

Quality Improvement Theory: What will it take to get there?

Learning Objectives

By the end of this session participants will:

- Be familiar with the basic components of Deming's System of Profound Knowledge
- Be able to distinguish between intrinsic and extrinsic motivation
- Be able to name at least two ways to ensure effective team work



Brief Look at QI Methods (1)

- **LEAN:** Toyota Production System
 - Create more value with less work.
 - Focused on reducing the “7 wastes”.
- **Six Sigma:** Motorola (Bill Smith, 1986)
 - Identify and remove the causes of defects (errors)
 - Emphasis on reducing variability and statistics
 - Infrastructure of people within the organization (“Black Belts”, “Green Belts”, etc.)



Differences in the focus and infrastructure of methods (above bullet points).
Also many similarities:
-foundation on the work of Walter Shewhart and W. Edwards Deming
-Philosophy of continuous improvement
- emphasis on data and team work

Brief Look at QI Methods (2)

- **The Model for Improvement** (Assoc. in Process Improvement)
 - Small, rapid tests of change before implementation
 - Focus on increasing adoption rate of proven changes
 - Widespread application in industry and health care



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Also many similarities:

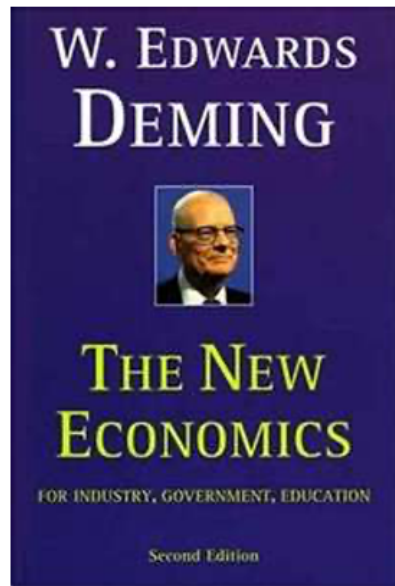
- foundation on the work of Walter Shewhart and W. Edwards Deming
- Philosophy of continuous improvement
- emphasis on data and team work

Employ small tests of change

Engage frontline staff and users of the system in the improvement process

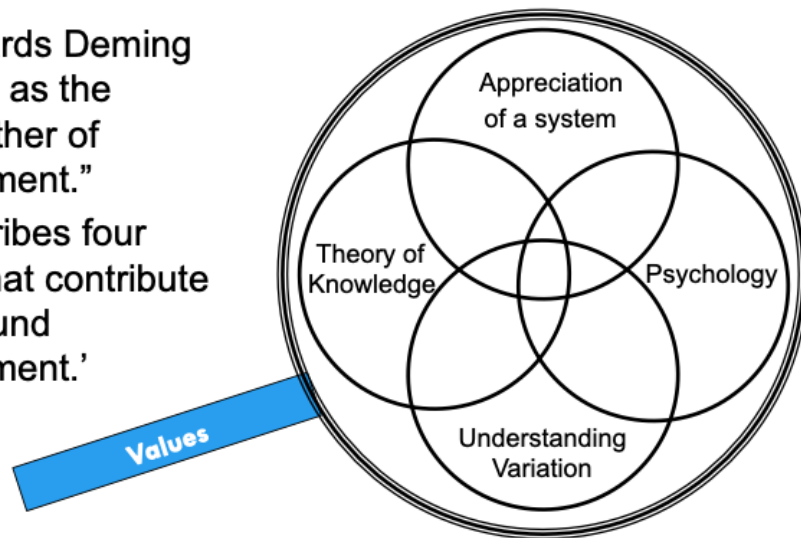
Are based on pioneers in industrial quality improvement such as W. Edwards Deming

Roots of QI Methods



Deming's System of Profound Knowledge

- W. Edwards Deming is known as the “grandfather of improvement.”
- He describes four lenses that contribute to ‘profound improvement.’



