

Quality Improvement Lecture #2: Overview of Quality Improvement Models

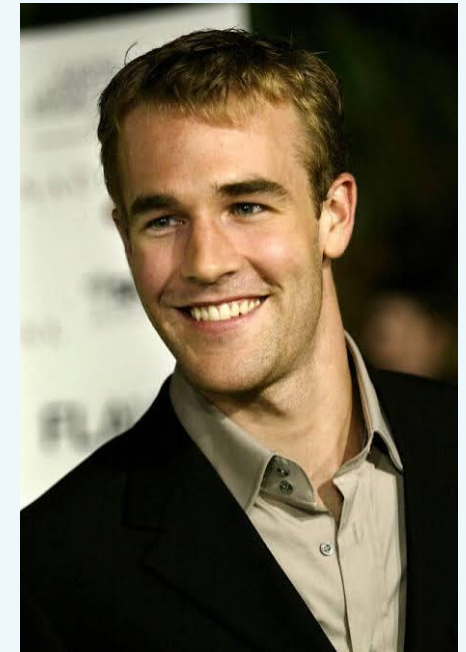
Mary Reich Cooper MD JD

Associate Professor, Jefferson College of Population Health
Thomas Jefferson University



Randy Gonzalez
TikTok
35 yo

Chadwick
Boseman in Black
Panther
43 yo



James van der
Beek
Dawson's Creek
48 yo

What is going on?

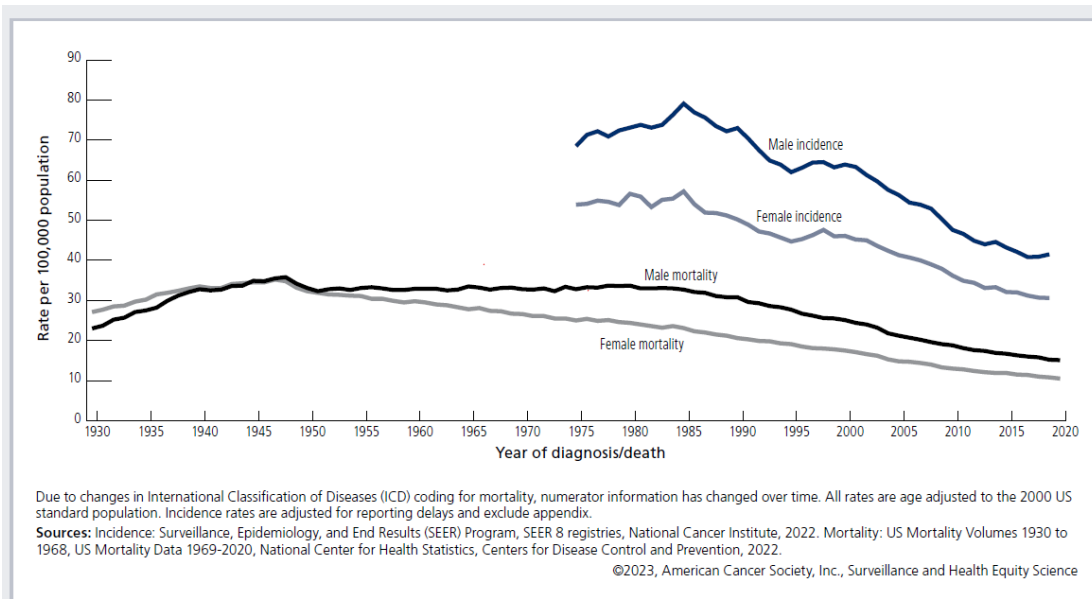
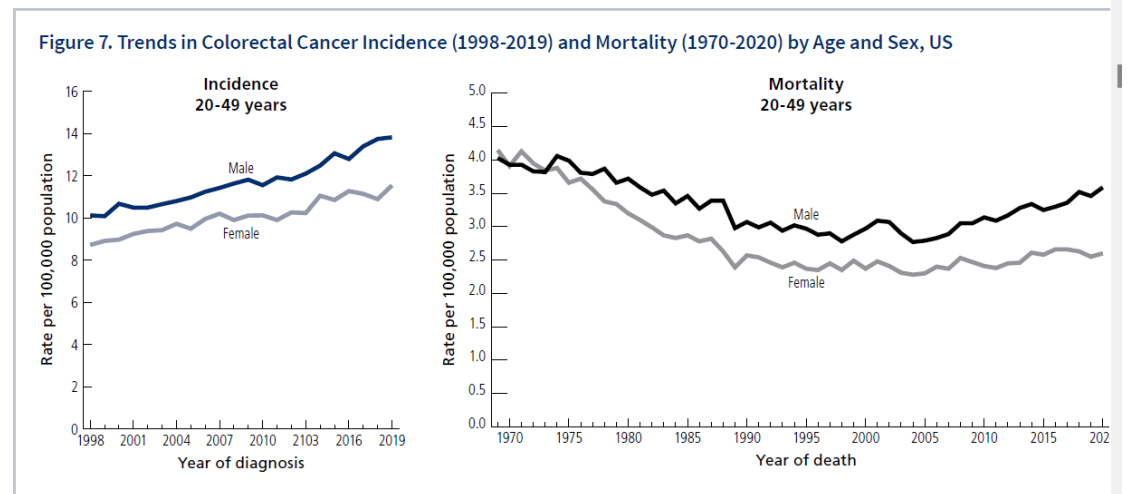
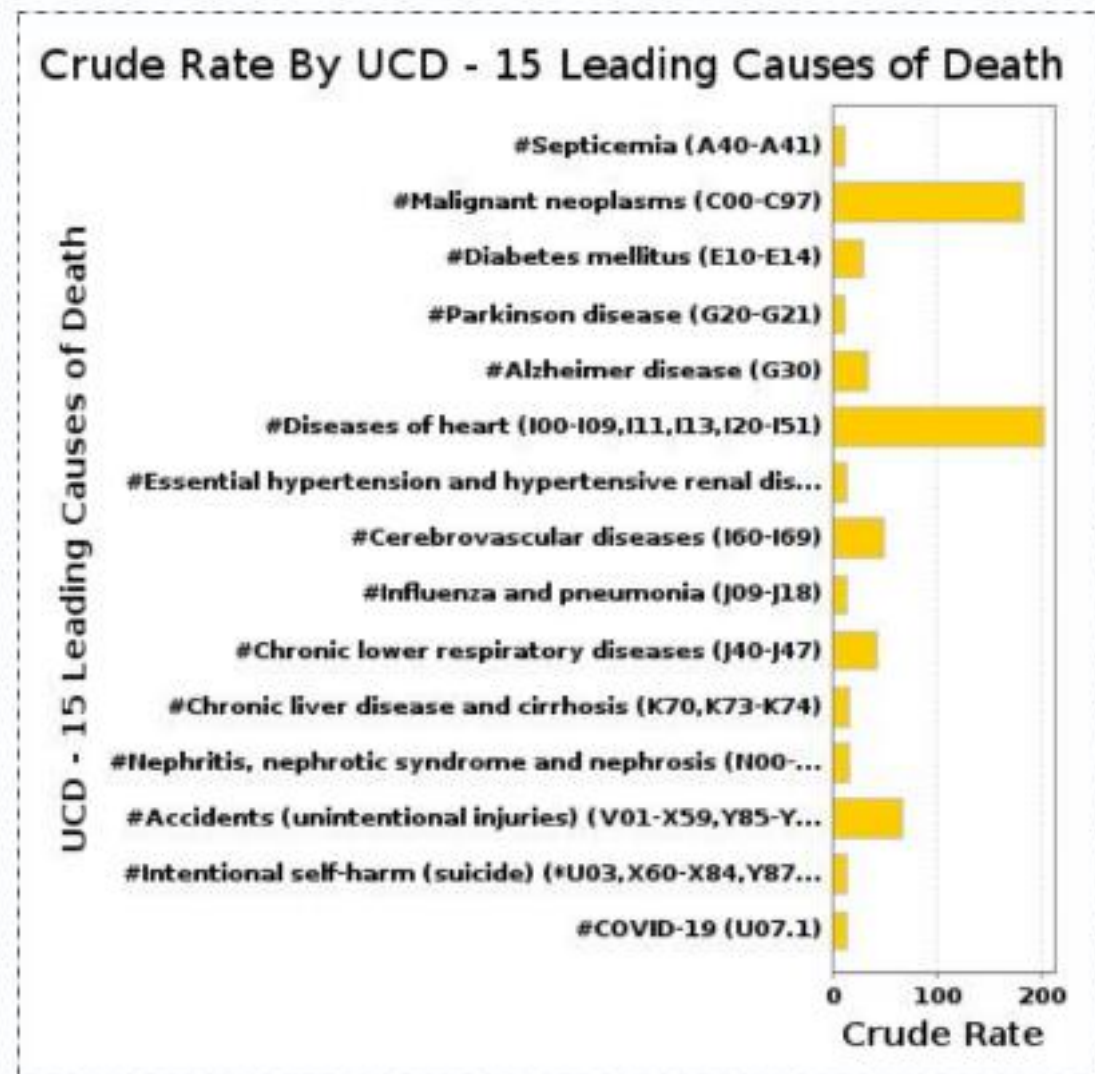


Figure 6. Long-term Trends in Colorectal Cancer Incidence (1975-2019) and Mortality



<https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/colorectal-cancer-facts-and-figures/colorectal-cancer-facts-and-figures-2023.pdf>

Leading Causes of Death: 2023 (not ranked)



Leading Causes of Death: 2024 Provisional



UCD - 15 Leading Causes of Death ↓
#Diseases of heart (I00-I09,I11,I13,I20-I51)
#Malignant neoplasms (C00-C97)
#Accidents (unintentional injuries) (V01-X59,Y85-Y86)
#Cerebrovascular diseases (I60-I69)
#Chronic lower respiratory diseases (J40-J47)
#Alzheimer disease (G30)
#Diabetes mellitus (E10-E14)
#Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)
#Chronic liver disease and cirrhosis (K70,K73-K74)
#Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)
#Influenza and pneumonia (J09-J18)
#Essential hypertension and hypertensive renal disease (I10,I12,I15)
#Parkinson disease (G20-G21)
#Septicemia (A40-A41)
#COVID-19 (U07.1)

SIGNS COMMON IN PEOPLE WHO DEVELOP EARLY-ONSET COLORECTAL CANCER

DIARRHEA



**RECTAL
BLEEDING**



**ABDOMINAL
PAIN**



**IRON-
DEFICIENCY
ANEMIA**



SOURCE: Fritz CDL, et al. *JNCI*, 2023.

