

Japan Birth Demographics

Investigation of birth trends in Japan over the last 100 years



Project Team



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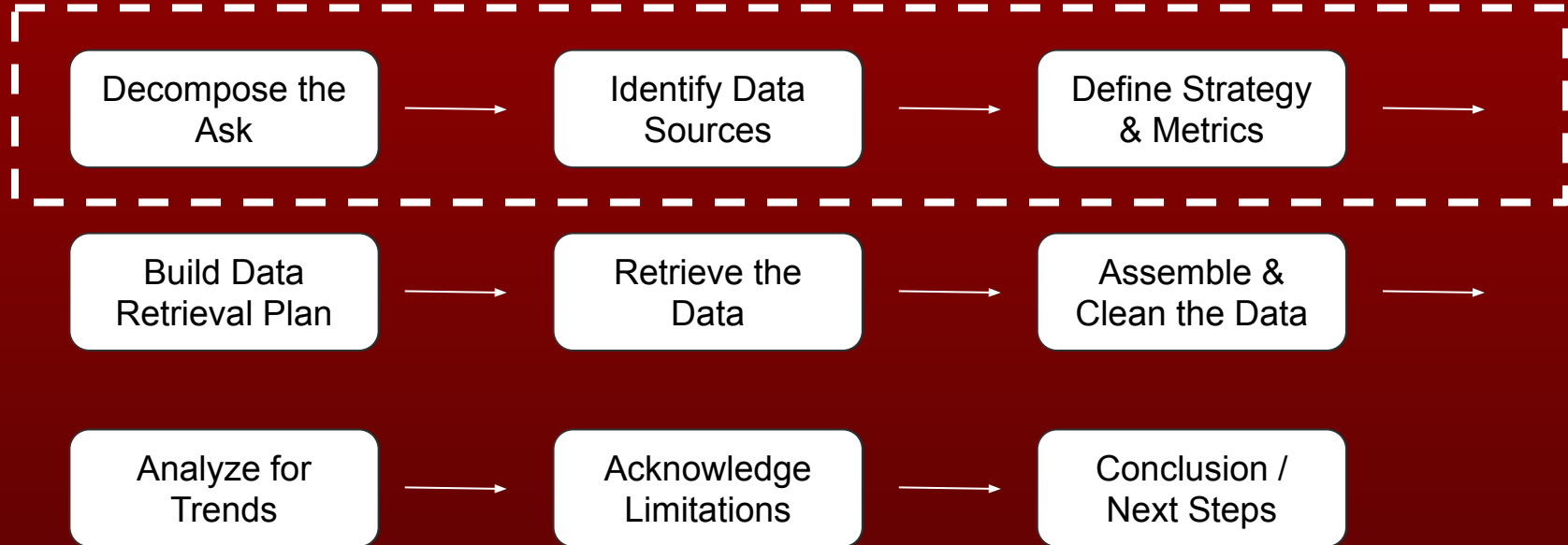
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The Questions

Investigation of birth trends in Japan over the last 100 years

Total Fertility Rate

How has the fertility rate changed over the last 100 years?

What are the potential factors driving the changes, such as economic conditions, social norms and government policies?

Stillbirths

What is the impact of major events on stillbirths?

Are there correlations between historical events and birth trends, providing valuable insights into societal responses to crises?

Ex-Nuptial Births

Is there a trend in the number of children born out of wedlock?

