Measuring Online Behavior Using a Nonprobability Sample

Presented at AAPOR's 73rd Annual Conference

May 2018

edison research

It wasn't that long ago that AM/FM radio was by far the most dominant player in the audio listening space. In this era, measurement of time spent listening was relatively easy – measure radio ratings, and don't worry about any other type of listening. After all, you can't sell ad space on a cassette tape. But the evolution of digital listening options has not only fragmented the listening audience, but also complicated the process of measuring that listenership. If you're primarily using an online sample, how do you accurately account for the correct proportion of digital listening, knowing that internet samples tend to overstate internet consumption?

Edison Research has clients spanning the entire audio space including terrestrial AM/FM commercial radio stations, public radio companies like NPR, satellite radio, streaming audio companies like Pandora and Spotify, and podcast companies. Naturally, these companies competing for ears look for research that can provide a comprehensive and accurate picture of the evolving American audio space.

This report will discuss how Edison Research measures online and offline behaviors using nonprobability samples. Approaches range from sampling for light internet users, weighting respondents based on how much time they use the internet, and sometimes combining nonprobability samples with traditional polling samples. Ultimately, this report will illustrate the importance and relevance of each method.
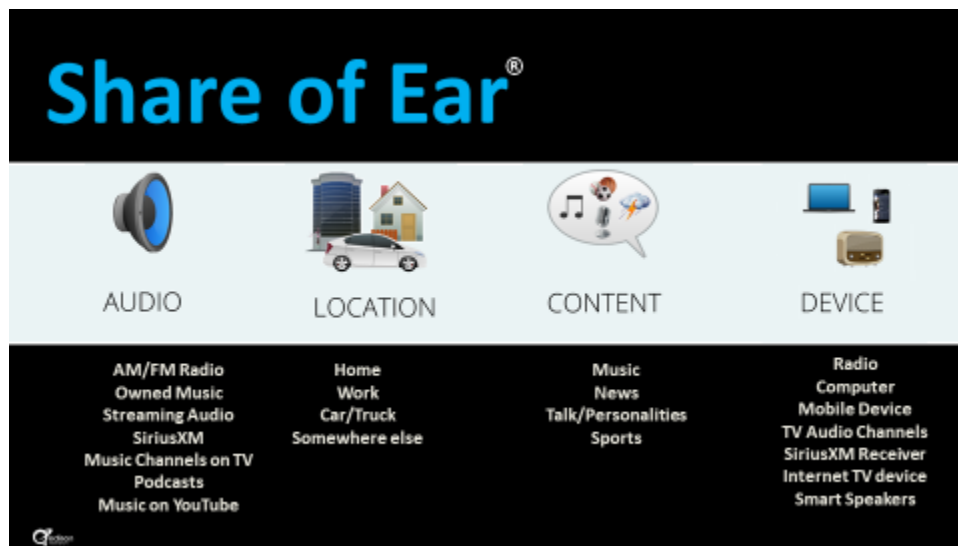
Share of Ear® is Edison's answer to developing a methodology that measures listening across the entire audio space. Respondents are instructed to fill out a one-day audio listening diary in which they are instructed to record what platform they listened to, at what location they listened, what kind of content they listened to, and what kind of device they listened on.

Share of Ear ® is conducted 4 times a year, with about 1,000 respondents completing the diary each quarter. Respondents are age 13 or older and in all 50 states the survey is offered in English and Spanish, and each day of the week makes up roughly 1/7 of the total sample.

One of the big questions we were confronted with was deciding how to recruit respondents. Since this is a commercial subscription product, cost and time were of paramount importance. That led us to want to use a nonprobability online panel, and for Share of Ear ® we use SSI's panel. Respondents recruited online are sent a link to an online survey to record their listening in real time. While they are filling out the diary the online program restricts them from moving past a time that has not yet occurred during their diary date.

One of our biggest concerns with using a nonprobability online sample was making sure we weren't overestimating the online components of the audio space such as streaming audio, podcasts, and music videos on YouTube. We responded to that concern in two ways. First, when recruiting for the online portion, we focus on recruiting people who use the internet less than three hours in the last day.

