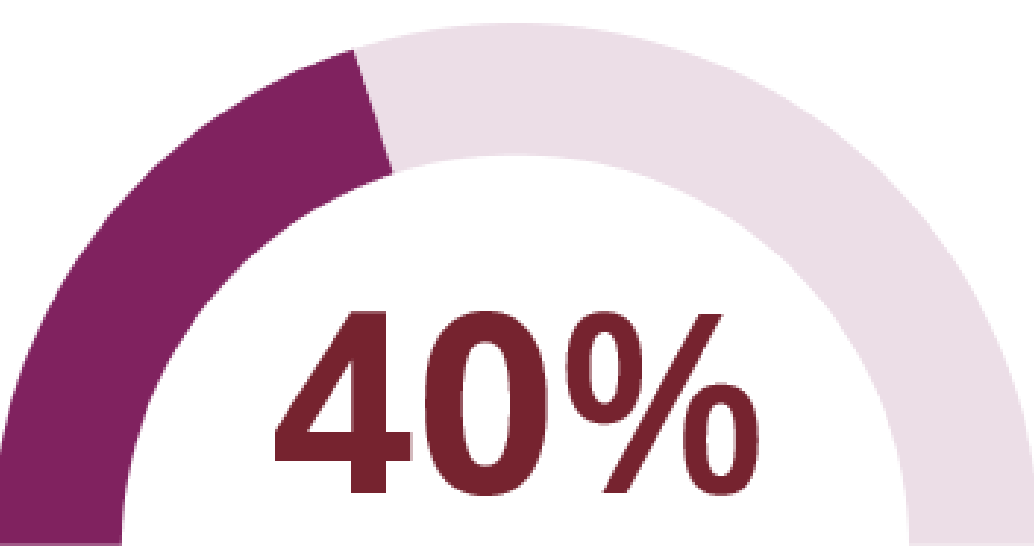


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Background: **Technology-related errors (TREs)** occur from the design, functionality or use of **electronic health records (EHRs)**. However, system managers require an effective means of prioritising EHR optimisation activities.



40%

of prescribing errors in hospitals are **technology-related**, which can be mitigated through EHR optimisation.

Pareto principle: Is one approach to **prioritising quality improvement initiatives**. It identifies the causes contributing to 80% of the effects, i.e. the vital few. Targeting the vital few will deliver the largest quality and safety gains.

Objective: To identify priority areas for EHR optimisation to **reduce technology-related prescribing errors** at two paediatric hospitals **using quality improvement methods**.

Methods: Records were **reviewed for prescribing errors**. Each error was assessed to identify **those related to technology**. TREs were examined to identify the **underlying mechanisms**, which describe ‘**how**’ each error occurred. Mechanisms were classified using the **Technology-Related Error Mechanism (TREM) classification**. We then used Pareto charts to identify the TRE mechanisms, that if addressed would have the greatest impact on patient safety.

