

## ( 6 ) Trends in Partnership Behaviour in Japan from the Cohort Perspective

Miho IWASAWA  
Ryuichi KANEKO

### **Abstract**

Assumptions about the future age-specific fertility rates required for population projections can be obtained using the cohort fertility method. With this method, we forecast the average completed family size of younger cohorts, based on the actual birth process of preceding cohorts. Since childbearing behaviour is affected by family formation and dissolution processes, it is inevitable to observe these processes for constructing and assessing the future fertility assumptions.

In this paper, we provide descriptive trends in patterns of partnership formation and dissolution from the birth cohort perspective. Recognizing that declining exposure to marriage may place a strong structural restriction on childbearing, we then examine the extent to which these behavioural changes contribute to fertility decline by cohorts. In addition to marriage, divorce, bereavement and remarriage may also be crucial factors for fertility. However, in most developed countries, the link between marriage and fertility has been weakening. We also look into the trends in the new patterns of family formation; unmarried cohabitation, non-marital fertility, and marriage preceded by pregnancy. We provide cohort indices for cohorts born from 1935 to 1990, incorporating some estimation for cohorts born after 1956. As for data, we use Vital Statistics data for calculation of fertility, marriage, and divorce rates, and we also use Japanese National Fertility Surveys for estimating the average family size by marital status.

The mean age of first marriage and the proportion never married has risen for cohorts born after 1950 and these changes in marital behaviour explain nearly 80 percent of the difference in family size for the cohorts born in 1950 and 1990.

At the same time, cumulative divorce rates among first married women have been increasing across cohorts. Based on synthetic cohort projection, 36 percent of first married women eventually experience divorce by age 50. However, since bereavement has been declining and some proportion of divorced women get remarried, the net contribution of the change in divorce, bereavement and remarriage to the cohort fertility decline between 1950 and 1990 is about 3%.

The visibility of cohabitation remains low in Japan but is clearly becoming an increasingly common part of the union formation process. Experience of cohabitation is associated with a rapid transition to parenthood through premarital pregnancy (especially among those at the lower end of the educational distribution), but cohabitation experience delays first birth beyond age 25 for women with higher education. Unmarried fertility is still very low in Japan, but has increased slightly since

the 1990s. The projected lifetime unmarried fertility of the 1990 cohort seems to be nearly .03 children; two percent of their cohort TFR. Another notable behavioural change is an increase in marriages preceded by pregnancy (MPP). Based on the extrapolative projections, the proportion of the MPP to first married women will rise to over 20% in the 1990 cohort, while it was less than 5% among cohorts born prior to 1950. Increase in unmarried childbearing is concentrated among teenagers, and the MPP is concentrated among women in their early 20s. These behaviours seem to be related to the trends in the contraceptive behaviour and unintended pregnancy.

## **Introduction**

Assumptions about the future age-specific fertility rates required for population projections can be obtained using the cohort fertility method. With this method, we predict the average completed family size of younger cohorts based on the actual birth process of preceding cohorts. Since childbearing behaviour is affected by family formation and dissolution, it is essential to consider these processes in the construction and assessment of future fertility assumptions. Results in this paper are based on the preliminary analyses for producing official population projections for Japan conducted by the National Institute of Population and Social Security Research (NIPSSR 2007, Kaneko 2007).

In this paper, we describe patterns of partnership formation and dissolution from a birth cohort perspective. Recognizing that declining exposure to marriage may place a strong structural restriction on childbearing, we then examine the extent to which these behavioural changes contribute to fertility decline, by cohort. In addition to marriage, divorce, widowhood, and remarriage may also be significant factors for fertility.

However, in most developed countries, the link between marriage and fertility has been weakening. We also look into the trends in new patterns of family formation: cohabitation, non-marital fertility, and marriage preceded by pregnancy. We provide cohort indices for cohorts born from 1935 to 1990, incorporating some estimation for cohorts born after 1956.

## **Data**

We use Vital Statistics data for calculation of fertility, marriage, and divorce rates. We also use Japanese National Fertility Surveys, conducted by NIPSSR every five years, for estimating average family size by marital status.

Since roughly 10% of marriages and 30% of divorces are not registered in the year in which they occur (Ishikawa 1995), we estimated the number of marriage and divorces in the year they actually occurred using ratios of delayed to on-time registration obtained from the observed data.

Due to the recent increase in non-Japanese residents and the relatively poor data on them, trends in indices among all residents in Japan including non-Japanese could be unstable and difficult to understand. We therefore focus on events in the lives of Japanese female residents and look into indices for those people.

### **Trends in marriage**

We will focus on the relationship between fertility trends and changes in marriage, divorce, widowhood and remarriage. In Table 1 shown in a UN report, low-fertility regions are classified according to four characteristics of nuptiality: age at first marriage, prevalence of marriage in the prime reproductive ages, prevalence of cohabitation, and prevalence of union dissolution. Characteristics of Eastern Asia and Southern Europe, such as high age at first marriage, and low prevalence of both marriage and cohabitation, seem to have the most negative impact on fertility. However, it has been suggested that in Japan the occurrence of divorce is actually higher than expected. Therefore, Japan might be moving into a more unfavorable situation for childbearing than ever before. We will return to the quantifiable change in divorce later.

Postponement of family formation, which has been widely witnessed in most industrial countries since the second half of the 20th century (Billari 2005), can be also seen in Japan. The mean ages at first marriage and first childbearing have risen dramatically since the late 1970s, and total fertility rates and total first marriage rates (the sum of age-specific first marriage rates for ages 15 to 49) continue declining (Figure 1, Figure 2).

To obtain data on cohort age-specific first marriage rates for those who have not reached the end of their reproductive ages, we applied a generalized log-gamma distribution model presented by Kaneko (2003) to the actual values for the cohort age-specific first marriage rates. Because future trends are highly uncertain, we work with three sets of assumptions (medium, high, and low).

The mean age at first marriage and the proportion of those never married has risen for cohorts born after 1950. We show the cumulative first marriage rates relative to those of the 1950 birth cohort, using the scheme provided by Frejka and Calot (2001). For recent birth cohorts, a decline from the base cohort observed in the 20s will not be entirely made up in the 30s (Figure 3, Figure 4).

### **Trends in Divorce and Marital Status Composition**

Divorce rates in Japan have risen since the 1960s, and the total divorce rate (sum of age-specific divorce rates for ages between 15 and 49) is beyond 0.25 in the 2000s (Figure 5). We tried to calculate the cohort index on divorce experience: that is, the proportion of those who experience

divorce at least once among women with marriage experience, by age and birth cohort. For future values, we made three assumptions. Medium values were produced with the assumption that the average trends in the past three years will continue. The lowest combination of rates over the last 10 years was used for the high assumption, and the highest combination over the last 10 years was used for the low assumption.

