

Unrestricted Immigration and the Foreign Dominance of United States Nobel Prize Winners in Science: Irrefutable Data and Exemplary Family Narratives—Backup Data and Information

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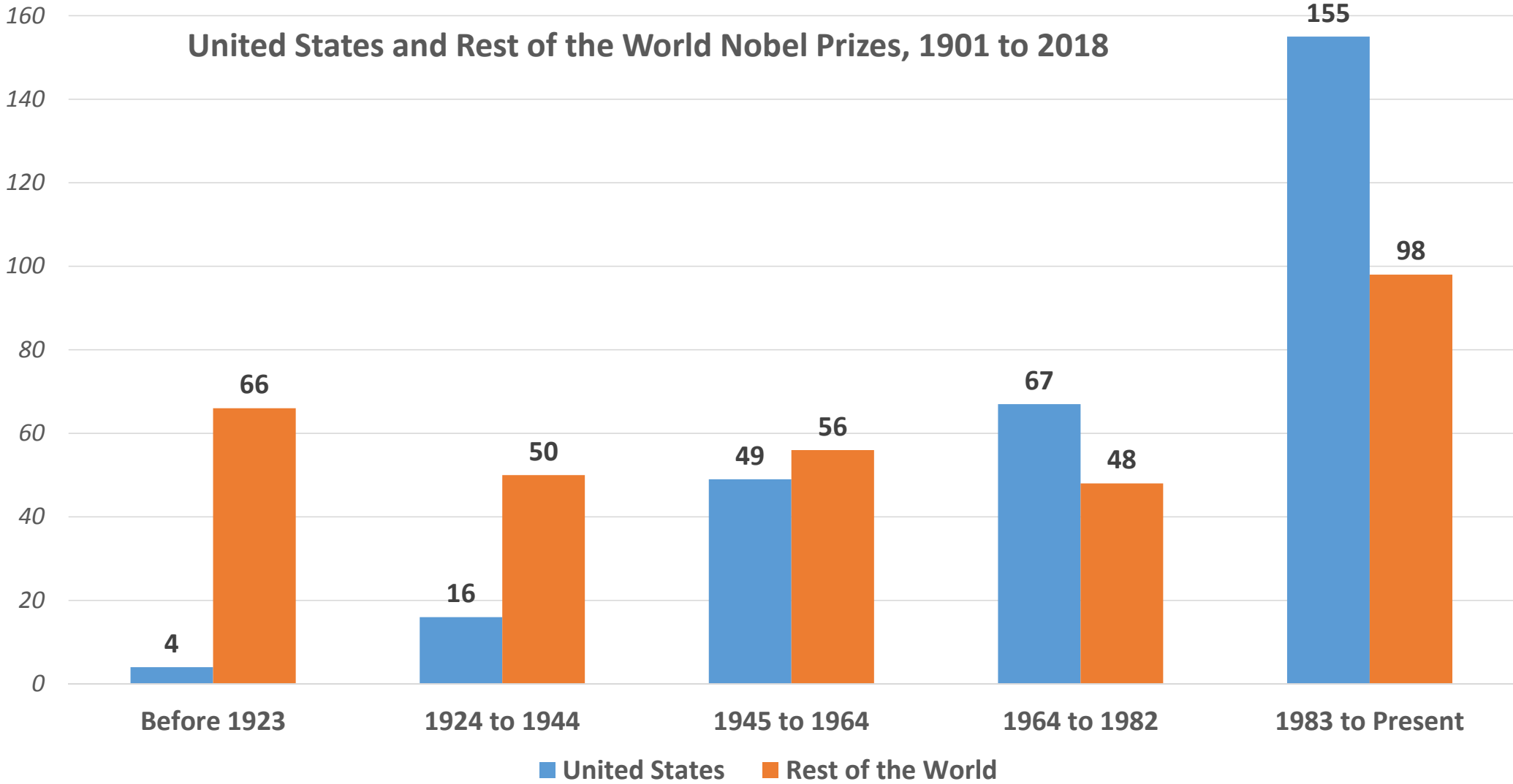
Lynn Caporale, Strategic Scientific Advisor and Author

The following slides were presented at the recent meeting of the American Association for the Advancement of Science. This project and paper is an outgrowth of that session, and will combine qualitative data on Nobel Prize Winners family histories along with analyses of the pattern of Nobel Winners. The first set of slides show some of the patterns so far found, and will be augmented for the formal paper. The second set of slides shows some examples of the Nobel families. The authors are developing a systematic data base of Nobel Winners (mainly US), their careers and their family histories. This turned out to be much more challenging than expected, since many winners do not emphasize their family origins in their own biographies or autobiographies or other commentary. Dr. Caporale has reached out to some laureates or their families to elicit that information. We plan to systematically compare the laureates to the population in the US at large, including immigrants and non-immigrants at various periods.

Outline of Presentation

- A preliminary examination of the 609 Nobel Prize Winners, 291 of whom were at an American Institution when they received the Nobel in physics, chemistry or physiology and medicine
- Will look at patterns of awards by era
- Single out the American Nobel Winners
- Report on their family background, including immigrant status and origin
- The special place of New York City
- How they compare with the population at large