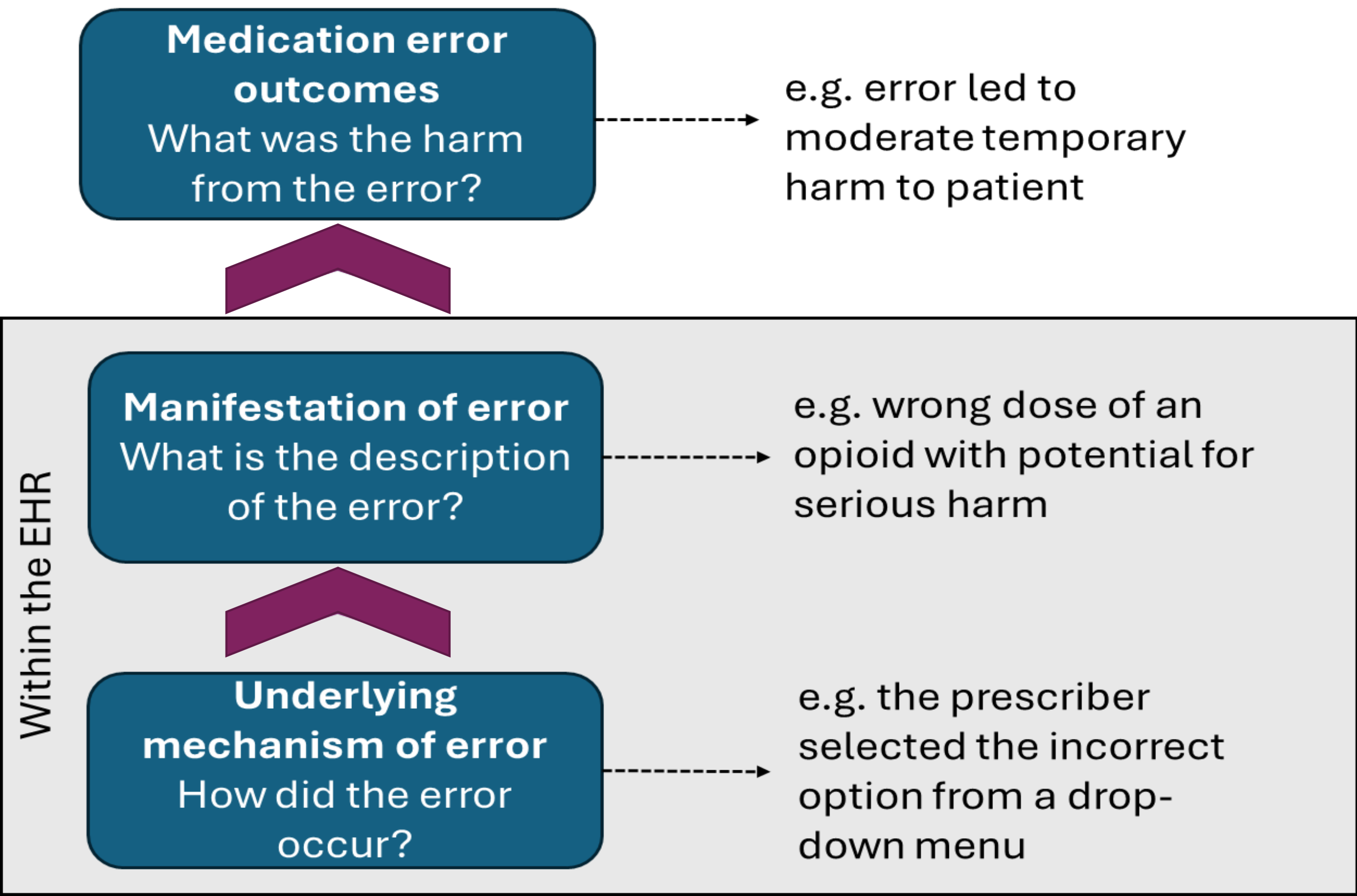


Figure 1. Conceptual diagram of technology-related error dimensions

Key Findings



Hospital 1

10,596 medication orders were reviewed for prescribing errors

564 prescribing errors identified were TREs.

