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CMS TRANSPLANT PROGRAM QUALITY WEBINAR SERIES

Data Display

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Enhancing Quality Assessment and Performance Improvement Programs in Transplant Programs and Hospitals

November 18, 2015

CMS Webinar Series
Transplant Centers

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1. Introduction to the Transplant QAPI: Regulatory Overview
2. Worksheet Overview
3. Comprehensive Program and 5 Key Aspects of QAPI
4. Objective Measures
5. Performance Improvement Tools and Methods
6. Adverse Events
7. Transplant Adverse Event "Thorough Analysis"
8. QAPI Tools (part 1)
9. QAPI Tools (part 2)
10. **Data display**
11. Writing an effective Plan of Correction and Other QAPI Resources
12. Interpretive Guidelines

Disclaimer

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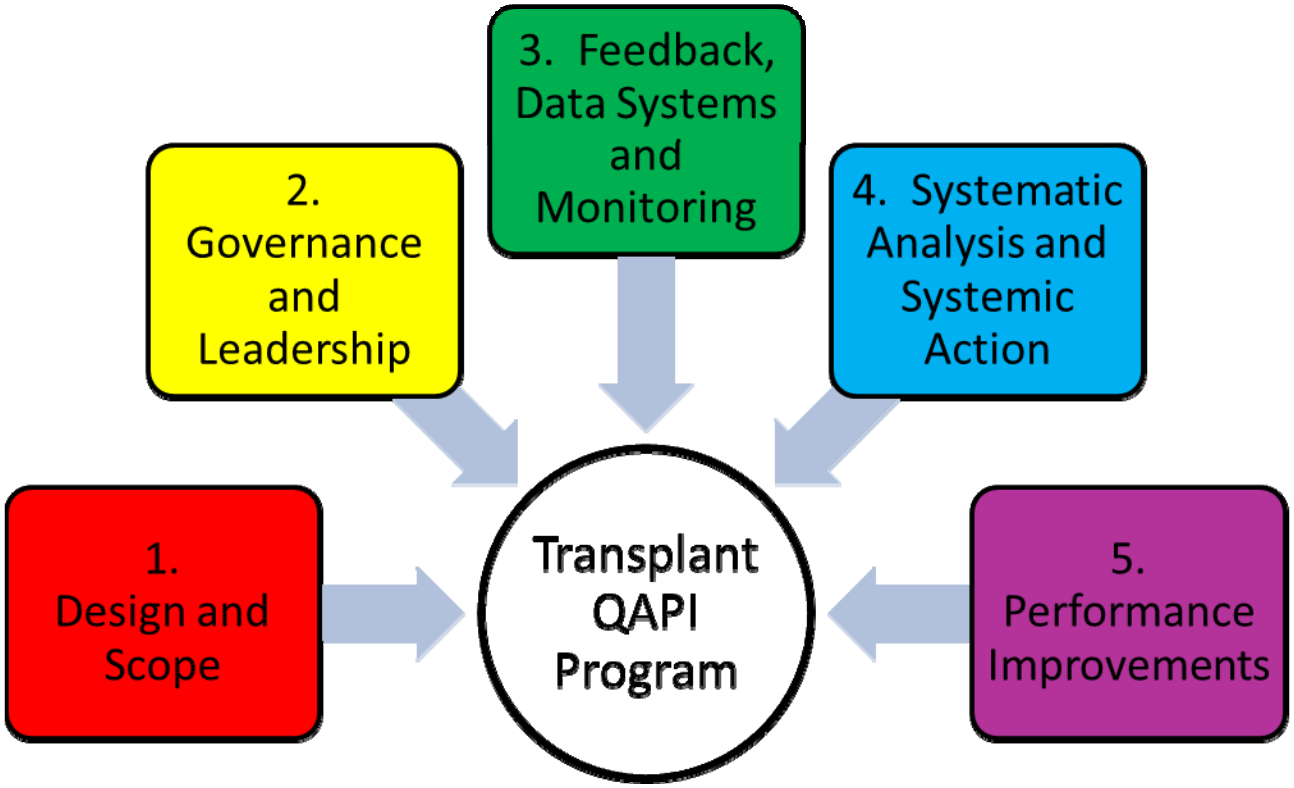
- This training series will contain Quality concepts, foundational Quality practices and historical perspectives of Quality Assessment and Performance Improvement methodologies (as they were originally developed) and guidance to help transplant program's meet compliance with the Conditions of Participation.
- CMS understands that: 1) Healthcare has various definitions of what Quality is, 2) There are many methods that can be employed and 3) There are many tools that can be utilized within quality assessment and process improvement activities.
- CMS also understands that some organizations blend several quality concepts and tools together to provide for a more nimble and individualized QAPI program.
- This training series does not support or advocate any particular QAPI method or tool. This training fully supports that QAPI activities include **data driven decisions** that lead to sustained improved performance and ultimately improved patient outcomes.

Purpose and Objectives

- The purpose of this session is to enhance Quality Assessment and Performance Improvement activities within Transplant Programs through increased knowledge of data analysis and data display.

- Upon completion of this session, the participant will be able to:
  - Discuss the need for proper data display in QAPI activities.
  - Understand data analysis and the need for proper data display in reporting activities.
  - Discuss how data display can aid in data analysis and QAPI program documentation.

The 5 Key Aspects of Transplant Quality

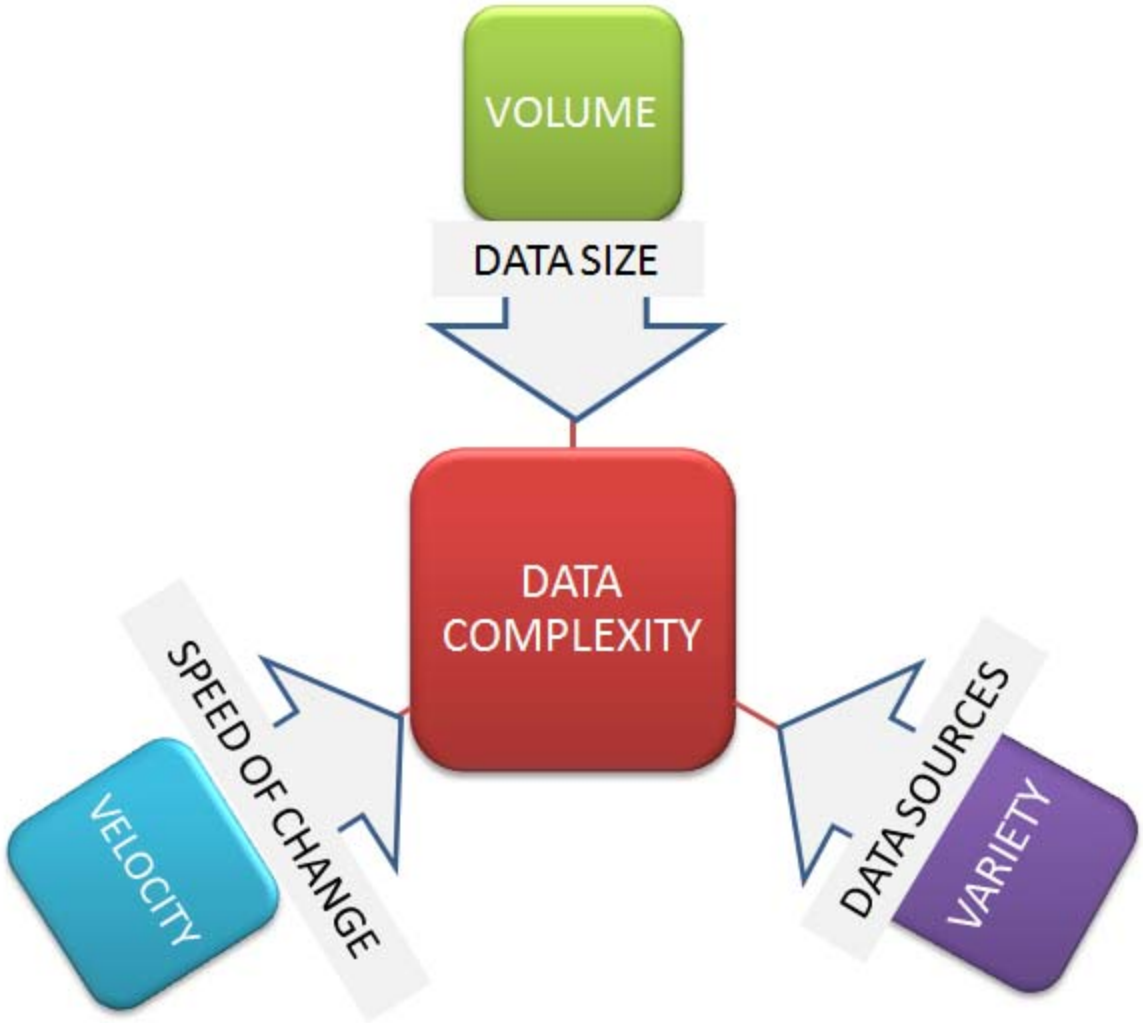


5 Key Aspects of QAPI

Data and Data Tools are involved in:

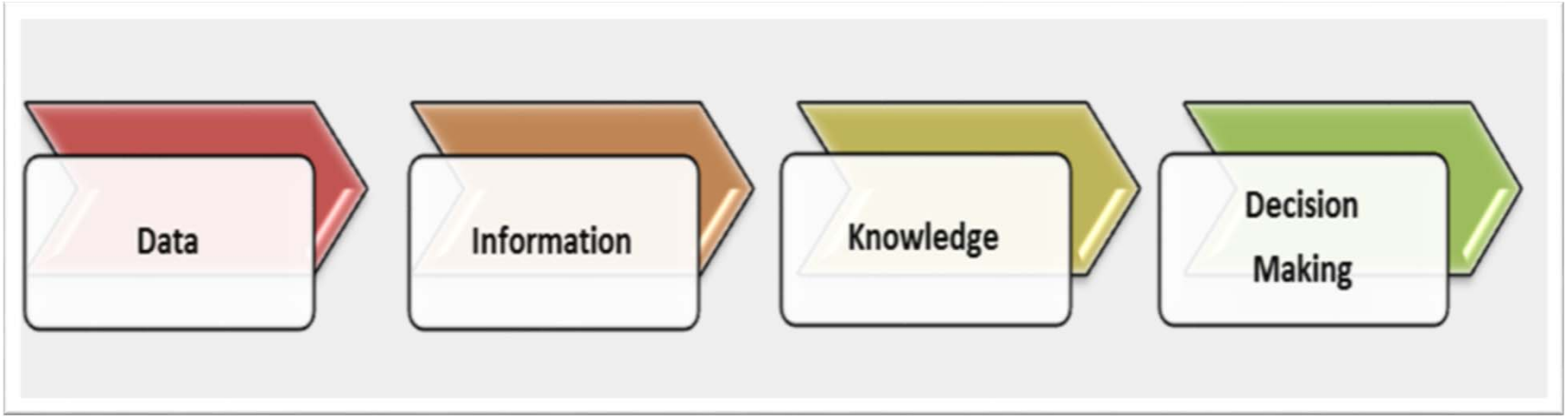
- **Aspect 1** – Design-The program is **data-driven**, reflects the complexity of transplant services, and addresses all systems of care and management practices relevant to transplantation.
- **Aspect 2** – Governance - The governing body ensures that the QAPI program is implemented, ongoing, **comprehensive**, effective, and that adequate resources are applied to conduct QAPI efforts and operate in a continuous manner. The governing body sets clear expectations for quality and safety.
- **Aspect 3** – Feedback Systems - **Process and outcome indicators** reflecting the complexity of services within the program are defined, measured, analyzed and tracked.
- **Aspect 4** – Analysis - The transplant QAPI program must **analyze** collected **data**.
- **Aspect 5** – Improvements - Performance improvements are concentrated efforts that involve **systematic gathering of information** to identify issues or problems, and subsequent development of interventions to prevent recurrences.

