Mean Birth Weight Fell by 73.03 g, from 3070.24 g in 1995 to 2997.22 g in 2024, and 0.510 of the Fall Was Singletons' Gestation Shifting to Earlier Weeks, 0.394 Was Lighter Weight Within the Same Week, and 0.083 Was the Share of Multiple Births Rising from 0.0172 to 0.0249 — the Fall Within the Same Week Shrinks as the Week Advances, from 91.0 g at 34 Weeks to 4.1 g at 41 Weeks [M097]

Difference in mean weight = part from the share of multiple births + part from singletons' mix of weeks + part within the same week for singletons + part within multiple births ── What separates them is whether babies are born in earlier weeks or are lighter in the same week

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Abstract

Using the birth tables of the Ministry of Health, Labour and Welfare's Vital Statistics (yearly mean birth weight 1951–2024, yearly length of gestation 1980–2024, and births by 100 g weight class × each week of gestation × singleton or multiple birth in 1995 and 2024), this paper split the yearly change in mean birth weight into the mix of gestation, weight within the same week, and the share of multiple births. No new mathematical theorem and no new law are claimed.

First, **mean birth weight was largest in 1975 for both boys and girls (boys 3.24 kg, girls 3.15 kg), then fell, and in 2005–2024 it has hardly moved (boys 3.04–3.05 kg, girls 2.95–2.96 kg).** Over the same years, the share born at 40 weeks or more fell from 0.4747 in 1980 to 0.2952 in 2024, and 36–39 weeks rose from 0.5023 to 0.6742. The share at 40 weeks or more fell in 16 of 17 transitions (Section 4).

Second, this is the core of the paper. **Among births with both weight and gestation known, mean weight fell by 73.03 g, from 3070.24 g in 1995 to 2997.22 g in 2024. Split, the part from singletons' mix of weeks is −37.21 g (0.510), the part within the same week for singletons −28.76 g (0.394), the part from the share of multiple births −6.09 g (0.083), and the part within multiple births −0.97 g (0.013); the largest is the shift of births toward earlier weeks** (Section 5).

Third, **the mean week of gestation for singletons moved earlier, from 38.996 to 38.677 weeks. The shares of singletons born at 37 and 38 weeks rose from 0.0732 and 0.1891 to 0.1056 and 0.2597, and at 40 and 41 weeks fell from 0.2760 and 0.1071 to 0.2367 and 0.0652** (Section 5).

Fourth, **mean weight within the same week fell in all 8 weeks from 34 to 41 for singletons, and the later the week, the smaller the fall: 91.0 g at 34 weeks, 44.6 g at 37, 17.1 g at 40, and 4.1 g at 41** (Section 6).

Fifth, mean weight recomputed from the midpoints of the 100 g classes matches the published values within 0.003 kg for all births (1995: 3.0702 kg, published 3.07; 2024: 2.9972 kg, published 3.00), and within 0.008 kg at 17 points including the 4-week gestation groups and singleton/multiple births (Section 3).

Sixth, what separates them is **whether babies are born in earlier weeks or are lighter in the same week**. "Babies' mean weight has fallen," for the fall since 1995, is half a change in the mix of weeks at birth and about four tenths a change within the same week.

Scope note: **This paper claims no new mathematical theorem and no new law** — births, birth weight classes, length of gestation, and mean weight are in public tables, and this paper only recomputed the mean from the midpoints of the 100 g classes and split the difference in mean weight into four parts. **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. It does not judge any individual baby's weight or development as "light" or "slow," and does not say whether a higher or lower mean weight is good or bad.** Why births moved to earlier weeks, or why weight fell within the same week (mothers' build, age, lifestyle, how the timing of delivery is decided, etc.), cannot be separated with these tables and is not discussed. Stillbirths, perinatal figures, and infant deaths are not covered. The split is one choice, weighting by the average of the two years, and sex is not separated. Before 1995 weight was recorded in 100 g units (with 0.05 kg added to the mean), and tables of weeks × 100 g classes are not on e-Stat, so no split is made. Prefectures are not compared. **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 mean weights recomputed from 100 g class midpoints, the shares, and the split in this paper were processed from them. What this paper adds: **splitting the 1995→2024 fall in mean birth weight into four parts — the share of multiple births, singletons' mix of weeks, singletons within the same week, and within multiple births — and showing that half is a change in the mix of weeks at birth, and that the fall within the same week shrinks as the week advances**.