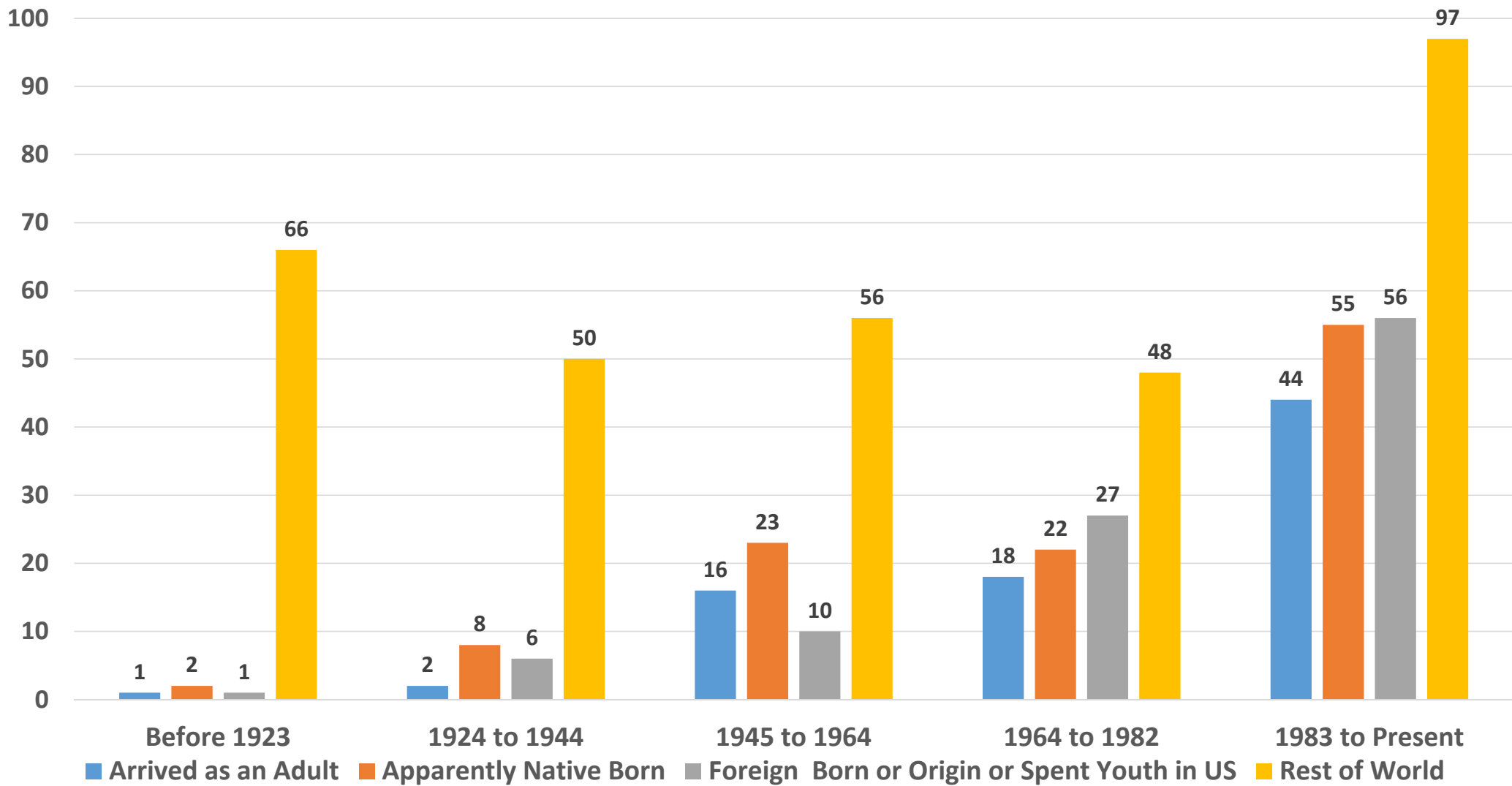
United States and Rest of the World Nobel Prizes, 1901 to 2018



Issues with Data on Nobel Winners

- Working with a very talented research assistant, we began to build a data set that included all USA nobel winners [Defined as being at a US Institution when the win occurred]
- Very basic data on Nobel winners is relatively easy to get: age, sex, nationality, year of win, usually place of birth, category, etc.
- However, data about early life, that is life before college and often before grad school is much harder, as is immigration history, especially for the young
- Parents nationality, for instance, was not always available
- Information on grandparents was very difficult to systematically, acquire, so any foreign connection are understated

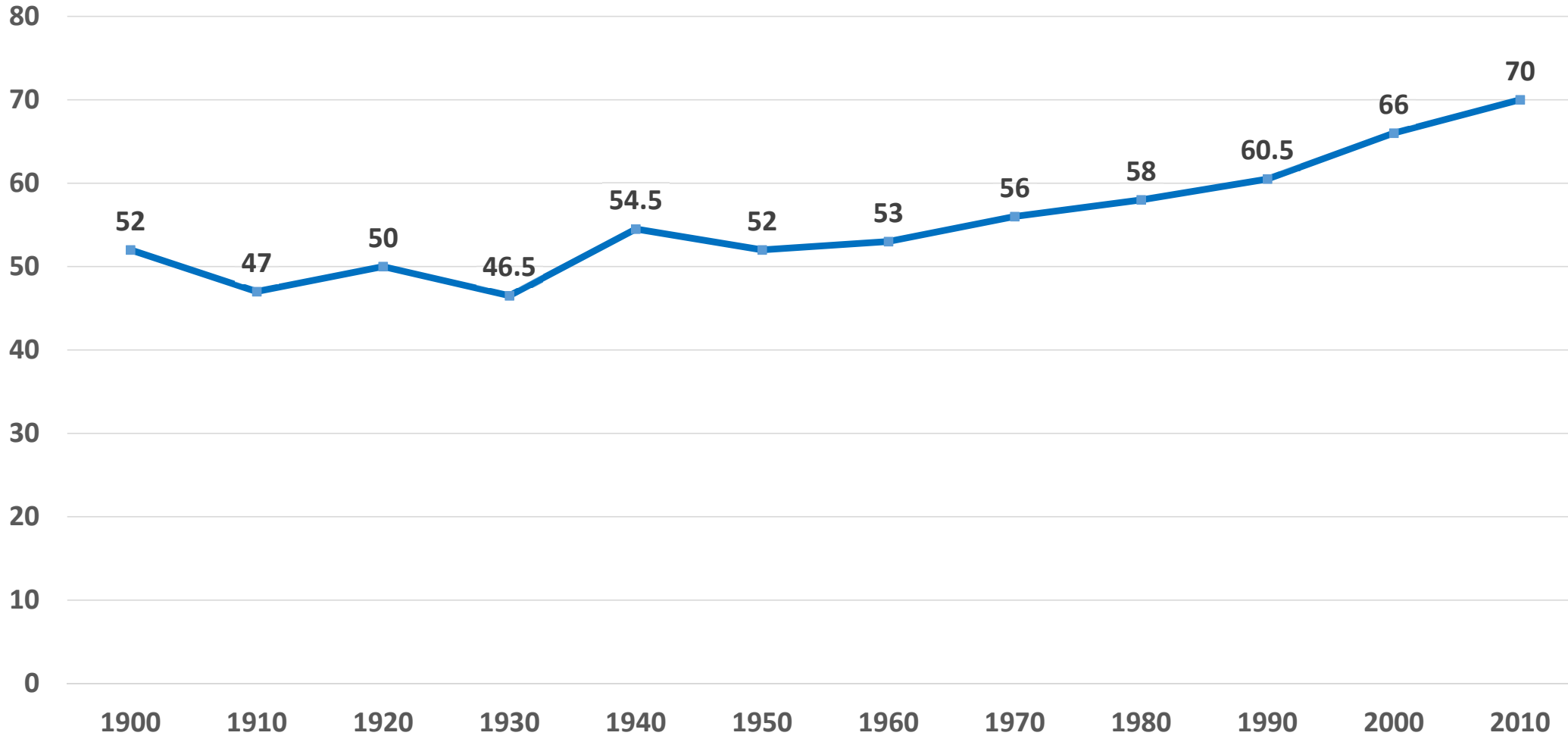
Origins of American Compared to Others Nobel Winners by Era