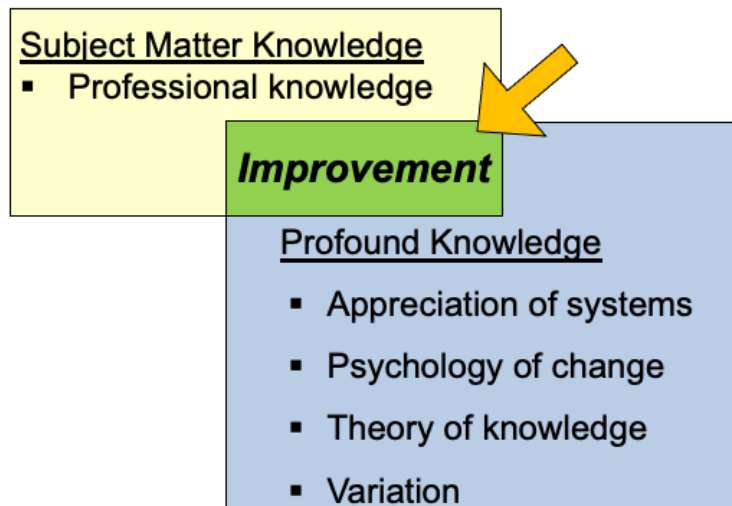
Note: slide uses animation. Click and image will appear.

EXPLAIN that:

- These ideas come from W. Edward Deming’s book “The New Economics.”
- Deming describes “profound improvement,” which consists of four lenses. The lenses are:
 - Appreciation of a system
 - Psychology
 - Understanding Variation
 - Theory of Knowledge
- Each lens is equally important.
- We will spend the next 10-15 minutes discussing these lenses.

The image on this slide depicts a magnifying glass.

Philosophy of Improvement



Source: Deming, W. *The New Economics for Government, Industry, & Education.*
Graphic Adapted from Associates in Process Improvement.

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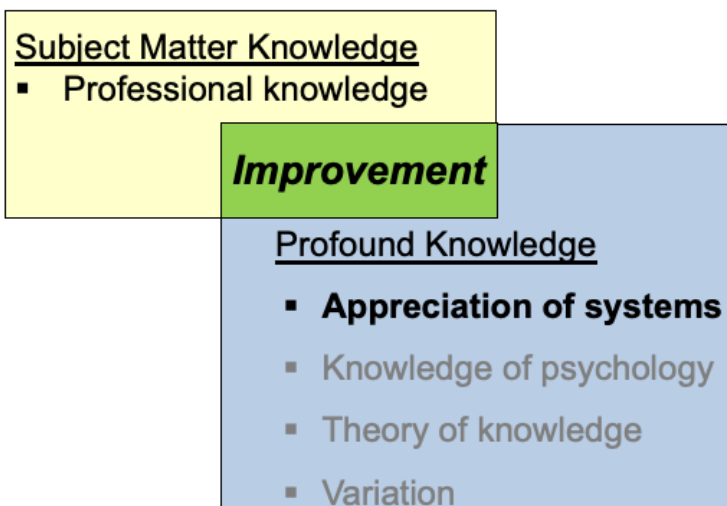
- **Subject Matter Knowledge** refers to the technical expertise. (In HIV care, these are the clinicians and nurses with the clinical know-how to serve patients and communities.)
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- **Improvement** occurs when subject matter knowledge and profound knowledge are combined together.

