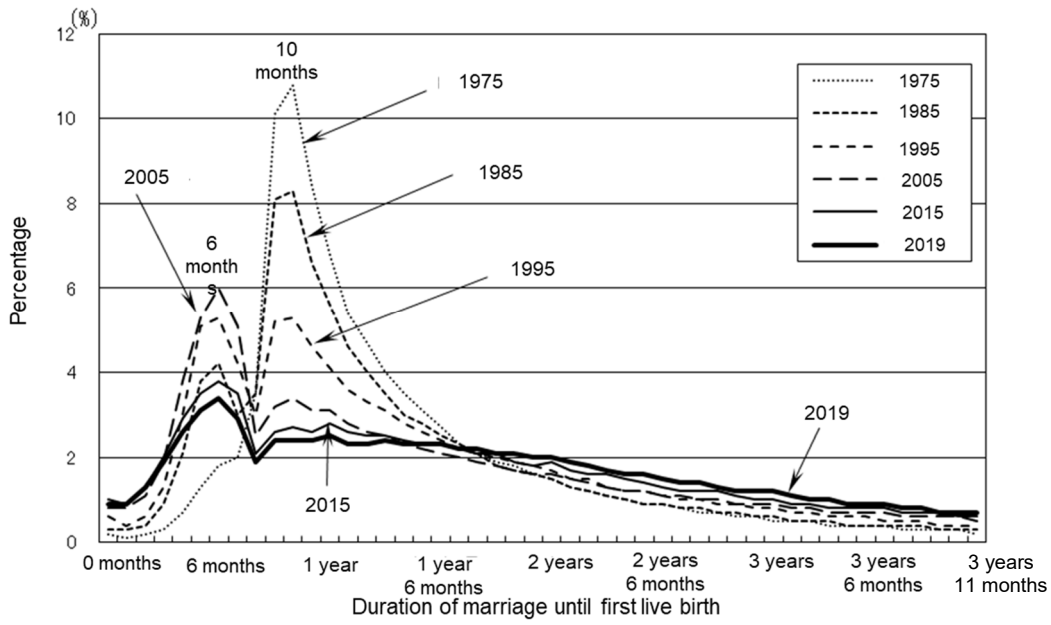
2 Manifold analysis of live birth trends

(1) Live birth according to the duration from the parents' marriage

The examination of the proportion of first live births according to the duration of marriage (the period starting from "the commencement date of conjugal cohabitation" until "the date of birth" on the Notification of Birth) indicates that, in 1975, first live births peaked in the 10th month. However, the proportion of first live births in the 6th month increased and the proportion in the 10th month relatively decreased in 1985. The proportion of first live births in the 6th month and that in the 10th month became almost the same in 1995, and the peak of first live births was observed in the 6th month in 2005, 2015 and 2019. The proportion of first live births at its peak during the period from 2005 to 2019 declined because the proportion of the long duration of marriage until first live birth has increased. (Figure 8 Statistics Table 4)

Figure 8 Percentage distribution of first live births according to the duration of marriage, 1975, 1985, 1995, 2005, 2015 and 2019



Notes: 1) The figures are for legitimate first live births.
2) The percentage distribution is against the total excluding those first live births for which the duration of marriage is unknown.
3) "0 months" refers to the case where the month of birth is the same as the month of commencement of conjugal cohabitation.

(2) Trends in live births when the duration of marriage is shorter than the period of gestation

According to the circumstances of live births, the proportion of first live births is at its peak where the parents' duration of marriage until first live birth is 6 months. On this basis, let us consider the case of a legitimate first live birth when the relevant duration of marriage is shorter than the period of gestation.

In this outline, we perform calculations based on the assumptions described below in relation to live births in the case where the duration of marriage is shorter than the period of gestation.