Source: CMS "A Conceptual Framework for Medicare Requirements for Quality Assessment and Performance Improvement in Solid Organ Transplant Programs"


VOLUME
DATA SIZE
DATA COMPLEXITY
SPEED OF CHANGE
VELOCITY
DATA SOURCES
VARIETY

Data

Data = “un-interpreted” observations or facts



Data that can help describe the situation must be collected and analyzed in order to become useful **information**. The **information** must then be analyzed in context to produce the **knowledge** needed to make an **informed decision**.

Data Characteristics

- **Valid** = The ability of the data element to measure what it is supposed to measure; its predictive value.
- **Reliable** = The ability of the data element to measure what it is supposed to measure in a reproducible way.
- **Usable** = The relative ease with which the data produced can be understood, used, and are relevant to the issues of interest.
- **Recordable** = The ability to capture and measure the data element.

Types of Data

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Nominal / Ordinal

- Nominal data are items which are differentiated by a simple naming system
- Ordinal data are set into some kind of order by their position on a scale

Continuous / Discrete

- Continuous measures are measured along a continuous scale which can be divided
- Discrete variables are measured across a set of fixed values

Transplant Data Sources - Examples

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Internal

- Medical Records
- Admissions & Readmissions
- Evaluations
- Discharges
- Patient Satisfaction
- Adverse Events
- Committee meetings
- Financial Audits
- Complaints and Grievances
- Operative Reports

External

- United Network for Organ Sharing (UNOS)
- Organ Procurement and Transplantation Network (OPTN)
- Scientific Registry of Transplant Recipients (SRTR)
- Centers for Medicare and Medicaid Services (CMS)
- American Society of Transplant Surgeons (ASTS)
- U.S. Department of Health and Human Services (organdonor.gov)
- National Institutes of Health (U.S. National Library of Medicine – MedlinePlus)
- Other Professional Associations and Consortiums

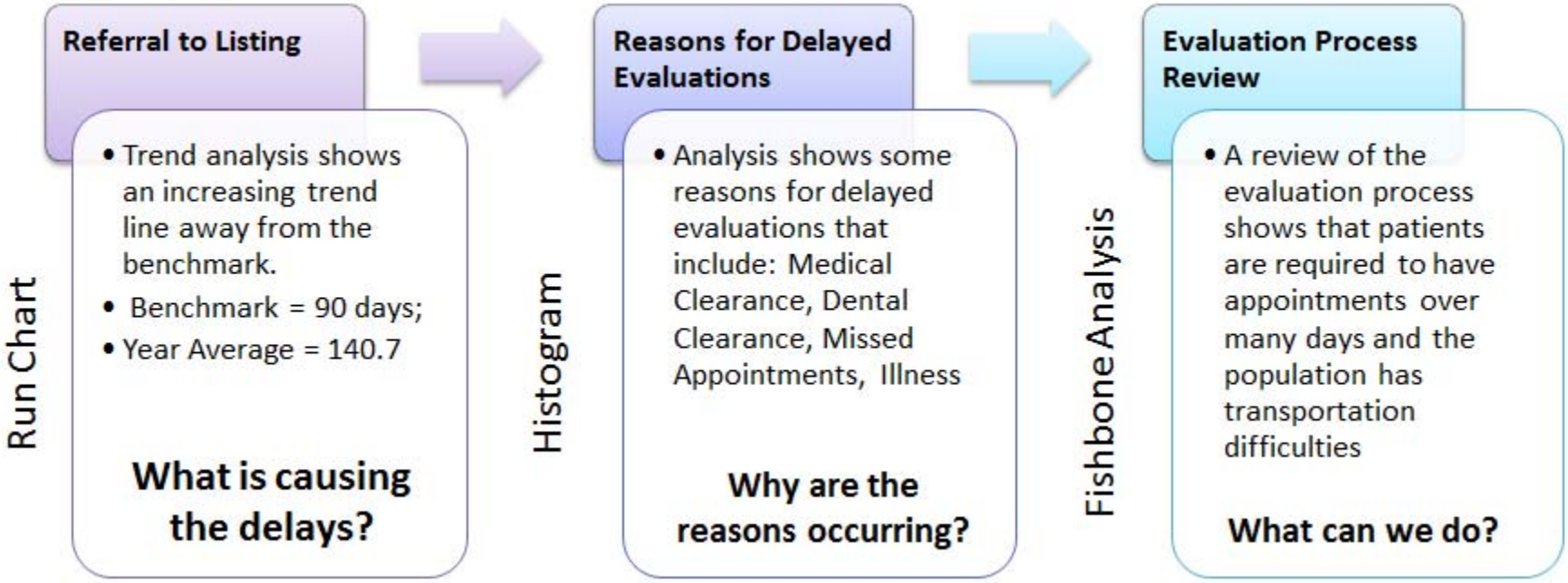
Raw QAPI Data vs Data Driven QAPI

Data collection is an essential first step, but raw data must be analyzed and used to assess quality and improve performance.

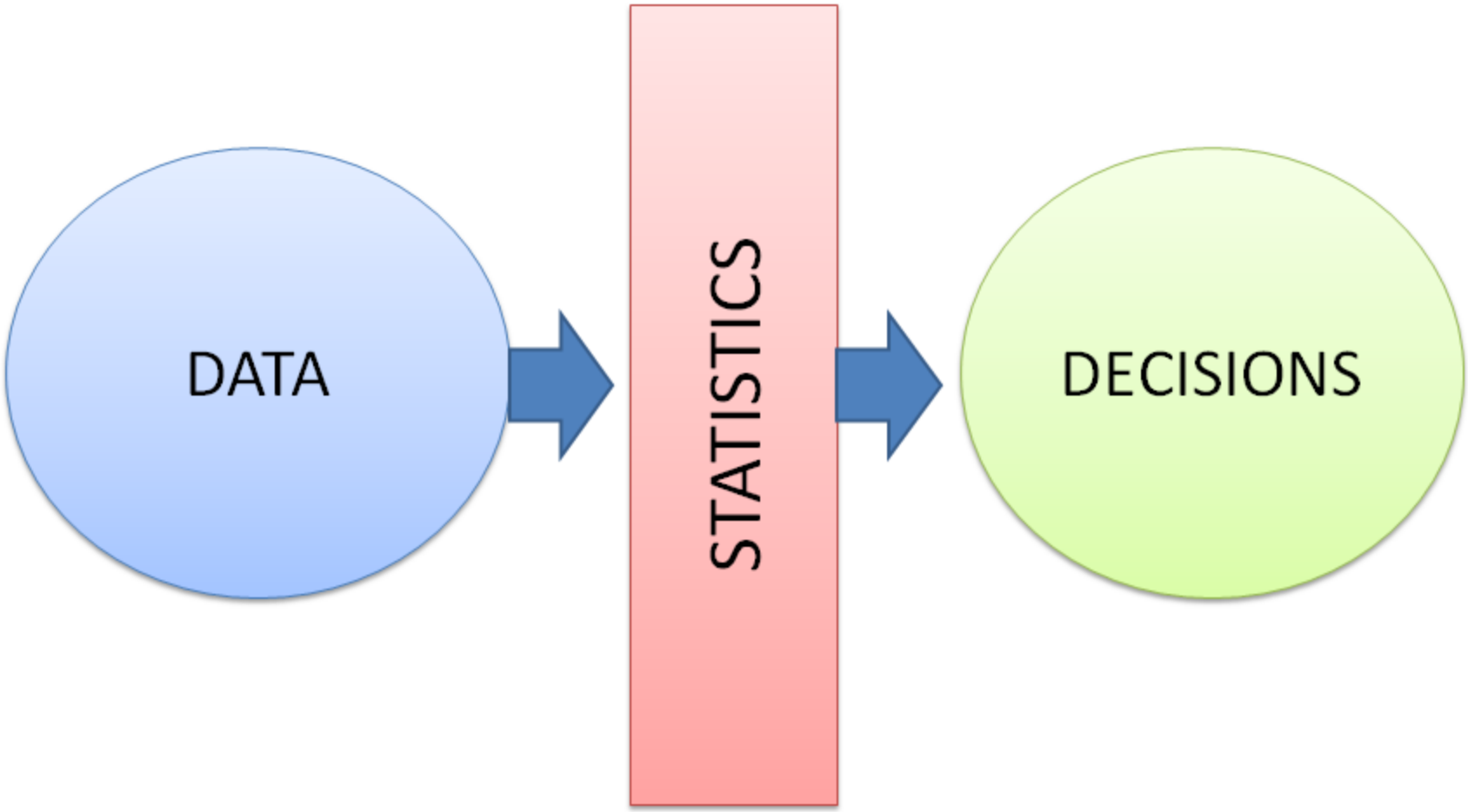
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
REFERRALS	16	11	20	13	27	20	16	21	7	13	17	18
CITY NEPHROLOGIST	14	9	15	10	23	15	11	20	7	7	15	14
OUTLYING NEPHROLOGIST	2	2	5	3	4	5	5	1	0	6	2	4
EVALUATIONS												
LIVING DONORS **Benchmark=4/month** NEW REFERRALS RE-EVALUATIONS	LD-5 NR-7 RE-4	LD-6 NR-8 RE-3	LD-3 NR-6 RE-1	LD-3 NR-7 RE-3	LD-1 NR-3 RE-0	LD-7 NR-7 RE-6	LD-4 NR-9 RE-2	LD-4 NR-8 RE-3	LD-2 NR-11 RE-3	LD-4 NR-8 RE-5	LD-4 NR-8 RE-5	LD-5 NR-5 RE-2
MEDIAN REFERRAL TO LISTING (# DAYS) **Benchmark= 90 days**	157	329	128	83	95	68	-	117	222	92	88	169
TRANSPLANTS PERFORMED	6	1	5	3	3	5	1	2	6	4	3	1
KIDNEY DONOR TYPE (pancreas alone and K/P are not represented here- they are always SCD donors)	SCD-2 ECD-1 DCD-0 LD-2	SCD-0 ECD-0 DCD-0 LD-0	SCD-0 ECD-0 DCD-2 LD-2	SCD-2 ECD-0 DCD-0 LD-1	SCD-1 ECD-0 DCD-0 LD-1	SCD-0 ECD-0 DCD-0 LD-3	SCD-0 ECD0 DCD-0 LD-1	SCD-1 ECD-0 DCD-1 LD-0	SCD-0 ECD-2 DCD-2 LD-2	SCD-2 ECD-0 DCD-1 LD-1	SCD-0 ECD-0 DCD-0 LD-2	SCD-0 ECD-1 DCD-0 LD-0
RATIO LIVING DONATION TO DECEASED DONATION **Benchmark-50%**	40%	40%	44.4%	55.5%	42.8%	52.9%	55.5%	50%	46.2%	43.3%	48.5%	47%
TOTAL # PEDIATRIC RECIPIENT TRANSPLANTS	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL # LIVING DIRECTED DONATION TRANSPLANTS	2	0	2	1	1	3	1	0	2	1	2	0
TOTAL # DECEASED DONOR KIDNEY TRANSPLANTS	3	0	2	2	1	0	0	2	4	3	0	1

