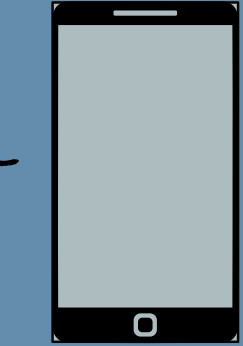


Team: Hrishikesh Kambli, Samaris Claussell, Blanca Iñigo, Aastha Merja, Aditya Khandeshi, Yi Yang
Clinical PI: Dr. Khyzer Aziz, Dr. Abimbola Aina, Dr. Frances Northington
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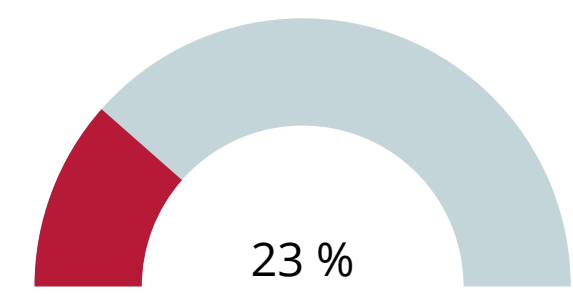


Take a picture to get more information!

Introduction

Hypoxic ischemic encephalopathy (HIE)

Brain injury occurring when the **brain does not receive enough oxygen or blood flow** for a period of time.



HIE accounts for **23% of neonatal deaths.**

Therapeutic hypothermia (TH)

- **Only intervention** used today for **neuroprotection** of HIE infants
- **Allows fetal brain time to heal** and minimizes the spread of damage

Objectives

- 1 Create a **prediction model** based on prenatal, newborn, and maternal clinical data evaluating **TH benefit**.

Outcomes to be evaluated include:

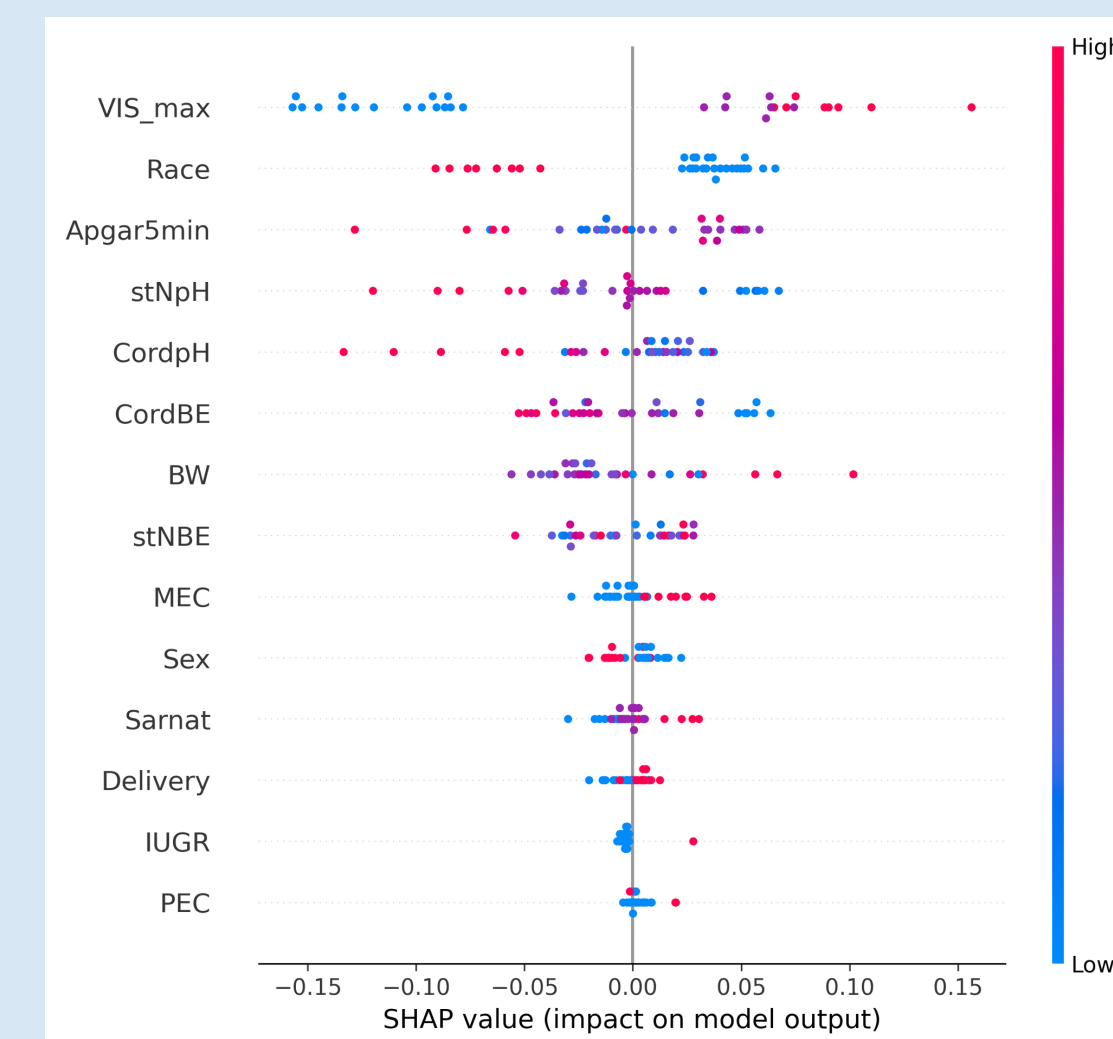
- **Length of stay (LOS)**
- **Time to full enteral feeds (FEFdays)**
- **Abnormal MRI (AbnMR)**