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- These are indeed important processes for ensuring a basic level of quality; however the problem with the sole use of this approach is that
 - issues are addressed when it is already too late (services have already been rendered).
 - can be costly
 - reduce productivity as everyone is preparing for inspection (and creating short term solutions to “pass”)
- Mixing this “quality control” approach with what W. Edward Deming called “profound knowledge” will yield transformational improvement.
- Deming believed that all four of these areas or lenses are equally important.
- W. Edward Deming’s work found that the impact is most powerful when Subject Matter Knowledge is combined with Profound Knowledge to change not only **what** is done (the content) but also **how** it is done (to what quality).
- There are four main areas of Deming’s concept of profound knowledge. These are areas, or lenses of thinking, that an improvement facilitator or advisor needs to understand to contribute to the subject matter expertise.
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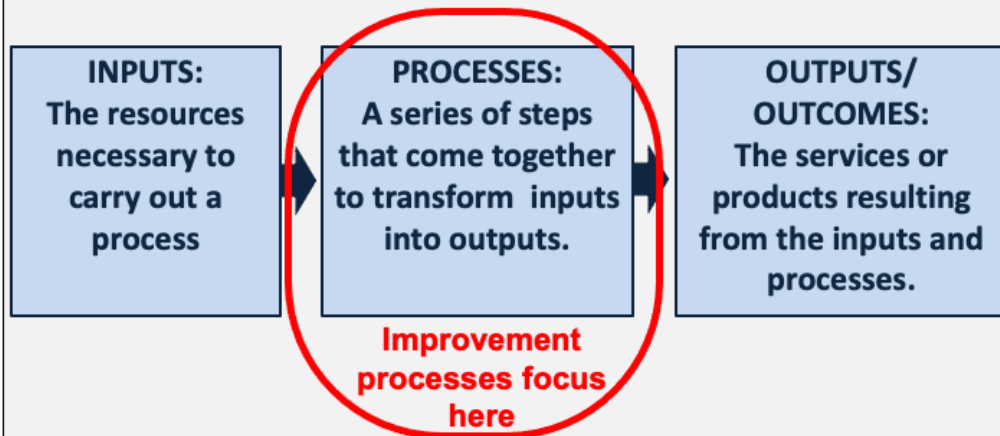
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#1: Appreciation of Systems (1)

SYSTEM: An interdependent group of items, people, or processes working together towards a common purpose



Source: Donabedian, A. 1980. *Explorations in Quality Assessment and Monitoring*. 3 vols. Ann Arbor, MI: Health Administration Press.

One of the exciting things about quality improvement is that it addresses issues within the system rather than individuals or other resources. QI (in the purist sense) tends to focus on improving system efficiency and eliminating waste rather than adding inputs or resources into the system.

It is important to know that interdependence between the components of a system creates a need for communication and cooperation. The greater the interdependence, the greater the need for the parts to work together (quality issues tend to occur at hand-offs between different people in a process).

The quality of the “output” or “outcome” is not based on the work of individual processes, but how those processes link together.

- The performance of a system is best understood when seen as a whole (as opposed to individual processes).

**“Every system is perfectly
designed to get the
results it gets.”**

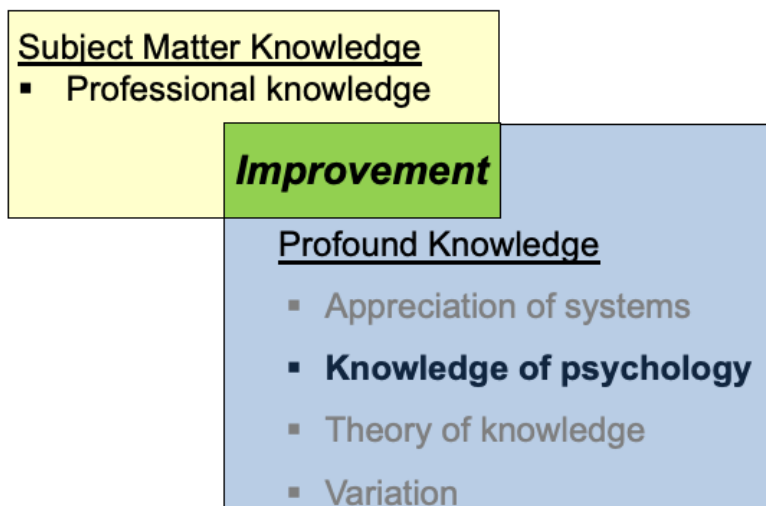
- Paul Batalden, M.D.



Source: Paul Batalden 1996. Personal communication to Donald Berwick, Former CEO of IHI

Batalden holds leadership positions at Dartmouth Medical School and IHI, of which he was a founding member and the original chairman of the board.

Philosophy of Improvement



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#2: Psychology

Quality improvement requires that we understand:

- What motivates people to do a good job
- How to form and maintain effective teams
- How ideas and changes spread from one person to the next and throughout an organization



#2: Psychology: Motivation

- Building intrinsic motivation is a powerful tool.
- Motivation:
 - Intrinsic: Pride in your work.
 - Extrinsic: Rewards for good work



Psychology

Leading transformation requires an understanding of psychology of people, groups, and change. This is especially important for managers and leaders in improvement.

People are different from one another and knowledge of how to use these differences to optimize everybody's abilities and inclinations. What motivates people?

