Using American Community Survey Estimates and Margins of Error

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Sirius Fuller

Decennial Statistical Studies Division, U.S. Census Bureau

Slide 1: Using American Community Survey Estimates and Margins of Error

Coordinator: Welcome and thank you for standing by. At this time, all participants are on a listen only mode until the question and answer session of today's conference. At that time, to ask a question, press Star 1 on your phone and record your name at the prompt. Today's call is being recorded. If you have any objections you may disconnect at this time. I would now like to turn the call over to (Sirius Fuller). Thank you, you may begin.

(Sirius Fuller): Hello, good afternoon. As the operator just said, my name is (Sirius Fuller) and I'm a mathematical statistician at the Census Bureau and today we're going to talk about using American Community Survey estimates and the margin of error. This is very similar to last year's presentation, but it may be new for you. I hope you'll learn something either way.

Slide 2: Outline

So the presentation will start with a discussion of the ACS estimates and then we'll get into what a margin of error is, and I'll explain why it matters. And as you might note from the screen, the margin of error can also be abbreviated as the MOE. And so I'll be using those interchangeably throughout the presentation.

Next, I'll discuss statistical testing or, more specifically, why statistical testing is important and how it uses the margin of error. And then we'll go over a few

special cases that you might encounter, and we'll walk through an example of how to approximate the margin of error for a combined estimate. And then I'll briefly go over some available resources at the end and we'll open up for questions.

Slides 3 and 4: ACS Estimates

So let's start talking about the ACS estimates. Every year over 3.5 million housing unit addresses are contacted by the US Census Bureau to participate in the American Community Survey which is also abbreviated as the ACS. The information obtained from this sample is then used to estimate characteristics about the total population in a timely and a cost-effective manner. However, these estimates differ from those that would be obtained in a Census where every household in the nation is contacted.

So, in other words, we can't be 100% confident that the sample is truly representative of the entire nation and this results in an element of uncertainty in the data. Users who are interested in more information about the ACS sample design should see the ACS Design and Methodology report. The URL is on the screen and will also be included at the end.

Slide 5: Availability of ACS Data Products

So to continue, ACS data products are available in a few different varieties. The ACS one-year estimates are based on data collected over 12 months and are available for geographic areas with a population of 65,000 or greater. We plan to release the 2017 ACS 1-year estimates in September of 2018.

The ACS 1-year supplemental estimates for about 60 detailed tables are available for geographic areas with populations of 20,000 or more. They are simplified versions of popular ACS tables, mainly univariate or bivariate

tables focused on key topics. And we plan to release the 2017 ACS 1-year supplemental estimates in October of this year.

The Census Bureau created the Supplemental Estimates in response to requests from data users for timely data for geographies that were below 65,000. They will provide more current data on annual updates from what's as twice as many geographies as compared to the standard one-year release.

The ACS 5-year estimates are based on data collected over 60 months and are available for geographic areas of all sizes down to the Census tract and block group level. We plan to release the 2013 - 2017 ACS five-year estimates in December of 2018. So ACS data are available for geographic areas with a population of 20,000 or more in the form of 1-year estimates and ACS data are available for all geographies in the form of 5-year estimates.

And as a side note, it's important that you do not compare one-year estimates with five-year estimates. We encourage you not to do so, because of overlap between the data.

Slide 6: Outline

So both the one-year and the five-year data are published with margins of error. So we will discuss that now.

Slide 7: What is the Margin of Error?

So as you might now, ACS estimates are available through American Fact Finder, or AFF. But here we have a typical data table which is a detailed table of sex by age and it has a table ID in the upper left corner of B01001. So if you ever look up something on AFF, you can either look up by the characteristic, so just sex and age, or by this table ID.

So the characteristics in the table which are circled in red on the left

Slide 8: What is the Margin of Error?

and then we have the estimates.

Slide 9: What is the Margin of Error?

