NEDS/Governor Workshop:

HSMR & Mortality

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Sherwood Forest Hospitals
NHS Foundation Trust

Introduction

- In this presentation, we will provide an overview of mortality at the Trust from the last 4 financial years, plus current data from the most recent financial year.
  - Furthermore, this report provides an update on metrics presented to the NEDS/Governors in December.

- The data that has been used to analyse the Trust's mortality is the Hospital Episode Statistics: Admitted Patient Care dataset. This is a national dataset compiling of each healthcare organisation's admitted patient activity, submitted by the organisations themselves. This effectively means the data that you will see today is the Trust's own data. (N.B. There are various organisations and a variety of uses for the HES data)

- A key definitions slide has been made available providing short summaries of terms used to analyse the Trust's mortality data. This presentation will look at both the Trust's crude mortality and how the Trust benchmarks to peers using an adjusted mortality rate, calculated using a well-known statistical model called the HSMR.

- Telstra Health UK collaborate with Sherwood Forest each month to analyse mortality data and present key insights regularly at Learning from Deaths, addressing new trends and any concerns.

Key Definitions

- Crude Rate = Observed deaths as a percentage of total number of discharges.

- Risk-adjusted Mortality Rate, e.g. HSMR, SHMI (or “relative risk”) = The ratio of the observed volume of deaths to the expected volume of deaths (and often multiplied by 100 by convention).
  - Confidence interval banding is applied to report values as “higher-”, “within-” or “lower-than-expected”.

- HSMR = the Telstra Health UK (formerly Dr Foster) superspell-based methodology, modelling expected mortality on 12 case-mix adjustments (such as age, palliative care, and number of previous emergency admissions) on in-hospital activity only.
  - HSMR is based on a subset of 56 diagnosis groups (CCS), giving rise to approximately 80% of in-hospital deaths nationally.

- SHMI = the NHS spell-based methodology, modelling expected mortality on 8 case-mix factors; and looking at patient outcomes 30-days post-discharge from hospital too.
  - SHMI looks across all diagnosis groups, but excludes any patient which has a primary or secondary code of COVID-19 found in any diagnosis position throughout their spell in-hospital.

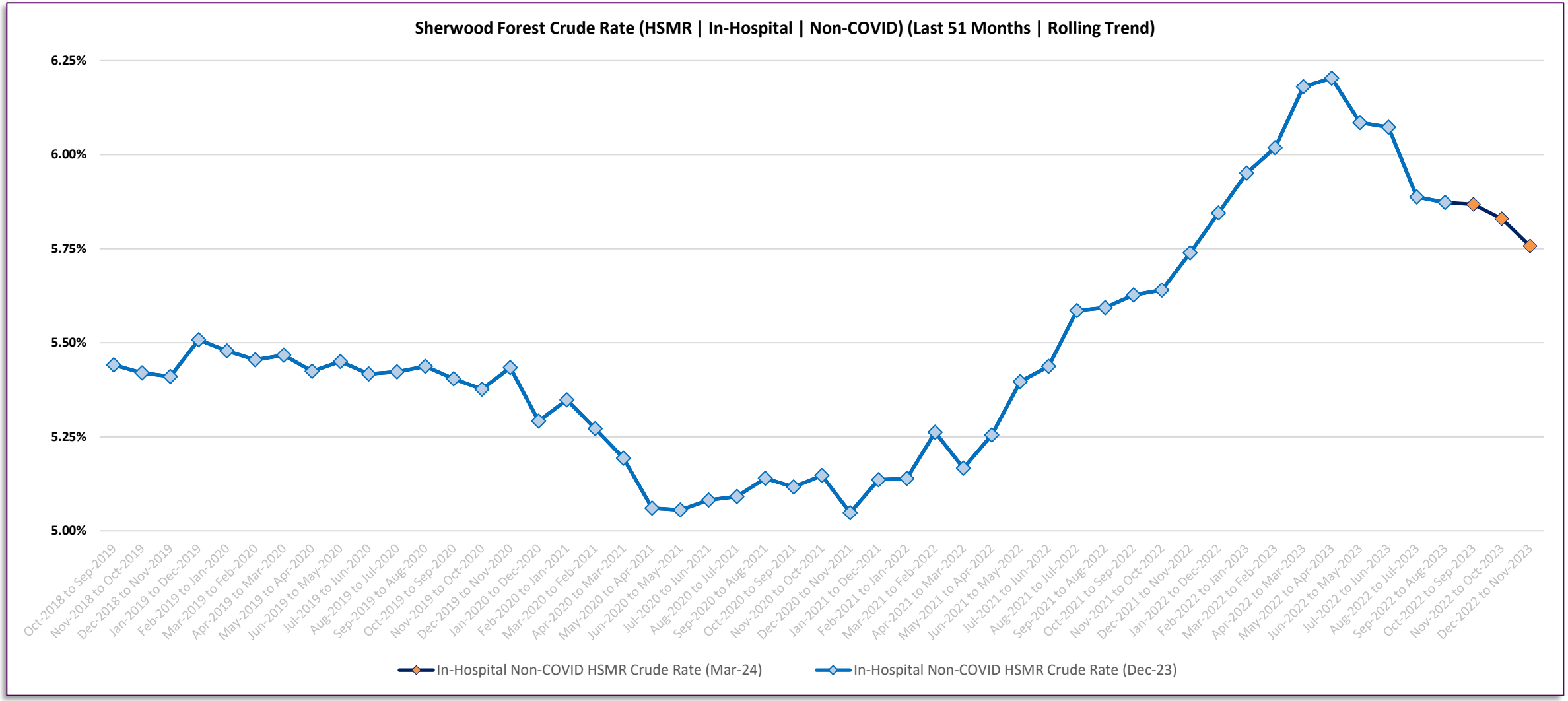
- Superspell = A continuous period of admitted care comprising one or more spells. Multiple spells are linked into a superspell when the patient is transferred between hospitals.