- 2 Evaluate feature importance with SHAP tests to identify features that have the greatest contribution to specific outcomes.

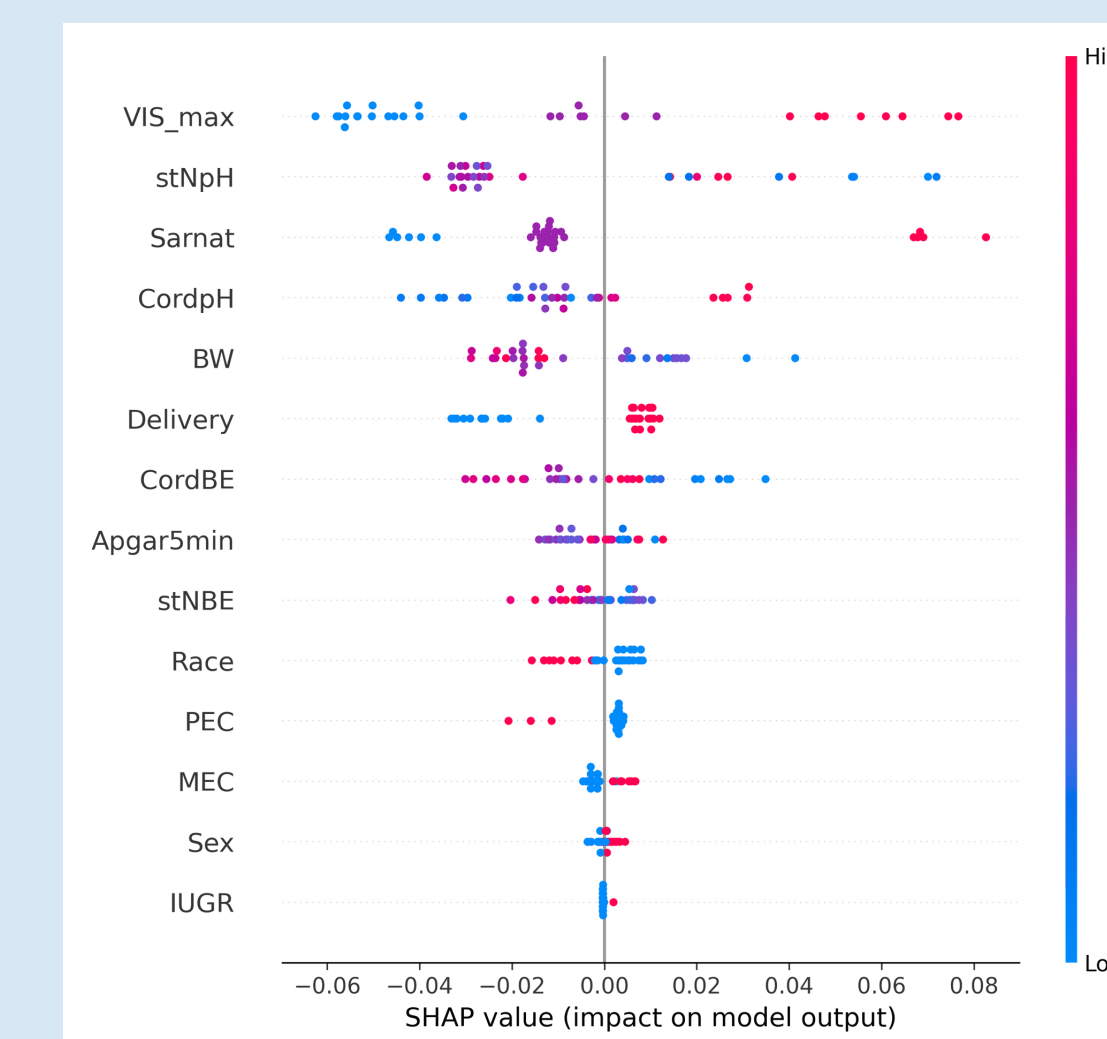
HYPOTHESIS: Identifying **modifiable metrics** (e.g. vasoactive drug delivery, oxygen delivery, hemoglobin/pH thresholds, etc.) will **aid physicians** in future **interventional treatment** of neonates with HIE.

