Understanding Student Performance

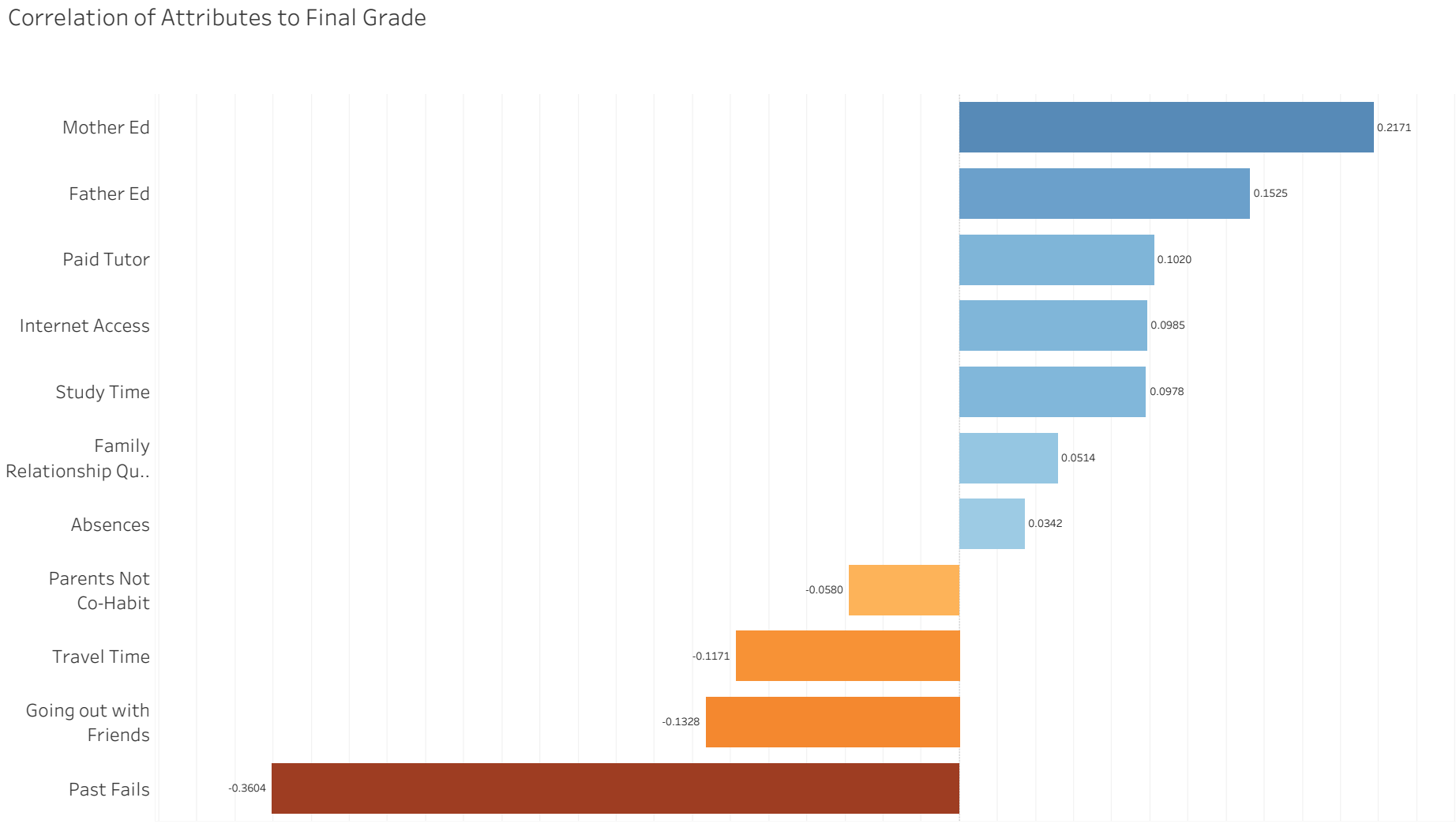
Proposal for a data driven study of student performance

Napa Valley Unified School District
March 2022

Example:
A study of secondary school student performance in Portugal

- Wine growing region of Portugal similar to Napa.
- Study of performance in math class.
- 400 students, 30 attributes were surveyed.
- Snapshot in time.
- Did a simple correlation study to illustrate the potential of data analytics.

