

CIC Study Group

Week 7



HAI Prevention Program

Agenda

- Review
 - Chapter 16 Quality Concepts
 - Chapter 19 Qualitative Research Study
 - Chapter 20 Research Study Design
- Next week's assignment

Chapter 16

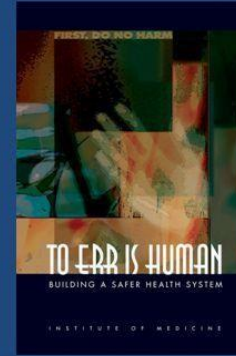
Quality Concepts

Key Concepts

- Healthcare quality and improvement uses interdisciplinary teams to deploy changes and improvements
- IPs have the responsibility of performing continuous quality improvement studies using systemic programs and tools and determine outcomes
- Tools for a quality toolbox:
 - Gap analysis
 - Root cause analysis (RCA)
 - Failure mode effect analysis (FMEA)
 - Control charts
 - Checklists
 - Guiding documents

Quality IPC Programs

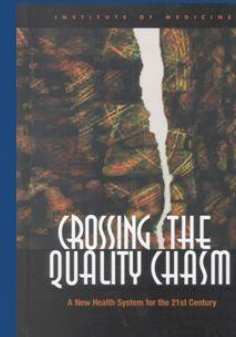
- 1996 Institute of Medicine (IOM) launched two phase concerted effort to improve the nations healthcare quality.
 - Phase 1: consisted of outlining serious nature of quality problem
 - Phase 2: consisted of how to transform the healthcare system and policy environment to close the gap between good quality and what exists in practice
- Released two 'monumental reports'
 - To Err is Human (1999)
 - Crossing the Quality Chasm (2001)



Institute of Medicine

To Err is Human (1999)

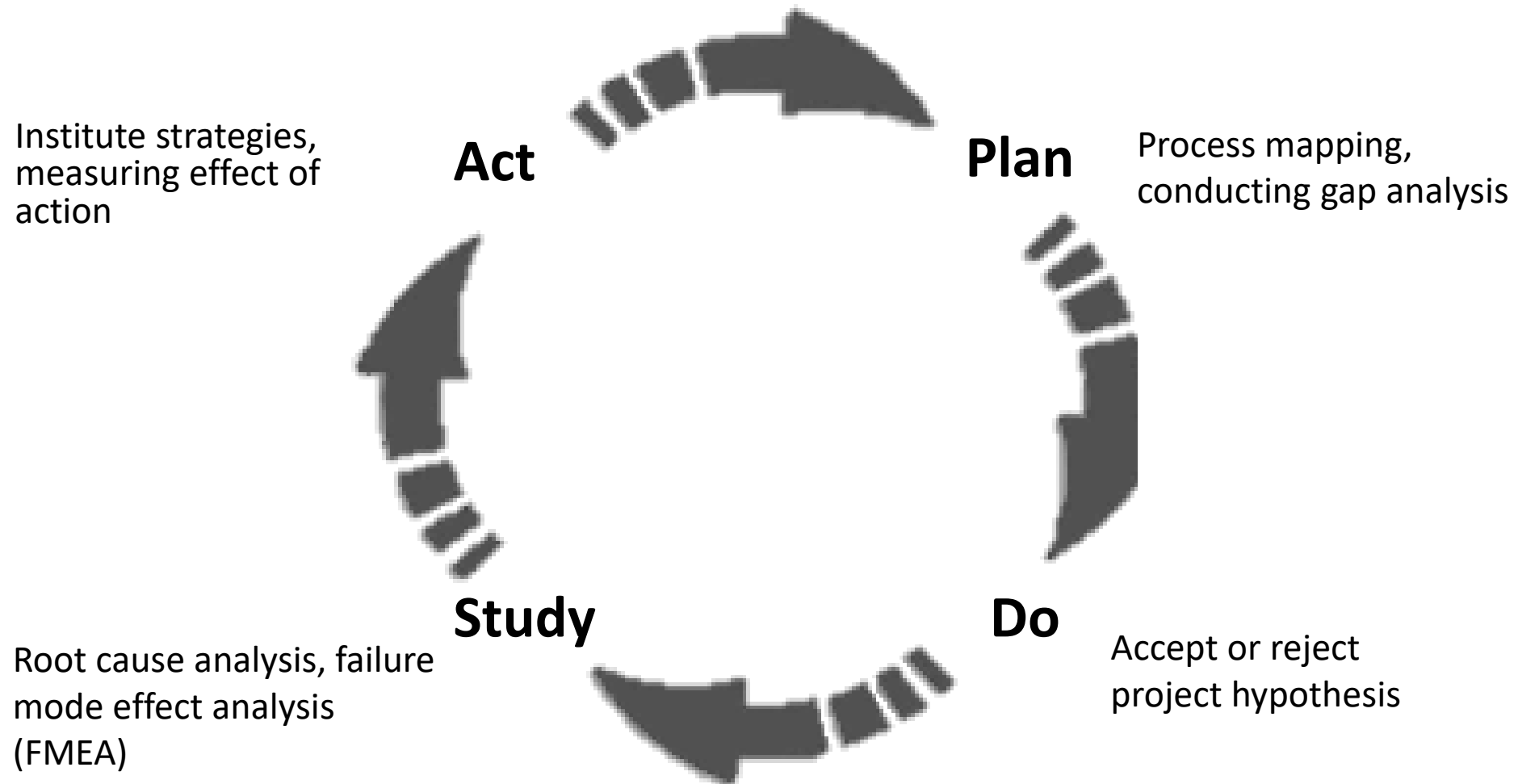
- Brought issue of patient safety and medical errors to for front
- 2% of all deaths are due to preventable medical errors



