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# What is Bayesian statistics?

- Statistical inference concerns unknown **parameters** that describe certain population characteristics such as the true mean efficacy of a particular treatment. **Inferences** are made using data and a statistical model that links the data to the parameters.
- In frequentist statistics, parameters are fixed quantities, whereas in Bayesian statistics the true value of a parameter can be thought of as being a random variable to which we assign a probability distribution, known specifically as **prior information**.
- A Bayesian analysis synthesises both sample data, expressed as the **likelihood function**, and the prior distribution, which represents additional information that is available.
- The **posterior distribution** expresses what is known about a set of parameters based on both the sample data and prior information.
- In frequentist statistics, it is often necessary to rely on large-sample approximations by assuming **asymptomatic normality**. In contrast, Bayesian inferences can be computed exactly, even in highly complex situations.

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