Intrinsic vs extrinsic motivation:

Intrinsic motivation to do your best, pride in what you do.

Extrinsic motivation is the rewards that are offered for good work. Extrinsic motivation can compromise the intrinsic motivation in each of us

- grades cause students to work for grades or a reward from parents for grades, rather than to work for the purpose of learning.
- In the workplace bonuses may cause people to work for rewards rather than for job satisfaction and to find meaning in their work and lives.

Example where drawing on intrinsic motivation has been successful: Couldn't find clinicians on-call and would create a large delay in starting c-sections to have to send a driver to go find the clinician on call in their home. Leadership at the hospital explained the problem (with data!) to the clinicians, and allowed them to make the choice to provide their cell phone numbers so they could be alerted and also made overnight headquarters to sleep at the hospital (though neither were mandatory). She drew on their intrinsic desire to help the patients and do a quality job. Almost all clinicians accepted the change—those did not, did so shortly due to peer pressure.

Discussion: How could intrinsic motivation help facilitate quality improvement at I-TECH?

#2: Psychology: Effective teams

- Set the stage for high performance:
 - Develop a common purpose (the aim)
 - Establish norms for the team (ground rules)
 - Define roles (day to day leader, sponsor, data, etc.)
 - Procedures for decision-making (consensus vs. voting)
 - Team meetings (clear agenda, minutes)
 - Following a common improvement model/ method



The interdependence of processes in a system requires multi-disciplinary teamwork. Many quality “problems” arise at hand-offs in processes, due to communication gaps or different understandings of what the process is. Therefore bringing people together that are responsible for interlinking processes in a system is essential to identifying where opportunities for improvement exist and coming up with solutions to address them.

What are some of the interlinking processes within HIV Care? What would a multi-disciplinary team look like to work on this?

Here are some suggestions or tips for forming high performing teams. These will be important to keep in mind as you form your teams and work on your QI project.

Based on these, start thinking about who you think should be on your team?