Past failure is the best predictor of future failure
Parents' educational level is the best predictor of good performance

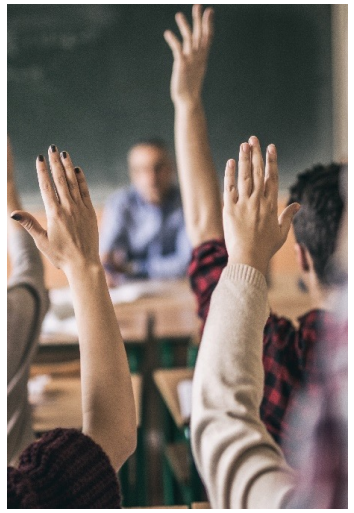


Based on a study of secondary school students in Portugal
Source: UC Irvine data repository

But Why?

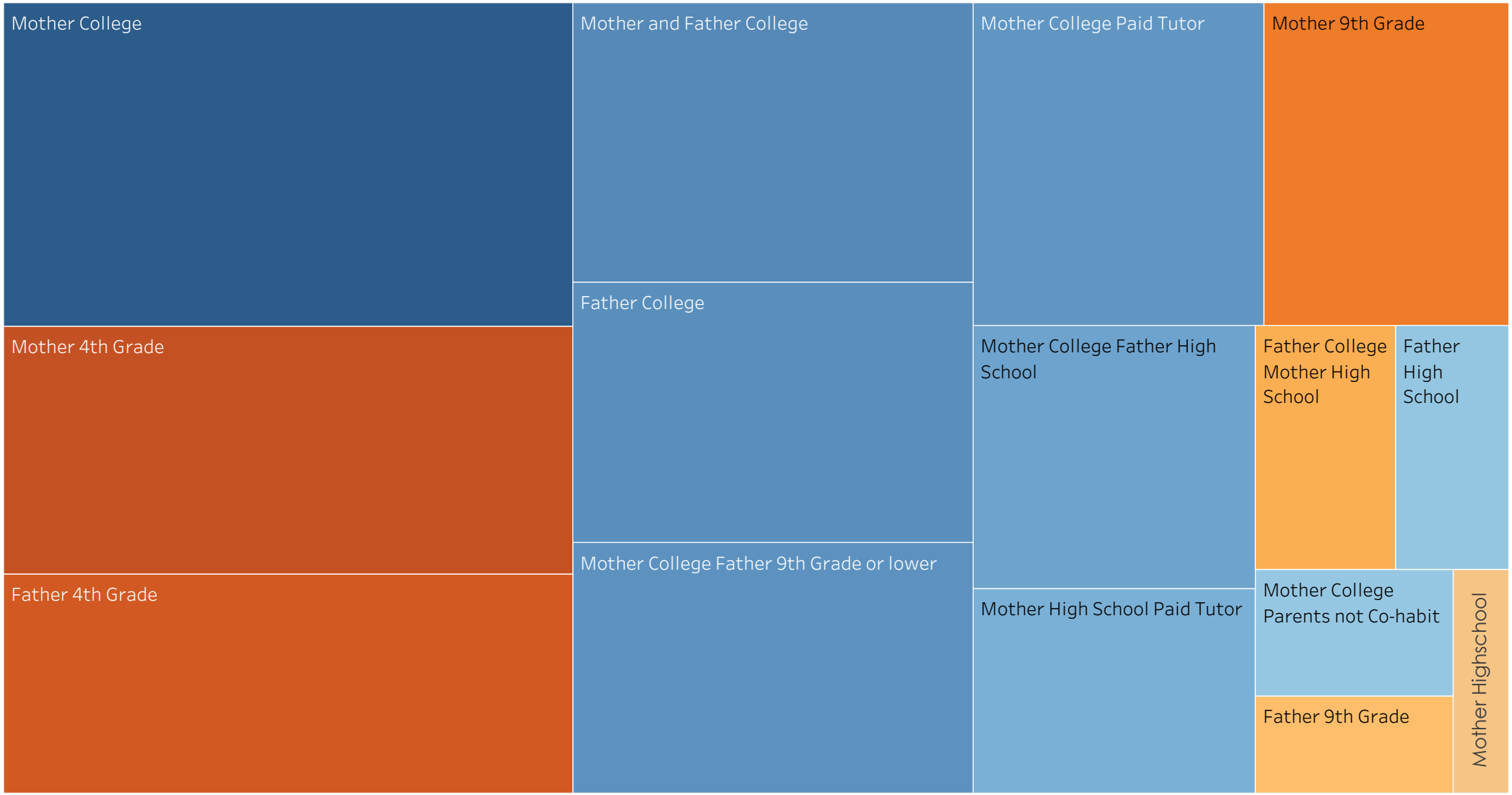
The Portugal study provides some initial insight, but many questions remain