<Assumptions> Approach concerning live births when the duration of marriage is shorter than the period of gestation

○ For this report, given that:

(1) Based on how the number of weeks of gestation is counted, a female is already in the second week of pregnancy at the time of ovulation when the menstrual cycle is 28 days; and

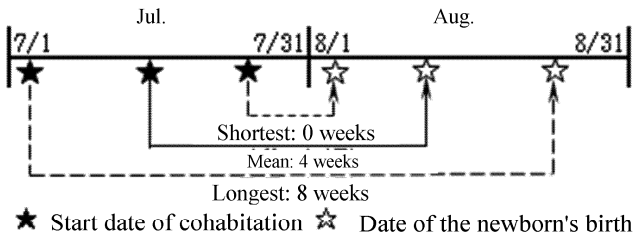
(2) In some cases, a couple register their marriage or start cohabitation after they return from their honeymoon;

we regard a live birth as that for which the duration of marriage is shorter than the period of gestation if the live birth is delivered in the case where

"The number of weeks of marriage < The number of weeks of gestation - 3 weeks" (= "The number of weeks of gestation ≧ The number of weeks of marriage + 4 weeks").

○ However, the duration of marriage is calculated from "Month and year of birth - Month and year of commencement of conjugal cohabitation" based on the Live Birth Form for Vital Statistics. Since this is available only as the number of months, there is a difference between the actual number of weeks of marriage and the duration of marriage (number of months).

(Example: When the duration of marriage is one month, the actual number of weeks of marriage may be from 0 weeks in the shortest to 8 weeks at the longest, or a mean of 4 weeks (refer to the following diagram).)



○ For the trial calculation of the number of live births when the duration of marriage is shorter than the period of gestation, the calculation is based on the average number of weeks of marriage in the duration of marriage (specifically, calculated in regard to the classification in the following table).

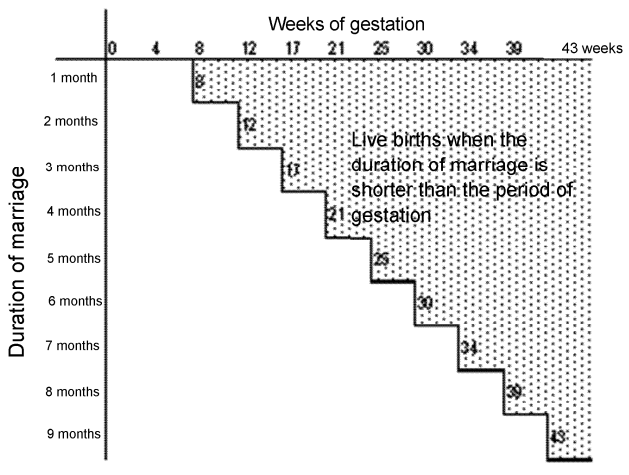
It should be noted, however, that there is a certain range of trial calculation results on both the upper and lower ends because there is also some range in the actual number of weeks of marriage as described above.

Cases where a live birth is regarded as based on the duration of marriage that is shorter than the period of gestation (assumption)

Duration of marriage	Weeks of gestation
1 month	8 weeks or longer
2 months	12 weeks
3 months	17 weeks
4 months	21 weeks
5 months	25 weeks
6 months	30 weeks
7 months	34 weeks
8 months	39 weeks
9 months	43 weeks

Note: Weeks of gestation are calculated by using the average number of weeks of marriage + 4 or more weeks.

Illustration of the concept



Note: As the commencement date of cohabitation on the Notification of Birth, the parents are supposed to enter the date of their wedding ceremony or the date of their commencement of conjugal cohabitation, whichever is earlier.

1) Annual trends in live births when the duration of marriage is shorter than the period of gestation

In light of the proportion of live births based on the duration of marriage shorter than the period of gestation to legitimate first live births, as calculated on the basis of the assumption outlined above, the proportion has recently turned downwards after its peak in 2002 (Table 6, Figure 9, Statistics Table 5).

