Measuring for improvement: Using data to drive change

25 November 2021

Dr Pat O'Connor, QI trainer, CEO QI Discovery

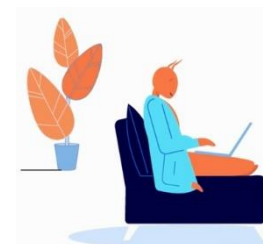**Mirek Skrypak, Associate Director of Quality and development, HQIP**

Having a good virtual meeting

Have slides

Stay on topic in the chat & use inclusive language

Don't take screen grabs/record it

Different ways to share views
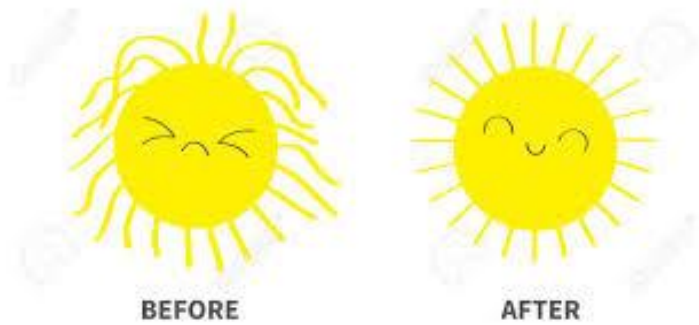
Be kind, supportive and fair

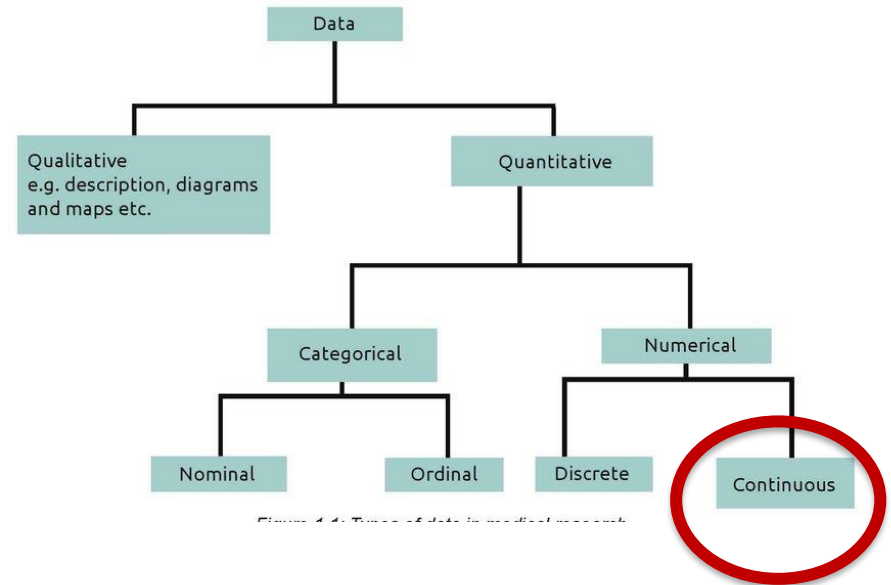**We may follow up**

Mute yourself if there is background noise

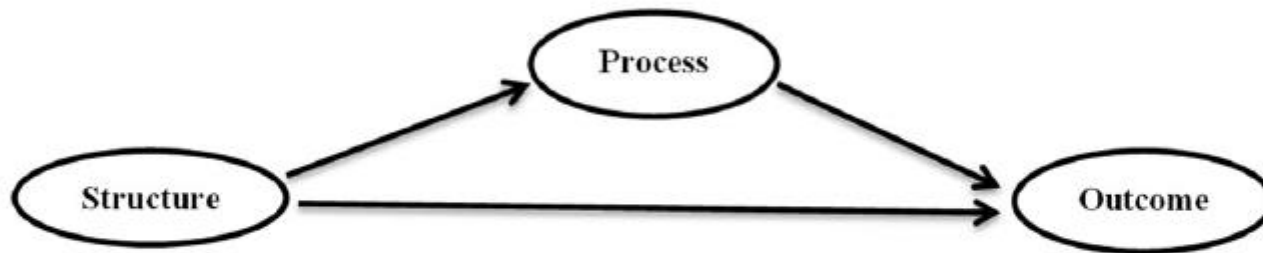**Share what you feel safe to do so and keep things confidential**

Your measurement framework

Vs

BEFORE   AFTER

Data

Qualitative
e.g. description, diagrams
and maps etc.

