

DATA ANALYSIS PROJECT:

Visualizing the History of Nobel Prize Winners

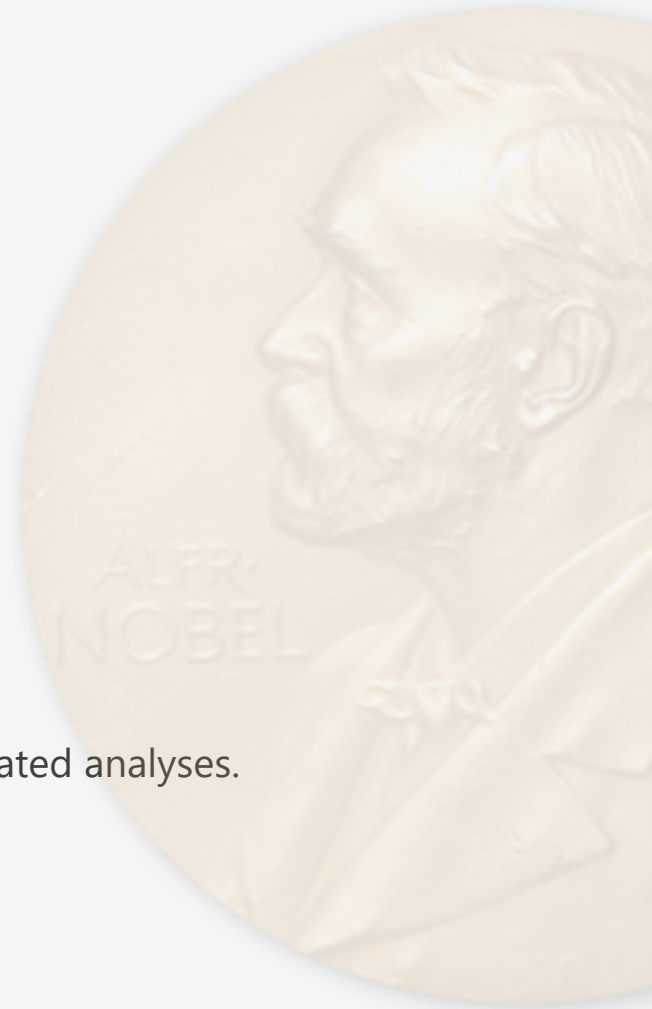
Explore a dataset containing a century's worth of Nobel Laureates



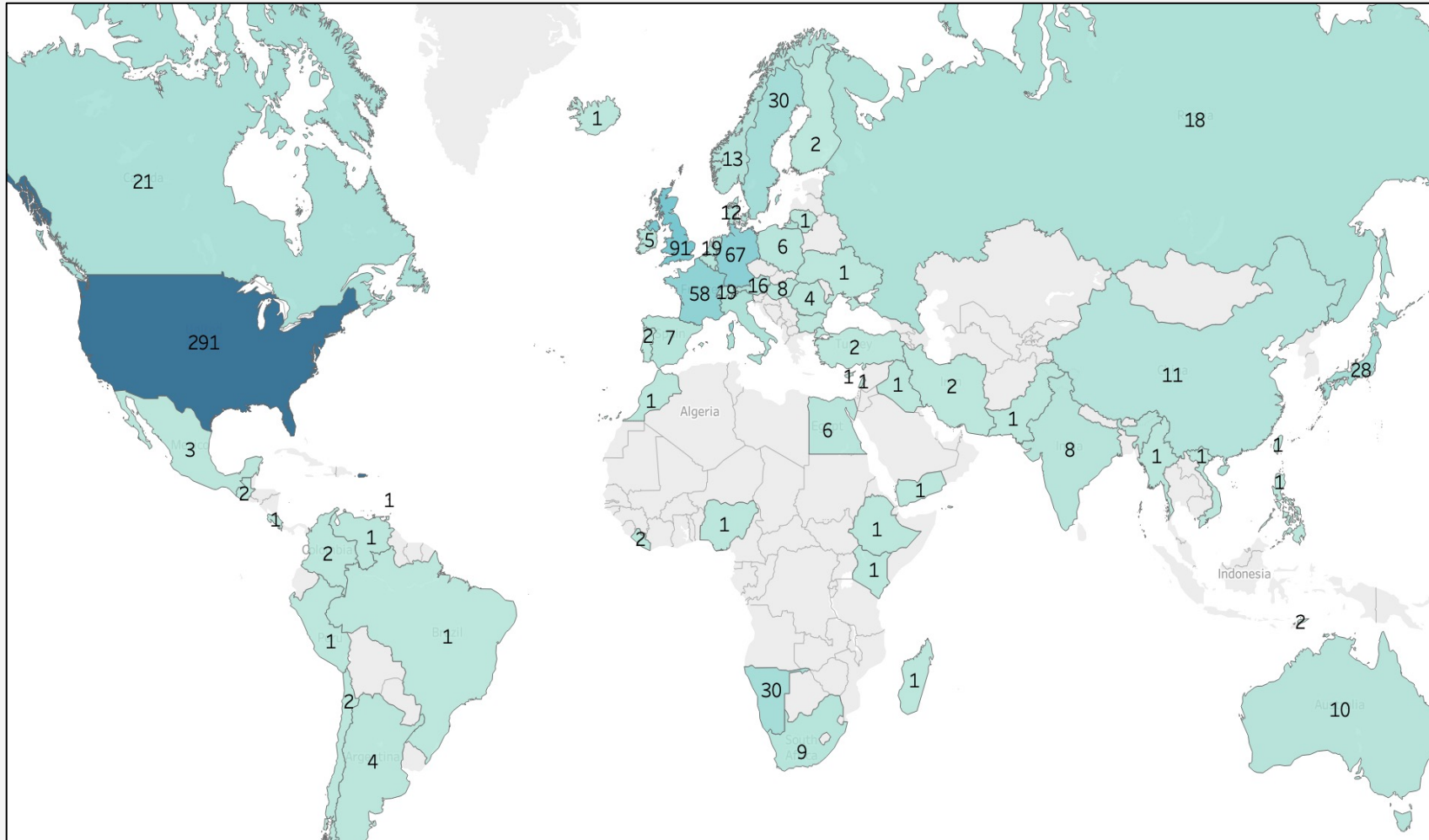
By Supoj Xu (Sean)

