

THE HOMELESS AVERAGE AGE 9? A CURRICULAR EXAMPLE

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Is the average age of a United States homeless person nine? No, as the majority of homeless are adults. Yet despite available facts, the claim persists. Evaluating sources related to this claim can form a strong exercise in statistical literacy at college and secondary school levels. This article details our experience in working with this social statistic. It includes background information on homelessness, design considerations, notes from using the exercise in college and high school, and a handout designed for high school use.

INTRODUCTION

How do we, as instructors, integrate media such as newspapers, commercials, and speeches into statistics classes? Working with public media forms part of statistical literacy, a goal for all courses. For instance, the Guidelines for Assessment and Instruction in Statistics Education (GAISE) College Report (2005) lists statistical literacy in the first recommendation. Going even further, the K-12 report (2007) defines the ultimate goal as statistical literacy. “Every morning, the newspaper and other media confront us with statistical information ... Such information guides decisions in our personal lives and enables us to meet our responsibilities as citizens.”

The problem is not finding examples from the media. Collections exist, such as the Chance news wiki (2009). Each issue provides five or six links and sets of discussion ideas. While these serve as great starting points, a good activity consists of more than an article and some questions. It needs to include background information to help the instructor answer questions, and guidance on the topics illustrated through that example.

This article describes our work in constructing a good integrated activity, on homelessness in the United States of America. It begins with our introduction to the topic, a sentence in a speech. We then describe our background research on validity, including a couple of interesting side issues. After the research, we mention design considerations, then provide activities designed for different audiences – the first for late in a college course, and the second for early in a high school course.

HOMELESSNESS

“The average age of a homeless person is nine”, says the striking claim. The first author first heard this statement at a Commencement speech in December 2007. The audience gasped. Was it true? There would have to be many, many kids at other places to balance the distribution for the adults we see at soup kitchens. The figure was suspicious. A small amount of research, such as a search on Google for “average age homeless”, finds many repetitions of the number. For instance, Mark Curnutte of the Cincinnati Enquirer mentions it in a 1999 story, while Rebecca Tyrlich at a Michigan television station includes it in a 2007 piece.

The problem is that most sources provide no citation for the number 9. An initial search traced the figure to a 1999 planning document by the city of St. Louis, Missouri (City of St. Louis 1999), which cited a Dallas organization called Rainbow Days, Inc. Contacting this group, however, provided no firm citation. From this initial search, the first author briefly used this example in introductory courses during spring 2008, with mixed success. It needed more background and context. Based on this experience, and other experiments with news articles, an abstract for a talk was contributed to the summer Mathfest conference (Molnar 2008). Then, things changed.

In June 2008, the New York branch of the Coalition for the Homeless began airing television ads, with the figure as the ending statement (Parpis 2008). A New York Times reporter saw the ads,

and decided to do some fact checking. Since the talk abstract was the only academic listing on the figure, she made a call; some comments appeared in the article (Lee 2008). After the controversy, the official ads were modified to remove the figure (Coalition for the Homeless 2009), but the earlier versions remain on Youtube (Coalition for the Homeless 2008). Before this article, both authors had planned to use the figure in class, but now the urgency for good research had increased.

STATISTICS ON HOMELESSNESS

Past figures on United States homelessness have been accompanied by controversy. In the late 1970s, cities closed many single room occupancy (boarding house with shared bathroom) facilities, forcing financially troubled people onto the streets (Kasinitz 1984). Combined with a recession and reductions in mental health commitments, the count of street people increased, with corresponding attention. Advocates began to cite an alarmingly large number, as they note: "At that time [November 1980], we concluded that approximately 1 percent of the population, or 2.2 million people, lacked shelter." (Hombs and Snyder 1982, page xvi) Unfortunately, this number had little basis in fact. In May 1984, Snyder admitted to a US Congressional hearing that the estimate was basically meaningless. "We have tried to satisfy your gnawing curiosity for a number because we are Americans with Western little minds that have to quantify everything in sight, whether we can or not." (Toufexis 1993) These hearings were held after the release of a government report that estimated 250,000 to 350,000 homeless, a somewhat flawed but reasonable statistical attempt. In the hearings, though some people defended the official estimate, the preponderance of testimony was highly critical of the government. The advocacy group even filed a criminal perjury complaint against the official statisticians (Bogard 2003, page 106).