And then on the right-hand side we have the margins of error. You may have seen the margins of error before and you're not sure what to do with them. And so we're going to discuss that now.

Slide 10: What is the Margin of Error?

So let's start with the definition. Put simply, the margin of error or MOE, is a measure of the possible variation of an estimate around the population value. Margins of error allow data users to be certain that at a given level of confidence, the estimate and the actual population value differ by no more than the value of the MOE. The Census Bureau uses a 90% confidence level as its standard. All ACS estimates published on AFF have margins of error calculated at this 90% confidence level.

It's also important to note that margins of error provided by the Census Bureau have the same units as their respective estimates. So, for instances, a percent estimate will have a margin of error which is a percent and a median estimate for income will have a margin of error in dollars.

Slide 11: What is the Margin of Error?

So let's look back at the sex by age table that we saw just a moment ago. Circled in red is the estimate for males who are under five years old. As you can see, the estimate is roughly 10.1 million, with a margin of error on the right-hand side of plus or minus 3,778. So since this figure is an estimate, we can't be 100% certain that there are exactly 10.1 million males under the age of five in the US. However, using the margin of error, we can be 90%

confident that the true number of males for this estimate lies within plus or minus 3,778.

Slide 12: Measures of Sampling Variability

So you might be wondering where the margin of error comes from. It's actually a member of the family of measures of sampling variability and so this slide shows how one can be derived from the other. So beginning at the top is the variance and it's calculated for each estimate where the estimate is tabulated. And put simply, the higher the variance, the greater the variability in the responses.

In the middle is the standard error or SE and that's found by taking the square root of the variance. And the standard error gives a clearer picture as to how much variability is in the estimate. As it's in the same units as the estimate itself.

The standard of error is then used to calculate the margin of error. And depending on the confidence level, you'll multiply the standard error by a different value. For the Census Bureau standard of the 90% confidence level, we multiply the standard error by 1.645 to get the margin of error.

Slide 13: Alternate Confidence Levels

There are a few other confidence levels that are widely used. One is the 95% confidence level and the next is the 99% confidence level. So you may be interested in using one of these and you can convert from the published margin of error to another confidence level. So to do that, it's pretty easy. What you will do is divide the published margin of error by 1.645 to get it back to a standard error and then you will multiple by the appropriate factor. So to convert between the published 90% confidence level and to convert it to

a 95% confidence level, you'll divide your published margin of error by 1.645 and then multiple it again by 1.96.

Slide 14: Alternate Confidence Levels

So to illustrate this, here's our estimate from the table before. We have the estimate of males who are under five-years-old and the margin of error as we saw before was 3778. And so if we wish to convert this to a 95% confidence level, we divide 3778 by 1.645 and then multiple it by 1.96 and we'll get a margin of error of roughly 450 1 which is the margin of error at the 95% confidence level.

Slide 15: Alternate Confidence Levels

So here's what we just saw and on the table on the bottom is the published 90% confidence level margin of error, the 95% confidence level that we just calculated and, also, the result if you were to calculate the 99% confidence level. As we can see, as the confidence level increases the margin of error increases and this especially clear as we go down the table.

Slide 16: Outline

So now that we know what the margin of error is and how it's calculated, you may wonder what the practical context is, why does it matter, what's it used for?

Slide 17: Confidence Intervals

One way to use the margin of error is to construct a confidence interval and a confidence interval is a range of values where at a given confidence level, you can be certain the true population lies. As we saw before, the margin of errors displayed with a plus and minus sign and that's a good clue to remember that the estimate plus or minus the margin of error provides the confidence interval.

So let's look at a hypothetical block level. And block groups are the smallest geography which the ACS publishes at. For our hypothetical block group has a median income of $3284 dollars and the margin of error on the right side is 20,922. So to calculate the upper bound of our confidence interval, we take the estimate of 37,000 dollars and add it to - add the margin of error to it. So we add 20,922 and you can see the result is $58,206. And to calculate the lower bound, we take the estimate and subtract the MOE and you can see that results in $16,362.