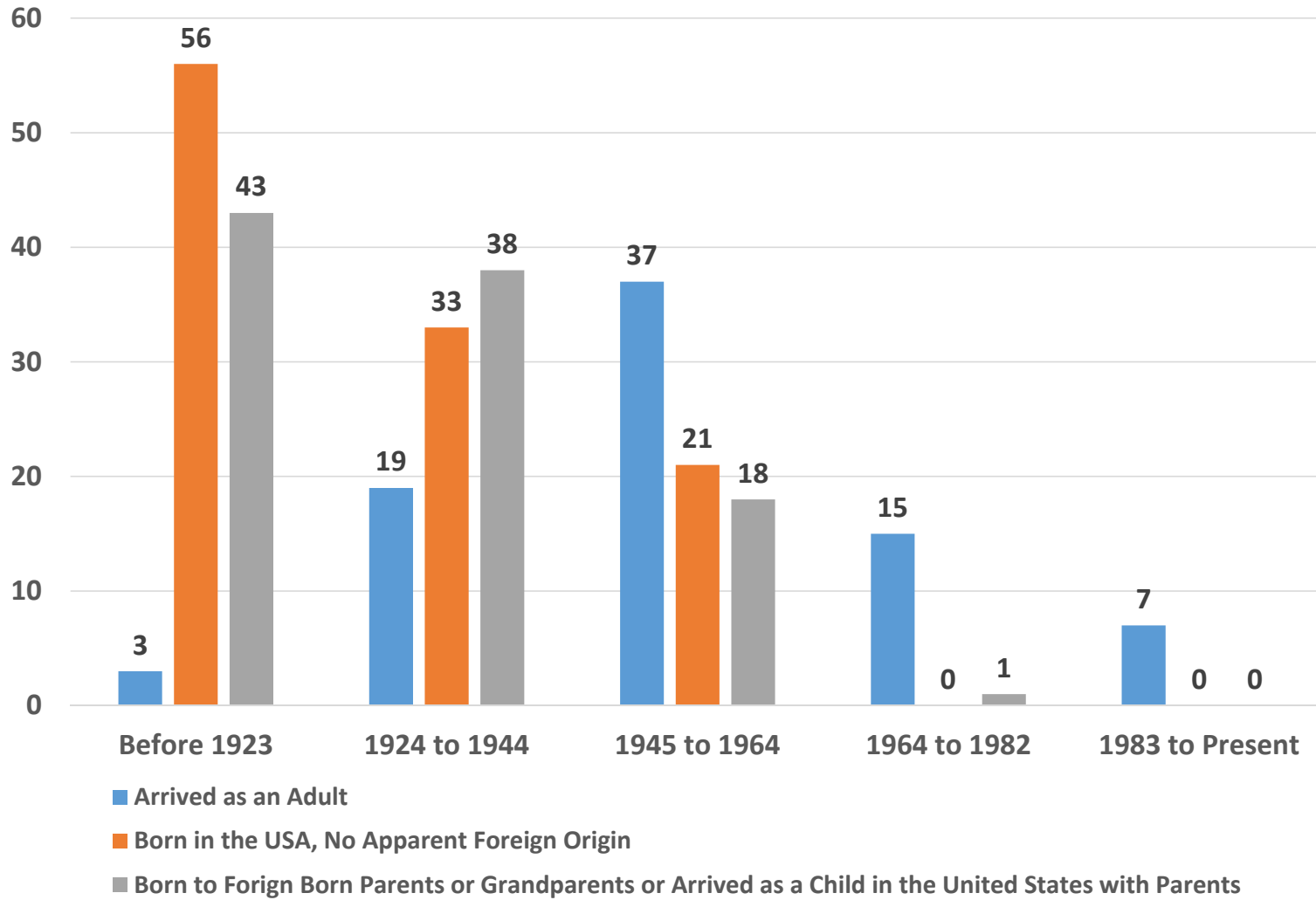
Origin of Nobel Winners United States by Era of Award, 1901 to 2018

	Foreign Born Grandparent	Foreign Born Parent	Foreign Born Arrived as Child	Foreign Born Arrived Early Career	Foreign Born Arrived Late Career	Foreign Born Arrived Mid Career	Native Born	Total
Before 1923	0	0	1	0	0	1	2	4
1924 to 1944	2	3	1	0	2	0	8	16
1945 to 1964	3	6	1	8	2	6	23	49
1964 to 1982	9	16	2	9	1	8	22	67
1983 to Present	22	30	4	22	7	15	55	155
Total	36	55	9	39	12	30	110	291

