In All 28 Years Since 1985, February Had the Fewest Births of Any Month, Yet Per Day, February Was the Lowest in 0 Years — More Than Half of February's Shortfall (0.512–1.077, Median 0.849) Is the Number of Days in the Month; the Seasonal Peak Moved from January–February in 1947–1975 to July–October from 1980 On, and the Seasonal Range Shrank from 0.528 in 1955 to 0.058 in 2006 [M110]

Index before adjusting for days = calendar factor (days in the month) × seasonal index (per day) — What separates them is the part set by the calendar or the part set by season

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Abstract

Using the Ministry of Health, Labour and Welfare's Vital Statistics (2024, Volume 1, Table 4.2, births and birth rates by month of birth and year, 36 years from 1947 to 2024), this paper looked at the seasonal shape of the month of birth. Monthly birth counts directly include the difference in the number of days in each month (28 to 31). This paper split this into a "calendar part" and a "seasonal part." No new mathematical theorem and no new law are claimed.

First, **in all 28 years since 1985, the month with the fewest births before adjusting for days was February. Yet per day, February was the lowest month in 0 years (February's seasonal index since 1985 was 0.924–1.006)** (Section 4).

Second, this is the core of the paper. **Splitting February's shortfall in logarithms into a calendar part and a seasonal part, the calendar part was more than half in all 28 years since 1985 (0.512–1.077,**

median 0.849). February has only 28 days (29 in leap years), so its calendar factor is 0.9205 (0.9508 in leap years), and by days alone it appears at 0.9205 times the average (Section 4).

Third, **the seasonal peak (the month with the most births per day) was January or February in all 7 years from 1947 to 1975, and July to October in all 29 years from 1980 on** (Section 5).

Fourth, **the seasonal range (maximum − minimum of the seasonal index) was largest in 1955 (0.528) and smallest in 2006 (0.058); it was 0.206 in 2021 (the largest since 2000, with January the trough at 0.886) and 0.162 in 2024** (Section 5).

Fifth, **the index derived from the table's "monthly rates converted to annual rates" agreed with the per-day index within 0.016 in all 36 years** (Section 3).

Sixth, what separates them is **the part set by the calendar or the part set by season**. When you hear that "few babies are born in some month," check the number of days in that month as well.

Scope note: **This paper claims no new mathematical theorem and no new law** — monthly birth counts are in a public table, and this paper only divided by the number of days in each month and split the result in logarithms. **This paper is a structural interpretation of the shape of numbers in public aggregate data; it is not medical advice, not a diagnosis, and not a treatment recommendation. The author is not a physician. Decisions about individual health should be discussed with a physician or a medical institution. This is a preprint that has not been peer reviewed. The reasons the seasonal peak moved and why January 2021 was low cannot be separated with this table and are not discussed. No month of birth is called good or bad.** The "seasonal part" is everything left in the monthly differences after removing the number of days; what it consists of is not separated. Up to 1995, only every fifth year was examined. **About the data**: the Vital Statistics (Ministry of Health, Labour and Welfare) were taken from e-Stat and used under the Government of Japan Standard Terms of Use (Version 2.0); the seasonal index, calendar factor, index before adjusting for days, range, and shares split in logarithms in this paper were processed from them. What this paper adds: **splitting monthly differences in births into a part set by the number of days and a seasonal part, and showing in numbers that most of "few births in February" is the calendar part**.

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1. Notation and question

- **Index before adjusting for days** N = births in the month ÷ (births in the year ÷ 12). 1 is the twelfth-share average.
- **Calendar factor** c = 12 × days in the month ÷ days in the year. The share expected from the number of days alone (1.0192 for 31-day months, 0.9863 for 30-day months, 0.9205 for February, 0.9508 for February in leap years).
- **Seasonal index** I = (births in the month ÷ days in the month) ÷ (births in the year ÷ days in the year). The per-day value; 1 is the year average.
- **N = c × I** holds exactly. In logarithms, ln N = ln c + ln I.

