

A Health Care Organization (Medicare extension)

Managerial & other problems in extending the current
Medicare system to a general customer population

TEAM 8

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Problem Statement

- ❑ Medicare covers 55 million people, providing insurance to one in six Americans
- ❑ Research shows that Medicare faces a host of challenges in the decades to come
- ❑ Expanding this system to ‘all’ will only exacerbate any existing issues and bring on its own set of challenges
- ❑ Finance, logistics and a number of other topics will need to be addressed in order to implement a new process of extending Medicare to ‘all’



Problem Areas

❑ Documentation Processing

- Errors in processing lead to longer claim duration
- Due to the variety of health insurances the code processing time is long

❑ Financing

- 10,000 people per day become eligible for Medicare, yet the number of taxpayers to fund the program is decreasing.

❑ Affordability & Health Care Cost Increase

- In 2013, half of all people on Medicare had incomes below \$23,500 per person
- Premiums & Medical spending continue to grow at a rate faster than inflation.

❑ Link between coverage and employment

- Millions of Americans left without coverage.

❑ Catastrophic Costs

- No supplemental insurance to eliminate risk of being impoverished by their medical expenses



Possible Improvements

❑ Documentation and Duration of Processing a Claim

❑ Medicare for All

- Abolish Parts A and B, A general benefits package available to all Americans.
- A Single-Payer, Tax-based, health care system

❑ Access to Care

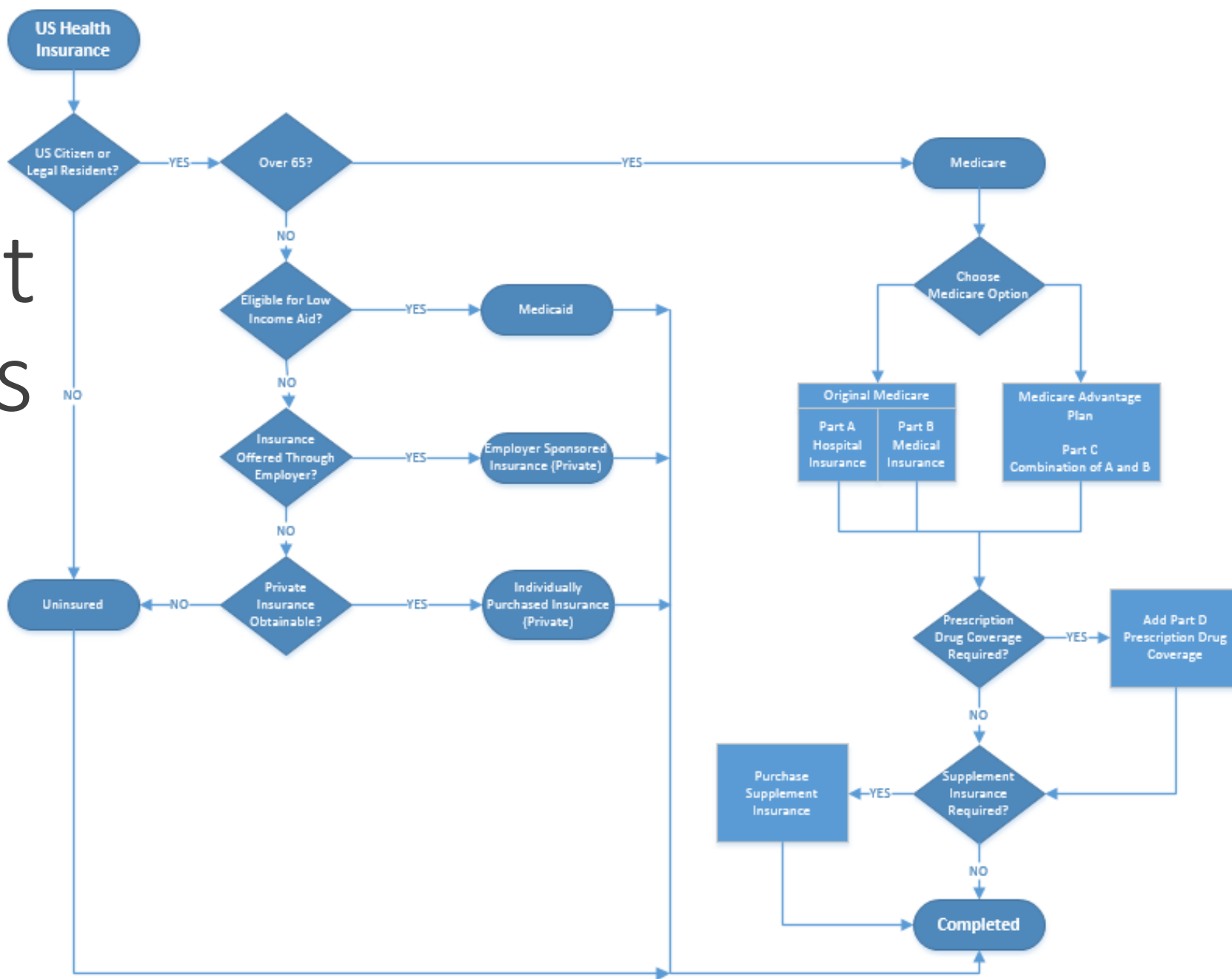
- All Americans would have access to healthcare

❑ Quality of Care

- Extending health insurance to millions who do not have it or do not have enough



Current Process Flow Chart



Cost of Poor Quality (COPQ)

Process	Internal Failure	External Failure	Appraisal	Prevention
Funding (Taxpayers / Government)	More Claims than Available Funds	Not Enough Taxpayer Input	Percent of Budget Allocated to Program.	Increase Medicare Taxes / Negotiate Lower Service Costs
Employees	Not Enough / Training			
Service Provider (Hospitals/Doctor's Office/etc.)	High Administration Fees, Medical Professional Miss Diagnosis	Limited Service Providers vs. User Needs	Medical Facilities, Quality of Care	Single Payer Tax System, (Cut Administration Fees)
Billing (Documentation / Paperwork)	Filed Incorrectly / Complexity / Poor Instructions	Patient Fills Out Incorrectly / Forgets Documentation		Universal Database (Patient Lookup) / Automated Form Finder (Questionnaire) / Information Distribution

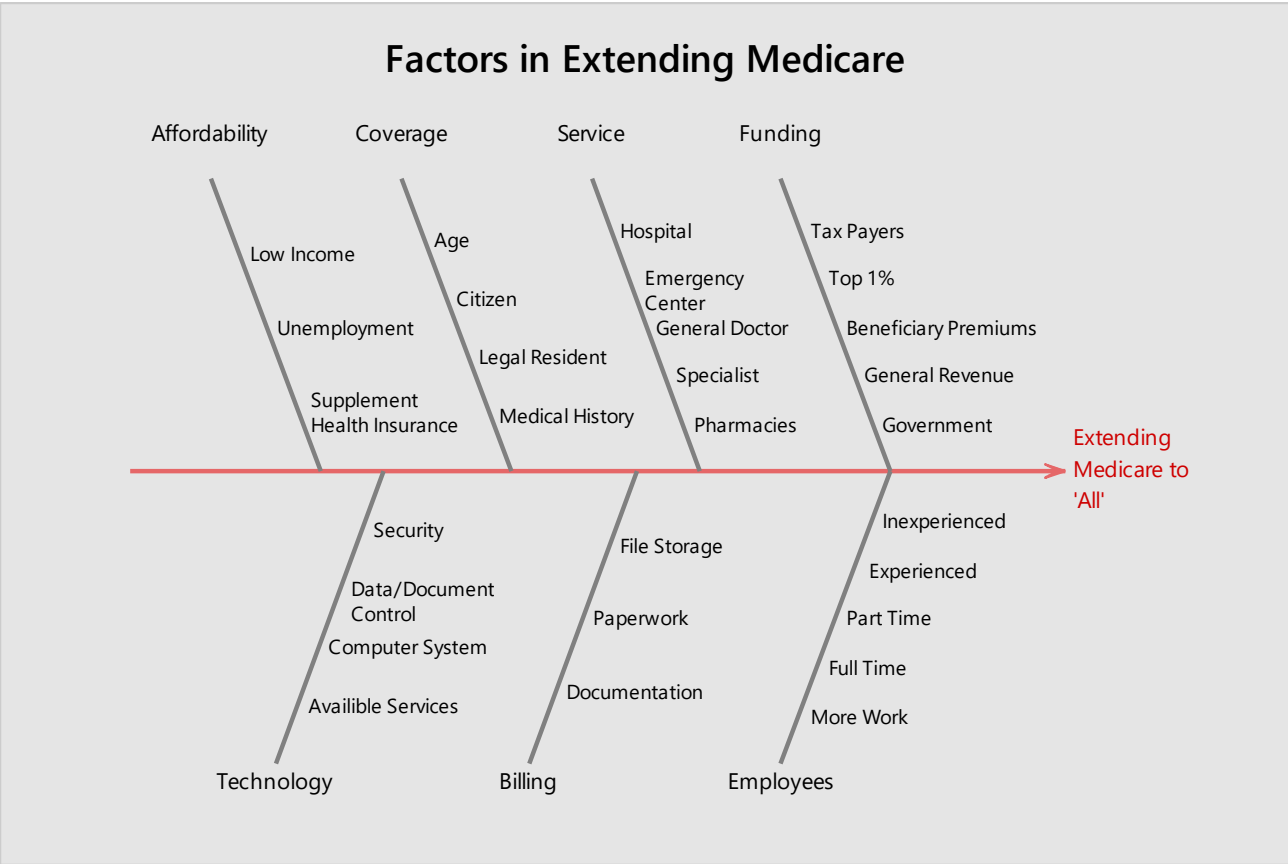


Affinity Diagram

Funding	Employees	Service Providers	Billing	Technology	Coverage	Affordability
Taxpayers	More Work (Single Insurance Organization)	Hospital	Documentation	Available Services	Age	Low Income
Top 1%	Full Time	Emergency Center	Paperwork	Computer System	Citizen	Unemployment
Beneficiary Premiums	Part Time	General Doctor	File Storage (Servers?)	Data / Document Control	Legal Resident	Supplement Health Insurance
General Revenues	Experience	Specialist		Security	Medical History	
Government	Inexperienced	Pharmacies				