Results - Feature importance in Outcomes

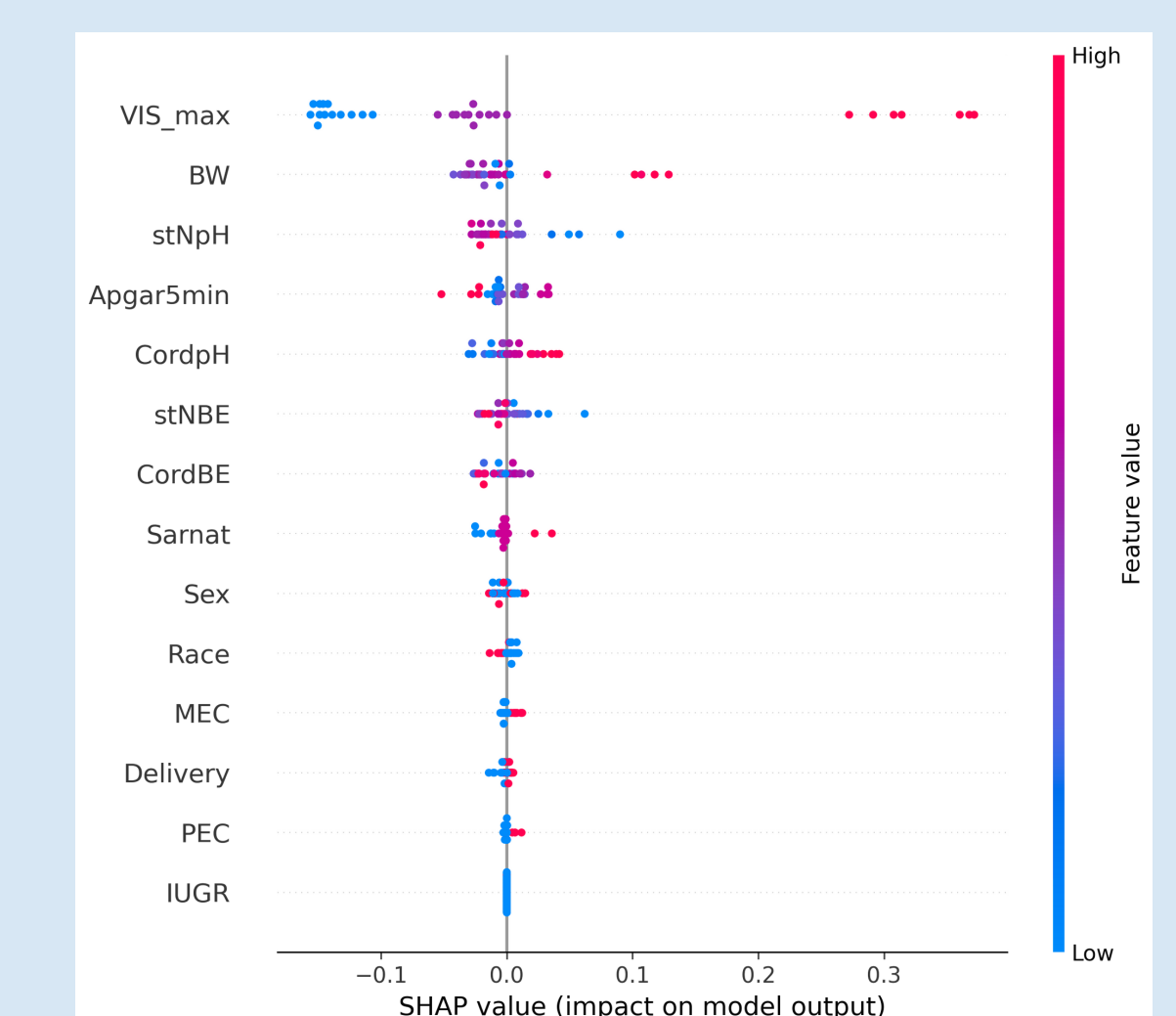
Length of stay (LOS)