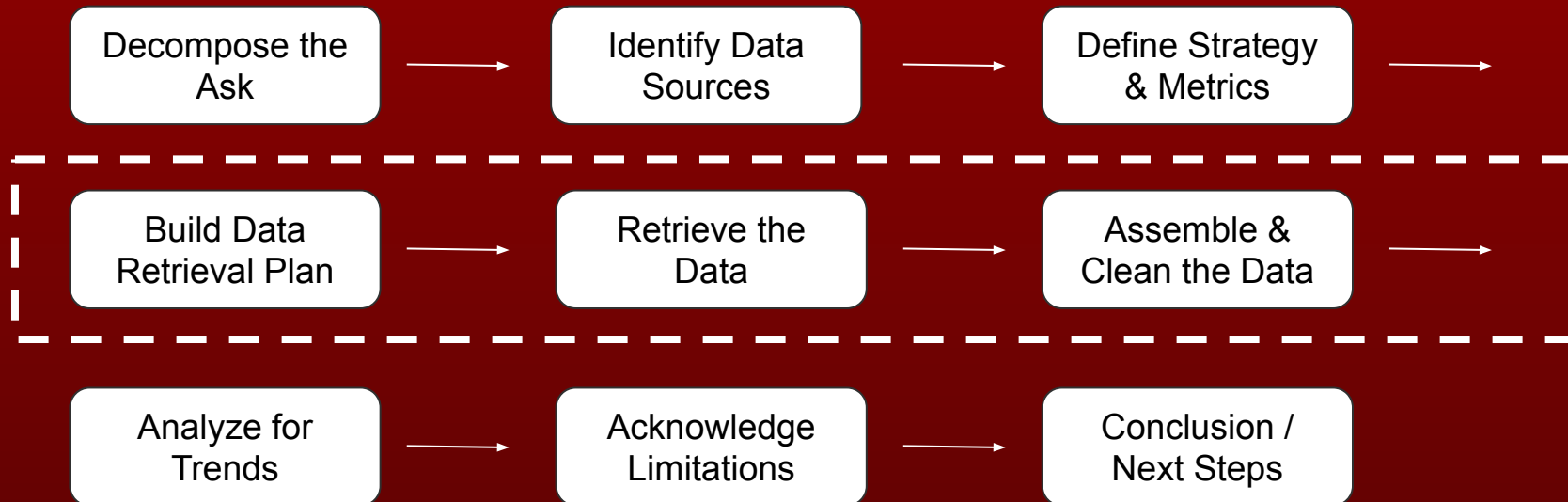
What is the evolving cultural and legal landscape surrounding marriage and childbirth in Japan?

Sex Ratio

Are there trends in the disparity between male and female birth rates?

Why would there be imbalances and are there implications for future population demographics?

