publicly available datasets. Here you'll find which of our many data sets are currently available via API. To make specific requests for the release of datasets, please sign up and submit your requests on our Developer Forum.

NEW: We now have a machine-readable dataset discovery service available in beta release. Visit our Discovery Tool page to learn more

EXPAND ALL | COLLAPSE ALL

American Community Survey (ACS)

November 30, 2021

American Community Survey 1-Year Data (2005-2020)

Areas with populations of 65,000+. Covers a broad range of topics about social, economic, demographic, and housing characteristics of the U.S. population.

October 15, 2020

American Community Survey 1-Year Supplemental Data (2014 - 2019)

High-level detailed tables tabulated on the 1-year microdata for geographies with populations of 20,000 or more.

September 15, 2016

American Community Survey 3-Year Data (2007-2013)

Areas with populations of 20,000+. Covers a broad range of topics about social, economic, demographic, and housing characteristics of the U.S. population.

March 17, 2022

American Community Survey 5-Year Data (2009-2020)

Data available down to the block-group level. Covers a range of topics about social, economic, demographic, and housing characteristics of the U.S. population.

United States Census Bureau

census.gov/data/developers/data-sets.html

- **Confirm Year** – Verify Year: 2020

2020 2019 2018 2017 2016 2015 2014 2013 MORE

2020

Variable Changes

Variables, and the values they represent, may change over time. Use this 2020 5YR API Changes document as a guide for which variables have changed from the prior year for 2020 ACS 5-Year Detailed Tables, Data Profiles and Subject Tables. See below for a description of each change type.

- No Change - The variable has not changed from the prior year (most variables).
- Updated - That variable has changed from the prior year and a matching variable for the current year has been found.
- No Match - The variable has changed from the prior year and no matching or comparable variable has been found.

For table changes, check the ACS product changes webpage for source table changes.

2020 Table & Geography Changes

Learn more about changes to tables and geography for each American Community Survey data release.

Top

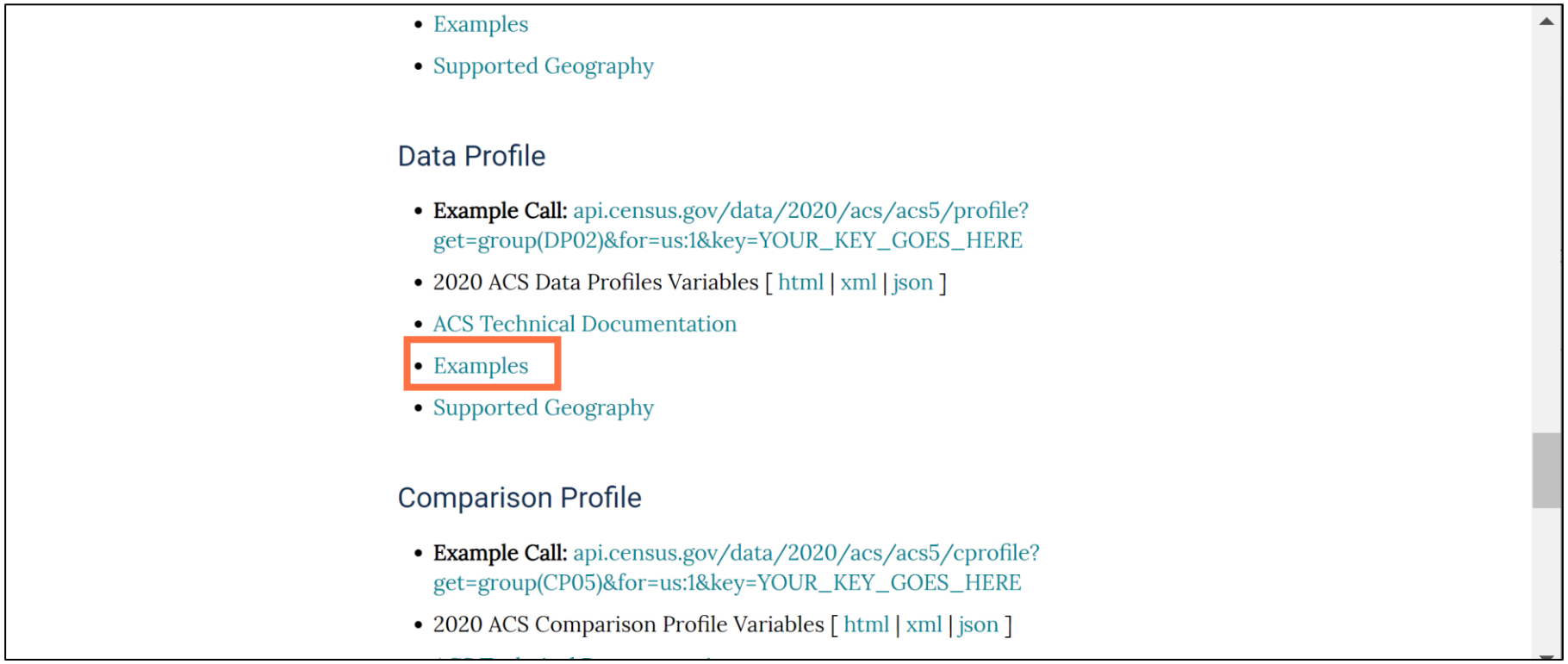
Geography Note

The 2016-2020 ACS 5-year data products that report data related to Congressional Districts are based on the 116th Congress. The Census Bureau does not collect congressional district boundaries from the states during the congressional session that

census.gov/data/developers/data-sets/acs-5year.html

United States Census Bureau

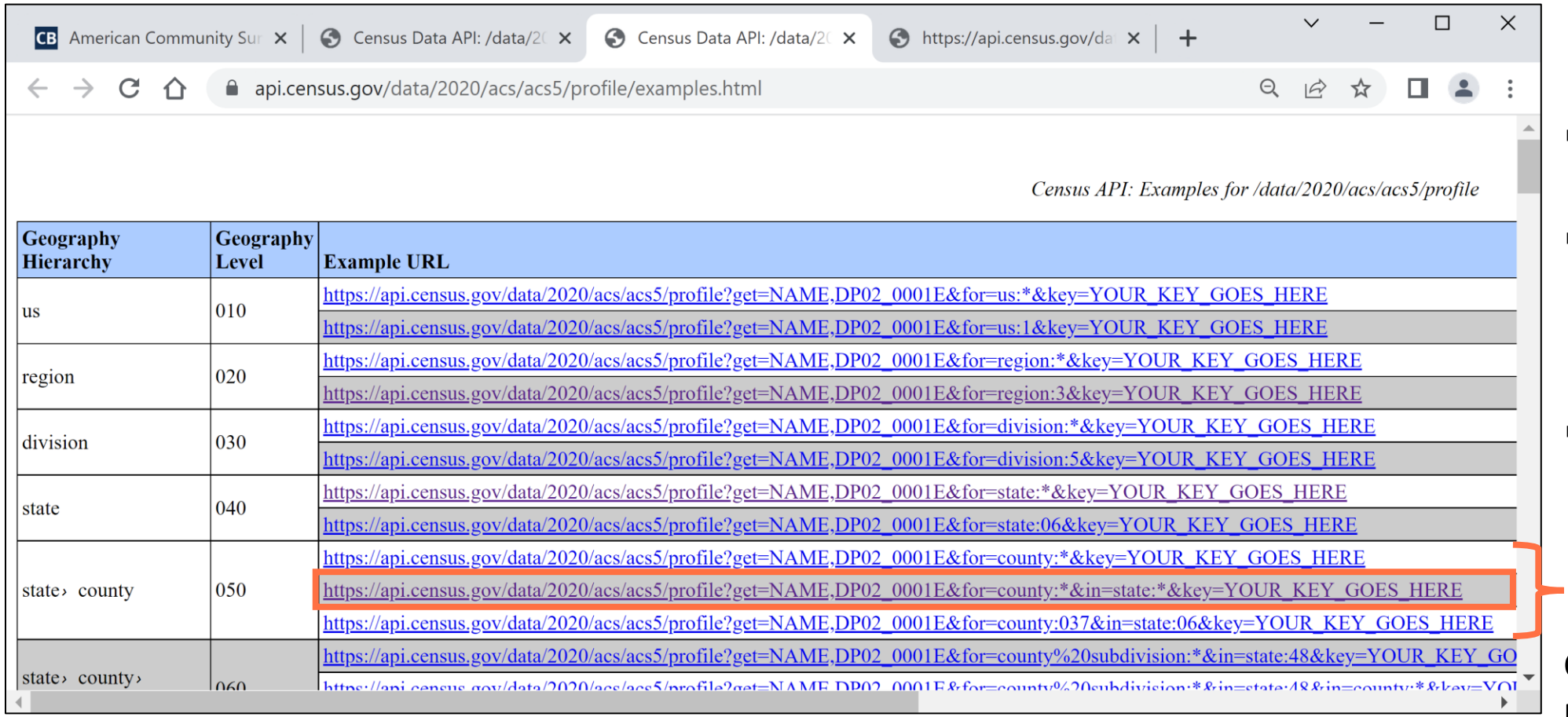
- **Choose Type of Table** – Click **"examples"** under Data Profiles. This will open the examples section of the API Discovery Tool for this dataset in a new tab.



census.gov/data/developers/data-sets/acs-5year.html

United States Census Bureau

- **Choose Your Geography –** Explore the available geographic levels on the left, copy a sample URL, and open a new tab



Census API: Examples for /data/2020/acs/acs5/profile

Geography Hierarchy	Geography Level	Example URL
us	010	https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=us:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=us:1&key=YOUR_KEY_GOES_HERE
region	020	https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=region:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=region:3&key=YOUR_KEY_GOES_HERE
division	030	https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=division:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=division:5&key=YOUR_KEY_GOES_HERE
state	040	https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=state:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=state:06&key=YOUR_KEY_GOES_HERE
state› county	050	https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=county:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=county:*&in=state:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=county:037&in=state:06&key=YOUR_KEY_GOES_HERE
state› county›	060	https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=county%20subdivision:*&in=state:48&key=YOUR_KEY_GO

https://api.census.gov/data/2020/acs/acs5/profile/examples.html

- &for=county:* gets data for all counties
- &for=county:*&in=state:* gets data for all counties in all states
- &for=county:037&in=state:06 gets data for Los Angeles County, CA

Copy the geography portion of the second county example and so you can edit the state code to California

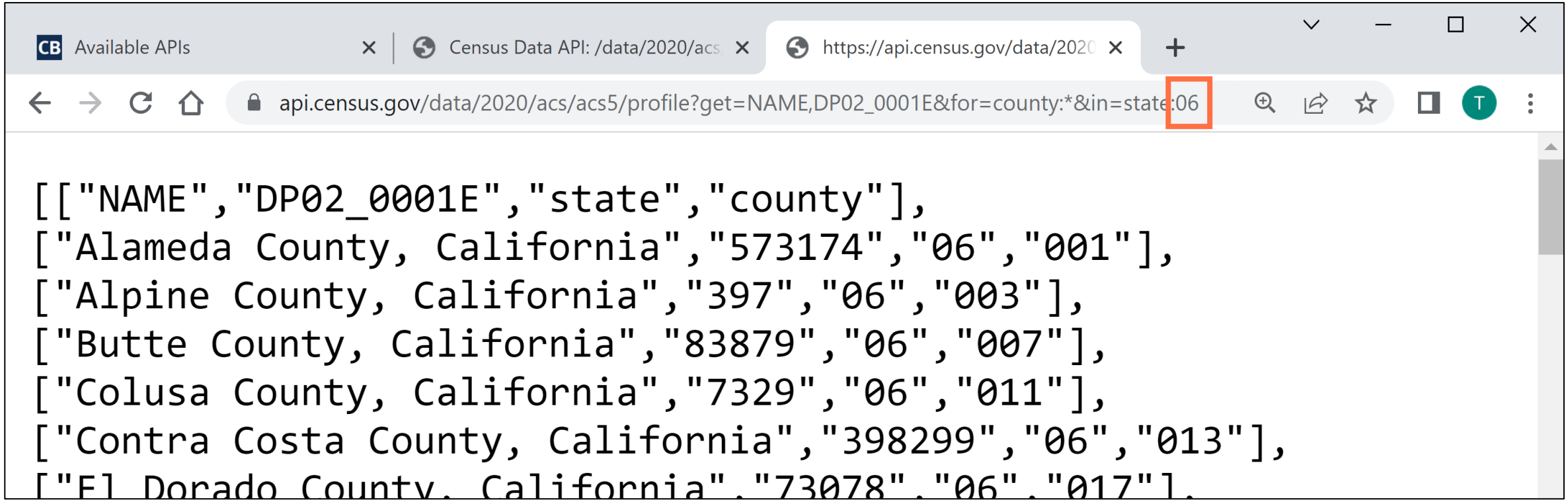
United States Census Bureau

- **Paste A Sample URL Into The Address Bar**
- **Enter Your API Key Or Delete "&key=YOUR_KEY_GOES_HERE"**
- **Press Enter And View Results**

https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=county:*&in=state:*

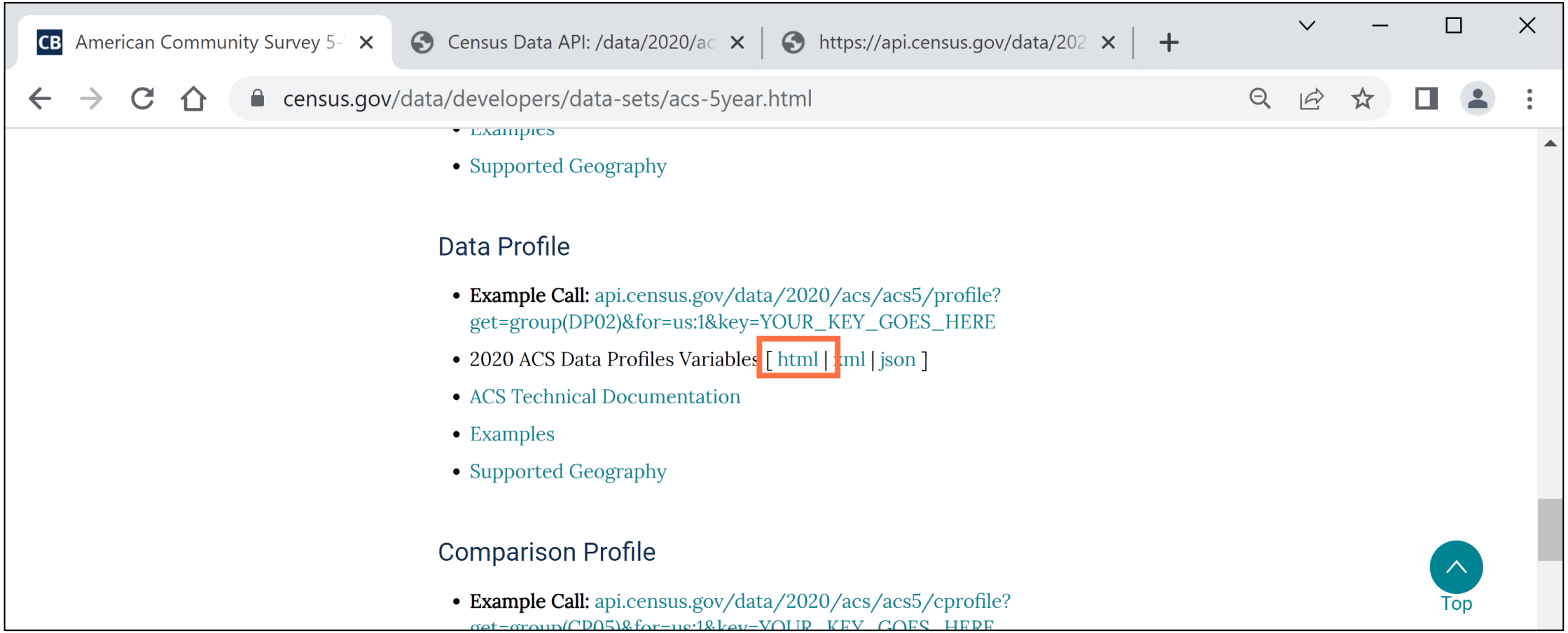
United States Census Bureau

- **Edit Geography Selection To Retrieve Data for all Counties in California –** In this example, replace the state wildcard (*) with state code **06** for CA



https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP02_0001E&for=county:*&in=state:06

