

China's Future & the Impact on American Agriculture

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NEAFA Annual Meeting

Albany, NY

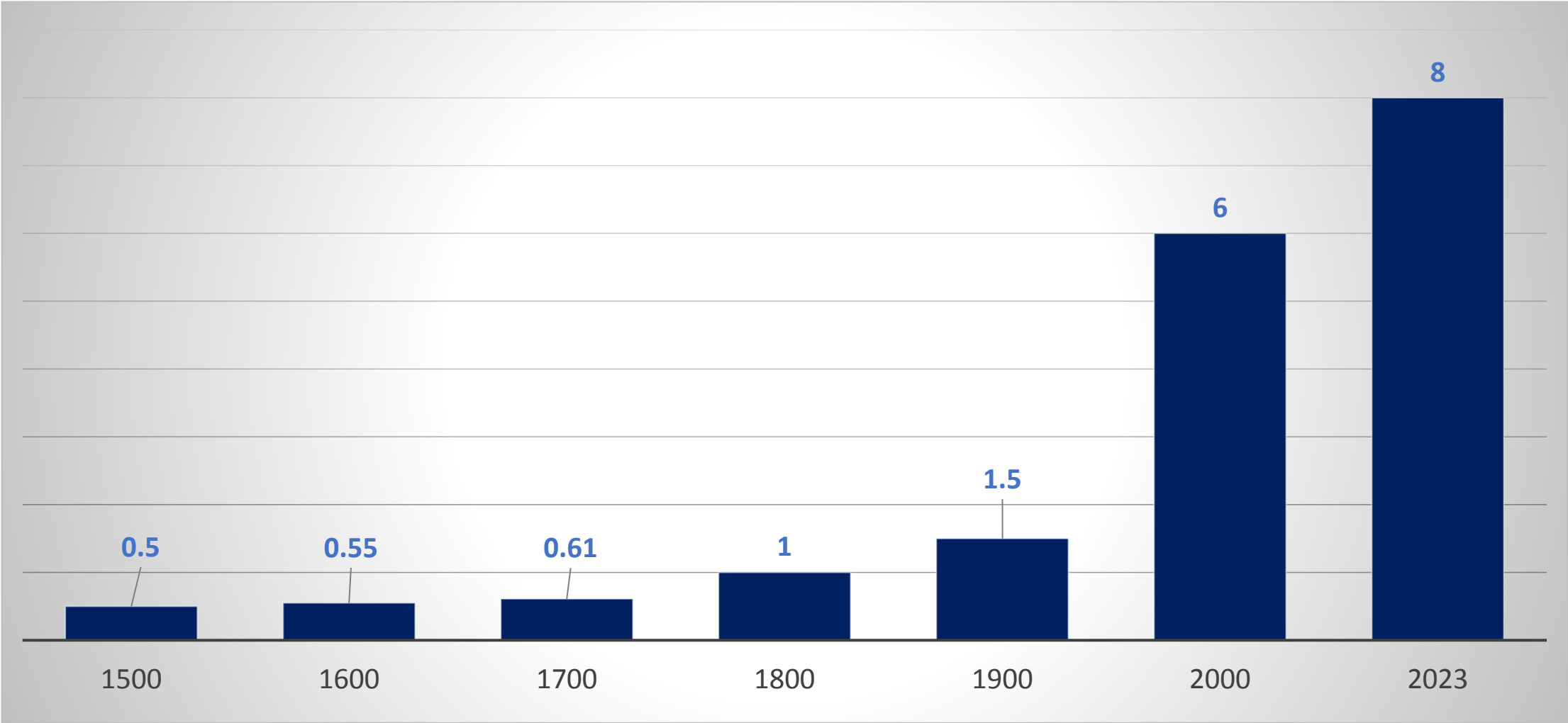
February 8, 2023



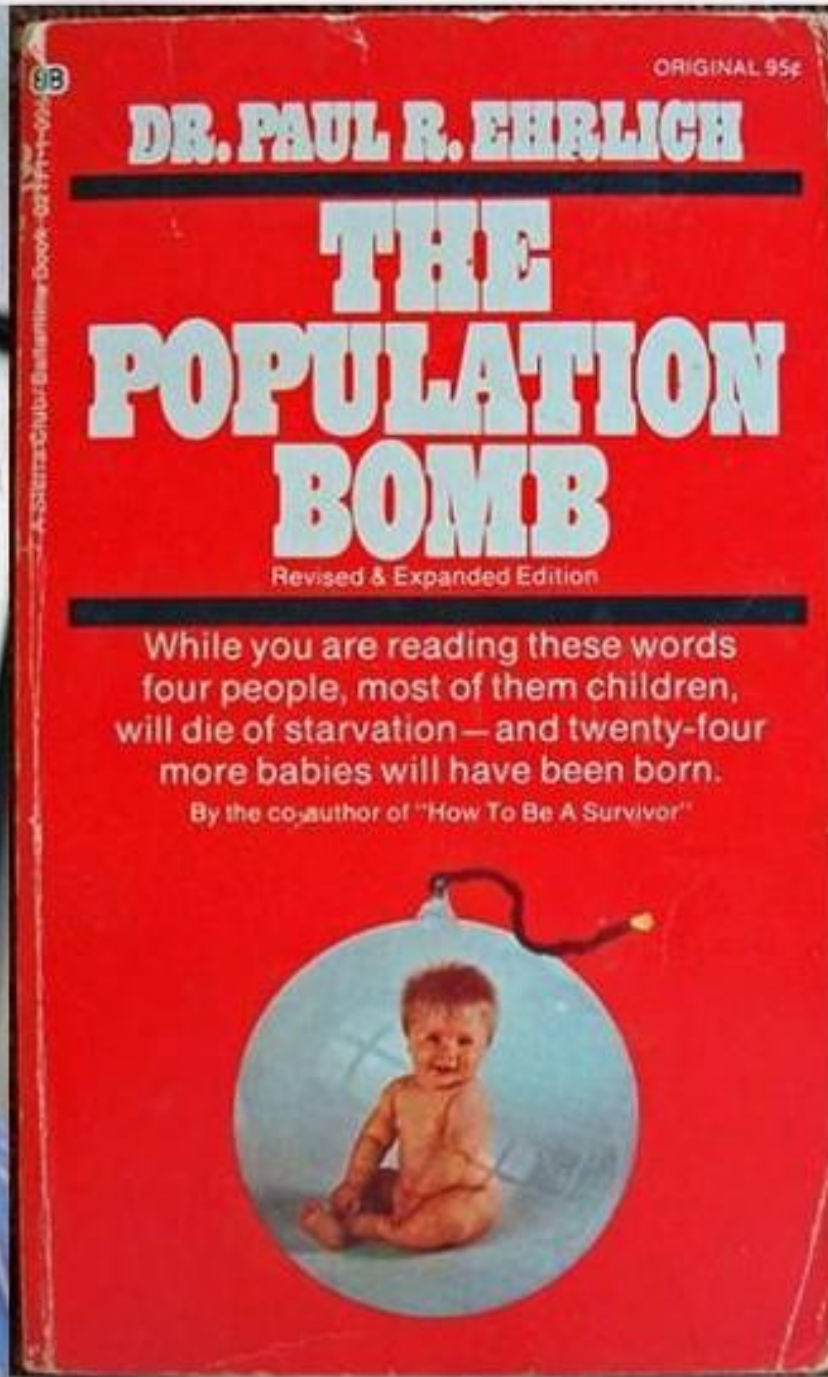


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Global Population (in Billions)



• **Data Source:** UN, US Census



“The battle to feed all of humanity is over. In the 1970s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now. At this late date nothing can prevent a substantial increase in the world death rate...”

-Paul Ehrlich, “The Population Bomb”

Top 10 US Ag Exports 2021 by Value (Millions)

