

Asymptotics are an important topics in statistics. Asymptotics refers to the behavior of estimators as the sample size goes to infinity. Our very notion of probability depends on the idea of asymptotics. For example, many people define probability as the proportion of times an event would occur in infinite repetitions. That is, the probability of a head on a coin is 50% because we believe that if we were to flip it infinitely many times, we would get exactly 50% heads.

We can use asymptotics to help is figure out things about distributions without knowing much about them to begin with. A profound idea along these lines is the Central Limit Theorem. It states that the distribution of averages is often normal, even if the distribution that the data is being sampled from is very non-normal. This helps us create robust strategies for creating statistical inferences when we're not willing to assume much about the generating mechanism of our data.