Crossing the Quality Chasm (2001)

- Urgently calls for changes to health care processes to improve quality of care
- Sets up framework for healthcare quality improvement
- Brings importance of patient and family centered healthcare to frontline

PDSA



Strategic Plan

- According to Joint Commission
 - Prioritize the identified risks for acquiring and transmitting infections
 - Set goals to limit
 - Unprotected exposure to pathogens
 - Transmission of infections associated with procedure
 - Transmission of infections associated with use of medical equipment, devices and supplies
 - Describe activities including surveillance
 - Describe process to evaluate efficacy of the plan

Performance Improvement Teams

Multidisciplinary teams are a valuable tool in deploying a quality-focused culture or process.

- A project team or committee is composed of subject matter experts who do the work.
- Senior leadership support is key!



Gap Analysis

Description: technique used to compare best practices with the current processes and determine the steps to take to move from a current state to a desired **future state**.



Root Cause Analysis

- **Description:** RCA takes a **retrospective look** at adverse outcomes and determines;
 - what happened,
 - why it happened
 - what an organization can do to prevent the situation from recurring.
- **Information collection:** through structured interviews, document reviews and field observations

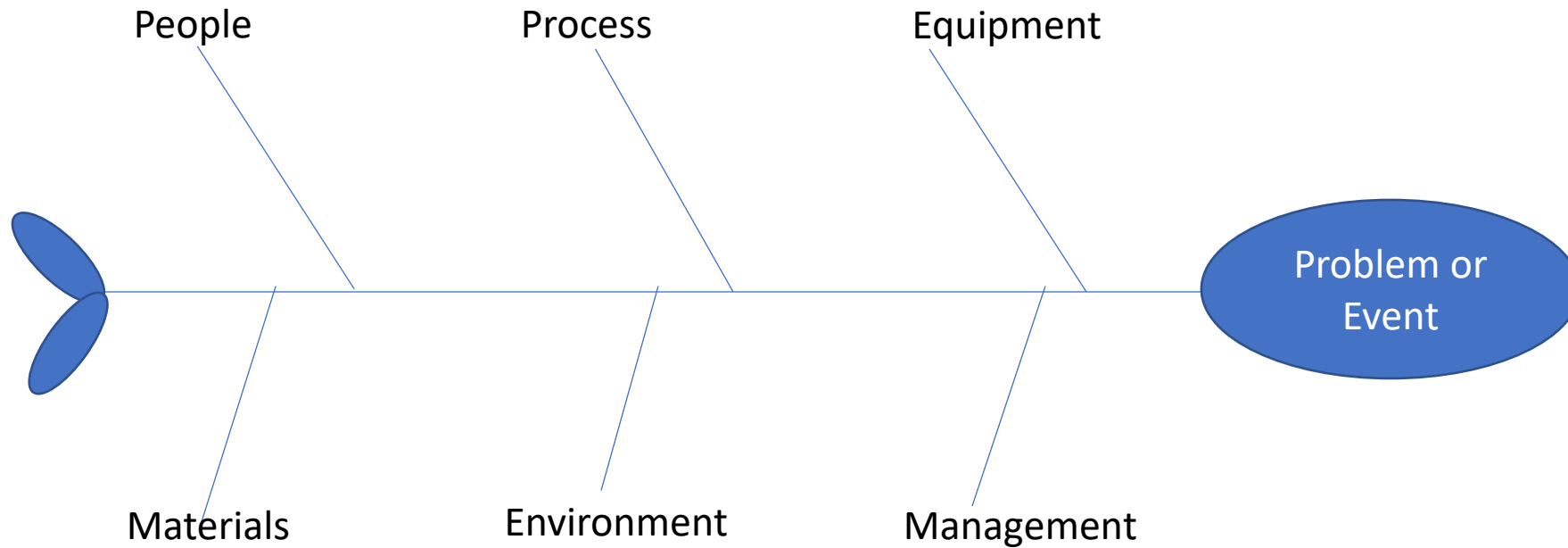
RCA Process

- Risk managers and patient safety experts use the RCA widely to investigate major incidents, sentinel events or errors in healthcare delivery.
- The RCA process avoids **individual blame**, considers human factors engineering, and analyzes redesign for a safer system.
 - Human and other factors
 - Process or system involved
 - Underlying causes and effects of the process
 - Risks and potential contributions to failure

What are some limitations of the RCA?

- The team must delve deep enough into the adverse cause of the problem to determine process change.
- The RCA may be expensive, time-consuming and labor intensive.
- Team members may require training on the techniques, goals, and outcomes before participating in the RCA.

Fishbone or Ishikawa Diagram



At the conclusion of the RCA, a team summarizes and identifies causes and begins to strategize about process redesign. The RCA serves as a formal structure to learn from past mistakes.

Root Causes 6 'Variations'

1) People

- Poor training
- No training
- People were trained but chose not to follow the procedure

2) Process

- No procedure or poor procedure
- Well written procedure but out of date

3) Equipment

4) Materials

5) Environment

6) Management that may affect the problem

Failure Mode Effect Analysis (FMEA)

- Proactive approach to identify failures and opportunities of error.
- FMEA began in the manufacturing industry.
- Veterans Affairs National Center for Patient Safety created.
 - Healthcare Failure Mode Effect Analysis (HFMEA)
- Joint Commission standards mandate healthcare organizations conduct this process every 18 months.
- Help reduce risk of adverse patient events and develop systematic method to perform process improvement.