Data Overview:

- **Data Size:** 18 columns; 1,000 records.
- **Major Fields:** Year Awarded, Prize Category, Recipient Name, Sex, Country, City, Birthday, etc.
- **Year Range:** 1901 - 2023 (122 years) – there was no Nobel Prize in 1940, 1941, 1942.
- **Nobel Prize** comprises of **6 categories**:
 - *Chemistry, Economic, Literature, Medicine, Peace, and Physics.*
- **Laureate** can be an individual or an organization, and the award can be shared.
- **Country fields** cover both birth country and death country.
- **Historic countries** (Ottoman Empire, Austria-Hungary, USSR, etc.) are excluded from country related analyses.
- **No duplicate** or **missing value** in important columns like ID, name, prize, year, etc.

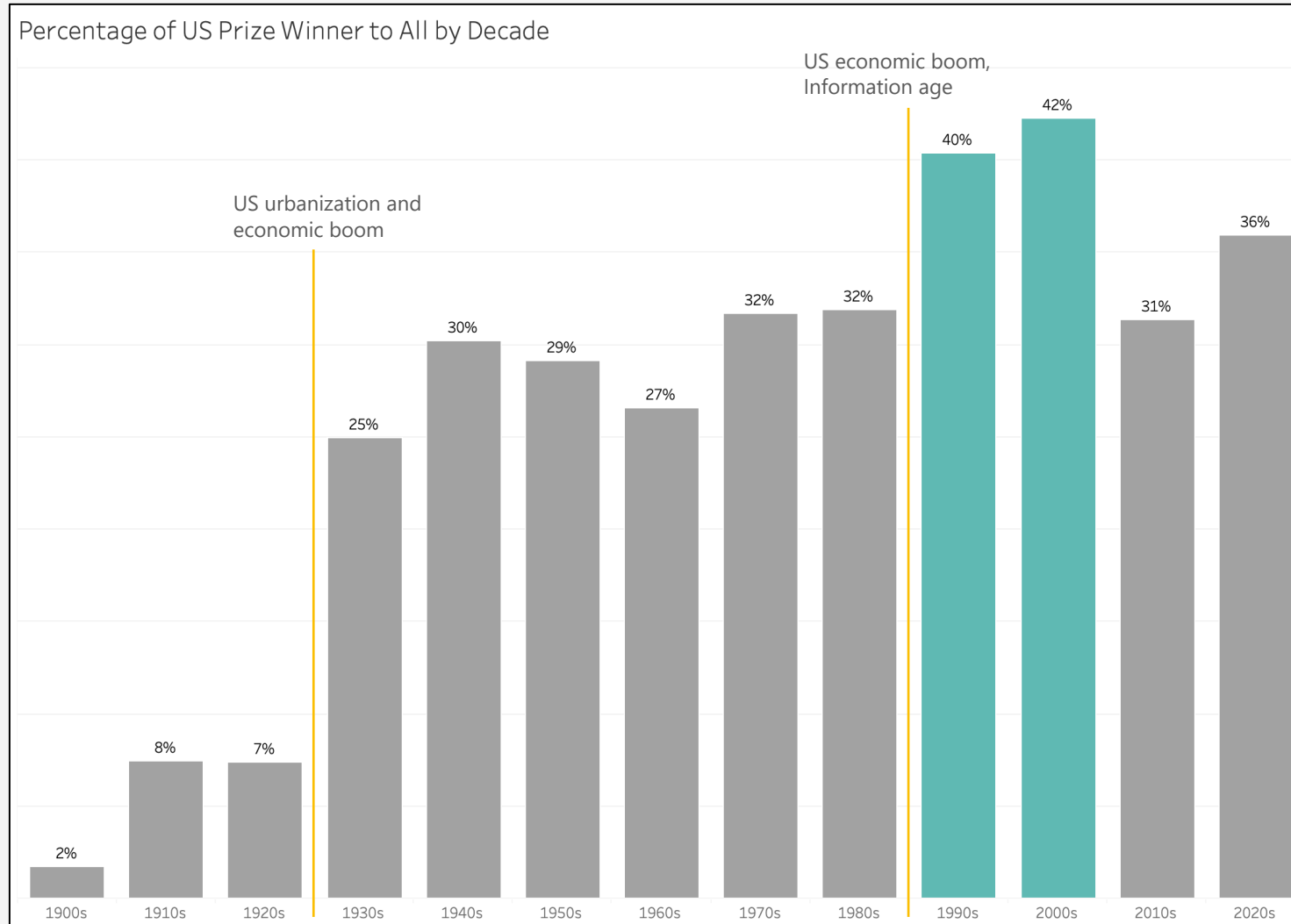


The United States has the greatest number of Nobel Prize winners along with Europe



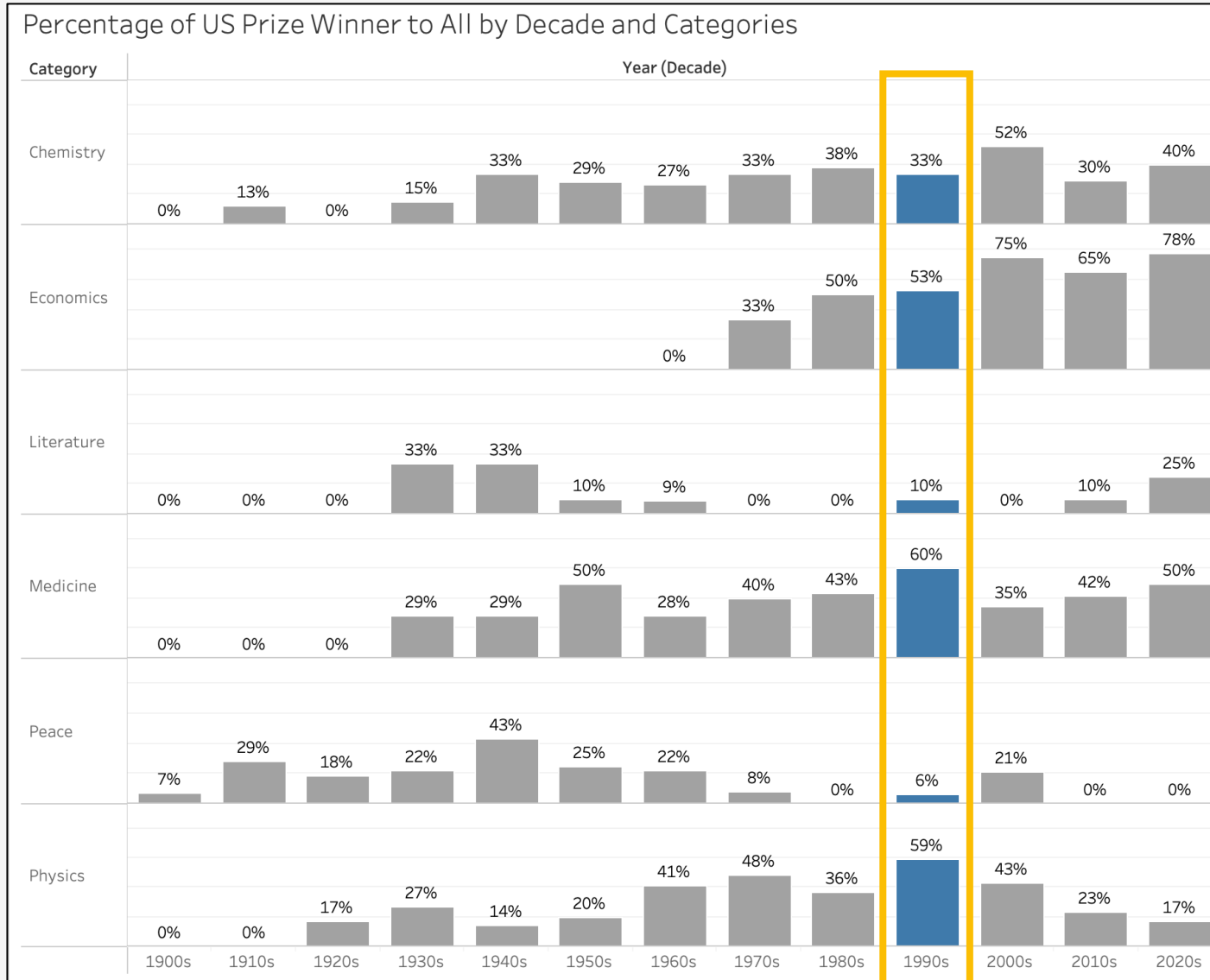
- **291** Nobel Prizes were awarded to **US-born individuals** representing roughly **30%** of all prizes won.
- Following the US, we have **the UK, Germany, and France** with 91, 67, and 58 Nobel Prizes, respectively.
- In Asia, we have **Japan** leading the pack with 28 Nobel Prizes, followed by China and India.
- **Thailand, Indonesia, Malaysia, and Singapore** have no Nobel Prize winner.

