

*Public Health Performance Management
Centers for Excellence*

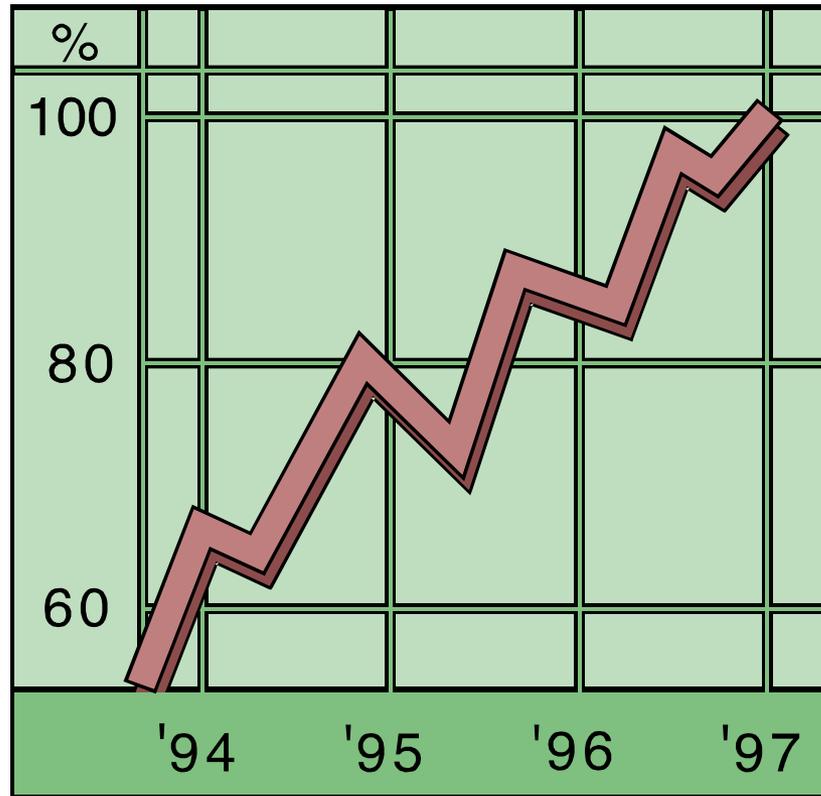
Experiencing the Quality Improvement Method

July 18, 2012

7/18/2012

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Project QI



Updated 6-7-12 (2)
Scott Davis, QI Coordinator, TPCHD

Project Quality Improvement objectives

- Understand basic method for Quality Improvement Projects
- Understand purpose and value of common QI tools, including Pareto diagrams, histograms and flow charts
- Simulate the group process and analytical approach of a QI project

Public Health Performance Management Centers for Excellence

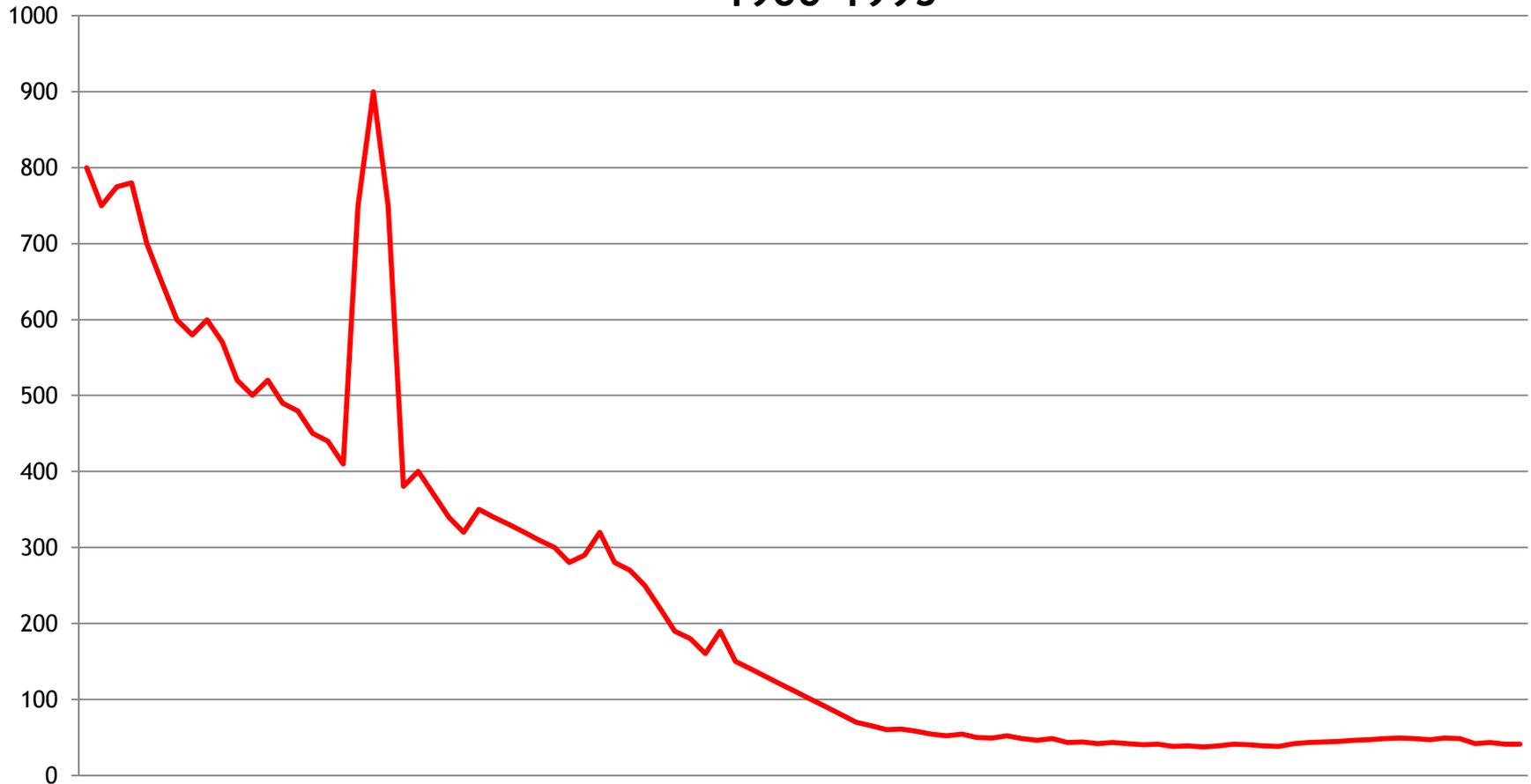
Handouts



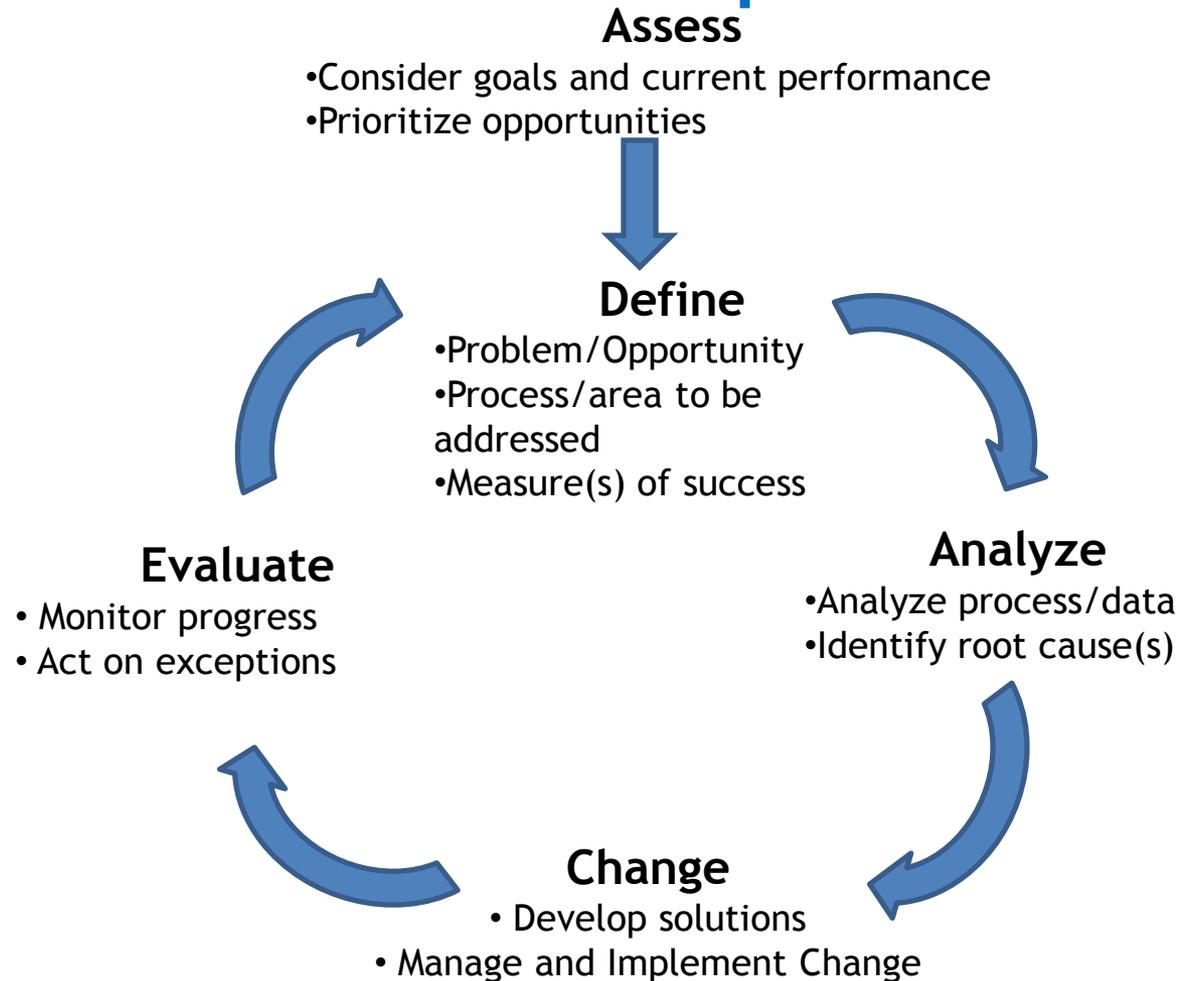
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An American Success Story