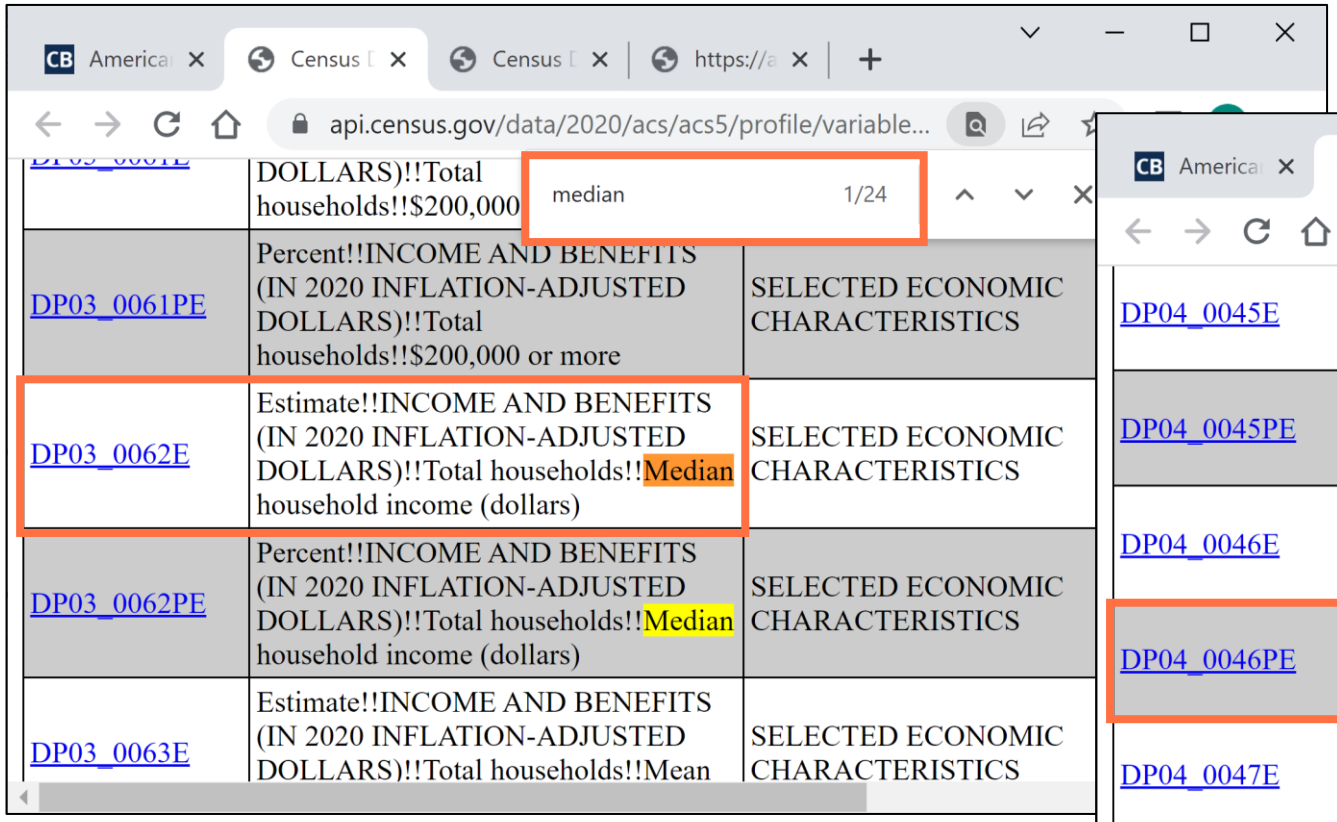
- **Find Your Variables:** Click the **html** link for "2020 ACS Data Profile Variables" on the ACS 5-Year Available APIs page



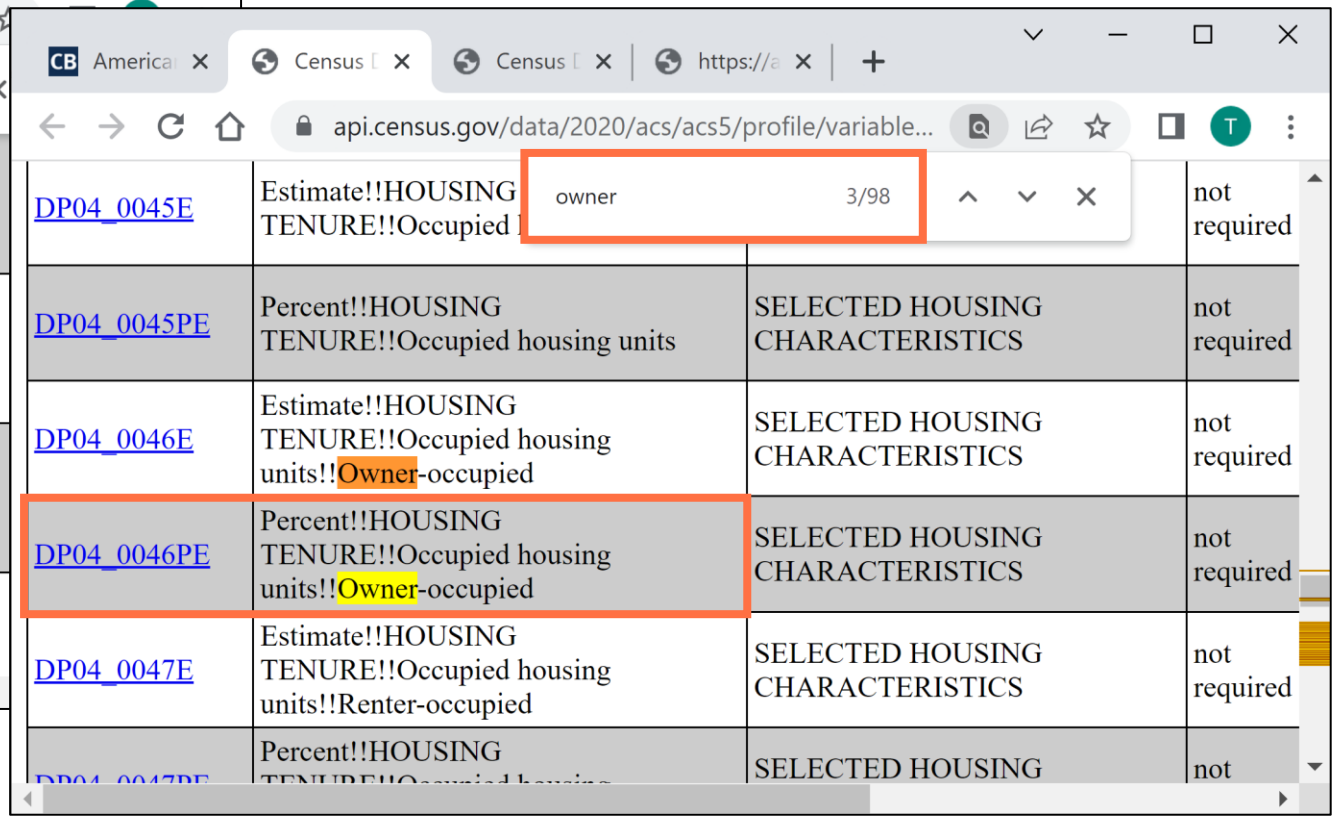
census.gov/data/developers/data-sets/acs-5year.html

United States Census Bureau

- **Find Your Variables:** Search the webpage **(CTRL+F)** to find your variables of interest, such as **"median"** to find **DP03_0062E**, median household income and "**owner**" to find **DP04_0046PE**, percent owner-occupied housing unites



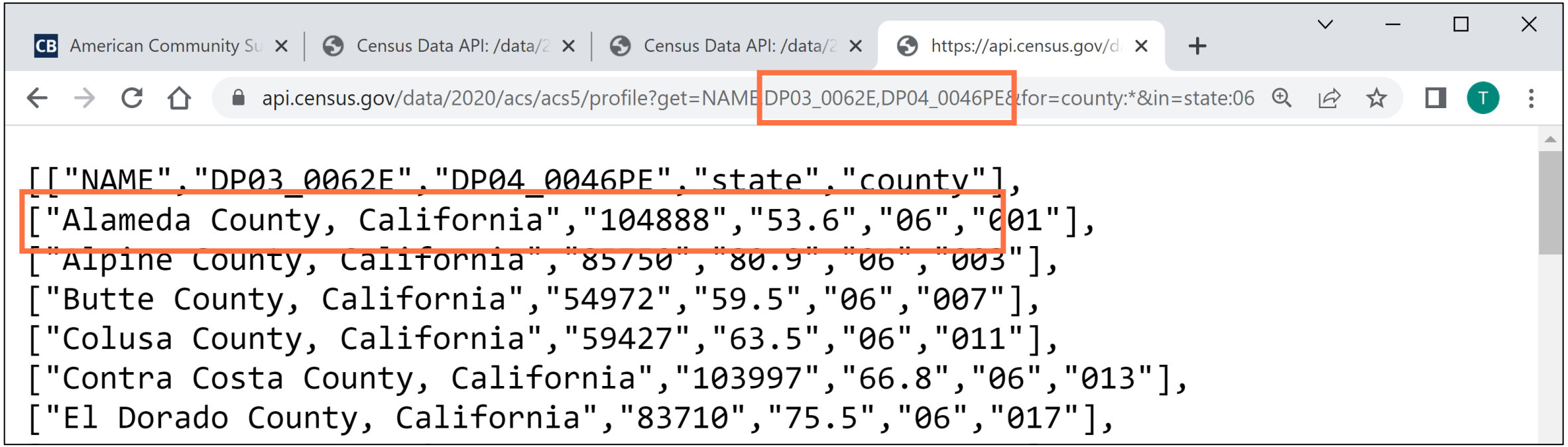
	DOLLARS)!!Total households!!$200,000	
DP03_0061PE	Percent!!INCOME AND BENEFITS (IN 2020 INFLATION-ADJUSTED DOLLARS)!!Total households!!$200,000 or more	SELECTED ECONOMIC CHARACTERISTICS
DP03_0062E	Estimate!!INCOME AND BENEFITS (IN 2020 INFLATION-ADJUSTED DOLLARS)!!Total households!!Median household income (dollars)	SELECTED ECONOMIC CHARACTERISTICS
DP03_0062PE	Percent!!INCOME AND BENEFITS (IN 2020 INFLATION-ADJUSTED DOLLARS)!!Total households!!Median household income (dollars)	SELECTED ECONOMIC CHARACTERISTICS
DP03_0063E	Estimate!!INCOME AND BENEFITS (IN 2020 INFLATION-ADJUSTED DOLLARS)!!Total households!!Mean	SELECTED ECONOMIC CHARACTERISTICS



DP04_0045E	Estimate!!HOUSING TENURE!!Occupied		not required
DP04_0045PE	Percent!!HOUSING TENURE!!Occupied housing units	SELECTED HOUSING CHARACTERISTICS	not required
DP04_0046E	Estimate!!HOUSING TENURE!!Occupied housing units!!Owner-occupied	SELECTED HOUSING CHARACTERISTICS	not required
DP04_0046PE	Percent!!HOUSING TENURE!!Occupied housing units!!Owner-occupied	SELECTED HOUSING CHARACTERISTICS	not required
DP04_0047E	Estimate!!HOUSING TENURE!!Occupied housing units!!Renter-occupied	SELECTED HOUSING CHARACTERISTICS	not required
DP04_0047PE	Percent!!HOUSING TENURE!!Occupied housing	SELECTED HOUSING	not

https://api.census.gov/data/2020/acs/acs5/profile/variables.html

- **Update Query With Variables Of Interest: DP03_0062E, DP04_0046PE**
- **View Results –** See median household income and percent owner-occupied housing units in CA counties. In Alameda County, median income was $104,888 and 53.6% of housing units were owner occupied.



https://api.census.gov/data/2020/acs/acs5/profile?get=NAME,DP03_0062E,DP04_0046PE&for=county:*&in=state:06

United States Census Bureau

Demo

1. Single estimate, Single Geo (Population Estimates Program)

   What was the Hispanic population in California as of 7/1/2019?

2. Multiple estimates, multiple geographies (American Community Survey)

   What was the median income and homeownership rate across all counties in California in 2020?

3. **Entire table – Groups functionality (Decennial Census)**

   How can I access table P2 from the 2020 Decennial Census Redistricting Data for all Metropolitan/Micropolitan Statistical Areas?

United States Census Bureau

Groups Functionality – Get All Results for a Table

- Add **group([insert table id])** as a variable in the query
- Pull results for more than 50 variables in a single call

Detailed Tables

- **Example Call:** api.census.gov/data/2018/acs/acs1?get=NAME,group(B01001)&for=us:1&key=YOUR_KEY_GOES_HERE
- 2018 ACS Detailed Tables Variables [html | xml | json]
- ACS Technical Documentation
- Examples and Supported Geography

Subject Tables

- **Example Call:** api.census.gov/data/2018/acs/acs1/subject?get=NAME,group(S0101)&for=us:1&key=YOUR_KEY_GOES_HERE
- 2018 ACS Subject Tables Variables [html | xml | json]
- ACS Technical Documentation
- Examples and Supported Geography

Data Profiles

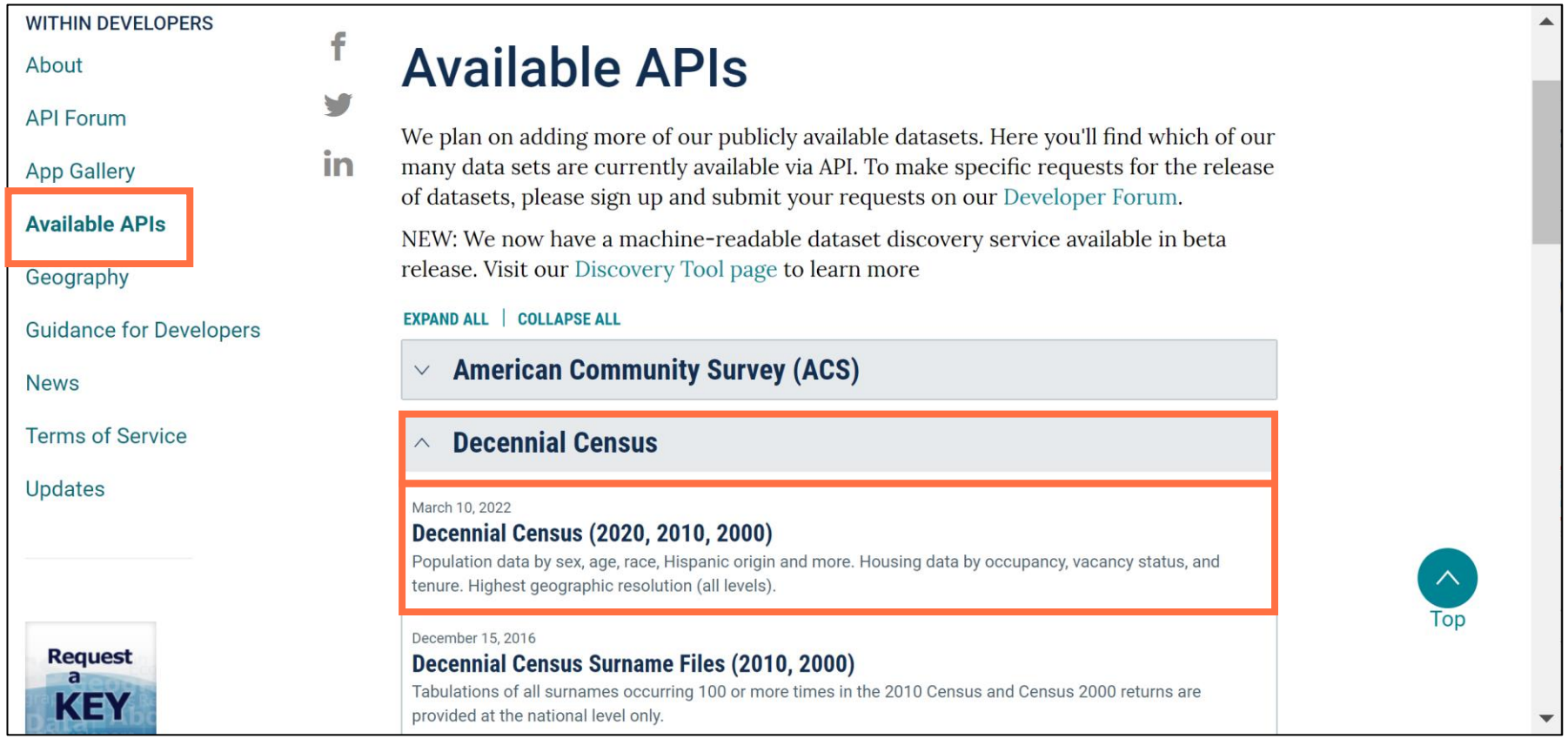
- **Example Call:** api.census.gov/data/2018/acs/acs1/profile?get=group(DP02)&for=us:1&key=YOUR_KEY_GOES_HERE
- 2018 ACS Data Profiles Variables [html | xml | json]
- ACS Technical Documentation
- Examples and Supported Geography

census.gov/data/developers/data-sets/acs-1year.2018.html

United States Census Bureau

Results for An Entire Table: P2 for All Metro/Micro Areas

- Select Your Dataset On The Developers Page



census.gov/data/developers.html

United States Census Bureau

- **Confirm Year** – Verify Year: 2020

census.gov/data/developers/data-sets/decennial-census.html

United States Census Bureau

- **Choose Type of Table** – Click **"2020 PL Examples and Supported Geography"** under Redistricting Data (PL 94-171)

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2020

For more information on the 2020 Decennial data, please visit this Page or HERE.