- **Range**: the maximum − minimum of the seasonal index in that year.

Question: How much of the difference between months of birth is explained by the number of days, and how much is seasonal? How has the seasonal shape changed over the years?

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2. Preview and design

Written honestly: the design was decided after looking at the table.

	Content
Table	Vital Statistics 2024, Volume 1, Table 4.2, births and birth rates (per 1,000 population) by month of birth and year
Noticed in the preview	In recent years February has the fewest births every year. February also has the fewest days
Noticed in the preview (2)	In the 1950s January was far higher; in recent years July to September are slightly higher
Noticed in the preview (3)	The table's birth rates are "converted to annual rates," which smooths out the difference in days per month (usable for cross-checking)
Comparison	Seasonal index, range, and peak and trough months for 36 years; the calendar and seasonal parts of February; cross-check with the table's rates

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3. Data and checks

Calculation 3.1 The retrieved file was fixed by SHA-256, and the following were checked.

- The header is total and January to December, and the birth and birth-rate blocks have the same 36 years (1947, every fifth year 1950–1995, and every year 2000–2024).
- The sum of the 12 months = the total. Only 1947 is 4 short, matching the note "month unknown 4."

- Index before adjusting for days = calendar factor × seasonal index holds exactly.
- The difference between the table's "monthly rate ÷ annual rate" and the seasonal index is within 0.016 in all 36 years (largest in 1975; the rates have one decimal place).

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4. The core — splitting February's shortfall into a calendar part and a seasonal part

Calculation 4.1 February's index split in logarithms

Year	Index before adjusting	Calendar factor	Seasonal index	Share of calendar part
1955	1.089	0.9205	1.183	−0.970
1990	0.909	0.9205	0.987	0.867
2006	0.910	0.9205	0.988	0.877
2019	0.893	0.9205	0.970	0.730
2024	0.910	0.9508	0.957	0.532

Observation 4.2: **In all 28 years since 1985, the month with the fewest births before adjusting for days was February. Per day, February was the lowest in 0 years, and February's seasonal index was 0.924–1.006.**

Observation 4.3: **In all 28 years since 1985, the calendar part was more than half of February's shortfall (in logarithms) (0.512–1.077, median 0.849).** 2024 was a leap year with a 29-day February, so the calendar share was small (0.532). In 1955 February's seasonal index was large (1.183), cancelling the calendar part so that February was above average (a negative calendar share).

