



Learning Disability Safety and Quality Dashboard

How to Guide



June 2026

Introduction

The Learning Disability Safety and Quality Dashboards has been built in excel with formatting included in to enable automatic presentation of the data in run charts. There is also a pareto chart used to display one of the metrics.

This how-to guide has been developed to support those individuals who are both inputting and reading the charts.

Using the Dashboard

Operational Definitions:

The first tab in the dashboard contains the operational definitions for each of the metrics recorded. An operational definition is a description, in quantifiable terms, of what to measure and how to measure it consistently, do that any person would collect it the same way and get the same answer.

An operational definition:

- Gives communicable meaning to a concept
- Is clear and unambiguous
- Specifies the measurement source, method and equipment needed

Data input:

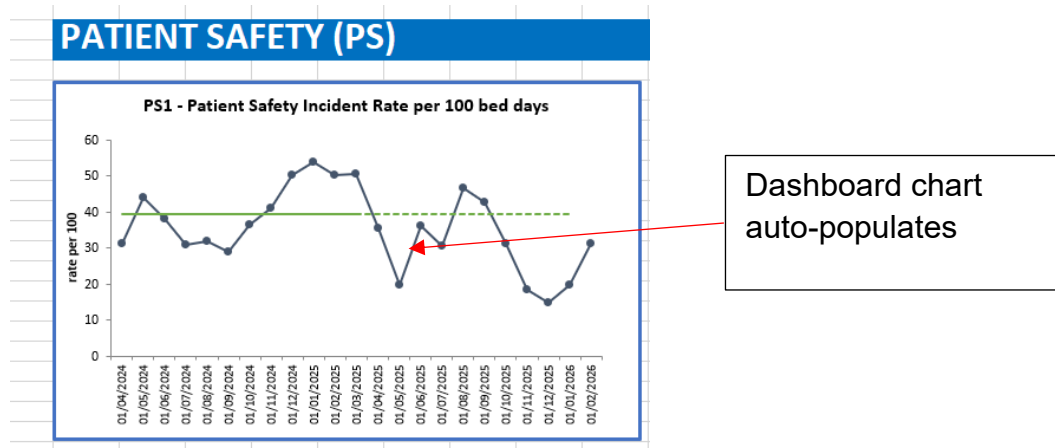
Each individual measure is represented in its own tab within the spreadsheet. Data is to be input into each separate measure (figure 1) and the graphs in the dashboard (Tab 2) will automatically populate as run charts as seen in figure 2 below. Each organisation will identify who is responsible for the data input at a local level.

Figure 1: Data input

	A	B	C	D	E	F	G
1		PS1 - Patient Safety Incident Rate per 100 bed days					
2	Time period	numerator	denominator	rate per 100	Baseline Median	Extended Median	New Media
3	01/04/2024	56	180	31.11	39.6		
4	01/05/2024	80	182	43.96	39.6		
5	01/06/2024	69	181	38.12	39.6		
6	01/07/2024	59	190	31.05	39.6		
7	01/08/2024	65	203	32.02	39.6		
8	01/09/2024	52	180	28.89	39.6		
9	01/10/2024	68	186	36.56	39.6		
10	01/11/2024	69	168	41.07	39.6		
11	01/12/2024	78	155	50.32	39.6		
12	01/01/2025	100	186	53.76	39.6		
13	01/02/2025	83	165	50.30	39.6		
14	01/03/2025	82	162	50.62	39.6	39.6	
15	01/04/2025	64	180	35.56		39.6	
16	01/05/2025	42	211	19.91		39.6	
17	01/06/2025	65	180	36.11		39.6	

Input data into the columns

Figure 2: Autogenerated graphs

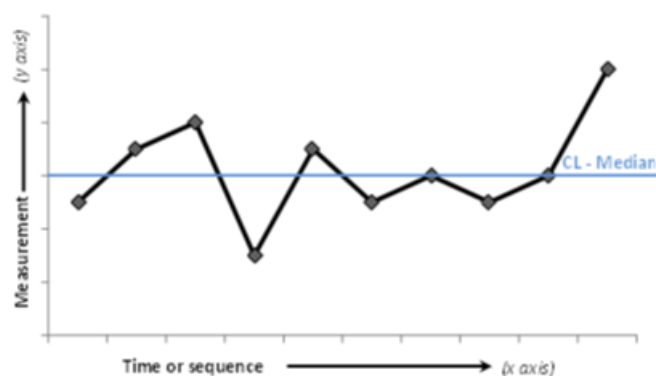


For any future charts being developed it is good chart etiquette to ensure there is a title on each graph, the axis are labelled and the parameters are set appropriately within the Y axis (vertical axis).

Understanding Run Charts:

A run chart is a line chart of data plotted over time. In other words, a run chart graphically depicts the process performance or data values in time order. Viewing data over time gives a more accurate conclusion and aids decision making. A run chart demonstrates a measurement on the vertical or y-axis, for example the percent, rate or number. The horizontal or x-axis usually consists of a time scale as seen in figure 3. Examples of time scales plotted along the x-axis can be days, weeks or months etc.