According to the medium assumption (synthetic cohort projection), 36 percent of first-married women in the 1990 birth cohort will eventually experience divorce by age 50 (Figure 6). This is consistent with the results on the proportion of divorce experience by marriage duration and marriage cohort calculated by Raymo et al. (2005), projecting that at least one third of marriages in 2002 may end in divorce within 20 years. Figure 7 shows that the occurrence of divorce in Japan more closely resembles Central Europe rather than Southern Europe.

Based on these trends in divorce experience and the future trends in the proportion of women never married by the age of 50 and the occurrence of remarriage estimated from National Fertility Survey data, we obtained the actual and assumed composition of marital status of women at age 50 by birth cohort from 1930 to 1990. We can see that first-marriage couples were in the majority up to the 1950s birth cohort, but due to the increase in women without marriage experience and divorced women, the proportion of first-marriage couples has been decreasing, and will eventually be around 50 percent (Figure 8).

While divorce rates have been increasing, widowhood has been declining due to the decline in male mortality rates. Widowhood is expected to be increasingly rare for recent birth cohorts.

### **Impact on cohort fertility**

What impact does the change in partnership behaviour - declining marriage rates and increasing divorce rates - have on fertility? We measured the contribution of both factors using models for cohort TFR.

We use a mathematical model in which cohort completed fertility consist of its segments from the factors, i.e., marriage, divorce, and couple's reproductive behavior with in marriage. With the model, the cohort cumulative fertility rate at age 50 (CTFR) is expressed as;

$$\begin{aligned} CTFR &= (1 - \gamma) \cdot CEB \cdot \delta \\ &= (1 - \gamma) \cdot (CEB^* (afm) \cdot \kappa) \cdot \delta. \end{aligned}$$

Here,  $\gamma$  is the proportion of never-married women at age 50 (one minus cumulative first

marriage rate), the CEB is the average completed number of children of women in the first-marriage couples, and  $\delta$  is the coefficient of the divorce and widowhood effects. As the second line of the equation indicates, the CEB can be broken down into the expected cumulative number of births (CEB\*) that is dependent of the age pattern of first marriage (denoted as *afm*) and  $\kappa$ , a coefficient that represents deviation of marital reproductive behavior from the expected pattern derived from the previous standard cohorts.

Change in  $\gamma$  and the age pattern of first marriage (*afm*) reflect behavioural change in first marriage, change in  $\delta$  indicates behavioural change in divorce, and change in  $\kappa$  reflects changes in couples' reproductive behaviour after marriage.

By calculating the counterfactual CTFR with unchanged coefficients, we can see the contribution of each behavioral change on the CTFR compared with the medium assumptions for the projection.

CEB\* requires a standard pattern for the completed number of children, by age at first marriage. We obtained this from the average pattern of 1932 - 1965 birth cohorts using the 7th through the 13th Japanese National Fertility Surveys (Figure 9).

Figure 10 shows the three simulated CTFRs. The first line is based on the assumption of no change in  $\gamma$ , *afm*,  $\kappa$ , or  $\delta$ , since the 1955 birth cohort, while the second curve provides the results where only  $\gamma$  and *afm*, (i.e., marriage behavior), have changed. The third curve uses the medium assumption with changes in all coefficients. Changes in marital behaviour explain 73 percent of the difference in family size for the cohorts born in 1950 and 1990.

The value of  $\delta$  was set in the following manner. Using data from the NFS, we calculated the completed number of children of women with marriage experience by four marital status categories: first-marriage couples (*ff*), couples with a first-married wife and a remarried husband (*fr*), couples with a remarried wife (*r*), and divorced/widowed women (*dw*) (Figure 11). We can obtain the indices for each marital status category relative to the average number of children for first-marriage couples ( $R_{..}$ ). In the previous section, we generated the predicted composition of female marital status at age 50 ( $P_{..}$ ) by birth cohort.  $\delta$  is the weighted mean of  $R_{..}$  with  $P_{..}$  as weights, as defined as below.

$$\delta = \{P_{ff} + P_{fr}R_{fr} + P_rR_r + P_{dw}R_{dw}\}/(1-\gamma).$$

$\delta$  is represented as the function of the proportion of those who experience divorce by age 50 (Figure 12).

Cumulative divorce rates among first-married women have been increasing across cohorts (Figure 6). Based on a synthetic cohort projection, 36 percent of first-married women will

eventually experience divorce by age 50 in the 1990 birth cohort. Therefore, the value of  $\delta$  in this cohort is 0.925.

Using the variable  $\delta$ , we can obtain a CTFR without the divorce, widowhood and remarriage effects or one with  $\delta$  held constant since the 1955 birth cohort (Figure 13).

However, since widowhood has been declining and some proportion of divorced women get remarried, the net contribution of the change in divorce, widowhood and remarriage to cohort fertility decline between 1950 and 1990 is about 3%.

### **New patterns of family formation: Cohabitation, nonmarital childbearing, and marriage preceded by pregnancy**

Do these changes in partnership formation and dissolution mean the emergence of new patterns of family formation? Here we show some aspects of change regarding new patterns of family formation recently observed in Japan.

In the context of the second demographic transition, novel patterns of family formation, such as cohabitation and extramarital childbearing, were once considered to be related to fertility decline to below replacement level. However, very low levels of these behaviours are now commonly found among the lowest-low fertility countries. The visibility of cohabitation remains low in Japan but is clearly becoming an increasingly common part of the union formation process (Figure 14, Figure 15). There is, however, substantial variation around the median duration of 15 months for the most recent cohabitating unions, with one-fifth of the cohabitations lasting under six months and roughly one-third lasting two years or more. Experience of cohabitation is associated with a rapid transition to parenthood through premarital pregnancy (especially among those at the lower end of the educational distribution), but cohabitation experience delays the first birth beyond age 25 for women with higher education.

The fertility of unmarried women is still very low in Japan, but has increased slightly since the 1990s. The projected lifetime unmarried fertility rate of the 1990 cohort is nearly .03 children; two percent of their cohort TFR. Compared with the pattern of age-specific nonmarital fertility rates in 1990, the pattern in 2005 shows a dramatic increase for women under age 25 (Figure 16). This change might be in common with some Anglo-Saxon countries such as the UK or the US, where the birth rates among unwed young mothers contribute to relatively high fertility. When we consider the impact of these changes on future fertility, we need to examine whether these people remain as single mothers or move into marital relationships and continue to reproduce as members of the latter group.

Another notable behavioural change is an increase in marriages preceded by pregnancy (MPP). Based on extrapolative projections, the proportion of MPP to first-married women will rise

to over 20% in the 1990 cohort, while it was less than 5% among cohorts born prior to 1950. The increase in childbearing of unmarried women is concentrated among teenagers, and the MPP is concentrated among women in their early 20s. These behaviours seem to be related to the trends in use of contraceptives and unintended pregnancy.

