Telling a Story With Your Data

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Disclosures

Employment: Infection Prevention & Management Associates, Inc

Speaker: Metrex

Advisory: SaniNudge

Session Description

In this presentation, we will look at the different types of data that are collected in healthcare safety and infection prevention programs and discuss how we use that data to make decisions about how we provide care. This session will cover data collection, the basics of data analysis, and strategies for sharing data in ways that make sense.
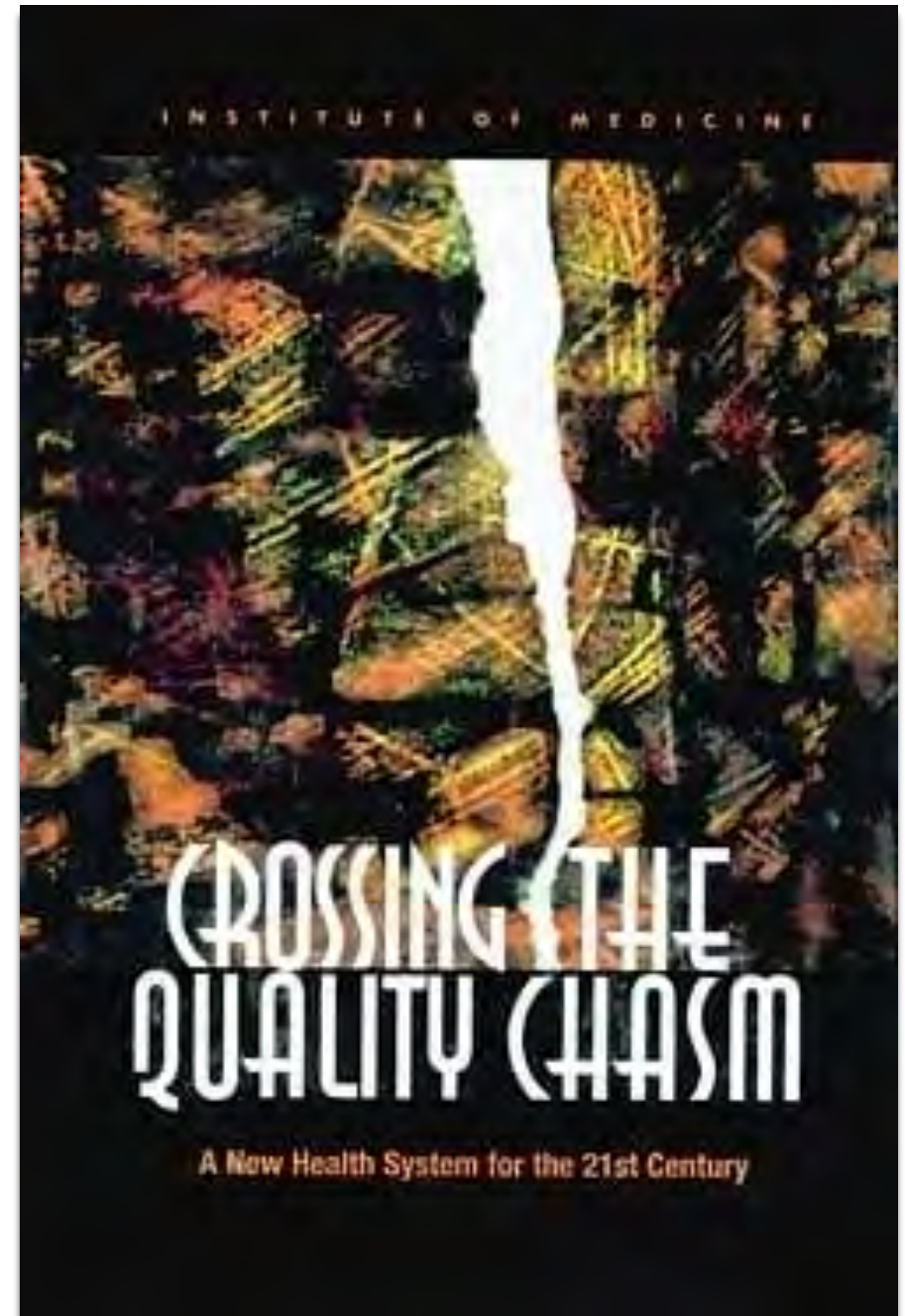
Learning Objectives:

1. Understand different types of data used in healthcare an infection prevention practice

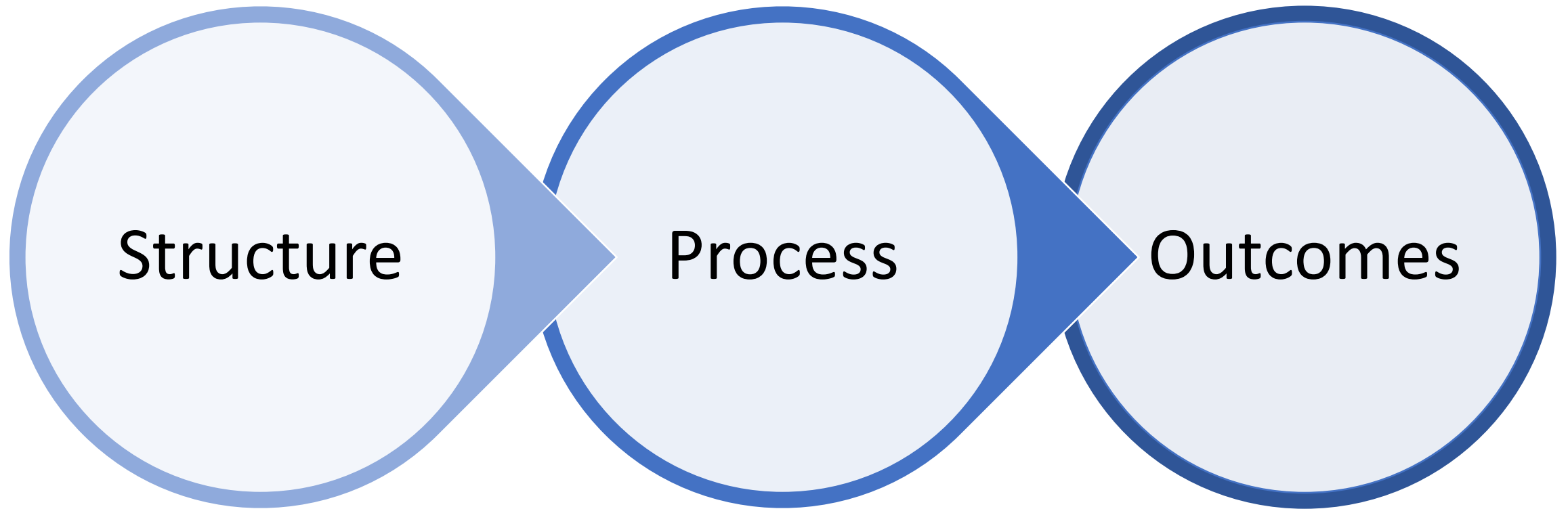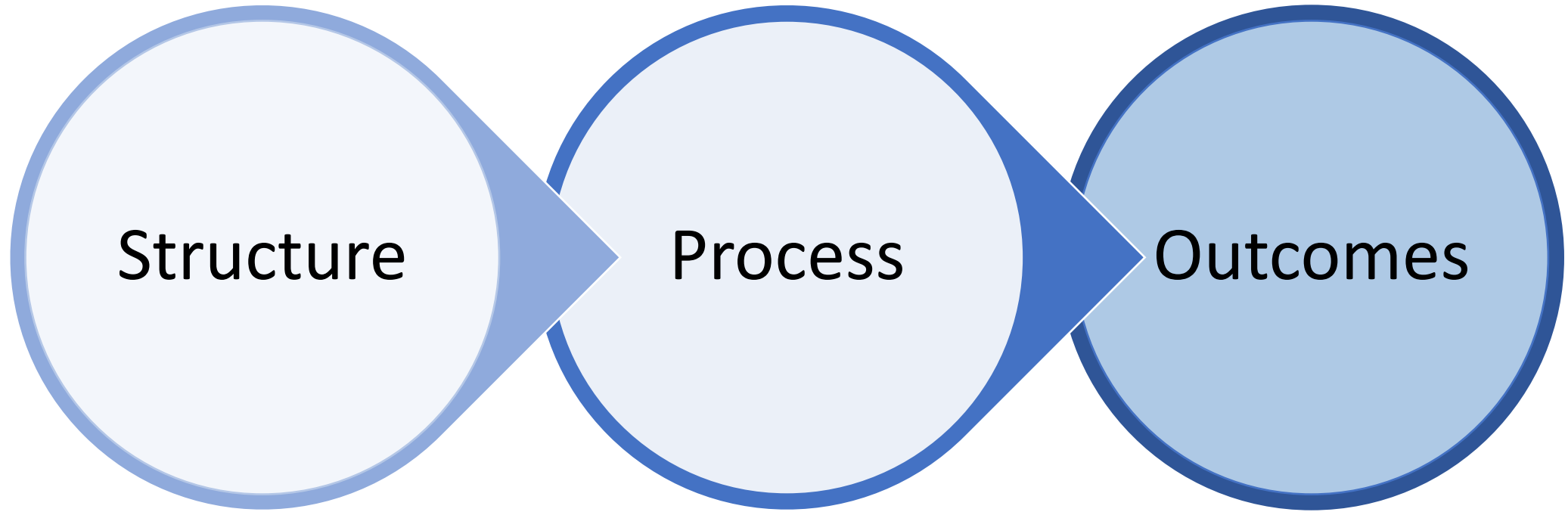2. Select appropriate graphical displays for different types of data

What is "Quality"

Defining Quality

- Safe
- Effective
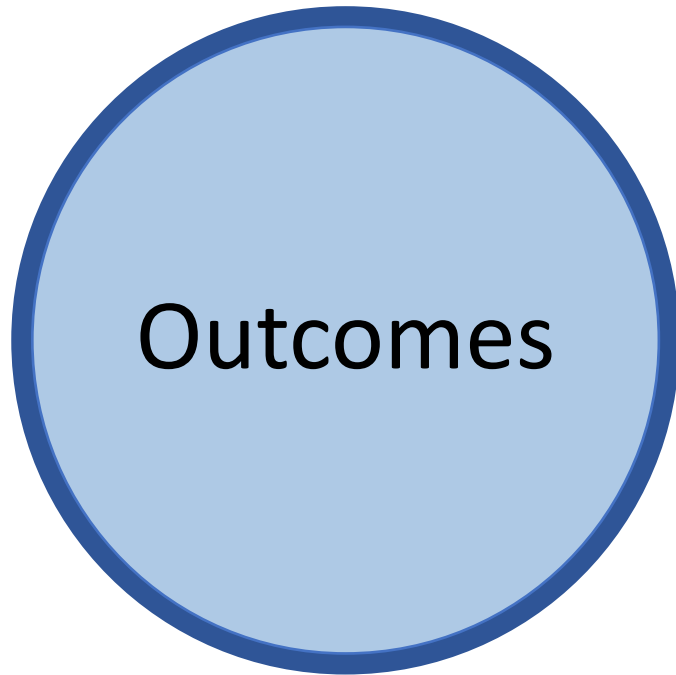- Patient Centered
- Timely
- Efficient
- Equitable

Source: Institute of Medicine (US) Committee on Quality of Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington (DC): National Academies Press (US); 2001.

How Do You Measure Quality?