- Primary Diagnosis = Patients are assigned their primary diagnosis within the HES: Admitted Patient Care dataset from their first episode (FCE)… unless this is a sign or symptom code, and then primary diagnosis is taken from their second episode (FCE).
  - Where deaths are recorded for primary diagnoses, this does not equate to a cause of death.
  - Procedure groups, and primary procedures, can be thought of in the same way.

HSMR Trends

The Trust's in-hospital crude rate is falling from a gradual deterioration in 2022:

As was documented when we met in December, the Trust's in-hospital crude rate notably rose throughout 2022 but had been making an improvement – with the most recent 3 months of data, this has continued.



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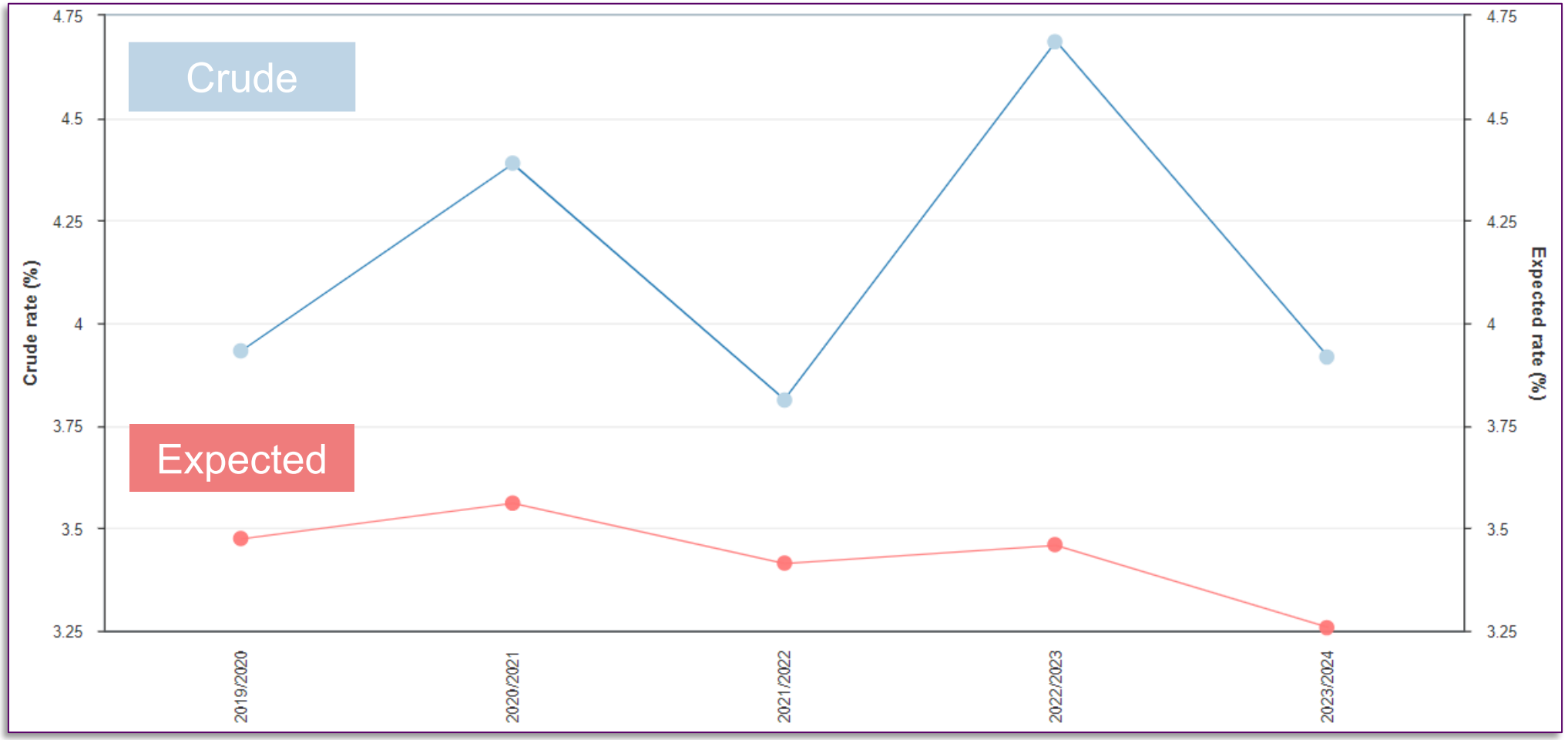
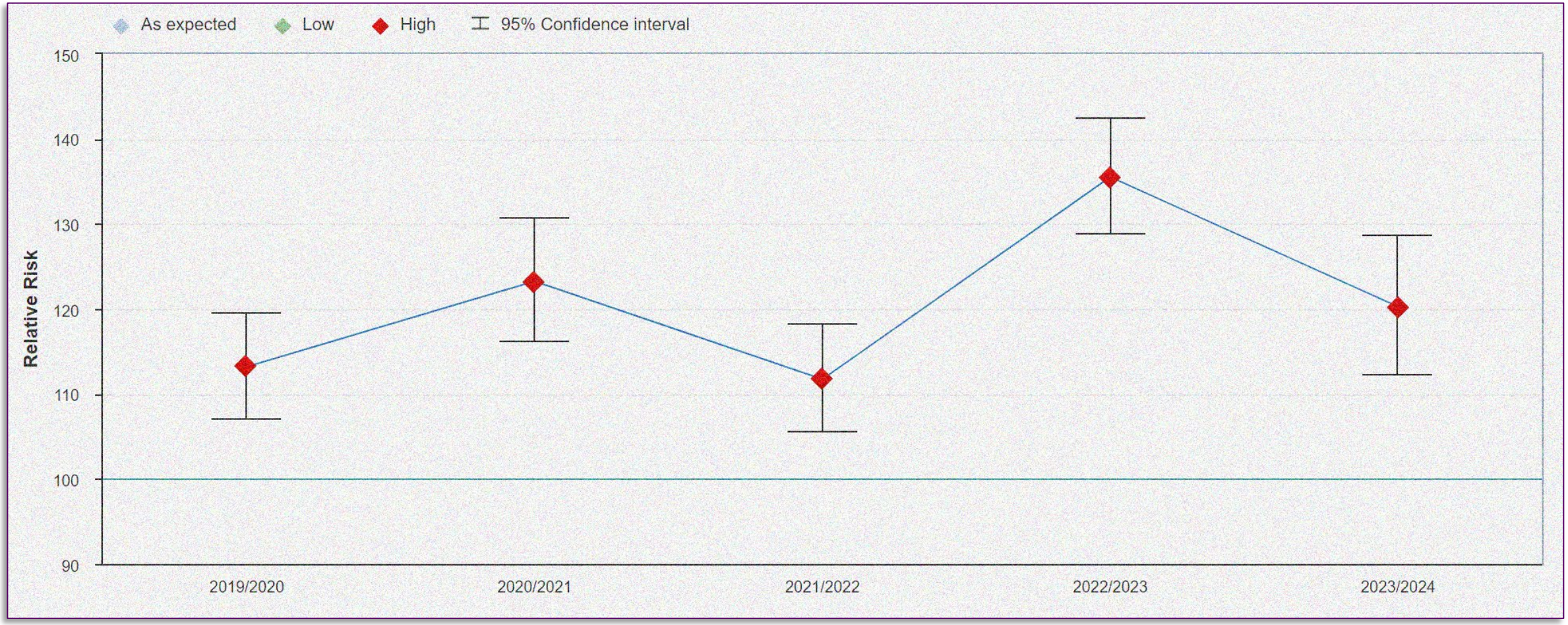
HSMR Crude Rate (blue) vs. Expected Rate (red) (Apr-19 to Nov-23 | FY Trend)