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The Data

Kaggle: Japan Birth Statistics

Collective data of Japan's birth-related statistics from 1899 to 2022

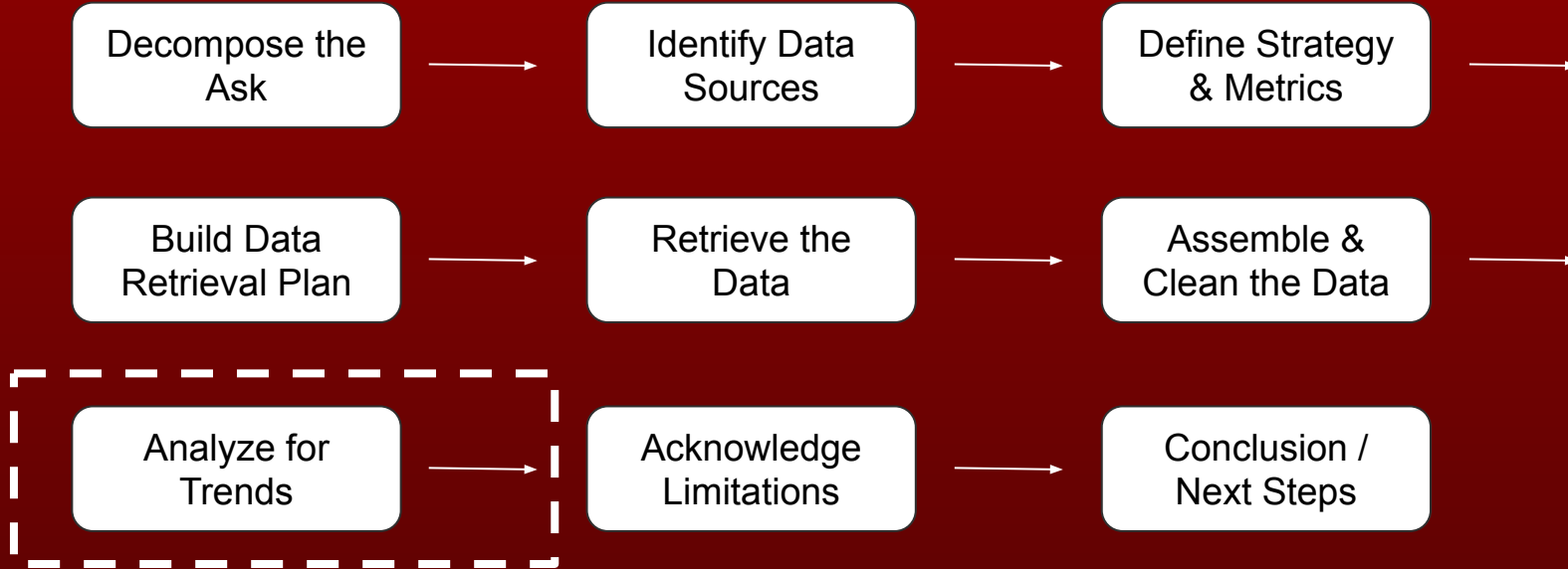
Rows of data: 10,000

Data size: 50 columns, 123 years

Data points: birth totals, gender totals, infant death totals, mothers age, ex-nuptial birth totals

<https://www.kaggle.com/datasets/webdevbadger/japan-birth-statistics/data>

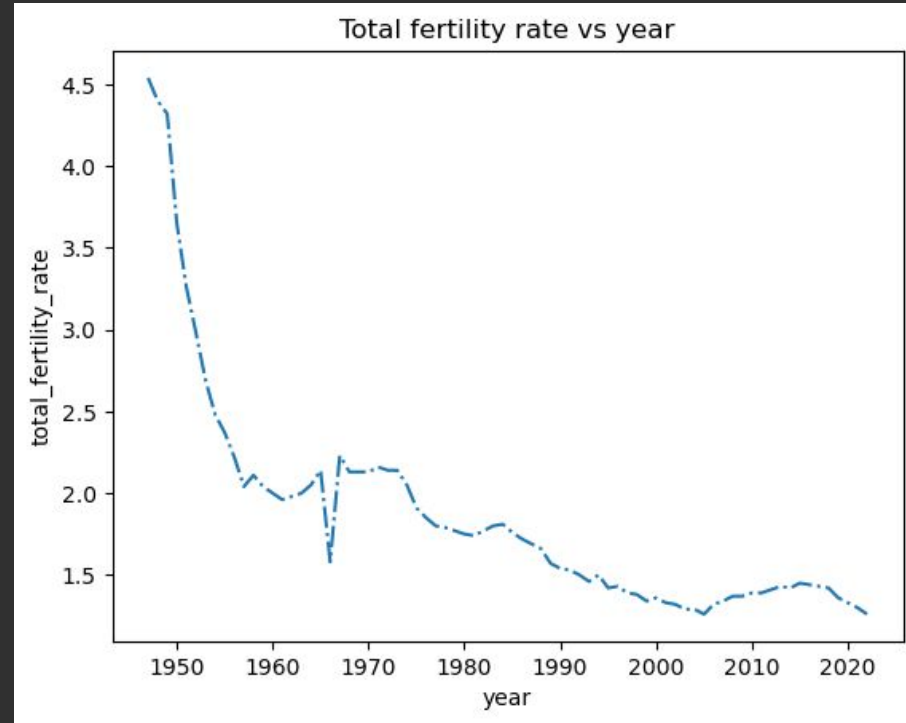
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Fertility Rate