- Other potential predictors
- Leading(time) predictors
- Root causes of first failure
- Detail behind parent educational level
  - Ability to help
  - Value placed on education
- Relationship between predictors



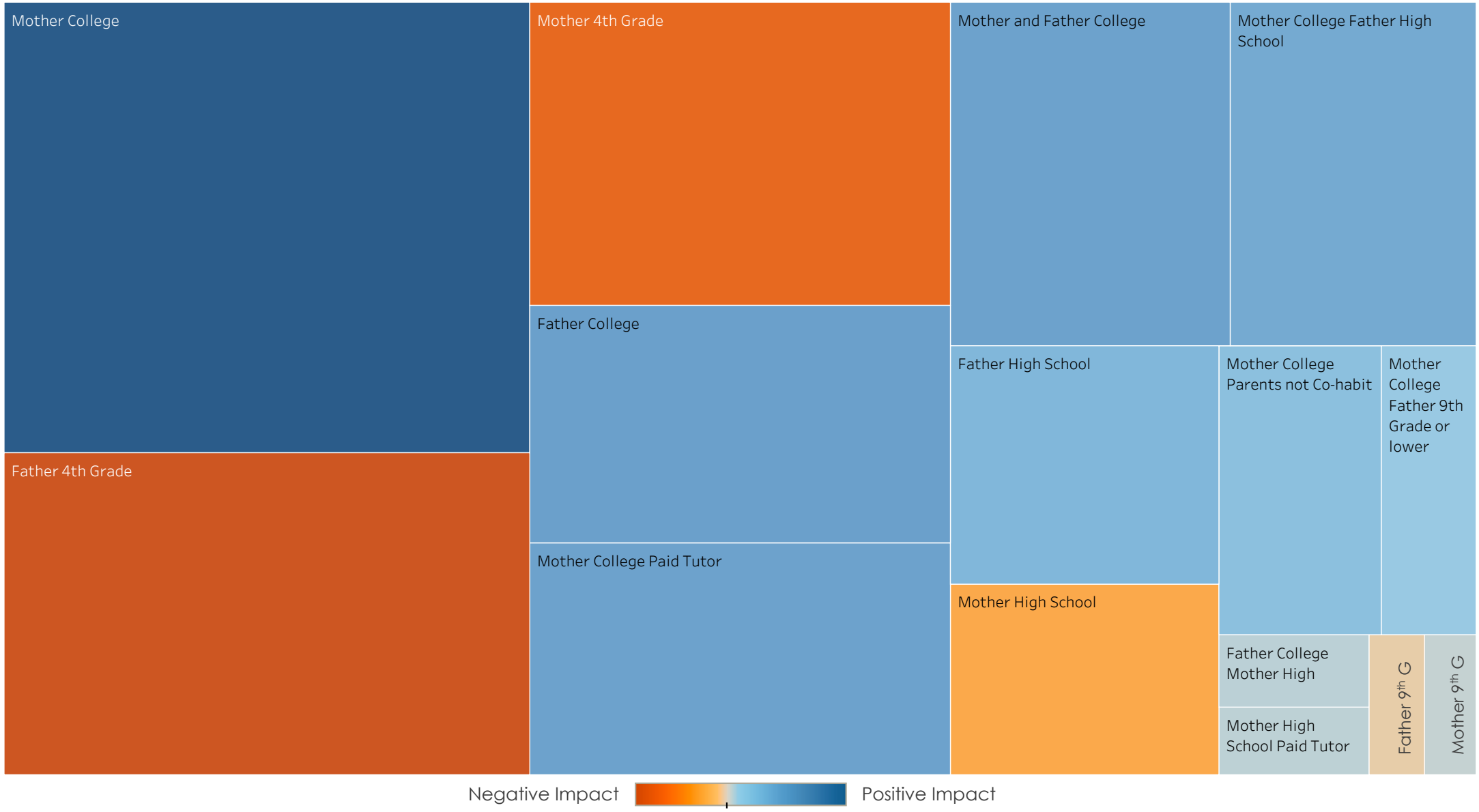
Mother's education level has high impact on final grade

Correlation of Parent Education Level to Final Grade

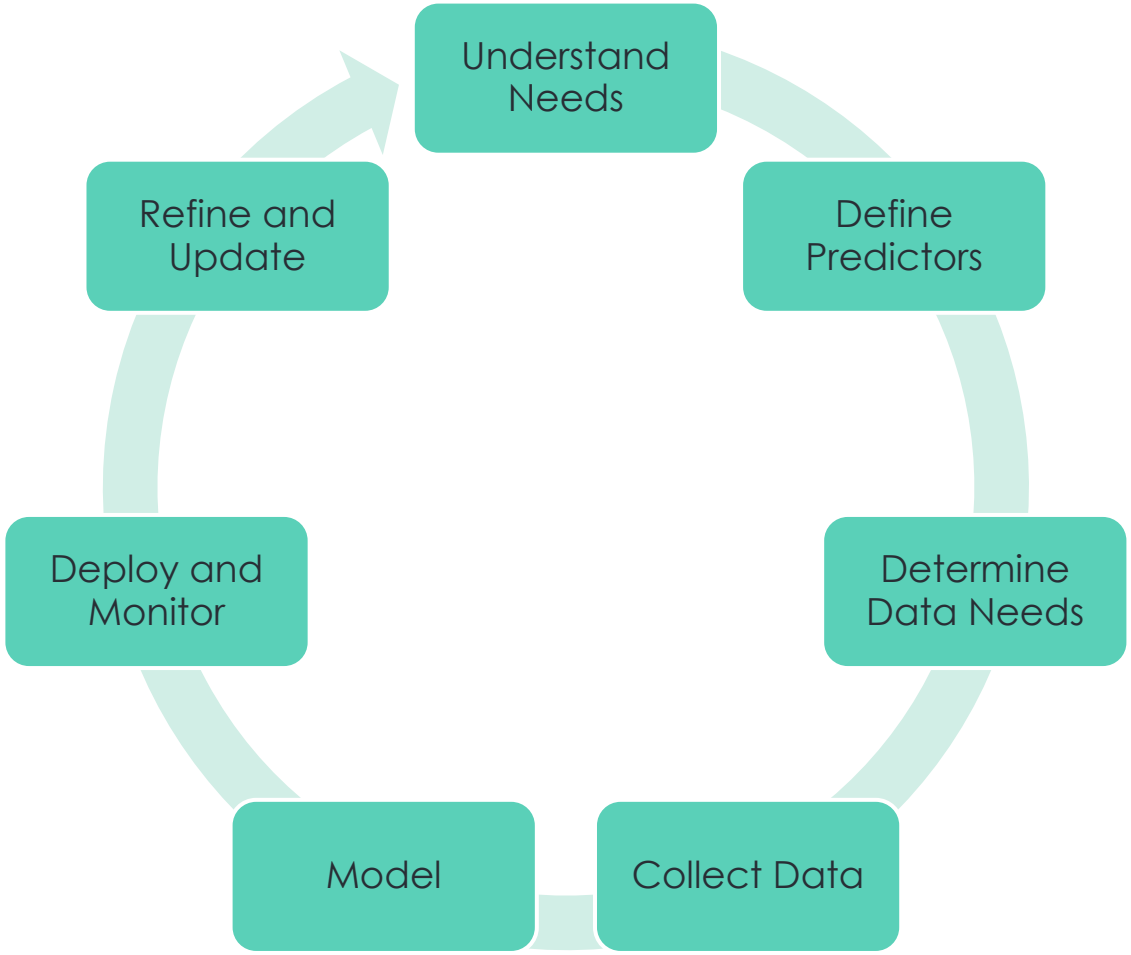


Mother's education level has high correlation to past failure

Correlation of Parent Education Level to Past Failure

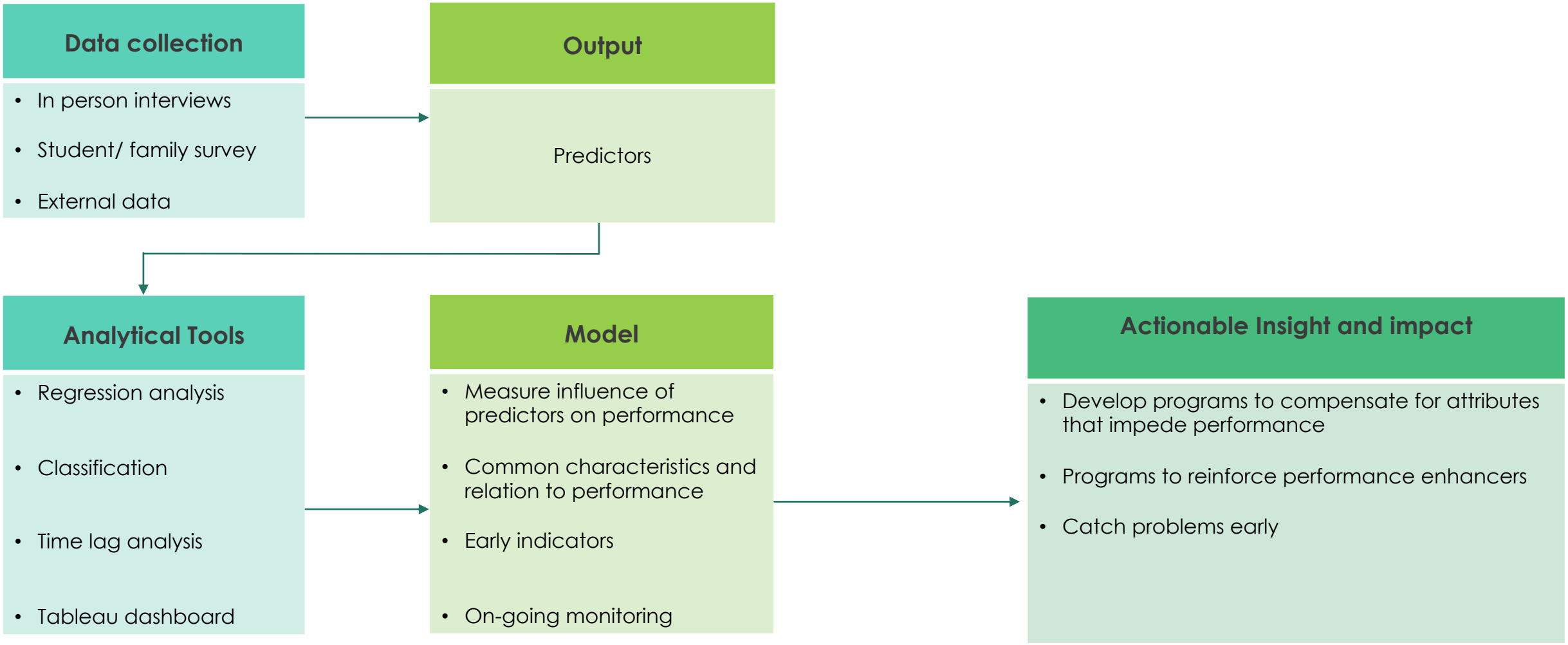


Agile, iterative process to define needs and build model



- Participation from core client team
- Communication intensive at all levels
  - Daily team meetings
  - Weekly updates and feedback
- Develop, get feedback, refine, iterate

Portugal data confirm relationship between predictors and performance
We can do more :



Regular success and progress measurement

- Low hanging fruit: expect internet access and tutoring to improve performance by approximately 10 %
- Communicating progress and issues to your satisfaction
- Identifying and collecting data
- Shaping data into a usable format for your organization
- Model meaningful insight
- Detect early signs of performance problems

A few assumptions and risks we would like to note

Assumptions	Risks	Risk Mitigation
• Student performance can be modeled • Predictors are stable over time • Core client team of 2-3 persons with near fulltime availability • Access to key stakeholders and decision makers	• Data privacy issues • Lack of participation by students and families in data collection efforts • Time to collect data • Key predictors are not within control of school district	• If legal/privacy issues emerge around critical data needs, reevaluate project approach and possibly viability • Regular data collection

Project timeline