

How to analyse HoNOS data

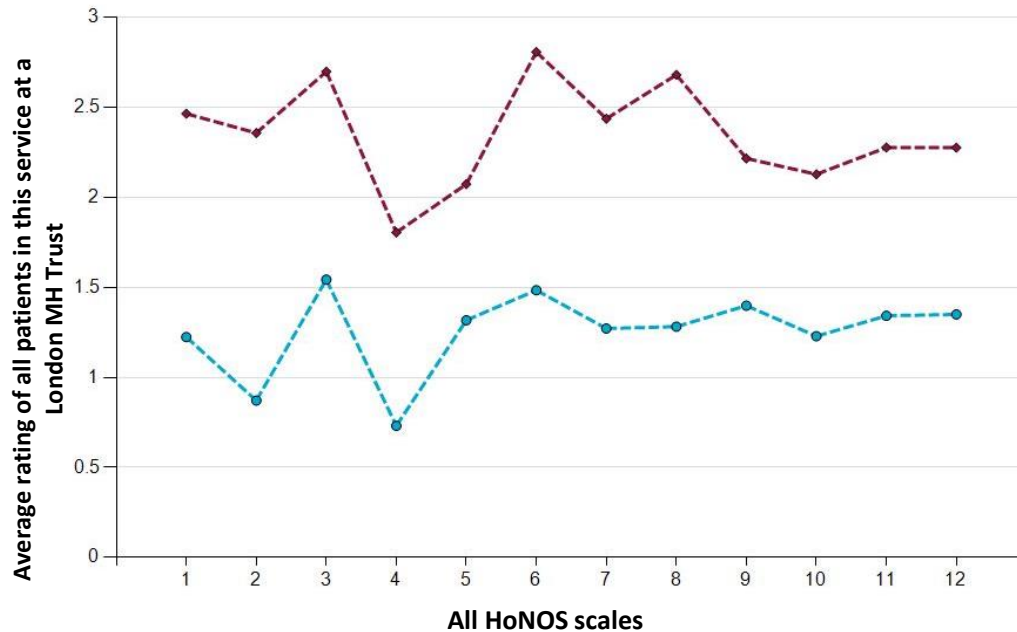
The purpose of these slides is to provide guidance on how to effectively analyse and interpret the HoNOS data.


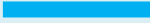
The first section of these slides illustrates how to analyse HoNOS **profiles** and the second section illustrates how to analyse HoNOS using **categorical change**.

Approaches to analysing HoNOS

The following slides show the aggregated average HoNOS scores of all the people receiving a particular service in a London Mental Health Trust. The aggregated profile gives an overall view of progress during their treatment within a particular service or team. Aggregated HoNOS scores can be used for a particular service type for example, community based services, inpatient units, Home Treatment Teams, Early Intervention in Psychosis teams etc.

The profile can also be viewed for an individual, to provide a view of that person's progress during treatment.



-  The red line shows the aggregation of initial ratings
-  The blue line shows the aggregation of ratings at discharge.