So the confidence interval at the 90% confidence level which, again, is the Census Bureau standard, is $16,362 to $58,206. And we can be 90% confident that the true population estimate lies somewhere within this range.

Slide 18: Why MOEs Matter

The margin of error can also allow you to see if there's enough evidence to conclude the estimates are statistically different from one another. So for an example, let's compare the block group we were just looking at to four other hypothetical block groups. So if we just look at the median household income, you would conclude that the first block at 37,284 was the smallest and block group 5 at 76,850 at the bottom of the table was the largest. But we're missing the margin of error.

Slide 19: Why MOEs Matter

So if we add it in, you can see that on the right - and as a note, this is hypothetical examples. Margins of errors for these estimates are high. And not all medians at the block group level have such high margin of errors, but it's' important to be aware of the MOE when you're looking at an estimate.

So we can see that what we thought was the smallest median household income has a margin of error or 20,922 and the so-called largest block group

at the bottom has a margin of error of $47,200. So if we want to conclude that one is the highest or the lowest, we'd have to do statistical testing to determine if that were the case or not.

Slide 20: Outline

So this leads us into the next section which is statistical testing using the margin of error. And before we begin, we'll start with a definition.

Slide 21: What is Statistical Testing

A statistical test is a test to determine if a difference is unlikely to occur by chance. To be statistically different, there must be statistical evidence that there are differences between two estimates. And statistical testing must be conducted anytime you explicitly or implicitly make a comparison between two estimates.

Slide 22: Statistical Testing

So in order to conduct statistical testing, you can use what's called a Z score formula. And on the screen is the generic version of it. And I should note that all formulas are available through our online resources which I'll get to at the end of this presentation.

So this formula uses both the estimates and the margin of error to generate a result and as we'll see in a minute, if the result is greater than 1.0, then the estimates are statistically different at the 90% confidence level. And as an aside, this formula uses margins of error. In general, a Z score formula uses standards of error, but you can use the margin of error and avoid making common mistakes. And it's easier to use because the margin of error is published directly on AFF.

Slide 23: Statistical Testing

So let's run through an example. Suppose we wished to compare the median age of the total population of the US to the median age of the total population of New York State. So for this example, we're using 2016 ACS 1-year data. And as you can see, circled in red, the median age for the United States is 37.9 with a margin of error of 0.1. And for New York, it's 38.4 with a margin of error of 0.1 as well.

So bear with me, I'm just going to take the estimates that we see at the top of this and I'm going to run them through the formula and then I'll sum it up in just a moment.

Slide 24: Statistical Testing

So step by step, you take the difference of the two estimates. So, we take 37.9 and subtract from it 38.4 which we get negative 0.5. And then we take the absolute value of that. So in step 2 we get 0.5 and then we square the individual margins of error. So it's 0.1 squared which results in 0.01 and you do that for both of them and you add them together to get 0.02.

Slide 25: Statistical Testing

Then in step 5, we take the square root of this sum which is approximately 0.141 and then we divide the two steps. So, 0.5 over 0.141 gives you 3.55. And as I mentioned earlier, since this result is greater than 1, then we conclude that there is statistical difference between these two estimates.

Slide 26: Statistical Testing

So to put it all together, on this slide, there's the generic Z-score formula which I showed earlier and then below it are all the steps combined into one.

Slide 27: Statistical Testing

The nice thing about the Z-score formula is that you can use it to compare a wide range of estimates, including estimates between different years, multi-year estimates between different non-overlapping time periods, estimates across geographic areas, and between surveys. Again, I'd like to note that single-year and multi-year estimates should never be compared in our data analysis. Comparisons between the one and the five-year data products will yield erroneous findings.

In addition, if you're going to compare ACS to Census estimates, before you begin, you want to make sure that the estimates are comparable. The questions for some estimates have changed. So it's no longer appropriate to compare them with Census data. And you can check compatibility via the link at the bottom of the page.

