Making sense of the numbers: A whole system approach from Sheffield

Dr Helen Crimlisk

helen.crimlisk@shsc.nhs.uk
@helencrimlisk
Why do we need data?

1. How much we’re doing
2. How well we’re doing
3. Whether things are getting better or worse
4. How to know if change has helped
5. To explain to others what we’re doing
What are the problems with data?

1. Not enough
2. Too much
3. Doesn’t connect up
4. Don’t understand it
5. Doesn’t make sense
The Data Dilemma

“In God we trust; all others bring data”

W Edwards Deming

“Experts often possess more data than judgement”

Colin Powell
Presenting data: RAG vs SPC

Statistical process control (SPC) chart – basic anatomy

We explain the value SPC brings to a time series of data.

This is a SPC chart.

It's a time series line chart with three reference lines that help you appreciate variation in the data. The reference lines are:

- centre reference line: the average line (often represented by the mean, sometimes the median)
- upper and lower reference lines: the process limits, also known as control limits.

You don’t set the limits – these are defined by the variability of data for the measure you are plotting. You can expect approximately 99% of data points to fall within the process limits. Don’t worry about the detail of why this is the case for now – it’s all to do with probability and we’ll talk about that a bit more later.

But from knowing that roughly 99% of data points will fall within the process limits, you start to appreciate how useful SPC is when you need to consider how likely it is that a target will be achieved.

Am I missing something here? Is it good or bad????
SPC rules common or special cause variation?

A single point outside the control limits

Whenever a data point falls outside a process limit (upper or lower) something unexpected has happened because we know that 99% of data should fall within the process limits.

Here is an example of a much higher waiting time in A&E for a particular month. This disruption was caused by a new software system taking a little time to bed in.

Average wait per breach (crowding)

A single point above or below the process limits

Upper process limit

Mean line

Lower process limit

Six consecutive points increasing or decreasing

A run of six or more values showing continuous increase or decrease is a sign that something unusual is happening in the system.

In this example, a trust implements an early warning communication system for serious cases arriving at A&E who are likely to require an inpatient admission. The flow through the system improves with fewer breached admissions.

Breach admitted

Upper process limit

Mean line

Lower process limit

A long run of consecutively decreasing points

Consecutive points above or below the mean line

A run of values above or below the average (mean) line represents a trend that should not result from natural variation in the system.

Here is an example of an improvement project being implemented in an outpatients department. Initially, you can see that the changes made had a positive effect on waiting times. This was sustained for 10 months but funding was withdrawn and waiting times deteriorated as a result.

Initial assessment times

Run of consecutive points above the mean

Upper process limit

Mean line

Lower process limit

Run of consecutive points below the mean

Upper process limit

Mean line

Lower process limit

Here is the same chart but with an additional reference line showing the target.

The target line is above the upper process limit (and what you want to see is this limit above the target) – so you cannot expect to hit the target; doing so would represent a highly unusual occurrence as approximately 99% of values fall within the process limits.

Remember sometimes the objective is to be higher than the target and sometimes lower:
- If higher, a target above the upper process limit cannot be expected to be achieved.
- If lower, a target below the lower process limit cannot be expected to be achieved.
The numbers are only our way of representing the story...
Data: What do the numbers mean?

Emperor Penguins (only ones in mating ritual after prolonged absence).

Data: What is the narrative?
Connecting Data from different sources

- National Strategy
  - NHS England Benchmarking data
- ICS/ACP Strategy
  - Transformation Data
- CCG/City/Region Strategy
  - CCG Quality Metrics
- Care Group / Service Strategy
  - Sharepoint Dashboards
- Team/ward strategy /QI projects
  - Team Dashboards
- Service User / Employee / Citizen
  - Care Plan / PDP / Commissioning plan
National NHS England Dashboard
https://www.nhsbenchmarking.nhs.uk

1. Adult Acute beds per 100k population
   - Acute bed numbers have been falling steadily in recent years, with a decrease nationally of 17% since 2012.
   - However last year (2016-17) the trend of decline appears to have stopped, with a median position of 20 beds per 100,000 weighted population.
   - Yorkshire and Humber have bed rates consistent with NHS average.
   - Sheffield bed numbers have reduced by 45% over the previous 3 year period and Sheffield has the lowest provision of beds per weighted population in the country.

2. Mental Health Act Admissions rate #1
   - Adult acute admissions under MHA are 69% of all admissions in Sheffield, the highest rate in the NHS.
   - National average rates are 36% of all admissions under MHA, increasing slightly over the 3 year period.
   - Yorkshire and Humber have MHA admission rates of 46%.
   - Over the 3 year period the number of people detained on admission in Sheffield has increased by 10.8%.
   - The detainment rate has increased by 27%, reducing the reduced overall number of
National NHS England Dashboard
https://www.nhsbenchmarking.nhs.uk

Narrative:

SHSC has the lowest bed stock in England (1) This is part of an explicit, strategic plan agreed with commissioners

The Mental Health Act admissions rate per 100K population is one of the highest in the country (2)

The weighted rate is average (3)

This has implications for staffing, workforce skill mix
South Yorkshire & Bassetlaw STP, is rated highly in terms of progress around IAPT, EIS 2 week wait (Which are the 2 mental health related measures) and system wide leadership and financial control.
Routine monitoring of Safety measures. Note improvement and change of baseline for falls (following on from a QI initiative) but no improvement in restrictive practices over last 6 months.
Last year in Sheffield the EIS waiting time performance data was declining. Narrative explanation was higher than usual referral rates and higher delayed discharges and a successful case was made for increased resource into the EIS team which is beginning to improve performance.
Data can be drilled down to ward (here PICU) or community team. Narrative: this data shows that in SHSC is average for restraints in adult and older adults, but has very low rates of face down restraint.
Quality Control, Planning and Improvement
Service User / Patient / Employee / Citizen

5 open “Shaping Sheffield events” with CCG and ICS

https://shsc.nhs.uk/about-us/corporate-information/publications/
25/10 Crowd Sourcing
http://www.liberatingstructures.com/12-2510-crowd-sourcing/

• Top 5 bold ideas to share
• Write headlines on a piece of paper
• Stand up – when music stops exchange thoughts
• Mark 0-5 (in secret) and swap cards
• Repeat x 5
• Final highest scores are shared
Top tips

• Look up your Trust on open access websites
• Look up Trust Board minutes/ Quality Report
• Speak to Director of Strategy & Quality
• Invite them to talk to consultants & others
• Accept that the measures are imperfect
• Be cautious / inquisitive about data
• Encourage/ explain value of measurement to others
• Get to grips with Statistical Process Control
  https://www.eventbrite.co.uk/e/making-data-count-ambassadors-event-tickets-55017468730
• Attend engagement events to explain the narrative behind the data
Further information

- [https://www.nhsbenchmarking.nhs.uk](https://www.nhsbenchmarking.nhs.uk)


- [https://improvement.nhs.uk/documents/2748/NHS_MAKING_DATA_COUNT_FINAL.pdf](https://improvement.nhs.uk/documents/2748/NHS_MAKING_DATA_COUNT_FINAL.pdf)