Strengths, Weaknesses, Opportunities, Threats Analysis (SWOT)

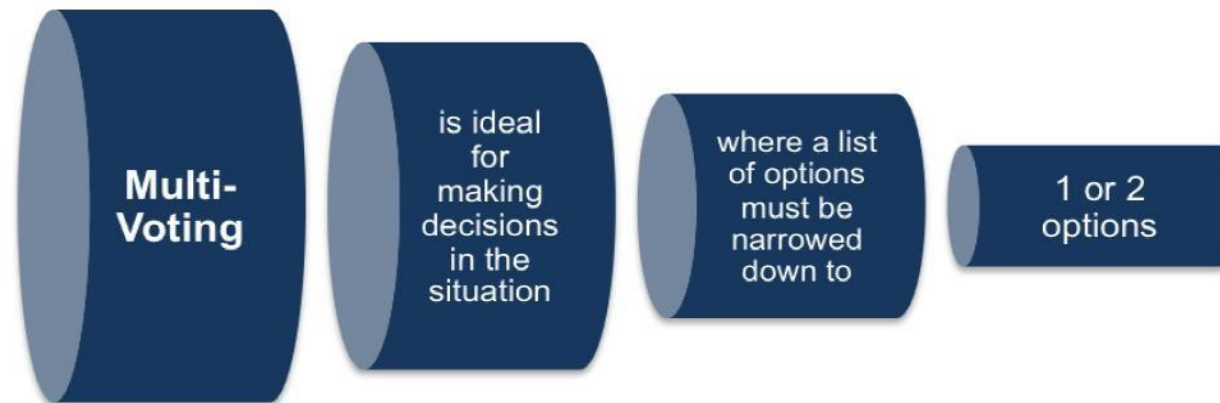
- Utilized to investigate public health issues and improve healthcare outcomes
- Conducting this type of analysis points out what the organization should plan for, and how to use resources and guide efforts within a formal framework



(Source The Balance How to Conduct a SWOT Analysis <https://www.thebalancesmb.com/swot-analysis-for-small-business-2951706>)

Multivoting

- The process of prioritizing a large list of topics to a final selection for performance improvement.
- Team members vote, rank their selection in order of priority and after votes are tallied, they decide on which project they will work on.
- Multivoting can occur multiple times to narrow the possibilities even further.



Goal-directed Checklist

- Applying checklists within the infection prevention process organizations can eliminate hazards and problems that affect the patients every day.
- Examples:
 - Hand washing
 - Cleaning skin with antiseptic

SURGICAL SITE INFECTION PREVENTION CHECKLIST

This checklist includes space for a patient label, the name of the person completing the checklist and the date. A number of SSI Bundle questions are include with space to indicate a "yes" or "no" answer and comments.

Patient Label

Name: _____

Date: _____

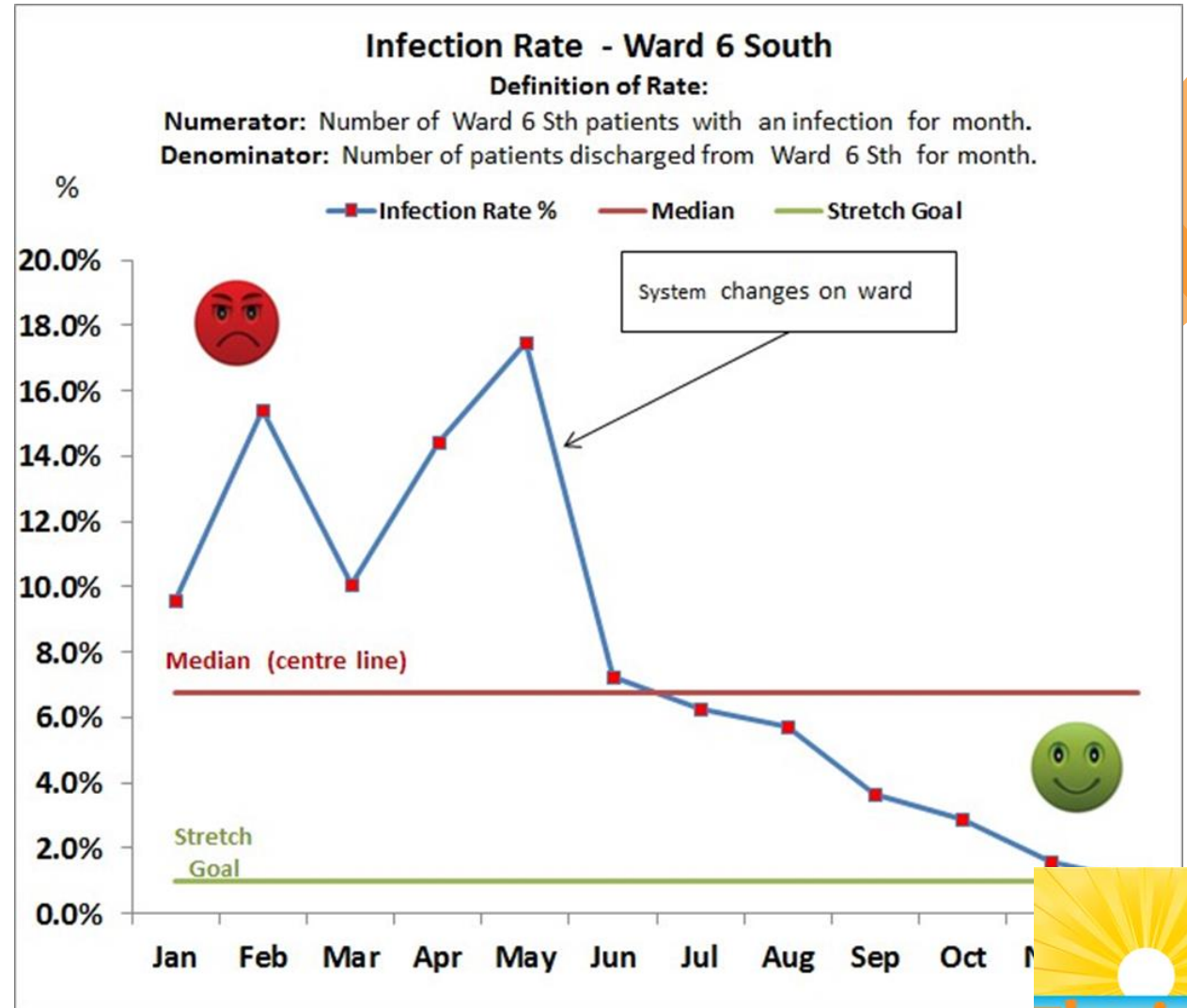
SSI Bundle	Y	N	Comments
Antimicrobial prophylaxis performed? Time antibiotic administered _____ _____ minutes before incision Time readministered _____ Appropriate dosage for patient weight? _____			
Surgical hand scrub performed?			
Appropriate PPE worn? Scrub gown, scrub suit, cap, sterile gloves, eye protection, surgical mask			
Patient covered with a drape?			
Drape separates surgical instruments, equipment and supplies?			
Proper ventilation maintained throughout surgery? Positive pressure maintained Minimum of 15 air exchanges per hour (3 of which must be fresh air) Filtering air through two filters that provide 90% efficiency Air introduced near the ceiling and exits near floor			
Surfaces and environment cleaned prior to surgery?			
Surgical instruments properly sterilized? Flash sterilization not used or used as little as possible?			
Foot traffic kept to a minimum?			
Patient skin cleaned prior to surgery?			
Hair removed with depilatory or clippers?			
Blood glucose levels monitored and maintained (<200 mg/dL)?			
Postoperative wound care performed? Maintain sterile dressing on wound 24-48 hours after surgery Change dressings every 2-4 hours until wound no longer drains or is clearer Change dressings 1-2 times a day after this			