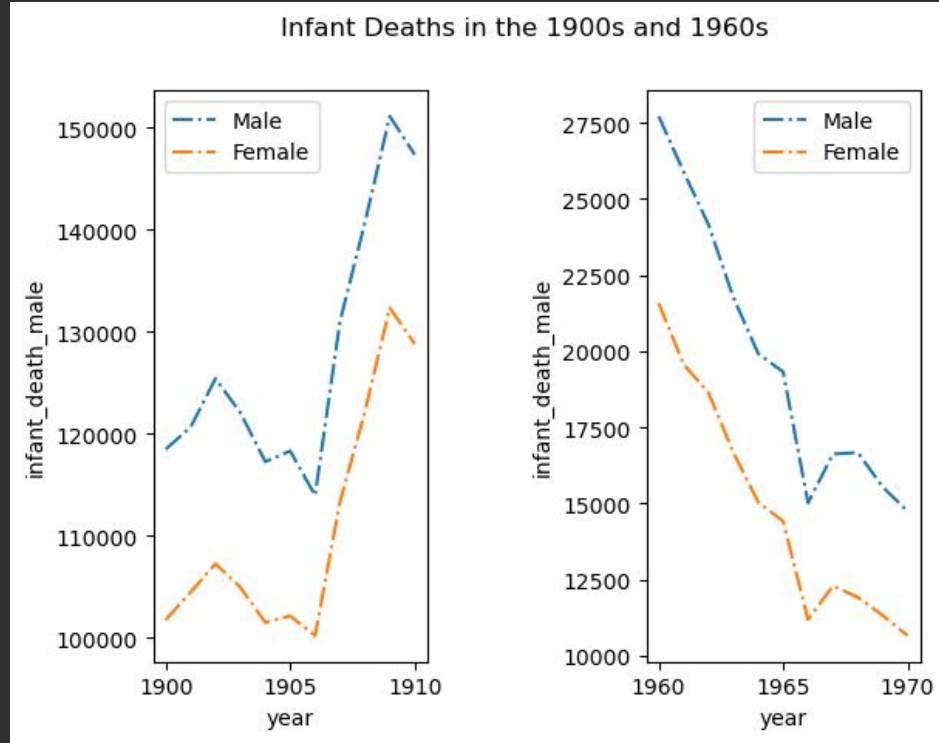
Definition: # of births per woman in her lifetime

How has the fertility rate changed over the last 100 years? We notice a large decrease after WWII, with a large dip in 1966. Hypothesis: could be war, famine, or pandemic in 1966



1966 was known as the year of the Fire Horse. According to superstition, women born during this year were seen as having bad omens and were not suitable for marriage.

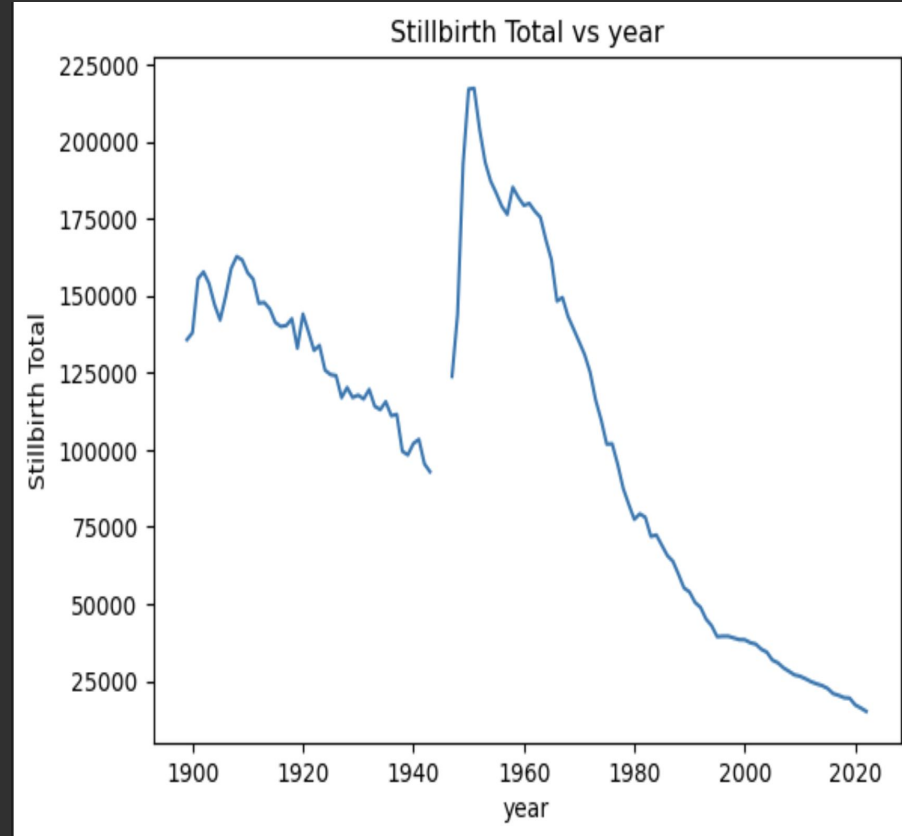
By looking at infant death rates, we can see that there were low points in both 1906 and 1966. This rules out famine, war or pandemic during those years. This leads us to suspect that Japanese couples chose not to have children during these years.



