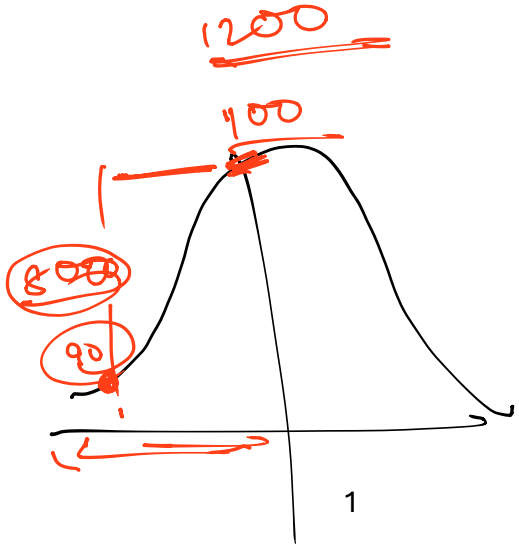
Chapter 2: Basic Data Analysis – Summary Statistics and Graphs

Meaning of the Variables

- P_L = → large
- P_S = → smaller
- s = S.D
- $\bar{x}$ = mean
- x = random variable.

Formulas

- Relative Risk (RR) = P_L / P_S
- Attributable Risk (AR) = $P_L - P_S$
- Attributable Risk % (AR %) = $\frac{AR}{P_L} \times 100$
- Number Needed to Change (NNC) = 1/AR
- Coefficient of Variation (CV) = Z-Score = $\frac{x - \bar{x}}{s}$



Fill in the Sign in sheet & Collect 2 sheets of the worksheet

SI PAL – Session #3

Basic and Conditional Probabilities

	Minor Fracture	Severe Fracture	Minor Joint	Severe Joint	Total
Male Athlete	147	52	74	291	564
Male Non-Athlete	141	38	39	372	590
Female Athlete	72	12	29	102	215
Female Non-Athlete	183	30	8	117	338
Total	543	132	150	882	1707

1. P (The person is a Male Athlete)

   ⇒ $\frac{564}{1707}$

2. P (The person is a Male)

   ⇒ $\frac{590+564}{1707}$

3. P (Female Athlete ∩ Minor Joint)

   ⇒ $\frac{29}{1707}$

4. P (Male Non-Athlete ∪ Severe Fracture)

   ⇒ $\frac{590+132-38}{1707} = \frac{684}{1707}$

5. P (Female Non-Athlete ∩ Severe Joint)

   ⇒ $117/1707$

6. P (Male Athlete | Severe Fracture) ⇒ Male Athlete give Severe fracture

   ⇒ $52/132$

7. P (Minor Fracture | Female Non-Athlete

   ⇒ $183/338$

8. P (Male Non-Athlete | Minor Joint)

9. P (Male Athlete ∪ Male Non-Athlete | Severe Joint)

10. P (Male | Joint)

    ↳ $\frac{776}{1082}$

Baye's Problem

Example 1

a) Fill in the table using the information below

- Suppose that a known disease occurs in 2% of the population
- The medical test produces a positive reading on 99.5% of those infected with the disease
- Suppose that this test gives a positive result in healthy patients 2% of the time
- Assume we have 100,000 random individuals who follow the above information perfectly
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	Has Disease	Does Not Have Disease	Total
Test Positive	1990	1960	
Test Negative	10	9640	
Total	2000	98000	100,000

b) Determine P (Have the Disease | Tested Positive)

$$\frac{1990}{1990 + 1960}$$

c) Determine P (Have the Disease | Tested Negative)

Example 2

Two dice (one red and one green) are to be rolled. The sample space consists of the 36 outcomes listed below. The first number is what is rolled on the Red die and the second number is what is rolled on the Green. Determine:

$$S = \begin{Bmatrix} 1,1 & 1,2 & 1,3 & 1,4 & 1,5 & 1,6 \\ 2,1 & 2,2 & 2,3 & 2,4 & 2,5 & 2,6 \\ 3,1 & 3,2 & 3,3, & 3,4 & 3,5 & 3,6 \\ 4,1 & 4,2 & 4,3 & 4,4 & 4,5 & 4,6 \\ 5,1 & 5,2 & 5,3 & 5,4 & 5,5 & 5,6 \\ 6,1 & 6,2 & 6,3 & 6,4 & 6,5 & 6,6 \end{Bmatrix}$$

a) P(At least one of the dice is a 5)

$\frac{11}{36}$

b) P(Sum of the dice is equal to 7)

$\Rightarrow \frac{6}{36}$

c) P(Sum of the dice is 11 or more)

$8/36$

d) P(Both are less than 3)

$\Rightarrow \frac{4}{36}$

e) P(Red is larger than Green) $\Rightarrow$ first No. > 2nd No

$15/36$

f) P(Sum is greater than 9) (sum is greater than 5)

$\Rightarrow 6/26$

g) P(Red = 6)

$\Rightarrow 6/36$

h) P(Largest number is a 5)

$\Rightarrow 9/36$

i) P(Smallest number is a 5)

$\Rightarrow 3/36$

Example 2

A deck of cards is shuffled and a card is drawn. Determine each of the following probabilities.

a) The probability that a face card is selected.

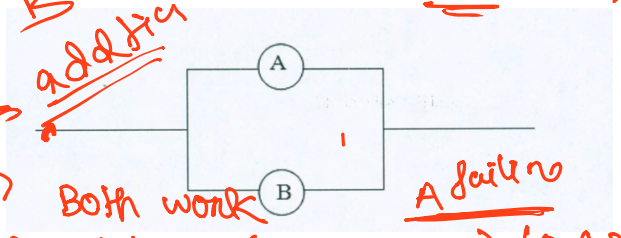
b) The probability that the card is not a 7.

c) The probability that the card is a Club.

d) The probability that a Red face is selected.

e) The probability that the card is Red or a King.

f) The card is red or a Club.



Circuit Problems

Determine the probability that the circuit works given that the component works probability is given bellow.

1. P(A) = 0.84 P(B) = 0.62

2. P(A) = 0.91 P(B) = 0.98

3. P(A) = 0.99 P(B) = 0.84

4. P(A) = 0.65 P(B) = 0.98