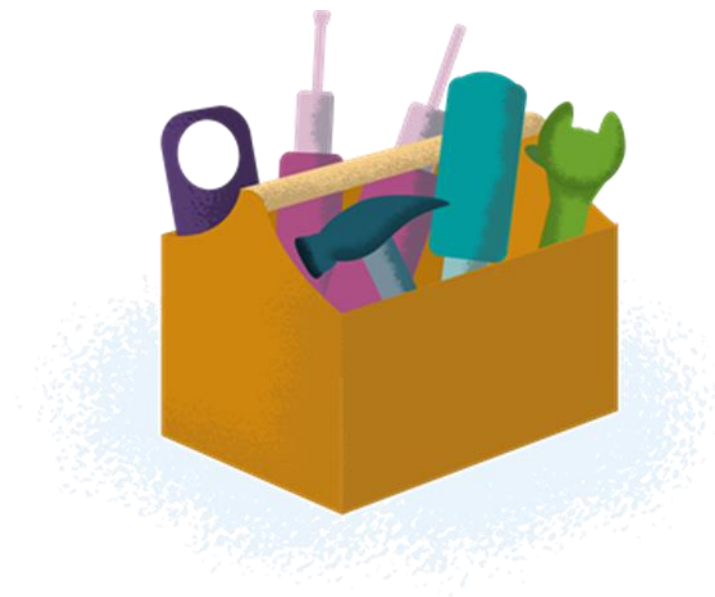




Improvement Cymru Academy Toolkit Guide



Measles Plot

What is a Measles Plot?

A Measles plot is a structured, way of collecting and analysing data that provides a visual image of the item being evaluated. It is also known as Measles chart or diagram, or a defect location check sheet or a defect map.

Rationale

Plotting data on a map of a physical environment, enables the data generated to be presented visually rather than collecting a count of the number of defects. If used consistently it can reveal patterns or danger zones. This enables action to be taken to eradicate or minimise these areas.

Background

Measles plots have been used for many years. One particularly well-known example is the cholera outbreak in London 1854 (See Diagram 1). Cholera is a gastrointestinal infection caused by the bacterium *Vibrio cholerae*. Thousands of residents fell ill, and many died. Awful as this outbreak was, it is likely that many more would have died if not for the work of a local doctor living in the area, Dr John Snow. He used information from local Hospital and public records and specifically asked residents if they had drunk water from each water pump. Using this information, he went on to create a measles plot on a street map of the area to illustrate the cluster of cases around each water pump. It was later discovered that the public well from which the pump drew water was dug only a few feet from a cesspit. The cloth nappy of a baby, who had contracted cholera from another source, had been washed in this cesspit and was the source of the outbreak.

Diagram 1: Measles plot of Cholera outbreak in London 1854



When to use?

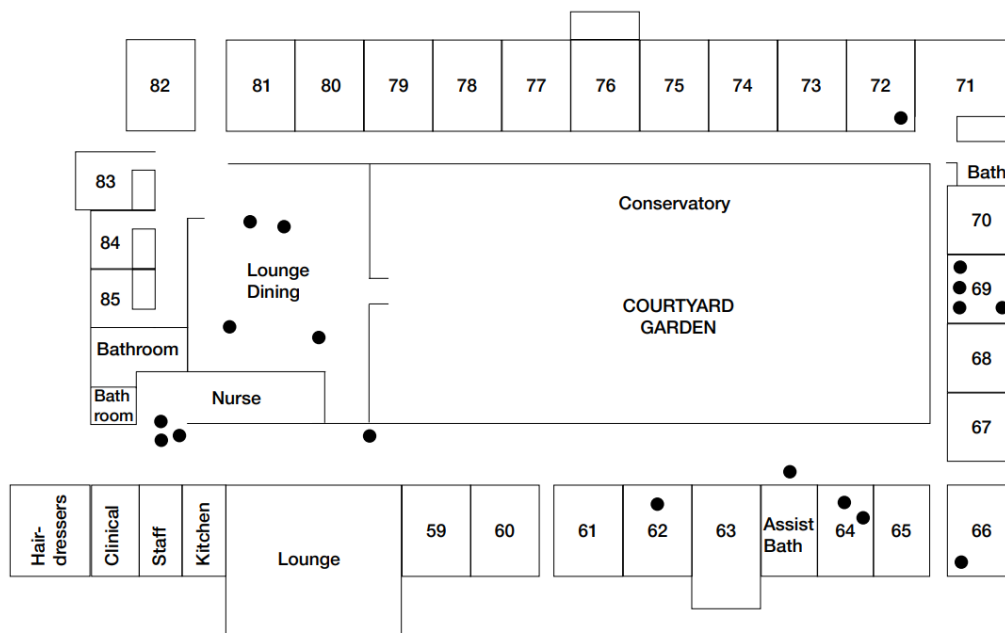
A Measles plot can be useful to track where incidents or adverse events are happening e.g., falls on a ward/ area. Data about variables such as individuals, types of accidents, times of day and environment factors can be collected and analysed to help in understanding the problem.

