Predicting Newborn Health

With Machine Learning

PRAMS
PREGNANCY RISK ASSESSMENT MONITORING SYSTEM

Meet The Team
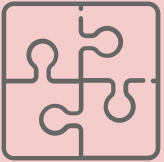

Patrick Arnold
Project Lead
GitHub

Agenda

Objectives

Data Overview

Modeling
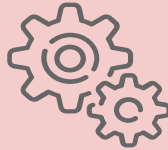
Recommendations

Future Insights

Objectives

Objectives — Overview — Modeling — Recs — Future
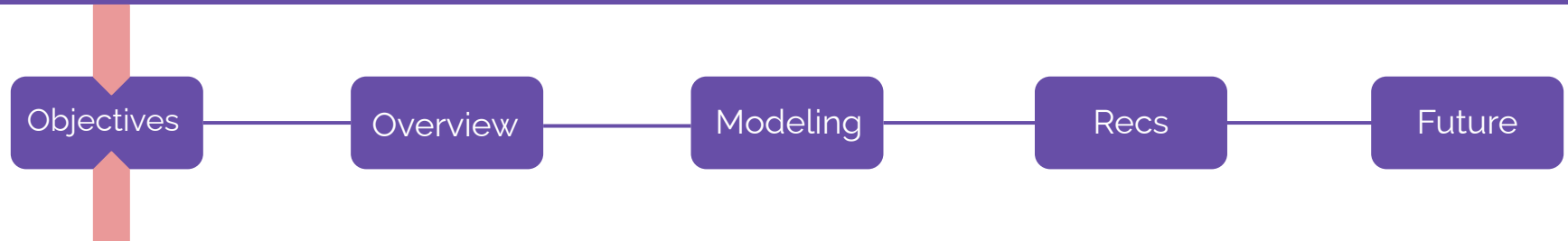
PRAMS Birth Preparedness Initiative

- USA infant mortality rate is 6 in 1000
- Build model to predict newborn health
- Determine best ways to improve infant health outcomes

APGAR Score

APGAR SCORES EXPLAINED

Indicator	0 Points	1 Point	2 Points
A Appearance (skin color)	Blue; Pale	Pink Body; Blue Extremities	Pink
P Pulse	Absent	Below 100 bpm	Over 100 bpm
G Grimace (reflex irritability)	Floppy	Minimal Response to Stimulation	Prompt Response to Stimulation
A Activity (muscle tone)	Absent	Flexed Arms and Legs	Active
R Respiration	Absent	Slow and Irregular	Vigorous Cry

Bottom Line

- Model Identified 6 in 10 At-Risk Newborns
- Second trimester exam
- Launch prenatal care program

