Nebraska Hospital Association
October 26, 2024

The Evolution of Quality in Health Care Beyond High-Reliability

What your organization must do now to maintain excellence

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Introduction- The Inevitability of Change

"It is not necessary to change.
Survival is not mandatory."

W. Edwards Deming

"All organizations are perfectly designed to get the results they are now getting. If we want different results, we must change the way we do things."

Jim Northup

Introduction- The Inevitability of Change

"You can always count on Americans to do the right thing…
…after they've exhausted all the other possibilities!"

Winston Churchill

"People do not change until the pain of staying the same…
… exceeds the pain of changing."

Anonymous

The Origin of Quality Improvement….. Crimea 1854

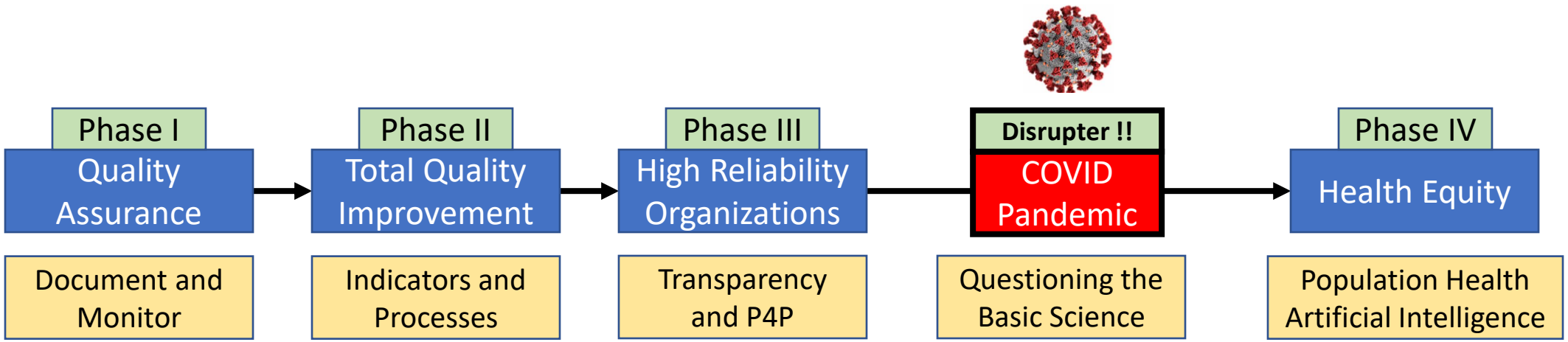
- Epidemic of cholera and diarrhea in British soldiers
- British sent a group of nurses to take care of them
- Accomplishments of the nursing team:
  - Reduced overcrowding
  - Established of proper ventilation
  - Removing horses from the human living quarters
  - Cleaning and disinfecting sewers/ latrines

Resulting in…..

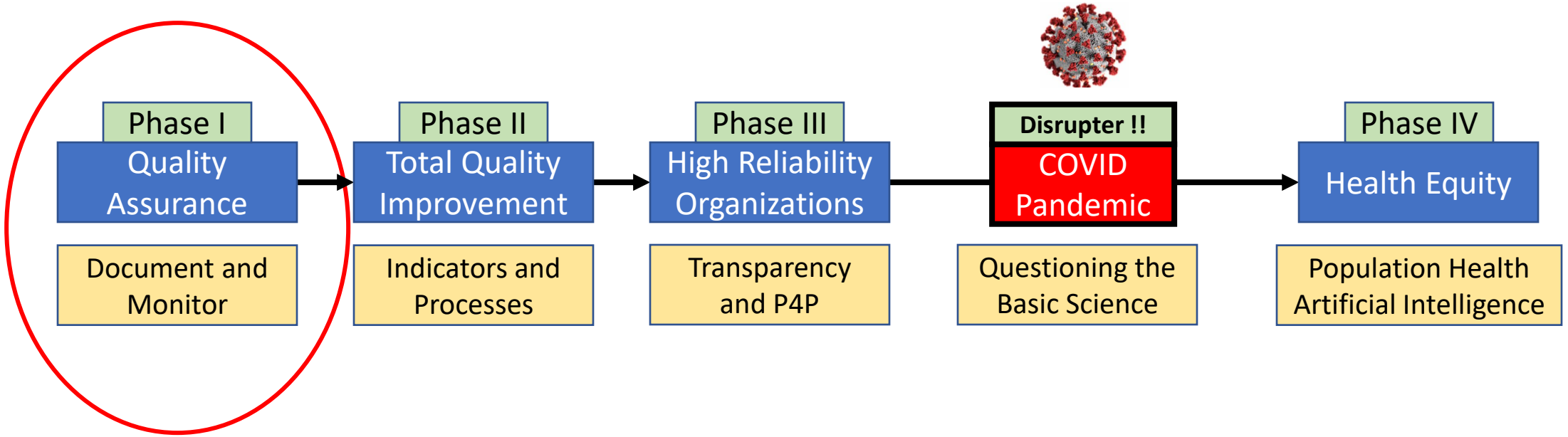
- Medical mortality reduction: 42.7% → 2.2%
- The “Environmental Theory” of disease

Florence Nightingale (1820-1910)

The Phases of Quality Improvement in Health Care



The Phases of Quality Improvement in Health Care



Phase I- Quality Assurance
Document and Monitor

Quality was assumed, we just had to “assure” it.

Q: “What do you call the person who graduates last in the class in medical school?”

A: “Doctor” (and maybe yours)

Phase I- Quality Assurance
Document and Monitor

Quality was assumed, we just had to “assure” it.

Local quality documentation and monitoring:

- Hospital Quality Assurance Committees
- Morbidity/ Mortality Committees
- Fundamental policies and procedures
- The increasing significance of accreditation
- The beginnings of quality improvement organizations

We thought all was well, but then…

Enter… Four Landmark Game-Changing Publications

1999 -To Err is Human: Building a Safer Health System

- Institute of Medicine (IOM)
- 44,000- 98,000 deaths/ year in hospitals from medical errors

2000- Managing Clinical Knowledge

- Yearbook of Medical Informatics-Boren/ Balas
- On average- 17 years between landmark study and general usage

Clinical Procedure	Landmark Trial	Current rate of use
Flu Vaccine	1968	64% (2000)
Pneumococcal Vaccine	1977	53% (2000)
Diabetic Eye Exam	1981	48.1% (2000)
Mammography	1982	75.5% (2001)
Cholesterol Screening	1984	69.1% (1999)

Balas EA, Boren SA (2000) Managing Clinical Knowledge for Health Care Improvement. *Yearbook of Medical Informatics.*

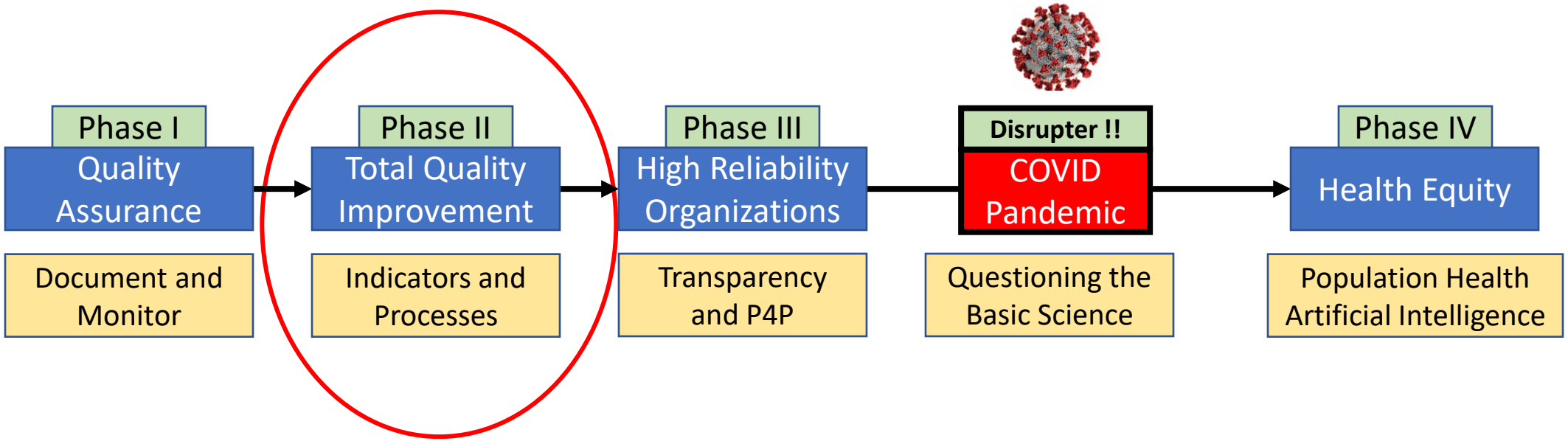
2001- Crossing the Quality Chasm

- Institute of Medicine (IOM) March 1, 2001
- More comprehensive- overuse, underuse, misuse

2003- Quality of Health Care Delivered to Adults in the USA

- McGlynn, New England Journal of Medicine
- Only 54.9% of patients received recommended care

The Phases of Quality Improvement in Health Care



Phase II- Total Quality Improvement
Indicators and Processes

From Quality Assurance to Total Quality Improvement

- The Explosion of Indicators
- The Quality Processes/ Tools
- The “Cost” of Quality

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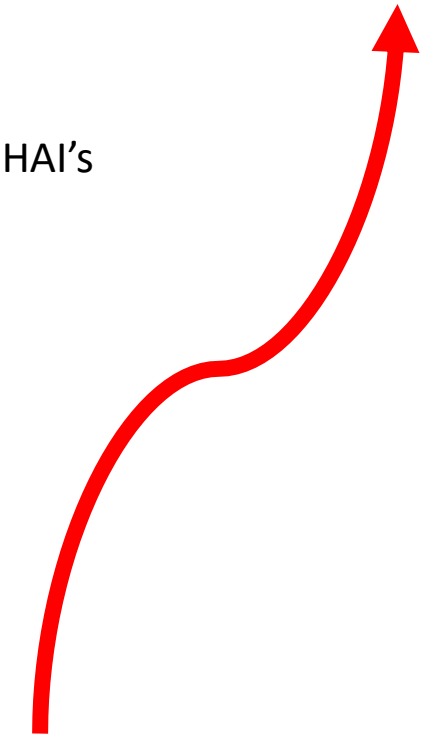
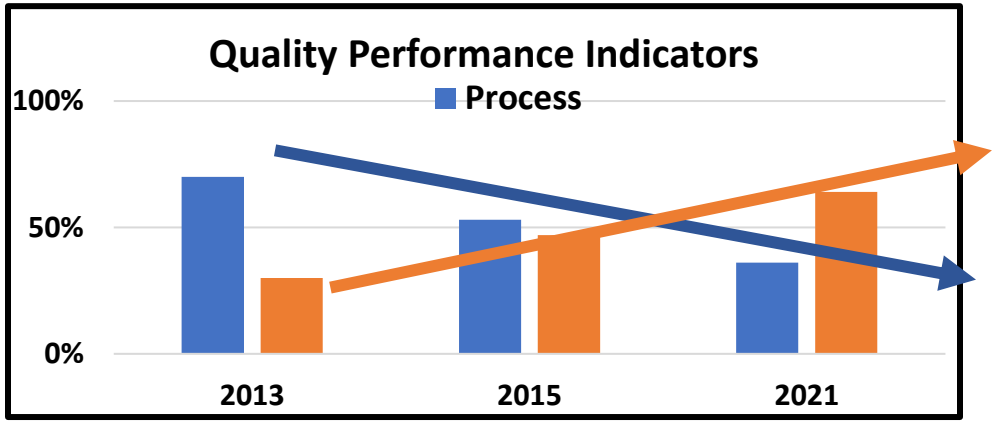
Phase II- Total Quality Improvement
Indicators and Processes

- NQF- 200 measures in the inpatient setting
- CMS-
  - Hospital inpatient quality reporting- core measures, HACs, readmissions, HAI's
  - Outpatient quality reporting
  - Value Based purchasing
  - Post-acute
  - Physician quality reporting
  - Long term care
  - Managed care star ratings
  - SNF/ hospice
- AHRQ- inpatient, prevention, patient safety, peds
  - Inpatient-mortality, utilization, volume
  - PSI- adverse events surgeries, procedures, birth
  - Peds QIs
- CAHPS
- Leapfrog
- Joint Commission- ORYX-
  - Hospital Accreditation Program (HAP) and Critical Access Hospital Accreditation (CAH) Program



Phase II- Total Quality Improvement
Indicators and Processes

From Process Indicators to Outcome Indicators



Challenges with process measurements and outcome measurements:

- Achievement of a process may NOT result in the desired clinical outcome
- Processes can be gamed:
  - Smoking cessation
  - Hospital in-patient mortality (transfer to hospice)
- Outcomes typically do NOT have a straightforward fix:
  - 30-day MI mortality
  - Cost per beneficiary

Phase II- Total Quality Improvement
Indicators and Processes

From Quality Assurance to Total Quality Improvement

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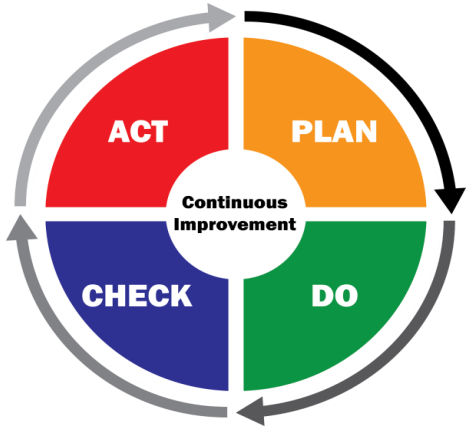
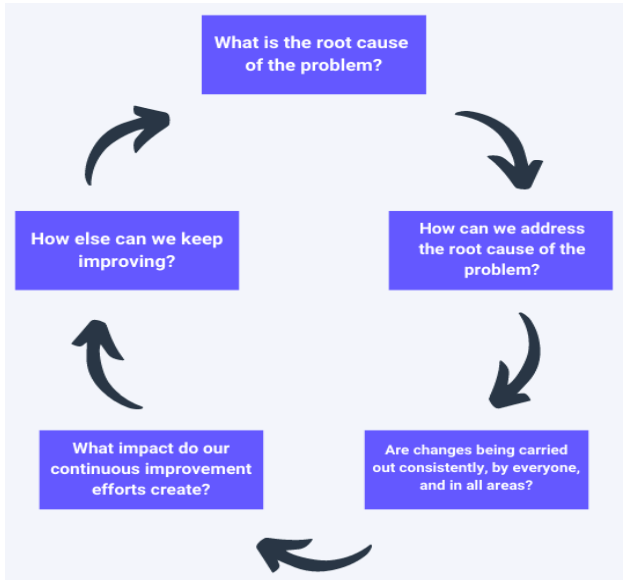
Phase II- Total Quality Improvement