Figure 3: Run chart example



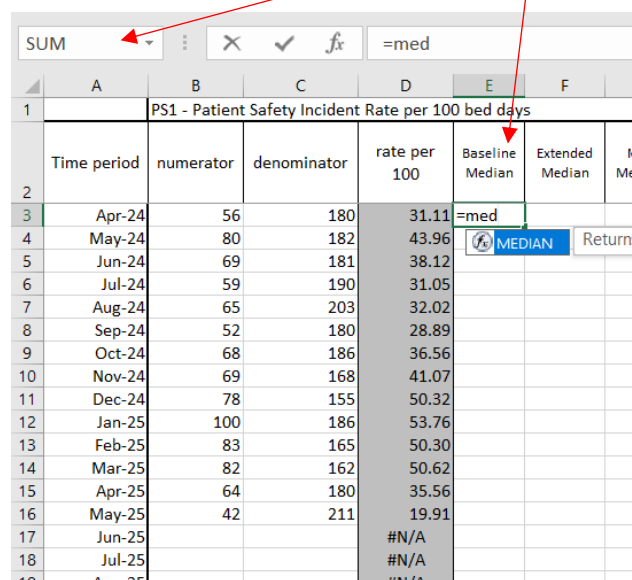
Calculating the Median:

To create a run chart you need to find the median, this is the middle number of the data set, when the data is put in order of highest to the lowest. A median is required when applying some of the data rules used to interpret a run chart. However, adding a median on a run chart that contains a small number of data points or a run chart with more than one data series can cause complexities when interpreting the run chart. The calculation

of the median value is completed using basic functions of Excel. You will need to define which data points will be used to calculate the median.

In the first cell under the Baseline Median heading type '=' and select 'Median' from the dropdown list in the top corner as seen below.

Figure 4: Calculating the Median



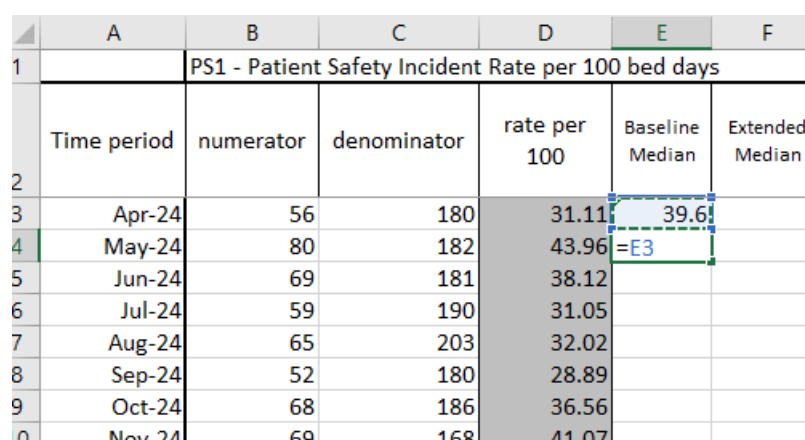
	A	B	C	D	E	F
1	PS1 - Patient Safety Incident Rate per 100 bed days					
	Time period	numerator	denominator	rate per 100	Baseline Median	Extended Median
2						
3	Apr-24	56	180	31.11	=med	
4	May-24	80	182	43.96		
5	Jun-24	69	181	38.12		
6	Jul-24	59	190	31.05		
7	Aug-24	65	203	32.02		
8	Sep-24	52	180	28.89		
9	Oct-24	68	186	36.56		
10	Nov-24	69	168	41.07		
11	Dec-24	78	155	50.32		
12	Jan-25	100	186	53.76		
13	Feb-25	83	165	50.30		
14	Mar-25	82	162	50.62		
15	Apr-25	64	180	35.56		
16	May-25	42	211	19.91		
17	Jun-25			#N/A		
18	Jul-25			#N/A		
19	Aug-25			#N/A		

If 'Median' is not immediately seen in the drop down menu then click on 'more functions' and scroll through the list until you find it.

A function box will then appear so now you highlight the data you wish included in the median value. You can use the first 10-12 data points to set the baseline. Click ok and the median value is now calculated in the first cell.

In the Baseline Median column in the next cell down type '=' and click on the cell above and press Enter, to copy the median value in the cell as seen in figure 5.