Slide 28: Statistical Testing Tool

So now that we've gone through an example to manually conduct statistical testing, I'll show you how to do it with a free tool that is provided by the Census Bureau. This is the Statistical Testing Tool. Using this tool, you can compare pairs of estimates as well as groups of estimates against each other. It's available for download as an excel spreadsheet and the link is provided at the bottom. And the spreadsheet comes with multiple tabs and there are two different tabs, one to test pairs of estimates and one to test multiple estimates altogether.

Slide 29: Statistical Testing Tool

So let's look at a couple screenshots. Here's an example for testing two estimates to each other. This spreadsheet has instructions at the top and columns for testing labels. The first estimate and the first margin of error, the second estimate and the second margin of error, and then a column for

whether or not somethings statistically different. The tab can compare up to 3230 estimates which is the number of counties in the United States.

You can enter in a label if you wish. Enter in the estimates and margin of error and then the tool will automatically populate the field for whether or not it's statistically different. So if it's not statistically different, it'll appear in red and then if it is, it will say - it'll be white, and it'll just say yes.

Slide 30: Statistical Testing Tool

So this is a second slide which is just talking about if statistically different appears automatically, the yes and no.

Slide 31: Statistical Testing Tool

So on the other tab, you can compare multiple estimates all to each other.

Slide 32: Statistical Testing Tool

So from before, we had five hypothetical block groups and we noted their estimates and margins or error. And you can use the Statistical Testing Tool to compare them all to each other. This tab compares up to 150 estimates against one another and you should be careful because this - you should only test one type of estimate at a time.

So once again, you can enter your own label, your estimate, and the margin of error. The label in the middle column will be automatically populated and then the results will be populated in the grid. As you can see, there's a little gray X and that's the estimate compared to itself. And then if it's not statistically different, you'll get a red no and if it is, you'll get a yes. And there are some cases where a statistical test in not appropriate and we'll go over that a little later.

Slide 33: Statistical Testing Tool

So we can see that everything is populated with red no's or X and so, none of the hypothetical block groups that we've been discussing are statistically different from one another. In addition, American FactFinder publishes a few types of data products that include statistical testing within them.

Slide 34: ACS Comparison Profile

The first type is the Comparison Profile. Comparison Profiles are similar to Data Profiles, except they include the estimate from prior years. As a note, estimates from the prior years are inflation adjusted and there's also an asterisks in the column next to the estimate if the estimate from the current year is statistically different from the prior year. You don't have to remember what the asterisks represents as it's included in the notes on AFF as well.

This particular example shows a five-year comparison profile. Comparison profiles for 5-year data are now available for the non-overlapping 2007-2011 and 2012-2016 5-year estimates. Comparison Profiles for one-year data products are also available. They are availableat a wide range of geographic areas including the nation, the state, counties, school districts, and congressional districts.

Slide 35: Ranking Tables

Another product type that includes statistical testing are the ACS Ranking Tables. Ranking Tables show you how different geographic areas compare to one another. And I should note that the only geographies provided in the ranking tables are the nation and the states. They're a little different from the comparison profiles in that you have to turn the statistical testing on. So if you notice, circled in red on the top of the page, is "with statistical significance". So you click that and then AFF will automatically populate the table with a statistical significant results.

Slide 36: Ranking Tables

You can change which geographies you're comparing using the drop-down menu. And the geography you chose, in this case, the United States, will have two-pound signs next to it. And then if the geographies are not significantly different from the chosen geography, a single pound sign will appear.

So here we've chosen the United States and we can see that the states at the bottom, Arizona, Colorado, Delaware, Missouri, and Oklahoma are not significantly different from it.

Slide 37: Ranking Tables

Again, you don't have to remember what these symbols mean as they are provided within the notes on the page that - the Ranking Table page.