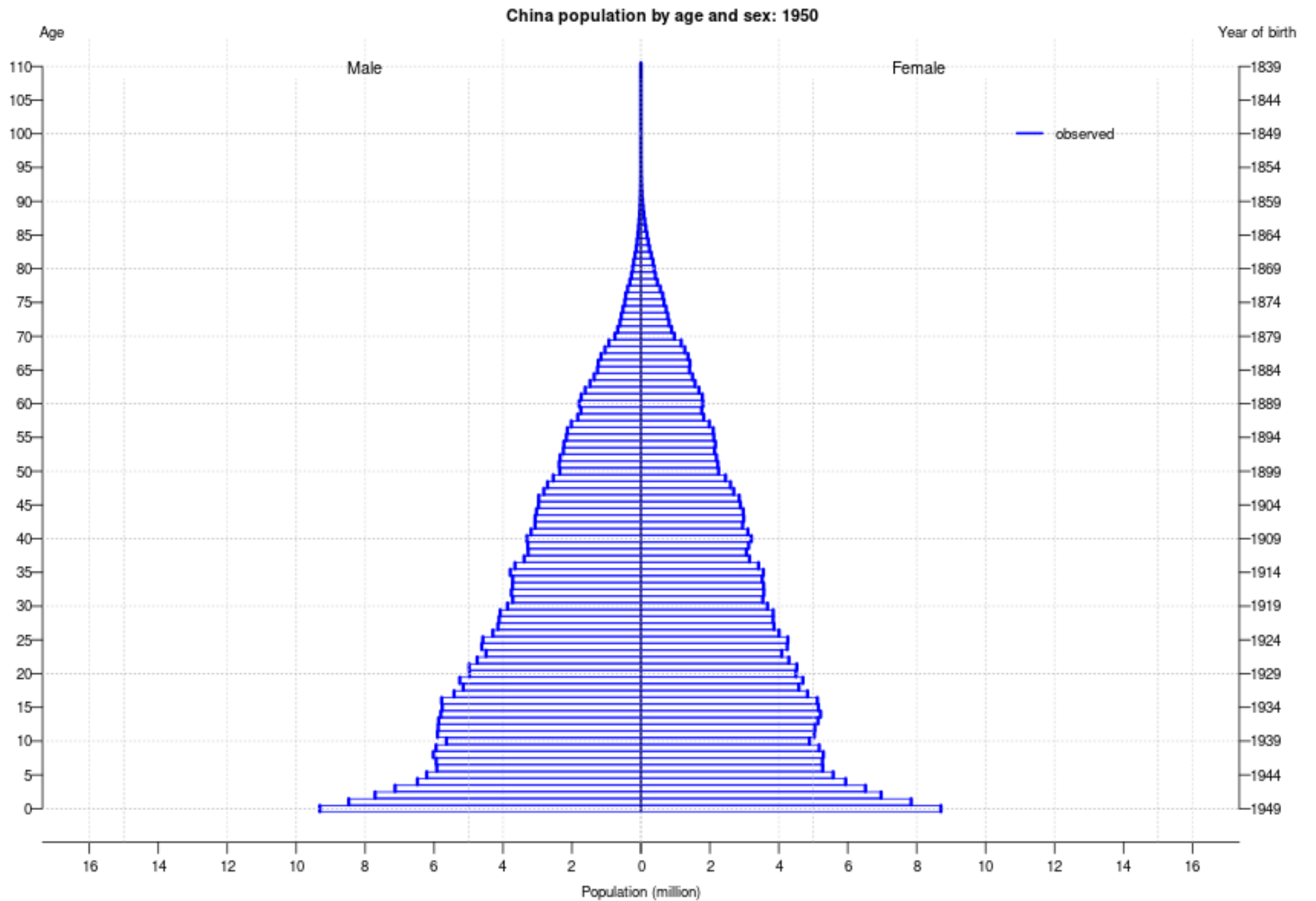
| Commodity | Total Export Value | China Value | China Rank | China % |
|----------------|--------------------|-------------|------------|---------|
| Soybeans & SBM | \$33,030 | \$15,851 | #1 | 48% |
| Corn | \$18,721 | \$5,096 | #1 | 27% |
| Beef | \$10,576 | \$1,592 | #3 | 15% |
| Tree Nuts | \$8,882 | \$978 | #2 | 11% |
| Pork | \$8,107 | \$1,698 | #1 | 21% |
| Dairy | \$7,660 | \$703 | #3 | 9% |
| Wheat | \$7,246 | \$803 | #3 | 11% |
| Prepared Food | \$5,860 | \$384 | #5 | 7% |
| Cotton | \$5,711 | \$1,343 | #1 | 24% |
| Poultry | \$5,250 | \$879 | #2 | 17% |

Data Source: USDA, FAS

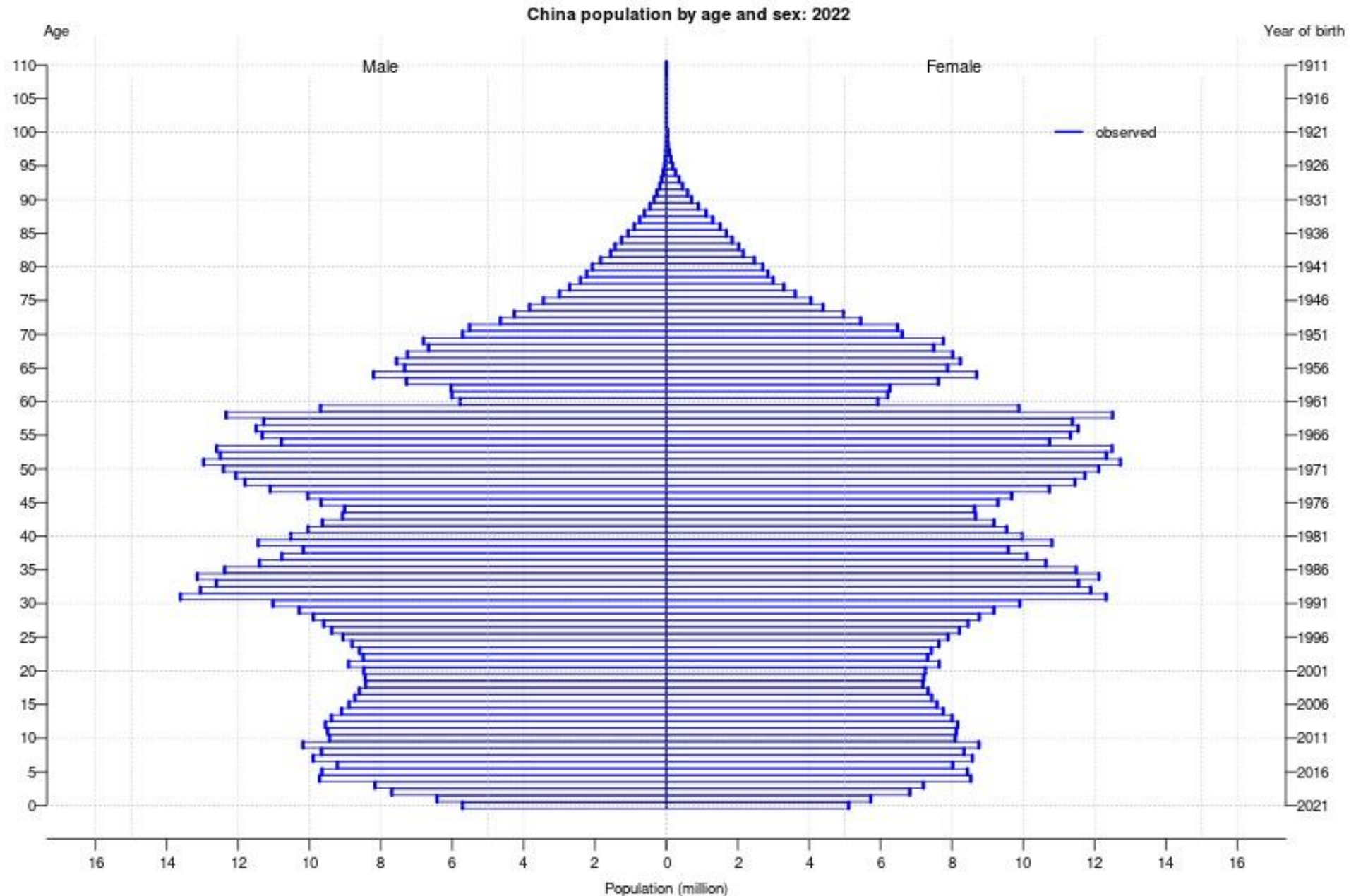


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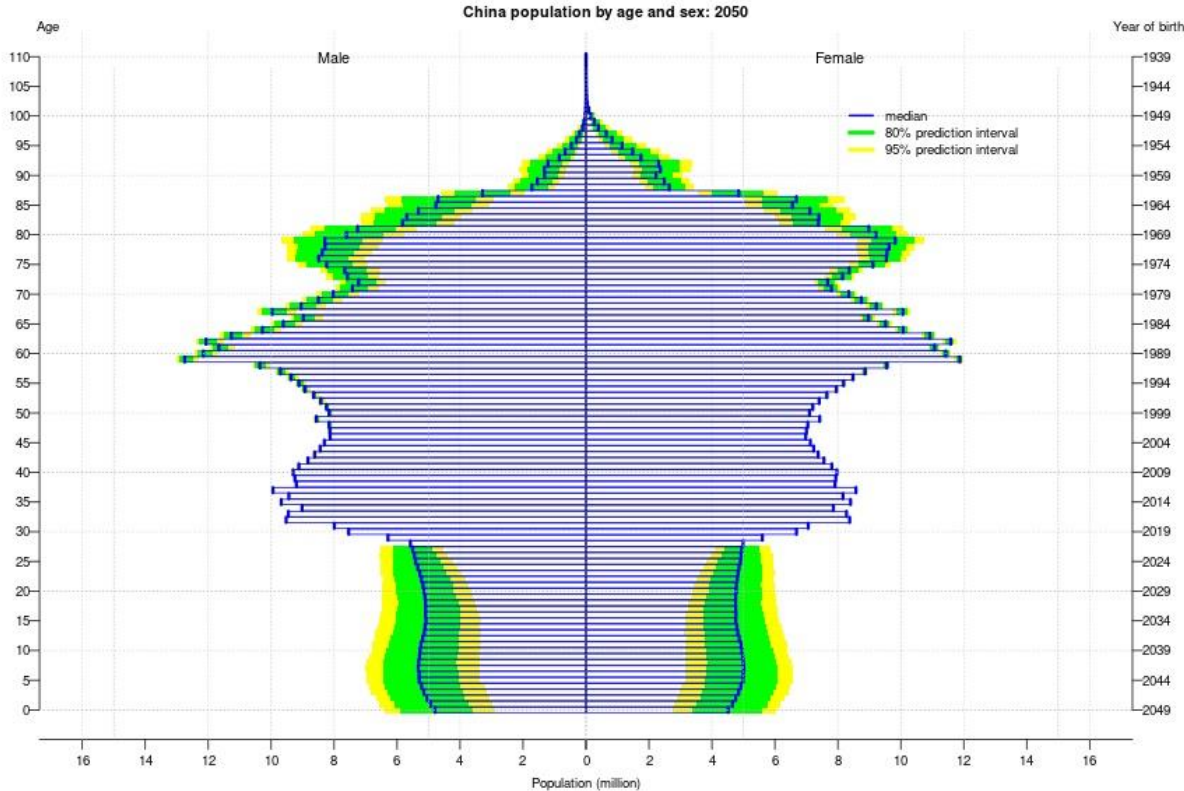
China 1950



