

1.6 Learning objectives

By the end of this chapter, you should be able to:

- determine the likelihood function using a random sample from **any** distribution
- combine this likelihood function with **any** prior distribution to obtain the posterior distribution
- name the posterior distribution if it is a “standard” distribution listed in these notes or on the exam paper – this list may well include distributions that are standard within the subject but which you have not met before. If the posterior distribution is not a “standard” distribution then it is okay just to give its density (or probability function) up to a constant.
- do all the above for a particular data set or for a general case with random sample X_1, \dots, X_n
- describe the different levels of prior information; determine and use conjugate priors and vague priors
- determine the asymptotic posterior distribution
- determine the predictive distribution, particularly when having a random sample from any distribution and a conjugate prior via Candidate’s formula
- describe and calculate the confidence intervals, HDIs and prediction intervals
- determine posterior distributions when the prior is a mixture of conjugate distributions