Figure 5: Copy of median value



	A	B	C	D	E	F
1	PS1 - Patient Safety Incident Rate per 100 bed days					
	Time period	numerator	denominator	rate per 100	Baseline Median	Extended Median
2						
3	Apr-24	56	180	31.11	39.61	
4	May-24	80	182	43.96	=E3	
5	Jun-24	69	181	38.12		
6	Jul-24	59	190	31.05		
7	Aug-24	65	203	32.02		
8	Sep-24	52	180	28.89		
9	Oct-24	68	186	36.56		
10	Nov-24	69	168	41.07		

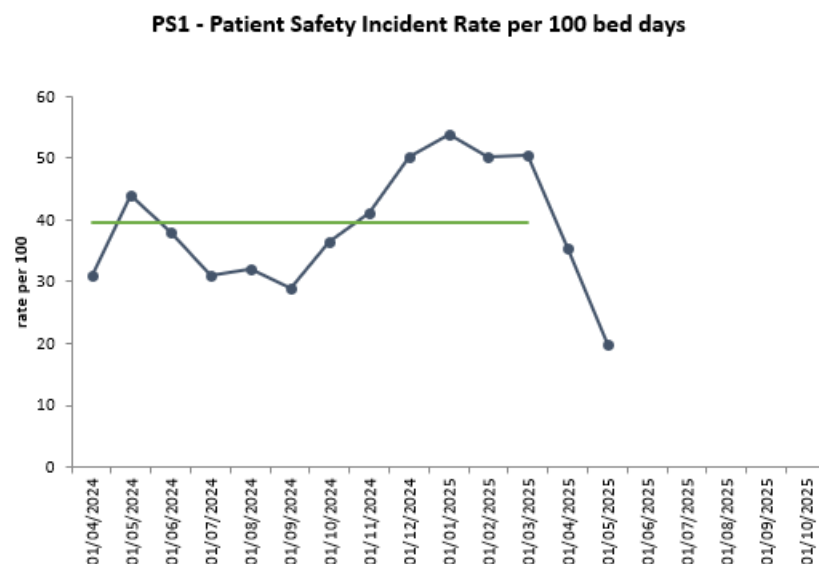
Click on the same cell that you just copied the median value into, hover over the bottom right corner of the cell until you have a + sign. Using your mouse click on the + and drag this down to your last data value as seen in figure 6.

Figure 6: Copying the median

	A	B	C	D	E	F
	PS1 - Patient Safety Incident Rate per 100 bed days					
	Time period	numerator	denominator	rate per 100	Baseline Median	Extended Median
	Apr-24	56	180	31.11	39.6	
	May-24	80	182	43.96	39.6	
	Jun-24	69	181	38.12	39.6	
	Jul-24	59	190	31.05	39.6	
	Aug-24	65	203	32.02	39.6	
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	Feb-25	83	165	50.30	39.6	
	Mar-25	82	162	50.62	39.6	
	Apr-25	64	180	35.56		
	May-25	42	211	19.91		

A median line will appear on the chart based on the values used to calculate the median and then copied down the date range as seen in figure 7.

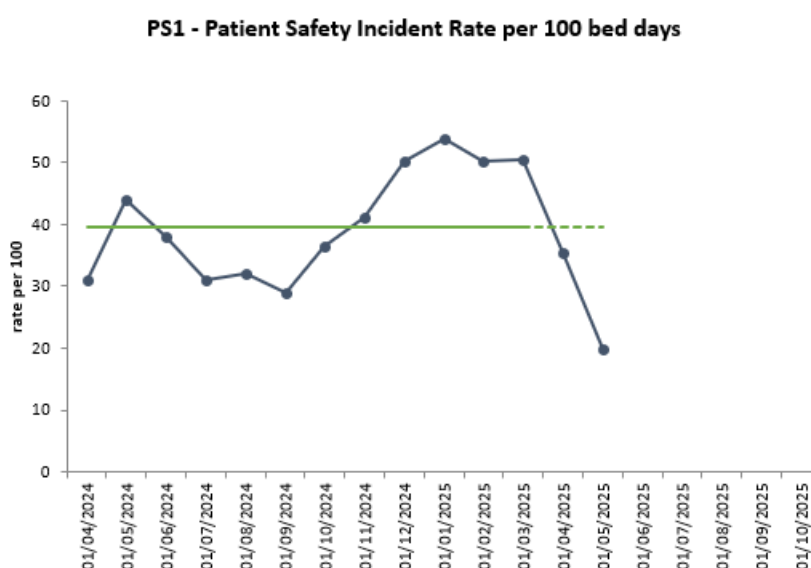
Figure 7: Baseline Median



Freezing and Extending the Baseline Median:

Freezing and extending the median in a run chart is a technique used to make it easier to detect meaningful changes in a process over time. You can do this once you have 10-12 data points and the baseline is showing a stable process. To do this you need to go to the Extended Median column and use the last data point in the baseline data period (in this example the last data point of the baseline is Mar-25). You insert a median using the same cell references used for the baseline median (E3:E14), this is then copied down the remainder of the data points input thereafter and a dotted line will appear on the graph as seen in figure 8.