Fritz CDL, Otegbeye EE, Zong X, et al. Red-flag signs and symptoms for earlier diagnosis of early-onset colorectal cancer. *J Natl Cancer Inst.* 2023;115(8):909-916. doi:10.1093/jnci/djad068

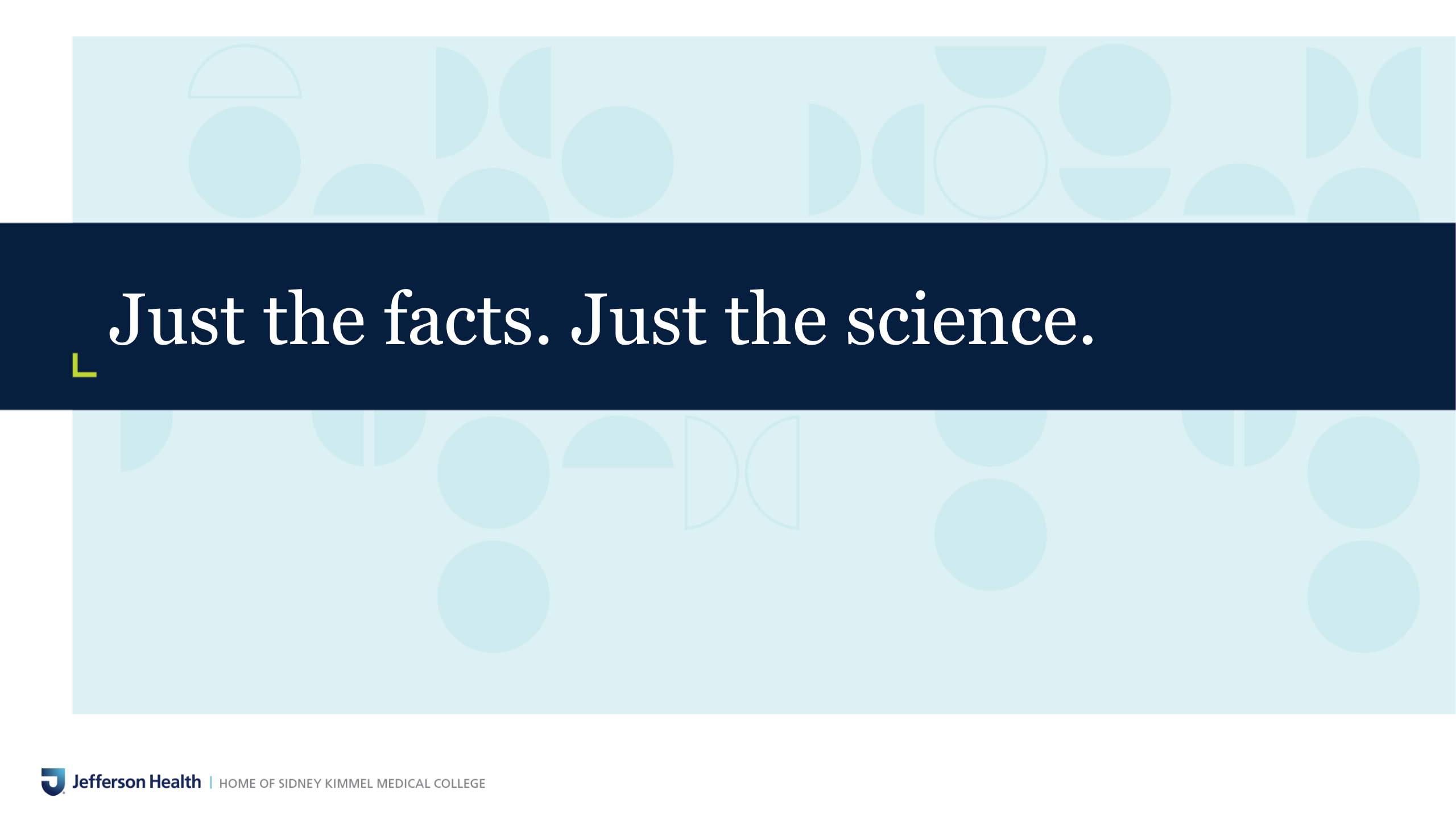
Demb J, Kolb JM, Dounel J, et al. Red Flag Signs and Symptoms for Patients With Early-Onset Colorectal Cancer: A Systematic Review and Meta-Analysis. *JAMA Netw Open.* 2024;7(5):e2413157. Published 2024 May 1. doi:10.1001/jamanetworkopen.2024.13157



I have no relevant financial disclosures
└ nor any conflicts of interest.



I have no political affiliations that I will discuss or
allow to permeate my discussion.



Just the facts. Just the science.

• Introduction	5 minutes	7:00-7:05
• Lecture	50 minutes	7:05-8:05
• Break	5 min	8:05-8:10
• Breakout Session	30 min	8:10-8:40
• Applying Concepts / Wrap-up	20 min	8:40-9:00

Objectives

- 1. Define quality and patient safety concepts and place the concepts in a quality framework
- 2. Introduce quality and patient safety tools and discuss the purpose of each tool
- 3. Apply the quality and patient safety concepts to create SMART Aims in example problems

What is Quality?

What is Healthcare Quality?

Healthcare Quality is defined as:

The level that healthcare systems, services and supplies **increase the likelihood for positive health outcomes** for patients, and are consistent with current state of the art knowledge and practices.



A layperson's definition can be found at
<https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/mms/quality-measure-and-quality-improvement->

Healthcare Quality

- Institute of Medicine (U.S.). Committee on **Quality** of Health Care in America. **Crossing the Quality Chasm: A New Health System for the 21st Century.** Washington, D.C.: National Academy Press, 2001.

Safe

Timely

Effective

Efficient

Equitable

Patient-centered Care



What are Healthcare Quality Failures? Examples?

- **Underuse.** Many patients do not receive medically necessary care.
- **Misuse.** Each year, more than 100,000 Americans get the wrong care and are injured as a result. More than 1.5 million medication errors are made each year.
- **Overuse.** Many patients receive care that is not needed or for which there is an equally effective alternative that costs less money or causes fewer side effects.

-

Patient Safety

Patient safety is the **absence of preventable harm** to a patient during the process of health care and **reduction of risk of unnecessary harm** associated with health care to an acceptable minimum. It is a framework of organized activities that creates **cultures, processes, procedures, behaviours, technologies and environments** in health care that consistently and sustainably lower risks, reduce the occurrence of avoidable harm, make error less likely and reduce impact of harm when it does occur

<https://www.who.int/news-room/fact-sheets/detail/patient-safety>

Safety 1

Safety 2

Safety 3

Adverse Event

- Adverse events refer to harm from medical care rather than an underlying disease. Important subcategories of adverse events include:
 - Preventable adverse events: those that occurred due to error or failure to apply an accepted strategy for prevention;
 - Ameliorable adverse events: events that, while not preventable, could have been less harmful if care had been different;
 - Adverse events due to negligence: those that occurred due to care that falls below the standards expected of clinicians in the community.

<https://psnet.ahrq.gov/primer/adverse-events-near-misses-and-errors>



Medical Error

Medical Error is the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim IOM 1999, adapted from Reason, 1990

- Commission and Omission
- Most medical errors do not result in adverse events

<https://nap.nationalacademies.org/resource/9728/To-Err-is-Human-1999--report-brief.pdf>

Healthcare is a Complex Adaptive System (CAS)

“a collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected such that one agent’s actions change the context for other agents”

Plsek PE, Greenhalgh T. The challenge of complexity in health care. Br Med J. 2001;323:625-8.



How do we evaluate what is wrong?

Reporting Systems

- All hospitals must have reporting systems
- Anyone can make a report
- Some hospitals have anonymous reporting systems



<https://psnet.ahrq.gov/primer/reporting-patient-safety-events>

Jefferson Reporting



TJUH, JHN & JMH
Clinical - Thomas Jefferson University Hospitals, Inc.

<      > **View All Clinical Apps & Tools**

Clinical Support Resources
Access essential guidelines, protocols, calculators, algorithms and pathways.

Scott Memorial Library
Access articles, books, databases, journals and videos available to TJUH Inc., residents and staff.

Physician Directory
Restricted Access

Clinical Announcements

- ISAR: Jefferson Health Ebola Virus Disease Travel, Exposure and...**
For all Jefferson Health
a month ago · 2456 Views
- ISAR: Pediatric Practice Referral Guidance - Jun. 3, 2026**
For Central and North Region Hospitals
a month ago · 122 Views
- ISAR: Hemoglobin A1c Testing Transition - Apr. 21, 2026**
For all Jefferson Health sites except...
2 months ago · 1102 Views
- ISAR: New Unified Schedule & Formulary Transition - Apr. 15...**
For All Jefferson Health Locations
2 months ago · 1138 Views

View All

General News

- New Analytics Portal Launching July 15 on CINE**
Beginning Wednesday, July 15, users w...
7 hours ago · 230 Views
- Resilience in Action: Redefining What's Possible After an Aneurysm**
Empowered by Jefferson Health's...
a day ago · 7 Views
- Gene Shaffer, MD, Appointed Vice Chair of the Department of...**
A message from James Raphael, MD...
a day ago · 44 Views
- A Year of Impact and Focus on What's Next - Jul. 07, 2026**
A message from Jefferson CEO Joe...
a day ago · 300 Views

View All

References & Resources

- [Abbreviations](#)
- [Administrative & Purchasing](#)
- [Clinical Nurse Ladder Program](#)
- [Clinician Education](#)
- [Code Blue](#)
- [Davis's Drug Guide](#)
- [Death Procedures \(EDS\)](#)
- [Easler Patient Education Direct](#)
- [Forms Library](#)
- [JeffSTAT](#)
- [Master Event Calendar \(Grand Rounds\)](#)
- [Medical Staff Resources](#)
- [Nursing Resources](#)
- [Nutrition Care Manual](#)
- [Radiation Oncology Dose Constraints](#)
- [Radiology Resources](#)
- [Rapid Response Team](#)
- [Regulatory Resources](#)

Find People

-  [People Directory](#)
-  [Departments & Services Directory](#)
-  [Physician Directory](#)
Restricted Access
-  [Nursing Unit & Security Phone Numbers](#)
-  [Radiologist Cell Phone Numbers](#)

Quality & Safety

Falls Resources
Access the Falls Committee Team Site, what to do if a patient falls and fall prevention policies and guidelines.