Redistricting Data (PL 94-171)

- **API Call:** api.census.gov/data/2020/dec/pl
- **Example for data that has an assigned key inserted:**
  api.census.gov/data/2020/dec/pl?get=NAME&for=state:*&key=[user key]
- 2020 PL API Variables [html | xml | json]
- 2020 PL Technical Documentation
- 2020 PL Examples and Supported Geography

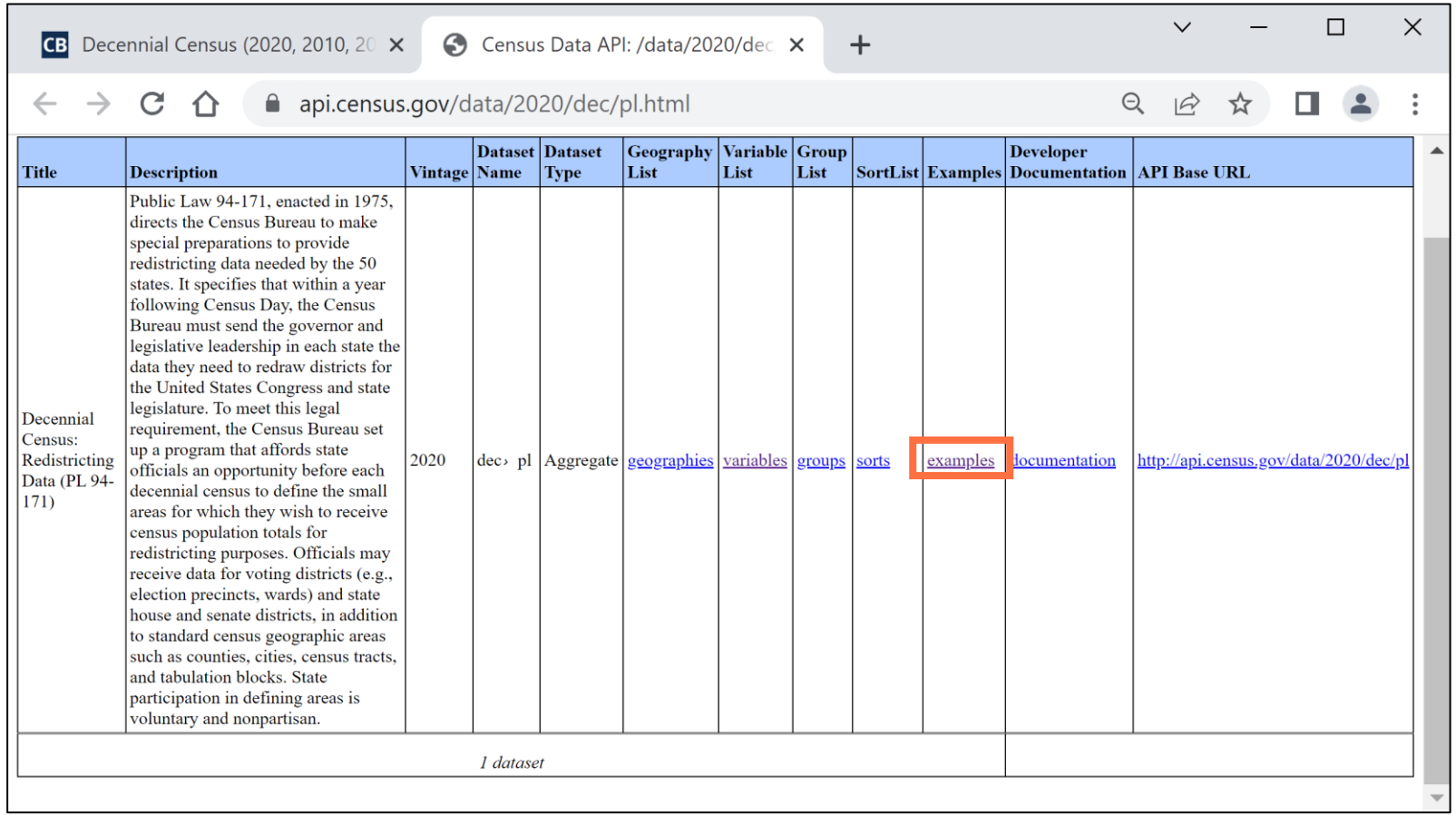
Decennial Post-Enumeration Survey

- **API Call:** api.census.gov/data/2020/dec/pes
- **Example for data that has an assigned key inserted:**
  api.census.gov/data/2020/dec/pes?get=NAME&for=us:*&key=[user key]
- 2020 PES API Variables [html | xml | json]

census.gov/data/developers/data-sets/decennial-census.html

United States Census Bureau

- **Choose "examples"** – Click the "examples" link

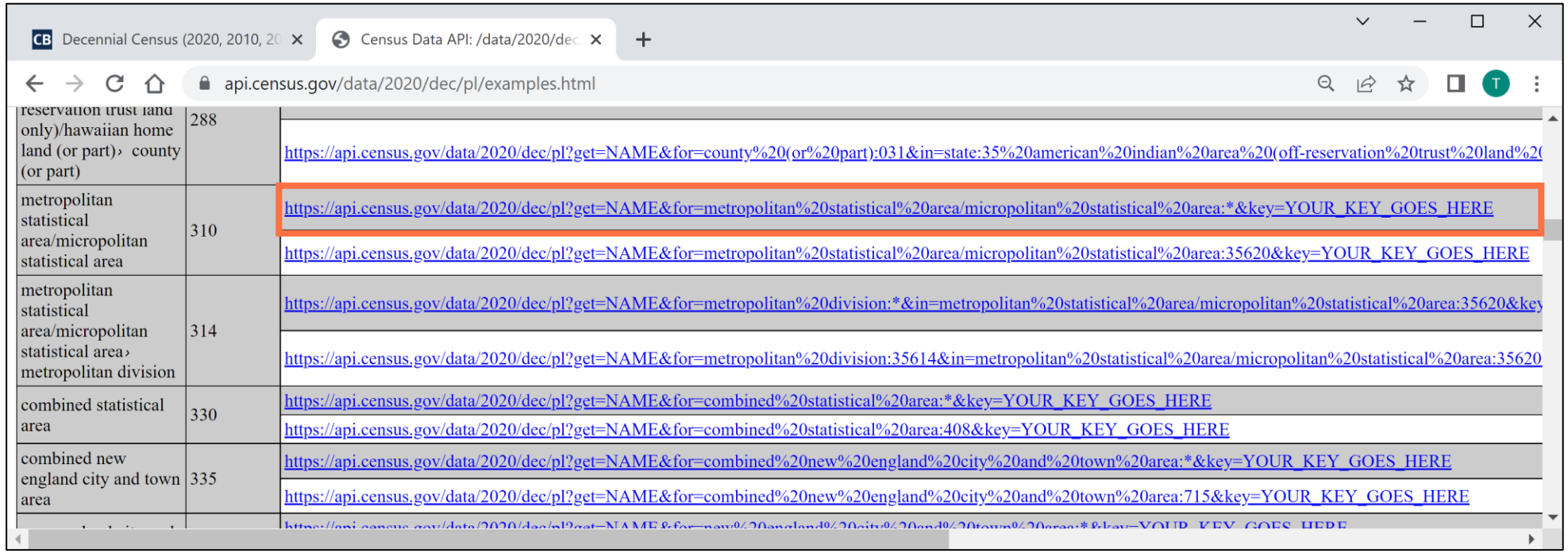


Title	Description	Vintage	Dataset Name	Dataset Type	Geography List	Variable List	Group List	SortList	Examples	Developer Documentation	API Base URL
Decennial Census: Redistricting Data (PL 94-171)	Public Law 94-171, enacted in 1975, directs the Census Bureau to make special preparations to provide redistricting data needed by the 50 states. It specifies that within a year following Census Day, the Census Bureau must send the governor and legislative leadership in each state the data they need to redraw districts for the United States Congress and state legislature. To meet this legal requirement, the Census Bureau set up a program that affords state officials an opportunity before each decennial census to define the small areas for which they wish to receive census population totals for redistricting purposes. Officials may receive data for voting districts (e.g., election precincts, wards) and state house and senate districts, in addition to standard census geographic areas such as counties, cities, census tracts, and tabulation blocks. State participation in defining areas is voluntary and nonpartisan.	2020	dec› pl	Aggregate	geographies	variables	groups	sorts	examples	documentation	http://api.census.gov/data/2020/dec/pl
1 dataset											

https://api.census.gov/data/2020/dec/pl.html

United States Census Bureau

- **Choose Your Geography –** Explore the available geographic levels on the left, copy a sample URL, and open a new tab



reservation trust land only)/hawaiian home land (or part)› county (or part)	288	https://api.census.gov/data/2020/dec/pl?get=NAME&for=county%20(or%20part):031&in=state:35%20american%20indian%20area%20(off-reservation%20trust%20land%2(
metropolitan statistical area/micropolitan statistical area	310	https://api.census.gov/data/2020/dec/pl?get=NAME&for=metropolitan%20statistical%20area/micropolitan%20statistical%20area:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/dec/pl?get=NAME&for=metropolitan%20statistical%20area/micropolitan%20statistical%20area:35620&key=YOUR_KEY_GOES_HERE
metropolitan statistical area/micropolitan statistical area› metropolitan division	314	https://api.census.gov/data/2020/dec/pl?get=NAME&for=metropolitan%20division:*&in=metropolitan%20statistical%20area/micropolitan%20statistical%20area:35620&key
		https://api.census.gov/data/2020/dec/pl?get=NAME&for=metropolitan%20division:35614&in=metropolitan%20statistical%20area/micropolitan%20statistical%20area:35620
combined statistical area	330	https://api.census.gov/data/2020/dec/pl?get=NAME&for=combined%20statistical%20area:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/dec/pl?get=NAME&for=combined%20statistical%20area:408&key=YOUR_KEY_GOES_HERE
combined new england city and town area	335	https://api.census.gov/data/2020/dec/pl?get=NAME&for=combined%20new%20england%20city%20and%20town%20area:*&key=YOUR_KEY_GOES_HERE
		https://api.census.gov/data/2020/dec/pl?get=NAME&for=combined%20new%20england%20city%20and%20town%20area:715&key=YOUR_KEY_GOES_HERE

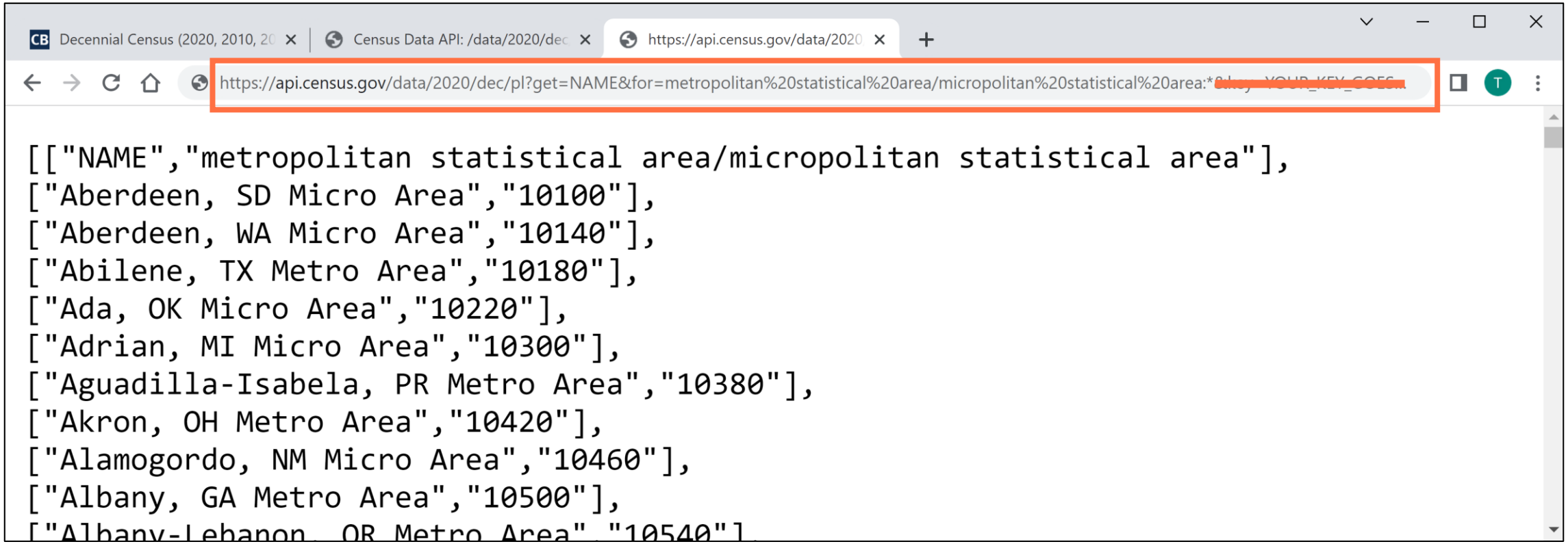
- &for=metropolitan%20statistical%20area/micropolitan%20statistical%20area:* gets data for all metro/micro areas