Analyzed Data

A data-driven program is one that analyzes raw data, turns the data into useful information and uses this information to make decisions related to program services and care practices.



Data Analysis



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Which is Better?

Which is Better: Lower or Higher?

75%	90%	99%

75% = 3 out of 4 people win the lottery

75% = 3 out of 4 recipients with graft failure

Recent poll indicates people feel 75% of statistics are made up

Percentages can have many meetings

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75%	90%	99%
75% = 3 out of 4 people win the lottery 75% = 3 out of 4 recipients with graft failure Recent poll indicates people feel 75% of statistics are made up	90% rate on ABO and other vital data verification means 1 of 10 recipients may receive a mismatched organ. A 90% submission rate for OPTN data is out of compliance with CMS regulation at 42 CFR §482.82(a)	

Choose Carefully How Data is Presented

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75%	90%	99%
75% = 3 out of 4 people win the lottery 75% = 3 out of 4 recipients with graft failure Recent poll indicates people feel 75% of statistics are made up	90% rate on ABO and other vital data verification means 1 of 10 recipients may receive a mismatched organ. A 90% submission rate for OPTN data is out of compliance with the CMS regulation at 42 CFR §482.82(a)	99% means that there will still be 5,000 incorrect surgical operations per week according to statistics and Six Sigma principles. 99% means there is a 1% medication error rate: 1 error for every 100 doses administered

Displaying Data

Deciphering Displayed Data

Effective Display

- Easily understood
- Clear labels
- Complete
- Important information is highlighted and explained
- At the proper scale
- Targets and goals identified (*if applicable*)

Problems with Display

- Biased labeling
- Comparing pie charts of different sizes
- The usage of thin slices which are hard to discern may be difficult to interpret.
- Making a pie chart 3D or adding a slant will make interpretation difficult due to distorted effect of perspective.
- Improper scaling
- Truncated graph
- Axis changes
- No scale
- Improper intervals/units
- Omitting data

Data Analysis & Interpretation

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Program

The program QAPI member should be interpreting the data to turn raw numbers into knowledge which will assist in making decisions that lead to action towards improvement.

- Data must be complete
- Undesired trends should be identified and acted upon
- Actions taken should be monitored for sustainability

Surveyors

Surveyors do not interpret data.

Surveyors question data to ensure the data is valid, reliable and that appropriate actions have been taken based on the interpreted results of the data.

Different Tools for Different Purposes

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Implementing QAPI Activities

Implementation starts with identification of the issues, design of the approach, data collection and validation, and then data analysis and display. Staff carrying out these activities will start by collecting raw data, using tools such as:

- Spreadsheets
- Run charts
- Check sheets

Monitoring, Tracking and Sharing QAPI Results

Monitoring performance and trends requires different tools. At this level, raw data and data collection tools are not useful. The data need to be analyzed and results need to be displayed effectively, using tools such as:

- Run charts
- Control charts
- Summary graphs

Reporting Data

Example: Program QAPI Committee

- Detailed Scorecards
- Dashboards
- Spreadsheets
- Control charts
- Bar graphs
- Pie charts
- Histograms
- Meeting Minutes
- Performance Improvements

Example: Hospital Executive Committee

- Summary Scorecards
- Composite Dashboards
- Summary reports
- Summary meeting minutes

Organizing the Tools

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Data Display

Control chart
Run chart
Histogram
Pie / Bar chart
Venn diagram

Data Analysis

Check sheet
Histogram
Scatter diagram
Frequency table
Pareto chart

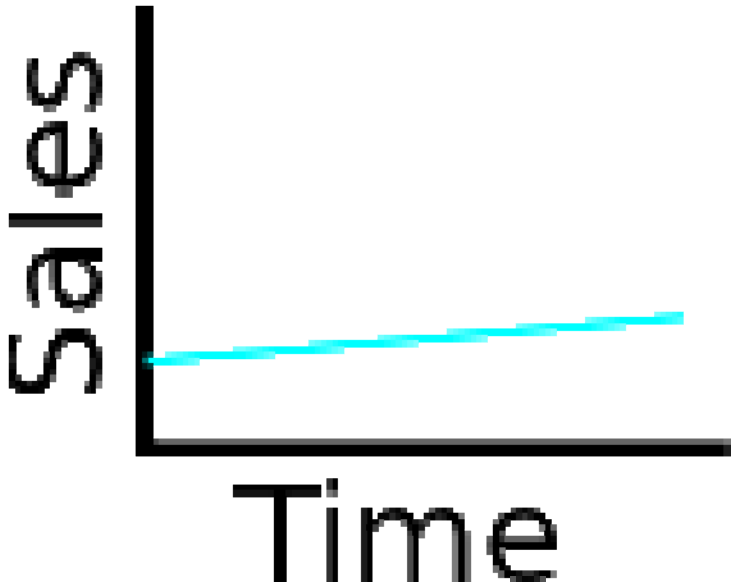
Data Reports

Control charts
Frequency table
Pie / Bar chart
Spreadsheets (*scorecards*)

Problem Solving

Ishikawa diagram
Flowchart
Pareto chart
Venn diagram

Identifying Problems with Data Display



How to Evaluate A Graph

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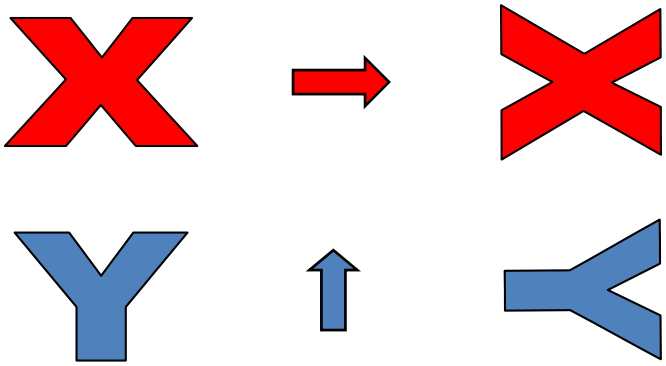
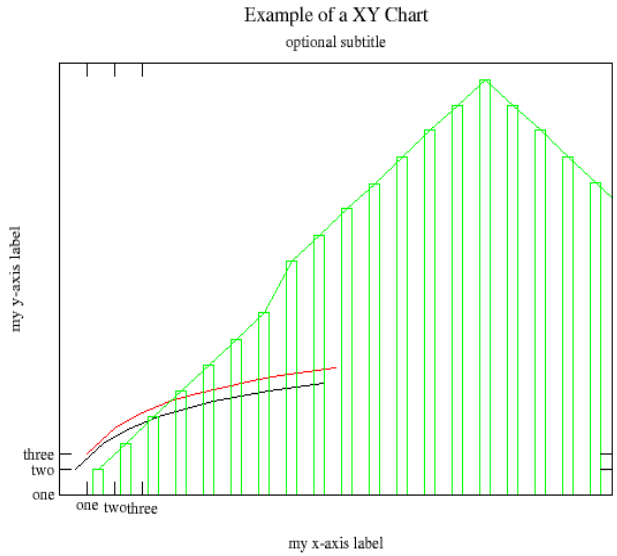
- Look at the Title
- Look at the X axis
- Look at the Y axis
- What are the "units" of each axis?
- What are the scales?
- Look for where X & Y axes cross
- Check for "holes" in the data





Remember: The 'Y' axis must always go up, in order to stand on it's "legs"

Bar Chart

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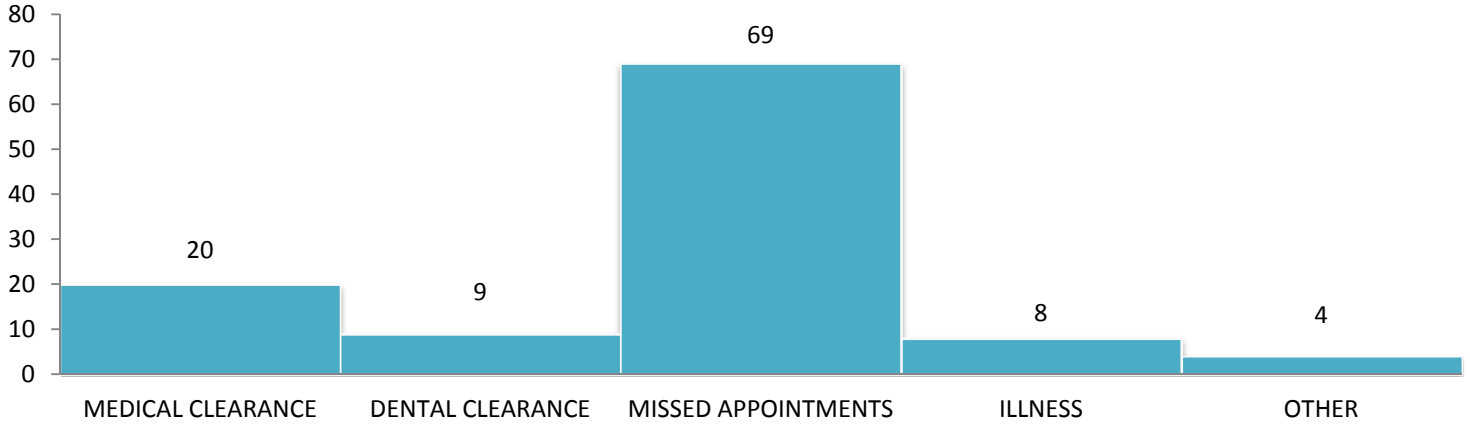
Example