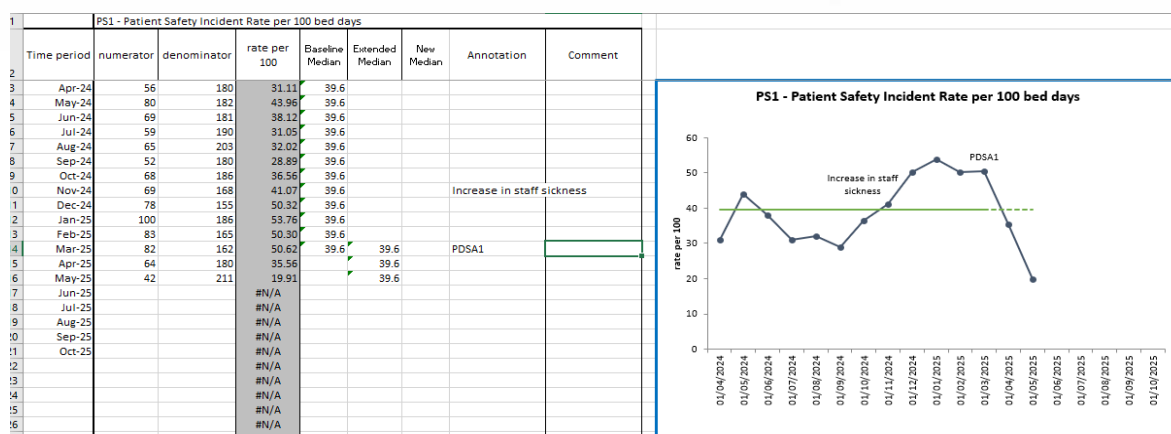
Figure 8: Extended Median



Annotations and Comments:

You can also add annotations and/or comments onto the graphs that help to complete the story of your data. **Use the Annotations column to enter text against specific data points that will appear on the chart.** This allow for specific events or changes to be documented and made visible on the graphs as seen below.

Figure 9: Adding annotations



There is also a larger comments box included beneath each of the graphs on the dashboard in tab 2. This allows for a deeper explanation of the data being observed and will support teams as they are reporting the information within the organisation.

Analysing the Data:

Variation is part of everyday life and every process has variation therefore all data will randomly vary over time. The decisions you make must depend on the type of variation you see in the data:

Random Variation: This is a stable pattern of common cause and often occurs as a result of day-to-day variation in the process. For example the number of steps you walk in a day.

You respond to this by working to reduce the variation

Non-Random Variation: This is when you see the pattern changing due to a special cause that may not be beneficial nor intentional and usually occurs due to external factors.

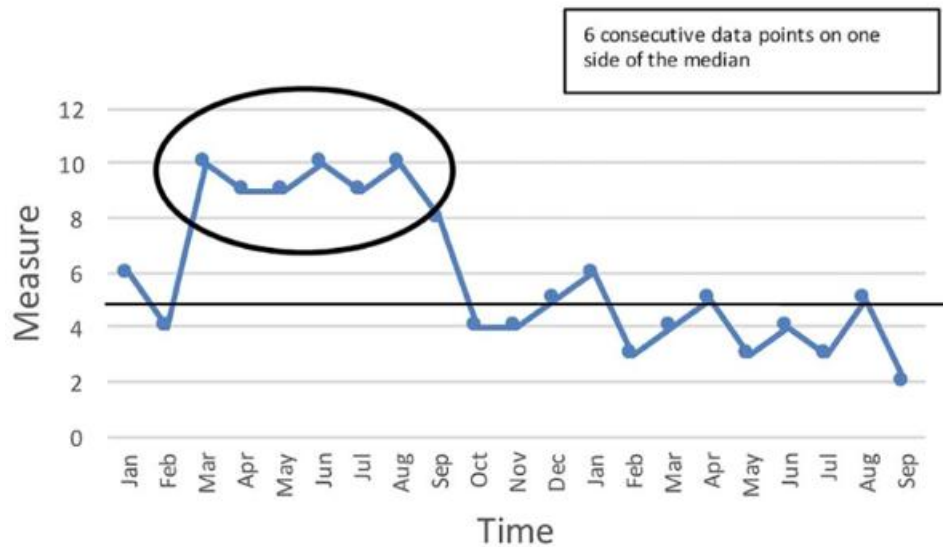
You respond to this by deepening your understanding of what is happening within the system. If it was not beneficial, you may want to avoid it happening again.

There are four rules to help you identify non-random variation. To make it easy for you remember them - we have called them the S.T.A.R. rules (Shift, Trend, Astronomical point and Runs).

Rule 1: A Shift

A shift is **six** or more consecutive points all above or all below the median. Values that fall on the median do not add to, nor do they break, a shift. Skip all values that fall on the median and continue counting.