Structure

Process

Outcomes

Donabedian model of healthcare quality

Structure → Process → Outcomes

How often do we cause harm?

Outcomes Data: What Already Happened
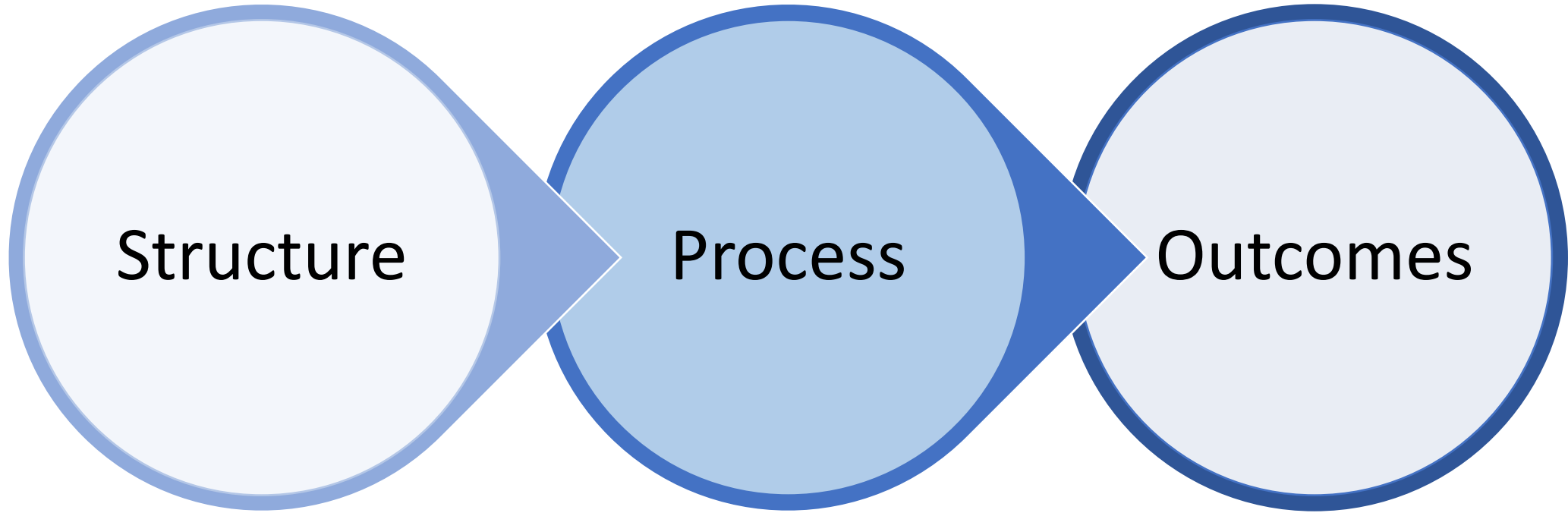
Outcomes

- **Common Examples**
  - Device associated infection rates – CLABSI, CAUTI, VAE
  - SSI
  - Injuries
  - Patient Safety Events
  - Needlesticks
  - Deaths / Mortality
- **Data Collection**
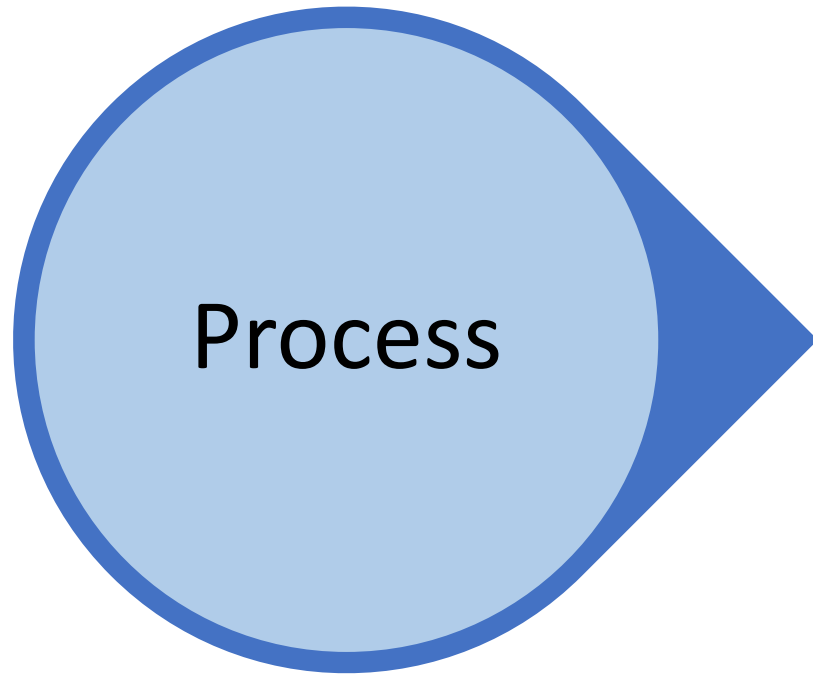 - Surveillance
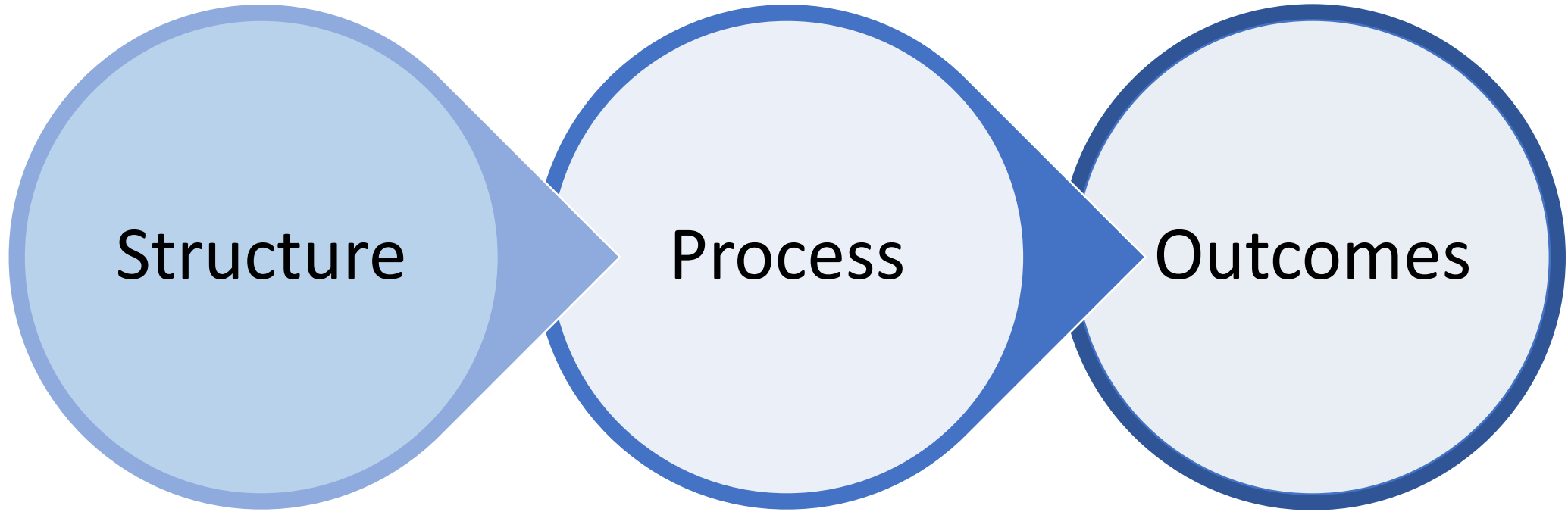 - Definitions
- **How We Use It**

Structure → Process → Outcomes

How often do we do what we are supposed to do?

Process Data: What is Happening
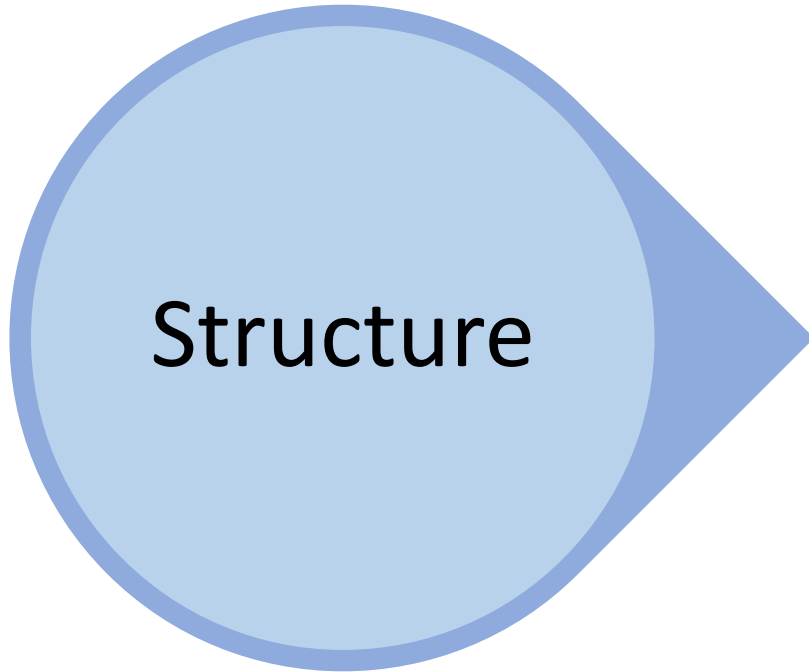
Process

- **Common Examples**
  - HAI Prevention Bundle Audits
  - Care Pathways
  - Focus Groups
- **Data Collection**
  - Audits
  - Observations
  - Chart Abstraction
- **How We Use It**

Structure

Process

Outcomes

Have we reduced the likelihood of harm?

Structure Data: What Are The systems?

Structure

- **Common Examples**
  - Environment of Care Audits
  - Equipment availability and usage
  - Staffing
- **Collection**
  - Audits
  - Facility Documents
  - Survey Results
- **How We Use It**

Data Collection

- What questions do you have?

- What data do you need to gather?