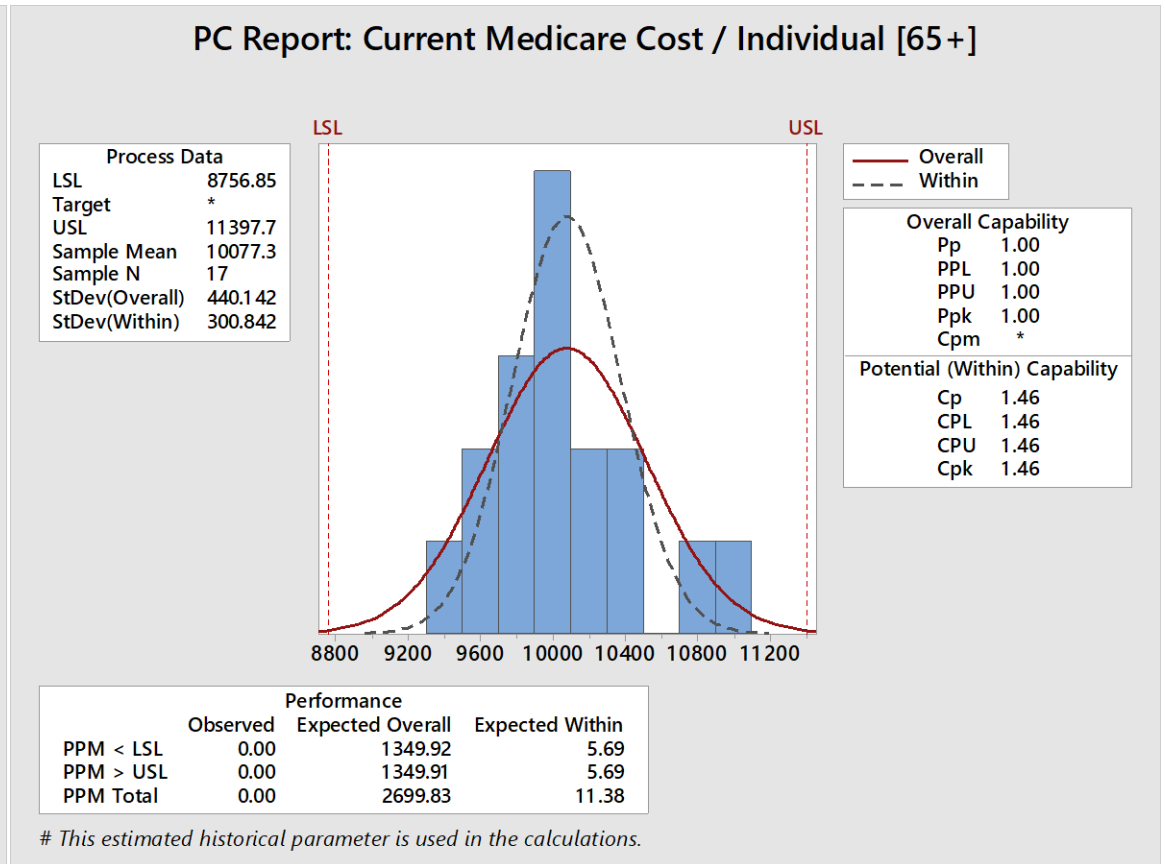
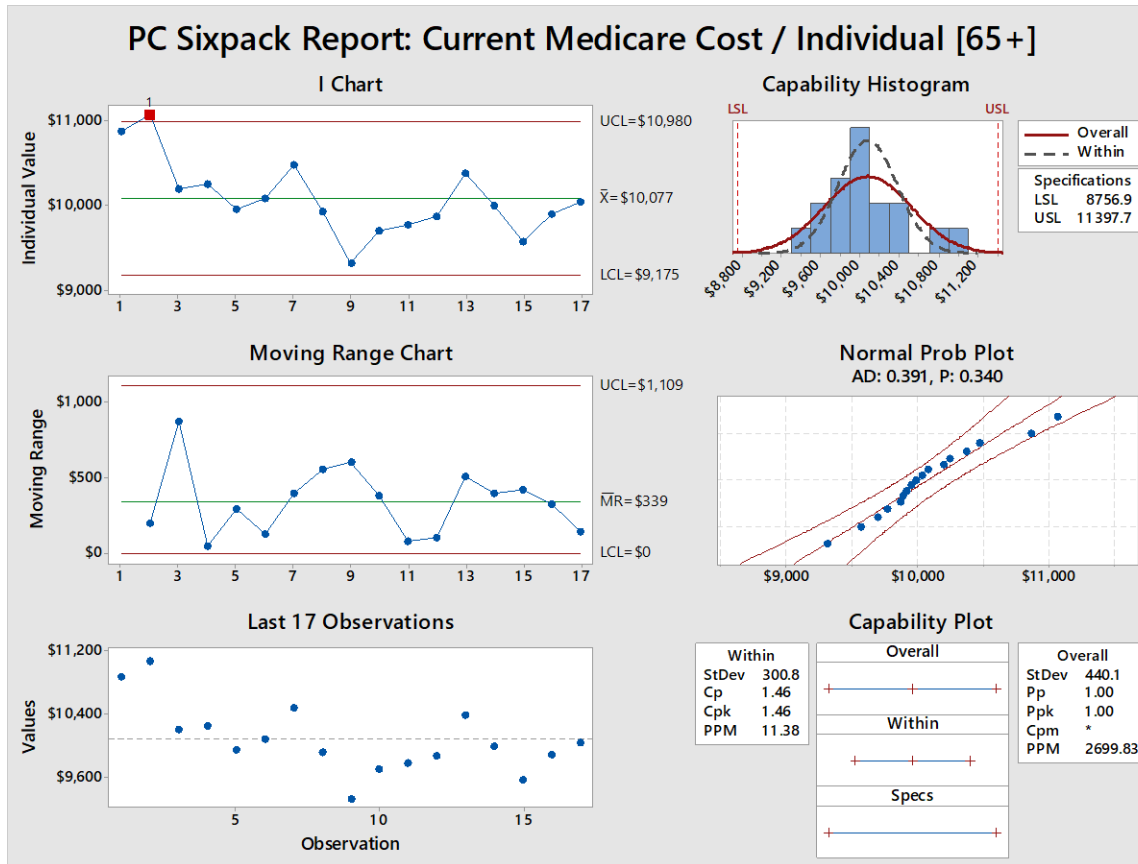
Fishbone (Ishikawa) Chart



Process Capability Analysis (Data Collection)

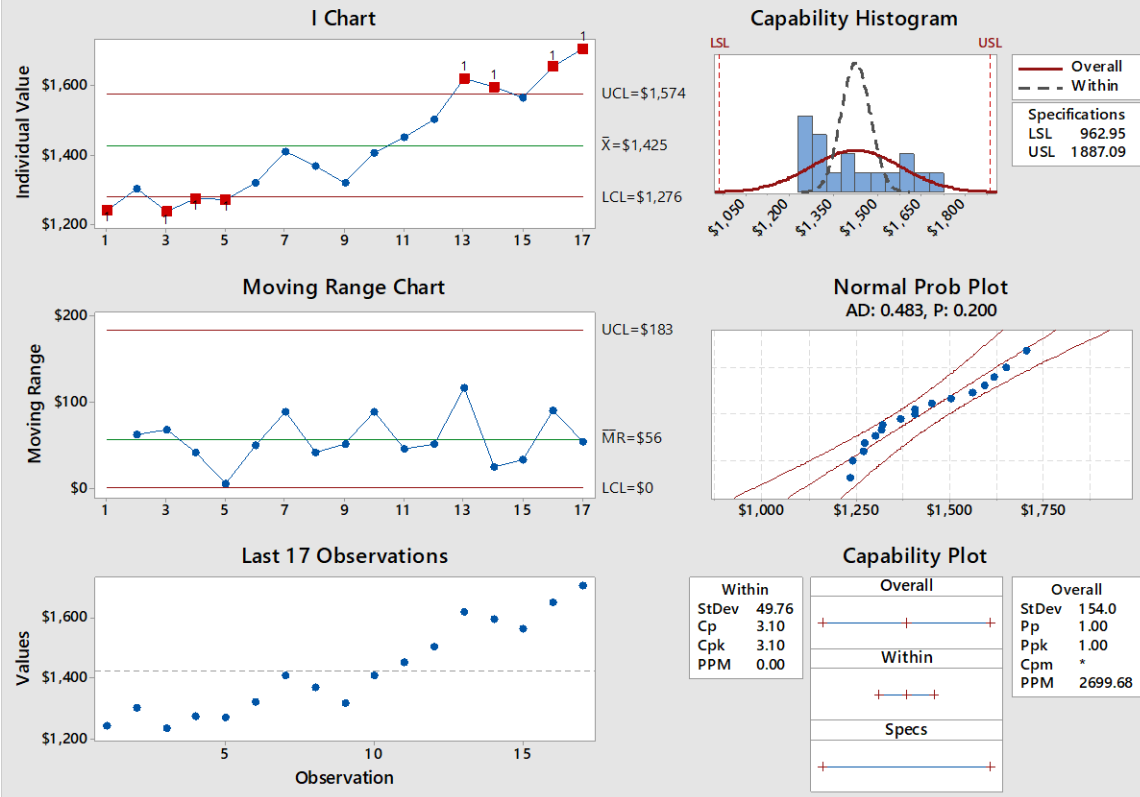
Actual	Net Medicare Spending (Billions)	Net Medicare For All Spending (Billions) 12% Administration Reduction	U.S. Population - 65+ [x1000]	Medicare Cost / Individual [65+]	U.S. Population - Total [x1000]	Medicare Cost / Individual [for 'All']	Projected (/Actual) Inflation	Inflation Index	Medicare Cost / Individual [65+] {2010 Dollar Value}	Medicare Cost / Individual [for 'All'] {2010 Dollar Value}
Projected										
Year										
2010	\$446.00	\$392.48	40,229	\$11,087	310,233	\$1,265	{1.21%}	72.51966076	\$10,869	\$1,240
2011	\$480.00	\$422.40	41,749	\$11,497	312,460	\$1,352	1.96%	73.94104611	\$11,067	\$1,301
2012	\$466.00	\$410.08	43,269	\$10,770	314,687	\$1,303	1.75%	75.23501442	\$10,198	\$1,234
2013	\$492.00	\$432.96	44,790	\$10,985	316,915	\$1,366	1.51%	76.37106314	\$10,245	\$1,274
2014	\$505.00	\$444.40	46,310	\$10,905	319,142	\$1,392	1.35%	77.40207249	\$9,950	\$1,270
2015	\$540.00	\$475.20	47,830	\$11,290	321,369	\$1,479	1.90%	78.87271187	\$10,077	\$1,320
2016	\$595.00	\$523.60	49,510	\$12,018	323,996	\$1,616	1.82%	80.30819522	\$10,474	\$1,409
2017	\$598.00	\$526.24	51,212	\$11,677	326,626	\$1,611	1.90%	81.83405093	\$9,918	\$1,368
2018	\$597.00	\$525.36	52,935	\$11,278	329,256	\$1,596	1.97%	83.44618173	\$9,318	\$1,318
2019	\$661.00	\$581.68	54,678	\$12,089	331,884	\$1,753	2.01%	85.12344999	\$9,700	\$1,406
2020	\$709.00	\$623.92	56,441	\$12,562	334,503	\$1,865	2.03%	86.85145602	\$9,774	\$1,451
2021	\$764.00	\$672.32	58,300	\$13,105	337,109	\$1,994	2.03%	88.61454058	\$9,871	\$1,502
2022	\$858.00	\$755.04	60,179	\$14,258	339,698	\$2,223	2.03%	90.41341575	\$10,379	\$1,618
2023	\$883.00	\$777.04	62,075	\$14,225	342,267	\$2,270	2.03%	92.24880809	\$9,987	\$1,594
2024	\$906.00	\$797.28	63,989	\$14,159	344,814	\$2,312	2.03%	94.1214589	\$9,566	\$1,562
2025	\$1,005.00	\$884.40	65,920	\$15,246	347,335	\$2,546	2.04%	96.04153666	\$9,889	\$1,652
2026	\$1,091.00	\$960.08	67,541	\$16,153	349,826	\$2,744	2.04%	98.00078401	\$10,032	\$1,704
2027	\$1,176.00	\$1,034.88	69,171	\$17,001	352,281	\$2,938	2.04%	100		