Process Control, Charts, Graphs, and Clinical Practice Guidelines

- Statistical Process Control (SPC)
 - Assumes limits of randomization in any task or process can be measured and graphically illustrated.
- Variation
 - Difference in process steps and outputs.
 - Two types
 - Special Cause
 - Not part of the system (or process) all the time nor does it affect everyone.
 - Common Cause
 - AKA random variation or second order change or noise, is inherently part of the system (or process) over time and affects everyone and all outcomes.

Run Charts

- Epidemiological tools used to identify process change over time.
- Allow for the mean or average to be determined and show changes in the mean/average.
- Demonstrate special cause variation when there is a steady pattern of observations points falling above or below the mean/average line in an equal pattern.



(Image: Simple Annotated Run chart of an infection rate over time (attribute data)

Web source: <https://www.cec.health.nsw.gov.au/CEC-Academy/quality-improvement-tools/run-charts>)

Affinity Diagrams

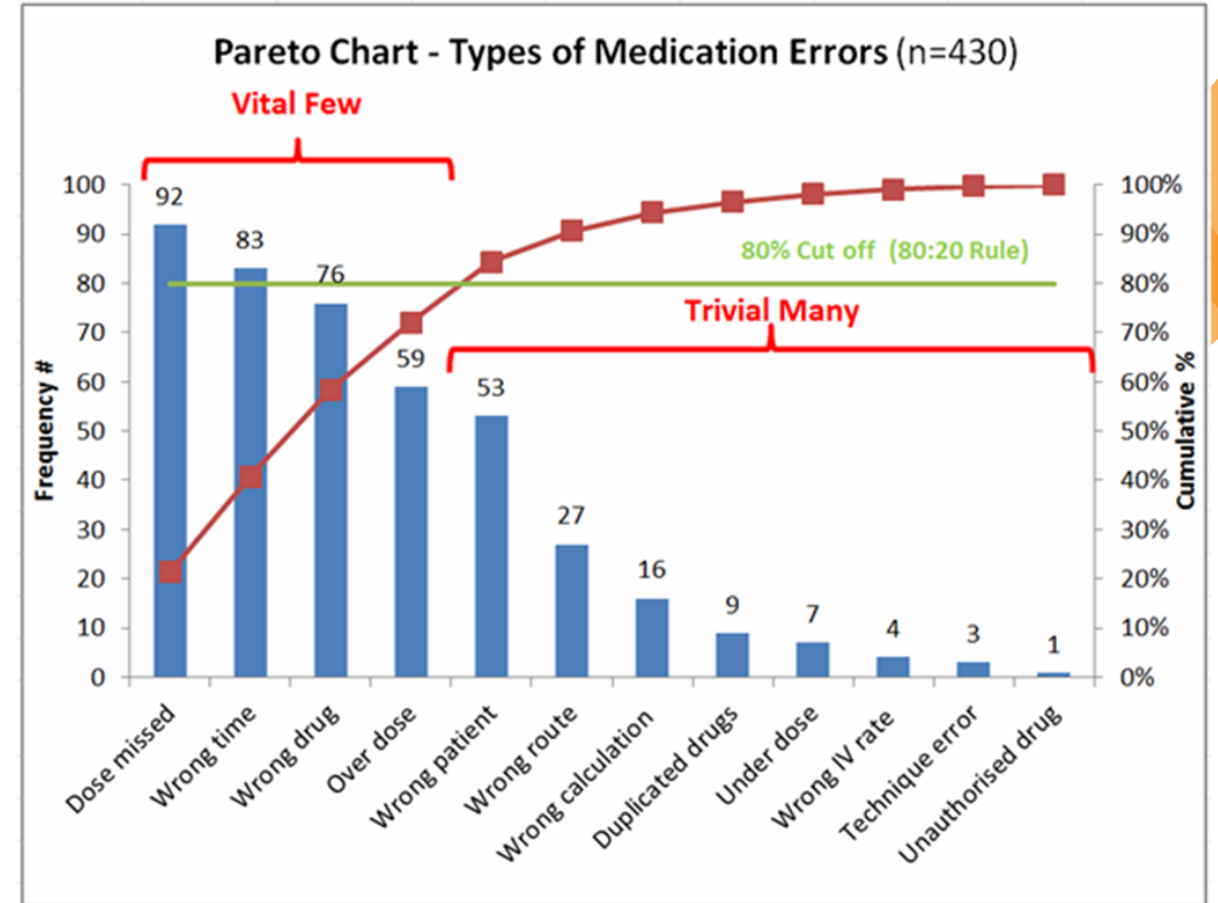
- Gather large amounts of language data and creatively group the data based on lines of natural relationships.
- Data is typically collected from brainstorming or customer surveys.
- May suggest cause and effect relationships giving something for the team to focus on.