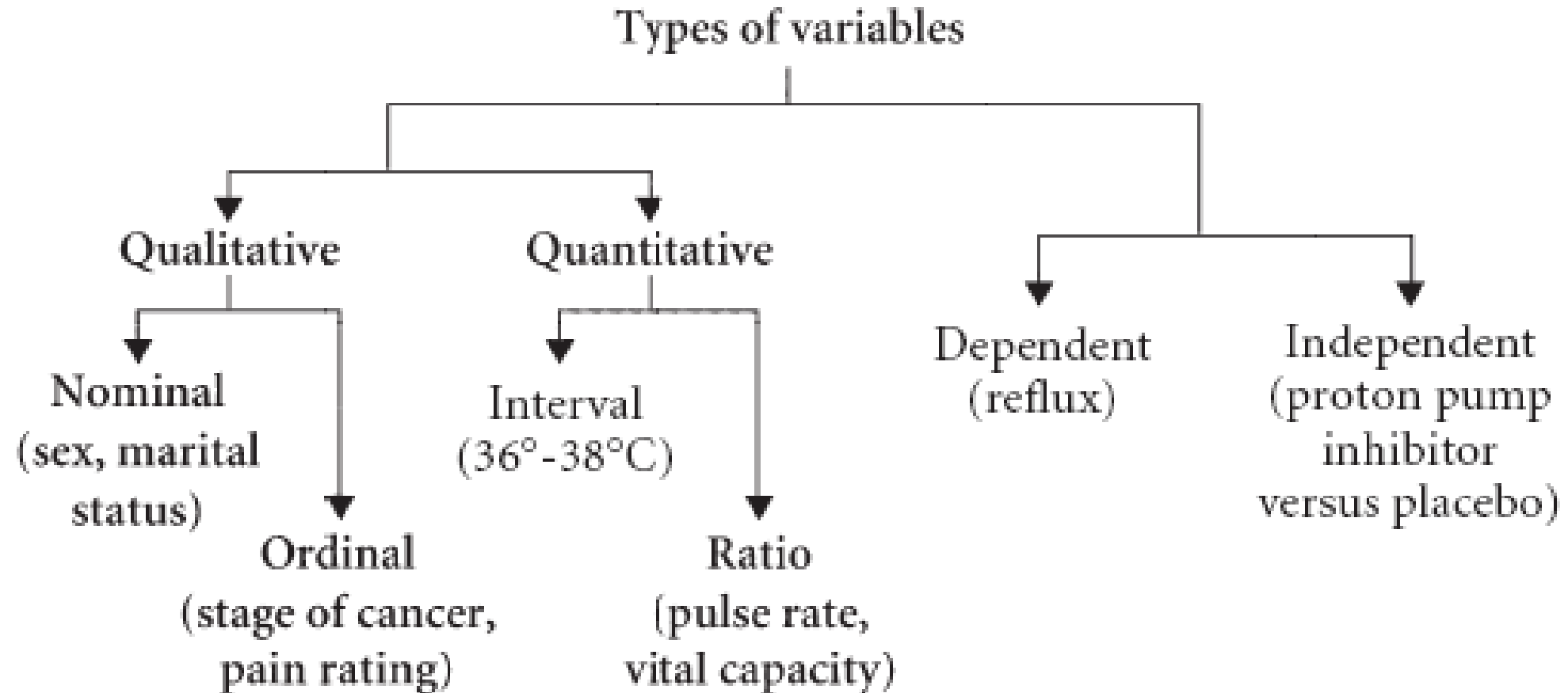- What could be available somewhere else?

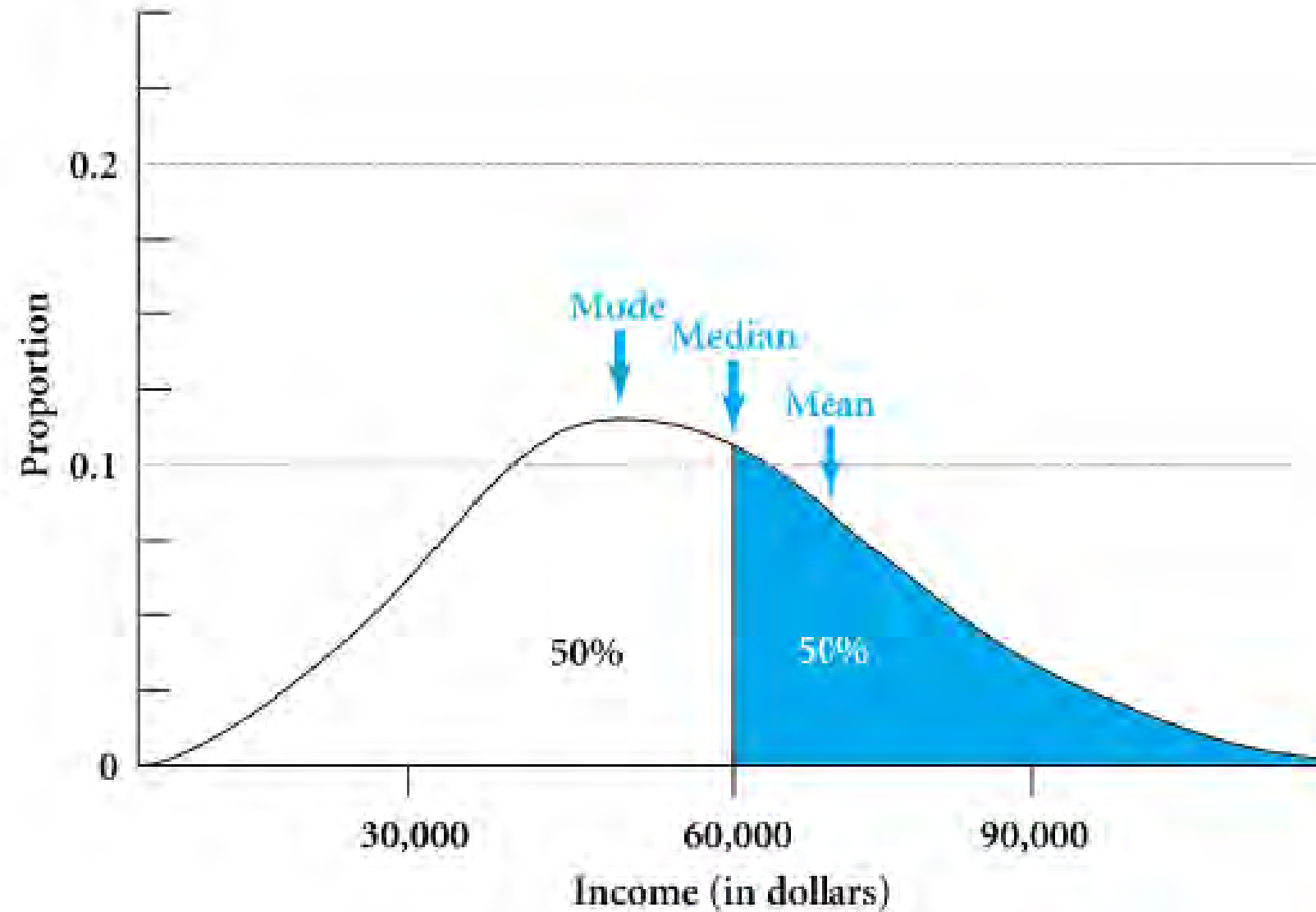# Do Something
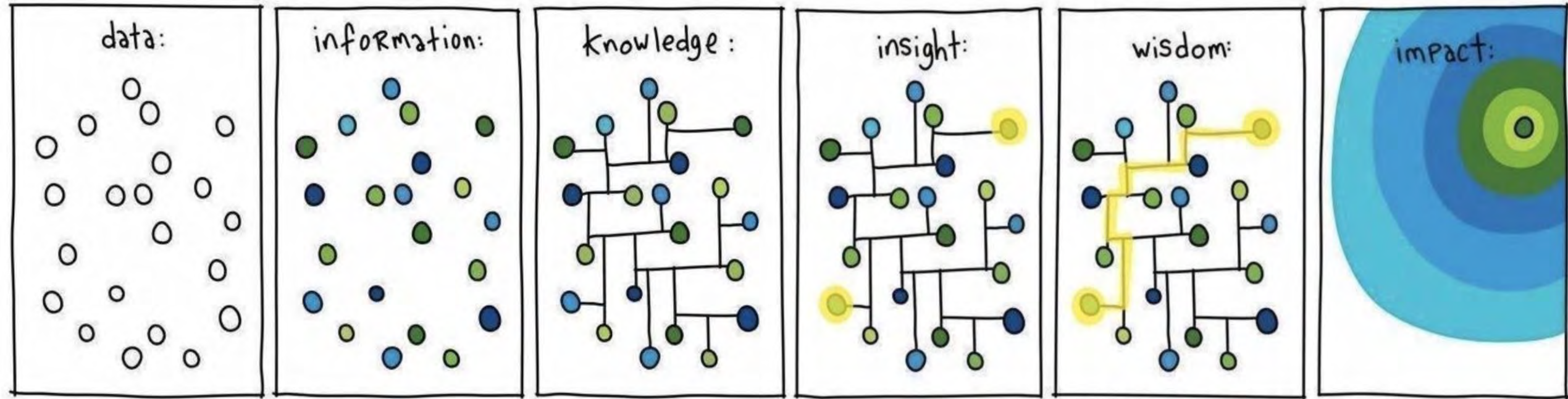
Organizing and Summarizing

- Have to have a way to simplify and communicate the data elements so can learn from it

- Find the middle

- Find the shape

- Find patterns

- How we analyze the data depends on what type of data we have
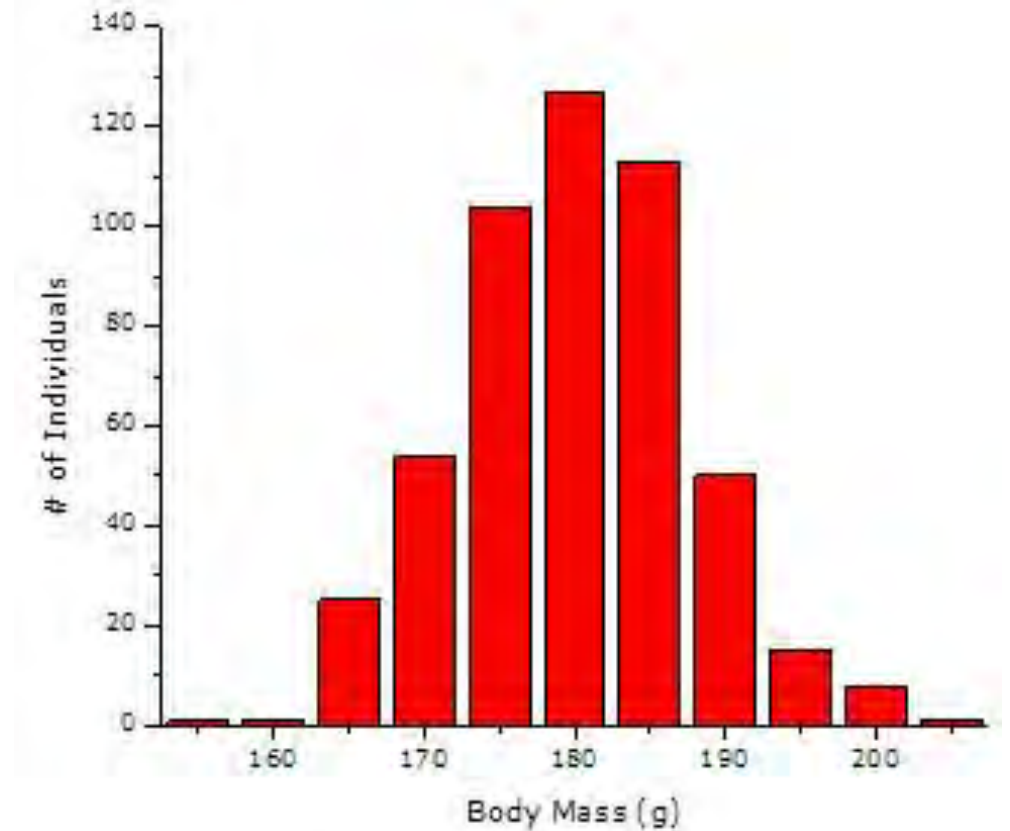
Understanding Your Data: Types of Variables
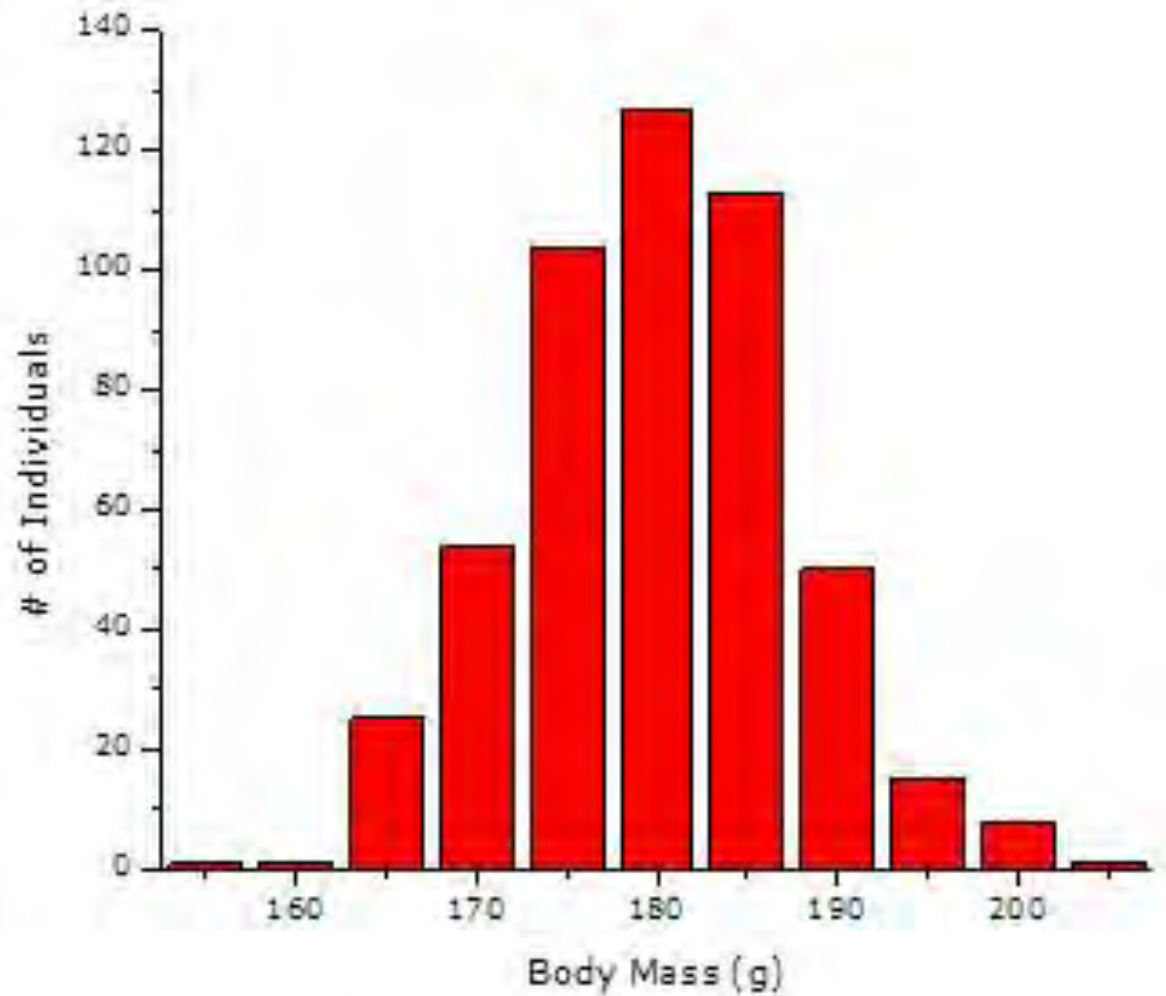
Find the Middle