China 2022

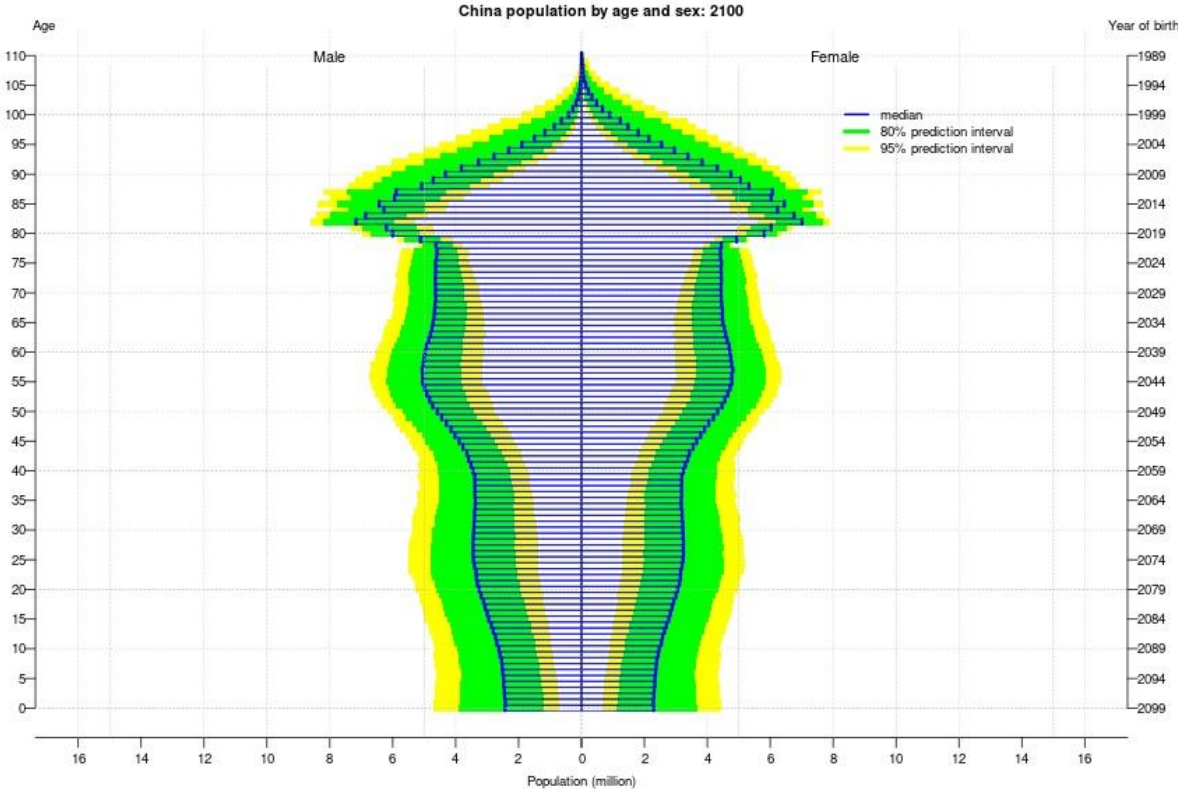


China 2050



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China 2100



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Three Drivers of Population Change

- **Fertility Rate**
 - Total Fertility Rate: Number of Babies Per Woman Per Lifetime
- **Mortality Rate**
 - Life Expectancy
 - Median Age
 - % Population 60+
- **Immigration**
 - Cultural Openness to Immigration
 - Ability to Attract Immigrants



China Fertility Rate 1950-2021

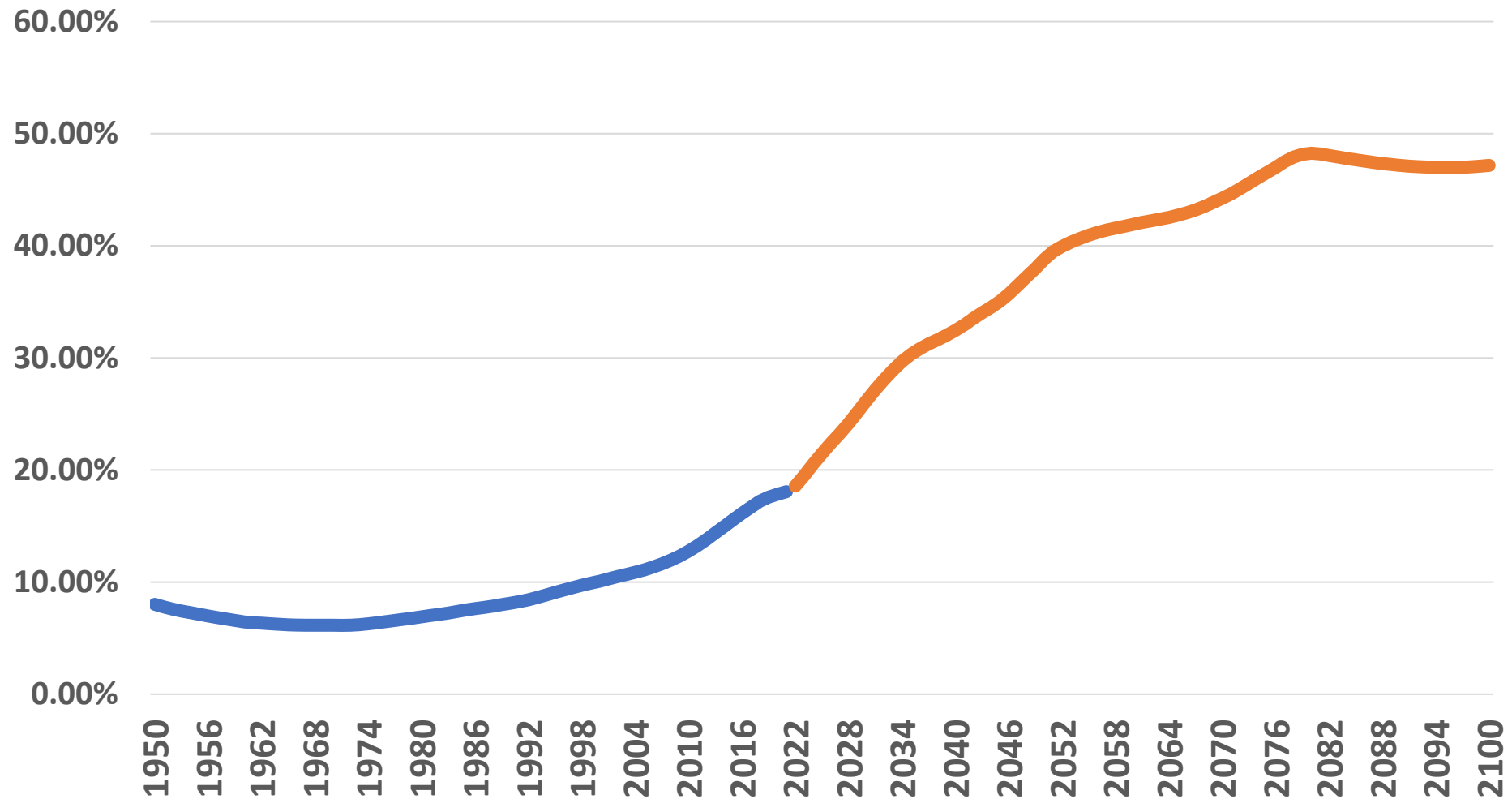


Drivers of Fertility Rate

- Urbanization
- Secularization
- Educational Attainment (Particularly Among Women)
- Rising Incomes