Choose this example

https://api.census.gov/data/2020/dec/pl/examples.html

United States Census Bureau

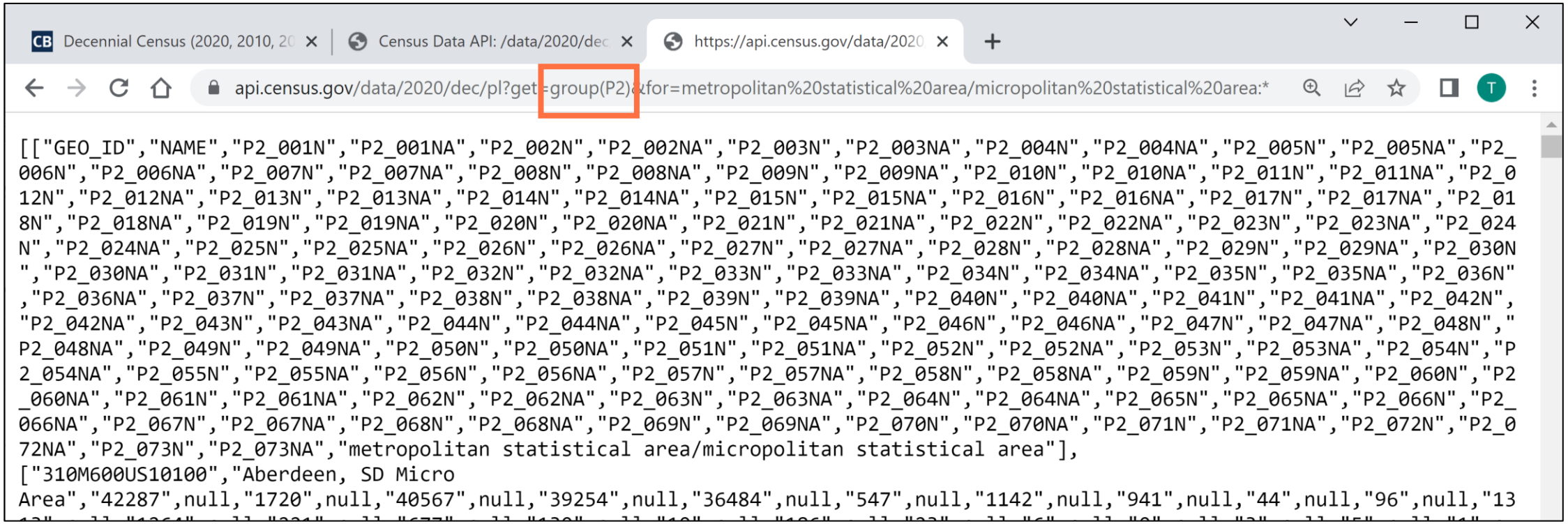
- **Paste A Sample URL Into The Address Bar**
- **Enter Your API Key Or Delete "&key=YOUR_KEY_GOES_HERE"**
- **Press Enter And View Results**



https://api.census.gov/data/2020/dec/pl?get=NAME&for=metropolitan%20statistical%20area/micropolitan%20statistical%20area:*

United States Census Bureau

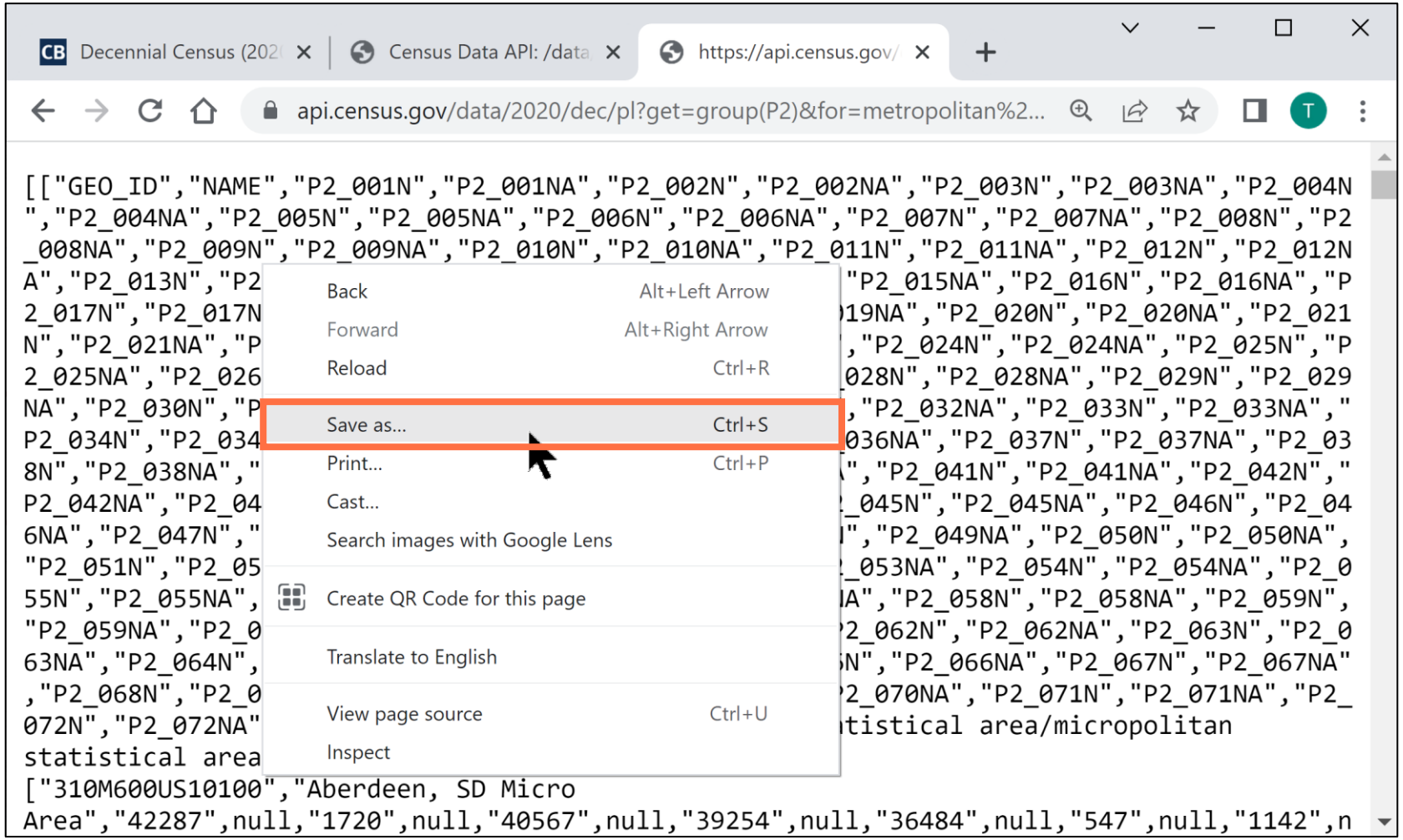
- **Edit Variable Selection To Retrieve Data for P2 –** In this example, replace NAME with **group(P2)**
- Press Enter



https://api.census.gov/data/2020/dec/pl?get=group(P2)&for=metropolitan%20statistical%20area/micropolitan%20statistical%20area:*

United States Census Bureau

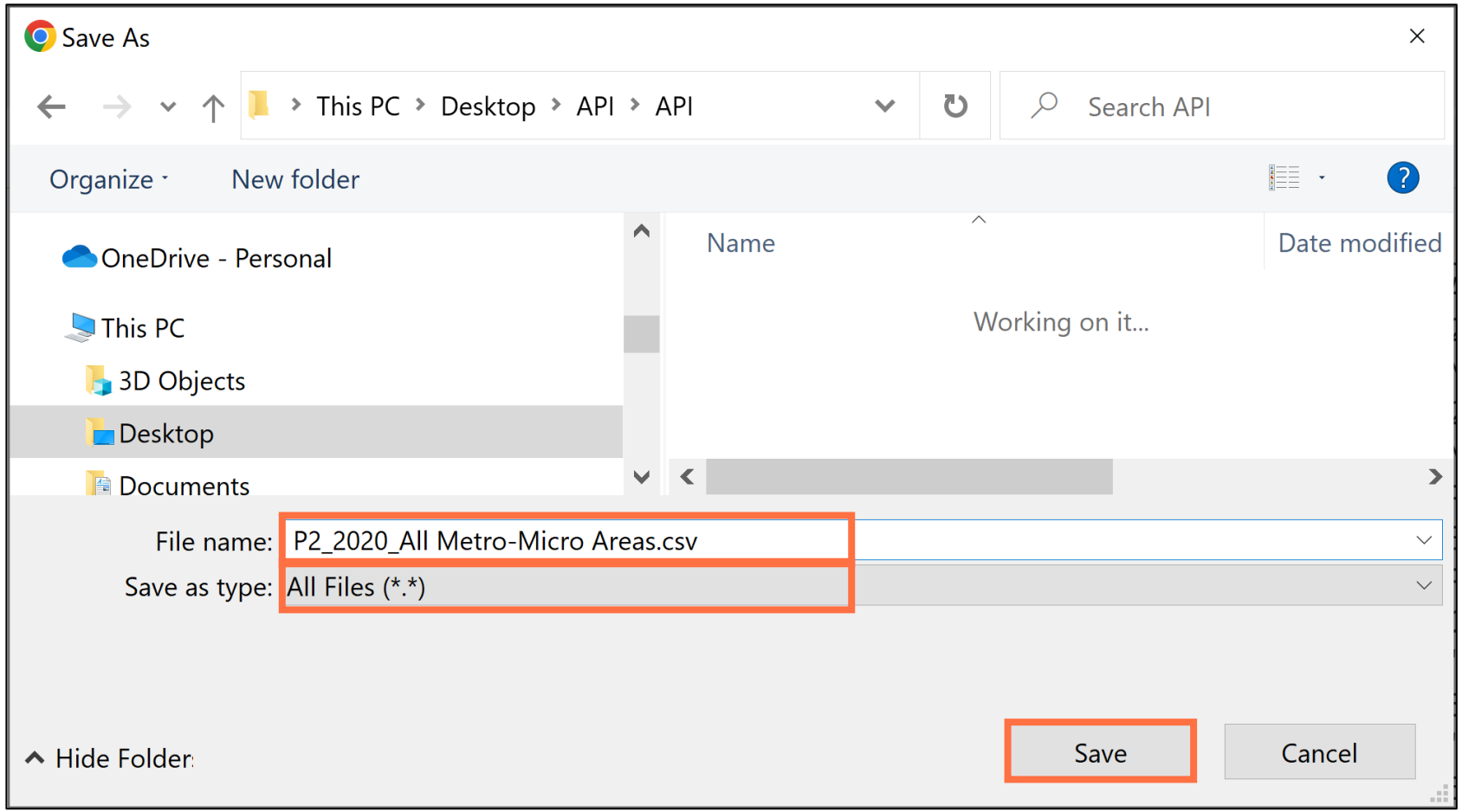
- **Save Results** – Right click the page and select **Save As**



https://api.census.gov/data/2020/dec/pl?get=group(P2)&for=metropolitan%20statistical%20area/micropolitan%20statistical%20area:*

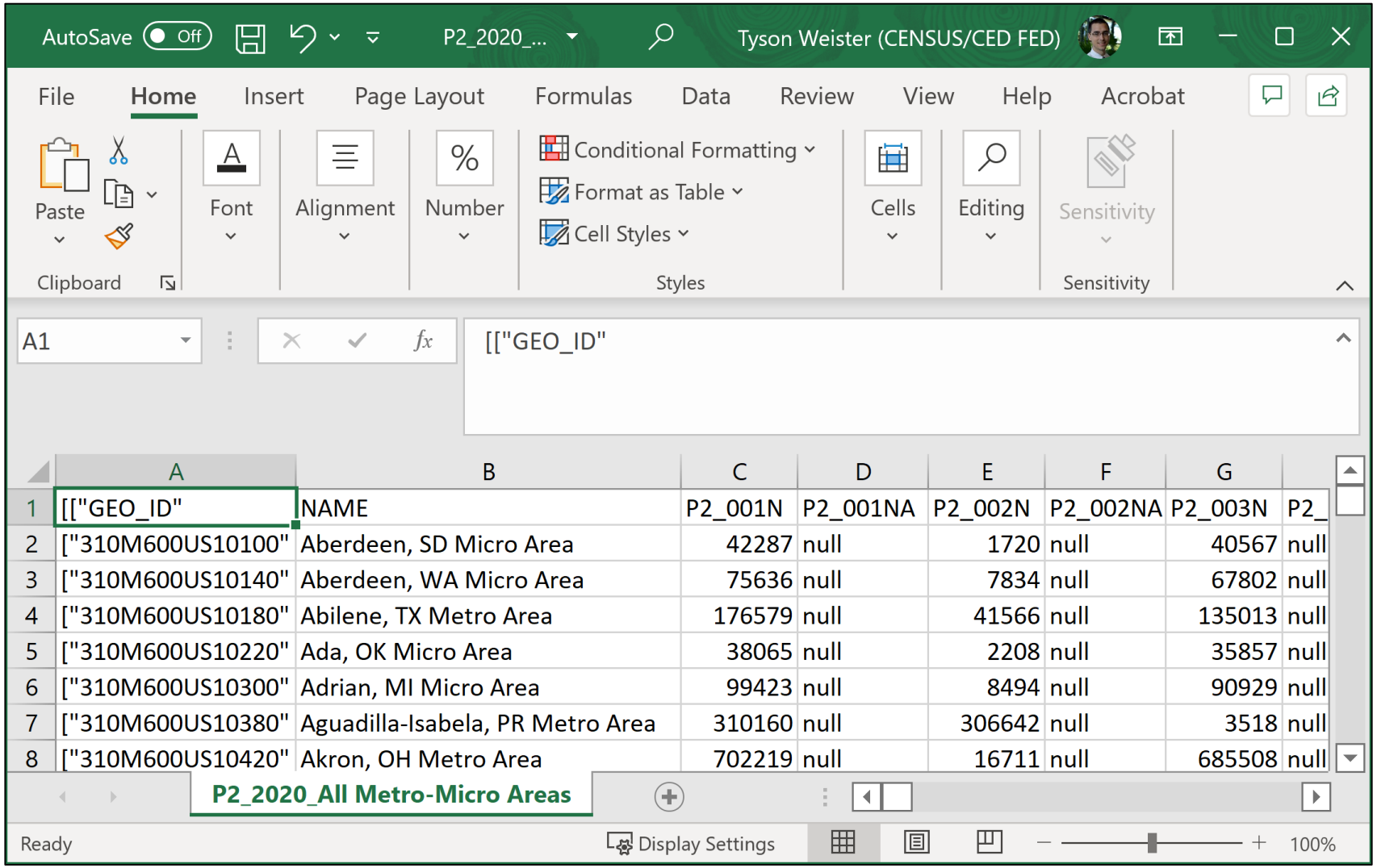
United States Census Bureau

- **Save As .csv –** Add **.csv** to the end of your filename and select **All Files** from the Save as type dropdown menu. Then click **Save**.