Measures of Central Tendency

- **Mean:** mathematical *average* of the values in a data set.
  - Used for describing numeric data
  - "Numeric Data" = Actual measurements of individuals (temperature, height, pulse)
    - Interval Variables
    - Ratio Variables
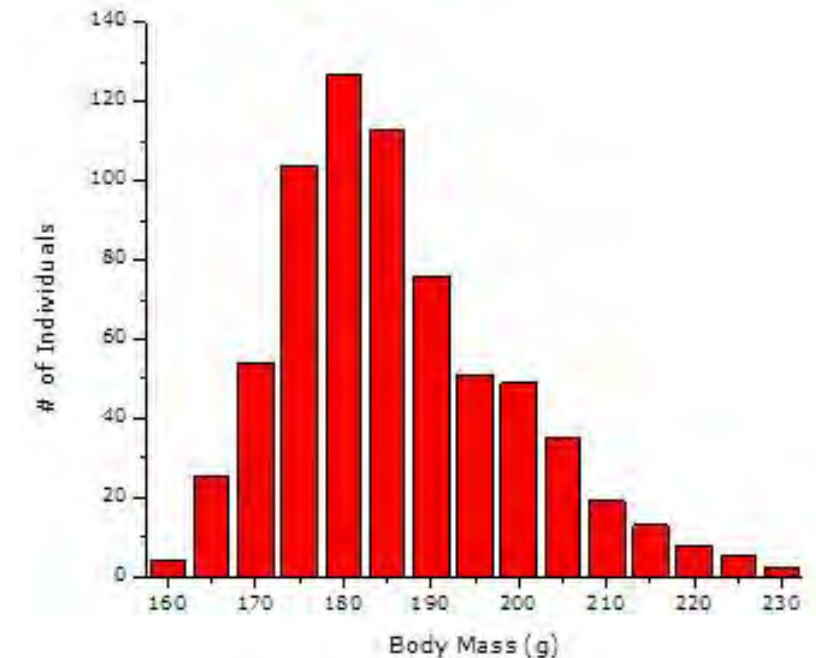   - Continuous Variables
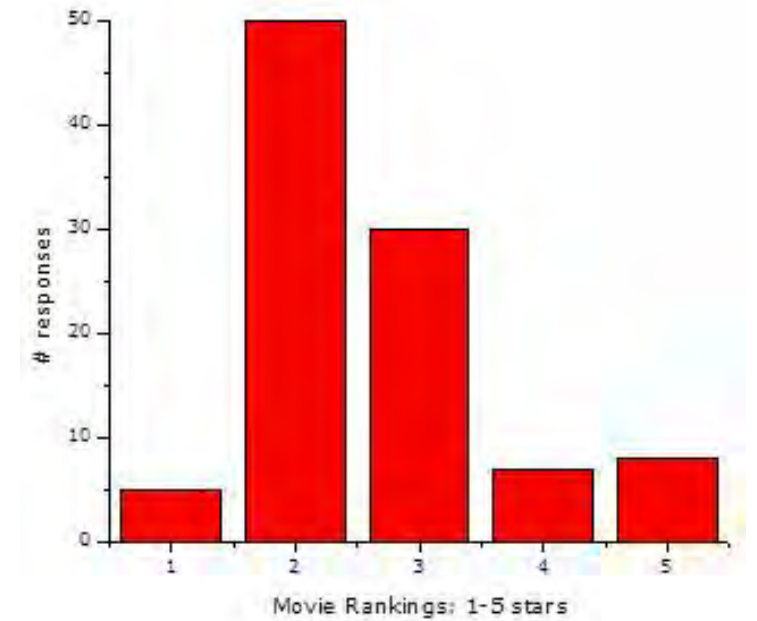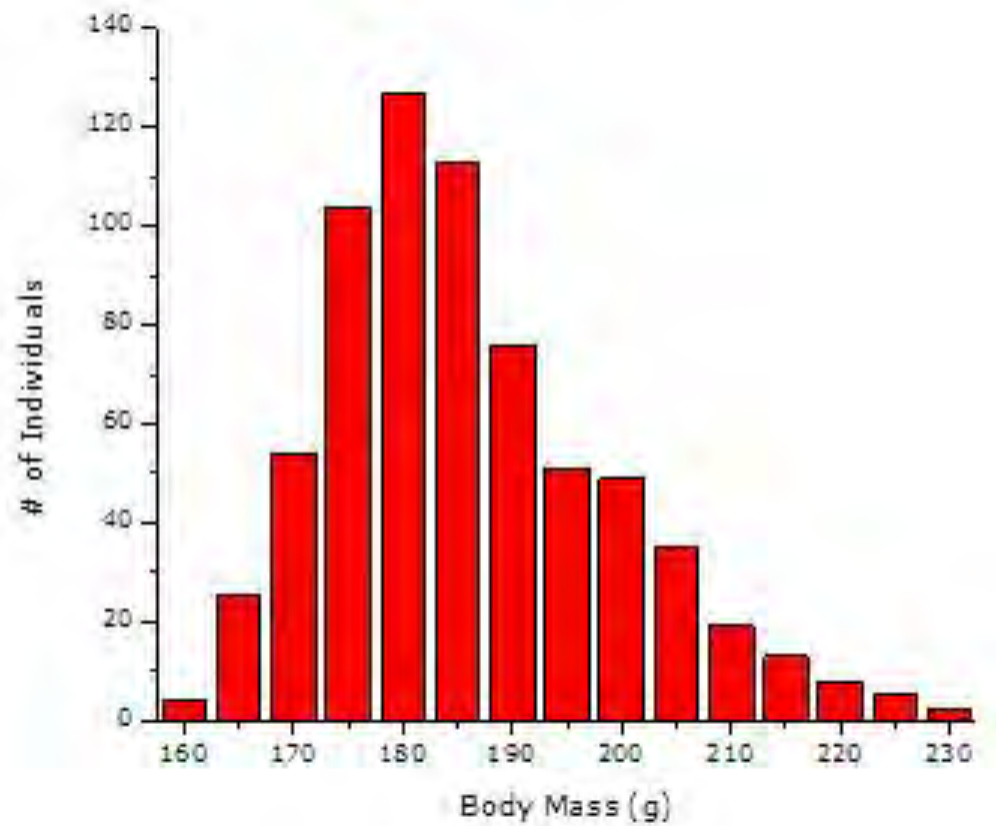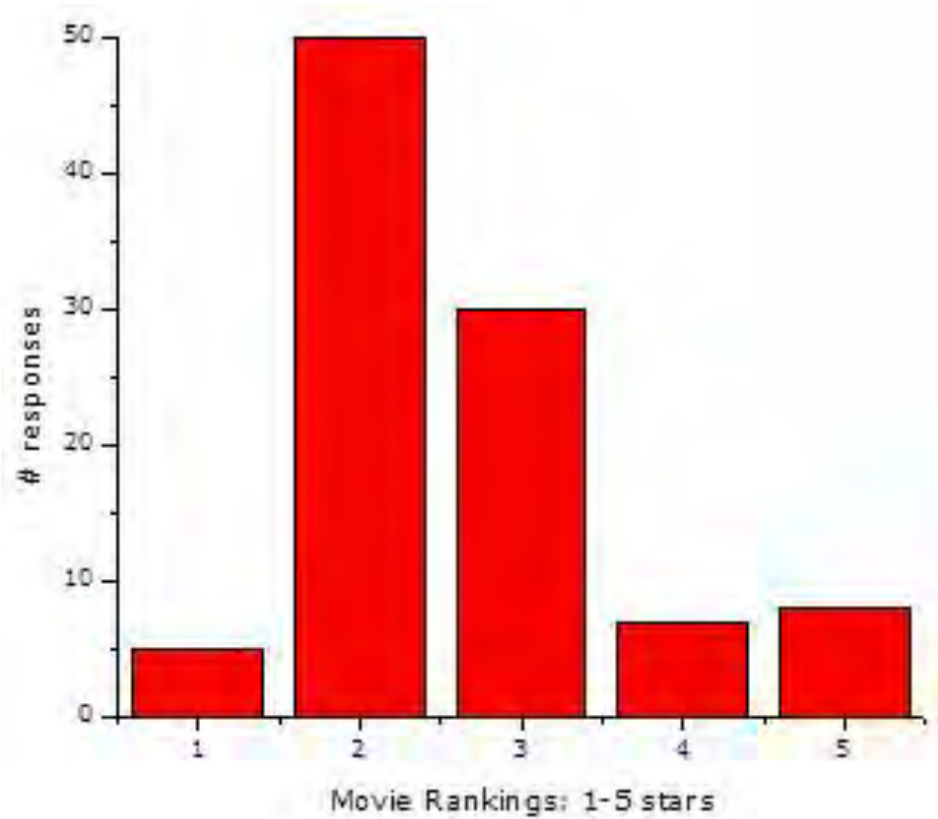   - Discrete Variables

Measures of Central Tendency

Measures of Central Tendency

Median: the value falling in the *middle* of the data set.