China 60+ % of Total Population

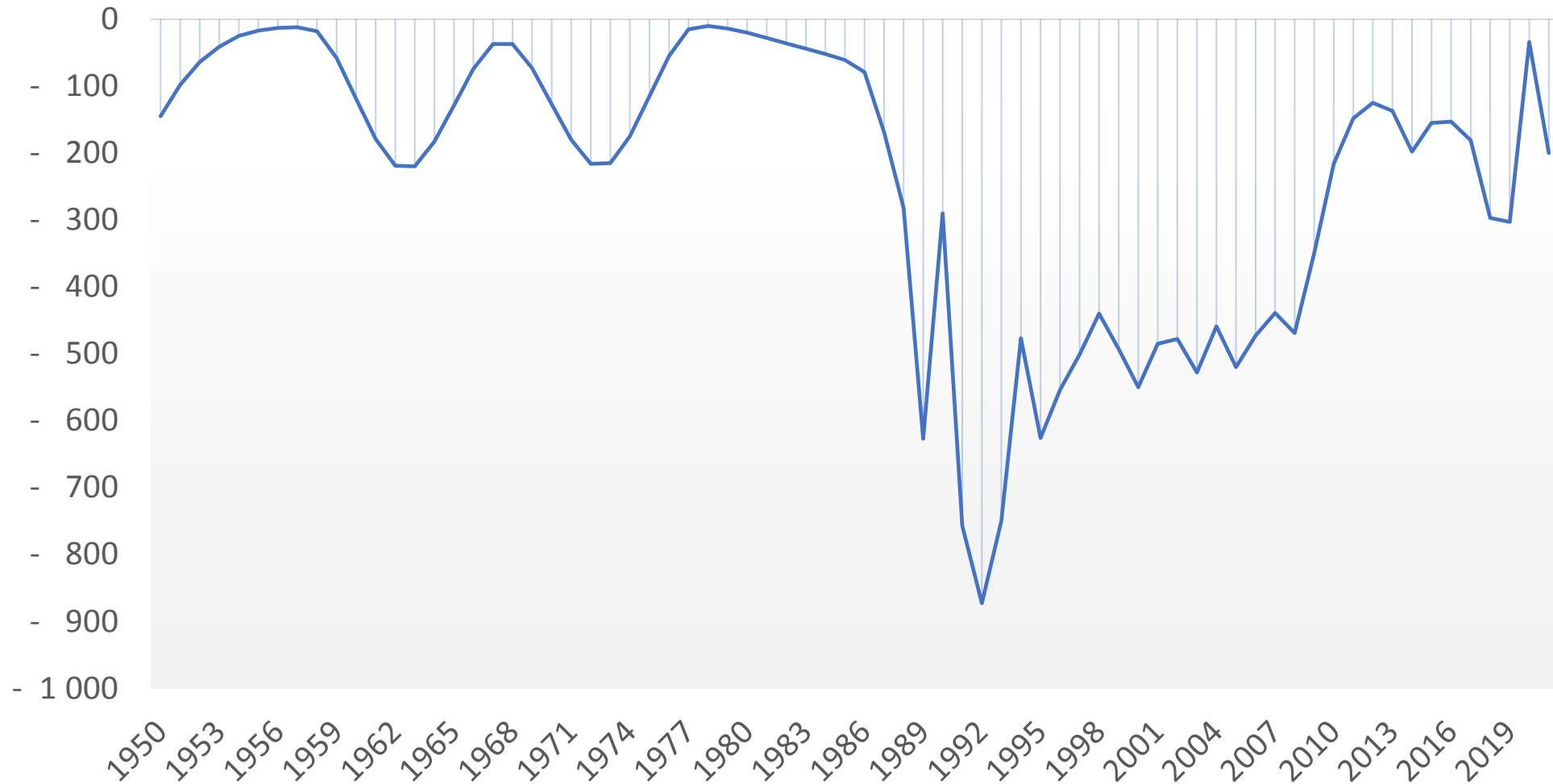
1950-2021 (Actual) 2022-2100 (Projected)



Data Source: United Nations (Medium Variant)

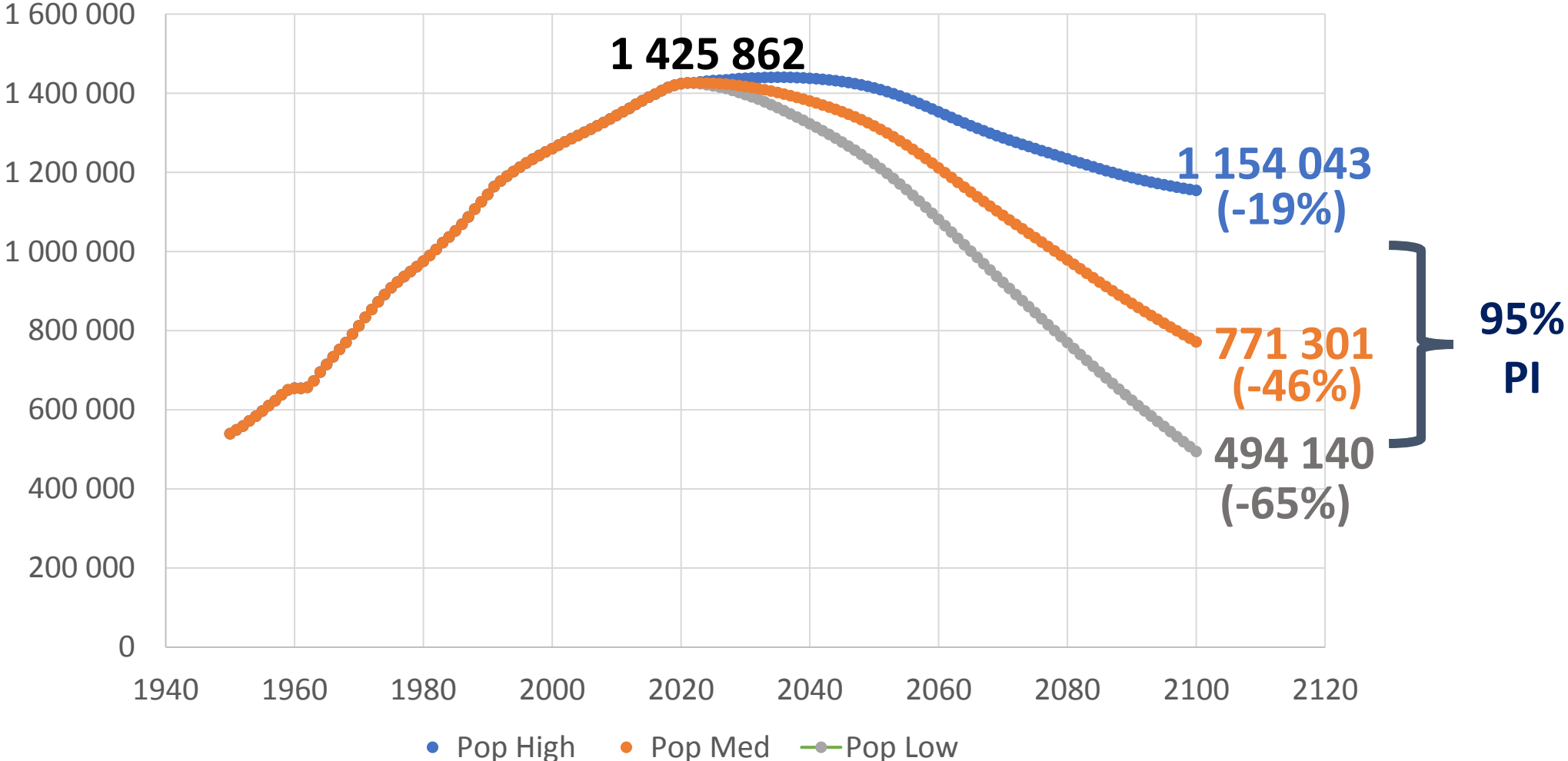
China Migration

1950-2021 (Thousands)



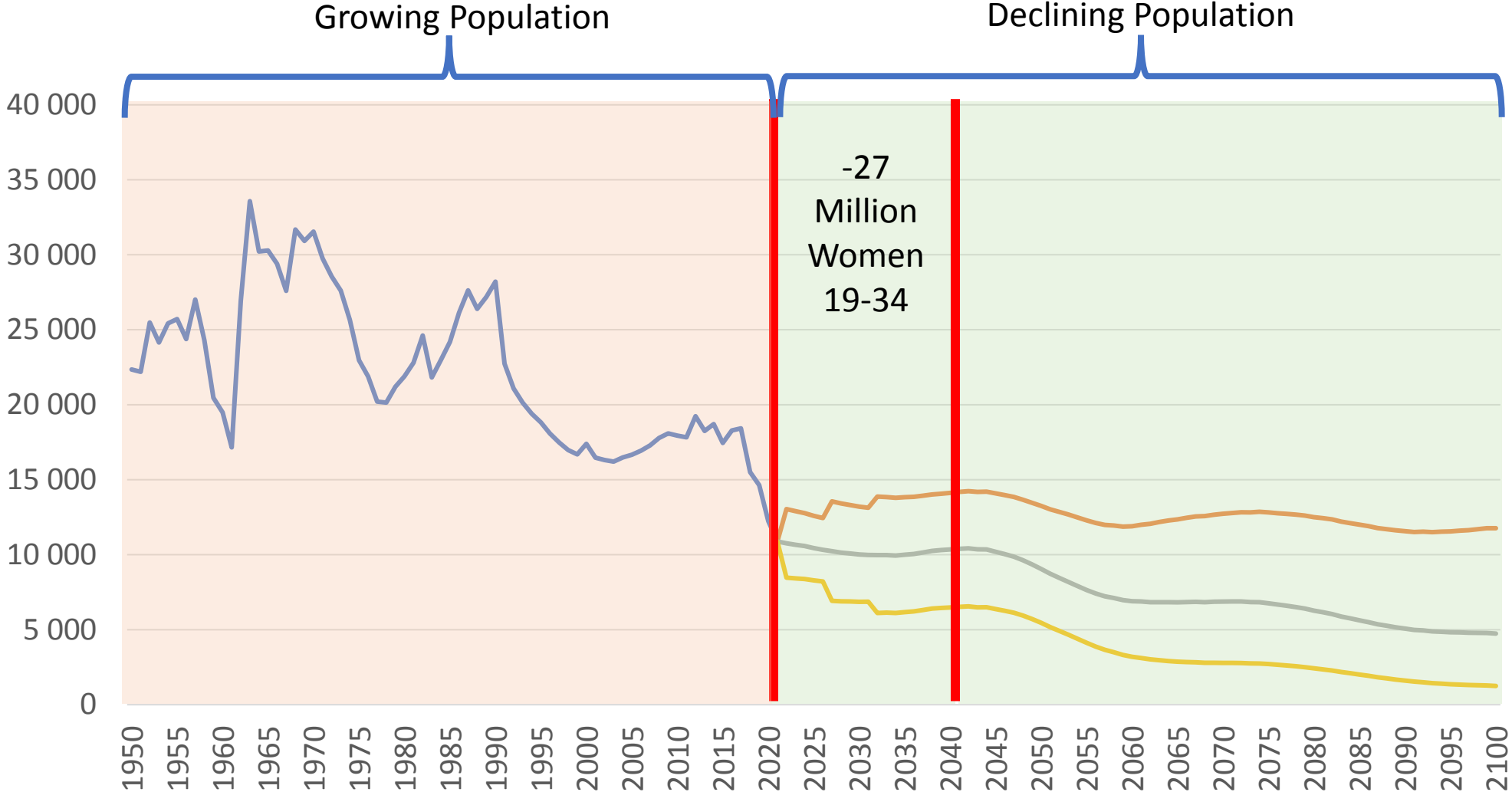
Data Source: United Nations

China UN Population 1950-2100



Data Source: United Nations

China Births (Thousands)

