

Census API Basics: Simple Steps to Better Data Access

January 14, 2025

>> Coordinator: Welcome. Thank you for standing by. Currently all participants are in listen-only mode. Today's webinar is being recorded, and the recording will be posted publicly. If you have any objections, you may disconnect at this time. Now I would like to turn the call over to your host for today, Deb Rivera.

>> Deb Rivera: Great. Thank you so much, Lisa. Good afternoon everyone. And welcome to our webinar event on the Census API Basics, Simple Steps to Better Data Access. This is your host Deb Rivera speaking. And today our presenter will introduce you to the API through a few core concepts and show you how simple URL modifications can unlock vast data sets without complex programming. Now, I want to take a moment and thank my Census Bureau colleagues for joining me today and helping to support our speaker. But before I turn things over to our presenter, I want to go over some housekeeping items. First of all, we would like to encourage you all to make use of the Q&A panel in WebEx to submit questions throughout the presentation. So if you have questions related to today's topic, you may submit questions through the Q&A panel. Make sure to use the All Panelists option from the drop-down menu, and this will allow our panelists to see your question. Now, I will be using the chat panel to send you all helpful information, including instructions, web links, and also contact information. So, again, for questions, please use the Q&A panel. Make sure to use the All Panelists option to submit. And look to the chat panel to find links and other helpful information. At the end of the webinar, we will take your questions through the WebEx audio line. Now, for this portion, we will ask participants to use the raised hand icon in WebEx to indicate if they have a question. You will be allowed to come off mute to ask your question. Just remember, when we call your name, to please unmute yourself. A quick note. The question and answer session today will focus on the application programming interface or the API. We will not be able to go in depth to address questions on data.census.gov, the data collection process, methodology, or other 2020 Census products. One more thing. We are recording the webinar today, and all of the materials for this training will be available through the Census Academy website. Again, thank you all so much for joining us, and it is my pleasure to introduce our presenter, Sam Patton. Thank you, Sam.

>> Sam Patton: Thank you so much, Deb, for that introduction. And as Deb mentioned, my name is Sam Patton, and I will be your presenter for the webinar today. Today we are going to be covering some basics of using the Census data API. So I'm so very happy to have you all join us here today, and I'm going to go ahead and get us started. To give a brief overview of our agenda today, we're going to start with some background and basic information about what the API is and some easy ways we can go and access it before we then jump into our demonstration. Our demonstration is going to make up most of our webinar today. We're going to work through these three different examples I have here on the screen. And I've kind of organized these from the most basic to a little bit more complex as we work through them. So although this is a basics webinar, I'm hoping, even if you have used the

API before, you're still able to learn something new today. And then we will close out were some resources at the end. And as Deb mentioned, we will be taking questions towards the end of the webinar. So keep those coming in the chat. And then at the very end of the webinar is when we'll be able to go and answer those questions. So I'll go ahead and get us started on the first agenda item here, where we're going to cover some background and basic information about the API. So the first thing I want to talk about is what the API is or application programming interface. So applications that are built on Census data typically take advantage of three underlying services. We have the Census data API. The Geocoder REST services. And then the TIGERweb REST services. Today, though, we are only going to focus on the first one here. And that is the Census data API. However, if you do have questions related to the Geocoder or TIGERweb, I did include the contact e-mails down at the bottom of the slides here. And, again, you all will be getting a copy of the slides when they are posted to our website in one to two weeks. And the basic definition of the Census API is that it is a data service that allows software developers and other data users to publicly access our data in a standardized way using a series of commands. So this is going to be an extremely efficient way to request data directly from the Census servers. And with the Census data API this standardization across multiple data sets is going to allow you to access data in the same way regardless of the survey or the data. So I've got a couple different uses and advantages for the API listed on the screen here. And we'll jump into those a little bit more in detail when we get over to our demonstration in just a bit. So who goes and uses the API? And it's not just software developers creating apps and dashboards that use the API. Because every day we have researchers; students; teachers; state, local, federal government employees; and a host of other people and organizations that are using the API to get their data. And keep in mind, too, that you don't need any kind of special software or knowledge of any programming language in order to access the API, because you can retrieve data from the API using nothing more than the web browser on your computer. And that's actually exactly what we're going to be doing today. We're not going to be using the API through any third-party software or utilizing a programming language like R or Python. We are only going to be accessing the API using our Internet browser. So if you joined today and you're a little bit nervous that perhaps we were going to get into some programming languages, don't worry, we're not doing that today. Or if you joined today and you're a little bit disappointed that we're not going to be getting into that, I also have something for you all as well, for our R and Python users. Stick around to the end because I have a list of different resources for R and Python users that you all can use later on to learn a bit more about accessing the API through R and Python. So what are some reasons you would choose to go and use the API? I've included a list of a couple popular reasons we've seen from data users in the past for why they go and use the API to access their data. Some of these may be by choice, just preference for using the API, but others may actually necessitate the use of the API. And I wanted to cover one of those examples that necessitated the use of the API, and that was the first one actually on the list here. And that's perhaps if you need some older data that's not available on a site, such as data.census.gov. And the example that I have here is pre-2010 ACS or American Community Survey data. So let's quickly walk through an example of what that looks like if you're trying to access the data first of all through data.census.gov. So here I am on data.census.gov. I navigated to an American Community Survey table. Specifically Table DP05, one of our data profiles. And when I got to this table, I wanted to go and see, what are