Deaths from Infectious Disease/100,000/year
1900-1995

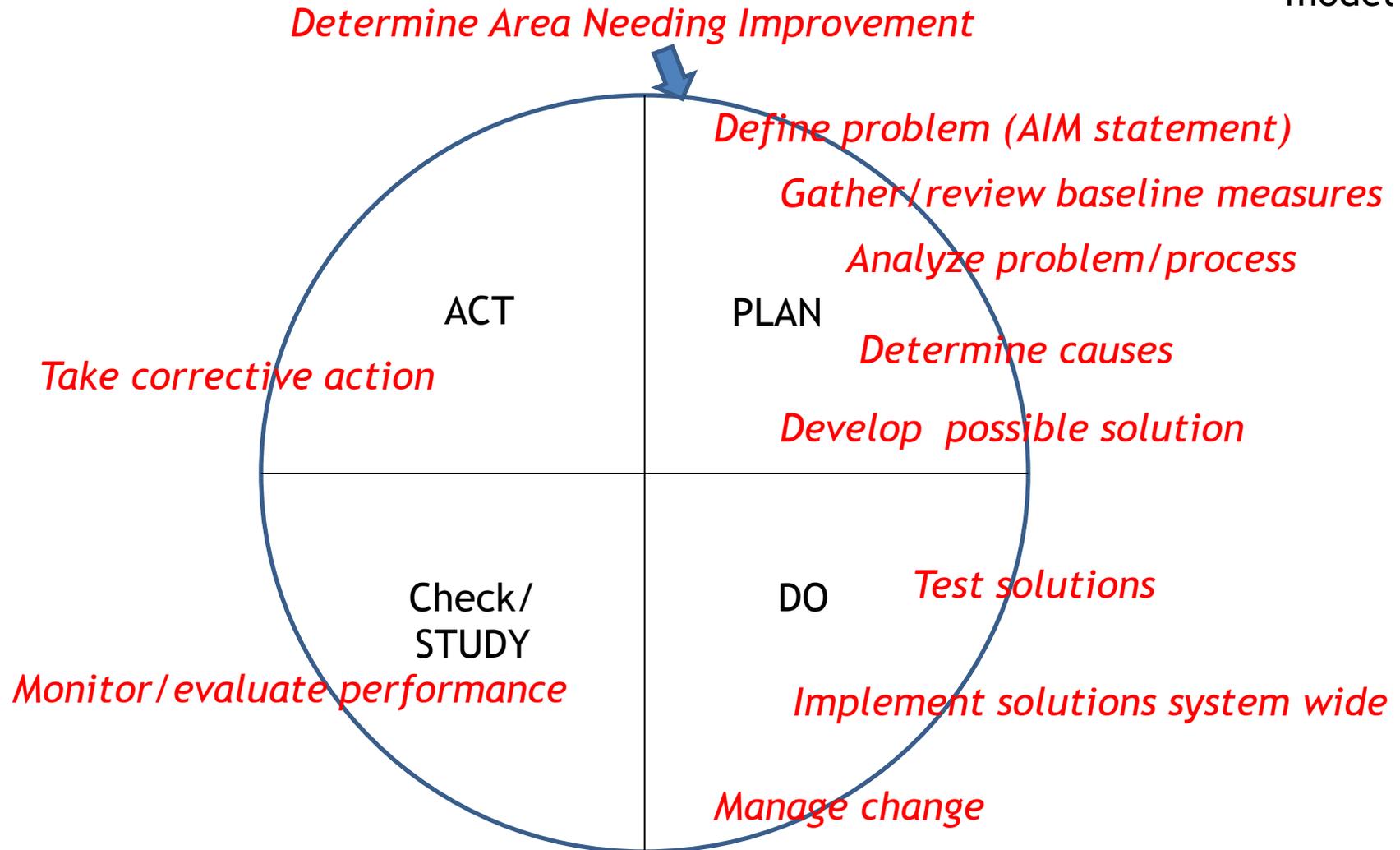


Public Health Continuous Improvement



Quality Improvement Project Steps

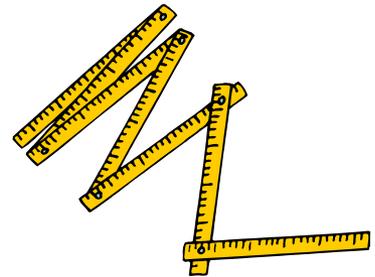
Using PDSA
model



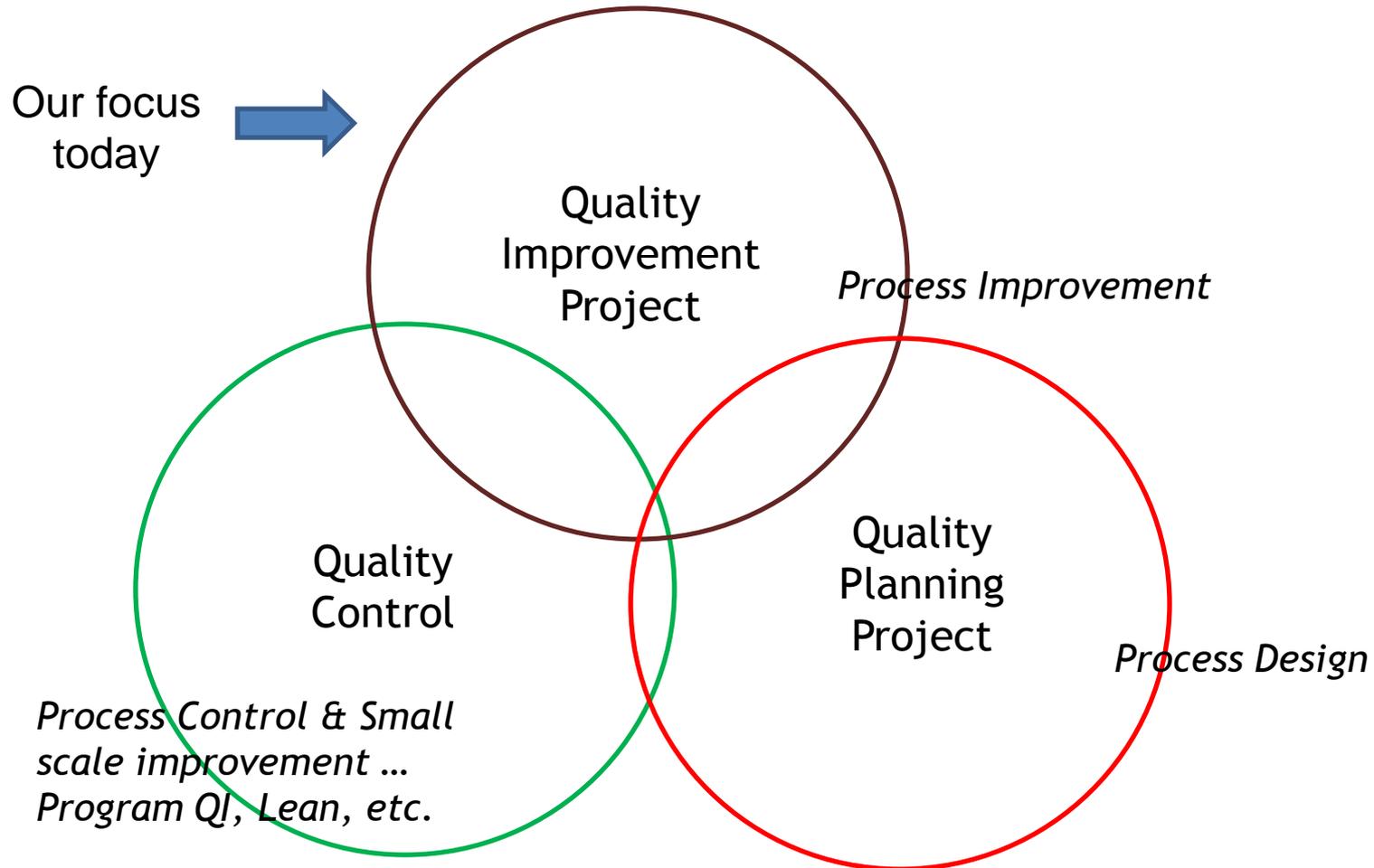
Quality Management Principles

All quality methods/approaches are based on...

- Meeting **customer requirements**
- Understanding **variation**
Process/system based variation
- Standardizing **process**
- Using **continuous scientific method**
Evidence based; never-ending



Same Basic Method ... Different Applications



Quality Improvement Project Steps

Based on
adaptation of
Public Health
model

Assess

1. Assess organizational goals and current performance
2. Determine most important problems/biggest opportunities

Define

3. Define problem/opportunity
4. Define process(es)/service to be addressed
5. Define measure(s) of success
6. Define stakeholders, customers and team

Analyze

7. Analyze process(es) and data
8. Determine potential causes
9. Determine “root” causes

Change

10. Consider solution options
11. Determine “best” solution(s)
12. Test Solutions
13. Manage Change
 - Social
 - Technical
14. “Hand-off” to operations - including Evaluation plan

Evaluate

15. Monitor performance against measures
16. Maintain solution(s) (if working)
17. Re-enter Improvement Cycle

Plan



Do



Study



Act



The QI-QP “Hybrid” Project

- Projects can start with a QI approach and not find narrow “root” causes
- Large portions or even all of the process may need to be re-designed
- Or, you may find that the original process was never designed with the customer in mind
- Even standard QI projects can sometimes benefit by borrowing from the QP toolbox

Assess

For Project QI & QP



Assess

- **Management Role - cannot be delegated**
 - Management Team
 - Quality Council
 - Strategic Planning Group
- **Sources of QI problems/opportunities**
 - Strategic priorities
 - PH Standards review
- **Tools for prioritization**
 - Criteria matrix
 - Prioritization matrices

Assess

- **Ideal** candidates for QI projects
 - Measureable
 - Repeatable
 - Sustainable
 - Important
- **First** projects
 - Easily measured
 - Highly repeatable
 - Feasible
 - Sensitive

Discussion

What are some possible projects within your agency which might match these QI criteria?



Assess

Set project teams up for success ...

- Develop clear problem and mission statements (draft)
- Determine sponsor and team leader
- Resource team

Training

Time

Attention



Define

First phase of Plan



Define

3. Define problem/opportunity
4. Define process(es)/service
