

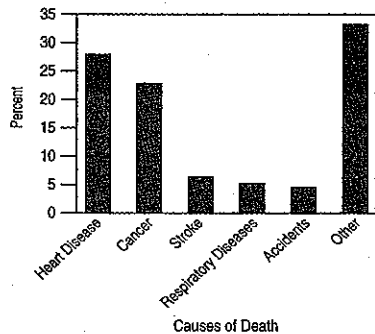
# Recitation 1 Solutions

## Chap. 3

13. a) Yes, because each person is assigned one cause of death so there is no overlap.

b)  $100 - (27.9 + 22.8 + 6.4 + 5.2 + 4.5) = 33.2\%$

c)



- 19.
- no ~~title~~ title
  - the total of all percentages is not 100%
  - area of each piece of the pie is distorted in this 3-D display

22. You can not conclude any cause and effect from these values because the cause may be due to some other factor that was not in the study.

You can only read what is displayed in the table:

- 76.4% of guns bought back were small caliber
- 54.7% of homicides ~~were~~ ~~used~~ involved medium sized caliber guns
- 4.3% of large or other caliber guns were bought back

29. a)  $292/1755 = 16.6\%$   
 b)  $110/931 = 11.8\%$   
 c)  $110/292 = 37.7\%$   
 d)  $931/1755 = 53\%$

35. a) ~~total BP~~ <sup>total BP</sup>

Type of BP	Marginal Distr.
Low	$95/474 = 20\%$
Normal	$232/474 = 48.9\%$
High	$147/474 = 31\%$

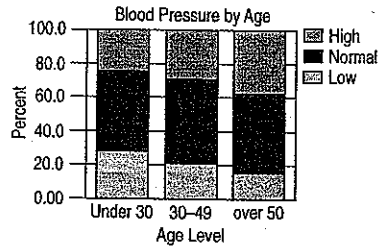
b)

Type of BP	Under 30 Conditional Distr.
Low	$27/98 = 27.6\%$
Normal	$48/98 = 49\%$
High	$23/98 = 23.5\%$

Type of BP	Conditional Distr. for 30-49
Low	$37/179 = 20.7\%$
Normal	$91/179 = 50.8\%$
High	$51/179 = 28.5\%$

Type of BP	Conditional Distr. for Over 50
Low	$3/197 = 15.7\%$
Normal	$93/197 = 47.2\%$
High	$73/197 = 37.1\%$

c)



d) As age increases, the percent of employees with high BP increases.

e) No. Direct conclusions cannot be drawn because the cause may be due to some other reason that's not in the study.

38. • Percentage of patients taking SSRI who had bone fractures:  
 $14/137 = 10.2\%$

• Percentage of patients not taking SSRI who had bone fractures:  
 $244/4871 = 5.0\%$

~~There~~ There is an "association" (this is not cause/effect) that patients taking SSRI are more likely to experience bone fractures.

## Chap. 4

11. a) Can't really tell because of the first tall bar on the left. Without this tall bar, we can say the data is skewed to the right and that the mean is larger than the median.

Median = value that marks the middle of the data values (50% of data values are on either sides of the median)

Mean = average, so the average will be larger if there are a bunch of large values in this data set (the long tail on the right of the histogram)

- b) • skewed to the right  
• mode = 8 days  
• there are large values to the right (possible outliers)

32. Consult the formatted data set (listed in ascending order).

a) median =  $Q_2$

$$\begin{aligned}\text{index of } Q_2 &= (n+1) \times 0.5 \\ &= 131 \times 0.5 \\ &= 65.5^{\text{th}}\end{aligned}$$

$$\Rightarrow Q_2 = 66 \text{ inches (from data values)}$$

$$\begin{aligned}\text{index of } Q_1 &= (n+1) \times 0.25 \\ &= 131 \times 0.25 \\ &= 32.75^{\text{th}}\end{aligned}$$

$$\Rightarrow Q_1 = 65 \text{ inches}$$

See next page.