the years that are available on data.census.gov? So I opened the year drop-down menu here, and I notice that I can only go back to the year 2010. However, some of our American Community Survey data users may be aware there is ACS data available going back to the year 2005 for the one-year estimates. But one of the only places you can access that is over on the API. So I was able to go over on the API, and you can see here I was able to pull up the same data, profile data except for the year 2005. So I just wanted to quickly show this to show that having knowledge of accessing the API will actually give you a wider range of data sets available than if you were just using a site like data.census.gov. So if you do choose to use the API, you can find everything you need to get started over on our developers page. So on this developers page, there's going to be a list of different links to help get you started. You can access different links, such as our Slack channel, our mailing list. Guidance, different guides that we have available for accessing the API. And then you can always request a key as well that we're going to talk about in a moment. You'll also see this link on the homepage there for the discovery tool. So I want today take a moment to talk about that as well. So in this discovery tool, this is where you can browse all of the data that's available within the API. So I do want to mention that is all of the data that's available. So this is going to -- when you open up the discovery tool -- initially show you over 1,600 individual data sets that are currently available all on one place here. So for our beginner users, I find they can be a little bit overwhelming having to parse through all these different data sets here. So I have a different option available that we're going to talk about in a moment here that we're going to use throughout the webinar. But I did want to mention this discovery tool because it is a great place to go if you have questions of whether a data set is or is not included in the API. You can always come over to this discovery tool and search through the list and see what data sets are available there. So and we do have another alternative to the discovery tool, and that's what we're going to be looking at today, which is our available APIs page. So this takes the data sets from the API and organizes them into a little bit easier-to-read format. Because you can see here, rather than having all of the data sets spread out, all of those 1,600 data sets spread out on one page, they're first grouped into their initial surveys or program areas here. For example, if we wanted just American Community Survey, we could open the drop-down menu for American Community Survey and then navigate to the different data sets within the ACS rather than navigating through a bunch of other data sets that perhaps we weren't quite looking for. So this is what we're going to be focussing on today, this available APIs page. And I will show you how to get there in just a moment. I also wanted to explain a bit more about the relationship between data.census.gov and the API. And so to explain this relationship, I have an analogy here. So what I have here is this Census API pond with all of these data fish swimming around in the API pond. And then we have a fishing boat there with two occupants in the boat doing some fishing. One occupant is representing data.census.gov, while the other is representing a third-party user. Let's first talk about the data.census.gov occupant here. And what this basically means is that data.census.gov is getting its data from the API. It's just taking this data and organizing it into an easier-to-read format for you into a user interface, whether that's through a feature result or a table or a map like you see on the bottom left of the slide here. So when you access the data from the data.census.gov, that's just a reminder that you are still accessing the data from the Census data API. What we also have here is a third-party user who's just directly querying API. This user is still getting the same data. They're just getting it in a purely statistical

format. It's not coming in that same easy-to-read table, map, or feature result format that you might find on data.census.gov. But you're able to access it quickly and easily in many ways, in a more programmatic way than you could perhaps on data.census.gov. My main takeaway I wanted to show with this slide, though, is that, regardless of whether you are accessing the data through data.census.gov or you're a third-party user accessing the data via the API, you are still getting the same data. And as I mentioned earlier, currently the Census data API has over 1,600 data sets available for public use. So I've included some of the more popular ones on the slide here. This is not an exhaustive list. Again, if you would like a full list of all of the data sets available on the API, you can access those either through the available APIs page or go on over to that discovery tool to see all of the data sets listed out one by one. I also wanted to take a moment to talk about API keys. So in all cases of using the Census API, making queries is going to be completely free. However, if you plan to make more than 500 queries or calls per IP address per day, then you will need an API key. So you can request a key at any time. It's completely free to do so. Just click on that Request a Key button that you find on the developers page. You'll enter your e-mail and organization, and shortly after you'll get another e-mail to activate your API key. So once you do that, you're able to go over that limit of 500 queries per IP address per day. I do want to mention, when you see me running queries today throughout the webinar, you'll notice I won't be using an API key. That's because I'm not coming anywhere close to running 500 queries today. I'll probably be running maybe 10 or 20 queries as we go through our examples. So I won't be needing an API key today. However, if you do plan on using the API later on, I definitely encourage you to sign up for a key. As I mentioned, it's completely free to do so. And it just ensures that you don't run into any kind of rate limits or anything like that. And especially if you are using the API through some kind of programming package, many of those actually do require an API key to use. So encourage you all to sign up for a key after the completion of the webinar if you don't have one already. And when we're looking at building API queries within our web browser, what we're going to be using are the examples pages from each of the data sets. So what I have here pulled up is the example URLs from the 2021 American Community Survey five-year data profiles. And when we're looking at the example URLs that I have listed here on the slide, at first glance it might look like they're almost identical. But you'll notice, when you look at the geography portion for each of those, that's where things start to differ. For example, if we're looking at the state geography, we see that we have two URLs listed here. And even looking at those two URLs again, they almost look identical. But the one difference between them is, after where it says 'ampersand for equals state colon,' the first one here has an asterisk while the other has a 06. So the first one that has an asterisk, which is also called a wildcard, indicates that we're pulling back all of the geographies available here. So in this case we would pull back all of the states in the United States. If we wanted to instead just pull back an individual state, we would replace that asterisk with what's called the state FIPS code, F-I-P-S code. And that's the unique identifier for each state in the U.S. For example, here, if we wanted to pull data just for California, we would replace that asterisk with a 06 and would pull data just for California. So we'll get into using these geography syntaxes in a bit when we get over to our examples. The last portion of this example URL I wanted to mention was where you would add a key if you have one. It just comes after the ampersand key equals portion. You would add in your key at the end of the query there. Again, you will notice, when I run my queries through my browser today,