## Conclusion

Fertility assumptions for the latest population projections for Japan based on the 2005 census suggests the extremely low level of fertility— in 2030 and after, the medium variant TFR for Japanese women is assumed to be 1.20. These prospects were led by drastic changes in the patterns of family formation and dissolution. Among the 1990 birth cohort, the mean age at first marriage is 28.2, the proportion of never-married women at age 50 grows to 23.5%, and 36% of first-married women will eventually experience divorce.

Counterfactual CTFRs with variant patterns of family formation and dissolution have shown that over 70% of the CTFR decline is attributed to a decline in marriage rates. The contribution of increase in divorce rate on CTFR's reduction would be 3% in the 1990 birth cohort according to calculation of the counterfactual value if divorce behaviour remained unchanged since the 1955 birth cohort,

Developed countries with relatively high fertility rates show relatively high levels of unmarried couples cohabiting and childbearing at young ages. The visibility of cohabitation and childbearing of unmarried couples is still low in Japan, but among cohorts born in the 1980s and later, these new patterns of family formation have been increasing. Since these changes could lead to a rise in fertility rates for women in their 20s in the near future, we need to pay attention to these trends.

## References

- Andersson, Gunnar and Dimiter Philipov. 2001. "Life-Table Representations of Family Dynamics in 16 FFS Countries." *MPIDR Working Paper Series, WP 2001-024*, Rostock, Germany: Max-Planck Institute for Demographic Research.
- Billari, Francesco C. 2005. "Partnership, Childbearing and Parenting: Trends of the 1990s," Pp.63-94 in M. Macura, A. L. MacDonald and W. Haug (eds.), *The New Demographic Regime: Population Challenges and Policy Responses*. New York and Geneva: United Nations.
- Frejka, Tomas and Gérard Calot. 2001. "Cohort reproductive patterns in low-fertility countries," *Population and Development Review*, 27 (1): 103-132.
- Ishikawa, Akira. 1995. "Statistical Comparison between Legal and Common-Law Marriage in

- Japan,” *Journal of Population Problems* 50(4):45-56. (in Japanese)
- Iwasawa, Miho.2002. “On the Contribution of the Changes in First Marriage Behaviour and Married Women’s Reproductive Behaviour to the Recent Decline in TFR of Japan,” *Journal of Population Problems*,58-3:15-44(in Japanese).(Paper presented at Joint Eurostat-UNECE Work Session on Demographic Projections, Vienna, Austria (21-23 September)).
- Iwasawa, Miho. 2005. “Cohabitation in Japan.” Pp. 71-106 in *Family Attitudes in an Era of Lowest-Low Fertility*, edited by Mainichi Newspaper Population Research Council. Tokyo: Mainichi Shimbunsha (in Japanese).
- Kaneko, Ryuichi.2003. “Elaboration of the Coale-McNeil Nuptiality Model as The Generalized Log Gamma Distribution,” *Demographic Research*, 9(10):223-262.
- Kaneko, Ryuichi.2007. “Population Prospects from the Lowest Fertility with the Longest Life: The New Official Population Projections for Japan and their Life Course Approaches” Paper presented at the Joint Eurostat/UNECE Work Session on Demographic Projections Organized in cooperation with the National Institute of Statistics of Romania (INSSE),Bucharest, Romania, 10-12 October.
- National Institute of Population and Social Security Research (NIPSSR). 2007. *Nihon no Syorai Suikei Jinko (Population Projection for Japan: 2006-2055)*, Tokyo: Kosei Tokei Kyokai.
- Raymo, James M., Miho Iwasawa, and Larry Bumpass. 2004. “Marital Dissolution in Japan: Recent Trends and Differentials,” *Demographic Research* 11:395-419.
- United Nations, Population Division.2003. *Partnership and Reproductive Behaviour in Low-fertility Countries*, ST/ESA/SER.A/221.

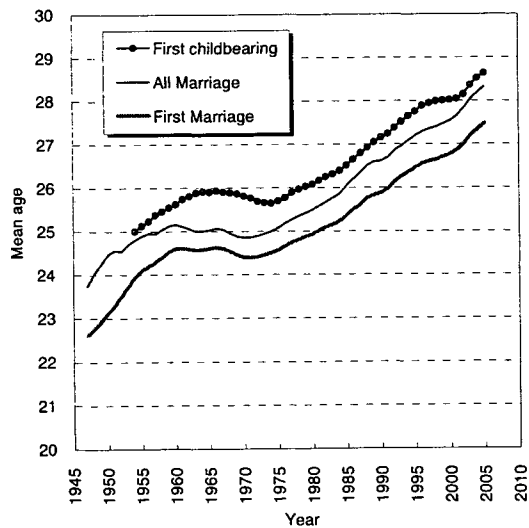


Table 1: Low-fertility regions by selected partnership characteristics

Age at first marriage	Prevalence of			Region
	Marriage	Cohabitation	Divorce	
Low	High	High	Low	
			High	
		Low	Low	Eastern Europe (bu,pl,ro,yu)
	Low	High	High	Eastern Europe (cz,hu,it,md,ru)
			Low	
		Low	High	
High	High	High	Low	
			High	
		Low	Low	
	Low	High	High	Northern Europe, Western Europe, Northern America, Australia/New Zealand
			Low	Eastern Asia, Southern Europe
		Low	High	<b>JAPAN?</b>

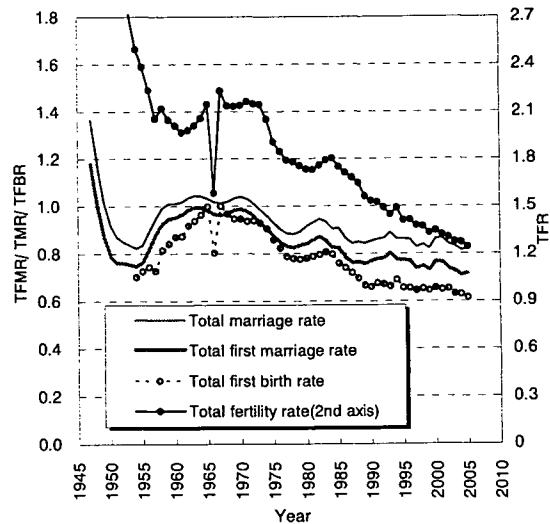
Source: UNPD(2003)(rearranged by the authors).

Figure 1: Mean age at first marriage, all marriage, and first childbearing among Japanese women



Data: Vital Statistics in Japan (own calculations based on age-specific marriage rates and fertility rates of Japanese women).