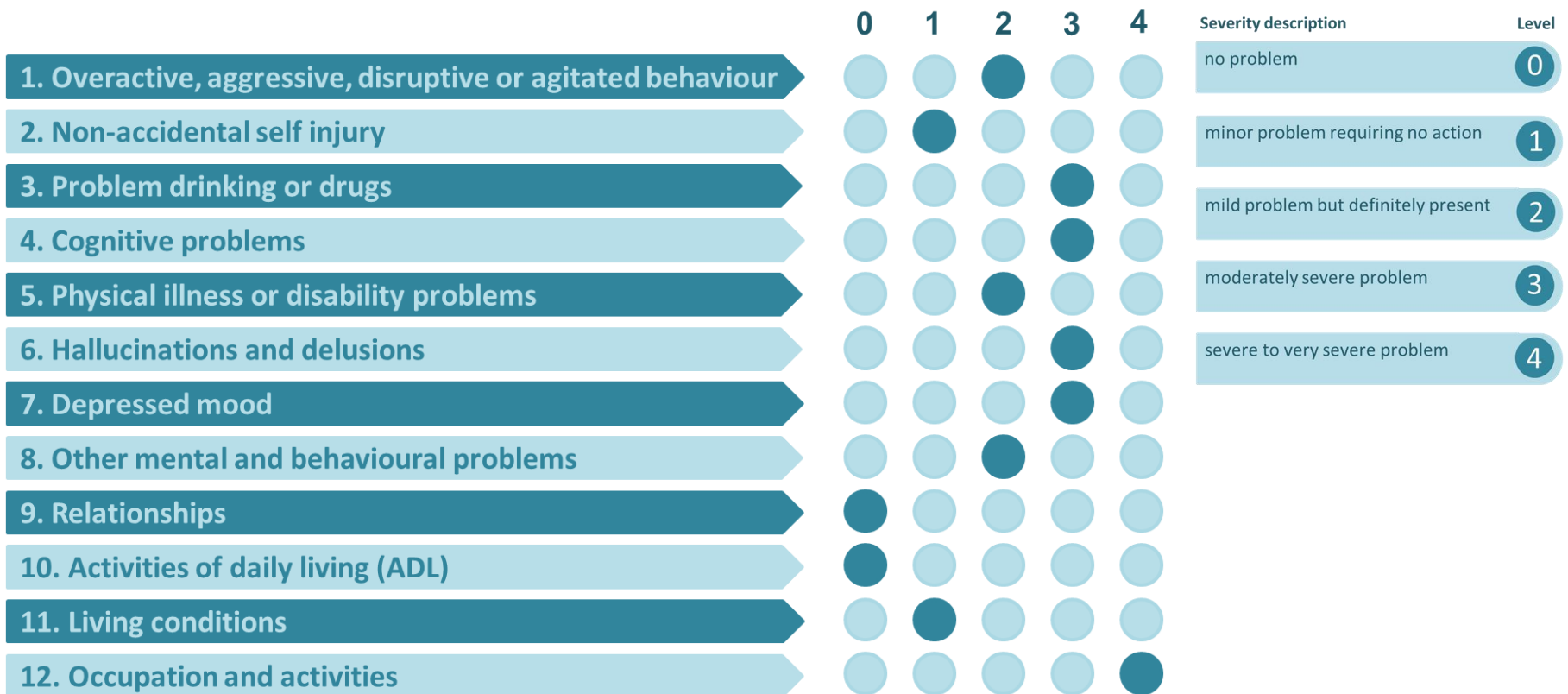
N.B In most cases the first (red) and last (blue) score will include a HoNOS near the start (assessment) and near the end (discharge) however this may not always be the case.

If the blue line is lower than the red line, it means that there has been an improvement for that scale (i.e. there has been progress in people's scores in that area).

HoNOS scales

Using HoNOS as a clinician reported outcome measure allows clinicians to build a picture of service users' needs across a range of areas including depressed mood and other mental health difficulties, physical health, relationships and housing.

The 12 scales can be seen below, with example scorings:

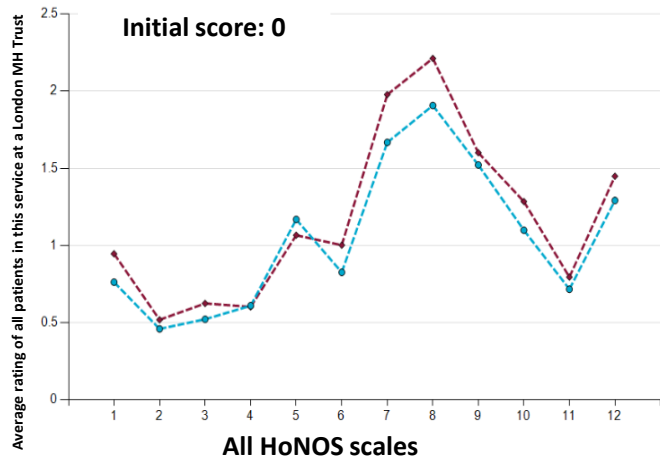


Setting a minimum score

Services which provide for a varied caseload will have a large variation in HoNOS scores. Some people will have no problem (score of 0) or a minor problem requiring no action (scoring 1) for some of the HoNOS scales. Where the initial score is 0 or 1, the second score is also likely to be 0 or 1. When looking at the average team score for each scale, if results with an initial score of 0 or 1 are included, they can dilute the average change for the team and can mask the improvement made by people who score highly in a given scale.