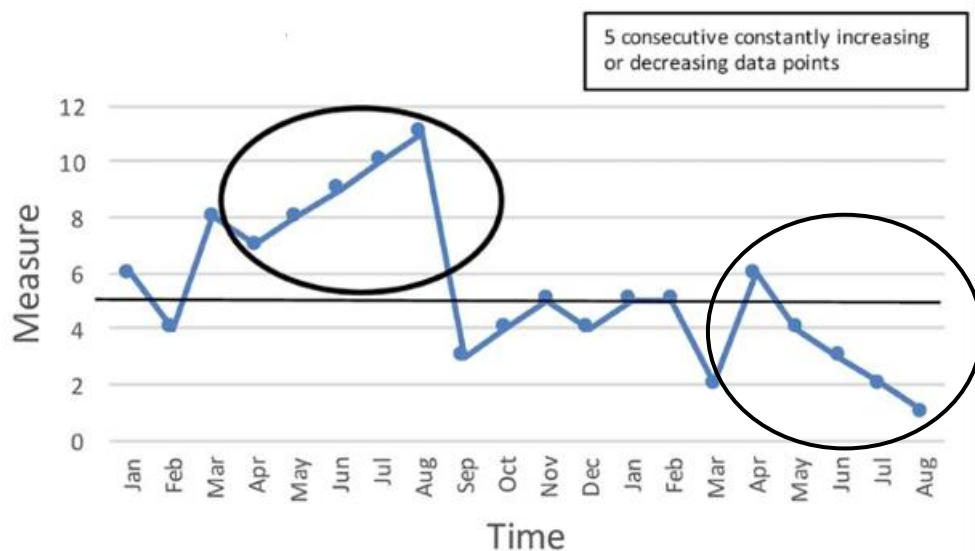
Figure 10: A Shift



Rule 2: A Trend

A trend is **five** or more consecutive points all going up or all going down. If the value of two or more consecutive points is the same, only count the first point and ignore the repeating values; like values do not make or break a trend

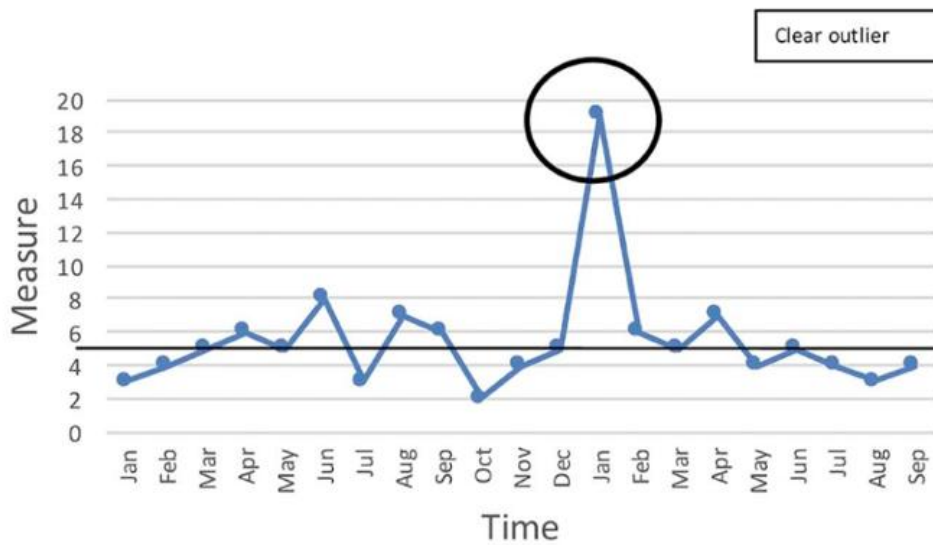
Figure 11: A Trend



Rule 3: Astronomical Point

An astronomical point is one which is obviously very different from the other values. This is not a mathematical assessment but rather one of subject matter knowledge and, therefore, must be made in partnership with someone who is working directly on the measure of interest and is aware of what may cause or influence such a value

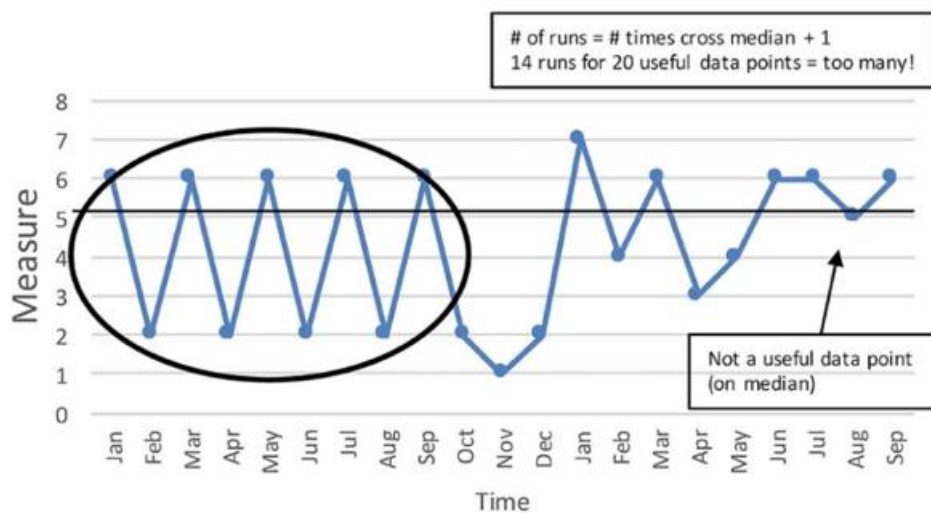
Figure 12: Astronomical Point



Rule 4: Too many or too few runs

A run is a series of points on one side of the median. Count the number of runs and always add one extra – this is the number of times the line crosses the median.