Eventually, counting techniques improved and overall numbers became less controversial. Even though the count will always have a unreported count, a dark figure, the most recent official government report is accepted by almost all advocates. It reports that under the Housing department definition, "on a night in January 2007, there were 671,888 sheltered and unsheltered homeless persons nationwide" (US Department of Housing and Urban Development 2008, page ii). Here, the definition is important. The housing department enumerates using a federal definition we call the "streets and shelters" definition. A person is counted if he or she has no regular adequate residence, or if the primary residence is a temporary shelter or institution (Federal Definition of Homeless 2007). An alternative is what we called the "doubled-up" definition, used by the Education department. For school services, a child is counted not only if that child lives on the street or in a shelter, but also if he or she is sharing housing due to economic issues or loss of residence (US Department of Education 2004, section 725). It is much more difficult to count doubled-up adults and children, and estimates are varied. The best available number would add 3 million people to the 700,000 or so, more than quadrupling the size of the group (National Alliance to End Homelessness 2007). This difference is not trivial. Other countries tend towards the "streets and shelters" definition. Australia, for instance, starts with a base number of about 20,000, those sleeping out or in improvised dwellings. This number increases by the same order of magnitude, to about 100,000, through adding people in boarding houses, under assistance, or doubled-up (McIntosh & Phillips 2000).

Approximately 63 percent of the Housing department count was composed of individuals, while 37 percent were members of families (US Department of Housing and Urban Development 2008, page ii). The government figures are in line with those currently cited by the National Coalition for the Homeless. In their online fact sheet "Who is Homeless?", they state that children under 18 account for 39 percent of the homeless population (National Coalition for the Homeless 2008). If over half of people are adults, an average age of 9 is impossible. Highly regarded sources agree. Unfortunately, many people still use the mistaken figure. Even though the New York coalition removed the statement from their current ads, another organization based in New York still sells a poster with pictures of kids and the statement "Today, the average age of a homeless person is nine" (Institute for Children and Poverty 2009).

The original source of the age value, that we could find, is a single line in an article from 1997. One of the two authors, Kate Collignon, was associated with the Institute for Children and Poverty; the other, Ralph da Costa Nunez, is associated with a related advocacy group, Homes for

the Homeless. Though it begins the article, the age value is uncited (Nunez & Collington 1997, page 55). Interestingly, it does not appear in other works by these authors, including a concurrent book (Nunez 1996). At best, it is a specific claim about a particular population of homeless families in New York City, the group served by Homes for the Homeless. It is not a general statement.

DESIGN CONSIDERATIONS

We wanted to focus on interpretation and concept reinforcement, which required us to sort through several questions. First, were we sufficiently knowledgeable about the subject? During the discussion, students asked questions about orphanages, shelters, living with relatives, and mental capacity. Answering these questions required knowing the source material. A college instructor preparing two classes per day might research each data set; a high school teacher preparing six classes per day cannot. In any case, this problem is solvable; we included the information above.

Second, what do the students already know? At Bellarmine, this example was used in the final week of a “Statistics and Society” course. This course for communications, nursing, and humanities majors focuses on statistical literacy; the textbook is *Seeing Through Statistics* (Utts 2005). Students had already studied summary statistics, graphics, and reading for bias. At Mexico, the example was used in the first month of a one-term introduction to statistics. Taken by relatively advanced grade 11 and 12 students, the textbook is *Stats: Modeling the World* (Bock, Velleman, & De Veaux 2007). Students had been introduced to mean, median, and mode, but not histograms or distributions, so more guidance was necessary.

Third, how much time is available? Full exercises with elaboration and discussion take time. The Bellarmine review paper took one 50 minute class period, while the Mexico exercise covered two 45 minute class periods. While the information could be condensed, we don’t recommend it. Doing so would strip the practical elements.

Fourth, what are the logistics of presentation and discussion? Our classrooms have Internet access to play the video directly, though it could be preloaded on a computer. Classrooms without video could show the poster instead. After the presentation, we held group discussion because our classes were under 20 students. Large classes, unfortunately, would have to rely on other techniques.

COLLEGE EXERCISE

The first author began the Bellarmine exercise by playing the television ad (Coalition for the Homeless 2008). Students were asked for their initial reactions; they were somewhat critical, though reluctant to take a firm conclusion. Then, in groups, they were asked to create separate samples of 10 integers, one with mean 9 and one with median 9, which they did relatively easily. Disappointingly, they had more trouble sketching a hypothetical distribution; the instructor had to provide help to most students. One possibility is to use a histogram applet, such as the one noted below in the high school exercise.

After the histogram, students were asked to read the New York Times article on the problem (Lee 2008). They didn’t know that their instructor was quoted, which led to moments of bemusement when they reached that part. They also were given information about the original source, the article from Educational Leadership (Nunez & Collignon 1997). After reading, the class discussed data reliability, and problems in any accurate count such as the dark figure.