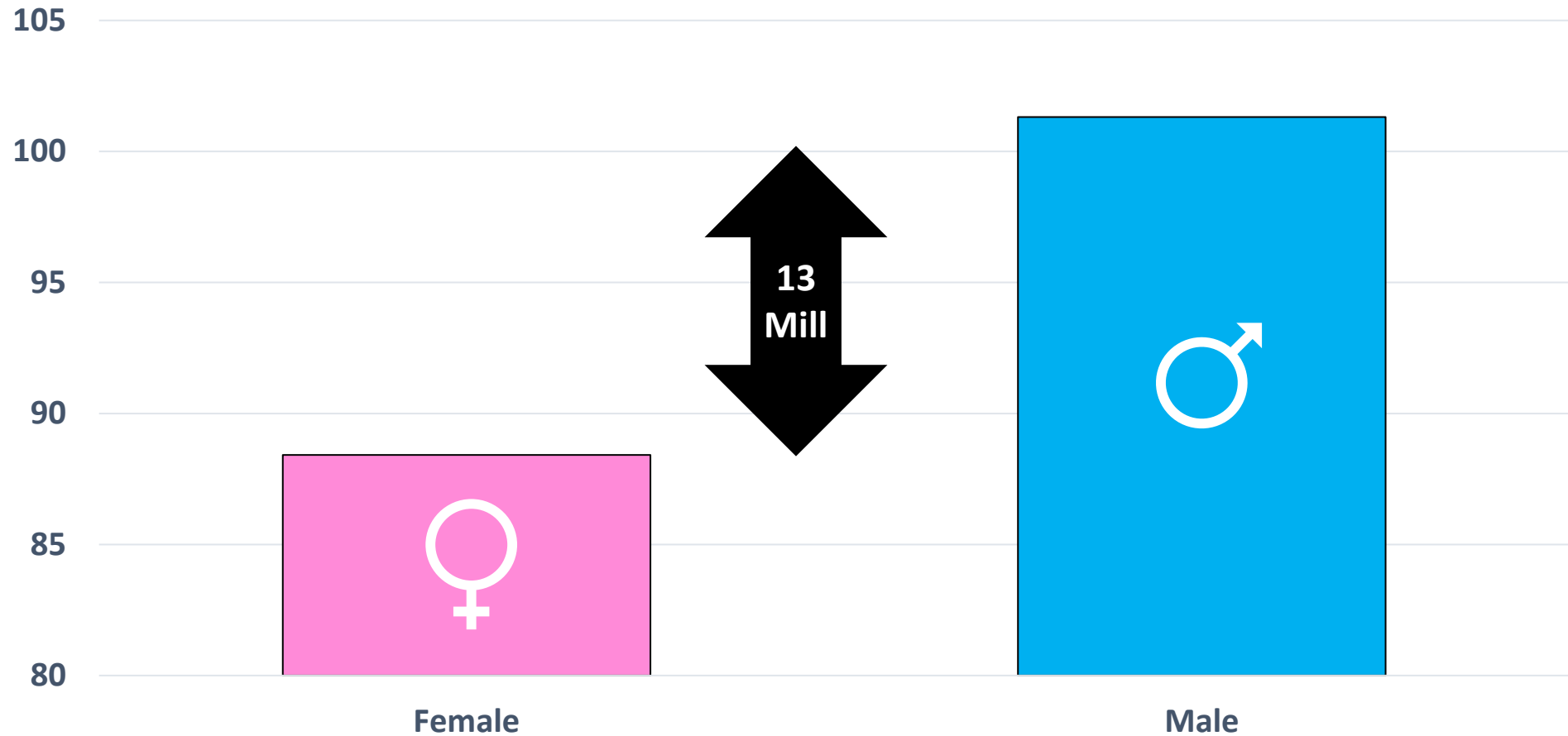


Data Source: United Nations

Births Births High Births Med Births Low

China Pop Aged 19-29 in 2021

(Millions)

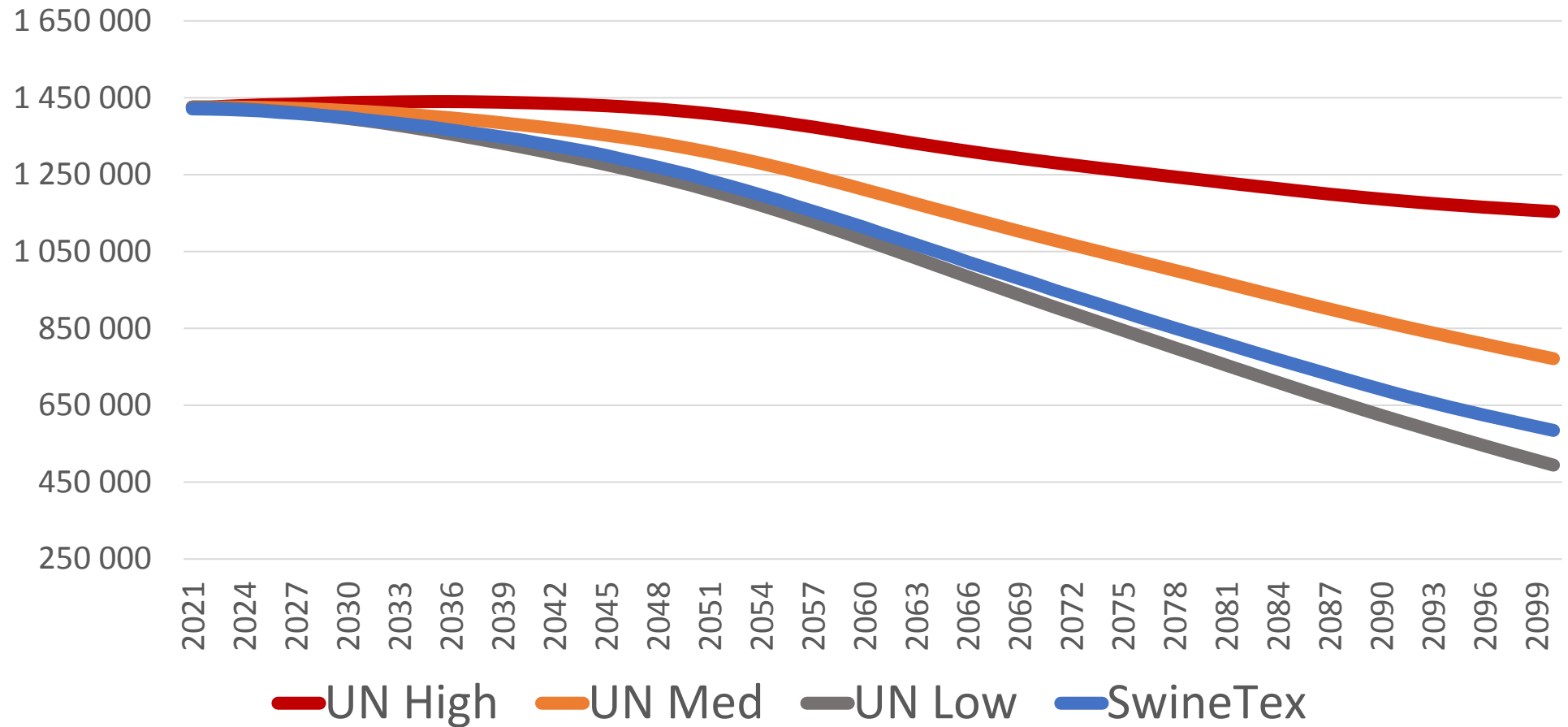


Data Source: United Nations

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China Population Projections

2021-2100 (Thousands)

