

## MAT 212 Chapter 11, Sections 1 & 2

- 11.1  $H_0$ : Drug is unsafe or ineffective.  
 $H_1$ : Drug is safe and effective.

A Type I error would be when the drug is considered safe and effective, when in fact it is either unsafe or ineffective.

If it is unsafe, then serious medical conditions or death could result.  
If it is safe, but ineffective, people are paying for a drug which is not helping their illness.

A Type II error would be when the drug is considered either unsafe or ineffective when it is safe and effective.

The drug will not make it to market, although it should. If there are not equivalently effective or safe drugs on the market, this could be lessen relief people receive from medicine.

- 11.2  $H_0$ : I can complete the Ph.D.  
 $H_1$ : I will be unable to complete the Ph.D.

A Type I error would be when you don't think you'll be able to complete the Ph. D, but in fact you are able to finish it.

You decide not to pursue the degree. It's unclear what happens in your future.

A Type II error would be when you feel you can complete the degree, but are unable to finish.

You've "wasted" 5 years of your life. Then again, maybe you've met several business contacts during your time in school.

- 11.4  $H_0$ : Risky investment is more successful

$H_1$ : Risky investment is not more successful

Type I Error: You think the risky investment is not more successful, but it is. You don't earn as much as you could have with your investment.

Type II Error: You think the risky investment is more successful, but it is not. You don't make extra with the risky investment.

11.5  $H_0$ : The plane is on fire

$H_1$ : The plane is not on fire

Type I Error: You think the plane is not on fire, but it is!

This leads to a potential tragic event.

Type II Error: You think the plane is on fire, but it is not.

You take action (land nearby) and cause delays. You erred on the side of safety, but a few passengers will probably be upset with you.