Current Sixpack & Process Capability

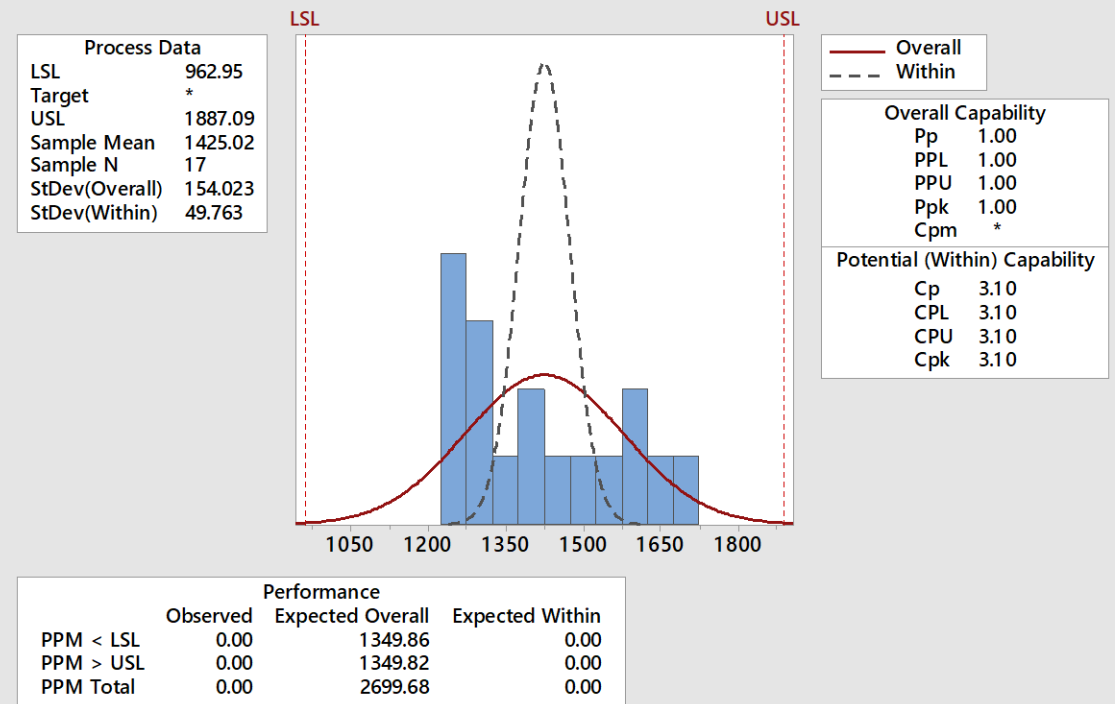


Proposed - Sixpack & Process Capability

PC Sixpack Report: Proposed Medicare Cost / Individual [Medicare for 'All']



PC Report: Proposed Medicare Cost / Individual [Medicare for 'All']



This estimated historical parameter is used in the calculations.

PCA Conclusion

There are several proposed solutions which take into account the health care system in its entirety to eliminate waste and reduce overall costs and quality of medical coverage.

Determining the direct affect on Medicare expansion to all as it relates to management of the program does not currently exist. The proposed plans for consolidation do not specifically address Medicare as it stands today. These plans incorporate health care as a whole into a new proposed Medicare 'for all' system. This will allow a sum of 44 million Americans currently without healthcare coverage to gain access and in turn, increase their overall quality of health care coverage.

With the Medicare system enrollment increasing and a lack of growth in the economy (which affects Medicare's revenue from payroll tax) the solvency of the Part A trust has been estimated to be depleted by the year 2028.

The PCA analyzing a healthcare system for 'all', in terms of cost per individual, is not valid as the data is not 'stable'. The results from this analysis led our group down the path of focusing on process improvements and reducing costs within the healthcare system that would allow a viable solution for 'all'.



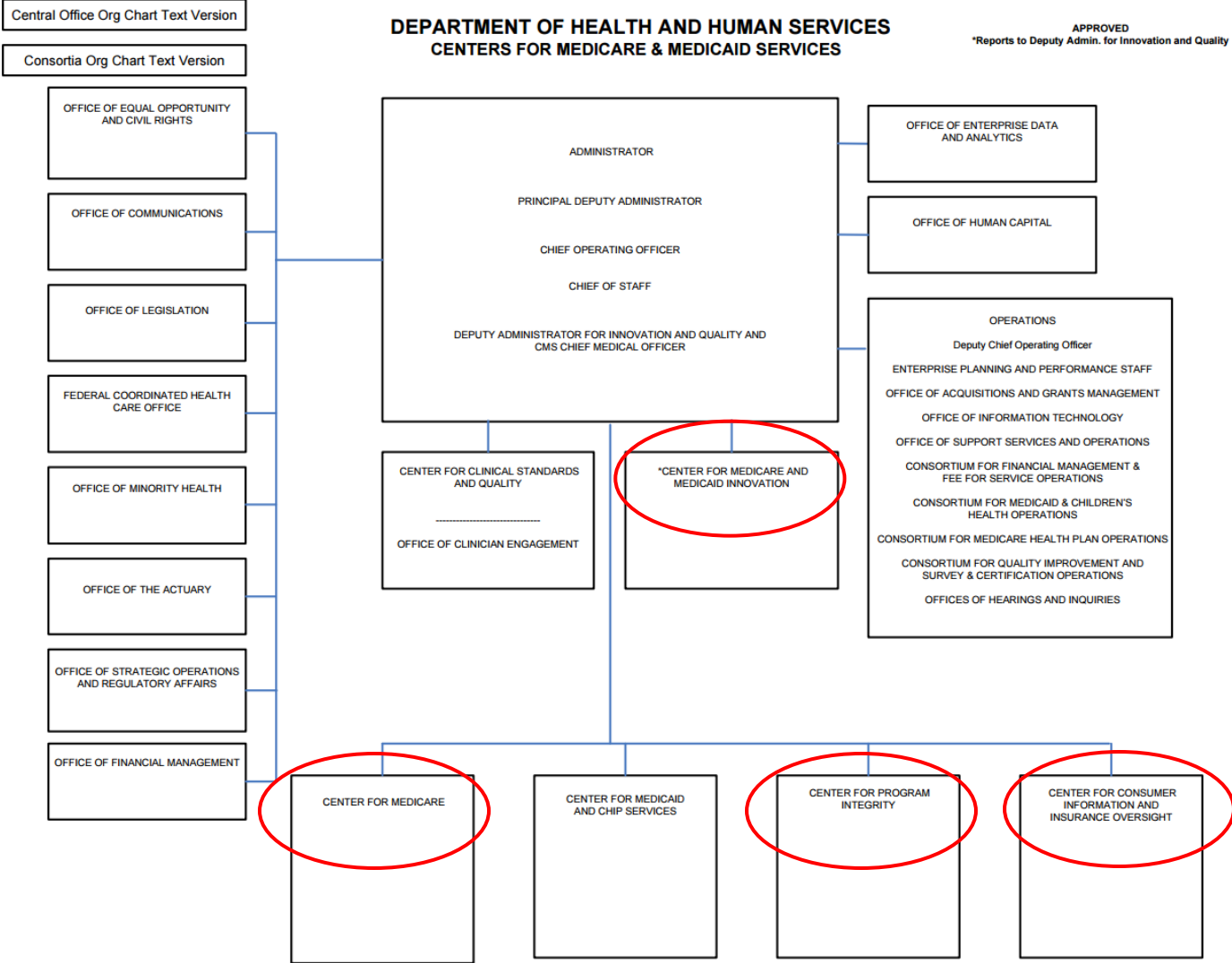
Quality Assessment

List of Concerns Derived from COPQ

- Funding for Medicare
- Under staffed do to increased customer base
- Poor training
- Available service providers
- Cost of medical expenses
- Increased documentation and paperwork (more errors)



Organizational Chart



Important Organizational Areas

❑ Center for Medicare and Medicaid Innovation

- ❑ Designs, Evaluates, Implements and Distributes Information About Effective & Innovative Payment and Service Delivery Models With a Goal of Enhancing the Quality of Healthcare and Reducing Costs while Carrying Out Core Business Functions

❑ Center for Medicare

- ❑ The Epicenter for National Medicare Program Policies and Operations that Identifies and Proposes Modifications to Current Medicare Programs and Policies
- ❑ Main Group for Management, Oversight, Budget and Performance of Medicare Plans that Carries Our Missions and Goals to Position the Organization to Meet Future Challenges

❑ Center for Program Integrity

- ❑ The Epicenter for All Medicare and Medicaid Fraud and Abuse Issues that Promotes Integrity of the Systems through Audits and Policy Reviews, Identifying and Resolving Program Vulnerabilities

❑ Center for Consumer Information and Insurance Oversight

- ❑ Sets and Enforces Standards for Health Insurance to Promote Fair, Affordable and Quality Health Coverage is Available and Provides Information on Insurance Coverage Options to the General Consumers
- ❑ Collects Data to Maintain, Implement and Monitor Compliance With Insurance Market Rules



Questions

- 1) What issues do you currently face within the Medicare system?
- 2) Walk me through the current process of applying for Medicare?
 - a) How long does the current process take?
 - b) Is it a difficult process?
- 3) Where do you feel the system is lacking support?
- 4) Do you have a training processes for employees?
- 5) How many errors are reported each week?
 - a) What are the majority of these errors?



Question 1

- What issues do you currently face within the Medicare system?
 - Billions of dollars being wasted
 - Avoidable harm to patients
 - Higher Volume of Chronic Diseases
 - Enrollment/Miss-understanding by Patients



Question 2

- Walk me through the current process of applying for Medicare?
 - a) How long does the current process take?
 - b) Is it a difficult process?

- Medicare cards should arrive within 30 days after individuals complete the Medicare Part A or B application during the Initial Enrollment Period. The Initial Enrollment Period begins three months before individuals turn 65 and lasts for seven months.

- You can sign up for Part A and/or Part B during the General Enrollment Period between January 1–March 31 each year if both of these apply:
 - You didn't sign up when you were first eligible.
 - You aren't eligible for a Special Enrollment Period.



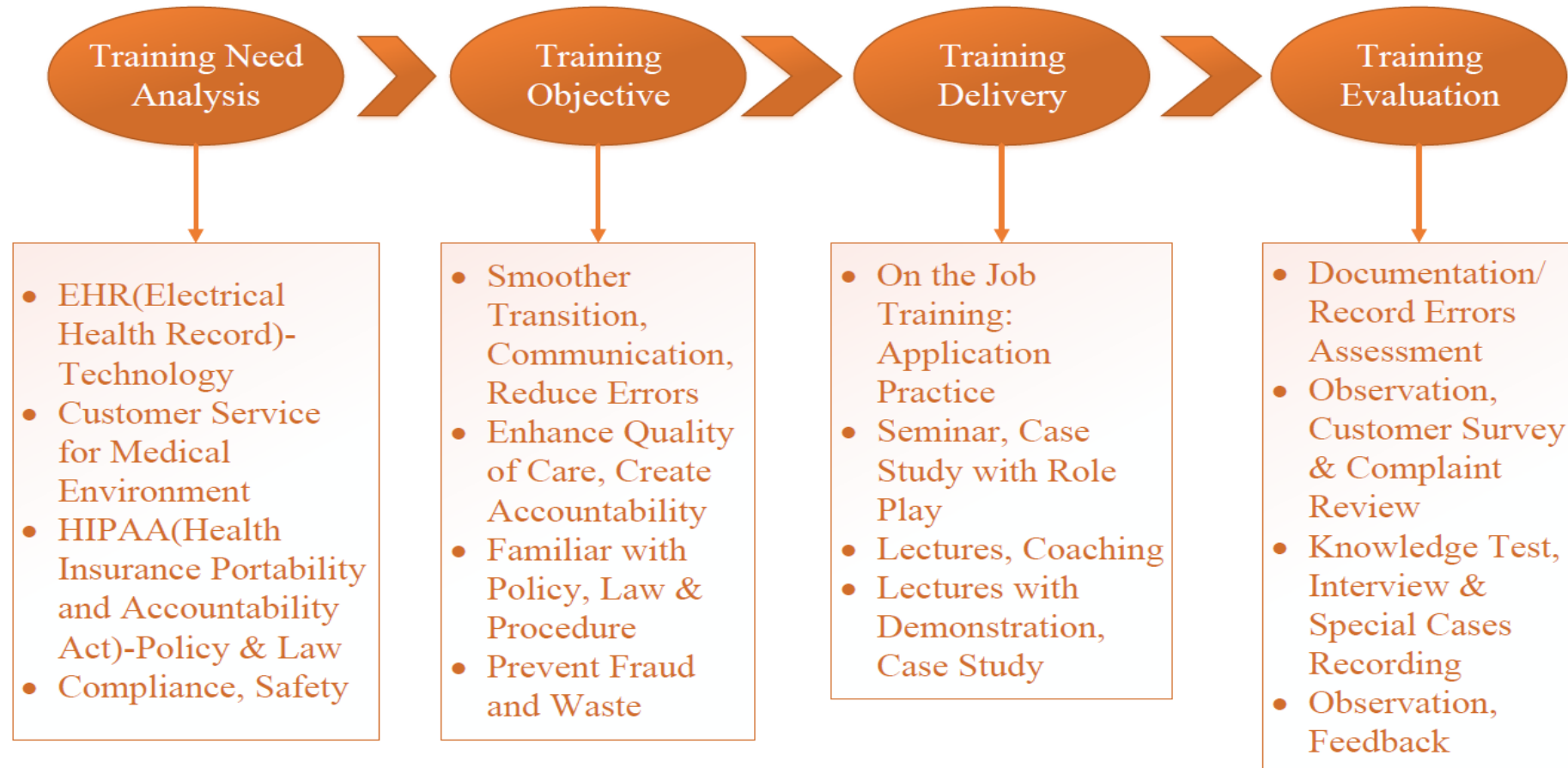
Question 3

- Where do you feel the system is lacking support?
 - Lack of support for family caregivers of elderly Medicare recipients
 - Payment process for services, medical equipment
 - Stringent supporting documentation requirements
 - Claims service lacking information for adjudication
 - Human Resource:
 - Well-trained employees, general doctors and specialists resource.
 - Communication:
 - Payment support and tools for different medical care providers to communicate and work together.
 - Screenings & Vaccines
 - Only certain screenings and vaccines are covered under part A or B.