Needlesticks
Learn what to do for needlesicks or other exposures and how to report the accident.

JeffPERT
View the Alert Activation Algorithm or call 5-CLUT (225-2550) for Pulmonary Embolism Response Team...

OnPoint Program for Advancing Care Excellence
Learn about Jefferson Health's quality, safety, experience, population health and equity program.

Environmental Health & Safety
Find resources for accidents & occupational health, lab safety, hazardous materials, respiratory protection & more.

Hand Hygiene Observation
Note the location and details of your hand hygiene observations.

Emergency & Safety Information

- [Emergency Codes](#) +
- [Emergency Management \(EOP\) & Phone Numbers](#) +

Patient Safety Strategies

- 5-Way Repeat Back - June 2024**
Monthly Safety Strategy
Modified: Jun 26, 2024

Click on an icon

RLDatix

Icon Wall

TRUBLE FINDING THE RIGHT TILE? USE SEARCH BOX BELOW

File Center
Tasks
New File
File Tracker

If you are an employee and had a work-related injury/illness, please notify your supervisor immediately and report the work-related incident through the Employee Event tile.
If you have any questions regarding work-related injury, contact your direct supervisor.
Supervisors, if you have questions regarding workplace illness/injury reporting please contact your local Jefferson workers compensation representative.

For guidance selecting between Behavioral, Workplace Violence, or Safety/Security Events please consult the following:

Behavioral Events (Events where the patient is the only person involved)

- Patient self-harm
- Non-suicidal self-injury
- Suicide/Suicidal on or off-site
- Drug-seeking behavior
- Patient non-compliance or non-adherent
- Unintentional harm to self or others as result of patient's medical condition
- Smoking in unauthorized area

Workplace Violence Events (Events where the patient involves someone else besides themselves)

- Involving a patient
- Any type of assault (attempted, physical, sexual, or verbal)
- Any type of harassment
- Bullying or intimidation
- Intentional Exposure
- Stalking
- Threat of violence

Safety/Security Events (Events where public safety/security personnel may need to be involved)

- Using illicit drugs
- Breach of Confidentiality
- Captured unauthorized departure
- Safety Policy violation
- Weapons found on premises or person
- Property Damage/Vandalism/Lost
- Unauthorized access/trespassing
- Fire/Disaster code/Chemical spill

FOR ANONYMOUS REPORTING CHECK THIS BOX

29 results are available.

☐ Anonymous Mode (click here to open a submission form anonymously)

Adverse Drug Reaction

Airway Management

Behavioral

Blood Product

Diagnosis/Treatment

Diagnostic Imaging

Employee Event (Accident/Injury/Incident)

Equipment/Medical Device

Patient Fall

Facilities

Healthcare IT

Infection

IV/Vascular Access Device

Lab/Specimen

Line/Tube

Maternal / Childbirth

Medication/Fluid

Patient ID/Documentation/Consent

Professional Conduct

Provision of Care

Radiation Treatment

Restraints

Safety/Security

Skin Tissue

Scissors

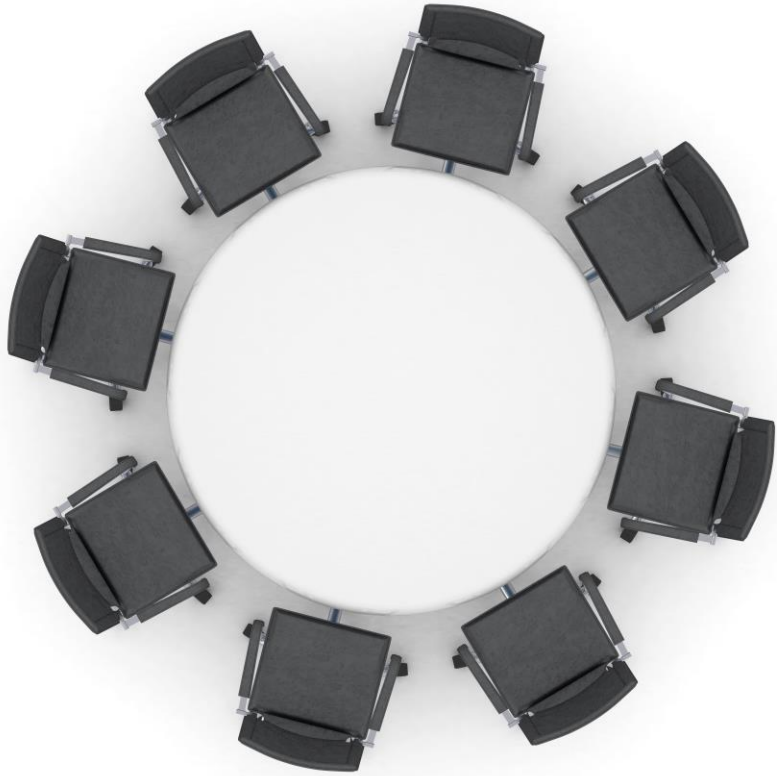
Walking

Target

Headset

Handshake

Feedback from Participants



Evidence-based Medicine

10% of what we do has good evidence to back it up

Howick, J., Koletsi, D., Pandis, N., Fleming, P. S., Loef, M., Walach, H., Schmidt, S., & Ioannidis, J. P. A. (2020). The quality of evidence for medical interventions does not improve or worsen: a metaepidemiological study of Cochrane reviews. *Journal of clinical epidemiology*, 126, 154-159. <https://doi.org/10.1016/j.jclinepi.2020.08.005>Links to an external site.



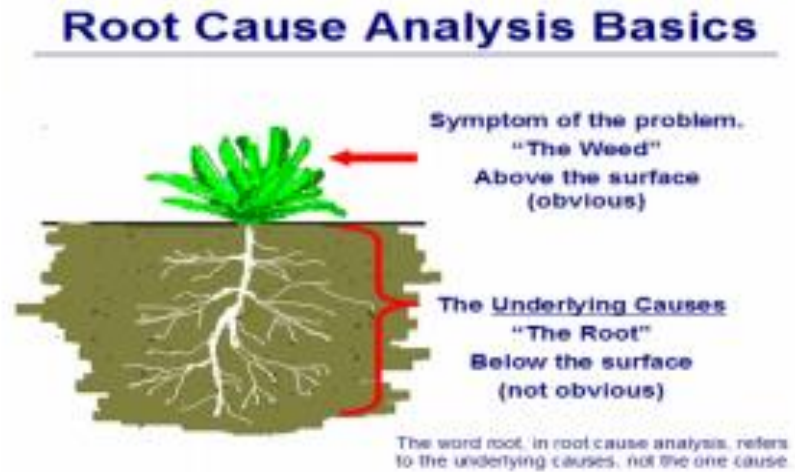
- Information gathering
- Clinical Decision Support (CDS)
- Quality Improvement Strategies



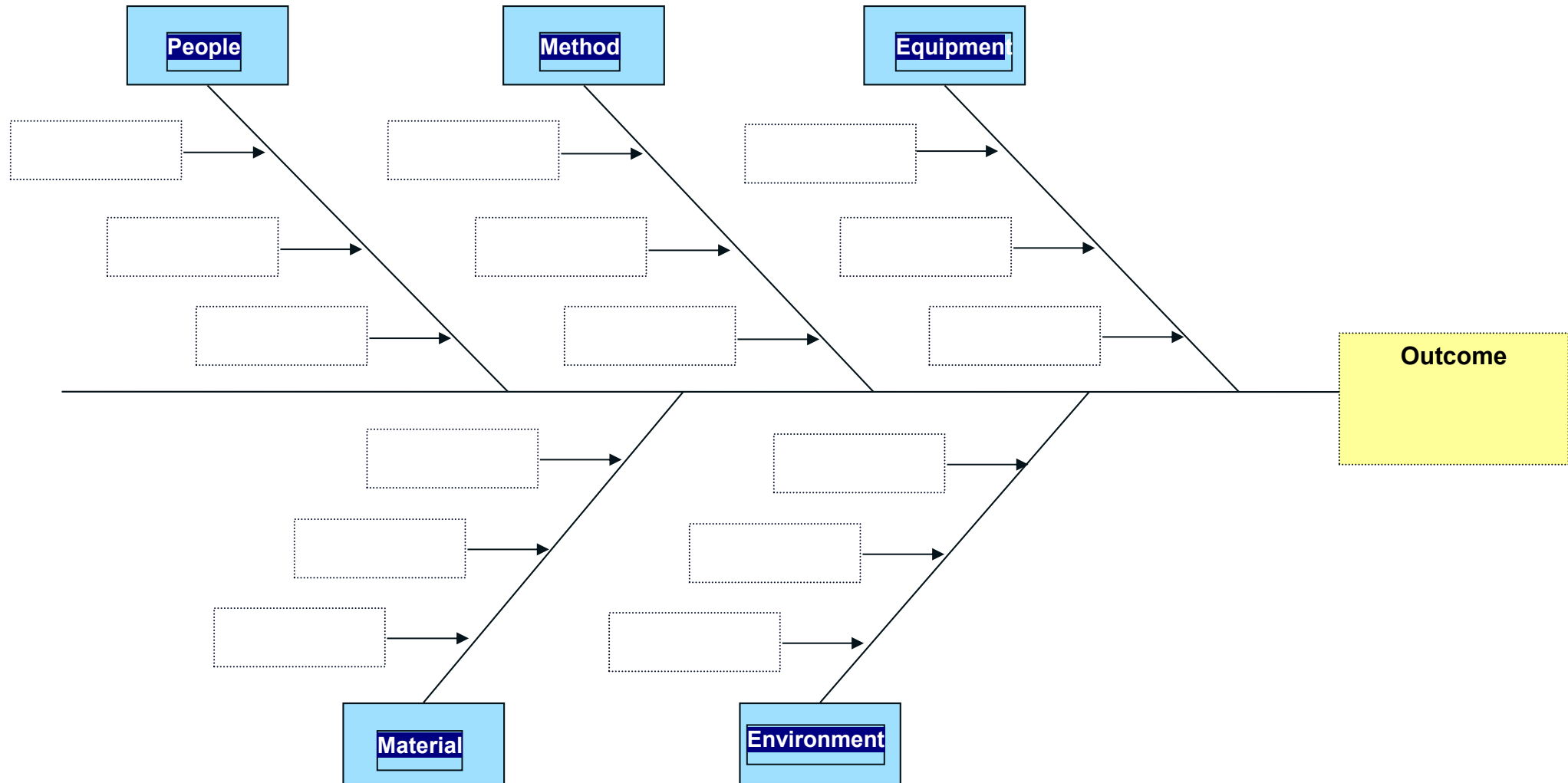
Taylor RA, Sangal RB, Smith ME, et al. Leveraging artificial intelligence to reduce diagnostic errors in emergency medicine: Challenges, opportunities, and future directions. *Acad Emerg Med*. 2025;32(3):327-339. doi:10.1111/acem.15066

Post hoc

Root Cause Analysis



Fishbone Analysis (Ishikawa Diagram)



Why?