A Coming Together of Various Methodologies

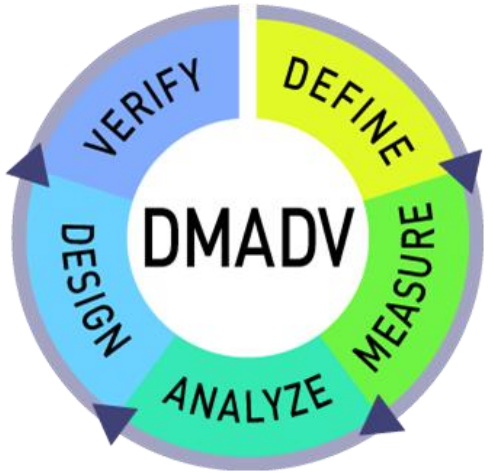


Continuous Improvement

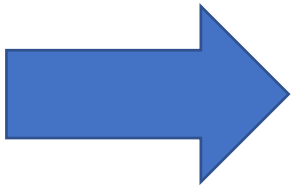
Lean

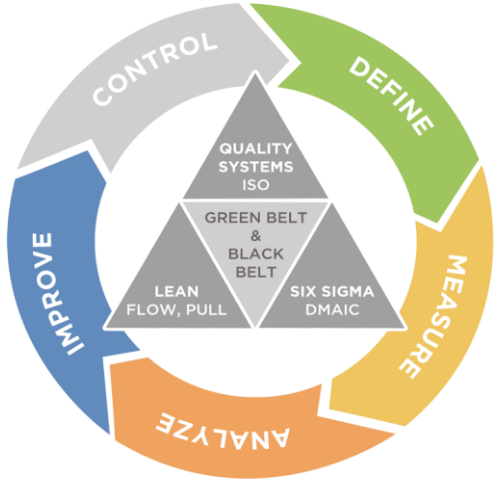


Kaizen Process



Six Sigma



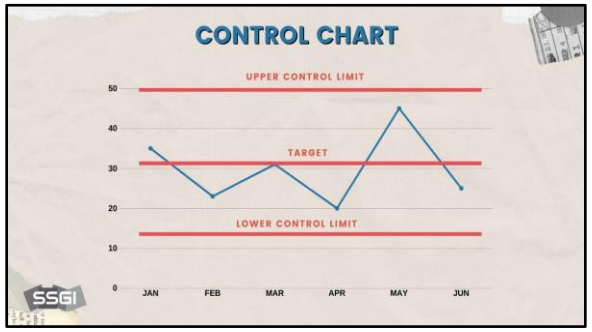


Lean/ Six Sigma

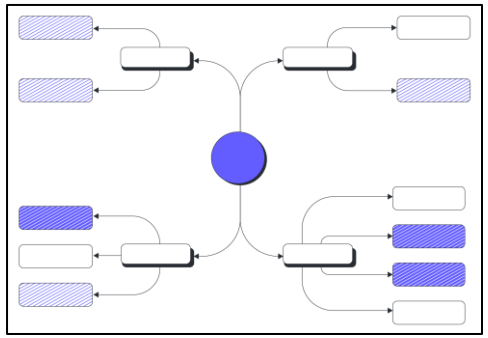
Phase II- Total Quality Improvement

Quality Improvement Tools

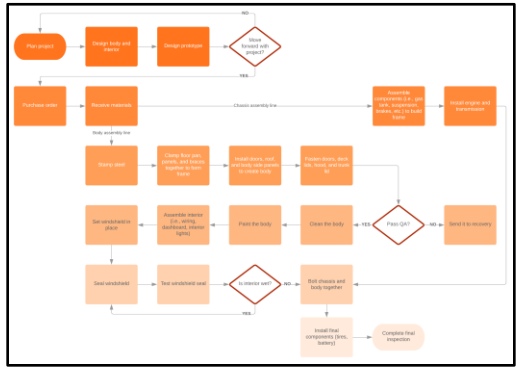
Control Chart

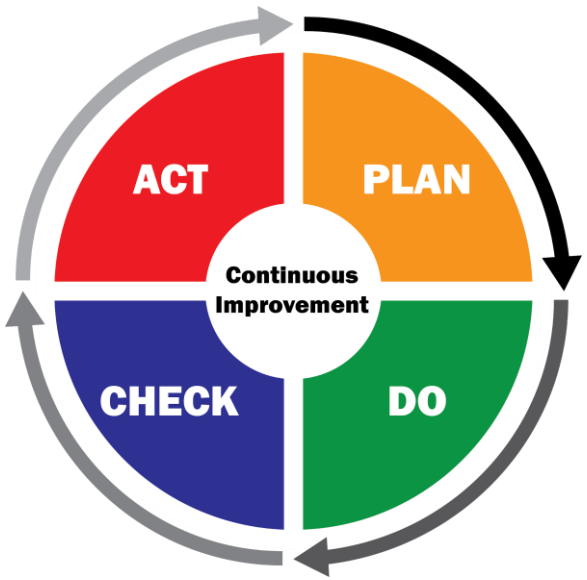


Brainstorming Tool

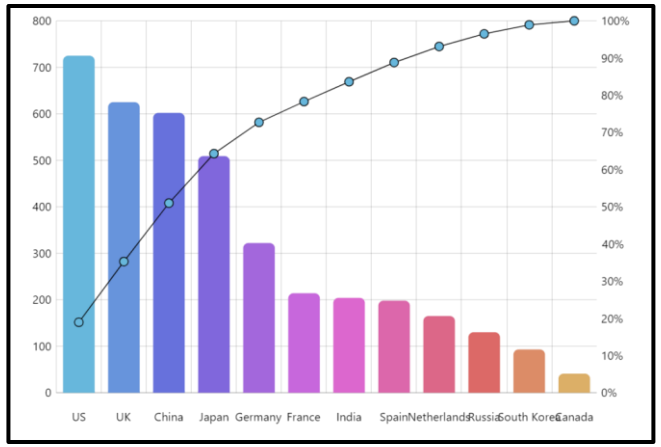


Process Chart

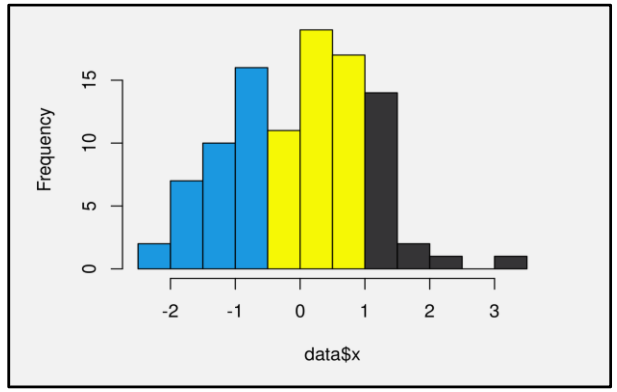




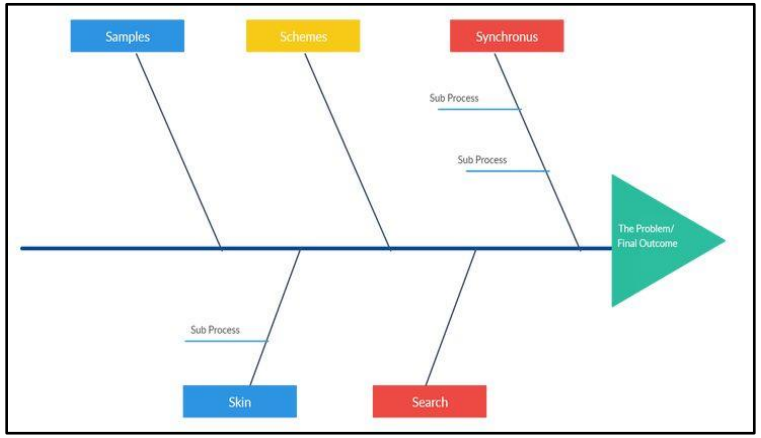
Pareto Chart



Histogram

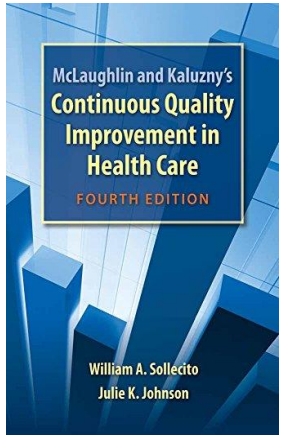


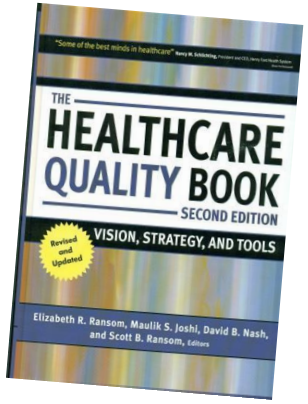
Fishbone Chart

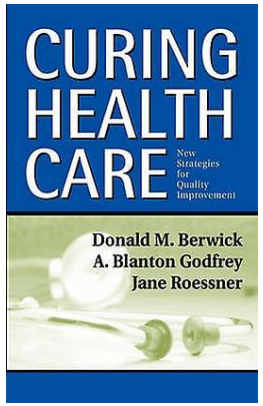


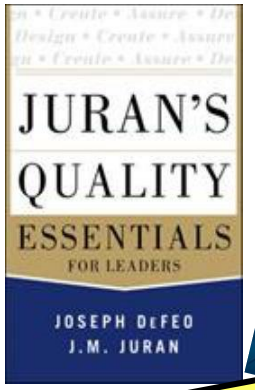
Phase II- Total Quality Improvement

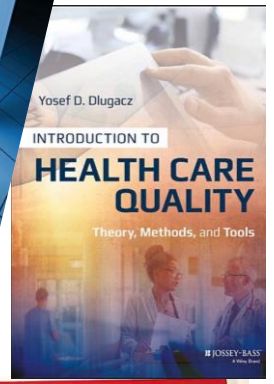
No Shortage of Reading Material

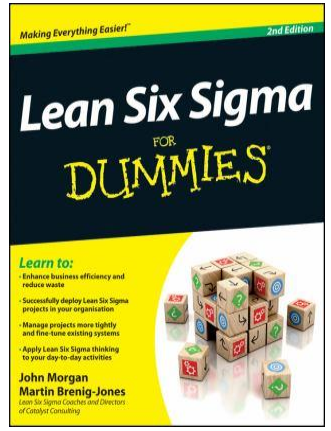




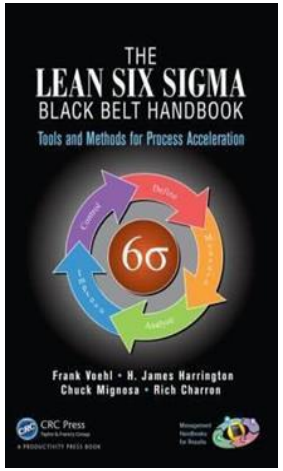


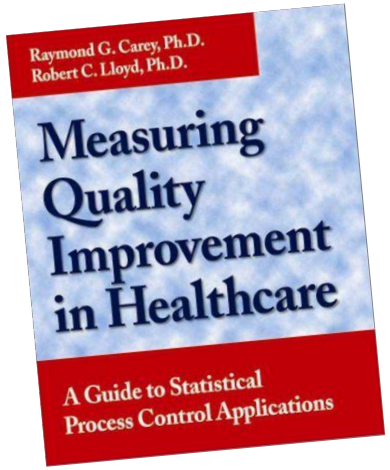


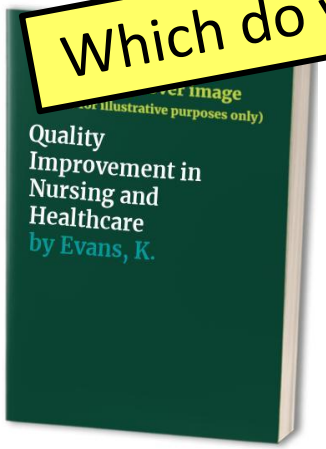


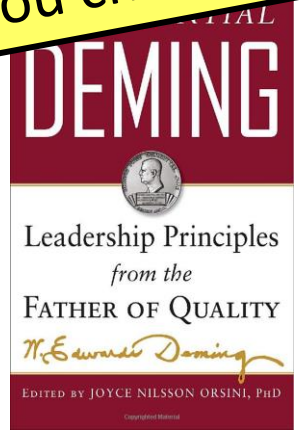


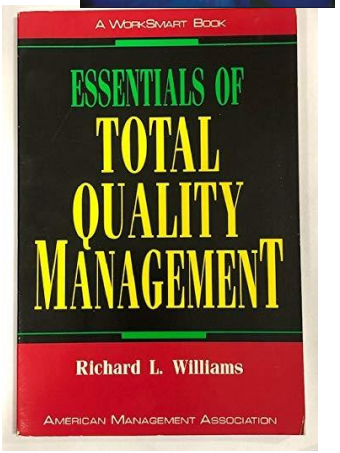
Which do you choose?

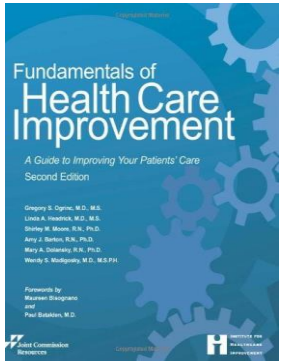












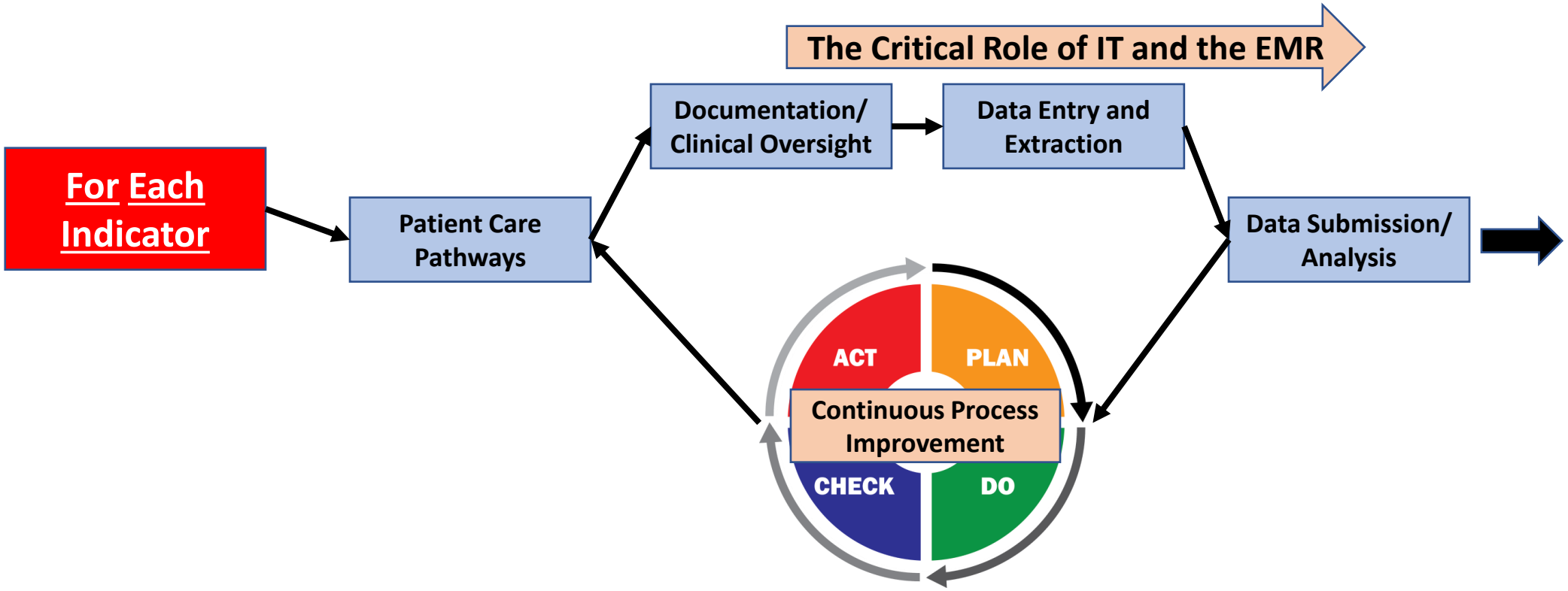
Phase II- Total Quality Improvement
Explosion of Indicators and Improvement Processes

From Quality Assurance to Total Quality Improvement

- The Indicators
- The Four Quality Processes/ Tools
- The “Cost” of Quality

Phase II- Total Quality Improvement

The Economic Impact of Indicators- The "Cost" of Quality

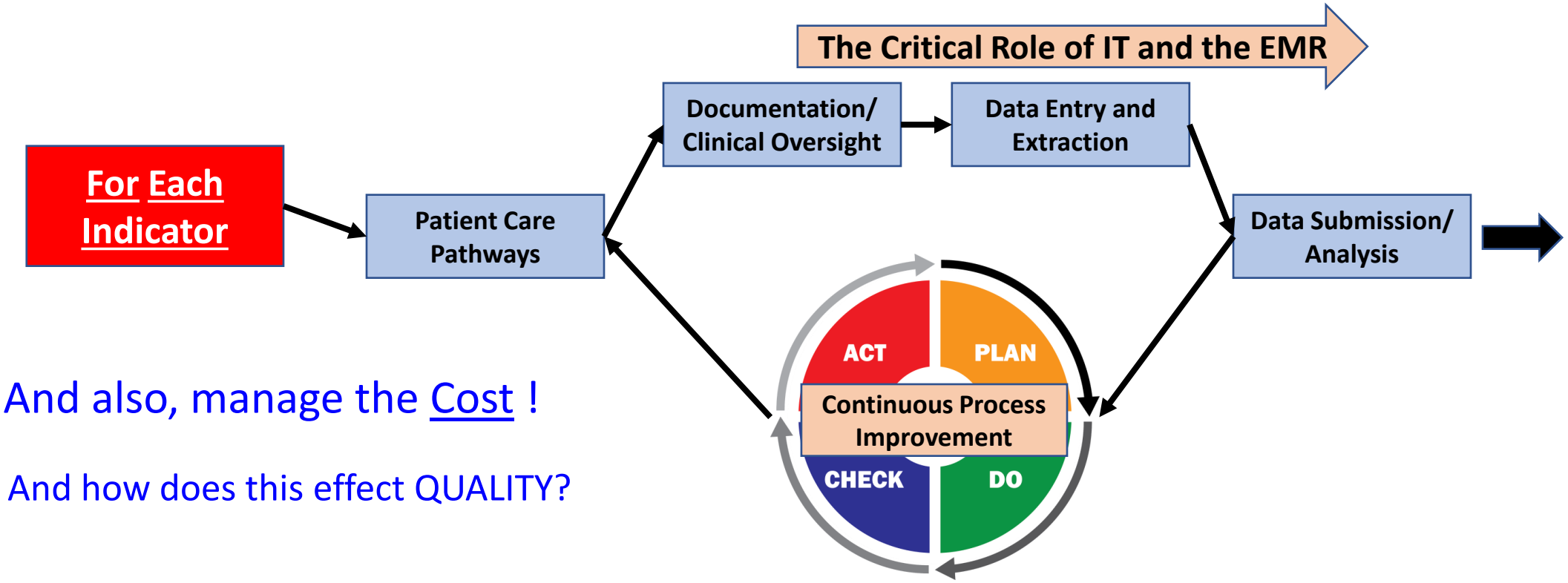


Staffing !, more staffing !!, and resources !!!

…and BURNOUT !!!!

