
Discussion about the statistical approach for preterm infants' project

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Retinopathy of prematurity (ROP)

- ROP is a leading cause of visual impairment in preterm infants (disorder of the retina)
- ROP generally affects infants born before week 38 of pregnancy (preterm baby)
- Preterm infants
 1. Extremely (<28 weeks)
 2. Very (28—<32 weeks)
 3. Moderately (32—<37 weeks)
- The smaller and more preterm a baby is, the greater their chance of having ROP
 1. Mild ROP
 2. Severe ROP

Intermittent Hypoxemia (IH)

- Defined as episodic drops in hemoglobin oxygen saturation (SpO₂)
- Immature respiratory control and lung structure
- **SpO₂**: Amount of hemoglobin carrying O₂ in the blood relative to the amount of hemoglobin not carrying O₂
- **Pulse oximeter** is used to measure SpO₂
- IH episodes occur up to hundreds of times per day
- IH have **a cumulative effect** on neonatal morbidity and mortality

Intermittent Hypoxemia (IH)

- A normal level of oxygen is usually **95% or higher**
- Define a threshold below which IH becomes clinically significant
 1. SpO2 <80%
- Valuable method to evaluate IH
 1. Duration of IH Events
 2. Frequency/ number of IH events
 3. Per cent time in hypoxemia
 - The percentage of time spent with SpO2 below threshold (SpO2 <80%) represents the cumulative IH events of short and long duration.
- Any fluctuations in SpO2 will increase the risk of ROP

Datasets

The study population included 230 infants including 200 infants without ROP and 30 infants with ROP.

Risk factors of dataset1(**ROP**):

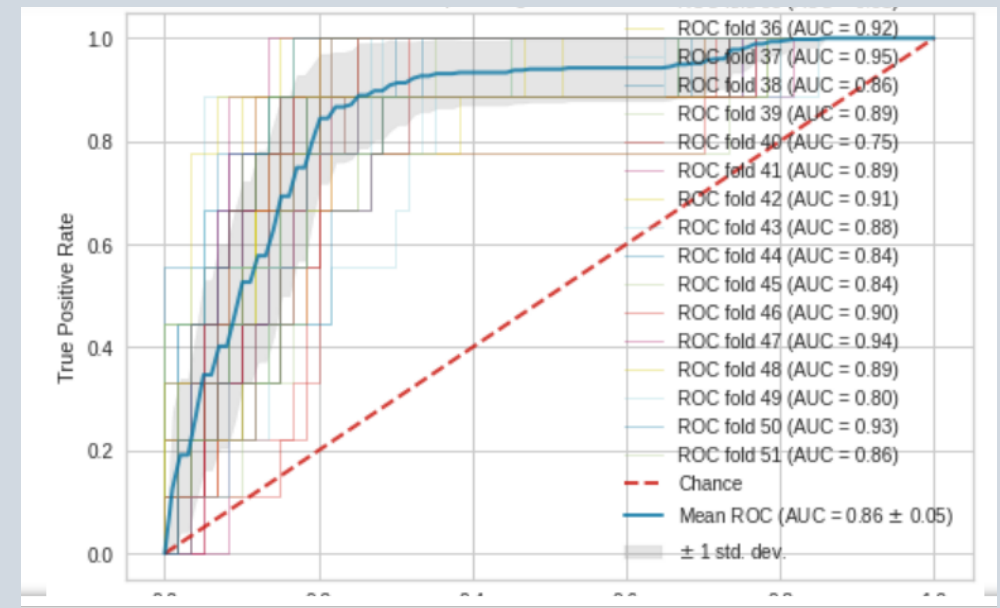
1. Birth weight
2. Gestational Age
3. Sex
4. Race
5. SGA%
6. Multiple Gestation
7. Prenatal Steroids
8. Cesarean section

Risk factors of dataset2 (**IH**):