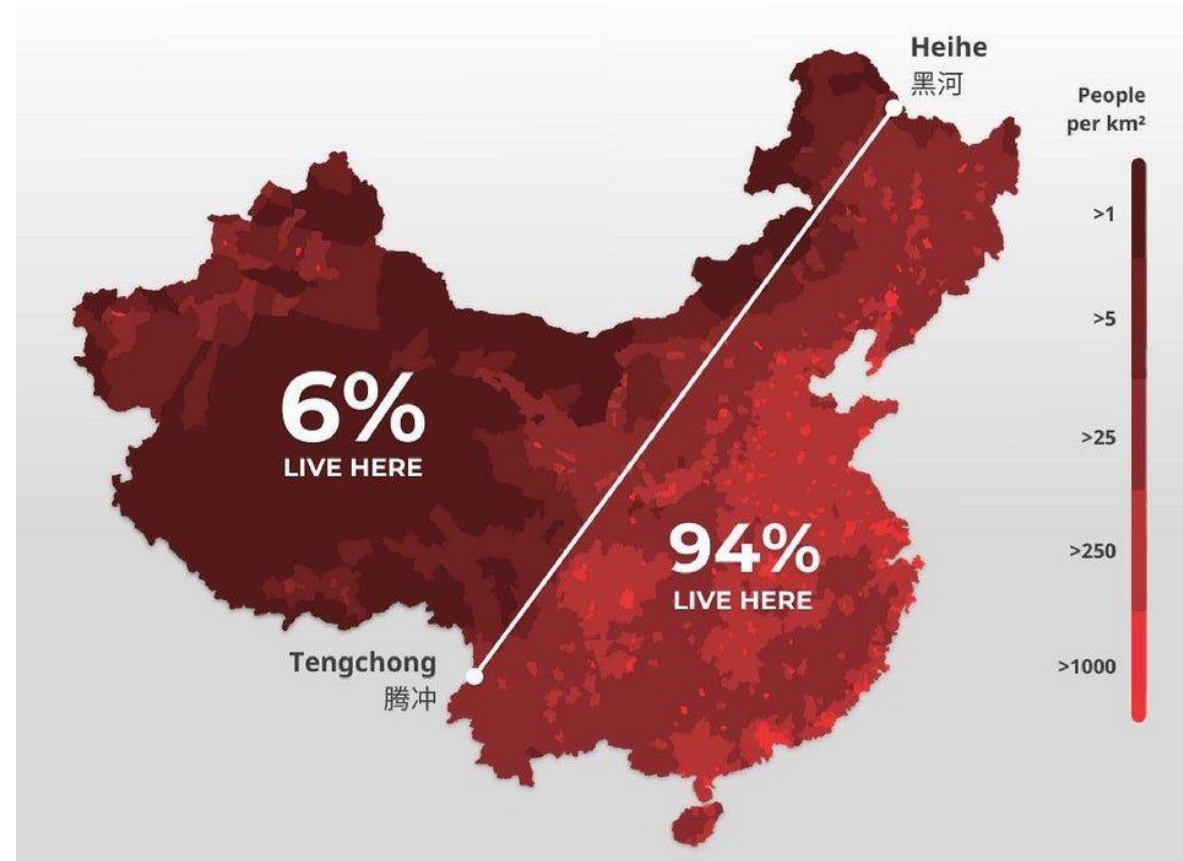


Data Source: United Nations, SwineTex Internal

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Drivers of China Food Imports

- More people
 - No longer true
- More Food Consumption/Capita
 - Per Capita Calorie Consumption may be flattening out
- Higher Quality Foods
 - Meat Consumption may be flattening out
- Lack of Self Sufficiency
- Economic Growth



Source: NASA, SEDAC, Columbia Univ.



Photo by [Debbie Tea](#) on [Unsplash](#)

Projections (China)

- We expect total caloric consumption to decline by 10-15% in the next 30 years.
 - ~80% from population decline and ~20% from population aging
 - We assume any increases in per capita consumption will be offset by reductions in food wastage
 - We assume no major shifts in food quality

US Ag Exports by Region

| Region | % of Total US Ag Exports 2021 | Pop Change 2022 to 2050 | Pop Change 2050 to 2100 |
|-----------------------------|-------------------------------|-------------------------|-------------------------|
| East Asia | 35.90% | -8.88% | -66.73% |
| North America | 27.80% | 12.78% | -11.54% |
| Europe | 7.10% | -5.73% | -19.89% |
| SE Asia | 8.50% | 14.00% | -6.32% |
| Middle East/N Africa | 4.90% | 28.71% | 18.39% |
| South America | 4.50% | 11.27% | -14.99% |
| S Asia | 4.20% | 19.12% | -1.35% |
| Central America | 3.30% | 15.16% | -15.27% |
| Caribbean | 2.50% | 7.29% | -19.28% |
| Sub-Saharan Africa | 1.30% | 44.98% | 39.05% |
| Oceania | 1.20% | 22.35% | 16.03% |

The Two Regions with the Fastest Declining Populations in the World (East Asia and Europe) Represent **43%** of Total US Ag Exports for 2021

The Two Regions with the Fastest Growing Populations in the World (Middle East/N Africa and Sub-Saharan Africa) Represent Just **6.2%** of Total US Ag Exports

Data Source: USDA United Nations (Medium Variant)

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East Asia Population Change 2022- 2050

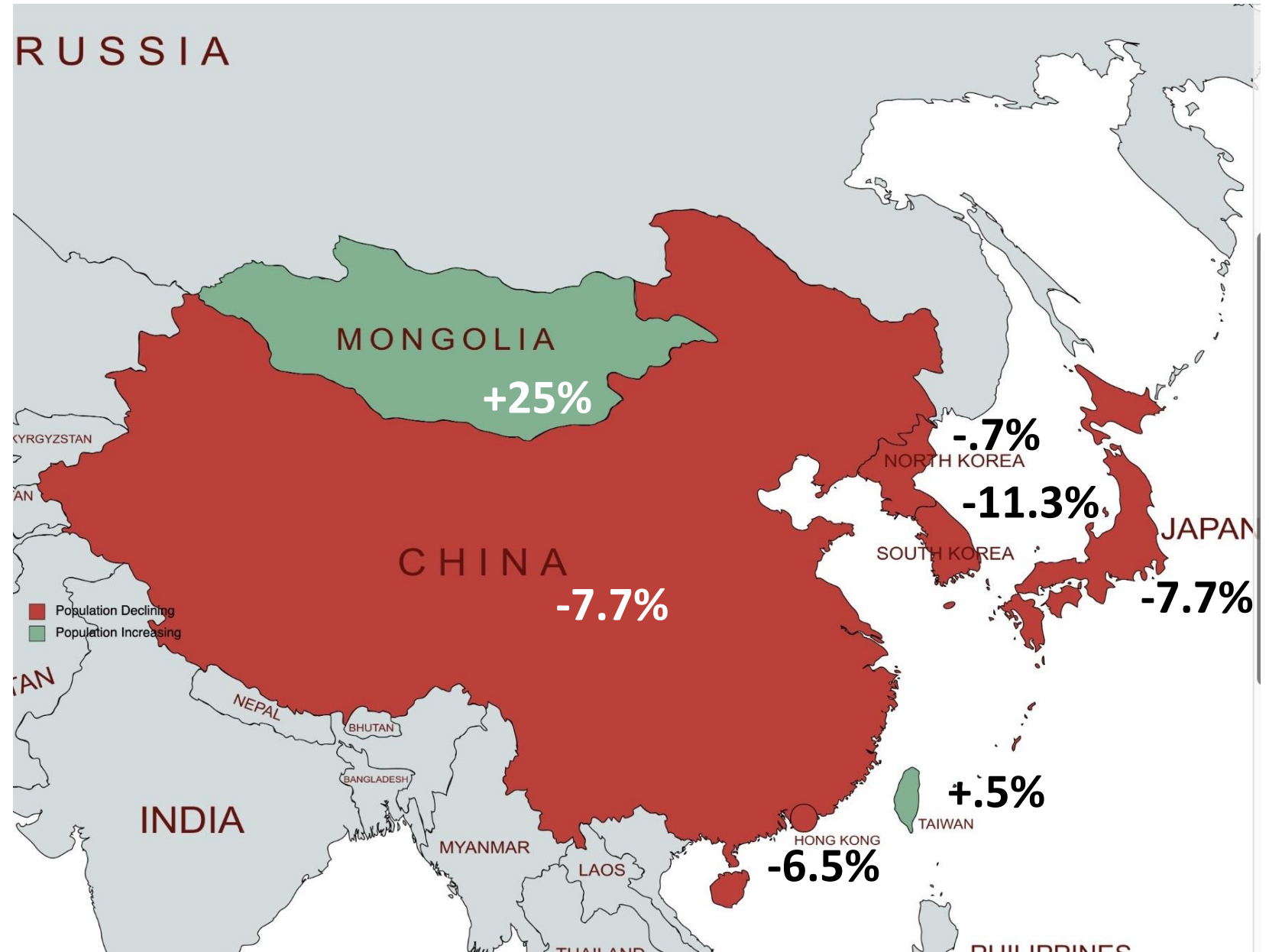
US Export Rank

China/HK: 1

Japan: 4

S. Korea: 6

Taiwan: 7



Data Source: USDA United Nations (Medium Variant)

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EU 27 + UK Population Change 2022- 2050

US Export Rank

EU 27: 5

UK: 14



Data Source: USDA United Nations (Medium Variant)