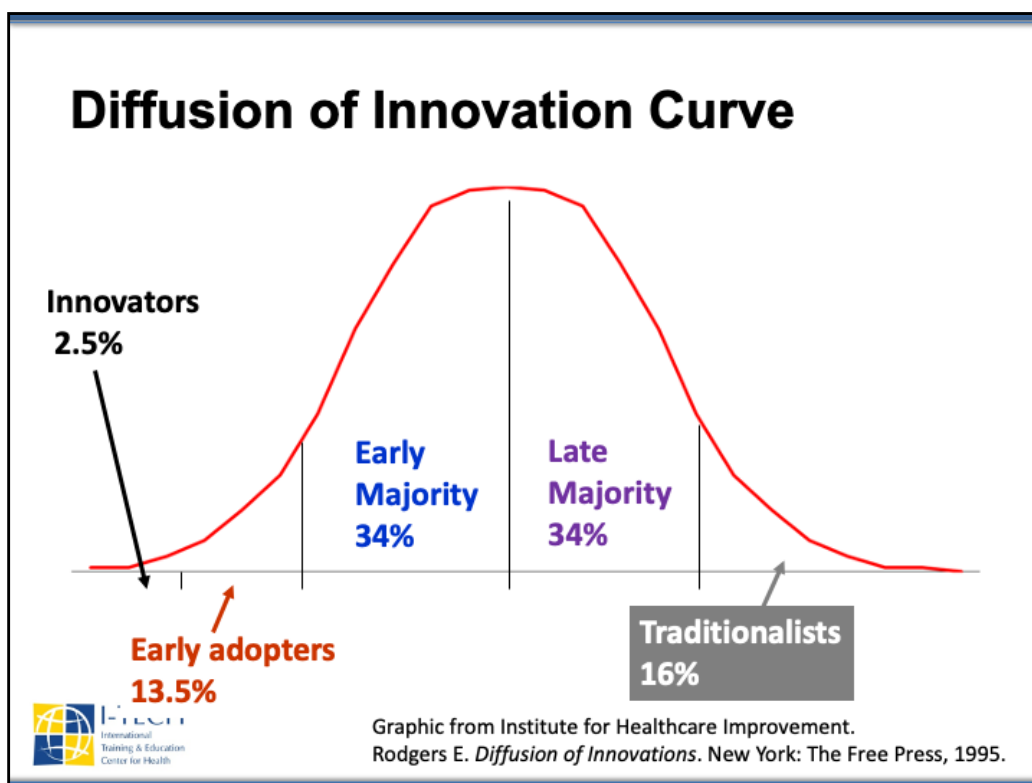
#2 Psychology: Spreading new Ideas

- Spreading new ideas (best practices) requires that people be willing to try something new.
- Change is hard! Someone has to take the risk and show others that a new way can work.
- Important to understand the theory of dissemination to know where / who to target our efforts to gain support for a change.

This is where the theory of diffusion of innovation comes in!



Can someone add to this slide?



Understanding how change is adopted in an organization will focus efforts. Many of you have probably seen Roger’s work on the Diffusion of Innovation in the context of behavior change. This concept is also fundamental to improvement, as improvement is about adopting and accepting change. Once a change has been shown to be successful among the innovators and early majority, this innovation will spread to other departments, units, organizations, etc.

Innovators:

- Gatekeeper for new ideas
- Many ideas are not successful
- Out of the mainstream of operations

Early Majority (key to successful change)

- Risk Takers
 - Opinion leaders
 - Key to successful change
 - More socially integrated
- (The innovator creates the idea and the early adopter makes it happen)

The early majority adopts the change after the early adopter demonstrates that it can work)

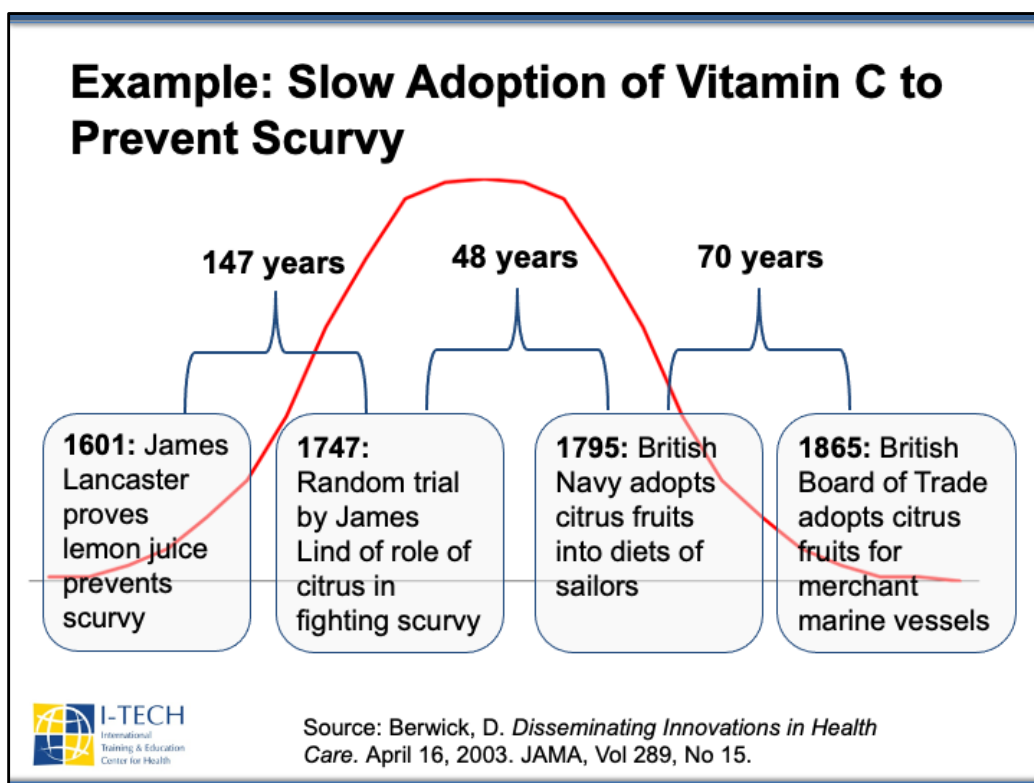
The late majority adopts the change after the early majority clearly demonstrates that the change is a better way)

Traditionalists:

- Passionate about their issues
- Sometimes called “Laggards”
- Where we put our energy--need to put their resistance aside in making change. This is why introducing and testing new ideas is so important!!!!