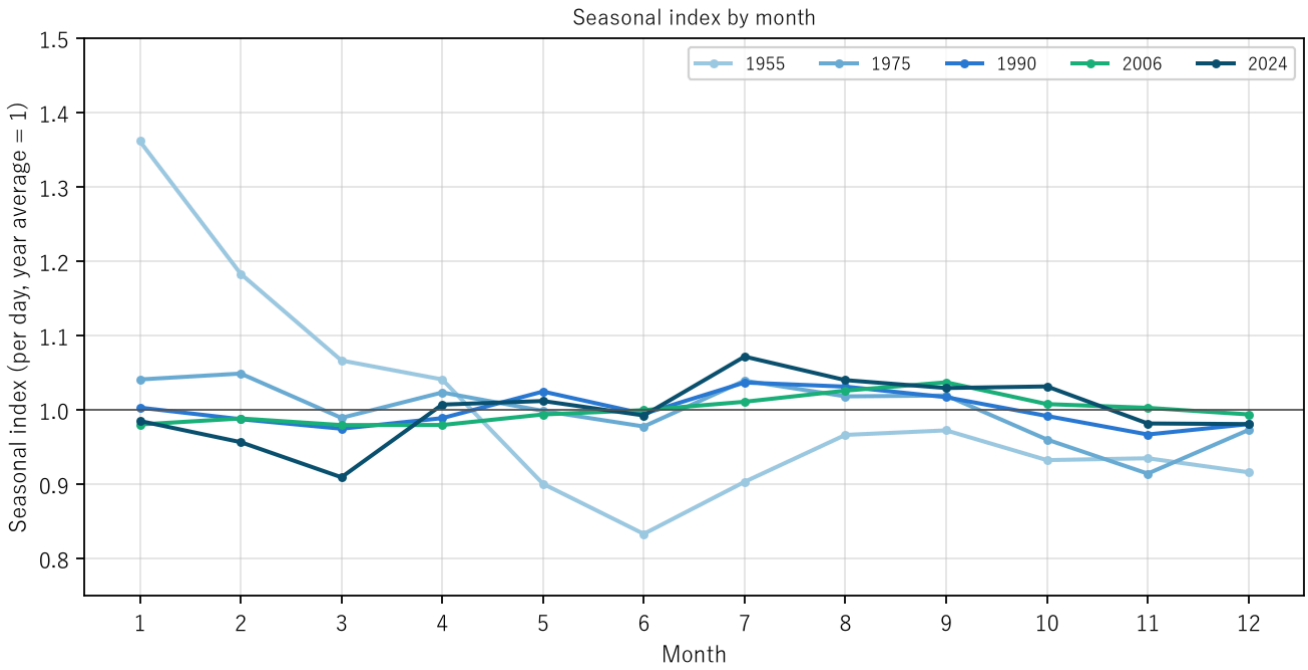


Figure 1: Seasonal index by month (per day, year average = 1) for 1955, 1975, 1990, 2006, and 2024.

5. How the seasonal shape changed

Calculation 5.1 Seasonal index by month

Month	1955	1990	2006	2024
January	1.361	1.003	0.980	0.985
February	1.183	0.987	0.988	0.957
March	1.066	0.975	0.980	0.909
April	1.041	0.989	0.980	1.007
May	0.901	1.025	0.994	1.012
June	0.833	0.995	1.000	0.992
July	0.903	1.037	1.011	1.072
August	0.966	1.031	1.026	1.040
September	0.972	1.017	1.037	1.029
October	0.932	0.992	1.008	1.032
November	0.935	0.967	1.003	0.982
December	0.916	0.981	0.994	0.981

Calculation 5.2 Range and months of peak and trough

Year	Range	Seasonal peak	Seasonal trough	Trough before adjusting
1947	0.477	January	December	December
1955	0.528	January	June	June
1965	0.180	February	June	June
1975	0.135	February	November	November
1980	0.127	September	November	November
1990	0.070	July	November	February
2006	0.058	September	March	February
2021	0.206	September	January	February
2024	0.162	July	March	February

Observation 5.3: **The seasonal peak was January or February in all 7 years from 1947 to 1975, and July to October in all 29 years from 1980 on. The range shrank from 0.528 in 1955, with 0.058 in 2006 the smallest.** In 2021 January was the trough (0.886) and the range 0.206; in 2024 the range was 0.162. Why the seasonal peak moved cannot be known from this table.

Observation 5.4: The month of the seasonal trough moves between years (March, April, May, November, December, January, and so on), but the trough before adjusting for days has been February every year since 1985. **The recent "February shortfall" is a shape of the calendar, not of the season.**