Figure 2: Total fertility rates, total (first) marriage rates, and total first birth rates among Japanese women



Data: Vital Statistics in Japan (own calculations based on age-specific marriage rates and fertility rates of Japanese women).

Figure 3: Cumulative age-specific first marriage rates: Actual values and assumptions, birth cohort 1935-1990

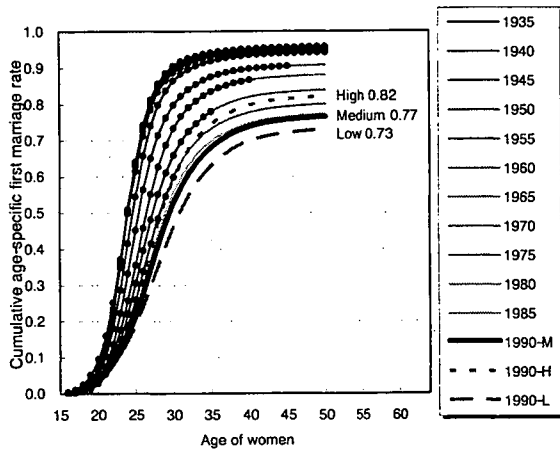


Figure 4: Differences in cumulative cohort first marriage rates between base and subsequent cohorts

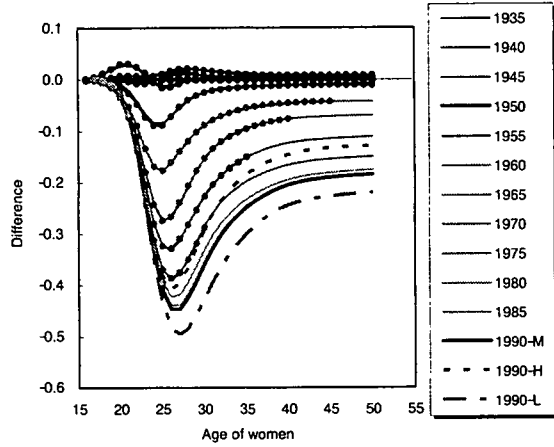
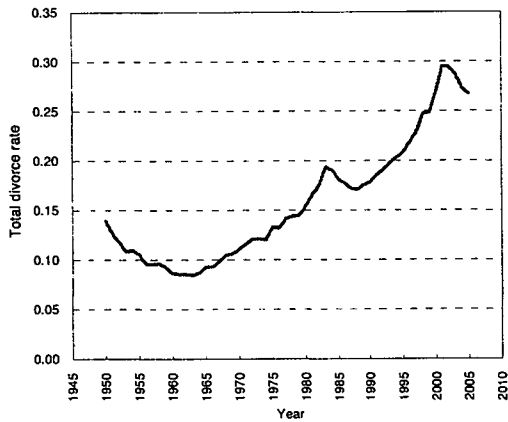


Figure 5: Total divorce rates among Japanese Women



Data: Vital Statistics in Japan (own calculations based on age-specific divorce rates of Japanese women).

Figure 6: Cumulative divorce rates among women who have been married at least once: Actual values and assumptions, birth cohort 1935-1990

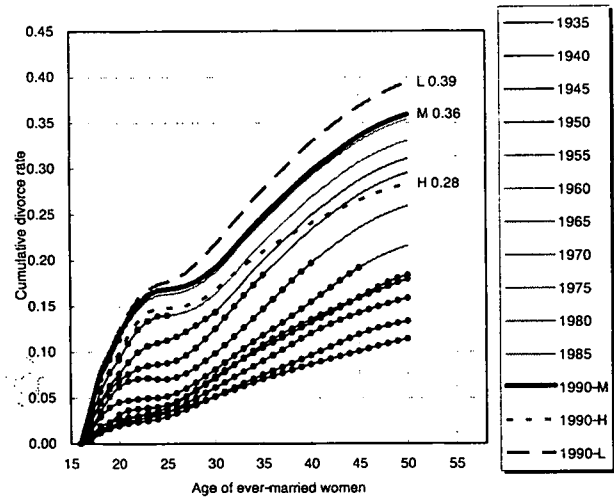
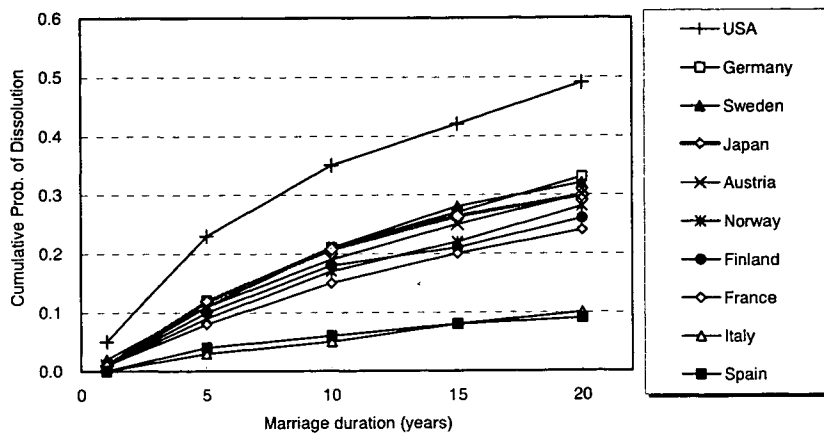


Figure 7: Cumulative probability of marital dissolution by marriage duration (Life table estimates): Selected countries



Sources: For Japan, Raymo, Iwasawa, and Bumpass(2005, 2006). For others, Andersson and Philipov(2001)

Figure 8: Marital status of women at age 50: Actual values and medium assumptions, birth cohort 1930-