Share of Ear®
- Conducted both online and offline
- Offline sample:
  - 350 respondents were recruited by telephone to take the diary on paper, and were screened for either no Internet access, or less than one hour of Internet usage in the last 24 hours
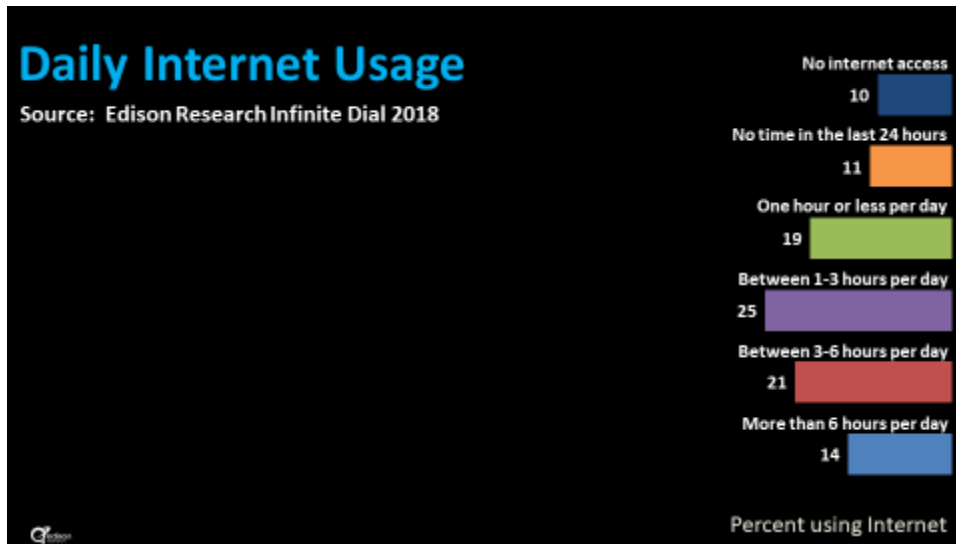 - 133 respondents completed and sent back their paper diary

Second, the online panel consists entirely of respondents who have internet access. To account for this, we decided to supplement the online sample with a telephone recruit of people who either don't have internet access at all or say that they used the internet for 1 hour or less in the last day. Respondents recruited over the phone are then mailed a paper diary and asked to fill it out one week after they've been recruited.
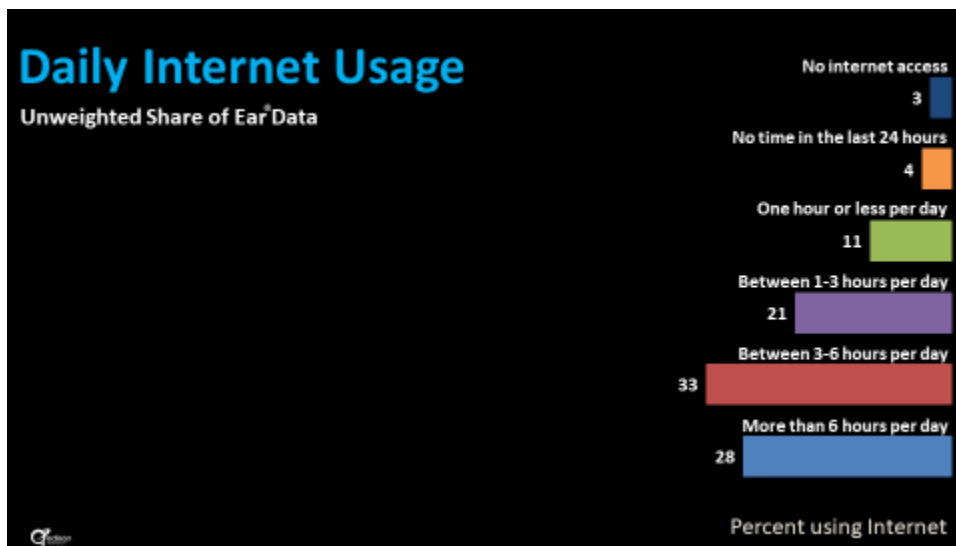