5. Define measure(s) of success
6. Define Customers, Stakeholders and Team



Tool Box!

Define

Tool: Project Definition Document



*A.K.A. ... Team Charter, AIM
Statement,
Scope of Work, etc.*

Define

Project Definition Document

- Sponsor and Team Leader draft together
- Team Leader and Team validate and edit
- Sponsor endorses final



Problem/Opportunity Statement

*Explains what the problem/opportunity is
and why it is important*

- Specific
- Clear
- Measurable
- 2-3 sentences
- Does not assume cause or solution

Problem/Opportunity Statement

A formula for QI Problem Statements

- Part one: Describe current operational performance
- Part two: Indicate the impact of that performance

“Currently ... (quantitative indicator of operational performance).”

“Resulting in ... (the outcomes such performance has on health, revenue, satisfaction, etc.).”

Problem/Opportunity Statement

Related to an existing process with opportunity for improvement

Current information indicates that the cycle time of inspections averages five business days, though some can take up to 3 weeks to complete. These outliers result in customer complaints and increased call volume.

Probably QI

Problem/Opportunity Statement

Related to an existing but poor performing process

Current data demonstrate that first maternal home visits meet the 7 day referral standard 65% of the time. Benchmark information indicates that other LHJs meet or exceed the 7 day standard 95% of the time.

Late response may limit our effectiveness on health outcomes for mother and child.

Probably QI

Problem/Opportunity Statement

Related to a potential new service

Changes to state law regarding Tattoo Parlors indicate that the Department will have new health inspection responsibilities starting next year. With an estimated 90 establishments in the County, this represents both a substantial potential cost but also a revenue opportunity for the Agency.

Probably QP

Problem/Opportunity Statement

Don't do this

We are getting too many customer calls and complaints due to lost packages, late deliveries, and mistake orders. We need to implement bar coding technology so that things run more smoothly.

Probably a mess

Quality Improvement Measures

Process measures

- Specific and operational *process measures* are required at this stage of Quality Improvement.
- Otherwise, team will not know how to approach it's analysis of the problem.

Outcome measures

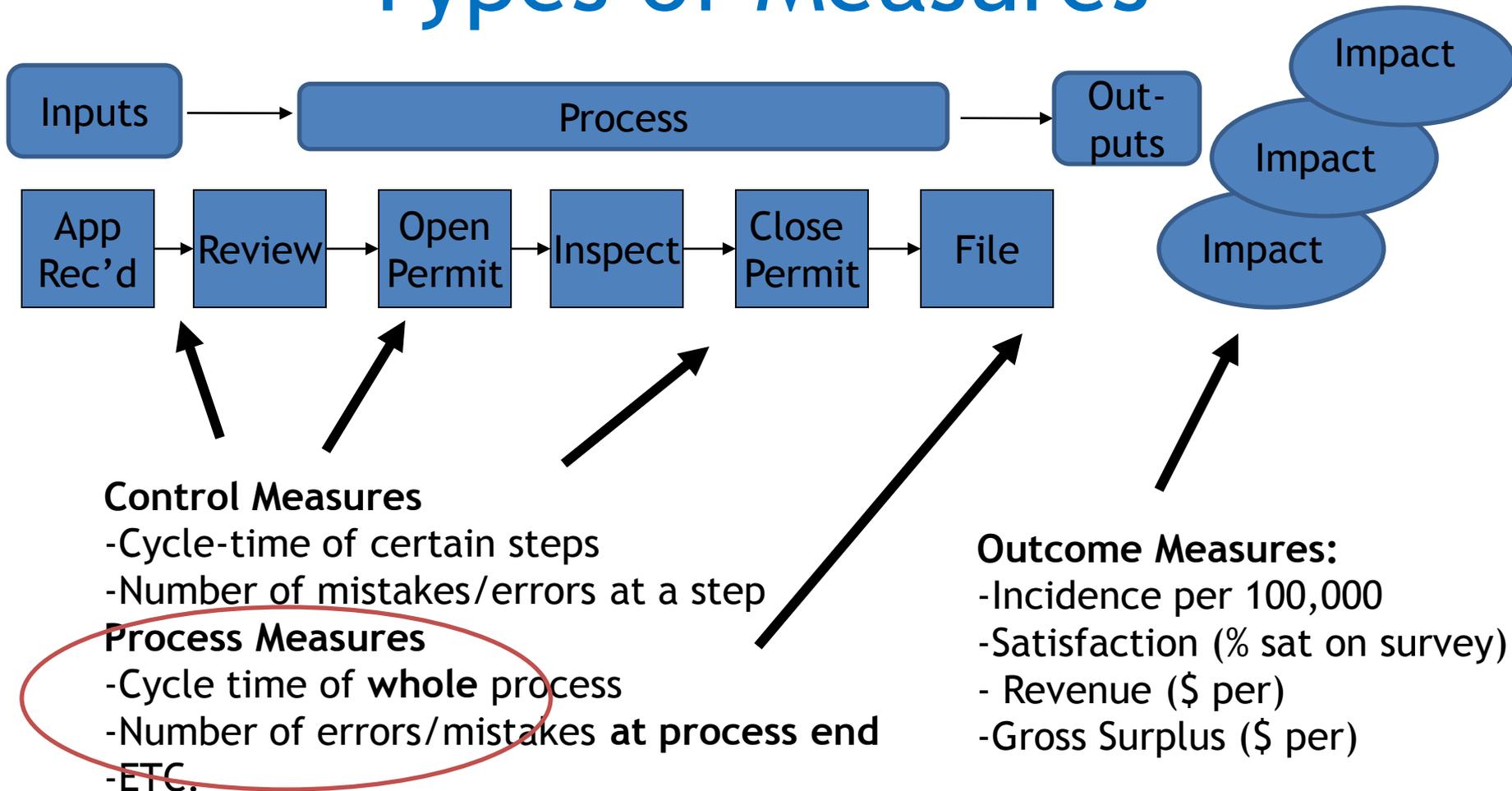
- May be proximate, distal or in between
- It is important to link these outcomes to the team's activities, BUT ... A QI team typically works on and fixes *process measures!!*