Stillbirth Rate

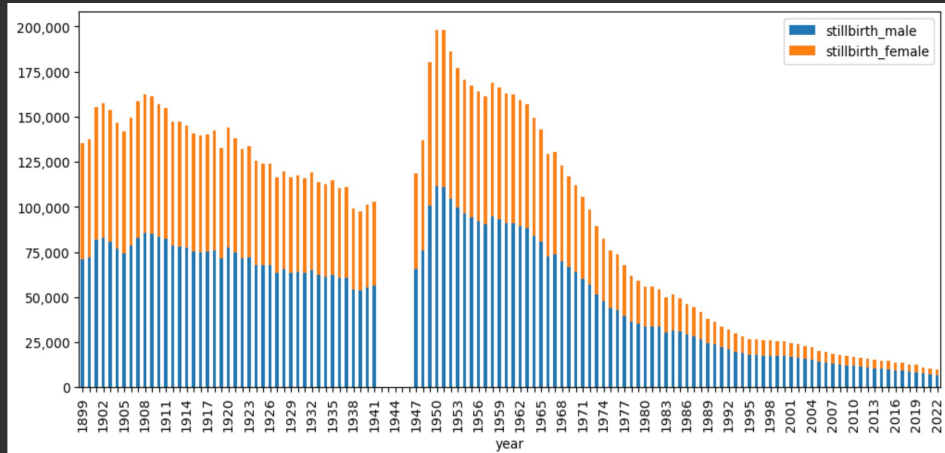
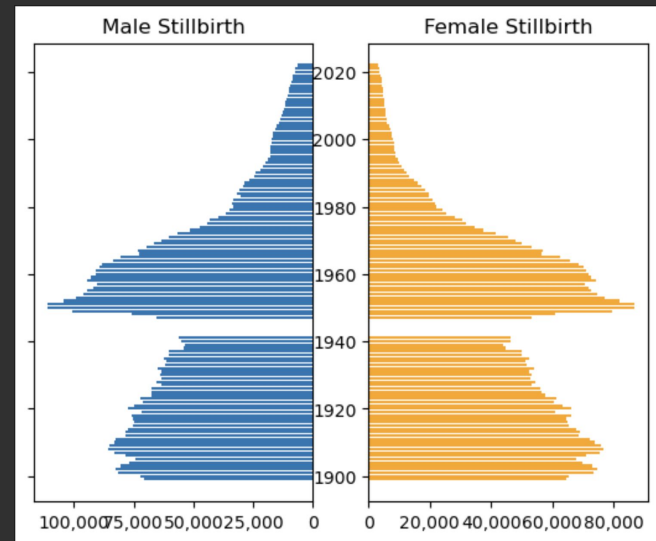
Definition: still-birth is a death or loss of a baby before or during delivery.

Question: how were stillbirths impacted by WWII? Were there any other historical events that impacted rates?