1. Notation and question

- **Mean weight**: mean birth weight (g). In the split, it is recomputed from the midpoints of the 100 g classes (lower end of the class + 50 g), excluding births with weight or gestation not stated.

- **Singleton / multiple**: whether one baby or two or more were born in one delivery.
- **Week groups**: 22–42 weeks one week each, with 21 weeks or less and 43 weeks or more each as one group.
- **Split**: mean weight = Σ (share of each singleton/multiple × week group × mean weight of that group). The difference between 1995 and 2024 is split into four parts — share of multiple births, singletons' mix of weeks, singletons within the same week, and within multiple births — weighting by the average of the two years. The four sum exactly to the difference.

Question: Did mean birth weight fall because babies were born in earlier weeks, because they were lighter in the same week, or because multiple births increased?

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2. Preview and design

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

	Content
Tables	Vital Statistics 2024, Volume 1, Table 4.24 (yearly gestation), Table 4.25 (yearly mean weight, boys and girls), Table 4.27 (mean weight of singletons and multiples), Volume 2, Table 14; 1995 Volume 2, Table 13; and the 1995 and 2024 retained tables, Table 4 (weight in 100 g classes × each week of gestation)
Noticed in the preview	Published mean weights are rounded to 0.01 kg, too coarse to split differences by week. Recomputing the mean from births by 100 g class × week in the retained tables allows comparison to the 1 g digit
Noticed in the preview (2)	The earliest year with a table of weeks × 100 g classes on e-Stat is 1995, after weights began to be recorded in grams in 1992
Noticed in the preview (3)	The share born at 40 weeks or more fell almost every round from 1980 to 2024
Comparison	Yearly mean weight, yearly gestation, the four parts of the 1995→2024 difference, and singletons' share and mean weight by week

3. Data and checks

Calculation 3.1 The 9 retrieved files were fixed by SHA-256, and the following were checked.

- The retained Table 4 has, for both 1995 and 2024, 9 blocks of (total, boys, girls) × (total, singleton, multiple), 30 week columns from 19 weeks or less to 48 weeks or more, and 66 weight-class rows (under 500 g to 6.9 kg or more). The check first failed because I miscounted them as 67. In all 9 blocks, summing the classes gives the total row and summing the weeks gives the total column. Singleton + multiple = total (1995: 1,187,064 = 1,166,596 + 20,468; 2024: 686,173 = 669,069 + 17,104).
- Mean weight recomputed from the midpoints of the 100 g classes matches, for all births, 3.0702 kg in 1995 (published 3.07) and 2.9972 kg in 2024 (published 3.00), within 0.003 kg. At 17 points including the 4-week gestation groups and singleton/multiple births it is within 0.008 kg. I first set 0.006 kg and it failed at 40 weeks or more in 1995 (+0.0074) and at 22–23 weeks in 2024 (+0.0068). Setting 0.005 kg for the 5 points including singleton/multiple births also failed at multiple births (+0.0060).
- The lowest class (under 500 g) was placed at 450 g. It has 154 births in 1995 and 297 in 2024; placing it at 250 g instead moves the mean by only 0.026 g in 1995 and 0.087 g in 2024.
- Table 4.25 has 28 rounds from 1951 to 2024, with a note that 0.05 kg was added to the mean up to 1991. Table 4.24 has 18 rounds from 1980 to 2024.