Why?

Why?

Why?

Why?



Anticipatory

Failure Modes Effects Analysis

Sample FMEA: Comparison of Five Medication Dispensing Scenarios

FMEA Matrices for Medication Dispensing Scenarios

Scenario 1

Scenario 1: Steps in the Process	Failure Mode	Failure Causes	Failure Effects	Likelihood of Occurrence (1-10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Profile Number (RPN)	Actions to Reduce Occurrence of Failure
Orders are written for new medications.	The first dose may be given prior to pharmacist review of the orders.	Medication ordered may be available and easily accessed in the dispensing machine.	Patient may receive incorrect medication, incorrect dose, or a dose via incorrect route.	6	5	1	30	Assign clinical pharmacists to patient care units so that all medication orders can be reviewed as they occur.
Orders are written to discontinue a medication or change the existing order.	Discontinued medications are still available after orders.	All doses needed for a 24-hour period are delivered to the drawer. Drawer is not changed until next routine delivery.	Patients may receive medications that have been discontinued or the incorrect dose of a	10	5	5	250	Schedule pick-ups of discontinued medications, including refrigerated medications, twice per day.

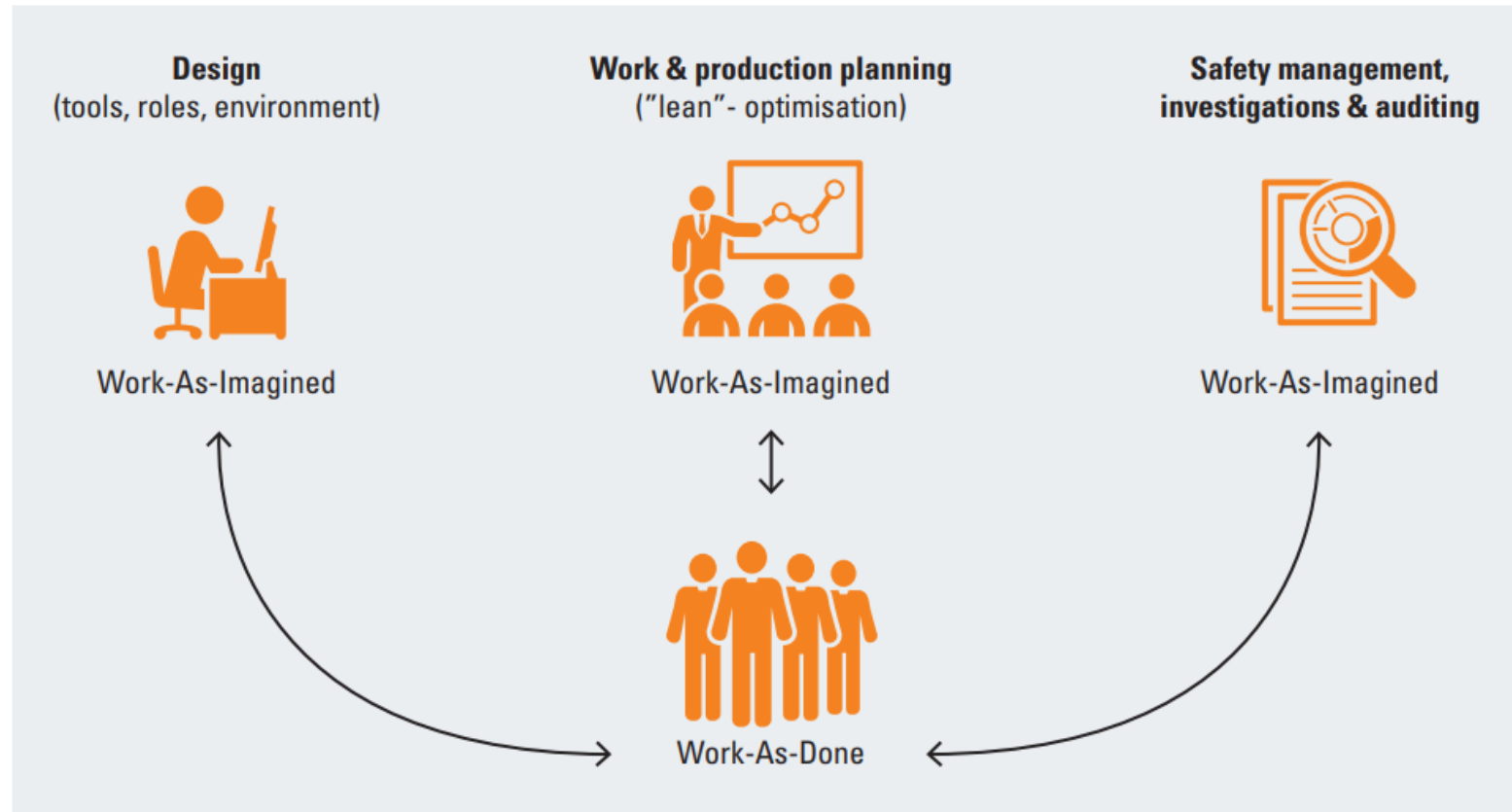
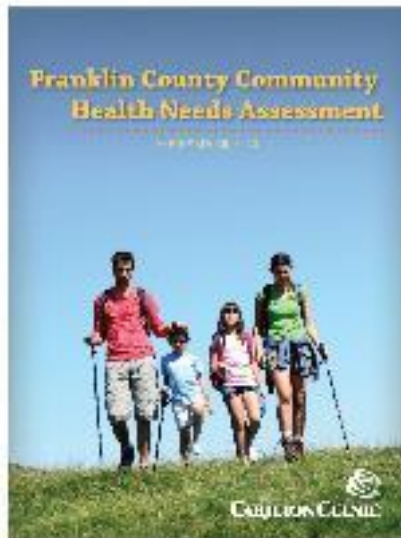


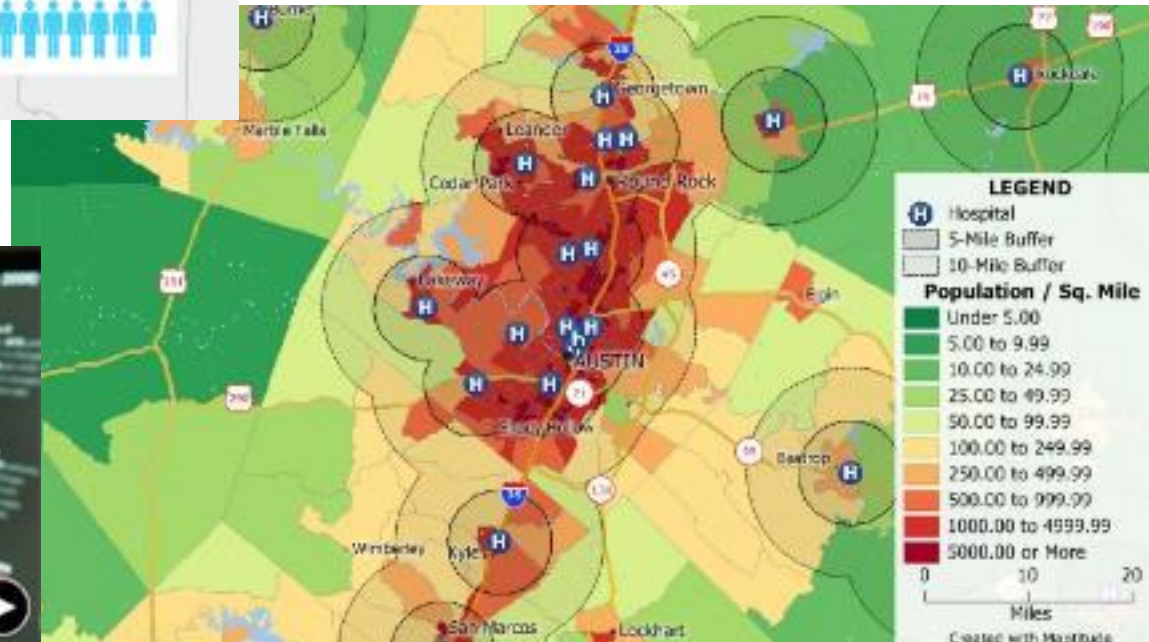
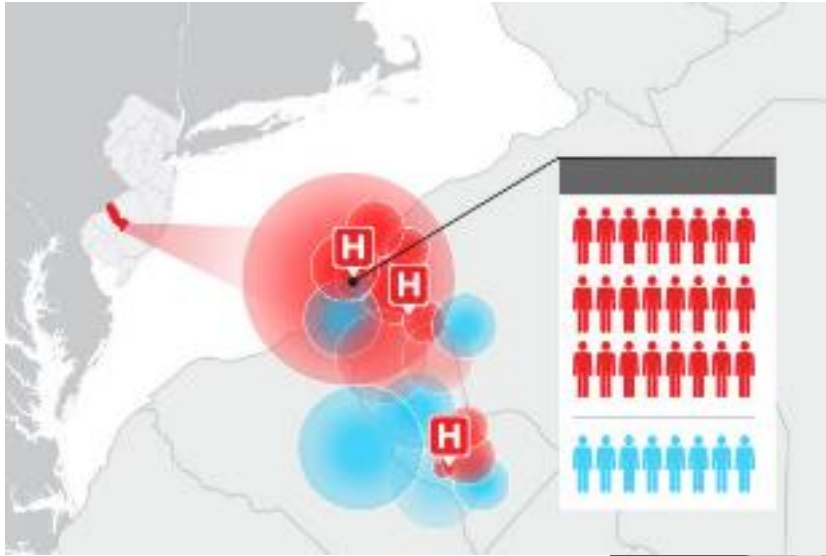
Figure 1: Work-as-Imagined and Work-as-Done

Where do we get the data?