- Used for ordinal data
  - "Ordinal Data" = ordered categories
    - ASA Scores, Wound Class
- Median also good for numeric data when the distribution is skewed
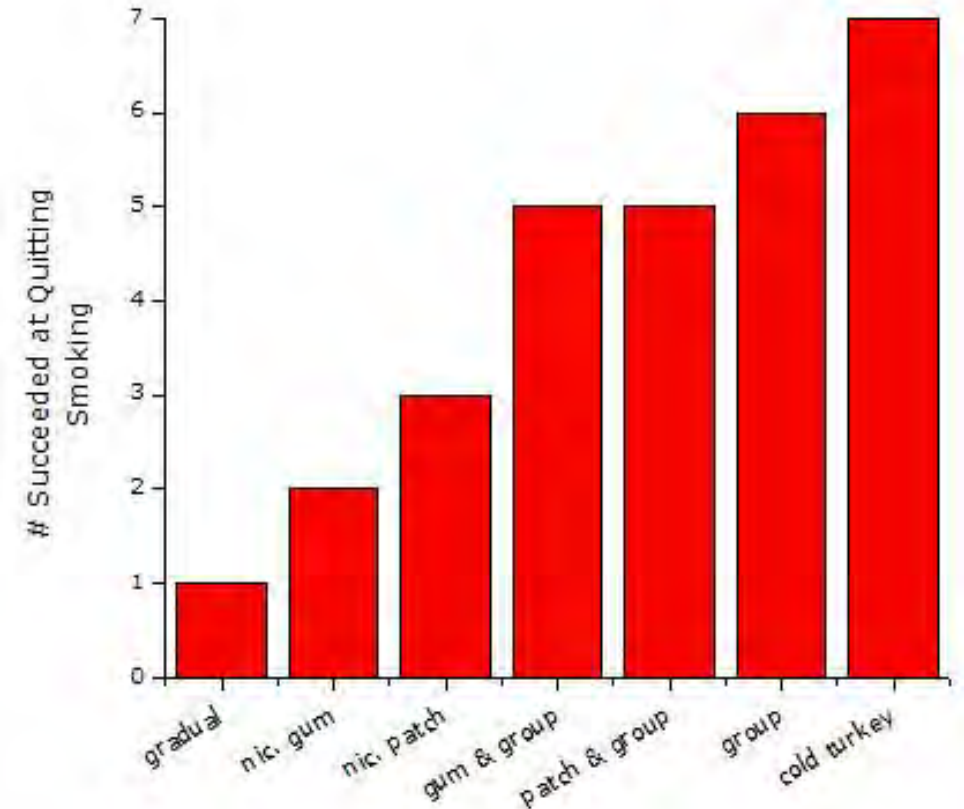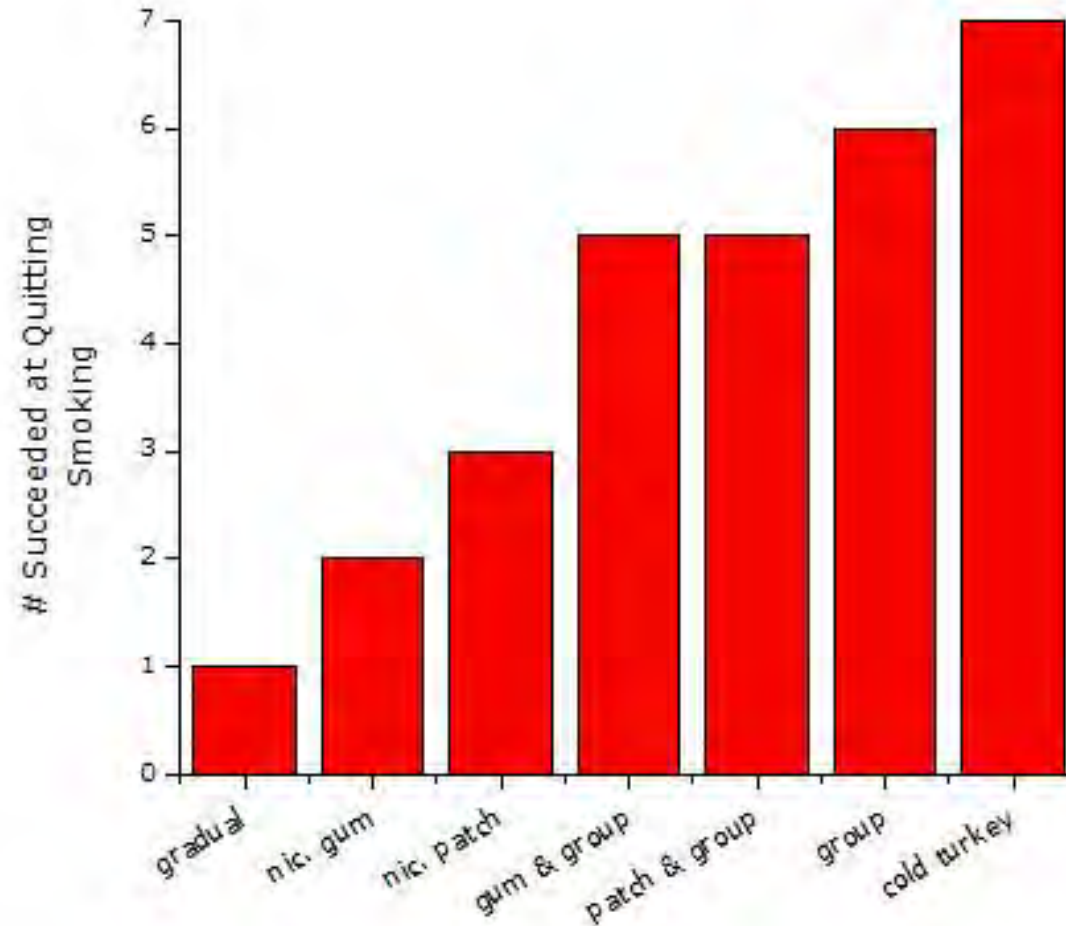
Measures of Central Tendency
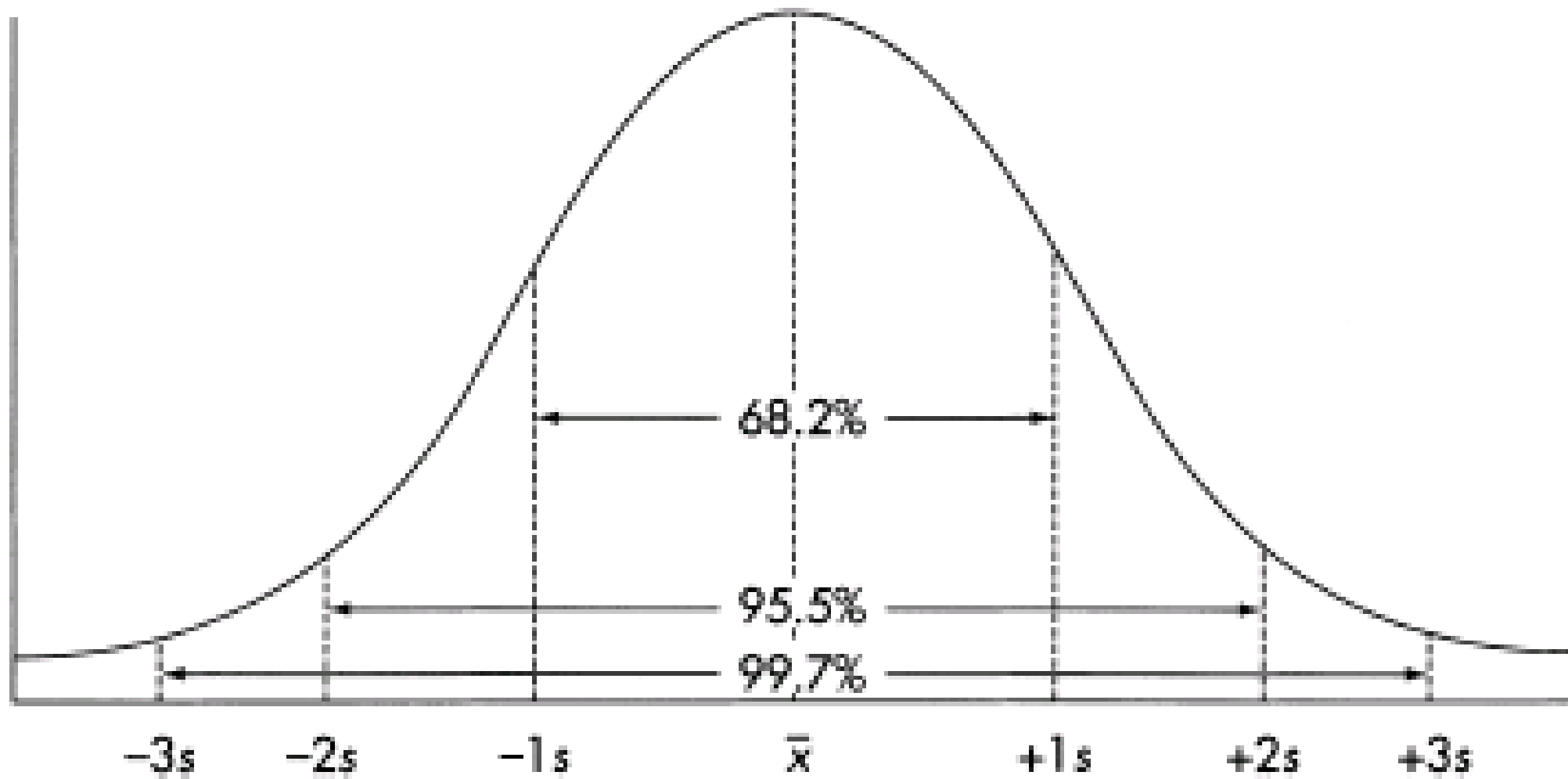
Measures of Central Tendency