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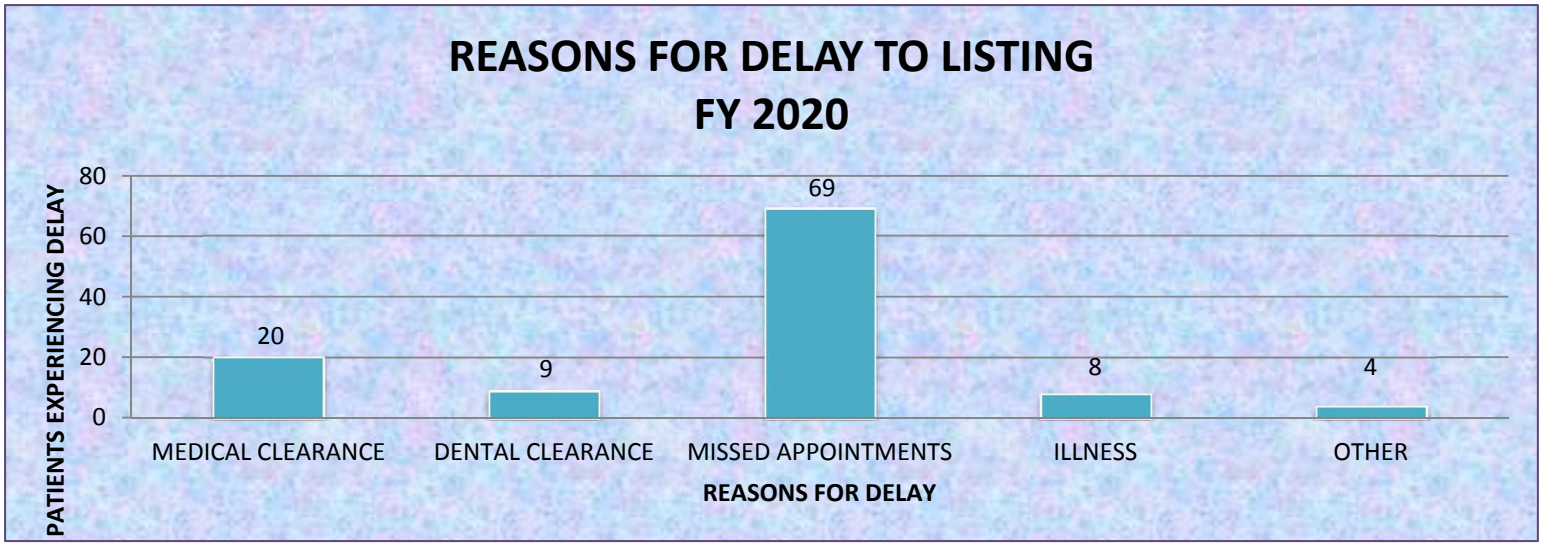

Histogram

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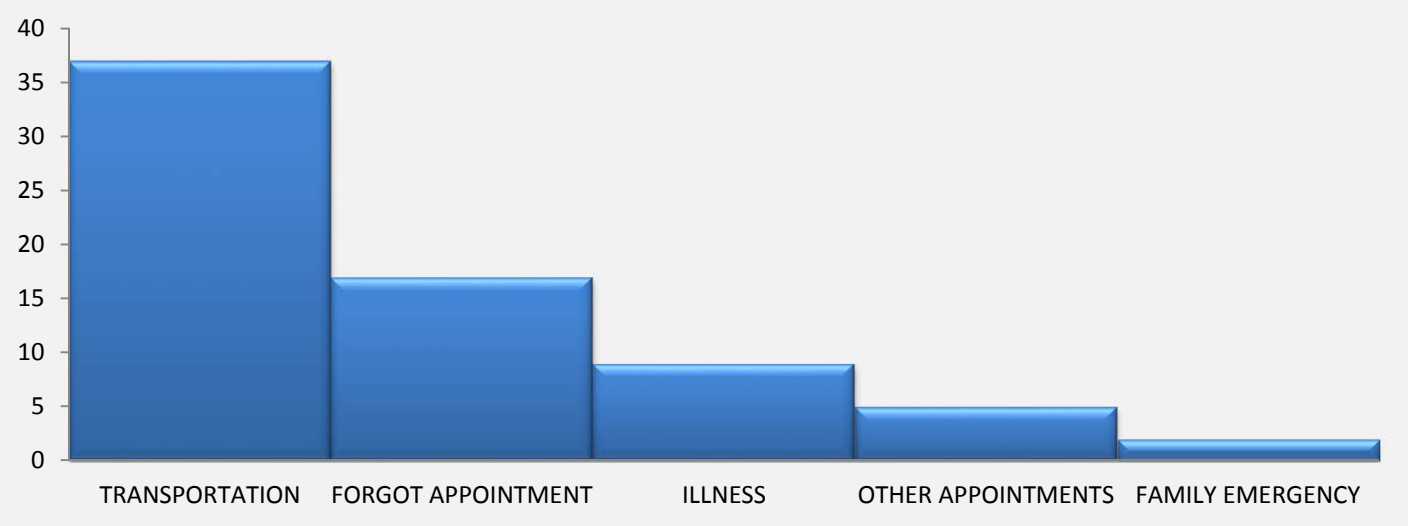
Example



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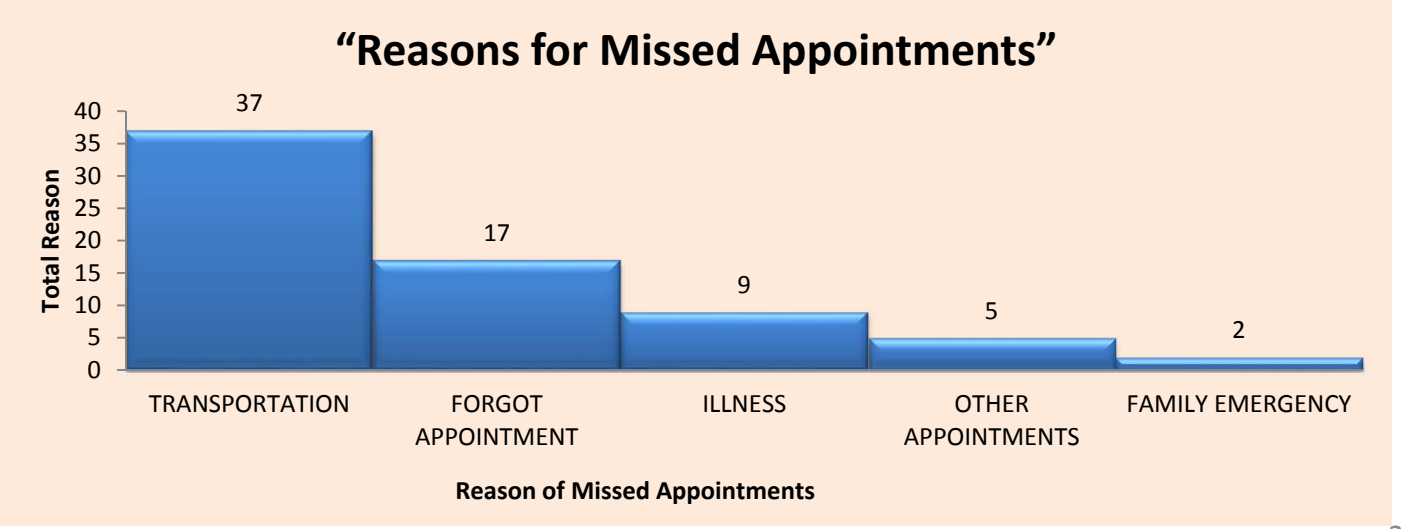

Run Chart

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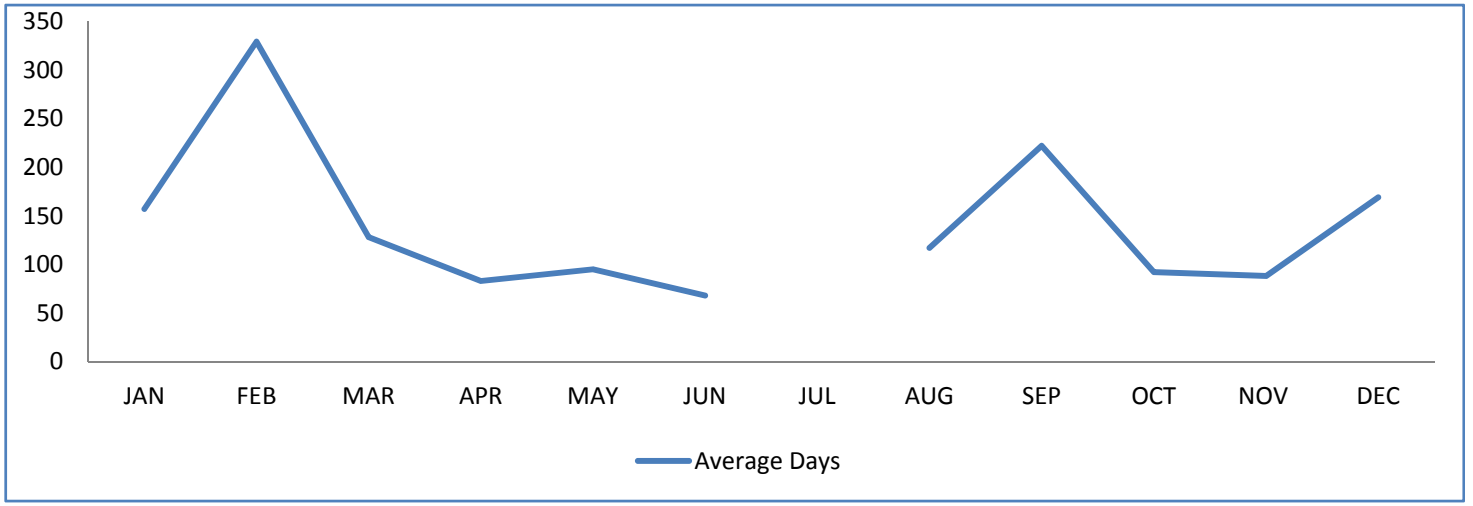
Example