Abnormal MRI (AbnMR)



Days to Full Enteral Feed (FEFdays)

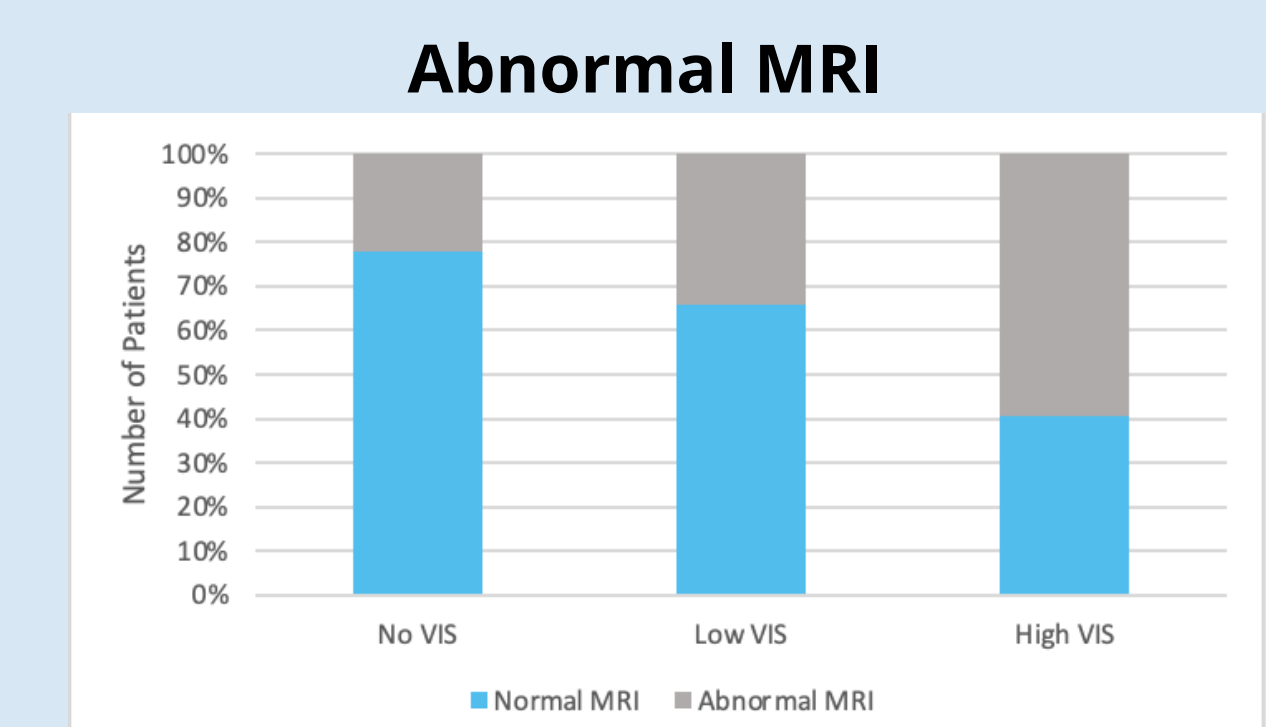


Conclusions

Features that have a higher impact on the outcome of babies that underwent TH:

- Infant's first pH (stNpH)
- Maximum Vasoactive Inotropic Score (VIS_max)
- Race