- **Mode:** the most frequently occurring value in a data set.
  - Used for nominal data
  - "Nominal Data" = named category
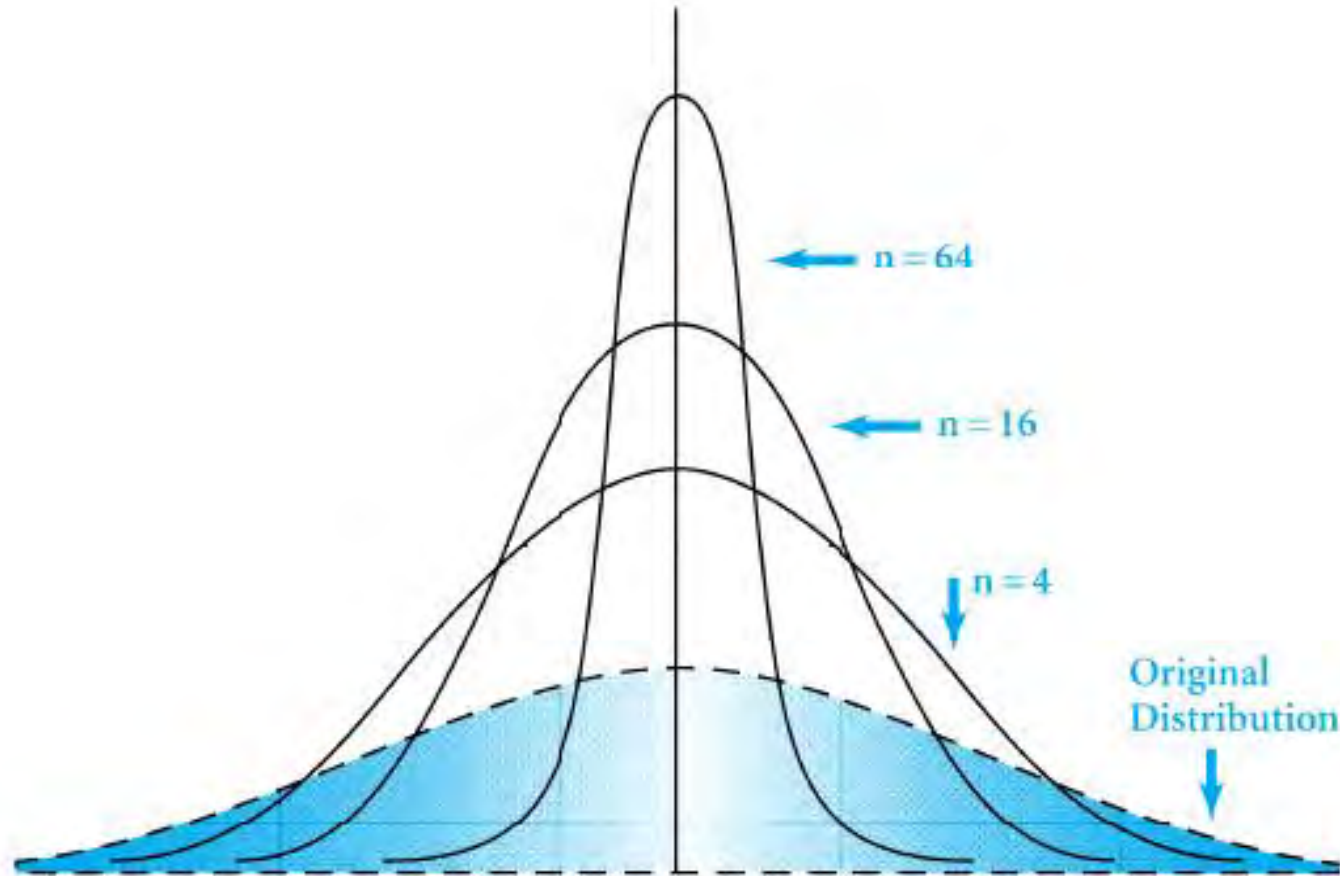   - Gender, Smoking Status

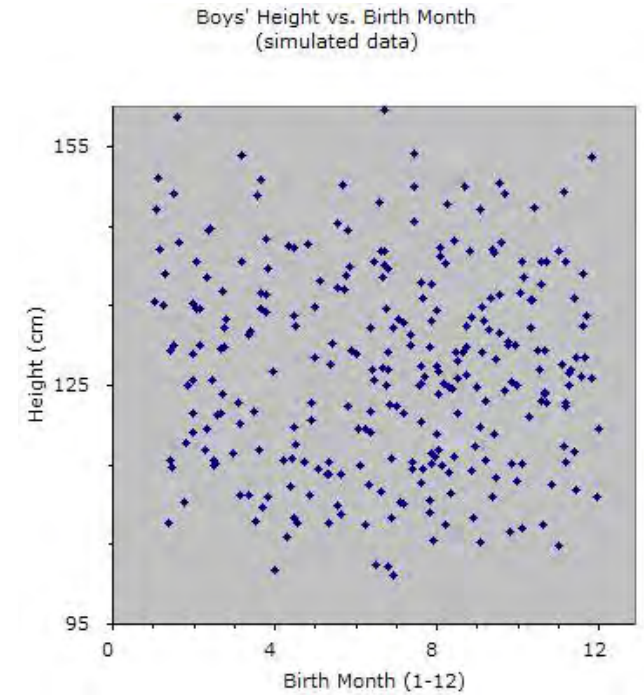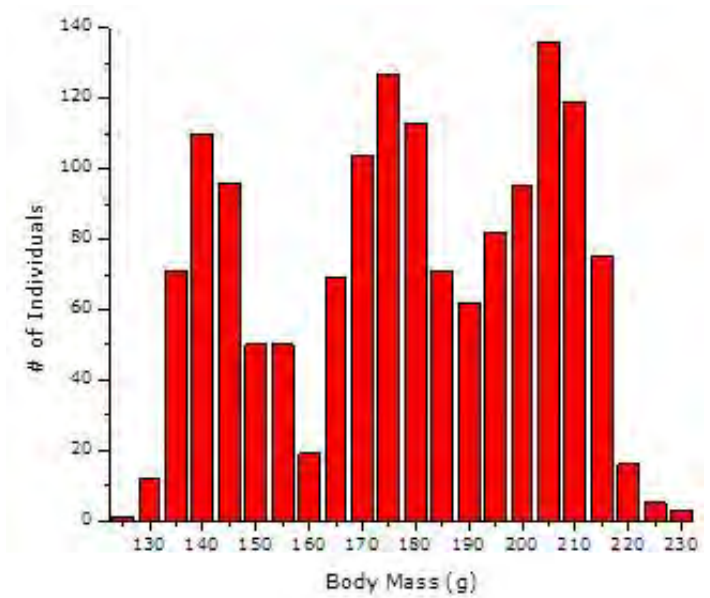# Measures of Central Tendency

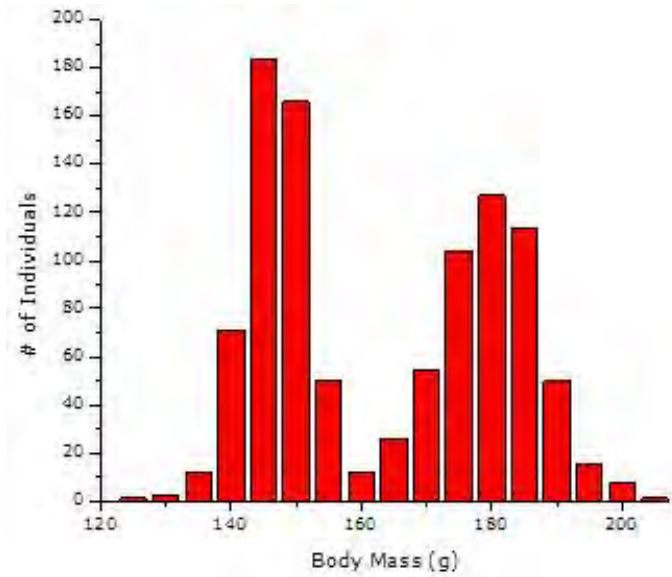# Normal Distribution

Find the Shape

Non-Normal Distributions

Presenting Difference Types of Data
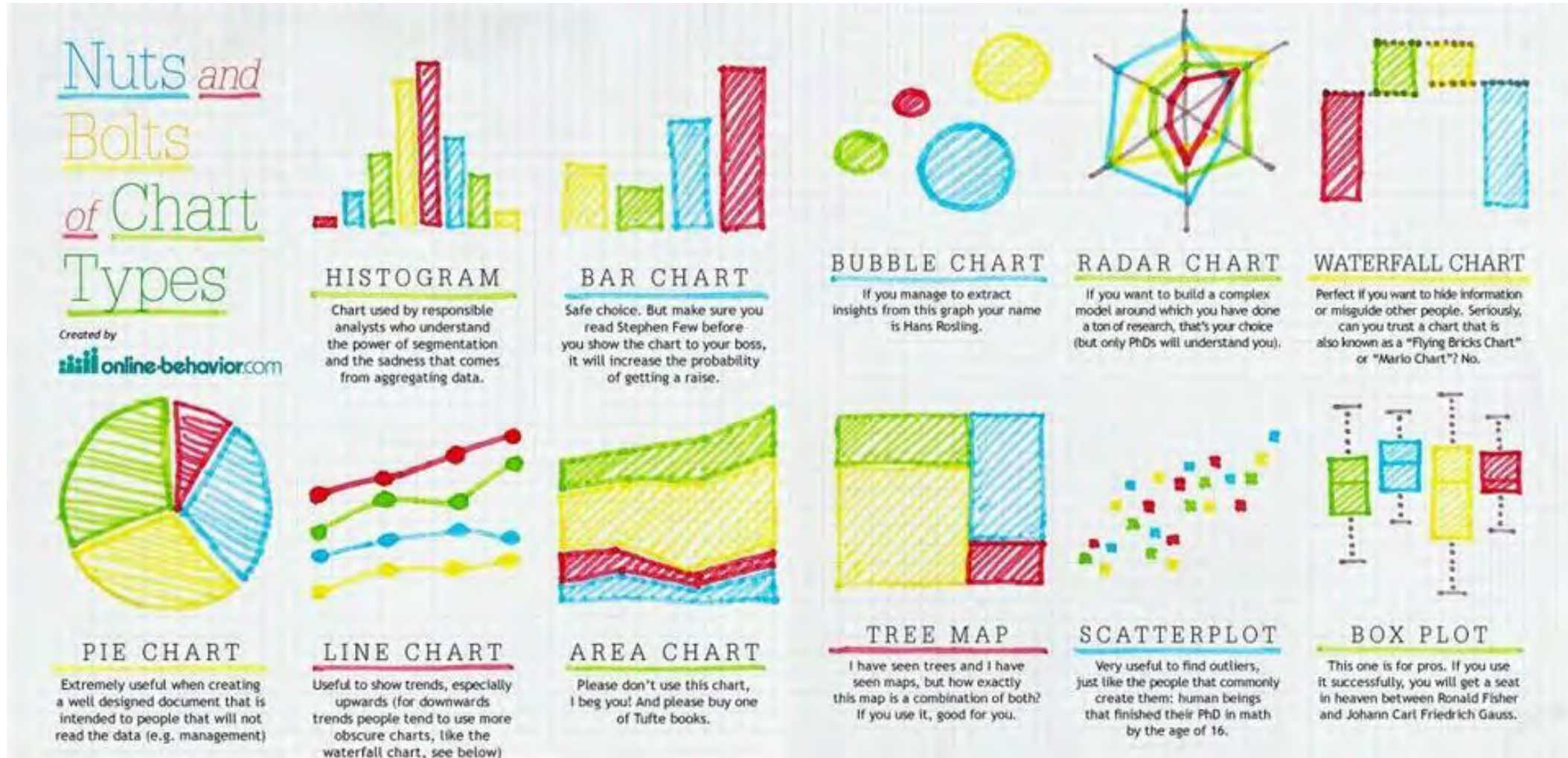
Column Charts and Bar Graphs
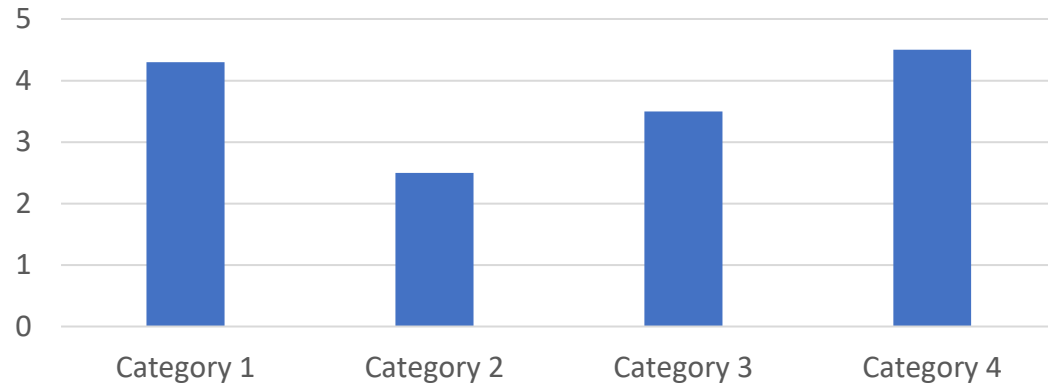
- Compare between items or groups
- Compare over time

