Statistics Quiz 18 Review
Lessons 55-58

A researcher wonders if elderly people postpone dying to experience another holiday. Data are collected showing that 10,000 total deaths occurred during week before and the week after a chosen holiday. 4958 of the deaths occurred during the week before the holiday. Construct a 90% confidence interval

Based on the result, does it appear that the elderly temporarily postpone dying near a holiday?

CH 8 Review (all proportions)

From pages 522-523
- R8.1
- R8.2a
- R8.4
- R8.6
- R8.7

From pages 524-525
- T8.1
- T8.4
- T8.6
- T8.9
- T8.11

CH 9 Review (all proportions)

From pages 594-596
- R9.1b
- R9.4
- R9.5

From pages 597-599
- T9.1
- T9.3
- T9.5
- T9.8
- T9.11

Consider the table showing the distribution of colors in a bag of skittles:

Red	29
Purple	15
Yellow	19
Orange	20
Green	22

The manufacturer claims the proportion of red candies is 0.20. Conduct a hypothesis test of the manufacturer's claim.

Find the sample size n needed to estimate the percentage of adults who have consulted fortune tellers. Use a .02 margin of error and a confidence level of 98%.

How would the previous value change if it is known that a previous poll found that 20% of adulte have consulted fortune tellers?

In 1997, a survey of 860 households showed that 144 of them use e-mail. Use those results to test the claim that more than 15% of households use e-mail. Use a 0.05 significance level to perform a hypothesis test.

Would your conclusion still be accurate today? Explain.

When testing gas pumps for accuracy, fuel-quality enforcement specialists tested pumps and found that 1336 of them were not pumping accurately (within 3.3 oz when 5 gal is pumped), and 5653 pumps were accurate. Use a 0.01 significance level to test the claim of an industry representative that less than 20% of the pumps are inaccurate.

In a survey funded by Burroughs-Welcome, 750 of 1000 adult Americans said they didn't believe they could come down with a sexually transmitted disease (STD). Construct a 95% confidence interval estimate of the proportion of adult Americans who don't believe they can contract an STD.

(A) (.728, .772)
(B) (.723, .777)
(C) (.718, .782)
(D) (.713, .787)
(E) (.665, .835)

In a recent Zogby International survey, 11% of 10,000 Americans under 50 said they would be willing to implant a device in their brain to be connected to the Internet if it could be done safely. What is the margin of error at the 99% confidence level?

(A) $\pm\sqrt{\dfrac{(1{,}100)(8{,}900)}{10{,}000}}$

(B) $\pm 1.96\dfrac{.5}{\sqrt{10{,}000}}$

(C) $\pm 2.576\dfrac{\sqrt{(.11)(.89)}}{10{,}000}$

(D) $\pm 1.96\sqrt{\dfrac{(.11)(.89)}{10{,}000}}$

(E) $\pm 2.576\sqrt{\dfrac{(.11)(.89)}{10{,}000}}$

A hypothesis test is run to test the accuracy of the claim that the true proportion of students who would return a lost wallet is p = 0.6 Describe a type 1 and type 2 error.

Statistics Quiz 18 Review
Lessons 55-58

Key

CH 8 Review (all proportions)

From pages 522-523
R8.1
R8.2a
R8.4
R8.6
R8.7

From pages 524-525
T8.1
T8.4
T8.6
T8.9
T8.11

CH 9 Review (all proportions)

From pages 594-596
R9.1b
R9.4
R9.5

From pages 597-599
T9.1
T9.3
T9.5
T9.8
T9.11

A researcher wonders if elderly people postpone dying to experience another holiday. Data are collected showing that 10,000 total deaths occurred during week before and the week after a chosen holiday. 4958 of the deaths occurred during the week before the holiday. Construct a 90% confidence interval

delay $\hat{p} = \frac{5042}{10000}$

$\sigma_{\hat{p}} = .005$

$z = 1.64$

error $= .008$

Interval: .496 to .512

Since .5 is in the interval we do not have sig. evidence the death is delayed.

Based on the result, does it appear that the elderly temporarily postpone dying near a holiday?

