1. Part Four *Research Applications*

**Ratings Methodology**

The research methodologies used by Arbitron and Nielsen are complex, and each company publishes several documents describing its methods and procedures that should be consulted for specific information. As men-tioned, the data for ratings surveys are cur-rently gathered by two methods: diaries and electronic meters/recorders. Each method has advantages and disadvantages.

Broadcast ratings provide a classic ex-ample of the need to sample the popula-tion. With about 114.5 million households in the United States in 2009, it would be impossible for any ratings company to con-duct a census of media use. The companies naturally resort to sampling to produce data that are generalized to the population. For example, Nielsen’s national samples are selected using national census data and in-volve multistage area probability sampling that ensures that the sample reflects actual population distributions. That is, if Los Angeles accounts for 10% of the television households in the United States, Los Angeles households should comprise 10% of the sample. Nielsen uses four stages in sampling: selection of counties in the country, selection

of block groups within the counties, selec-tion of certain blocks within the groups, and selection of individual households within the blocks. Nielsen claims that about 20% of the households in the NTI-metered sample of approximately 10,000 households are replaced each year.

To obtain samples for producing broad-cast audience estimates, Arbitron and Nielsen use recruitment by telephone, which includes calls to both listed and unlisted telephone numbers. Although all ratings companies begin sample selection from tele-phone directories, each firm uses a statistical procedure to ensure that unlisted telephone numbers are included. This eliminates the bias that would be created if only people or households listed in telephone directo-ries were asked to participate in broadcast audience estimates. Nielsen calls its proce-dure a Total Telephone Frame; Arbitron uses the term *Expanded Sample Frame*, as well as address-based sampling and sampling to reach cell phone–only households.

Target sample sizes for local audience measurements vary from market to market. Each ratings service uses a formula to es-tablish a minimum sample size required for



**A CLOSER LOOK**

**Ratings Diaries and Reports**

In the previous editions of this textbook, we has also changed our typical procedure of

included sample pages from Arbitron and including sample pages from each company’s

Nielsen diaries as well as pages from each ratings books. Hard copies of ratings books

company’s ratings books. The problem with are no longer published. All of the information

reproducing sample pages from diaries is for broadcasters and advertisers is available

that they become out of date very quickly. The only online. However, we offer an alternative

Internet has changed our approach. Instead in the Reading a Ratings Book section of this of including examples of diaries here, we will chapter. Don’t overlook these sources of addi-direct you to each company’s website to see tional information. the most current examples. Next, the Internet

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a specific level of statistical efficiency, but there is no guarantee that this number of subjects will actually be produced. Although many people may agree to participate in an audience survey, there is no way to force them all to complete the diaries they are given or to use electronic meters accu-rately. Additionally, completed diaries are often rejected because they are illegible or obviously inaccurate. The companies are often lucky to get a 50% response rate in their local market measurements.

Finally, since participation by minor-ity groups in audience surveys is generally lower than for the remainder of the popu-lation, the companies make an extra effort to collect data from these groups by contact-ing households by telephone or in person to assist them in completing the diary. These methods are used in high-density Hispanic (HDHA) and high-density African American (HDBA) areas; otherwise, return rates could be too low to provide any type of audience estimates. When the return (*intab* or *in-tab*) is low, statistical weighting or samplebalancing is used to compensate for the shortfall. This topic is discussed later.

**Data Collection.** Perhaps the best-knownmethod of gathering ratings data from a sample is by means of electronic ratings-gathering instruments, in particular the Nielsen People Meter, as mentioned earlier in the chapter. The People Meter was introduced as the *audimeter* in 1936 to record radio use on a moving roll of paper. (A. C. Nielsen

purchased the audimeter from Robert Elder and Louis Woodruff, professors at the Massachusetts Institute of Technology.) In 1973 the audimeter changed to a new tech-nology and the device was called the *storage* *instantaneous audimeter* (SIA). Finally,during the 1987–1988 television season, Nielsen offered service with the new People Meter. The meter records viewing data and the central computer in Dunedin, Florida, calls each NTI household each day to re-trieve the stored data. These data are used to compute the National Television Index. The data collection is automatic and does not require participation by anyone in the NTI households.

The second major form of data collec-tion, diaries, requires subjects to record the channels they tune to or the stations they listen to, when they watched or listened (time periods, or **dayparts**), **such** as “prime time” (8:00 p.m.–11:00 p.m. EST). Arbitron uses diaries for radio; Nielsen uses diaries for the households in its NAC (National Audience Composition) sample to supple-ment the information gathered from the metered households because the audimeter cannot record the number of people who are watching each television set.