Pie Chart

Data

1st Qtr   2nd Qtr   3rd Qtr   4th Qtr
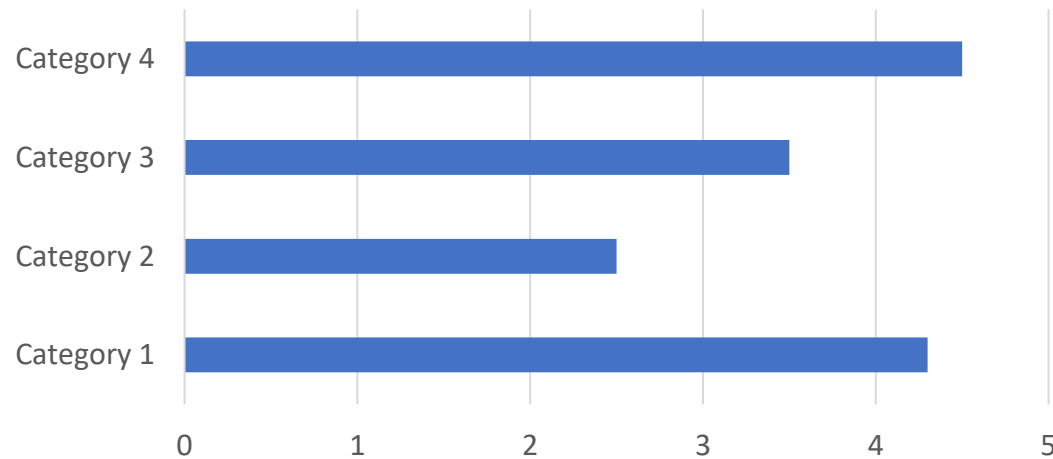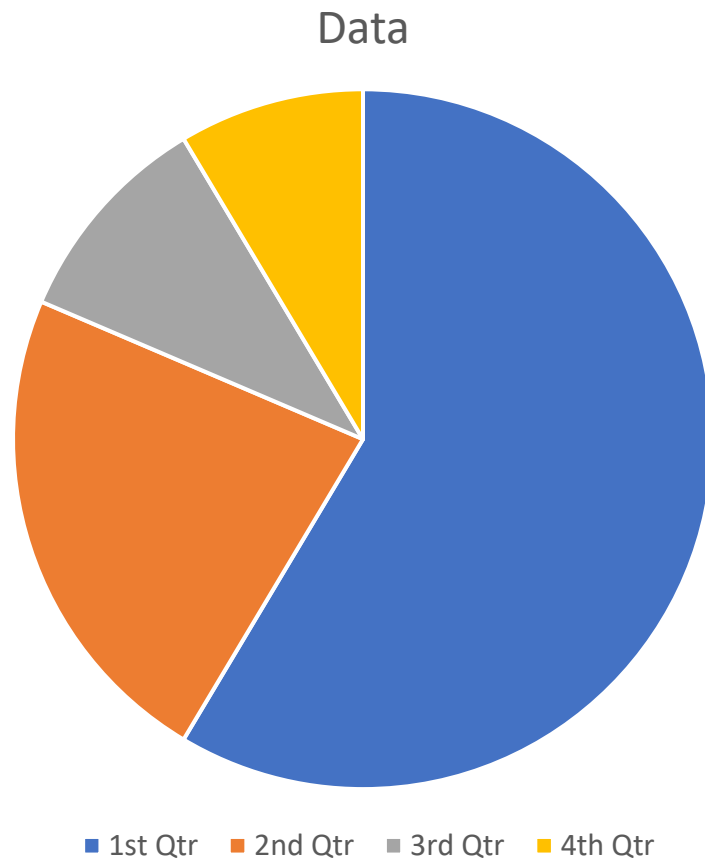
- Static number "snapshot"
- Proportions of a whole
- Percentages

Stacked Column Charts and Bar Graphs

- Composition
- Compare several items

Line Graph
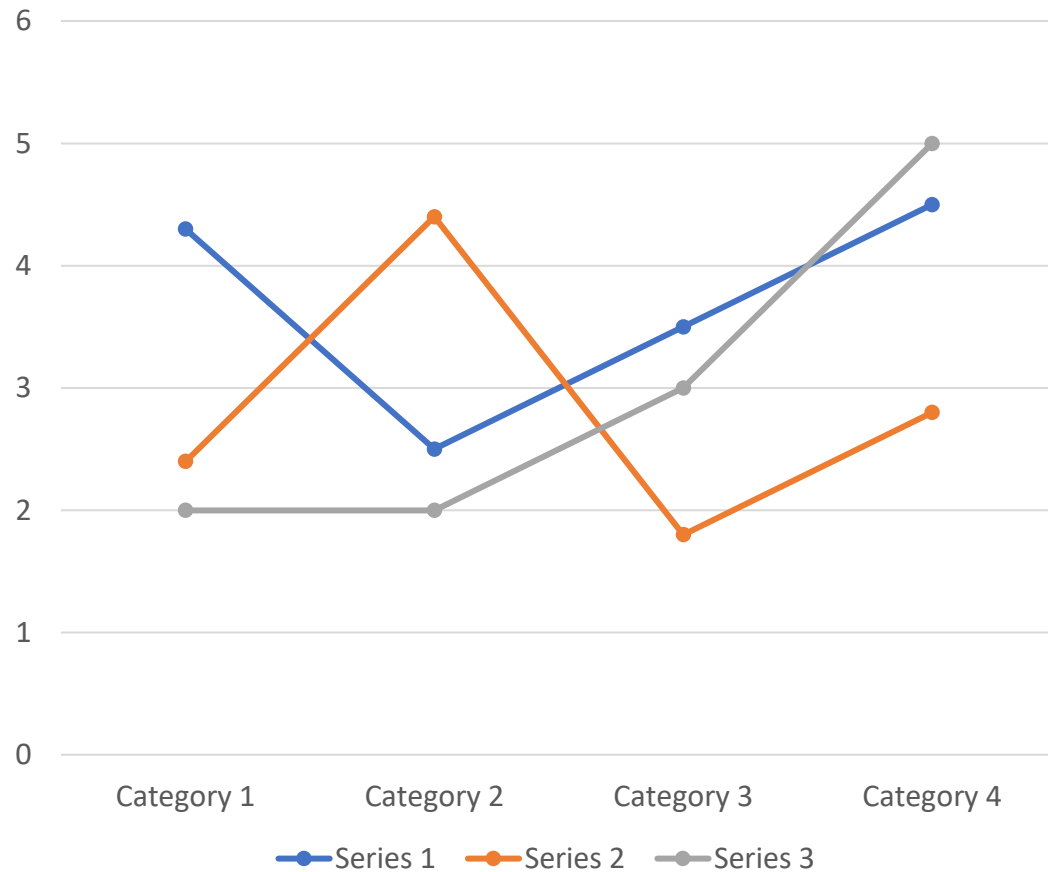
- Show change over time
- Can show several categories
- Useful for continuous data

Scatter Plots and Bubble Charts
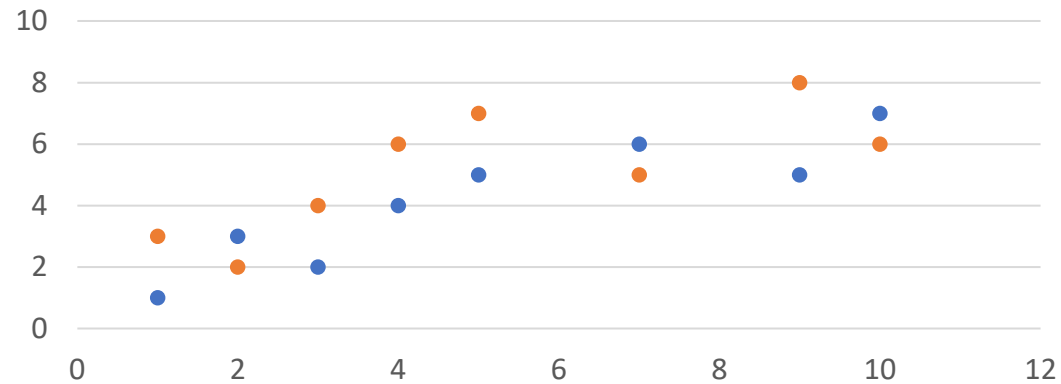
- Distribution
- Relationship between variables
- Visualize trends
- Summarize data with no clear pattern
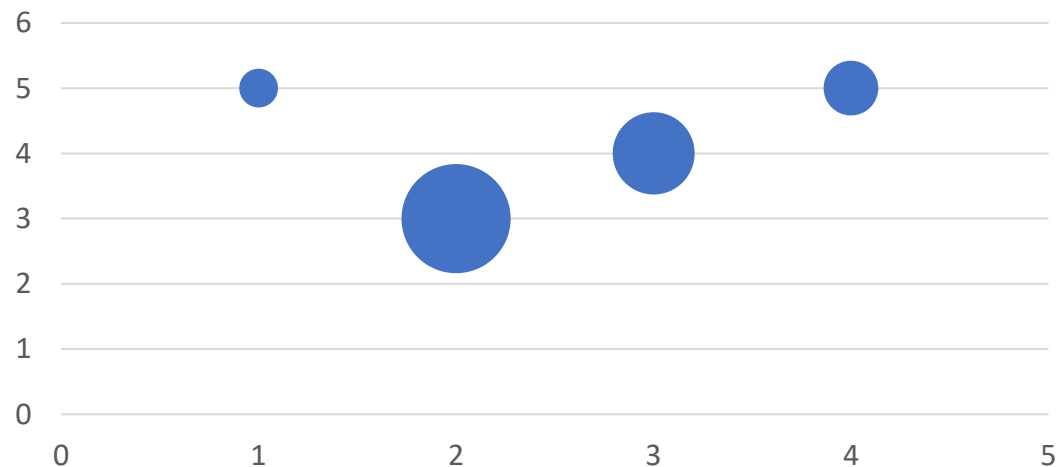
Data Display