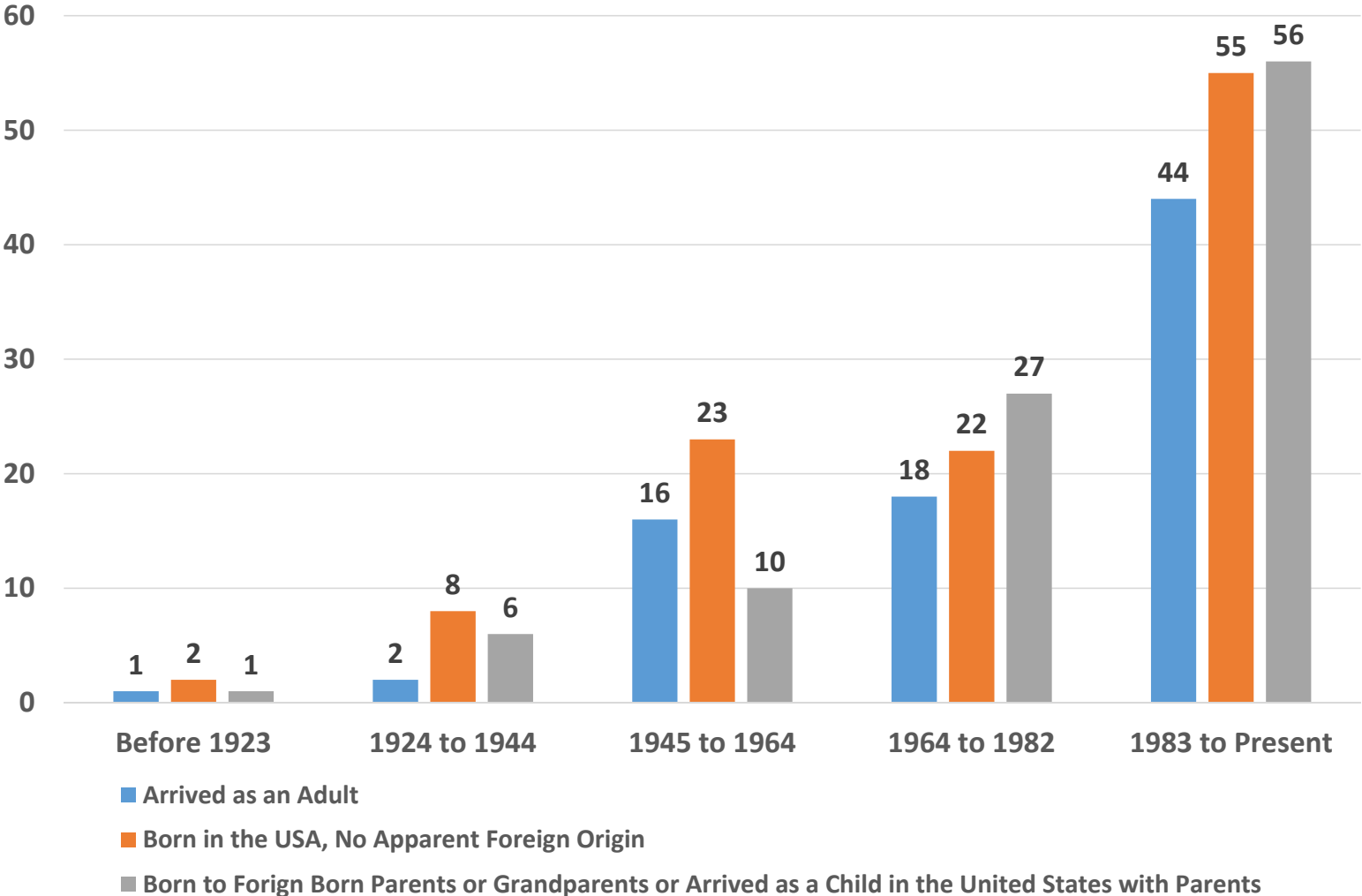
Median Age at Award by Decade, All Science Nobels