Share of Ear®
- Respondents are weighted to represent American population 13+ by:
  - Age
  - Sex
  - Race
  - Census region
  - Day of week
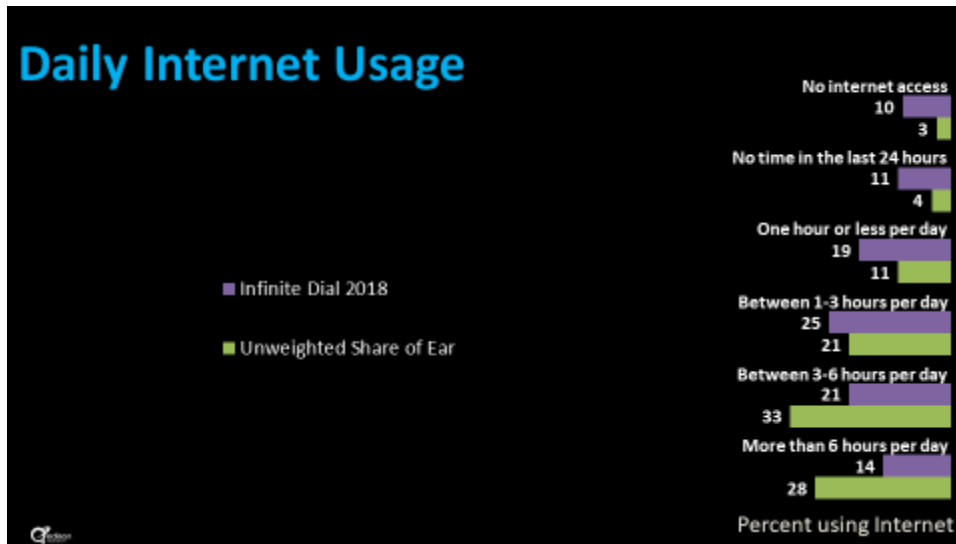 - Internet usage in the last 24 hours

After the data is collected, we weight the data to represent the American 13+ population census figures by age, sex, race, and census region. We also weight by day of week and internet usage in the last 24 hours. As we look a little more closely at internet usage, you'll see why it is such an important factor and why we choose to use it to weight the data.

Daily Internet Usage
Source: Edison Research Infinite Dial 2018

| Category	Percent
No internet access	10
No time in the last 24 hours	11
One hour or less per day	19
Between 1-3 hours per day	25
Between 3-6 hours per day	21
More than 6 hours per day	14

Percent using Internet

This estimate of internet usage in the last 24 hours comes from a live interviewer phone survey Edison has conducted once a year for the last 20 years called The Infinite Dial. This is a survey conducted completely on the phone, using RDD sample, calling both cell and land-line phones. There are no official government sources for daily internet usage, so this is the best source we have for this information.

Daily Internet Usage
Unweighted Share of Ear Data

Category	Percent
No internet access	3
No time in the last 24 hours	4
One hour or less per day	11
Between 1-3 hours per day	21
Between 3-6 hours per day	33
More than 6 hours per day	28

Percent using Internet

This next slide shows internet usage in the last 24 hours in the unweighted Share of Ear ® data.