4. Yearly mean weight and gestation

Calculation 4.1 Mean birth weight (Table 4.25, kg)

Year	1951	1975	1985	1995	2005	2015	2024
Boys	3.14	3.24	3.20	3.11	3.05	3.04	3.04
Girls	3.06	3.15	3.12	3.03	2.96	2.96	2.95

Calculation 4.2 Share by length of gestation (Table 4.24, excluding gestation not stated)

Year	40 weeks or more	36–39 weeks	Under 37 weeks	42 weeks or more
1980	0.4747	0.5023	0.0412	0.0443
1995	0.3890	0.5855	0.0491	0.0118
2005	0.3725	0.5989	0.0568	0.0057
2015	0.3400	0.6322	0.0558	0.0022
2024	0.2952	0.6742	0.0585	0.0008

Observation 4.3: **Mean weight was largest in 1975 for both boys and girls, and in 2005–2024 it stays at 3.04–3.05 kg for boys and 2.95–2.96 kg for girls. The share born at 40 weeks or more fell from 0.4747 in 1980 to 0.2952 in 2024, below the previous round in 16 of 17 transitions. 42 weeks or more went from 0.0443 to 0.0008.** Note that 0.05 kg was added to mean weights up to 1991, so the 1975 peak is compared with values measured differently.

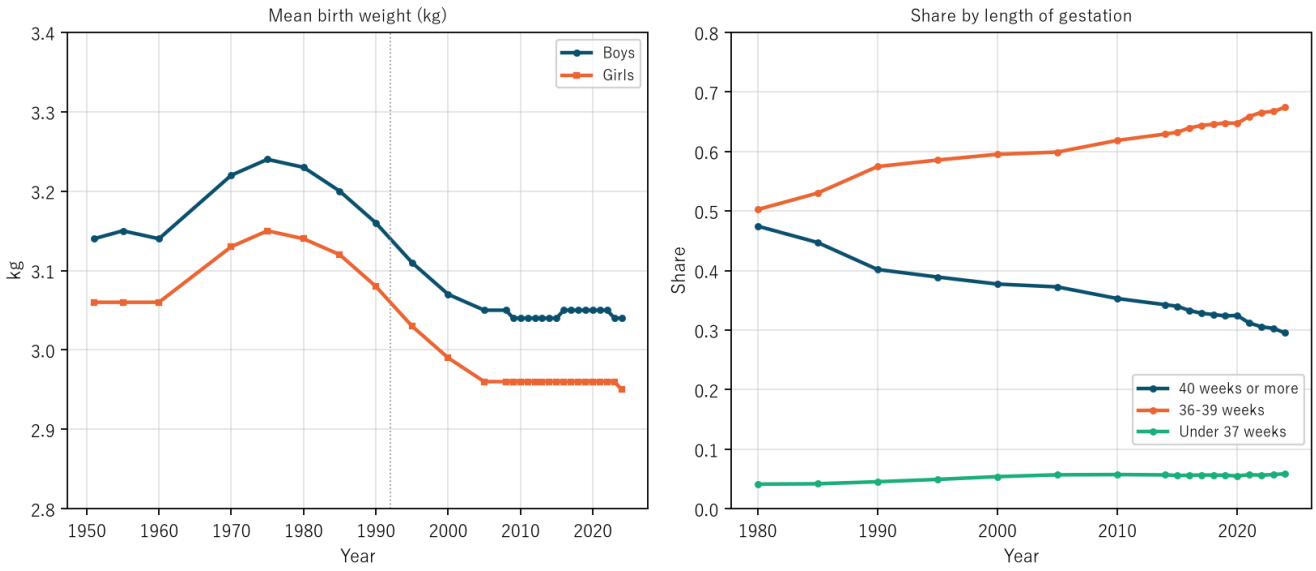


Figure 1: Left, mean birth weight (kg, boys and girls); the dotted line is 1992, when weights began to be recorded in grams. Right, share by length of gestation (40 weeks or more, 36–39 weeks, under 37 weeks).

