

# 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**