Understanding this concept is important in anticipating and planning for resistance to change in an organization. Re-focus the energy from Traditionalists to the Early Adopters

Can you think of an innovation and where you were on this adoption curve (email, cell phones)?

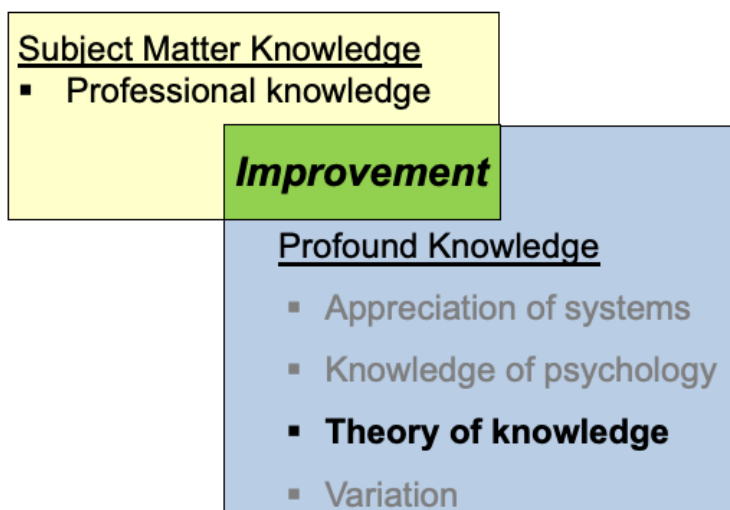


The situation:

- in 1497 with exploration about the Cape of Good Hope, 100/167 men died of scurvy. Diet was suspected to be a factor, but noone knew about the role of Vitamin C in fighting scurvy.
- In 1601 Captain James Lancaster had a fleet of 4 ships. He gave sailors on one ship 3 teaspoons of lemon juice per day. Half way through the trip, 40% of the sailors on the other 3 ships died of scurvy, but noone died on the ship receiving lemon juice.
- This remarkable discovery went unnoticed.
- 1747: 147 years later a random trial proved the role of vitamin c in fighting scurvy.
- 1795: It took 48 years for the British Navy to react by incorporating citrus fruits in the diets of sailors. When they did, scurvy disappeared.
- 1865: It took 70 more years for the British Board of Trade to adopt the innovation for merchant marine vessels.

•In healthcare, it is about 17 years from when a best practice is identified through research before it is put into wide spread practice. How can we speed up this diffusion so more patients benefit from the very best practices? This is what we do in quality improvement collaboratives.

Philosophy of Improvement



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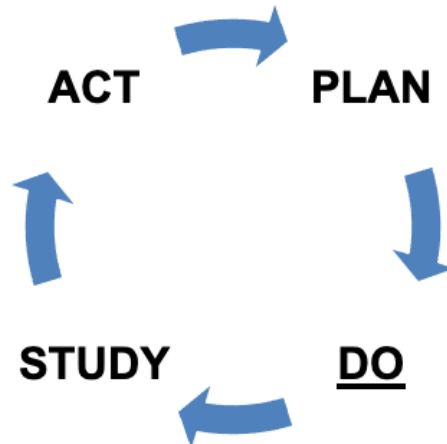
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#3: Theory of Knowledge – Sequential Learning by **DOING!**