One way around this is to only include in the analysis the HoNOS scales which were scored 2 or above in the initial rating.

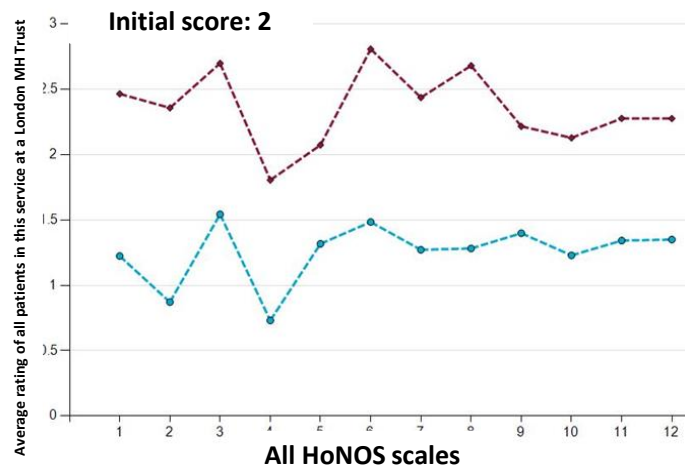


This chart shows the profiles with all patient scores included – i.e. including any **initial scores of 0 or 1** when calculating the team average. This can have the effect of masking the improvements made by people who do score highly in a given scale. You can see in this chart there is little difference between initial and final scores.

People with scores of 0 or 1 require no active medical or formal psychological treatment for those areas/scales, so will not receive an intervention from specialist (secondary) mental health services

The red line shows the aggregation of initial ratings

The blue line shows the aggregation of ratings at discharge.



A **minimum initial score of 2** has been chosen (mild problem but definitely present) to set the minimum threshold for analysing aggregated HoNOS profiles for each service. This score reflects the severity of symptoms or difficulties that would normally be treated in a Mental Health service.

In this graph only the scales where 2 or above has been scored have been included in this data. This now shows a greater difference.



Trusts should agree what they will set the minimum initial score as

Effect size

It can be hard to judge the size of the improvement just by looking at the graphs.

Using 'effect size statistics' such a Cohen's d can aid interpretation of HoNOS data because it calculates the significance of the change:

$$\text{Cohen's } d: \frac{\text{Mean difference}}{\text{Standard deviation}}$$

or

$$\frac{\text{Mean}_2 - \text{Mean}_1}{\text{Pooled standard deviation}}$$

Effect Size (Cohen's d)	Interpretation of HoNOS	
-0.8 or lower	Improvement of critical clinical importance	} Clinically significant improvement
-0.5 to -0.8	Improvement of moderate clinical significance	
-0.2 to -0.5	Small or clinically negligible improvement	
-0.2 to 0.2	No change	
0.2 to 0.5	Small or clinically negligible deterioration	} Clinically significant deterioration
0.5 to 0.8	Deterioration of moderate clinical significance	
0.8 or higher	Deterioration of critical clinical importance	