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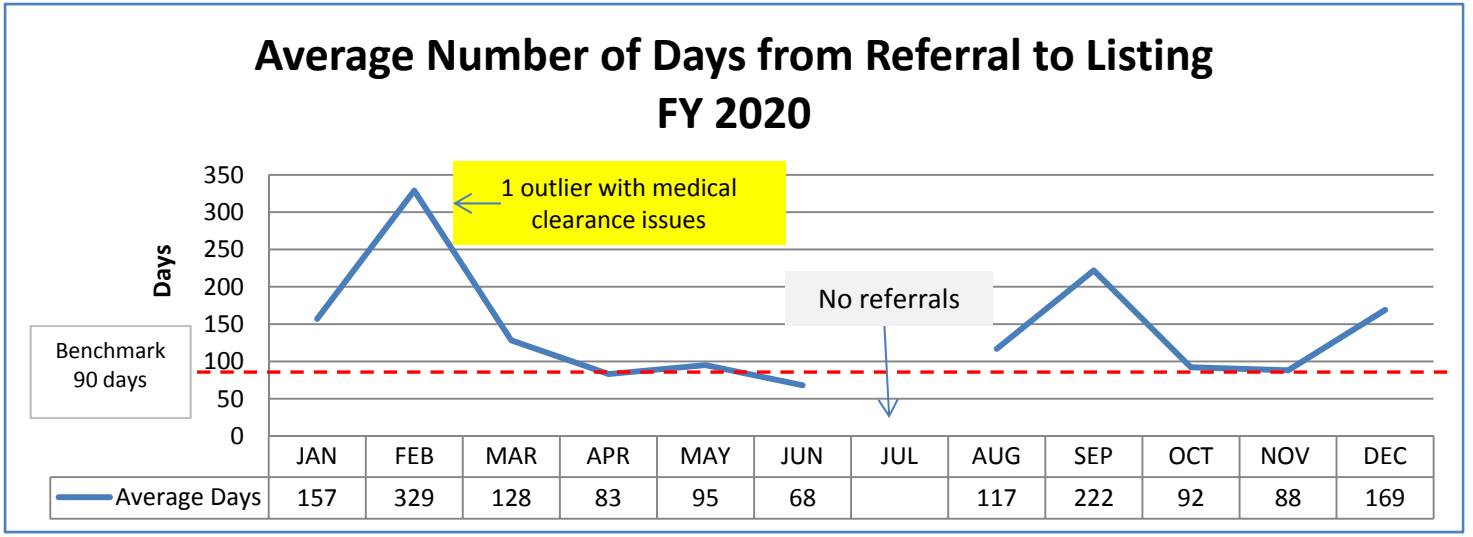

Control Chart

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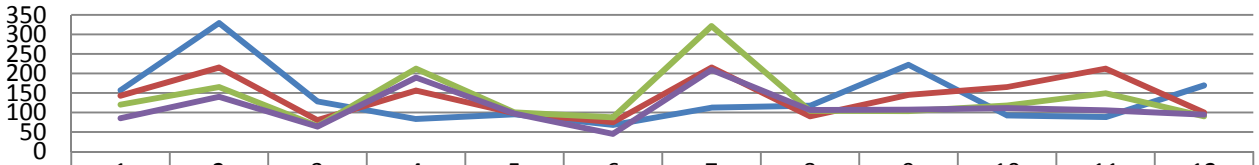
Example

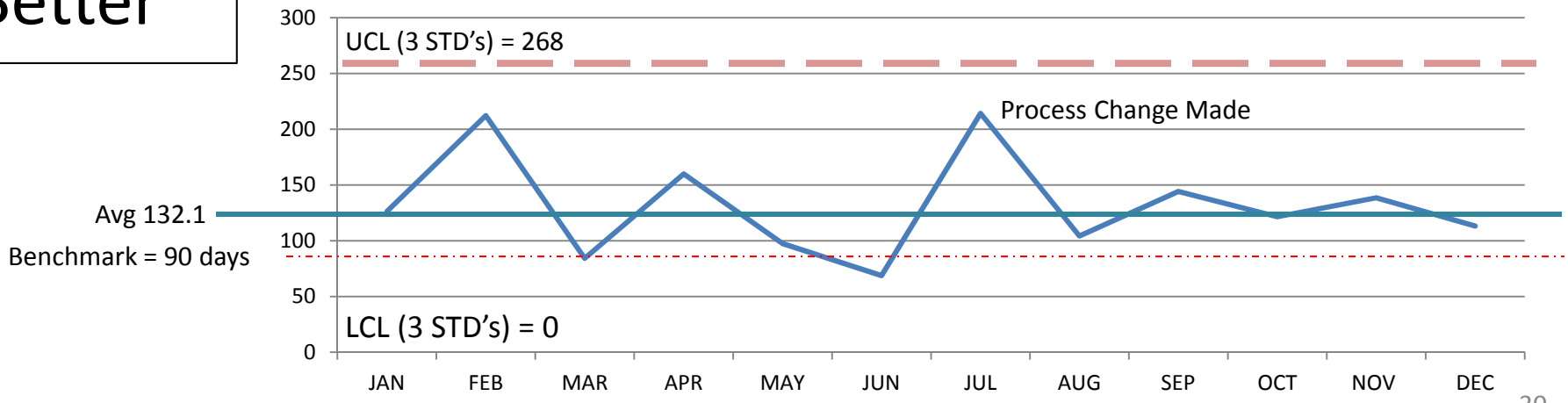
Average Number of Days from Referral to Listing 2010 to 2013



	1	2	3	4	5	6	7	8	9	10	11	12
2010 DAYS	157	329	128	83	95	68	112	117	222	92	88	169
2011 DAYS	143	215	80	156	98	75	215	90	145	165	212	100
2012 DAYS	120	165	65	212	100	87	321	104	103	118	149	90
2013 DAYS	85	140	64	189	97	45	209	106	107	111	105	94

Better

Referral to Listing Control Chart



Flow Chart

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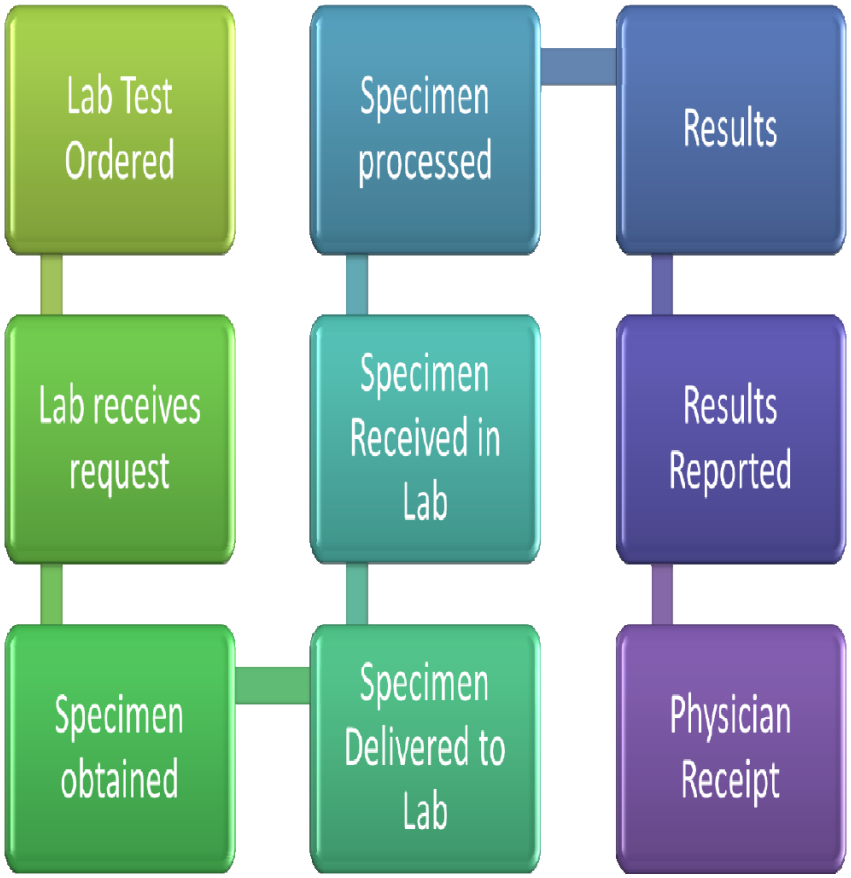
Example



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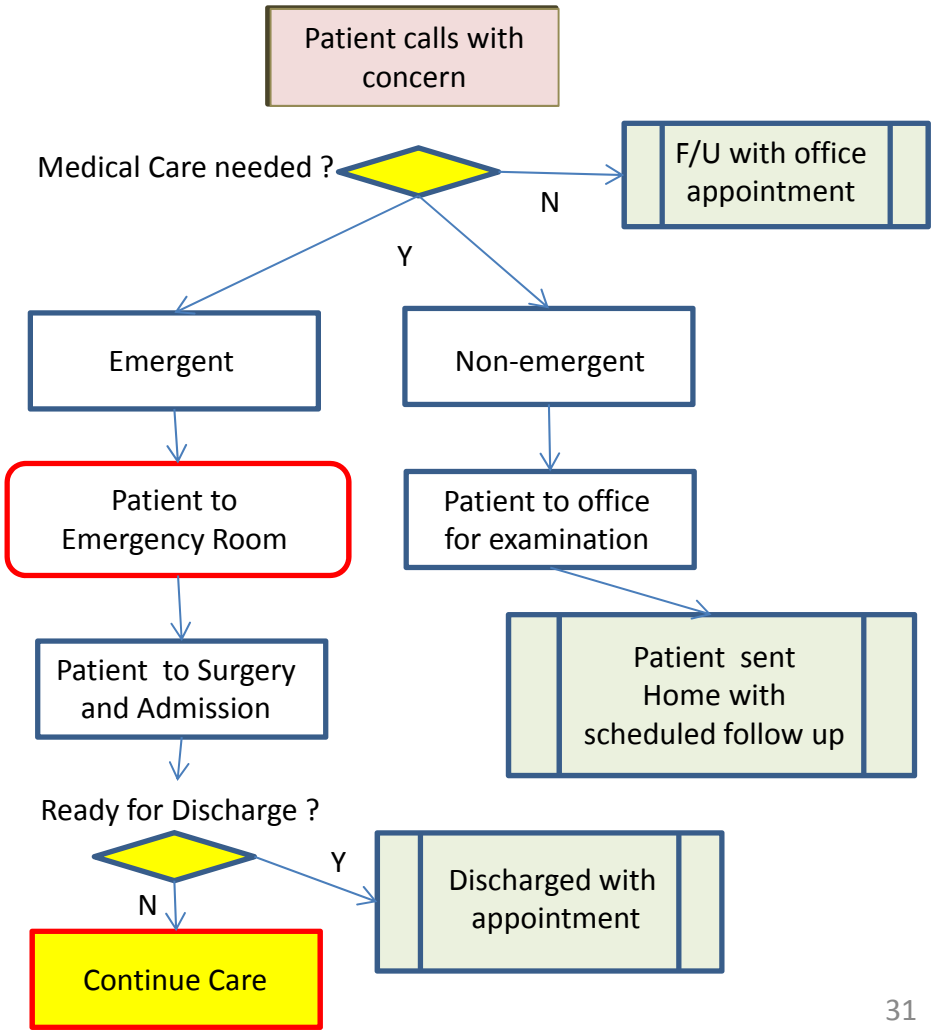