Figure 13: Runs



A reference table (figure 14) is used to determine if there are too many or too few runs. If the number of runs falls within the range between the lower and upper limit – this is random variation. If the number of runs falls outside the range between the lower and upper limit – this is non-random variation

Figure 14: Reference Table

Table 1: Runs table

Total number of data points on the chart that do not fall on the median	Lower limit for the number of runs ($<$ than this number is 'too few')	Upper limit for the number of runs ($>$ than this number is 'too many')
10	3	9
11	3	10
12	3	11
13	4	11
14	4	12
15	5	12
16	5	13
17	5	13
18	6	14
19	6	15
20	6	16
21	7	16
22	7	17
23	7	17
24	8	18
25	8	18
26	9	19
27	10	19
28	10	20
29	10	20
30	11	21
31	11	22
32	11	23
33	12	23
34	12	24
35	12	24
36	13	25
37	13	25
38	14	26
39	14	26
40	15	27

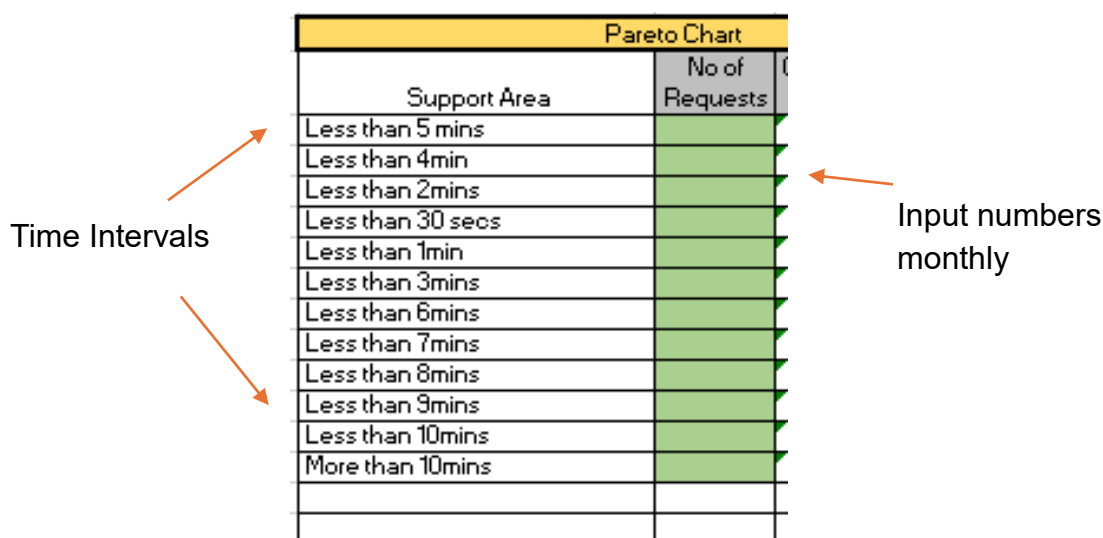
Changing the centreline (Re-phasing):

As a general rule, you only revise a run chart's baseline centerline when there is a signal of change. For example, we have a shift of six or more consecutive data points above the median. If these data continue to sustain for 10 to 12 points, we can establish a new centre line starting at the beginning of the shift.

Pareto Chart: Recording Duration of Safety Intervention Holds

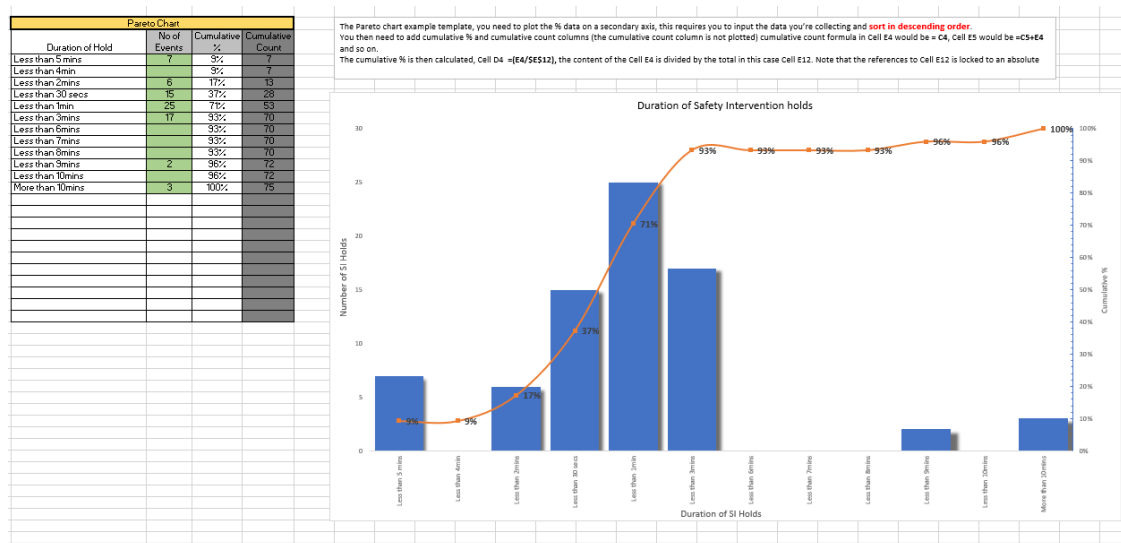
A Pareto chart is a simple but effective bar graph. The lengths of the bars represent duration (time), and are arranged with longest bars on the left and the shortest to the right. In this way the chart visually depicts which situations are more significant therefore is a more appropriate chart to use when recording the duration of Safety Intervention Holds. The line in the chart represents the cumulative amount. The criteria for recording duration have been pre-set from less than 30 seconds to over 10 mins and the data is input each month as a number against each of the relevant time intervals as seen in figure 15.

