CASE STUDY

ML-Driven Clinical Variation Analysis for Cost of Care

CitiusTech partnered with Client to build an advanced analytics framework to identify modifiable factors that uncover factors that drive LOS/ Cost beyond patient severity.

Business Problems

Client faced challenges in understanding and introducing targeted, high-impact interventions for reducing patient hospital length of stay and the cost associated with it.

- **High administrative burden :** dashboards monitoring each factor such as Hb levels to identify potential sources of increased cost and to add interventions.
- **No standard mechanism** to understand the modifiable factors affecting patient LOS, cost.
- **Manual methods** to understand the patient factors.
- **Difficulty in analysis of high cost due** to true clinical modifiable drivers rather than due to patient severity.

CitiusTech Solution

CitiusTech designed and implemented an advanced ML-driven "CVR Framework" to CitiusTech developed a cluster-based, ML-driven clinical variation framework for the client.

Key features include:

- **Unsupervised Patient Subgrouping:** identified 5 clinically meaningful patient clusters, validated by physicians.
- **Predictive Models:** cluster-wise ML models flag high cost / high LOS
- **Outlier Detection:** For each cluster, outliers were patients with high cost / LOS after accounting for unexplained clinical outcomes.
- **Root cause analysis :** Produced statistically validated insights on drivers of prolonged LoS/ high cost of care.

Value Delivered

- Identification of outliers within clinically similar patient groups.
- Data-driven root cause analysis.
- Foundation for implementing targeted clinical interventions.
- Scalable framework : to extend to other procedures.