I'm not going to be using a key because I'm not going to be hitting that limit of 500 queries today. And the last thing I wanted to mention before we get into our examples is a new feature on the API. And that's this `ucgid` predicate function that you can add on at the end of your URLs. So I mentioned earlier how you can add in these different geographies using the example URLs that are provided there. But we also have this new option, this `ucgid` option that allows you to pull geographies in ways that were not available before. For example, what I did here was pull all zip code tabulation areas fully or partially within Maryland using this `ucgid` pseudo geo ID. So if you're interested in learning more about using this `ucgid` predicate function, I included a link down here at the bottom. It's a page within our user guide that will help you get started with using that `ucgid` function. All right. With that background information out of the way, let's go ahead and get started on our examples here. So, again, I've got three examples I'm going to work through here. And I'm going to start off with a really simple one, just finding the population of all states in the U.S. So to do this, just looking for the total population of all states in the U.S., and the data set I'm going to use is the 2020 Census. So when I think about accessing data via the API, I like to break it down into three separate parts. I like to think about which variable, geography, and data set I'm trying to pull here. So my variable, I'm going to be looking for total population. My geography is going to be all states in the U.S. And then my data set is going to be the 2020 Census data. Particularly, I'm going to use the 2020 Census redistricting data. And I'll talk about in a moment why particularly I chose that one over some of the other ones. So let's go ahead and get started by going over to our web browser here and going to the developers page. So, first of all, how did I get to the developers page? Well, there's a couple different ways to get here. If you're anywhere on census.gov and you see the data and maps drop-down here, doesn't always show up on every page. But if you do see data and maps, you're able to get on over to the developers link right here. That's one way to get here. Another way to get here, the way I typically get there is a really easy URL redirect. So many of you have probably been to data.census.gov before. It's a pretty easy URL to remember. If you can just remember api.census.gov, if you just type api.census.gov in your browser and hit Enter, that will also redirect you right back over to the developers page. That's typically how I get here myself. So on this page, as I mentioned earlier, we have different links, such as different training materials available. Our slack channel as well as requesting a key. I'm not going to focus on any of those for now. Where I'm actually going to focus is actually back towards the top of the page on this link that says Available APIs. That's where I'm going to get started by clicking on that Available APIs link. So on this page, I'm able to choose from my data set that I want available. So I know I was looking through data from the 2020 Census. So I'm going to start with the Decennial Census here. Then within Decennial Census we've got a couple different links to choose from. I'm just going to focus on the first one here where it says Decennial Census 2020, 2010, and 2000. I'm going to click on this link here. And then from here, we can go back to 2010 or 2000 if you would like to look at those older years. I'm going to stick with 2020 for now. And the way that it's organized on this page is it's showing the more recently released Decennial Census data sets towards the top here. For example, the supplemental demographic and housing characteristics file or SDHC here. And we have the detailed DHCB. I'm going to keep on scrolling down until I get to the redistricting data here. Because I'm just looking for total population, you could find total population from some of the other 2020 Census data sets here. The only reason I chose this redistricting data set is that it was one of the first data

sets released as of the 2020 Census data that was released. And I've just found, for API users especially, our newer users, that the variables list is a little bit more condensed within this redistricting data here. So it's just a little bit easier to access for our first-time user. That's really the only reason I'm choosing this redistricting data over some of the other ones. Again, you could probably find total population data from some of the other data sets on this page. But I'm going to stick with the redistricting data here. And the place I'm going to go to get started is this last bullet point here where it says 2020 PL Examples and Supported Geography. So what I'm going to do is just click directly on that link here, and it's going to open up a new tab for me. So it opens me up directly to the data set page for the 2020 Census redistricting data. We've got a description of the data set here, and then we've got a couple different links to choose from. The two links I'm going to focus on for this example here is the examples link and then the variables link. So what I'm going to do with these two is open them up in two separate tabs and then kind of work back and forth between the two tabs. So on examples, I'm going to right click on it and choose Open Link in New Tab. So I've got that ready to go in a tab. And then the variables list is the only other link that I need from this page here. So I'll just click directly on it so it's open in the tab here. So, again, got my variables list ready to go here. And then in my other tab I've got my examples list here. I'm going to start with the example because I like to start with my geography. So, again, what geography are we looking for here? We were looking for all states in the U.S. So I know I probably want to look under the state geography hierarchy here. That's noted by Geography Level or also called Summary Level 040. And then we've got two URLs to choose from here. So, again, how do we know which URL we want to pick? Well, the only difference between these two is right here. One has this ampersand for equals state colon asterisks. And one has a 06 at the end. So, again, we want all states in the U.S., so we don't want that 06 here. We want every geography pulled back for us, so we're going to choose the link that has the asterisk or wildcard within it. So on this one I can just click directly on this first link here, and it is going to go ahead and open up for me in this tab. So on this page, what we're getting right now is just the names and state FIPS codes, F-I-P-S codes for each state. So we can see Pennsylvania has a code of 42. California, 06. And so on down the list here. But right now we don't have any actual data available here. We're not pulling any total population data yet because we haven't told the API what variable we want. So what I'm going to do is leave this tab open here. I'm not going to close out of it because I still need it. I'm going to go over to my variables list here and find what variable I need. So on this variables list, what I want to pull into the API is the name of the variable here. But sometimes the names can be a little bit hard to understand, so we're going to look at the label to understand what is contained within that variable. So I'm going to scroll on down until I see some variables that are relevant to me. I'm not looking for any geography data right now. What I'm looking for is total population data. So I should be able to pull it from this data here. So this is giving me right here a total population variable, this P1 underscore 001. And it's exactly what we're looking for. Within this table here, this is all coming from Table P1. If you wanted to know the population of one race or the white alone population or black or African-American alone population, or any other race and ethnicity you could here. However, I just want the total population of each state. So what I'm going to use is this variable right here P1 underscore 001N. So what I did, I just clicked and dragged to highlight this variable, and then I'm going to copy it. So right click and Copy. Or you can just remember that number, because what we're doing is taking that variable back over to