33% of all errors were **errors that occur when using new workflows**



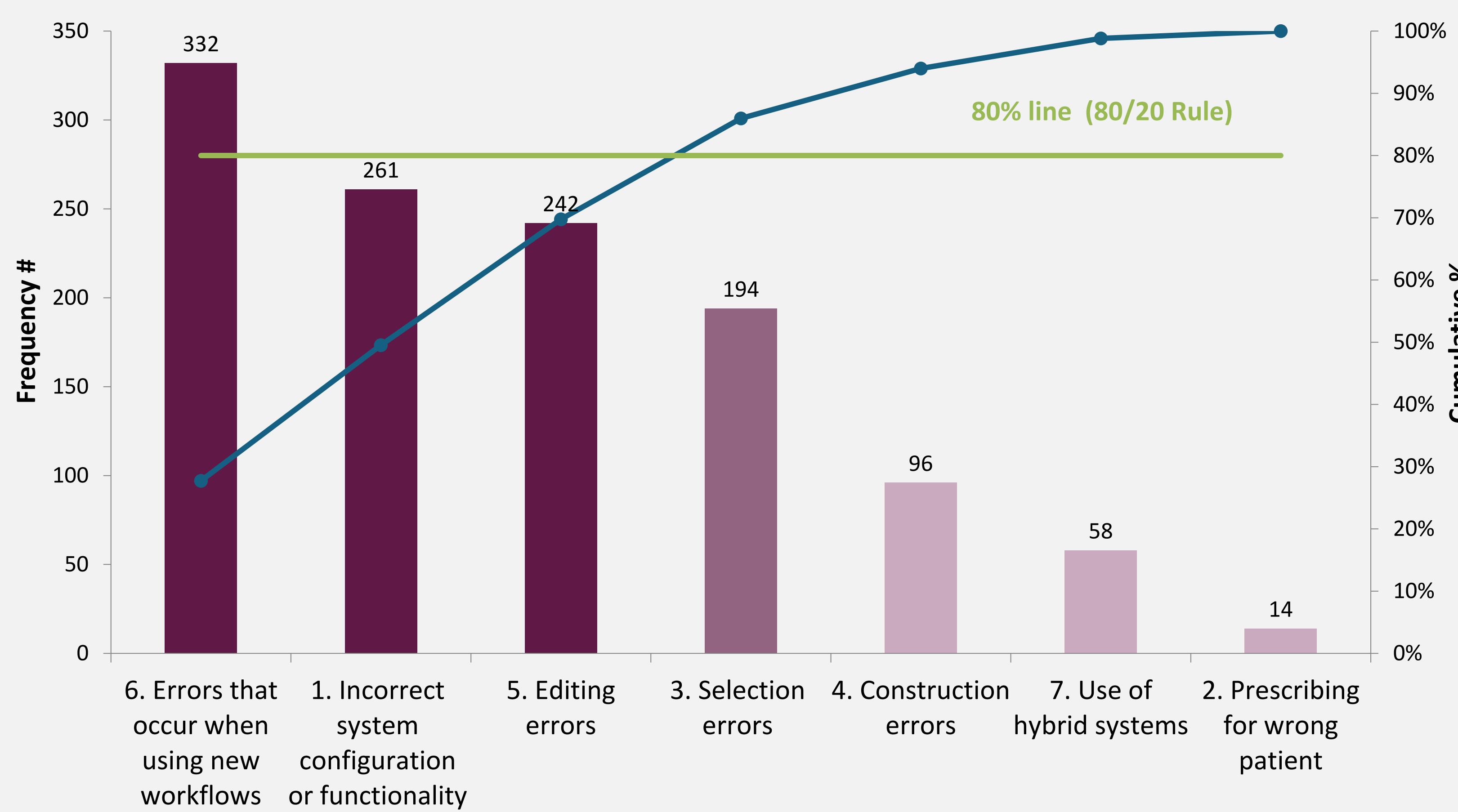
Hospital 2

8,335 medication orders were reviewed for prescribing errors

633 prescribing errors identified were TREs.

24% of all errors were **editing errors**

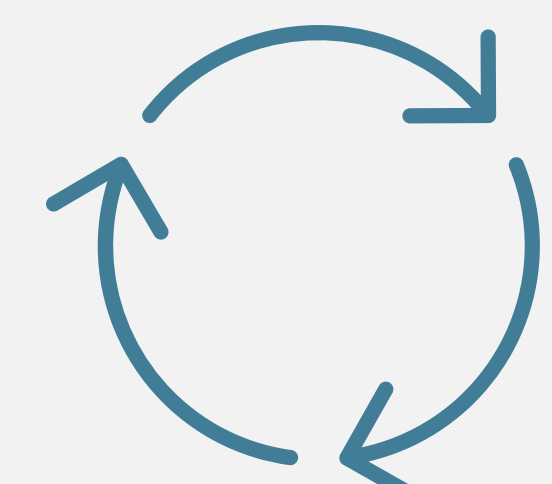
Figure 2. **Pareto chart** of the underlying mechanisms of technology-related prescribing errors at two paediatric hospitals



Four mechanism categories contributed to **86%** of **errors**, **three** of which contributed to **70%** of **errors**

Pareto charts by site demonstrated different profiles of TRE mechanisms.

Examples of errors for top four mechanism categories



Errors that occur when using new workflows
Medication already on the chart was prescribed using an order set creating a duplicate order



Incorrect system configuration
A pre-programmed order sentence contains an error



Editing errors
Editing pre-programmed doses in a dose calculator results in an error



Selection errors
An order sentence is selected from a drop-down menu with the incorrect medication form

Conclusion

Understanding the relative contribution of the underlying mechanisms of TREs can assist in prioritising EHR optimisation activities. This study suggests underlying mechanisms such as *errors in order sentences* was a low-hanging fruit that, if addressed, would mitigate a large portion of errors. Recommendations are available in the **Health Innovation Series** on e-Medication Safety.