United States Census Bureau

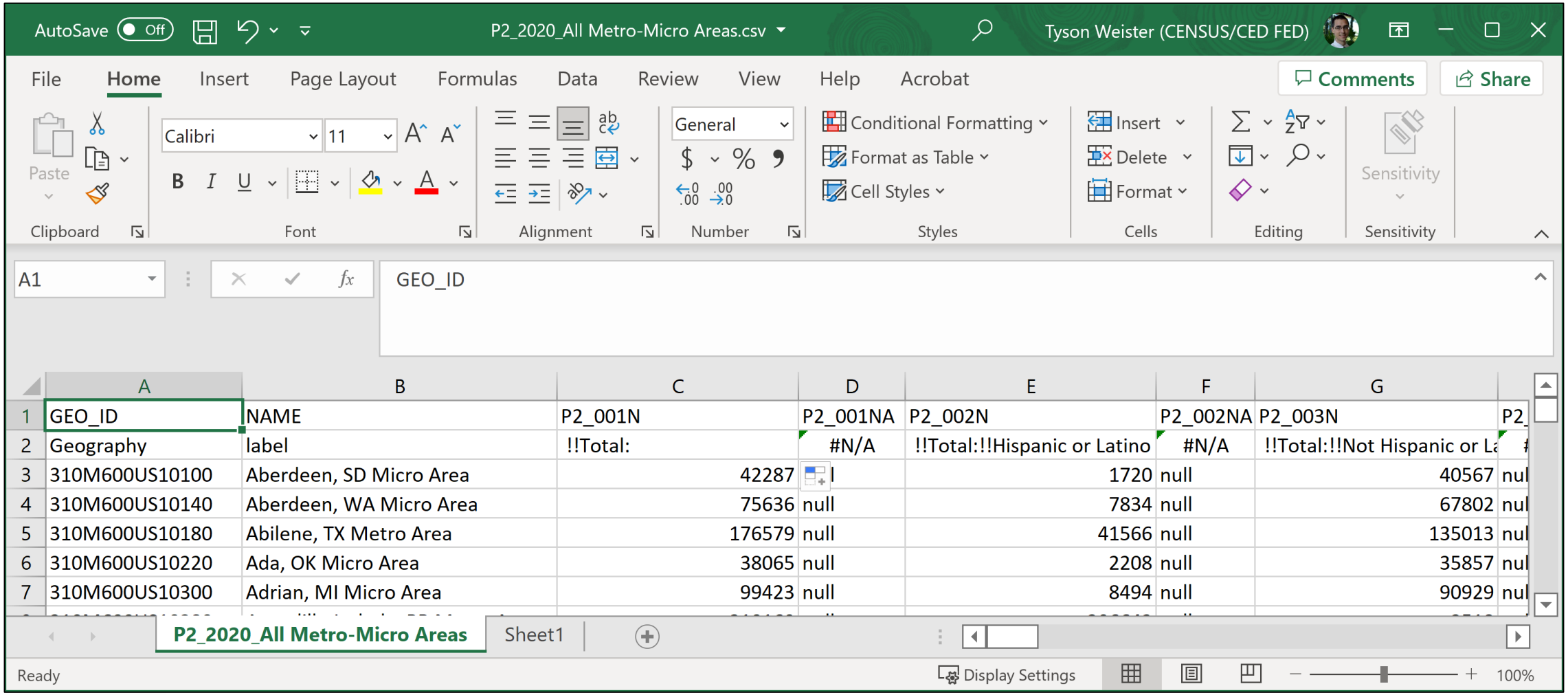
- **Open .csv In Excel** – Each variable has its own column for easy viewing



	A	B	C	D	E	F	G	
1	[["GEO_ID"	NAME	P2_001N	P2_001NA	P2_002N	P2_002NA	P2_003N	P2_
2	["310M600US10100"	Aberdeen, SD Micro Area	42287	null	1720	null	40567	null
3	["310M600US10140"	Aberdeen, WA Micro Area	75636	null	7834	null	67802	null
4	["310M600US10180"	Abilene, TX Metro Area	176579	null	41566	null	135013	null
5	["310M600US10220"	Ada, OK Micro Area	38065	null	2208	null	35857	null
6	["310M600US10300"	Adrian, MI Micro Area	99423	null	8494	null	90929	null
7	["310M600US10380"	Aguadilla-Isabela, PR Metro Area	310160	null	306642	null	3518	null
8	["310M600US10420"	Akron, OH Metro Area	702219	null	16711	null	685508	null

United States Census Bureau

- Clean up the table in Excel and pull in the labels for each variable. Step-by-step instructions are included in the next section



	A	B	C	D	E	F	G	
1	GEO_ID	NAME	P2_001N	P2_001NA	P2_002N	P2_002NA	P2_003N	P2_
2	Geography	label	!!Total:	#N/A	!!Total:!!Hispanic or Latino	#N/A	!!Total:!!Not Hispanic or La	#
3	310M600US10100	Aberdeen, SD Micro Area	42287	l	1720	null	40567	nul
4	310M600US10140	Aberdeen, WA Micro Area	75636	null	7834	null	67802	nul
5	310M600US10180	Abilene, TX Metro Area	176579	null	41566	null	135013	nul
6	310M600US10220	Ada, OK Micro Area	38065	null	2208	null	35857	nul
7	310M600US10300	Adrian, MI Micro Area	99423	null	8494	null	90929	nul

United States Census Bureau

Formatting Excel File

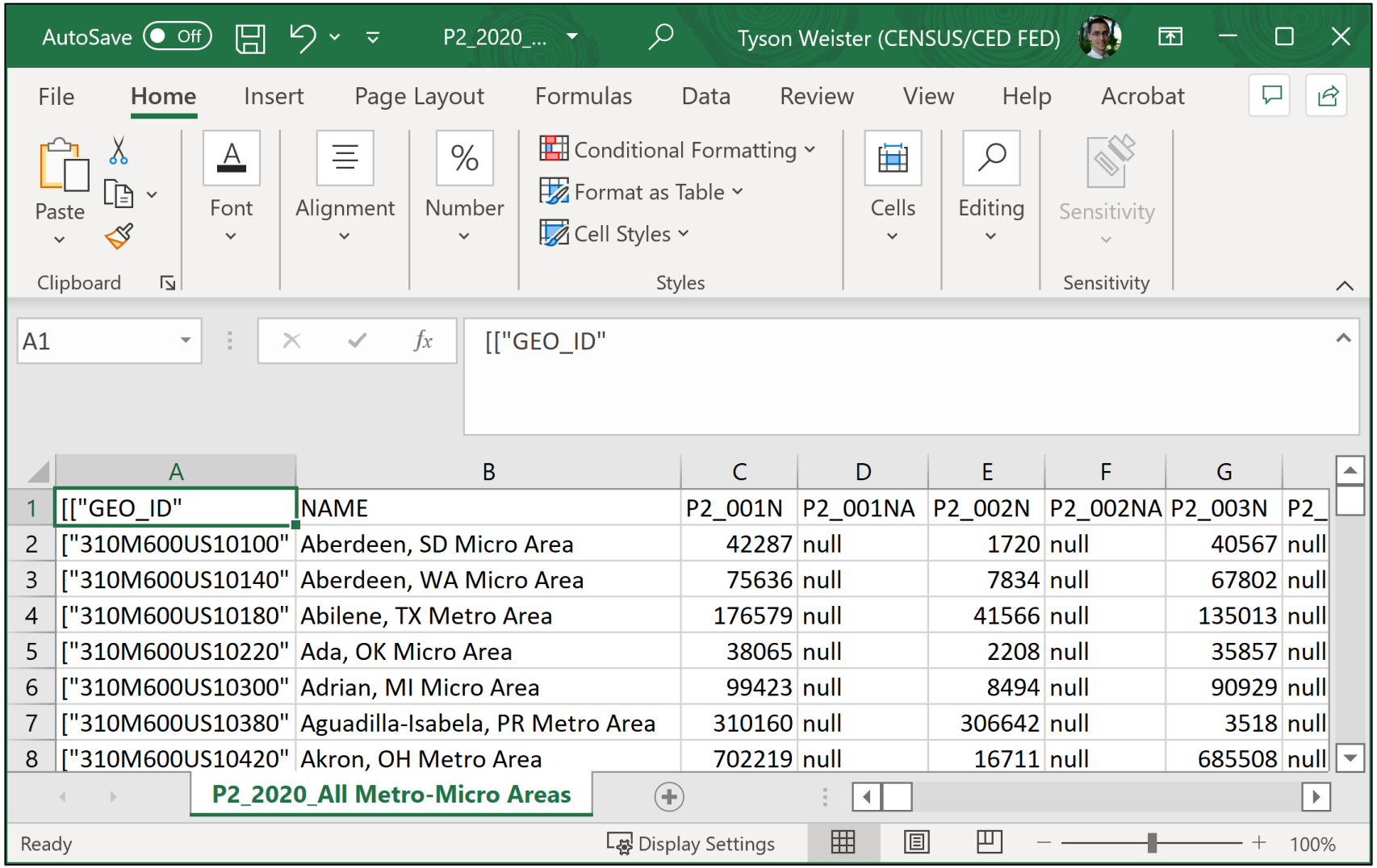
In this section, you will learn how to use Excel to:

1. Remove special characters using Find and Replace

2. Add labels for the variable names using VLOOKUP

United States Census Bureau

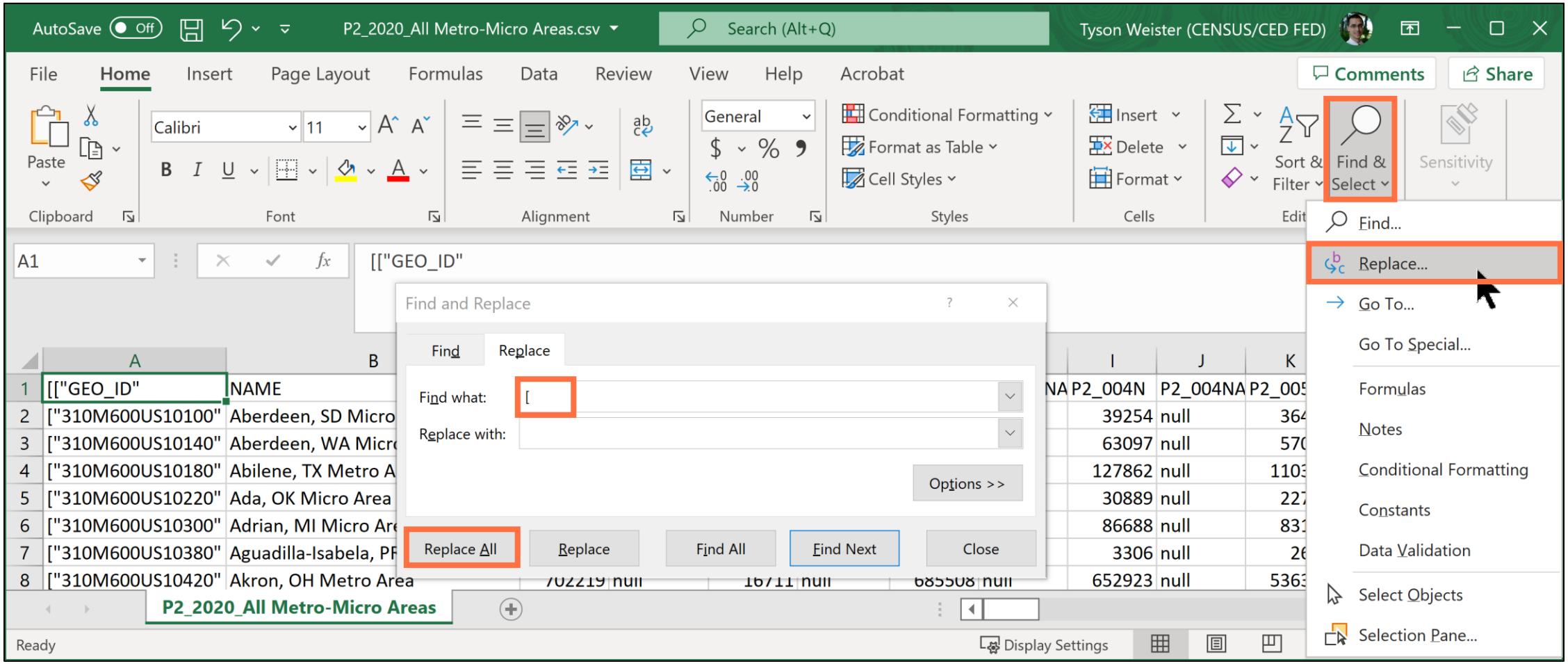
- **Open .csv In Excel** – Each variable has its own column for easy viewing



	A	B	C	D	E	F	G	
1	[["GEO_ID"	NAME	P2_001N	P2_001NA	P2_002N	P2_002NA	P2_003N	P2_
2	["310M600US10100"	Aberdeen, SD Micro Area	42287	null	1720	null	40567	null
3	["310M600US10140"	Aberdeen, WA Micro Area	75636	null	7834	null	67802	null
4	["310M600US10180"	Abilene, TX Metro Area	176579	null	41566	null	135013	null
5	["310M600US10220"	Ada, OK Micro Area	38065	null	2208	null	35857	null
6	["310M600US10300"	Adrian, MI Micro Area	99423	null	8494	null	90929	null
7	["310M600US10380"	Aguadilla-Isabela, PR Metro Area	310160	null	306642	null	3518	null
8	["310M600US10420"	Akron, OH Metro Area	702219	null	16711	null	685508	null

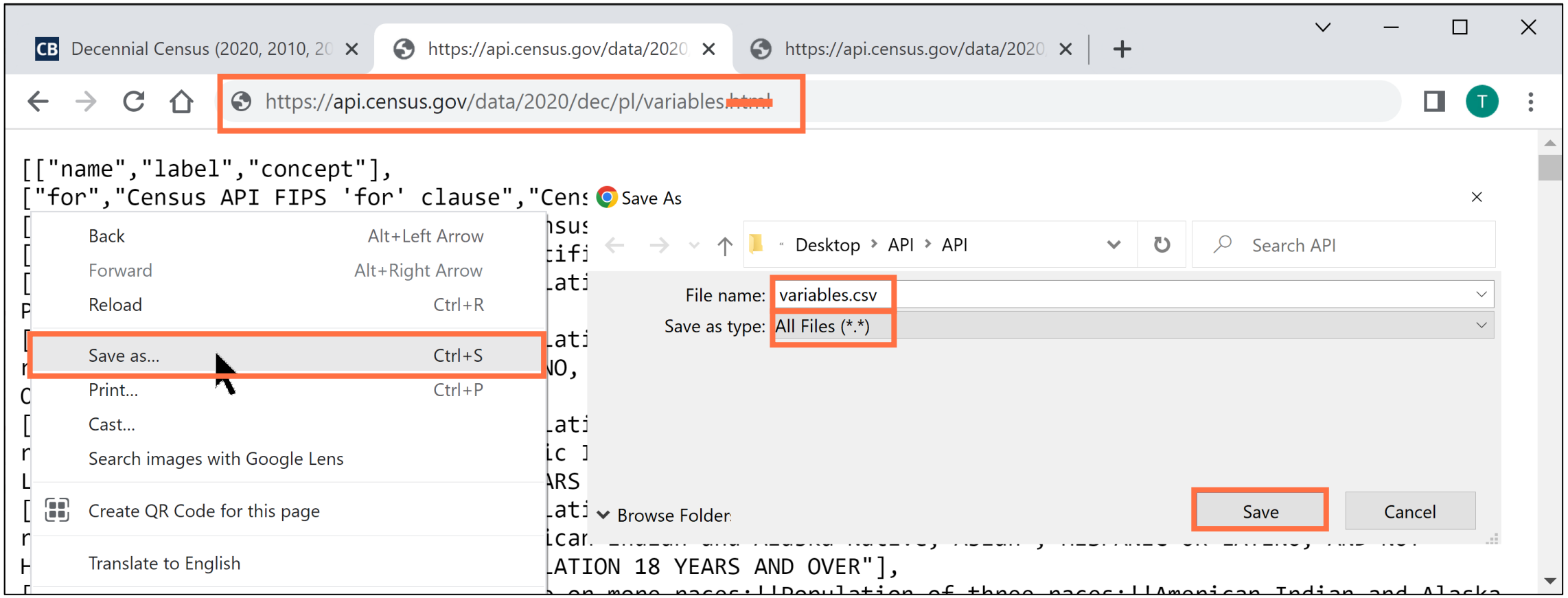
United States Census Bureau

- **Remove special characters–** In this example, use Excel's **Find and Replace.** Copy the open bracket **[**, paste into "Find what", and select **Replace All.** Repeat this step for the quote **"** and closed bracket **]**