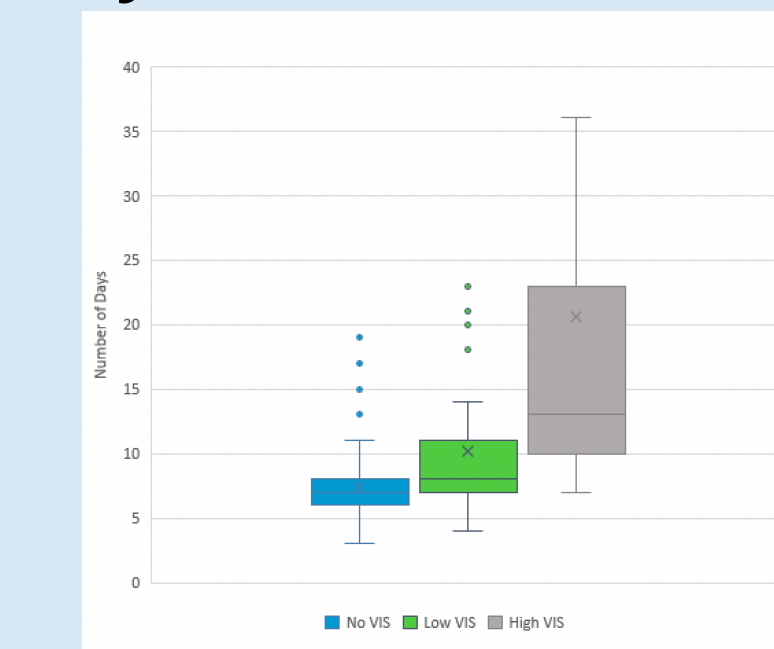
Outcome Breakdown by Vasoactive Inotropic Score



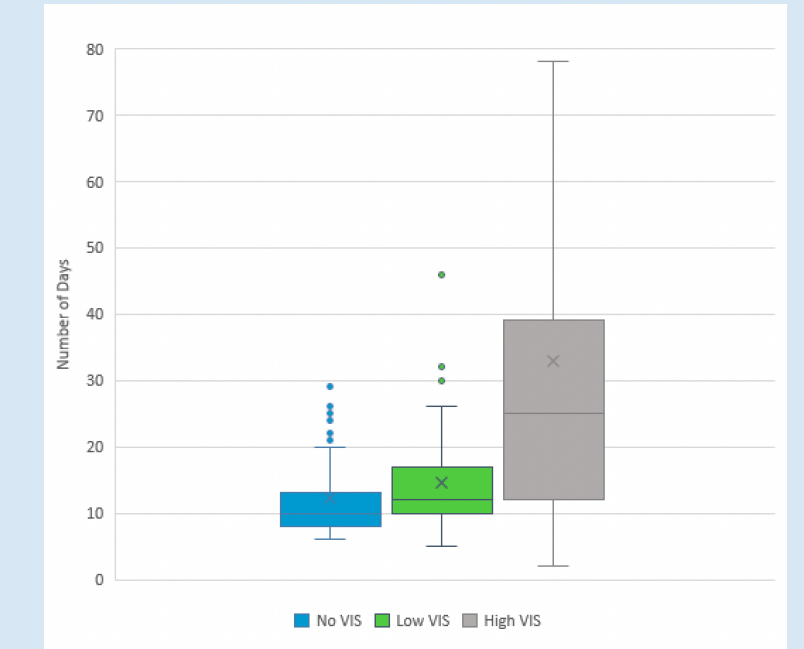
Features correlated with VIS_max

- Gestational age
- Delivery method
- Lactate
- Nucleated RBCs
- Seizures
- Non-reassuring fetal HR tracing
- Apgar 5 minute score
- Sarnat score
- Race