The Ratio of US-born Nobel Prize laureate has gone up since 1930s, peaked in 90s & 2000s



- The ratio of US-born Nobel Prize winner has significantly gone up from **7% in 1920s** to **25% in 1930s** and been staying above 25% ever since.
- In **1990s** and **2000s**, the US-born ratio had peaked at **40%** and **42%** to total Nobel Prize winners which is corresponding with the US economic boom and the birth of internet.

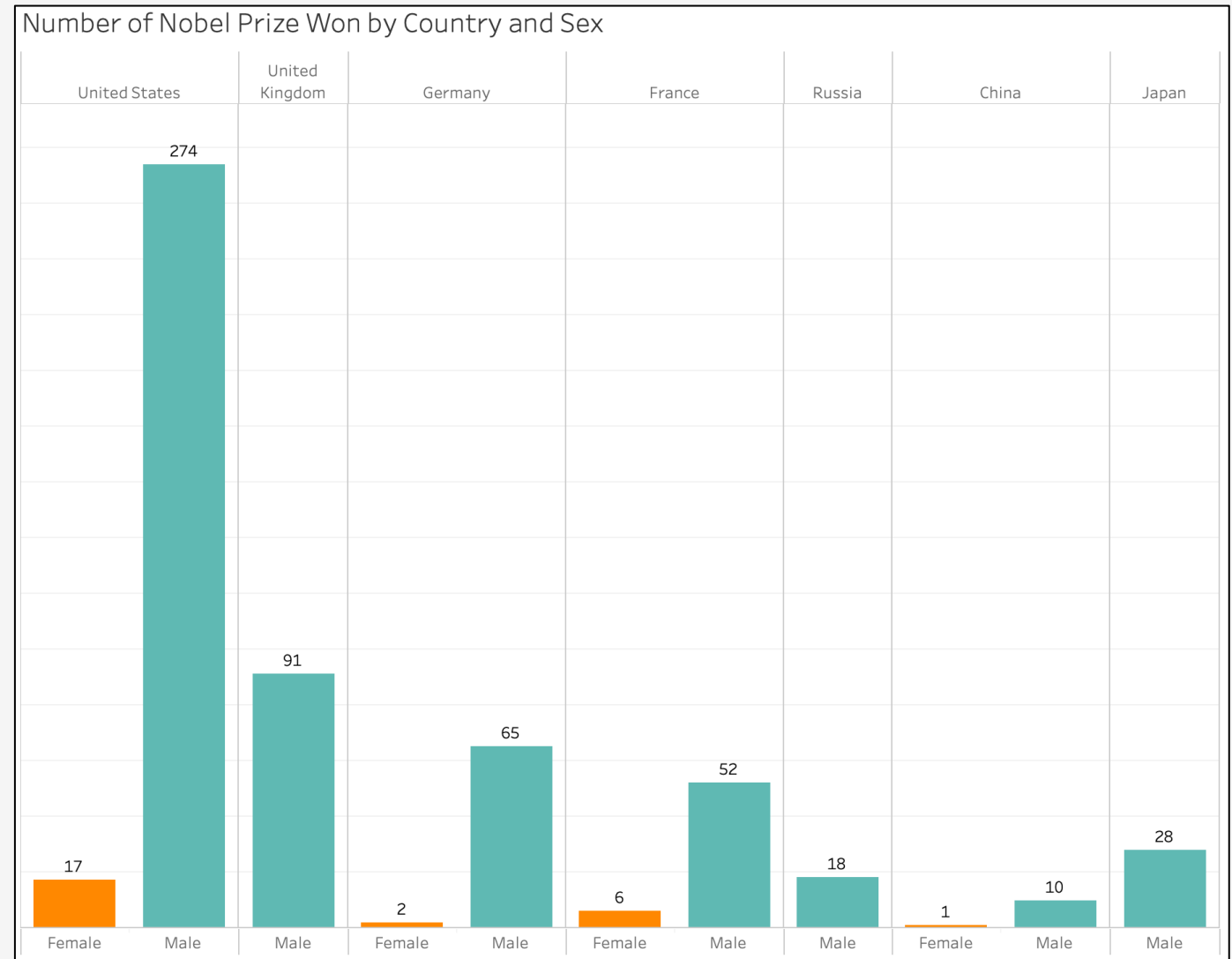
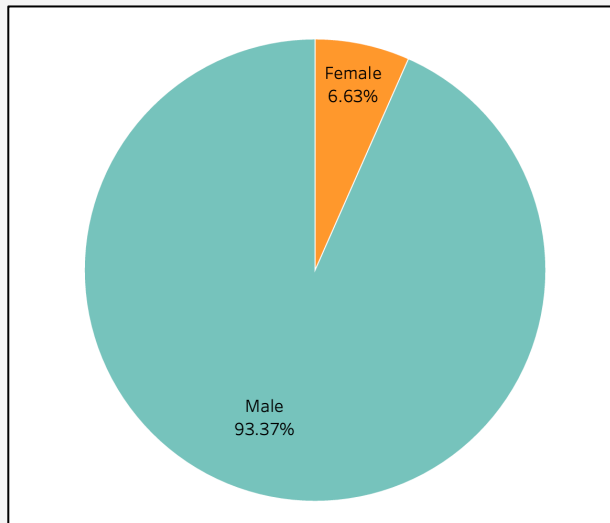
In the 90s, there were US-born Nobel Prize winners in every single category