1. average_duration<80%
2. % time<80%
3. # events<80%

Data processing

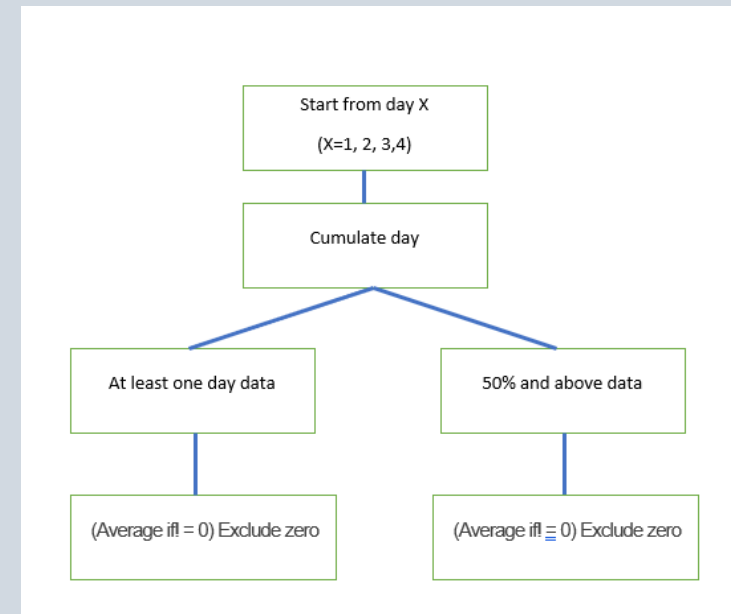
Evaluation Metrics	Score
AUC	0.86
F Score	0.52
Sensitivity	0.74
Specificity	0.83