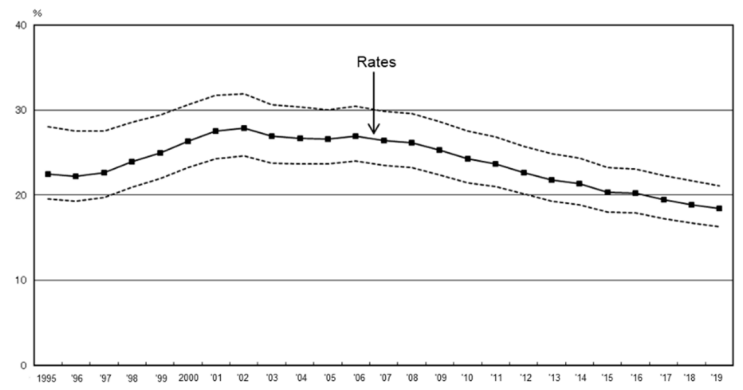
Note that this proportion refers to the proportion of live births based on the duration of marriage shorter than the period of gestation to legitimate first live births, not to marriages.

Table 6 Number and percentage distribution of live births based on the duration of marriage shorter than the period of gestation against legitimate first live births, 1995 - 2019

Year	Legitimate first live births (in thousands)	Live birth when the duration of marriage is shorter than the period of gestation	
		Live births (in thousands)	Percentage against legitimate first live births (%)
1995	557	125	22.5
1996	563	125	22.2
1997	559	126	22.6
1998	571	136	23.9
1999	565	141	25.0
2000	569	150	26.3
2001	559	154	27.5
2002	555	155	27.9
2003	531	143	26.9
2004	522	139	26.7
2005	497	132	26.6
2006	507	137	26.9
2007	503	133	26.4
2008	500	131	26.2
2009	494	125	25.3
2010	491	119	24.3
2011	475	113	23.7
2012	465	105	22.6
2013	461	101	21.8
2014	453	97	21.3
2015	457	93	20.3
2016	439	89	20.2
2017	420	82	19.5
2018	407	77	18.9
2019	382	70	18.4

Note: The number of legitimate first live births refers to figures excluding those concerning which the duration of marriage is unknown.

Figure 9 Rates of live births based on the duration of marriage shorter than the period of gestation, against legitimate first live births, 1995 - 2019

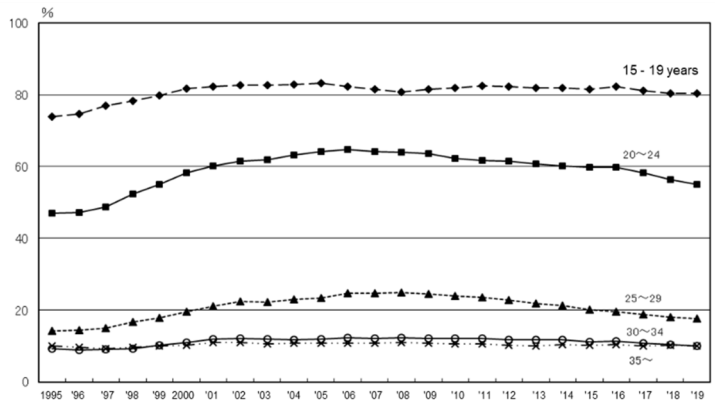


Note: The dotted lines show the range assumed due to the fact that the duration of marriage is available only as the number of months.

2) Live births based on the duration of marriage shorter than the period of gestation according to the age groups of mothers

In light of the proportion of live births based on the duration of marriage shorter than the period of gestation to legitimate first live births according to the mothers' age groups, the proportion in 2009 was 80% for "ages 15 - 19," 60% for "ages 20 - 24," 20% for "ages 25 - 29," and 10% for the age of 30 and over. It grew higher as the age bracket became younger. In recent years, the proportion has gradually been declining for ages in the twenties. (Figure 10)

Figure 10 Percentages of live births based on the duration of marriage shorter than the period of gestation against legitimate first live births, by age group of mother, 1995 - 2019