Looking across the last four complete financial years does further demonstrate how much higher crude rate was in FY22/23 than when compared with previous years. Meanwhile, the HSMR expected rates of mortality have been fairly static in comparison, although we should be mindful of the slight drop off so far this year.



HSMR (Apr-19 to Nov-23 | FY Trend)

While the Trust has consistently reported "higher-than-expected" HSMR values in the last four financial years, it is clear that the HSMR for FY22/23 is significantly higher than normal for the Trust. Synonymous with the improvement in crude rate for data in the current FY, HSMR also looks to be returning to a more normal position for the Trust.



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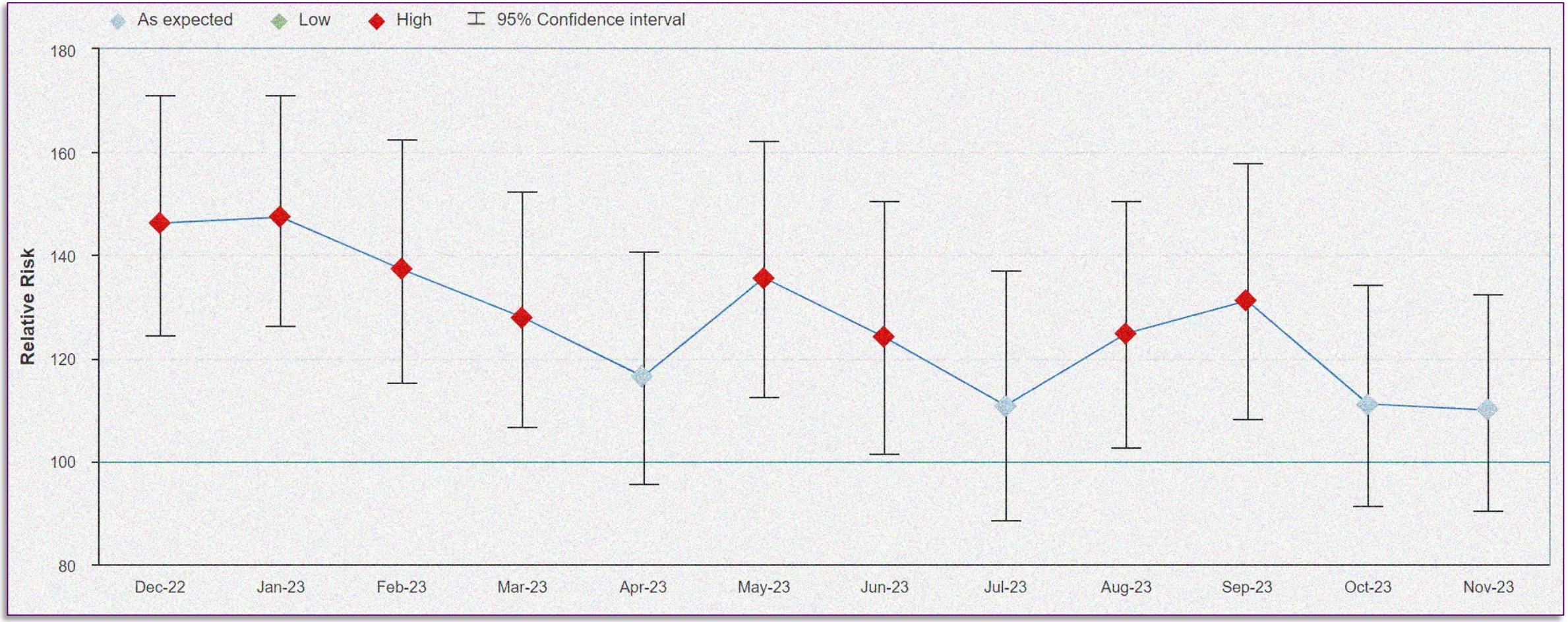
HSMR (Dec-22 to Nov-23 | Single-month Trend)