Community health needs assessment and profiles



Geocoding and hotspotting



Benchmarking Data Sets

The collage consists of three overlapping screenshots:

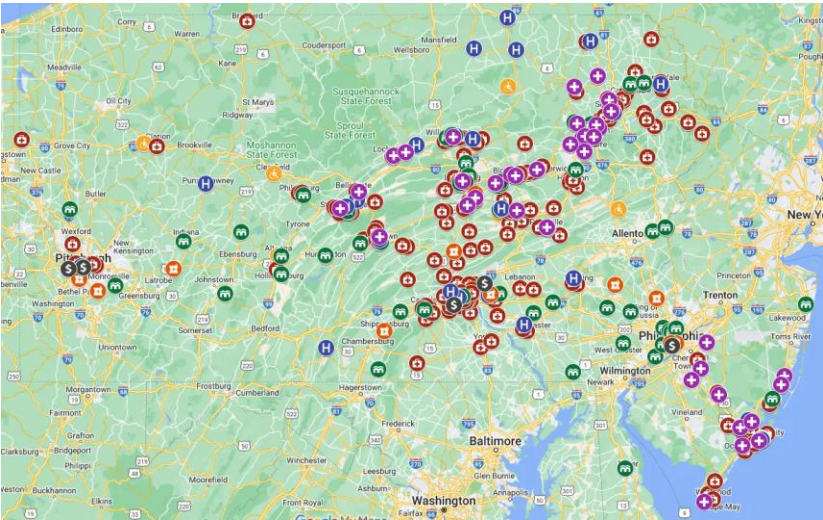
- Top Left:** A document cover for "HEDIS 2006 Technical Specifications". It features a large blue "2006" on the left and a red "HEEDS" logo at the top.
- Top Right:** The "HealthyPeople.gov" website. It includes the ODPHP (Office of Disease Prevention and Health Promotion) logo, a search bar, and navigation links like "Tools & Objectives", "Leading-Health Indicators", and "Data Search".
- Bottom:** The "Agency for Healthcare Research and Quality" (AHRQ) website. The main heading is "National Healthcare Quality and Disparities Reports". Below this are five colored boxes: "Reports" (Read and download the full reports), "National View" (National summary scores by state, territory, and DC), "State View" (State-level summaries and hospital score measures), "Data Query" (Search data across specific measures), and "Resources" (Resources to improve quality performance). A sidebar on the right promotes a "Mental Health Webinar" on Thursday, March 23, with a "Register now" link.





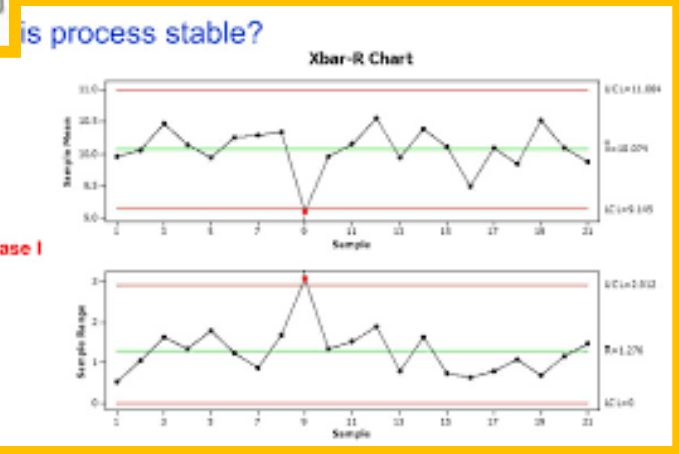
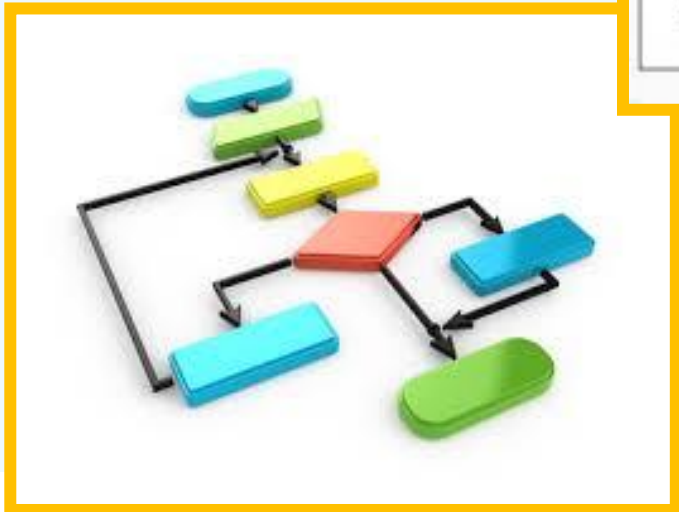
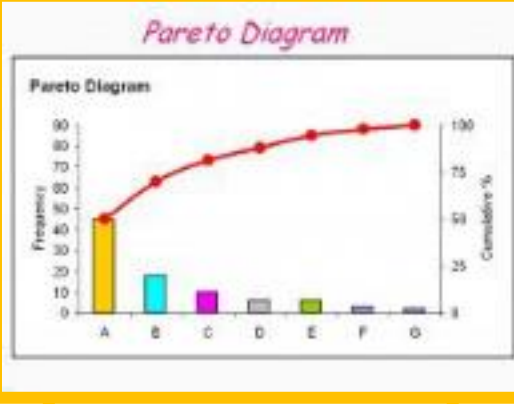
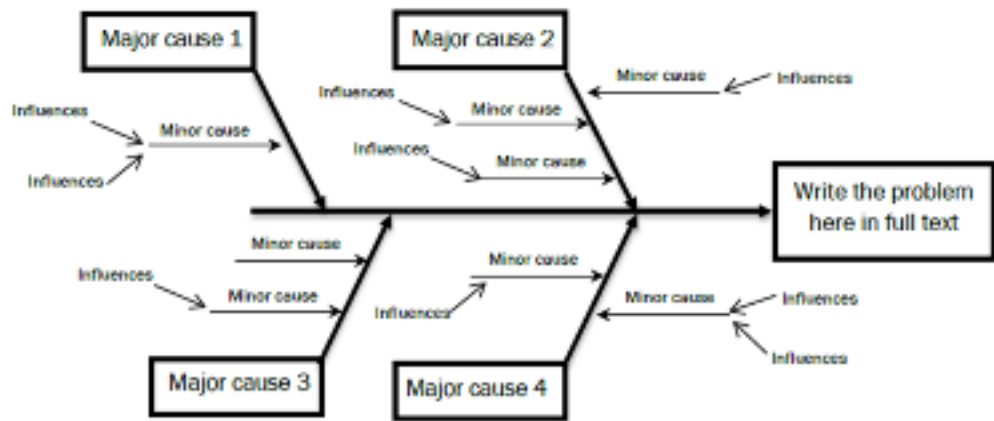
<https://www.carevive.com/why-cancer-registries-matter-for-survivorship-care-programs/>