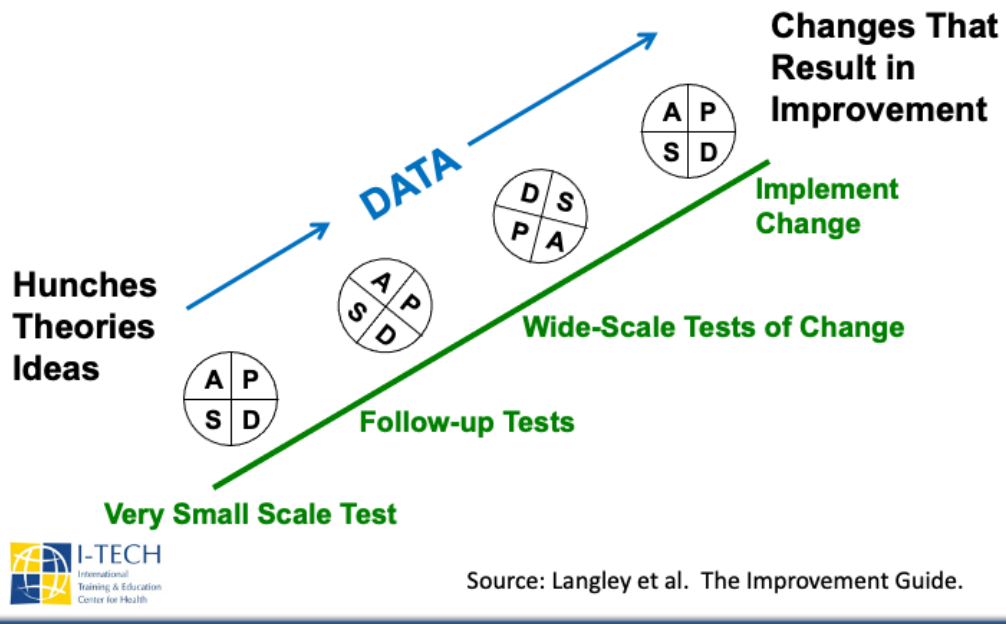


The Theory of Knowledge

Knowledge only comes from theory and prediction. Learning by testing theories/ assumptions on a small scale, using PDSA cycles. This is why prediction is an important part of PDSA cycles to learn how well we know a system and predict the effect of change. This is the scientific method, used for action-oriented learning. (IHI website, model developed by Associates in Process Improvement)

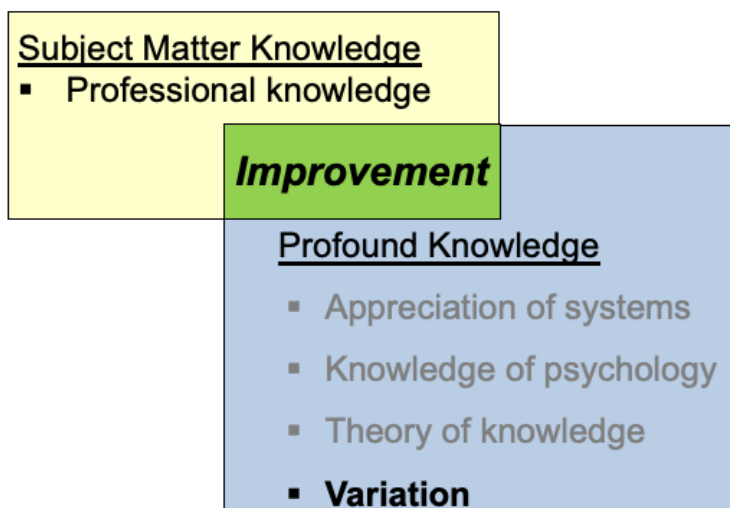
This is also sometimes called Shewhart's Cycle, or Plan Do Check Act.

#3: Theory of Knowledge



We won't spend as much time here as many of you are very familiar with the concept of learning through PDSA cycles.

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#4: Variation

- Two types of variation:
 - Common Cause: Found regularly within control limits of a process or system and due to normal fluctuation in the process/ system.
 - Special Cause: Points outside the limits of a control chart (outlier). Caused by a circumstance out of the ordinary and can not be predicted.



Knowledge of Variation

Variation is an intuitive concept. For example, when you take a bus, you know that the bus might arrive 3 minutes early, or 3 minutes late—this is within normal expectations for variation—this is common cause variation. There might be one day when the bus arrives 30 minutes late. This is out of the ordinary and likely due to extraordinary circumstances (e.g. the bus broke down, there was an accident, storm, etc.).

In improvement, data points are displayed on charts to distinguish between special and common cause variation. We aim to reduce unintended variation as much as possible so that the outcome can be reliably predicted.

Can you think of examples of variation in a process? Why would we want to reduce variation?

Understanding common cause versus special cause variation and the effects of the system on the performance of people.

In systems, you want to be able to predict/ anticipate performance—therefore understanding and reducing variation is an important part of improvement.