Sherwood Forest report a HSMR value for Nov-23 of 109.92 which is "within expected". The value for Nov-23 should be noted for reflecting two consecutive months of "within expected" values (something which last happened 18 months ago), and for the second lowest crude rate reported for the month of November in the last 5 years. Provisional insight into Dec-23 suggests these patterns of improvement will continue.



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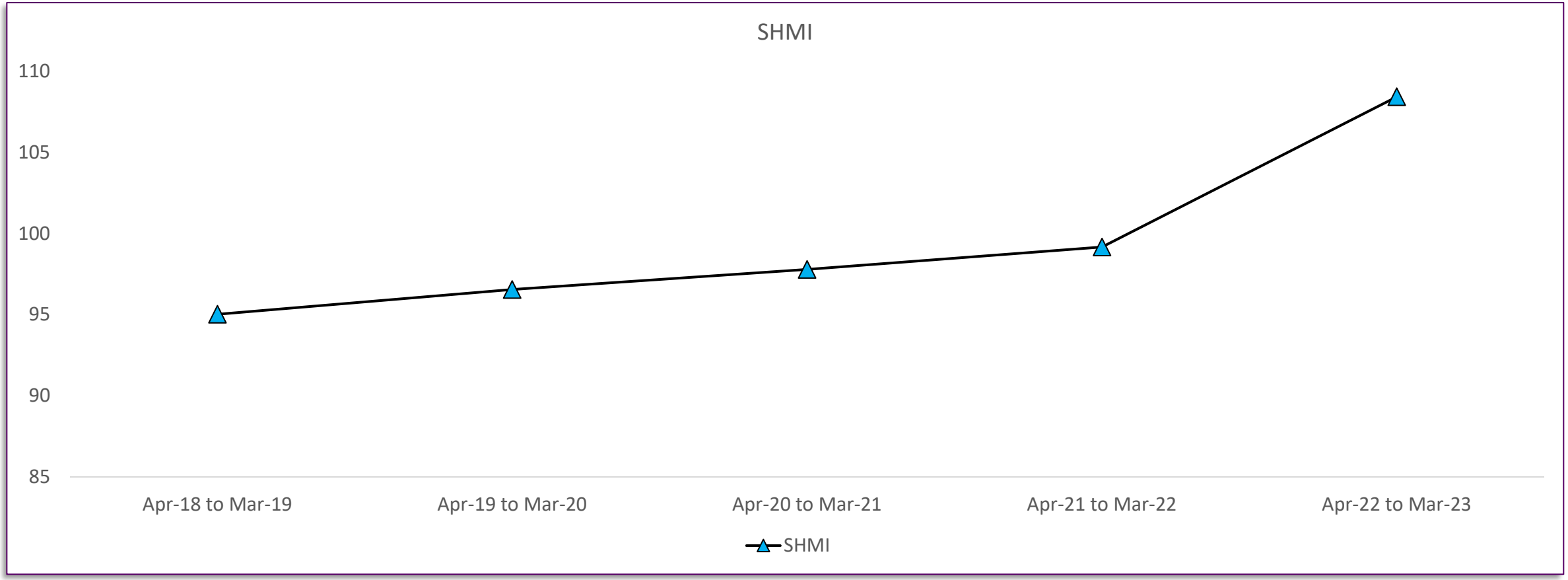
SHMI Trends

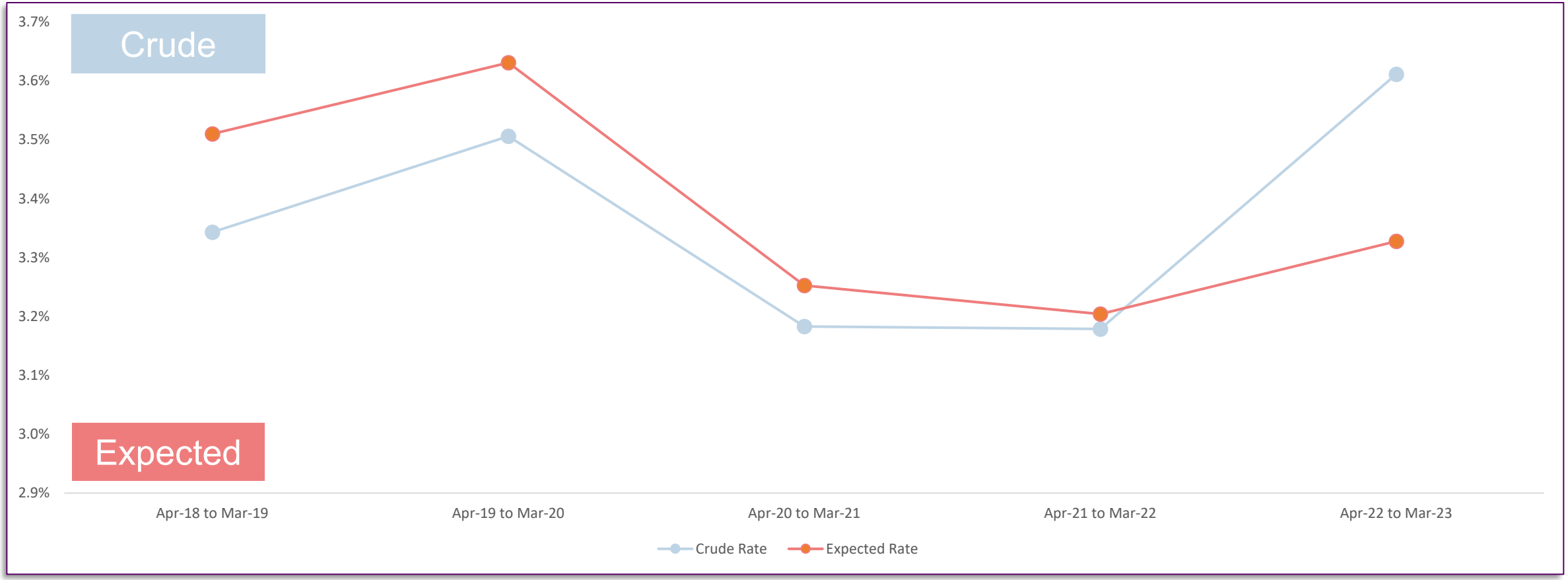
SHMI Trend (Last 5 Years | FY Trend)