Quantitative

Categorical

Numerical

Nominal   Ordinal   Discrete   Continuous

Figure 1.1: Types of data in medical research

Bright Future Ahead

@MirekQI @HQIP

HQIP
Healthcare Quality
Improvement Partnership

OPEN UK
Organisation of Paediatric Epilepsy Networks in the United Kingdom

RCPCH
&Us
The voice of children,
young people and
families

epilepsy action

Young Epilepsy

EPILEPSY12

RCPCH EQIP
Epilepsy quality improvement programme

Data behind the NCAs and sources for QI

A Unidirectional path

B Mediation path

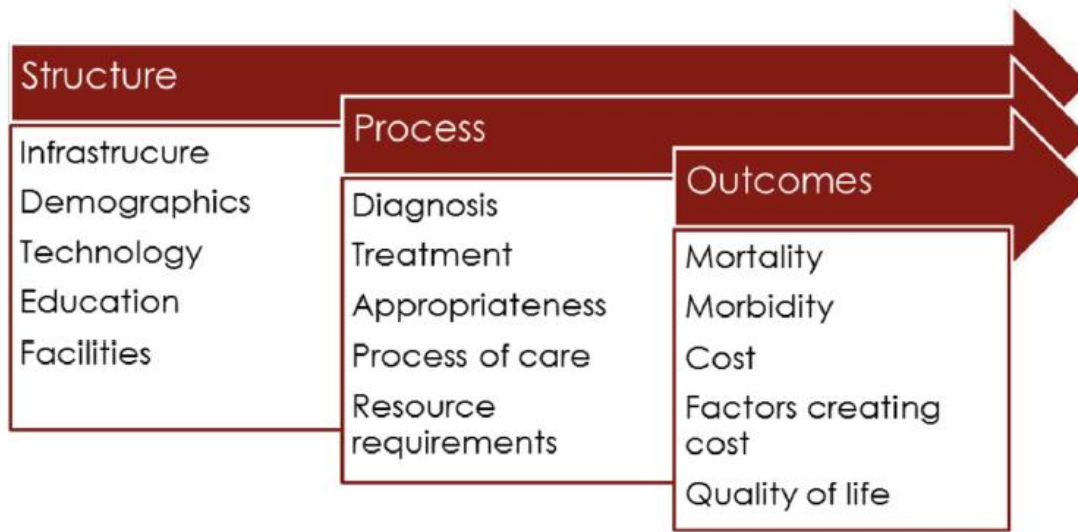**C** Non-recursive (reciprocal) path

@MirekQI @HQIP

Data behind the NCAs and sources

Consequences of quality improvement

	Anticipated		Unanticipated	
	Direct	Indirect	Direct	Indirect
Desirable	Goals		Serendipities	
Undesirable	Trade-offs		"Classic" Negative Unintended Consequences	

All four consequences can be:
- *Direct (an outcome)* or
- *Indirect (a process believed to be linked to an outcome)*

Structure

Infrastrucure
Demographics
Technology
Education
Facilities

Process

Diagnosis
Treatment
Appropriateness
Process of care
Resource requirements

Outcomes

Mortality
Morbidity
Cost
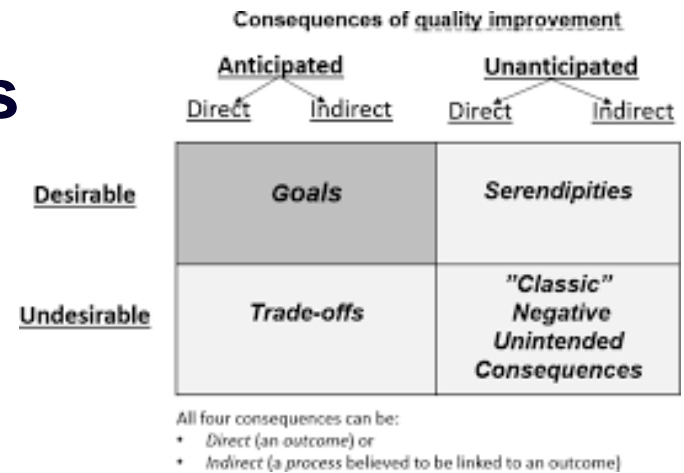Factors creating cost
Quality of life

Figure. 1   The Donabedian model.

Patient reported experience measures (PREMs): a measure of people's experience of health care services, as reported by patients (for example, the NHS Friends and Family Test).

Patient reported outcome measures (PROMs): a measure of the health status of patients as reported by patients (for example, pain levels or quality of life before and after surgery).

Some key questions to ask as a project team…

- Do we know how good we are?

- Do we know where we stand relative to the best?

- Over time, where are the gaps in our practice that indicate a need for change (i.e. improvement)?

- In our efforts to improve, what's working ?

- Do we know/understand where variation exists in our organisation?

@MirekQI @HQIP
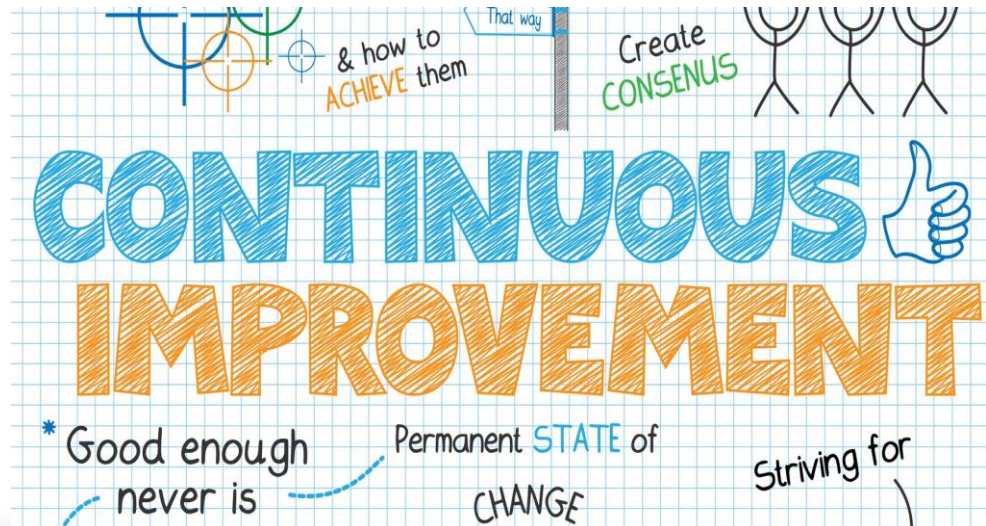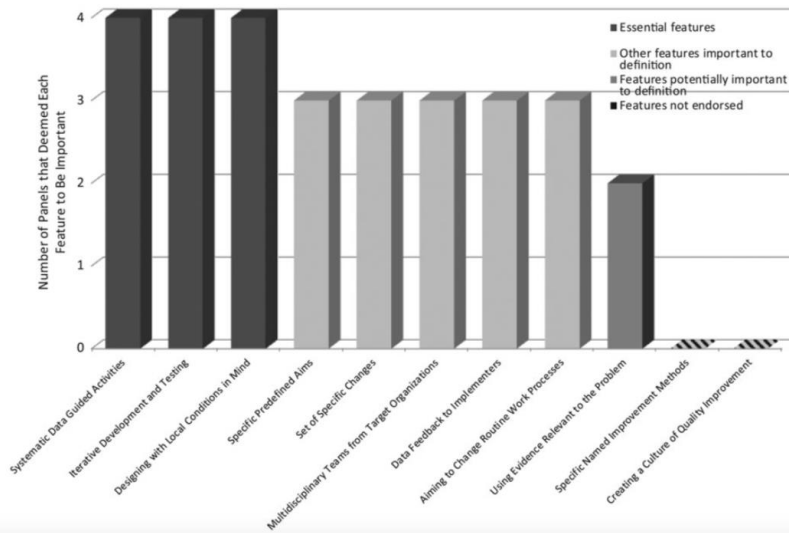
EPILEPSY12 + **RCPCH EQIP**
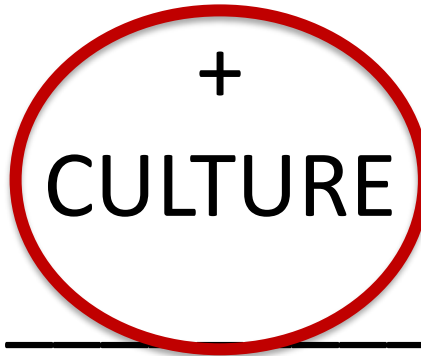Epilepsy quality improvement programme