No

Consider the table showing the distribution of colors in a bag of skittles:

Red	29
Purple	15
Yellow	19
Orange	20
Green	22

total = 105

The manufacturer claims the proportion of red candies is 0.20. Conduct a hypothesis test of the manufacturer's claim.

Ho $p = .2$
Ha $p \neq .2$

$\hat{p} = \frac{29}{105} = .276$

$\sigma_{\hat{p}} = .04$

$z = 1.95$

doubled p-val = .051

Fail to Reject
Lack evidence to say p is different from .2 for red candies.

Find the sample size n needed to estimate the percentage of adults who have consulted fortune tellers. Use a .02 margin of error and a confidence level of 98%.

don't know p, so use .5

$$error = z\sqrt{\frac{pq}{n}}$$

$$.02 = 2.326\sqrt{\frac{(.5)(.5)}{n}}$$

$$.008598 = \sqrt{\frac{.25}{n}}$$

$$\frac{.0000739}{1} = \frac{.25}{n} \qquad n = 3381.4$$

$\boxed{\text{Answer} = 3382}$

How would the previous value change if it is known that a previous poll found that 20% of adulte have consulted fortune tellers?

use $.2 = p$ $\quad .8 = q$

$$.008598 = \sqrt{\frac{(.2)(.8)}{n}}$$

$$\frac{.0000739}{1} = \frac{.16}{n} \qquad n = 2164.1$$

$\boxed{\text{Answer} = 2165}$

In 1997, a survey of 860 households showed that 144 of them use e-mail. Use those results to test the claim that more than 15% of households use e-mail. Use a 0.05 significance level to perform a hypothesis test.

$H_0: p = .15$

$H_a: p > .15$

$\hat{p} = \frac{144}{860} = .167$

$\sigma_{\hat{p}} = .012$

$z = 1.432$

1 sided p-value $= .076$

Fail to reject

Lack evidence to say more than 15% use email in 1997

Would your conclusion still be accurate today? Explain.

No, more use email today

The 15% claim would be rejected.

When testing gas pumps for accuracy, fuel-quality enforcement specialists tested pumps and found that 1336 of them were not pumping accurately (within 3.3 oz when 5 gal is pumped), and 5653 pumps were accurate. Use a 0.01 significance level to test the claim of an industry representative that less than 20% of the pumps are inaccurate.

$H_0: p = .2$

$H_a: p < .2$

$\hat{p} = \frac{1336}{6989} = .191$

$\sigma_{\hat{p}} = .005$

$z = -1.85$

p-value $= .032$

(1-sided)

Reject Ho

We have sig. evidence that fewer then 20% are inaccurate.

In a survey funded by Burroughs-Welcome, 750 of 1000 adult Americans said they didn't believe they could come down with a sexually transmitted disease (STD). Construct a 95% confidence interval estimate of the proportion of adult Americans who don't believe they can contract an STD.

(A) (.728, .772)
(B) (.723, .777)
(C) (.718, .782)
(D) (.713, .787)
(E) (.665, .835)

In a recent Zogby International survey, 11% of 10,000 Americans under 50 said they would be willing to implant a device in their brain to be connected to the Internet if it could be done safely. What is the margin of error at the 99% confidence level?

$$\text{error} = z\,\sigma_{\hat{p}}$$

$$z\sqrt{\frac{pq}{n}}$$

$$2.56\sqrt{\frac{(.11)(.89)}{10000}}$$

(A) $\pm\sqrt{\dfrac{(1{,}100)(8{,}900)}{10{,}000}}$

(B) $\pm 1.96\dfrac{.5}{\sqrt{10{,}000}}$

(C) $\pm 2.576\dfrac{\sqrt{(.11)(.89)}}{10{,}000}$

(D) $\pm 1.96\sqrt{\dfrac{(.11)(.89)}{10{,}000}}$

(E) $\pm 2.576\sqrt{\dfrac{(.11)(.89)}{10{,}000}}$

A hypothesis test is run to test the accuracy of the claim that the true proportion of students who would return a lost wallet is p = 0.6 Describe a type 1 and type 2 error.

$H_0: p = .6$
$H_a: p \neq .6$

null true

Type 1: prop is .6, we find it is not .6
we mistakenly reject a true null

Type 2: prop is not .6, we fail to reject .6