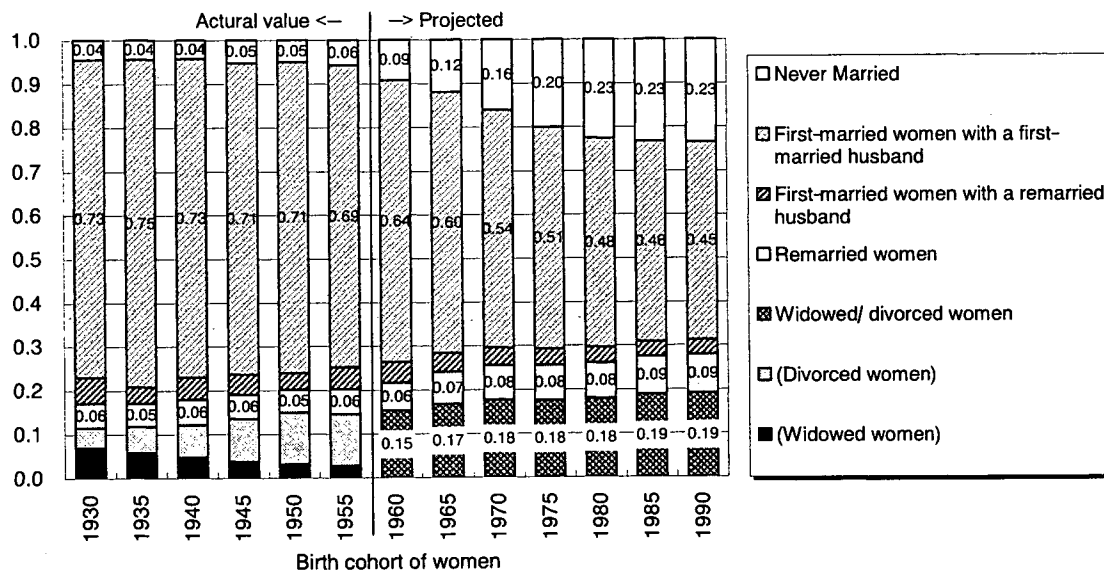
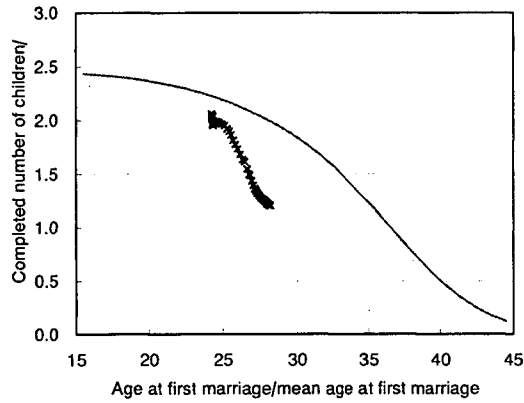


Figure 9: Completed number of children of first married couples by wife's age at first marriage and CTFRs by mean age at first marriage



Data: Women aged 40-49 in the 7th -13th Japanese National Fertility Survey (NIPSSR).

Figure 10: Simulated results with respect to marital behavior and medium assumption for cohort total fertility rates, birth cohort 1935-1990

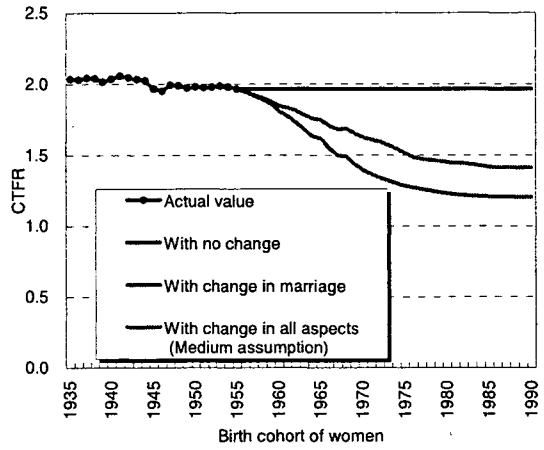
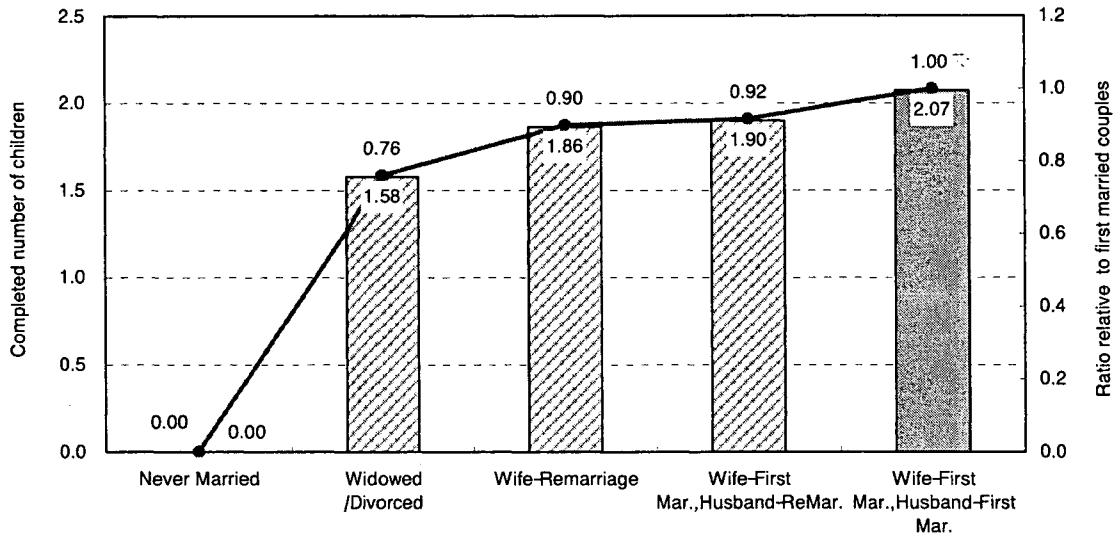


Figure 11: Completed number of children by marital status and relative ratio to first marriage couples



Data: Women aged 40-49 in the 13th Japanese National Fertility Survey (2005).

Figure 12: Association between the proportion of women with divorce experience at age 50 and the  $\beta$

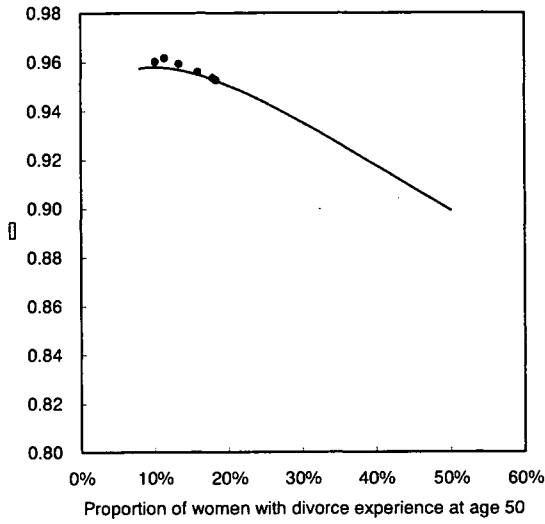


Figure 13: Simulated results with respect to divorce behavior and medium assumption for cohort total fertility rates by birth cohort of women