Quality Measures

A specific quantitative indicator of performance - a *number*

- Process Measure
- How long something takes (#days, #hours)
 - How often something is damaged, incomplete, broken, in error, late (% of total, a count)
- Outcome Measures
- How often people get sick (# incidences)
 - How satisfied a customer is with a specific aspect of performance (% sat' with *X*)
 - How much a specific action costs (\$ per *X*)

Types of Measures



The perfect measure is ...

- Sensitive
- Consistent
- Accurate



But Sensitive and Consistent are most important!

Perfect accuracy is not necessary for quality improvement!

Quality Planning Measures

- QP indicators will be broader at this stage of project
- Typically ... there will be outcome indicators vv. Health outcomes, Revenue, cost, and satisfaction
- May also have (depending on what is known about customer needs) “cycle time” or “defect” or other process indicators
- Process (& control) Indicators will be determined in Change Phase

Target

“Decrease late inspections **to 2% or less**”

- A goal or expectation for a specific measure.
- May be based on a known customer standard
- May be an arbitrary %/# increase/decrease
- Not absolutely necessary to move forward
- May not be able to identify a target until team analyzes process and understands current performance
- Targets apply to a given improvement cycle;
Does not mean that’s all you will ever achieve

What if there's no measure in place?

Very common in services ...

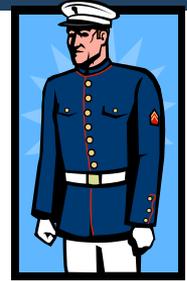
- Consider putting on-going measure in place as team begins (best, but not always possible/practical)
- Consider a “pre” sample (not ideal but better than nothing)
- Sometimes you need to do analysis even to know HOW you would put measures in place
- You may have to wait until Change phase to put measures in place (not ideal)

Mission Statement

Explains what your purpose and goals are

- Typically, an imperative statement regarding your *primary* measure
- Should not assume specific cause or solution (usually)
- Should be specific and measurable
- *May* contain a target
- *May* contain a timeline
- 1-2 sentences

*Mission Statement



Clearly states what you are going to do regarding your primary measure of success...

Direction + number + Target + Timeframe

(#)



Start here ...

Remember “S.M.A.R.T.” objectives are:

- Sensitive
- Measurable
- Attributable
- Realistic
- Time-limited

**A.K.A., Aim statement, purpose statement, goal statement, etc.*

Mission Statements

Examples

Suited to QI ...

- Reduce # of late deliveries from 12.5% of total to 2% (or less) of total [by e.o.y.]
- Reduce # of hours from request to order entry to within 24 hours [by start of 3rd quarter]

Suited to QP...

- Establish new inspection service for Tattoo Parlors that is compliant with state law, is revenue positive, and is satisfactory to parlor owners [prior to RCW implementation date]

Mission Statement Suitable for chaos

Don't do this

- Improve the permitting process
- Increase the effectiveness of purchasing
- Make the vaccine ordering process better
- Increase customer satisfaction

Practice



Pair up ... discuss possible **problem statement, measures, and mission statement** for a project you may be working on soon

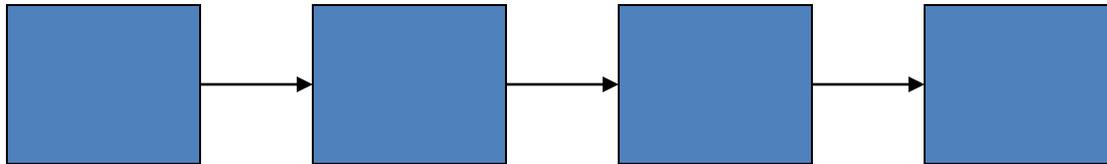
Process Boundaries

- The “start” and “stop” of the process you will be working on
- Helps determine scope of project
- Helps determine stakeholders, customers and team
- Helps determine appropriate measures
- Process boundaries will be more abstract for a QP project than a QI project



Tool Box!

High Level Flow Chart



- Documents start and end of process
- Documents primary objectives/steps of process
- 4-7 steps (typically)
- More conceptual

Exercise

- Nirvana County ... part 1



Who is the customer?

- Not always easy to define in service industry
- Especially hard in government services



Who is the customer?

- **Direct/Primary Customers:**
Who receives the *end product* of the process?
Who *experiences* the process?
Who is *paying* us?
- Usually, design to or fix to the needs of: The **DIRECT** customer
- More than 2 direct customers may indicate a lack of focus

Who is the customer?

Other stakeholders ...

- **Indirect/Secondary customers:**

Regulatory/Political entities that govern our responsibilities and place constraints on what we do (laws, ordinances, regulations, etc.)

Senior Management that govern our responsibilities and place constraints on what we do (policies, etc.)

Suppliers/employees that are part of the existing process and need support to do their job

Team Membership

- QI project team membership based largely on (high level) steps of existing process
- QP project team membership may include some representatives of existing process but not necessarily all. May also include:
 - “Fresh Perspective” - someone outside of existing process known for creative ideas
 - Potential suppliers
 - Customers

Team Selection Criteria

- Balance team/input “horizontally” (across process) and “vertically” (mgrs & staff)

Anticipate resistance - seek input from all stakeholders*

Remember: “People support what they help to build ...”

5-7 is ideal team size

- *Not all stakeholders need to be team members - but you need to find a way to get their input and keep them updated

Key Role: Project Sponsor

- Person primarily responsible for resourcing and governing the project
- Usually has a large stake in the success of the project AND the on-going success of the process

Key Role: Team Leader

- Responsible for success of the project
- May have stake in on-going success of the process

Characteristics ...

- Able to suspend bias
- Comfortable with analytical methods
- Comfortable with groups
- Effective leader

Key Role: Process Owner

- Person (or management group) with largest stake in the successful on-going performance of the process
- May correspond with team leader or team sponsor
- “Sustaining the Gains” requires that the organization define accountability for process performance
- May not be able to define until the process/service is better understood by the team

Key Role: Team Facilitator

- Responsible for providing knowledge re: Quality methods and tools
- Supports effective group process
- Sometimes the team leader and the team facilitator will have to be one and the same ... though this can be hard to do