1. Systematic data guided activities (audit ie *before and after* and QI ie *continuous*)
2. Iterative development and testing (QI)
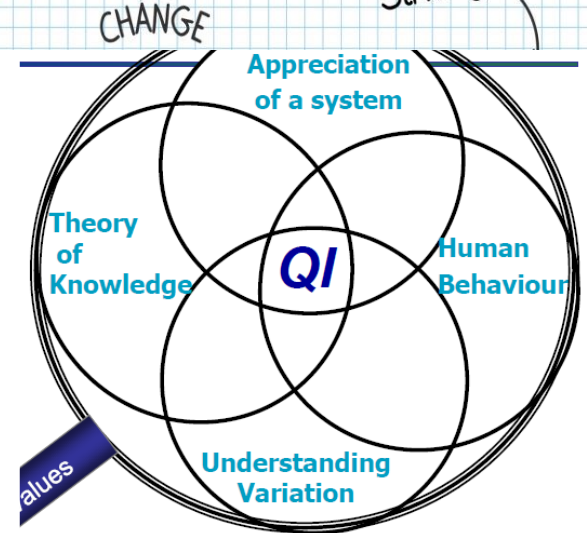3. Designing with local conditions in mind (audit and QI)

@MirekQI @HQIP

STRUCTURE
+
PROCESS
+
CULTURE
_____
OUTCOME

Continuous Improvement

& how to ACHIEVE them

That way

Create CONSENSUS

* Good enough never is

Permanent STATE of CHANGE

Striving for

Appreciation of a system

Theory of Knowledge

QI

Human Behaviour

Understanding Variation

Values

Essential features
Other features important to definition
Features potentially important to definition
Features not endorsed

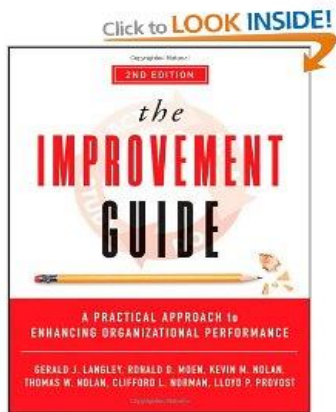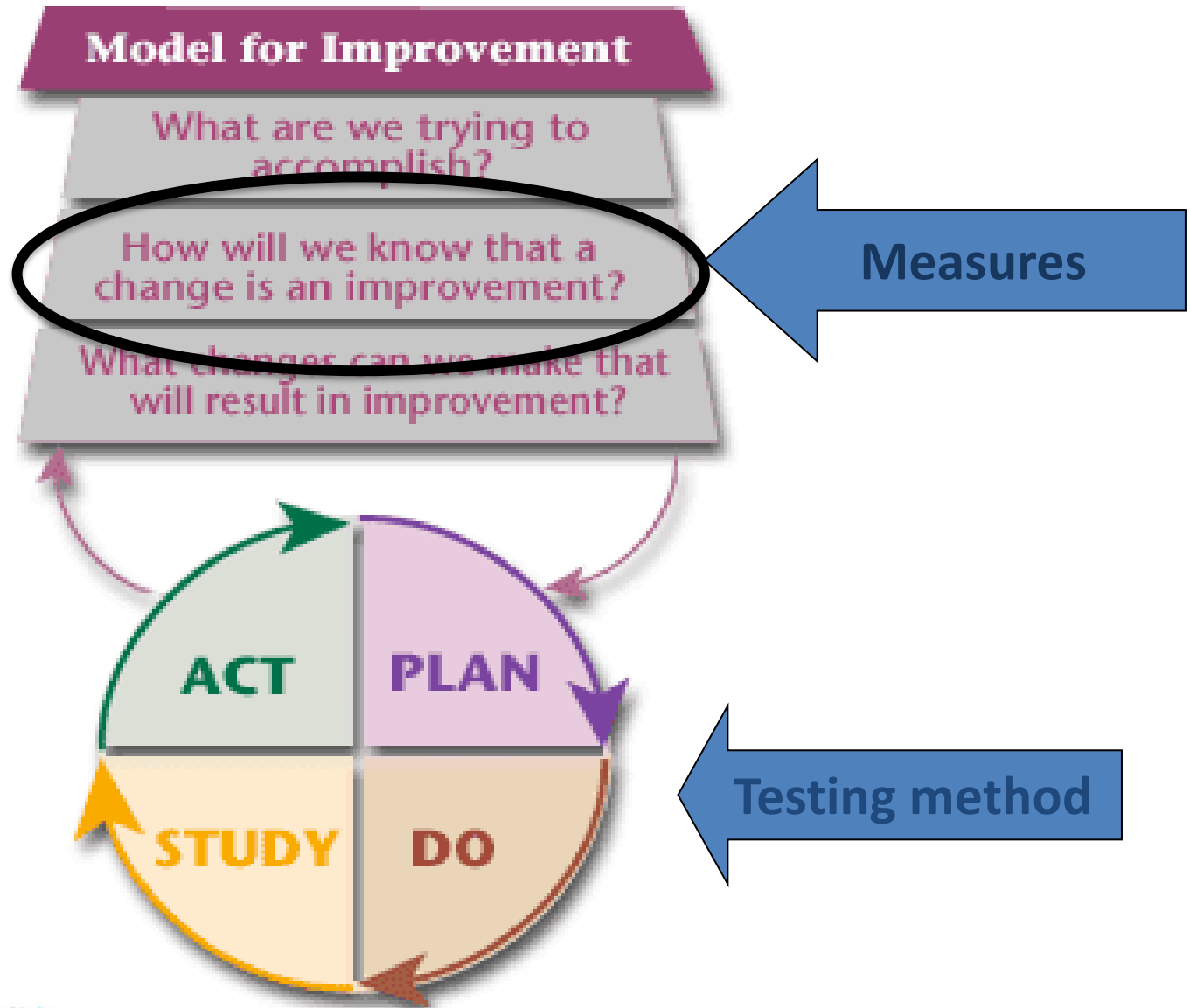Number of Panels that Deemed Each Feature to Be Important