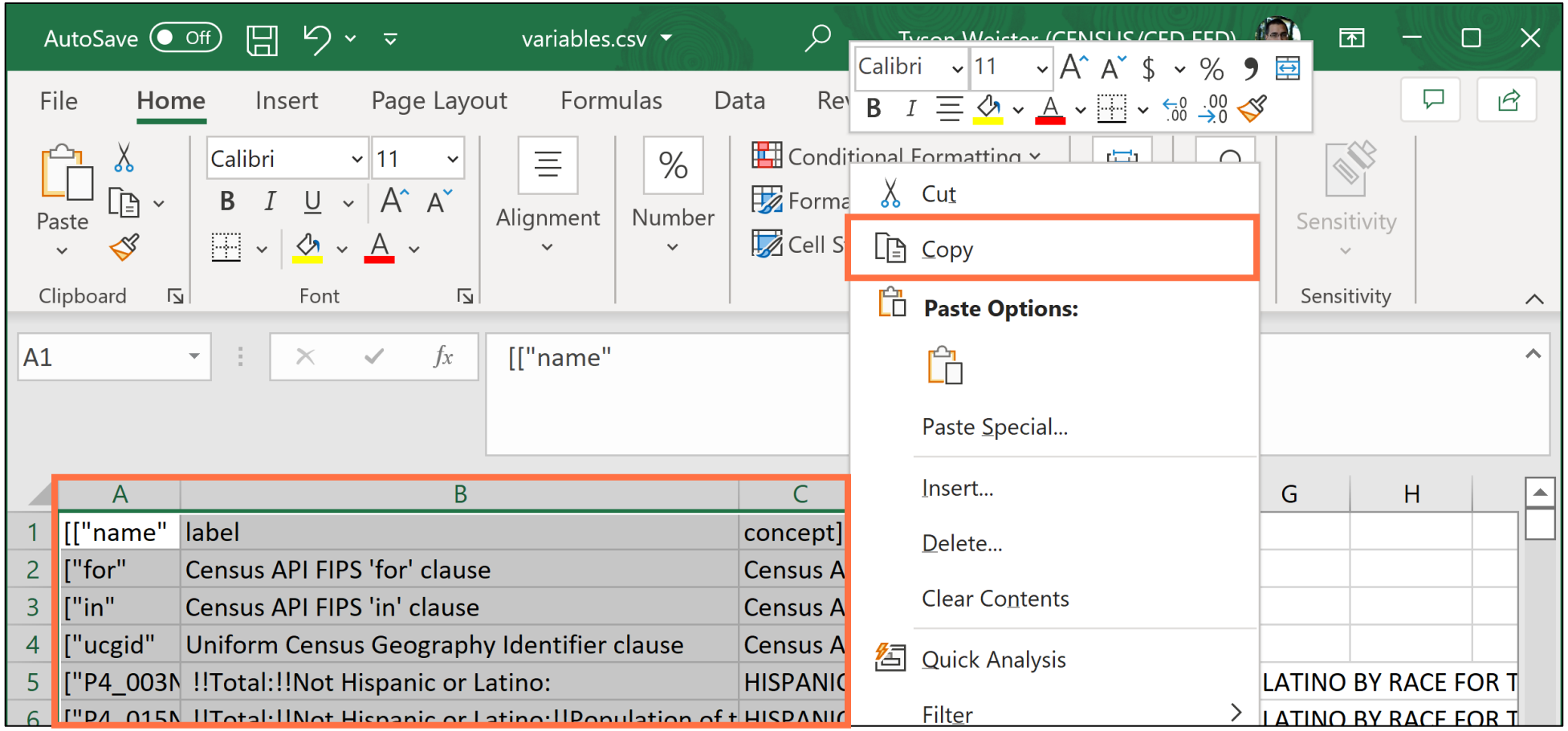
United States Census Bureau

- **Run API Query To Get A List of All Variables In the 2020 Decennial Census Redistricting Data –** Delete **.html** from the webpage you pulled the variables from to run the query. Save as results as **.csv.**

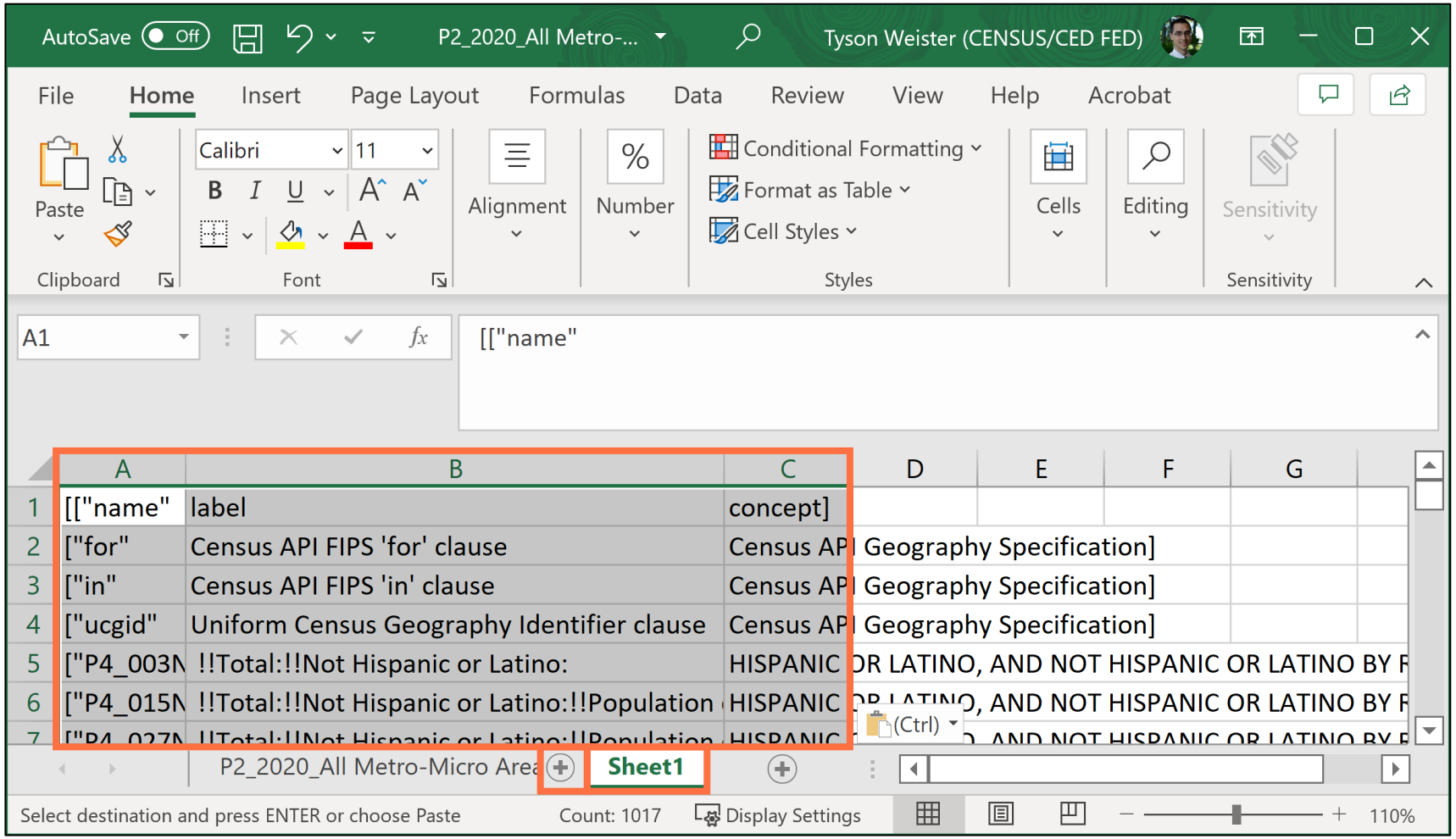


https://api.census.gov/data/2020/dec/pl/variables.html

- Copy the list of variables from the .csv file
  - Press **Control + A** to select all cells
  - **Right click** the selection and select **Copy**



- **Create a new worksheet in the .csv file with the data and paste the variable names**
  - Click the plus sign next to P2_2020_All Metro-Micro Areas to create a new sheet
  - Paste the variable names in Sheet 1



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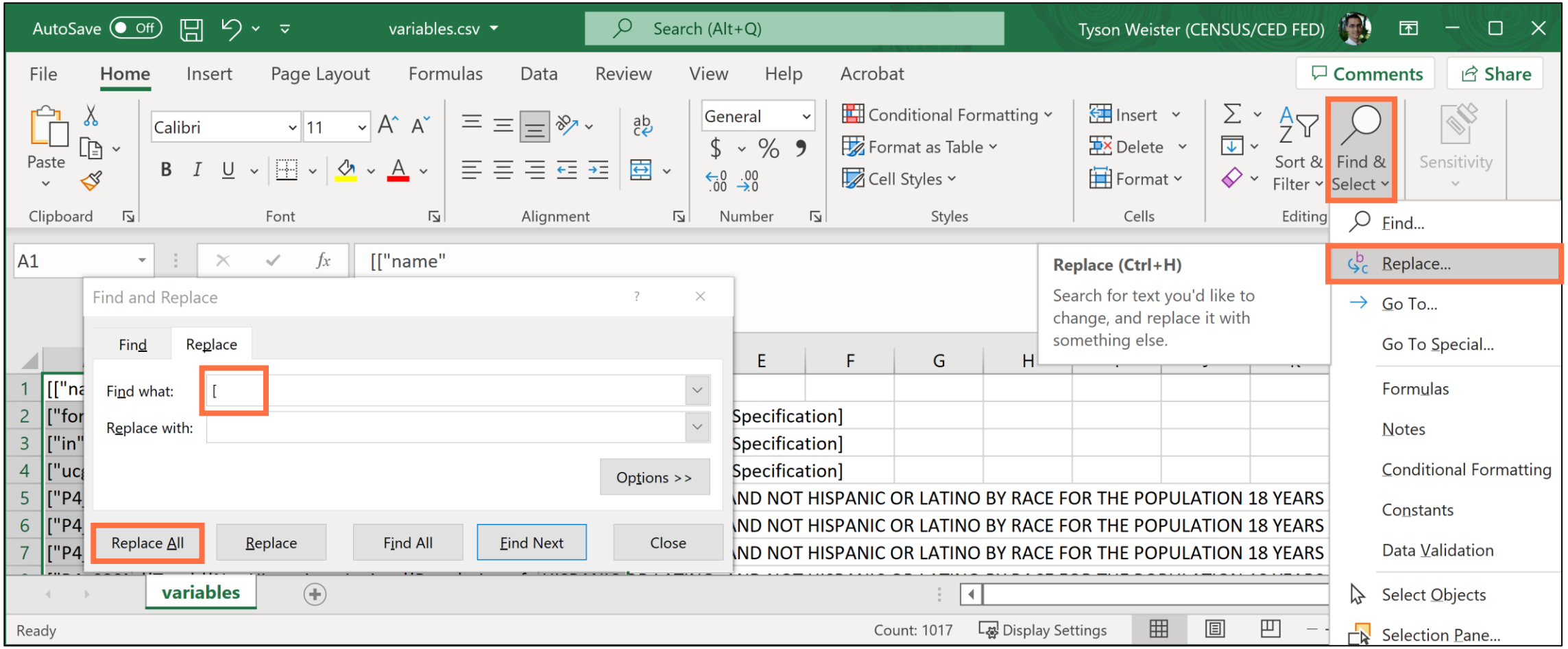
- **Remove special characters–** In this example, use Excel's **Find and Replace.** Copy the open bracket **[**, paste into find what, and select **Replace All.** Repeat this step for the quote **"** and closed bracket **]**



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- **Use VLOOKUP Function To Pull Matching Variable Labels Into Table**
  - Navigate to the P2_2020 All Metro-Micro Areas worksheet. Right click row 2 and select **Insert**
  - Click cell C2 and type **=VLOOKUP(**
  - Click cell C1 and type a comma (**,**). This tells Excel you want to find a match for P2_001N

	A	B	C	D	E	F	G	H
1	GEO_ID	NAME	P2_001N	P2_001NA	P2_002N	P2_002NA	P2_003N	P2_003
2			=VLOOKUP(C1,					
3	310M600US10100	Aberdeen, SD Micro Area					40567	null
4	310M600US10140	Aberdeen, WA Micro Area	75636	null	7834	null	67802	null
5	310M600US10180	Abilene, TX Metro Area	176579	null	41566	null	135013	null
6	310M600US10220	Ada, OK Micro Area	38065	null	2208	null	35857	null
7	310M600US10300	Adrian, MI Micro Area	99423	null	8494	null	90929	null
8	310M600US10380	Aguadilla-Isabela, PR Metro Area	310160	null	306642	null	3518	null

VLOOKUP(lookup_value, **table_array**, col_index_num, [range_lookup])

P2_2020_All Metro-Micro Areas | Sheet1

Enter | Display Settings | 100%

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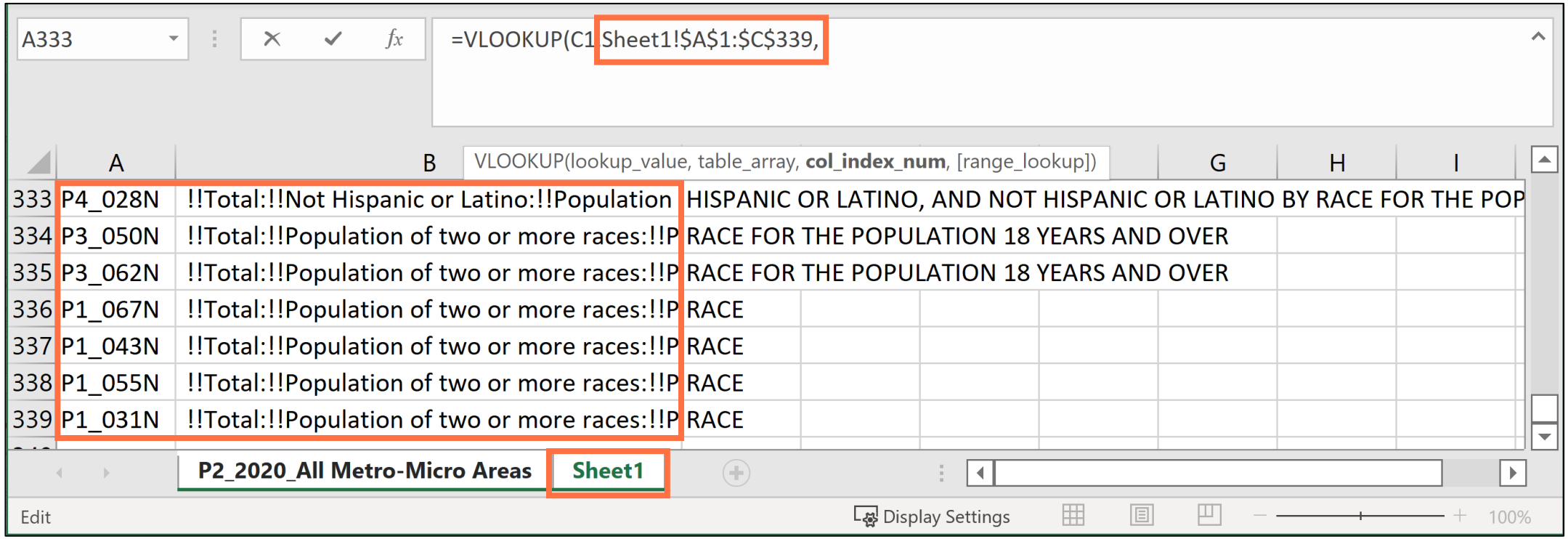
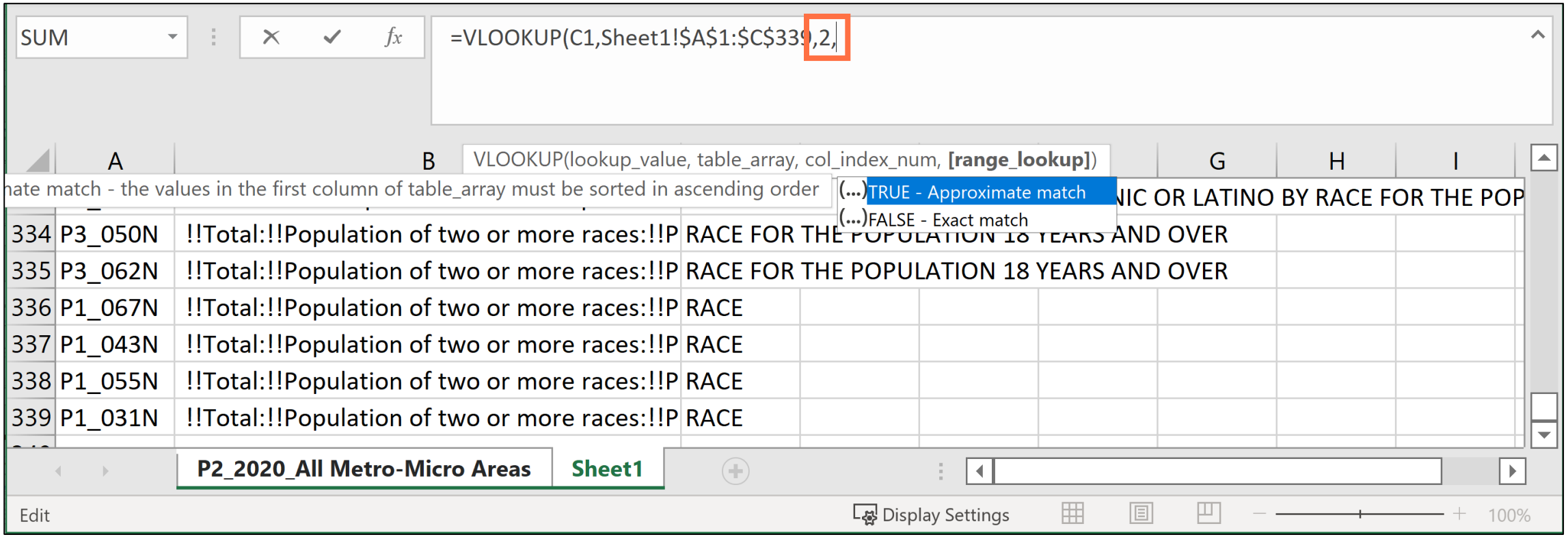
- Use VLOOKUP Function (continued)
  - Click **Sheet 1** to open the worksheet with the names and labels
  - Select all contents of this table. This tells Excel to look for a match for P2_001N somewhere in this table.
  - Press **F4** one time to lock the location and enter a comma (,).