Analyze

Still in Plan



For Quality Improvement

Analyze

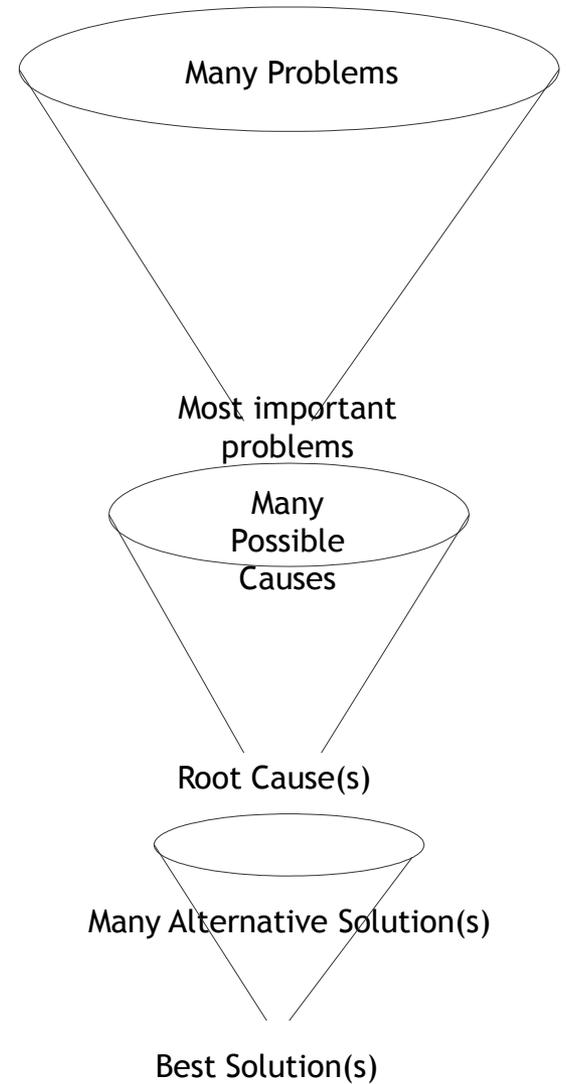
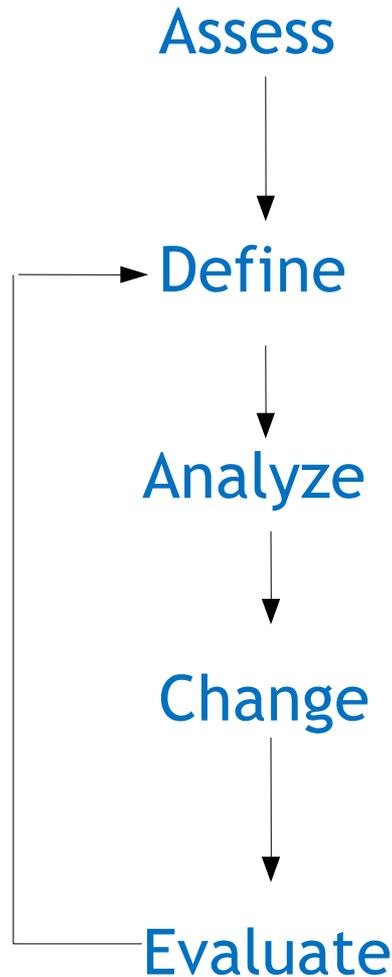
7. Analyze the process(es) and data
8. Determine potential causes
9. Determine “root” causes

(Sometimes in Analyze Phase you will discover that the process is undefined, wildly variable, and incapable of meeting customer needs. When this is the case you may “jump” to the Change Phase and borrow from the QP tool box.)

Analyze

- From the Greek root: “to break-down”
- Problems rarely have just one cause
- But, they usually do have 1-3 causes which cause *most of the problem*
- These are the “root” causes

The Improvement Funnel





Tool Box!

Analysis Tool (concept) Stratification



aka ... “Cutting” the data ...

What did John Snow ask?

London Cholera Epidemic 1854

- Who is dying of cholera?
- Where do they live?
- What did they eat, drink, do prior to getting sick?
- What do they have in common?
- Why the Broadstreet pump?



Analyze for QI

The *key* to effective analysis is coming up with clear questions!



General questions lead to more specific questions ...

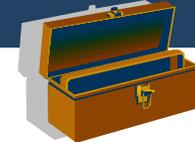


Analysis of “Cycle-Time”

Typical Questions & Tools



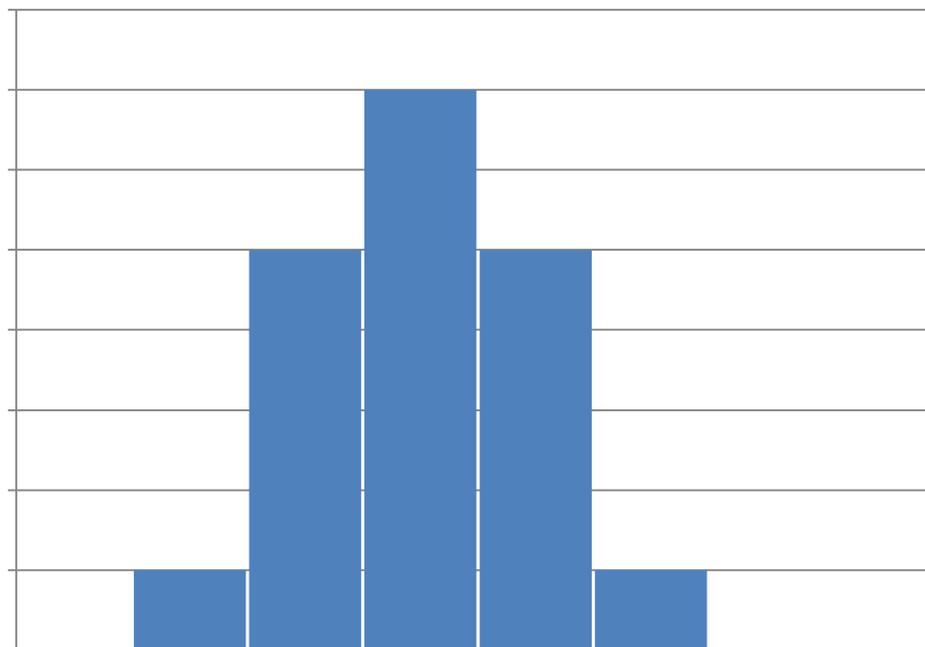
- What are the boundaries and steps of the process (flow chart)
- What is total time?
- Are there patterns in total time (seen in histogram/box plot) that would indicate an association? If so, focus there.
- What are major steps/intervals of process and how long do those take? Which ones take most of the time? Focus there.
- Within intervals are there patterns (seen in histogram/plot) which would indicate an association? Focus there.
- Within intervals or between steps are there rework loops (seen in flow charting)? Focus there.
- Once you are focused, develop specific theories (use Cause and Effect Diagram)
- Test/investigate your best theories.



Tool Box!

Histograms

aka ... Frequency Distributions



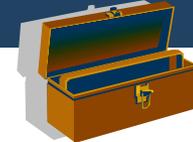


Analysis of “Defects”

Typical Questions & Tools



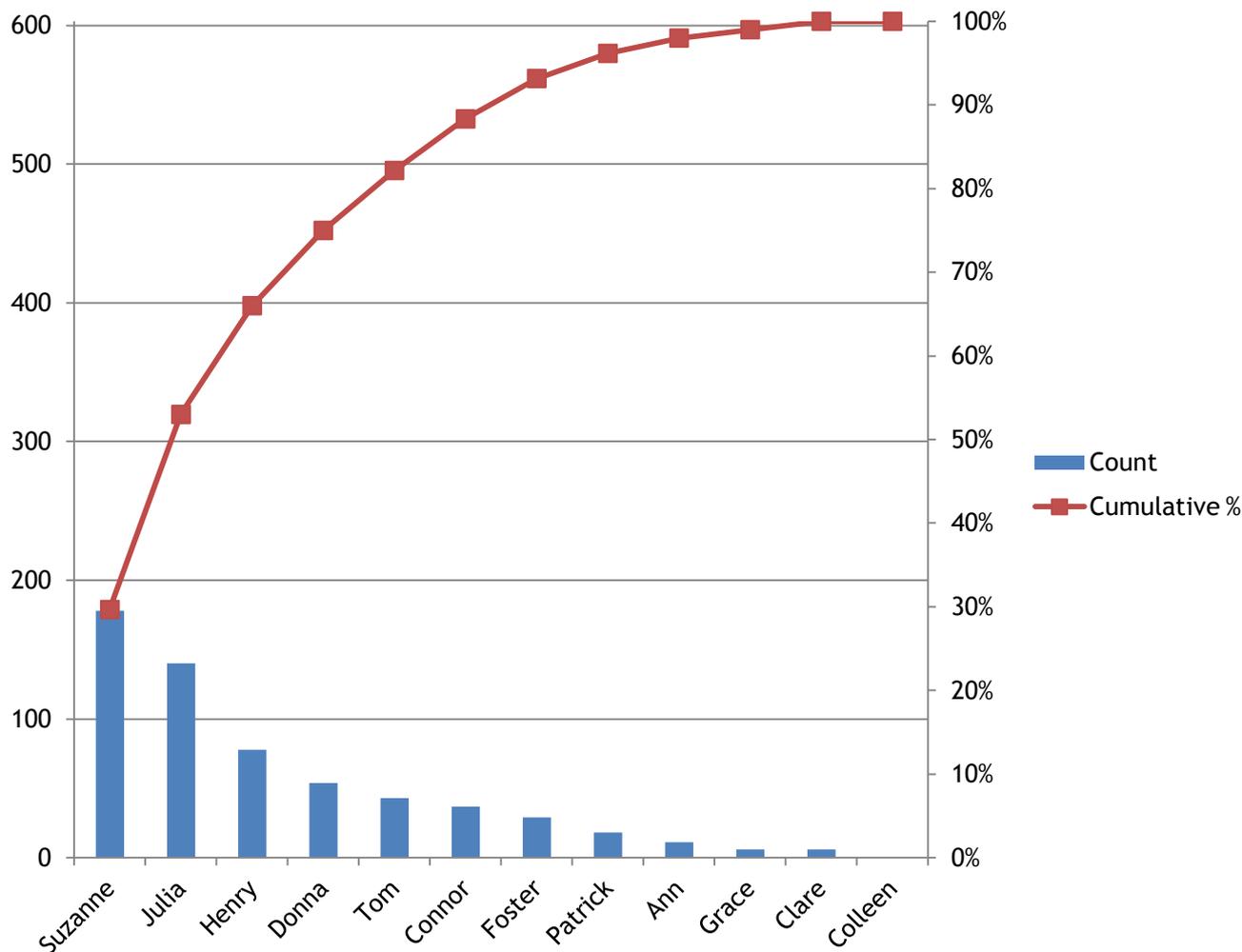
- How many defects are there (absolute and % of total)?
- Do some kinds of defects happen more often than others (determined through Pareto diagram)? Focus there.
- Do those defects happen more often when associated with a particular variable (time of day, day of week, shipment type, vendor, customer type, employee, etc.)? (Pareto chart or similar). Focus there.
- You may repeat this “what happens most?” focusing operation multiple times.
- Once you are focused, develop specific theories (use Cause and Effect Diagram)
- Test/investigate your best theories.