Slide 38: Outline

So now that we're a little more familiar with statistical testing and some of the various products and tools available, - sometimes you may come across something that looks a little different. So we're going to go over some special cases now.

Slide 39: Special Cases – Controlled Estimates

So the first special case you may encounter is a controlled estimate. So certain estimates that are published in the ACS are controlled to match the official population estimates. And if this has occurred, then the margin of error will have five stars instead of a number. You may use this in statistical testing, simply set the margin of error to zero.

Slide 40: Special Cases – Zero Estimate MOE's

Another special case is if the estimate that you are looking at is zero. Here we have an example of a table and circled you see that the estimate for males under 5 years old is 0 and it has a margin of error plus or minus 23. Estimates of zero have a non-zero margin of error, because the ACS is a survey. And so households with rare characteristics may not be surveyed, but they still may exist.

Slide 41: Special Cases – Medians and Aggregates

There are also some special cases where statistically testing is not possible. So here we have a table of the median income in the past 12 months by place of birth in the United States. And this is for, in case you're interested, Adak city, Alaska.

Slide 42: Special Cases – Medians and Aggregates

So the first instance where statistical testing in not possible, is if you see an estimate with a dash and a margin of error with two stars. Medians and also aggregates with too few observations are displayed this way. In addition, if you have a percent of ratio where you're dividing by zero, then instead of an estimate, you'll have this dash and two stars.

Slide 43: Special Cases – Medians and Aggregates

The second special case is if the median is in the highest or lowest interval of an open-ended distribution. So in this case, you'll have an estimate followed by a minus or a plus sign and then the margin of error will have three asterisks. So for this estimate we have the foreign-born with 2,500then a minus. This 2,500 with a minus is not actually a number, it just indicates that the margin of error - or excuse me, the estimate is lower than $2,500, and we can't say anything more about it.

Slide 44: Special Cases – Medians and Aggregates

So in both of these cases, statistical testing is not possible and if you were to copy these estimates into the statistical testing spreadsheet, it would show up with the gray dash to indicate that no testing was carried out.

Slide 45: Special Cases – Displayed in Apps and the API

In addition, I want to point out that there are other methods than American FactFinder for obtaining ACS data. So here we have two examples. One on the left is My Tribal Area app and the other on the right is a screen shot were you to obtain data using the application programing interface or API. And the API is commonly used by developers of apps.

So you might see some different notation and the documentation for wherever you're getting the data will explain what you're looking at. So there are no additional special cases, but the display might show things a little differently.

Slide 46: Estimates with Large MOE's

Another special case is if you have estimates where the margin of error is larger than the estimate itself. And this occurs mainly in estimates for small geographies or small groups of people or households which have a small sample size. So in the table for poverty status in the US by sex by age which is what we're looking at, we're looking at Census tract estimates. And you can see that many of these estimates have margins of error that are larger than the estimate itself.

Slide 47: Estimates with Large MOE's

You should exercise caution when using these estimates, because they have questionable reliability. Large margins of errors can signal that the sample size of the estimate is small. Unfortunately, there are no ideal solutions to dealing with this, however a few workarounds are available. One method is to

use a larger geographic area. So for example, you could use county estimates instead of tracked estimates. Another method is to form a larger group of - combining estimates together to form a larger estimate. And if you did that, you'd have to approximate the margin of error.

Slide 48: Outline

So this leads us into the next section which would be how to approximate the margin of error if your estimate that you're creating is not published.

Slide 49: Deriving New Estimates – Must approximate the MOE

So here we have table B01001 which we've seen before. Suppose you wish to have the estimate of children who are under 5 years-old. Well, it's published for both males and females, but not combined. So you would have to calculate yourself and then approximate the margin of error.

Slide 50: Approximating the MOE

So adding the two estimates together is pretty straight forward. Approximating the margin of error is a little more involved. But we'll go through it in just a moment. As a note, when approximating the margin of error, the MOE will not necessarily match published ACS estimates or ACS estimates were the estimate created using the ACS microdata. And this is because the approximation method does not include the covariance.