Stillbirth Rate

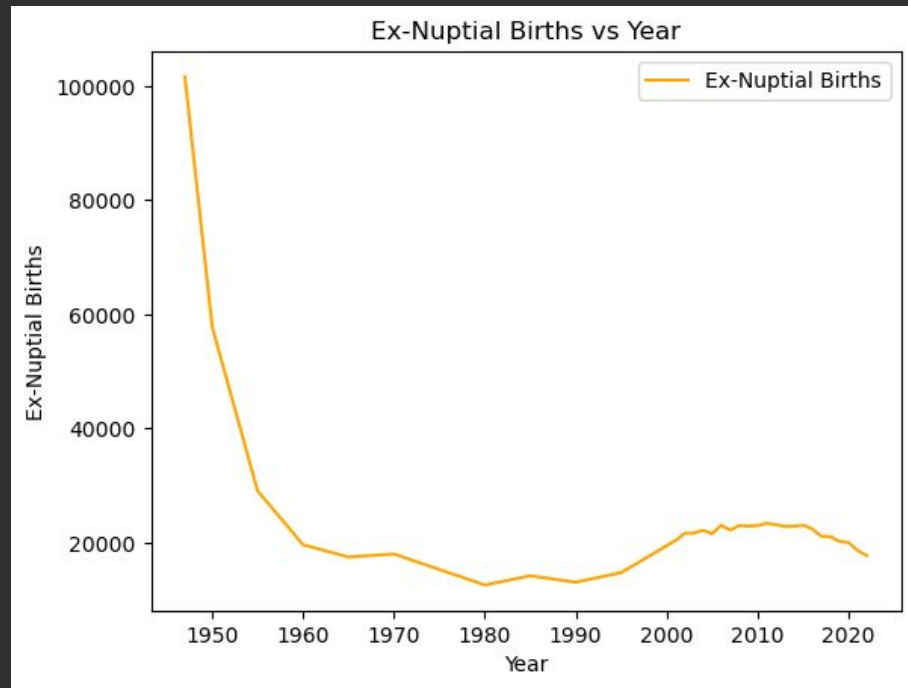
It appears that stillbirth rates increased after WWII. It also looks like there were high rates of stillbirths in the early 1900s and declining in the subsequent years up to the war.



Ex-Nuptial Births

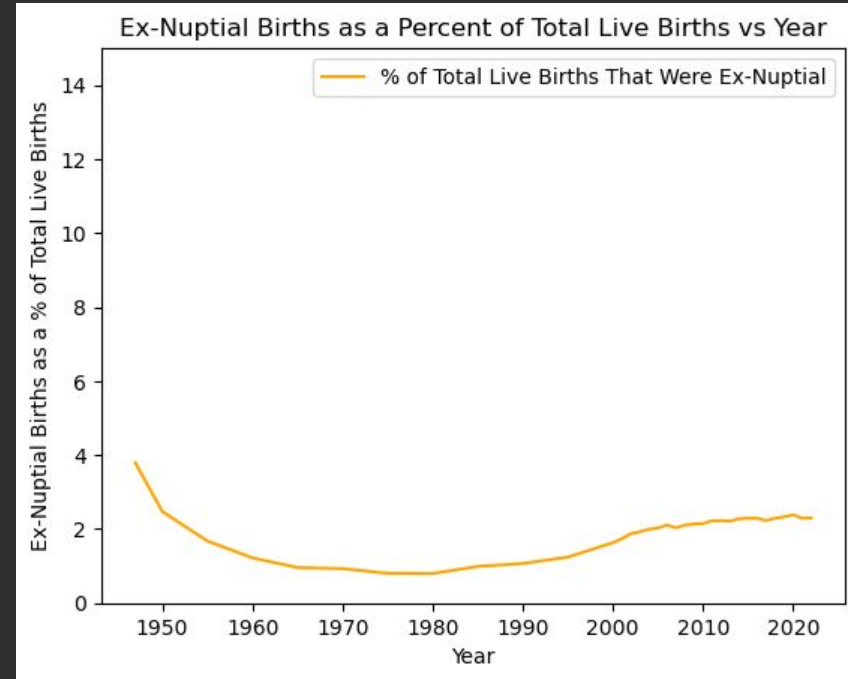
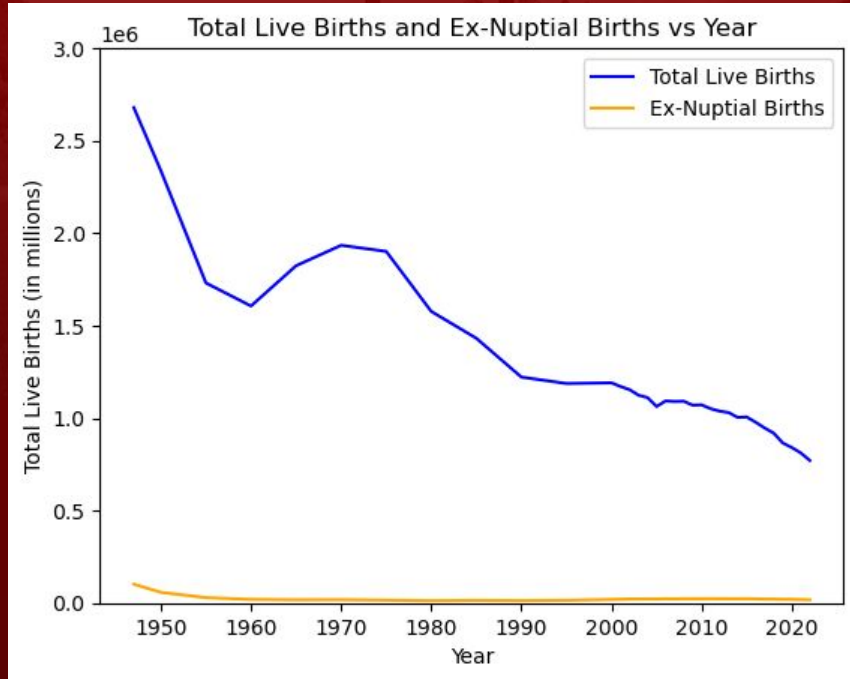
Definition: Number of total live births to unmarried parents