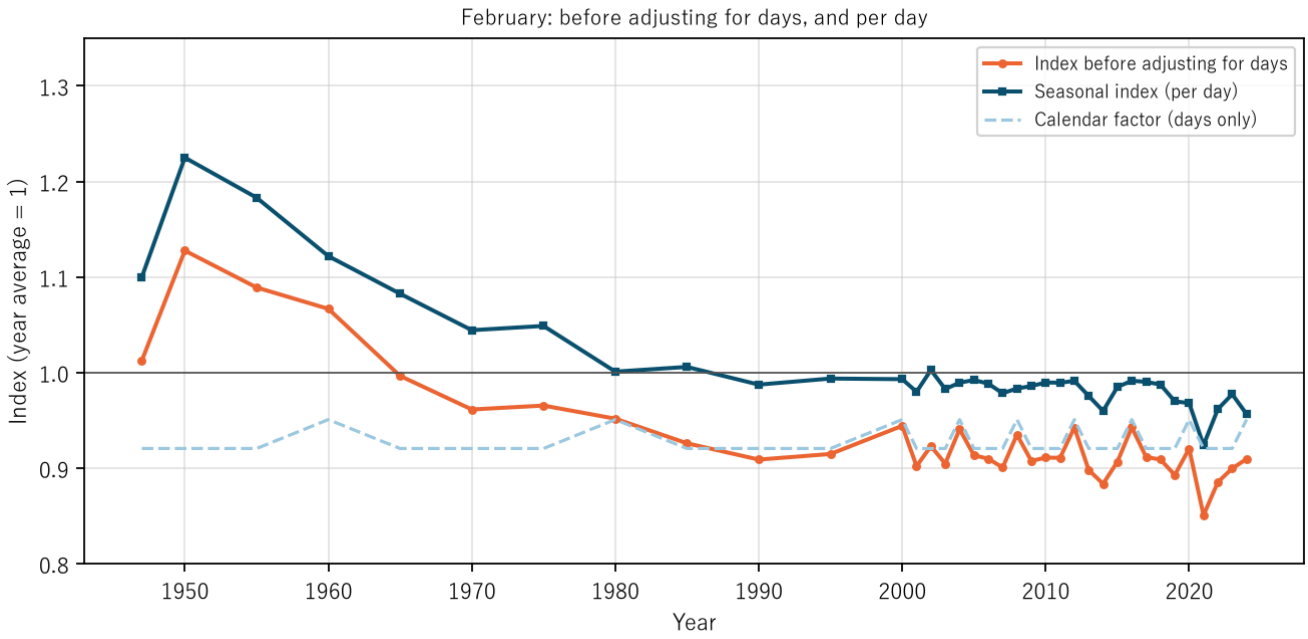


Figure 2: February's index. Orange is before adjusting for days, navy the per-day seasonal index, and the light-blue dashed line the calendar factor (0.9508 in leap years).

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6. Limitations

1. **The reasons the seasonal peak moved and why January 2021 was low are not separated or discussed. No month of birth is called good or bad.**
2. The "seasonal part" is everything left in the monthly differences after removing the number of days; its contents are not separated.
3. Up to 1995, only every fifth year was examined; years in between were not.
4. Values for 2004, 2006, and 2009–2017 are after the recount for reporting omissions (note 3 to the table).

Conclusion

Since 1985, the month with the fewest births has been February every year. Per day, February has never been the lowest. More than half of February's shortfall is the calendar part: February has only 28 days.

The seasonal peak moved from January to July–October, and the seasonal range became much smaller.

What separates them is one thing — the part set by the calendar or the part set by season.

When you hear that "few (many) babies are born in some month," **check the number of days in that month and the per-day value as well.**

Data and reproduction

Data	Vital Statistics 2024, final figures, Volume 1, births, Table 4.2: births and birth rates (per 1,000 population) by month of birth and year (Ministry of Health, Labour and Welfare, e-Stat) (retrieved 27 September 2026)
Terms of use	e-Stat follows the Government of Japan Standard Terms of Use (Version 2.0). The seasonal index, calendar factor, index before adjusting for days, range, and shares split in logarithms in this paper were processed from it and are not numbers produced by the government
Coverage	Japan; 36 years from 1947 to 2024 (every fifth year up to 1995)
Verification	`検算/M110.py` (`--zu` also draws the figures). Every number in the text is taken from `検算/M110_output.txt`
Raw data	`data/` holds the retrieved file and `SOURCES.md` (URL, retrieval date, SHA-256, terms of use, definitions and how the calculations were set up)
Figures	`図/M110_zu1` and `図/M110_zu2` (png, svg, English versions)

References

- Ministry of Health, Labour and Welfare. Vital Statistics 2024, final figures, Volume 1, births, Table 4.2: Births and birth rates (per 1,000 population) by month of birth and year (in Japanese). e-Stat (accessed 27 September 2026). https://www.e-stat.go.jp/