Tool Box!

Pareto Diagram

Example



Pareto Principle

Examples

- 1% of people control 90% of the wealth in the U.S.
- The first two years and last two years of life consume 85% of our health care expenditures
- 15% of cars on the road cause 50% of the auto-related pollution
- 10% of U.S. consumers purchase 43% of all beer
- What % of your “friends” contribute most of the Facebook posts?



Tool Box!

Data Collection Planning Matrix

Question to be answered	Possible source of information	Method/tool for gathering information	Sample size required	How info will be displayed

How much data?

- Avoid drawing inferences from small numbers
- But ... QI rarely requires levels of confidence associated with academic science
- Balance time/volume to collect against the costs and risks involved
- Generally ... *minimum* size of 35
 - More if it's easy to get
 - More if you anticipate “cutting” the data a lot
 - Consider whether the data is representative of the whole

Exercise

- Nirvana County ... part 2



How Rigorous

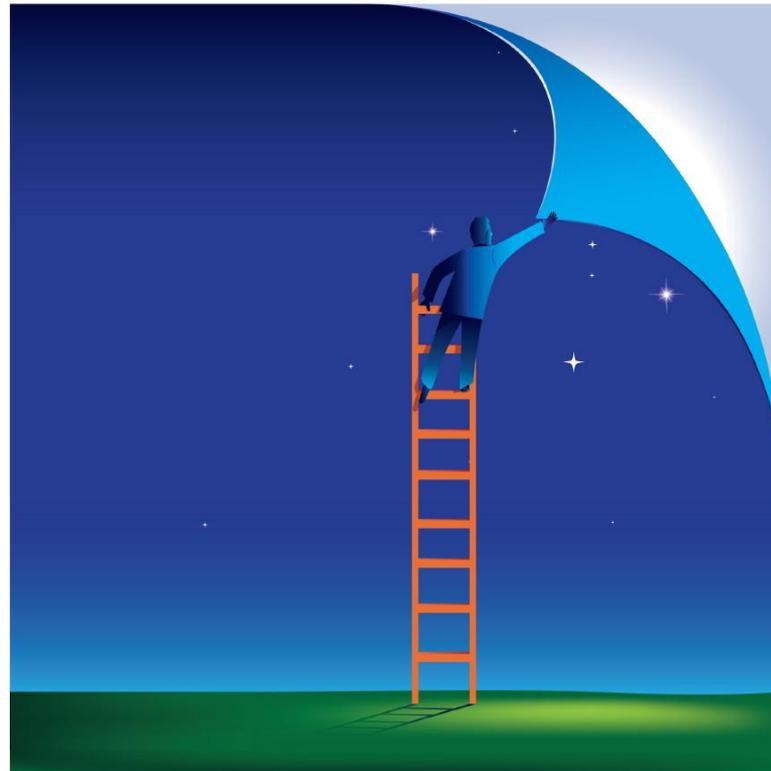
Do We Really Need to Be?

- Scope: *How many pieces of the organization are involved?*
- Depth: *How many people are affected?*
- Complexity: *How interdependent/dynamic are the variables?*
- Risk: *Customer impact? Cost implications? Public impact?*

The more “S-D-C or R” the more rigor required

Exercise

- Nirvana County ... part 3

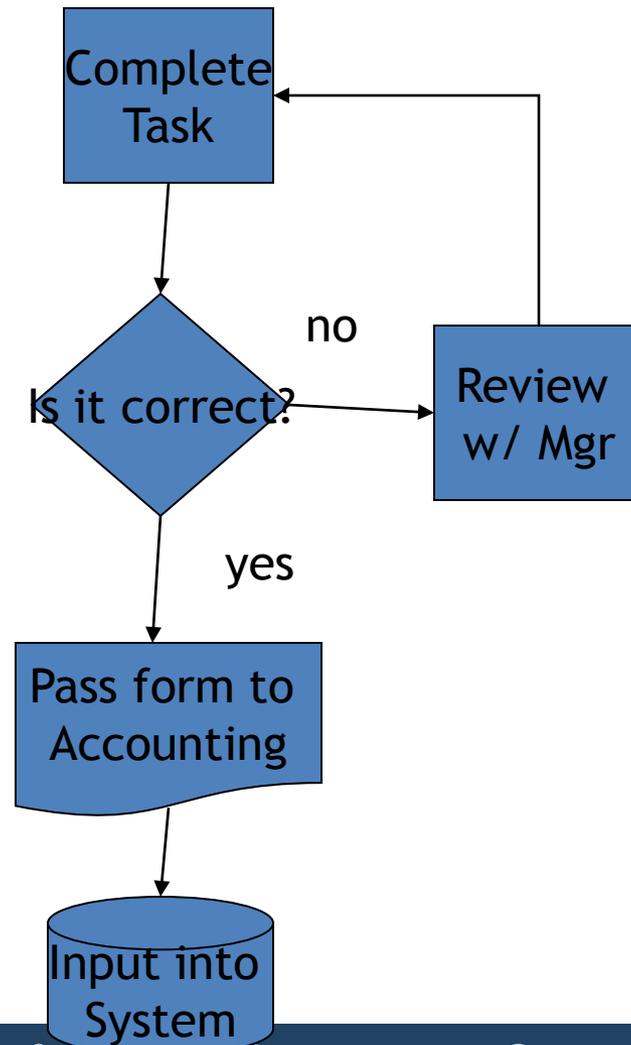




Tool Box!