The SHMI for the Trust has been gradually rising year-to-year, however the deterioration in HSMR is also matched in the SHMI. While SHMI for FY22/23 is "within expected", it is moving towards "higher-than-expected" and an SPC-chart would (in all likelihood) show this to be higher-than-normal for the Trust.



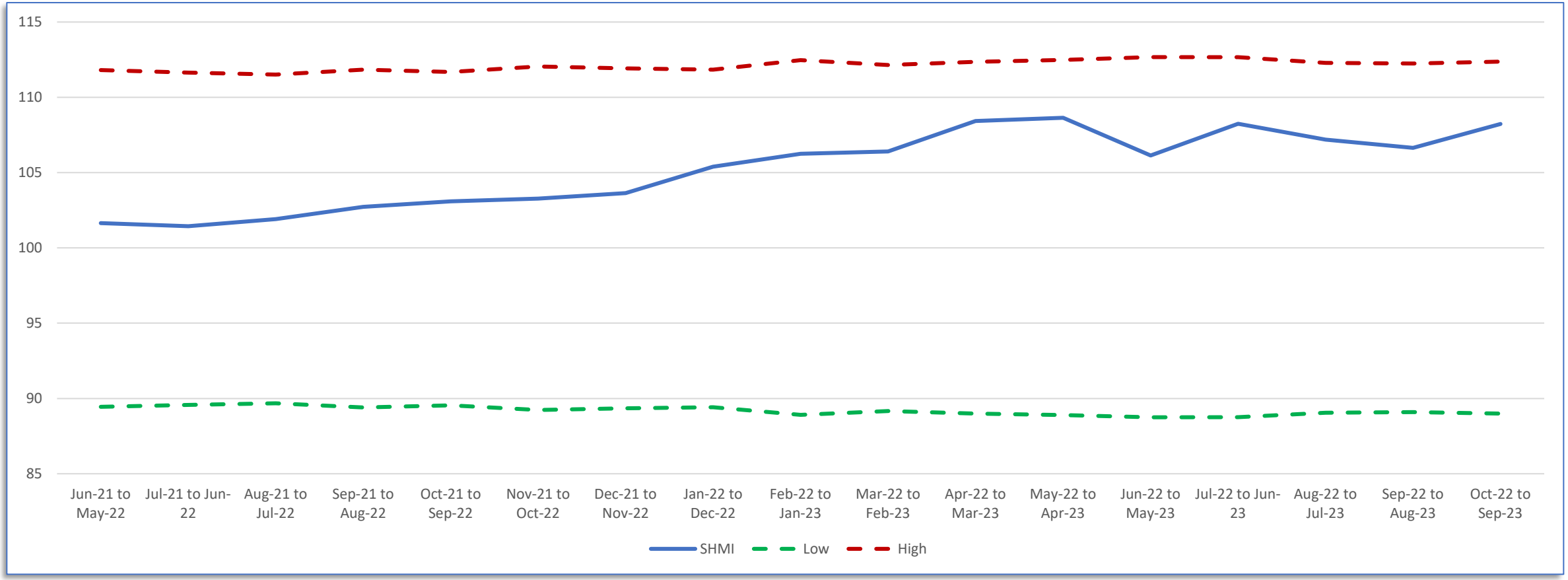
SHMI Crude Rate (blue) vs. Expected Rate (red) (Last 5 Years | FY Trend)

As with the trends in HSMR, the overarching reason for the rise in SHMI is because crude rate is at a 5-year high and rose sharply in FY22/23, while expected rate remains fairly flat. It is important to note with regards to the expected rate that SHMI does not adjust for palliative care.