(Image: Example of affinity diagram from a brainstorm session. Web source <https://draft.io/example/affinity-diagram>)

Pareto Charts

- Series of vertical bars arranged and sorted in descending order with a cumulative percent line on the y-axis.
- QAPI tool to categorize data and compare units of data against the whole.
- Identify where efforts will produce the greatest value.



(Image: Pareto Chart from Web Source
<https://www.leansixsigmadefinition.com/glossary/pareto-chart/>)

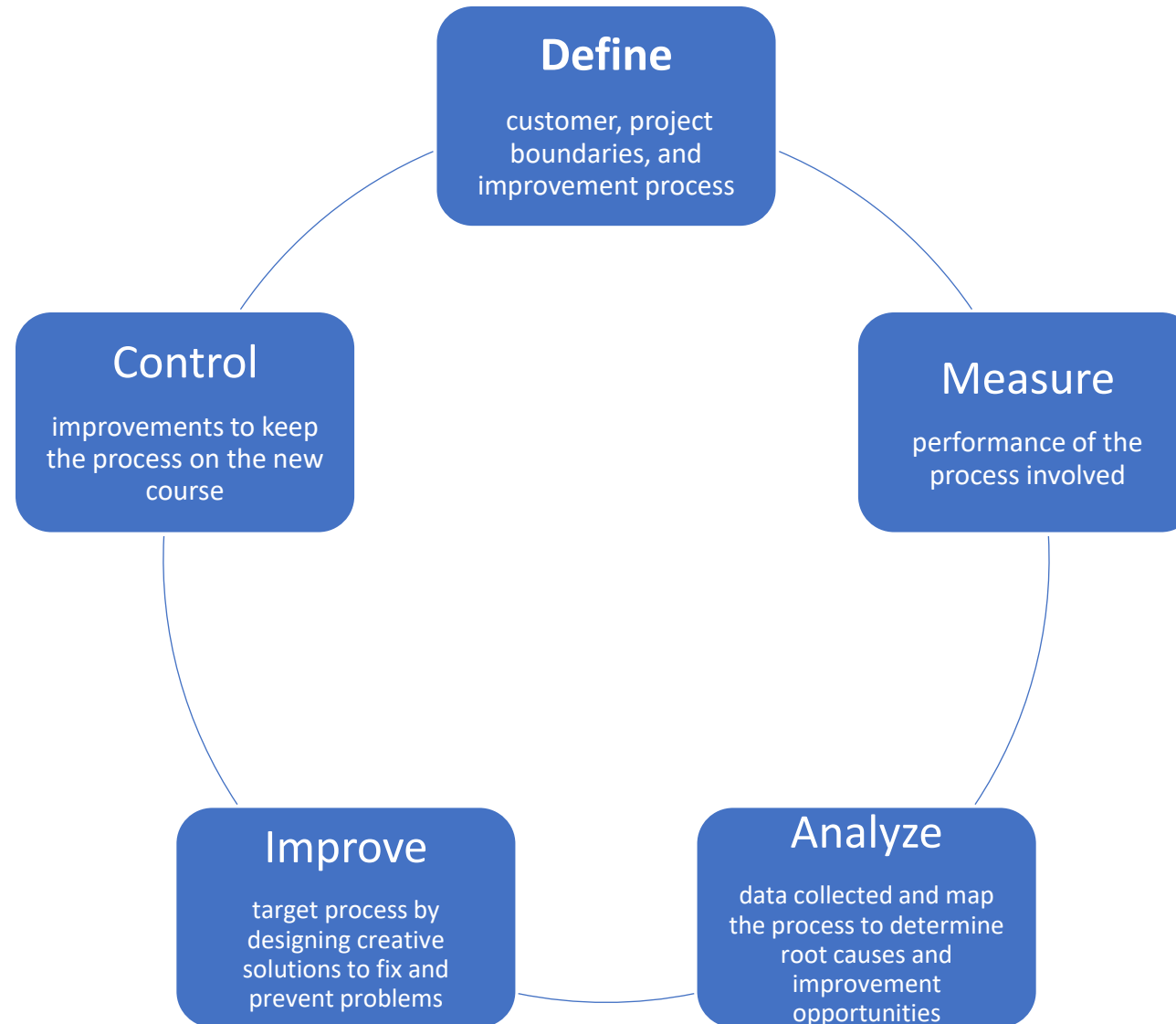
Six Sigma and the Lean Approach

- Concentrates on precision and accuracy.
- Strategies utilized
 - Value stream mapping
 - Transitional mapping
 - Just in time training
- Both processes use the DMAIC format.