Question: Is the relatively higher rate in the immediate post-war years significant or explained by random chance?



Ex-Nuptial Births

In the context of total live birth per year, were ex-nuptial births unusually high?

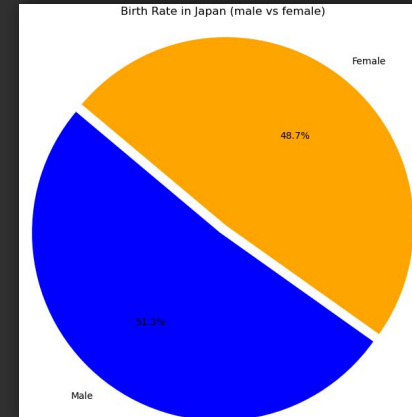
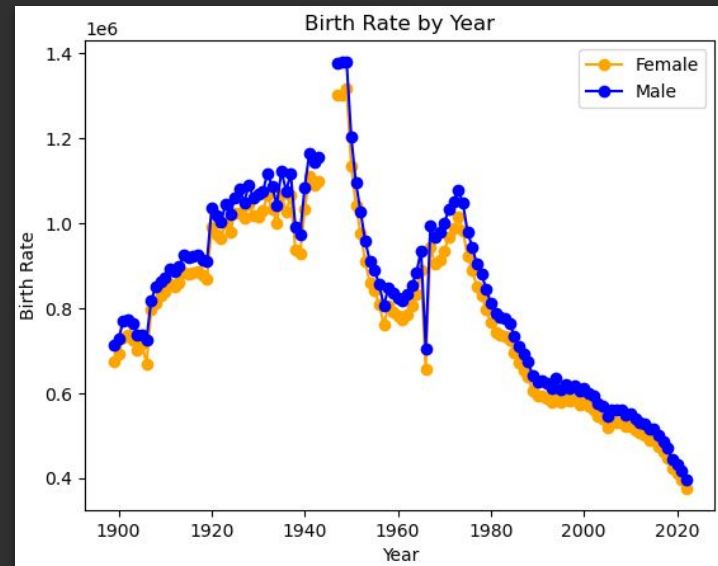