Large Data Sets



Medicare Provider Analysis and Review (MEDPAR) File

Methods



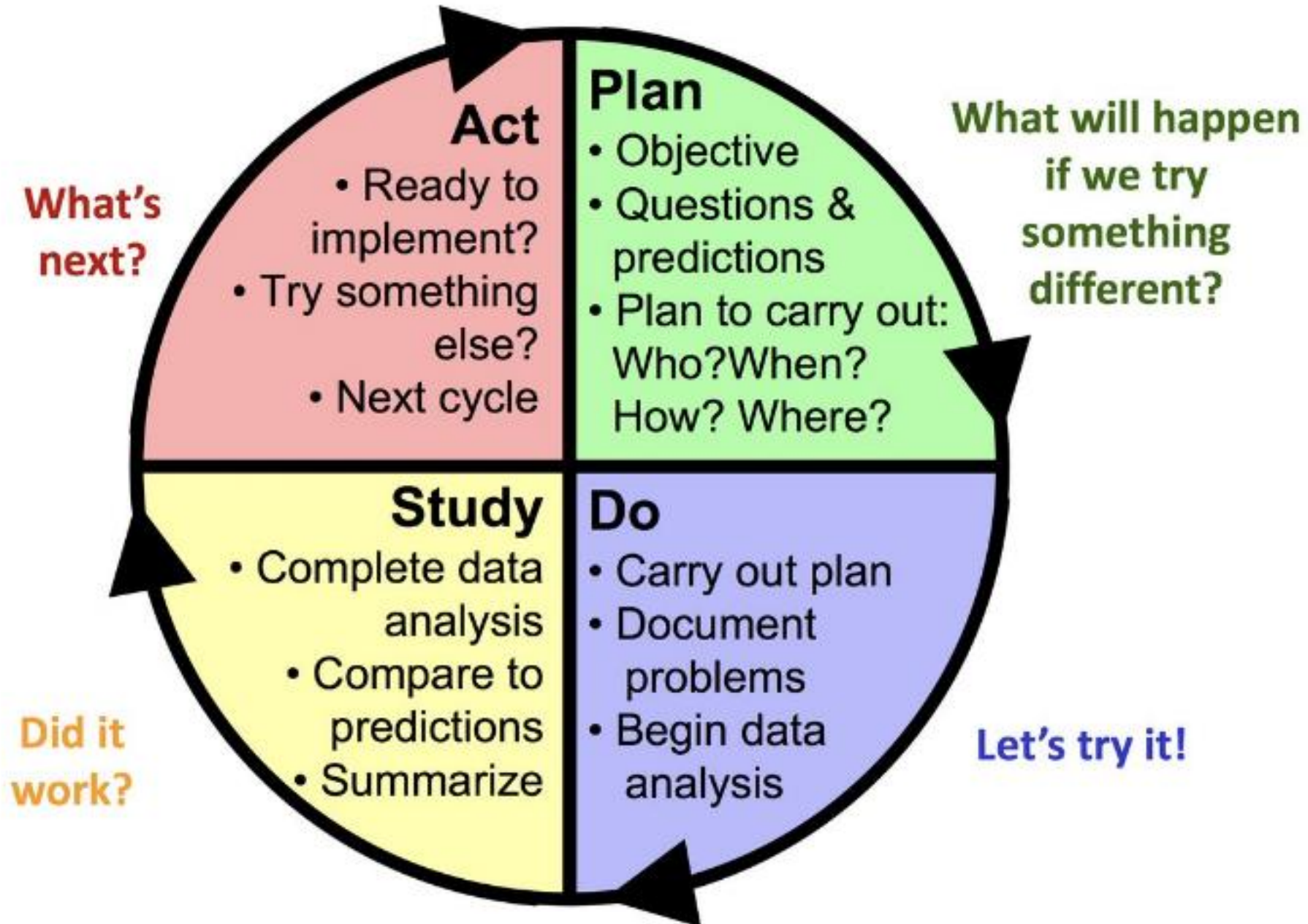
Model for Improvement



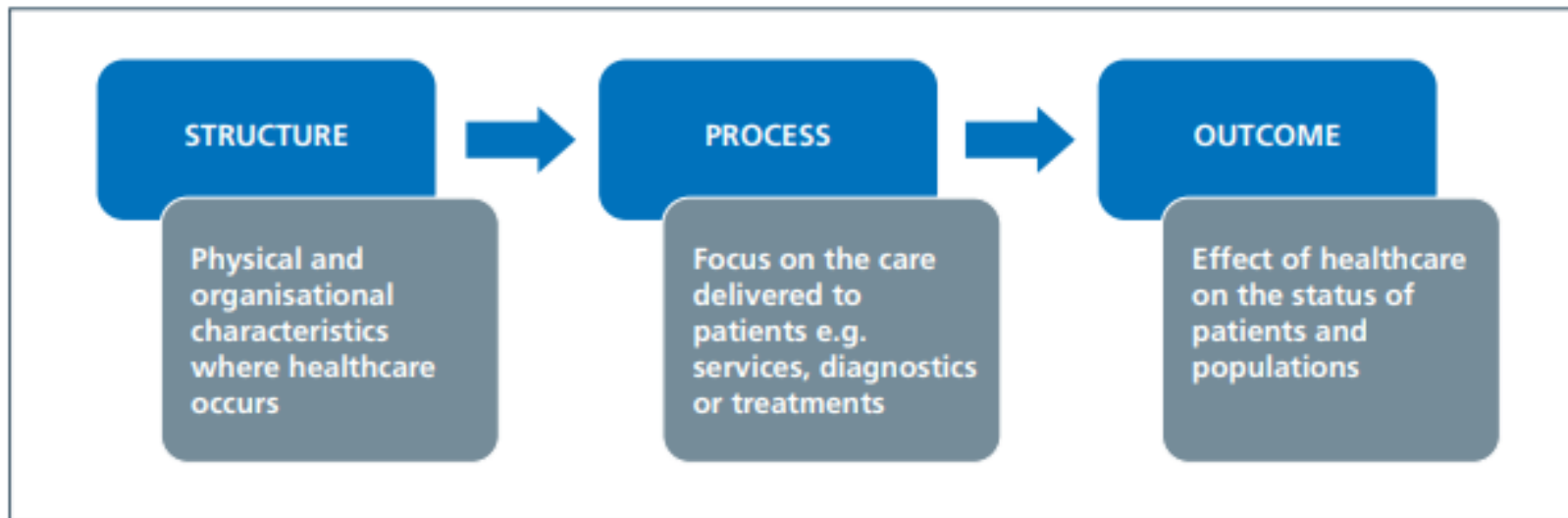
Shewhart
Deming
IHI

Best M, Neuhauser D. Walter A Shewhart, 1924, and the Hawthorne factory. *Qual Saf Health Care*. 2006;15(2):142-143. doi:10.1136/qshc.2006.018093

The PDSA Cycle for Learning and Improvement



Donabedian Model



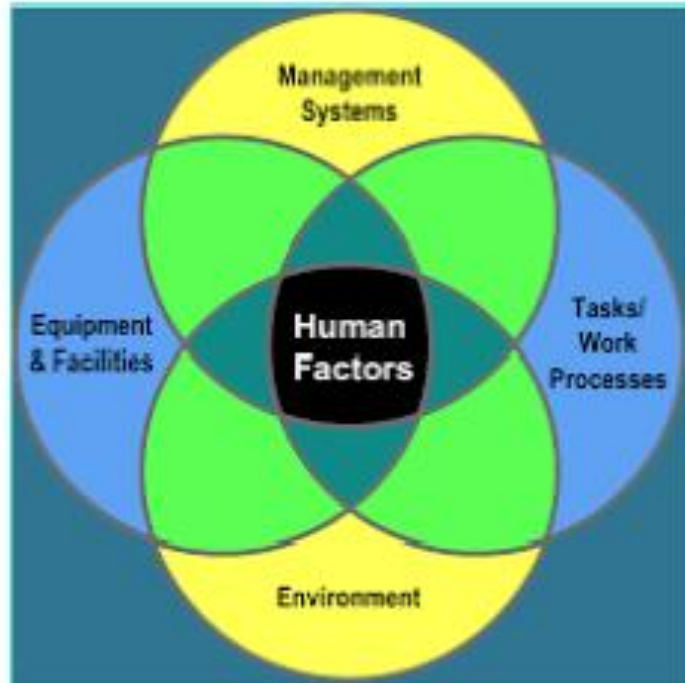
<https://improvement.nhs.uk/documents/2135/measuring-quality-care-model.pdf>