Fishbone Diagram 1

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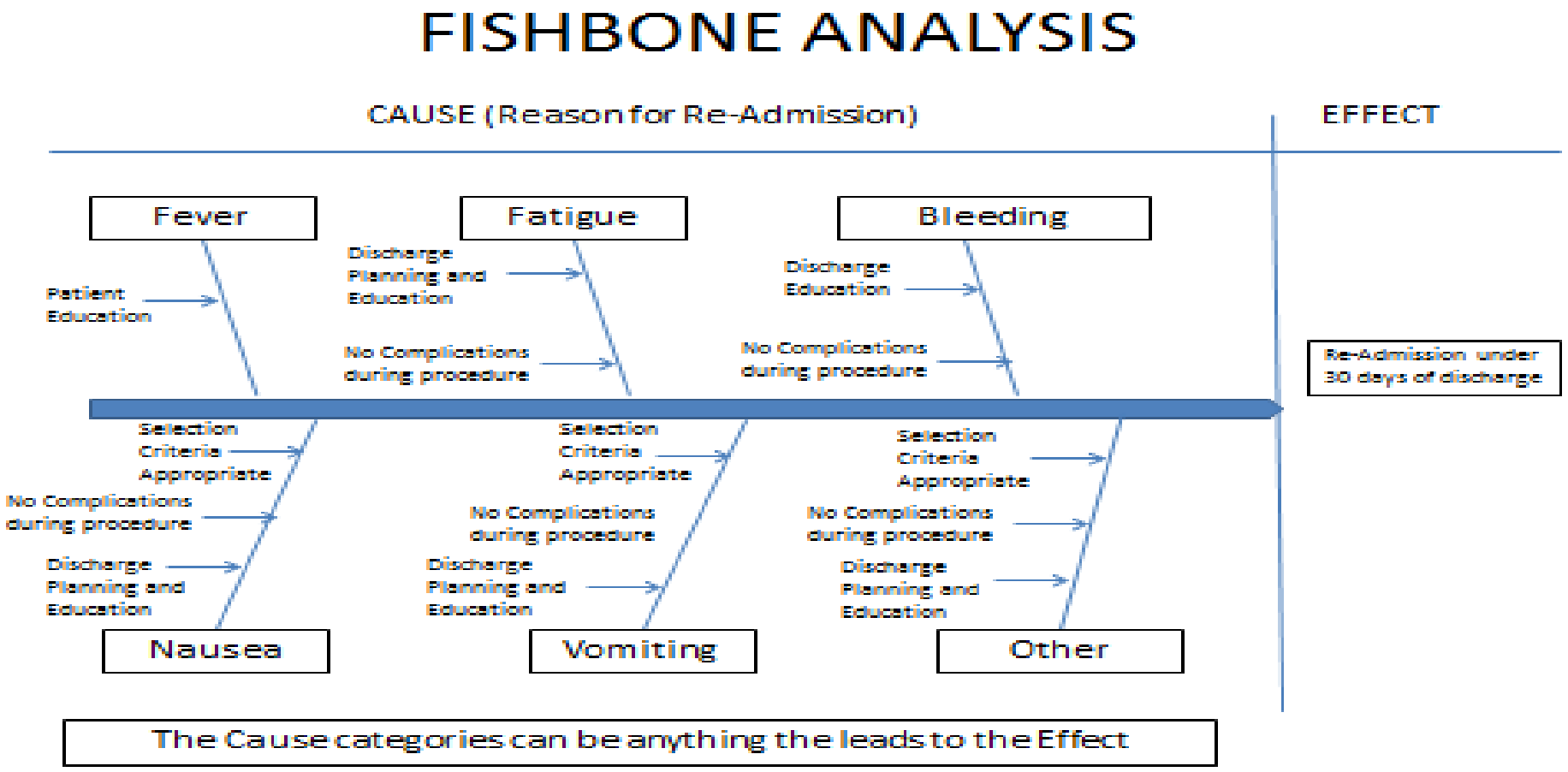
Example



Fishbone Diagram 2

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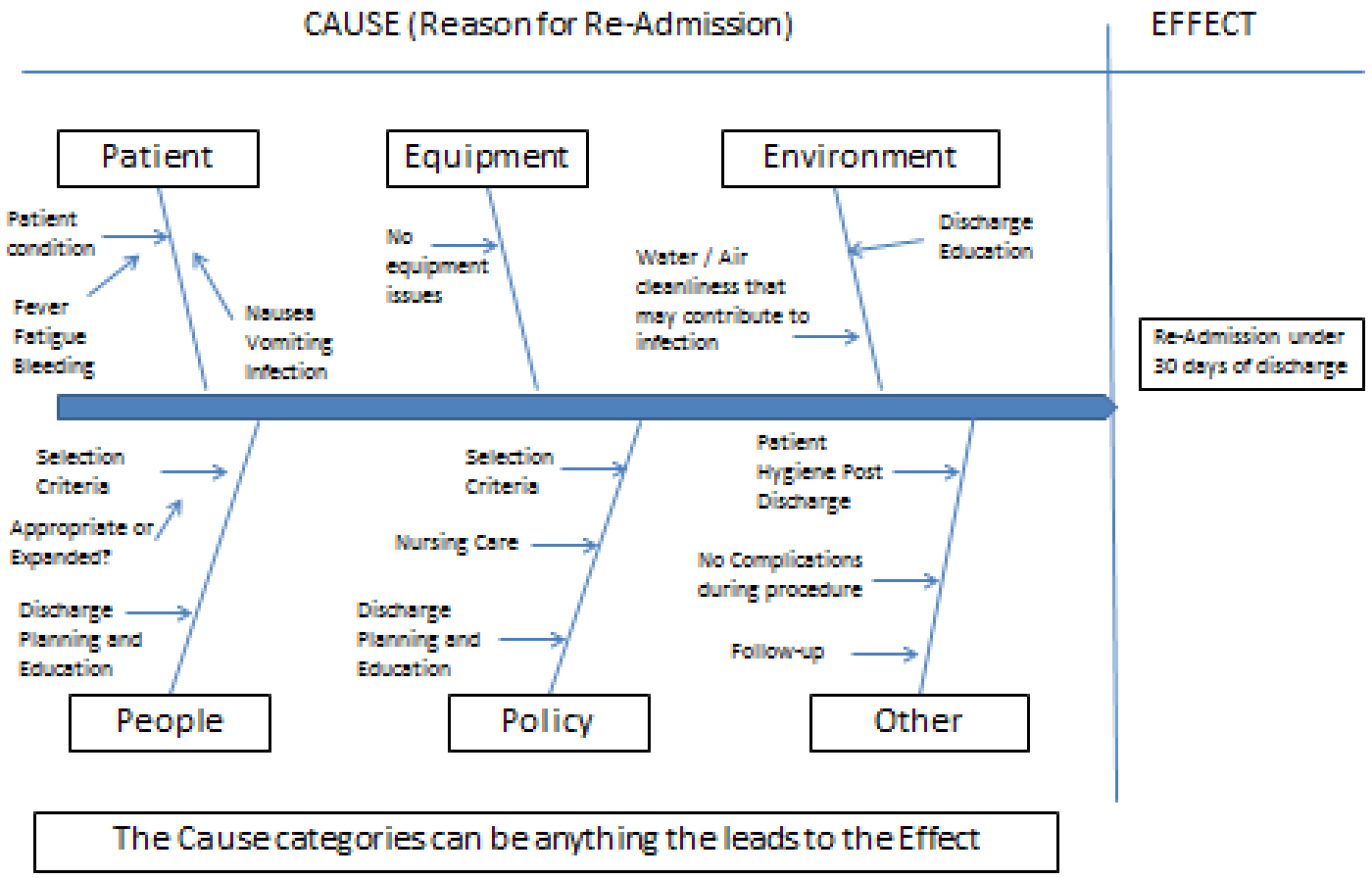
Better