Phase II- Total Quality Improvement

The Economic Impact of Indicators- The "Cost" of Quality



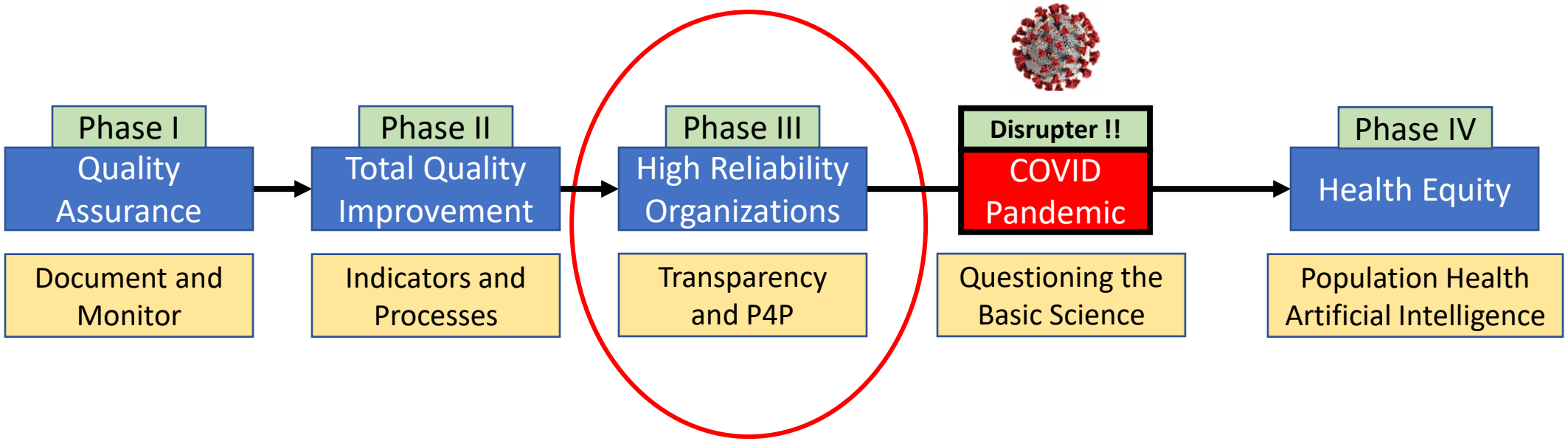
And also, manage the Cost !

And how does this effect QUALITY?

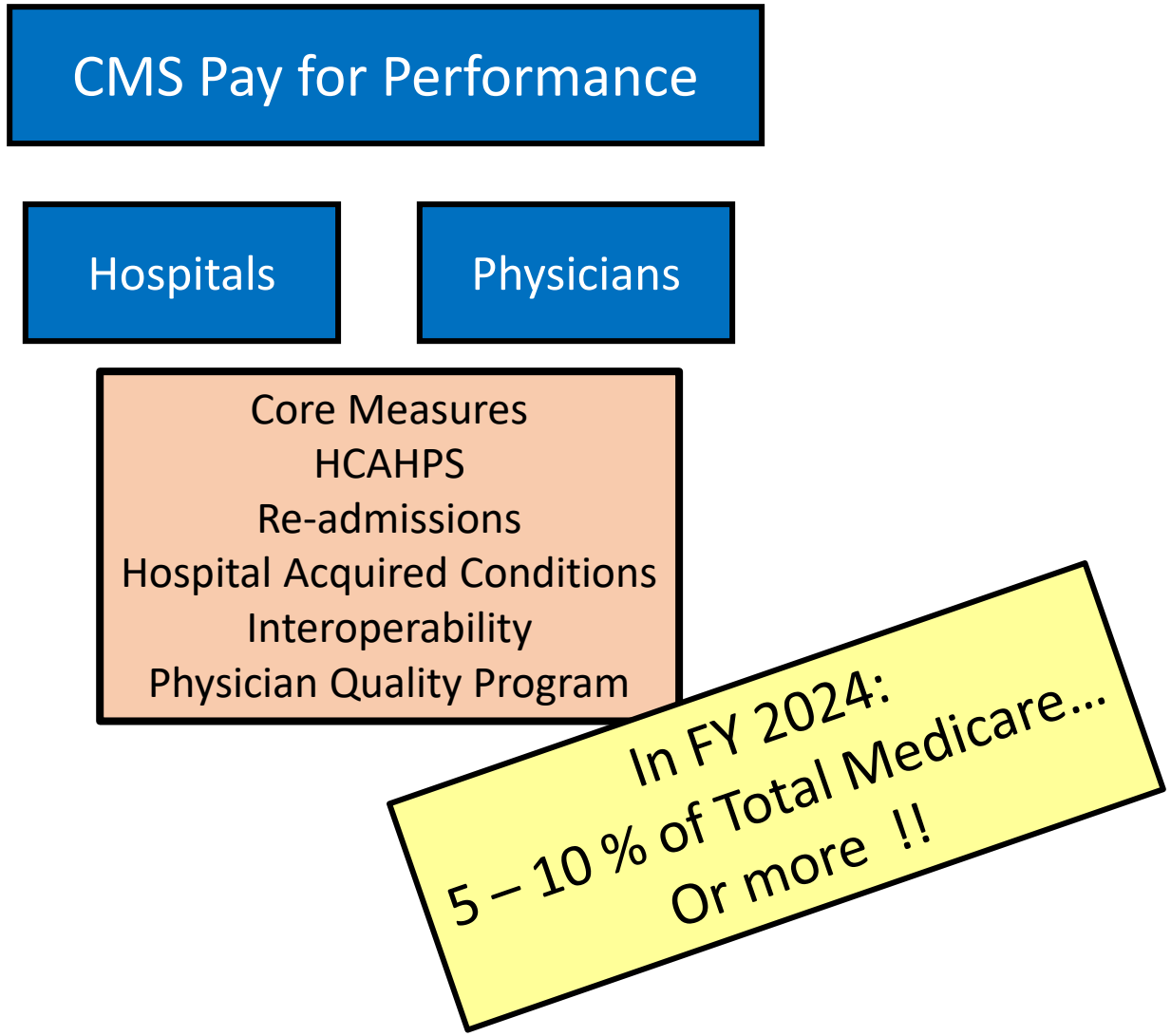
Staffing !, more staffing !!, and resources !!!

…and BURNOUT !!!!

The Phases of Quality Improvement in Health Care



Phase III- High Reliability Organizations
Pay for Performance and Transparency



Phase III- High Reliability Organizations
Public Data Sources

1. CMS Hospital Quality Star Rating

Rating:	Number	Percent
5 Stars-	429	13.9%
4 Stars-	890	28.8%
3 Stars-	890	28.8%
2 Stars-	692	22.4%
1 Star-	192	6.2%
Total Hospitals:	3,093	

2. The Leapfrog Hospital Safety Grade

Grade	%	Number
A	29%	844
B	28%	788
C	36%	1032
D	6%	184
F	.5%	14

3. The Medicare Advantage Star Rating

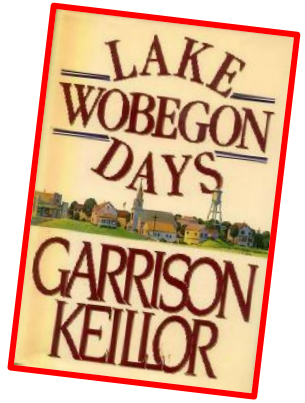
2023			
Stars	Number	%	% Enroll
5	57	11%	22%
4.5	67	13%	26%
4	136	27%	25%
3.5	116	23%	19%
3	90	18%	7%
2.5	37	7%	2%
2	4	1%	0%

4. Healthgrades and US News & World Report

Phase III- High Reliability Organizations
Pay for Performance and Transparency

Can all hospitals in the U.S. be in the top decile?

Can we all be 5-stars?



Does Public Data Improve Outcomes?

Read all about it !!

April 2005

Examples:

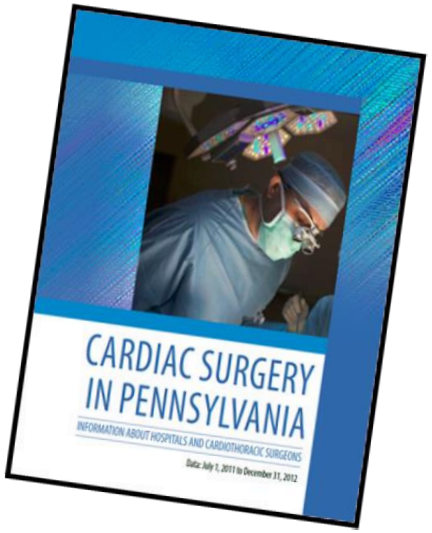
1. CABG Mortality, Pennsylvania
2. Beta Blocker indicator post MI

Does Public Data Improve Outcomes?

1. CABG Mortality Pennsylvania

2011- 2012

Released: November 2013



Hospital Data

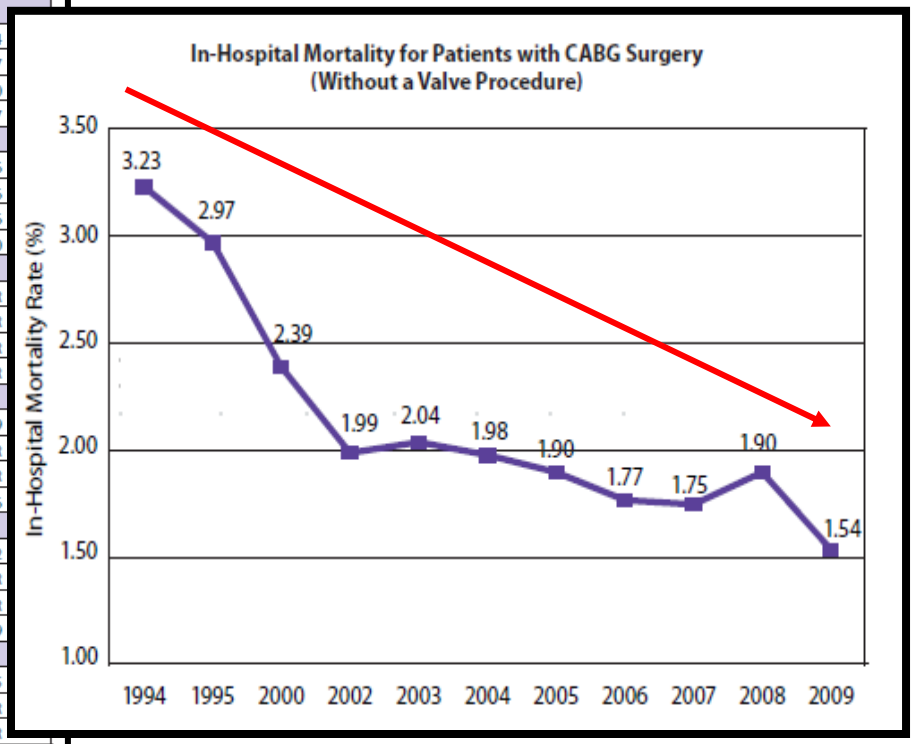
Hospital Data 2008-2009 (Two Years Combined)

	Number of Cases			Mortality		Readmissi	
	2008	2009	Total	In-Hospital	30-Day	7-Day	30
Statewide							
CABG without Valve	10,099	9,591	19,690	1.7%	2.2%	5.8%	1
Valve without CABG	3,162	3,365	6,527	2.7%	3.0%	7.1%	1
Valve with CABG	2,370	2,369	4,739	5.4%	6.5%	9.2%	2
Total Valve	5,532	5,734	11,266	3.9%	4.5%	8.0%	1
Abington Memorial							
CABG without Valve	111	142	253	⊙	⊙	⊙	
Valve without CABG	98	80	178	●	●	⊙	
Valve with CABG	28	15	43	⊙	⊙	⊙	
Total Valve	126	95	221	●	●	⊙	
Albert Einstein							
CABG without Valve	68	66	134	⊙	⊙	⊙	
Valve without CABG	17	11	28	NR	NR	NR	
Valve with CABG	9	13	22	NR	NR	NR	
Total Valve	26	24	50	⊙	⊙	⊙	
Allegheny General							
CABG without Valve	245	219	464	⊙	⊙	⊙	
Valve without CABG	142	130	272	⊙	⊙	⊙	
Valve with CABG	57	69	126	⊙	⊙	⊙	
Total Valve	199	199	398	⊙	⊙	⊙	
Altoona Regional							
CABG without Valve	122	116	238	⊙	⊙	●	
Valve without CABG	41	59	100	⊙	⊙	⊙	
Valve with CABG	31	50	81	○	⊙	⊙	
Total Valve	72	109	181	○	⊙	⊙	
Aria Health							
CABG without Valve	202	183	385	●	●	⊙	
Valve without CABG	14	15	29	NR	NR	NR	
Valve with CABG	36	30	66	⊙	⊙	●	
Total Valve	50	45	95	⊙	⊙	●	

Surgeon Data

Surgeon Data 2008-2009 (Two Years Combined)

	Number of Cases			Mortality		Readmissions		Post-Surgical Length of Stay
	2008	2009	Total	In-Hospital	30-Day	7-Day	30-Day	
Myers, John L.								
CABG without Valve	0	0	0	NR	NR	NR	NR	NR
Valve without CABG	0	2	2	NR	NR	NR	NR	NR
Valve with CABG	0	0	0	NR	NR	NR	NR	NR
Total Valve	0	2	2	NR	NR	NR	NR	NR
Navid, Forozan								
CABG without Valve	74	89	163	⊙	⊙	●	●	6.4
Valve without CABG	16	18	34	⊙	⊙	NR	NR	7.7
Valve with CABG	17	28	45	●	●	⊙	●	10.0
Total Valve	33	46	79	●	●	⊙	⊙	8.7
Nixon, Todd E.								
CABG without Valve	93	96	189	⊙	⊙	●	●	4.6
Valve without CABG	23	21	44	⊙	⊙	⊙	⊙	6.6
Valve with CABG	29	22	51	⊙	⊙	⊙	⊙	7.6
Total Valve	52	43	95	⊙	⊙	⊙	⊙	7.0
Nunez, Anthony I.								
CABG without Valve	0	15	15	NR	NR	NR	NR	NR
Valve without CABG	0	4	4	NR	NR	NR	NR	NR
Valve with CABG	0	0	0	NR	NR	NR	NR	NR
Total Valve	0	4	4	NR	NR	NR	NR	NR
Nutting, Ron D.								
CABG without Valve	52	54	106	⊙	⊙	⊙	⊙	5.9
Valve without CABG	15	7	22	NR	NR	NR	NR	NR
Valve with CABG	6	11	17	NR	NR	NR	NR	NR
Total Valve	21	18	39	⊙	⊙	⊙	⊙	7.6
Olenchock Jr., Stephen A.								
CABG without Valve	30	53	83	⊙	⊙	⊙	⊙	5.2
Valve without CABG	13	16	29	NR	NR	NR	NR	NR
Valve with CABG	6	17	23	NR	NR	NR	NR	NR
Total Valve	19	33	52	⊙	⊙	⊙	⊙	6.9
Osevala, Mark A.								
CABG without Valve	170	144	314	⊙	⊙	⊙	⊙	5.5
Valve without CABG	11	12	23	NR	NR	NR	NR	NR
Valve with CABG	9	15	24	NR	NR	NR	NR	NR
Total Valve	20	27	47	⊙	●	⊙	⊙	6.8



Does Public Data Improve Outcomes?

2. Beta blockers post-MI

1981- The Beginning

…the landmark publications

The NEW ENGLAND JOURNAL of MEDICINE

April 2,1981- The Norwegian study showed that when beta-blockers are given after an acute MI, the mortality rate and rate of re-infarction was reduced by over **40%**.

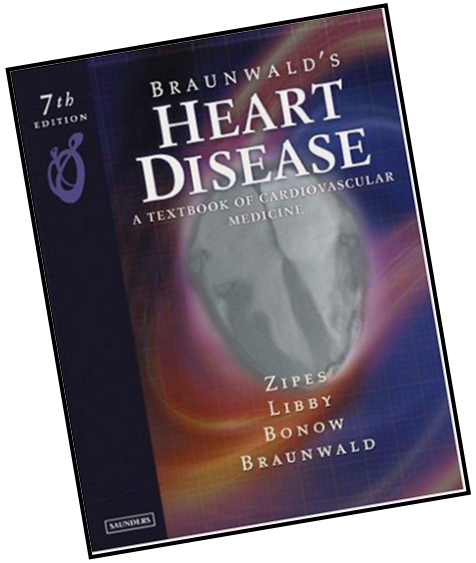
JAMA
The Journal of the American Medical Association

March 26,1982- The BHAT study showed similar results. The study was stopped prematurely due to the strength of the data.

1984- The Evidence is Disseminated

…3 years after the landmark publications

1984- Beta-blocker recommendations are included in the Braunwald's Heart Disease- a Textbook of Cardiovascular Medicine



1996, 1997- Tracking of Performance

…15 years after the landmark publications

1996- NCQA/ HEDIS begins tracking “beta-blockers after acute MI”

The ACC published guidelines for acute MI which include the use of beta-blockers

1997- JCAHO/ORYX adds beta blocker as an indicator

NCQA Measuring quality. Improving health care.