STRUCTURES: System Design

**All organizations are perfectly
designed to get the results they get!**

Arthur W. Jones

Design



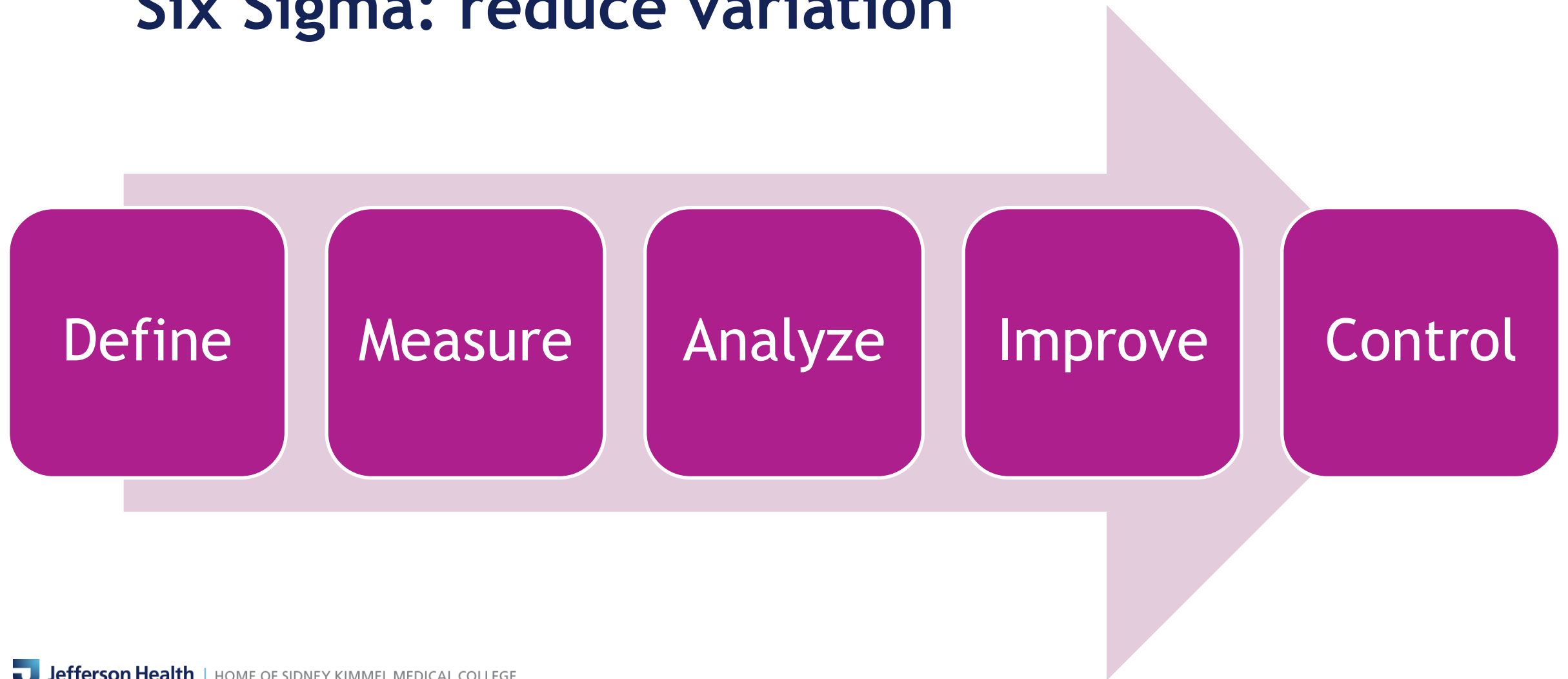
LEAN: reduce waste

Lean Waste in Health Care

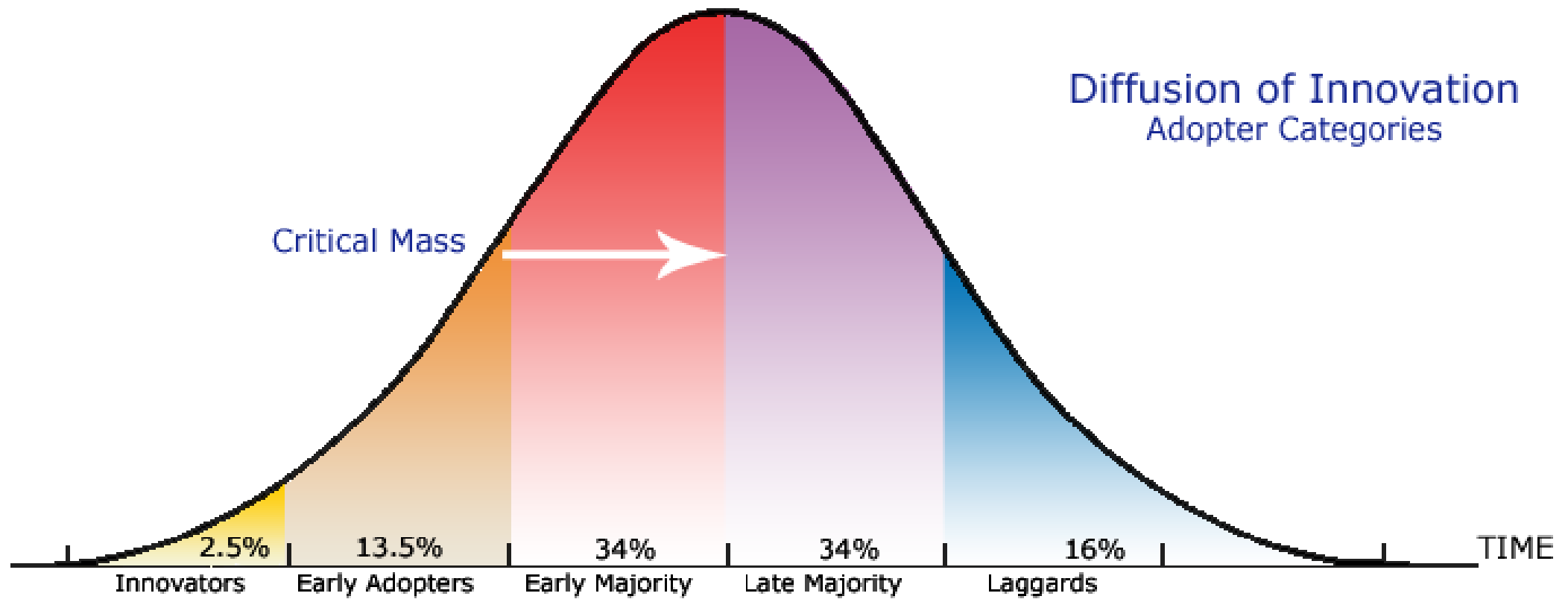


NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

Six Sigma: reduce variation



Innovation



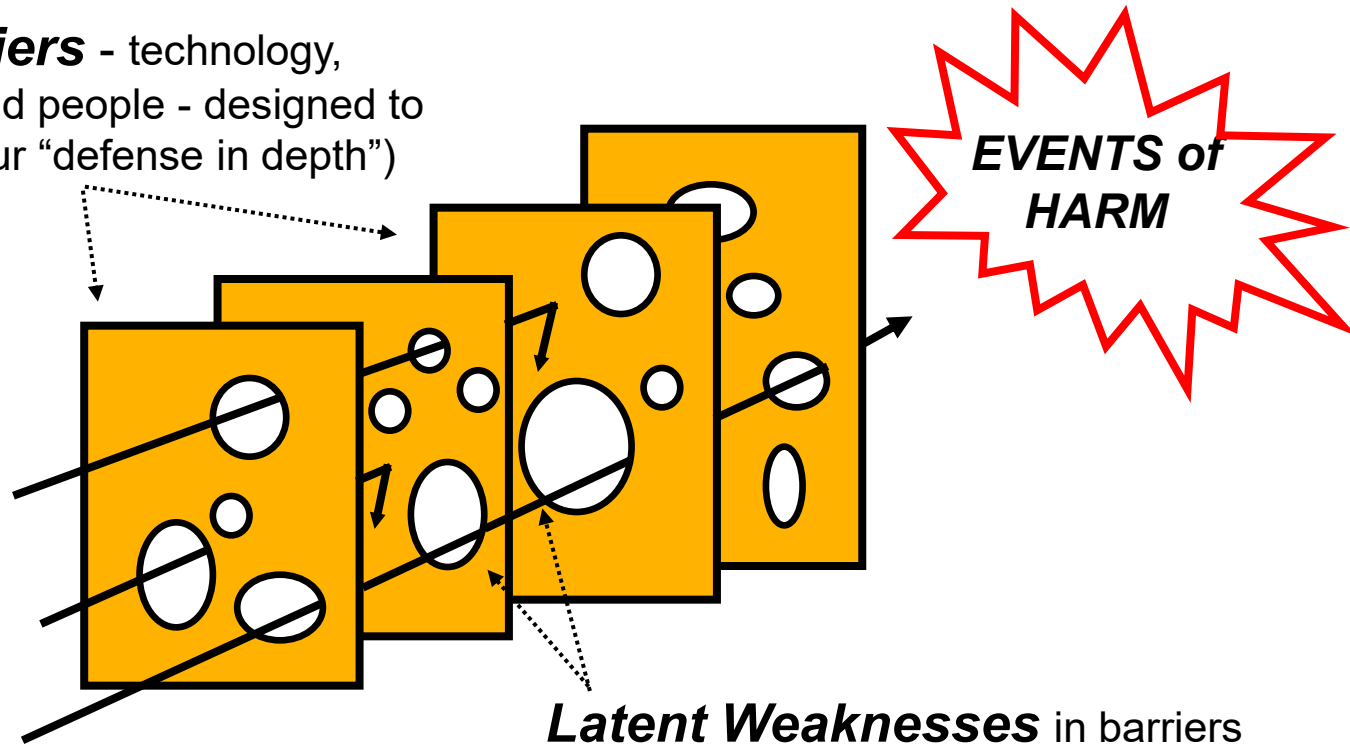
Adapted from E.M Rodgers, Diffusion of Innovations, 3rd ed.1963

Why do Events Happen?

The Swiss Cheese Effect

Multiple Barriers - technology, processes, policies and people - designed to stop active errors (our “defense in depth”)

Active Errors
by individuals result
in initiating action(s)



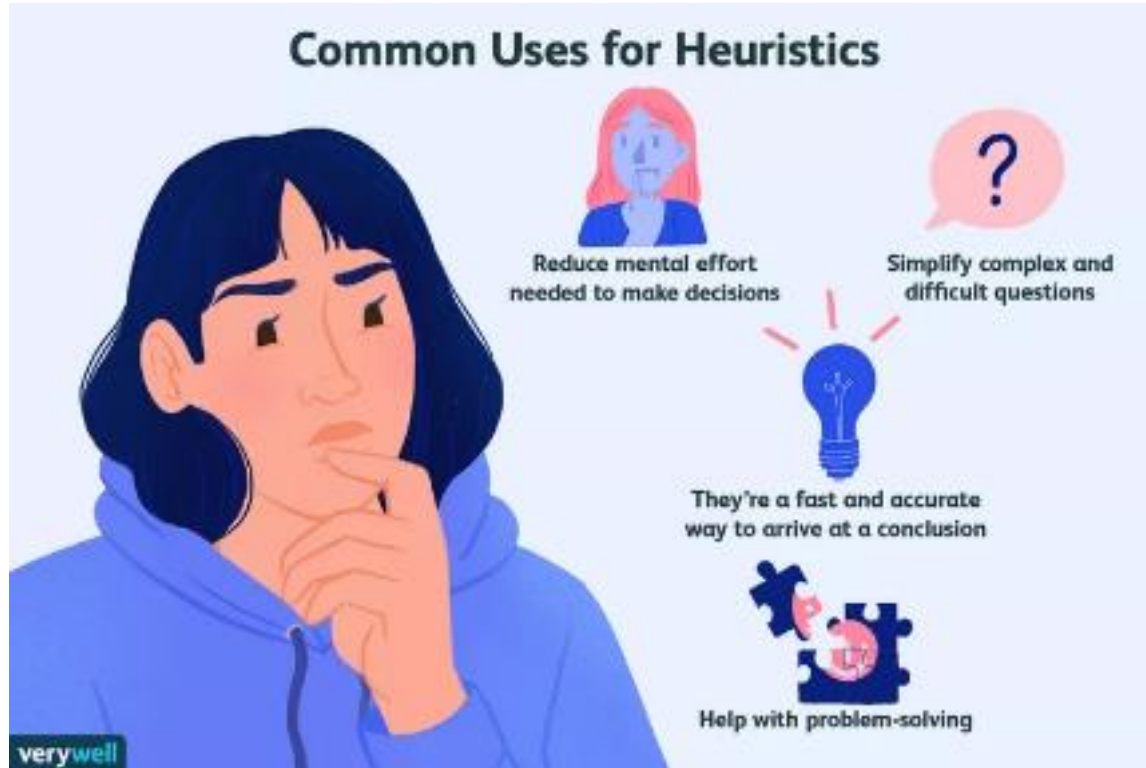
Latent Weaknesses in barriers

Adapted from James Reason, *Managing the Risks of Organizational Accidents* (1997)



How do we redesign healthcare?

Heuristics and Cognitive Biases

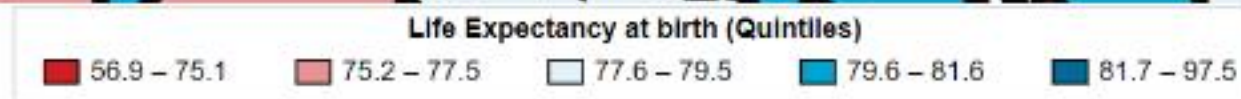
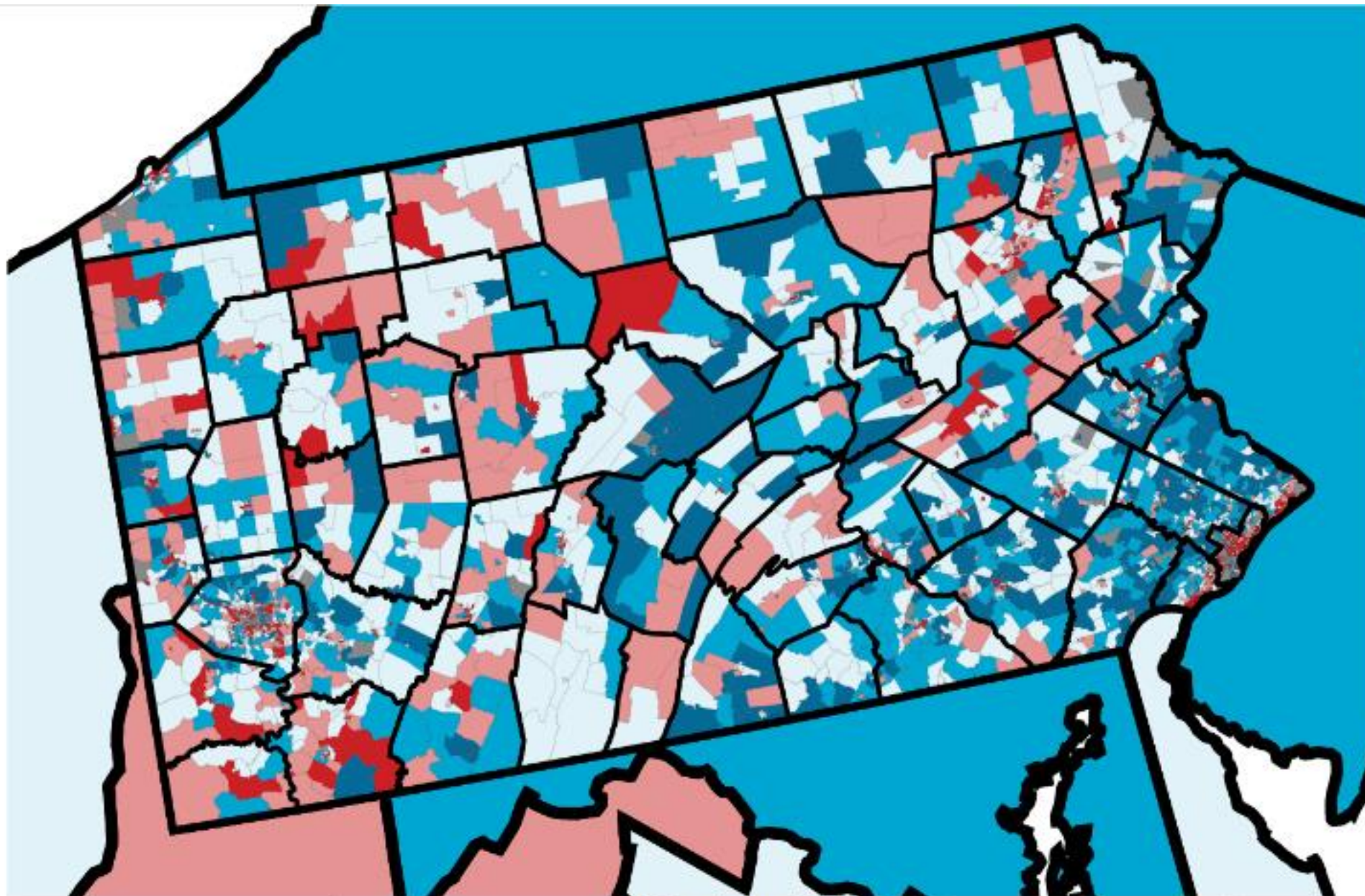