Daily Internet Usage

When we compare the two data sets, there are some very noticeable differences. The groups that we really want to point out are those who don't have internet access, those who have spent no time online in the last 24 hours, and those who spent one hour or less online. Despite conducting an offline version of Share of Ear ®, adding the nonprobability online sample results in the overall sample being much lower in these groups than the overall population.
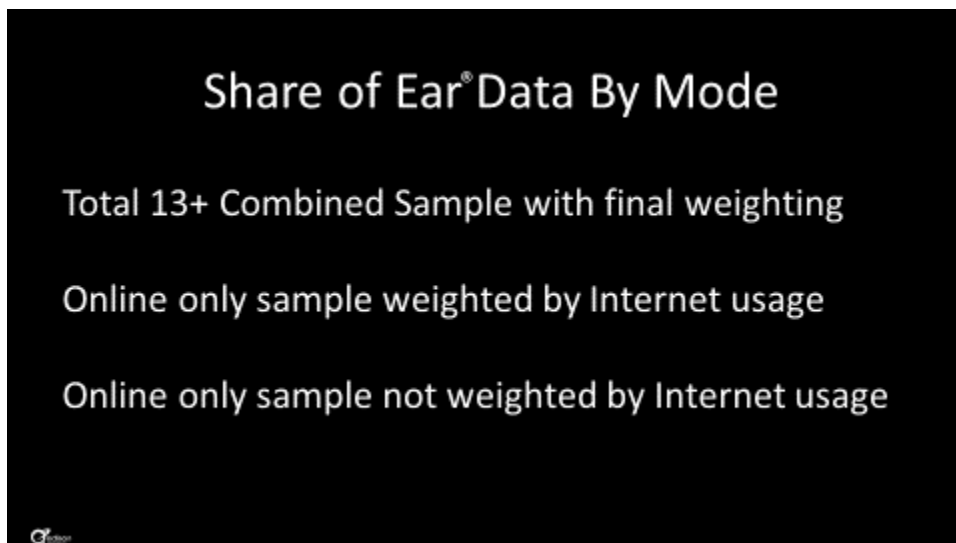

Now let's look at Share of Ear ® data by mode and weighting scheme employed and show how a few different estimates change based on that. The three modes we will be comparing are: Total 13+ Combined sample, which is the online and offline samples combined and weighted to demographics and internet usage; the online only sample weighted by both demographics and internet usage; and the online only sample only weighted by demographics and not weighted by internet usage.