The third major technique used to collect data—the telephone—is not currently used by any accredited ratings research company. However, Arbitron and Nielsen do use the telephone for initial sample recruiting and to conduct a variety of special studies, allowing clients to request almost any type of survey



**A CLOSER LOOK**

**Arbitron and Nielsen Diaries**

For a description and visual examples of pages from Arbitron’s diary, go to [*www.arbitron.com/*](www.arbitron.com/downloads/diary.pdf) [*downloads/diary.pdf; for*](www.arbitron.com/downloads/diary.pdf) Nielsen’sdiary, go to

[*http://diary.tvratings.com/.* If the](http://diary.tvratings.com/) *links* are nolonger valid, search for “*Arbitron diary*” and “*Nielsen diary*”.

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research project. One of the most frequent types of custom work is the **telephone** **coincidental**. This procedure measures the sizeof the medium’s audience at a given time; the survey coincides with actual viewing or listen-ing. The method involves selecting a sample of households at random and calling these homes during the viewing or listening period of inter-est. Respondents are simply asked what they are watching or listening to at that moment. This method avoids having respondents try to recall information from the previous day. Coincidentals are inexpensive (generally a few thousand dollars) and are frequently used by station management to receive immediate feedback about the success of special pro-gramming. In most cases, coincidentals are used for advertising sales purposes.

The fourth method of ratings data col-lection is Arbitron’s Portable People Meter (PPM), which the company introduced in the mid-1990s to improve the validity and reli-ability of radio ratings. Arbitron describes the PPM in its publication, *PPM Encoding* *Handbook for Radio,* in this way:

The Arbitron Portable People Meter (PPM) system replaces the Arbitron personal Diary with a small, portable, personal electronic meter that automatically records exposures to encoded stations. Participating broad-casters encode their stations by install-ing Arbitron encoding equipment, which embeds a unique inaudible code into their audio signals. Whenever a PPM detects this signal—which is acoustically masked from listeners, but receivable by the Meter—the Meter records the code, along with the date and time of the exposure. A station receives credit for a quarter-hour of listening if the Meter records five or more minutes of exposure to the station’s encoded signal within that quarter-hour. [The five minutes need not be contiguous.]

Members of the public are selected as respondents in each new PPM market

at random, based on landline and cell-phone-only sample frames. These respon-dents, called “panelists,” are asked to wear or carry the Meter each day from the time they rise until the time they retire at bed-time. Each individual six years of age or older in a participating household receives his or her own Meter and individual docking station. The panelists dock their Meters when they retire. The docking station transmits the data to a collector located in the panelist’s home, which transmits the recorded exposure data to Arbitron. While docked, the Meter’s battery is also recharged and its internal clock is reset. In addition, to help identify at-home listening, the collector emits a low-power Radio Frequency (RF) signal that can be detected by a Meter when listening takes place at home.

The PPM measures all types of radio listening, including listening to radio stations on the Internet. However, for the PPM to recognize a radio station, the station’s signal must be encoded. Arbitron states that “A radio station (FM/AM/HD Radio/Internet) whose broadcasts include unique inaudible codes that can be heard by the meters carried by PPM panelists. Only encoded stations can be measured in the PPM service. A station is not required to subscribe to the PPM data in order to encode.”

As of 2009, Arbitron’s PPM is used in several markets in the United States, but the methodology continues to be the focus of heated debate among broadcasters, advertis-ers, and even government officials.

In summary, each of the audience data collection methods has its critics: elec-tronic meters are criticized because they do not provide specific audience information and may cause respondent fatigue; diaries, because participants may fail to record view-ing or listening as it happens and may rely on recall to complete the diary at the end of

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the week. In addition, many critics contend that diaries are used to “vote” for or against specific shows and that actual viewing is not recorded. Arbitron’s PPM is criticized for potentially reducing the size of some radio station’s audience because the device is not universally accepted by all types of respon-dents. And, finally, critics of data collection by telephone (although not currently used by any national company) say that the method favors responses by younger people, who are more willing to talk on the telephone; older respondents generally do not have the patience to answer the questions about their viewing or listening habits.

One thing is certain: While the debate about the accuracy of the various audience ratings methods will continue, research com-panies, including Arbitron and Nielsen, will continue their pursuit of more valid and reli-able data collection procedures.

**Interpreting the Ratings**

Interpreting broadcast ratings and under-standing the terminology used can best be explained with an example. While this example uses television, the procedures are the same for radio ratings. Let’s assume that Nielsen has collected TV viewing informa-tion (see Table 14.1) for a specific daypart on “traditional” network television. (Only three networks are shown to simplify the



**Table 14.1** Hypothetical TV Viewing Data

**Network** **Households**

ABC 2,200

CBS 2,000

NBC 1,800

|  |  |
| --- | --- |
| Not watching | 4,000 |
|  |  |

Total 10,000

discussion. In reality, the list would include dozens of TV stations and networks.)

Recall that Nielsen’s NTI sample includes about 10,000 households in the United States, and the data collected from them are generalized to the total population of about 114.5 million television households. The first number to compute is the rating for each network.