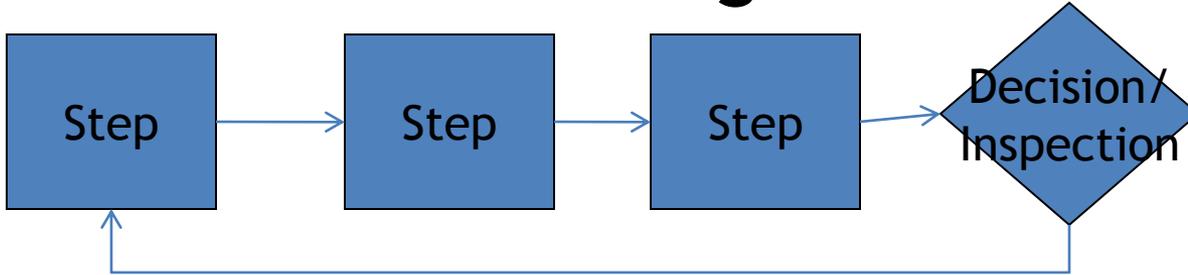
Analysis Tool

Detailed Process Flow Chart

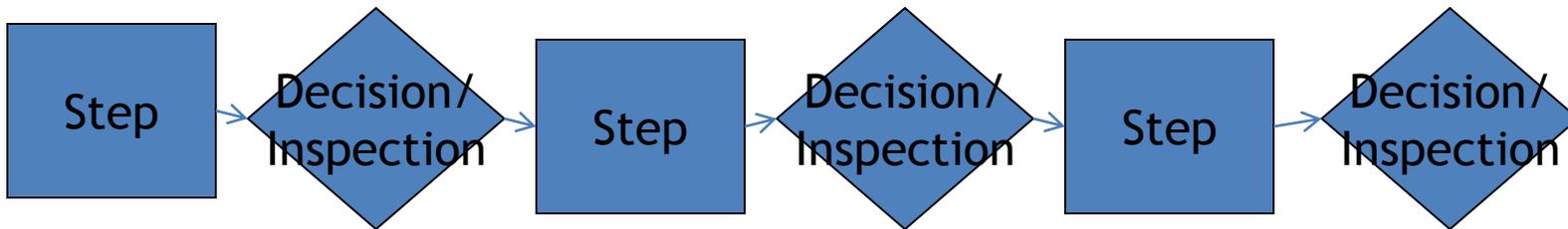


Analysis Tool

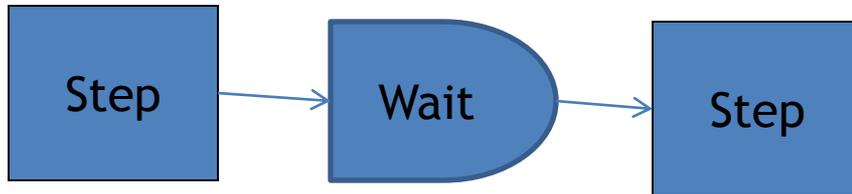
Things to look for



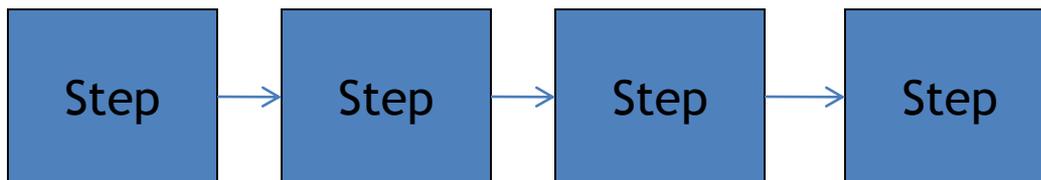
Re-work
Loops – esp.
long ones



Multiple
inspections



Wait states

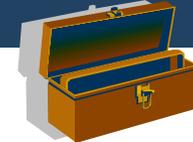


Too many steps;
Hand-offs

Analyze: Are we there yet?

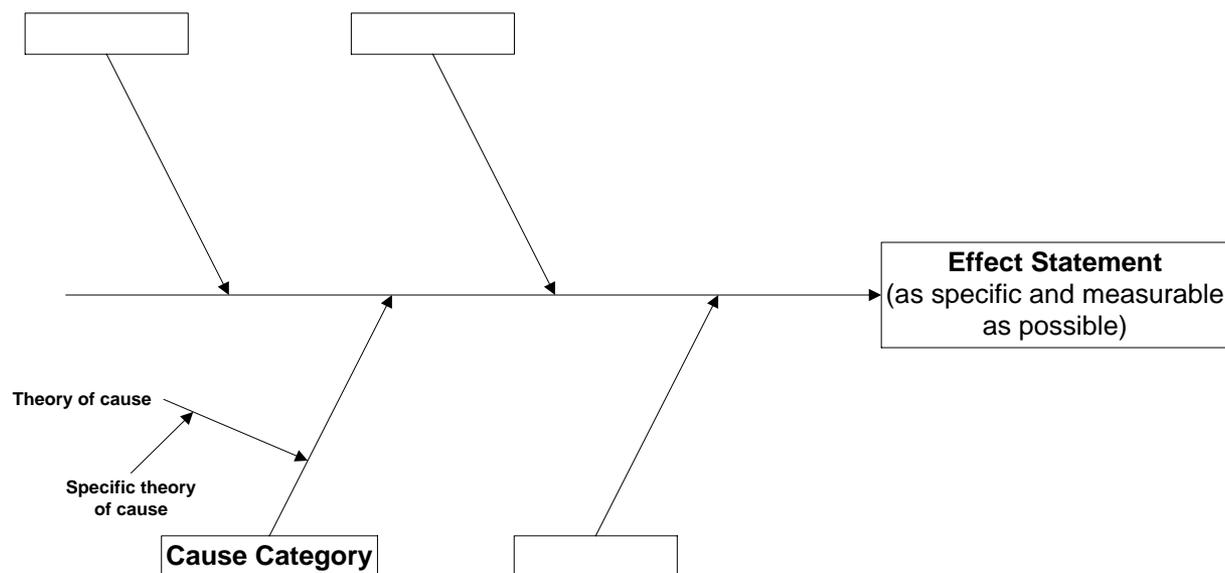
- Analyze is (usually) the hardest phase of QI
- It's easy to feel lost
- Doesn't always feel like you're making progress
- Can be hard to know when to stop





Tool Box!

Analysis Tool: Cause & Effect Diagram



“Fishbone” Format
(Aishikawa)

Exercise

- Nirvana County ... part 4



Analysis Tool: Cause & Effect Diagram

Typical Cause Categories

Machines

Process (methods)

Materials

People (men)

Environment (milieu)

Customers (patrons)

OR: Brainstorm causes on Post-It Notes and then group in natural affinities (see affinity diagram)

Exercise

- Nirvana County ... part 5



QI Analysis Tools

 A Lot

When will I use them?

 A little

	Assess	Define	Analyze (early)	Analyze (late)	Change	Evaluate
Flow Charting						
Stratification						
Pareto Diagrams						
Histograms						
Box Plots						
Scatter Plots						
Trend Charts						
C.E.D.s						

Analyze: Are we there yet?

- Have you moved from asking what, where, when, why to answering “why?”
- Have you narrowed enough that you have a good sense of what specific thing(s) you are going to fix?
- Are you confident you will have an impact on your mission if you fix the “root causes” you’ve found?

Yes!

Then you are ready for the CHANGE phase!



“We’re finally there!”

Change

Yep ... still in Plan



For Quality Improvement

Change

11. Consider solution options
12. Determine “best” solution(s)
13. Test Solutions
14. Manage Change
 - Social
 - Technical
15. “Hand-off” to operations - including Evaluation plan

Change

Quality Design Principles for QI

- Fix only what is broken
- Keep it Simple Silly
Fewer parts means less to break
- Control (failure proof) rather than inspect *if you can*
- Locate inspection as close to source of “defect” as possible, *if you can’t*
- Build in means to do QC and QP after the project is over
- Keep flow smooth - avoid batches, piles, wait states

Change

More Quality Design Principles

- **Keep the flow “smooth”**
 - ... avoid backlogs, bottlenecks, batches
- **Keep it “just in time”**
 - ... avoid big inventories; “pull” rather than “push”
- **Always Add Value**
 - ... every step should be about the customer
- **Avoid waste**
 - ... there shouldn't be “parts left over”/extra steps

Nuggets on the Ground



*Sometimes in the course of addressing root causes you may see simple obvious things that could also be changed. If it doesn't distract resources from your main purpose and it will do some good ...
Go for it!*

Change

More Quality Design Principles

- The only variation that is “ok” is customer variation
- Strive for the “one best way”



Solutions and Controls

Documented process
Training
Inspection/Supervision
Performance Aids
Audits
Reminders
Check lists
Measurement feedback
Hard controls/Failure Proofing

Harder to sustain
performance



Easier to sustain
performance

Beware QA “solutions”

- Be *aware* of the cost of quality
- *Beware* of inspection!
- Layering-on multiple inspections is NOT effective quality management
- Inspection is expensive, variable, and unsustainable

Consider Solution Options

- Brainstorm options to address “root” causes. BE CREATIVE!
- Multi-vote/rank order “best” options
- Design options in detail
- Test options/Prevent Failure*
- Select options to implement

*How rigorously you need to test an option depends on the monetary and social costs. If there's little risk to trying something out, and you have a measure that will tell you if it worked, go ahead!