(Image: What is the lean six sigma. Web source
<https://leansixsigmabelgium.com/blog/what-is-lean-six-sigma/>)

DMAIC



Concept Check

Which of the following refers to patient harm that is the result of treatment by the healthcare system rather than from the health condition of the patient?

- ☒ A. Adverse event
- ☐ B. Dire consequence
- ☐ C. Unanticipated event
- ☐ D. Sentinel event

Concept Check

The Director of Infection Prevention and Control is leading a process improvement project to decrease the rates of CLABSIs in one of the hospital's ICUs. The multidisciplinary team has discussed multiple process improvement strategies to decrease these blood stream infections. In developing the final improvement plan which of the choices below is most likely to help decrease the rates of these infections?

- A. Performing a gap analysis each month
- B. Performing a failure mode effect analysis immediately
- ☒ C. Incorporating the use of a CLABSI bundle and a checklist to ensure that all aspects of the plan are followed
- D. Perform a SWOT analysis

Concept Check

After reviewing the quarterly report, the manager of the adult ICU contacts the IP for assistance to create a plan to reduce central line infections. Which of the following should the IP recommend:

- A. Wait for next report to see if the rate has decreased
- B. Create an Intravascular Team
- ☒ C. Develop a multidisciplinary team to review and implement best practices
- D. Send a referral to Medical Affairs for peer review

Chapter 19

Qualitative Research Study

Concept Check -Pop Quiz!

Narrative

Phenomenology

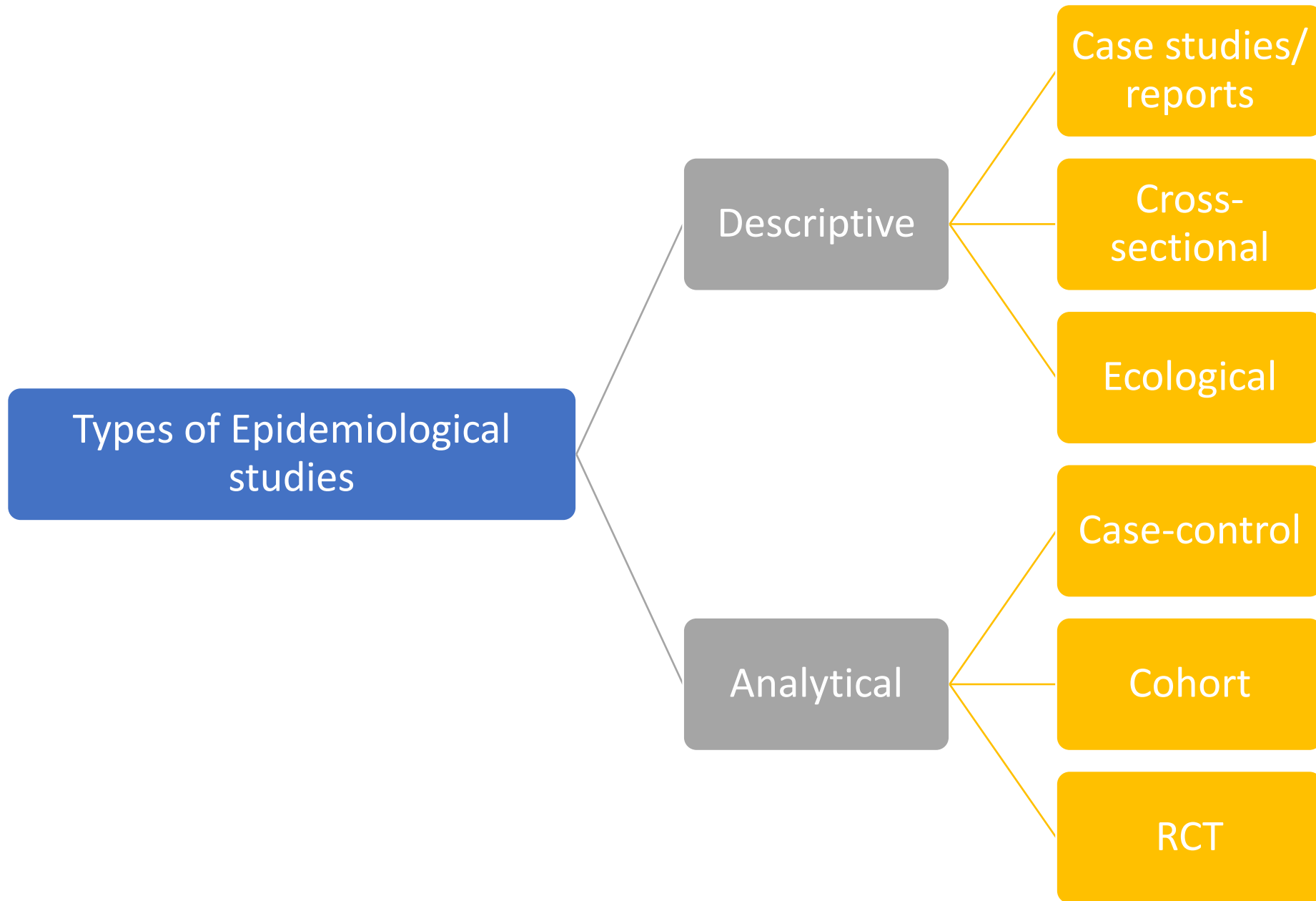
Grounded Theory

Ethnography

- A. Generate new theories, explanations or concepts about a process or series of actions
- B. Complex account of an individual's experience in context of social or cultural environment
- C. Goal to understand live of individuals and human behavior linked specifically to cultural experiences
- D. Strives to remove individuality and discover the essence of the event