Figure 15: Data input for Pareto Chart



As the data is input into the chart the bars and line will continually adjust as displayed in figure 16 below

Figure 16: Data input



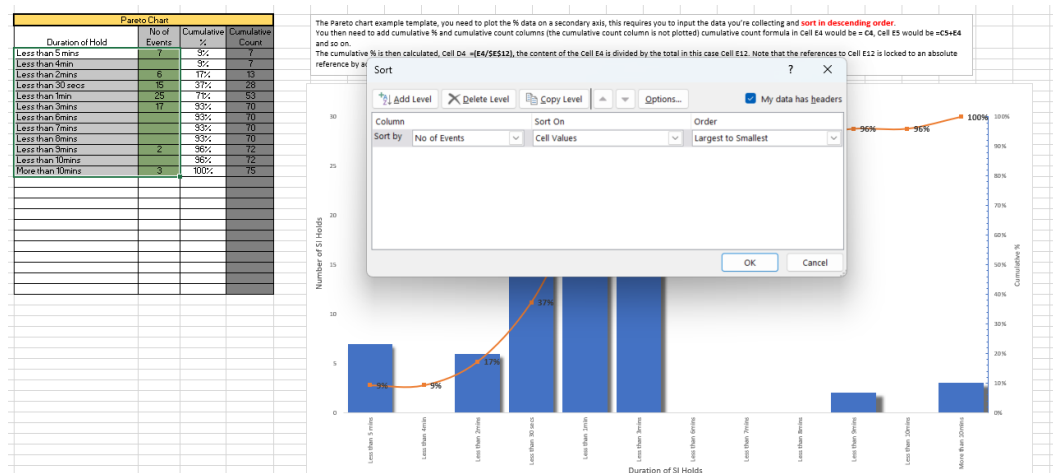
At the end of each monthly data period it is necessary to get your data in the right order. In order to do this you need to highlight the first 2 columns and sort in descending order as seen in the pictures below

Highlight the first 2 cells

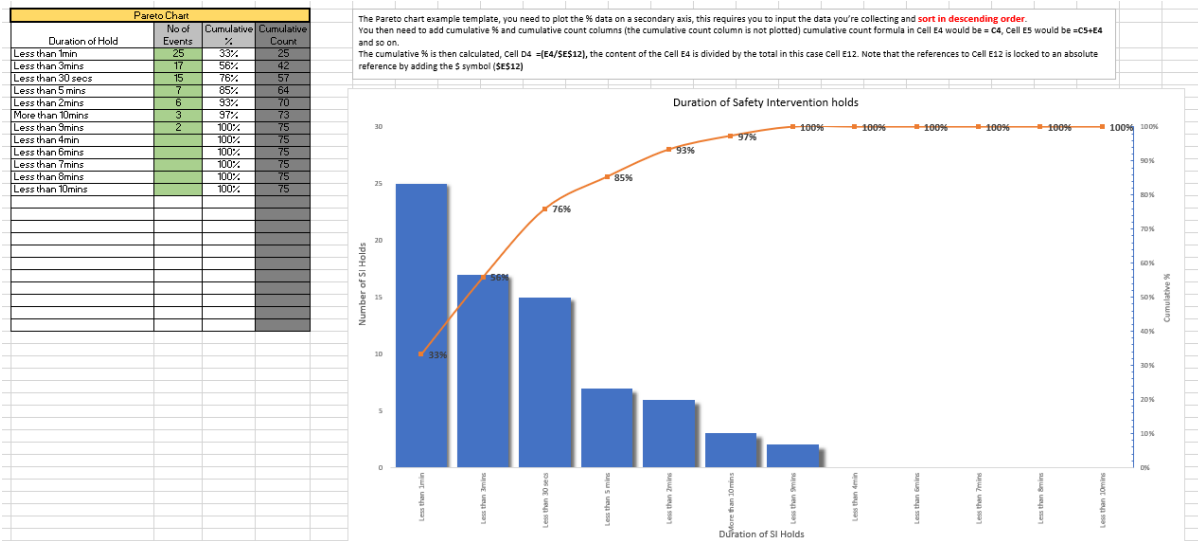
	B	C	D	E
	Pareto Chart			
	Duration of Hold	No of Events	Cumulative %	Cumulative Count
	Less than 5 mins	7	9%	7
	Less than 4mins	6	9%	7
	Less than 2mins	6	17%	13
	Less than 30 secs	15	37%	28
	Less than 1min	25	71%	53
	Less than 3mins	17	93%	70
	Less than 6mins		93%	70
	Less than 7mins		93%	70
	Less than 8mins		93%	70
	Less than 9mins	2	96%	72
	Less than 10mins		96%	72
	More than 10mins	3	100%	75