Measuring Results

- **Measurement MATTERS**
- **Your ability to see what is going on**
- **Generate light not heat!**
- **Measures for improvement**
- **Tell a story with data and narrative**
- **Use a simple run chart**
- **Info graphics**

The Model for Improvement

Seek Usefulness Not Perfection

Types of data

Qualitative – words, sentences, stories

Quantitative- numbers percentages rates

Young Epilepsy

EPILEPSY12

RCPCH EQIP
Epilepsy quality improvement programme

Why measure?

Critical part of testing and implementing

change.

Allows us to know if change resulted in

an improvement.

Allows us to determine further impact of

the change.

To evidence improvements.

The Three Faces of Performance Measurement

Aspect	Improvement	Accountability	Research
Aim	Improvement of care (efficiency & effectiveness)	Comparison, choice, reassurance, motivation for change	New knowledge (efficacy)
Methods: • Test Observability	Test observable	No test, evaluate current performance	Test blinded or controlled
• Bias	Accept consistent bias	Measure and adjust to reduce bias	Design to eliminate bias
• Sample Size	"Just enough" data, small sequential samples	Obtain 100% of available, relevant data	"Just in case" data
• Flexibility of Hypothesis	Flexible hypotheses, changes as learning takes place	No hypothesis	Fixed hypothesis (null hypothesis)
• Testing Strategy	Sequential tests	No tests	One large test
• Determining if a change is an improvement	Run charts or Shewhart control charts (statistical process control)	No change focus (maybe compute a percent change or rank order the results)	Hypothesis, statistical tests (t-test, F-test, chi square), p-values
• Confidentiality of the data	Data used only by those involved with improvement	Data available for public consumption and review	Research subjects' identities protected

Top tips

- **Make the data collection system easy to use .....*the right thing easy to do***
- **Designed by the front line**
- **Ask 5 people how the data is collected**
- **Involve the middle managers**
- **What are we learning from the data?**
- **Is the system capable of change?**
- **What is our prediction?**
- **Have a plan**

Who What When Where How

- **Plan explicitly:**
- **Who will collect the data?**
- **What sampling method with they employ?**
- **When and where will they collect the data?**
- **How will they do it?**
  - **Step by step procedures.**

Never postpone improvement to wait for the IT department!!
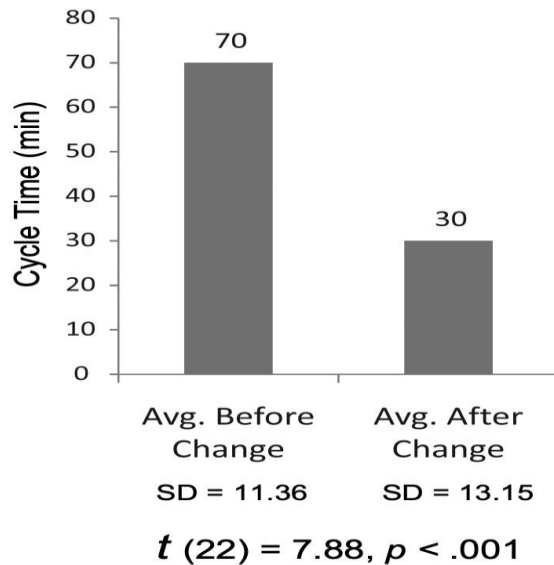
Where is the problem
Look at Frequency

Histogram of staff happiness at work score

Example Pareto
clothing items returned
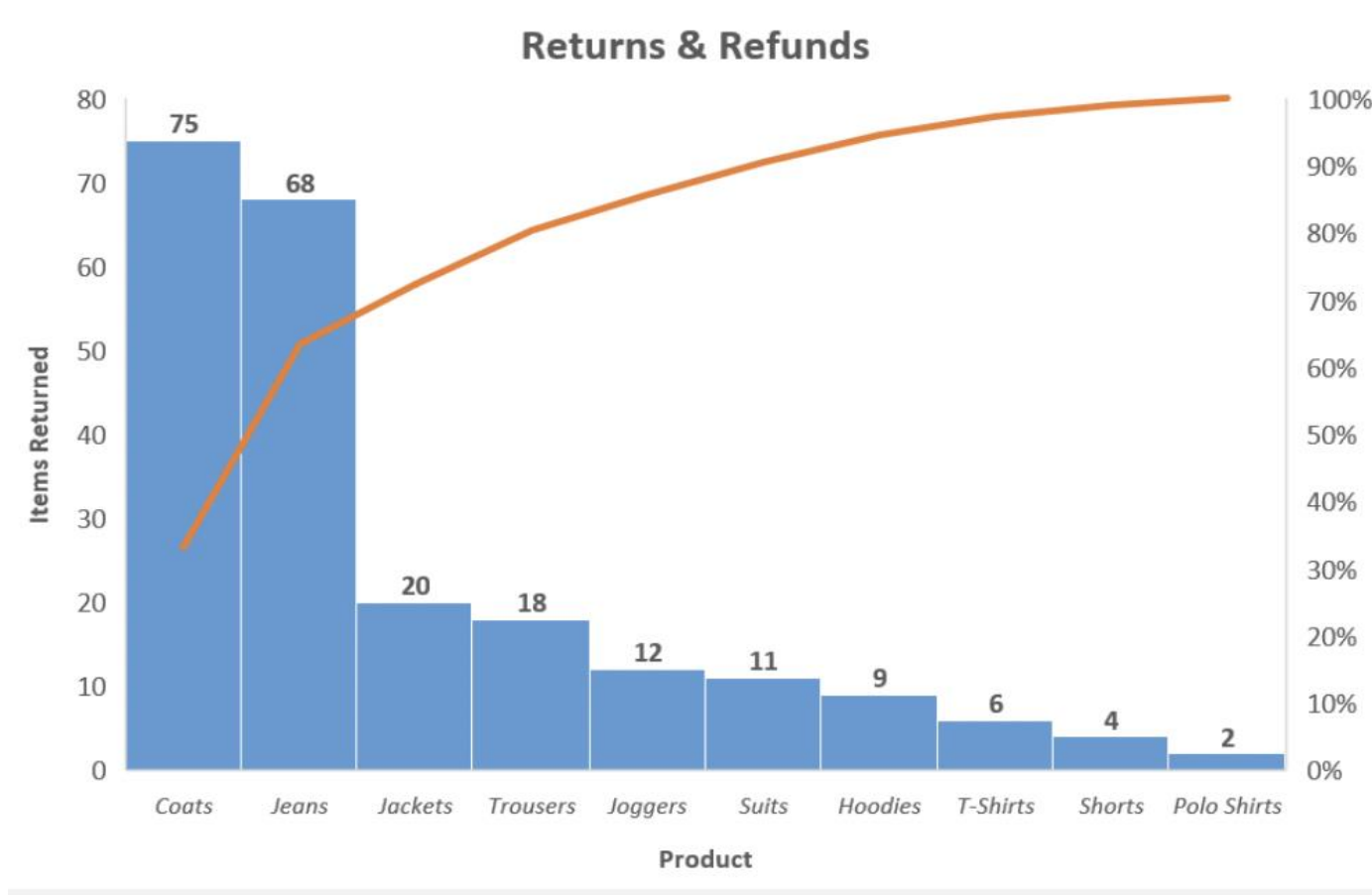
Has the change resulted in Improvement?