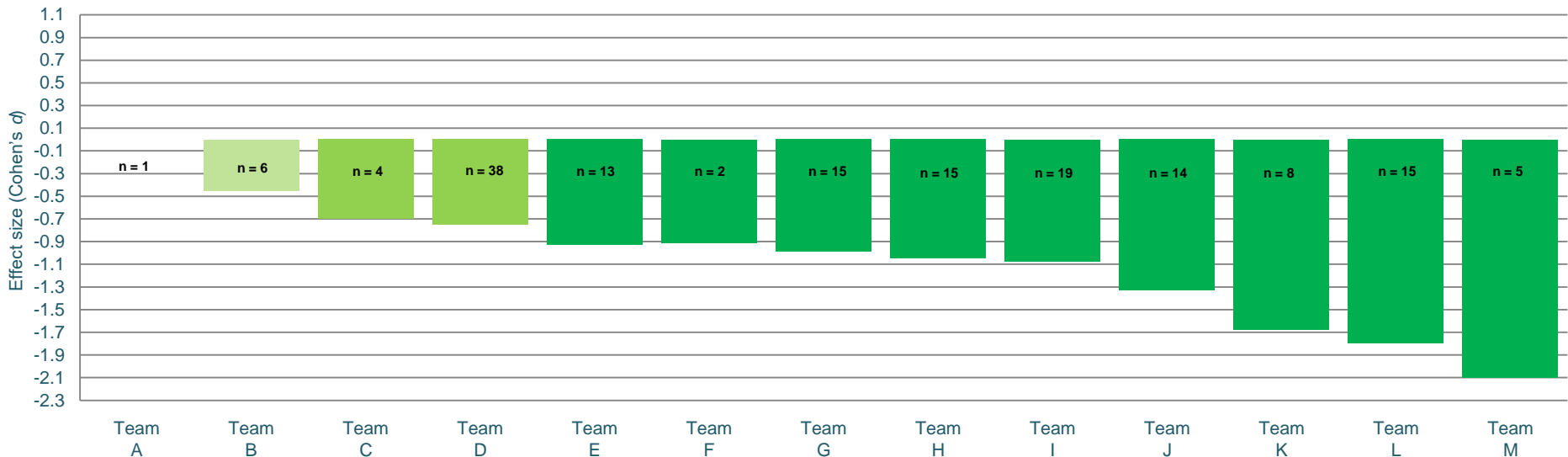
The more extreme the effect size (positive or negative), the more statistically significant we would determine the change to be.

Analysing an effect size

Trusts may want to look in more detail at particular scale(s), patient characteristics or diagnoses, to explore any unwarranted variation in the impact of treatment on people using a service.

The chart below provides an example of how effect size for scale 2 (non-accidental self-injury) can be looked at across different teams within a community mental health service.

Effect size within Adult CMHT for scale 2: Non-accidental self-injury (minimum initial score = 2)



Here, you can see the variation across teams. These differences can be accounted for by various factors such as:

- number of paired measures ('n')
- data quality
- variation in the recording practices of different teams
- staffing levels
- caseload of various teams
- complexity of people seen by the service/different teams
- clinical practices and clinical pathways

The above analysis provides a starting point for discussion and should enable the clinician to ask questions about the differing outcomes of the services notwithstanding the data quality. The example provided here is looking at a particular HoNOS scale, however the grouping could be done at any level including protected characteristics (ethnicity, gender etc.) or diagnosis, and could in future be used to complement discussions about equity of access to care.

Categorical Change

The Categorical Change method is another way of looking at changes in HoNOS score.

It uses a scoring method which groups the answers scored for each question into two categories:



Low (L) severity – scores of 0-2



High (H) severity – scores of 3-4

Severity description

Level

no problem

0

minor problem requiring no action

1

mild problem but definitely present

2

moderately severe problem

3

severe to very severe problem





4

Low (L) severity

High (H) severity

Categorical Change

It gives a visual way of showing how many people have **improved** in a particular scale ('high to low'), have **deteriorated** ('low to high') or have remained **unchanged** ('high to high' or 'low to low') on each scale, comparing first and last ratings.

-  High to High (HH) – Unchanged
-  High to Low (HL) – Improvement
-  Low to High (LH) – Deterioration
-  Low to Low (LL) – Unchanged

This example shows the string of HoNOS scores collected at two points for a person. Each question is individually assessed for improvement.

HoNOS on admission (entry)												
HoNOS scale	1	2	3	4	5	6	7	8	9	10	11	12
Score	3	1	1	3	3	1	2	1	4	3	3	2
Cat change	H	L	L	H	H	L	L	L	H	H	H	L

HoNOS on discharge (exit)												
HoNOS scale	1	2	3	4	5	6	7	8	9	10	11	12
Score	1	0	1	3	1	0	1	1	2	1	1	3
Cat change	L	L	L	H	L	L	L	L	L	L	L	H

HoNOS scale												
1	2	3	4	5	6	7	8	9	10	11	12	
HL	LL	LL	HH	HL	LL	LL	LL	HL	HL	HL	LH	

Example: The scores for Scale 1 (Overactive, aggressive, disruptive or agitated behaviour) shows an 'entry' score of High and an 'exit' score of Low. When put together there has been an **improvement** in that area for this person (HL).