Next, students were given links to four online articles, from a national advocacy group (National Coalition for the Homeless 2007), nonprofit research group the Urban Institute (1999), local source Louisville Coalition for the Homeless (2008), and the 2008 federal Housing report. Each group was asked to look at one article, evaluate potential bias, and report back to the class. As the students had prior experience with evaluation, they did fairly well. Finally, given that all sources reported that between 25 and 40 percent of counted homeless were children, the students were asked about the original claim. All came to doubt the claim that the average age is 9.

Overall, the exercise went well. Late in the course, the students felt comfortable around each other and the instructor. That, combined with class size under 20, led to many good comments. A larger class would need to break discussion into smaller groups. For a class that

wanted to broach the subject earlier in the semester, a plan such as the high school one below would be better.

HIGH SCHOOL EXERCISE

The second author began the first day in Mexico by showing the television ad (Coalition for the Homeless 2008). Students were asked to record their initial reactions. Overall, students were shocked and saddened, yet believing; only one student expressed some level of genuine disbelief. The remainder of the period was spent reviewing the basics of mean, median and mode, then investigating data sets and the resulting histograms. For data sets that were symmetric, skewed right, and skewed left, the class discussed how the mean and median compare in each case, using the Exploring Histograms online applet (National Council of Teachers of Mathematics 2009). Since the tool generates histograms and summary statistics from a user-entered data set, it was easy to see the changes when intervals were modified or an outlier was entered. As a follow-up assignment, students were to generate a realistic sample of 15 numbers with mean 9 and sketch a histogram, then repeat this with a realistic sample of 15 numbers with median 9.

Unfortunately, most of the students did not complete the homework assignment. On the second day, the class discussed the work of one student who generated a list of 15 numbers ranging from 0 to 18 with a mean of 9. By substituting a few adult ages, it was relatively easy for students to see the difficulty in creating a representative sample of 15 ages that fit the average age 9 criteria.

Largely convinced that the mean age of homeless people in the United States cannot be 9, the class turned to the possibility that the Coalition was referring to median age. The students received an excerpt from the "Who is Homeless?" fact sheet (National Coalition for the Homeless 2008) and were asked to look for relevant information. They quickly found the information that 39% of homeless people are 18 years and younger. Following a brief discussion, all but one student seemed convinced that the average age cannot be 9 under either interpretation of the word average. Because the last student wasn't fully convinced, discussion ensued about the value of questioning information and thinking independently. For further reference, the students received a handout with multiple sources of information on homelessness. The class discussed the potential bias associated with each source. Students were further convinced of the infeasibility of the statistic given that contradicting information came from the National Coalition for the Homeless, an advocacy group.

To complete the lesson, students revisited their earlier reflections on the average age 9 statistic and recorded their current thoughts. Most students were somewhat disillusioned by the awareness that there are untrue statistics in the media. As such, we (the authors) feel that the primary goal of the lesson, providing an opportunity for students to think critically about a statistic presented in the media, was achieved. Through guided discussion, students were also able to apply the concepts of mean and median within a relevant context and draw conclusions. The tertiary goal, understanding and applying histograms within a relevant context, was minimally achieved. Because of time constraints and students' lack of prior knowledge of distributions, they achieved only a cursory understanding of histograms. One recommendation is to devote more time to developing student understanding of distributions.

HANDOUTS

The three pages of the Mexico handout appear below. Except for the first page of the Mexico handout, blank space for student response has been removed.