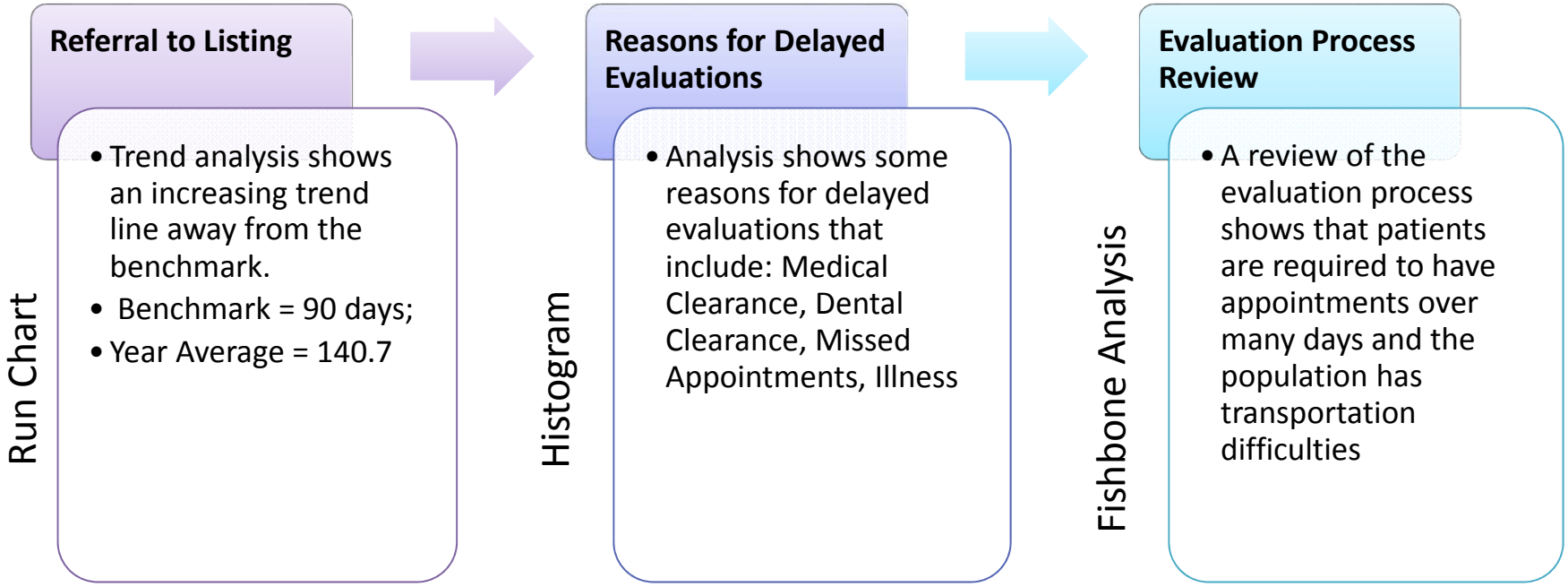
FISHBONE ANALYSIS



The Cause categories can be anything the leads to the Effect

DATA DRIVEN DECISION MAKING

Decision Making Example



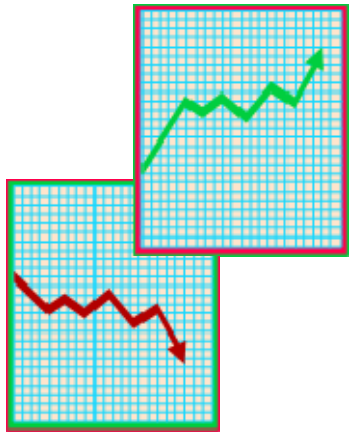
Data

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MEDIAN REFERRAL TO LISTING (# DAYS) **Benchmark= 90 days**	157	329	128	83	95	68	-	117	222	92	88	169

Step 1 – Determine Current Performance

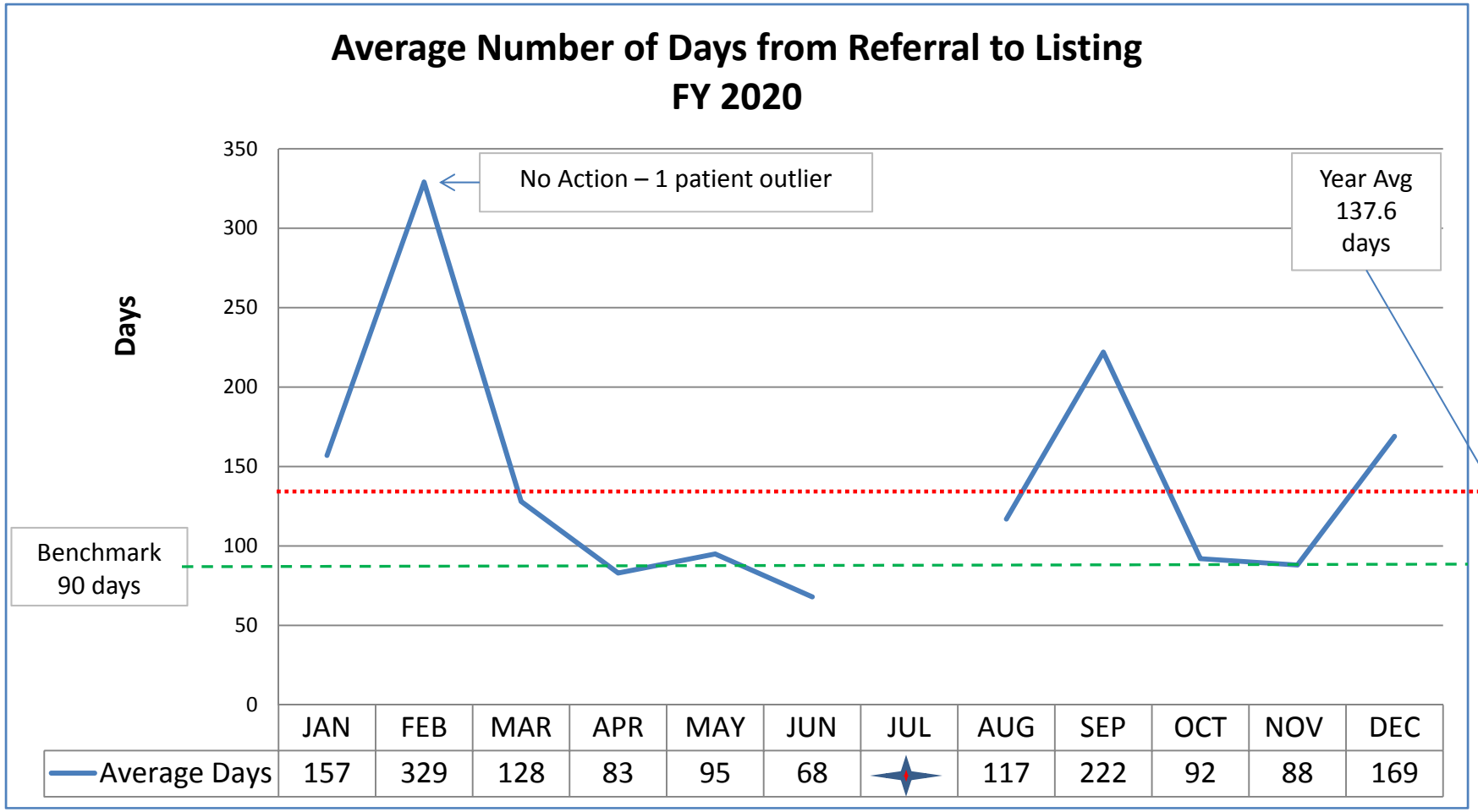
- Develop a run chart (line chart) to understand and visualize the level of current performance.

- Items needed: raw data over a period of time, spreadsheet for creating chart, benchmark data, period average, and actions already taken.



Run Chart Example

Analysis: Year Average is 137.6 days; Benchmark is 90 days (**over 8 of 11 months**) Action Required

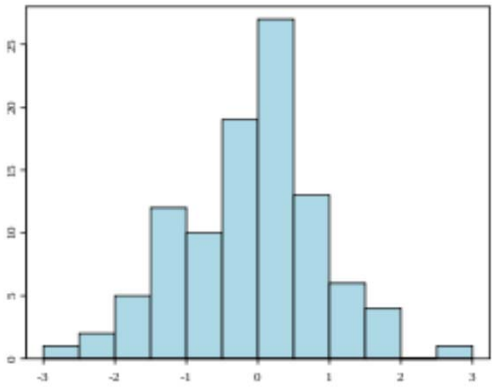


missing data

Step 2 – Identify Reasons Underlying Performance

- Develop a histogram to understand and visualize the reason(s) underlying current performance.

- Items needed: Total number of patients being evaluated, the reason for delay for any patient that has experienced a delay over the given time period, and spreadsheet for creating Histogram.



Histogram Example

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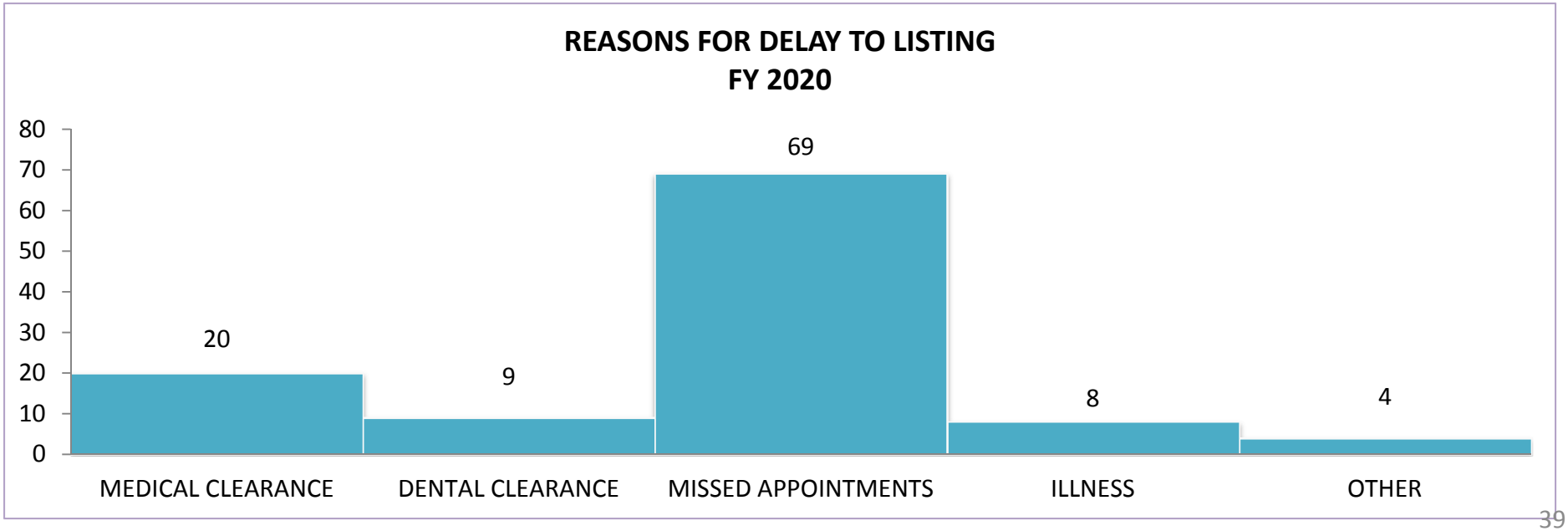
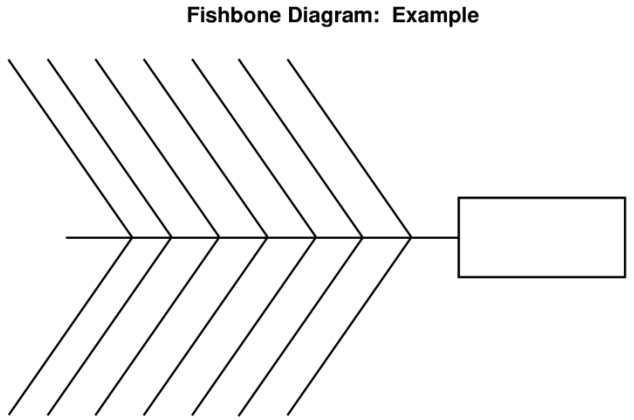
REASONS FOR DELAY TO LISTING	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	FY 2020
MEDICAL CLEARANCE	1	1	2	2	1	3	1	2	0	3	2	2	**20**
DENTAL CLEARANCE	1	0	1	1	1	0	1	2	0	0	1	1	**9**
MISSED APPOINTMENTS	4	5	3	6	7	6	8	7	6	5	5	7	**69**
ILLNESS	0	1	0	1	0	0	1	0	1	2	1	1	**8**
OTHER	1	0	1	0	0	0	0	0	0	1	0	1	**4**