Solutions

Typical Evaluation Criteria

- **Effectiveness**
How much of root cause is eliminated?
- **Sustainability**
How well can this solution be maintained?
- **Cost**
Less is better than more
- **Time to implement**
Less is better than more
- **Likely Resistance**
Less is better than more

Solution Testing

remember your SDCR

- Can you confirm your solution with further data collection?

- Can you “pilot” your solution?

Implement in smaller setting for specific period and evaluate?

- Can you “sanity test” your solution option with the users?

Demonstrate option to people in process and see it is understood, feasible, etc.

Implementation

2nd half of change phase / The Do phase



Implementation - Basic Responsibility Matrix

What	Who	When
Task Description	Name	Due date

Change Management

- Biggest barriers to change are often social rather than technical
- *Even a positive change* will be resisted to some degree



Communication vs. Training

- Communication builds awareness and readiness
- Training develops specific skills or knowledge necessary to fulfill a step/role in the process

Communication Plan

<i>Audience/ Stakeholder Group</i>	<i>Key Messages</i>	<i>How</i>	<i>Who</i>	<i>When</i>

Typical QI Key Messages

- The problem and why it is important
- Who was on the team - how staff input was obtained
- Why and how the chosen solutions will address the problem
- How staff might benefit from the changes
- The efforts being made to make the change as easy as possible

Training Plan

<i>Employee Category</i>	<i>Responsibilities</i>	<i>Skills/ Knowledge Required</i>	<i>Medium</i>	<i>Who</i>	<i>When</i>

Evaluation Plan

Performance Indicator/ measure	Display tool	Maintained by	Responsible actor	Process Owner
# late reports	Weekly Trend Chart	Unit Supervisor	Unit supervisor	Program Mgr
# days to complete process	Box Plot Trend Chart; Monthly Histogram	Mgmt Analyst	Program Mgr	Division Mgr

Typical Hand-off "package"

- Implementation Plan/Schedule
- Process draft to be posted to intranet and/or revised process flow chart
- Other controls (software change, reminders, forms, etc.)
- Communication/Training Plan
- Evaluation (follow-up) plan

Audit schedule

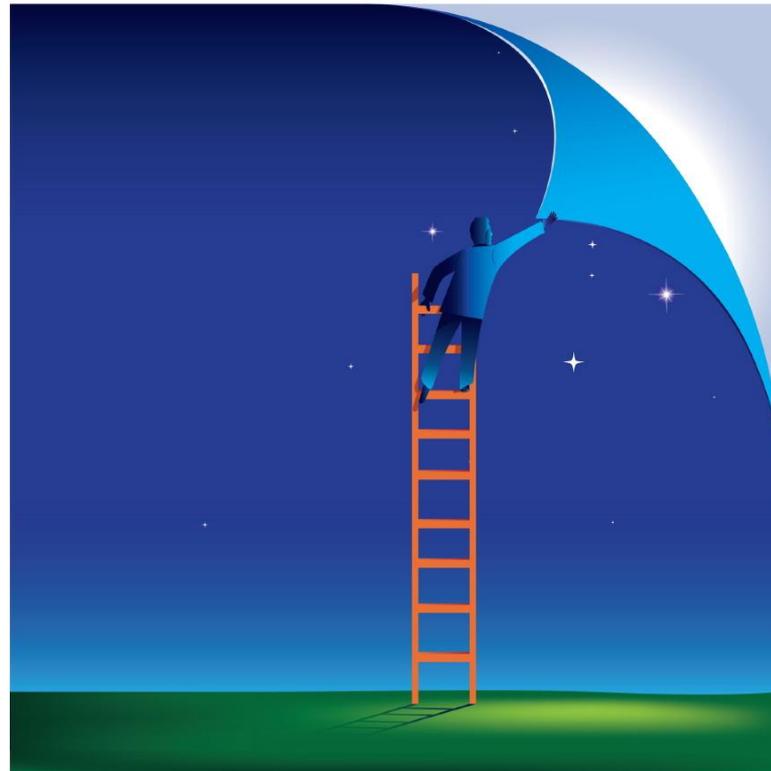
Measurement feedback mechanism

Control charts or other visual measurement tools

Defined accountability to act on non-compliance/process failure

Exercise

- Nirvana County ... wrap up



Evaluate

Check & Act



Evaluate

16. Monitor performance against measures
17. Maintain solution (if working)
18. Re-Enter Improvement Cycle as needed

Evaluation Objectives

- Limit variation in process as much as possible
- Understand predictable range of variation
- Understand sources of variation
- React to trends rather than isolated events
- Incrementally improve

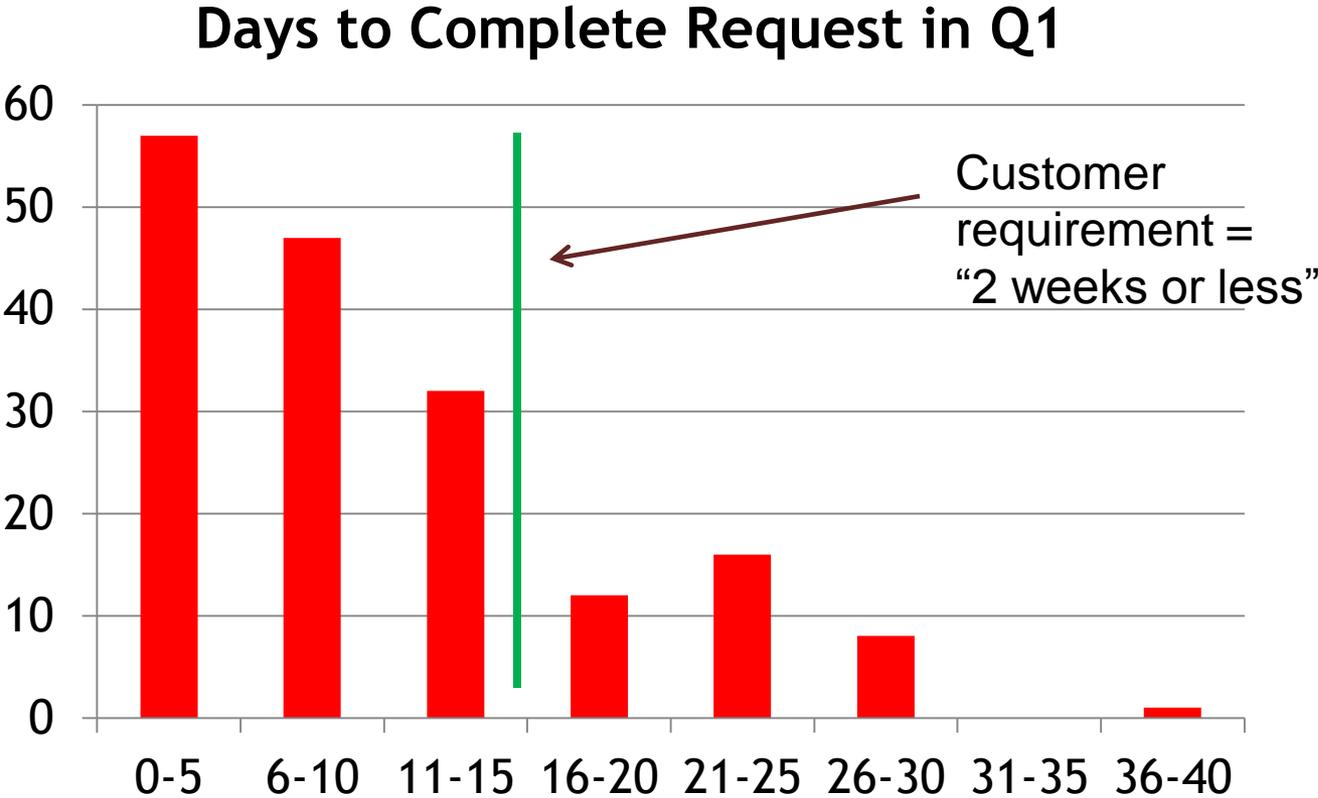
Trend* Chart for Evaluation

Positive Tests Per Month



**Run / line*

Histogram for Evaluation



Accountability and Responsibility

It is not enough just to measure!

- **Who** is responsible for maintaining, formatting, and distributing the data?
- **Who** is responsible for taking action on variances and bad trends?
- **Who** is accountable for ensuring that these things take place?
- **Who** is accountable to ensure process is continually improved?

Quality Improvement in Public Health objectives

- Understand basic method for Quality Improvement Projects
- Understand purpose and value of common QI tools, including Pareto diagrams, histograms and flow charts
- Simulate the group process and analytical approach of a QI project

Public Health Performance Management Centers for Excellence

References

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