Question 4

□ Do you have a training process for employees?



Question 5

❑ How many errors are reported each week?

❑ Comprehensive Error Rate Testing (CERT)

❑ Improper Payment Categories

- ❑ No Documentation
- ❑ Insufficient Documentation
- ❑ Medical Necessity
- ❑ Incorrect Coding
- ❑ Other

Service Type	Improper Payment Rate	Improper Payment Amount (2)
Inpatient Hospitals	6.20%	\$7.0B
Durable Medical Equipment	39.90%	\$3.2B
Physician/Lab/Ambulance	12.70%	\$11.5B
Non-Inpatient Hospital Facilities	14.70%	\$21.7B
Overall	12.10%	\$43.3B

2015 Improper Payment rates & amounts.



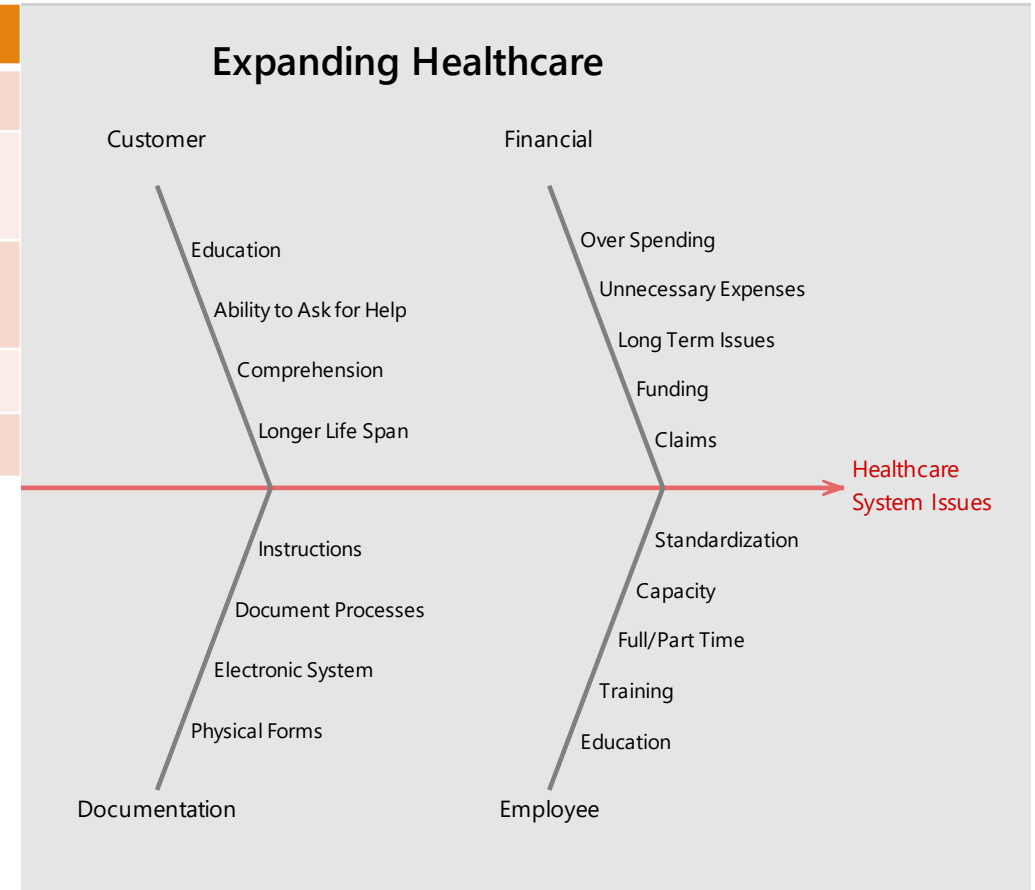
Diagnostic of Issues

- ❑ The lack of information is leading to unnecessary spending
- ❑ Long gap between filing application and acceptance into the program.
- ❑ Inefficient processes and training
 - ❑ Lack of training in the required billing procedures creates problems and denied or rejected claims.
- ❑ Missing proper documentation for processes
 - ❑ Incorrect documentation leads to excess time & money spent to verify claims.
- ❑ Employees unable to answer customer questions
- ❑ Not utilizing available resources
- ❑ Lack of funding sources to keep up with the growing demand of new enrollees, and the increasing number of Medicare patients with severe illness & high medical costs.



Root Cause Analysis

Financial	Employee	Customer	Documentation
Over Spending	Education	Education	Physical Forms
Unnecessary Medical Expenses	Training	Ability to Ask For Help	Electronic System
Long Term Health Issues	Full/Part Time	Comprehension	Documents Processes
Funding	Capacity	Longer Life Spans	Instructions
Claim Service	Standardization		



Results from Diagnostics and Root Cause Analysis

- ❑ Medicare's current status of high enrollment vs. the low number of taxpayers supporting the system cannot sustain the increasing costs associated with fraud and waste.
- ❑ Are fraud/waste being prevented and have we eliminated the opportunity for overbilling.



Solutions for Quality Issues

- ❑ Monitoring and auditing reporting
 - ❑ Implement compliance and practice standards
 - ❑ Designate a compliance officer
- ❑ Conduct appropriate training and education
- ❑ Respond appropriately to detected offenses and develop corrective action
 - ❑ Develop open lines of communication with employees
 - ❑ Enforce disciplinary standards through well-publicized guidelines
- ❑ Create a better process for evaluating medical needs and requirements
- ❑ Standardize operations



Assess Improvements and How-to Sustain

- Do our auditing reports indicate an increase/decrease in the total number of errors
 - If errors continue, increase, What specific area is affected most
 - Have employees been successfully trained in their specific area of expertise as it relates to the Medicare process.
 - Have disciplinary standards been enforced on violators, have previous violators conformed to the new standards.

- Questionnaires for employees and doctors

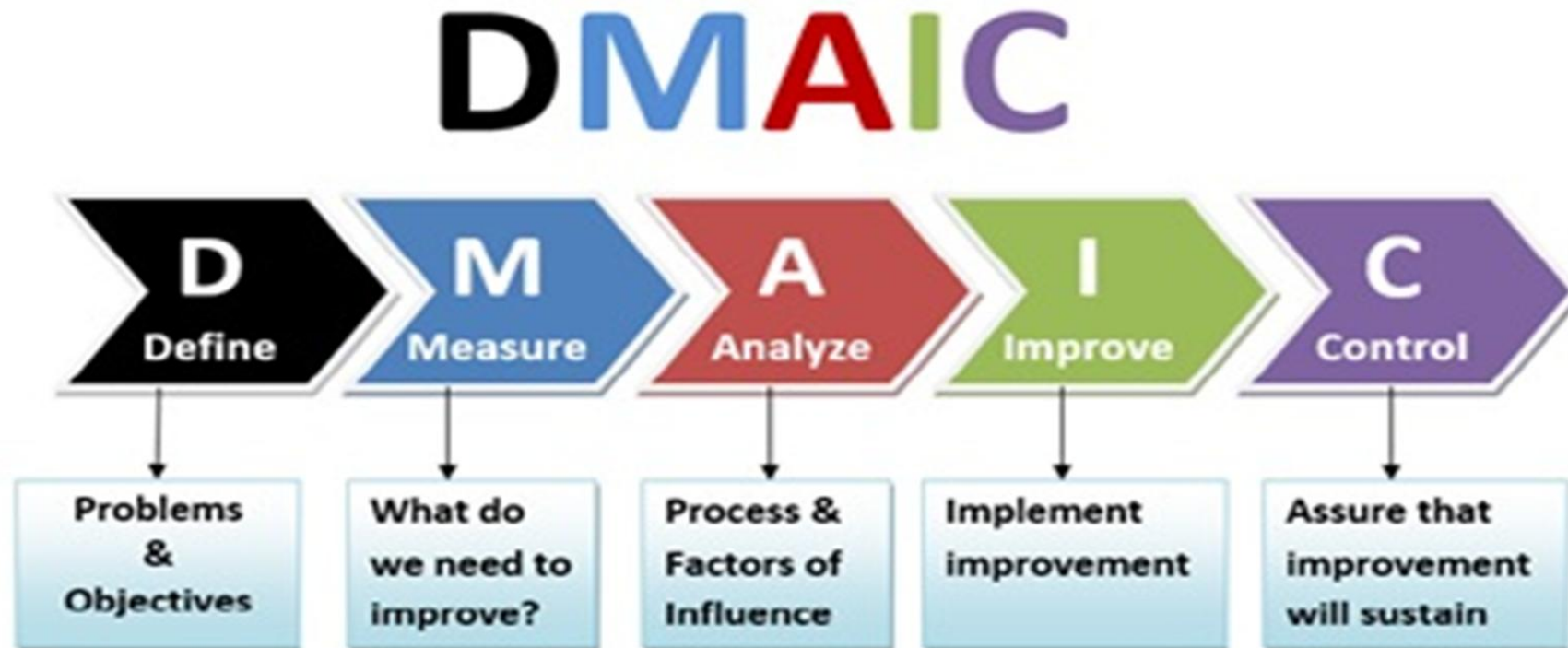
- Training videos that are required on a regular basis

- Hold Kiasens to evaluate processes



Six Sigma Overview

Six Sigma is a methodology for continuous improvement. Through data collection and evaluation the goal of six sigma is to reduce variation in processes and preventing deficiencies in product.