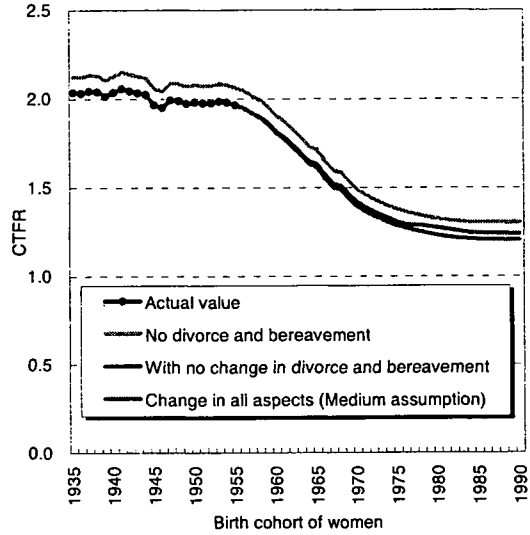
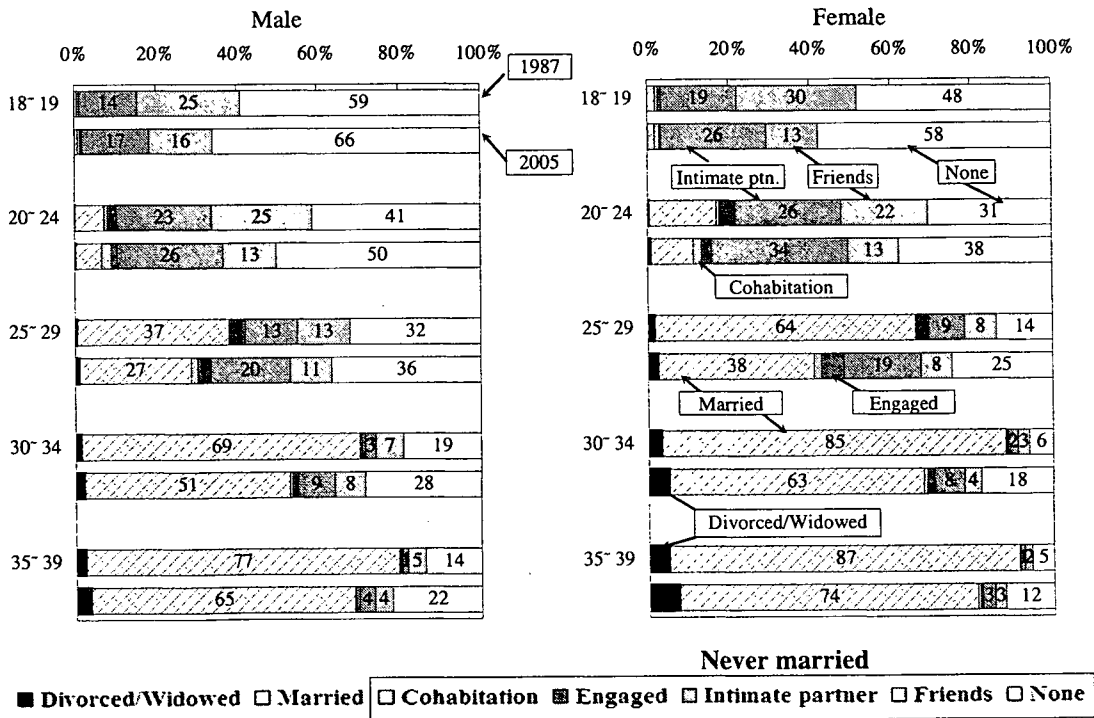
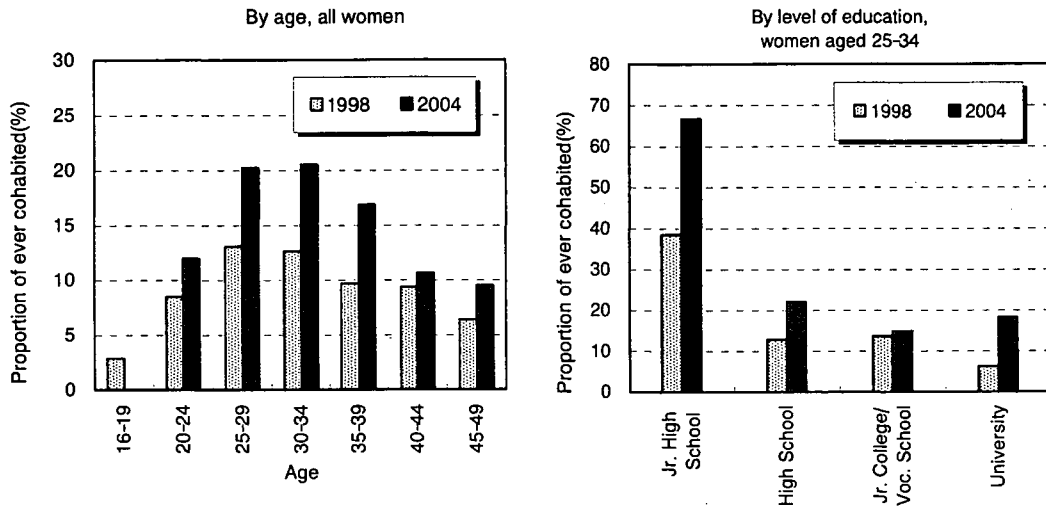


Figure 14: Partnership status by age group in 1987 and 2005



Data: Japanese National Fertility Survey in 1987, 2005 (NIPSSR)

Figure 15: Proportion of women who have ever cohabited: 1998 and 2004



Source: Own calculations from the 24th National Survey on Family Planning (1998) and the 1st SPFG(2004) conducted by the Population Problems Research Council, the Mainichi Newspapers(Iwasawa 2005).

Figure 16: Age-specific non-marital fertility rates: 1990 and 2005

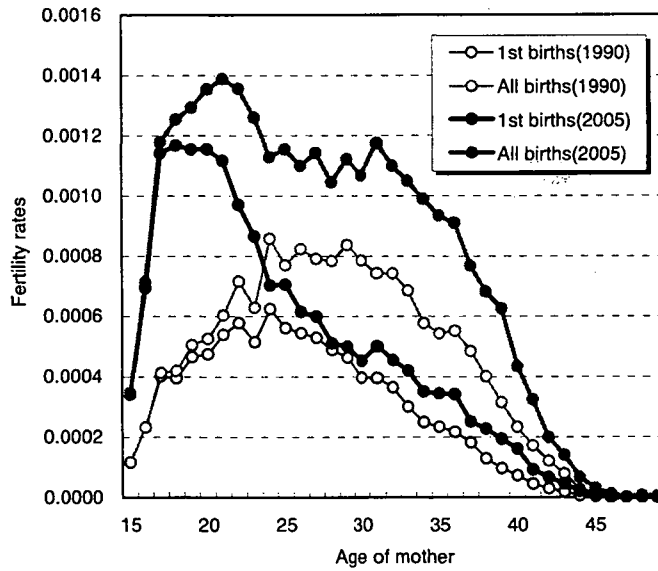


Table 2: Cohort indices based on medium variant assumptions for future fertility trends