**Rating.** An audience **rating** is the percent-age of people or households in a population with a television or radio tuned to a specific station, channel, or network. Thus, the rat-ing is expressed as the station or network’s audience divided by the total number of television households or people in the target population:

People or Housholds

Rating 5



Population

This formula is typical in mass media re-search. However, the numerator in the formula is actually People or Households Viewing TV / People Listening to Radio. For example, using the hypothetical data in Table 14.1, ABC’s rating is computed as

2,200

Rating 5 10,000 5 0.22 or 22% or 22

This indicates that approximately 22% of the sample of 10,000 households was tuned to ABC at the time of the survey. (Note that even though ratings and shares are percent-ages, when the data are reported, the deci-mal point and % symbol are eliminated.)

The combined ratings of all the net-works or stations during a specific time period (daypart) provide an estimate of the total number of *Homes Using Television* **(HUT)**. Since radio ratings deal with peoplerather than households, the term *Persons* *Using Radio* **(PUR)**is used. The HUT or

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PUR can be found either by adding together the households or persons using radio or television or by computing the total rating and multiplying it by the sample (or popu-lation when generalized). The total rating in the sample data in Table 14.1 is .60, which is computed as follows:

2,200

ABC 5 10,000 5 .22 or 22%

2,000

CBS 5 10,000 5 .20 or 20%

1,800

NBC 5 10,000 5 .18 or 18%

HUT 5 6,000 Total Rating 5 .60 or 60%

In other words, about 60% of all house-holds (HH) with television were tuned to one of the three networks at the time of the survey. As mentioned, the HUT can also be computed by multiplying the total rating by



the sample size: 0.60 3 10,000 5 6,000. The same formula is used to project to the popu-lation. The population HUT is computed as: 0.60 3 114.5 million 5 68,700,000.

TV stations, networks, and advertisers naturally wish to know the estimated number of households in the HUT tuned to specific channels. Ratings data from the sample of 10,000 households are used to provide a *rough* estimate of the households tuned to each net-work (or station), as shown in Table 14.2.

**Share.** An audience **share** is the percentageof the HUT or PUR that is tuned to a spe-cific station, channel, or network. It is deter-mined by dividing the number of households or persons tuned to a station or network by the number of households or persons using their sets:

Persons or Households



HUT or PUR

**Table 14.2** Household Estimates Using Ratings and Shares

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Network** | **Rating** |  | **Population** |  | **Rough Population HH Estimate** |
|  |  |  |  |  |  |  |  |  |  |
| ABC | 22.0 |  | 3 | 114,500,000 | 5 | 25,190,000 |  |
| CBS | 20.0 |  | 3 | 114,500,000 | 5 | 22,900,000 |  |
| NBC | 18.0 |  | 3 | 114,500,000 | 5 | 20,610,000 |  |
|  |  |  |  |  |  |  |  |  |  |
| *Total* | *60.0* |  |  |  |  | *68,700,000* |  |
|  |  |  |  |  |  |  |  |  |  |
| **Network** | **Share** |  | **HUT** |  | **Exact Population HH Estimate** |
|  |  |  |  |  |  |  |  |  |  |
| ABC | 36.7 |  | 3 | 68,700,000 | 5 | 25,212,900 |
| CBS | 33.3 |  | 3 | 68,700,000 | 5 | 22,877,100 |
| NBC | 30.0 |  | 3 | 68,700,000 | 5 | 20,610,000 |

*Total* *100* *68,700,000*

|  |  |
| --- | --- |
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From Table 14.1, the sample HUT is 6,000 2,200 1 2,000 1 1,800 , or 60% of 10,000. The audience share for ABC would be:

2,200

Share 5 6,000 5 0.367 or 36.7%

That is, of the households in the sample whose television sets were on at the time of the survey, 36.7% were tuned to ABC. (People may not have been watching the set but may have recorded that they did in a diary, or the People Meter recorded the information.) The shares for CBS and NBC are computed in the same man-ner: CBS Share 5 2,000/6,000, or 33.3%; NBC Share 5 1,800/6,000, or 30.0%.

Shares are also used to provide an *exact* estimate of households in the target popu-lation, computed by multiplying the share by the HUT or PUR. The rough and exact household estimates for each network are shown in Table 14.2.

Estimating the number of households tuned to specific channels and networks provides a broad indication of audience size. However, broadcasters, advertisers, and other people who use TV ratings are also interested in the estimated of the number of people tuned to a channel or network. Most references in books and on the Internet say that to estimate the number of people tuned to a channel or network, Nielsen multiplies the number of estimated households by the average household size (average num-ber of people per household) in the United States—3, 4, or 5. Actually, both items are incorrect. Nielsen does not multiply the number of households by a constant number such as 3, 4, or 5, or any other number. In addition, references using 3, 4, or 5 as the average number of people per household in the United States in 2009 are wrong. In

2009, the average is 2.5 people per house-hold, although the number does vary by region of the country.