Sex Ratio

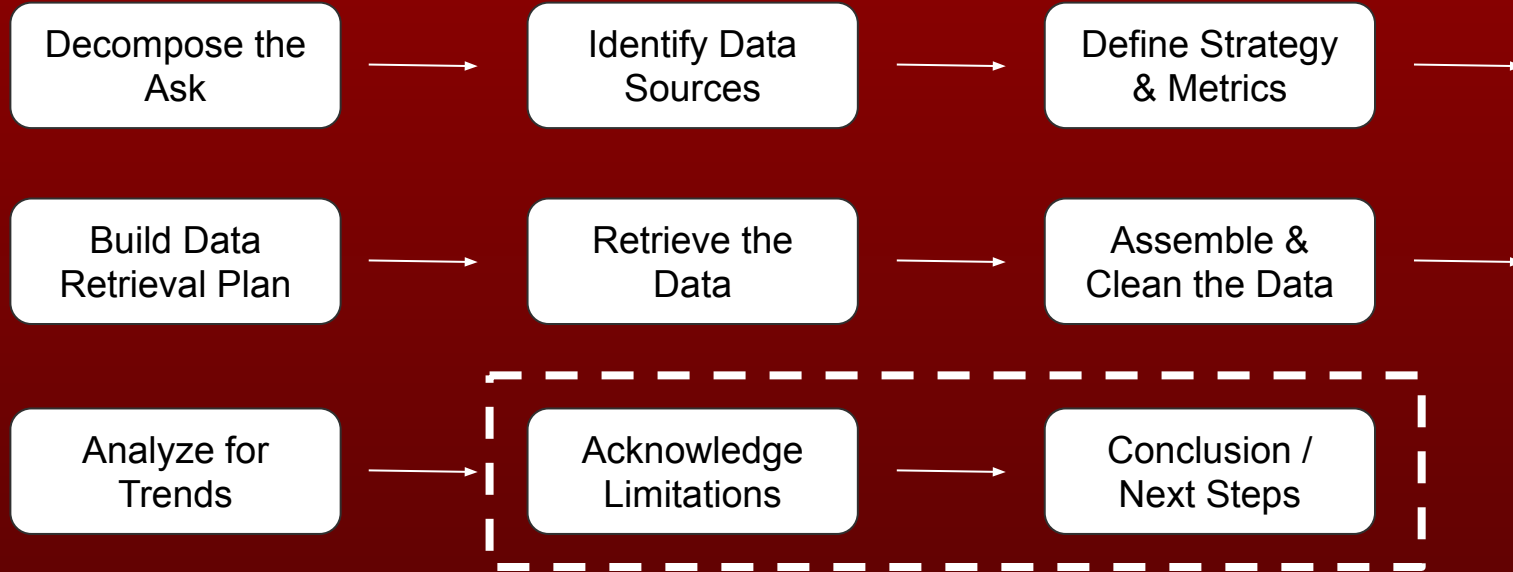
Are there trends in male vs female birth rates?

Sex ratio is fairly consistent at 51% male / 49% female.

While there may be a higher ratio of male births in Japan, the difference is fairly small and similar to what is observed in overall human population.



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Limitations

1. Some data is missing between the years 1944-1946 due to records lost during World War II.
2. Between the years 1947 and 2000, the data set reports ex-nuptial births every five years. From 2000 to 2022, it reports ex-nuptial births every year.

Next Steps

1. Compare by regions
2. Gather pre-1947 data on ex-nuptial births per year
3. Discover a statistical testing technique capable of determining whether changes seen in population subsets are meaningful or attributable to random chance

References

Data source: <https://www.kaggle.com/datasets/webdevbadger/japan-birth-statistics>

Drixler, Fabian F. “Hidden in Plain Sight: Stillbirths and Infanticides in Imperial Japan.” *The Journal of Economic History*, vol. 76, no. 3, 2016, pp. 651–96. JSTOR, <http://www.jstor.org/stable/43917379>. Accessed 10 Feb. 2024.

Hashimoto, Masanori. “Economics of Postwar Fertility in Japan: Differentials and Trends.” *Journal of Political Economy*, vol. 82, no. 2, 1974, pp. S170–94. JSTOR, <http://www.jstor.org/stable/1829999>. Accessed 10 Feb. 2024.

Kanae Kaku (1975) Increased induced abortion rate in 1966, an aspect of a Japanese folk superstition, *Annals of Human Biology*, 2:2, 111-115, DOI: 10.1080/03014467500000651

Yamada, H. Superstition effects versus cohort effects: is it bad luck to be born in the year of the fire horse in Japan?. *Rev Econ Household* 11, 259–283 (2013).
<https://doi.org/10.1007/s11150-012-9162-9>

Questions?

