

MATH 1000 IN-CLASS ACTIVITY 1

MONDAY, JANUARY 15

Instructor: Alex Rice

Name:

These discussion topics were inspired by the introduction of *How Not to Be Wrong* by Jordan Ellenberg, titled “When am I Going to Use This?”

Survivorship Bias

The anecdote about Abraham Wald and the missing bullet holes is an example of the statistical phenomenon known as *survivorship bias*, one of the many pitfalls of statistical analysis that we will encounter this semester.

Here we discuss another potential examples of this phenomenon:

- (1) The most widespread treatment option for addiction is the twelve-step program (and close relatives), which originated in 1935 with the formation of Alcoholics Anonymous. A shortcoming of these programs, from a medical perspective, is that they are not conducive to traditionally accepted forms of statistical analysis to determine their effectiveness (think long-term drug trials with a placebo group, for example).

Suppose that, in an effort to collect data concerning the effectiveness of Alcoholics Anonymous, a researcher attended meetings all over the country, and at each meeting recorded the time elapsed since each person had consumed alcohol. After months of work, the researcher reported that of over 10,000 meeting attendees surveyed, the average attendee had abstained from alcohol for 2.7 years prior to the meeting in which they were surveyed. (To be clear, I totally made these numbers up for the sake of this exercise.)

- a) Do you think that this data constitutes evidence that a new person struggling with alcohol dependency who enters Alcoholics Anonymous will abstain from alcohol for an average of 2.7 years? Why or why not?

- b) Can you think of a way to modify the researcher's methodology to remove some of the bias from her results?

Additional discussion topic, time permitting: eHarmony.com