Slide 51: Approximating the MOE

So here we'll just quickly walk through the examples. So if you wanted to calculate the estimate of children under the age of five-years-old, you would add up the estimate for males and females. So you'd add up 10.1 million for males and 9.7 million for females and you'd get the result which is 19,866,960. And to approximate the margin of error, you would take the MOE for males and square it. So we're going to square 3,778 and then we'll

also square the MOE for females, the 3,911 and we'll add them together. And then we'll take the square root and that will give us the approximate MOE which is 5,438.

Slide 52: Approximating the MOE

One way this approximation can differ from the actual MOE is if you were aggregating multiple zero estimates. In this case, the approximate MOE could diverge from the actual margin of error. And so the - our recommendation is to only include one zero estimate margin of error and include the largest one.

So as an example, let's say you want to know the total number of children under 10-years-old who identify as Native Hawaiian or another Pacific Islander in Maine and Rhode Island. So as you can see, the estimate for the - 3 out of the 4 estimates is 0 and the estimate for the children aged 5 to 9 for Rhode Island is 41. So to get the estimate as we did before, we add it all up to get 41. And to approximate the margin of error, we could use the approximation formula, but as recommended, we're going to take the MOE from the non-zero estimate -- so that's 37 -- and then we're going to take the 29, which is the largest MOE of all the 0 estimates.

Now if we put that in our formula, we get an approximate margin of error of 47. If were to include all the margin of errors, we'd a margin of error of 56 which is somewhat larger.

Slide 53: Variance Replicate Tables

Advanced users may be interested in the Variance Replicate Tables. The Variance Replicate Tables include estimates, margin of errors, and their corresponding 80 variance replicate for selected ACS 5-year Detail Tables. And the reason I'm mentioning this is these tables can be used to calculate the margin of error for derived estimates and the variance replicates can be used

to calculate a margin of error that includes the covariance. So you do not have to approximate the margin of error.

I'm not going to cover what the covariance is, because it's out of scope of this presentation, but you should know that the covariance must be calculated individually for each derived estimate which makes it prohibitive to provide to the public. So if the covariance is large, the approximation can be very different from the actual MOE. And using the Variance Replicate Tables provides a means to calculate this actual MOE.

As a note, these tables require a fair understanding of statistical programing to use and if you wish to know more, you can follow the link for the documentation at the bottom of the slide.

Slide 54: Collapsed Tables

It should also be noted that some Detailed Tables have a collapsed version available. So here we have an example. On the left is the table for sex by age for black or African-American alone. And on the right is the collapsed version.

So if you wish to have an estimate that is provided in the collapsed version, you do not have to approximate the margin of error. So, for example, if you wish to - know the number of children under 18 years-old who are male, you could simply refer to the collapsed version of the table as opposed to approximating - adding up the estimates and then approximating the margin of error which you'd have to do using the detail table.

As a note, the detail table is beginning with a B and the collapsed version begins with a C. C stands for collapsed.

Slide 55: Outline

Now I'm going to quickly go through a few resources and then we'll open up the line to questions.

Slide 56: Resources

The ACS website includes many great resources for users looking for more information. So here are a few highlights that might help you.

Slide 57: ACS Documentation

The code lists, definitions and accuracy page on the ACS website is a great resource for data users. You can find the Instructions for Applying Statistical Testing where you can find how to derive the margin of error for not just counts, but also percents and ratios and other derived products.

Slide 58: ACS Documentation

In addition, there's the link for the Statistical Testing Tool where you can download the tool for free.

Slide 59: ACS Documentation

And there's also the Accuracy of the Data Document. The Accuracy document provides the same equations that are in the Instructions for Applying Statistical Testing, but there are also worked examples. And you may notice that there's a version for the 1-year and the 5-year and that's because the 5-year Accuracy document has information pertaining particularly to the 5-year data product, but the worked examples are essentially the same.