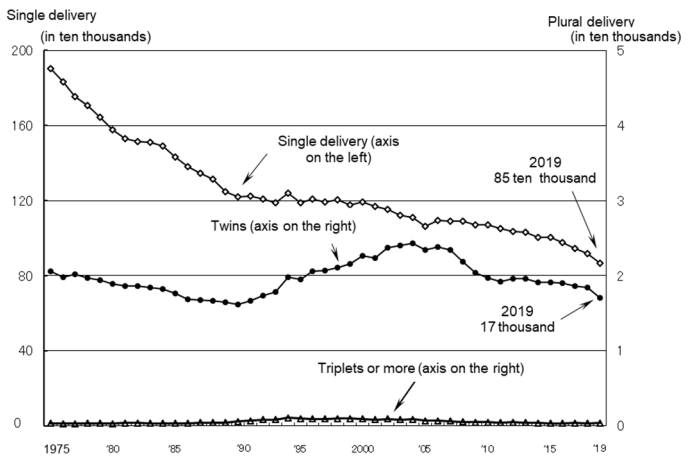
Note: The percentages are against legitimate first live births excluding those concerning which the duration of marriage is unknown.

(3) Live births by plurality of birth

With respect to the number of live births in terms of plurality of birth, nearly all births have been single deliveries. Despite an increasing trend in twins observed until 2004, the number of twins born has been decreasing since 2005.

In 2019, the number of children born as single deliveries was 85 ten thousand, while the number of twins born stood at 17 thousand. (Figure 11)

Figure 11 Live births by plurality of birth, 1975 - 2019



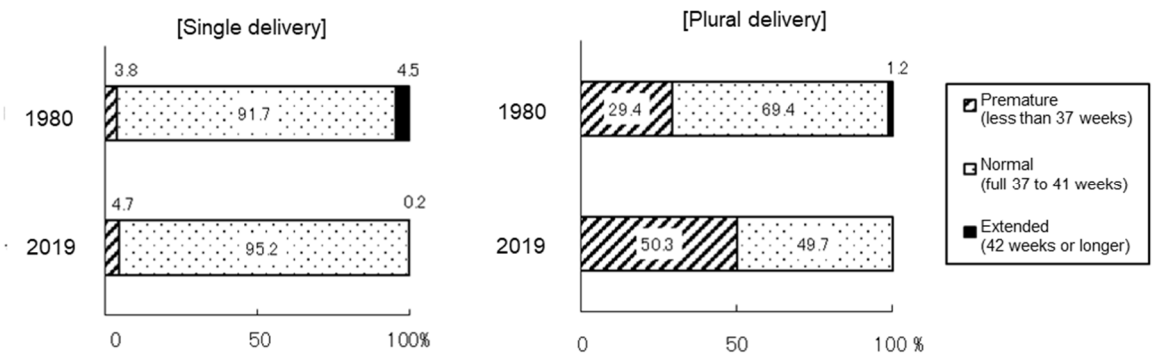
Note: Single delivery refers to the delivery a live birth from a single embryo and does not include fetal deaths. Plural delivery refers to the delivery of a number of live births, such as twins or triplets, born from multiple embryos and does not include fetal deaths.

(4) Live births by period of gestation

A comparison of the proportion of live births by period of gestation (premature, normal and extended) in 1980 and that proportion in 2019 shows that "normal" gestation periods accounted for more than 90% of the single delivery cases in both years. Although "extended" gestation periods amounted to 4.5% of all the single deliveries in 1980, the same percentage had fallen to 0.2% by 2019.