our other tab where we're building out this API query. And we're going to paste into our URL up here. So where do we put it, though? The place that you put your variables is anywhere after the equal sign here and anywhere before this ampersand for equals portion. We're putting it within this get equals portion here. Or we call the get equals portion or the get function here. So this name right here, that actually is a variable in itself. Name, we're getting the name of each state. That's a geography variable there. So we want to add in another variable for the total population. So when we're adding in new variables, the way that we do that is adding in first a comma to separate our variables. You always want to have a comma between them. And then we'll paste in what we had copied earlier, P1 underscore 001N. So when I do that, I've added my variable in. My query is good to go. So I can go ahead and just hit Enter on my keyboard. The page refreshes. And we can see now, as I zoom in, we've got not just the name of each state, but we've got that population variable for each state available following it there. For example, right here, Utah has a population of 3,271,616 as of the 2020 Census. So that was all I wanted to show for that first example there just a really quick and easy one, pulling a simple variable to get the population of every state in the U.S. So next up we're going to add in a couple more variables. Now I want to try to find data from the male and female population under five by race and ethnicity for all counties in Delaware. And I'm going to use the 2023 ACS five-year estimates. So, again, breaking down this question into those three parts there. We've got our variables that we're looking for, male and female under five population. Geography going to be all counties in Delaware. And then our data set, this time we are going to use the 2023 ACS five-year estimates. So heading back over to my browser. Actually, before I go into the API here, I wanted to show you why you might choose to use the API over something like data.census.gov to pull this data. So what I did earlier was go to data.census.gov, I added some filters for age and sex, race and ethnicity, and all counties in Delaware. And it gave me back a list of tables here, this B01001A, B0101B, C, D, E, et cetera, list of tables. And what I've seen data users in the past is that they need sex by age data broken down by race and ethnicity. But when you come to this series of tables, you have to look at nine different tables for each of the data points you want. For example, if I wanted the male under five population, I can see it's right here. For the white alone population, I need to go to the next table here. To see it for the black or African-American alone population. And then I would have to repeat this process all the way down to the Hispanic or Latino population here. So it takes a bit of time navigating through all of these different tables here. So what I want to see if I can do is perhaps pull all of that data in one single query within the API. So what I'm going to do here is, actually before I even go to the API, take note of what data sets I'm looking at here. And the way that I do that is I like to look at the data set that I'm looking at here. So I know I'm looking at Table B01001A here. So that's a table ID I'm looking for. And here I'm looking at the 2023 ACS five-year estimates detail tables. So actually coming over to data.census.gov first helps me lay the groundwork for what I'm looking for on the API. I know where to get started. I know I need to go to the ACS. I know I need to go to 2023, the five-year estimates, and detail tables. So let's go ahead and hop back over to our available APIs page and start building out our PII query. So I'm going to go back over to my other tab here where I was on the Decennial Census. But let's scroll back up here just to go back to the available APIs page, which you can do so, you can click here to get there. You can click here to get there. You can click back on the top of your screen. That's where I'll click to get back to the available APIs page. And this time on

available APIs, we are going to be looking at the American Community Survey. And, remember, I knew that because I saw it over on data.census.gov. I know where to get started here. So I'll open up the American Community Survey. And, again, I know where to go here. I was looking at the five-year data here. So I wasn't looking at the one-year data. I'm going to scroll on down until I get on over to the five-year data here. And then on this page, each one of these data set pages might look a little bit different. The American Community Survey one has a lot of helpful information about the different types of tables that are available. The different years you can get to. Comparing and variable changes as well. But I'm going to keep on scrolling down until I get to detail tables. And, again, right here I know I needed to go to detailed tables because I was looking at that on data.census.gov. It told me exactly what table I needed to go to. So the links here might look a little bit different than how they looked on the redistricting data page that we were just looking at, but we're still trying to get to the same two places on this one. We want that list of variables, and we want the list of examples. So, once again, I'm going to open up the examples list, right click on it, and choose Open Link in New Tab. And then the variables list here, we've got a couple different ones to choose from. I'm going to choose HTML just because, working within my web browser, that's going to be the easiest one for me to access and work through. So I'll right click on HTML and open that up in a new tab. So just like before, we've got our variables list open here. This one does take a little bit longer to load because there's a lot of detailed tables, variables that are available here. And then we have our example URLs available like we did before. So, once again, I'm going to leave my variables page open here and come back to it in just a bit. Let's start with our example URLs. Let's start with our geography here. So on this one, I was looking for all counties in Delaware. So I know I probably want to look right here at geography level 050. And we have three different URLs to choose from this time. So on this one I'm probably going to choose the second one, because looking at the geographies available here, I can see this is going to give me all counties in all states. And, again, I know that because of those asterisks there. That's all counties in all states. I don't know what is the state FIPS code for Delaware yet, but I can find it if I click on the second link here. So I'm going to click on the second link to get started on this query. So here it's giving me the estimated total population of every county in the United States. That's just the default variable given to us within this example URL here. I want to first clean up my geography though. I want to change this asterisk to the state FIPS code for Delaware. So I don't know what that is right now. I can see, though, that it's listed on the page here. So I can see we have a state code here. And I can see the state code for Alabama is 01. The other numbers following that, that's going to be the county code for each one of the counties in Alabama or every other state in the U.S. as we go through it. So I know I'm going to do a quick search through this to look for the state FIPS code for Delaware. So to do that, what I use a lot of times in the API is the search function built into my browser. So to open that up if you're on a windows computer, you just use Control and F. If you're on a Mac, it would be Command and F. So within Google Chrome here, it opens up the search box up at the top. And I'm going to do that so I can quickly type in Delaware. So it will take me down to the counties within Delaware. And once I get there, I can quickly see it looks like the county code -- or, excuse me, the state code for Delaware is 10. So with that number 10, all I'm doing with it is going up into my URL, and I'm going to get rid of this asterisk. That's all I want to remove is that one asterisk and replace with the number 10. And you can see why, when I hit Enter, I'm doing that just