Slide 60: Compass Handbooks

There are also the Compass Handbook for data users. They're at the link which is at the bottom of the slide and these handbooks provide an overview

of the ACS and are tailored for specific groups. So for example, at the top there's What Congress Needs to Know or third down is What General Data Users Need to Know. There's several different ones. There's ones for researchers, et cetera.

Slide 61: Training Presentations

In addition, past training presentations for various different topics on the ACSare provided on the website. And some topics include how to access the ACS data and how to work with the Public-Use Microdata Sample. And this presentation and the slides will be available shortly after this presentation.

Slide 62: Crosswalk

As I mentioned earlier, if you're comparing ACS and Census tables, you need to make sure that they are comparable, and they haven't changed. So you can use this crosswalk to make sure that the tables you are looking at are comparable.

Slide 63: Design and Methodology

In addition, if you wish to have more technical information on the ACS, you can look at the Design and Methodology document and, in particular, if you're looking for margins of errors, use chapter 12 which is for Variance Estimation.

Slide 64: Source Us!

And then very briefly, if you are using ACS data, we'd appreciate it if you'd source us. Recommendation would be to say US Census Bureau and then the year. So you'd say 2012-2016, American Community Survey 5-year estimates or 5-year data. Here are just some examples of how to do that.

Slide 65: Continue the Conversation #ACSdata

You can contact ususing the phone number or email provided for data user support. We're also on social media @uscensusbureau and using hashtag ACS data.

Slide 66: Data Users Group

In addition, there's a ACS data user group which was put together through the Census Bureau and the Population Reference Bureau and it's free to join and you can ask other data users who may have a similar question that you have and have already answered it. So it's a great resource outside of theCensus Bureau.

Slide 67: Need Local Stats?

In addition, there are also Data Dissemination Specialists who may be nearby you and they're willing to give presentations to answer any further questions or needs that you have. So the phone number is there as well as their email address.

Slide 68: Outline

So this concludes our presentation and if you have any questions, I'll be happy to take them.

Slide 69: Questions

Coordinator: Thank you, we'll now begin the question and answer session. If you would like to ask a question, please press Star 1 on your touchtone phone. Make sure your phone is unmuted and record your name clearly when prompted. You name will be required to introduce your question. If you need to withdraw your question, you may press Star 2. Again, to ask a question,

please press Star 1 and record your name. It will take a moment for questions to come through. Please standby.

And we have a question coming in, one moment. And the first question comes from (Doug). Your line is open.

(Doug): Thank you very much. In the past I've seen trends in data, whether it's population or other types of information that had maybe, like, a 10-year history. And I've seen combined ACS and Census Bureau data from - let's say from the, you know, the Decennial Census. I understood you to say you cannot use because of different definitions in how the data is formulated?

(Sirius Fuller): No, I'm sorry. You may compare them, but sometimes the ACS questions have changed enough that you may not compare them. So to determine if the question is still comparable, then you would use the website - see if I can get it up. The crosswalk website. So you'd put in your detailed table and the Census table and it would tell you whether or not you can compare them and if there were any caveats that you should be aware of.

(Doug): Okay, for the most part, is, like, population is - you know, comparable between ACS and the Decennial Census? Are there some, like, really targeted types of data elements that can't be compared between the Decennial Census and the ACS?

(Sirius Fuller): Well, off the top of my head, I don't really know. I don't work with that too much, although we - ACS did add questions regarding computers and the internet and that was not asked on the Census. And it should be noted that the 2010 Census had only 10 questions. And so the ACS replaced the long-form version of the Census. So if you wish to compare, you'd be comparing back to the Census 2000 data. That's what this crosswalk is for.

(Doug): Okay.

(Sirius Fuller): Thank you for your question.

Coordinator: And again, as a reminder, if you'd like to ask a question, please press Star 1 and record you name. The next question comes from (Brent), your line is open.