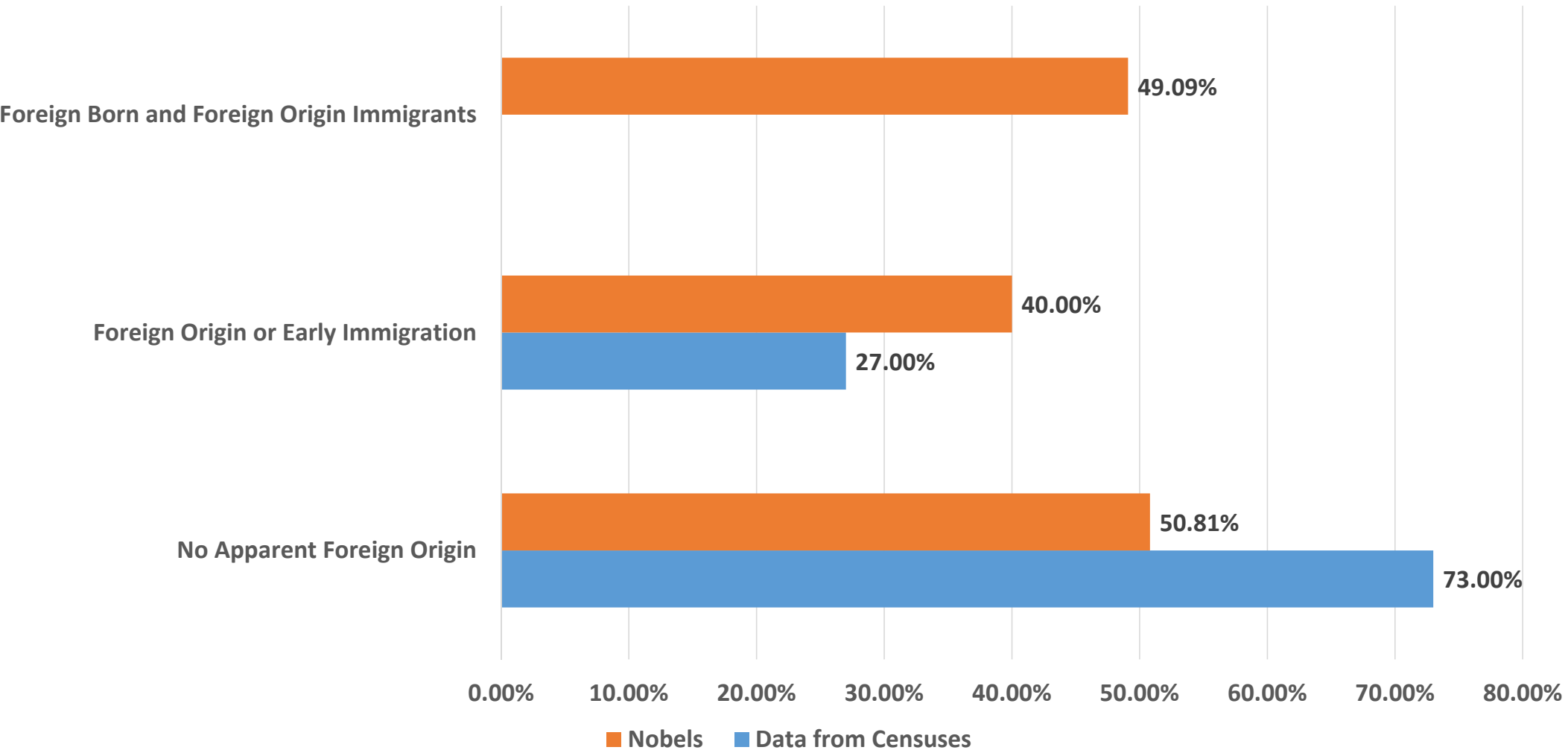
Arrival in the United States for Nobel Winners by Birth Year, 1901 to 2018



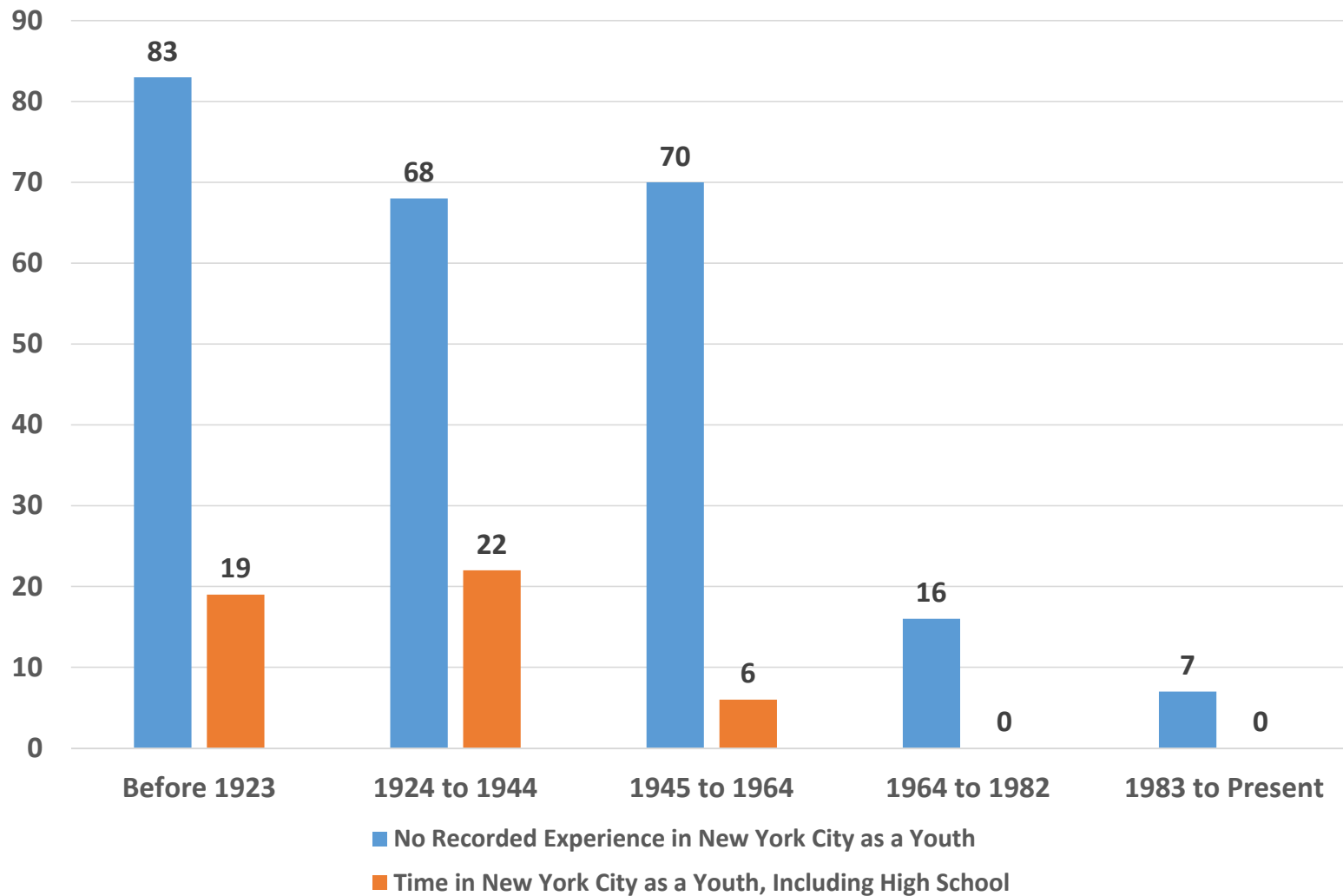
Year of Award and Arrival in the United States for Nobel Winners, 1901 to 2018