Name: _____
Statistics

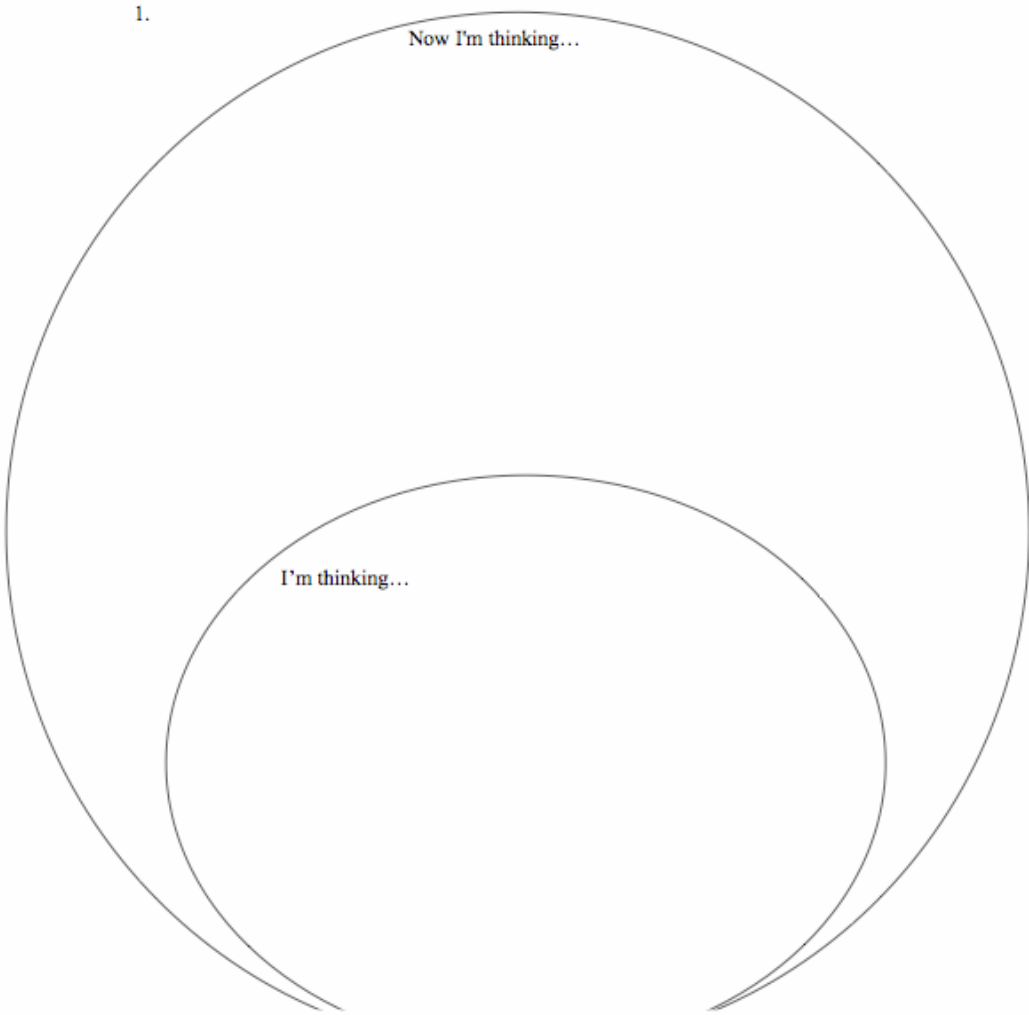
“The average age of a homeless person is 9.”

- Coalition for the Homeless TV ad (aired in New York City in June 2008)
<http://www.youtube.com/watch?v=HW4hhDAZnpY>

1.

Now I'm thinking...

I'm thinking...



What does the coalition mean by “average”?

2. a) Give a realistic sample of 15 numbers with a mean of 9.
- b) Sketch a histogram display of the data sets you created. If you have Internet access, use the Exploring Histograms tool at <http://illuminations.nctm.org/LessonDetail.aspx?ID=L449>
- c) Is your histogram symmetric, skewed left, or skewed right?
- d) Which is greater, the mean or median?
3. a) Give a realistic sample of 15 numbers with a median of 9.
- b) Sketch a histogram display of the data sets you created. If you have Internet access, use the Exploring Histograms tool at <http://illuminations.nctm.org/LessonDetail.aspx?ID=L449>
- c) Is your histogram symmetric, skewed left, or skewed right?
- d) Which is greater, the mean or median?

More information:

- Here's the NY Times online article about the statistic
<http://cityroom.blogs.nytimes.com/2008/06/25/to-be-young-like-9-on-average-and-homeless/?pagemode=print>
- The original source for the claim is a single quote without citation in an article in the October 1997 issue of Educational Leadership. On page 56, in an article by Ralph da Costa Nunez and Kate Collignon, this sentence appears: "The shocking truth is the average age of a homeless person in the United States is 9 years."
- The actual count of homeless in America is known as a *dark figure*, because there will always be some instances of the event (being homeless) that are unknown and unaccounted for.

Here are a few potentially reliable sources. What are some potential biases with each source?

*National Coalition for the Homeless, a nonprofit advocacy group, with a 2007 flyer:

<http://www.nationalhomeless.org/publications/facts/Whois.pdf>

*The Urban Institute, a nonprofit research group, with a 1999 report:

<http://www.urban.org/publications/310291.html>

*The US department of Housing and Urban Development, with a 2008 report to Congress using 2007 data: <http://www.hudhre.info/documents/3rdHomelessAssessmentReport.pdf>

Looking through the data, in these counts between 25 and 40 percent of the counted homeless are people under 18. Now, what do you think about the original claim about age? Write your thoughts under "Now I'm thinking..."

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