Cycle Time Results for Units 1, 2 and 3

Avg. Before Change: 70, SD = 11.36
Avg. After Change: 30, SD = 13.15

$t(22) = 7.88$, $p < .001$

Unit 1
Unit 2
Unit 3

Change
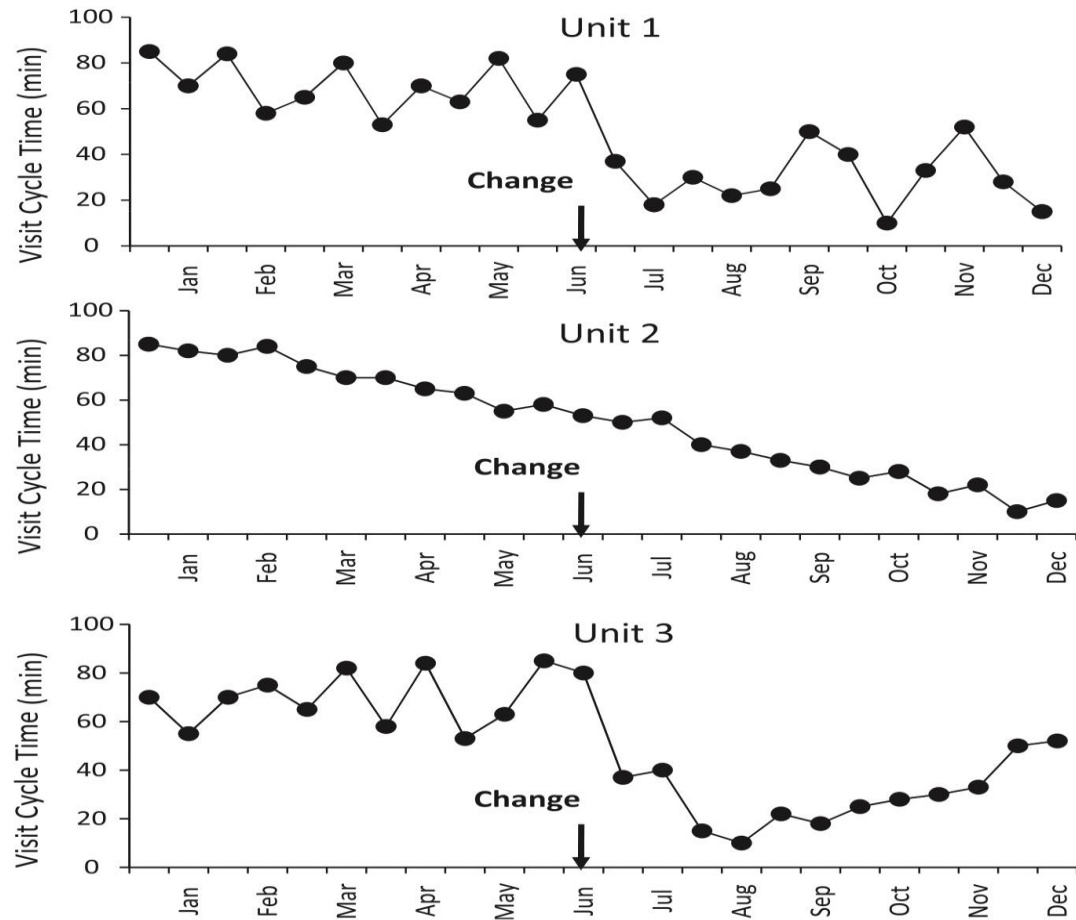
Difficult to see progress with these

Red, Amber, Green (RAG)

	Target	A	M	J	J	A	S	O	N	D	J	F	M
Cat A Performance	75%	70.4	70.6	70.2	69.0	67.9	68.2	66.9	64.0	65.0	65.3	65.0	66.5
Cat A Cardiac Arrest	80%												
ILT Response <8 mins	75%												
Cat B Performance	95%												
On Scene <19 mins	95%												
PTS Cancelled	0.5%												
999 Pick-up <10 secs	99%												
Cat C calls to NHS24	25%												
Turnaround <15 mins	50%												