Data Overview

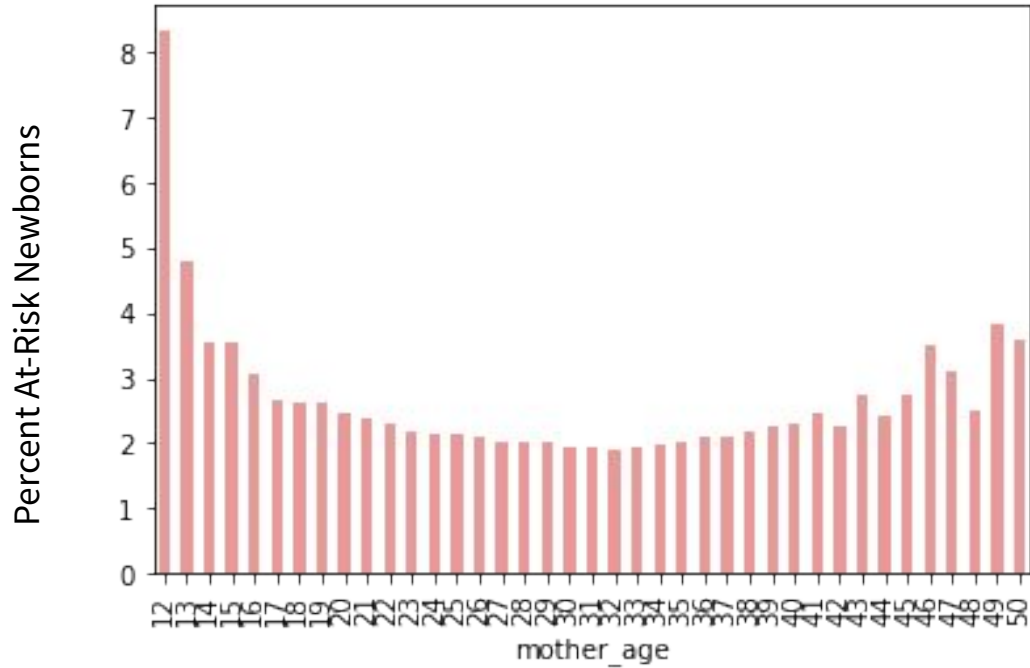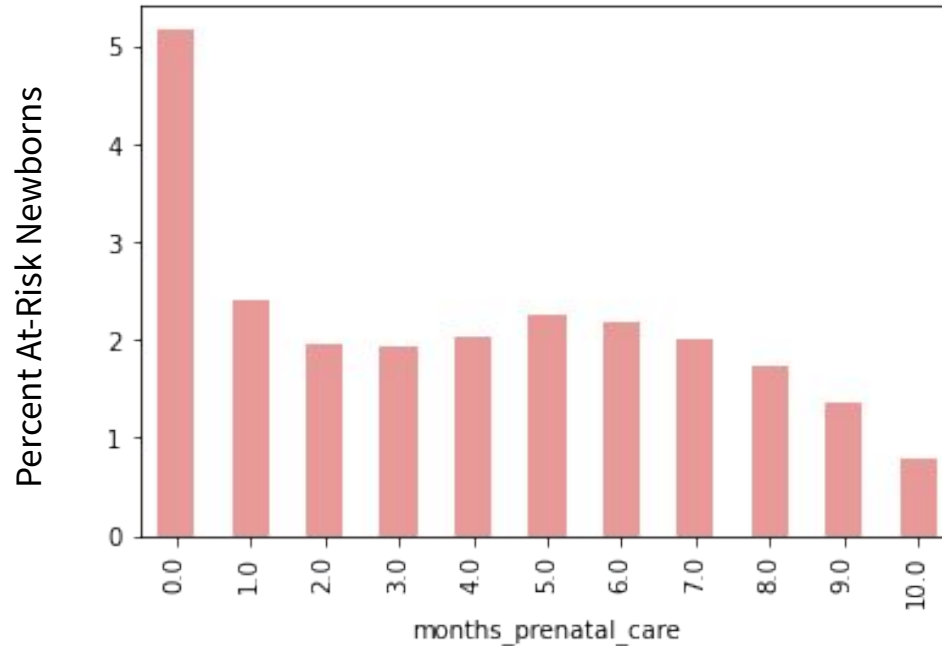Objectives — Overview — Modeling — Recs — Future
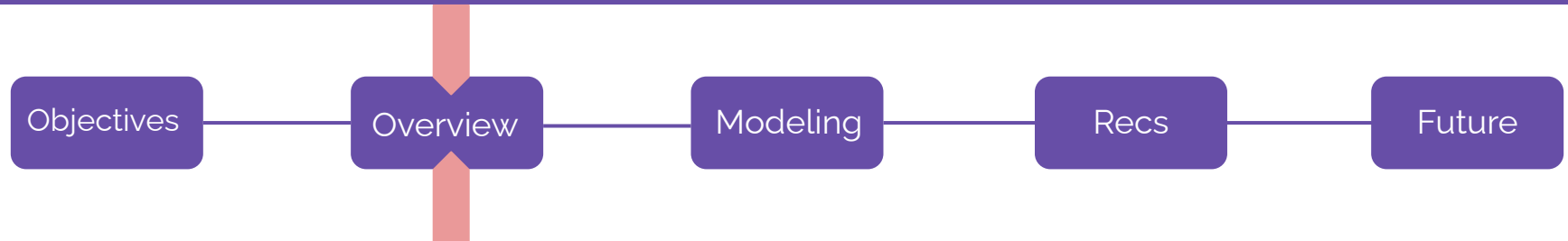
Data: National Center for Health Statistics

