

9.1: Introduction to the Lesson

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Up to this point, you have been learning about linear regression, which is intended for one quantitative response variable and at least one predictor. When we have a binary response variable and at least one predictor, we use logistic regression.

Common ways of summarizing binary variables include using probabilities and odds. For example, you may want to estimate the odds (or probability) of people developing heart disease later in their lives based on characteristics such as blood pressure, cholesterol, and whether the person smokes regularly or not. You may consider using a linear regression model, because the odds of developing heart disease later in life are numerical. However, a linear regression model may end up having estimated odds that are less than 0 (odds are nonnegative by their nature). A logistic regression model is set up to guarantee the estimated odds are never negative.

Typical questions that a logistic regression model can answer include how does smoking increase the odds of developing heart disease? Do characteristics such as weight help us better predict the odds of developing heart disease when we already know the person’s blood pressure and cholesterol? How confident are we of our estimated odds?

In this lesson, you will learn about the logistic regression model. Similar to what you learned when studying the linear regression model, you will learn how to estimate and interpret the coefficients of a logistic regression model, perform various inferential procedures to answer various questions of interests, and learn how to assess the fit of the model. As you study the logistic regression model, it will be helpful for you to compare and contrast what you are learning with what you learned about the linear regression model.

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