- Use VLOOKUP Function (continued)
- Enter a **2** and then a comma (**,**). This tells Excel pull the corresponding label in column B when it finds a matching variable name in the table.



- Use VLOOKUP Function (continued)
- Enter **0)** and press **enter** to specify that you want exact matches only, and to complete the VLOOKUP function.

SUM

=VLOOKUP(C1,Sheet1!$A$1:$C$339,2,0)

	A	B	C	D	E	F	G	H	I
333	P4_028N	!!Total:!!Not Hispanic or Latino:!!Population	HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE FOR THE POP						
334	P3_050N	!!Total:!!Population of two or more races:!!P	RACE FOR THE POPULATION 18 YEARS AND OVER						
335	P3_062N	!!Total:!!Population of two or more races:!!P	RACE FOR THE POPULATION 18 YEARS AND OVER						
336	P1_067N	!!Total:!!Population of two or more races:!!P	RACE						
337	P1_043N	!!Total:!!Population of two or more races:!!P	RACE						
338	P1_055N	!!Total:!!Population of two or more races:!!P	RACE						
339	P1_031N	!!Total:!!Population of two or more races:!!P	RACE						

P2_2020_All Metro-Micro Areas | Sheet1

Edit | Display Settings | 100%

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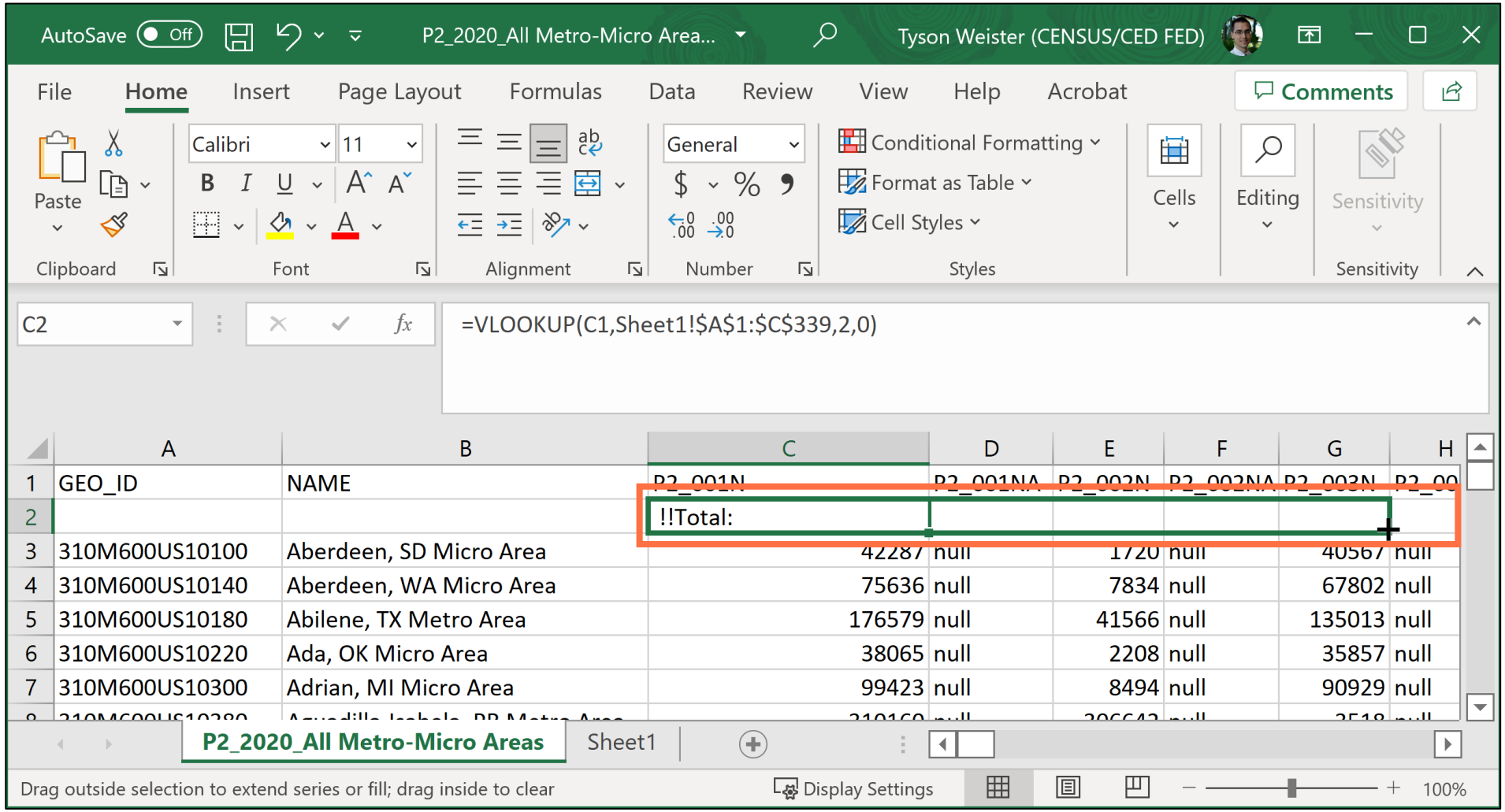
- Find the green box in the lower right corner of cell C2
- Click, hold, and drag the box to other cells



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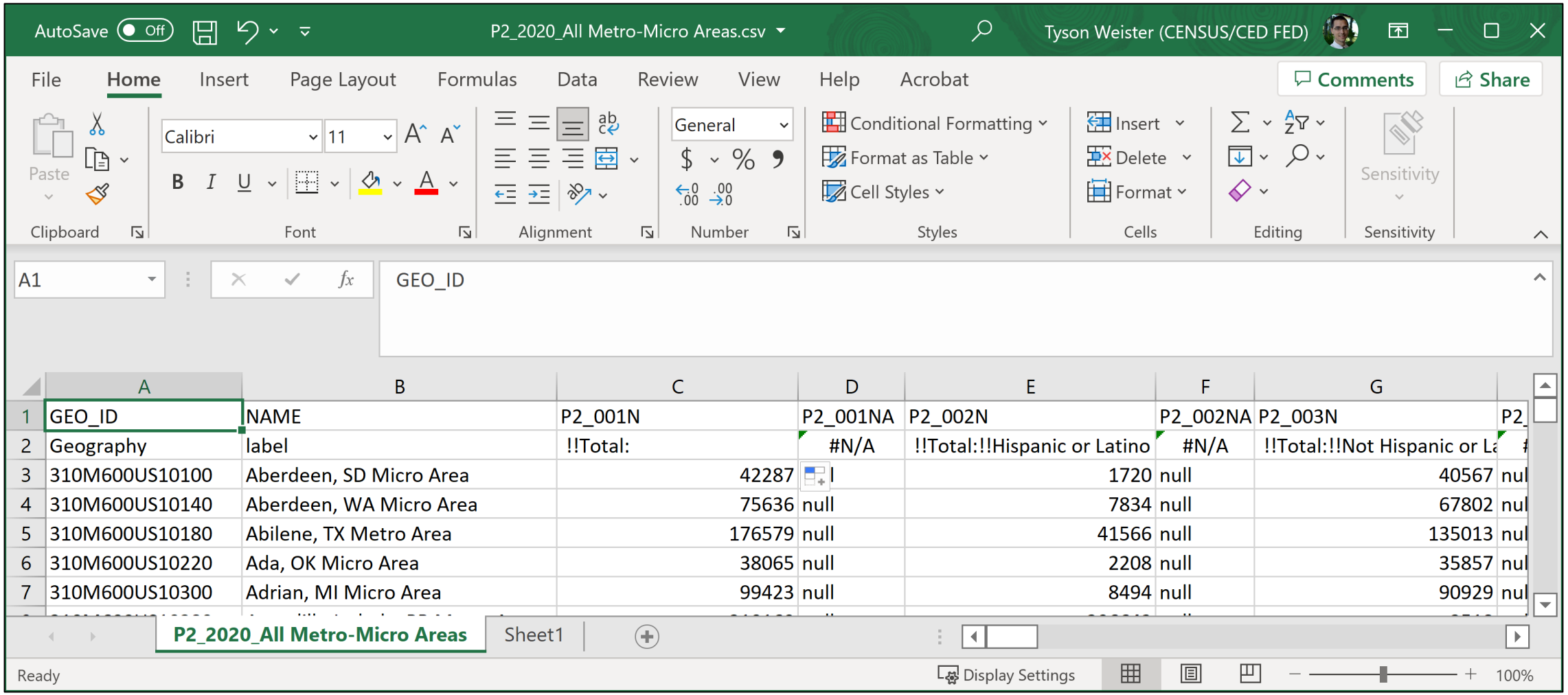
- View your final table result with labels



	A	B	C	D	E	F	G	
1	GEO_ID	NAME	P2_001N	P2_001NA	P2_002N	P2_002NA	P2_003N	P2_
2	Geography	label	!!Total:	#N/A	!!Total:!!Hispanic or Latino	#N/A	!!Total:!!Not Hispanic or La	#
3	310M600US10100	Aberdeen, SD Micro Area	42287	l	1720	null	40567	nul
4	310M600US10140	Aberdeen, WA Micro Area	75636	null	7834	null	67802	nul
5	310M600US10180	Abilene, TX Metro Area	176579	null	41566	null	135013	nul
6	310M600US10220	Ada, OK Micro Area	38065	null	2208	null	35857	nul
7	310M600US10300	Adrian, MI Micro Area	99423	null	8494	null	90929	nul

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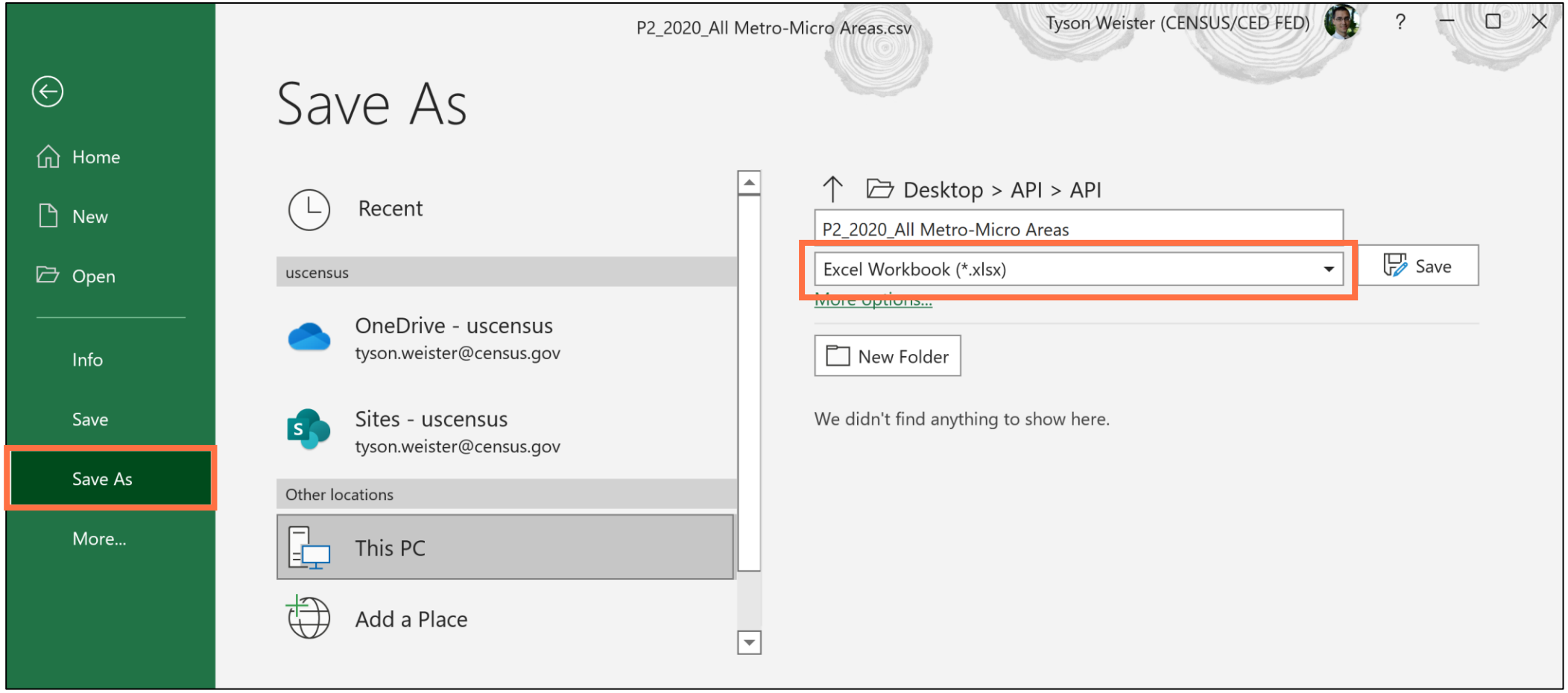
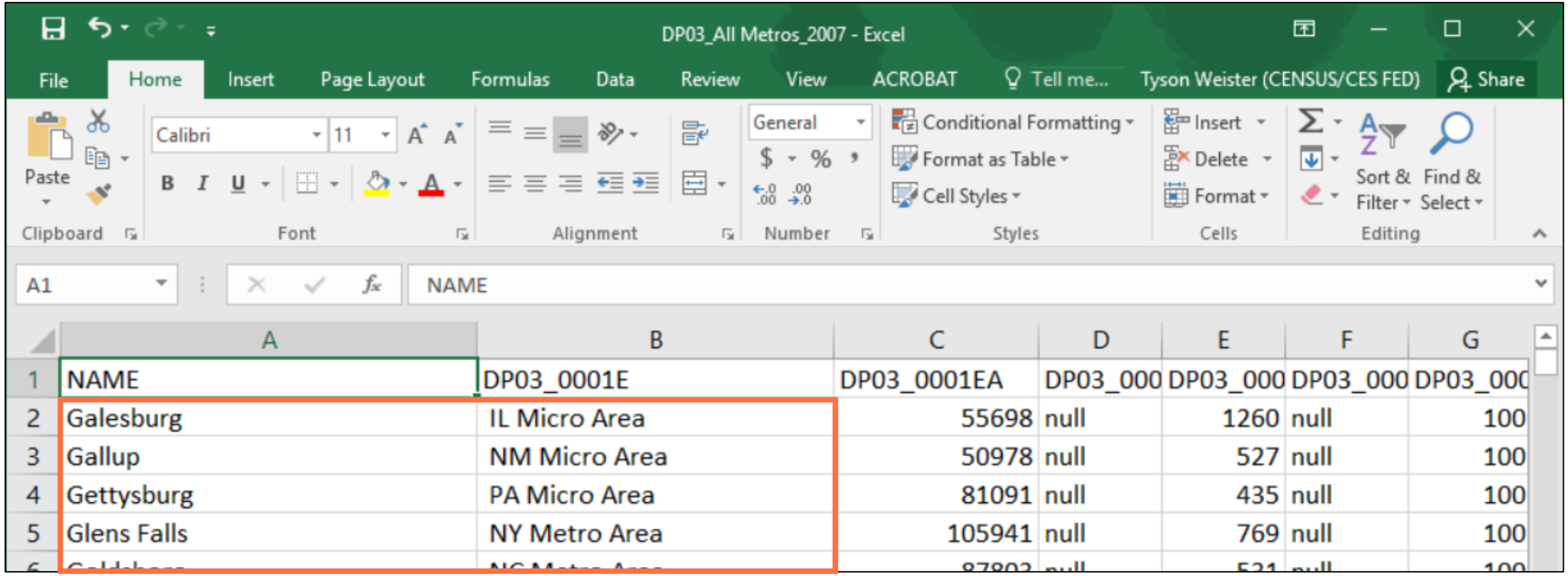
- Save as a .xlsx file to keep the changes



- If the geography label is split across columns in your .csv output:

  Edit your API query so it starts with another variable instead of NAME (example: ?get=**GEO_ID,**NAME instead of ?get=NAME)



	A	B	C	D	E	F	G
1	NAME	DP03_0001E	DP03_0001EA	DP03_000	DP03_000	DP03_000	DP03_000
2	Galesburg	IL Micro Area	55698	null	1260	null	100
3	Gallup	NM Micro Area	50978	null	527	null	100
4	Gettysburg	PA Micro Area	81091	null	435	null	100
5	Glens Falls	NY Metro Area	105941	null	769	null	100

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Outline

- API Basics
- Building an API Request
- API Demo
- **Resources for Learning More**

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Benefits and Limitations of API

Benefits of API

- Get the exact variables and geographies you need
- Quickly update queries to get data across years: Most variables are consistent from year to year
- It has more datasets than data.census.gov

Limitations of the API calls:

- Only one geographic summary level at a time
- Not all collections of geographies are available (e.g. all census tracts in the U.S.)