If Nielsen does not multiply household estimates by the average number of people per household (constant) to estimate the number of viewers, how does the company produce the estimates? To explain the procedure, we will use actual Nielsen data for the week of March 9, 2009, shown in Table 14.3—the top 10 programs for the week. Nielsen re-leases this information to the public because the data show only total household estimates and total viewers over one year old (referred to as the 21 (2 plus) audience). Broadcasters do not sell, and advertisers do not buy, advertising based on Household and 21 rat-ings and shares because the data are for the total audience, and there is no interest in this group. The interest is in specific demo-graphic targets, known as “demographics,” “demos,” “demo cells,” or simply “cells,” such as Females 25–34. Every TV program is designed for a specific demo (cell), and that is how advertising time is bought and sold—an advertiser purchases time on a pro-gram because the program attracts a specific audience the advertiser wants to reach. (See the special note on demos at the end of this chapter.)

Now refer to Table 14.3. The actual Nielsen data include everything but the col-umn titled Viewers per HH (VPHH). The authors calculated the data for this column. (Nielsen rarely includes the VPHH number in public information because there is no specific use for the number.) Looking at the VPHH column, the two often-stated “facts” about how Nielsen computes the number of viewers are immediately proved to be wrong—Nielsen does not use a constant for the average number of people per household, and the number is not 3, 4, or 5. So what is the source of the numbers in the Viewers per HH column?

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**Table 14.3** Nielsen Top 10 TV Programs

**Top 10 TV Programs for the week of March 9, 2009\***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Households** | **Viewers** | **Viewers** |
| **Rank** | **Program** | **Network** | **Rating** | **Estimate (000)** | **Estimate (000)** | **Per HH\*\*** |
|  |  |  |  |  |  |  |
| 1 | *American Idol-Tuesday* | FOX | 14.6 | 16,717 | 25,767 | 1.54 |
| 1 | *American Idol-Wednesday* | FOX | 14.6 | 16,717 | 25,547 | 1.53 |
| 3 | *Dancing with the Stars* | ABC | 14.1 | 16,145 | 22,829 | 1.41 |
| 4 | *CSI* | CBS | 10.3 | 11,794 | 17,132 | 1.45 |
| 5 | *Desperate Housewives* | ABC | 10.3 | 11,794 | 14,602 | 1.24 |
| 5 | *Grey’s Anatomy* | ABC | 9.1 | 10,420 | 13,642 | 1.31 |
| 7 | *CSI: Miami* | CBS | 9.0 | 10,305 | 14,215 | 1.38 |
| 7 | *The Mentalist* | CBS | 9.0 | 10,305 | 14,322 | 1.39 |
| 9 | *Criminal Minds* | CBS | 8.9 | 10,191 | 14,342 | 1.41 |
| 10 | *CSI: New York* | CBS | 8.6 | 9,847 | 13,633 | 1.38 |

\*Live 1 SD Viewing (Same Day Recorded)

\*\*Includes viewers over the age of two in household

To demonstrate that VPHH is not a constant number, we computed the num-bers in a simple way—we “backed into” the VPHH numbers. That is, we divided the number of estimated viewers by the number of estimated households. For example, the VPHH for *American Idol-Tuesday* is 1.54 (25,767/16,717 5 1.54).

As mentioned, Table 14.3 shows that the VPHH is different for each of the top 10 programs, and none is a constant or even 2.5, the 2009 average people per household in the United States. The reason each VPHH is different is that each program attracts a different audience. While some programs may be popular among a wide audience, others appeal to a smaller group of people. For example, the *American Idol* programs have the largest VPHH numbers, 1.54 and 1.53, because the program is designed for a

broad audience—males and females of all ages. On the other hand, *Desperate House-wives* has the lowest VPHH, 1.24, because itis designed for a smaller group of people— older viewers, and possibly more females than males, or vice versa.

In summary, Viewers per HH is not computed with a constant number. It is a weighted number calculated by Nielsen prior to a ratings period, and that number is mul-tiplied by the Households estimate to pro-duce the “Viewers Estimate (000)” shown in Table 14.3 (the data released to the public). The weighted number is calculated by us-ing several items including, but not limited to, the program’s target demographic, what time the program is aired, and historical viewing data from previous ratings periods. (Incidentally, notice that the two episodes of *American Idol* were tied for first place with a rating of 14.6. This is less than 50% of the rating the number one TV program received just a few years ago. The large number of choices on television has fragmented the television audience.)

One final point about audience ratings and shares is that while television uses both ratings and shares for decision making and advertising sales, radio uses only shares because the ratings are too small and offer little information.