7

First, we'll look at the average amount of time respondents said they listened to any audio. For the total sample it was 3 hours and 34 minutes, but if you take out the offline respondents, that number increases to 4 hours and 13 minutes, and if you take the online data and don't weight by internet usage it grows to 4 hours and 47 minutes. This is just one example of how excluding respondents with no internet access or light internet usage and not weighting by internet usage can lead to very different results.
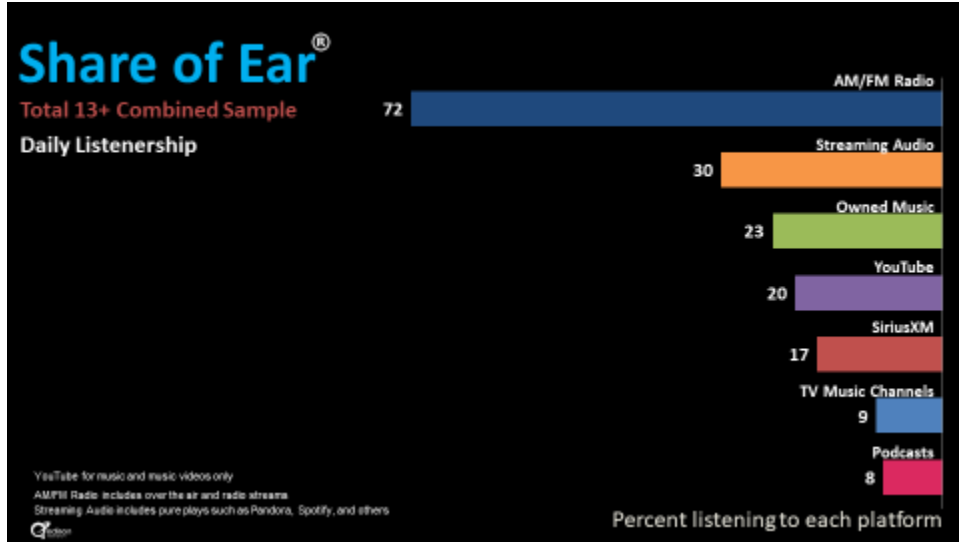
Next, let's look at the percentage of respondents who listened to various audio platforms. To give you some idea of what the various categories mean: AM/FM is any AM/FM radio listening either using an AM/FM radio or listening to an internet stream of an AM/FM radio station. Streaming audio includes products like Pandora, Spotify, Apple Music, etc. Owned music is any content that the respondent owns, including CDs, digital files, etc. YouTube is music video listening on YouTube (respondents are instructed to exclude non-music related videos). SiriusXM is any listening