5. The core — splitting the 1995→2024 difference in mean weight into four parts

Calculation 5.1 Difference in mean weight (births with both weight and gestation known: 1,186,432 in 1995, 685,992 in 2024)

Part	g	Share of the difference
Share of multiple births	−6.09	0.083
Singletons' mix of weeks	−37.21	0.510
Singletons within the same week	−28.76	0.394
Within multiple births	−0.97	0.013
Total (3070.24 → 2997.22)	−73.03	1

Observation 5.2: **Of the 73.03 g fall, the largest part is singletons' mix of weeks (0.510), followed by within the same week (0.394) and the share of multiple births (0.083).** The share of multiple births rose from 0.0172 to 0.0249. The singleton mean fell from 3084.07 g to 3016.68 g (−67.39 g) and the multiple mean from 2281.92 g to 2236.02 g. Splitting singletons alone, the mix of weeks is −38.01 g and within the same week −29.38 g.

Calculation 5.3 Singletons' share and mean weight by week of gestation

Week	Share 1995	Share 2024	Mean 1995 (g)	Mean 2024 (g)	Change (g)
36	0.0213	0.0232	2624.2	2550.8	−73.4
37	0.0732	0.1056	2833.3	2788.7	−44.6
38	0.1891	0.2597	2988.1	2953.1	−35.0
39	0.3001	0.2849	3111.8	3079.8	−32.0
40	0.2760	0.2367	3213.5	3196.5	−17.1
41	0.1071	0.0652	3291.0	3286.9	−4.1
42	0.0114	0.0008	3340.6	3406.8	+66.2

Observation 5.4: **The mean week of gestation for singletons moved earlier, from 38.996 to 38.677 weeks (−0.319 weeks). The shares at 37 and 38 weeks rose, and those at 40, 41, and 42 weeks fell. The most common week was 39 in both years (0.3001 and 0.2849).** The mean weight at 42 weeks is +66.2 g, but its share in 2024 is only 0.0008.

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6. The fall within the same week

Observation 6.1: **Mean weight within the same week fell for singletons in all 8 weeks from 34 to 41, and the later the week, the smaller the fall (34 weeks −91.0 g, 35 weeks −88.7 g, 36 weeks −73.4 g, 37 weeks −44.6 g, 38 weeks −35.0 g, 39 weeks −32.0 g, 40 weeks −17.1 g, 41 weeks −4.1 g).** Most of the within-week part (−28.76 g) comes from weeks 38–40, which hold large shares. Why earlier weeks fell more cannot be known from these tables.

