Nobel Prize Winners - Analysis

E10

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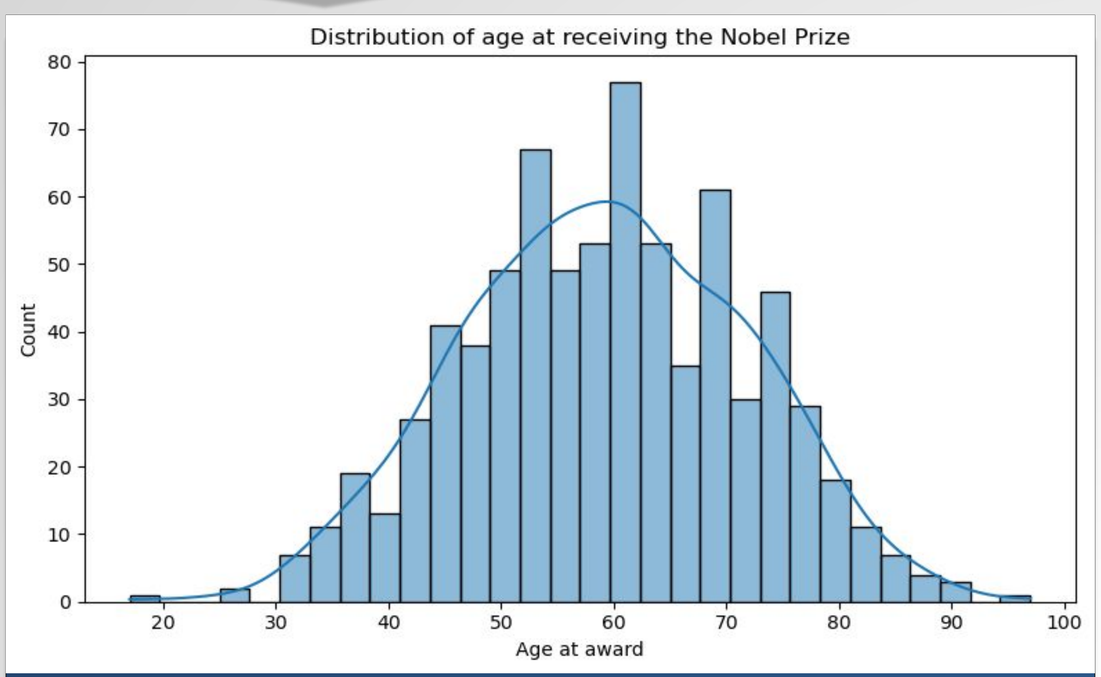
1. Introduction

- The aim of this project is to explore patterns in Nobel Prize awards and relate them to broader country-level development indicators.
- **Business goals:**
  Analyze distribution of laureates by time, category, gender, region and age.
- Model age at award based on category, decade, gender and region.
- Explore relationship between country HDI and Nobel output per capita (1990+)



- Age at receiving the Nobel Prize, all laureates 1901–2023. The distribution is roughly bell-shaped with a peak around the late 50s.

2. Datasets

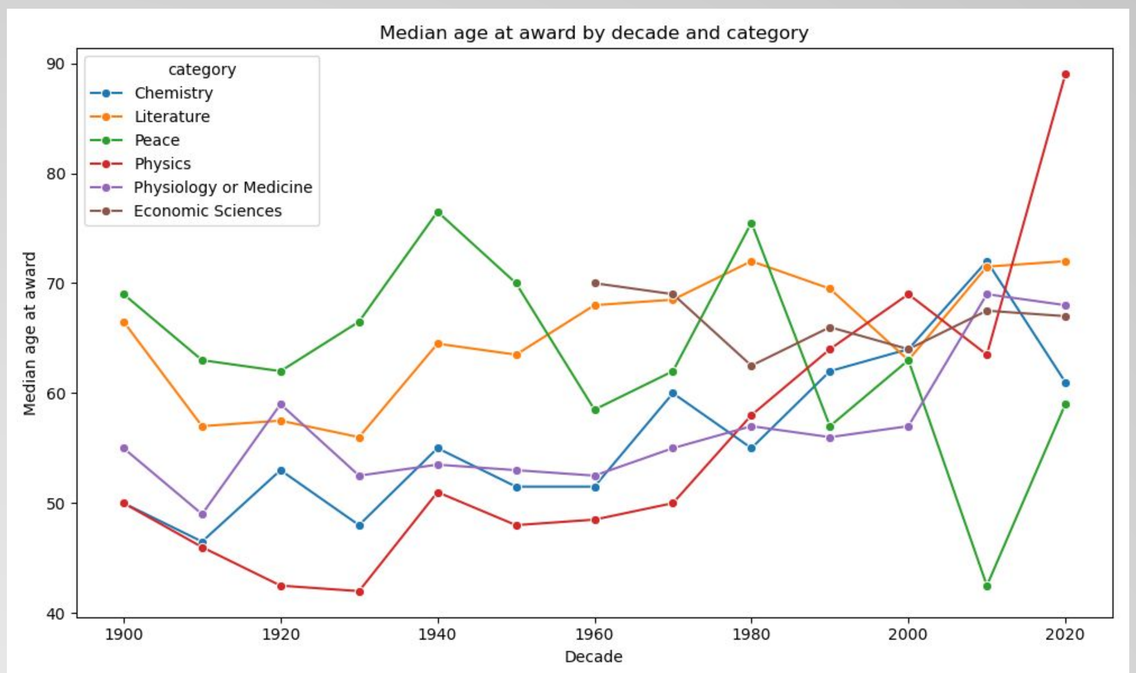
- We are using two datasets from Kaggle: Nobel Laureates [1901-2025] and Human Development Index Dataset [1990-2022].
- The first provides laureate level information. The second provides country level HDI and population measures.