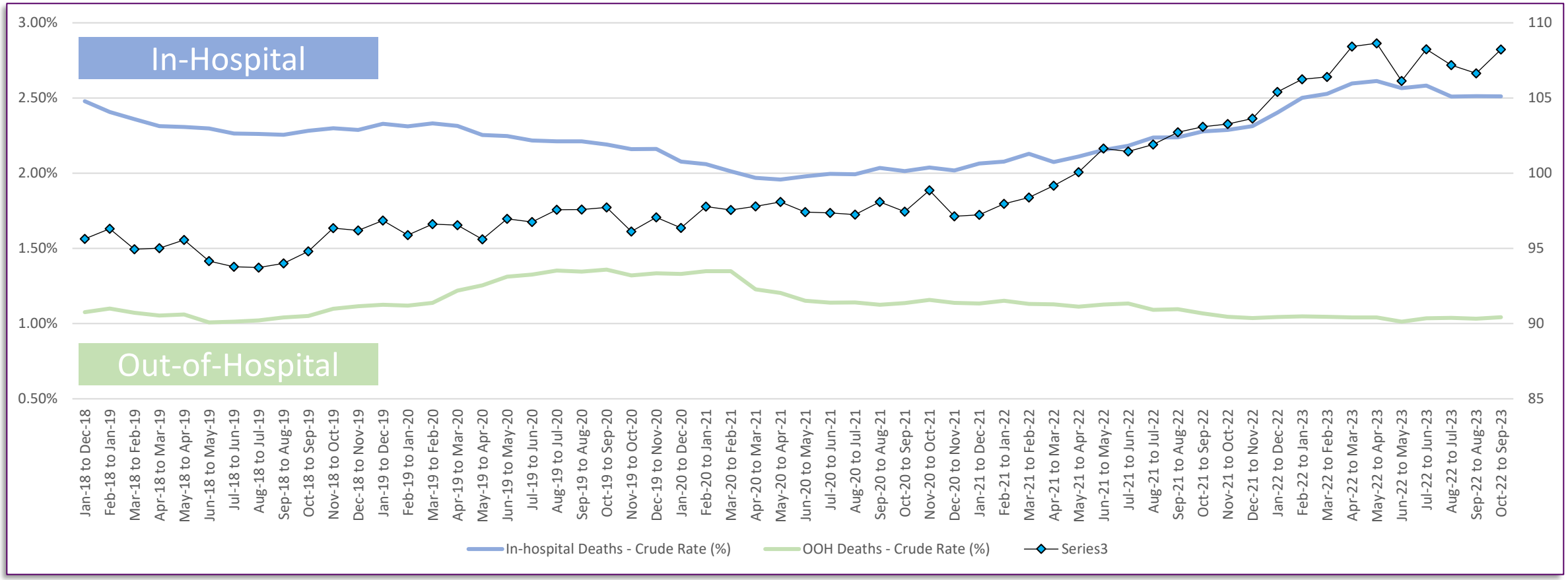
SHMI (Oct-22 to Sep-23 | Last 12 Months | Rolling Trend)

Current SHMI values reported for the Trust show some level of stability following the deterioration – but they remain fairly high compared with previous. It should be noted though that changes in the SHMI are much more gradual.



SHMI Methodology (e.g. Inpatient, Non-COVID) In-Hospital vs. OOH Crude Rates
(Dec-18 to Sep-23 | Rolling Trend)

Utilising publicly available SHMI data from the last five years finds that in-hospital crude rate (blue) has risen over the past year, and is marginally now at an all time high. Of note, out-of-hospital crude rate has been gradually decreasing too – almost in a mirror reduction. This leads to a vital question: ***why is there a trend throughout FY22/23 of more patients dying in hospital than in the community?***