Cohort Index (Japanese Women)		Women's birth cohort										
		1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
Proportion never-married		5.8%	9.3%	12.0%	16.2%	20.0%	22.6%	23.3%	23.5%	23.6%	23.6%	23.6%
Mean age at first marriage		24.9	25.7	26.5	27.0	27.5	27.9	28.1	28.2	28.2	28.3	28.3
CTFR		1.96	1.81	1.61	1.39	1.28	1.23	1.21	1.20	1.20	1.20	1.20
Completed number of children of first married couples		2.16	2.06	1.93	1.84	1.78	1.74	1.71	1.70	1.69	1.69	1.69
Distribution	Childless	12.7%	17.5%	22.7%	30.0%	34.3%	36.4%	37.4%	37.4%	37.4%	37.5%	37.5%
	One	11.8%	13.8%	16.9%	19.0%	18.9%	18.3%	18.1%	18.2%	18.2%	18.2%	18.2%
	Two	47.1%	43.5%	40.8%	36.0%	33.9%	33.4%	33.1%	33.1%	33.1%	33.1%	33.2%
	Three	23.4%	20.5%	15.8%	11.8%	10.2%	9.5%	9.4%	9.4%	9.4%	9.4%	9.4%
	Four or more	5.0%	4.7%	3.9%	3.3%	2.7%	2.3%	2.1%	1.9%	1.8%	1.8%	1.8%
Mean age at childbearing	All	28.2	28.7	29.3	29.7	30.0	30.2	30.3	30.3	30.3	30.3	30.3
	1st	26.3	27.0	27.8	28.4	28.7	29.0	29.1	29.1	29.1	29.1	29.1
	2nd	28.8	29.4	30.1	30.5	30.9	31.0	31.1	31.1	31.2	31.2	31.2
	3rd	31.3	31.6	32.0	32.3	32.6	32.7	32.9	33.0	33.1	33.1	33.1
	4th or more	33.7	34.0	34.3	34.4	34.5	34.6	34.7	34.7	34.7	34.8	34.8

Source: NIPSSR, Population Projection for Japan: 2006-2055 (2007).

## 6 死亡仮定に関する研究



## (1) わが国の平均寿命の動向と死亡率推計モデルの検討

石井 太

### はじめに

国立社会保障・人口問題研究所「日本の将来推計人口（平成14年1月推計）」においては、人口推計のための手法としてコーホート要因法が用いられている。死亡によるコーホート変動の推計には将来の生残率を用いるため、将来人口推計には将来の死亡率の推計が必要である。将来死亡率推計には死亡率推計モデルが用いられているが、適切な死亡率推計モデルの選択に際しては、平均寿命・死亡率の動向や利用可能なデータなどの観点を含め、総合的に判断する必要がある。実際、公式将来人口推計においても、平成9年推計では死因を考慮したモデルが採用されていたが、わが国の死亡率への適合性、人口動態統計の改定に伴う死因統計の接続性を考慮しつつ、平成14年推計ではLee and Carter (1992) によるLee-Carterモデルを修正したモデルが採用されたところである(小松 2002)。

本研究は、このような問題意識に基づき、わが国の平均寿命の動向およびその要因についての考察を行うとともに、死亡率推計モデルに関する検討を行うものである。

## 1. わが国の死亡動向

### 1.1 平均寿命伸長の年齢要因

わが国の平均寿命伸長の要因を年齢・死因構造などの観点から人口学的分析を行った先行研究としては、高橋(1982)、重松・南條(1981)などが挙げられる。しかしながら、最近の状況までを含めた人口学的分析は、近年それほど多いとはいえない状況にある。そこで、本研究では、まず、わが国の平均寿命伸長に関する人口学的な要因について、最近までの状況を踏まえ、包括的な分析を試みる。

はじめに、我が国の死亡率が戦後どのような推移をたどってきたか、その動向を述べる。1950～52年の死亡状況を表す第9回生命表によれば、平均寿命は男が59.57年、女が62.97年であり、男女差は3.40年であった。これ以降、我が国の死亡率は低下を続け、平均寿命も大幅に伸長をしてきたところである。2004年の簡易生命表によれば、平均寿命は男が78.64年、女が85.59年となっており、この間、男は19.07年、女は22.62年と約20年の平均寿命の伸長があったことになる。また、男女差も6.95年と第9回生命表の約2倍となっており、拡大傾向が続いてきている(図1)。

この平均寿命伸長の要因を、年齢階級別死亡率の寄与に分解したものが、図2、図3で

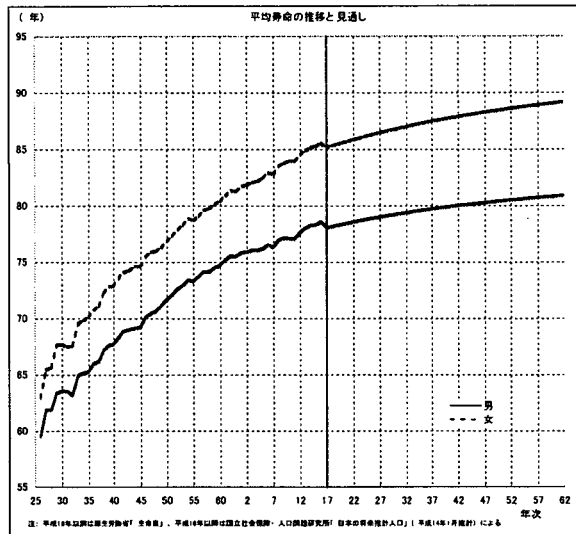


図1 平均寿命の推移と見通し

ある。ここでは、第9回生命表以降の各回の完全生命表及び2004年簡易生命表の間の平均寿命の伸びについて、15歳階級ごとの死亡率の寄与に分解したものを示した。なお、第9回生命表は作成基礎期間が1950～52年であることから便宜上1951年と表示している。第10回生命表以降の作成基礎期間は1955年から5年毎の単年である。また、特に、1975年以降については、より詳細に5歳階級としたものを図12、図13に示した。