Define

Evaluation of Projects:

- 1) Poor training and long processing time for claims
 - Medicare fraud and waste continue to impact the programs financial abilities
 - Missing and incorrect paperwork causes significant delay in patient claims processing

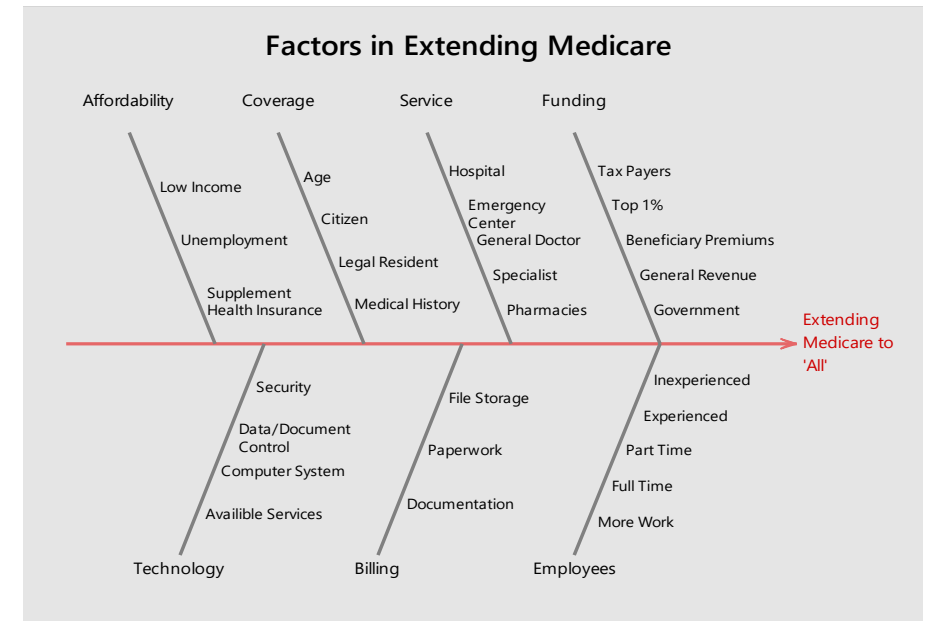
- 2) Understaffing do to increased population eligible for Medicare
 - Current eligibility is limited to Americans over 65 and disabled Americans, totaling ~55
 - Current American population is ~324M

- 3) Cost of medical expenses and prescription drug
 - 1) Premiums and medical spending continue to grow at a rate faster than inflation
 - 2) Eligible expenses and coverage will be determine by the government



Measure

- ❑ Document the current process
- ❑ Plan for Data Collection
 - Number of Americans impacted by lack of health care coverage
 - Administrative and financial impacts of Medicare fraud
 - Forecasting of Medicare financial future under a single payer tax based system
- ❑ Validate Measure System
 - Data stabilization
 - Normal distribution
- ❑ Measure the baseline performance
 - Current Cost per enrolled individual
 - Potential cost savings under Medicare for all coverage
- ❑ Measure the Process Capability



Analyze

- ❑ Test theories on variations of implementation, flow diagrams, process capability analysis
 - Follow system to determine where issues occur and identify non-value added tasks

- ❑ Analyze data collected
 - Determine cost and time savings

- ❑ Verify root causes

- ❑ Prioritize efforts of improvement



Improve

Evaluate alternatives

Design

- Establish a program to effectively open Medicare to all Americans providing affordable income taxed based options.

Test

- Develop a pilot program to evaluate the process with a small sample size. Evaluate problems which may have surfaced during the pilot program, Remedy.

Prepare an implementation schedule

- Phasing of enrollment to all Americans on a rank system, e.g. Currently enrolled Medicare patients, Americans without insurance, Americans who wish to switch from their current provider to Medicare.

Prove the effectiveness and financial abilities



Control

- ❑ Documentation: Documenting the improvements made to the Medicare System
 - Operating procedure, informing the public
- ❑ Support: Employee training of the new program guidelines and processes
- ❑ Staff consolidation and training
- ❑ Finalize, implement and monitor
 - Analysis of projected vs. actual results



House of Quality

Quality Characteristics									Priority Score
	Faculty	Facilities	Patient Identification	Documentation Management	Database Management	Processing Time	Quantity of Records	Number of Errors	
Customer Needs									
Clear Instructions	3		3	2		3	2	3	3
Trained Staff	3	1	1	3		3	3	3	3
Information Center		2	1	3		1		2	3
Maintained Facilities		3							2
Fast Processing	3	1	3	2	3	3	1	2	3
Security of Patient Files	2	1	2	2	3	1	1	1	3
No errors in Processing	3		1	3	3	3	1	3	3
Good Quality of Service	1			1		1	1	2	4
CTQ Priority Score	15	8	11	16	9	15	9	16	
Percentage of Total	15.2	8.1	11.1	16.2	9.1	15.2	9.1	16.2	
Target Limits	Trained and Helpful Staff	Facilities Able to Accommodate Needs	Secure Identification	Doc. Resources and Training	Organized Records and Databases	Reduce Cycle Time	Ensure Correct Information	Shoot for Zero Defects	

3=Strong
2=Moderate
1=Weak

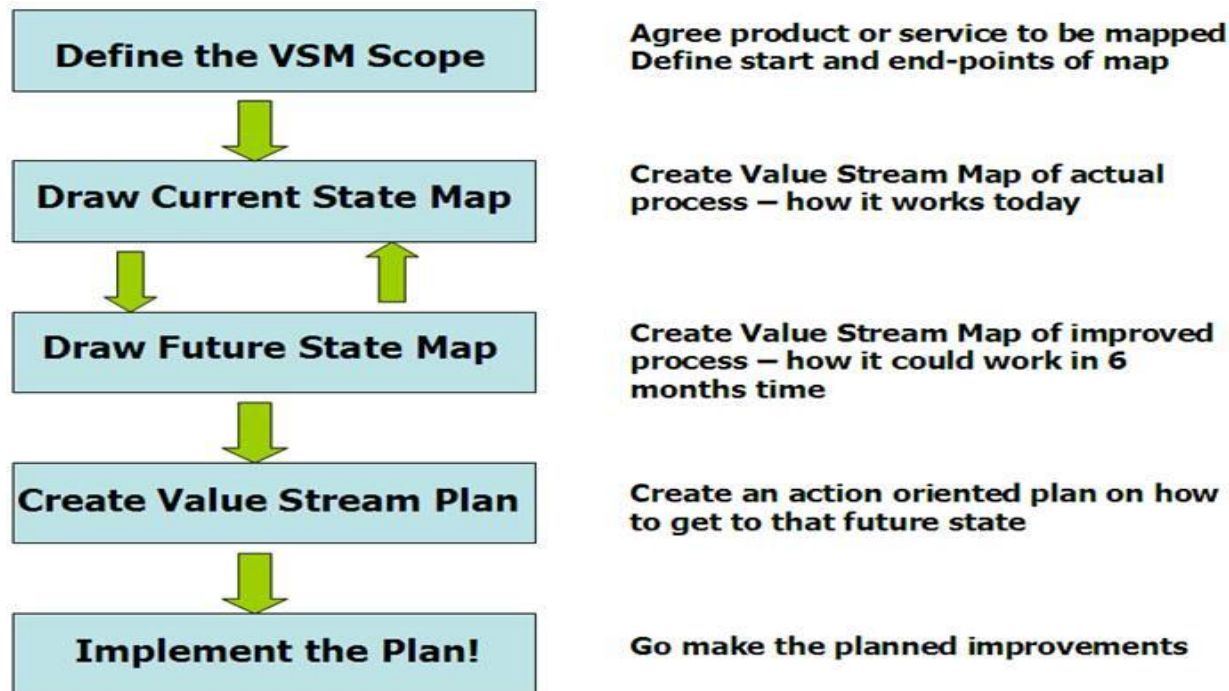
Key Factors for Improvement

- Managing documentation properly
 - Training documentation
 - Forms
- Reducing the number of errors in documentation and records
- Properly train faculty
- Reduce processing time