to SiriusXM through a dedicated receiver or a stream on the internet. TV Music channels are the channels on your TV such as Music Choice, Podcasts are any podcasts listened to on any device. The first slide shows the total sample. If you look at the online only sample:
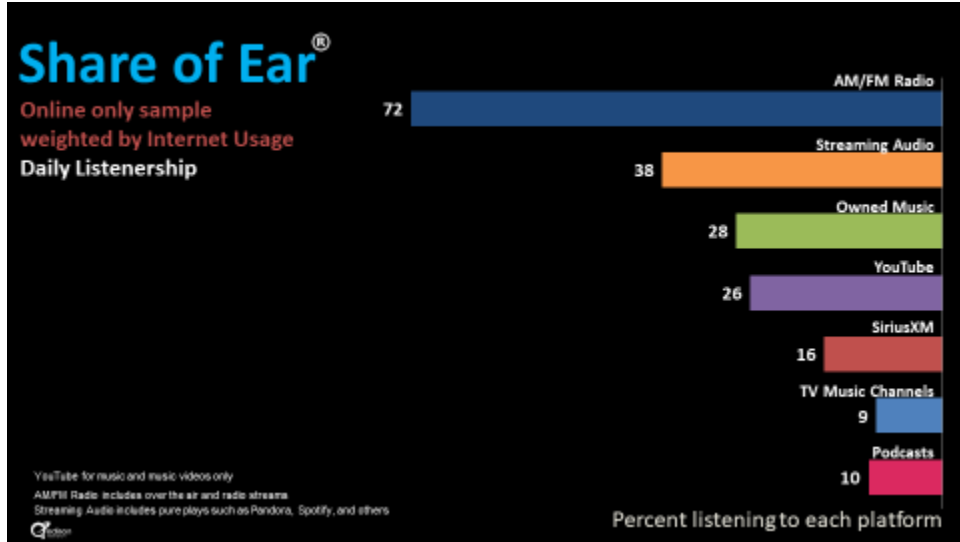
And here is the data of the online only sample, weighted by internet usage:
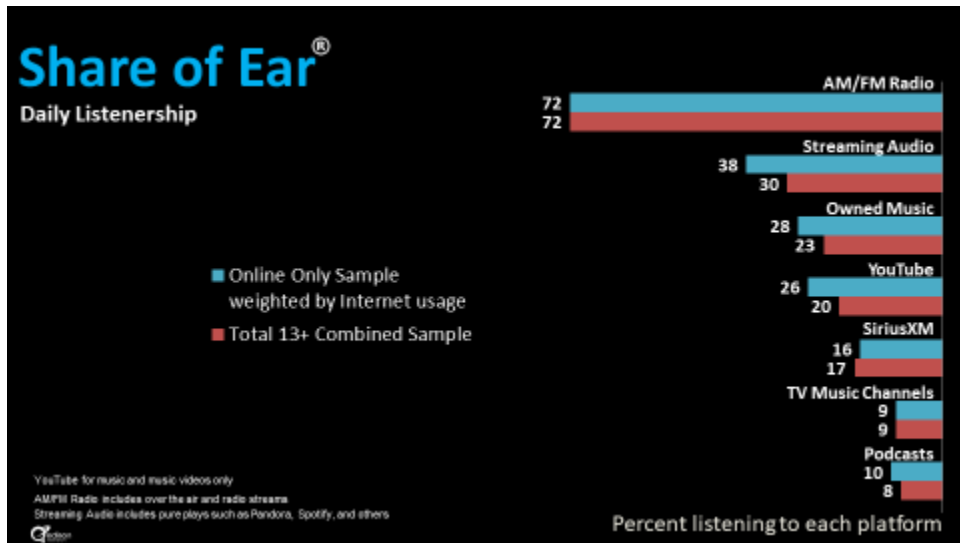
Comparing the two samples, you can see that streaming audio goes from 30% to 38%, Owned music goes from 23% to 28%, and Music Videos on YouTube goes from 20% to 26%. Again, behaviors on the internet are considerably higher if you take out the no-internet and light internet users.
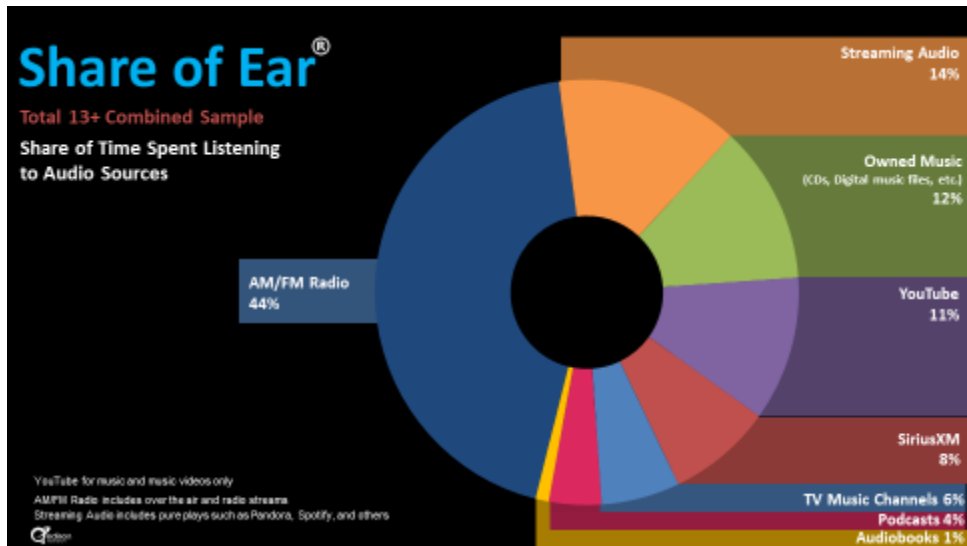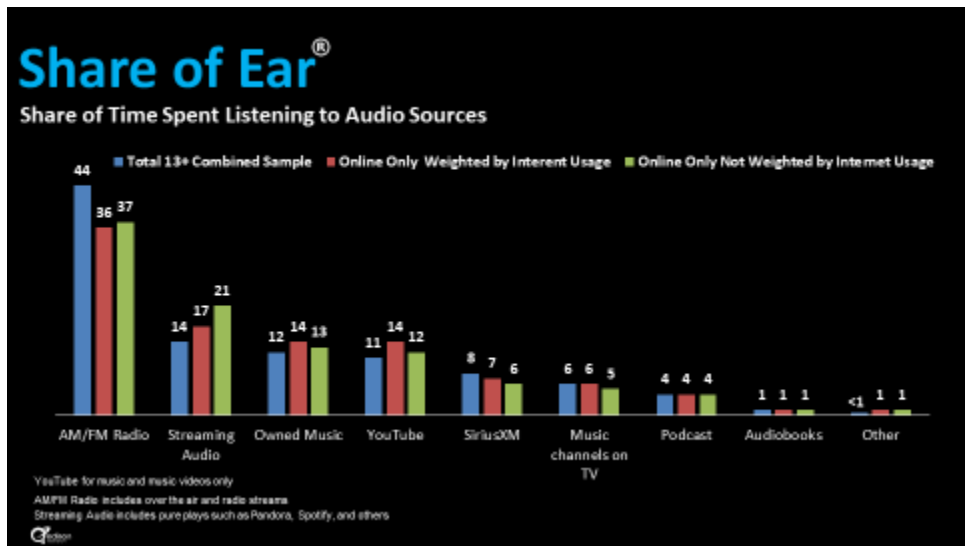
Next we'll look at the percentage of time each platform receives. The first slide shows the total data set.
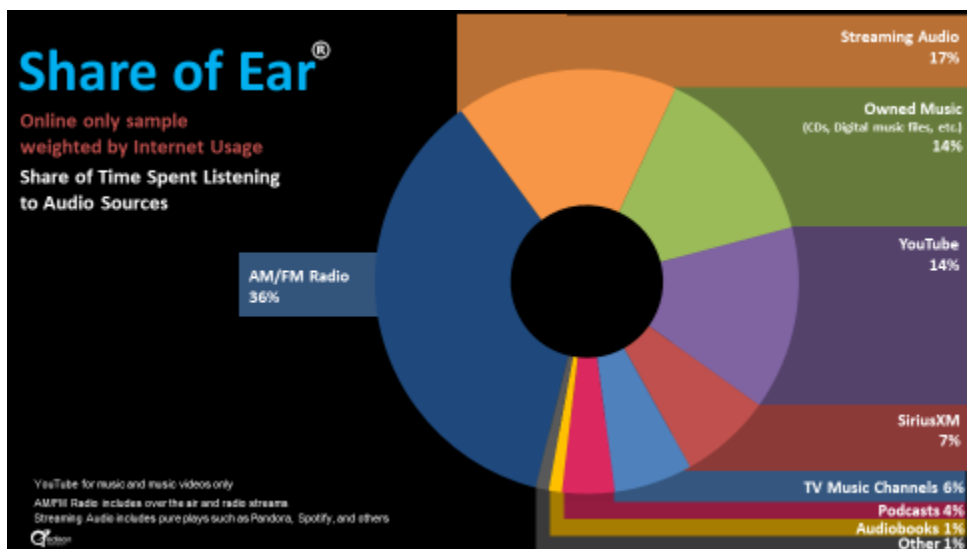
The next slide shows the online only data weighted by internet usage.
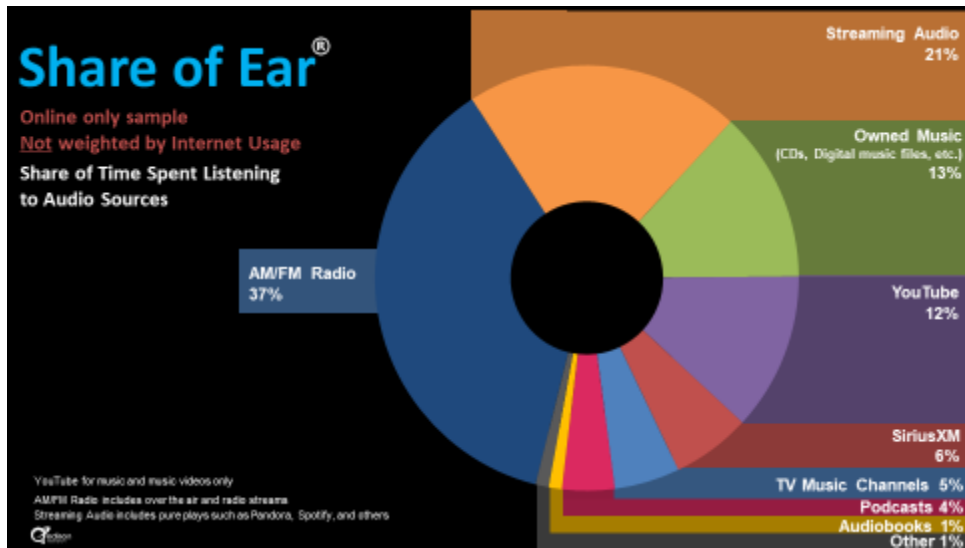
This slide shows the online only data when it is not weighted by internet usage.