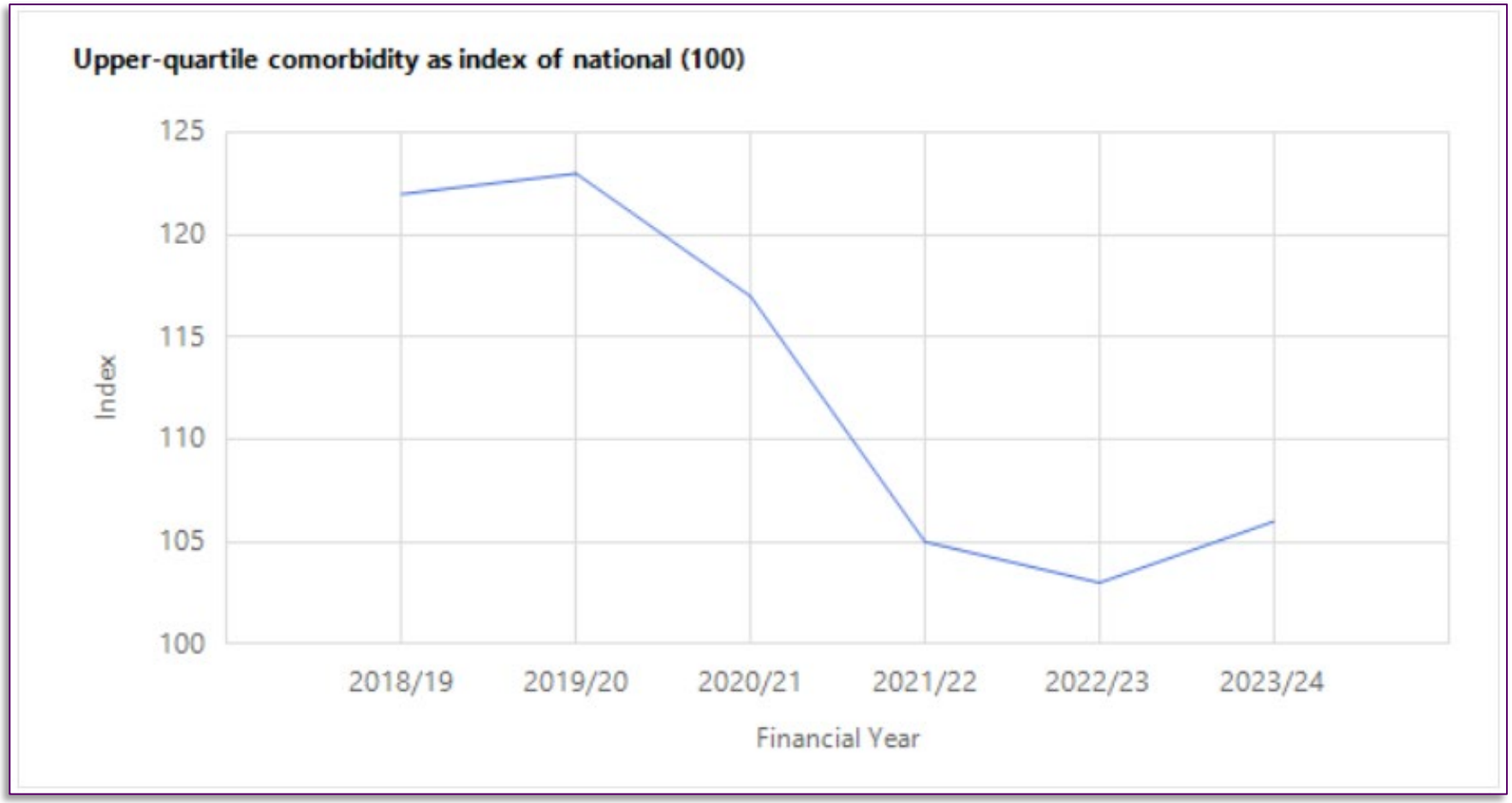
“Expected” Mortality: Key Influencers

Trends in Comorbidities (Last 5 Financial Years + Current)

Comorbidities are a key element in the HSMR and SHMI models. The higher a Charlson comorbidity score, the higher the risk of mortality for individual patients' admissions, leading to higher expected rates of mortality.

One method for analysing comorbidities between Trusts is to measure the proportion of activity with a comorbidity score in the national upper quartile. This is what the graph to the right is looking at.

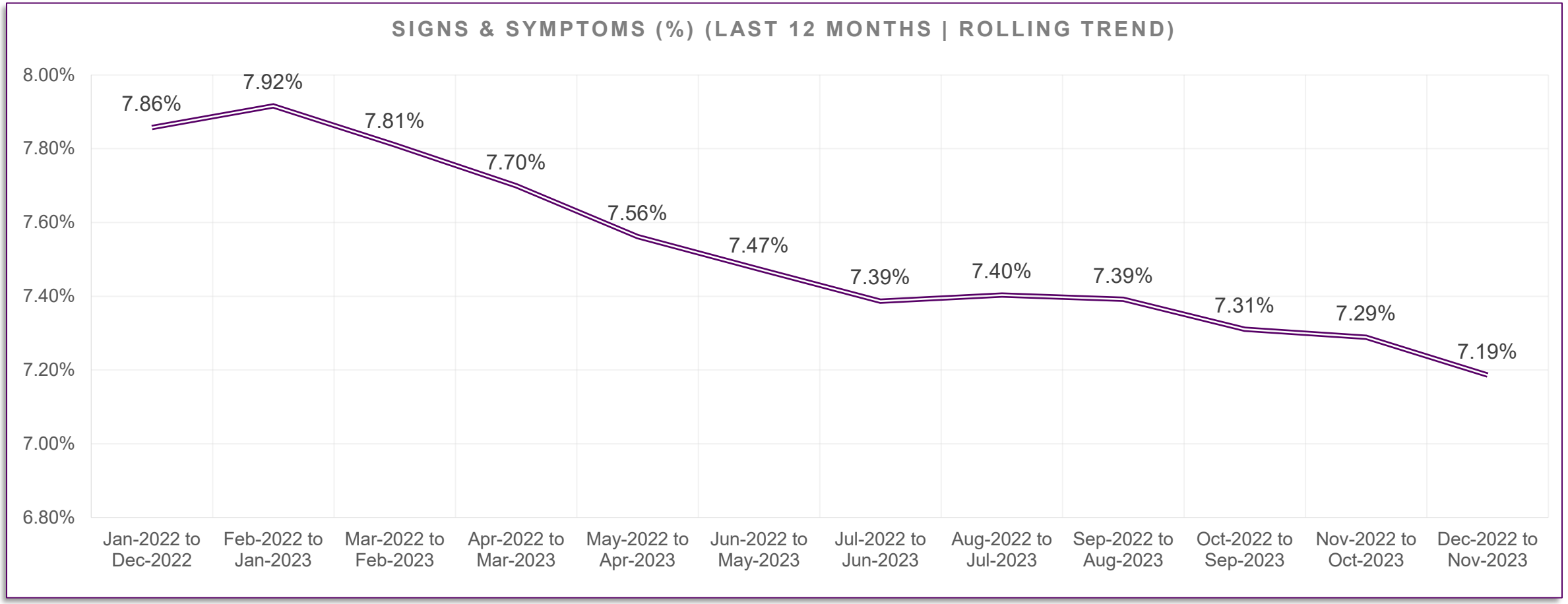
Across the last five years, the Trust have seen a reduction in the proportion of spells with a higher comorbidity score, relative to the national average.



	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Upper-quartile comorbidity	29.4%	30.1%	28.6%	26.2%	25.8%	27.0%
as index of national (100)	122	123	117	105	103	106

% of HSMR Activity with a Primary Diagnosis of 'Sign or Symptom' (Dec-22 to Nov-23 | Last 12 Months | Rolling Trend)