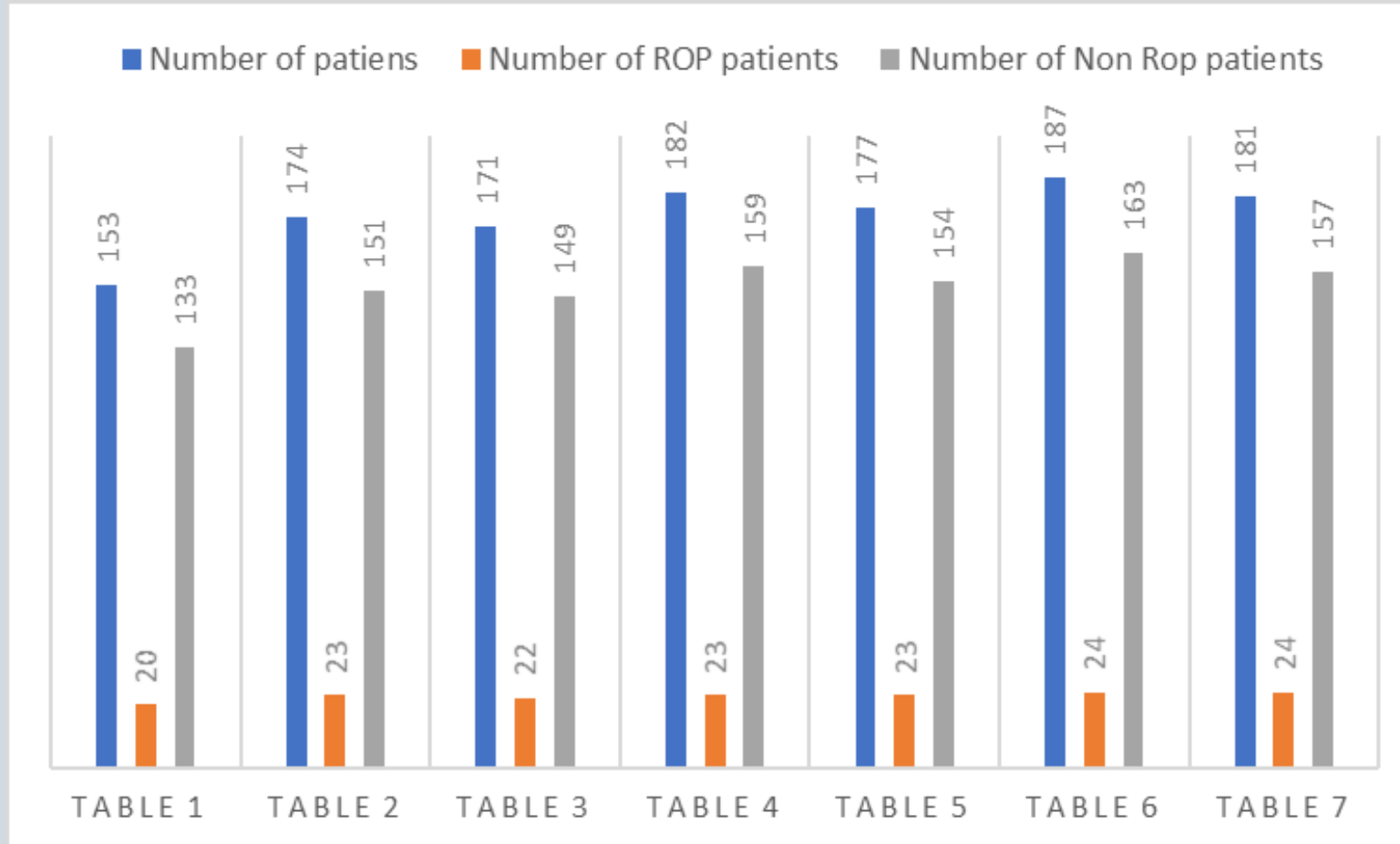
IH Dataset

- 230 different data files
- Each data file shows data for each patient
- The daily data is different for each patient (IH001: 10 days data, IH0140: 68 days data)

