00: TEST

Reading

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The first topic we're going to cover in this class is *estimation*. That is, how to use observed sample data to estimate population parameters. A health-care study, for example, might want to estimate the proportion of people who have private health insurance and the mean annual cost for those who have it. Some studies assume a particular *parametric* family of probability distributions for a response variable and then estimate the parameters of that distribution in order to fit the distribution to the data.

This set of notes covers the basics of estimating a parameter by constructing an *estimator*, that yields a single number, called a *point estimate*.

Motivating Example: The 2018 General Social Survey asked "Do you believe there is a life after death?" For the 2,123 people interviewed, one point estimate for the *population* proportion of Americans who would respond yes is the sample proportion, which was 0.81.

1 Definitions and Notation

Before we get started, let's re-introduce ourselves to some key definitions from probability, add some new definitions, and introduce the notation that we'll use.

Parameter

Estimator

Estimate

Probability Density Function (PDF)

Probability Mass Function (PMF)

Likelihood function