Click on Sort and Filter at the top right of your spreadsheet

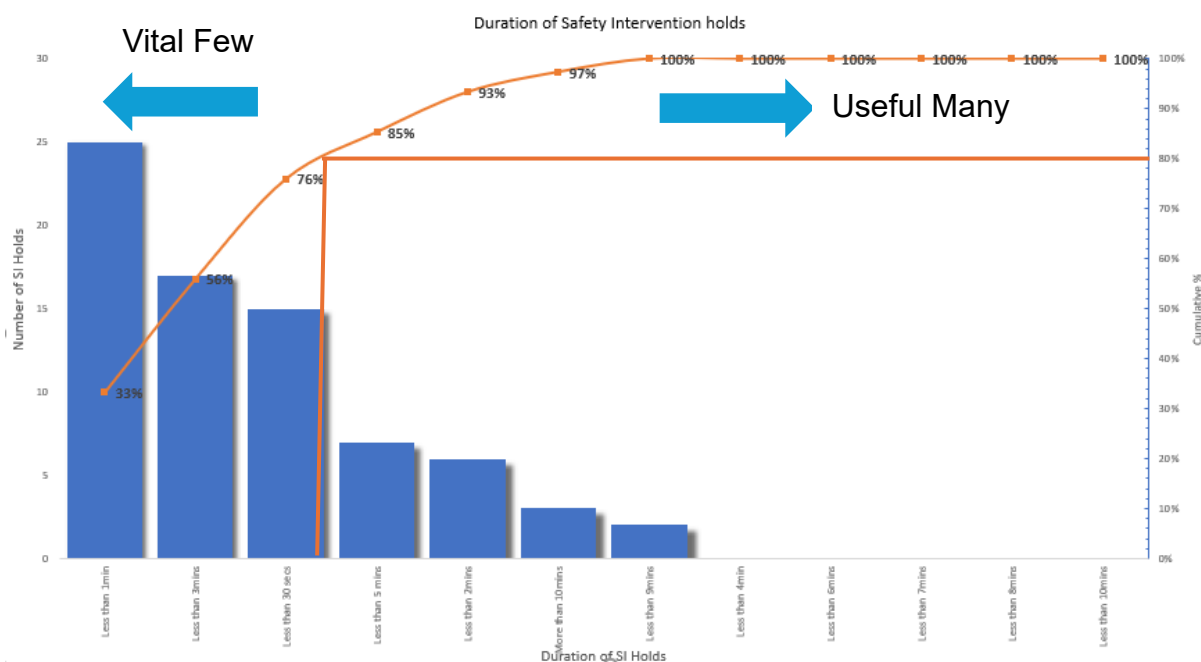
Select Largest to smallest from the Drop Down box (under order) and click ok



Your pareto chart will now be presented in the correct view



Once a Pareto Chart is constructed, clarity emerges on which few out of the many occurrences have the most impact on the results. The Cumulative percentage curve makes it easier to visually answer the question – “Which 20% of the causes are responsible for 80% of the results?”



Those that fall within the vital few are the most common time durations for safety intervention holds used. This data is an ongoing cumulative count each month and must be reviewed at least quarterly for changes.



References

Ihi.org. (2019). IHI resource Page. [Online] Available at:
<http://www.ihl.org/resources/Pages/Tools/RunChart.aspx> (accessed 01/06/26)

performanceandimprovement.nhs.wales/functions/quality-safety-and-improvement/improvement/improvement-cymru-academy/resource-library/academy-toolkit-guides/run-charts/ (accessed 08/06/26)

Improvement.nhs.uk. (2019) Run charts NHS Improvement. [Online] Available at:
<https://improvement.nhs.uk/resources/run-charts/> (accessed 08/06/26)

Perla, R, J., Provost, L, P. and Murray, S, K. (2011). The run chart: a simple analytical tool for learning from variation in healthcare processes. BMJ Quality & Safety, 20, pp. 46-51.

Provost.L. & Murray.S. (2011). The Health Care Data Guide: Learning from Data for Improvement. USA. John Wiley & Sons

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