AMERICAN COLLEGE of CARDIOLOGY

Joint Commission on Accreditation of Healthcare Organizations

1998- Effective with Relative Contraindications

…17 years after the landmark publications

The New England
Journal of Medicine

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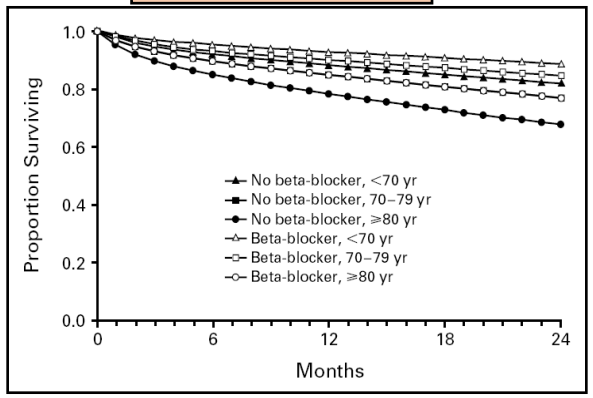
VOLUME 339 AUGUST 20, 1998 NUMBER 8

EFFECT OF BETA-BLOCKADE ON MORTALITY AMONG HIGH-RISK AND LOW-RISK PATIENTS AFTER MYOCARDIAL INFARCTION

STEPHEN S. GOTTLIEB, M.D., ROBERT J. MCCARTER, SC.D., AND ROBERT A. VOGEL, M.D.

Patients by Age



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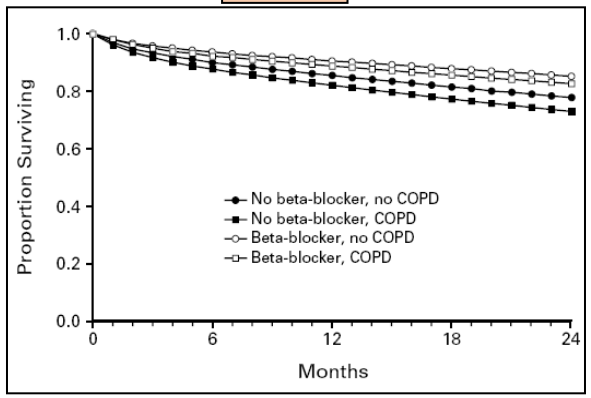
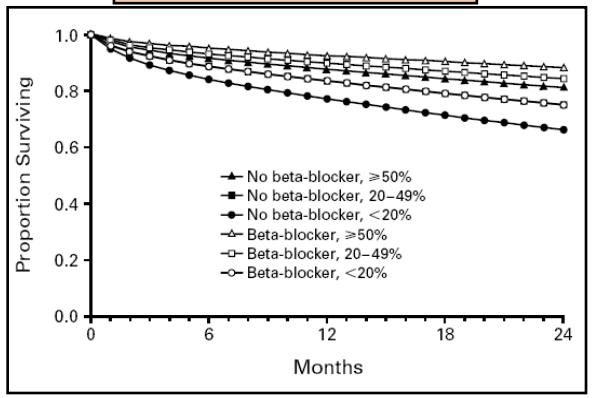
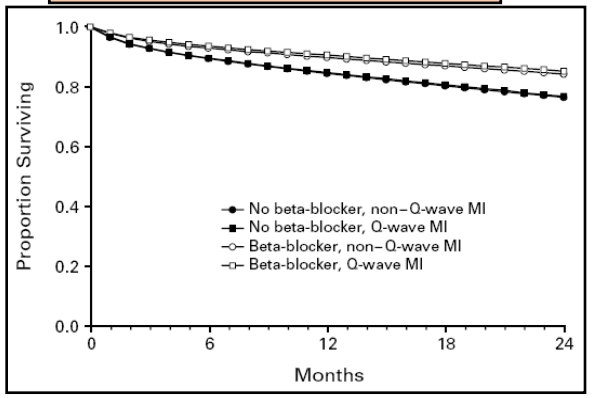


Low Ejection Fraction



Q Wave vs Non-Q Wave MI



2001- Public Tracking of Performance

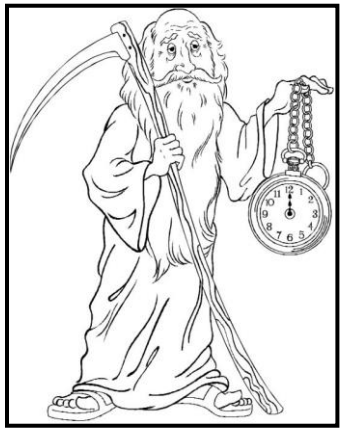
…20 years after the landmark publications

2001- CMS adds “beta-blockers after discharge” to its publicly reported Core Measures

2007- Retirement of the Indicator

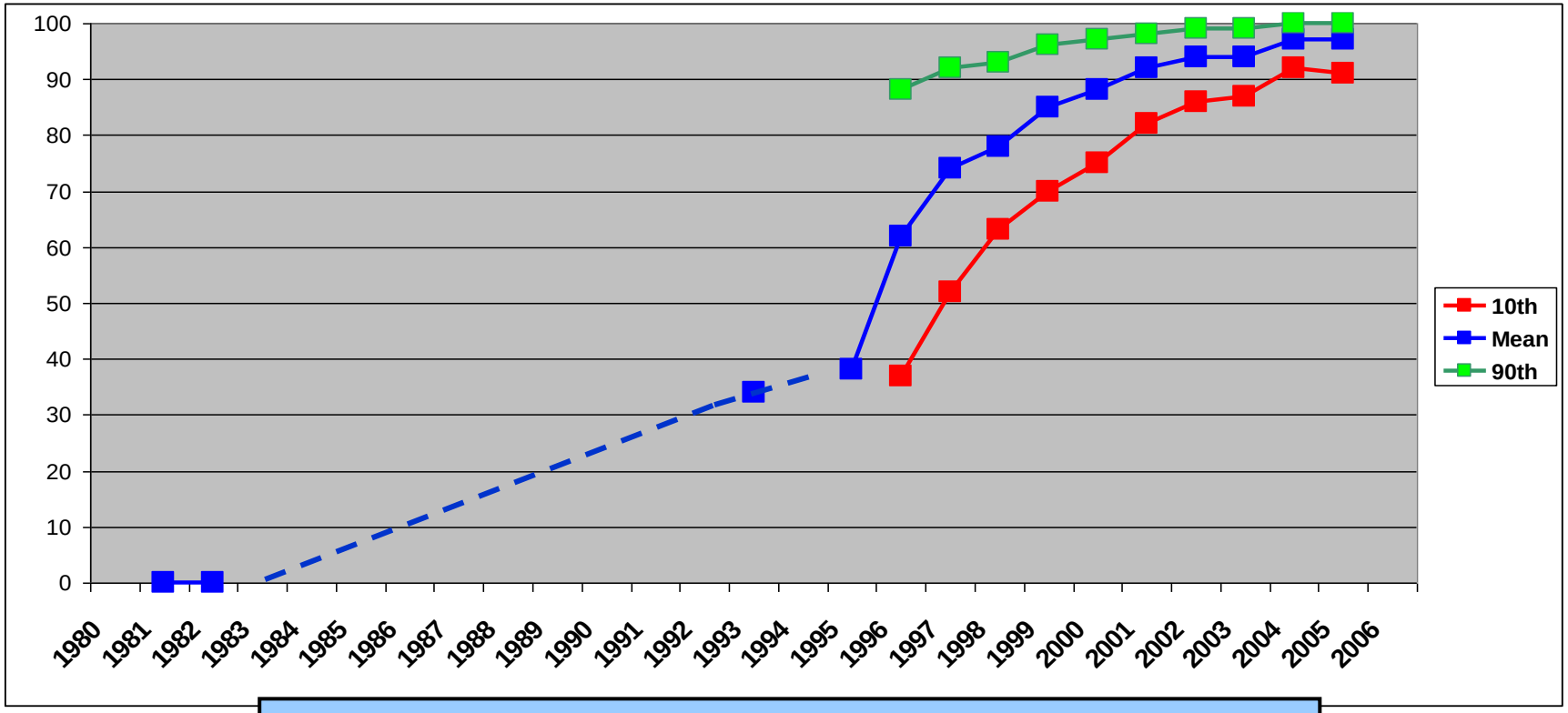
…26 years after the landmark publications

May 8, 2007- NCQA decides to retire "Beta Blocker within 7 days of discharge in acute MI" after determining it no longer differentiates amongst health plans and is no longer needed



Beta Blockers after Myocardial Infarction

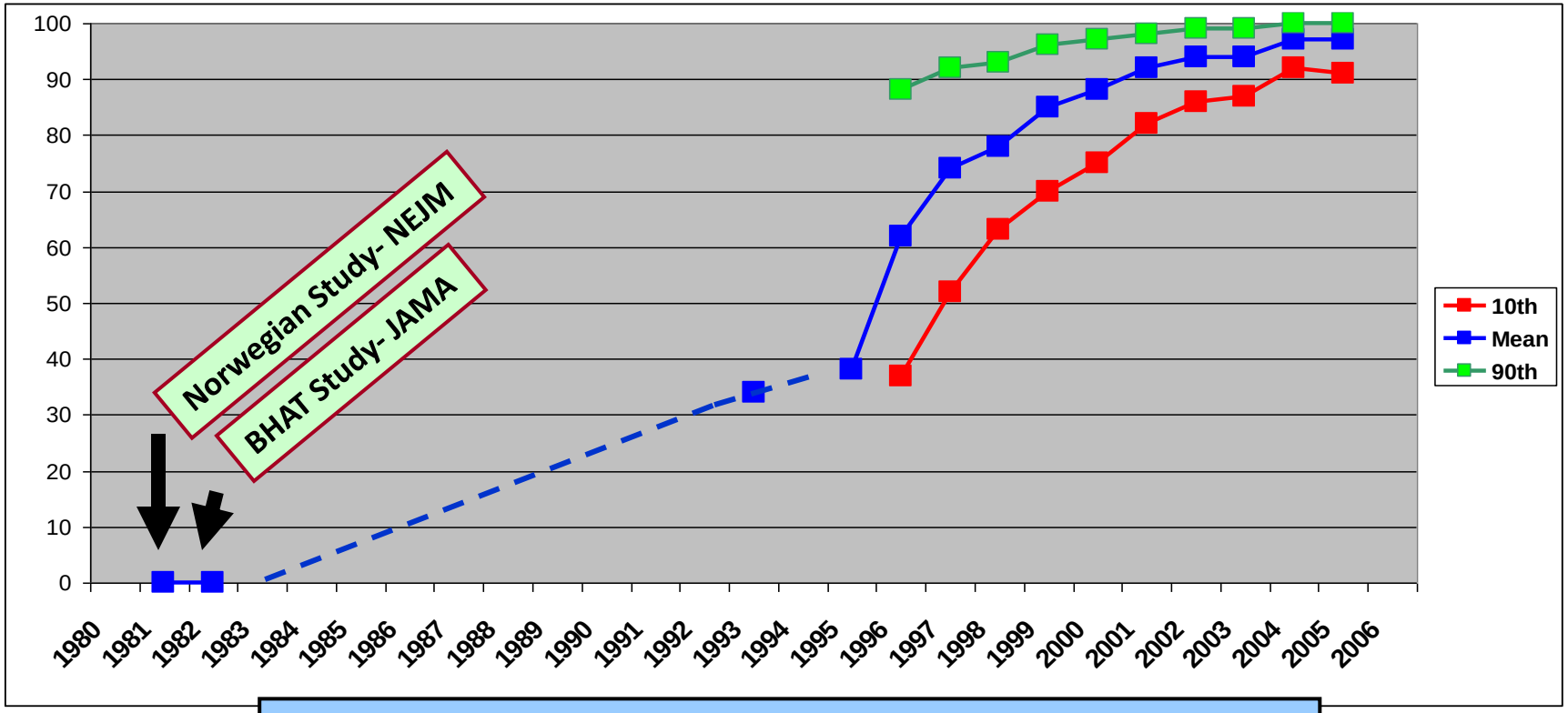
Clinical Compliance Over Time



Percent of Patients with Acute MI Discharged on a Beta Blocker

Beta Blockers after Myocardial Infarction

Clinical Compliance Over Time



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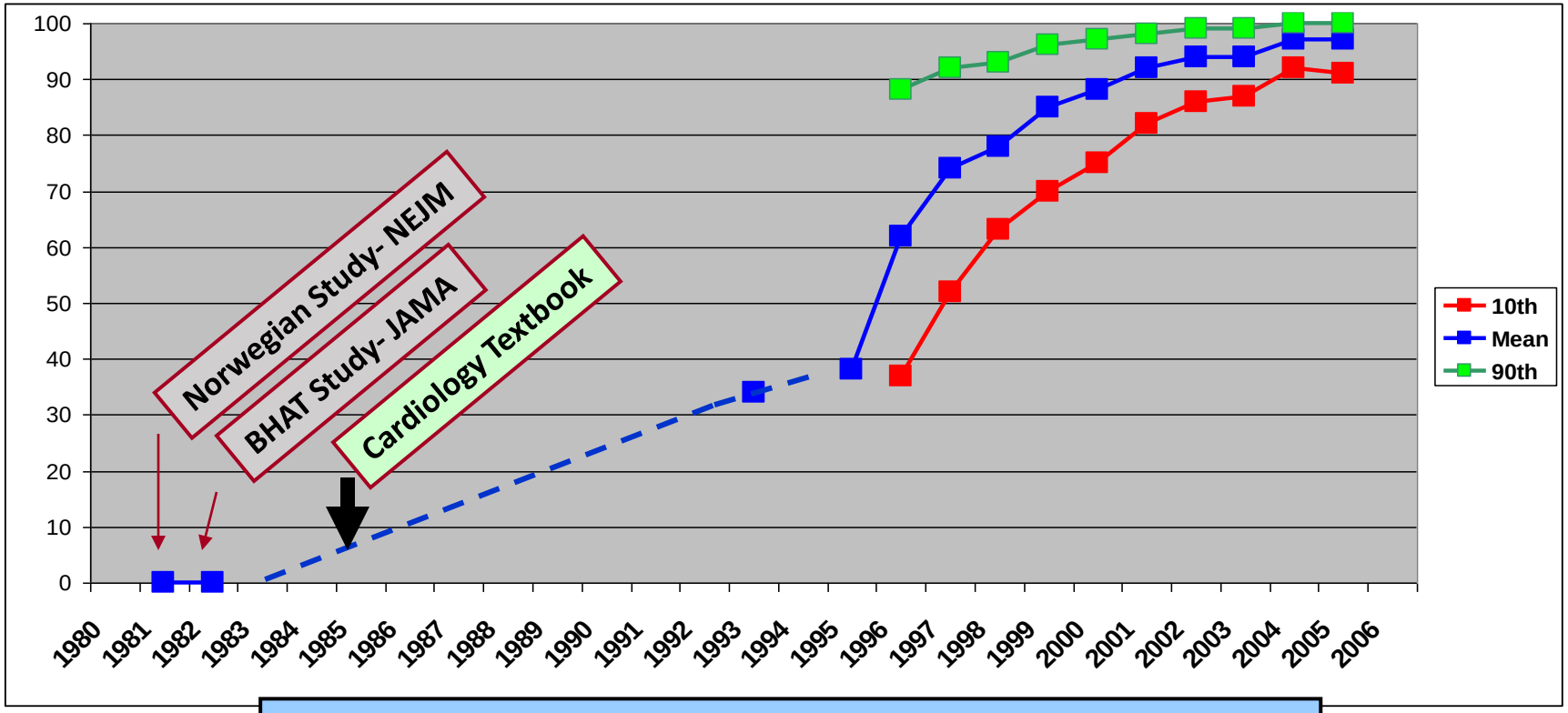