Looking at the data side-by-side, you will see that there are many differences. AM/FM radio decreases almost 20% based on mode of interview. Streaming audio shows a 50% increase from the total sample to the online-only sample that isn't weighted by internet usage. Other changes aren't as dramatic, but it is clear that if you exclude no and light internet users you will see many differences in online behaviors.
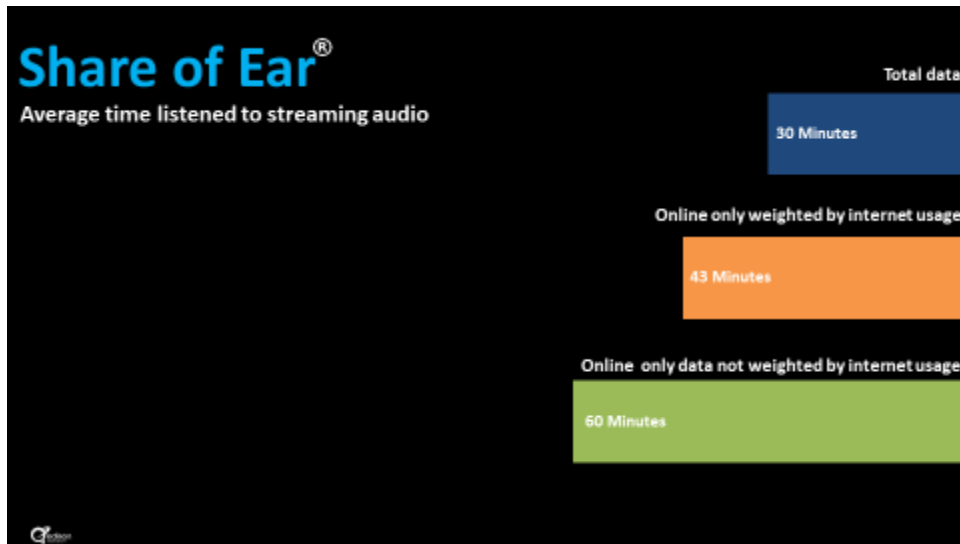
We've already established that if you don't weight by internet usage and only use a nonprobability sample, the data will show that people listen to much more audio than the overall sample. We also showed that the percentage who listened to streaming audio changes based on how you conduct and weight the survey. When you combine those effects, you'll see that the average time spent listening to streaming audio doubles from 30 minutes among the total sample to 60 minutes among the nonprobability sample not weighted by internet usage.