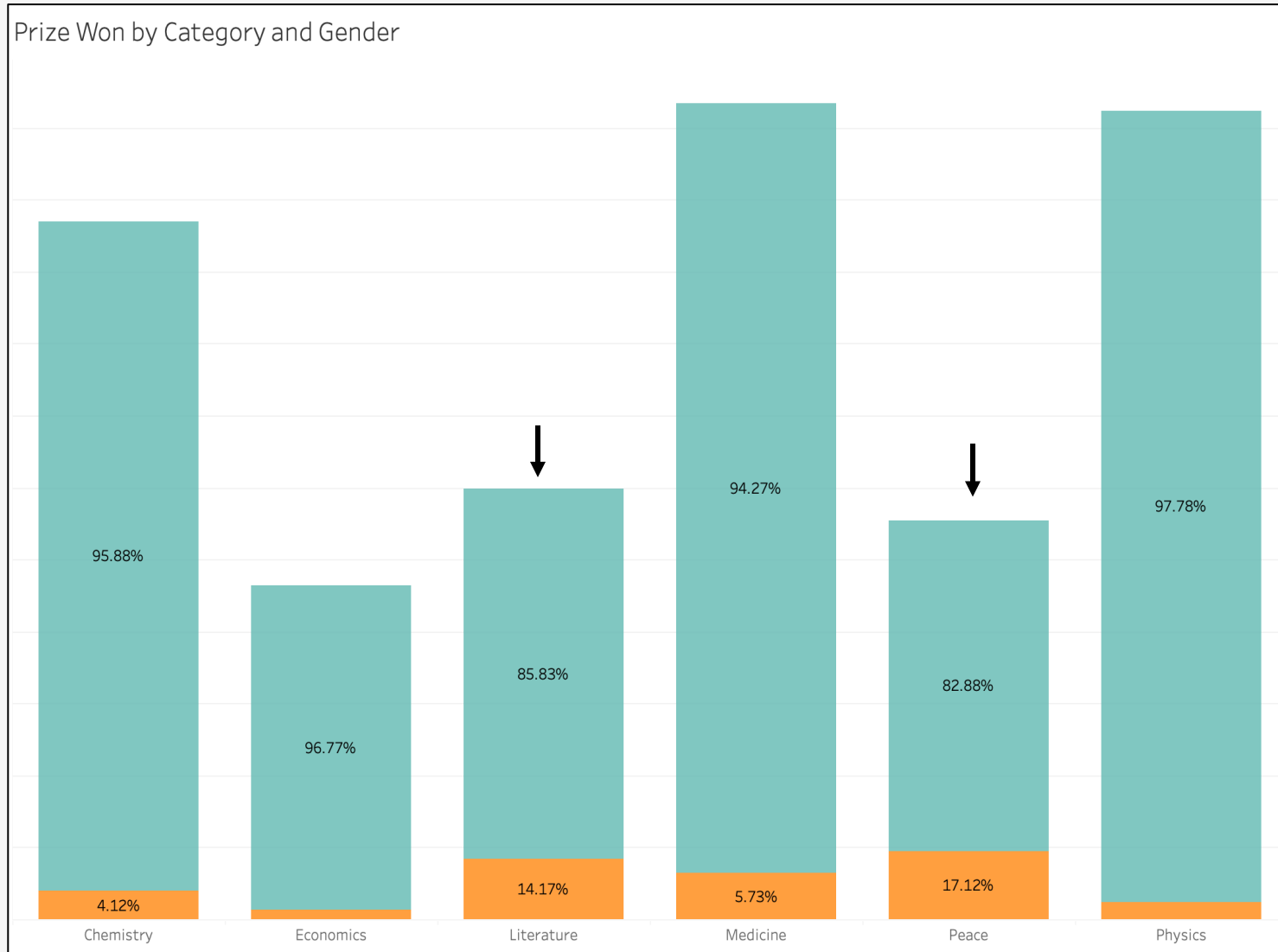
- **1990s** also has among the highest ratios of US-born Nobel Prize winners.
- The US has been very dominating in **science categories** like Chemistry, Medicine, Physics, as well as category of Economics since 1930s.
- The US used to have high portion of Nobel Prize winners in **Peace** category **post 1970s** but have none in the last 2 decades.
- **Physics** has less US-born winners in the past 30 years, while **Economics** has been more and more dominated by them in the past 50 years.