to clean up my page. So I'm not seeing every county in the U.S. I'm just seeing every county in Delaware here. So now we have our geography sorted within our URL. Now we need to sort out those variables again. Because I'm not interested in just the total population here. I'm interested in that male and female under five population separated by race and ethnicity here. So to do that, I'm going to go back over to my variables page that I had earlier here. And I'm going to do that same trick of opening up the search box here. And this time I'm going to search for B01001A. And, again, the reason I'm searching for that B01001A is because, going back quickly to data.census.gov, that was the table that I found I was looking for right here. The next one I'm going to search for could be B01001B, then C, then D, et cetera, for this. And, again, I'm trying to find that male under five population right here. And then the female under five population as well. So coming back to my variables list here, I can see that these are 1001A table. And then looking at -- we are looking at the white alone population. And right here is going to be the male under five population. So what I'm going to do with that is take this variable right here, that B01001A underscore 003E is the first variable I want. So I'll copy that variable, go back to my URL that I'm building out here, and then I'm going to replace this variable here. You all can leave it in if you would like. Again, it's just the estimated population of each county here. I'm going to go ahead and remove it and replace it with that variable that I had just copied there, the male under five for the white alone population. So that's the first variable I'm pasting in there. So back over on my variables page here, I'm going to do the same thing for the female under five population. So just scrolling on down until right here I see female under five. I am still looking at the white alone population. This time it is this B01001A underscore 018E. I'll go ahead and copy this link here. Back to my other URL, adding in another comma, because we're adding another variable. And then pasting in that variable there. So let's do the same thing maybe just two more times for the black or African-American alone population. So back on our variables page here, we're just kind of working through the same steps again. Now we're going to look at B01001B, which is that black or African-American alone population here. And the variables do look quite similar here. So this time the only difference between the white alone and black alone population is we went from the A iteration here to now the B iteration within the table ID. So I'll copy that variable here for the male under five population, add in a comma, paste it into our URL. Go one more time back over to our variables list here, and let's add in one more variable for the female under five population for the black or African-American alone population noted by this variable right here. So let's copy in that variable. This is going to be our last one here, add in a comma, paste in that variable. So we added in just four variables here. But now when we hit Enter, we can view all of that data in one place here. So we can see the male and female, white alone, and black and African-American alone populations listed out here following each of the counties within the -- within Delaware here. So that was just another way I wanted to show you all could come and use the API if you wanted to perhaps save some time iterating through a lot of different tables. I know we just did four different variables here, but you could iterate through all nine of those different races and ethnicities and pull them all back in one place here. The last thing I wanted to actually show on this example here before we move onto our next one was what the rest of these variables mean here. So we were looking at, let's say, B01001A underscore 003E. What exactly does that mean? So the first part, the B01001A, is the table ID there. Then we have that underscore 003E, which actually those numbers are corresponding to -- you can think of them as the rows on

the table here that we're seeing in data.census.gov. So if we actually count out one, two, three, we can see that male under five population for the white alone within Kent County here was 2,823. And when we go back to the API, we're getting the exact same number from there. So, similarly, for the female under five population, it ends with a 018E here. I won't count all the way out to it, but it would be the 18th row in this table here where we're getting that 2,799 number. So that's what we're looking at when we're seeing these different variable names that are added in here. The E is actually representing an estimate for that table. And then M would be a margin of error within that table. So really quickly just wanted to point out those variable naming conventions there. And that's going to be all for that exercise here. So I'm going to move on to our final example here where we're going to be covering the groups functionality within the API. So using this groups functionality is going to allow us to pull all of the results within an entire table. For example, if you didn't want to pull individual results like I was just doing, you could instead use the group functionality to pull all of the results from that table. The advantages of this is it's going to allow you to pull more than 50 variables within a single call. For the exercises that I was just walking through, we were only able to add up to 50 of those variables separated by commas. However, many of our tables have 100, 200 variables within them. Using this group functionality is going to allow you to pull all of those variables back at once. And the other advantage of this is you're able to pull data from tables not available on sites like data.census.gov. So that's what I wanted to show for my final example here was pulling some data from the API that you could not actually access on data.census.gov. So my example here, I want to download a data profile table for all places in Nebraska using the 2005 ACS one-year estimates. So, again, breaking down the three parts of this API query here. Rather than a variable this time, we're using a group. We're going to use DP01. Our geography is going to be all places in Nebraska. And then that data set we're going to use the 2005 ACS one-year estimates. So let's get started on this one over in the browser here. Again, let me show one more example on data.census.gov why you would perhaps choose to use this example. So what I did, again, I looked up all places in Nebraska, and I pulled up the data profiles just by typing DPACS in the search bar here. And I got on over to table DP5. So on this table I was looking at it. I see right now I'm looking at the 2023 one-year estimates. But if I go to my years, the furthest I can go back is to the year 2010. And so for -- as I mentioned earlier, many of our ACS users might be aware that there is ACS data available back to the year 2005 accessible via the API. So that's what I wanted to show on this last example is how we can pull similar data, perhaps not exactly the same here as it's from 2005, but pull it for the ACS data via the API. So what I'm going to do is go back on over to my other tab here where I was looking at ACS data. We're going to go back up again to our available APIs here. I'm going to click into American Community Survey. And this time I'm going to use the one-year data because that does go back all the way to 2005. So as I scroll on down here, we're able to switch the year when we get about halfway down the page. If I click on the More button here, I can scroll on down, and I can go all the way back to 2005. So that's where I'm going on this one, back to 2005. And then when we get to 2005, you might notice that some of our earlier ACS data sets we don't have things like subject tables or comparative profiles. Back in 2005 we just had the detail tables, but we did have the data profiles as well. So that's what I'm going to look at here is our data profiles. So on this one, again, I'm going to click on the last bullet point here for examples and supported geography. And then this time, rather than looking at the variables link, I'm