This is why frequent data collection is so important for improvement, as you can learn about overall trends. Before/after data misses this opportunity to learn about this important attribute of a process.

In order to understand variation in a process, you must have time series data available (run charts). To differentiate between special cause vs common cause, run charts will need control limits.

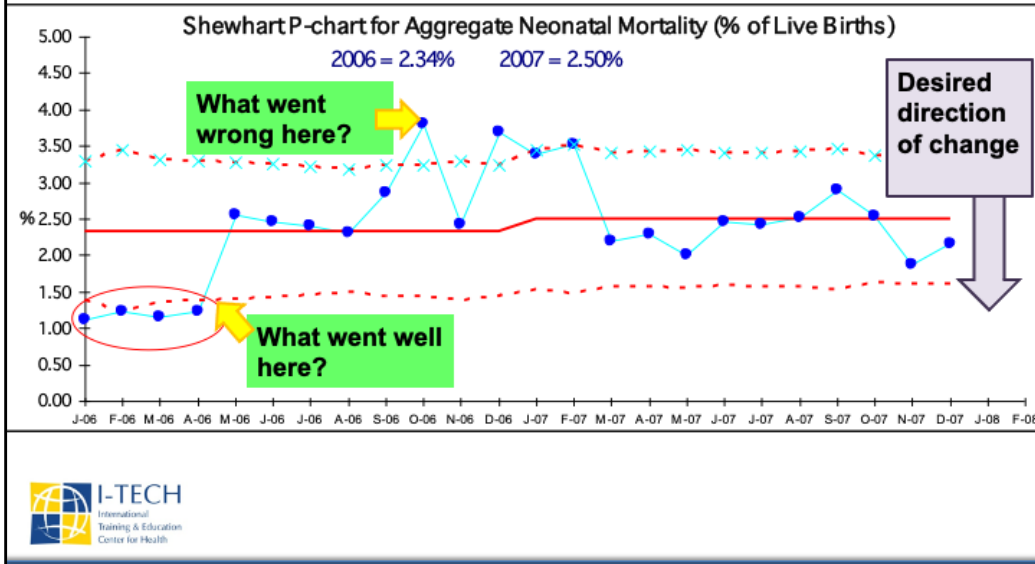
This is a differentiator between QI and Evaluation—using real time data for decision making .

#4 Variation (1)

- Reasons to study variation:
 - Learn where something went right and find out if it can be tested to become permanent.
 - Identify where something went wrong and avoid it from happening again.
 - Produce predictable results by reducing unwanted variation.



#4: Variation in Newborn Mortality (Aggregate data from 10 Hospitals)



Control charts were first used by Walter Shewhart when he was working with Bell telephone company to improve the reliability of their telephone transmission systems. Even simple run charts (without control limits) are very effective for displaying data over time and understanding a process.

Discussion:

What do you see in this control chart? Without knowing the specifics, what story does this chart tell you?

Discuss the special cause variation (outliers) due to missing/ inaccurate data

- Note the reduced variation in the data in 2007. Which data would you trust?
- What would this look like a before and after chart? 2006 and 2007 may look the same aggregated in a bar chart, but the variation characteristics are very different between the two years.

Summary: Lenses of Profound Knowledge

Appreciation for a System

- Interdependence, dynamism
- Optimization, interactions
- System must have an aim
- Whole is greater than sum of parts
- Adding inputs without improving processes will not always improve outcomes!

Understanding Variation

- Variation is to be expected
- Different types of variation
- Importance of tracking data over time to understand variation

Theory of Knowledge

- Prediction
- Learning from theory, experience
- Sequential learning (PDSA) for learning and improvement
- Need for common learning structures and mental models (Model for Improvement, Key Driver Diagram!)

Psychology

- Interaction between people
- Intrinsic motivation, movement
- Beliefs, assumptions
- Build the will to change
- Participation and team work!



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Team meeting: Getting Started

- During this first LS team meeting, please:
 - Review and ratify the charter
 - Think about who your team will need to include to reach the collaborative aim.

Identify:

- A data person
- A patient engagement person
- A champion in leadership



We want each team to be clear on the commitment and the roles of the QI teams. Think about the need for buy-in at your facility and plan to ensure you have the necessary technical expertise and knowledge of your system to be successful.