Women are under-represented among Nobel Prize winners accounting for a small fraction of all winners and across the major countries

- Overall, female laureates only represent **less than 7%** of all laureates. While male represents over 90%.
- This low female ratio applies to major countries including **US, UK, Germany, France, Russia, China, Japan**, and more.
- Many countries **only have male winners**, for example, Japan has all 28 prizes won by men.



Peace and Literature categories have among the highest ratios of female laureates



- Female laureates represent **14%** of total in Literature category and **17%** in Peace category.
- Female laureates in **Chemistry, Economics, Medicine, and Physics** categories are extremely under-represented **with less than 6%** ratio of total.
- All of the above categories fall within the area of **science** or **STEM** field.

First women to receive a Nobel Prize won under Physics category back in 1903

Female Prize Winner by Year				
Year	Full Name	Sex	Category	Birth Country
1903	Marie Curie, née Skłodowska	Female	Physics	Russian Empire (Poland)
1905	Baroness Bertha Sophie Felicita von Suttner, née Cou..	Female	Peace	Austrian Empire (Czech R..
1909	Selma Ottilia Lovisa Lagerlöf	Female	Literature	Sweden
1911	Marie Curie, née Skłodowska	Female	Chemistry	Russian Empire (Poland)
1926	Grazia Deledda	Female	Literature	Italy
1928	Sigrid Undset	Female	Literature	Denmark
1931	Jane Addams	Female	Peace	United States of America
1935	Irène Joliot-Curie	Female	Chemistry	France
1938	Pearl Buck	Female	Literature	United States of America
1945	Gabriela Mistral	Female	Literature	Chile
1946	Emily Greene Balch	Female	Peace	United States of America
1947	Gerty Theresa Cori, née Radnitz	Female	Medicine	Austria-Hungary (Czech R..
1963	Maria Goeppert Mayer	Female	Physics	Germany (Poland)
1964	Dorothy Crowfoot Hodgkin	Female	Chemistry	Egypt
1966	Nelly Sachs	Female	Literature	Germany
1976	Betty Williams	Female	Peace	Northern Ireland
	Mairead Corrigan	Female	Peace	Northern Ireland
1977	Rosalyn Yalow	Female	Medicine	United States of America
1979	Mother Teresa	Female	Peace	Ottoman Empire (Republi..
1982	Alva Myrdal	Female	Peace	Sweden
1983	Barbara McClintock	Female	Medicine	United States of America
1986	Rita Levi-Montalcini	Female	Medicine	Italy
1988	Gertrude B. Elion	Female	Medicine	United States of America
1991	Aung San Suu Kyi	Female	Peace	Burma (Myanmar)
	Nadine Gordimer	Female	Literature	South Africa

- The first female prize winner is **Marie Curie** and she won in **Physics** which has one of the lowest rate of female winning.
- After Marie, there was no other woman to win Nobel Prize in Physics **until 60 years later**.
- **Aung San Suu Kyi** is the first South East Asian women receive a Nobel Prize. She was recognized for her non-violent fight for democracy and human rights in Myanmar.

There are only four people globally to ever receive a Nobel Prize more than one time

Repeat Prize Winners					
Full Name	Category	Sex	Birth Country	Won	
Comité international de la Croix Rouge (International Committee of the Red Cross)	Peace	NA	NA	3	
Office of the United Nations High Commissioner for Refugees (UNHCR)	Peace	NA	NA	2	
Marie Curie, née Skłodowska	Chemistry	Female	Russian Empire (Poland)	1	
	Physics	Female	Russian Empire (Poland)	1	
Linus Carl Pauling	Chemistry	Male	United States of America	1	
	Peace	Male	United States of America	1	
John Bardeen	Physics	Male	United States of America	2	
Frederick Sanger	Chemistry	Male	United Kingdom	2	

- One of the four repeat Nobel Prize winners is **female**, who is also the **first women** to ever win a Nobel Prize (**Marie Curie**).
- Despite her incredible contribution, she **wasn't initially nominated** due to bias against women in academic fields.
- Two other repeat winners were born in the **United States** and another was born in the **United Kingdom**.
- There are **two organizations** having received Nobel Prize more than once. Both of them are international organizations within Peace categories.