going to, again, open the examples list in a new tab. And then I'm going to open this group list. I'm going to save it for a moment. We'll come back to this group list in a second. So on our examples list, we were looking for all places in Nebraska. So I'm looking right here where it says state place at geography level 160. For those who aren't familiar with places, that's going to include our cities as well as our Census-designated places. So if you're looking for a city, a lot of people aren't aware that they have to look in the place geography. Just keep that in mind. If you're looking for a city within Census data, come to the place geography. And on this one, again, I'm going to choose the second URL just because it's going to allow me to pull all places and all states. And then I can find the state FIPS code for Nebraska like we did earlier. So I'm going to click on the second link here to get us started. And like we did on our last example for Delaware, I'm going to open up that Control F search box and this time search for Nebraska just so I can quickly find what the state FIPS code is for Nebraska. And I can see it right here. That state FIPS code is 31. So just as we did before, I'm going to replace that asterisk with the number 31. And then when I hit Enter, I've cleaned up my geography, and I'll pulled all places within Nebraska here. And if you're wondering why there's only two cities that are appearing, that's because we are looking at the American Community Survey one-year estimates, which do have a population threshold of 65,000 or more. So that's only going to show places like our larger cities here within Nebraska. That's why we're only seeing Lincoln and Omaha for this actual example here. So now that we have our geography sorted, let's pull the entire table for what we were looking for on data.census.gov. We were looking at DP05. So I'm going to try that first. I'm not going to look at any name or an individual variable here. So right after the equal sign, I'm actually going to highlight and delete both of those and then replace that with group open parentheses DP05 and then close my parentheses. So that should pull Table DP05 for me. But when I hit Enter and I try to do it, it's telling me that DP05 doesn't exist. And that's why I wanted to pull up this groups tab that I opened earlier. When we go back to the 2005 ACS, you'll notice that back in 2005 DP05 -- DP05 didn't quite exist yet. We only had Table DP01, which is probably going to be the closest table to Table DP05. So rather than DP05, I'm going to go ahead and replace that with DP01 because I see that is available on the groups list here. So I'll change that DP05 to a DP01. And then when I hit Enter, I can see I've got all of these variables and all of this data on here. It's a lot of information, and it's kind of hard to parse through within my browser. So what I'm going to do is actually save it to Excel. Before I save it to Excel, though, I wanted to show you all a new feature on the API. So especially if you're a returning user to the API, this might be of very great interest to you all. We added in a new functionality where, if at the end of the URL you add an ampersand descriptive equals true, what that does is gives me the names for each one of these variables on the list here. So really helpful when you're trying to pull a large data table like we're doing here. Again, I know it looks like a lot within our browser here, but I think, when I save it to Excel in a second, it's going to be cleaned up and make a little bit more sense. So to save this to Excel, what we do is just anywhere on the page right click on the screen and chose Save As. That will open my file browser here within Windows. I'm going to give this file a name. I'll call it DP01 Nebraska. The actual file name doesn't matter. What does matter is a .CSV at the end. Make sure do you add a .CSV. And the other thing you want to make sure you want to do is change the Save As time over to All Files. When we make those two changes, I'll go ahead and click Save and then open up that CSV file within Excel here. And now things are starting to go look a bit cleaner within Excel. I will go ahead and wrap

this text here so you all can see. This Row 2 was what was added in by that ampersand descriptive equals 2 option -- true option, excuse me. So without that, I would not know what DP01 underscore 007E meant. Adding in that descriptive equals true option gives me those data labels. So super helpful if you're pulling large data tables like this or even just adding it into your regular queries. You don't have to be using a group functionality there. The one thing that might look like it's missing here is the geographies. So I'm going to look for those in Excel here just by using Control and F and searching for Nebraska. And for whatever reason, on some of these older ACS tables, the names are output in kind of the middle of the output of the API here. So what I like to do is just kind of move those by cutting and inserting those cut cells towards the front of the file here, just as an optional step to clean things up. So that is really going to be it for this final example here. Just wanted to quickly show you all how you can pull and access that older ACS data that perhaps you could not find on a site like data.census.gov. This gives you access. Although it might look in a bit different format, a lot of similar data than what you would find over on data.census.gov for those earlier American Community Survey years here. So with that being said, I'm going to really quickly close out with a couple resources here. Before I get to those resources, I wanted to mention another upcoming change to the API, a new feature. Whereas, I just showed you all how to save as a CSV, using that Save As function within your browser, we are adding an output format option at the end of URLs. Like you can see here, you add in an ampersand output format equals CSV, which will directly output that format into a CSV for you. I do want to mention this feature's not yet available. It is planned for release in just a couple of days on January 16th. So keep an eye out for that. The other thing I wanted to mention here that I didn't touch on before is that API calls actually are case sensitive. So keep that in mind when you're using different variable names and different functions like this output format that we'll have available in the future. All right. With that being said, I want to quickly wrap up with some resources, and then we'll have some time for questions here at the end. So before we get there, I wanted to mention that, if you have any feedback, whether that's on data.census.gov, the API, or our recently refreshed microdata access tool, please send those on over to census.data@census.gov. Many of the changes and improvements we make to our data tools and platforms are based on user feedback. So we do find it very valuable when you send us your feedback over to census.data@census.gov. If you'd like to receive e-mail updates, you can do so at the link provided here. Just check the box for whatever updates you're interested in and enter your e-mail. For example, if you check data.census.gov updates, you'll receive things such as our monthly newsletter. And then, if you're interested in any more comprehensive workshop, these are our most comprehensive learning courses that we have available. For our data.census.gov platform, we have a basics, advanced and mapping workshop. And then an MDAT as well as an API workshop as well. So these are going to be two to three hours long. A lot of information available within them. We actually have an API one coming up next week. It's similar to the webinar today but a bit more detail. We're going to go into some things and a bit more time that will be spent going through some of the exercises. So encourage you all to join that if you'd like to learn more. And then, lastly, I did want to mention, as I talked about earlier for our R and Python users, this slide is for you all. If you have any questions about R or Python, I definitely encourage you all to join our Slack channel because there's a lot of different R and Python users in there who can help you out. I comprised this list of different materials for people who are interested in learning