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Sub-Saharan Africa

Net Population
Difference 2021-
2100

~2.4 Billion

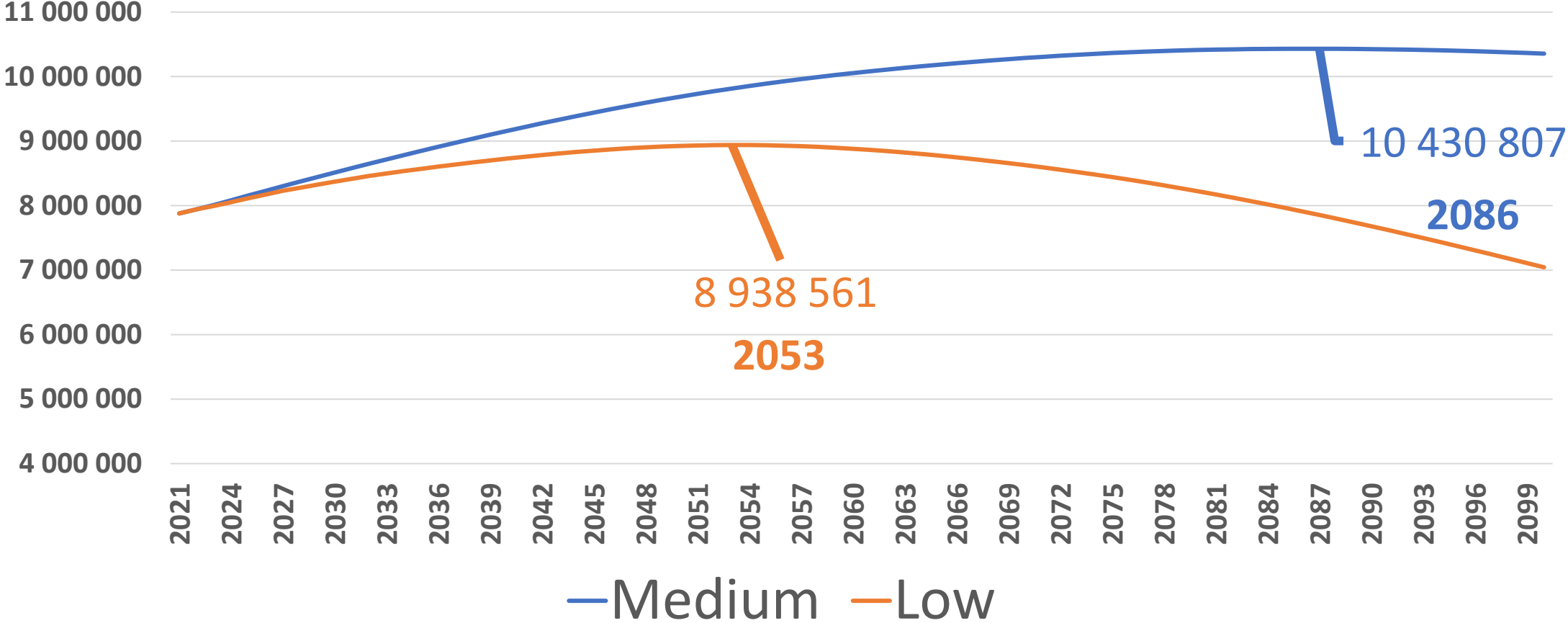
96% Expected to
Come from Sub-
Saharan Africa



Data Source: USDA United Nations (Medium Variant)

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UN Global Population Projections (Peak)



Data Source: United Nations (Medium/Low Variants)
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What's Changing?

- Shift away from East Asia and Europe towards Sub-Saharan Africa, The Middle East and Northern Africa
- Transition markets in SE Asia, Latin America (Still growing between now and 2050, but declining thereafter)
- Immigration will offset natural population declines in The US, Canada, Australia/New Zealand and some European countries.
 - Competition for workers will be intense
- Rapidly aging populations will fundamentally change consumption patterns and put pressure on all economic systems

What can we do?

- Start a dialogue within the industry
 - How will these changes impact the industry?
 - What systems will need to change to adjust?
- Shift from feeding more to feeding fewer mentality
- Market research: consumption patterns of older people
 - Women Aged 80+ is fastest growing demographic in the world
- Develop relationships with geographies with favorable demographics
 - Immigration
 - Market Development

Reasons for Optimism

- American Agriculture is and will continue to be the most competitive in the world
 - Low Cost of Production
 - Excellent Efficiency/Productivity
 - Unparalleled Natural Resources
 - Strong Economic & Political System
 - **The Most Creative, Hardest Working, Most Dedicated People in the World**





THANK YOU.

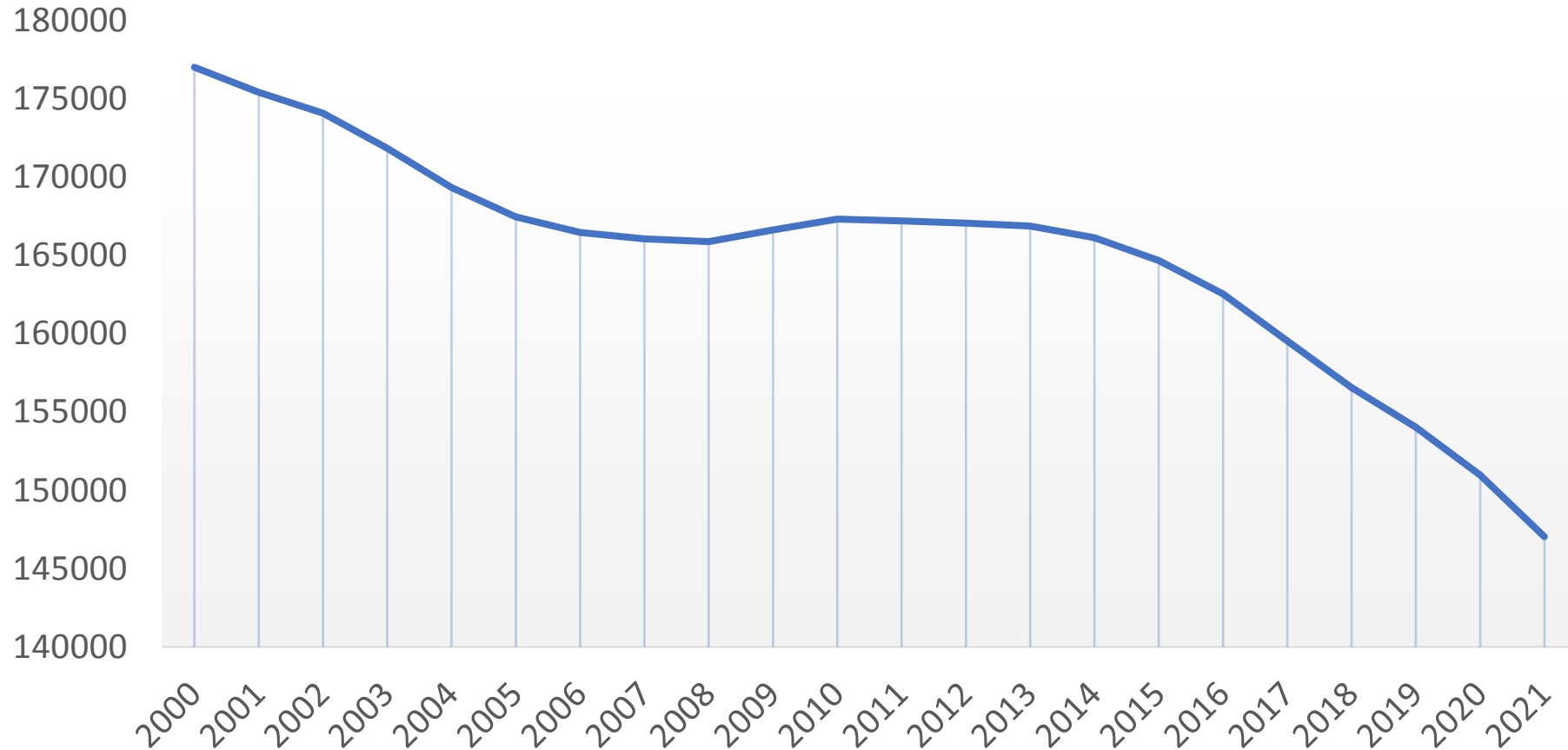
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China Female Age 19-34 Population

2000-2021 (Thousands)