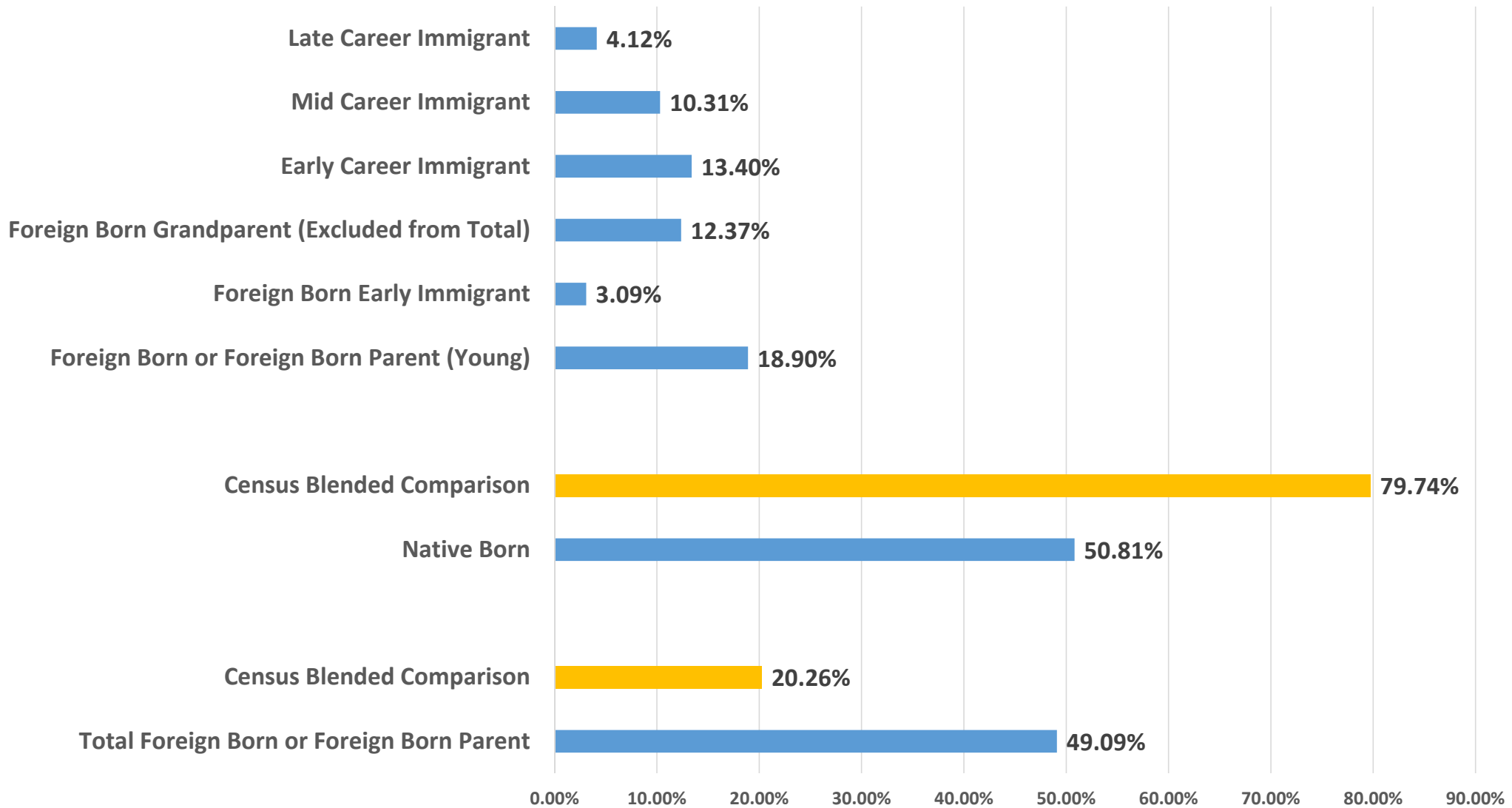
New York Presence for Foreign Born and Foreign Origin Nobel Winners US as Youth Compared to All Youth (Blended Comparison)



Time Spent in NYC as a Youth and Arrival in the United States for Nobel Winners, 1901 to 2018



Foreign Origin of Noble Winners Compared to Census Data (Blended Comparison)



Family origins of Nobel Laureates

Lynn Helena Caporale

AAAS 2/15/19



Family origins of Nobel Laureates

- Breaking Barriers
- Examples of 3 Nobel Laureate's families' biographies and contributions
- Contributions of children and grandchildren of pre-1924 immigrant families: Nobel Laureates in Chemistry, Medicine or Physiology
- Representative contributions by physicists from pre-1924 families
- Selected Holocaust Survivors and Refugees: family unification and IRC
- Broader Contributions to STEM and Education
- Summary

Breaking Barriers



A young Dr. Eliach feeds chickens on the day in 1941 when Germans occupied her town.
(Yaffa Eliach Collection/The Shtetl Foundation/U.S. Holocaust Memorial Museum)

*Focus on mostly penniless,
non-formally educated,
non-English speaking,
immigrants and refugees
who came to the US ~a century ago*



BBC <https://www.bbc.com/news/world-latin-america-55111111>
En Yalambogoch, el pueblo desde el que salió Felipe con su padre, la migración de menores hacia Estados Unidos es muy común.



Southern and Eastern Europeans (many of them Catholics and Jews) D. Reed [R-PA] said,
“arrive sick and starving and therefore less capable of contributing to the American economy, and unable to adapt to American culture.”

Breaking Barriers



I.I. Rabi b 1898, Rymanow, Austria-Hungary: parents brought him to New York's Lower East Side as a baby.

When his father worked, he worked as a tailor. When he did not work, the family went hungry.