In relation to the period of gestation for plural deliveries, 30% of such births were "premature" and 70% were "normal" in 1980, whereas, in 2019, the proportion of "premature" exceeded "normal," indicating a substantial rise in the proportion of "premature." (Figure 12)

Figure 12 Percentage distribution of live births by period of gestation (premature, normal and extended), 1980 and 2019



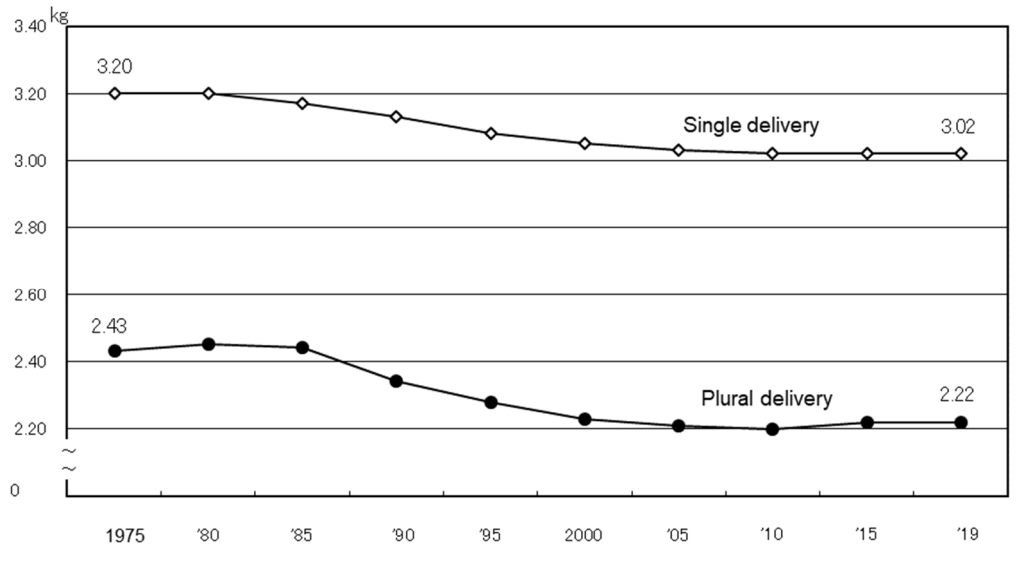
Notes: 1) The percentages distributed represent figures against the total excluding those live births concerning which the period of gestation is unknown.
2) Single delivery refers to the delivery a live birth from a single embryo and does not include fetal deaths.
Plural delivery refers to the delivery of a number of live births, such as twins or triplets, born from multiple embryos and does not include fetal deaths.

(5) Birth weight

The examination of birth weights by plurality of birth finds that the mean birth weight for single deliveries in 1975 was 3.20 kg. Since then, the birth weight fell year by year, down by 0.18 kg to 3.02 kg in 2019. The trend for plural deliveries is the same, with the mean birth weight for plural deliveries decreasing by 0.21 kg from 2.43 kg in 1975 to 2.22 kg in 2019. (Figure 13)

With respect to the proportion of cases in which the birth weight was less than 2.5 kg, although the number of such cases represented 4.6% of all the single deliveries in 1975, the percentage gradually rose year by year and reached 8.1% in 2019. In many plural delivery cases, the birth weight was less than 2.5 kg, and the percentage of cases with such birth weight was 52.5% in 1975, representing approximately half of all the plural deliveries in the year, and subsequently climbed to 71.4% in 2019. (Table 7)

Figure 13 Mean birth weight by plurality of birth, 1975 - 2019



Notes 1) Single delivery refers to the delivery a live birth from a single embryo and does not include fetal deaths. Plural delivery refers to the delivery of a number of live births, such as twins or triplets, born from multiple embryos and does not include fetal deaths.
2) Since birth weights had been measured in units of 100 grams until 1990, we added 0.05 kg to the calculated means for the mean birth weights of born children.