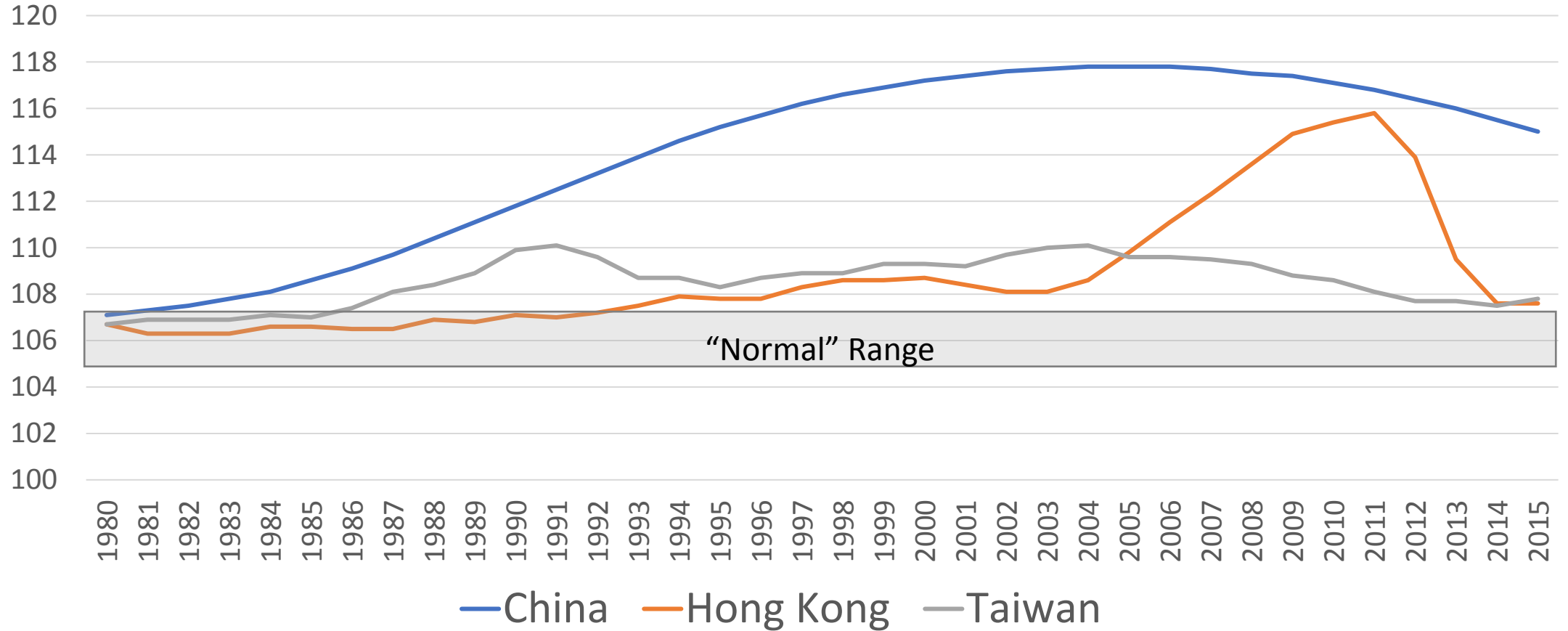


Data Source: United Nations

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Sex Ratio at Birth 1980-2015

(Males/100 Females)



Data Source: United Nations

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Top 10 US Ag Exports to China (2021)

Soybeans

Corn

Sorghum

Pork

Beef

Cotton

Tree Nuts

Poultry

Wheat

Dairy

Data Source: UN, US Census

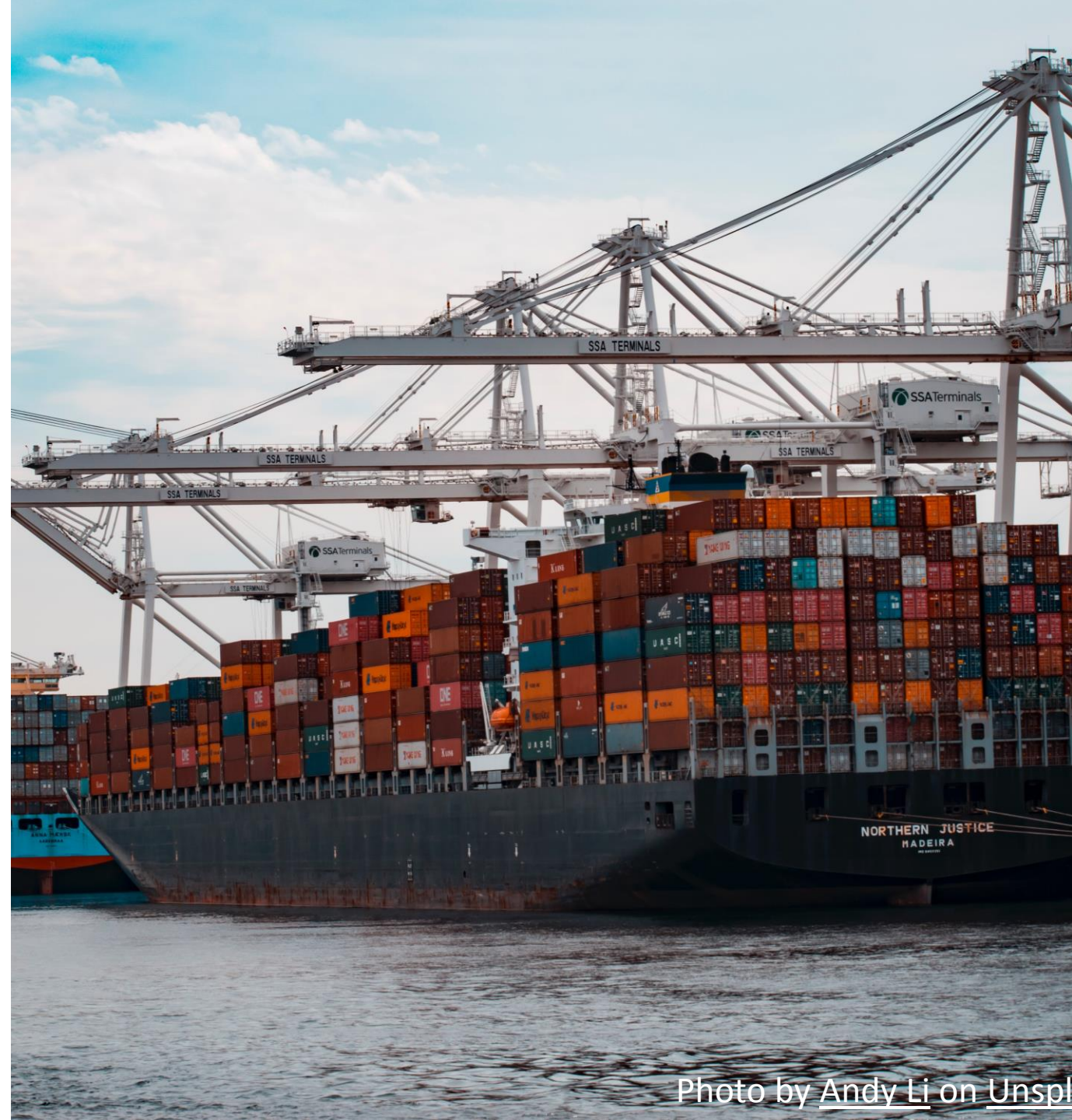
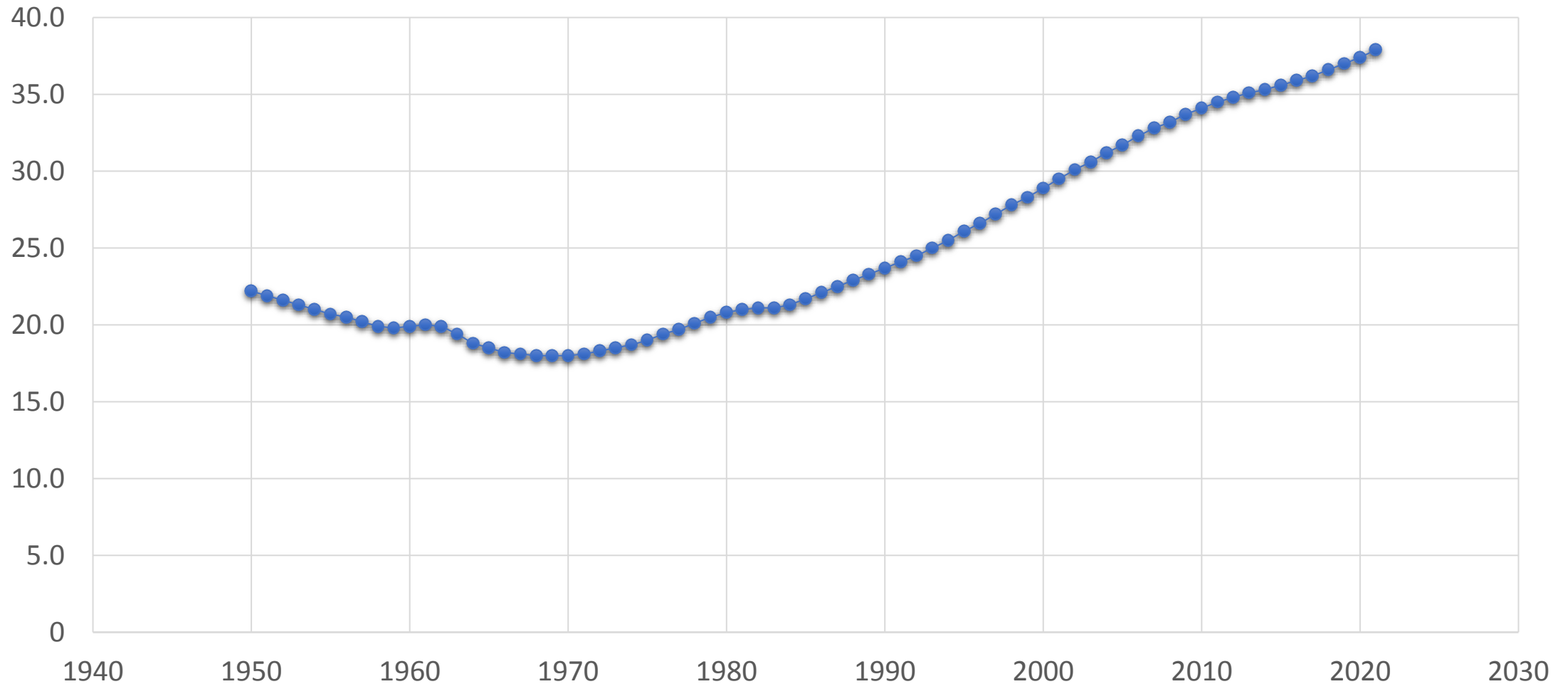


Photo by [Andy Li](#) on [Unsplash](#)

China Median Age 1950-2021



Data Source: United Nations

Drivers of Fertility Rate

- Urbanization
- Secularization
- Education (Particularly Among Women)
- Rising Incomes
- Infant and Childhood Mortality