We need the deterministic model to learn about the average or expected behavior.

We need the stochastic model to know about the variation.

Stochastic model shows us if an observation is unusual.

Inference is a way to learn something about a larger population from the properties of a sample. More formally: Inference is estimating population *parameters* from sample *statistics*.  
 We use the deterministic model to calculate model parameter estimates  
 We use the stochastic model to quantify condfidence and significance

Probability Density Functions are used for continuous distributions

Probability Mass Functions are used for discrete distributions

Values of PDFs and PMFs are always non-negative, by definition of probability

Cumulative and Quantile Functions also exist