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- Update the Year In Your Query and Year-Related Variables to Get Data Over Time
  - Most variables are consistent from year to year but check for changes

2018

Median Household Income:
https://api.census.gov/data/**2018**/acs/acs1/profile?get=NAME,DP03_0062E&for=state:24

Population Under 5 Years:
https://api.census.gov/data/**2018**/acs/acs1/profile?get=NAME,**DP05_0005E**&for=us:*

2016

Median Household Income:
https://api.census.gov/data/**2016**/acs/acs1/profile?get=NAME,DP03_0062E&for=state:24

Population Under 5 Years:
https://api.census.gov/data/**2016**/acs/acs1/profile?get=NAME,**DP05_0004E**&for=us:*

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Visualizing Table & Variable Changes

DP05_0004E

2018

Label	Maryland Estimate	Margin of Error
SEX AND AGE		
Total population	6,042,718	*****
Male	2,930,350	±3,655
Female	3,112,368	±3,655
Sex ratio (males per 100 females)	94.2	±0.2
Under 5 years	361,435	±1,984
5 to 9 years	364,571	±7,821
10 to 14 years	385,477	±7,761
15 to 19 years	379,728	±3,952
20 to 24 years	384,168	±4,448

2016

Label	Maryland Estimate	Margin of Error
SEX AND AGE		
Total population	6,016,447	*****
Male	2,917,773	±2,890
Female	3,098,674	±2,890
Under 5 years	362,895	±1,594
5 to 9 years	376,707	±7,454
10 to 14 years	374,531	±7,360
15 to 19 years	385,317	±3,768
20 to 24 years	394,489	±3,979

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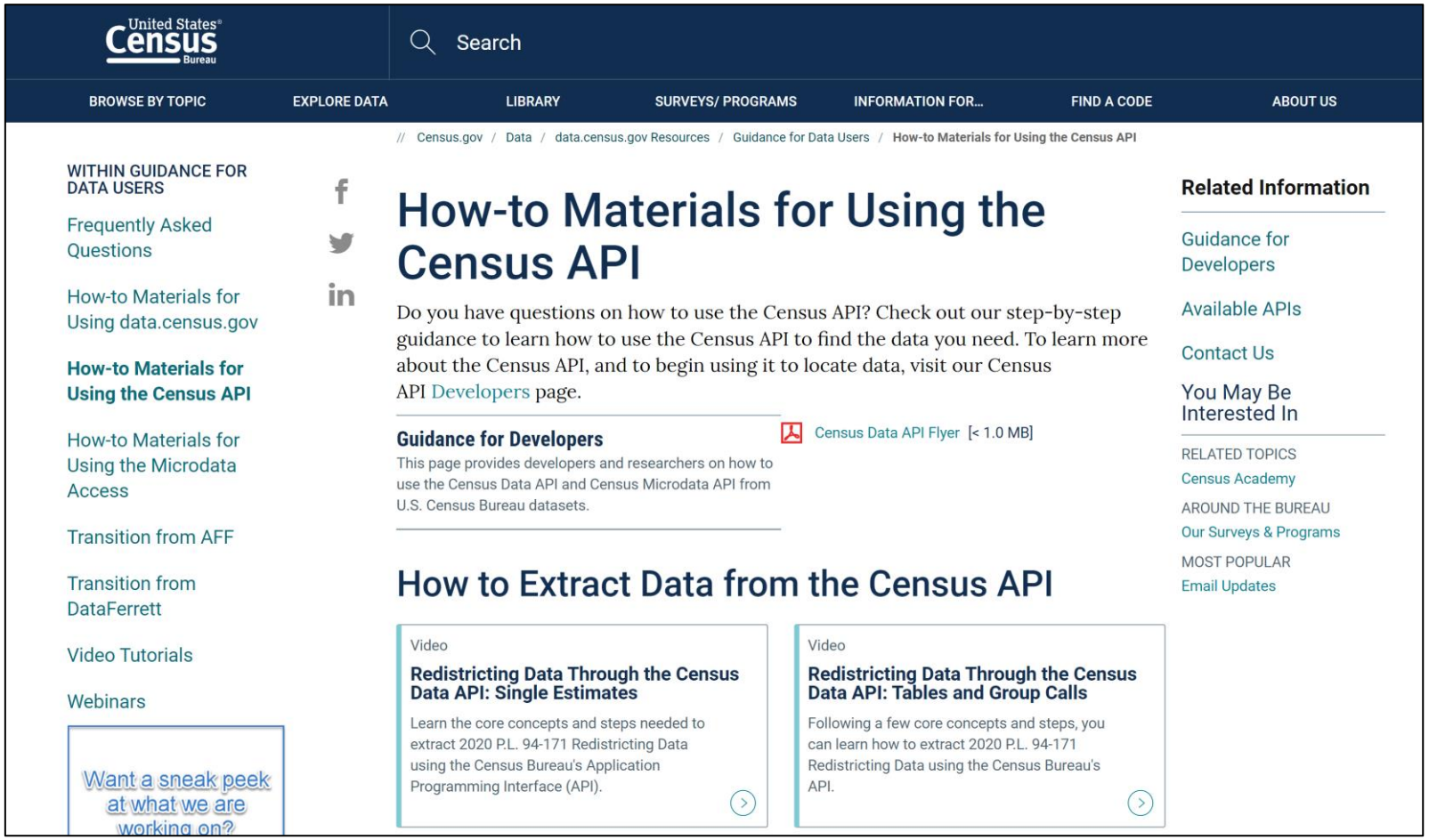
Learn More

API Resources Page:
census.gov/data/what-is-data-census-gov/guidance-for-data-users/how-to-materials-for-using-the-census-api.html

Feedback/Data Questions:
census.data@census.gov

API Training Requests:
ced.cedsci.outreach@census.gov



Webinar Evaluation

https://questionweb.com/59212/

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Questions

Media:

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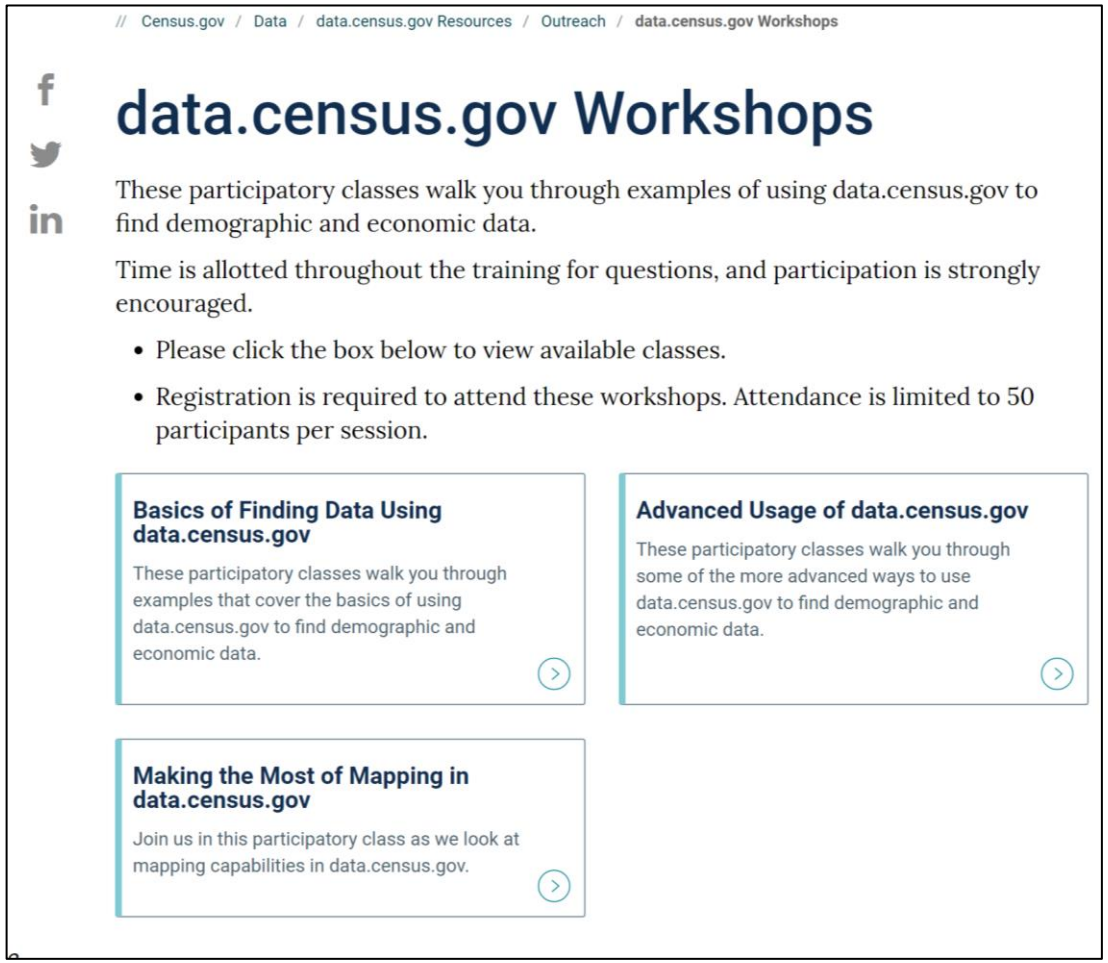
data.census.gov Workshops



// Census.gov / Data / data.census.gov Resources / Outreach / data.census.gov Workshops

data.census.gov Workshops

These participatory classes walk you through examples of using data.census.gov to find demographic and economic data.

Time is allotted throughout the training for questions, and participation is strongly encouraged.

- Please click the box below to view available classes.
- Registration is required to attend these workshops. Attendance is limited to 50 participants per session.

Basics of Finding Data Using data.census.gov

These participatory classes walk you through examples that cover the basics of using data.census.gov to find demographic and economic data.

Advanced Usage of data.census.gov

These participatory classes walk you through some of the more advanced ways to use data.census.gov to find demographic and economic data.

Making the Most of Mapping in data.census.gov

Join us in this participatory class as we look at mapping capabilities in data.census.gov.

Basic, Advanced, and Mapping

- New workshop: “Making the Most of Mapping in data.census.gov”
- Choose one of many dates
- Register in advance (up to 50 people per session)

census.gov/data/what-is-data-census-gov/outreach/workshops.html

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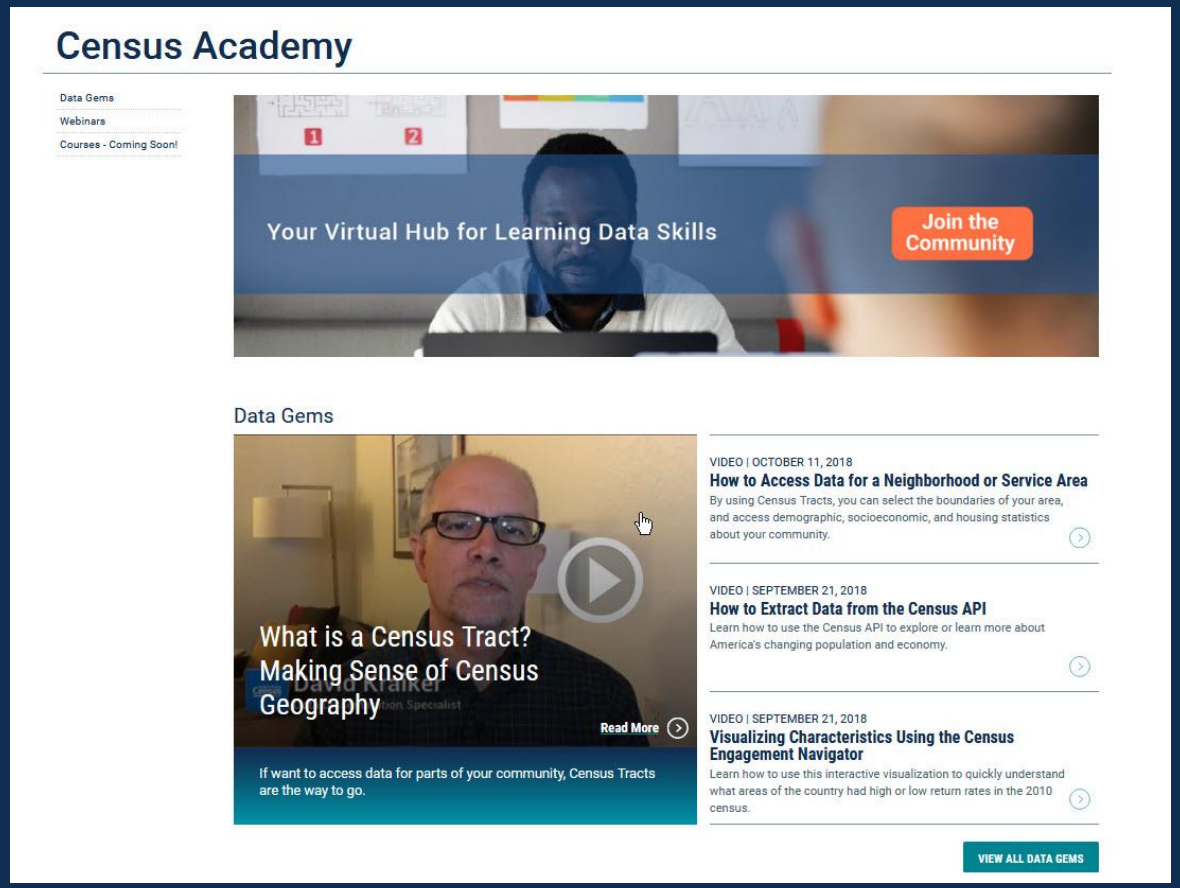
Data Dissemination and Training: census.gov/academy



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