Public Domain/ Wikipedia

Year by Year Comparison

2014-15
2013-14
2012-13

Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
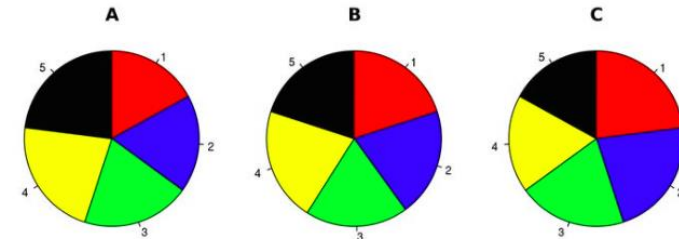
Management Reports

KPI	Nov14	2014 av.	YTD av.	Oct15	Nov15	RAG	Trend
Cost/value of orders	14.5%	13.9%	12.0%	12.1%	12.0%	⊙	↗
Complaints	1	10	6	4	8	⊙	↗
Delivery on time	95.3%	96.2%	96.1%	96.2%	95.9%	⊙	↘
Customer satisfaction	93%	91%	80%	80%	80%	⊙	→
Sickness	2.7%	3.1%	4.3%	4.3%	4.3%	⊙	→
Picking errors	35	35.9	39	38	40	⊙	↗
Selling days in month	21	N/A	N/A	22	20	N/A	N/A
Inventory FDOS	18	22	31	29	33	⊙	↗
Safety (major incidents)	0	0.7	1.5	2	1	⊙	↘
Training	100%	100%	100%	100%	100%	⊙	↘