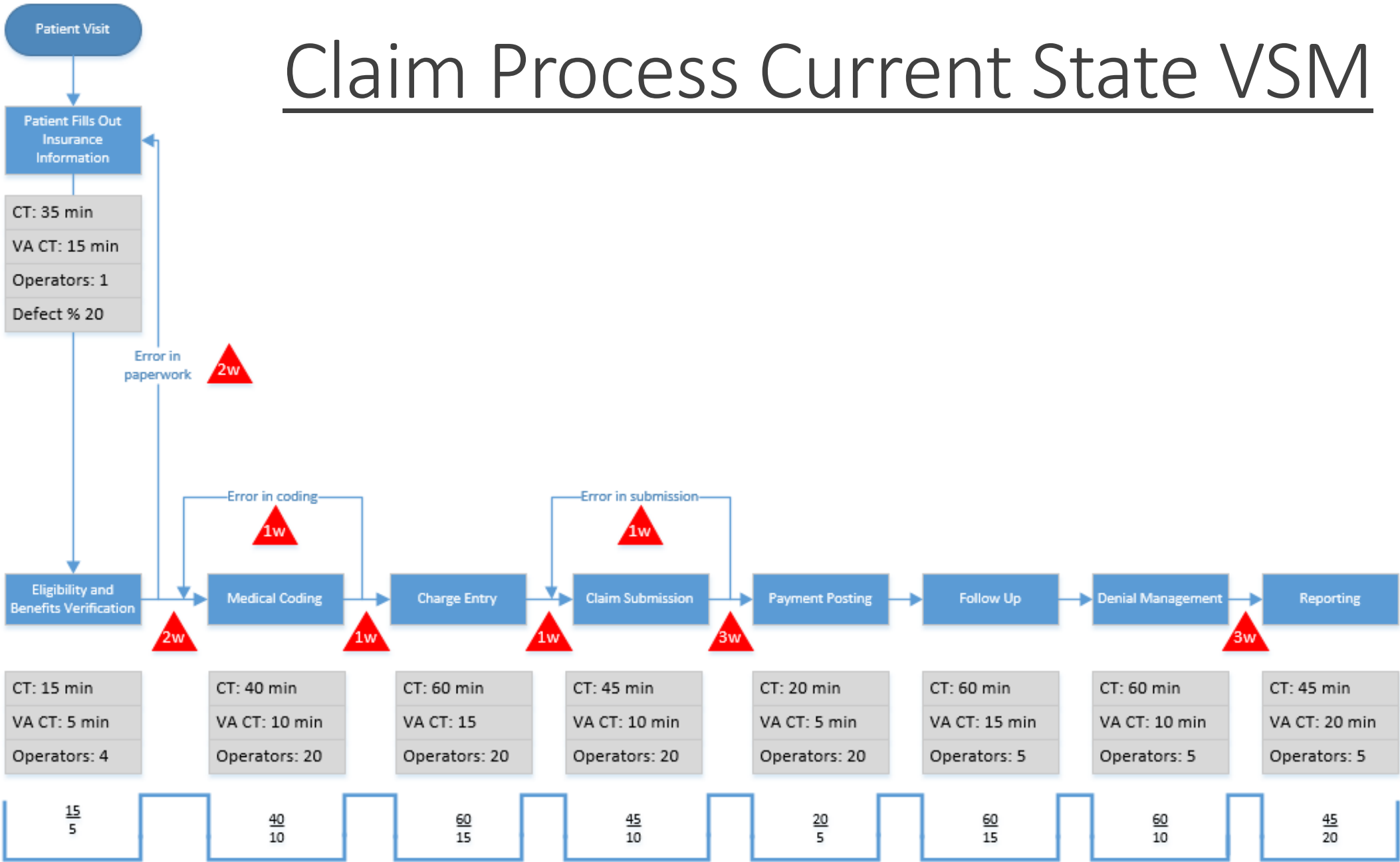


Value Stream Mapping

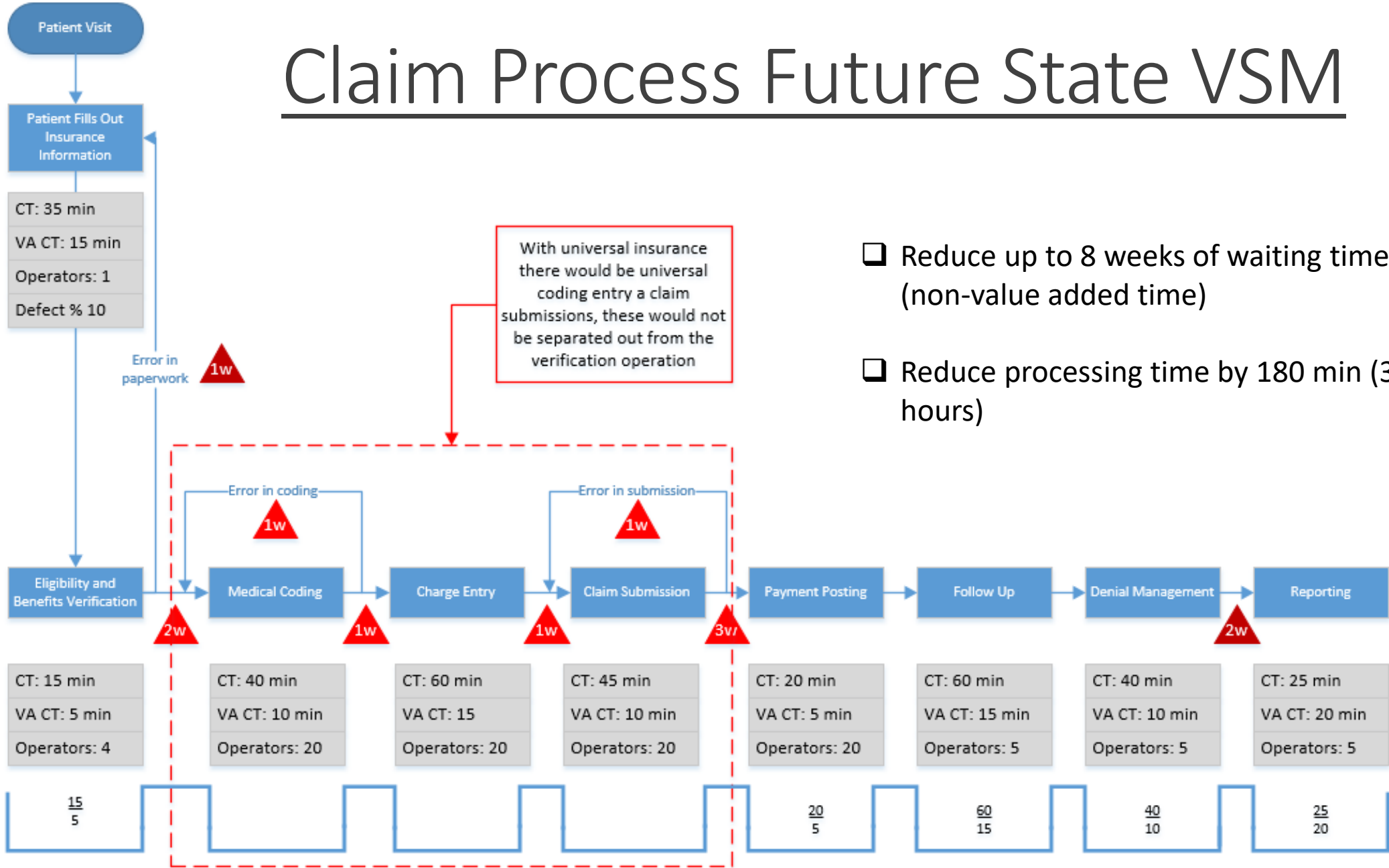
A lean manufacturing technique used to analyze the flow of materials and information currently required to bring a product or service to a consumer. It is a graphical tool for identifying non-value added activities within a process.



Claim Process Current State VSM



Claim Process Future State VSM



- ❑ Reduce up to 8 weeks of waiting time (non-value added time)
- ❑ Reduce processing time by 180 min (3 hours)

VSM Conclusion

- ❑ Universal health insurance means that the process will be more standardized. Resulting in a number of current processes to be eliminated.
- ❑ Creating standardized instructions and documentation will reduce errors and improve process time.



Measurements System Analysis

- An important element of Six Sigma methodology.
- Evaluates the test method, measuring instruments, and the entire process of obtaining measurements.

MSA Considerations

- Selecting the correct measurement and approach
- Assessing the measuring device
- Assessing procedures and operators
- Assessing any measurement interactions
- Calculating the measurement uncertainty of individual measurement devices and /or measurement systems.



Factors Affecting Measurement System

- ❑ **Equipment:** measuring instrument, calibration, fixing, etc.
- ❑ **People:** operators, training, education, skill, care.
- ❑ **Process:** test method, specifications
- ❑ **Samples:** materials, items to be tested, sampling plan, sample preparation
- ❑ **Environment:** temperature, humidity, conditioning, pre-conditioning
- ❑ **Management:** training programs, metrology system, support of quality management system

Measurement systems analysis technique

- ❑ **Gage R&R** - measures the amount of variability induced in measurements by the measurement system itself, and compares it to the total variability
- ❑ **Repeatability**
- ❑ **Reproducibility**



Results Gage R&R

Two-Way ANOVA Table With Interaction

Source	DF	SS	MS	F	P
Part	9	88.3619	9.81799	492.291	0.000
Operator	2	3.1673	1.58363	79.406	0.000
Part * Operator	18	0.3590	0.01994	0.434	0.974
Repeatability	60	2.7589	0.04598		
Total	89	94.6471			

Gage R&R Study

Source	VarComp	%Contribution (of VarComp)
Total Gage R&R	0.09143	7.76
Repeatability	0.03997	3.39
Reproducibility	0.05146	4.37
Operator	0.05146	4.37
Part-To-Part	1.08645	92.24
Total Variation	1.17788	100.00

Source	StdDev (SD)	Study Var (6 * SD)	%Study Var (%SV)
Total Gage R&R	0.30237	1.81423	27.86
Repeatability	0.19993	1.19960	18.42
Reproducibility	0.22684	1.36103	20.90
Operator	0.22684	1.36103	20.90
Part-To-Part	1.04233	6.25396	96.04
Total Variation	1.08530	6.51180	100.00



Equations

Repeatability: the variation in measurements taken by a single person/instrument on the same item under the same condition.

By using the ANOVA table the estimate for repeatability is **0.03997**

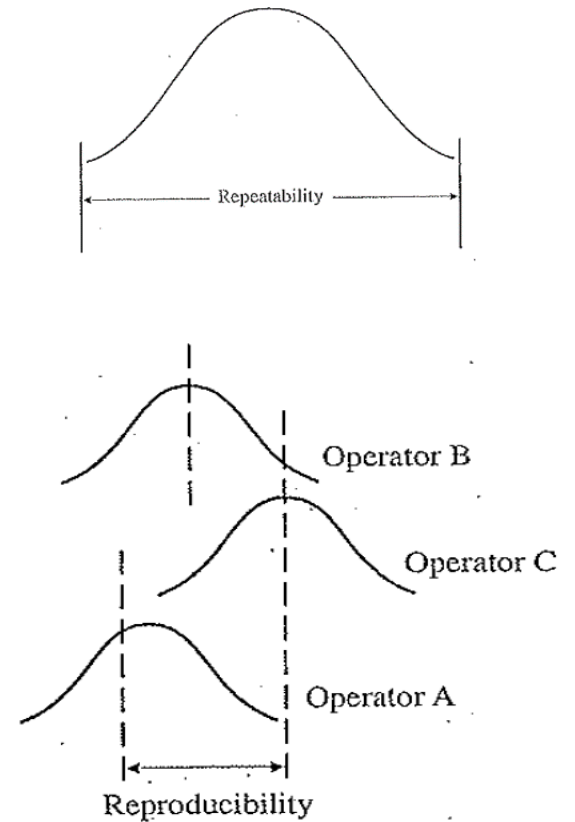
Reproducibility: is the ability of an entire analysis of an experiment or study to be duplicated.

Reproducibility = VarComp for Operator = **0.05145**

b = number of operators = 3, n = number of replicates =3, a = number of parts =10

$$\text{Part-to-Part} = \frac{\text{MS Parts} - \text{MS Repeatability}}{b \cdot n} = \frac{9.81799 - 0.03997}{3 \cdot 3} = \mathbf{1.08645}$$

$$\text{Operator} = \frac{\text{MS Operator} - \text{MS Repeatability}}{a \cdot n} = \frac{1.58363 - 0.03997}{10 \cdot 3} = \mathbf{0.05146}$$



Varcomp & %StudyVar

Source	VarComp	Calculation	%Contribution
Total Gage R&R	0.0914253	$0.0914253/1.17788*100$	7.7619
Repeatability	0.03997	$0.03997/1.17788*100$	3.3934
Reproducibility	0.0514553	$0.0514553/1.17788*100$	4.3685
Operator	0.0514553	$0.0514553/1.17788*100$	4.3685
Part-To-Part	1.08645	$1.08645/1.17788*100$	92.2377
Total variation	1.17788	$1.17788/1.17788*100$	100.0000

Source	VarComp	Square Root of VarComp = StdDev	6 x StdDev = Study Var	Calculation StudyVar/Total Var *100	%Study Var
Total Gage R&R	0.0914253	0.302366	1.8142	$1.8142/6.51181*100$	27.86%
Repeatability	0.03997	0.199925	1.19955	$1.19955/6.51181*100$	18.42%
Reproducibility	0.0514553	0.226838	1.36103	$1.36103/6.51181*100$	20.90%
Operator	0.0514553	0.226838	1.36103	$1.36103/6.51181*100$	20.90%
Part-To-Part	1.08645	1.04233	6.25397	$6.25397/6.51181*100$	96.04%
Total Variation	1.17788	1.0853	6.51181	$6.51181/6.51181*100$	100.00%



MSA Related to the Health Care System

- ❑ MSA and a Gauge R & R could be used to analyze the following:
 - ❑ Accuracy of reporting
 - ❑ Length of time for operations
 - ❑ Record length of time for certain tasks based on operators
 - ❑ This would measure reproducibility
 - ❑ Correct number of operators required for certain tasks/positions



Acceptance Sampling & OC Curve

Sampling Plan

Sampling the entire lot is not feasible so the consumer devises a test plan which allows him to take a sample from the lot and then determine if the lot is acceptable by looking for a certain number of defects.

OC curves

- ❑ Give consumers a guide to document/determine their likelihood of accepting a lot (product).
- ❑ Lot contains a certain percentage of defects.
- ❑ Sampling plans are built around OC curves to help ensure the acceptance/rejection rate is consistent with policy.