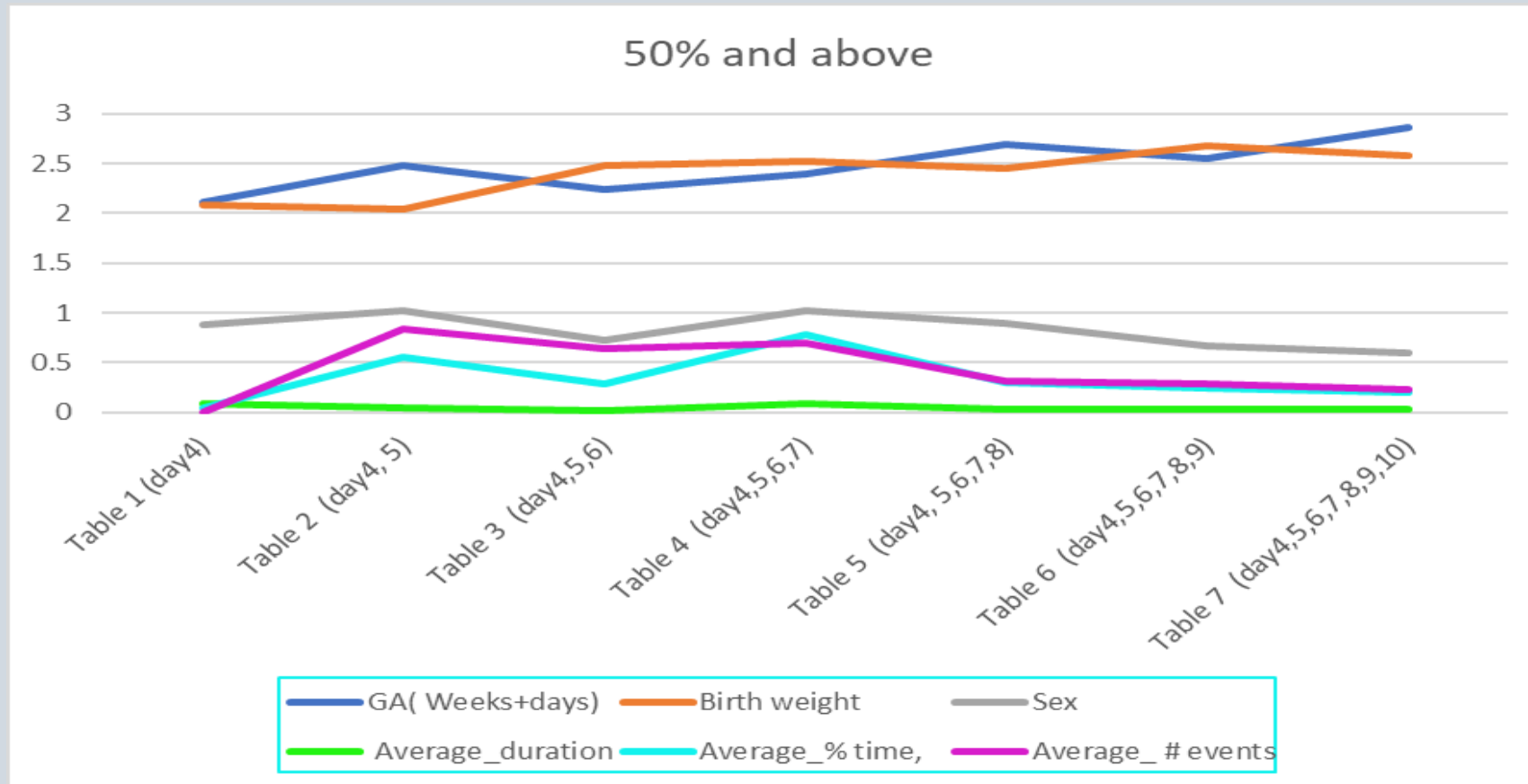
Starting day	At least one day data & 50% and above data
Day 1	14 patients, 0 ROP patient
Day 2	68 patients, 7 ROP patients
Day 3	119 patients, 11 ROP patients
Day 4	153 patients, 20 ROP patients