Percent of Patients with Acute MI Discharged on a Beta Blocker

Beta Blockers after Myocardial Infarction

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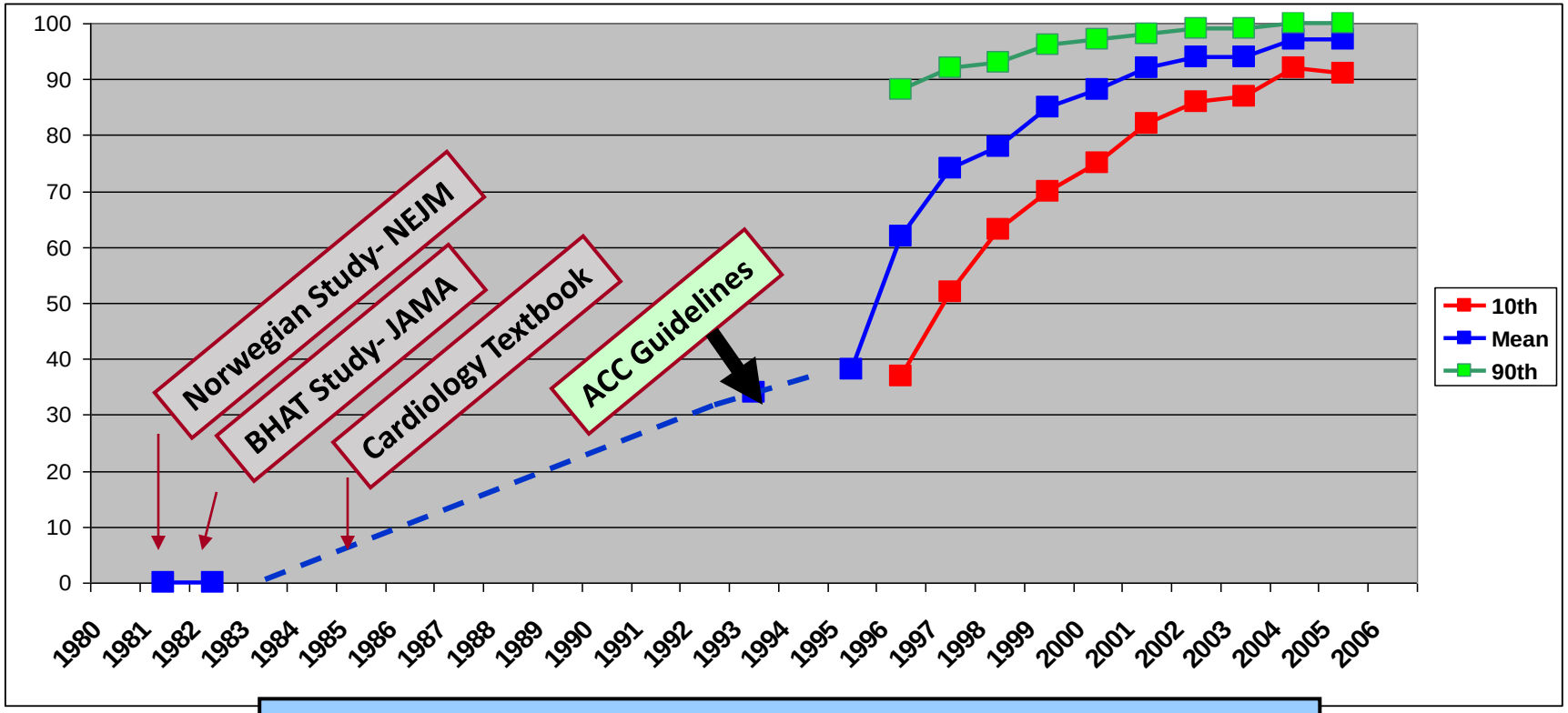
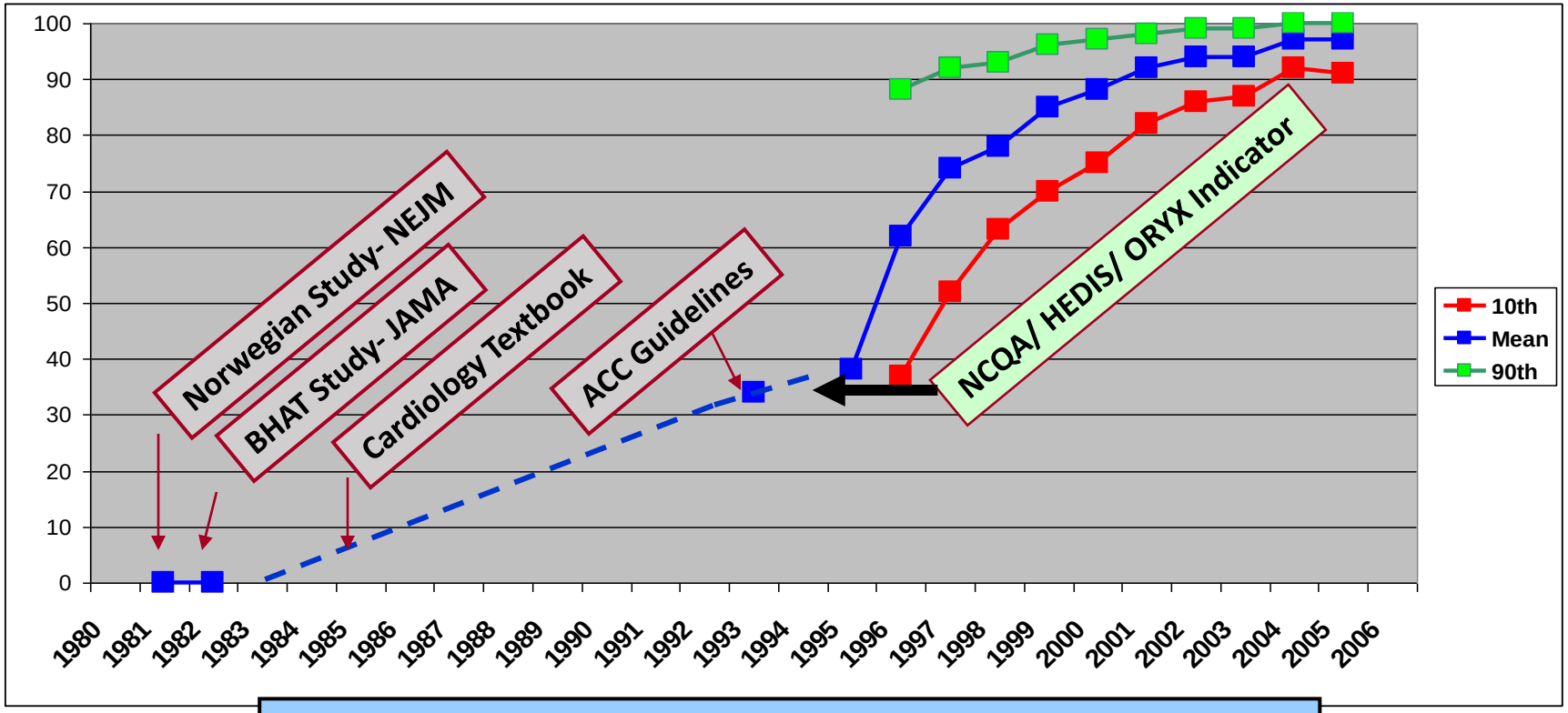


Percent of Patients with Acute MI Discharged on a Beta Blocker

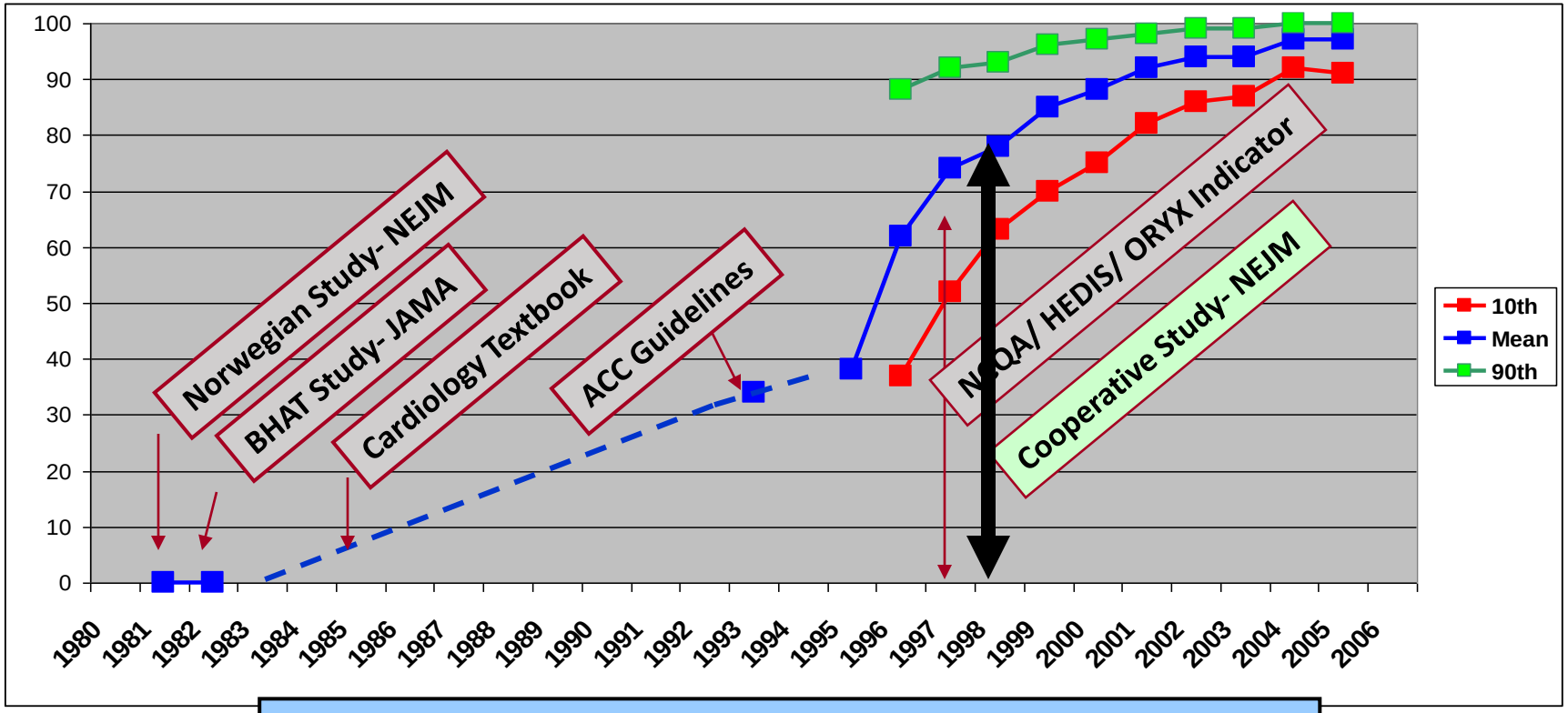
Beta Blockers after Myocardial Infarction