Table 7 Live births and percentage distribution according to birth weight and mean birth weight, 1975 - 2019

Year	Mean birth weight (kg)	Total	Number			Percentage (%)		
			2.5kg Less than	1.5kg Less than	1.0kg Less than	2.5kg Less than	1.5kg Less than	1.0kg Less than
Single delivery								
1975	3.20	1 880 507	85 986	5 317	877	4.6	0.3	0.0
1980	3.20	1 557 694	71 830	5 089	1 290	4.6	0.3	0.1
1985	3.17	1 413 629	69 051	5 831	1 290	4.9	0.4	0.1
1990	3.13	1 204 855	67 654	5 293	1 853	5.6	0.4	0.2
1995	3.08	1 166 596	75 982	5 627	2 042	6.5	0.5	0.2
2000	3.05	1 166 926	86 522	5 803	2 169	7.4	0.5	0.2
2005	3.03	1 038 400	83 694	6 140	2 451	8.1	0.6	0.2
2006	3.02	1 068 135	86 649	6 284	2 741	8.1	0.6	0.3
2007	3.02	1 065 737	87 606	6 469	2 707	8.2	0.6	0.3
2008	3.02	1 068 797	88 140	6 353	2 600	8.2	0.6	0.2
2009	3.02	1 049 142	87 281	6 228	2 566	8.3	0.6	0.2
2010	3.02	1 051 104	88 151	6 333	2 679	8.4	0.6	0.3
2011	3.02	1 031 188	85 912	6 259	2 586	8.3	0.6	0.3
2012	3.02	1 017 165	84 688	6 179	2 597	8.3	0.6	0.3
2013	3.02	1 009 811	83 997	6 157	2 510	8.3	0.6	0.2
2014	3.02	984 119	81 787	6 108	2 580	8.3	0.6	0.3
2015	3.07	986 253	81 352	5 851	2 490	8.2	0.6	0.3
2016	3.07	957 874	78 400	5 499	2 352	8.2	0.6	0.2
2017	3.07	927 105	75 723	5 387	2 192	8.2	0.6	0.2
2018	3.07	899 661	72 850	5 260	2 323	8.1	0.6	0.3
2019	3.02	847 837	69 040	5 051	2 172	8.1	0.6	0.3
Plural delivery								
1975	2.43	20 933	10 981	1 004	163	52.5	4.8	0.8
1980	2.45	19 195	9 829	883	200	51.2	4.6	1.0
1985	2.44	17 948	9 123	968	286	50.8	5.4	1.6
1990	2.34	16 730	9 678	1 225	438	57.8	7.3	2.6
1995	2.28	20 468	13 130	1 686	568	64.1	8.2	2.8
2000	2.23	23 621	16 366	2 097	697	69.3	8.9	3.0
2005	2.21	24 130	17 578	2 057	664	72.8	8.5	2.8
2006	2.21	24 539	17 910	2 089	719	73.0	8.5	2.9
2007	2.21	24 081	17 558	2 056	707	72.9	8.5	2.9
2008	2.21	22 359	16 339	1 929	693	73.1	8.6	3.1
2009	2.20	20 894	15 390	1 775	584	73.7	8.5	2.8
2010	2.20	20 201	14 898	1 753	553	73.7	8.7	2.7
2011	2.20	19 619	14 466	1 683	534	73.7	8.6	2.7
2012	2.20	20 067	14 623	1 806	602	72.9	9.0	3.0
2013	2.21	20 006	14 627	1 731	589	73.1	8.7	2.9
2014	2.22	19 490	13 987	1 585	497	71.8	8.1	2.6
2015	2.22	19 468	13 856	1 660	594	71.2	8.5	3.1
2016	2.23	19 368	13 702	1 517	539	70.7	7.8	2.8
2017	2.23	19 041	13 637	1 517	468	71.6	8.0	2.5
2018	2.23	18 739	13 419	1 482	493	71.6	7.9	2.6
2019	2.22	17 402	12 422	1 416	474	71.4	8.1	2.7

Notes: 1) The percentages distributed represent figures against the total including those cases in which the mean birth weight is unknown.

2) Single delivery refers to the delivery a live birth from a single embryo and does not include fetal deaths. Plural delivery refers to the delivery of a number of live births, such as twins or triplets, born from multiple embryos and does not include fetal deaths.

3) Since birth weights had been measured in units of 100 grams until 1990, we added 0.05 kg to the calculated means for the mean birth weights of born children.