<https://www.verywellmind.com/what-is-a-heuristic-2795235>

- **High reliability** is described as a condition of persistent mindfulness within an organization
- **High reliability organizations** are those that operate in complex, high-hazard domains for extended periods without serious accidents or catastrophic failures

<https://psnet.ahrq.gov/primer/high-reliability>





<https://www.cdc.gov/nchs/data-visualization/life-expectancy/index.html>

The Triple Aim remains strong in healthcare

- Improving the health of populations
- Reducing the per capita costs of healthcare
- Improving the patients' experience of healthcare

Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff (Millwood)*. 2008;27(3):759-769. doi:10.1377/hlthaff.27.3.759



Even as it has evolved to the Quintuple Aim

- Improving the health of populations
- Reducing the per capita costs of healthcare
- Improving the patients' experience of healthcare
- Caring for our workforce
- Ensuring health equity

Nundy, S., Cooper, L. A., & Mate, K. S. (2022). The Quintuple Aim for Health Care Improvement: A New Imperative to Advance Health Equity. *JAMA*, 327(6), 521-522.

<https://doi.org/10.1001/jama.2021.25181>



Population health has been defined as the health outcomes of a group of individuals, including the distribution of such outcomes within the group

- Kindig D, Stoddart G. [What is population health?](#) *American Journal of Public Health* 2003 Mar;93(3):380-3. Retrieved 2008-10-12

What are Social Determinants of Health?

- The social determinants of health (SDOH) are the non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems.
- The SDOH have an important influence on health inequities - the unfair and avoidable differences in health status seen within and between countries. In countries at all levels of income, health and illness follow a social gradient: the lower the socioeconomic position, the worse the health.

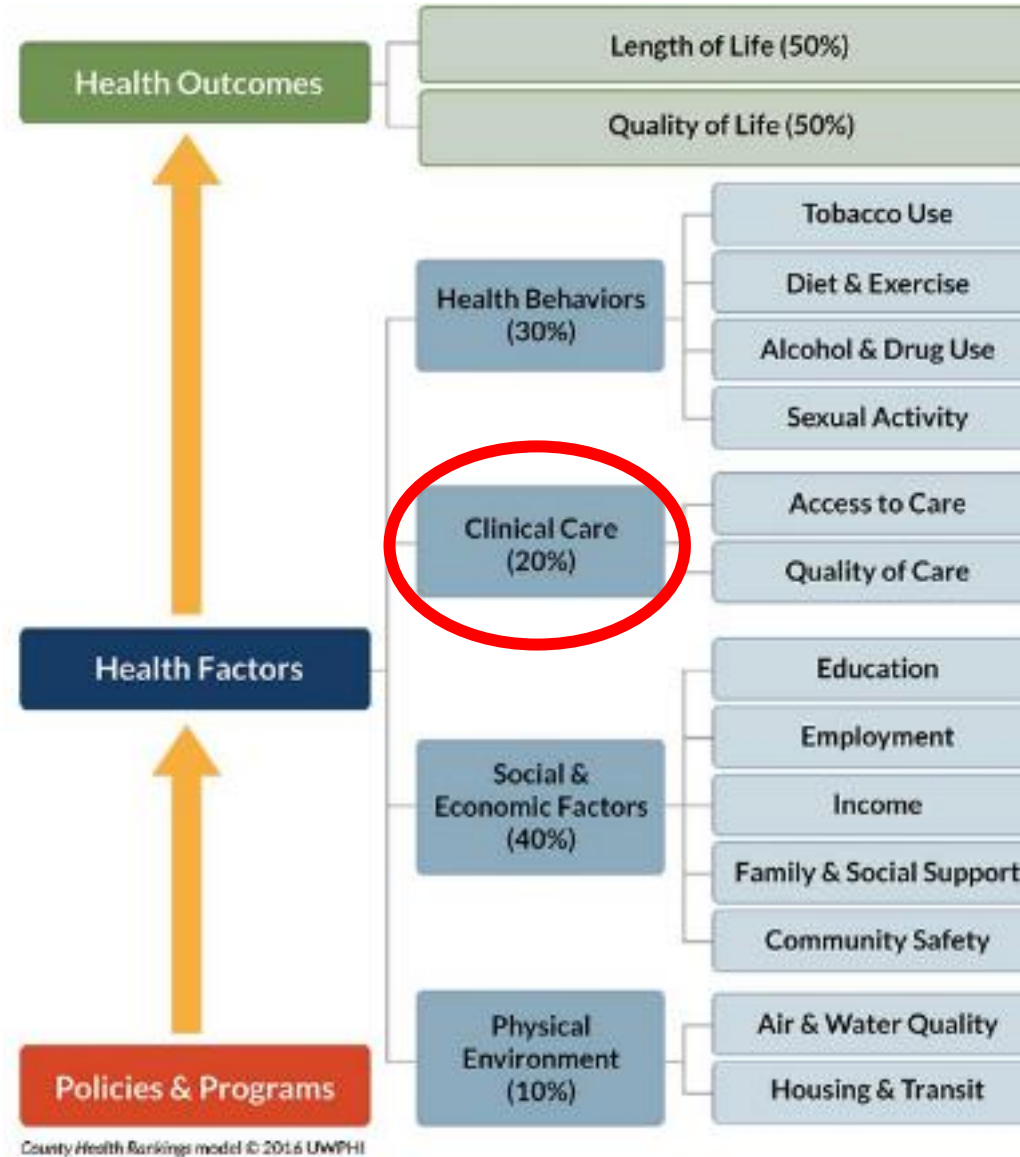
https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1

Figure 1
Social Determinants of Health

Economic Stability	Neighborhood and Physical Environment	Education	Food	Community and Social Context	Health Care System
Employment	Housing	Literacy	Hunger	Social integration	Health coverage
Income	Transportation	Language	Access to healthy options	Support systems	Provider availability
Expenses	Safety	Early childhood education		Community engagement	Provider linguistic and cultural competency
Debt	Parks	Vocational training		Discrimination	Quality of care
Medical bills	Playgrounds	Higher education		Stress	
Support	Walkability				
	Zip code / geography				
Health Outcomes Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations					



A closer look



<https://www.countyhealthrankings.org/>

Healthy People 2030

Social determinants of health (SDOH) have a major impact on people's health, well-being, and quality of life. Examples of SDOH include:

- Safe housing, transportation, and neighborhoods
- Racism, discrimination, and violence
- Education, job opportunities, and income
- Access to nutritious foods and physical activity opportunities
- Polluted air and water
- Language and literacy skills



Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved [date graphic was accessed], from <https://health.gov/healthypeople/objectives-and-data/social-determinants-health>

BINGO

L

<https://bingobaker.com#68cb6b9a87d3a093>

L



L QIPS



Break-out Exercise



A **goal** is an aspirational statement about what you want to achieve

- An **objective** describes how you'll show progress toward your goal

Meaningful goals

- What is a goal?
- A goal is an aspirational statement about what you want to achieve:
- Broad, future-oriented statement that describes expected effect
- Defines scope
- Provides framework for objectives
- *Example: All employees in Tubman County work in environments that support mental well-being.*

Checklist: What makes a meaningful goal?

- Concise
- Free from jargon
- Specific about expected effect
- Easily understood
- Declarative statement
- Does not include solution or specific service/program
- Conveys ultimate destination

SMART Aim

SPECIFIC

Who and what?

MEASURABLE

By how much?

ACHIEVABLE

How?

RELEVANT

Why?

TIME-BOUND

When?

Different ways to write SMART objectives

- There are multiple approaches and ways to explain how to write SMART objectives. Here are some other sentence structures for objectives:
- [Who] will do [what] resulting in [measure] by [when].
- By [when], [who] will do [what] resulting in [measure].
- By [when], [measure - includes who and what].
- [Measure - includes who and what] by [when].

Problems:

- 1. Discharges from the hospital continue to be impacted by readmissions in Congestive Heart Failure, and in the past year the rate has been about 21%. Contracting is going to be impacted.
- 2. A family medicine physician's office notices that vaccine adherence has dropped to 80% of children ages 1 to 5, and addressing vaccine hesitancy is taking more time in the office.
- 3. The hospital has decided to roll out ERAS guidelines that impact pre-procedure cleansing, pre-procedure medications and eating, and post-procedure discharges. The peri-op and procedure areas are concerned that the flow of the patients will be impacted.
- 4. Patients discharged from the Emergency Department are not filling out their Patient Sat/Experience surveys, with a response rate of only 8%



Mary Reich Cooper, MD, JD

Associate Professor and Program Director
Healthcare Quality and Safety and Operational
Excellence

Master's in Healthcare Administration
Interim Program Director Population Health
She/her/hers

📞 267-207-1423

🌐 <https://www.linkedin.com/in/maryrcooper/>

@ Mary.r.cooper@Jefferson.edu





Jefferson
Health

HOME OF SIDNEY KIMMEL MEDICAL COLLEGE

JeffersonHealth.org