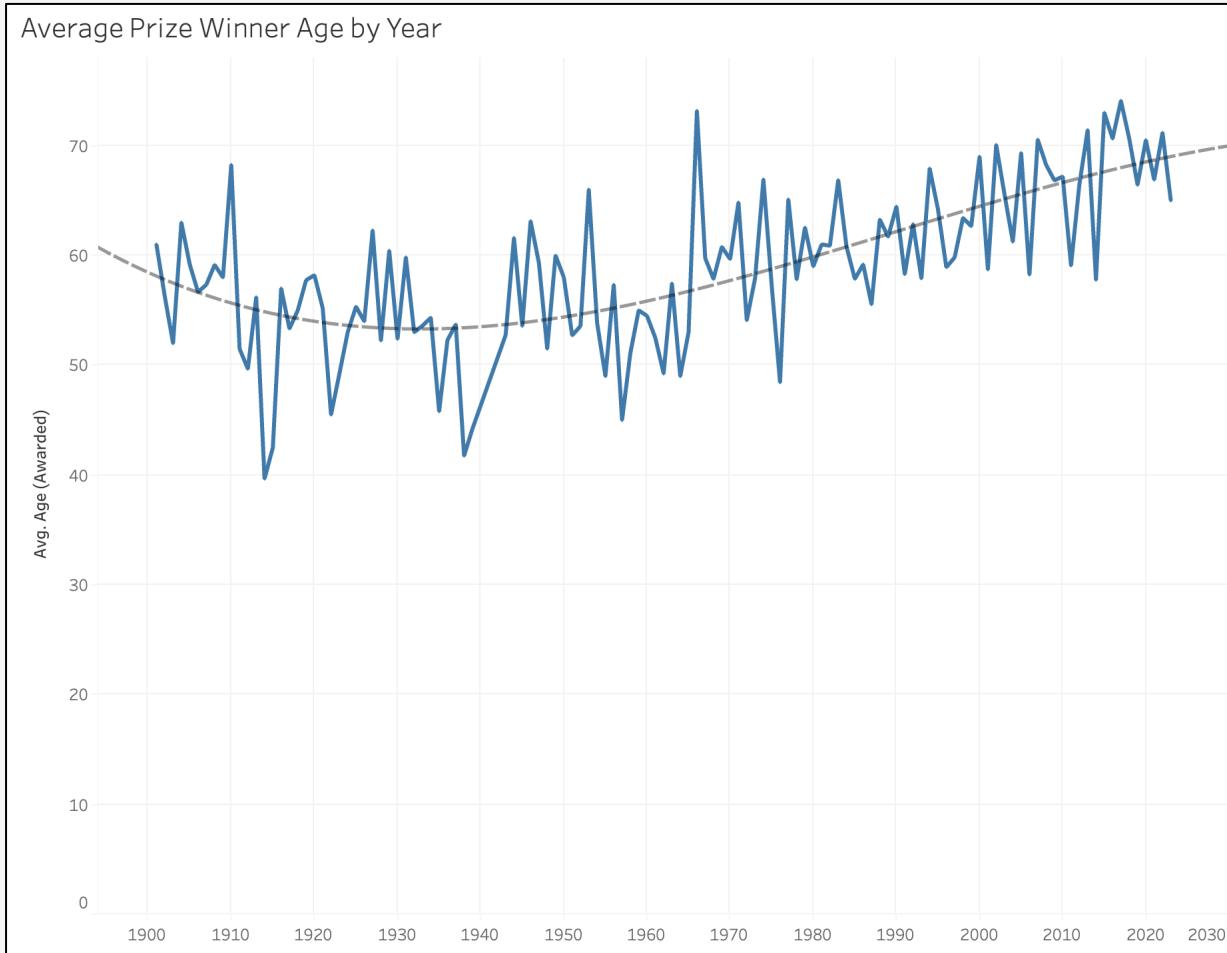
The Ratio of female Nobel Prize winners have increased significantly in the past 20 years

Statistically the ratio of female have **improved** since 2000s, with **2020s** as the best decade for women for all categories.

Percentage of Female Prize Winner to All by Decade

Category	1900s	1910s	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010s	2020s
Chemistry	0%	13%	0%	8%	0%	0%	7%	0%	0%	0%	4%	4%	30%
Economics							0%	0%	0%	0%	5%	5%	11%
Literature	10%	0%	20%	11%	17%	0%	9%	0%	0%	30%	30%	30%	50%
Medicine	0%	0%	0%	0%	7%	0%	0%	4%	13%	5%	15%	8%	13%
Peace	7%	0%	0%	11%	14%	0%	0%	23%	9%	18%	14%	36%	29%
Physics	8%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	4%	17%