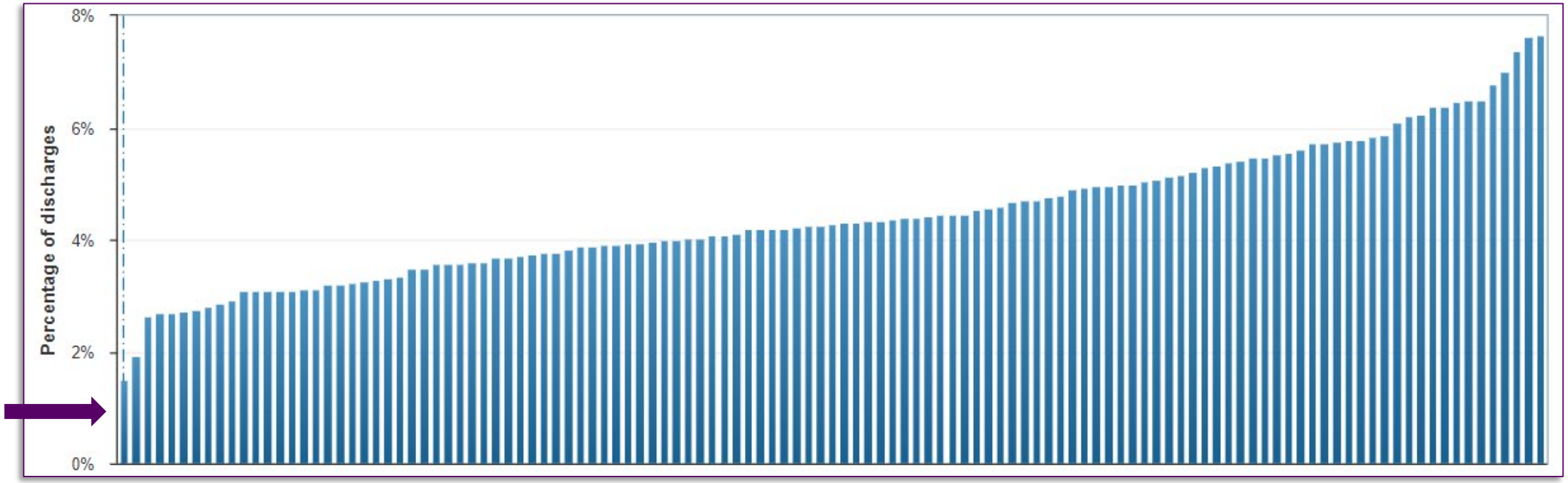
An important improvement that the Trust have made in clinical documentation is a steady reduction over the past year where less HSMR patients admitted have a primary diagnosis of a sign/symptom (e.g. abdominal pain); in an area where the Trust are performing better than both regional and national peers.



In-Hospital Non-COVID HSMR Palliative Activity vs. National Peers

Another key element to the HSMR model is an adjustment for palliative care. There is some debate as to whether HSMR models should adjust for palliative coding. At current, this strictly refers to specialist palliative care (a secondary diagnosis code of Z51.5; not end-of-life care) received by a patient across their entire admission into hospital. The alternative SHMI model does not adjust for palliative care.

Nationally, acute non-specialists in the last four years have reported a rate of 4.3% of all non-COVID superspells with palliative care. At SFH, the rate is 1.5% and this is the lowest in the country. Does this have a negative impact for HSMR at the Trust? Using SPC charts, we can determine that Trusts with low rates of palliative care generally have higher HSMR values – but additionally, it helps to rule out palliative care documentation as a silver bullet for overall improvement.



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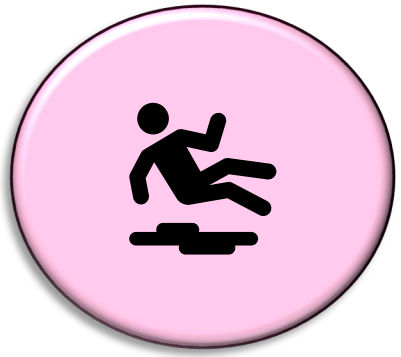
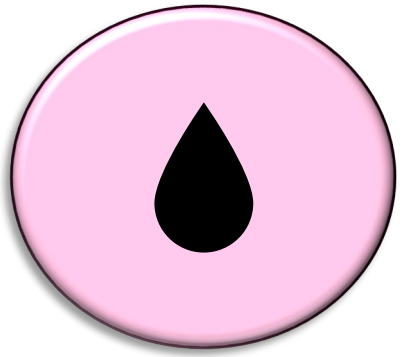
Diagnosis Group Outliers

Monitoring Diagnosis Groups:

- *Continuing to understand outliers and alerts, triangulating methodologies to look at what is “noise” and what are the “signals”*



Other connective tissue disease



Fluid and Electrolyte Disorders

Superficial injury, contusion

The Journey so far…

It’s taken time and a great deal of work!

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GETTING IT RIGHT FIRST TIME…

- Clerking – Consistency, Clarity, Co-morbidities, Communication
- Clinical Decision Marking – Primary Diagnosis: timely and accurate (not symptoms/signs)
- Consultant Episodes – ED – EAU – Ward

PALLIATIVE CARE

- Early / timely recognition (including EOL)
- Working partners / stakeholders in Primary Care
- Patient’s wishes – ReSPECT
- Front door approach
- Support to specialty areas

Mechanisms for Action:

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TASK AND FINISH GROUP:

- Documentation, Primary Diagnosis, Co-morbidities, Palliative Care

LEARNING FROM DEATHS:

- Review, Challenge and Escalation; Targeted Reviews
- Triangulation – specialty areas; internal intelligence; Medical Examiner Service
- Telstra Health UK

INTERNAL EDUCATION AND COMMUNICATION:

- Grand Round, Med Managers, Quality Committee
- Mortality Workshops
- Specialty / Divisional Support

EXTERNAL REVIEW

Since December…

What have we put in place in the last three months to continue to drive improvement?

Maintained Strategic & Experienced Approach to Reporting of Mortality

Revisited Supporting Approach

Closer Monitoring of Trends in Clinical Documentation

Interrogation of ‘small number’ groups as a means to understand process of “documentation > coding > data submission” in more detail

Thank you

Questions?