Reference:

- https://www.kaggle.com/datasets/ahmeduzaki/nobel-prize-winners-dataset-1901-2025
- https://www.kaggle.com/datasets/lucasyukioimafuko/human-development-index-hdr-dataset-1990-2022

3. Used Methods

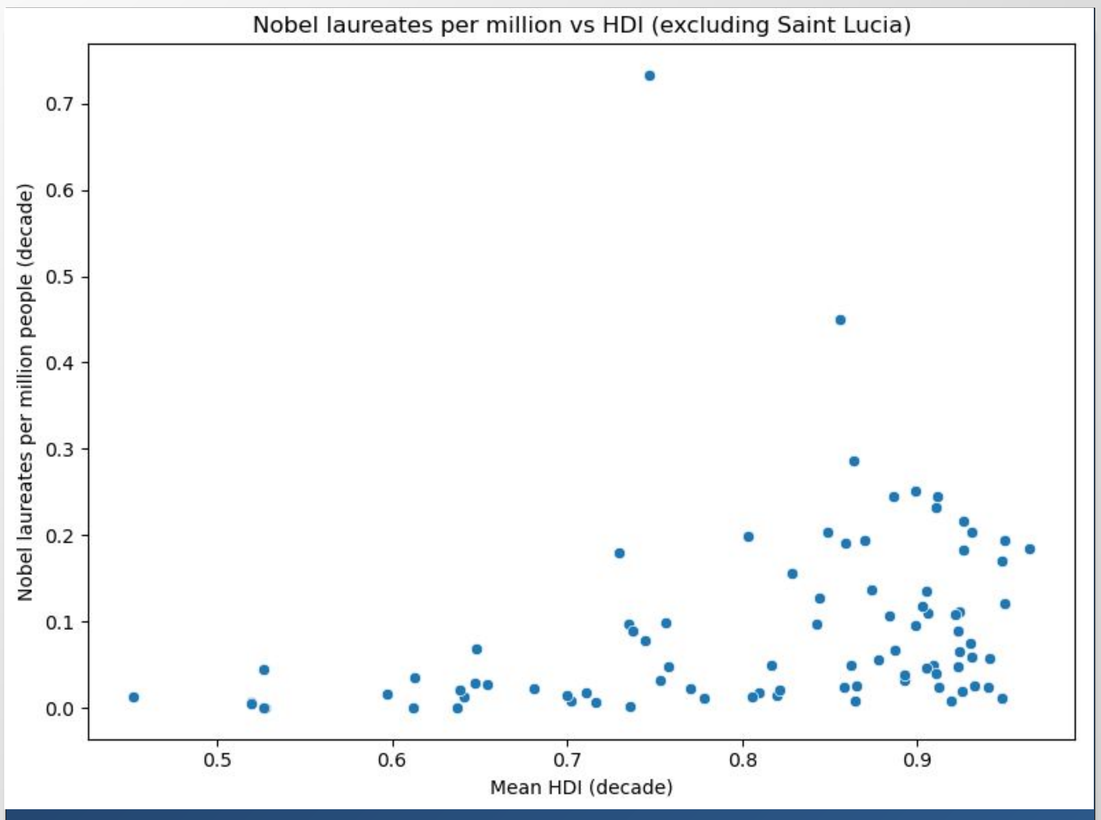
- Data cleaning and data-quality checks for the Nobel dataset.
- **Feature engineering** - birth_year, age_at_award, decade, region.
- **Exploratory data analysis** -
  age distribution and trends by decade comparisons by category, sex and region.
- **Statistical modelling** - OLS regression for age at award using category, sex, region and time.
- **Scikit-learn experiment** - regression models for age at award (LinearRegression, Ridge, Lasso) train/test split, MSE and R^2 comparison with the OLS model.



- Median age at award for Nobel Prize winners across six categories from 1900 to 2020, showing variation by field and decade.

4. Approach

- **Data cleaning** - removed obvious errors, dealt with missing birth dates and checked that HDI values stay within [0, 1].
- **Harmonising countries** - mapped birth and affiliation countries to a common list of country names and world regions, then joined them with the HDI dataset.
- **Nobel-level analysis** - studied the distribution of age at award, compared categories, sexes and regions, modelled age at award using a linear regression model.
- **Country-level analysis** - aggregated laureates by country and decade, computed Nobel laureates per million inhabitants, linked these outputs to HDI and population data to test the HDI–Nobel relationship.



- Nobel laureates per million people vs mean HDI (country–decade, excluding Saint Lucia). There is only a weak positive relationship (correlation ≈ 0.29).

5. Results and Conclusions

- Our main conclusion is that we can describe several clear patterns (e.g. older laureates over time, strong differences between fields), but we cannot build a practically useful model that would accurately predict a future laureate's age from these simple features alone.

GitHub: https://github.com/KarlGm4n/nobel-dataset