www.scottishambulance.com

No Pie charts

42% Sweetcorn
60% Peppers
49% Bacon
56% Pepperoni
26% Spinach
33% Olives
51% Tomato (as a topping)
42% Pineapple
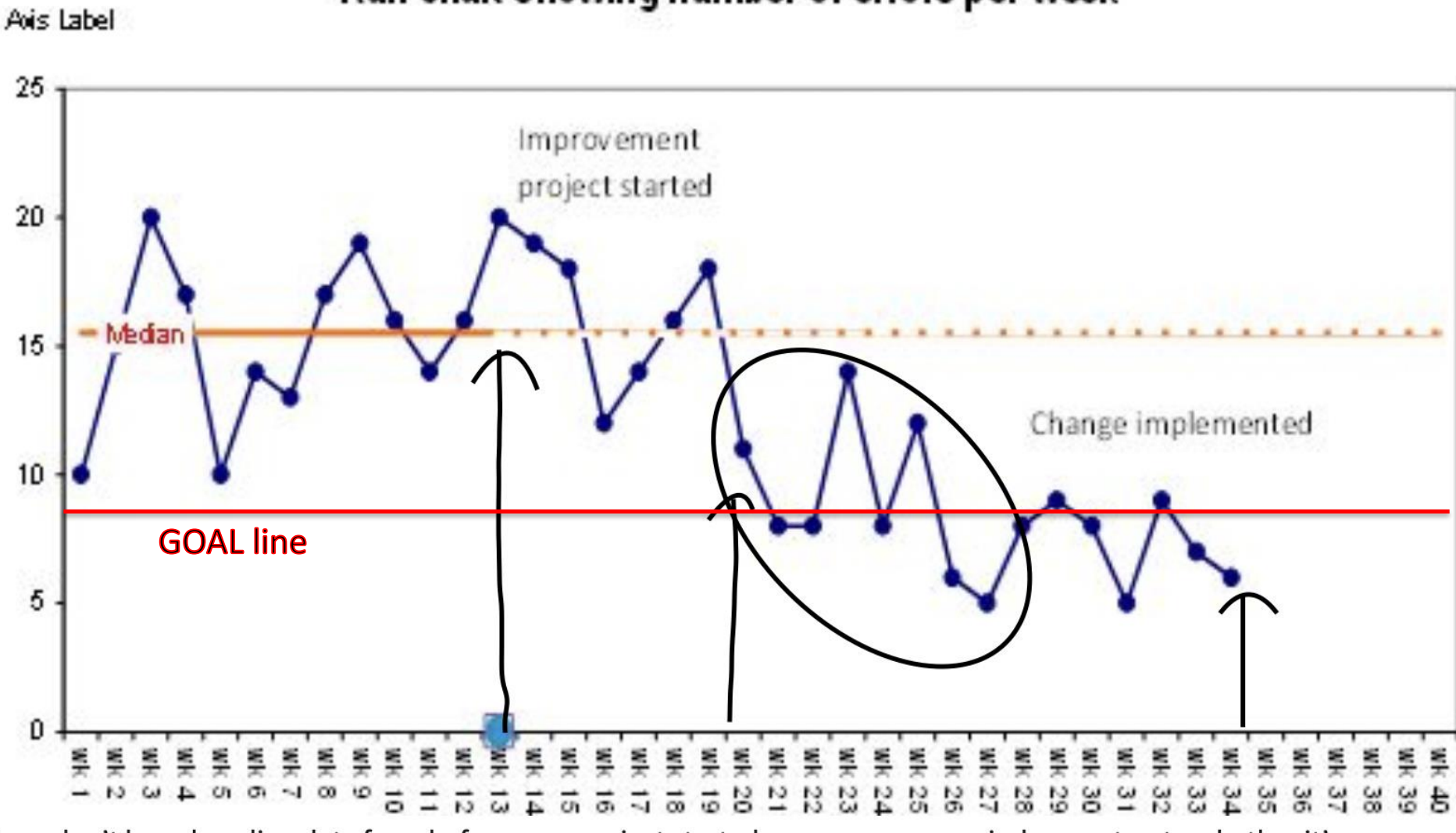61% Ham
65% Mushrooms
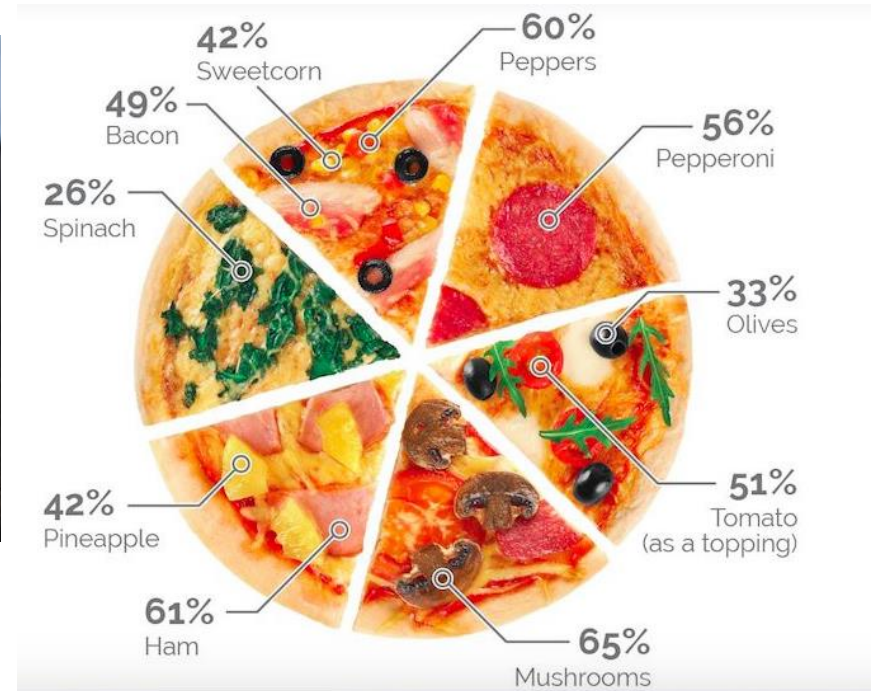
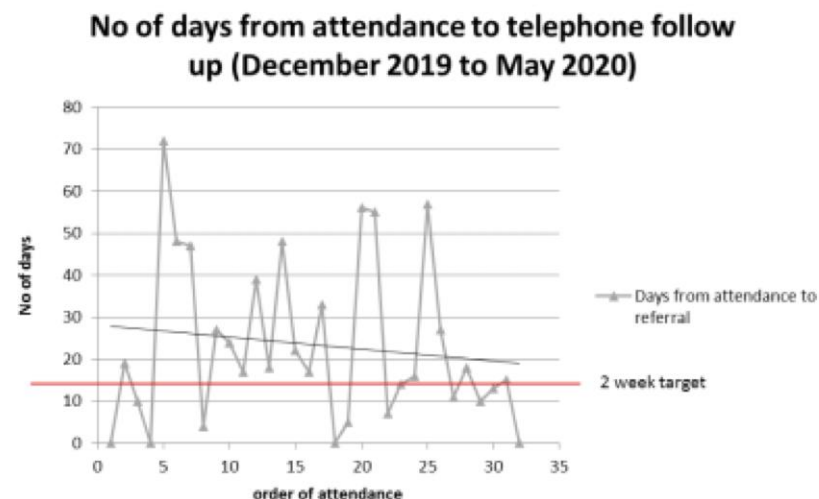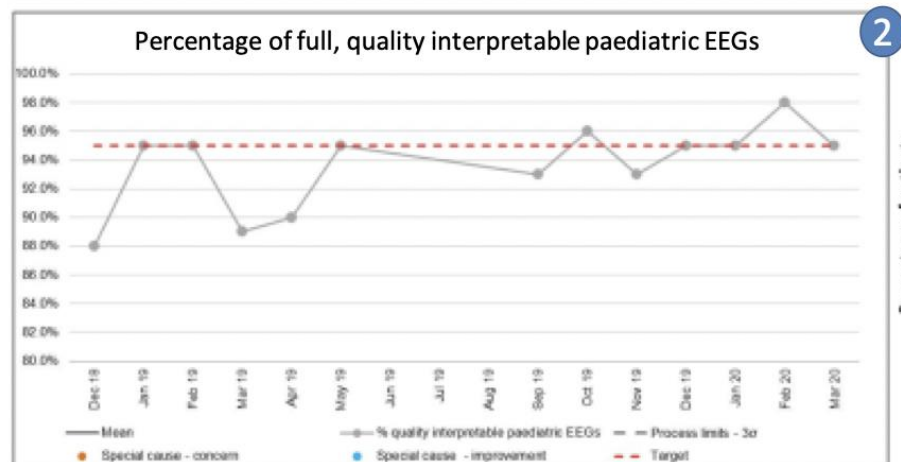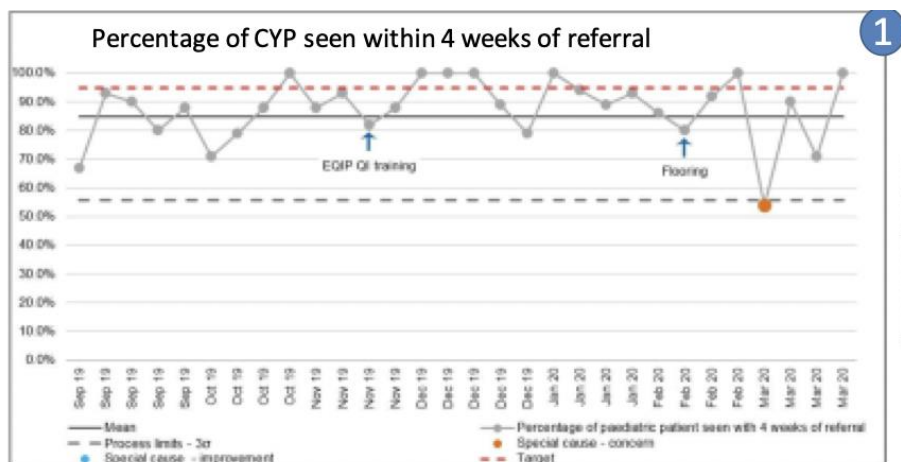# Measuring Results
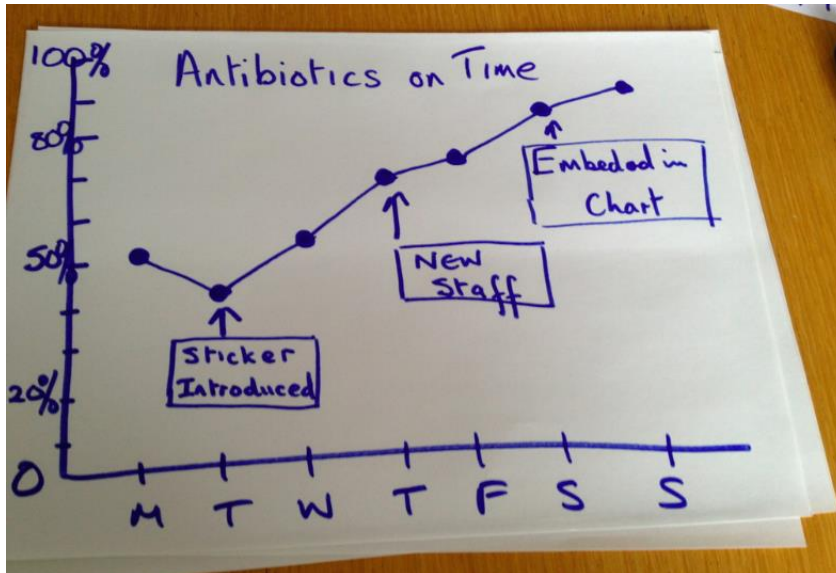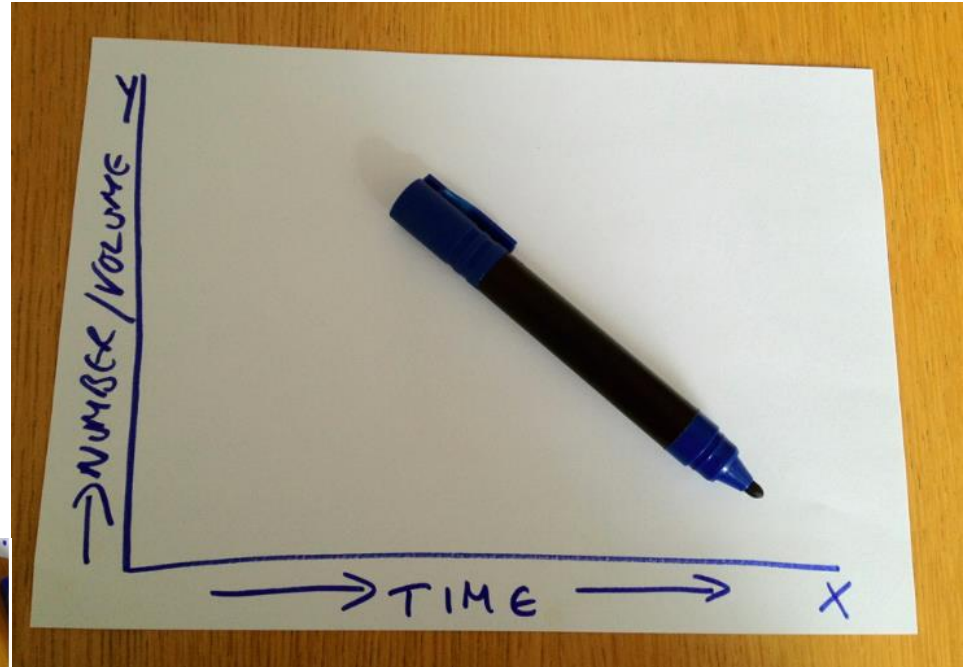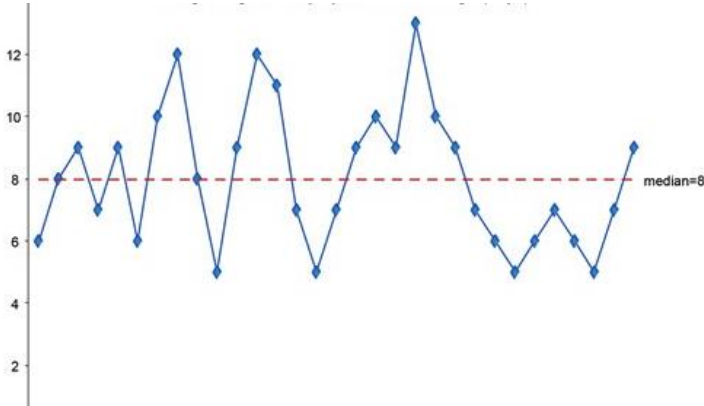
Measuring Change