ANSI/ASQC Z1.4

Inspection for adding all extension patients to documentation system:

- AQL = 0.05
- Lot Size (total patients in the group)=3000
- Type of sampling: Single
- Inspection Level : Level 2
- LTPD = 0.1

ANSI FORM

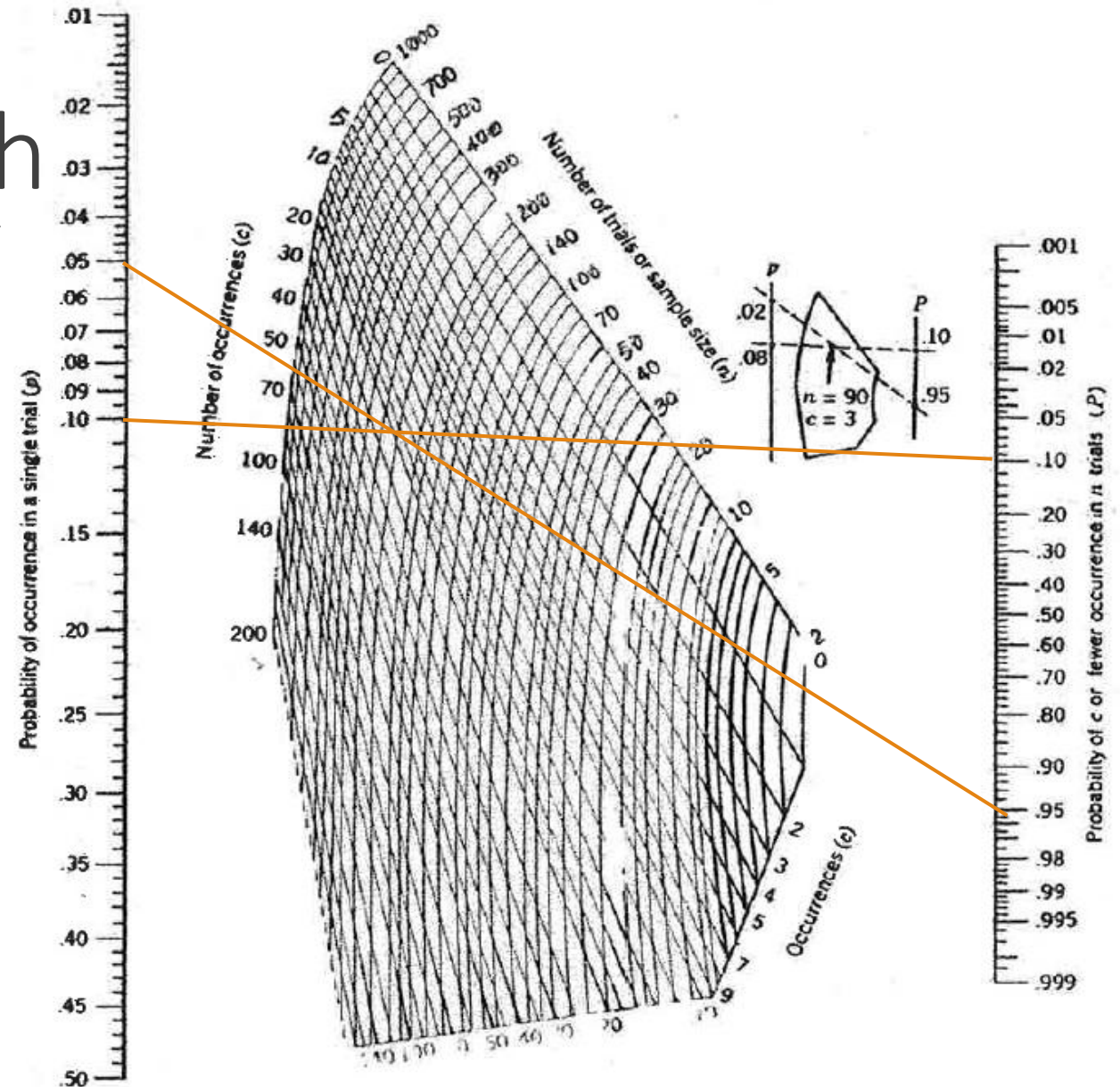
- Code Letter: K
- Sample Plan: **n=125, c=12**

(After our extension plan: Accept when In 3000 patients, less than 12 are not successfully adding into the documentation system)

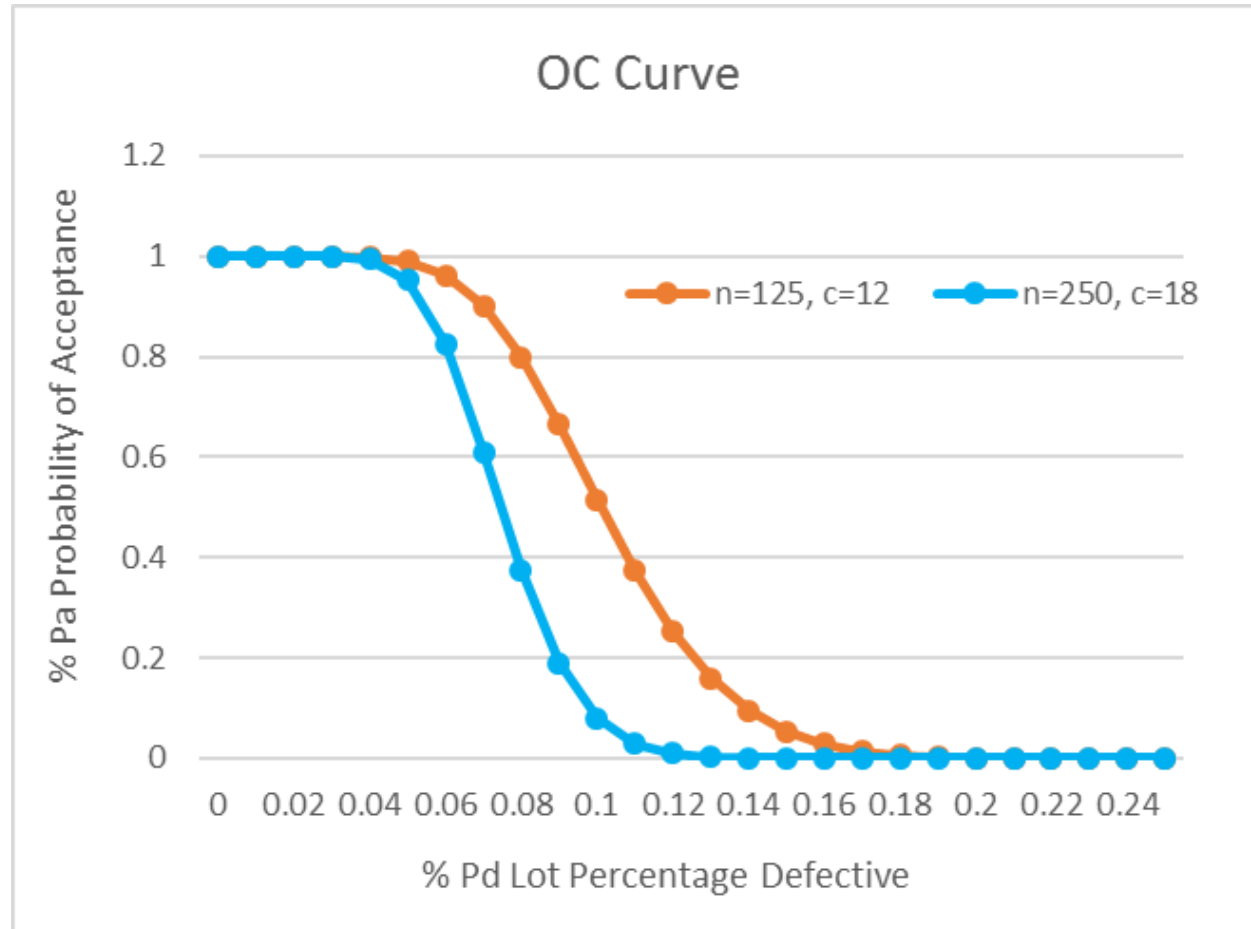


Binomial Nomograph

- ▣ AQL=0.05, LTPD=0.1
 α (producer risks)=0.05
 β (customer risks)=0.1
- ▣ $OC(P=0.05)=1-\alpha=0.95$
 $OC(P=0.1)=\beta=0.1$
- ▣ From nomograph:
 $n=250, c=18$



OC Curves (Excel)



OC CURVE: ANSI/ASQC			OC CURVE: Nomograph	
Binomial		N(TOTAL ITEMS IN LOT)	Binomial	
n=	125.00	3000	n=	250
c=	12.00		c=	18
PD	Pa	Average Total Inspection	Pa	Average Total Inspection
0.00	1	125	1	250
0.01	1	125	1	250
0.02	1	125	1	250
0.03	0.99989	125	0.99977	251
0.04	0.99843	130	0.99391	267
0.05	0.98999	154	0.95264	380
0.06	0.96232	233	0.8261	728
0.07	0.90108	409	0.61069	1321
0.08	0.79963	701	0.37432	1971
0.09	0.66518	1088	0.18998	2478
0.10	0.51602	1516	0.08075	2778
0.11	0.37299	1928	0.02919	2920
0.12	0.25165	2276	0.00911	2975
0.13	0.15897	2543	0.00249	2993
0.14	0.09436	2729	0.0006	2998
0.15	0.05282	2848	0.00013	3000
0.16	0.02798	2920	2.6E-05	3000
0.17	0.01407	2960	4.5E-06	3000
0.18	0.00673	2981	7.3E-07	3000
0.19	0.00307	2991	1.1E-07	3000
0.20	0.00134	2996	1.5E-08	3000
0.21	0.00056	2998	1.9E-09	3000
0.22	0.00023	2999	2.2E-10	3000
0.23	8.7E-05	3000	2.4E-11	3000
0.24	3.2E-05	3000	2.5E-12	3000
0.25	1.1E-05	3000	2.4E-13	3000



Economic Comparison

- $N = 3000$
- $n = 250$
- $P = 0.05, P_a = 0.952$
- Set , Inspection cost per item: $I = \$2$ (to inspect 1 patient document)

Damage cost incurred if a defective slips through inspection: $A = \$10$ (to add into the system again)

$$P_b = I/A = 2/10 = 20\% > 5\%$$

100% inspection should be used!



Definitions

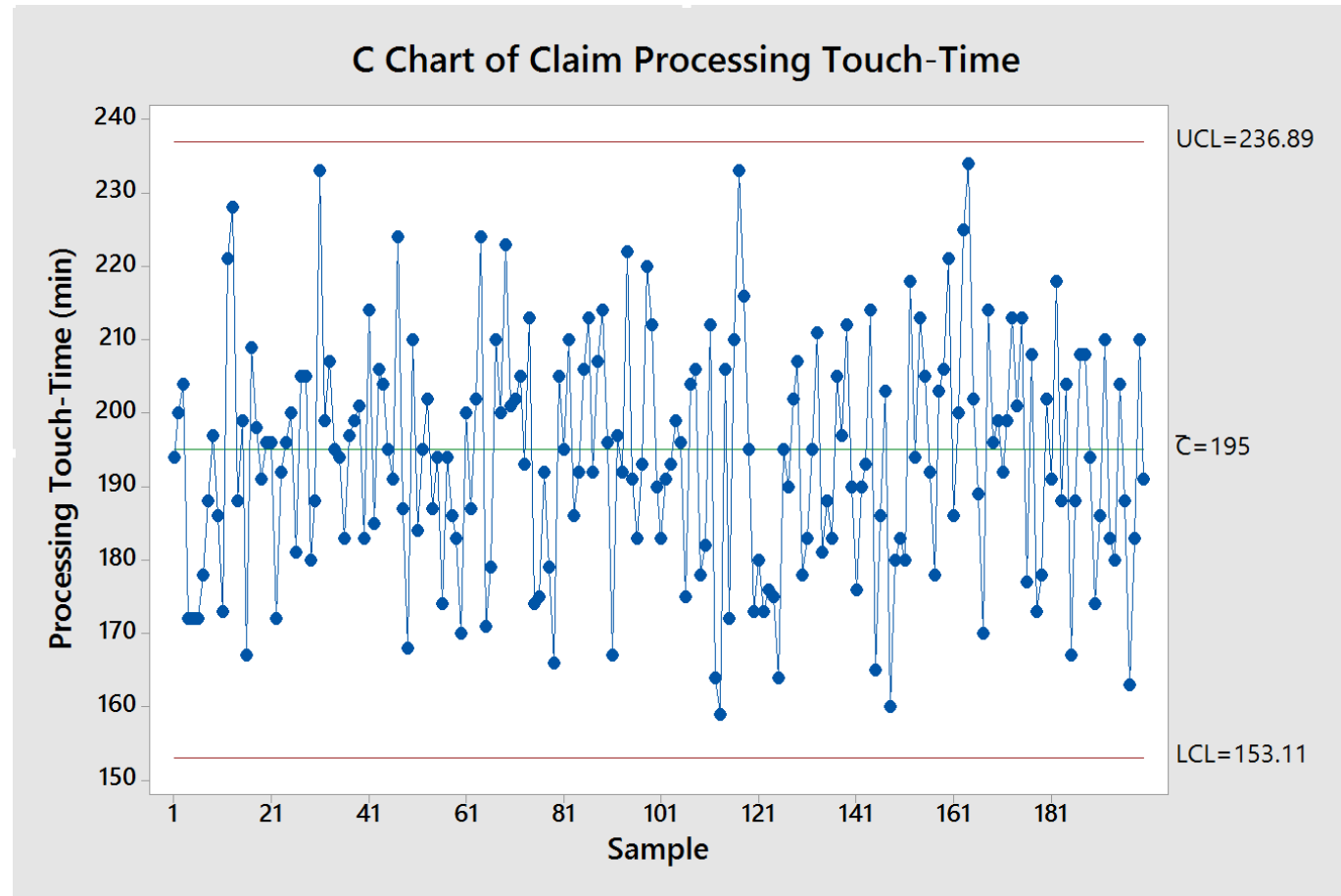
- ❑ **Statistical Process Control (SPC)** - the application of statistical methods to the measurement and analysis of variation in a process
- ❑ **Statistical Control Charts** – a comparison of process performance data to computed statistical control limits drawn as limit lines on a chart. Distinguishes between common causes and special causes of variation.