(Brent): Hi, thank you for this. Two very fast questions, I hope. One as you mentioned, the Z-score being one or less - greater I guess, because your 90% confidence interval. What about 95%?

(Sirius Fuller): Right, so for the Z-score, the regular Z-score uses the standard error. If you converted it, it should still work, but you'd have to be careful to use - it would be at the 95% confidence level and your margins of error would all have to be at the 95% confidence level.

(Brent): Okay. And then the other question, you gave us the way to calculate margin of error for sums, for adding different categories. What about a ratio? So, for example, employment to population ratio.

(Sirius Fuller): Right, so, there's a different approximation formula and that may be found in the Instructions for Statistical Testing. So going back a few slides, there is the link to the instructions for finding statistical testing and so, if you wish to calculate - appreciating the ratio, that formula is in there. And if you wanted a worked example, you can find one in the accuracy document.

(Brent): All right, thank you.

Coordinator: And our next question comes from (Clark). Your line is open.

(Clark): Yes, I'm curious about the MOE for percentages. I feel like I've seen the lowest level, the lowest number of margin of error at 0.1 - plus or minus 0.1. Is there a lower threshold for those, or have I just not seen, you know, MOEs for .006, say? How do you deal with that?

(Sirius Fuller): So the published percent and margin of error is to the nearest 10th, the 0.1. So it is possible to have a margin of error that is greater than 0 but less than 0.1 and that is rounded up to 0.1 on AFF.

(Clark): Okay, good. So that's - I've seen that correctly.

(Sirius Fuller): Yes.

(Clark): Thank you.

(Sirius Fuller): Thank you.

Coordinator: Our next question comes from (Krista). Your line is open.

(Krista): Hi, you had mentioned estimates of large MOEs and I was wondering if the bureau has a definition of what is considered a large MOE or is that just subjective?

(Sirius Fuller): Well, you can use the coefficient of variation to calculate a ratio between the standard error or the margin of error and the estimate. There's no hard and fast definition of what a large MOE is. Depending on the context, you know, if your margin of error is 10% of the estimate, that might be very large or if

your - in other contexts, you could have a margin of error that's half the estimate.

A margin of error that's equal to or greater than the estimate is, you know - if you have 100 people plus or minus 120, that's - you can see that as unreliable.

(Krista): Right.

(Sirius Fuller): The other thing to mention is that the size of the margin of error may not be as important as the comparison. So you may be really more interested in making a comparison and so you might have an estimate with a relatively large margin of error, but the comparison you're making - the second estimate has a small margin of error. And so when you do the statistical testing, they might still be significantly different which might be what you're looking for. And I hope that answers your question.

Coordinator: And I am currently showing no further questions in the queue.

Coordinator: We did have another question coming in.

(Sirius Fuller): That's fine.

Coordinator: And again, - yes, it comes from (Krista) again. Your lines back open.

(Krista): Hi, thank you. Sorry to keep everybody. I was just curious, with the collapsed and the detail tables, if I'm looking at a, like, a detail table and I wanted to see the collapsed width, would we just change the C in front of the table number and then vice versa? Does that work all the time?

(Sirius Fuller): Yes, so in American Fact Finder, you can search by the table ID. So the B01001. And if you wish to find if there was a collapsed version, you would replace the B with a C. So, C01001. Not all tables have collapsed versions and if you're looking at the five-year estimates, many or most will have only a detailed or a collapsed version. You may not get both- but it's worth checking.

(Krista): Okay, so it's most likely the one-year estimates that would have both. Is that what you're saying?

(Sirius Fuller): Yes.

(Krista): Okay, thanks.

(Sirius Fuller): You're welcome.

Coordinator: And again, I'm showing no questions in the queue.

(Sirius Fuller): All right. Well, if that's it, thank you for joining us and as I said before, we'll have the presentation and recording up on the website shortly.

Coordinator: Thank you. That concludes today's conference. Thank you for participating. You may disconnect at this time.

END