Clinical Compliance Over Time



Beta Blockers after Myocardial Infarction

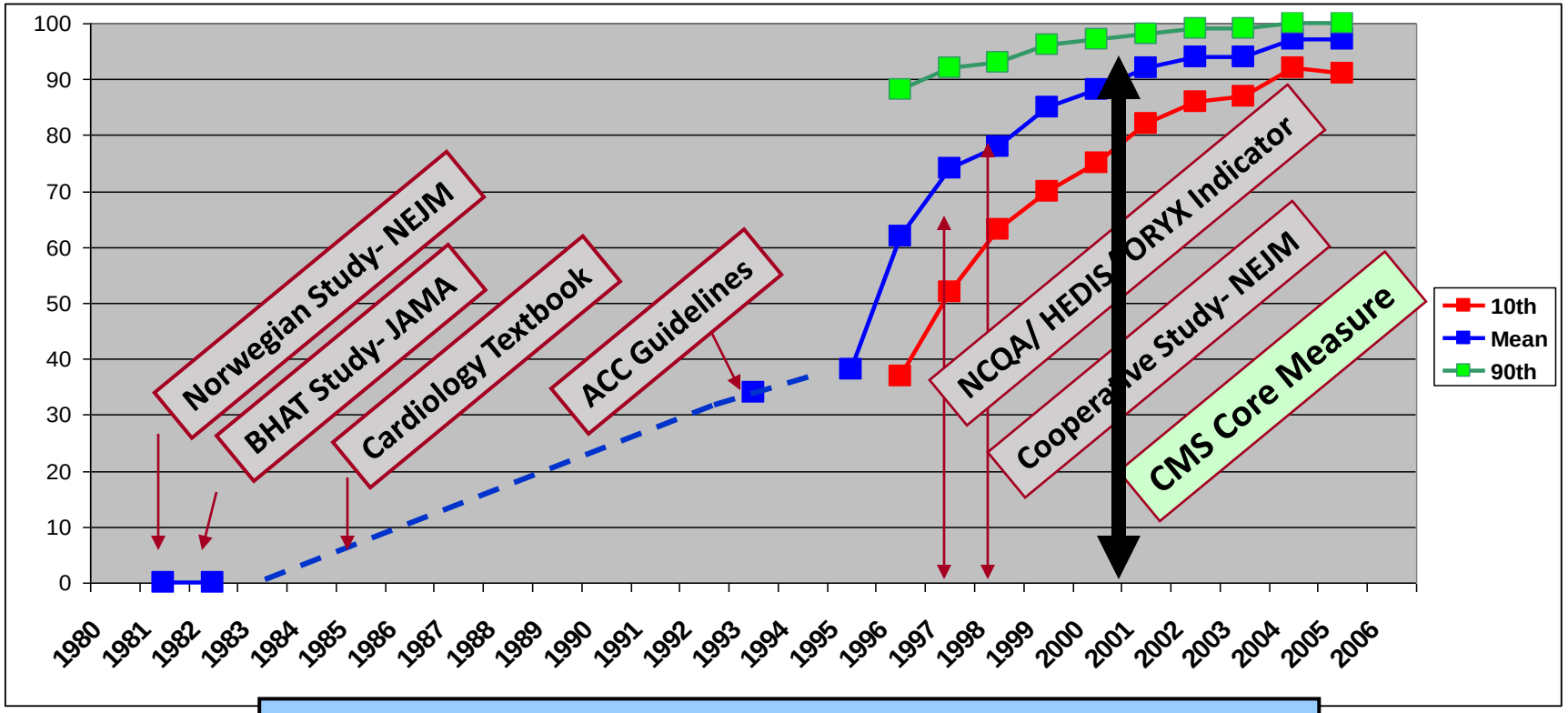
Clinical Compliance Over Time



Percent of Patients with Acute MI Discharged on a Beta Blocker

Beta Blockers after Myocardial Infarction

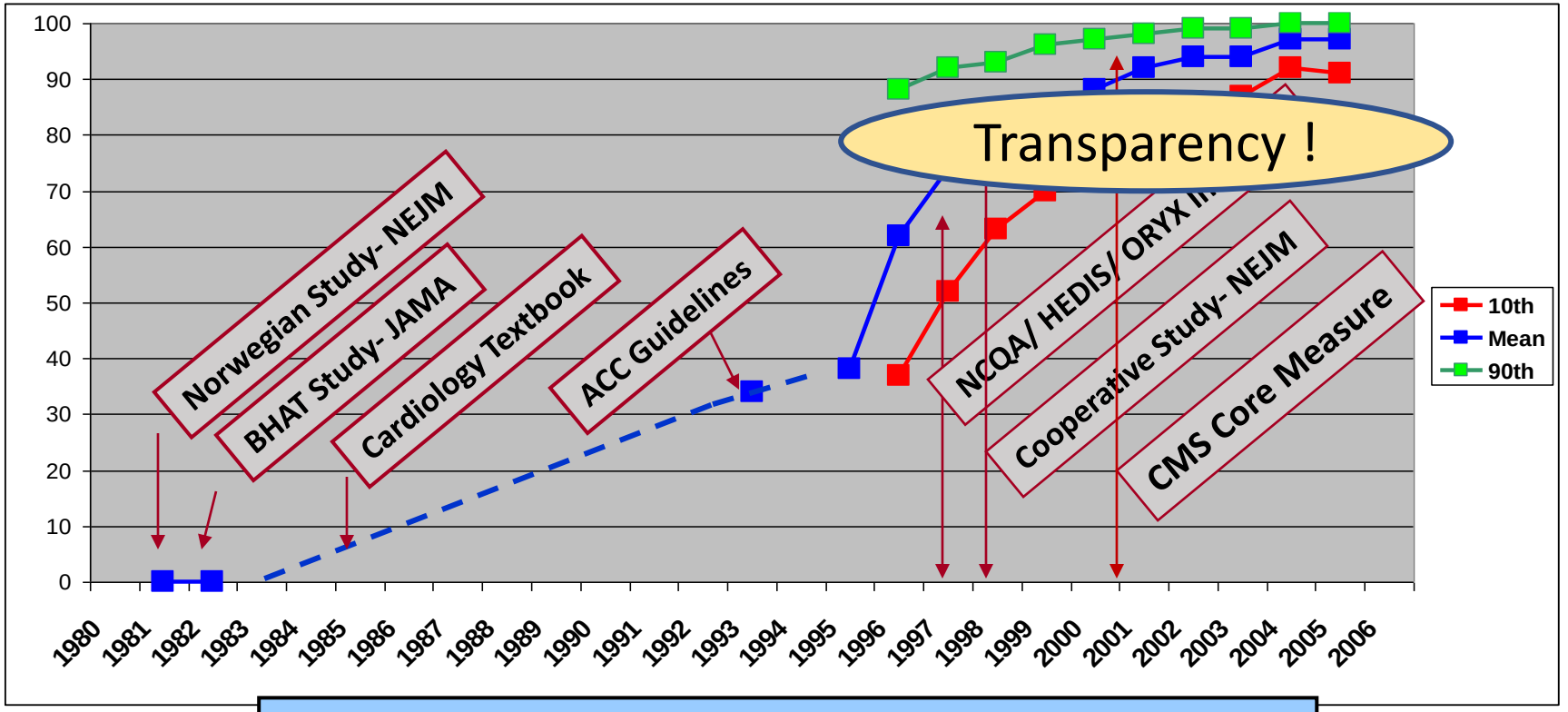
Clinical Compliance Over Time



Percent of Patients with Acute MI Discharged on a Beta Blocker

Beta Blockers after Myocardial Infarction

Clinical Compliance Over Time



Percent of Patients with Acute MI Discharged on a Beta Blocker

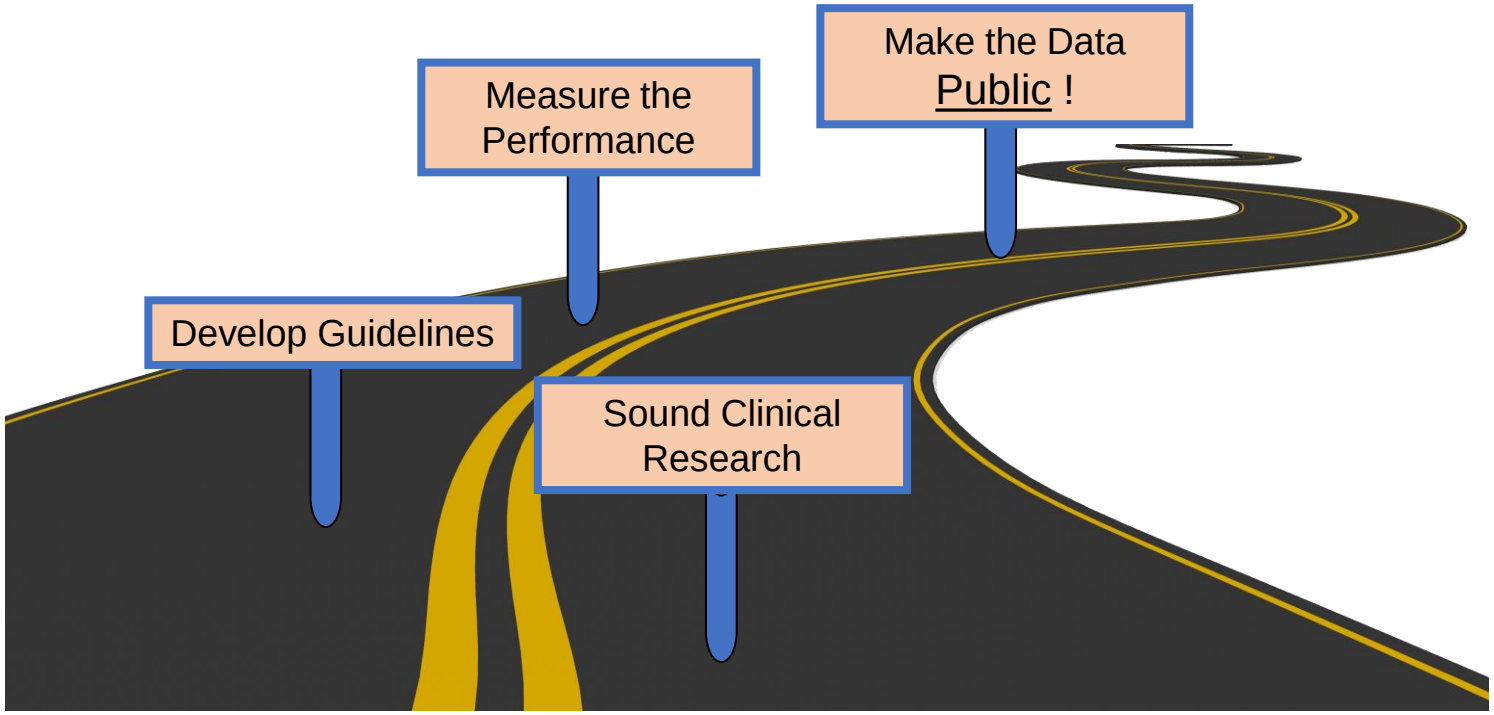
Beta Blockers after Myocardial Infarction

Lessons Learned !

- The length of time from the initial study until compliance and retirement was 26 years !!
- Sound clinical research and even a medical textbook were not sufficient. Neither resulted in significant physician practice change
- Publication of guidelines had a positive effect on physician compliance
- Measuring the performance publicly was the important motivator for change

Does Making Data Public Improve Outcomes?

How to Speed up the Process



That which is measured, tends to improve.
That which is measured publicly, tends to improve faster.

Judith Hibbard, Health Affairs, 2003

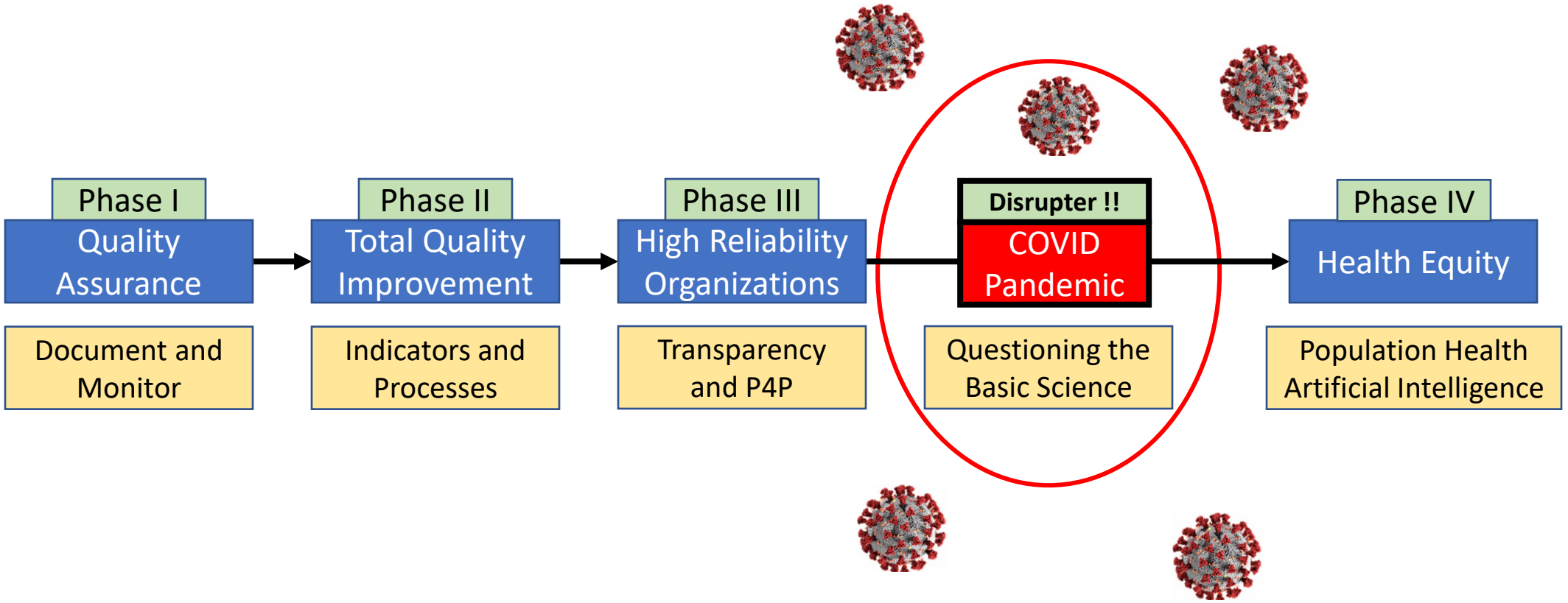
Does Making Data Public Improve Outcomes?

If the other guy's getting better, then you'd better be getting better faster than that other guy's getting better…

…Or you're getting worse.

Tom Peters

The Phases of Quality Improvement in Health Care



The Disrupter! - The Influence of a Pandemic

Questioning the Basic Science

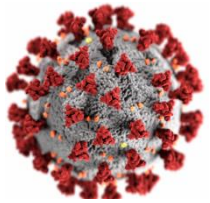
1. The four dimensions of decision-making

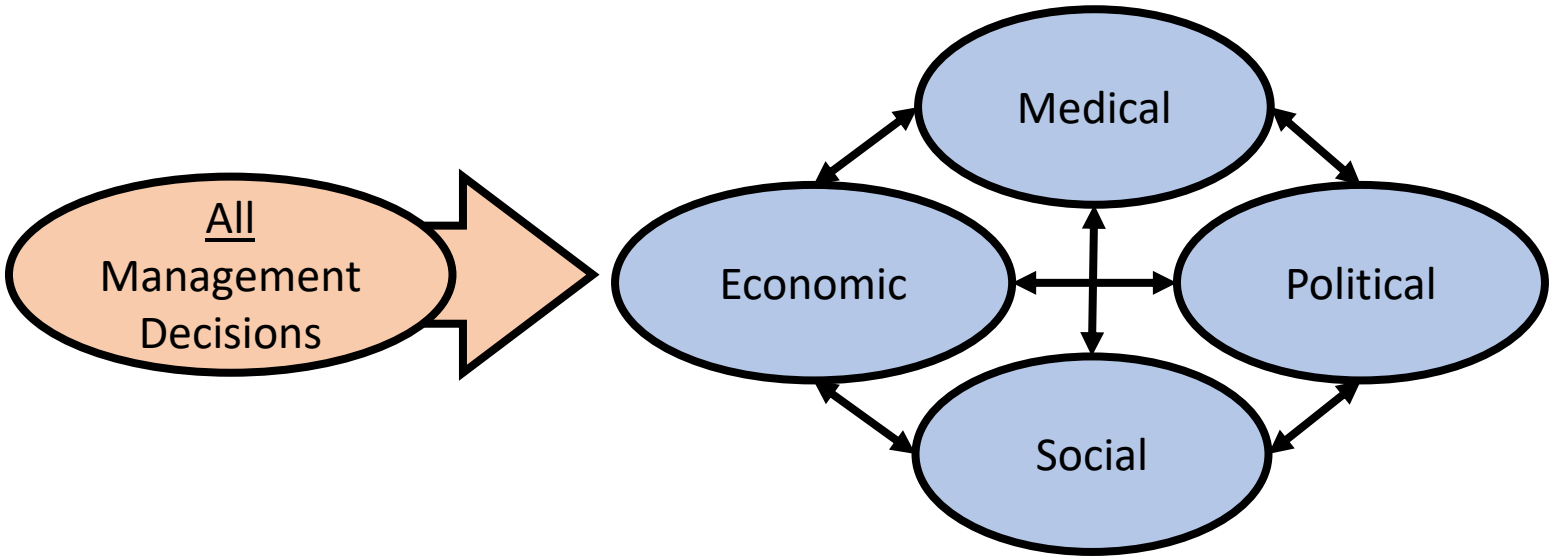
2. Differentiating science from scientific opinion

The Disrupter! - The Influence of a Pandemic

Questioning the Basic Science

1. The four dimensions of decision-making



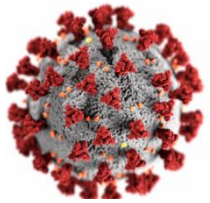


These four dimensions will often be in conflict

The Disrupter! - The Influence of a Pandemic

Questioning the Basic Science

2. Differentiating science from scientific opinion



"Following the Science"

Scientific Observation	→	Expert Opinion	→	Leadership Policy
Objective facts may change with future observations		Subjective "experts" may disagree		Subjective/ Political takes input of multiple experts

Ultracrepidarianism…

The habit of giving opinions and advice on matters outside of one's knowledge.
Giving opinions and advice about things a person knows nothing about.

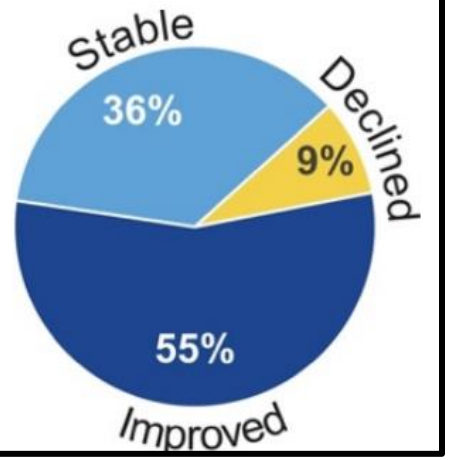
National Impact Assessment- CMS 2021

So, how did we do?

Measure Performance Trends

336 measures with ≥ 3 years of data from 2013 to 2018 were analyzed.
See Appendix E for analytic results for all measures.

91% of the analyzed measures had
improved or stable performance.



The Good News…

…We improved the great majority of the indicators

Enter… Four Landmark Game-Changing Publications

…Again !!

2016- BMJ- Top Three Causes of Death in the USA- 2013

1. Heart Disease- 611,105
2. Cancer- 584,881
3. Medical errors!- 251,454

Makary, BMJ 2016

2023- CDC

- 2-year decline in US life expectancy between 2019-2021

2023- CDC

- 2-year rise in maternal mortality between 2019-2021

2023- NEJM The Safety of Inpatient Health Care

- At least one adverse event in 23.6% admissions
- 22.7% felt to be preventable
- A preventable event occurred in 6.8% of all admissions

Bates, NEJM, Jan 12, 2023

The Future of Quality- Have We Come Full Circle?
Where are We Now?

The Good:

- We have developed excellent processes for data collection and improvement
- We have improved the great majority of indicators
- Our hospitals are safer than ever before– and we can prove it!

The Bad:

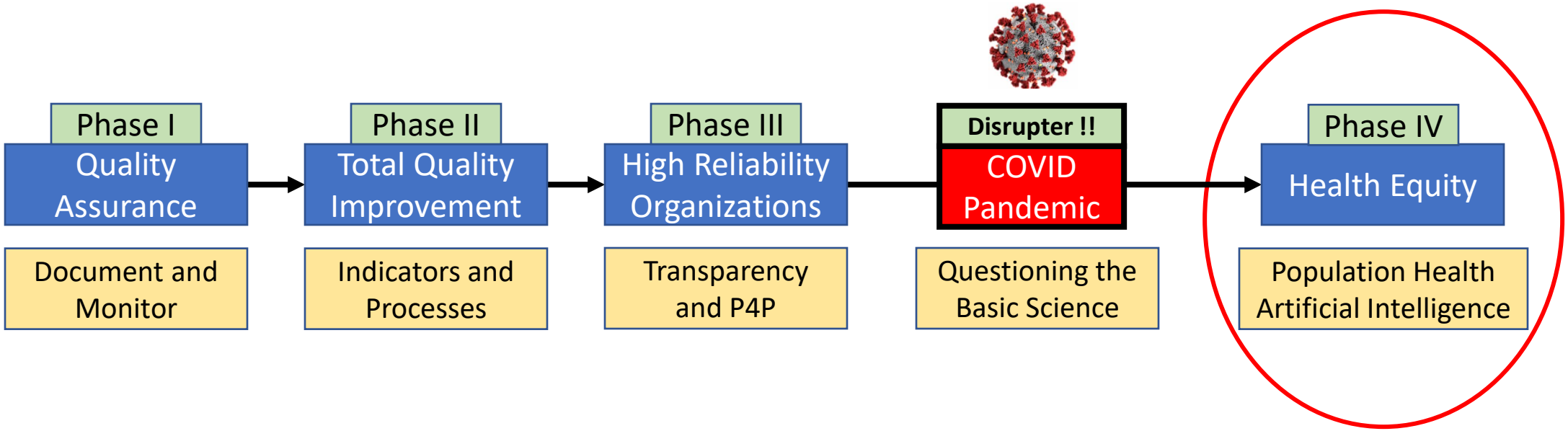
- These efforts have come with a gigantic cost in staffing FTEs/ resources
- There is huge and increasing demand put on the EMR/ Information Systems
- We may have hit the indicators, but we have not achieved the desired quality result?

The Ugly:

- Major health outcomes have not improved, some have gotten worse
  - Overall US mortality
  - Maternal mortality
  - Vaccination rates
  - Drug overdoses
  - Access to care

Not just COVID!

The Phases of Quality Improvement in Health Care



Phase IV- The Future of Quality- Achieving Health Equity

Achieving Population Health through Artificial Intelligence

At the health care system level:

1. Go back to the basics- master the processes
2. Optimize pay for performance

At the health care policy level:

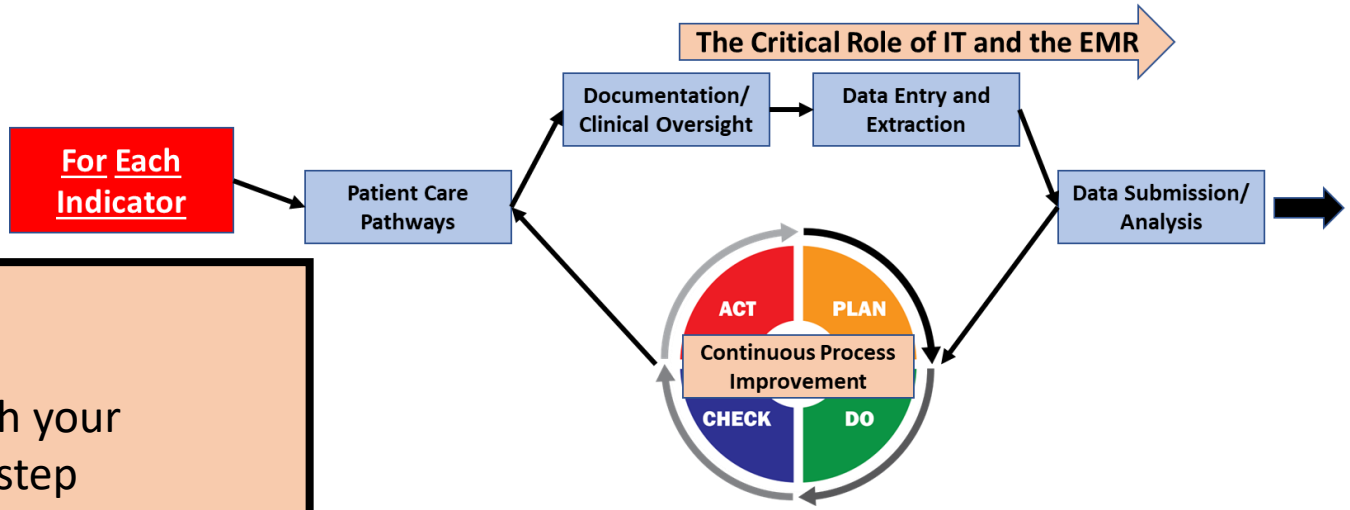
3. Establish quality indicators earlier in the timeline of disease
4. Align the quality improvement process with health equity

At ALL Levels of Health Care

5. Partner with artificial intelligence

1. Get Back to the Basics

Master the Processes



Challenges for 2024 and Beyond

Master the improvement methodology with which your organization is most comfortable- optimize each step

Develop a robust data analysis process with medical team

The role of IT is critical to mechanize and simplify the process. Staffing resources are precious. COST management is king!