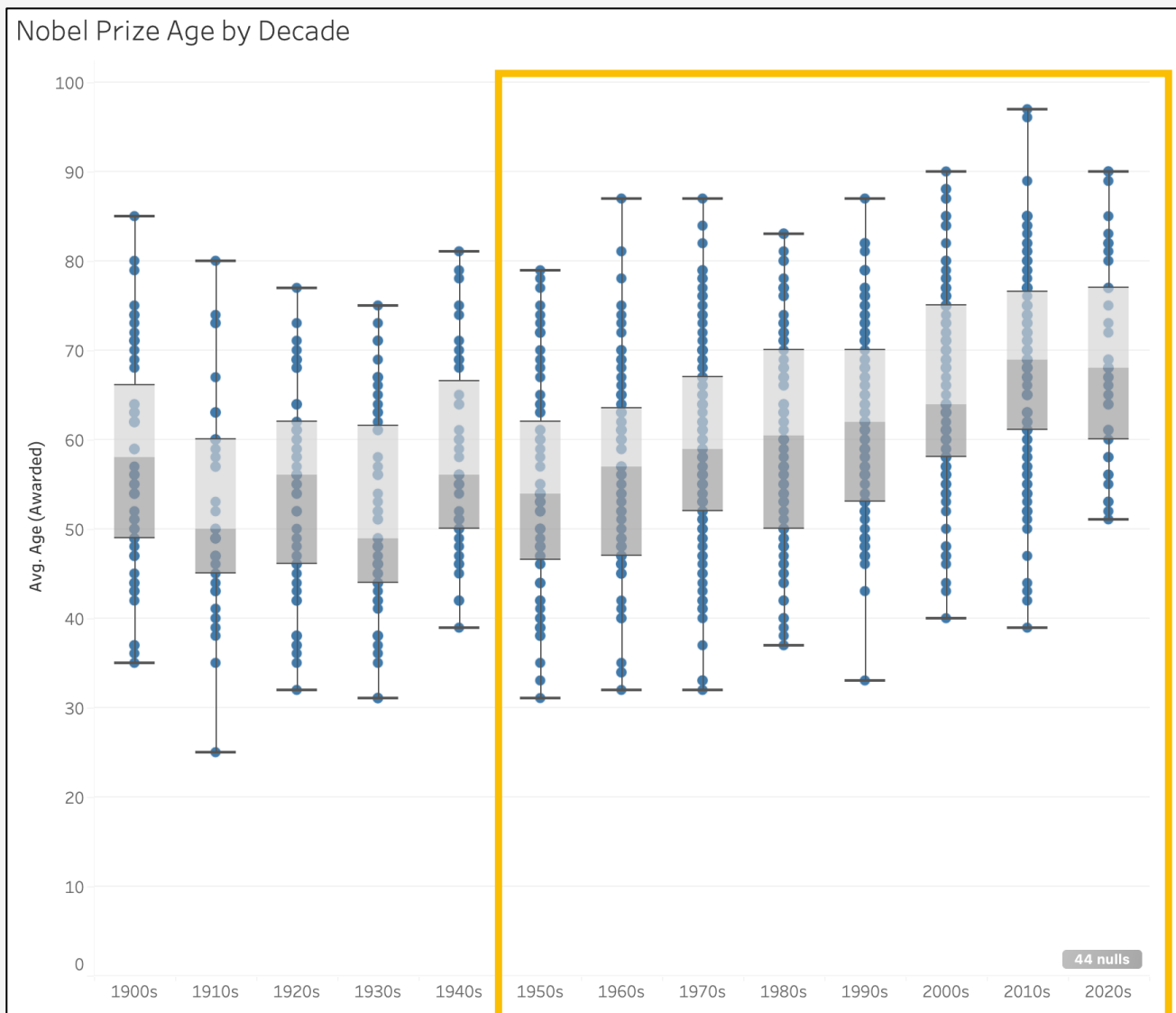
The average age of Nobel Prize laureates have been rising overall



- Since the foundation of Nobel Prize, the average age of laureates has increased from the lowest at **40 years old** all the way to more than **65 years old** in 2020s.
- The youngest Nobel Prize laureate at the time of the award is **17 years old** (Malala Yousafzai), and the oldest one is **97 years old** (John B. Goodenough).
- John was awarded for his role in developing **lithium-ion batteries**. While Malala was recognized for her fight against **children suppression** and **right for education** in Pakistan.



The median age of Nobel Prize laureates have also been rising overall



- Looking at each decade, **IQR age range** and **median age** have been clearly **increasing** in the past 70 years since 1949.
- In 2020s, **75%** of Nobel Prize laureates were **60 years old and over** at the time of receiving the award. Only 25% are below the age point.

Project Summary / Key Takeaways

- ❖ **US-born** and **Europe-born** continue to account for the majority of Nobel Prize winners among all other countries/continents. They could be **a good model** for education, social development, funding, and policies making for **better innovation**. On the other hand, this might indicate **unfair bias** against or **the lack of attention** on great achievements by people from other parts of the world.
- ❖ There has been a **major imbalance** between male and female prize winners, even more so in **STEM fields** like Physics, Chemistry, Medical, and Math. This strongly suggests **the existence of complicated barriers** against women in science and academic fields such as discrimination, the lack of role model, social norms, and stereotypes. **Though, the female-to-male ratio has been much better in the last 10-20 years.**
- ❖ A Nobel Prize laureate today is more likely to be a **65-year-old male** from **the West**. It is important for the Nobel Prize committee to be aware of the **demographic trends** and ensure the transparency, objectivity, equality, and inclusivity of their awarding decisions to people that deserve them, regardless of their network, wealth, power, race, sex, or age.

End of the presentation

Thank you!

Link to dashboard: <https://public.tableau.com/app/profile/sean.x7307/viz/NobelPrizeEDA/Dashboard#1>