Chart Title
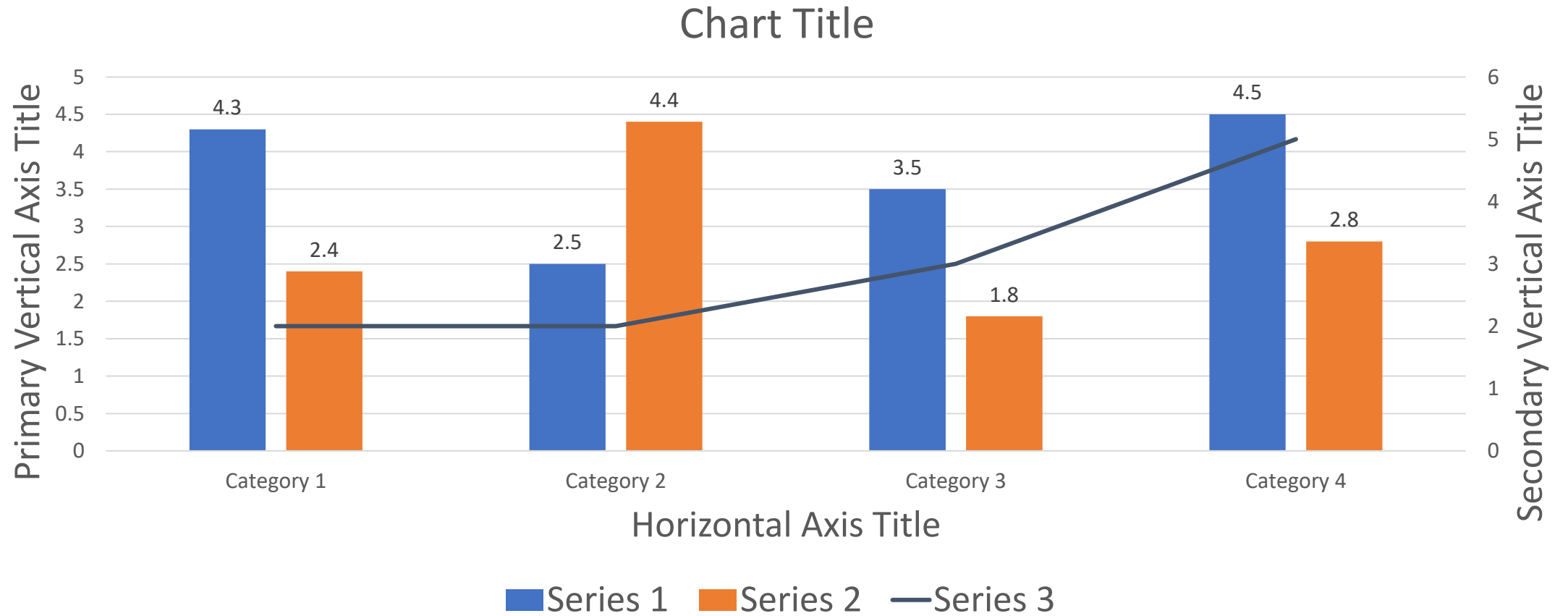
Chart Cheat Sheet

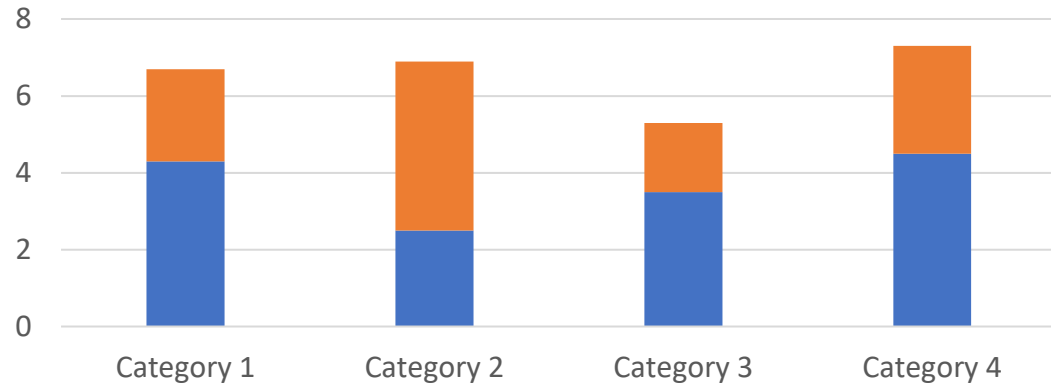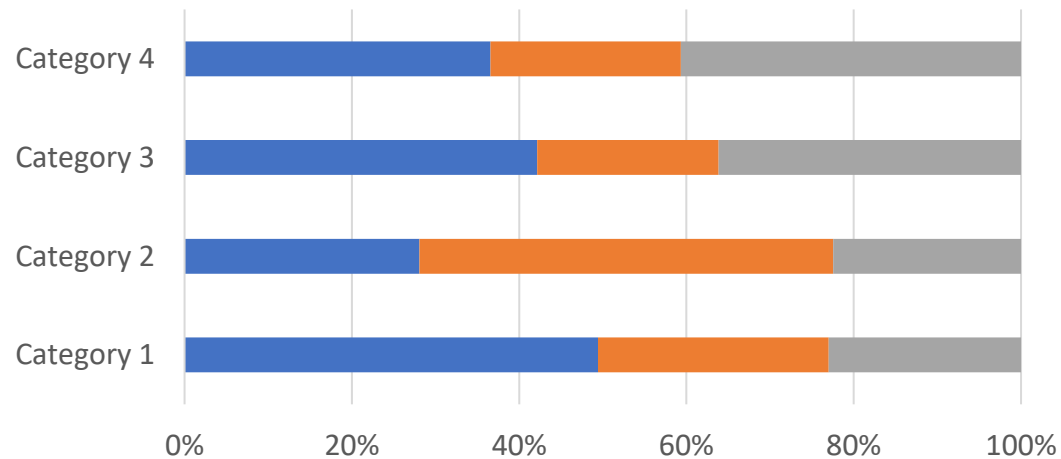| Compare Values	Show the Make-Up	Distribution	Trend	Relationship
How does my data compare? What are my high and low values?	How to individual parts combine to make up the whole?	What are the range of information, normal tendency, outliers?	How has this data changed over time?	How to the variables relate to each other?
Bar Chart Column Chart Pie Chart Scatter Plot Histogram	Pie Chart Stacked Column Stacked Bar Area Chart	Bar Chart Column Chart Line Chart Scatter Plot Histogram	Column Chart Line Chart	Scatter Plot Line Chart Bubble Chart

See the Patterns

Central Line Insertion Audits					
Patient	**HH**	**Maximum Barrier**	**CHG**	**Insertion Site Selection**	**Checklist Used**
A	Y	N	Y	Y	A Y
B	Y	Y	Y	N	B Y
C	Y	Y	Y	Y	C Y
D	N	N	Y	Y	D N
E	Y	Y	Y	Y	E Y
F	Y	Y	Y	Y	F Y
G	Y	Y	Y	N	G Y
H	Y	N	Y	Y	H Y
I	Y	Y	N	Y	I Y
J	Y	Y	Y	Y	J Y

See the Patterns

Central Line Insertion Audits					
Patient	**HH**	**Maximum Barrier**	**CHG**	**Insertion Site Selection**	**Checklist Used**
A	Y	N	Y	Y	A Y
B	Y	Y	Y	N	B Y
C	Y	Y	Y	Y	C Y
D	N	N	Y	Y	D Y
E	Y	Y	Y	Y	E N
F	Y	Y	Y	Y	F Y
G	Y	Y	Y	Y	G Y
H	Y	N	Y	Y	H Y
I	Y	Y	N	Y	I Y
J	Y	Y	Y	Y	J Y

See the Patterns

Central Line Insertion Audits					
Patient	**HH**	**Maximum Barrier**	**CHG**	**Insertion Site**	**Checklist Used**
A	Y	N	Y	Y	Y
B	Y	Y	Y	N	Y
C	Y	Y	Y	Y	Y
D	N	N	Y	Y	Y
E	Y	Y	Y	Y	N
F	Y	Y	Y	Y	Y
G	Y	Y	Y	Y	Y
H	Y	N	Y	Y	Y
I	Y	Y	N	Y	Y
J	Y	Y	Y	Y	Y
Unit Total	**90%**	**70%**	**90%**	**90%**	**90%**

See the Patterns

Central Line Insertion Audits						
Patient	HH	Maximum Barrier	CHG	Insertion Site	Checklist Used	Patient Received Full Bundle
A	Y	NO	Y	Y	Y	A	NO
B	Y	Y	Y	NO	Y	B	NO
C	Y	Y	Y	Y	Y	C	Y
D	NO	NO	Y	Y	Y	D	NO
E	Y	Y	Y	Y	NO	E	NO
F	Y	Y	Y	Y	Y	F	Y
G	Y	Y	Y	Y	Y	G	Y
H	Y	NO	Y	Y	Y	H	NO
I	Y	Y	NO	Y	Y	I	NO
J	Y	Y	Y	Y	Y	J	Y
Total	90%	70%	90%	90%	90%	40%

Make It Relevant

- Identify your audience

- What matters to them?

- How do you bring them data that recruits them in making changes?

Find The Story
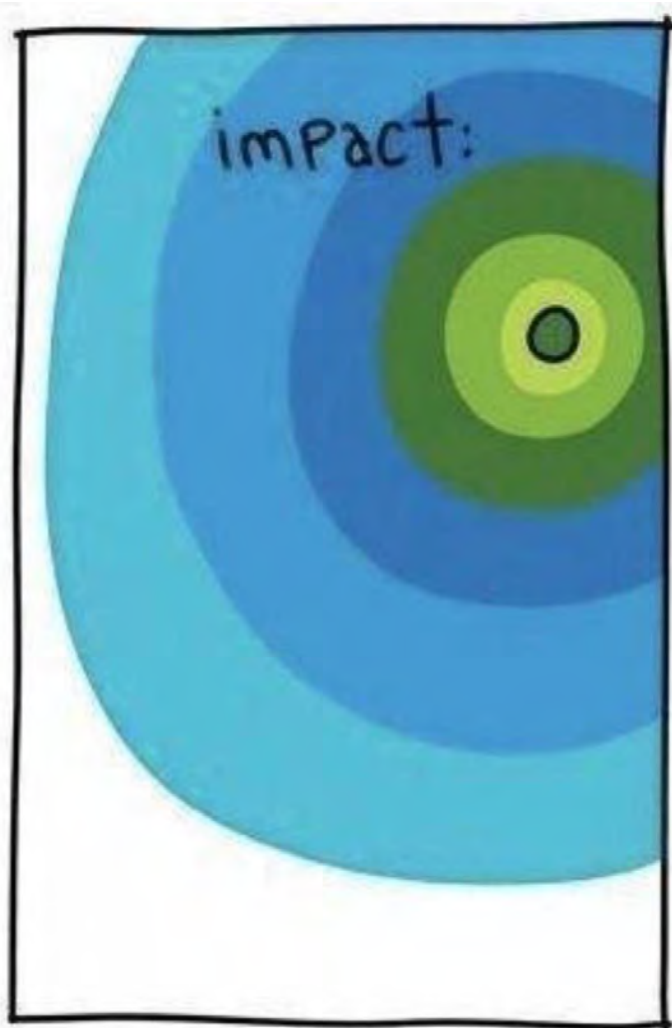
- Impact
  - Human
  - Financial
  - Operational
- Connect to Heart
- Make it Memorable

What Questions Can I Answer?

Contact Info

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