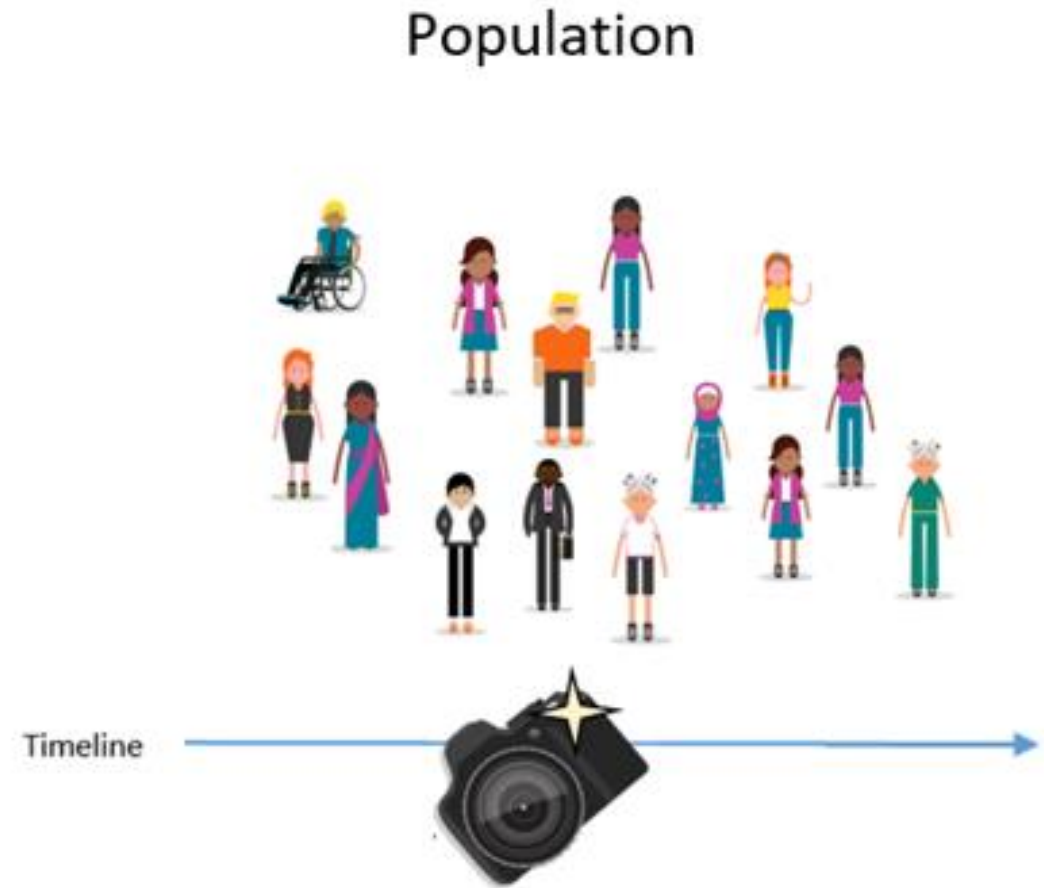
Chapter 20

Research Study Designs



Cross sectional studies

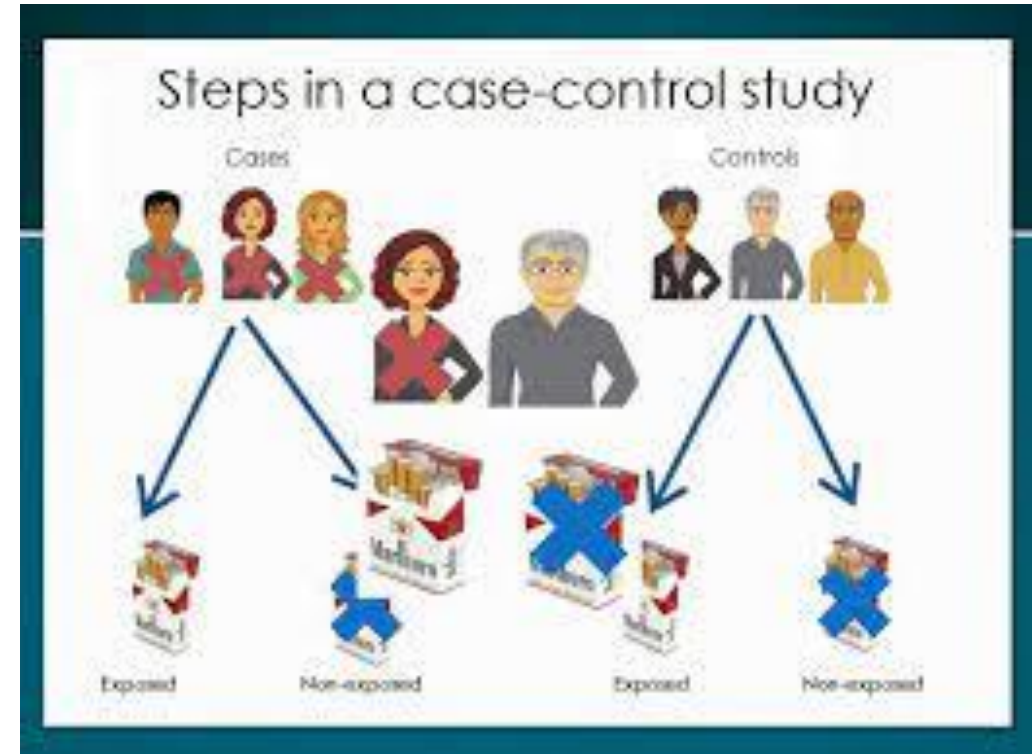
- Common observational study design.
- Provide a “**snapshot**” of a population.
- Assessment of disease and risk factors are performed at a point in time without follow-up.
- Use prevalent cases rather than incident cases.
- Generally used for hypothesis generation.