- 20,000 births
- Sampled from over 3 million in USA 2019
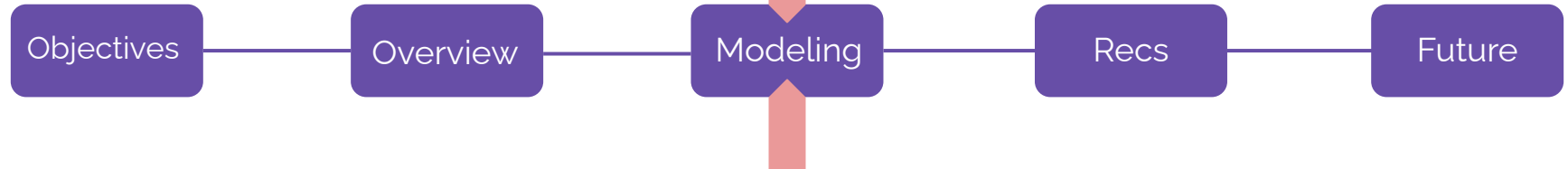- 2% of newborns have a low APGAR Score

Mothers Aged 17 - 40 Had Healthier Newborns

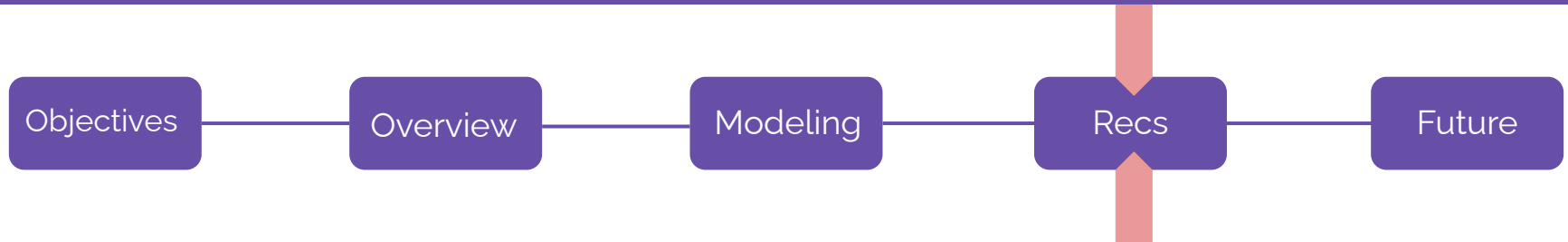# Three Months of Prenatal Care Significantly Improves Newborn Outcomes

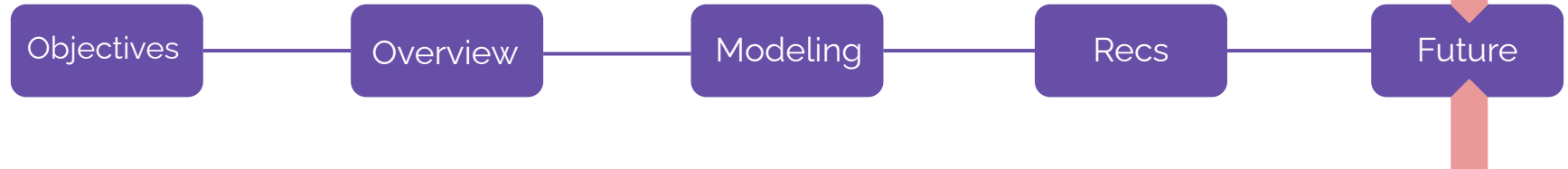# Modeling

Best model Identified 6 in 10 At-Risk Newborns

Recommendations

Objectives — Overview — Modeling — Recs — Future

Model Deployment

- Model Identified 6 in 10 At-Risk Newborns
- Second trimester exam
- Launch prenatal care program

Future Insights

Objectives — Overview — Modeling — Recs — Future

- Other countries
- Compare resampling methods
- Different models for each milestone of pregnancy