through R, tidycensus is one of the most popular R packages available for that. And then censusdis is another popular Python package available here. So I've included a couple different links here to help you all get started for our R and Python users. All right. With that being said, I'm going to go ahead and turn things on over to Deb to talk about our webinar evaluation and open us up for some questions.

>> Deb Rivera: Great. Thank you so much, Sam. So now we are just about ready to start taking your questions. So if you would like to ask a question, just hit that raise hand icon next to your name. I'll call on you. And when it's your turn, unmute yourself and just give it a quick two seconds before speaking to account for any lag. So if do you have a question, please feel free to start raising your hands now. But before we dive into your questions, I want to let you know that we've set up a quick evaluation survey that will pop up automatically when you exit WebEx today. So when you see that survey window, please take a moment to share your thoughts with us. We would love to hear what worked well, what we could do better. And especially any other topics that you are interested in learning about in future webinars. So that survey will appear right after we wrap up. Please keep an eye out for it and don't close the window. Your feedback really helps make these sessions more valuable for everyone. Now, if you have any questions remaining after our session concludes today or if you'd simply prefer to send us your question via e-mail, please feel free to reach out to any of these inboxes that we've listed here. If you are a member of the media, you can contact the public information office at pio@census.gov. And for general data.census.gov, API, or MDAT questions from the public or training requests, please reach out to the Center For Enterprise dissemination. So now we can go ahead and start taking your questions. Let's see if we have anybody queued up? All right. I see, Tamara, your hand is raised. Lisa, can we go ahead and please unmute Tamara. All right. Tamara --

>> Coordinator: Request was -- yeah, the request was sent.

>> Deb Rivera: Okay. All right. Thank you. Okay. Well, I'm not seeing any other questions in queue right now. But, Sam, we have received numerous questions through our Q&A feature. While we're waiting for live questions to come through, I'd love to maybe share some common API questions that I think would be valuable for everybody to hear, if that's okay with you.

>> Sam Patton: Yes. Sounds great, Deb.

>> Deb Rivera: All right. Perfect. So the first question that we typically get is, how do I figure out what data set to start out on the API? For example, how did you know to go to the redistricting data on the first example?

>> Sam Patton: Yeah. So I think, if you're a newer user to census data, it's actually a great idea to work between both data.census.gov and the API. You saw me do it for the last two examples, where I kind of started on data.census.gov, and then I moved on over to the API. So if you don't know exactly what data set to use or what you're looking for, it's a great idea to start on data.census.gov. For example, if you wanted to know median income, but you didn't know what table or anything to use, you could go to data.census.gov, add a filter for income of households, find the table you're looking for, and then take that table ID over to

data.census.gov and start building out your query. So I think doing some back and forth between the two sites is a really good practice actually.

>> Deb Rivera: Okay. All right. Thank you for that. Check for a question. I'm not seeing any, but we are still are taking live questions. If anybody has any questions related to today's content, we'd love to hear them. All right. Another common question that we do receive is, I'm having issues with activating my API key. What should I do or who should I contact?

>> Sam Patton: So if you are having any issues with the API key, I would say often times we have seen in the past where sometimes people will receive a message that there was an issue with their key, but the key is actually still working. So if you receive any kind of error message, try and run a query with your key, and sometimes you'll see that it actually is working. However, if you're still experiencing issues and you can't figure things out on your end, send us an e-mail to the e-mail you see on your screen right here, census.data@census.gov. We can help you out with that key if you're still running into issues later on.

>> Deb Rivera: All right. And I did send that e-mail address out in the chat. If anybody would like to copy it, it's available there. Thank you for that, Sam. Another common question that we receive is, is there a way to pull data from multiple years at once for ACS or Decennial Census data?

>> Sam Patton: Unfortunately, there's not at this time. You will have to pull individual years. You can edit those within the URL. You'll have to pull one year at a time within the data set there. So you would have to change between each year and pull, for example, 2023 ACS. Then you would have to pull 2022, et cetera. I think through perhaps R and Python you might be able to find some ways around that. But as it is right now, when we're accessing it through the browser, you'd have to pull individual data sets one by one.

>> Deb Rivera: Okay. Great. Thank you so much, Sam. And I'm just doing a quick check here to see, we do have a raised hand from Rey DeCastro. Lisa, can we please unmute that line. Your line is open. So we have unmuted Rey DeCastro. Can you hear us? I'm not -- I'm not sure.

>> Sam Patton: Not hearing anything on my end.

>> Deb Rivera: Yeah, me either. I'm so sorry. If you wanted to try queuing up again. Not really sure what's going on there. , All right. All right. So one last question, Sam -- I'll keep an eye out to see if anybody else queues up -- is sometimes when I'm pulling data from one year to the next, the numbers seem wildly different. Can the API variables change?