(Image: Cross-sectional design. Web source
<https://deakin.libguides.com/quantitative-study-designs/cross-sectional>)

Case-Control Studies

- Begin with the identification of individuals who **have the outcome** of interest.
- Select a control group without the outcome for comparison.
- After case-control status defined, **exposures are assessed and evaluated.**
- More timely and less expensive than prospective cohort studies.
- Good for studying **rare** outcomes or outcomes that develop over a long time.



(Image: Overview Case Control Studies Part 1 Handout. Web source http://eta.health.usf.edu/publichealth/PHC6000/Revamp/Module%204/4.1_Case-control-studies-I_handout.pdf)

Case-Control Example

- In September 1993, an outbreak of *Salmonella enteritidis* phage 4 (SE) occurred at a Chinese restaurant in El Paso Texas.
- Case-control study was conducted to investigate the cause.
- Cases were people with diarrhea or culture-confirmed SE who ate at the restaurant between August 27-Sept 15.
- Controls were meal companions of the cases without undue effects during the outbreak.
- The table shows the foods reportedly consumed from the restaurant.

Food Item	Cases n=19	Controls n=17
Breaded chicken	14	11
Any chicken	16	16
Egg rolls	14	3
Fried rice	14	9

Boyce et al. (1996) Epidemiol Infect

Example continued

- Which food item do you suspect is the source of SE?

Food Item	Cases n=19	Controls n=17	Odds Ratio Case vs Control	P-value
Breaded chicken	14	11	1.53	0.82
Any chicken	16	16	0.33	0.68
Egg rolls	14	3	13.07	0.003
Fried rice	14	9	2.49	0.34

Boyce et al. (1996) Epidemiol Infect

Cohort studies

- Groups are defined regarding their exposure to a factor of interest.
- Presence or absence of risk factor is determined **before** outcome occurs.
 - Goal: to assess whether the incidence of an event is related to a suspected exposure.
- The term “cohort” describes any designated group of persons who are followed or traced over a period of time.
- Prospective cohort study considered the “gold standard” because events can be recorded as they occur.
- Cohort data reflect the cause-effect temporal sequence of events.

EXAMPLES

Cohort

- Rare exposure
- Follow over time and record exposure
- Beginning group is disease free
- MOA
 - Relative Risk, incidence rates, attributable risk

Case-control

- Rare disease
- Compare disease + to disease –
- Collect exposure data retrospectively
- MOA
 - Odds ratio

Criteria	Cohort	Case-Control	Cross-sectional
Cost and Time	High	Low	Low
Number of subjects required	Large	Small	Large
Suitable for rare exposures	Good	Poor	Poor
Suitable for rare outcomes	Poor	Good	Poor
Recall Bias	Not likely	Very likely	Not likely
Completeness of information	High	Low	Full, but only cross-sectional
Loss to follow-up	More	Less	None
Changes in the characteristics of the subjects	More likely	Less likely	None
Assessment of temporal relationship	Good	Difficult	Not possible

Concept Check

1081 community dwelling Japanese individuals, aged 60 and older, without dementia, had data available from a food frequency questionnaire in 1990 to identify dietary intake of potassium and calcium. After 17 years, 305 participants were identified from medical records as having dementia. The investigators reported findings that higher self-reported dietary intakes of potassium and calcium reduced the risk for dementia.

1. Frame the research question that likely supported this study.

Does dietary intake in Japanese people 60 years and older affect their risk of developing dementia later in life?

2. What research design was used to conduct this research?

Retrospective Cohort Study

Question adapted from "Self-reported dietary intake of potassium, calcium, and magnesium a risk of dementia in the Japanese: Hisayama Study. Available at <https://pubmed.ncbi.nlm.nih.gov/22860881/>

Concept Check

Surveys were mailed to every 20th person listed in local telephone directory. Each person was asked to report age, sex, drinking habits and breast cancer presence during the preceding week. Nearly 40% of the surveys were completed and returned. About 10% of women reported the presence of breast cancer overall. Fifteen percent of heavy drinkers reported breast cancer and 8 percent of teetotalers reported breast cancer.

1. What research design was likely used to conduct this study?

Cross-Sectional Study Design

Group Member Spotlight

Week 8 Assignments

Action Items

- Assigned chapter readings:
 - Chapter 5- Infection Prevention and Behavioral Interventions
 - Chapter 122- Infectious Disease Disasters: Bioterrorism, Emerging Infections, and Pandemics
 - Chapter 36 -Pneumonia