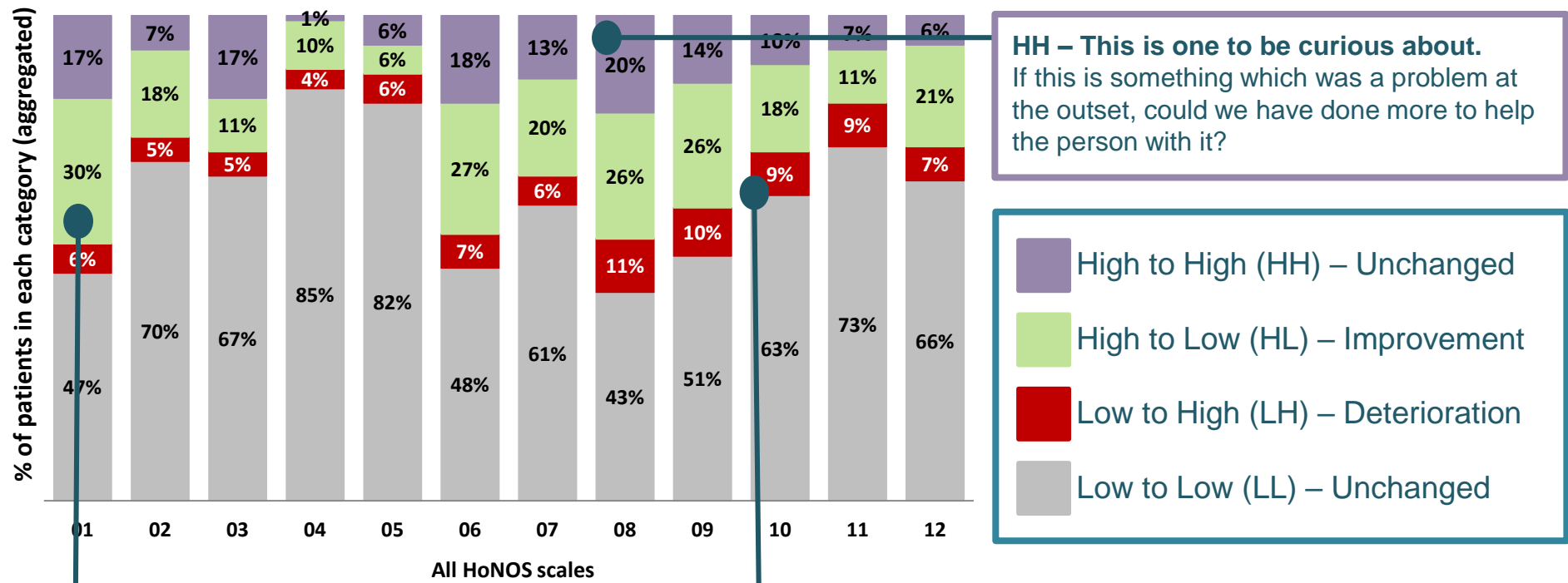
How the data is presented



Categorical change has been developed based on feedback from staff looking at HoNOS data for the first time. It can be useful as it shows change in an easy to visualise format, and shows the dynamic nature of change.

The data can be visualised in a chart, as shown below:

Categorical change model by questions: Inpatient admission to inpatient discharge (aggregated scores)



HH – This is one to be curious about.
If this is something which was a problem at the outset, could we have done more to help the person with it?

- High to High (HH) – Unchanged
- High to Low (HL) – Improvement
- Low to High (LH) – Deterioration
- Low to Low (LL) – Unchanged

HL – This is one to be positive about.
This shows people improving.

LH – This is one to be concerned about.
Whilst this can sometimes be the case, a large number of people moving from low to high scores may need attention

Setting a minimum score

Having a minimum cut off (i.e. removing LL scores) in a categorical change chart can help with looking at average HoNOS change in teams.

This can make it easier to focus on areas where meaningful change is taking place. The example below shows the same chart as before with the LL scores removed:

