HULT
INTERNATIONAL
BUSINESS SCHOOL

GROUP 4

Priyanka Saini

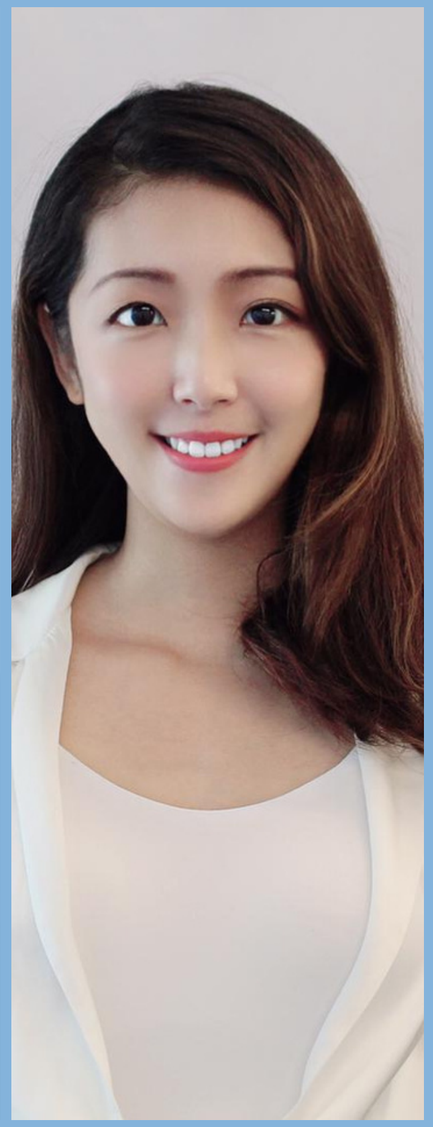
Project Manager

Siddharth Varada

Data Scientist

Veera Thota

Healthcare Specialist



Amber Wang

Business Analyst

PHARMACO

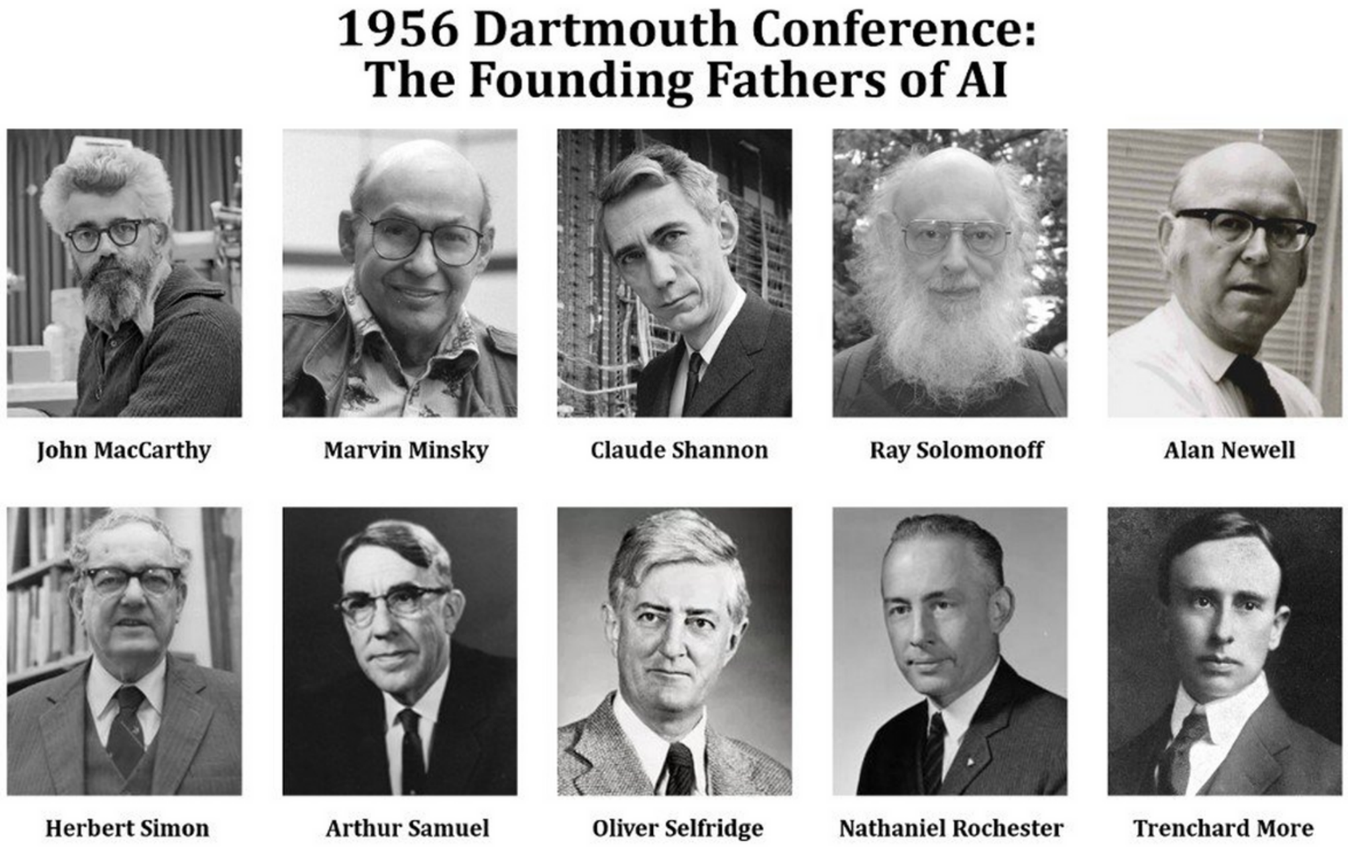
INTRODUCTION

DATA COLLECTED AND EXTRACTED BY ARTIFICIAL INTELLIGENCE

SINCE 1950'S

THE PROBLEM?

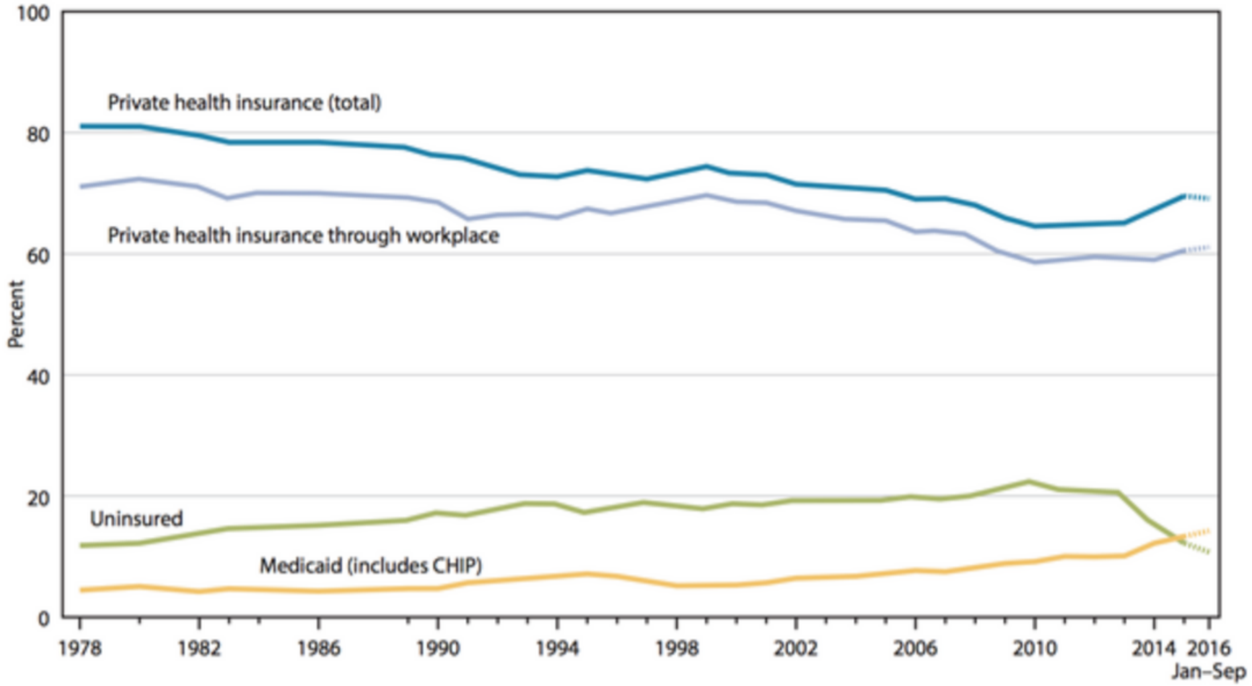
ARTIFICIAL INTELLEGENCE ALGORITHMS



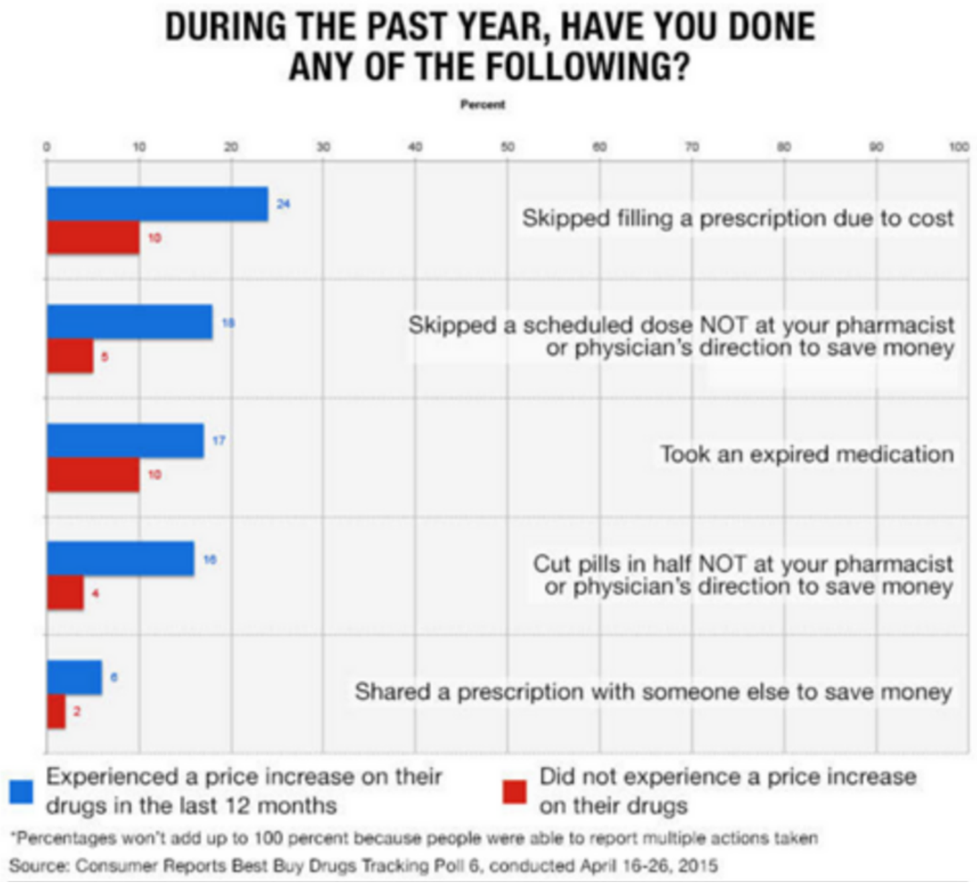
As of September 2016, 12.3% of Americans remained without any medical insurance coverage. The percentage is higher for those aged 19-25, as 14.6% of them are uninsured.

PHARMACO

Figure 27. Health insurance coverage among adults aged 18–64, by type of coverage: United States, selected years 1978–September 2016 (preliminary data)



Source: PharmaCo, 2016



OBJECTIVES

The First Objective

To make algorithms gender & race and discrimination-free

The Second Objective

To make AI more efficient keeping individual's privacy intact

The Third Objective

To find a solution for Pharma Co to maximize profits and reduce expenditure

MECHANICS

```
Coefficients:
                     Estimate Std. Error z value Pr(>|z|)
(Intercept)         0.5933658  0.0333846  17.774  < 2e-16 ***
num_lab_procedures -0.0030343  0.0004087  -7.425 1.13e-13 ***
num_procedures     -0.1298805  0.0048184 -26.955  < 2e-16 ***
num_medications     0.0845247  0.0013442  62.882  < 2e-16 ***
number_outpatient   0.0053073  0.0064490   0.823    0.411
number_emergency    0.0777659  0.0119300   6.519 7.10e-11 ***
number_inpatient   -0.0010917  0.0066794  -0.163    0.870
number_diagnoses   -0.0490977  0.0041678 -11.780  < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Num of procedures has the biggest impact on diabetes medication.

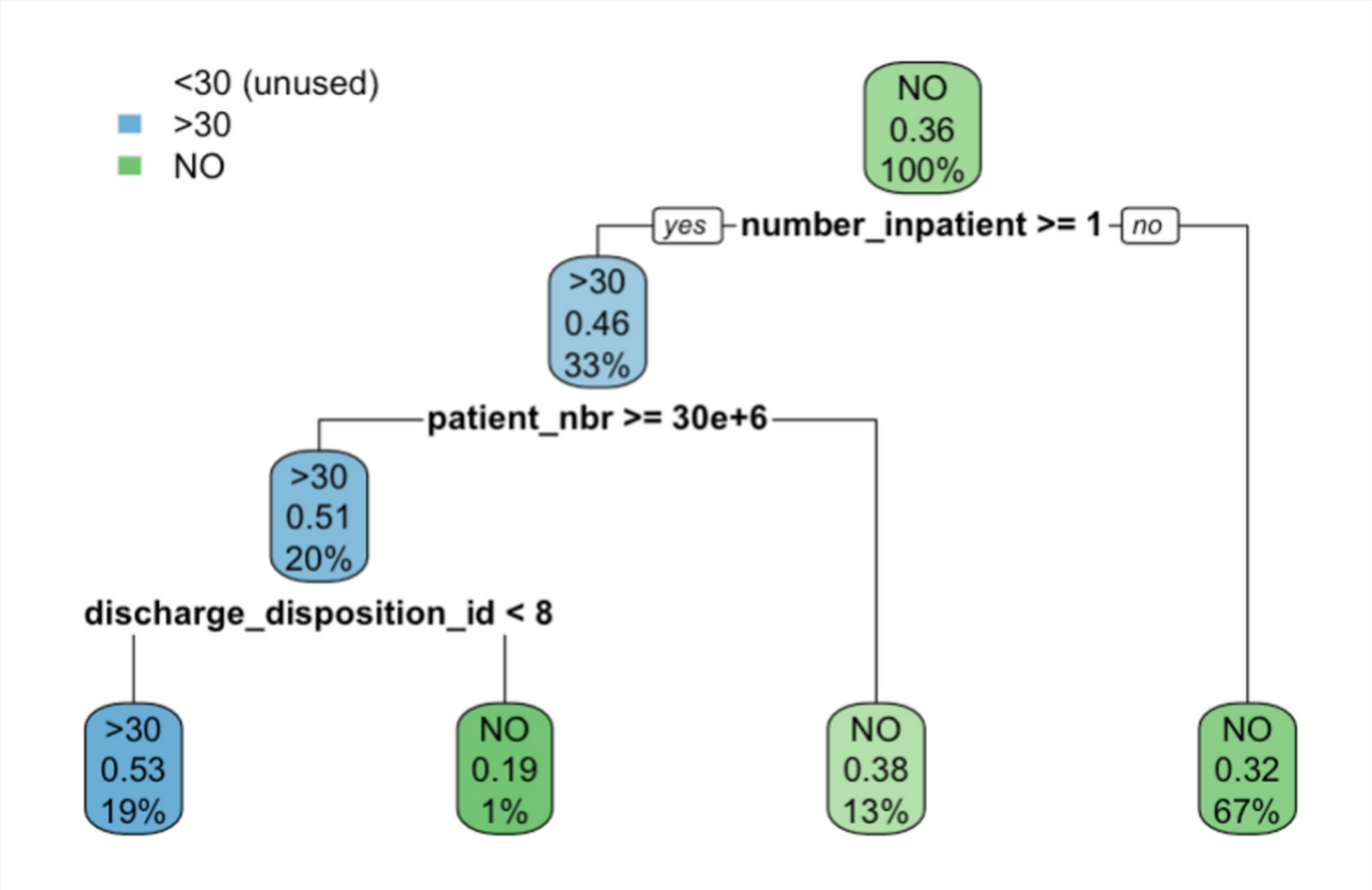
MECHANICS

```
Call:
lm(formula = payer_code_binary ~ race, data = diabetic_data)

Residuals:
    Min      1Q  Median      3Q     Max 
-0.7605 -0.6251  0.3749  0.3749  0.4875 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)    
(Intercept)          0.76046    0.01021  74.497  < 2e-16 ***
raceAfricanAmerican -0.24213    0.01079 -22.431  < 2e-16 ***
raceAsian           -0.17387    0.02176  -7.992 1.35e-15 ***
raceCaucasian       -0.13538    0.01036 -13.068  < 2e-16 ***
raceHispanic        -0.24794    0.01484 -16.702  < 2e-16 ***
raceOther           -0.20498    0.01617 -12.677  < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Linear regression model. Bias against race

MECHANICS

Prediction of Decision Tree purposes- target clients



We had 3 categories that the patient falls into for readmission

- NO: no readmission
- >30: more than 30 admission chance
- <30: less than 30 admission chances

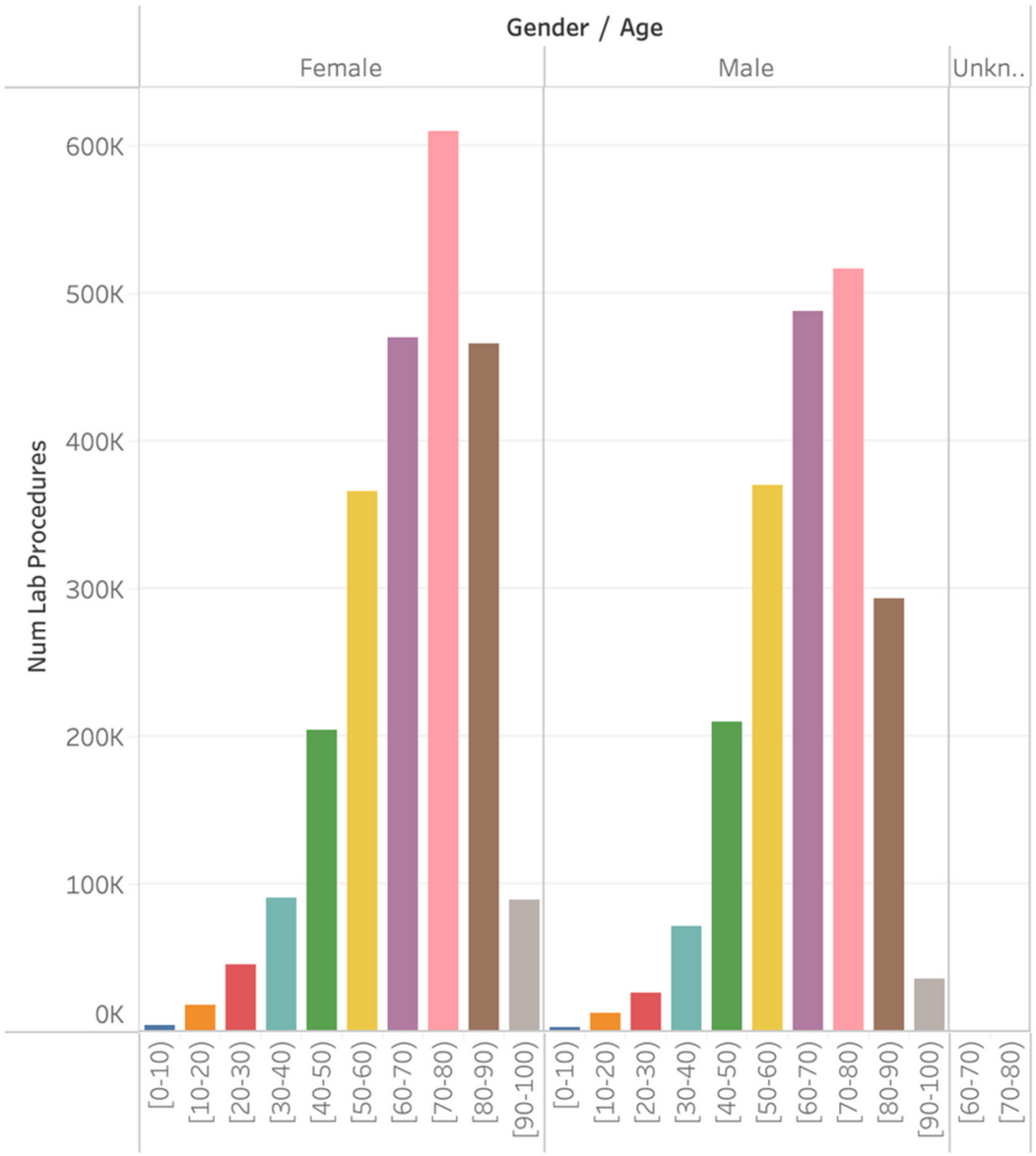
The model for PharmaCo can predict their future patients how long they are admitted.
The longer they stay the more drugs they use

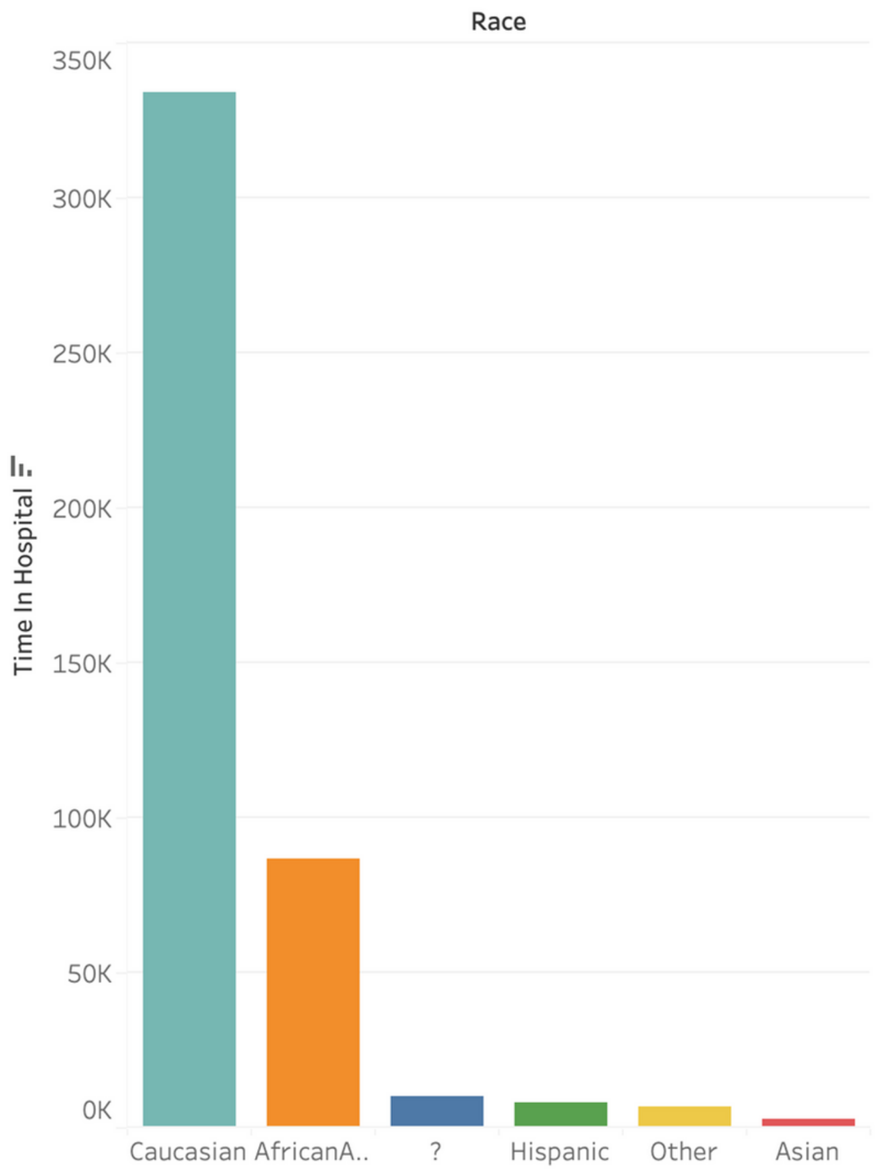
MECHANICS

Project Findings

Females (Aged 70-80) are more vulnerable to diabetes than males as they undergo a higher number of lab procedures.

The companies will have to come up with unique models rather than relying on a generalized method of payment Targetting age group from 40-80.

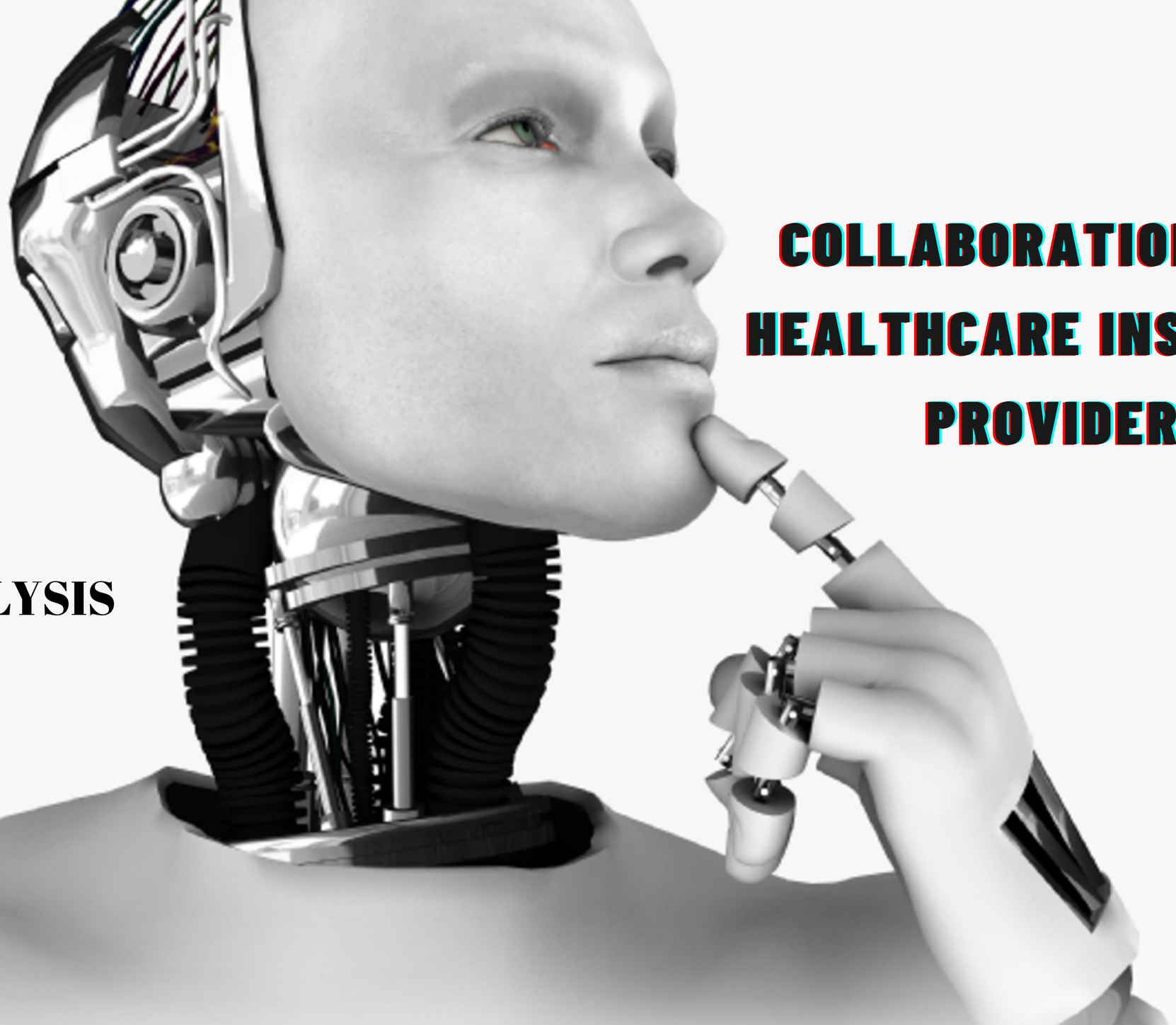




MECHANICS

Project Findings

The Caucasian group spends the most time in hospital so insurance companies can look to target this in their financial models and promotional campaigns.



COLLABORATION WITH HEALTHCARE INSURANCE PROVIDERS

BENEFIT TO SOCIETY

RECOMMENDATION

BASED ON ANALYSIS

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