## 32. Data Set

Index: 1 2 3 4 5

60 60 61 61 61 61 61 61 61 62 62 62 62 62 62 62 62 62 62 62 63 63 63 63 63

63 63 64 64 64 64 64 64 65 65 <sup>32</sup>65 65 65 65 65 65 65 65 65 65 65 65 65

65 65 65 65 65 66 66 66 66 66 66 66 66 66 66 66 66 66 66 66 66 <sup>65</sup>66 66

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69 69 69 70 70 70 70 70 70 <sup>98</sup>70 70 70 70 70 70 71 71 71 71 71 71 71 71

72 72 72 72 72 72 72 72 72 72 73 73 73 73 74 74 75 75 75 75 76

$$\begin{aligned} \text{index of } Q_3 &= (n+1) \times 0.75 \\ &= 131 \times 0.75 \\ &= 98.25^{\text{th}} \end{aligned}$$

$$\Rightarrow Q_3 = 70 \text{ inches}$$

$$IQR = Q_3 - Q_1 = 70 - 65 = 5 \text{ inches}$$

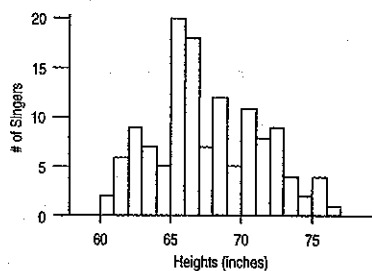
$$b) \text{ mean} = \frac{8725}{130} = 67.12 \text{ inches}$$

$$\begin{aligned} \text{variance} &= s^2 = \frac{1}{n-1} [\sum (y - \bar{y})^2] \\ &= \frac{1}{129} [\sum (y - 67.12)^2] \\ &= 14.38 \end{aligned}$$

$$SD = \sqrt{s^2} = \sqrt{14.38} = 3.79 \text{ inches}$$

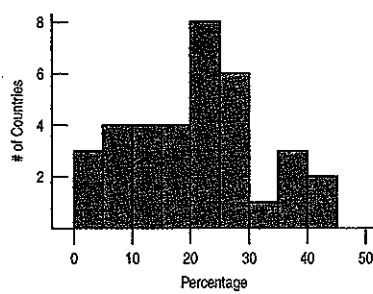
(SD = standard deviation)

c)



- d) • histogram has a mean of 67.12 inches  
 • a median of 66 inches  
 • 50% of data values are between 65 and 70 inches  
 • the SD is 3.79 inches

46.



- Mode = 20%
- cluster of values larger than 35%, making the mean larger

51. First list the "Scores" in ascending order.

$$\begin{aligned} \text{a) index of } Q_2 &= (50+1) \times 0.5 \\ &= 25.5^{\text{th}} \end{aligned}$$

$$\Rightarrow Q_2 = 239$$

$$\begin{aligned} \text{index of } Q_1 &= (50+1) \times 0.25 \\ &= 12.75^{\text{th}} \end{aligned}$$

$$\Rightarrow Q_1 = 233$$

$$\begin{aligned} \text{index of } Q_3 &= (50+1) \times 0.75 \\ &= 38.25^{\text{th}} \end{aligned}$$

$$\Rightarrow Q_3 = 242$$

$$IQR = Q_3 - Q_1 = 242 - 233 = 9$$

$$\text{mean} = 11882/50 = 237.64$$

$$\text{variance} = s^2 = 32.40$$

$$SD = 5.69 = \sqrt{32.4}$$

## 51. Data Values

224 225 227 230 230 230 230 230 231 231 232 233 233 234 234

235 236 236 238 238 238 238 238 238 239 239 239 240 240 240

240 241 241 241 241 241 242 242 242 242 242 242 243 243 244

244 246 246 246 247



b) Report Median and IQR b/c histogram is skewed to the left.

c) - median of 239

- 50% of scores between 233 and 242

- histogram is skewed to the left so <sup>minority</sup> ~~majority~~ of average scores to the left are extreme cases (possible outliers)

- Alabama, Mississippi, and New Mexico had lower average scores