Days to Full Enteral Feed

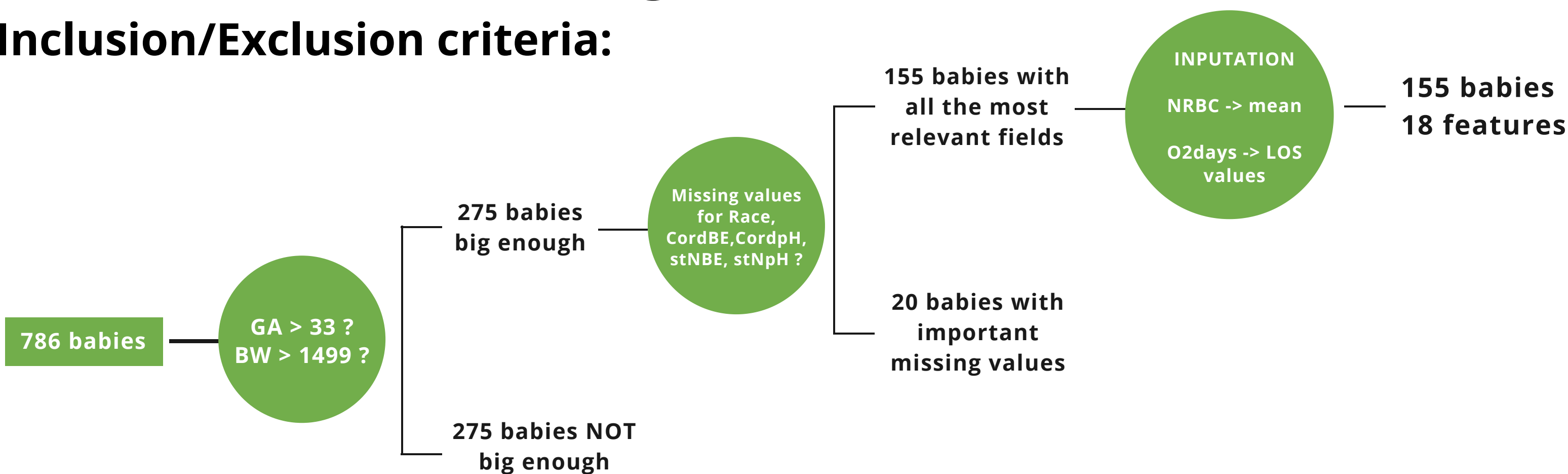


Length of Stay



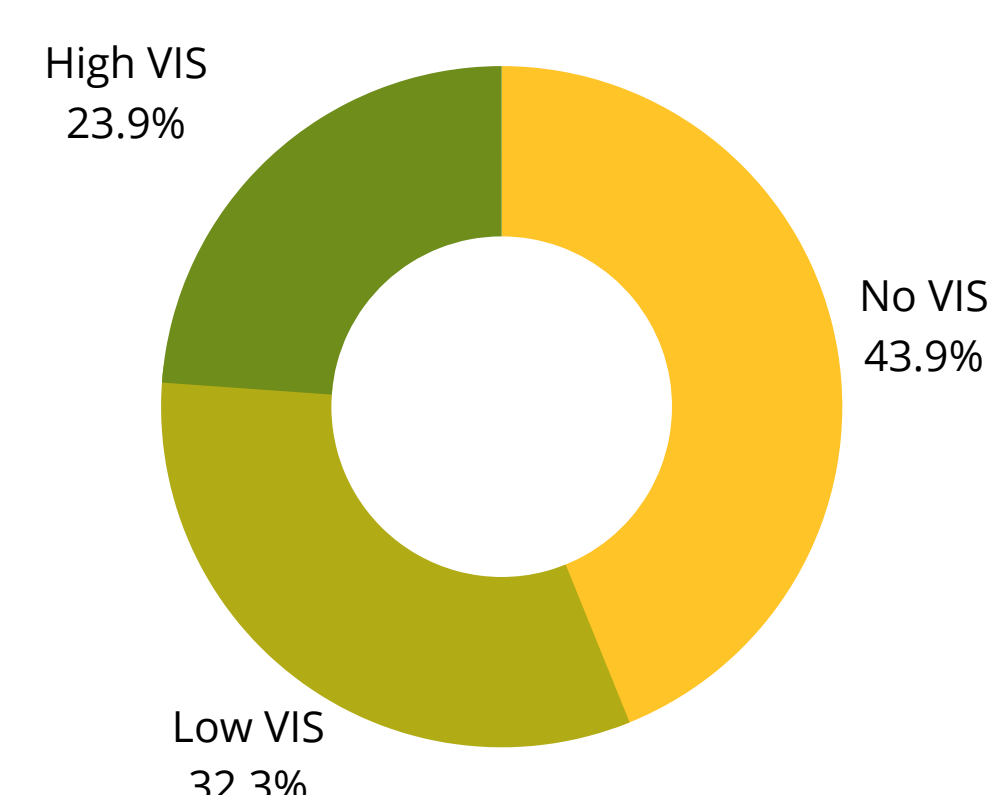
Data Preprocessing

Inclusion/Exclusion criteria:

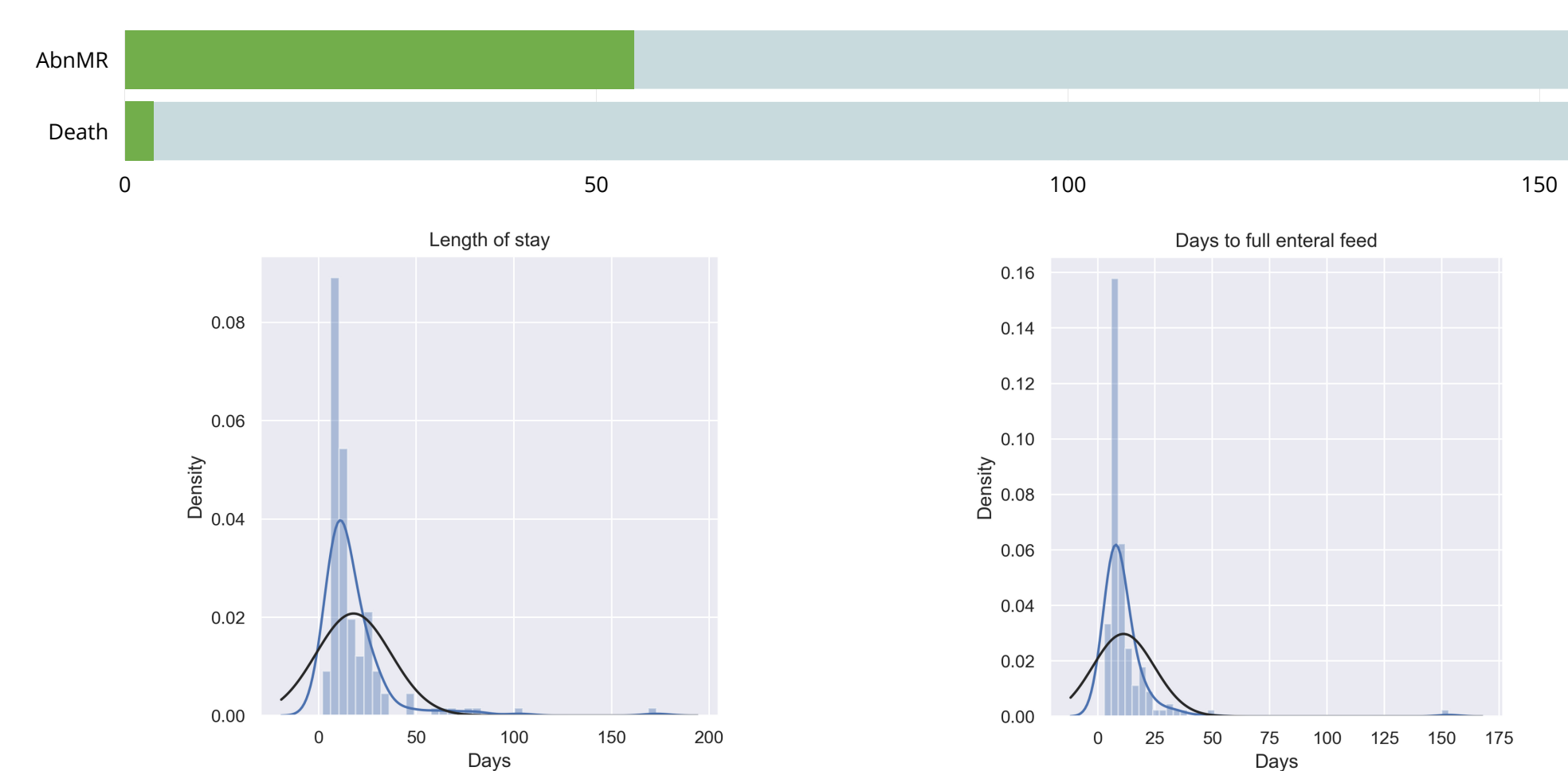


Cohort description

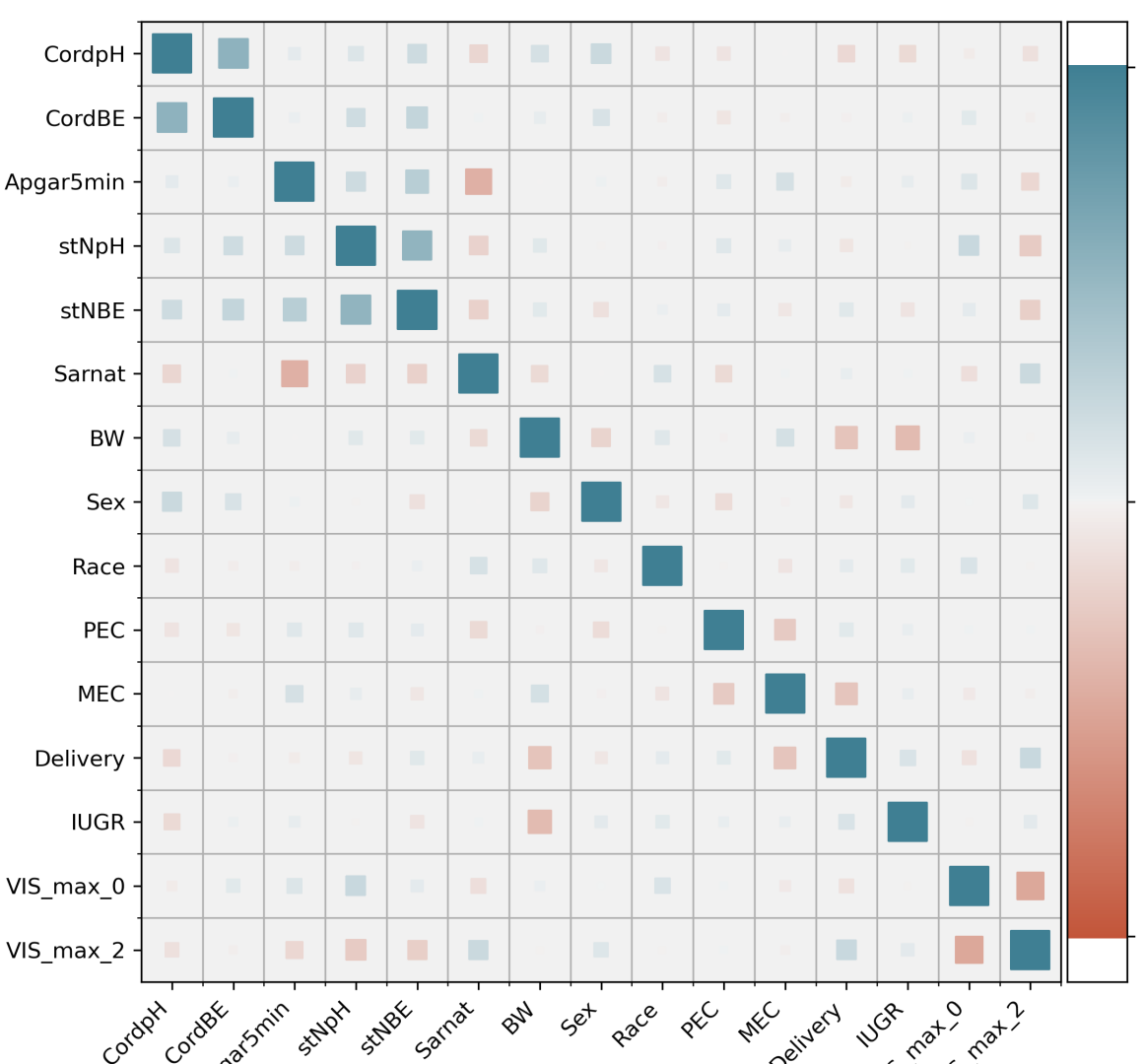
Maximum Vasoactive Inotropic Score



Outcome distributions



Feature and Model Assessment



Feature selection to address correlation between CordpH and CordBE

Evaluated scenarios:

- Dropping CordpH
- Dropping CordBE
- Maintaining both
- Dropping both and adding **Badgas** (A categorical feature that represents both CordBE and CordpH)

Model Performances vs Outcomes