Improve interoperability and automation- minimize staff and resources

Staffing !, more staffing !!, and resources !!!

…and BURNOUT !!!!

2. Optimize Pay for Performance

Your Organization/ Payors/ Tie to Reimbursement

How you define and manage quality

- Health System Quality Dashboard

How payors/employers define and manage quality

- Hospital Quality Star Rating (CMS)
- eapfrog Hospital afety Grade

How quality effects reimbursement	Potential Medicare Dollars At Risk
Value Based Purchasing (VBP)	-2% to +2%
HAC Reduction Program (HACRP)	-1% to 0%
Readmission Reduction Program (HRRP)	-3% to 0%
Quality Payment Program (physicians)	-9% to 9%
Other Payors, etc	-5% to 5%

Challenges for 2024 and Beyond

The amount at risk for P4P may exceed operating margin. Therefore, successful P4P is necessary to achieve profitability.

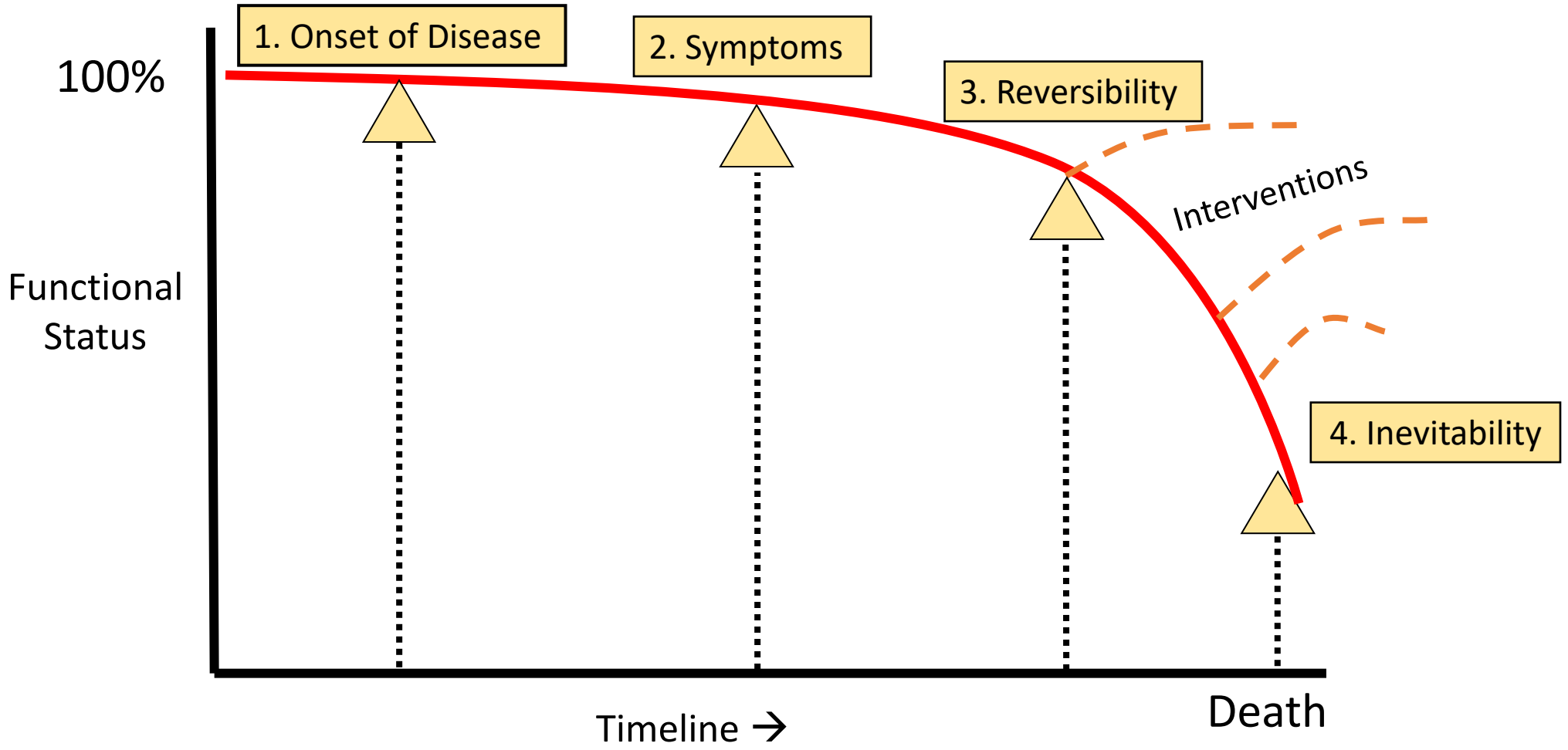
Outcome indicators will tend to “levelize” the playing field, resulting in fewer organizations being statistically superior. Therefore, you will see a regression to the mean, and less likelihood for individual organization upside.

New P4P indicators need to be identified proactively and aggressively managed.

P4P outlying indicators need to be identified, prioritized, and urgently corrected.

3. Establish Quality Metrics Earlier in the Timeline of Disease

Natural Course of Untreated Disease



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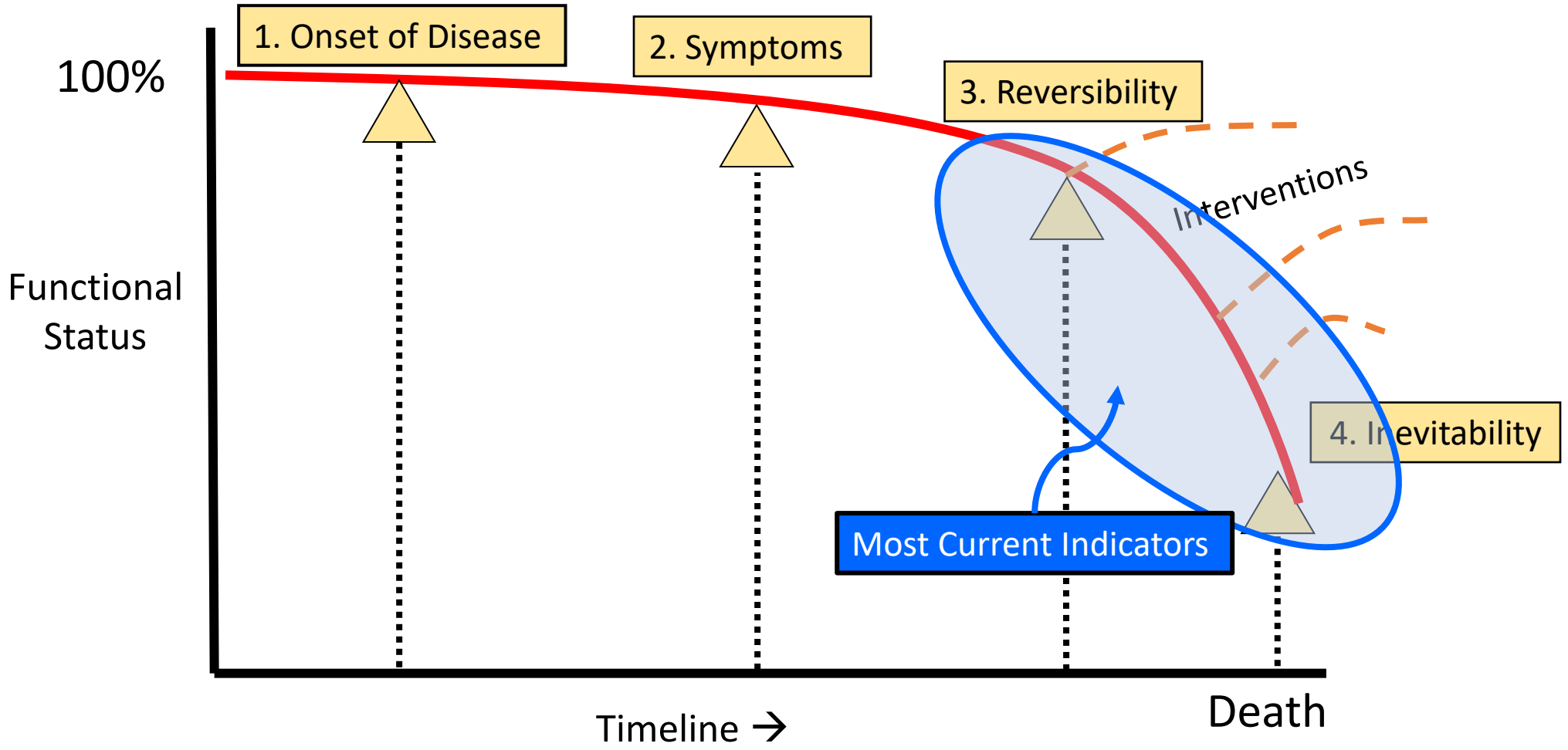

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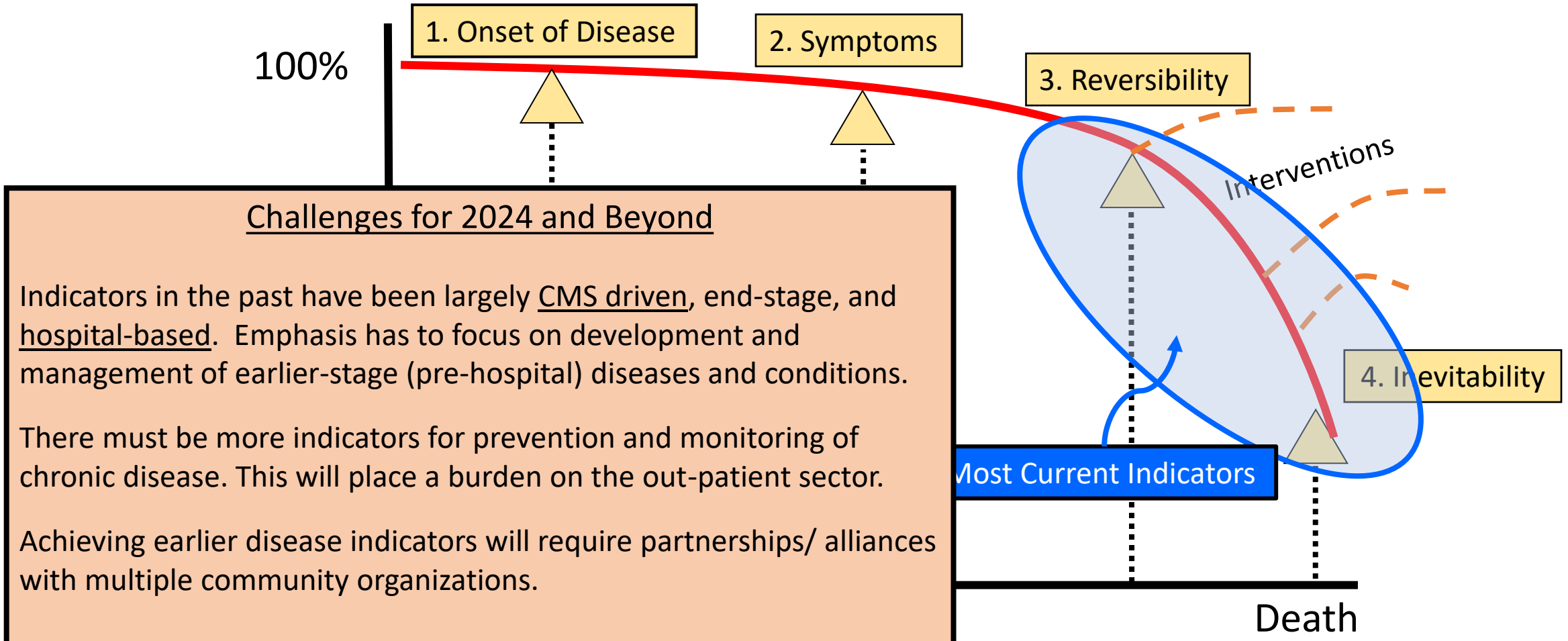


Challenges for 2024 and Beyond

Indicators in the past have been largely CMS driven, end-stage, and hospital-based. Emphasis has to focus on development and management of earlier-stage (pre-hospital) diseases and conditions.

There must be more indicators for prevention and monitoring of chronic disease. This will place a burden on the out-patient sector.

Achieving earlier disease indicators will require partnerships/ alliances with multiple community organizations.

4. Align the Quality Improvement Process with Health Equity Goals

US Total Life Expectancy

Overall drop in US life expectancy by 2.7 years over past two years:

- 6.6 years for the American Indian/Alaska Native population (similar to 1944 levels)
- 4.2 years for Hispanic Americans
- 4.0 years for Black Americans
- 2.4 years for White Americans
- 2.1 years for Asian Americans.

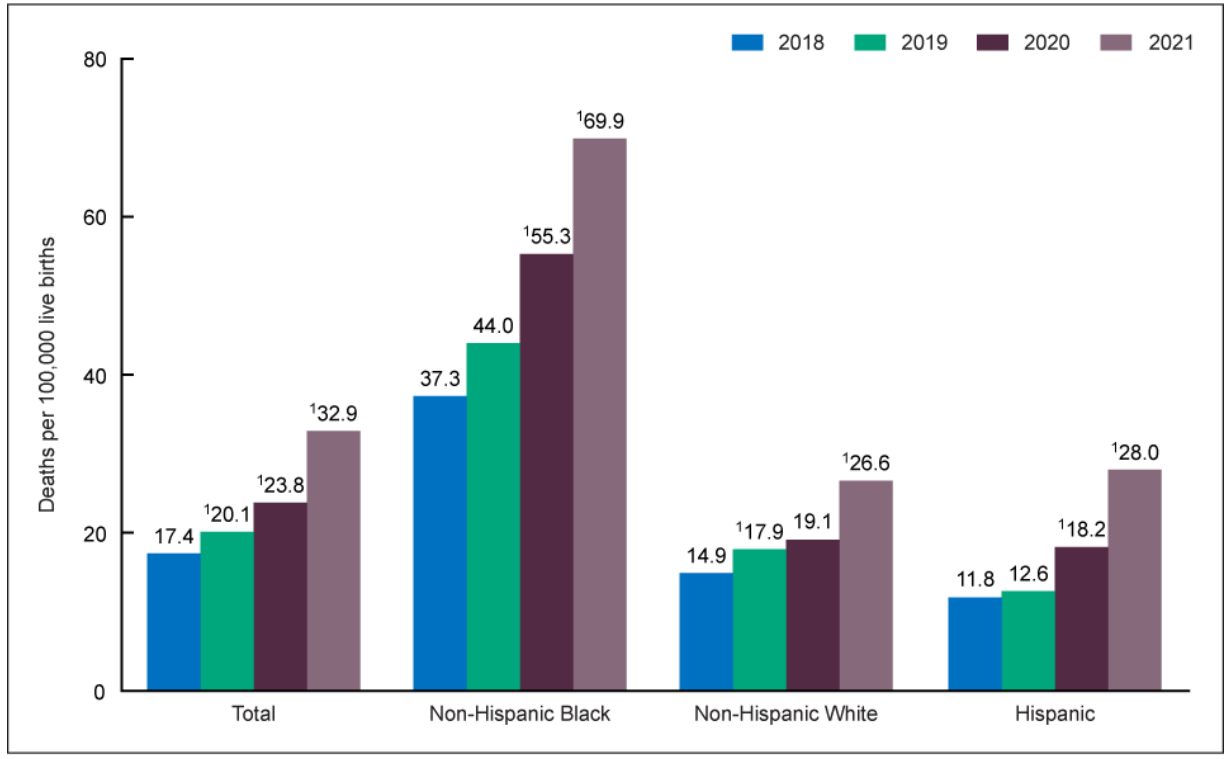
Medical Contributing factors:

COVID
Drug Overdose
Injuries

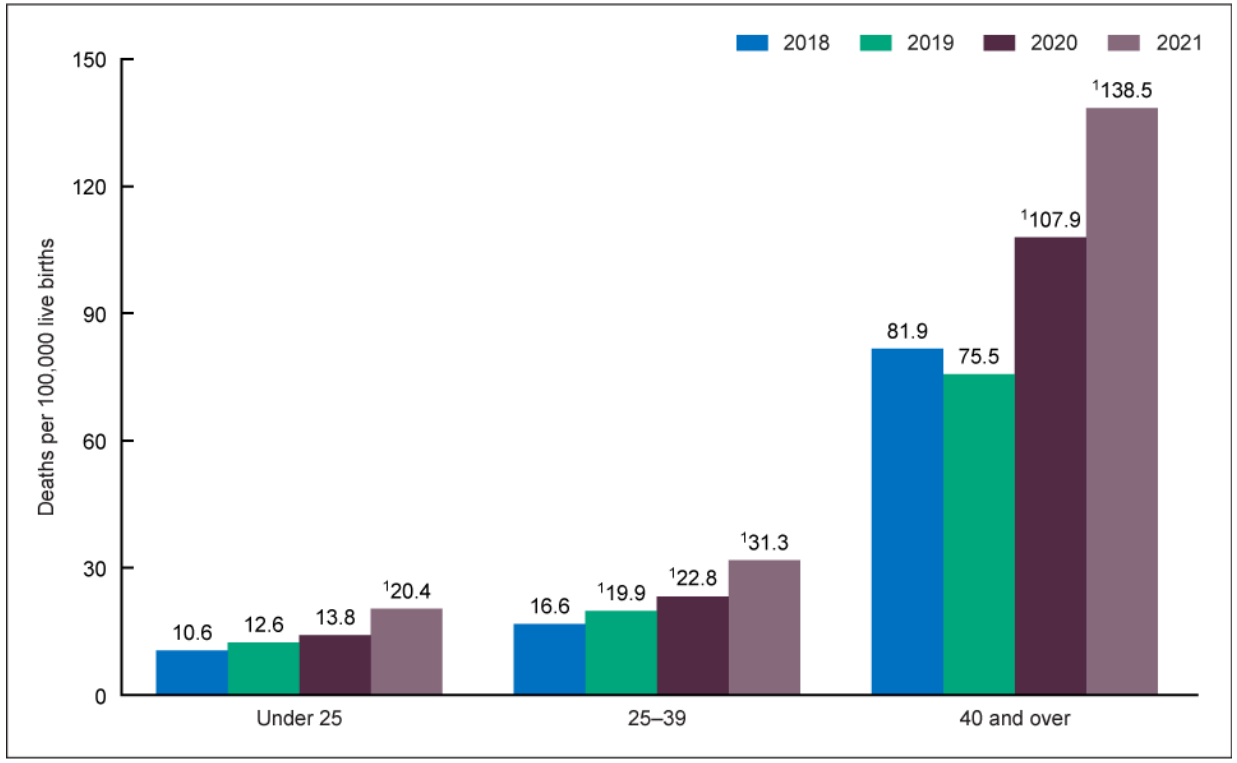
CDC, 2023

4. Align the Quality Improvement Process with Health Equity Goals

US Maternal Mortality



[1]Statistically significant increase from previous year ($p < 0.05$).
NOTE: Race groups are single race.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.