“Had we stayed in Europe, I probably would have been a tailor” *Nobel Prize in Physics*

“It takes a person like me to really understand what a wonderful country America is.””

[nytimes.com/1988/01/12/obituaries/isidor-isaac-rabi-a-pioneer-in-atomic-physics-dies-at-89.html?pagewanted=all&src=pm](https://www.nytimes.com/1988/01/12/obituaries/isidor-isaac-rabi-a-pioneer-in-atomic-physics-dies-at-89.html?pagewanted=all&src=pm)

Frank Wilczek: *My grandparents arrived with nothing, and no knowledge of English*

Louis Ignarro: *“Neither my dad nor mom had any formal education, not even the first grade.....*



*Only in America could the son of an **uneducated carpenter [immigrant from Naples]** receive the Nobel Prize in Medicine”.*



EGF: Stanley Cohen (b. 1922)



- Biography

- Parents came to US from Russia in the early 1900's: father a tailor; mother, a housewife.
- “**Brooklyn College** was a city school and had a policy of no tuition; *the cost of an education would have been prohibitive for my parents.*”

- Discovered Epidermal Growth Factor (**EGF**) and its receptor

- Many breakthrough anti-cancer therapies target members of the EGF receptor family

Cohen S. The epidermal growth factor (EGF). *Cancer*. 1983 May 15;51(10):1787-91.

EGFR Antagonists in Cancer Treatment *N Engl J Med* 2008; 358:1160-1174



Paternal Grandparents

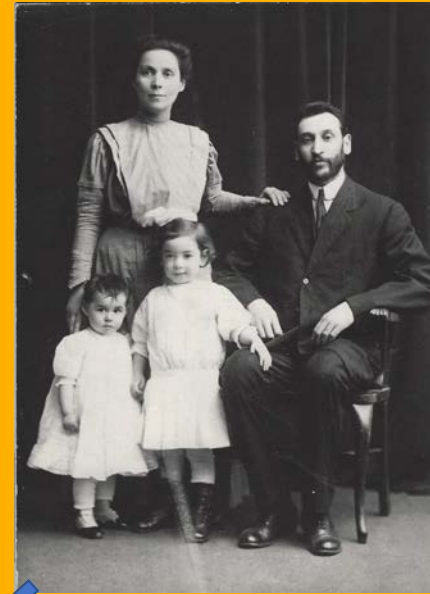
(and their children)

Mariam (Mary) Kremsdorf &
Louis Lefkowitz

Fled Czestochowa Poland in 1904
after a devastating pogrom

Very limited English

Capmaker in NY



Maternal Grandparents

(and their children)

Bernard and Rivka Levine

Left Russia ~1900

Conversed in Yiddish

Kosher Butcher in NY



Paternal Grandparents

(and their children)

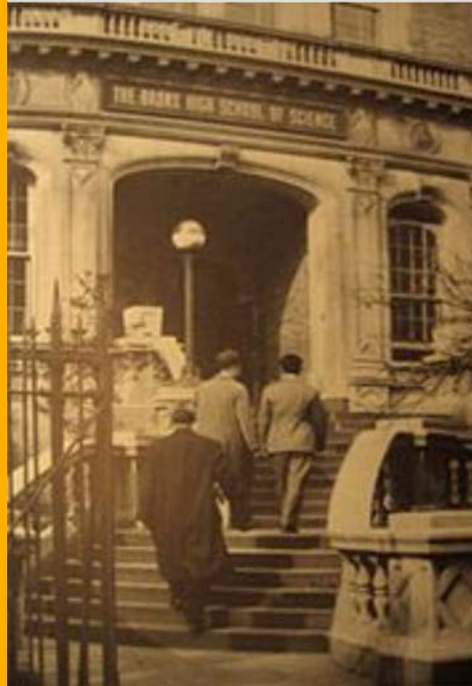
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Robert J. Lefkowitz MD

Nobel Prize in Chemistry: G-protein coupled receptors



Bronx High School of Science



Maternal Grandparents

(and their children)

Bernard and Rivka Levine

Left Russia ~1900

Conversed in Yiddish

Kosher Butcher in NY



Grandparents

Parents

David Savit (Savitzky) 1904 Ukraine

came with widowed mother and 8 siblings;
grocer, dress manufacturer, newsstand

Rose Bleiweiss Savit 1902 Poland

Solomon ben Mikhail Gourevitch 1902 Belarus

Garment presser; exploitation wages; shot at during union rally

Celia Bolotin ~1905 Russia; captured by Czar's police

Mary Savit

Oscar Horvitz

<https://www.nobelprize.org/prizes/medicine/2002/horvitz/biographical/>

H. Robert Horvitz

“H” in memory of great-grandfather Hersch, who had been shot and killed by the Nazis
a few years before Bob was born in 1947



Nobel Prize in Physiology or Medicine (shared)

“for ... discoveries concerning genetic regulation of organ development and programmed cell death”

- Cell death is an active process requiring the function of specific genes
- Medical implications range from neurodegeneration to cancer
 - the major clinical features of many neurodegenerative diseases e.g. Alzheimer's Huntington's, Parkinson's, ALS, other disorders, stroke, traumatic brain injury are cells that die that shouldn't.
 - certain cancers ultimately result from too little cell death.