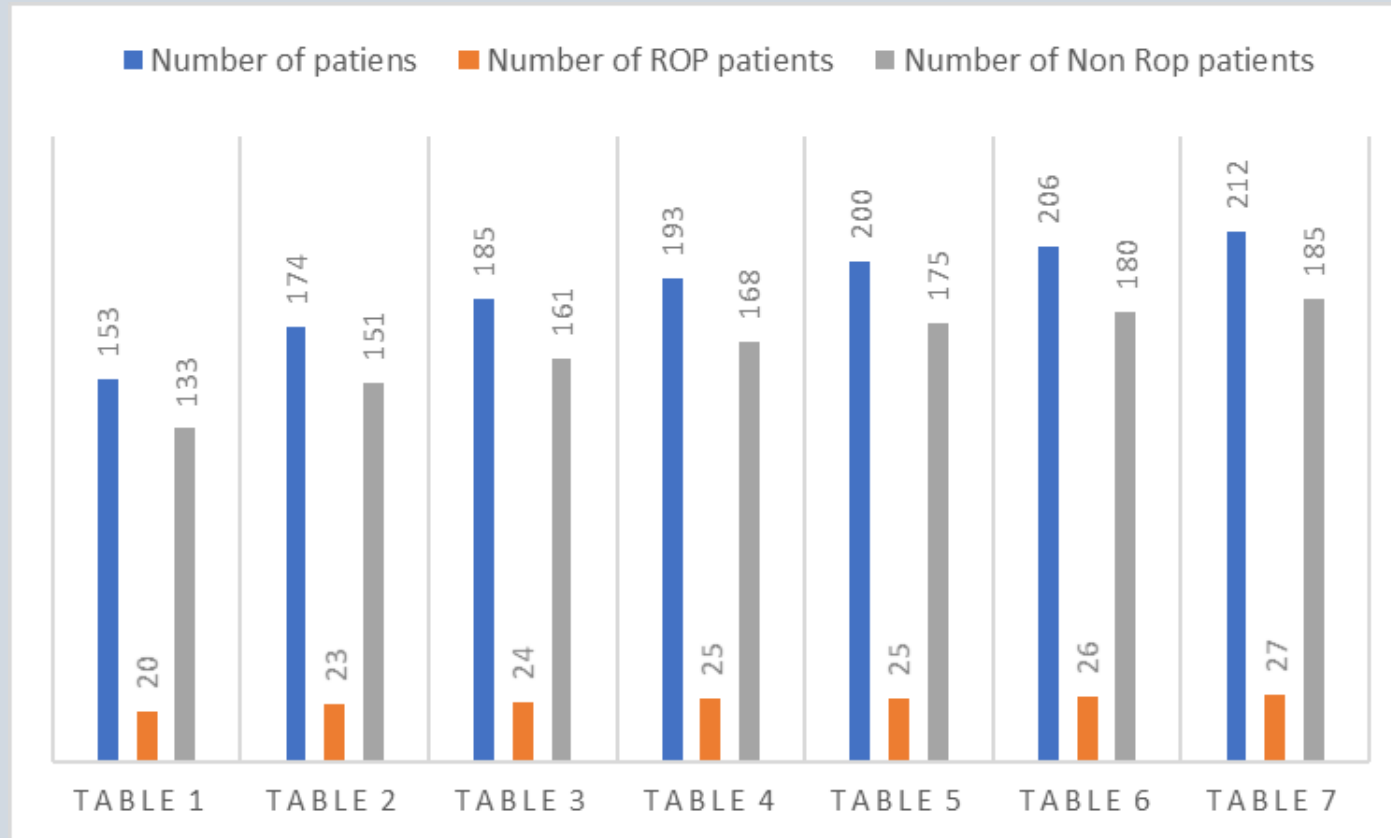
(day 4 to day 10) tables_50% and above



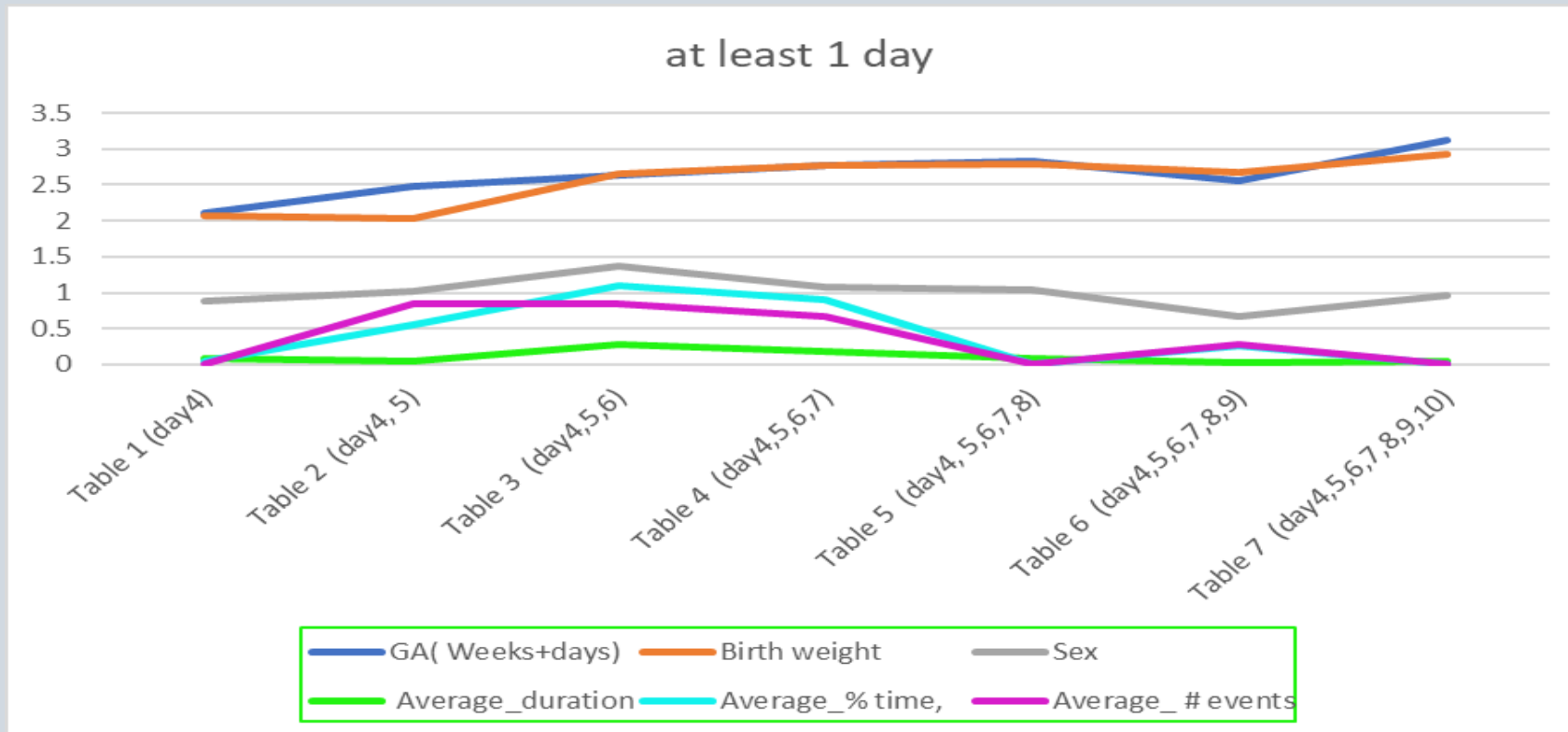
Trends over tables for 50% and above data



(day 4 to day 10) tables_ at least one day data



Trends over tables for at least 1 day data



Trends over tables for at least 1 day data