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CDC, 2023

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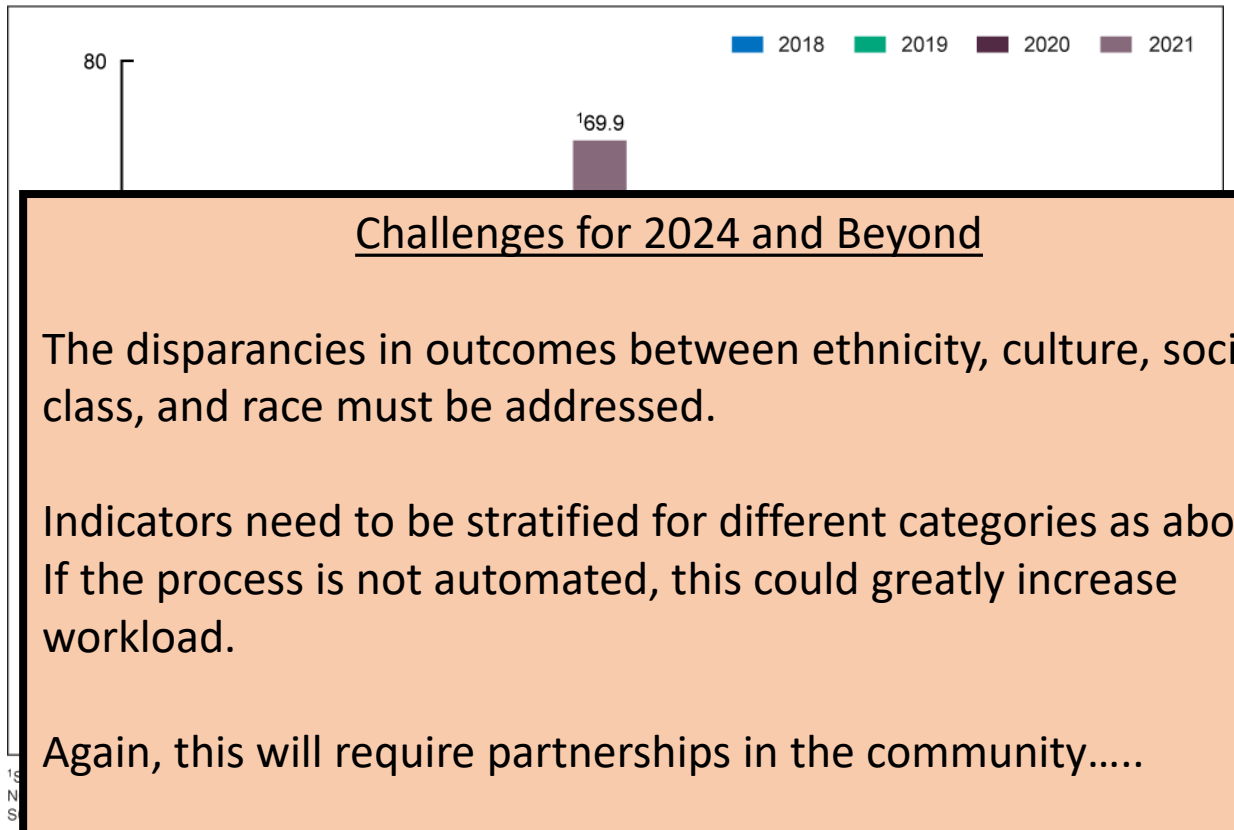
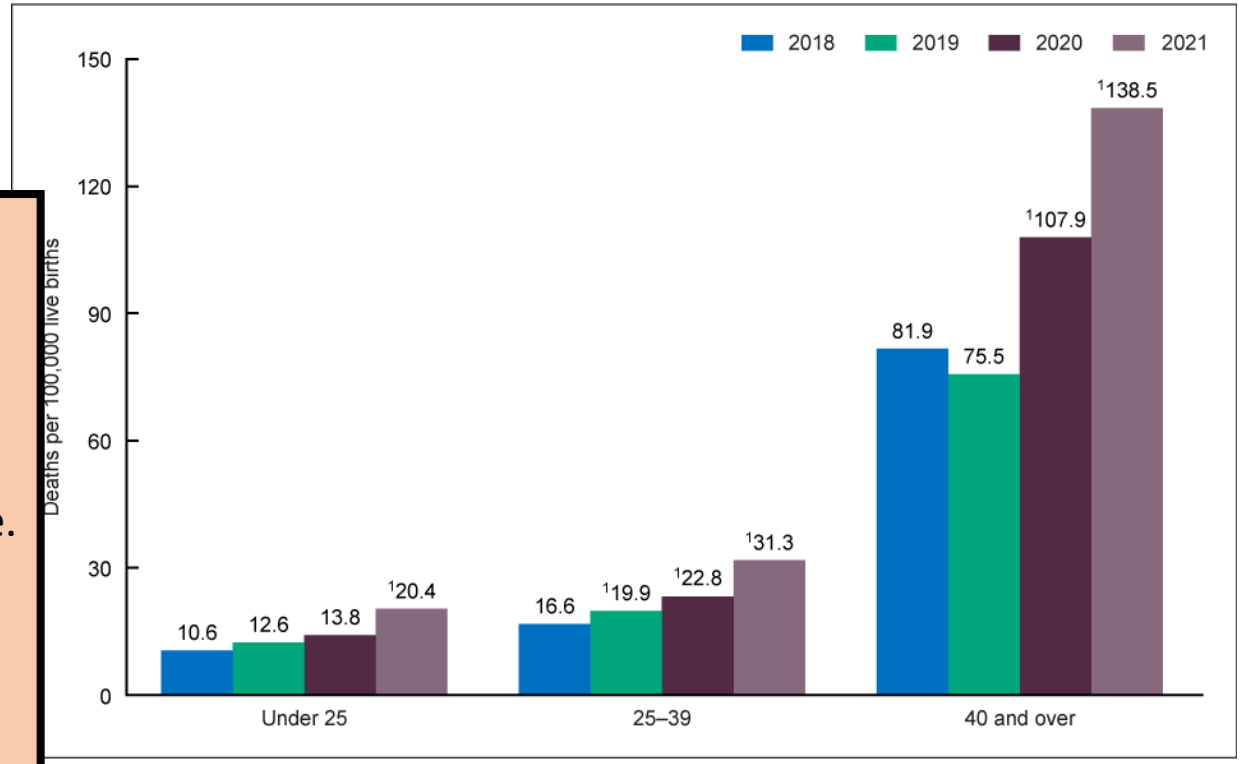




istically significant increase from previous year ($p < 0.05$).
RCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Challenges for 2024 and Beyond

The disparancies in outcomes between ethnicity, culture, social class, and race must be addressed.

Indicators need to be stratified for different categories as above. If the process is not automated, this could greatly increase workload.

Again, this will require partnerships in the community…..

This is larger than the organization

CDC, 2023

5. Partner with Artificial Intelligence

Opportunities for Artificial Intelligence in Health Care

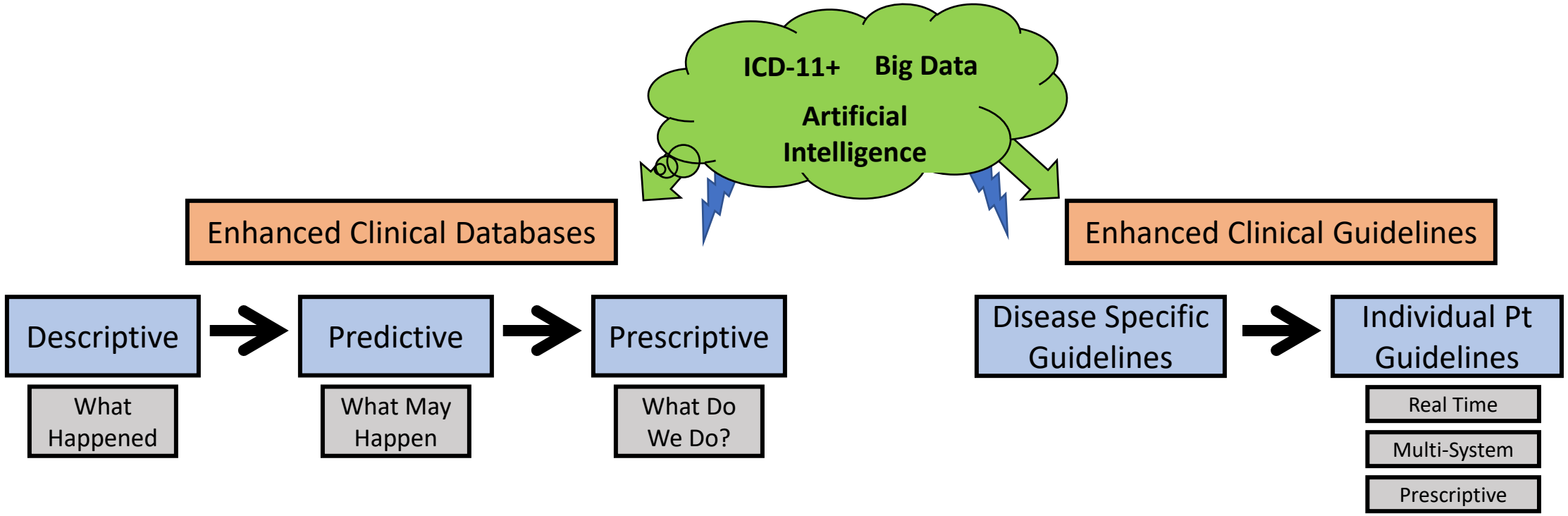
1. Medical imaging and pathology
2. Patient empowerment and navigation
3. Remote patient monitoring
4. Improved diagnosis
5. New drug discovery
6. Personalized treatment plans
7. Reduce drug adverse events
8. Fraud, waste, and abuse
9. Health risk assessments
10. Improve access to care
11. Reduce documentation
12. Virtual assistants and robotics
13. Regulatory compliance
14. Pre-authorization of services .
15. Medical education and simulation
16. Medical billing/ revenue cycle
17. Clinical trial design and monitoring
18. Improve surgical performance
19. Improve and monitor outcomes in behavioral health
20. Reduce disparities and improve health equity
21. Reduce gaps in care
22. Target opportunities for early intervention
23. Improving point of care testing
24. Monitor and reduce the cost of care
25. Reducing medical errors

Shulkin, blog, May 2023

5. Partner with Artificial Intelligence

Opportunities for Artificial Intelligence in Health Care

The Future of Medical Databases/ Guidelines



The End Game--

The Journey to Zero Defects……

Going from known complication…..

….. to kn

complication.

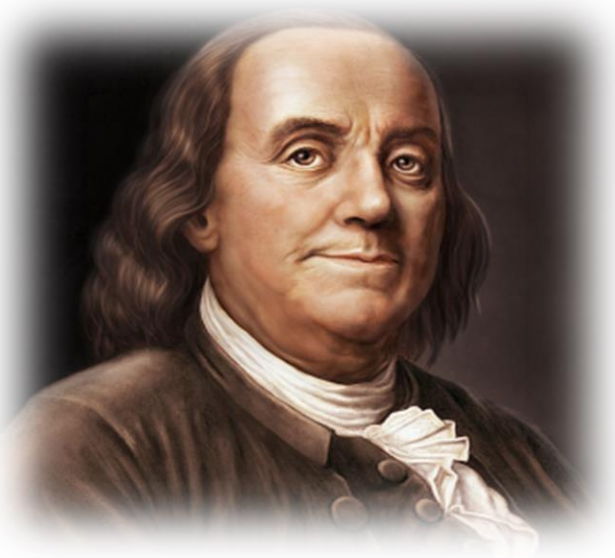
Perfection is unattainable. But if we chase it,

we can catch excellence.

Vince Lombardi

It’s All About Change

It’s All About Change

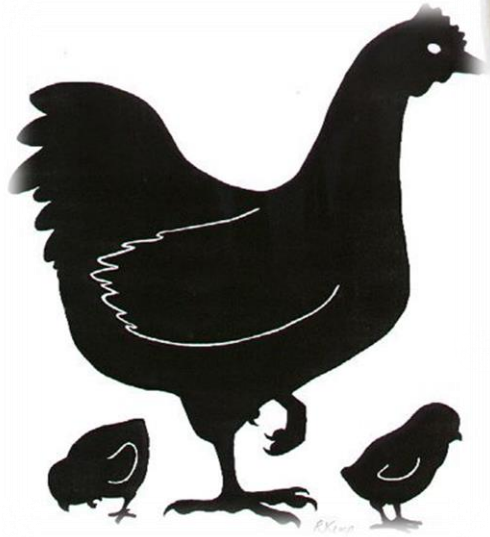


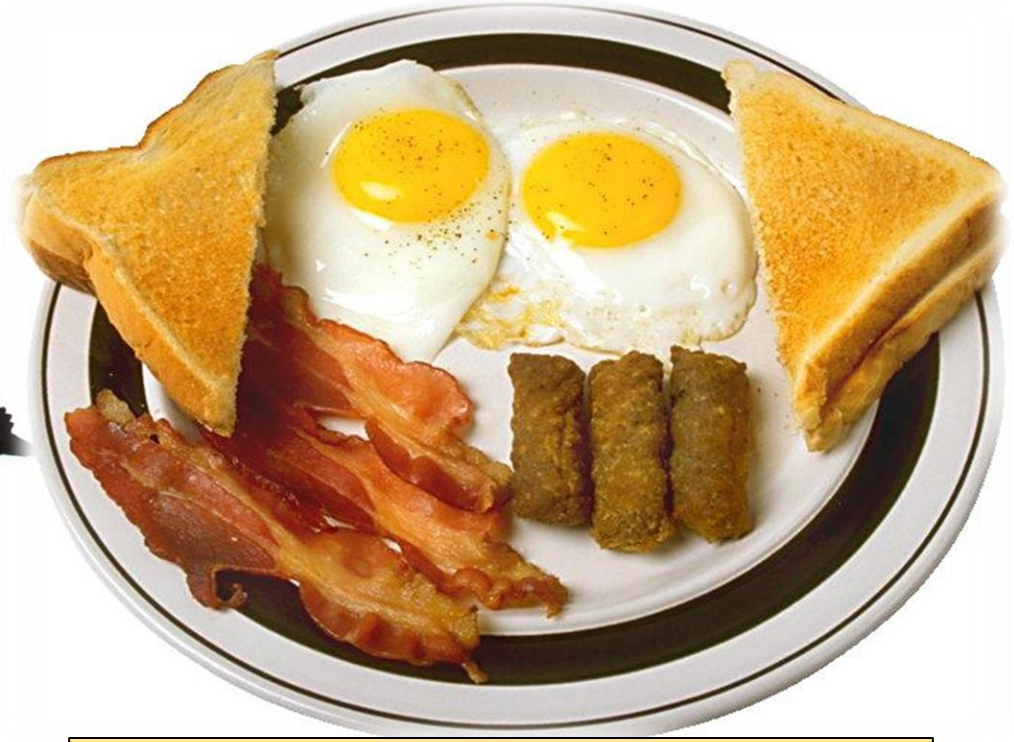
When you're finished changing, you're finished.

Ben Franklin

It’s All About Change

The Goal is to have Bacon and Eggs for Breakfast





The chicken is motivated
The pig is committed !!

It’s All About Change

To the world you may be just one person,

But to one person you may just be the world.

Unknown