Two types of QC charts

- ❑ **Variable Charts**
 - ❑ Measurements are quantitative and are taken continuously
- ❑ **Attribute Charts**
 - ❑ Measurements are qualitative



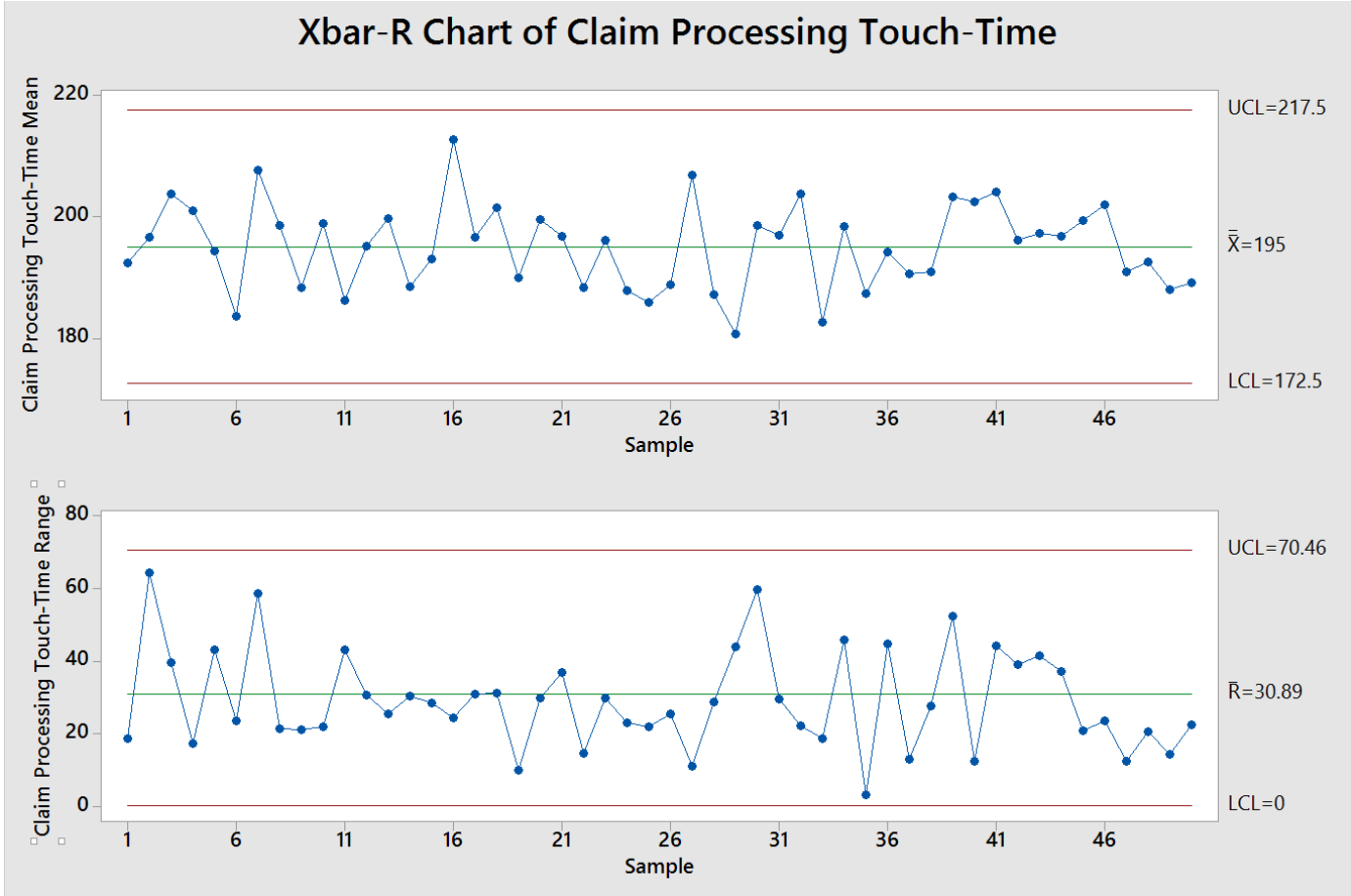
Calculating Attribute SPC



Avg.
Processing
Touch-Time:
195 min.



Calculating Variable SPC



Observations: 4

Applying SPC to the Healthcare System

Using control charts can help evaluate:

- Duration to process a claim
- The time used to file paperwork

The results will show if the processes are in control and where improvement may be required.



Failure Mode Effects Analysis (FMEA)

- ❑ An FMEA:
 - ❑ Identifies the ways in which a product or process can fail (bottom up analysis)
 - ❑ Estimates the risk associated with specific causes
 - ❑ Prioritizes the actions that should be taken to reduce risk
- ❑ FMEA is a team tool
- ❑ There are two different types of FMEAs:
 1. **Design**
 2. **Process**

RPN is the product of the severity, occurrence, and detection scores. Typically these are given a value between 1-10 which allows for better precision in estimates and a wide variation in scores.

$RPN = \text{Severity} \times \text{Occurrence} \times \text{Detection}$



FMEA

Function	Failure Mode	Effects	Severity	Causes	Occurrence	Detection Action	Ease of detection	Risk Priority Number	Recommended Actions
Medicare	Cannot see Doctor	Long wait time to see doctor	5	Claims Processing Times	5	None	5	125	Training
	Eligibility	No Insurance	9	No/Little insurance opportunities	5	None	5	200	Creation of Additional Healthcare Options
Medicare for All	Not enough Doctors	Long wait times to see doctor	8	Doctors not willing to work with Medicare	5	None	6	200	Expand Medical Network
				Mass enrollment	7	None	7	392	Limit Number of new enrollees, Phased approach
				Large Sick/Aging Population	6	Update Notice	7	336	Expand Medical Network

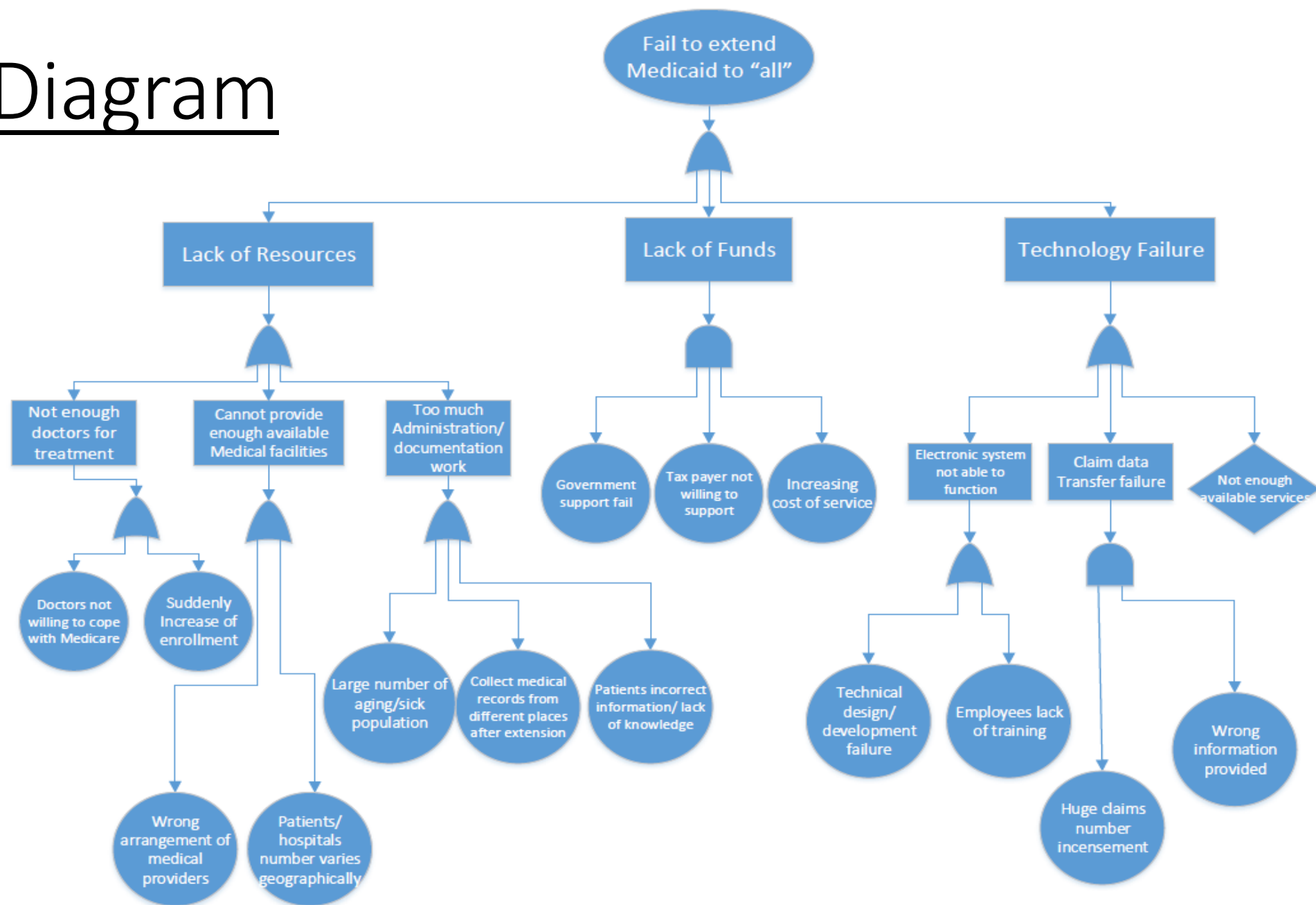


Fault Tree Analysis (FTA)

- ❑ A top down failure consequence assessment technique in identifying safety concerns so that product modifications can be made:
 - ❑ Identification of a single failure point and safety concerns
 - ❑ Evaluation of software, non-machine interfaces and design change impacts
 - ❑ Simplification of maintenance and trouble-shooting procedures
 - ❑ Assessment of modification or enhancements



FTA Diagram



Conclusion - Data Analysis Summary

Data Results Proved:

- The various studies and analysis presented in this presentation prove the following are important areas to focus recourses:
 - Reduce processing time
 - Eliminate non-value added tasks
 - Standardize operations
 - Proper training

Improving these areas will reduce costs making the system more affordable for all



Conclusion

- ❑ Healthcare as a whole is increasing at an exponential rate. Some people can obtain healthcare through work but those who cannot struggle to afford proper healthcare.
- ❑ The best way to reduce the cost of healthcare is to reduce the processing time and remove non-value added operations.
 - ❑ A universal healthcare system “for all” would create a more standardized system that would support these objectives.

This report is representing the population of individuals who currently do not have healthcare/health insurance and those who have been driven into poverty due to high medical costs.



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