<https://infinitehistory.mit.edu/video/h-robert-horvitz-%E2%80%999968-2002-nobel-laureate-lecture-physiology-or-medicine-10182002>

Grandparents

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Oscar Horvitz

<https://www.nobelprize.org/prizes/medicine/2002/horvitz/biographical/>

Gifts stolen from the world:

family members who did not leave were killed



Maternal Great Grandparents
Hersch Dovid Bleiweiss
Amy Weisman Bleiweiss

Maternal grandmother's sister
Ann Bleiweiss

Died in WWII Concentration Camps

Children of Pre-1924 Refugees and Immigrants (examples of Nobel Laureates)

- Bacterial Genetic Recombination (transduction & conjugation)

Josh Lederberg: Stuyvesant HS

- Recombinant DNA: **Paul Berg (Lincoln H.S.)**
- DNA Synthesis **Arthur Kornberg; CCNY**
- Genetic Code: **Marshall Nirenberg**
- Retroviruses; Reverse Transcriptase: **Howard Temin**
- Epidermal Growth Factor (EGF) (**Stanley Cohen; Brooklyn College**)

Children of Pre-1924 Refugees and Immigrants (examples of Nobel Laureates) con'd



- Nucleic acid metabolism antimetabolite drugs: anti-leukemia, antivirals (e.g. AZT) **Gertrude Elion (Walton HS; Hunter College)**
- Release, reuptake, and storage of the neurotransmitters epinephrine & norepinephrine **Julius Axelrod (Seward Park HS; CCNY)**
- Direct Methods for X-ray Crystallography I & J **Karle, (CCNY), Herbert Hauptman (CCNY)**
- Radioimmunoassay: **Rosalyn Sussman Yalow** (child/grandchild; **Walton HS; Hunter College**)
- Nitric Oxide signaling in CV system: **Ferid Murad, Louis Ignarro, Robert Furchgott** (grandchild)
- Biochemistry of Vision: **George Wald (Brooklyn Tech)**

Grandchildren of Pre-1924 Refugees and Immigrants

(examples of Nobel Laureates in chemistry and Medicine or Physiology) slide 1

- Cellular Origin of Retroviral Oncogenes **Harold Varmus** (Director of NIH)
- DNA Mismatch Repair: **Paul Modrich**
- Apoptosis (programmed cell death) **H. Robert Horvitz**
- G-protein coupled receptors (GPCR) **Robert Lefkowitz** (**Bronx Science**)
- Reverse Transcriptase: **David Baltimore**
(President of Rockefeller University & Caltech)
- Prions: **Stanley Pruisner**
- Antibody Structure **Gerald Edelman John Adams HS**

Grandchildren of Pre-1924 Refugees and Immigrants

(examples of Nobel Laureates in chemistry and Medicine or Physiology) slide 1

- Hepatitis B virus **Baruch Blumberg**
- MRI: **Paul Lauterbur**
- Use of Green Fluorescent Protein (GFP) **Martin Chalfie** & **Roger Tsien** (child)
- Molecular basis of Eukaryotic Transcription **Roger Kornberg**
- Machinery regulating vesicle traffic **James Rothman** & **Randy Sheckman**
- G Proteins: **Martin Rodbell** ?
- Organ Transplantation: **Joseph Murray**
- Innate Immunity **Bruce Beutler** (child/grandchild)
- Regulation of cholesterol metabolism: **Michael Brown** & **Joseph Goldstein**

Physics Nobel Laureates (examples of children and grandchildren)

Interferometer and its use: First US Science Nobel: **Albert Michelson** (arrived as an infant)

Resonance method for recording magnetic properties of atomic nuclei: **I.I. Rabi; John Jay HS**

Electroweak: **Sheldon Glashow & Steven Weinberg** (both children, both **Bronx HS of Science**)

Laser Tweezers: **Arthur Ashkin** (child; **James Madison HS**)

Tau Lepton: **Martin Lewis Perl** (child; **James Madison HS**)

Asymptotic Freedom in Strong Interaction: **Frank Wilczek** (grandchild; **Martin Van Buren HS**)

Quantum Electrodynamics: **Richard Feynman** (child; **Far Rockaway HS**)

Quantum Electrodynamics: **Julian Schwinger** (child; **Townsend Harris HS; CCNY** (then Columbia))

Detection of the Neutrino: **Frederick Reines** (child)

J/psi particle (charm quark): **Burton Richter** (child; **Far Rockaway HS**)

Accelerating expansion of the Universe: **Saul Perlmutter** (grandchild)

Refugees from WWII and the Holocaust

(Family migration)

Nobel Laureates

- Theoretical prediction of the course of chemical reactions: **Roald Hoffman** (b. 1937 in Poland; escaped arranged from labor camp. Most of family murdered, including biological father, Hillel Safran (in photo holding 3 months old Roald Hoffman); **Stuyvesant HS**
- Odorant receptors and the organization of the olfactory system: **Richard Axel**: parents fled Poland when Nazis invaded
- Microwave background radiation: **Arno Allan Penzias**: b 1933 Munich; evacuated age 6 Kindertransport; **Brooklyn Tech**
- Physiological basis of Memory Storage in Neurons: **Eric Kandel** (escaped to uncle in Brooklyn, 1939 age 9)
- Knockout mice: **Mario Capecchi**:
Mother survived Dachau; found 9 year old Mario deathly ill in a hospital in Italy; he had lived on the streets

Others

- Medical Genetics and Pharmacogenetics: Arno Motulsky: was on the St. Louis
- Intel: Andrew Grove: Survivor of the Nazi Holocaust and the 1956 Soviet invasion of his native Hungary resettled in the U.S. by the International Rescue Committee in 1957.



Kandel age 3 and brother, in Vienna 1932

Children and Grandchildren of Pre-1924 Refugees and Immigrants

examples of other groundbreaking biomedical scientists

- DNA damage stress response: **Evelyn Witkin** child; Washington Irving HS
- Polio Vaccines: **Jonas Salk** (child; CCNY) and **Albert Sabin** (immigrant)
- Statins: **Pindaros Roy Vagelos**; child
- Genetic engineering: **Stanley Cohen** (of C&B); grandchild
- Bacterial Virulence Factors: **Stanley Falkow**; child
- Phage lambda; replica plating: **Ester Zimmer Lederberg**; child
- Built research powerhouse U of Tx SW Med Center: **Don Seldin**; child

In addition to
Nobel Laureates from pre-1924 families

- Broad Contributions to STEM, medicine and education
- Ongoing contributions

Devotion to Family and Community is a much-needed “skill”
Broad Contributions to our (scientific) community