>> Sam Patton: Yes, they can actually. And that ties in well to the last question about pulling data year over year. The reason that we can't pull multiple years at once is because those variables sometimes can change from one year to the next. So if you're pulling data over time and all you're doing is changing the URL, changing from one year to the next, make sure that you're also checking for any variable changes between years. Whether that's on the variables page or using that new descriptive equals true option, you can see if there was any changes in the labels from one year to the next. So that's really important to do because

we've seen -- we've had messages from people in the past where they're pulling data from one year to the next, and they say, oh, this number increased ten fold from one year to the next. It doesn't seem correct. And actually what had happened was the variable changed, so they were looking at an entirely different data point than what they were looking at the year prior. So really important to check for any variable changes from one year to the next. Again, using that descriptive equals true option can be really helpful. Or the ACS team, in particular, has started to put together a variable changes document over on their available APIs page. So check that one out as well.

>> Deb Rivera: Okay. All right. I think I do have that link that I can send. We do have a question on the line. So we'll go ahead and take that, and then we can wrap up today. Lisa, can you please unmute Colleen.

>> Colleen: Hi, this is Colleen. Can you hear me?

>> Deb Rivera: We can. Hello.

>> Colleen: Good afternoon. Thank you for taking the question. I was just curious, I haven't used the API to pull data before. And I was wondering if the order you list the variables on that URL line dictate the order it gets listed or downloaded in that Excel layout? Or does it have its own default order that it will follow regardless of the ordering you do?

>> Sam Patton: Yeah. Thank you for that question. So it does actually change. For the variables it matters what order you put them in. So you could move, for example, if we moved that name variable around, the name of the geography, that would change what order it outputs on the API there. So it does actually matter which order you change those API variables within a field. You can play around with it yourself in the URL. If you just move variables around, you'll see that it changes the output order of those.

>> Deb Rivera: Great. Thank you. And thank you so much for your question, Colleen. Sam, we did get one more question, and I am inclined to take it just because we haven't received any. So can you please unmute Laura's line. That will be the last one.

>> Coordinator: The request was sent for her to unmute.

>> Deb Rivera: Okay. Laura, you should be able to unmute yourself, wait two seconds, and then speak your question. Laura, can you hear us? Yeah, I'm not sure. I do apologize. I'm not sure if that is an issue that we're having or maybe it's WebEx, but we can't hear you. You should have received a request to unmute yourself. Or you should be able to try to unmute yourself.

>> Laura: Hear me?

>> Deb Rivera: Oh, there you are. Hello, Laura.

>> Laura: Yeah. The -- I guess the request to unmute was a little delayed. My question is, how would a person know that there are more data years on the API than what's listed on data.census.gov?

>> Sam Patton: That's a good question. It's not -- when you're on data.census.gov, I will say it's not entirely clear that there is, for example, a 2009 ACS you can go back to. It's kind of just some knowledge that either you can find through the ACS web page or either through the API page. I think that's some good -- feedback we've received before is perhaps referencing it on -- directly on data.census.gov, referring that you can find that older data via the API. But for me a good place that I go and check to see if older data sets are available, because there's tons of different data sets available on the API that I'm not always extremely familiar with. I'll either look on that available APIs page, and it will tell me what years are available. Or sometimes I'll just go directly to that discovery tool. I didn't show it today, but I showed it on one of the earlier slides. That will show you all of the different data sets available there. So you can search through that discovery tool, and it's going to list out all of the different years of the different data sets that are available there. So you can do it that way. You can also just edit the URL sometimes, working through the URL. Editing between different years to see if older years are available. That doesn't always work because sometimes the syntax of the URL changes. But often times you can find some older URLs or some older years quickly by kind of just working through some quick URL changes. And then also, if you're just not sure, just send us an e-mail, and we can let you know if some of those older data sets exist or not. That's always a great place to just -- if you want to be -- double, triple check, you can just send us an e-mail there.

>> Deb Rivera: Thank you, Sam. Thank you so much, Laura, for that question. And I do apologize, we are over time here. And I know that we still have a few slides to get through. So in the interest of time, I would like to encourage anyone who has questions, please, please reach out to us. We have an excellent team ready to take your questions. They usually are able to get back to folks within 24 hours, sometimes less than that. So I do encourage you all, if you have any questions now, later, tomorrow, whenever, please send us that in writing via e-mail. We'd really appreciate it. So with that, Sam, I will turn it back over to you so we can cover the additional resources that you have to share.

>> Sam Patton: Yeah. Thank you so much, Deb. And, again, please do e-mail us. I promise everyone, if they didn't get their question answered, I will keep an eye on that myself and get to any questions that we didn't get to. Or go ahead and join our API workshop coming up next week. We have a lot more time in there to work through different questions. Encourage you all to join that as well. But with that being said, I will really quickly just close us out with two more slides here. Just wanted to mention our resources pages that are available. We've got our data.census.gov resources and our API resources. And then, again, those two feedback e-mails you can reach out to. That census.data@census.gov one, that's the one you want to send if you have any follow-up questions from the webinar today. And then, lastly, wanted to give a mention to our data dissemination specialists. They're a really great group of Census Bureau employees who can provide personalized trainings for data users across the country. So if you have a data question that you need help with and you want a data dissemination specialist to help you personally, you can go ahead and reach out to the census.askdata@census.gov e-mail, and they can follow up with you there. But with that being said, wanted to say thank you all so much for joining us today. This was a really great webinar. It was my pleasure to be your presenter today. Again, any follow-up

questions, go ahead and send us an e-mail. Otherwise, I will turn things over to Lisa to close us out.

>> Coordinator: This concludes today's webinar. Thank you for your participation. You may disconnect at this time.