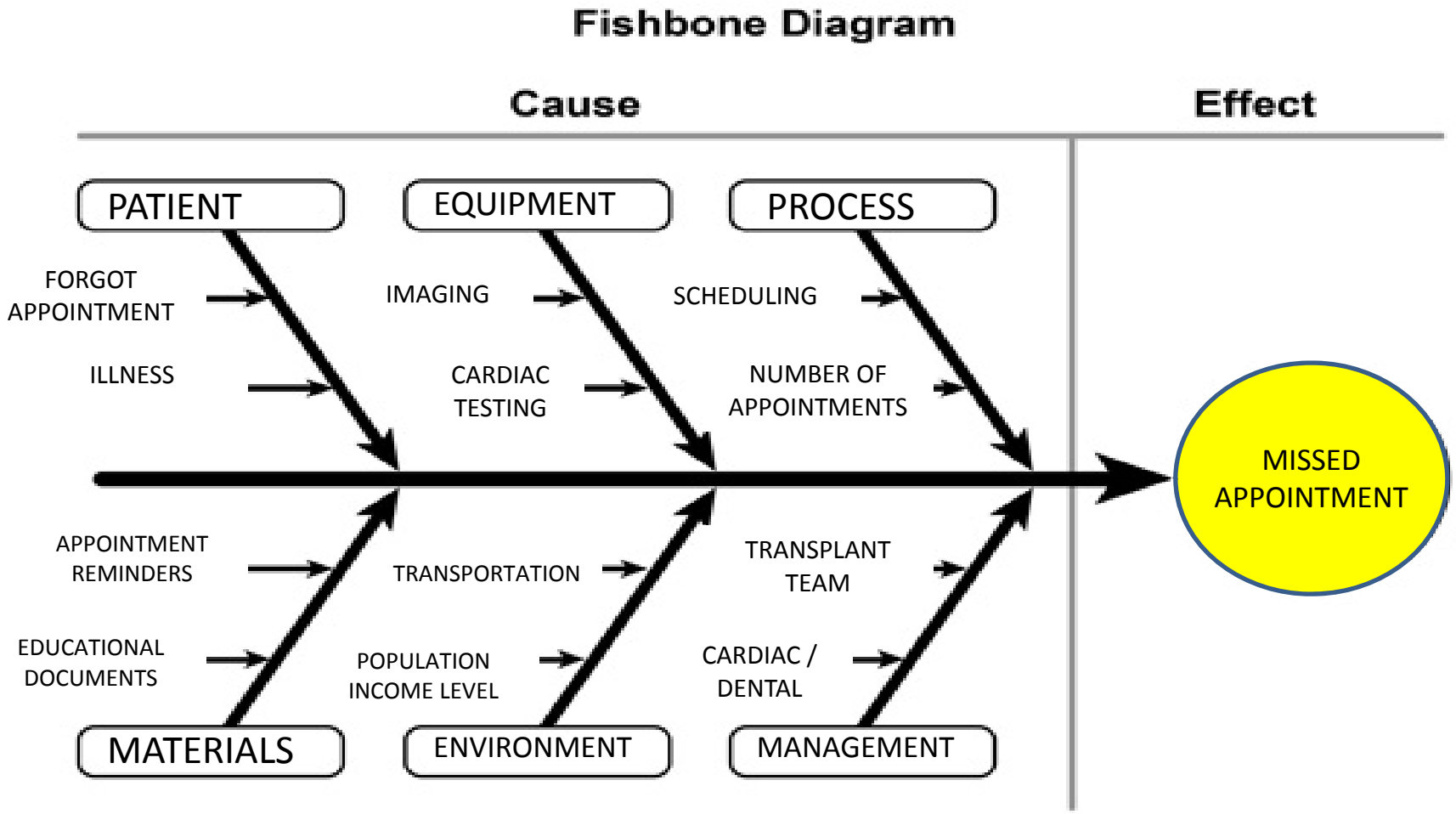
Step 3 – Analyze factors leading to effect

- Conduct a cause/effect analysis using a fishbone diagram to understand and visualize factors contributing to missed appointments.

- Items needed: Total number of patients missing appointments, the reason for delays over the given time period, and blank fishbone diagram template.



Fishbone Analysis Example



Fishbone Analysis

- This tool often generates many contributing factors that may lead to the effect. Carefully examine each category when brainstorming potential solutions.

- Contributing factors may lead to questions that require further clarification. The program may need to use other data tools to find the answers.

- Since the data indicate that missed appointments were the largest contributor to delays in evaluations, the program will next want to consider the issues facing patients who need to attend multiple and varied appointments.

Step 4 – Understand reasons behind missed appointments

- Develop a Histogram to determine the reasons patients are missing appointments.

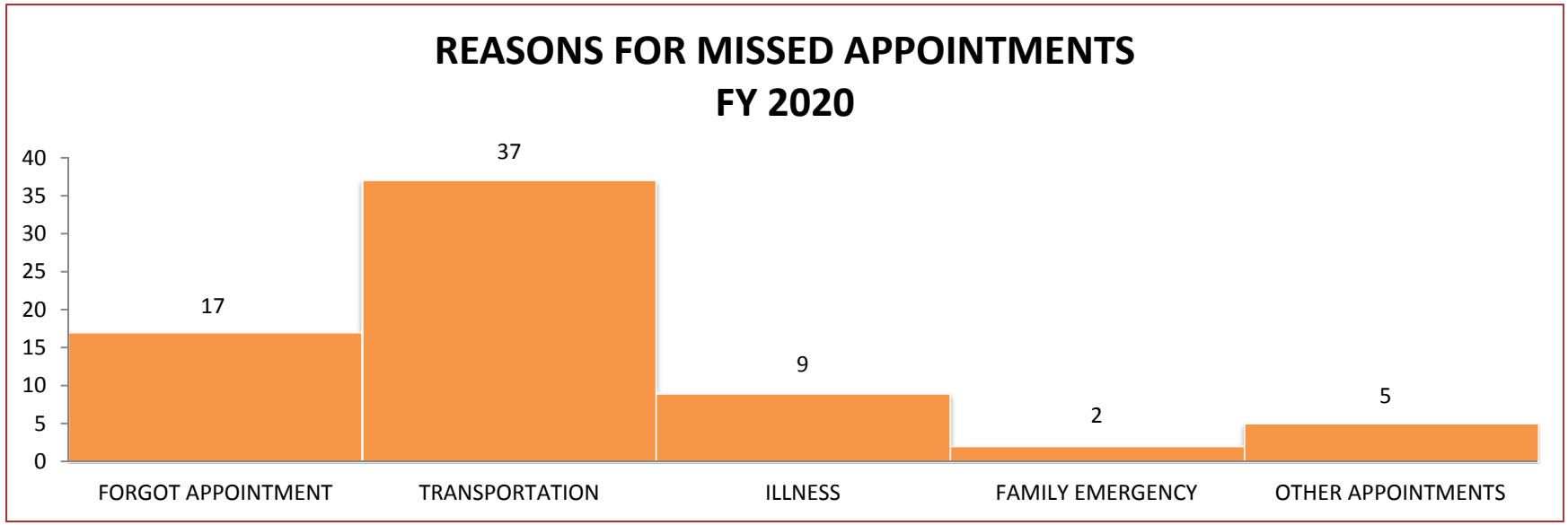
REASONS FOR DELAY TO LISTING	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	FY 2020
MEDICAL CLEARANCE	1	1	2	2	1	3	1	2	0	3	2	2	**20**
DENTAL CLEARANCE	1	0	1	1	1	0	1	2	0	0	1	1	**9**
MISSED APPOINTMENTS	4	5	3	6	7	6	8	7	6	5	5	7	**69**
ILLNESS	0	1	0	1	0	0	1	0	1	2	1	1	**8**
OTHER	1	0	1	0	0	0	0	0	0	1	0	1	**4**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	FY 2020
REASONS FOR MISSED APPOINTMENTS	4	5	3	6	7	6	8	7	6	5	5	7	**69**
TRANSPORTATION	2	3	2	3	4	3	5	3	3	4	2	3	37
FORGOT APPOINTMENT	0	1	0	1	2	0	2	3	2	1	2	3	17
ILLNESS	1	0	1	0	1	1	0	1	1	0	1	2	9
OTHER APPOINTMENTS	0	1	0	2	0	1	1	0	0	0	0	0	5
FAMILY EMERGENCY	1	0	0	0	0	1	0	0	0	0	0	0	2

- Items needed: Total number of patients missing appointments, the reason for missing the appointments over the given time period, and a spreadsheet to create the chart.

Histogram Example #2

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	**FY 2020**
REASONS FOR MISSED APPOINTMENTS	4	5	3	6	7	6	8	7	6	5	5	7	**69**
FORGOT APPOINTMENT	0	1	0	1	2	0	2	3	2	1	2	3	17
TRANSPORTATION	2	3	2	3	4	3	5	3	3	4	2	3	37
ILLNESS	1	0	1	0	1	1	0	1	1	0	1	2	9
FAMILY EMERGENCY	1	0	0	0	0	1	0	0	0	0	0	0	2
OTHER APPOINTMENTS	0	1	0	2	0	1	1	0	0	0	0	0	5



Data-Driven Decision

- The objective measure 'Referral to Listing' presented undesired performance, which could lead to negative patient outcomes.
- A Run chart established the current level of performance.
- A Histogram displayed the reasons 'why' the delays were occurring and identified missed appointments as the major reason.
- Use of a Fishbone diagram helped the team identify contributing factors underlying the missed appointments.
- Exploration of the contributing factors helped generate potential solutions to improve performance and, ultimately, patient outcomes.

- **The next step would be to take action on "Transportation" and "Forgot Appointment" factors.**

Closing

Closing Summary

- QAPI data must be collected and analyzed in order to be turned into useful information.
- The data must be valid, reliable, usable and recordable.
- An important aspect of data, data display and quality measures is that they are meaningful.
- QAPI data displays and reports should be clear and easily understood.

Questions & Answers

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