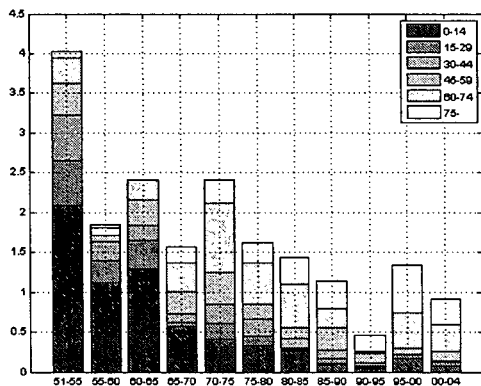


図2 平均寿命の伸びの要因分解 男

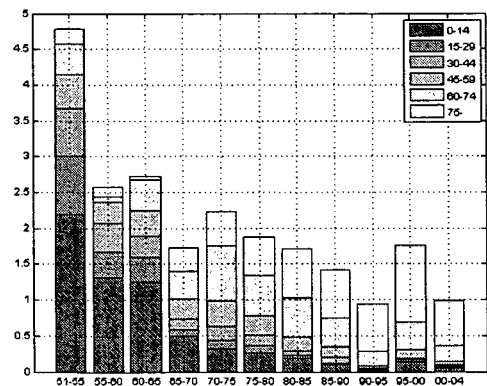


図3 平均寿命の伸びの要因分解 女

要因分解には Preston et al. (2001) の方法を用いた。その基本的な考え方は、異なる生命表間のある年齢の死亡率改善の平均寿命の伸びへの寄与を求めるに当たり、当該年齢より低い年齢には改善前、高い年齢には改善後の生命表の死亡率を仮定し、当該年齢の死亡率について改善前後の死亡率を用いた2種類の生命表を作成し、両者の平均寿命の差を

もってその年齢の死亡率の寄与とするものである。

この要因分解に基づいてこの50年間の平均寿命の伸長要因を年齢階級別に見てみると、男女とも1960年代前半までは、30歳未満の年齢階級の死亡率改善によるところが大きい。それ以降では高齢期における死亡率改善の影響が大きくなり、近年では平均寿命の伸長のかなりの部分が高齢期の死亡率改善の寄与によっていることが見て取れる。また、特に近年の女子の高齢期の死亡率改善の平均寿命の伸びへの寄与は大きく、これが男女の平均寿命格差の拡大をもたらしていることがわかる。

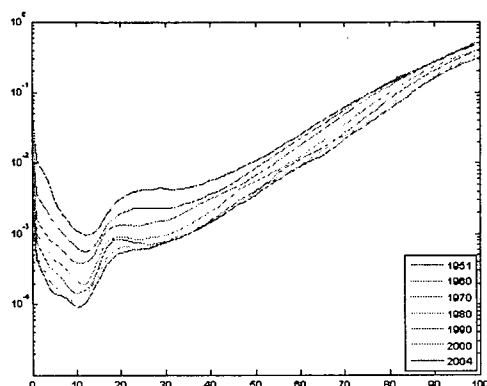


図4 年齢別死亡率(対数値)の推移 男

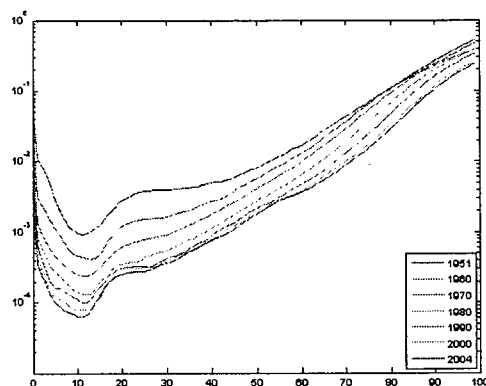


図5 年齢別死亡率(対数値)の推移 女

さらに、これらを年齢別死亡率のレベルで観察するため、図4、図5に第9回生命表から一つおき(概ね10年おき)の完全生命表及び2004年簡易生命表の男女それぞれの年齢別死亡率(対数値)をグラフに示した。これによれば、この50年間の年齢別死亡率は、男女とも、当初、低年齢における改善が起き、その後、高年齢における改善へと変わってきていることが分かる。

ところで、この近年における高年齢での死亡率の変化は、見方を変えると、死亡率曲線が高齢側にシフトしている動きと見ることもできる。すなわち、わが国の近年の高齢死亡率改善を年齢シフトという死亡状況の変化と捉えることができる可能性を示唆しているといえる。

しかしながら、これを確認するためには、平均寿命伸長がどのような要因で起きているのかについて、人口学的により詳細に観察する必要がある。そこで、次節において、平均寿命伸長要因に関する死因構造の要因分析を行うこととする。

## 1.2 平均寿命伸長の死因分析

死因別死亡数の長期的な年次観察を行うにあたっては、死因統計の連続性が問題となる。人口動態統計では目的に応じたいくつかの死因分類に基づいて統計表が作成されてい

るが、その中で、「死因年次推移分類表」とよばれる分類は、年次毎の死因の動向を観察することを主目的とした分類表である。そこで、本研究においても、この死因年次推移分類に準拠して観察を行うこととする。ただし、分類番号 Hi08「慢性気管支炎及び肺気腫」では、1967年以前については分類対応が完全でないことから、本研究では計上せず「その他の死因」に入れる扱いとした。また、分類番号 Hi12「腎不全」については、1978年以前については死因統計がないため、値が計上されていない。このため、腎不全に関する死因統計の連続性には注意が必要である。

さらに、わが国の死因別死亡統計に関してもう一点注意が必要な事項がある。図6はわが国の心疾患死亡者数の推移を示したものである。

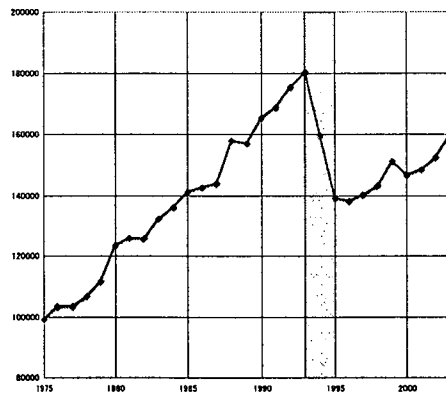


図6 心疾患死亡者数の推移

これを見ると、1993～1995年間の心疾患死亡者数の統計調査結果に大きな断絶が生じていることが分かる。これは、平成7(1995)年1月に施行された新しい死亡診断書(死体検案書)の「死亡の原因欄には、疾患の終末期の状態としての心不全、呼吸不全等は書かないで下さい」という注意書きが事前周知され、その影響によるものと考えられている。これに伴い、他の死因による死亡者数もこの影響を受け、この期間の前後における死因別死亡統計の接続性に問題が生じている。以下の分析においてはこの点にも留意が必要である。

さて、平均寿命の伸長の分析の前に、わが国の死因別死亡率の推移を年齢調整死亡率で俯瞰することとする。グラフに示したものが、図14、図15である。

男、女とも上側に1950年以降、下側には1975年以降の拡大図を示している。これによれば、わが国は1950年代、結核の死亡率が大きく減少し、死亡率低下に寄与した。これにより、わが国の死因構造は、感染症中心から生活習慣病中心へと変化したとされている。さらに、1960年代以降は脳血管疾患の死亡率低下が著しく、1980年代初頭に男女とも悪性新生物の死亡率を下回るまでに減少した。悪性新生物の死亡率については、男では1990年代前半までは増加ないし横ばいと傾向を示してきたところであるが、1990年代