The last data point we're going to present is the percentage of respondents who own a smart speaker, defined as speakers you can talk to, such as the Amazon Echo, Google Home, and the Apple HomePod. There are small differences in the samples, but this data point is relatively stable. We point to this to show that not all online behaviors will show dramatic differences - but if you don't include light or no internet users, you won't know for sure what measures are being impacted.

There should be real concerns about measuring online behavior using only a nonprobability based panel, because most respondents who are in nonprobability panels are very heavy internet users and therefore exhibit much higher online behaviors than people who are not in the panel.

None of this information should be taken as an indictment of nonprobability online surveys. Edison does quite a number of surveys using them and they do have a place in the survey industry - the decrease in cost alone means we have to find a way to incorporate them into our surveys. We believe that mixing in offline data and then weighting the combined data by internet usage can help to properly represent Americans' online behavior.

However, if your project cannot for budgetary or timing reasons have an offline component, we would recommend trying to seek out light internet users while conducting the survey. It will take a little longer in fielding, but the tradeoff is worth it, giving you the ability to accurately weight by internet usage (and make sure you represent the data as "Online Americans").

We as an industry should continue discussing how to fit nonprobability online samples into the research world, including how to sample, weight, and present research that is conducted online. While this presentation focuses on how nonprobability panels impact online behavior, more research should be done on how they impact offline behavior, which could help us decide if internet usage should be weighted on for all surveys or just ones whose focus is online behavior.

Measuring Online Behavior Using a Nonprobability Sample

Presented at AAPOR's 73rd Annual Conference

May 2018

edison research