Run chart showing number of errors per week

Measurement Summary

- **Baseline data**

- **Use a run chart**

- **Record interventions**

- **Re-calculate mean when a shift occurs**

- **Narrative information- look for ideas and themes in the data that you are using to change what the patients families need and impact on improvement**

Examples EQIP 19

Narrrative Data presentation
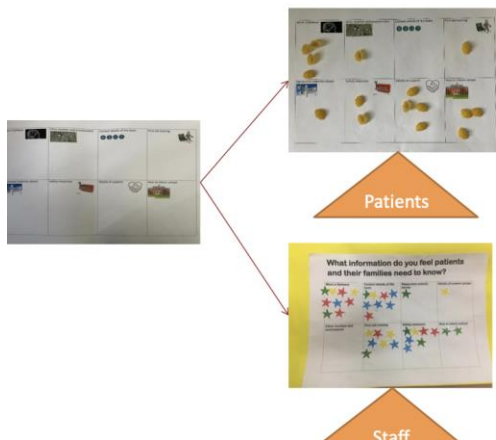
Make a pareto chart and a run chart

- https://learn.nes.nhs.scot/2348/quality-improvement-zone/qi-tools/pareto-chart

- https://www.lmpartnership.org/sites/default/files/nine-steps-create-storytelling-run-chart.pdf

- https://psmu.improvement.nhs.uk/psc-shared-library/tools-and-guides/24-run-charts-as-a-simple-analytical-tool-for-understanding-variation-in-healthcare/file

Questions

1. What data are you capturing or planning to capture ie retrospective, currently, in the future and beyond this project?

2. What challenges do you have around data?

3. What solutions have you found?

Teamwork discussion for 15 min

Take home tasks

In preparation for your next progress call, please explore:

1. How are you measuring improvement in your project?

2. How are your tests of change informing the data you want to collect?

3. You should now be thinking about the ways your team are going to present your data to your team and within your final project

Evaluation