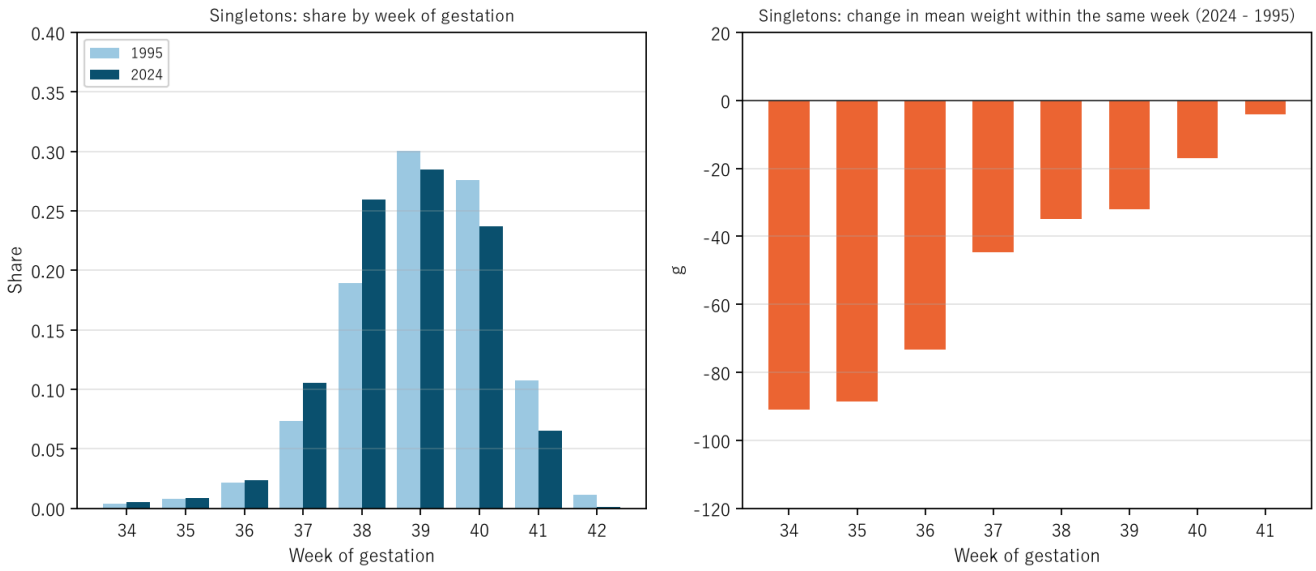


Figure 2: Left, singletons' share by week of gestation (1995 and 2024). Right, change in mean weight within the same week (2024 − 1995, g).

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7. Limitations

1. **Why births moved to earlier weeks, or why weight fell within the same week, cannot be separated with these tables and is not discussed.**
2. The split is one choice, weighting by the average of the two years, and sex is not separated. Means recomputed from the midpoints of the 100 g classes match the published means within 0.008 kg, but include small deviations from the distribution within each class.
3. No split is made before 1995. The 1975 peak is a value up to 1991 with 0.05 kg added.
4. Weeks of gestation are completed weeks; days within the week are not known.
5. The paper does not judge any individual baby's weight or development, and does not say whether a higher or lower mean weight is good or bad.

Conclusion

Mean birth weight fell by 73.03 g from 1995 to 2024. Of that, 0.510 was singletons' gestation shifting to earlier weeks, 0.394 was lighter weight within the same week, and 0.083 was the rising share of multiple births. The fall within the same week shrinks as the week advances, from 91.0 g at 34 weeks to 4.1 g at 41 weeks.

What separates them is one thing — whether babies are born in earlier weeks or are lighter in the same week.

When you hear that "babies' mean weight has fallen," **look together at how the mix of weeks at birth changed, what happens when comparing the same week, and how the share of multiple births moved.**

Data and reproduction

Data	Vital Statistics 2024, Volume 1, Tables 4.24, 4.25, and 4.27, Volume 2, Table 14, and retained table on births, Table 4; Vital Statistics 1995, Volume 2, Table 13, and retained table on births, Table 4 (Ministry of Health, Labour and Welfare, e-Stat) (retrieved 26 September 2026)
Terms of use	e-Stat follows the Government of Japan Standard Terms of Use (Version 2.0). The mean weights recomputed from 100 g class midpoints, the shares, and the split in this paper were processed from it and are not numbers produced by the government
Coverage	Japan, births; yearly mean weight in 28 rounds from 1951 to 2024, yearly gestation in 18 rounds from 1980 to 2024, and the split for 1995 and 2024
Verification	`検算/M097.py` (`--zu` also draws the figures). Every number in the text is taken from `検算/M097_output.txt`
Raw data	`data/` holds the retrieved files and `SOURCES.md` (URLs, retrieval date, SHA-256, terms of use, definitions and how the calculations were set up)
Figures	`図/M097_zu1`, `図/M097_zu2` (png, svg, English versions)

References

- Ministry of Health, Labour and Welfare. Vital Statistics 2024, final figures, Volume 1, births, Tables 4.24, 4.25, and 4.27; Volume 2, births, Table 14; retained tables, births, Table 4 (in Japanese). e-Stat (accessed 26 September 2026). https://www.e-stat.go.jp/
- Ministry of Health, Labour and Welfare. Vital Statistics 1995, final figures, Volume 2, births, Table 13; retained tables, births, Table 4 (in Japanese). e-Stat (accessed 26 September 2026). https://www.e-stat.go.jp/