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Econ 3640
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Assignment 4

Probabilities Versus Frequencies

Probability: represents a state that is calculated based on previously assigned probabilities according to the rules of probability theory. **Frequency**: a factual property of the real world that we can measure or estimate. The phrase estimating a probability is just as much a logical incongruity as "assigning a frequency" or "draw a square circle. The biggest difference between the two is: probabilities change when we change our state of knowledge, frequencies do not. We only have observable info about frequency, while probabilities are the "odds" or "chances" that events will happen. You are only able to estimate probability dependent upon your current probability equation and understanding, if this were to change, therefore your probabilities would change. You cannot change frequencies.

From the text, it seems like people misunderstand that the inferences made from probabilities are actually frequencies being adapted to fit someone's explanation.
Halley's Mortality Table is a good example of using observed frequencies as probabilities. Halley's table was biased in a sense where he only showed what he wanted to show, leaving out many factors (segregation of male and female data, reasons for death, etc.). The end result is that it pays more to leave your original data as raw, unprocessed as in the future there may be better tools that can help understand the phenomena. The table was considering great for their time as a rule of thumb for governing bodies to use and understand, however with the use of modern tools, we may be able to pull more granular details out of his reporting if it were truly accurate as possible.

The bottom line. Frequencies are things being observed, not necessarily happening because of the "probability" of it happening. But make it clear though, as stated before when making probabilities, probabilities are relative and will change with more knowledge. Frequencies (in this case people dying) do not. This concept is rather terrifying because the basis that we make judgements off of using probabilities can be entirely wrong.

Imagine if as society we are using a statistical probability equation at the time to understand the chances of getting diabetes based solely upon genetic makeup. It could say I have a 95% chance of getting diabetes and I would live my life in fear.
However, in 10 years they have updated their probability matrix to now account for new data, which shows that because of their probability updates, I now have a 2% chance of getting diabetes. This is an extreme example, but it's used to make a point: probability is relative and always changes, and by basing things solely off it may be considered reckless.
So therefore, making probability assumptions based upon frequencies is at best relative to current understanding, thus making it more of a "guess" rather than a statistical chance that something is actually going to happen.