Ideally the measles plot should be in a prominent place whereby staff can see patterns emerging.

The example below in diagram 2 is a large-scale floor plan for a building that was used to plot where falls occur. A floor plan should be available from the maintenance department as these are used regularly for fire safety and maintenance purposes. Using this floor plan, each fall was plotted by staff, which then facilitated the identification of clusters of falls within certain areas. This was used to identify opportunities to reduce the falls within the high-risk areas or occurrence. Used consistently it can reveal patterns of falls over time which in turn can identify 'danger zones' where falls most frequently occur. Used together with falls/accident/incident

records, variables such as individuals involved, types of accident, times of day, and environmental factors can be analysed. The clinical team can then take action to minimise the risk of falls in these areas.

Diagram 2: An example of falls within a care home.



Source: [Falls and Fractures \(careinspectorate.com\)](https://www.careinspectorate.com/falls-and-fractures/)

How to use?

Decide what you are going to observe, such as adverse event or product defect against location of occurrence.

Involve representatives from your team (who know the process well) in the process of plotting the dots on the Measles plot.

Explain what is being done and what the potential benefits may be for both the team (minimising waste of effort) and improved experience for patients.

Ask estates for a diagram (or draw your own) of the floorplan of the area you are working with. e.g., ward layout.

Plot dots where each 'defect' is happening. e.g., when a fall occurs, draw a spot on the map to identify the location of the incident. Use different colours for different times of day etc to highlight the differences.

Once you have established where the incidents occur, go to the environment, and determine why incidents are occurring in that location.

Look at this from the perspective of the cohort of individuals that have suffered the adverse event in that location. i.e., patient or staff. Is there something about that environment that is leading to the adverse events seen? You will need to engage the individuals involved in the falls to understand the sequence of events that led to each fall. It is useful to collect data and analyse and understand when the incidents are most likely taken place. This task is completed by the team involved. This will allow you to focus improvement changes that are more likely to succeed as there is team involvement. You may wish to repeat the process periodically.

What next?

Other tools to support the analysis such as a Pareto chart (See Pareto toolkit guide), would clearly highlight the time of day that the incidents most frequently occur. Fishbone analysis would then help you and your improvement team to identify why incidents occur in the area(s) you have identified (See Fishbone toolkit guide).

Helpful tips

By including the team who work in the respective area, you can raise awareness and ownership of the 'defect'.

You can use in conjunction with risk assessment processes.

Additional resources

If you would like to learn more about making improvement to your workplace take a look at our website for what we offer you <https://phw.nhs.wales/services-and-teams/improvement-cymru/improvement-cymru-academy/> or email us Improvement Cymru Academy (Public Health Wales) improvementcymruacademy@wales.nhs.uk to find about the improvement courses we can offer.

References

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[John Snow and the 1854 Cholera Outbreak - Past Medical History](#)[Accessed 8 September 2022].

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